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APPENDIX 0 – ACRONYMS

AA	American Airlines
AAC	Aircraft Approach Category
AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ABC	Airport Bridge Company
AC	Advisory Circular
ACM	Airport Certification Manual
ACRP	Airport Cooperative Research Program
ACS	Access Control System
ADA	Americans with Disabilities Act
ADF	Airport Development Fund
ADG	Airplane Design Group
ADRM	Airport Development Reference Manual
ADT	Average Daily Traffic
AEP	Airport Experience Program
AFFF	Aqueous Film Forming Foam
AGL	Above Ground Level
AHU	Air Handling Unit
AIG	Airport Infrastructure Grants
AIM	Aeronautical Information Manual
AIP	Airport Improvement Program
AIT	Advanced Imaging Technology
ALP	Airport Layout Plan
ALPU	Airport Layout Plan Update
ALSF	Approach Lighting System with Sequenced Flashing Lights
AMC	Airport Maintenance Campus
AMS	Auxiliary Marketing Services

ANSI	American National Standards Institute
AOB	Airport Office Building
AOC	Airport Operations Center
APC	Automated Passport Control
APE	Area of Potential Effect
APU	Auxiliary Power Unit
ARC	Airport Reference Code
ARFF	Aircraft Rescue and Fire Fighting
ARPA	American Rescue Plan Act
ASDE	Automated Surface Detection System
ASHRAE	American Society of Heating Refrigeration and Air Conditioning Engineers
ASOS	Automated Surface Observing System
ASR	Airport Surveillance Radar
AST	Aboveground Storage Tank
ASTM	American Standards for Testing Material
ASV	Annual Service Volume
ATADS	Air Traffic Activity Data Systems
ATCT	Air Traffic Control Tower
ATDS	Airport Technical Design Standard
ATI	Air Traffic International
ATMS	Advanced Transportation Management System
ATO	Airline Ticketing Office
ATS	Airport Terminal Services
AULA	Airport Use and Lease Agreement
BACS	Building Automation & Control System
BEA	Bureau of Economic Analysis
BHS	Baggage Handling System
BIL	Bipartisan Infrastructure Law
BRAC	Base Realignment and Closure

BSO	Baggage Service Office
C2ER	Council for Community and Economic Research
CAA	Clean Air Act
CADD	Computer-Aided Design Drafting
CAGR	Compound Annual Growth Rate
CARES	Coronavirus Aid, Relief, and Economic Security
CATEX	Categorical Exclusion
CBIS	Checked Baggage Inspection System
CBO	Congressional Budget Office
CBP	Customs and Border Protection
CBR	Community Business Rules
CBRA	Checked Bag Resolution Area
CBSA	Core-Based Statistical Area
CCE	Climate Control East
CCTV	Closed Circuit Television
CCW	Climate Control West
CDC	Center for Disease Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFS	Commodity Flow Survey
CHRC	Criminal History Records Check
CHRP	Central Heating & Refrigeration Plants
CIP	Capital Improvement Program
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CMP	Corrugated Metal Pipe
CMU	Concrete Masonry Unit
COLI	Cost of Living Index
CONOP	Concept of Operations
CONRAC	Consolidated Rental Car

COSA	City of San Antonio
CPE	Cost Per Enplanement
CR	Control Room
CRAC	Computer Room Air Conditioners
CRDF	Centralized Receiving Distribution Facility
CRRSA	Coronavirus Response and Relief Supplemental Appropriations
CUP	Central Utility Plant
CX	Concourse C Extension
CY	Calendar Year
DAS	Distributed Antenna System
DDFS	Design Day Flight Schedule
DME	Distance Measuring Equipment
DNL	Day-Night Average Sound Level
DOD	Department of Defense
DOT	Department of Transportation
EA	Environmental Assessment
EBEN	Eastbound Entrance
EBEX	Eastbound Exit
ECP	Equivalent Check-in Positions
EDS	Explosive Detection Systems
EGSE	Electric GSE
EIS	Environmental Impact Statement
EMS	Environmental Management System
EMT	Electrical Metallic Tubing
EOC	Emergency Operations Center
EOL	End of Life
EOS	End of Support
EPG	Engineering Policy Guide
EPS	Economic & Planning Services

EQA	Equivalent Aircraft
ERW	Electric Resistance Welded
ESA	Environmental Science Associates
ETD	Explosives Trace Detection
EVAC	Emergency Evacuation
EWG	East-West Gateway
F&B	Food and Beverage
FAA	Federal Aviation Administration
FACP	Fire Alarm Control Panel
FAF	Freight Analysis Framework
FAS	Fire Alarm System
FBO	Fixed Base Operators
FCA	Facility Condition Assessment
FCI	Facility Condition Index
FDA	Food and Drug Administration
FE	Federal Endangered
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Years
FHWA	Federal Highway Administration
FIDS	Flight Information Display System
FIRM	Flood Insurance Rate Map
FIS	Federal Inspection Service
FO	Fiber Optic
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FT	Federal Threatened
FURSAP	Formerly Utilized Sites Remedial Action Program
FWS	Fish & Wildlife Service

FY	Fiscal Year
GA	General Aviation
GAAP	Generally Accepted Accounting Principles
GARB	General Airport Revenue Bonds
GC	Ground Control
GCS	Glycol Collection System
GDP	Growth Domestic Product
GHG	Green House Gas
GIS	Graphical Information System
GPS	Global Positioning System
GPU	Ground Power Units
GSE	Ground Support Equipment
GTC	Ground Transportation Center
HCM	Highway Capacity Manual
HIRL	High Intensity Runway Lights
HMI	Human-Machine Interface
HS	Hot Spot
HVAC	Heating Ventilating and Air Conditioning
HVU	Heating and Ventilating Unit
I/O	Input / Output
IAF	Initial Approach Fixes
IATA	International Air Transport Association
IBC	International Building Code
ICAO	International Civil Aviation Organization
ICC	International Code Congress
ICE	Immigration & Customs Enforcement
IFC	International Fire Code
IFR	Instrument Flight Rules
ILS	Instrument Landing System

IMC	Instrument Meteorological Conditions
ISA	International Standard Atmosphere
ISO	International Organization of Standards
IT	Information Technology
JCI	Johnson Controls, Inc.
LC	Local Control
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LIB	Lambert International Boulevard
LIFR	Low Instrument Flight Rules
LLWAS	Low Level Windshear Alert System
LOC	Localizer
LOS	Level Of Service
LOU	Letter of Understanding
LWCA	Land and Water Conservation Act
MALS	Medium Intensity Approach Lighting System
MALSR	Medium Approach Light System with Runway Alignment Indicator Lights
MCC	Motor Control Center
MCP	Motor Control Panel
MDNR	Missouri Department of Natural Resources
MLW	Maximum Landing Weight
MMFO	Multimode Fiber Optic
MMS	Multi-Mode Strand
MMT	Mean Maximum Temperature
MOANG	Missouri Air National Guard
MODNR	Missouri Department of Natural Resources
MODOT	Missouri Department of Transportation
MOS	Modifications of Design Standards
MPC	Mobile Passport Control

MPFP	Mechanical Plumbing and Fire Protection
MPOE	Main Point of Entry
MRO	Maintenance, Repair and Overhaul
MSA	Metropolitan Statistical Area
MSD	Metropolitan Sewer District
MSE	Mechanically Stabilized Earth
MSL	Mean Sea Level
MTOW	Maximum Gross Takeoff Weight
MUFIDS	Multi-User Flight Information Display System
MVFR	Marginal Visual Flight Rules
NAAQS	National Ambient Air Quality Standards
NAC	Notification Appliance Circuit
NADP	Noise Abatement Departure Procedures
NAS	Network-Attached Storage
NAVAID	Navigational Aid
NB	Narrow Body
NBEG	Narrowbody Equivalent Gate
NCEI	National Centers for Environmental Information
NEC	National Electrical Code
NEPA	National Environmental Policy Act
NFDC	National Flight Data Center
NFPA	National Fire Protection Association
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory

NTAD	National Transportation Atlas Database
O&D	Origin and Destination
O&M	Operations and Maintenance
OCC	Operations Control Center
OEM	Original Equipment Manufacturer
OEW	Operating Empty Weight
OFA	Object Free Area
OS	Operating System
PA	Public Address
PAPI	Precision Approach Path Indicator
PARCS	Parking Access and Revenue Control System
PAS	Public Address System
PAX	Passengers
PBP	Professional Business Providers
PC	Personal Computer
PCI	Pavement Condition Indices
PEL	Planning and Environmental Linkages
PFC	Passenger Facility Charges
PHADPM	Peak Hour-Average Day-Peak Month
PHF	Peak Hour Factor
PHS	Public Health Services
PIC	Pilot in Command
PLB	Passenger Loading Bridges
PLC	Programmable Logic Controller
PM	Preventative Maintenance
PMAD	Peak Month Average Day
PPE	Personal Protective Equipment
PSU	Providers of Services for UAM
PTZ	Pan-Tilt-Zoom

RAC	Rent-A-Car
RCP	Reinforced Concrete Pipe
RCRA	Resource Conservation and Recovery Act
RDC	Runway Design Code
REDIM	Runway Exit Interactive Design Model
REIL	Runway End Indicator Lights
RJ	Regional Jet
RMC	Rigid Metal Conduit
RNAV	Area Navigation
RNP	Required Navigation Performance
ROD	Record of Decision
ROFA	Runway Object Free Area
ROM	Rough Order of Magnitude
RON	Remain Overnight
ROT	Runway Occupancy Time
RPP	Regional Price Parity
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RTU	Rooftop [Air Conditioning] Unit
RUL	Remaining Useful Life
RVR	Runway Visual Range
SAAS	San Antonio Airport System
SADF	Spent Aircraft Deicing Fluid
SARS	Severe Acute Respiratory Syndrome
SC	Supervisor/coordinator Combined
SCADA	Supervisory Control and Data Acquisition
SDP	Strategic Development Plan
SE	State Endangered
SEMA	State Emergency Management Agency

SHPO	State Historic Preservation Office
SIDS	Standard Instrument Departures
SIP	State Implementation Plan
SLC	Signaling Line Circuit
SM	Statute Mile
SME	Subject Matter Experts
SMFO	Single-Mode Fiber Optic
SMGCS	Surface Movement Guidance and Control System
SOP	Standard Operating Procedure
SRE	Snow Removal Equipment
SS / SM	Single Strand / Single Mode
SSCP	Security Screening Checkpoint
STA	Security Threat Assessment
STARS	Standard Terminal Arrival Routes
STIP	Statewide Transportation Improvement Plan
STLAA	St. Louis Airport Authority
STP	Surface Transportation Program
SUAS	Small Unmanned Aerial Systems
SWMM	Stormwater Management Model
SWPP	Storm Water Pollution Prevention Plan
T1	Terminal 1
T2	Terminal 2
TAB	Testing, Adjusting, and Balancing
TAC	Tactical Air Navigation System
TAF	Terminal Area Forecast
TAR	Tonnage per Area Ratio
TDG	Taxiway Design Group
TDZL	Touchdown Zone Lights
TE	Tech Electronics

TERPS	Terminal Instrument Procedures
TNC	Transportation Network Companies
TR	Telecom Room
TRACON	Terminal Radar Approach Control
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act
TSS	Threshold Siting Surfaces
UAM	Urban Air Mobility
UAS	Unmanned Aerial Systems.
UL	Underwriter Laboratories
UMSL	University of Missouri-St. Louis
UPS	Uninterruptible Power Supply
USACE	U.S. Army Corps of Engineers
USB	Universal Serial Bus
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USO	United Services Organization
UST	Underground Storage Tank
VALE	Voluntary Low Emissions Program
VFD	Variable Frequency Drive
VFR	Visual Flight Rules
VLAN	Virtual Local Area Network
VMC	Visual Meteorological Conditions
VOC	Volatile Organic Compounds
VOIP	Voice Over Internet Protocol
VOR	Very High Frequency Omnidirectional Range
VPN	Virtual Private Network
VSR	Vehicle Service Road

VSS	Video Surveillance System
VTOL	Vertical Take-Off and Landing
WB	Wide Body
WFS	World Flight Services
WHMP	Wildlife Hazard Management Plan
WTMD	Walk Through Metal Detector
WTO	World Trade Organization

APPENDIX 2A – SUSTAINABILITY INITIATIVES

2A.1 SUSTAINABILITY VISION

The Airport developed the EMS with a sustainable focus and adopted the definition of sustainability as a holistic approach to managing the Airport to ensure:

- The integrity of its economic viability, operational efficiency, natural resource conservation and social responsibility
- That future development meets the needs of the present without compromising the ability of future generations to meet their needs

2A.2 RECYCLING AND REUSING

Terminal concessionaires, aircraft passengers, and employees generate large quantities of waste. The Airport established initiatives to reduce the amount of waste and recycle or reuse it when possible.

SINGLE-STREAM RECYCLING

The Airport's single-stream recycling program consists of the following initiatives:

- Comprehensive terminal and concourse recycling program, including public containers for recyclable and waste containers in major pathways of terminals and concourses, as well as parking garages.
- Single stream collection system to capture more recyclables such as cardboard, aluminum, paper products and plastics.
- Recycling contract gives the Airport rebates for recyclables diverted from landfill:
  - over 416 tons of solid waste diverted from area landfills in 2019
  - diversion rate = 11.5%
- Extensive employee/tenant training to improve awareness about recycling and sustainability initiatives.
- The Airport is working toward the Mayor's sustainability initiative to have single stream recycling available at 100% of government buildings.

FOOD WASTE COMPOSTING

The Airport's food waste composting program consists of the following initiatives:

- The five restaurants in the Food Waste Composting Program at Terminal 1 composted 15.9 tons of food waste, collected from un-served waste and customer left-overs, to high grade agricultural compost for use on farms and gardens.

- STL received a $25,000 grant from St. Louis-Jefferson Solid Waste District. These funds were used to help defray the cost of recycling organic waste from the Airport restaurants, which is then composted and used for other purposes.

CONSTRUCTION MATERIAL AND EQUIPMENT REUSE AND RECYCLING

The Airport's construction material and equipment reuse and recycling program consists of the following initiatives:

- Construction contractors are required to recycle construction material such as concrete used for runway reconstruction, thus reducing the cost of purchasing materials.
- Donated the Airport's qualified surplus building materials to Habitat for Humanity, for reuse or resale. The donation supports the local community and avoids landfill disposal.
- Recycle used pallets.
- Recycle used electronics.
- Recycle used fluorescent bulbs and ballasts.

2A.3 WATER QUALITY

The Airport's water quality program consists of the following initiatives:

- Work with airline station managers to improve locations where aircraft deice within the collection area for glycol and implement a winter deicing protocol.
- Airlines at STL use a bio-based deicing fluid that is environmentally friendly and more cost effective for air carriers.

2A.4 WATER CONSERVATION

Potable water usage was examined to develop conservation recommendations in order to improve the efficiency of STL's water use. The Airport's water conservation program consists of the following initiatives:

- The Airport Experience Program (AEP) renovations included restroom remodeling in Terminal 1 and associated concourses. The restroom renovations included the installation of low flow fixtures that reduced the demand to about one half of that required by older fixtures.
- The sustainability policy for water conservation places requirements on water efficient fixtures.

2A.5 AIR QUALITY

The airport is located in non-attainment area for ozone (marginal) and PM2.5 (moderate). The Airport is eligible for 75/25% AIP participation under voluntary low emissions program (VALE) guidelines because it is a medium hub. VALE provides funding at airports with the intent of reducing emissions and improving air quality.

The largest sources of air emissions that operate at an airport are commercial aircraft, ground support equipment, and landside vehicles. The Airport's air quality program consists of the following initiatives:

- Green House Gas Emissions:
  - Green House Gas (GHG) inventories were conducted in 2005, 2010, 2013 and 2015, and showed significant GHG reductions (see **Table 2A-1**). As we expected, electricity usage is by far the largest contributor:
    - 2005: 84,949 Metric tons CO2e
      (i) Gov: Airport = 18,393 Metric tons CO2e (or 7%)
      (ii) Community: airport = 84,949 Metric tons CO2e (or 1%)
    - 2010: 78,484 Metric tons CO2e
    - 2013: 80,885 Metric tons CO2e
      (i) GOVERNMENT 2013 GHG Emission = 19,593 Metric tons CO2e
      (ii) COMMUNITY 2013 GHG Emission = 61,292 Metric tons CO2e
    - 2018:
      (i) Gov: Airport = 17,857 Metric tons CO2e (or 9%)
      (ii) Community: Airport = 71,453 Metric tons CO2e (or 1%)
- Airport vehicles:
  - Over 80% of the Airport's fleet is powered by alternative fuel vehicles, as summarized in **Table 2A-1**, such as compressed natural gas (CNG), Bio-Diesel, Electric, and Hybrid vehicles.
  - The airport operates a parking facility and provides shuttle service between parking area and the terminal. All shuttle buses run on CNG. The airport owns the vehicles and contracts with the third party for their operation and maintenance.
  - Private ground transportation fleets (such as taxis, limousines, hotel shuttles, TNC, etc.) are not required to operate clean vehicles at the Airport.
- Vehicle charging stations:
  - The Airport has electric vehicle charging stations on site.
  - The Airport has three CNG fueling stations on site, including a public use station.

Table 2A-1: Airport Vehicles Inventory

FUEL TYPE	FUEL TYPE CODE	NUMBER OF VEHICLES	PERCENTAGE OF FLEET
Unleaded	1	45	11%
Diesel B-20	2	82	19%
CNG/Unleaded	3	164	39%
CNG ONLY	4	54	13%
Propane	5	46	11%
Electric	6	3	1%
CNG/Diesel	7	19	4%
Propane/Unleaded	8	1	0%
Diesel/Electric	9	2	0%
Unleaded/Electric	10	5	1%
Others		3	0%
		424	100%

Sources: St. Louis Airport Authority, March 2020.

- Grants for improving air quality:
  - The Airport prioritizes acquiring funding to develop its own alternative fuel fleet, since the airport has direct control over those vehicles. It is also prioritizing gate electrification/electric ground power equipment for any additional funding opportunities.
  - 2012 VALE grant to purchase two zero emission vehicles for use by Airport Maintenance.
  - 2017 VALE grant to purchase 6 CNG buses
  - 2018 VALE grant for gate electrification (Gates A16, A18, A19 and A10): purchase of and installation of four electric preconditioned air units (PCAs) and five ground power units (GPUs) and electrical upgrades. Gate electrification, which provides electrical power for aircraft parked at the gates, eliminates the use of higher-emitting aircraft auxiliary power units (APUs) that use jet fuel and mobile ground generators that use diesel fuel. Gate electrification is considered zero emissions under the VALE program. Eliminating the fuel powered APUs and GPUs is a best management strategy.
  - The Airport was able to acquire two buses with VW grants
- County policies:
  - St. Louis County has an anti-idling policy prohibiting idling for more than three (3) consecutive minutes for any vehicle (other than emergency vehicles), unless the engine is being used to operate loading/unloading device (St. Louis County Air Pollution Control Code, Ordinance 612.340), which falls under its air pollution nuisance ordinance. The Airport operates its own police department who enforce the anti-idling policy in the secure areas of the Airport. County

police enforce the idling policy on the public access roads in the Airport. Violators can be fined up to $1,000.

2A.6 ENERGY REDUCTION

Electricity is the primary utility used at STL. The Airport's energy reduction program consists of the following initiatives:

- Partnered with Ameren to conduct a comprehensive energy efficiency study;
- Established a Utility Task Force that aims to reduce energy consumption, water usage and cost, through development of baseline energy use data, monitoring of utility usage, and integration of utility meters locations in the GIS map.
- Energy-efficient projects:
  - Installed more efficient LED lighting in work and office spaces, terminals, concourses, airfield (high mast lighting on apron) and parking garages.
  - Installed light occupancy sensors throughout the Airport.
  - Replaced light standards on the Airport-owned roads with energy efficient fixtures.
  - Installed new programmable thermostats.
  - Each aircraft gate can be served with electric equipment containing batteries. The increased electricity consumption came at a cost savings compared to avoidance of use of diesel, propane and jet fuel. The annual fuel savings were valued at a diesel cost of $14.67/MMBtu and jet fuel of $11.29/MMBtu. Another major benefit is the reduction in emissions pollution, which helps STL be a better neighbor and improves the quality of the work atmosphere. Additionally, the reduced emissions of carbon dioxide at the site outweigh the carbon footprint of electricity generation.
  - The next phase of the program is targeting replacement of building systems like chilled water pumps.
- Results:
  - Achieved a reduction of over 8.1 million kilowatts-hours of electricity demand per year
  - rebates through the BizSavers Program returned to the airport $490,642.
  - Ameren estimated that the efficiency projects would reduce STL energy costs by an average of $480,000 annually ($40,000 monthly).
- Three employees completed nationally recognized Building Operator Certification Program, focused on energy efficient building operations and preventative maintenance procedures.
- Realized savings of 30-40 percent from switching to a Transport Natural Gas account.
- Every kWh of electricity avoided by STL has a comparatively greater impact of GHG reductions than in other parts of the country because the 75 percent of the electricity in the grid in its region is generated by coal power plants. Using EPA's eGrid emissions rate for the Southeast Region, STL's energy efficiency efforts have resulted in approximately 8.4 million lbs. of CO_2e annually.

- Other on-Airport energy projects:
  - 2019 Ameren Solar Plant: a 1MW ground-mounted solar photovoltaic (PV) system is located at the intersection of Missouri Bottom Road and North Lindbergh Avenue, bordered by railroad tracks, and is in the extended centerline of Runway 12L/30R. The solar plant can supply electricity for up to 100 local homes. The climate mitigation benefits estimated to be 2,145,774 lbs. of CO_2 per year.
- STL received the Missouri Governor's Energy Efficiency Award in 2016 for its reduction in energy use.

2A.7 BIODIVERSITY

A Biodiversity Policy was developed to promote biodiversity, evaluate in-house operations, and incorporate biodiversity into the Airport's planning and development projects. The Airport's biodiversity program consists of the following initiatives:

- Two honey bee colonies with over 50 hives and 3 million bees, where each hive produces up to 800 pounds of honey each year, sold a local Farmer's Markets. Robins Apiaries leases a 400-square-foot patch, in a quiet, secluded area.
- Tender perennials and tropicals are reused for more than one growing season. They are stored in the Landscape building. LED lights and new benching were installed in 2018 to provide an environment for optimal plant growth.
- New plants are purchased from greenhouses that use best practices to include sustainability within their organization.
- Plant debris from the landscape is processed for recycling.
- Purchasing of soil and mulch is from local companies that incorporate sustainability practices in their operations.
- Eliminate invasive plants from the Airport landscape and replanting with Missouri native species that will require less irrigation once established.
- Landscaping team leaders have Public Operators pesticide license's which require training every 3 years by the Missouri Department of Agriculture.

APPENDIX 3A – COMPARISON OF STL ALPU FORECAST WITH FAA TERMINAL AREA FORECAST

Summarizing and Documenting Draft Airport Planning Forecasts
St. Louis International Airport (STL)

A. Forecast Levels and Growth Rates

Base year: 2019

						Average Annual Compound Growth Rates			
	2019	2020	2025	2030	2035	2019-2020	2019-2025	2019-2030	2019-2035
Passenger Enplanements									
Air Carrier	6,730,968	4,682,697	7,109,522	7,767,094	8,511,895	-30.4%	0.9%	1.3%	1.5%
Commuter	1,222,549	925,364	1,023,511	1,118,177	1,225,401	-24.3%	-2.9%	-0.8%	0.0%
TOTAL	7,953,517	5,608,062	8,133,033	8,885,271	9,737,297	-29.5%	0.4%	1.0%	1.3%
Operations									
Itinerant									
Air carrier	110,507	103,173	115,910	118,538	129,455	-6.6%	0.8%	0.6%	1.0%
Commuter/air taxi	75,100	77,403	66,155	68,070	72,375	3.1%	-2.1%	-0.9%	-0.2%
Total Commercial Operations	185,607	180,576	182,065	186,609	201,830	-2.7%	-0.3%	0.0%	0.5%
General aviation	6,446	5,889	6,446	6,446	6,446	-8.6%	0.0%	0.0%	0.0%
Military	1,412	1,546	1,546	1,546	1,546	9.5%	1.5%	0.8%	0.6%
Local									
General aviation	499	456	499	499	499	-8.6%	0.0%	0.0%	0.0%
Military	334	366	366	366	366	9.5%	1.5%	0.8%	0.6%
TOTAL OPERATIONS	194,298	188,832	190,921	195,465	210,686	-2.8%	-0.3%	0.1%	0.5%
Instrument Operations									
Peak Hour Operations	37	35	36	37	40	-3.0%	-0.3%	0.1%	0.5%
Cargo/mail (enplaned + deplaned tons)	75,000	83,000	80,000	86,000	93,000	10.7%	1.1%	1.3%	1.4%
Based Aircraft									
Single Engine (Nonjet)	0	0	0	0	0				
Multi Engine (Nonjet)	0	0	0	0	0				
Jet Engine	20	20	20	20	20	0.0%	0.0%	0.0%	0.0%
Helicopter	0	0	0	0	0				
Other	2	2	2	2	2	0.0%	0.0%	0.0%	0.0%
TOTAL	22	22	22	22	22	0.0%	0.0%	0.0%	0.0%

B. Operational Factors

	2019	2020	2025	2030	2035
Average aircraft size (seats)					
Air carrier	155.0	155.0	154.9	155.0	155.0
Commuter	49.2	46.3	46.7	47.4	48.0
Average enplaning load factor					
Air carrier	80.0%	60.1%	80.9%	86.3%	86.4%
Commuter	77.5%	59.8%	79.2%	82.7%	84.4%
GA operations per based aircraft	347	317	347	347	347

Comparison of Draft Airport Planning Forecast and FAA TAF

St. Louis International Airport (STL)

Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements			
2019	7,953,517	7,772,673	2.3%
2025	8,133,033	8,775,587	-7.3%
2030	8,885,271	9,545,175	-6.9%
2035	9,737,297	10,449,182	-6.8%
Commercial Operations			
2019	185,607	185,607	0.0%
2025	182,065	194,764	-6.5%
2030	186,609	209,946	-11.1%
2035	201,830	227,707	-11.4%
Total Operations			
2019	194,298	194,298	0.0%
2025	190,921	203,443	-6.2%
2030	195,465	218,625	-10.6%
2035	210,686	236,386	-10.9%

Note: TAF data is on a U.S. government fiscal year basis (October through September).

APPENDIX 3B – CRITICAL AIRCRAFT DETERMINATION

The critical aircraft determination is an important aspect of airport planning and design for federally obligated airports. It sets dimensional requirements for an airport, such as the distance between taxiways and runways, and ensures adequate facility development at the airport. Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5000-17, *Critical Aircraft and Regular Use Determination*, published in 2017, clarifies the definitions and methodology for determining the critical aircraft at an airport, as described in FAA AC 150/5300-13A, and how it should be used for planning and design purposes.

The critical aircraft is defined as "…a single aircraft or a composite of several different aircraft composed of the most demanding characteristics of each". The characteristics include physical aircraft size (wingspan) and approach speed. The FAA must approve the existing and future (20-year forecast) critical aircraft for the STL as part of the forecast process, which will then be used to determine applicable FAA design standards in facility planning and future design initiatives. The critical aircraft determination is also a key consideration in FAA decision-making for project justification. Beyond the airport-wide critical aircraft designation, during the airfield planning process, specific critical aircraft will be considered for the individual runways and taxiways, as appropriate based on their use.

Per the ACs identified above, a minimum of 500 annual operations (defined as "regular use") are required to establish the list of potential critical aircraft or "family" of critical aircraft. Identification of the STL "family" of critical aircraft is based on guidance from the ACs and the *2020 Airport Layout Plan Update (ALPU)* fleet mix forecast. **Table 3B-1** shows the most demanding aircraft projected to operate at STL with at least 500 annual operations through 2040; both aircraft are wide-body all-cargo aircraft operated by FedEx and UPS. The forecast number of aircraft operations are from the ALPU Planning Scenario 1, which assumes a three-year recovery period from COVID-19 traffic declines.

The previous Master Plan (2012) identified the STL critical aircraft as the Boeing MD-11, a D-IV aircraft. The current FY2020 critical aircraft is the "family" of D-IV aircraft, which includes the Boeing 767-300F/300ER and Boeing 757-300 passenger aircraft. The "critical aircraft "family" is anticipated to remain unchanged through the planning horizon (FY2040).

Table 3B-1: Most Demanding Aircraft Through 2040 (Based on STL ALPU Planning Scenario 1)

	AIRCRAFT OPERATIONS			
AIRCRAFT GROUP	FY2019 ACTUAL	FY2020 ESTIMATED	FY2030 FORECAST	FY2040 FORECAST
D-IV	**890**	**866**	**1,404**	1,463

APPENDIX 3C – FORECAST APPROVAL LETTER AND 2022 REVIEW

U.S. Department
of Transportation

**Federal Aviation
Administration**

Central Region
Iowa, Kansas
Missouri, Nebraska

901 Locust
Kansas City, Missouri 64106
(816) 329-2600

August 21, 2020

Mr. Dana L. Ryan
Planning and Development
St. Louis Lambert International Airport
11495 Navaid Road
Bridgeton, MO 63044

Dear Mr. Ryan:

Aviation Demand Forecast and Critical Design Aircraft Approval
St. Louis Lambert International (STL), Bridgeton, MO
AIP No. 3-29-0085-162-2019

The submitted Aviation Demand Forecast is approved.

The existing and ultimate family of Critical Design Aircraft, Airport Reference Code (ARC) D-IV: B767-300F/ER and B757-300, is approved.

Please have the operations numbers updated on your 5010 Master Record to match the current year information from the forecast.

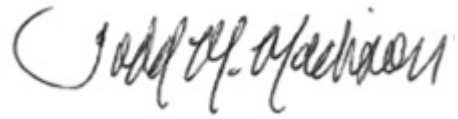
The comparison of the airport's aviation demand forecast to the FAA's Terminal Area Forecast (TAF) is within ten percent of the five year forecast period, and within fifteen percent of the ten year forecast period. The airport's forecast accounts for the COVID-19 pandemic and discusses sources of forecast risks in a post pandemic world, while the TAF does not because it was formulated and issued prior to the pandemic in January 2020. As a result, the airport's forecast has much lower projections of activity in the five and ten year time periods than the TAF.

The FAA acknowledges the disparity in the comparison between the airport's forecast and the TAF. In order to mitigate the disparity and associated risks posed by the pandemic, federal funding decisions will be based on current aviation demand at the time of the funding request. Should the airport sponsor request federal aid based on a forecast year, rather than actual activity level, then the forecast will need to be updated and approved by the FAA before federal funding can be considered for the requested project.

You may proceed with developing the remainder of the report and the Airport Layout Plan drawings.

If you have any questions regarding this project, please call me at (816) 329-2640 or via email at todd.madison@faa.gov.

Sincerely,



Todd M. Madison, P.E.
Missouri State Planner

cc: Jennifer Kuchinski, WSP USA Inc.
Amy Ludwig, MoDOT Aviation Section

MEMO

TO: Jerry Beckmann, Dana Ryan, STLAA

FROM: John van Woensel

SUBJECT: **STL Master Plan Aviation Demand Forecast Review and Proposed Interim Adjustments**

DATE: **September 30, 2022**

EXECUTIVE SUMMARY

This memo presents findings of a review of the August 2020 FAA-accepted forecast for the St. Louis Lambert International Airport (STL) Airport Layout Plan Update and Master Plan (ALPU/MP), and provides a recommendation of proposed adjustments to the forecast elements to be used during advanced planning and environmental studies for the terminal program. The review was conducted to determine if industry trends and the actual recovery of aviation demand at STL from the impacts of the COVID-19 pandemic warrant adjustments to the demand forecast elements. After reviewing actual STL fiscal year (FY) 2022 passenger enplanements, aircraft operations, aircraft fleet, and the FAA Terminal Area Forecast (TAF) for STL, as well as national FAA forecasts and other industry outlooks, we propose the following:

- Passenger Enplanements: STL is recovering very closely to the FAA-accepted forecast, with passenger enplanements tracking approximately 4.1% above the forecast for FY 2022[1]. While STL is recovering slightly faster than anticipated, we expect that in several years, growth is expected to track with the accepted forecast. There is no indication that the long-term growth projections are invalid or should be changed. However, international service to Europe materialized in 2022 instead of the forecast 2036. While the numbers are relatively low, because international passengers have a greater facility impact, these projected enplanements should be added to the totals for FY 2032 and FY 2037.
- Passenger Aircraft Fleet Mix: only minor adjustments to the commercial aircraft fleet mix are proposed, as a result of accelerated airline fleet modernization, including:
  - Replacing older aircraft models with newer versions of the same models (e.g., A319 to A319neo)
  - Reflecting the earlier-than-planned retirement of some aircraft (e.g., B717-200)

[1] STLAA's fiscal year ends each year on June 30th. Unless otherwise indicated, the information presented in this memo is based on STLAA's fiscal year.

  - Accelerating the elimination of smaller (50-seat) regional jets (RJ) (e.g., CRJ-200, CRJ-700, E135/140/145)

- Passenger Aircraft Operations: updating the fleet by swapping similarly-sized aircraft has no impact on seats and total aircraft operations; however, the elimination of small RJs does. Approximately 2,500 fewer aircraft operations are anticipated in FY 2037, reflecting the replacement of smaller regional jets with larger regional jets. It is assumed that this replacement does not, on average, increase regional seats or enplanements.
- Flight schedule: current airline schedules do not contain notable changes in peak hour activity and day-night split.
- Documentation: we recommend that this memo be shared with the FAA for their comment and concurrence; it would then become part of the official forecast record in the form of an amendment or appendix to the ALPU/MP forecast chapter. Detailed adjusted spreadsheets would be attached to the final version of this memo.

EXISTING CONDITIONS/BACKGROUND

The St. Louis Airport Authority (STLAA) is initiating advanced planning and preNEPA efforts for the proposed consolidated terminal at STL, which resulted from the 2022 ALPU/MP, also referred to as "the master plan". The current planning forecast (FAA term) for STL is the master plan forecast, which was accepted by the FAA in August 2020. Since the forecast was prepared and accepted in the early days of the COVID-19 global pandemic, the aviation industry has continued to see dramatic change: there was limited growth in FY 2021, then significant growth in FY 2022, partially recovering to FY 2019 activity.

This memo documents a review of recent aviation industry and local trends and data, and a recommendation of whether any adjustments to the forecast (or a new planning forecast) are warranted. The purpose of this analysis is to ensure that a valid and current forecast is used in the advanced planning and preNEPA efforts. While the master plan forecast focuses on five-year intervals through 2040, this analysis uses FY 2032/2033 and FY 2037/2038, because of the planned late-2031 (calendar year [CY]) full opening date of the new consolidated terminal.

ACTIVITY COMPARISON

Planning forecast projections of aviation demand for FY 2022 were compared with actual passenger enplanements, fleet mix data, and aircraft operations. Actual aircraft operations and enplanements were obtained from the *STLAA Activity Statistics Reports*; fleet mix data was obtained from STL's ANOMS database (actual), Airline Data, Inc (airline schedules), and industry news reports.

PASSENGER ENPLANEMENTS

STL and many other U.S. airports are strongly recovering from COVID-19. Given the high rates of growth being experienced during this recovery, a variation of 4.1% in actual enplanements represents a close tracking to the projected recovery enplanements. Passenger enplanements were forecast at 6,048,202 in FY 2022, compared to actual FY 2022 enplanements of 6,293,730.

Based on review and comparison with the following industry outlooks, there is no indication that the long-term outlook reflected in the planning forecast should change:

- Boeing Outlook: in its *2022 Commercial Market Outlook*, Boeing projects that global aviation activity will return to 2019 levels in the 2023 to 2024 timeframe, at which time long-term growth rates will return to pre-2019 levels. According to this forecast, passengers in North America are projected to increase at a compound annual growth rate (CAGR) of 2.6% for the next 20 years.
- FAA National Forecast: The FAA *Aerospace Forecast Federal FY (FFY) 2022 through FFY 2042* shows enplanements recovering in the U.S. to FFY 2019 levels by FFY 2024. Enplanements are projected to increase at a CAGR of 2.5% from FFY 2024 through FFY 2042, which is similar to long-term growth rates historically and projected prior to the COVID-19 pandemic.
- STL FAA TAF: The STL TAF projects that STL will reach FFY 2019 enplanement levels by FFY 2024. The TAF long-term growth rate for STL is a CAGR of 1.9% from FFY 2025 through FFY 2040. This rate is slightly higher than the long-term growth rate of 1.6% for the FAA-accepted forecast for the master plan.
- Southwest Airlines: As the air carrier with the highest passenger share at STL, the outlook for this carrier is important. Southwest Airlines is financially among the strongest airlines, and its national and STL recovery have been stronger than most. In the second quarter of CY 2022, Southwest Airlines posted record quarterly revenues that were 13% higher than those of the same quarter in CY 2019, as well as net income that was 2.6% higher than the same quarter of CY 2022, despite a 57.7% increase in fuel costs per gallon in the same quarter of FY 2019.

However, international service to Europe materialized in 2022 instead of the forecast 2036, with thrice weekly flights to Frankfurt, Germany, starting in June 2022. Although the associated enplanement numbers are relatively low, international passengers have a greater impact on facilities, and as such, these enplanements should be added to the projections for FY 2032 and FY 2037. It is estimated that approximately 60% of the Frankfurt enplanements is new traffic. The remaining 40% of Frankfurt enplanements are diverted from connecting flights to Europe (i.e. 40% of the Frankfurt enplanements would have occured at STL without the Frankfurt flight).

Currently, the Lufthansa flight to Frankfurt operates three times a week; with an assumed annual average 75% load factor and an average A330-300 seating capacity of 255, this represents approximately 30,000 enplanements per year, or 18,000 new enplanements (60% of 30,000). In 2032 and 2037, assuming five weekly flights, this represents approximately 50,000 annual enplanements, or 30,000 new enplanements.

Table 1 summarizes proposed enplanement adjustments to the master plan forecast.

Table 1: Passenger Enplanements Adjustments

	PASSENGER ENPLANEMENTS		
	FY 2022 (ACTUAL)	FY 2032	FY 2037
Master Plan Forecast		9,162,376	10,039,620
Lufthansa Service to Frankfurt (Estimated New Traffic)		30,000	30,000
Adjusted Forecast	**6,296,168**	**9,192,376**	**10,069,620**

Source: WSP USA, 2022.

PASSENGER AIRCRAFT FLEET MIX

Fleet mix projections were reviewed against the latest aircraft fleet changes. Only minor adjustments to the commercial aircraft fleet mix are proposed due to accelerated airline fleet modernization, including:

- Replacing older aircraft models with newer versions of the same models (e.g., A319 to A319neo)
- Reflecting the earlier-than-planned retirement of some aircraft (e.g., B717-200)
- Accelerating the elimination of smaller (50-seat) regional jets (RJ) (e.g., CRJ-200, CRJ-700, E135/140/145)

For example, Delta Air Lines announced in September 2020 that the B717-200 would be completely retired from its fleet by December 2025. This aircraft was assumed to still be operating in the 2037 forecast. In this forecast adjustment effort, the B717 will be replaced with the A220, for which Delta has placed a large order, and which was not included in the original FY 2022 fleet mix forecast. Likewise, some aircraft models were replaced with their more recent equivalent (e.g A319 with A319neo).

Table 2 summarizes the proposed aircraft substitutions and additions.

Table 2: Proposed Aircraft Model Replacements

AIRCRAFT TYPE	PROPOSED ACTION
A220	Add in 2032
A319	2032 & 2037: 50% become A319neo
A320	2032: 75% become A320neo & 25% become A320S
A320neo	Add in 2032
A321	2032: 50% of A321 become A321S, 50% become A321neo
A321neo	Add in 2032
A330-300	2032 & 2037: add to reflect new Frankfurt service by Lufthansa (5 flights/week)
B717-200	2032 & 2037: 100% become A220
B737MAX 7	Add in 2032
B737-700	2032: 75% become B737MAX 7; 2037: 100% become B737MAX 7
B737-800	2032: 75% become B737MAX 8; 2037: 100% become B737MAX 8
B737-900	2032: 75% become B737MAX 9; 2037: 100% become B737MAX 9
Canadair Regional Jet 200	2032: 90% become E175; 2037: 100% become E175
Canadair Regional Jet 700 (50 seats)	2032: 90% become E175; 2037: 100% become E175
Canadair Regional Jet 700	2032: 90% become E175; 2037: 100% become E175
E135/140/145	2032 & 2037: 100% become E175

Note:
A320S/A321S = with sharklets

Sources: WSP USA, 2022; CMT, 2022.

Table 3 compares average seats for the proposed aircraft fleet changes and indicates whether an adjustment in aircraft operations is required to keep the number of seats relatively the same.

Aircraft seats and operations for the CRJ-200, CRJ-700 (50 seats) and E135/140/145 were reassigned to the E175. Since the E175 has a larger seating capacity, the resulting number of total aircraft operations decreased to keep the total number of seats the same. This adjustment is consistent with carriers reducing service frequency to some smaller makets. It should also be noted that aircraft operations were added for the new flight from STL to Frankfurt, Germany, introducing the Airbus A330-300 to the fleet mix.

Table 3: Comparison of Average Aircraft Seats

MASTER PLAN FORECAST		FORECAST ADJUSTMENTS		AIRCRAFT OPERATIONS ADJUSTMENT?
Original Aircraft	Average Seats	Replacement Aircraft	Average Seats	
B717-200	110	A220	120	No
CRJ-200	50	E175	70	Yes
CRJ-700 (50 seats)	50	E175	70	Yes
CRJ-700	69	E175	70	No
E135/140/145	50	E175	70	Yes
B737-700/-700W	143	B737MAX 7	150	No
B737-800/-800W	175	B737MAX 8	175	No
B737-900/-900W	180	B737MAX 9	180	No

Sources: WSP USA, 2022; CMT, 2022.

AIRCRAFT OPERATIONS

A comparison of actual to forecast aircraft operations shows a 5.4% decrease (163,554 forecast versus 154,940 actual). This change is also in line with industry trends, as carriers continue to upgauge and reduce frequencies to smaller makets. **Table 4** summarizes the adjusted fleet mix for FY 2032 and FY 2037, as well as the corresponding aircraft operations numbers.

As shown in Table 4, as a result of fleet mix changes (larger aircraft replacing smaller aircraft and addition of the Lufthansa flight), a net small reduction in aircraft operations is anticipated for both FY 2032 (approximately 1,900 fewer aircraft operations) and FY 2037 (approximately 2,300 fewer aircraft operations).

Table 4: Proposed Adjustments to STL's 2020 Aviation Activity Forecast

	AIRCRAFT OPERATIONS			
AIRCRAFT TYPE	FY 2032 FORECAST	FY 2032 ADJUSTED	FY 2037 FORECAST	FY 2037 ADJUSTED
A220-100		2,590	-	2,832
A319	6,915	3,457	7,554	3,777
A319 neo	1,642	5,099	1,795	5,572
A320	1,387	-	1,503	-
A320S	-	347	-	376
A320 neo	-	1,041	-	1,128
A321	4,437	-	4,808	-
A321S	-	2,219	-	2,404
A321 neo	-	2,219	-	2,404
A300-600	556	556	546	546
A330-300	-	520	-	520
B717-200	2,590	-	2,832	-
B737-700W	63,026	15,757	64,113	-
B737-700	9	2	10	-
B737-800W	15,154	3,789	18,972	-
B737-800	14,002	3,500	15,310	-
B737-900W	699	175	765	-
B737-900	1,439	360	1,573	-
B737MAX 7	-	47,277	-	64,123
B737MAX 8	8,434	30,302	11,624	45,907
B737MAX 9	-	1,604	-	2,338
B 757-200	28	28	-	-
B767-300	1,422	1,422	1,463	1,463
CRJ 200	3,736	374	4,018	-
CRJ 700 (50 seats)	1,151	115	1,259	
CRJ 700	7,130	713	7,779	-
CRJ 900	7,562	7,562	8,161	8,161
Cessna Single	11,089	11,089	11,642	11,642

Single TP	6,427	6,427	6,798	6,798
E170	485	485	530	530
E175	7,601	20,065	8,311	23,036
E175W	7,346	7,346	8,032	8,032
E190	-	-	-	-
E135/140/145	4,068	-	4,448	-
MD-11	4	4	-	-
Tecnam P2012	421	421	442	442
B787-800	-	-	208	208
Other	2,246	2,246	2,283	2,283
Total Passenger/Cargo Aircraft Operations	**181,007**	**179,108**	**196,783**	**194,525**

Source: WSP USA, 2022.

APPENDIX 4A – RUNWAY EXIT DESIGN INTERACTIVE MODEL (REDIM) ASSUMPTIONS

Table 4A-1: Runway 11 Fleet Mix

AIRCRAFT TYPE	EXISTING %	FUTURE %
CRJ7	12	12
B737	9	13
E145	9	9
B738	7	10
C402	7	8
CRJ9	7	11
A319	5	5
C208	5	5
CRJ2	5	-
E75L	5	5
E45X	4	4
MD88	4	-
MD90	4	-
A320	3	3
B712	2	2
B739	2	2
E75S	2	1
A321	1	1
B734	1	1
B752	1	1
BE40	1	1
C56X	1	1
E135	1	1
E170	1	4
MD83	1	-

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*, August 2, 2020; CMT, August 2020 (analysis).

Table 4A-2: Runway 29 Fleet Mix

AIRCRAFT TYPE	EXISTING %	FUTURE %
CRJ7	12	13
E145	12	10
B737	10	14
CRJ9	7	10
B738	6	10
CRJ2	6	-
E45X	6	6
C402	5	5
E75L	5	5
MD90	4	-
A319	3	3
C208	3	5
MD88	3	-
A320	2	2
B712	2	2
B739	2	2
E170	2	2
A321	1	2
B733	1	1
B734	1	1
B752	1	1
BE40	1	1
C172	1	1
C56X	1	1
E135	1	1
E75S	1	2
MD83	1	-

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*, August 2, 2020; CMT, August 2020 (analysis).

Table 4A-3: Runway 6 Fleet Mix

RIGHT EXITS			LEFT EXITS		
AIRCRAFT TYPE	EXISTING %	FUTURE %	AIRCRAFT TYPE	EXISTING %	FUTURE %
C402	60	59	C208	67	65
B737	10	14	BE40	5	5
B738	6	6	C56X	4	4
CRJ7	3	3	C310	3	3
A319	2	2	CL30	2	2
CRJ2	2	-	B752	2	2
CRJ9	2	3	C172	1	2
E45X	2	1	CL60	1	1
A320	1	1	C182	1	1
B712	1	1	C25A	1	1
B733	1	1	E55P	1	1
B734	1	1	BE55	1	1
B739	1	1	BE9L	1	1
E135	1	1	B190	1	1
E140	1	-	B350	1	1
E170	1	1	BE36	1	1
E75L	1	2	BE58	1	1
E75S	1	1	C152	1	1
MD82	1	-	C441	1	1
MD88	1	-	C680	1	1
MD90	1	-	GLF4	1	1
E145	-	2	H25B	1	1
			HDJT	1	-
			LJ40	-	1
			LJ75	-	1

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*, August 2, 2020; CMT, August 2020 (analysis).

Table 4A-4: Runway 24 Fleet Mix

RIGHT EXITS			LEFT EXITS		
AIRCRAFT TYPE	EXISTING %	FUTURE %	AIRCRAFT TYPE	EXISTING %	FUTURE %
C56X	11	12	C402	32	32
C310	9	9	C208	24	24
BE58	4	2	B737	12	13
B190	4	3	CRJ7	6	6
CL30	3	3	B738	5	6
C680	3	4	CRJ9	3	5
CL60	3	3	E145	3	3
EA50	3	1	CRJ2	2	-
GLF4	3	3	E75L	2	2
PC12	3	2	A319	1	1
C182	2	1	A320	1	1
C560	2	2	A321	1	1
C750	2	2	B712	1	1
CL35	2	2	B733	1	1
E545	2	1	C172	1	1
GLF5	2	2	E170	1	1
H25B	2	2	E45X	1	1
PA31	2	2	E75S	1	1
A306	1	1	MD83	1	-
AC50	1	1	MD90	1	-
B350	1	1			
B734	1	1			
B763	1	1			
BE20	1	1			
BE30	1	2			
BE33	1	1			
BE40	1	4			
BE55	1	1			

BE9L	1	2			
C177	1	1			
C206	1	1			
C25A	1	1			
C25B	1	1			
C25C	1	1			
C340	1	1			
C421	1	1			
C525	1	1			
C550	1	1			
DA40	1	1			
E135	1	2			
E55P	1	3			
F2TH	1	1			
F900	1	1			
FA20	1	1			
G280	1	1			
GL5T	1	1			
CLEX	1	1			
GLF6	1	1			
LJ35	1	1			
LJ45	1	1			
LJ60	1	1			
P28A	1	1			
P32R	1	1			
P46T	1	1			
PA32	1	-			
PA46	1	-			

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*, August 2, 2020; CMT, August 2020 (analysis).

Table 4A-5: Runway 12R Fleet Mix

RIGHT EXITS			LEFT EXITS		
AIRCRAFT TYPE	EXISTING %	AIRCRAFT TYPE	EXISTING %	AIRCRAFT TYPE	EXISTING %
B737	35	36	B734	13	14
B738	13	15	C56X	9	10
C402	10	10	B752	7	8
E145	5	3	A306	5	6
C208	4	4	BE40	5	6
A139	4	4	C680	5	2
CRJ7	4	4	CL30	5	4
CRJ9	3	5	E135	5	6
E75L	3	3	B763	4	3
B733	3	3	CL60	4	4
CRJ2	2	-	E55P	4	3
MD83	2	-	PC12	2	2
A321	2	4	CL35	2	2
E45X	2	2	G280	2	2
E170	1	3	GLF4	2	2
E75S	1	1	GLF5	2	2
B739	1	1	H25B	2	2
A320	1	1	B190	1	1
MD82	1	-	B350	1	1
MD90	1	-	B762	1	1
MD88	1	-	BE20	1	1
B712	1	1	C172	1	1
			C25A	1	1
			C25B	1	1
			C525	1	1
			C550	1	1
			C560	1	1
			C750	1	1

			E190	1	1
			E545	1	1
			F2TH	1	1
			F900	1	1
			GALX	1	1
			GL5T	1	1
			GLF6	1	1
			LJ35	1	1
			LJ45	1	1
			LJ60	1	1
			LJ75	1	1

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*, August 2, 2020; CMT, August 2020 (analysis).

Table 4A-6: Runway 30L Fleet Mix

RIGHT EXITS			LEFT EXITS		
AIRCRAFT TYPE	EXISTING %	AIRCRAFT TYPE	EXISTING %	AIRCRAFT TYPE	EXISTING %
B734	12	13	B737	37	39
B752	10	10	B738	14	16
A306	7	9	C402	12	12
B763	7	7	C208	5	5
C680	7	4	A319	4	4
CL30	6	7	B733	3	3
CL60	5	4	CRJ7	3	3
E135	5	3	A321	2	2
E55P	4	4	CRJ9	2	4
BE40	3	3	E145	2	1
C750	2	2	E75L	2	2
CL35	2	2	E75S	2	2
DC10	2	2	MD83	2	
G280	2	2	A320	1	1
GLF4	2	2	B712	1	1

GLF5	2	2	B739	1	1
B190	1	1	C56X	1	1
B350	1	1	CRJ2	1	-
B762	1	1	E170	1	2
BE20	1	1	E45X	1	1
C25A	1	1	MD82	1	-
C25B	1	1	MD88	1	-
C525	1	1	MD90	1	-
C550	1	1			
C560	1	1			
E190	1	3			
E545	1	1			
F2TH	1	1			
F900	1	1			
GALX	1	1			
GLEX	1	1			
GLF6	1	1			
LJ35	1	1			
LJ45	1	1			
LJ60	1	1			
LJ75	1	1			
PA31	1	1			
PC12	1	1			

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*, August 2, 2020; CMT, August 2020 (analysis).

Table 4A-7: Runway 12L Fleet Mix

RIGHT EXITS			LEFT EXITS		
AIRCRAFT TYPE	**EXISTING %**	**AIRCRAFT TYPE**	**EXISTING %**	**AIRCRAFT TYPE**	**EXISTING %**
B737	37	39	C56X	11	12
B738	14	16	CL30	6	7
C402	6	6	B752	7	9

CRJ7	5	5	C680	6	3
E145	5	5	A306	5	8
A319	4	4	C750	4	2
B733	4	4	CL60	5	6
C208	3	3	PC12	5	3
CRJ9	3	5	E55P	4	4
A321	2	2	BE40	3	3
CRJ2	2	-	CL35	2	2
E45X	2	2	G280	2	2
E75L	2	2	GLF4	2	2
MD83	2	-	GLF5	2	2
A320	1	1	H25B	2	2
B712	1	1	LJ75	2	2
B734	1	1	B762	1	1
B739	1	1	BE20	1	1
B763	1	1	C172	1	1
E170	1	1	C25B	1	1
E75S	1	1	C525	1	1
MD82	1	-	B737	1	-
MD88	1	-	BE9L	1	1
MD90	1	-	C310	1	1
			B190	1	1
			C25A	1	1
			C560	1	1
			AC50	1	1
			B350	**1**	1
			BE30	1	1
			C550	1	1
			E135	1	1
			E190	1	1
			E545	1	1
			F2TH	1	1

			F900	1	1
			FA10	1	1
			GALX	1	1
			GL5T	1	1
			GLF6	1	1
			LJ35	1	1
			LJ40	1	1
			LJ45	1	1
			LJ60	1	1
			MD11	1	-
			P46T	1	1
			PA31	1	1
			SR22	1	-

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*, August 2, 2020; CMT, August 2020 (analysis).

Table 4A-8: Runway 30R Fleet Mix

RIGHT EXITS			LEFT EXITS		
AIRCRAFT TYPE	**EXISTING %**	**AIRCRAFT TYPE**	**EXISTING %**	**AIRCRAFT TYPE**	**EXISTING %**
C680	8	5	B737	34	36
B734	7	8	B738	13	15
B752	7	11	E145	6	6
CL60	6	7	C402	5	5
E55P	6	6	CRJ7	5	5
PC12	5	4	A319	4	4
A306	4	5	CRJ9	4	7
B738	3	-	B733	3	3
B763	3	3	CRJ2	3	-
BE40	3	3	E75L	3	3
G280	3	3	A321	2	3
GLF4	3	3	C208	2	2
H25B	3	3	C56X	2	2

C560	2	2	E45X	2	2
C750	2	2	MD90	2	-
CL35	2	2	A320	1	1
F2TH	2	2	B712	1	1
GLF5	2	2	B739	1	1
LJ75	2	2	CL30	1	1
AC50	1	1	E170	1	2
B190	1	1	E75S	1	1
B350	1	1	MD11	1	-
B762	1	1	MD82	1	-
BE20	1	1	MD83	1	-
BE58	1	1	MD88	1	-
BE9L	1	1			
C172	1	1			
C25A	1	1			
C25B	1	1			
C310	1	1			
C525	1	1			
C550	1	1			
E135	1	1			
E190	1	1			
E545	1	1			
F900	1	1			
FA10	1	1			
GALX	1	1			
GL5T	1	1			
GLF6	1	1			
LJ35	1	1			
LJ40	1	1			
LJ45	1	1			
LJ60	1	1			
P46T	1	1			

PA31	1	1			

Sources: St. Louis Airport Authority, *L3 Harris Operations Data,* 2016-2019 (aircraft operations); Unison, *Aviation Activity Analysis and Forecasts*

Table 4A-9: REDIM Airport Inputs

INPUT	VALUE
Airport Elevation (MSL)	618 Feet
Average Airport Temperature	56 °F
Surface Condition	88% Dry 12% Wet

Source: FAA National Flight Data Center (NFDC), National Climatic Data Center (NCDC), Station WBAN 13994, data recorded for the period of 01/01/2010 – 12/31/2019.

Table 4A-10: REDIM Runway Inputs

INPUT	RWY 11-29	RWY 6-24	RWY 12L-30R	RWY 12R	RWY 30L
Runway Landing Distance Available	9,001’	7,602’	9,003’	10,552’	10,819’
Runway Width	150’			200’	

Sources: Federal Aviation Administration, National Flight Data Center (NFDC), August 2, 2020; CMT, August 2020 (analysis)

APPENDIX 4B – DESIGN DAY FLIGHT SCHEDULE (DDFS)

Technical Supplement on the Development of Design Day Flight Schedules for Commercial Passenger Aircraft Operations at St. Louis Lambert International Airport

This Technical Supplement provides a summary of the development of Design Day Flight Schedules (DDFS) corresponding to the forecast of commercial passenger aircraft operations at St. Louis Lambert International Airport (STL). The DDFS details were provided to the Airport Layout Plan Update (ALPU) Team in Excel file format.

4B.1 DESIGN DAY

The design day was designated to be the peak month busy day, the third Thursday of July 2019 for the baseline flight schedules.

4B.2 DESIGN DAY FLIGHT SCHEDULES

DDFS are the most detailed of operational profiles derived from annual aviation activity forecasts. They break out the forecast flight arrivals and departures for the design day into a hypothetical schedule of individual flights, with corresponding flight details: airline operator, equipment type, number of seats, arrival time at STL, and departure time from STL. DDFS provide useful details for terminal planning.

For the STL ALPU, DDFS were prepared for forecast years 2025, 2030, and 2040.

Figure 4B-1 provides a snapshot of the DDFS for 2040.

4B.3 DDFS DEVELOPMENT PROCESS

The development of future DDFS was an iterative process. Using the actual flight schedules at STL for July 25, 2019 as a starting point, adjustments were made to achieve consistency with:

- The forecast decrease in annual operations from FY2020 to FY2025, the forecast increase from FY2025 to FY2030, and the forecast increase from FY2030 to FY2040.
- The forecast distribution of annual passenger aircraft operations (departures and arrivals) by airline, reflecting projected changes in airlines shares over the years.
- The forecast distribution of each airline's operations by aircraft type (fleet mix), reflecting projected aircraft retirements and replacements.

Figure 4B-1: Design Day Flight Schedule Snapshot

Scenario 1: Design Day Schedule Forecast 2040

TERMINAL	CARRIER	ARR TIME	DEP TIME	AC CODE	DESIGN CAT	SEATS	FREQUENCY
T2	WN	0:05	5:03	73W	3	143	1
T2	WN	0:15	5:07	73H	3	175	1
T1	AA	1:20	8:30	738	3	160	1
T2	WN	1:25	6:05	73W	3	143	1
T2	WN	5:10	6:52	73W	3	143	1
T2	WN	5:15	6:57	73W	3	143	1
T2	WN	5:15	6:57	73W	3	143	1
T2	WN	5:15	6:57	73W	3	143	1
T1	UA	5:48	6:30	320	3	150	1
T1	F9	5:59	6:41	321	3	230	1
T2	WN	6:00	6:42	73W	3	143	1
T2	WN	6:15	6:57	73W	3	143	1
T1	9K	7:05	7:47	CNA	2	9	1
T2	WN	7:10	7:52	73W	3	143	1
T2	WN	7:17	7:59	73W	3	143	1
T2	WN	7:20	8:02	7M8	3	175	1
T2	WN	7:20	8:02	73W	3	143	1
T1	3E	7:30	8:12	CNC	2	8	1
T2	WN	7:40	8:22	73W	3	143	1
T2	WN	7:40	8:22	73W	3	143	1
T2	WN	7:44	8:26	73W	3	143	1
T1	LF	7:50	8:32	ERJ	2	30	1
T2	WN	7:55	8:37	73W	3	143	1
T1	3E	8:00	8:42	CNC	2	8	1
T2	WN	8:00	8:42	73W	3	143	1
T1	9K	8:05	9:47	CNA	2	9	1
T2	WN	8:05	8:47	73W	3	143	1
T2	WN	8:05	8:47	7M8	3	175	1
T2	WN	8:05	8:47	73W	3	143	1
T1	AA	8:08	8:50	319	3	128	1
T2	WN	8:15	8:57	73W	3	143	1
T2	WN	8:17	8:59	73W	3	143	1
T1	DL	8:22	9:04	320	3	157	1
T2	WN	8:33	9:15	7M8	3	175	1
T1	AC	8:48	9:30	319	3	128	1
T1	9K	8:50	9:32	CNA	2	9	1
T1	AA	8:50	9:32	CR9	3	76	1
T1	9K	8:52	9:34	CNA	2	9	1
T1	9K	8:53	9:35	CNA	2	9	1
T2	WN	8:55	9:37	73W	3	143	1
T1	DL	9:03	9:45	320	3	157	1
T1	AA	9:04	9:46	738	3	160	1
T1	9K	9:06	9:48	CNA	2	9	1
T2	WN	9:07	9:49	73W	3	143	1
T2	WN	9:19	10:01	73W	3	143	1
T2	WN	9:20	10:02	73W	3	143	1
T2	WN	9:25	10:07	73H	3	175	1
T2	WN	9:25	10:07	73W	3	143	1
T2	WN	9:25	10:07	73W	3	143	1
T2	WN	9:25	10:07	73W	3	143	1
T2	WN	9:29	10:11	73W	3	143	1
T1	3E	9:30	10:12	CNC	2	8	1
T2	WN	9:30	10:12	73W	3	143	1
T2	WN	9:30	10:12	73W	3	143	1
T2	WN	9:30	10:12	73W	3	143	1
T2	WN	9:30	10:12	73W	3	143	1
T1	DL	9:32	10:14	CR9	3	76	1
T2	WN	9:40	10:22	73W	3	143	1
T2	WN	9:45	10:27	73W	3	143	1
T2	WN	9:50	10:32	73W	3	143	1
T2	WN	9:51	10:33	73W	3	143	1
T1	UA	9:55	10:37	ERJ	2	50	1
T2	WN	10:01	10:43	73W	3	143	1

TOTAL FREQUENCIES: 303

COLOR CODING KEY

- REMAIN OVERNIGHT AIRCRAFT 2025
- CHANGE OF GAUGE
- FLIGHT REMOVED
- FLIGHT REINSTATED
- FLIGHT ADDED
- REMAIN OVERNIGHT AIRCRAFT
- ADJUSTMENT TO MATCH FAA APPROVED FORECAST
- T1/T2 PEAK ADJUSTMENT

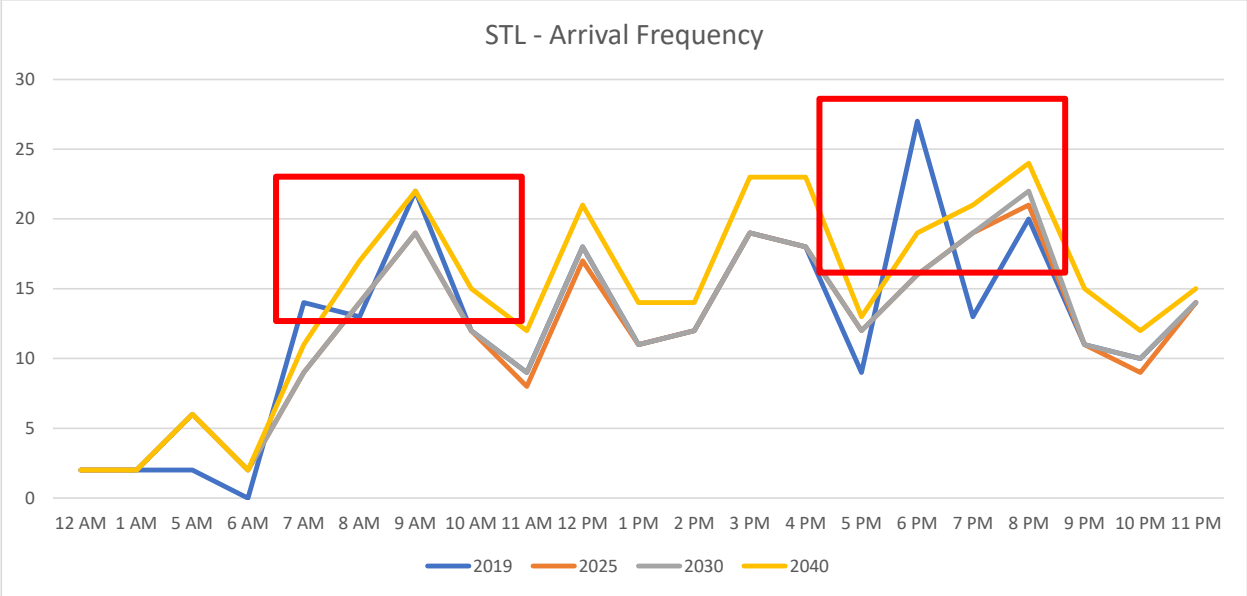
Note: This snapshot is for illustration only. It does not show the complete DDFS developed for 2040.

Source: Unison, October 2020.

Adjustments involved deleting/reinstating/adding flights, assigning arrival and departure times on added flights, changing arrival and departure times of certain flights, and replacing aircraft on certain flights. The schedule adjustments ensured that every flight arrival is paired with a departure, and evening arrivals that remain overnight (RON arrivals) are paired with early morning departures.

The DDFS adjustments also targeted achieving close consistency with the time of day distributions of flight arrivals and departures by terminal given by the baseline schedules, not only in terms of flight frequencies but also in terms of seats. The initial iterations carried forward the baseline time of day distribution of flight arrivals in each terminal essentially unchanged. Further adjustments were made to flatten the peak (peak spreading) in the final DDFS. **Figure 4B-2** illustrates peak spreading in the final DDFS time of day distribution of flight arrivals.

Figure 4B-2: Illustration of Peak Spreading in the Deisgn Day Flight Schedule Time of Day Distribution of Flight Arrivals



Source: Unison, October 2020.

APPENDIX 4C – ROADWAY GEOMETRY ANALYSIS

Table 4C-1: Intersection Geometry Analysis – Missouri Bottom Road

Missouri Botton Rd.												
Cross Street	Corner	Curve Name	PM Radius	Meet Min. R?	Turning Lane Width	Design Veh Fit?	Storage Length	Shoulder Width	Island	ADA	Access Mgmt.	Signal Config.
		R#	FT		FT		FT	FT	Notes	Notes	Notes	Notes
Lindberg Blvd.	NE	R6	100	Yes	11	Yes	143	8	Divisional Island- Meets Criteria	There is no ADA compliance nor do I see a reason there should be	Intersections are closely spaced.	All of the signals look fairly new. They are not LED. The spacing is compliant.
Lindberg Blvd.	NW	R5	75	Yes	25	Yes	128	11	Channelizing/Divisional Island meets criteria			
Lindberg Blvd.	SE	R7	63	Yes	20		113	10	Channelizing Island meets criteria			
Lindberg Blvd.	SW	R4	75	Yes	14		115	11				
Banshee Rd.	NE	R8	75	Yes	13	Yes		9				
Banshee Rd.	NW	R3	50	Yes	11			8				
Banshee Rd.	SE	R1	50	Yes	12	No		8				
Banshee Rd.	SW	R2	50	Yes	11	No		6				

Notes: Banshee Rd. SE/SW do not have channelizers and therefore can use the intersection for turning. It is low volume.

Source: WSP USA, September 2020.

Table 4C-2: Intersection Geometry Analysis – Airport Rd. and McDonnell Blvd.

Airport Rd. & McDonnell Blvd.											
Corner		PM Radius	Meet Min. R?	Turning Lane Width	Design Veh Fit?	Storage Length	Shoulder Width	Island	ADA	Access Mgmt.	Signal Config.
	R#	FT		FT		FT	FT	Notes	Notes	Notes	Notes
NE	R2	38	No	11	N/A	65	0	Divisional Island- Meets Criteria	No ADA around the intersection. Should be more conectivity to the abadoned subdivision that is slated for future development.	The distance between intersections are too close.	The signal equipment is fairly old and rusted. They are an old standard similar to light post. They are not LED. The spacing is compliant.
NW	R1	53	Yes	12	Yes	88	0	Divisional Island meets criteria			
SE	R4	56	Yes	16	No	71	0	Channelizing Island meets criteria			
SW	R3	184	Yes	12	Yes	84	0				

Notes:

Source: WSP USA, September 2020.

Table 4C-3: Intersection Geometry Analysis –I-70 Eastbound and Pear Tree Dr.

I-70 Eastbound Exit & Pear Tree Dr.											
Corner		PM Radius	Meet Min. R?	Turning Lane Width	Design Veh Fit?	Storage Length	Shoulder Width	Island	ADA	Access Mgmt.	Signal Config.
	R#	FT		FT		FT	FT	Notes	Notes	Notes	Notes
NE	R2	15	N/A	N/A	Yes	75	6	Divisional/Channelizing Island- Meets Criteria	There is no ADA compliance and I don't see a reason there should be.	Intersections are too close.	All of the signals look fairly new. They are not LED. The spacing is compliant.
NW	R1	66	Yes	16	Yes		6	Divisional Island meets criteria			

Notes:

Source: WSP USA, September 2020.

Table 4C-4: Ramp Geometry Data – Access from Terminal 1 to Airflight Dr./Lambert International Blvd. and Interstate-70

RAMP GEOMETRY DATA															
Alignment	Config.	Operating Speed (mph)	Min. Operating Speed Meet?	Accel/ Decel	Speed Change Lane Length (ft)	Min. Length Meet?	Lane Width (ft)	Inside Shoulder Width (ft)	Outside Shoulder Width (ft)	Enter/Exit Ramp Radius (ft)	Degree of Convergence/ Divergence (6D Max.)	Degree Meet?	Loop Ramp Turning Radius (ft)	Min. Curve Radius Meet?	Min. Curve Length Meet?
Ramp C	Loop	10	Yes	N/A	N/A		16	1	7				114.00	N/A	N/A
Ramp D	Loop	10	Yes	N/A	N/A		16	1	1				136.00	N/A	N/A
Ramp F	Loop	35	Yes	Accel	N/A		16	12	1				200.00	Yes	Yes
EBEX	Directional	30	Yes	Decel	500	Yes	18	4	6	7822	0.73	Yes			
EBEN LOOP	Loop	20	No	Accel	480	No	18	4	6	600	9.55	No	130.00	Yes	Yes
EBEN DIR.	Directional	50	Yes	Accel	250	Yes	16	4	6	5061	1.13	Yes			

Notes: I-70 has a posted speed of 60 mph. Posted speed on LIB is 35 mph. EBEN Loop need 1,100' of acceleration lane and only has 480'. EBEN Loop also need a minimum ramp operating speed of 30 and now sits at 20.

Source: WSP USA, September 2020.

Table 4C-5: Ramp Geometry Notes

RAMP GEOMETRY DATA											
Alignment	Roadway Classification	Posed Speed (mph)	Lane Width (ft)	Inside Shoulder Width (ft)	Outside Shoulder Width (ft)	Min. Lane Width Meet?	Min. Inside Shoulder Width Meet?	Min. Outside Shoulder Width Meet?	Vertical Clearance Observations	Access Management Observations	ADA Observations
Ramp C	Local Access	10	16	1	7	Yes	Yes	Yes			Inappropriate use.
Ramp D	Local Access	10	16	1	1	Yes	Yes	Yes			Inappropriate use.
Ramp F	Major Collector	35	16	12	1	Yes	Yes	Yes		Too close to signalized intersection Ticketing Dr. to the west.	Inappropriate use.
EBEX	Interchange Ramp	30	18	4	6	Yes	Yes	Yes		Good relative to other ramps.	Inappropriate use.
EBEN LOOP	Interchange Ramp	20	18	4	6	Yes	Yes	Yes		Good relative to other ramps.	Inappropriate use.
EBEN DIR.	Interchange Ramp	50	16	4	6	Yes	Yes	Yes		Good relative to other ramps.	Inappropriate use.
LIB	Major Collector	35	11	2	2	Yes	Yes	Yes		Signalized intersection spacing too close West of T1.	Sidewalks and ramps are generally provided, but not up to ADA standard.
Air Cargo Dr.	Local Road	40	12	N/A	4	Yes	Yes	Yes			Inappropriate use.
Pear Tree Dr.	Local Road	35	12	2	8	Yes	Yes	Yes			ADA infrastructure to the south side. Looks compliant where in place.
Airflight Dr.	Local Road	10	12	2	Varies	Yes	Yes	Yes	Substandard clearnace of 13'. Min. is 14.5'	Ramp Terminals need to be 800' apart. Currently 550'.	Inappropriate use.
McDonnell Blvd.	Major Collector	40	12	N/A	14	Yes	Yes	Yes			Inappropriate use.
Airport Rd.	Principle Arterial	35	12	10	0	Yes	Yes	No		Signalized intersection spacing too close in front of MCD.	ADA infrastructure to the south side. Does not appear compliant with current ADA standards - ramps, utility obstructions, width, connectivity.
Banshee Rd.	Local Road	35	12	N/A	8	Yes	Yes	Yes			Inappropriate use.

Notes: ADA inappropriate use infers pedestrians in that realm would be unsafe and unwelcome. No provisions should be made.

Source: WSP USA, September 2020.

Table 4C-6: Roadway Geometry Analysis – Lambert International Blvd. Horizontal Sight Distance

LIB Horizontal Sight Distance																	
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Min. Curve Radius (ft)	Min. Curve Radius Meet?	Curve Length (ft)	Is Min. Curvature Length Met?	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2						
1	T1 Cell Lot	LT	35	540.00	-20.00	520.00	261.00	250.0	15.0	12.00	9.0	1.00	371.0	Yes	525.00	Bad	Bad
2	Credit Union	RT	35	455.00	-26.00	429.00	363.00	250.0	18.1	12.00	12.1	1.00	371.0	Yes	525.00	Bad	Bad
3	Before Ramp F	LT	35	2000.00	-26.00	1974.00	436.00	250.0	4.0	12.00	-2.0	1.00	371.0	Yes	525.00	Bad	Met
4	Ramp A/G Gore	RT	35	3000.00	-26.00	2974.00	650.00	250.0	2.6	12.00	-3.4	1.00	371.0	Yes	525.00	Met	Met

Notes: Curve 1 fails even with a graphical check. Fence obscures. Curve 2 passes the HSSD on a grapical check.

Source: WSP USA, September 2020.

Table 4C-7: Roadway Geometry Analysis – Air Cargo Dr. Horizontal Sight Distance

Air Cargo Dr. Horizontal Sight Distance																	
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Min. Curve Radius (ft)	Min. Curve Radius Meet?	Curve Length (ft)	Is Min. Curvature Length Met?	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2						
1	Taxi Line	RT	40	2220.00	-18.00	2202.00	1190.00	305.0	5.3	12.00	-0.7	2.00	533.0	Yes	600.00	Met	Met
2		LT	40	425.00	-18.00	407.00	181.00	305.0	28.2	12.00	22.2	3.00	533.0	No	600.00	Bad	Bad
3		RT	40	612.00	-18.00	594.00	174.00	305.0	19.5	12.00	13.5	3.00	533.0	Yes	600.00	Bad	Bad

Notes: Curve 2 and 3 both pass HSSD grapically. While Curve 2 and 3 fail the minimum length, it is approaching and intersection, and therefore the speeds should be reduced through this traffic calming feature.

Source: WSP USA, September 2020.

Table 4C-8: Roadway Geometry Analysis – Ramp C Horizontal Sight Distance

Ramp C Horizontal Sight Distance													
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2		
1		LT	15	115.00	0.00	115.00	177.00	80.0	6.9	18.00	-2.1	2.00	Met

Notes: Design speed was upped from 10 to 15 to test HSSD. Posted speed in 10 mph.

Source: WSP USA, September 2020.

Table 4C-9: Roadway Geometry Analysis – Ramp D Horizontal Sight Distance

Ramp D Horizontal Sight Distance													
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2		
1		RT	15	180.00	-6.00	174.00	65.00	80.0	4.6	12.00	-1.4	1.00	Met
2		LT	15	136.00	0.00	136.00	201.00	80.0	5.8	16.00	-2.2	1.00	Met

Notes: Design speed was upped from 10 to 15 to test HSSD. Posted speed in 10 mph.

Source: WSP USA, September 2020.

Table 4C-10: Roadway Geometry Analysis – Ramp F Horizontal Sight Distance

Ramp F Horizontal Sight Distance													
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2		
3		RT	35	62.00	0.00	62.00	153.00	250.0	88.7	16.00	80.7	11.00	Bad

Notes: Curve 3 passes HSSD grapically.

Source: WSP USA, September 2020.

Table 4C-11: Roadway Geometry Analysis – I-70 IBEX Directional Horizontal Sight Distance

I-70 EBEX Directional Horizontal Sight Distance													
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2		
1		RT	30	420.00	0.00	420.00	163.00	200.0	11.9	22.00	0.9	6.00	Met

Notes:

Source: WSP USA, September 2020.

Table 4C-12: Roadway Geometry Analysis – I-70 EBEN Loop Horizontal Sight Distance

I-70 EBEN Loop Horizontal Sight Distance													
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2		
2		RT	20	131.00	0.00	131.00	380.00	115.0	12.4	18.00	3.4	4.00	Met

Notes:

Source: WSP USA, September 2020.

Table 4C-13: Roadway Geometry Analysis – I-70 EBEN Directional Horizontal Sight Distance

I-70 EBEN Directional Horizontal Sight Distance													
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset					M - Lane width / 2		
1		RT	50	1168.00	0.00	1168.00	391.00	425.0	19.3	16.00	11.3	6.00	Bad

Notes: Curve 1 passes HSSD grapically.

Source: WSP USA, September 2020.

Table 4C-14: Roadway Geometry Analysis – I-70 EBEN Directional Horizontal Sight Distance

"Roadway" Horizontal Sight Distance																			
Curve	Curve	Direction of Curve	Design Speed (mph)	Radius of Curve (ft)	Offset to Centerline of Inside Lane (ft)	Radius of Centerline of Inside Lane (ft)	Length of Curve of CL of Inside Lane (ft)	Required SSD (ft)	Middle Ordinate (M)	Lane Width (ft)	Required Width of Sight Obstruction Free Zone (from edge of travelway) (ft)	Usable Shoulder (ft)	Min. Curve Radius (ft)	Min. Curve Radius Meet?	Degree of Divergence	Open Road Curve Length (ft) 60 MPH & Less <= 5 Deg	Curve Length (ft)	Is Min. Curvature Length Met?	Horizontal Clearnace Requirements Met within Roadway?
						R + Offset		Fig. 42-1A	Eq. 43-4.1		M - Lane width / 2		Fig. 43-2A		DMS -> Decimal	Chpt. 43-2.05	Chpt. 43-2.05		
1	14+56.70	LT	70	7400.00	-6.00	7394.00	5000.00	730.0	9.0	12.00	3.0	12.00	1500.0	Yes	0.77	100.00	1050.00	Met	Met

Notes: *Roadway Classification and other pretinent geometric items. Traffic volume information. Design Vehicle. Notes on drainage.*

Source: WSP USA, September 2020.

Table 4C-15: Roadway Geometry Analysis – I-70 EBEN Directional Horizontal Sight Distance

"Roadway" Vertical SSD																			
Design Speed	PVI Station	Elevation	Curve Length	PVC	PVT	G1	G2	Curve type: (Crest/Sag)	Algrebraic Difference	Designed K-Value	Crest K-Value		Sag Min. K-Value	Test K-Value	K Value Criteria Met	Min. SSD	Avail. SSD	VSSD Criteria	Min. Curve Length	Min. Curve Length Met
mph	Sta	ft	ft	Sta	Sta	%	%				IDM Fig. 44-3A (Crest) Des. -> Min.		IDM Fig. 44-3C (Sag)			ft	ft, Eq. 44-3.1 - 44-3.5	ft	Sag > 3.2V; Crest > 3V	
70	153+50.00	696.58	400	151+50.00	155+50.00	-1.87	-0.93	SAG	0.939	426	247	#REF!	181	181	Met	730	-478	Graphical Check	224	Met

Source: WSP USA, September 2020.

APPENDIX 4D – INTERSECTION MOVEMENTS ANALYSIS

Table 4D-1: Intersection Movement Measures of Effectiveness – Morning Peak Hour – Existing (2019)

INTERSECTION		MOVEMENT	VOLUME	DELAY (SEC)	DELAY STOPPED (SEC)	QUEUE LENGTH AVG (FT)	QUEUE LENGTH MAX (FT)	LOS
1	Hunter Ave & Natural Bridge Rd	EB Right	0	0.0	0.0	0	0	A
		EB Through	180	0.1	0.0	0	0	A
		NB Left	0	0.0	0.0	0	0	A
		NB Right	0	0.0	0.0	0	0	A
		WB Left	7	0.9	0.1	0	11	A
		WB Through	215	0.1	0.0	0	0	A
2	Natural Bridge Rd & I-70 WB Ramps	EB Right	10	0.8	0.0	0	13	A
		EB Through	170	10.9	4.6	6	121	B
		NB Left	113	16.4	9.5	9	123	B
		NB Right 1	31	4.2	0.3	1	64	A
		NB Right 2	152	1.8	0.0	0	0	A
		WB Through	109	5.7	2.2	2	61	A
		WB Through	104	5.6	2.6	3	96	A
3	Lambert Intl Blvd & Cypress	NB Left	157	12.2	7.0	7	102	B
		NB Right	140	1.3	0.0	0	0	A
		WB Left	72	5.3	2.1	1	75	A
		WB Right	292	1.8	0.2	1	99	A
		WB Through	56	4.8	1.6	1	48	A
		WB Through	62	8.7	3.6	2	129	A
4	Cypress Rd & I-70 EB Ramps	EB Left	31	22.3	17.3	6	69	C
		EB Right	7	1.0	0.1	0	7	A
		EB Through	15	21.1	14.9	6	69	C
		NB Left	14	1.7	0.4	0	22	A
		NB Right	183	1.8	0.1	0	32	A
		NB Through	195	11.3	7.3	9	140	B
		SB Left	75	7.1	3.9	3	88	A
		SB Right	53	0.7	0.0	0	0	A
		SB Through	235	6.7	3.9	7	102	A
		WB Left	58	23.2	17.7	8	99	C
		WB Right	71	1.7	0.1	0	42	A

		WB Through	34	24.3	16.4	8	99	C
5	Lambert Intl Blvd & I-70 WB On Ramp	EB Left	0	0.0	0.0	0	0	A
		EB Right	0	0.0	0.0	0	83	A
		EB Through	183	1.7	0.4	1	46	A
		SB Left	0	0.0	0.0	0	0	A
		SB Right	0	0.0	0.0	0	0	A
		SB Through	0	0.0	0.0	0	0	A
		WB Left	194	2.5	0.2	0	76	A
		WB Right	0	0.0	0.0	0	0	A
		WB Through	136	0.4	0.0	0	0	A
6	Lambert Intl Blvd & American Airlines/Cape Air Maintenance Repair and Overhaul Facilities	EB Left 1	0	0.0	0.0	0	0	A
		EB Left 2	35	3.9	1.5	1	63	A
		EB Right	20	1.7	0.7	0	21	A
		EB Through	145	1.9	0.8	1	63	A
		NB Left	6	51.2	43.5	4	48	D
		NB Right	5	58.1	51.0	4	48	E
		NB Through	0	0.0	0.0	4	48	A
		SB Left	10	28.5	24.5	5	80	C
		SB Right 1	18	28.0	24.6	5	80	C
		SB Right 2	0	0.0	0.0	5	80	A
		SEB Left	0	0.0	0.0	0	0	A
		SEB Right	0	0.0	0.0	0	0	A
		SEB Through	0	0.0	0.0	0	0	A
		WB Left	4	1.4	0.0	1	67	A
		WB Right 1	17	1.8	0.3	1	67	A
		WB Right 2	0	0.0	0.0	1	67	A
		WB Through	373	1.3	0.4	1	67	A
7	Lambert Intl Bvld & Terminal 1 Exit	EB Right 1	0	0.0	0.0	11	106	A
		EB Right 2	24	17.5	12.0	11	106	B
		EB Through	136	16.4	11.4	11	106	B
		NB Left	0	0.0	0.0	0	0	A
		NB Right	0	0.0	0.0	0	0	A
		NB Right 2	0	0.0	0.0	0	0	A
		NWB Right	58	7.8	0.7	1	51	A
		SB Left	259	39.8	29.9	44	169	D
		SB Right	101	38.7	29.9	44	169	D
		SB Through	6	37.3	29.2	44	169	D
		SB Through 2	0	0.0	0.0	44	169	A

		SEB Left	208	48.3	37.3	36	155	D
		SEB Right	49	40.3	31.5	36	155	D
		SEB Through	0	0.0	0.0	36	155	A
		WB Left	95	6.9	3.8	3	70	A
		WB Left	0	0.0	0.0	22	151	A
		WB Through	245	24.9	17.8	22	151	C
8	Air Flight Dr & I-70 Ramps	NB Through	538	4.6	2.2	9	154	A
		SB Through	249	6.4	2.9	5	139	A
		WB Left	270	35.4	28.0	47	248	D
		WB Right	79	17.5	11.1	2	127	B
		WB Through	415	14.8	6.7	35	298	B
9	Pear Tree Dr & I-70 EB Off Ramp	EB Right	0	0.0	0.0	31	153	A
		EB Through	173	38.1	30.4	31	153	D
		NB Right	48	10.3	2.9	2	82	B
		SB Left	650	8.3	4.2	21	234	A
		SB Right	0	0.0	0.0	0	37	A
		SB Right	80	2.0	0.2	0	37	A
		SB Through	19	9.6	5.0	21	234	A
		WB Left	25	35.7	30.4	5	73	D
		WB Through	130	33.6	25.6	27	200	C
10	Pear Tree Dr & Air Flight Dr	EB Left 1	502	21.3	14.9	39	278	C
		EB Left 2	0	0.0	0.0	39	278	A
		EB Right	38	15.9	11.2	32	384	B
		EB Through	333	14.7	9.0	32	384	B
		NB Left	5	46.0	36.5	25	191	D
		NB Right 1	16	51.4	43.3	25	191	D
		NB Right 2	0	0.0	0.0	25	191	A
		NB Through	62	48.4	38.6	25	191	D
		SB Left	276	47.7	38.2	109	481	D
		SB Right	110	3.2	1.1	1	128	A
		SB Through	75	47.3	37.2	104	483	D
		WB Left	10	30.0	25.5	2	40	C
		WB Right 1	388	6.2	1.2	9	228	A
		WB Right 2	0	0.0	0.0	9	228	A
		WB Through	41	38.7	29.2	8	91	D
11	Natural Bridge & Edmundson	EB Right	148	3.1	0.1	0	76	A
		EB Through	477	6.1	2.3	13	281	A
		NB Left 1	145	42.4	33.5	47	249	D

		NB Left 2	27	42.1	33.3	47	249	D
		NB Right	50	5.7	0.2	47	249	A
		WB Left	29	3.8	1.8	0	45	A
		WB Through	294	5.5	2.2	8	192	A
		WB Through	54	5.6	2.4	8	192	A
12	Lambert Intl Blvd & Terminal 2 Exit	EB Through	488	8.0	4.2	13	170	A
		SB Left 1	101	30.9	23.8	19	158	C
		SB Left 2	160	34.0	25.8	34	231	C
		SB Right 1	184	35.5	26.1	40	244	D
		SB Right 2	188	36.8	28.1	43	278	D
		WB Through	271	1.3	0.8	1	42	A
13	Lambert Intl Blvd & Terminal 2 Garage Exit	EB Through	749	2.6	0.3	2	126	A
		SB Left	25	47.9	39.1	7	86	D
		SB Right	15	43.0	36.4	3	43	D
		WB Through	256	0.1	0.0	0	0	A
14	Lambert Intl Blvd & Terminal 2 Entrance	EB Left	514	26.8	17.9	59	389	C
		EB Through	262	0.9	0.1	0	30	A
		SB Left	5	70.7	65.5	2	39	E
		SB Right	40	5.9	0.2	0	3	A
		WB Right	241	18.4	12.9	23	200	B
		WB Through	216	15.6	10.5	13	113	B
15	Air Cargo Dr & Terminal 2	NB Left 1	331	2.1	0.7	4	152	A
		NB Right	110	0.7	0.0	1	108	A
		NB Right	110	-0.2	0.0	1	109	A
		NB Through	313	2.2	0.8	4	152	A
		WB Left 1	5	41.6	32.4	23	168	D
		WB Left 2	40	44.8	36.4	23	168	D
		WB Right 1	39	41.3	35.8	10	108	D
		WB Right 2	41	41.8	35.4	23	168	D

Notes:
AVG - average
EB – eastbound
FT - feet
LOS – level of service
MAX - maximum
MRO – Maintenance, Repair and Overhaul Facilities
NB – northbound
SB – southbound
WB – westbound

Sources: Lambert Traffic Management Enhancement Project, 2017; WSP USA, October 2020 (VISSIM analysis).

Table 4D-2: Intersection Movement Measures of Effectiveness – Afternoon Peak Hour – Existing (2019)

INTERSECTION		MOVEMENT	VOLUME	DELAY (SEC)	DELAY STOPPED (SEC)	QUEUE LENGTH AVG (FT)	QUEUE LENGTH MAX (FT)	LOS
1	Hunter Ave & Natural Bridge Rd	EB Right	0	0.0	0.0	0	0	A
		EB Through	459	0.3	0.0	0	0	A
		NB Left	0	0.0	0.0	0	0	A
		NB Right	16	5.9	0.3	1	62	A
		WB Left	17	2.5	0.7	0	32	A
		WB Through	428	0.1	0.0	0	0	A
2	Natural Bridge Rd & I-70 WB Ramps	EB Right	103	2.0	0.3	0	66	A
		EB Through	371	13.9	6.3	19	190	B
		NB Left	126	20.0	12.7	13	141	B
		NB Right 1	28	5.2	0.5	1	66	A
		NB Right 2	131	2.1	0.0	0	0	A
		WB Through	319	5.7	2.1	5	110	A
		WB Through	183	7.4	3.2	6	135	A
3	Lambert Intl Blvd & Cypress	NB Left	210	13.8	8.1	10	131	B
		NB Right	132	1.7	0.0	0	0	A
		WB Left	111	6.3	2.4	3	111	A
		WB Right	436	4.9	1.0	6	201	A
		WB Through	292	5.6	1.8	4	109	A
		WB Through	94	10.7	4.8	12	196	B
4	Cypress Rd & I-70 EB Ramps	EB Left	39	27.8	22.5	10	90	C
		EB Right	12	1.3	0.2	0	18	A
		EB Through	25	28.8	22.2	10	90	C
		NB Left	5	3.7	1.7	0	14	A
		NB Right	238	3.5	0.7	0	91	A
		NB Through	271	18.2	12.6	21	221	B
		SB Left	142	10.4	6.3	7	132	B
		SB Right	37	0.9	0.1	0	0	A
		SB Through	368	9.0	5.6	14	141	A
		WB Left	124	27.8	21.6	21	159	C
		WB Right	32	1.5	0.1	0	30	A
		WB Through	11	26.5	18.8	21	159	C
		EB Left	4	2.9	0.9	0	0	A

5	Lambert Intl Blvd & I-70 WB On Ramp	EB Right	6	1.6	0.1	1	114	A
		EB Through	265	2.8	0.9	2	77	A
		SB Left	5	50.1	43.0	1	37	D
		SB Right	5	6.5	0.2	0	0	A
		SB Through	0	0.0	0.0	1	37	A
		WB Left	374	5.6	0.8	3	156	A
		WB Right	5	1.6	0.0	0	0	A
		WB Through	428	1.4	0.2	0	56	A
6	Lambert Intl Blvd & American Airlines/Cape Air Maintenance Repair and Overhaul Facilities	EB Left 1	0	0.0	0.0	0	0	A
		EB Left 2	9	4.5	1.4	2	79	A
		EB Right	0	0.0	0.0	0	0	A
		EB Through	254	2.3	0.9	2	79	A
		NB Left	21	52.5	44.3	10	91	D
		NB Right	9	53.6	46.3	10	91	D
		NB Through	0	0.0	0.0	10	91	A
		SB Left	9	34.9	30.3	5	68	C
		SB Right 1	9	37.2	33.0	5	68	D
		SB Right 2	0	0.0	0.0	5	68	A
		SEB Left	0	0.0	0.0	0	0	A
		SEB Right	0	0.0	0.0	0	0	A
		SEB Through	0	0.0	0.0	0	0	A
		WB Left	5	2.4	0.3	3	100	A
		WB Right 1	5	1.9	0.7	3	100	A
		WB Right 2	0	0.0	0.0	3	100	A
		WB Through	728	1.6	0.5	3	100	A
7	Lambert Intl Bvld & Terminal 1 Exit	EB Right 1	0	0.0	0.0	21	146	A
		EB Right 2	19	22.7	15.8	21	146	C
		EB Through	252	20.8	14.4	21	146	C
		NB Left	0	0.0	0.0	0	0	A
		NB Right	0	0.0	0.0	0	0	A
		NB Right 2	0	0.0	0.0	0	0	A
		NWB Right	138	9.4	1.6	3	73	A
		SB Left	228	40.1	30.2	43	164	D
		SB Right	112	41.6	32.5	43	164	D
		SB Through	6	36.2	28.1	43	164	D
		SB Through 2	0	0.0	0.0	43	164	A
		SEB Left	406	42.8	31.2	65	238	D

		SEB Right	151	40.9	30.0	65	238	D
		SEB Through	0	0.0	0.0	65	238	A
		WB Left	56	8.3	4.4	1	63	A
		WB Left	0	0.0	0.0	39	238	A
		WB Through	481	23.7	16.3	39	238	C
8	Air Flight Dr & I-70 Ramps	NB Through	559	3.6	1.1	8	252	A
		SB Through	352	6.3	2.1	5	139	A
		WB Left	261	38.8	31.9	47	198	D
		WB Right	26	21.5	15.3	1	78	C
		WB Through	489	19.1	6.7	61	443	B
9	Pear Tree Dr & I-70 EB Off Ramp	EB Right	5	42.3	35.9	41	215	D
		EB Through	231	37.1	29.2	41	215	D
		NB Right	35	10.5	3.0	2	61	B
		SB Left	663	9.4	4.9	24	285	A
		SB Right	0	0.0	0.0	0	50	A
		SB Right	84	2.7	0.5	0	50	A
		SB Through	14	10.9	5.2	24	285	B
		WB Left	39	29.3	19.6	5	91	C
		WB Through	191	25.5	17.1	30	289	C
10	Pear Tree Dr & Air Flight Dr	EB Left 1	436	27.2	19.8	44	295	C
		EB Left 2	0	0.0	0.0	44	295	A
		EB Right	13	19.4	13.7	63	477	B
		EB Through	479	18.9	12.3	63	477	B
		NB Left	4	58.0	48.0	41	222	E
		NB Right 1	19	52.5	43.3	41	222	D
		NB Right 2	0	0.0	0.0	41	222	A
		NB Through	96	54.7	44.0	41	222	D
		SB Left	336	46.0	35.3	116	469	D
		SB Right	143	3.6	1.0	11	390	A
		SB Through	38	45.1	34.0	111	469	D
		WB Left	5	16.4	11.3	1	33	B
		WB Right 1	515	11.6	2.9	34	411	B
		WB Right 2	0	0.0	0.0	34	411	A
		WB Through	81	42.4	31.0	20	138	D
11	Natural Bridge & Edmundson	EB Right	121	3.2	0.1	2	184	A
		EB Through	710	7.4	2.0	24	391	A
		NB Left 1	192	65.3	52.8	126	501	E

		NB Left 2	73	63.6	51.4	126	501	E
		NB Right	61	12.5	4.7	126	501	B
		WB Left	41	5.0	2.8	1	50	A
		WB Through	409	7.4	2.9	20	317	A
		WB Through	152	7.7	3.2	20	317	A
12	Lambert Intl Blvd & Terminal 2 Exit	EB Through	556	11.4	5.5	19	192	B
		SB Left 1	101	34.2	26.7	21	171	C
		SB Left 2	102	34.9	27.1	22	197	C
		SB Right 1	157	37.7	28.5	36	223	D
		SB Right 2	158	38.1	29.6	37	247	D
		WB Through	750	1.4	0.9	4	70	A
13	Lambert Intl Blvd & Terminal 2 Garage Exit	EB Through	759	3.0	0.4	3	128	A
		SB Left	25	45.3	36.4	6	89	D
		SB Right	31	40.2	33.7	7	59	D
		WB Through	720	0.2	0.0	0	0	A
14	Lambert Intl Blvd & Terminal 2 Entrance	EB Left	425	27.9	18.6	51	357	C
		EB Through	357	1.0	0.1	0	31	A
		SB Left	5	69.0	63.8	2	37	E
		SB Right	77	8.1	0.3	0	38	A
		WB Right	184	14.9	10.5	14	139	B
		WB Through	644	15.8	10.0	35	249	B
15	Air Cargo Dr & Terminal 2	NB Left 1	242	2.3	0.9	3	111	A
		NB Right	137	0.7	0.0	1	65	A
		NB Right	137	-0.2	0.0	0	65	A
		NB Through	230	2.5	1.0	3	113	A
		WB Left 1	5	42.0	32.3	30	225	D
		WB Left 2	78	41.4	32.9	30	225	D
		WB Right 1	28	37.8	32.5	7	89	D
		WB Right 2	33	42.2	35.5	30	225	D

Notes:
AVG - average
EB – eastbound
FT - feet
LOS – level of service
MAX - maximum
MRO – Maintenance, Repair and Overhaul Facilities
NB – northbound
SB – southbound
WB – westbound

Sources: Lambert Traffic Management Enhancement Project, 2017; WSP USA, October 2020 (VISSIM analysis).

Table 4D-3: Morning Intersection Movement Measures of Effectiveness – 2030 No-Build

INTERSECTION		MOVEMENT	VOLUME	DELAY (SEC)	DELAY STOPPED (SEC)	QUEUE LENGTH AVG (FT)	QUEUE LENGTH MAX (FT)	LOS
1	Hunter Ave & Natural Bridge Rd	EB Right	0	0.0	0.0	0	0	A
		EB Through	194	0.1	0.0	0	0	A
		NB Left	0	0.0	0.0	0	0	A
		NB Right	0	0.0	0.0	0	0	A
		WB Left	8	1.0	0.1	16	0	A
		WB Through	232	0.1	0.0	0	0	A
2	Natural Bridge Rd & I-70 WB Ramps	EB Right	542	23.8	16.7	364	48	C
		EB Through	0	0.0	0.0	364	48	A
		NB Left	42	16.9	11.7	429	42	B
		NB Right 1	361	16.3	10.1	429	42	B
		NB Right 2	5	51.8	42.0	185	29	D
		WB Through	18	51.2	42.9	185	29	D
		WB Through	0	0.0	0.0	185	29	A
3	Lambert Intl Blvd & Cypress	NB Left	68	51.4	41.2	185	29	D
		NB Right	298	49.6	39.6	505	126	D
		WB Left	119	4.2	1.7	140	1	A
		WB Right	80	49.3	38.7	507	121	D
		WB Through	11	32.7	27.6	44	2	C
		WB Through	422	8.2	1.9	301	15	A
4	Cypress Rd & I-70 EB Ramps	EB Left	0	0.0	0.0	301	15	A
		EB Right	45	37.8	28.3	95	9	D
		EB Through	160	3.3	0.1	138	1	A
		NB Left	517	6.7	2.5	344	16	A
		NB Right	158	42.2	33.1	281	51	D
		NB Through	29	42.9	33.9	281	51	D
		SB Left	53	5.9	0.3	281	51	A
		SB Right	30	4.1	2.0	46	1	A
		SB Through	318	5.7	2.2	207	9	A
		WB Left	59	5.8	2.3	207	9	A

		WB Right	529	8.9	4.8	185	15	A
		WB Through	109	30.1	23.0	161	19	C
5	Lambert Intl Blvd & I-70 WB On Ramp	EB Left	173	33.2	24.9	249	36	C
		EB Right	199	36.0	26.3	269	44	D
		EB Through	202	37.5	28.4	289	48	D
		SB Left	294	1.4	0.8	43	2	A
		SB Right	811	2.9	0.4	128	3	A
		SB Through	27	46.5	37.7	86	7	D
		WB Left	16	40.8	34.4	45	4	D
		WB Right	279	0.1	0.0	0	0	A
		WB Through	558	27.0	17.8	411	66	C
6	Lambert Intl Blvd & American Airlines/Cape Air Maintenance Repair and Overhaul Facilities	EB Left 1	283	1.1	0.2	32	0	A
		EB Left 2	5	70.6	65.5	38	2	E
		EB Right	43	6.0	0.3	6	0	A
		EB Through	259	18.8	13.0	209	25	B
		NB Left	235	15.6	10.5	123	14	B
		NB Right	358	2.1	0.7	168	5	A
		NB Through	119	0.7	0.0	122	1	A
		SB Left	119	-0.2	0.0	124	1	A
		SB Right 1	340	2.2	0.8	168	5	A
		SB Right 2	5	46.6	36.9	178	26	D
		SEB Left	44	44.6	36.2	178	26	D
		SEB Right	42	40.7	35.0	103	10	D
		SEB Through	44	43.3	36.6	178	26	D
		WB Left	11	1.0	0.1	15	0	A
		WB Right 1	183	11.5	4.9	124	8	B
		WB Right 2	122	16.7	9.8	129	10	B
		WB Through	33	4.2	0.3	63	1	A
7	Lambert Intl Bvld & Terminal 1 Exit	EB Right 1	165	1.9	0.0	0	0	A
		EB Right 2	118	5.7	2.2	64	2	A
		EB Through	113	6.0	2.9	104	3	A
		NB Left	170	12.3	7.0	110	8	B

		NB Right	151	1.4	0.0	3	0	A
		NB Right 2	76	5.5	2.2	81	2	A
		NWB Right	316	2.1	0.2	119	1	A
		SB Left	62	4.9	1.7	52	1	A
		SB Right	66	8.8	3.6	131	3	A
		SB Through	33	22.8	17.7	84	7	C
		SB Through 2	8	1.0	0.1	9	0	A
		SEB Left	16	24.5	18.0	84	7	C
		SEB Right	15	1.6	0.3	22	0	A
		SEB Through	197	1.9	0.1	38	0	A
		WB Left	212	12.3	8.0	140	10	B
		WB Left	82	7.8	4.4	84	3	A
		WB Through	57	0.7	0.0	0	0	A
8	Air Flight Dr & I-70 Ramps	NB Through	255	7.0	4.1	110	8	A
		SB Through	64	23.9	18.3	103	10	C
		WB Left	76	1.8	0.2	48	0	A
		WB Right	37	24.2	16.5	103	10	C
		WB Through	0	0.0	0.0	0	0	A
9	Pear Tree Dr & I-70 EB Off Ramp	EB Right	0	0.0	0.0	88	0	A
		EB Through	196	2.0	0.5	52	1	A
		NB Right	0	0.0	0.0	0	0	A
		SB Left	0	0.0	0.0	0	0	A
		SB Right	0	0.0	0.0	0	0	A
		SB Right	212	2.8	0.3	90	1	A
		SB Through	0	0.0	0.0	0	0	A
		WB Left	148	0.4	0.0	0	0	A
		WB Through	0	0.0	0.0	0	0	A
10	Pear Tree Dr & Air Flight Dr	EB Left 1	37	4.5	1.8	64	1	A
		EB Left 2	21	2.3	1.1	28	0	A
		EB Right	155	2.0	0.9	64	1	A
		EB Through	6	53.6	45.9	55	4	D
		NB Left	5	56.4	49.5	55	4	E

		NB Right 1	0	0.0	0.0	55	4	A
		NB Right 2	11	32.5	28.0	84	6	C
		NB Through	20	31.9	28.0	84	6	C
		SB Left	0	0.0	0.0	84	6	A
		SB Right	0	0.0	0.0	0	0	A
		SB Through	0	0.0	0.0	0	0	A
		WB Left	0	0.0	0.0	0	0	A
		WB Right 1	5	2.1	0.5	73	2	A
		WB Right 2	19	2.0	0.5	73	2	A
		WB Through	0	0.0	0.0	73	2	A
11	Natural Bridge & Edmundson	EB Right	407	1.4	0.4	73	2	A
		EB Through	0	0.0	0.0	109	12	A
		NB Left 1	26	19.9	13.6	109	12	B
		NB Left 2	145	17.4	12.0	109	12	B
		NB Right	0	0.0	0.0	0	0	A
		WB Left	0	0.0	0.0	0	0	A
		WB Through	0	0.0	0.0	0	0	A
		WB Through 2	62	7.9	0.0	48	1	A
12	Lambert Intl Blvd & Terminal 2 Exit	EB Through	281	39.6	29.5	172	46	D
		SB Left 1	111	39.0	29.9	172	46	D
		SB Left 2	6	35.6	27.2	172	46	D
		SB Right 1	0	0.0	0.0	172	46	A
		SB Right 2	226	49.2	38.0	164	40	D
		WB Through	53	40.8	31.9	164	40	D
13	Lambert Intl Blvd & Terminal 2 Garage Exit	EB Through	0	0.0	0.0	164	40	A
		SB Left	102	7.8	4.3	82	3	A
		SB Right	0	0.0	0.0	158	25	A
		WB Through	267	25.9	18.6	158	25	C
14	Lambert Intl Blvd & Terminal 2 Entrance	EB Left	585	5.1	2.5	167	11	A
		EB Through	269	7.3	3.5	153	6	A
		SB Left	291	35.6	27.7	257	51	D

		SB Right	85	17.9	11.4	136	2	B
		WB Right	448	19.6	9.3	368	57	B
		WB Through	0	0.0	0.0	161	33	A
15	Air Cargo Dr & Terminal 2	NB Left 1	187	38.2	30.4	161	33	D
		NB Right	51	11.3	3.6	83	3	B
		NB Right	707	9.0	4.5	256	24	A
		NB Through	0	0.0	0.0	40	0	A
		WB Left 1	87	2.4	0.4	40	0	A
		WB Left 2	21	10.6	5.3	256	24	B
		WB Right 1	27	34.0	28.8	83	5	C
		WB Right 2	142	33.5	25.5	211	29	C

Notes:
AVG - average
EB – eastbound
FT - feet
LOS – level of service
MAX - maximum
MRO – Maintenance, Repair and Overhaul Facilities
NB – northbound
SB – southbound
WB – westbound

Sources: Lambert Traffic Management Enhancement Project, 2017; WSP USA, October 2020 (VISSIM analysis).

Table 4D-4: Morning Intersection Movement Measures of Effectiveness – 2030 No-Build

INTERSECTION		MOVEMENT	VOLUME	DELAY (SEC)	DELAY STOPPED (SEC)	QUEUE LENGTH AVG (FT)	QUEUE LENGTH MAX (FT)	LOS
1	Hunter Ave & Natural Bridge Rd	EB Right	0	0.0	0.0	0	0	A
		EB Through	497	0.3	0.0	0	0	A
		NB Left	0	0.0	0.0	0	0	A
		NB Right	17	6.2	0.4	64	1	A
		WB Left	19	2.4	0.7	31	0	A
		WB Through	462	0.1	0.0	0	0	A
2	Natural Bridge Rd & I-70 WB Ramps	EB Right	470	34.9	25.2	374	57	C
		EB Through	0	0.0	0.0	374	57	A
		NB Left	15	22.0	15.9	516	83	C
		NB Right 1	522	20.6	13.7	516	83	C
		NB Right 2	5	61.7	50.8	248	55	E
		WB Through	20	63.4	52.9	248	55	E

		WB Through	0	0.0	0.0	248	55	A
3	Lambert Intl Blvd & Cypress	NB Left	103	67.2	54.5	248	55	E
		NB Right	362	51.6	39.7	492	152	D
		WB Left	155	7.4	3.7	434	12	A
		WB Right	42	50.6	38.5	492	148	D
		WB Through	5	19.4	13.2	35	1	B
		WB Through	545	20.4	7.7	551	91	C
4	Cypress Rd & I-70 EB Ramps	EB Left	0	0.0	0.0	551	91	A
		EB Right	86	46.6	33.7	160	22	D
		EB Through	131	3.5	0.2	221	4	A
		NB Left	770	8.0	2.3	428	31	A
		NB Right	199	110.4	91.0	547	250	F
		NB Through	76	111.7	92.3	547	250	F
		SB Left	63	37.0	24.4	547	250	D
		SB Right	46	5.9	3.2	54	1	A
		SB Through	439	16.3	7.5	459	49	B
		WB Left	163	14.9	6.7	459	49	B
		WB Right	599	11.8	5.7	218	22	B
		WB Through	109	32.8	25.4	169	21	C
5	Lambert Intl Blvd & I-70 WB On Ramp	EB Left	111	34.9	27.1	205	24	C
		EB Right	170	38.4	28.9	244	40	D
		EB Through	172	39.4	30.5	275	43	D
		SB Left	811	1.6	1.0	76	5	A
		SB Right	818	3.4	0.5	135	4	A
		SB Through	27	44.3	35.6	91	7	D
		WB Left	34	39.6	33.0	66	7	D
		WB Right	781	0.2	0.0	0	0	A
		WB Through	459	28.0	18.4	394	56	C
6	Lambert Intl Blvd & American Airlines/Cape Air Maintenance Repair and	EB Left 1	384	1.1	0.2	29	0	A
		EB Left 2	5	68.6	63.4	37	2	E
		EB Right	85	8.4	0.3	48	0	A
		EB Through	200	14.7	10.1	152	14	B

	Overhaul Facilities	NB Left	698	16.2	10.3	275	39	B
		NB Right	263	2.4	1.0	124	3	A
		NB Through	148	0.8	0.0	80	1	A
		SB Left	148	-0.2	0.0	81	1	A
		SB Right 1	248	2.6	1.1	128	4	A
		SB Right 2	5	40.3	30.5	242	34	D
		SEB Left	85	42.4	33.7	242	34	D
		SEB Right	31	40.0	34.5	85	8	D
		SEB Through	36	41.9	35.1	242	34	D
		WB Left	112	2.2	0.3	65	0	A
		WB Right 1	401	15.2	7.1	203	23	B
		WB Right 2	136	20.4	13.1	150	15	C
		WB Through	30	5.6	0.8	62	1	A
7	Lambert Intl Bvld & Terminal 1 Exit	EB Right 1	142	2.3	0.0	0	0	A
		EB Right 2	344	5.8	2.2	115	6	A
		EB Through	198	8.0	3.6	147	7	A
		NB Left	228	14.2	8.4	143	11	B
		NB Right	143	1.8	0.0	2	0	A
		NB Right 2	121	6.3	2.4	106	3	A
		NWB Right	471	6.0	1.4	226	10	A
		SB Left	315	5.8	1.9	126	5	A
		SB Right	103	11.2	5.1	215	16	B
		SB Through	42	28.7	23.4	101	12	C
		SB Through 2	13	1.5	0.3	23	0	A
		SEB Left	27	29.2	22.6	101	12	C
		SEB Right	6	3.5	1.4	18	0	A
		SEB Through	258	4.4	1.1	101	1	A
		WB Left	293	19.6	13.7	244	26	B
		WB Left	155	11.0	6.7	133	9	B
		WB Through	40	0.9	0.1	0	0	A
8	Air Flight Dr & I-70 Ramps	NB Through	397	9.7	6.2	156	16	A
		SB Through	137	28.2	21.9	169	24	C

		WB Left	35	1.7	0.2	32	0	A
		WB Right	11	28.1	20.3	169	24	C
		WB Through	4	4.0	1.6	6	0	A
9	Pear Tree Dr & I-70 EB Off Ramp	EB Right	7	2.0	0.1	124	2	A
		EB Through	287	3.1	1.1	87	2	A
		NB Right	5	54.3	47.2	39	2	D
		SB Left	5	7.1	0.8	0	0	A
		SB Right	0	0.0	0.0	39	2	A
		SB Right	407	6.4	1.0	201	4	A
		SB Through	6	2.1	0.2	0	0	A
		WB Left	465	1.7	0.2	61	0	A
		WB Through	0	0.0	0.0	0	0	A
10	Pear Tree Dr & Air Flight Dr	EB Left 1	10	5.3	2.1	82	2	A
		EB Left 2	0	0.0	0.0	0	0	A
		EB Right	275	2.4	0.9	82	2	A
		EB Through	22	52.4	44.3	96	10	D
		NB Left	10	53.8	46.5	96	10	D
		NB Right 1	0	0.0	0.0	96	10	A
		NB Right 2	10	35.3	30.5	71	5	D
		NB Through	10	37.2	33.3	71	5	D
		SB Left	0	0.0	0.0	71	5	A
		SB Right	0	0.0	0.0	0	0	A
		SB Through	0	0.0	0.0	0	0	A
		WB Left	0	0.0	0.0	0	0	A
		WB Right 1	5	2.5	0.4	108	4	A
		WB Right 2	6	2.1	0.8	108	4	A
		WB Through	0	0.0	0.0	108	4	A
11	Natural Bridge & Edmundson	EB Right	790	1.6	0.5	108	4	A
		EB Through	0	0.0	0.0	161	23	A
		NB Left 1	20	23.1	16.3	161	23	C
		NB Left 2	274	21.7	15.0	161	23	C
		NB Right	0	0.0	0.0	0	0	A

		WB Left	0	0.0	0.0	0	0	A
		WB Through	0	0.0	0.0	0	0	A
		WB Through 2	150	9.9	1.9	76	4	A
12	Lambert Intl Blvd & Terminal 2 Exit	EB Through	247	40.3	30.4	169	47	D
		SB Left 1	122	42.5	33.0	169	47	D
		SB Left 2	7	35.6	27.3	169	47	D
		SB Right 1	0	0.0	0.0	169	47	A
		SB Right 2	439	45.0	32.7	251	74	D
		WB Through	163	43.1	31.4	251	74	D
13	Lambert Intl Blvd & Terminal 2 Garage Exit	EB Through	0	0.0	0.0	251	74	A
		SB Left	60	9.0	4.9	63	2	A
		SB Right	0	0.0	0.0	262	45	A
		WB Through	522	24.7	16.9	262	45	C
14	Lambert Intl Blvd & Terminal 2 Entrance	EB Left	598	4.7	1.7	359	17	A
		EB Through	382	8.6	3.7	171	8	A
		SB Left	282	38.6	31.4	220	50	D
		SB Right	29	22.3	15.9	99	2	C
		WB Right	519	30.8	12.9	501	138	C
		WB Through	6	39.6	33.1	220	44	D
15	Air Cargo Dr & Terminal 2	NB Left 1	250	37.9	29.8	220	44	D
		NB Right	39	12.6	4.7	68	2	B
		NB Right	718	10.8	5.6	310	30	B
		NB Through	0	0.0	0.0	58	0	A
		WB Left 1	91	3.5	0.9	58	0	A
		WB Left 2	15	11.9	5.8	310	30	B
		WB Right 1	41	29.6	20.0	96	5	C
		WB Right 2	206	26.0	17.7	300	34	C

Notes:
AVG - average
EB – eastbound
FT - feet
LOS – level of service
MAX - maximum
MRO – Maintenance, Repair and Overhaul Facilities
NB – northbound
SB – southbound
WB – westbound
Sources: Lambert Traffic Management Enhancement Project, 2017; WSP USA, October 2020 (VISSIM analysis).

Table 4D-5: Morning Intersection Movement Measures of Effectiveness – 2040 No-Build

INTERSECTION		MOVEMENT	VOLUME	DELAY (SEC)	DELAY STOPPED (SEC)	QUEUE LENGTH AVG (FT)	QUEUE LENGTH MAX (FT)	LOS
1	Hunter Ave & Natural Bridge Rd	EB Right	0	0.0		0	0	A
		EB Through	208	0.1	0.0	0	0	A
		NB Left	0	0.0		0	0	A
		NB Right	0	0.0		0	0	A
		WB Left	9	1.1	0.2	16	0	A
		WB Through	249	0.1	0.0	0	0	A
2	Natural Bridge Rd & I-70 WB Ramps	EB Right	11	0.9	0.1	14	0	A
		EB Through	196	12.1	5.2	131	9	B
		NB Left	131	17.2	10.2	135	12	B
		NB Right 1	35	4.2	0.3	63	1	A
		NB Right 2	177	2.0	0.0	0	0	A
		WB Through	127	5.8	2.2	68	2	A
		WB Through	121	6.2	2.9	107	3	A
3	Lambert Intl Blvd & Cypress	NB Left	182	12.6	7.2	120	8	B
		NB Right	162	1.6	0.0	3	0	A
		WB Left	82	5.6	2.2	86	2	A
		WB Right	339	2.4	0.3	133	2	A
		WB Through	66	5.1	1.8	55	1	A
		WB Through	70	9.0	3.8	137	4	A
4	Cypress Rd & I-70 EB Ramps	EB Left	35	23.2	18.2	89	7	C
		EB Right	8	1.0	0.1	12	0	A
		EB Through	17	24.6	18.2	89	7	C
		NB Left	16	1.7	0.3	23	0	A
		NB Right	211	2.3	0.2	44	0	A
		NB Through	228	13.2	8.6	157	12	B
		SB Left	87	8.2	4.7	93	3	A
		SB Right	60	0.7	0.0	0	0	A
		SB Through	274	7.4	4.3	113	9	A
		WB Left	69	23.9	18.3	108	10	C

		WB Right	82	2.0	0.2	53	0	A
		WB Through	39	24.9	17.2	108	10	C
5	Lambert Intl Blvd & I-70 WB On Ramp	EB Left	0	0.0		0	0	A
		EB Right	0	0.0		91	0	A
		EB Through	210	2.0	0.5	55	1	A
		SB Left	0	0.0		0	0	A
		SB Right	0	0.0		0	0	A
		SB Through	0	0.0		0	0	A
		WB Left	226	3.1	0.3	101	1	A
		WB Right	0	0.0		0	0	A
		WB Through	159	0.4	0.0	0	0	A
6	Lambert Intl Blvd & American Airlines/Cape Air Maintenance Repair and Overhaul Facilities	EB Left 1	0	0.0		0	0	A
		EB Left 2	40	5.0	2.2	72	1	A
		EB Right	23	2.6	1.3	30	0	A
		EB Through	166	2.3	1.0	72	1	A
		NB Left	7	53.0	45.2	59	4	D
		NB Right	6	55.0	48.0	59	4	D
		NB Through	0	0.0		59	4	A
		SB Left	12	32.5	27.9	87	7	C
		SB Right 1	21	32.0	27.9	87	7	C
		SB Right 2	0	0.0		87	7	A
		SEB Left	0	0.0		0	0	A
		SEB Right	0	0.0		0	0	A
		SEB Through	0	0.0		0	0	A
		WB Left	5	2.6	0.7	77	2	A
		WB Right 1	20	2.2	0.6	77	2	A
		WB Right 2	0	0.0		77	2	A
		WB Through	436	1.5	0.4	77	2	A
7	Lambert Intl Bvld & Terminal 1 Exit	EB Right 1	0	0.0		117	14	A
		EB Right 2	28	20.2	13.9	117	14	C
		EB Through	155	18.6	12.9	117	14	B
		NB Left	0	0.0		0	0	A

		NB Right	0	0.0		0	0	A
		NB Right 2	0	0.0		0	0	A
		NWB Right	67	7.9	0.8	49	1	A
		SB Left	301	39.4	29.3	177	49	D
		SB Right	120	39.3	30.0	177	49	D
		SB Through	6	37.4	28.7	177	49	D
		SB Through 2	0	0.0		177	49	A
		SEB Left	242	49.9	38.5	177	42	D
		SEB Right	57	41.3	32.2	177	42	D
		SEB Through	0	0.0		177	42	A
		WB Left	109	8.3	4.7	92	4	A
		WB Left	0	0.0		166	28	A
		WB Through	286	26.9	19.4	166	28	C
8	Air Flight Dr & I-70 Ramps	NB Through	623	5.9	3.0	253	21	A
		SB Through	288	8.7	4.5	162	7	A
		WB Left	311	39.3	30.2	315	61	D
		WB Right	92	19.7	12.6	194	8	B
		WB Through	477	27.6	13.7	432	107	C
9	Pear Tree Dr & I-70 EB Off Ramp	EB Right	0	0.0		172	35	A
		EB Through	200	40.4	32.1	172	35	D
		NB Right	55	13.8	5.8	88	3	B
		SB Left	753	18.4	10.5	343	59	B
		SB Right	0	0.0		67	11	A
		SB Right	92	7.8	3.7	67	11	A
		SB Through	22	16.4	8.9	343	59	B
		WB Left	29	32.2	26.9	82	5	C
		WB Through	151	32.5	24.7	222	30	C
10	Pear Tree Dr & Air Flight Dr	EB Left 1	575	33.7	24.2	432	88	C
		EB Left 2	0	0.0		432	88	A
		EB Right	46	19.6	13.7	472	65	B
		EB Through	386	19.3	12.4	472	65	B
		NB Left	5	55.8	45.6	200	36	E

		NB Right 1	19	55.1	46.2	200	36	E
		NB Right 2	0	0.0		200	36	A
		NB Through	73	59.0	47.2	200	36	E
		SB Left	318	53.2	42.3	520	152	D
		SB Right	127	8.3	4.8	213	2	A
		SB Through	85	52.5	41.1	522	148	D
		WB Left	11	34.2	28.3	46	2	C
		WB Right 1	452	15.9	6.5	414	58	B
		WB Right 2	0	0.0		414	58	A
		WB Through	48	39.7	29.2	101	10	D
11	Natural Bridge & Edmundson	EB Right	171	3.4	0.1	172	1	A
		EB Through	553	7.0	2.6	379	19	A
		NB Left 1	170	49.1	38.1	324	63	D
		NB Left 2	31	48.4	37.4	324	63	D
		NB Right	55	7.0	1.0	324	63	A
		WB Left	32	4.8	2.4	46	1	A
		WB Through	341	15.0	7.5	308	32	B
		WB Through 2	64	14.9	7.3	308	32	B
12	Lambert Intl Blvd & Terminal 2 Exit	EB Through	567	9.5	5.2	194	18	A
		SB Left 1	116	30.2	23.0	175	21	C
		SB Left 2	185	33.1	24.6	263	39	C
		SB Right 1	213	36.7	26.8	282	49	D
		SB Right 2	215	38.2	28.7	314	52	D
		WB Through	316	1.4	0.8	46	2	A
13	Lambert Intl Blvd & Terminal 2 Garage Exit	EB Through	868	3.9	0.7	140	3	A
		SB Left	29	45.4	36.6	91	7	D
		SB Right	18	41.5	35.1	48	4	D
		WB Through	299	0.1	0.0	0	0	A
14	Lambert Intl Blvd & Terminal 2 Entrance	EB Left	595	28.1	18.4	439	80	C
		EB Through	303	1.5	0.3	36	0	A
		SB Left	6	70.6	65.4	40	3	E

		SB Right	48	6.2	0.3	10	0	A
		WB Right	277	19.1	13.1	220	27	B
		WB Through	252	15.9	10.7	128	15	B
15	Air Cargo Dr & Terminal 2	NB Left 1	382	2.2	0.8	183	5	A
		NB Right	128	0.7	0.0	137	2	A
		NB Right	128	-0.2	0.0	140	1	A
		NB Through	363	2.2	0.8	184	6	A
		WB Left 1	6	48.7	38.6	200	29	D
		WB Left 2	48	45.3	36.6	200	29	D
		WB Right 1	45	40.6	34.8	113	11	D
		WB Right 2	47	44.5	37.6	200	29	D

Notes:
AVG - average
EB – eastbound
FT - feet
LOS – level of service
MAX - maximum
MRO – Maintenance, Repair and Overhaul Facilities
NB – northbound
SB – southbound
WB – westbound

Sources: Lambert Traffic Management Enhancement Project, 2017; WSP USA, October 2020 (VISSIM analysis).

Table 4D-6: Afternoon Intersection Movement Measures of Effectiveness – 2040 No-Build

INTERSECTION		MOVEMENT	VOLUME	DELAY (SEC)	DELAY STOPPED (SEC)	QUEUE LENGTH AVG (FT)	QUEUE LENGTH MAX (FT)	LOS
1	Hunter Ave & Natural Bridge Rd	EB Right	0	0.0		0	0	A
		EB Through	530	0.4	0.0	0	0	A
		NB Left	0	0.0		0	0	A
		NB Right	19	6.3	0.4	67	1	A
		WB Left	20	2.6	0.7	32	0	A
		WB Through	495	0.1	0.0	0	0	A
2	Natural Bridge Rd & I-70 WB Ramps	EB Right	119	2.4	0.4	69	1	A
		EB Through	429	16.0	7.6	221	27	B
		NB Left	147	21.3	13.9	163	17	C
		NB Right 1	33	6.1	1.1	64	2	A
		NB Right 2	152	2.5	0.0	0	0	A
		WB Through	368	6.1	2.3	126	6	A

		WB Through	213	8.9	4.1	164	9	A
3	Lambert Intl Blvd & Cypress	NB Left	246	14.8	8.9	153	13	B
		NB Right	152	1.9	0.0	6	0	A
		WB Left	129	6.6	2.6	113	3	A
		WB Right	503	7.0	1.7	247	15	A
		WB Through	336	6.0	2.0	126	6	A
		WB Through	110	11.6	5.4	234	22	B
4	Cypress Rd & I-70 EB Ramps	EB Left	45	29.7	24.4	108	13	C
		EB Right	14	1.6	0.4	23	0	A
		EB Through	29	30.4	23.8	108	13	C
		NB Left	6	3.5	1.4	19	0	A
		NB Right	275	5.1	1.4	105	1	A
		NB Through	316	21.0	14.7	259	30	C
		SB Left	166	11.9	7.4	139	10	B
		SB Right	42	1.0	0.1	0	0	A
		SB Through	425	10.2	6.6	161	18	B
		WB Left	147	28.8	22.4	181	26	C
		WB Right	37	1.8	0.3	35	0	A
		WB Through	12	27.0	19.5	181	26	C
5	Lambert Intl Blvd & I-70 WB On Ramp	EB Left	5	3.9	1.4	5	0	A
		EB Right	7	2.7	0.5	130	2	A
		EB Through	307	3.3	1.2	94	3	A
		SB Left	6	55.2	48.1	40	2	E
		SB Right	6	7.2	0.9	0	0	A
		SB Through	0	0.0		40	2	A
		WB Left	435	7.1	1.2	215	6	A
		WB Right	6	2.1	0.2	0	0	A
		WB Through	495	1.9	0.3	64	1	A
6	Lambert Intl Blvd & American Airlines/Cape Air Maintenance Repair and	EB Left 1	0	0.0		0	0	A
		EB Left 2	11	6.6	3.0	87	2	A
		EB Right	0	0.0		0	0	A
		EB Through	295	2.6	1.0	87	2	A

	Overhaul Facilities	NB Left	24	51.2	43.2	95	11	D
		NB Right	11	51.5	44.2	95	11	D
		NB Through	0	0.0		95	11	A
		SB Left	11	36.5	31.7	72	5	D
		SB Right 1	11	39.7	35.5	72	5	D
		SB Right 2	0	0.0		72	5	A
		SEB Left	0	0.0		0	0	A
		SEB Right	0	0.0		0	0	A
		SEB Through	0	0.0		0	0	A
		WB Left	5	3.5	1.1	113	4	A
		WB Right 1	6	2.1	0.8	113	4	A
		WB Right 2	0	0.0		113	4	A
		WB Through	842	1.7	0.6	113	4	A
7	Lambert Intl Bvld & Terminal 1 Exit	EB Right 1	0	0.0		180	27	A
		EB Right 2	21	24.5	17.1	180	27	C
		EB Through	294	25.6	17.8	180	27	C
		NB Left	0	0.0		0	0	A
		NB Right	0	0.0		0	0	A
		NB Right 2	0	0.0		0	0	A
		NWB Right	161	12.1	3.5	82	5	B
		SB Left	265	41.6	31.2	173	50	D
		SB Right	130	43.6	33.9	173	50	D
		SB Through	7	37.6	28.9	173	50	D
		SB Through 2	0	0.0		173	50	A
		SEB Left	468	53.9	39.6	262	93	D
		SEB Right	172	51.0	37.6	262	93	D
		SEB Through	0	0.0		262	93	A
		WB Left	64	9.5	5.2	68	2	A
		WB Left	0	0.0		281	50	A
		WB Through	557	25.7	17.6	281	50	C
8	Air Flight Dr & I-70 Ramps	NB Through	610	5.7	2.2	438	41	A
		SB Through	408	26.6	17.4	390	77	C

		WB Left	302	40.5	32.5	234	52	D
		WB Right	31	21.6	15.2	113	2	C
		WB Through	530	40.7	19.3	528	208	D
9	Pear Tree Dr & I-70 EB Off Ramp	EB Right	6	41.3	34.5	241	49	D
		EB Through	268	40.8	32.0	241	49	D
		NB Right	42	18.5	9.8	78	4	B
		SB Left	764	20.6	11.9	396	72	C
		SB Right	0	0.0		87	1	A
		SB Right	98	9.8	4.6	87	1	A
		SB Through	16	19.1	10.4	396	72	B
		WB Left	43	31.7	22.2	105	6	C
		WB Through	214	26.3	18.3	328	37	C
10	Pear Tree Dr & Air Flight Dr	EB Left 1	500	51.5	38.0	439	109	D
		EB Left 2	0	0.0		439	109	A
		EB Right	16	24.0	17.6	534	119	C
		EB Through	557	23.0	15.8	534	119	C
		NB Left	5	85.5	72.1	270	84	F
		NB Right 1	21	85.7	73.0	270	84	F
		NB Right 2	0	0.0		270	84	A
		NB Through	109	95.4	78.8	270	84	F
		SB Left	382	60.0	46.5	513	205	E
		SB Right	166	16.4	10.2	484	24	B
		SB Through	44	58.5	44.9	513	202	E
		WB Left	5	24.7	16.6	34	1	C
		WB Right 1	534	36.5	18.6	605	209	D
		WB Right 2	0	0.0		605	209	A
		WB Through	84	53.4	38.1	247	25	D
11	Natural Bridge & Edmundson	EB Right	141	3.9	0.3	249	6	A
		EB Through	816	8.4	2.7	456	37	A
		NB Left 1	180	188.7	154.0	567	347	F
		NB Left 2	68	187.4	153.5	567	347	F
		NB Right	57	76.6	56.9	567	347	E

		WB Left	47	12.4	6.6	60	1	B
		WB Through	444	52.8	28.2	569	188	D
		WB Through 2	165	49.4	25.8	569	188	D
12	Lambert Intl Blvd & Terminal 2 Exit	EB Through	625	11.9	5.7	239	23	B
		SB Left 1	117	32.7	25.3	182	23	C
		SB Left 2	119	34.0	26.1	225	25	C
		SB Right 1	182	39.0	29.3	259	43	D
		SB Right 2	184	39.9	30.8	288	47	D
		WB Through	869	1.7	1.1	82	5	A
13	Lambert Intl Blvd & Terminal 2 Garage Exit	EB Through	859	4.0	0.7	142	4	A
		SB Left	28	44.2	35.6	92	7	D
		SB Right	36	39.5	32.9	67	8	D
		WB Through	836	0.2	0.0	2	0	A
14	Lambert Intl Blvd & Terminal 2 Entrance	EB Left	482	28.2	18.3	416	62	C
		EB Through	405	1.3	0.3	32	0	A
		SB Left	6	68.6	63.4	38	2	E
		SB Right	90	8.7	0.4	54	0	A
		WB Right	215	15.1	10.3	162	16	B
		WB Through	748	16.6	10.5	297	43	B
15	Air Cargo Dr & Terminal 2	NB Left 1	278	2.5	1.0	128	4	A
		NB Right	157	0.8	0.0	86	1	A
		NB Right	157	-0.1	0.0	87	1	A
		NB Through	262	2.6	1.1	134	4	A
		WB Left 1	6	42.0	32.0	245	37	D
		WB Left 2	91	43.2	34.3	245	37	D
		WB Right 1	33	39.5	33.9	89	8	D
		WB Right 2	39	41.9	35.0	245	37	D

Notes:
AVG - average
EB – eastbound
FT - feet
LOS – level of service
MAX - maximum
MRO – Maintenance, Repair and Overhaul Facilities
NB – northbound
SB – southbound
WB – westbound

Sources: Lambert Traffic Management Enhancement Project, 2017; WSP USA, October 2020 (VISSIM analysis).

APPENDIX 5A – INDIVIDUAL TAXIWAY ALTERNATIVES AND EVALUATION

This appendix presents taxiway mitigation alternatives organized by runway corridor. Organizing the discussion by runway corridors helps convey alternatives that solve several geometric issues simultaneously, while maintaining safety and operational efficiency. Before discussing the full airfield alternatives, individual taxiways alternatives were identified and analyzed. This methodology provides a better understanding of how the full airfield layout alternatives were developed.

ALTERNATIVES EVALUATION CRITERIA

The criteria used in the evaluation of the airfield taxiway alternatives utilized a red, amber, green (RAG) analysis scoring method (spotlight scoring). The RAG analysis gives a red score for a negative (-) result, an amber score for a neutral/not applicable result, and a green score for a positive (+) result. One key strength of the RAG scoring method is that it allows to remove any subjectivity from the analysis and quantify benefits and/or detriments to the system. The assessment criteria utilized to screen the different alternatives are the following:

- Provides a 90°Intersection Crossing (green or red)
- Crossing Outside High Energy Zone (green or red)
- Eliminates Direct Access from Apron (green or red)
- Impact to Runway Occupancy Time (ROT)
    - Green - less than 2 seconds
    - Yellow - 2 to 5 seconds
    - Red - greater than 5 seconds
- Primary Taxi Routing (Distance)
    - Green - No impact or limited impact (less than a 15% increase in taxi distance)
    - Red - impact (15% or greater increase in taxi distance)

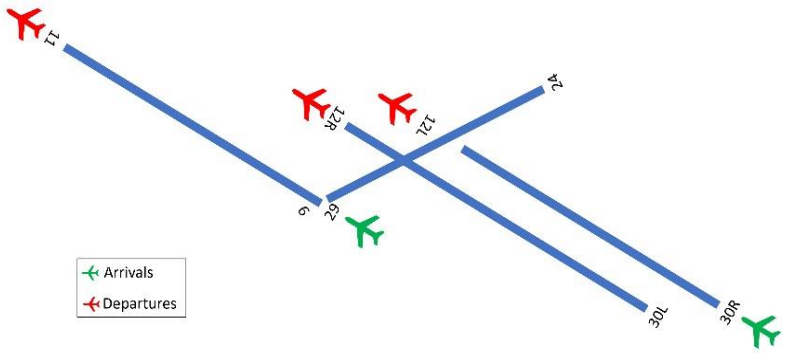
If the alternative scores all green and/or yellow, the alternative is carried forward in analysis.

RUNWAY 12R-30L CORRIDOR

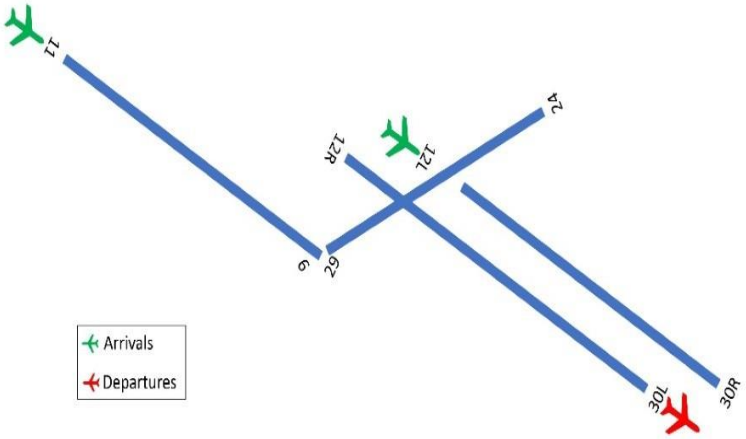
Runway 12R-30L and its surrounding taxiways see a majority of the Airport's traffic through direct utilization or by crossing this area on the way to and from other runways and the terminal apron. Positioned directly adjacent to the terminal, Runway 12R-30L is used primarily for departures in the operational flows used by STL ATCT personnel. Aircraft depart from Runway 12R when the airfield is operating in a Southeast Flow, and from Runway 30L in a Northwest Flow. **Figure 5A-1** shows the Northwest and Southeast flow and usage of Runway 12R-30L.

Figure 5A-1: Runway Use Configurations

Northwest Flow (Visual Meteorological Conditions to Category I)



Southeast Flow (Visual Meteorological Conditions to Category I)



Source: CMT

TAXIWAY S

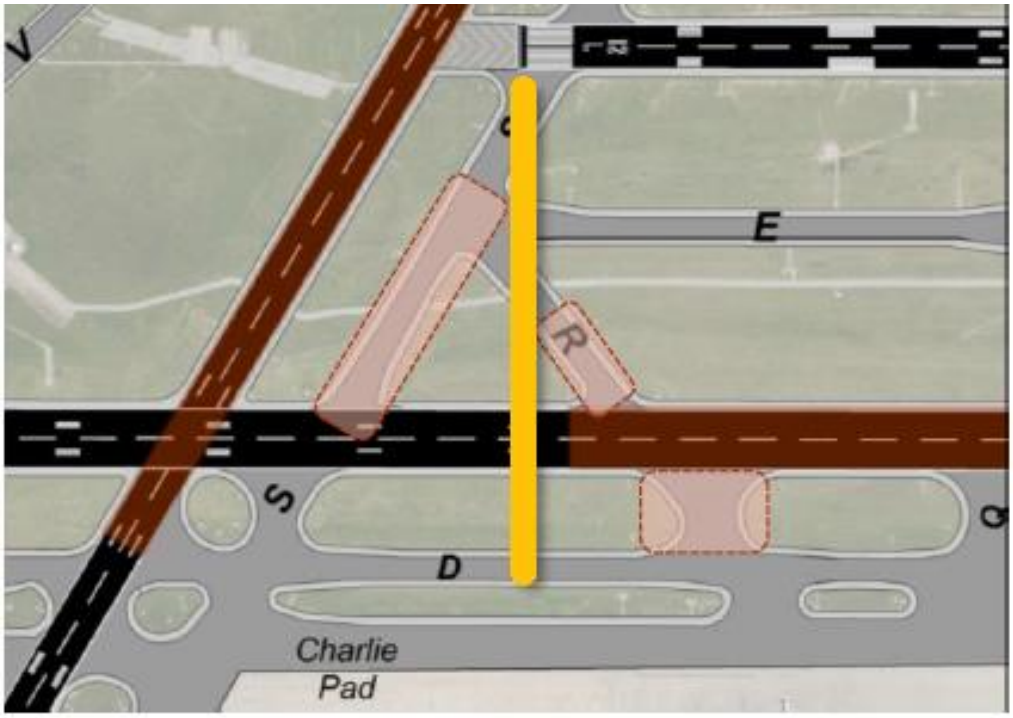
The previous chapter discussed how Taxiway S presents the following geometric issues within Runway 12R-30L corridor:

- **Runway 12R-30L Nonstandard Angle Intersection**: Taxiway S contributes to an intersection that intersects Runway 12R-30L at a nonstandard angle. Per FAA guidance, 90° runway-to-taxiway intersections are preferred, to optimize pilot visibility.

In addition to these issues, it is also observed that Taxiway S is in proximity to the intersection of Taxiways S, R, and E, which has been classified as a wide expanse of pavement. Currently, Taxiway S serves as a partial parallel taxiway to Runway 6-24.

TAXIWAY S – ALTERNATIVE #1

Figure 5A-2: Taxiway S – Alternative #1



Source: CMT

Alternative #1 for Taxiway S consists of removing the portion of Taxiway S crossing between Taxiway E and Runway 12R-30L and removing Taxiway R connectors north and south of Runway 12R-30L. In addition, this alternative adds a perpendicular connector that runs from the Runway 12L threshold to Taxiway D. This alternative will solve several issues by consolidating several taxiways into a single connector between 12L and Taxiway D. **Figure 5A-2** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A- 1.**

Table 5A- 1: Taxiway S – Alternative #1 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiway S and Taxiway R connectors, plus the perpendicular connector from 12L to Taxiway D, will cause a slight increase in ROT for Runway 12R-30L. The REDIM model was completed with the removal of Taxiway S and the results are shown in **Table 5A- 2.**

Table 5A- 2: Runway 12R-30L Impact without Taxiway S

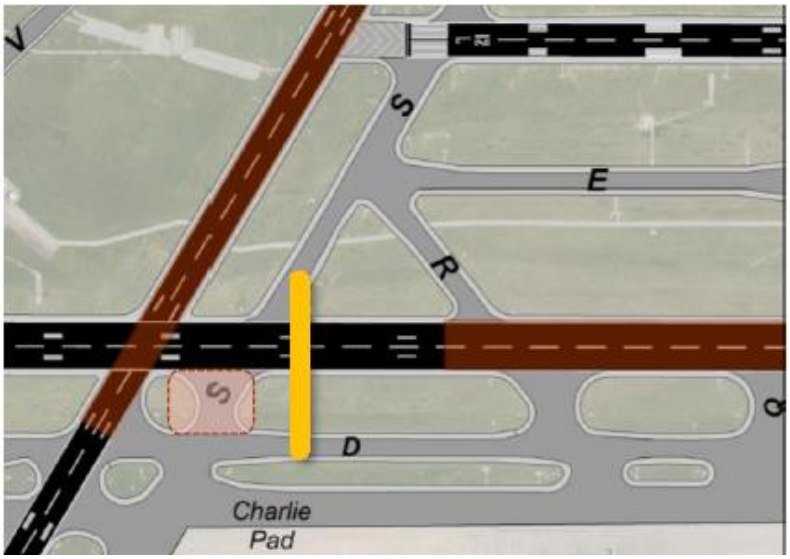
WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 12R (Northbound/Southbound)	55.1 / 50.3	Current 30L (Northbound/Southbound)	57.9 / 50.6
Future 12R (Northbound/Southbound)	57.8 / 51.6	Future 30L (Northbound/Southbound)	60.2 / 51.6
Net Change (Northbound/Southbound)	2.7 (4.9%) / 1.3 (2.6%)	Net Change (Northbound/Southbound)	2.3 (4.0%) / 1.0 (2.0%)

Source: CMT

It is important to mention that although Alternative #1 increases the ROT, it does eliminate the nonstandard intersection.

TAXIWAY S – ALTERNATIVE #2

Figure 5A-3: Taxiway S – Alternative #2



Source: CMT

Taxiway S Alternative #2 consists of removing the Taxiway S connector between Runway 12R-30L and Taxiway D. In addition, this alternative adds a perpendicular connector that runs from the northbound Taxiway S to Taxiway D. This alternative maintains options to provide dual connectors between Taxiway E & D for redundant crossings of Runway 12R-30L. **Figure 5A-3** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-3**.

Table 5A-3: Taxiway S – Alternative #2 Evaluation

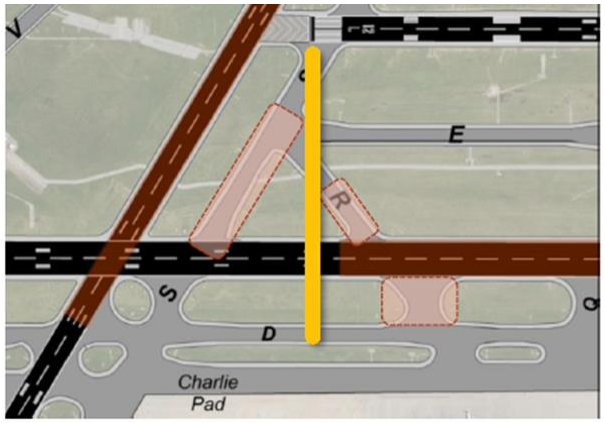
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As depicted on the diagram above, Taxiway S in between Runway 12R-30L and Taxiway D was removed. Along with this change a 90° intersection with the runway was added. These modifications will provide a crossing outside the high energy zone of Runway 12R-30L, and this will not have any significant impact on ROT and taxi routing distance. **Figure 5A-4** shows a summary of the alternatives presented for Taxiway S.

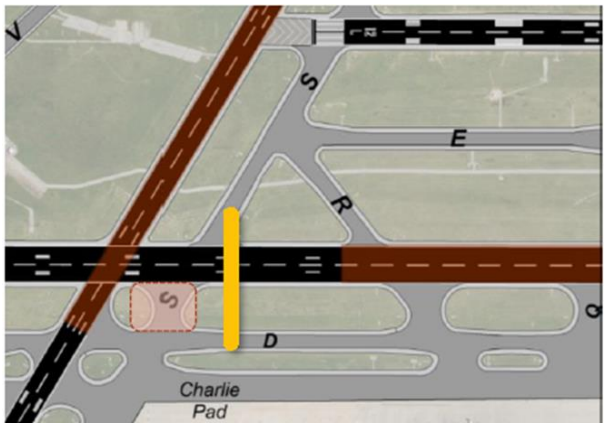
Figure 5A-4: Taxiway S – Alternatives Summary

Alternative #1



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

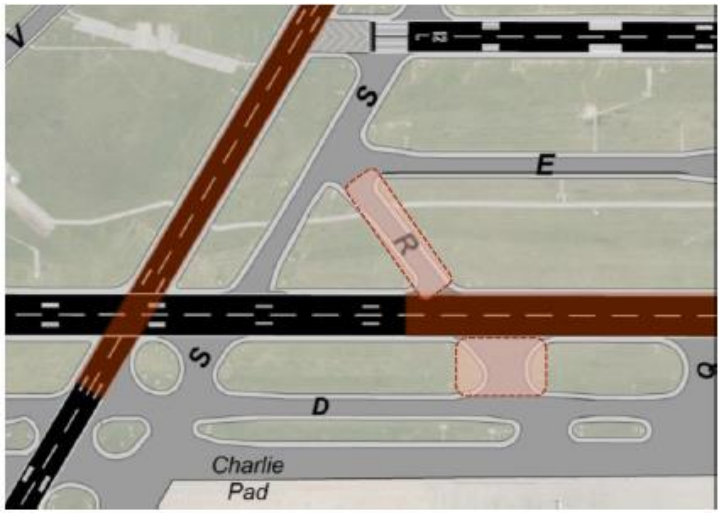
TAXIWAY R

The Facilities Requirements chapter discusses how Taxiway R presents the following geometric issues within Runway 12R-30L corridor:

- **Runway 12R-30L Direct Access:** Direct access exists when access is available directly from an apron to a runway without a turn in the Taxiway system. Providing direct access is considered a contributing factor to runway incursions.
- **Runway 12R-30L High Energy Zone Crossing:** Taxiway R contributes to a crossing in the high energy zone in the middle third of the runway. High energy crossings are classified as nonstandard conditions by FAA because the middle third of the runway is the area where a pilot can least maneuver to avoid collision. High energy crossings are only applicable when there is a runway crossing movement, and while the FAA identifies this area in the middle third of the runway, each ATC at a given airport may defined this area slightly different. As stated in the Facility Requirements chapter, it is recommended that these crossing opportunities are mitigated through relocation or removal of taxiways to prohibit crossing within the middle third of Runway 12R-30L.
- **Runway 12R-30L Nonstandard Angle Intersection**: Taxiway R contributes to a nonstandard intersection which crosses Runway 12R-30L. Per FAA guidance, 90° runway-to-taxiway intersections are preferred, to optimize pilot visibility.
- In addition to these issues, it is also observed that Taxiway R is in proximity to the intersection of Taxiways S, R, and E, which has been classified as a wide expanse of pavement.

TAXIWAY R – ALTERNATIVE #1

Figure 5A-5: Taxiway R – Alternative #1



Source: CMT

Alternative #1 for Taxiway R consists of removing Taxiway R connector between Taxiway D and Runway 12R-30L and the crossing between Runway 12R-30L and Taxiway E. This alternative will have an impact to redundancy, providing a single connector between Runway 6-24 and the high energy zone of Runway

12R-30L. **Figure 5A-5** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-4.**

Table 5A-4: Taxiway R – Alternative #1 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiway R will increase the ROT for Runway 12R-30L and the taxi routing distance. The increase in ROT is higher for traffic which lands at 30L due to the location of Taxiway R. Taxiway R is utilized by a greater percentage of aircraft when landing 30L, in comparison with 12R. It is also important to note that with Taxiway R being at a 30° angle, it allowed for a lower ROT because aircraft can exit at a higher speed. The removal of this connector represents the removal of a high-speed exit from 30L The REDIM model was completed with the removal of Taxiway R, the results are shown in **Table 5A-5.**

Table 5A-5: Runway 12R-30L Impact without Taxiway R

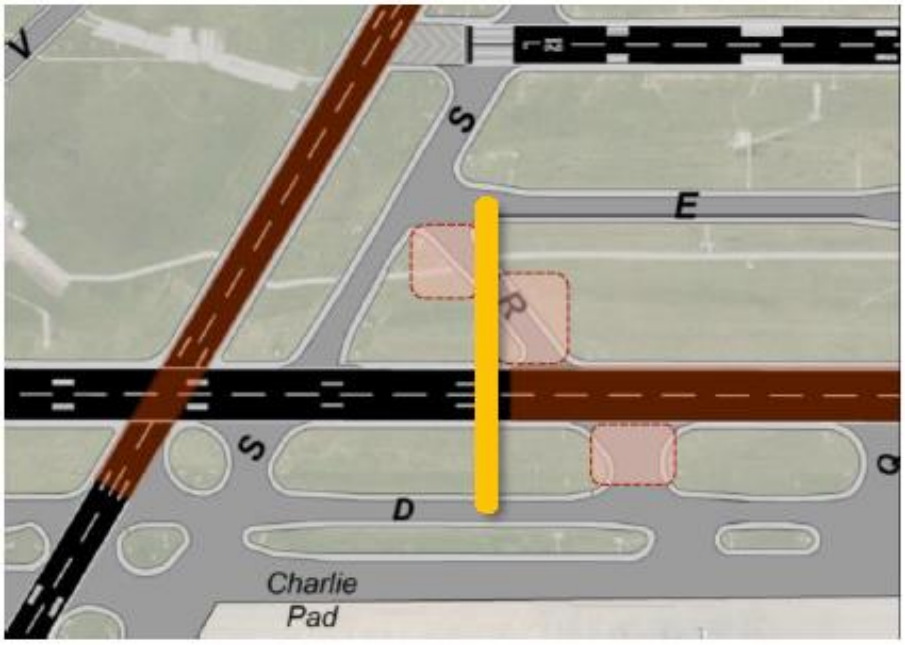
WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 12R (Southbound)	50.3	Current 30L (Northbound/Southbound)	57.9 / 50.6
Future 12R (Southbound)	51.2	Future 30L (Northbound/Southbound)	65.6 / 57.6
Net Change (Southbound)	0.9 (1.8%)	Net Change (Northbound/Southbound)	7.7 (13.3%) / 7 (13.8%)

Source: CMT

It is important to mention that while Alternative #1 has a negative impact on the ROT and taxi routing distance, it does eliminate various geometric issues such as direct access, the high energy crossing, nonstandard intersection, and it provides an improvement to Taxiway S, R, and E intersection.

TAXIWAY R – ALTERNATIVE #2

Figure 5A-6: Taxiway R – Alternative #2



Source: CMT

Alternative #2 for Taxiway R consists of replacing the existing Taxiway R with a 90° intersection with Runway 12R. This alternative maintains options to provide dual connectors between Taxiway E & D for redundant crossings of Runway 12R-30L. **Figure 5A-6** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-6**.

Table 5A-6: Taxiway R – Alternative #2 Evaluation

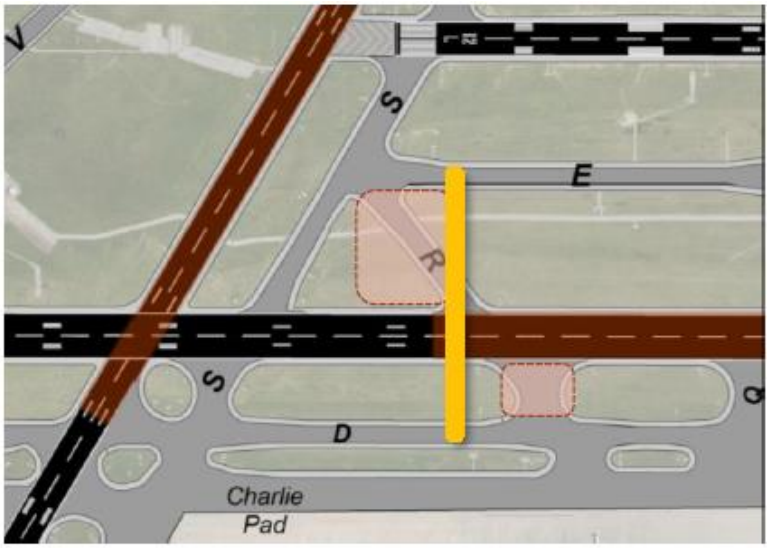
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of the existing Taxiway R and replacement with a 90° intersection with Runway 12 will provide a crossing outside the high energy zone of Runway 12R-30L, eliminates the direct access from the apron and will not have a significant impact on ROT and taxi routing distance. This alternative will also provide an improvement to the Taxiway S, R, and E intersection.

TAXIWAY R – ALTERNATIVE #3

Figure 5A-7 : Taxiway R – Alternative #3



Source: CMT

Alternative #3 for Taxiway R consists of replacing the existing Taxiway R with a 90° intersection taxiway with Runway 12R. However, the difference between Alternative #2 and #3 is that the crossing in Alternative #3 is located a few feet southeast from the crossing proposed in Alternative #2. This will enhance the separation of Taxiway E, R, and S intersection.

This alternative also maintains dual connectors between Taxiway E & D for crossings of Runway 12R-30L. This also makes an incremental improvement to the high-energy crossing (90° intersection and movement towards the outer limit of the high energy zone). **Figure 5A-7** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-7**.

Table 5A-7: Taxiway R – Alternative #3 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

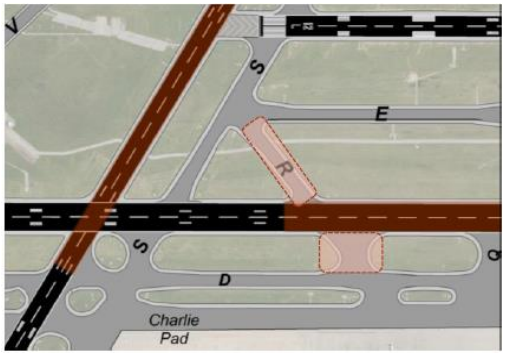
Source: CMT

As shown in the figure above, the removal of the existing Taxiway R and replacement with a 90° intersection with Runway 12 will not provide a crossing completely outside the high energy zone of Runway 12R-30L. However, it still provides an improvement to this condition by moving the crossing to the outer limit of the high energy zone. This alternative will eliminate the direct access from the apron and will not have significant

impact on ROT and taxi routing distance. **Figure 5A-8** shows a summary of the alternatives presented for Taxiway R.

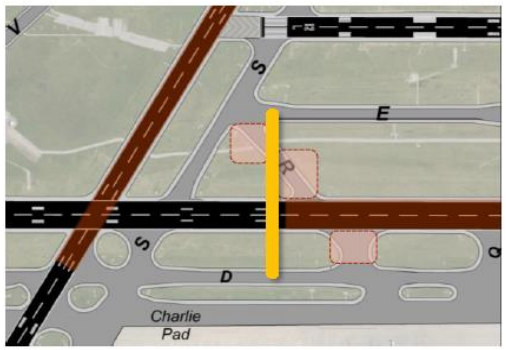
Figure 5A-8: Taxiway R – Alternatives Summary

Alternative #1



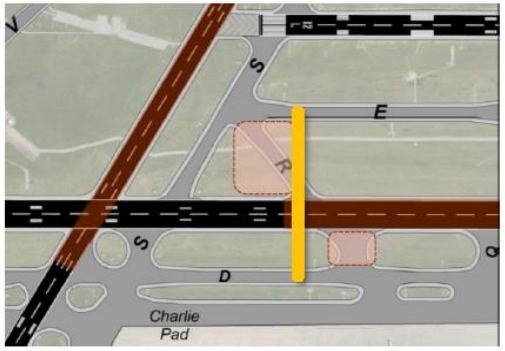
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

TAXIWAY Q & TAXIWAY P

The previous chapter discussed how Taxiway Q and Taxiway P present the following geometric issues within the Runway 12R-30L corridor:

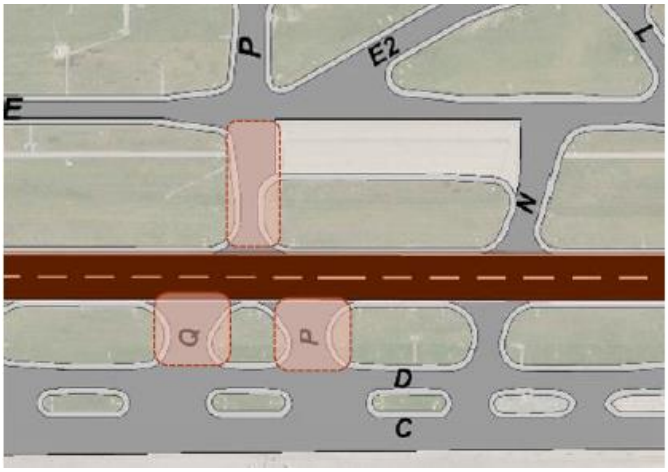
- Direct access to Runway 12R-30L
- Crossing at High Energy Zone of Runway 12R-30L
- Nonstandard intersection with Runway 12R-30L

In addition to these issues, Taxiways Q & P represent two crossing points that merge into one single taxiway north of Runway 12R-30L, this geometry is also known as a "Y" shaped taxiway crossing a runway.

According to the study *Problematic Taxiway Geometry Overview* published by the FAA and DOT[1]., multiple taxiway entrances at one runway location, such as Y-shaped connectors, present opportunities for ground navigation errors as a result of wide expanses of pavement and difficulties in reading signage. This nonstandard geometry promotes the potential for runway incursions and for aircraft vacating one runway to enter a wrong taxiway or a different runway. This geometry is considered unsafe, and the following alternatives seek to mitigate the various issues.

TAXIWAYS Q & P – ALTERNATIVE #1

Figure 5A-9: Taxiway Q & P – Alternative #1



Source: CMT

Alternative #1 for Taxiways Q & P consists of removing Taxiways Q & P connectors between Taxiway D and Runway 12R-30L and removing Taxiway P connector between Runway 12R-30L and Taxiway E. **Figure 5A-9** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-8.**

Table 5A-8: Taxiways Q & P – Alternative #1 Evaluation

[1] Problematic Taxiway Geometry Study Overview – DOT/FAA/TC-18/2 - January 2018

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiways Q & P will cause an increase in the ROT for Runway 12R-30L and in the taxi routing distance. The REDIM model was completed with the removal of Taxiways Q & P, the results are shown in **Table 5A-9.**

Table 5A-9: Runway 12R-30L Impact without Intersection (Taxiways Q & P)

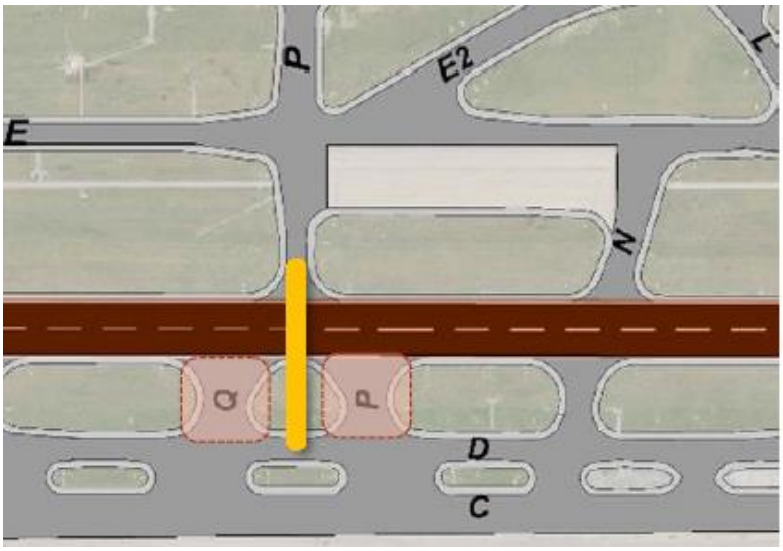
WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 12R (Northbound/Southbound)	55.0 / 50.3	Current 30L (Northbound/Southbound)	57.9 / 50.6
Future 12R (Northbound/Southbound)	57.8 / 51.7	Future 30L (Northbound/Southbound)	63.6 / 51.6
Net Change (Northbound/Southbound)	2.8 (5.1%) / 1.4 (2.8%)	Net Change (Northbound/Southbound)	5.7 (9.8%) / 1.0 (2.0%)

Source: CMT

It is important to mention that while Alternative #1 has a negative impact on the ROT and taxi routing distance, it does eliminate the direct access and the high energy crossing concerns. The nonstandard intersection issue is also eliminated as part of this alternative.

TAXIWAYS Q & P – ALTERNTIVE #2

Figure 5A-10: Taxiways Q & P – Alternative #2



Source: CMT

Alternative #2 for Taxiways Q & P consists of removing Taxiways Q & P between Taxiway D and Runway 12R-30L and adding a single 90° crossing with the runway which will serve as an extension of Taxiway P going from the north side of the runway and intersecting Taxiway D on the south of Runway 12R-30L. **Figure 5A-10** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-10**.

Table 5A-10: Taxiways Q & P – Alternative #2 Evaluation

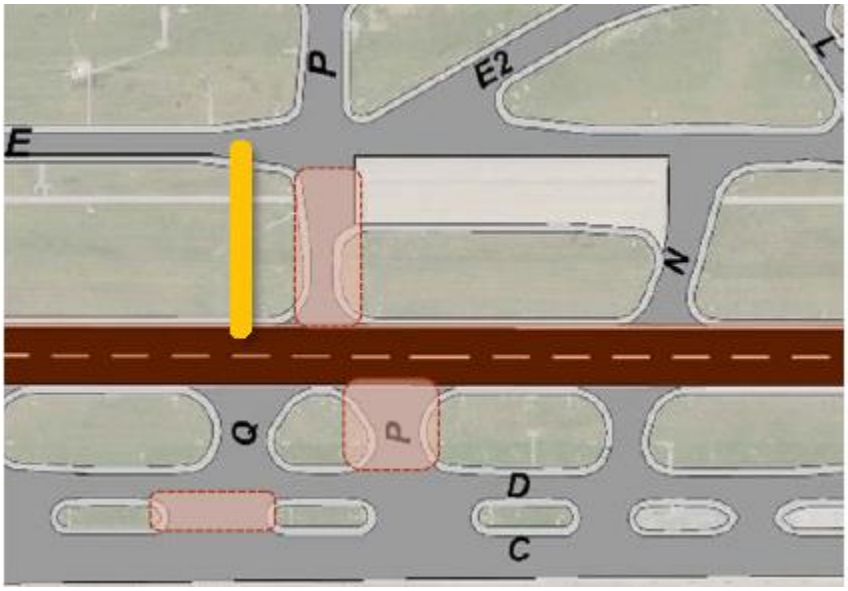
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of the existing Taxiway Q & P connectors and replacement with an extension of Taxiway P will provide a 90° intersection with the runway. This alternative does not mitigate the crossing in the high-energy zone of the runway, but it does eliminate the direct access concern. This alternative will not have a significant impact on ROT and taxi routing distance. It is worth noting that this alternative will require signage and lighting relocation/improvements to the proposed 90° intersection if it gets carried forward to construction.

TAXIWAYS Q & P – ALTERNATIVE #3

Figure 5A-11: Taxiways Q & P – Alternative #3



Source: CMT

Alternative #3 for Taxiways Q & P consists of removing Taxiway P connectors north and south of Runway 12R-30L and adding a 90° single crossing between Taxiway E and Runway 12R-30L. **Figure 5A-11** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-11.**

Table 5A-11: Taxiways Q & P – Alternative #3 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

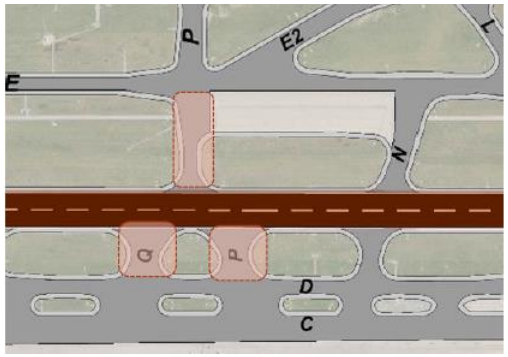
Source: CMT

As shown in the figure above, the removal of the existing Taxiway P connectors north and south of the runway, and the replacement with the perpendicular intersection, will provide a 90° intersection with the runway. This alternative does not mitigate the crossing in the high-energy zone of the runway, but it does eliminate the direct access concern.

This alternative will not have significant impact on ROT and taxi routing distance. It is worth noting that this alternative allows the slowing of arrivals on Runway 30R that use Taxiway E 2 before crossing Runway 12R-30L at Taxiway Q. **Figure 5A-12** shows a summary of the alternatives presented for Taxiway Q & P.

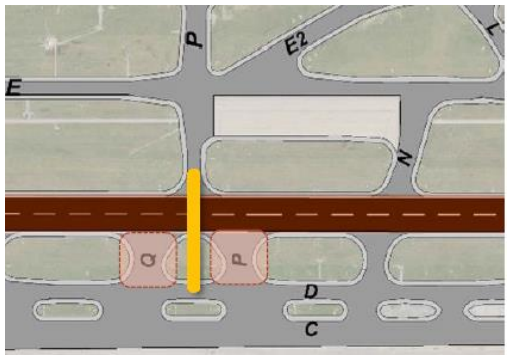
Figure 5A-12: Taxiway Q/P – Alternatives Summary

Alternative #1



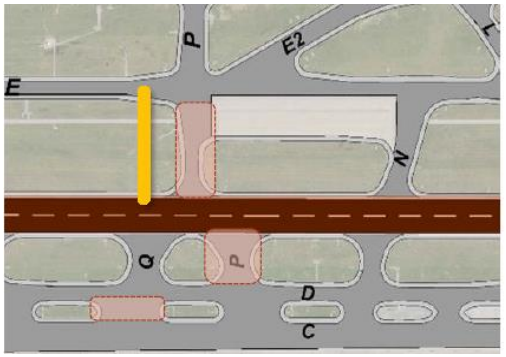
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

TAXIWAY N

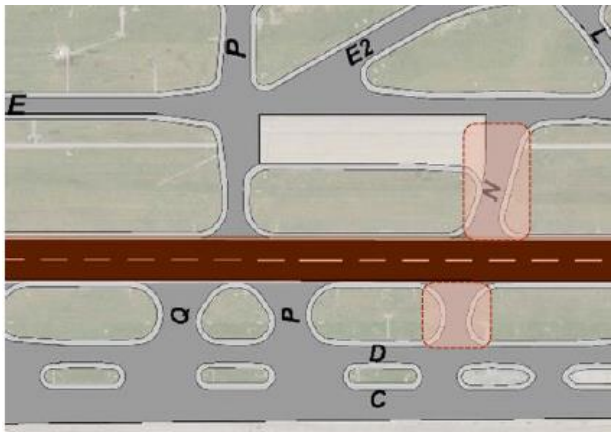
The previous chapter discussed how Taxiway N presents the following geometric issues within the Runway 12R-30L corridor:

- Direct access to Runway 12R-30L
- Crossing at High Energy Zone of Runway 12R-30L
- Nonstandard intersection with Runway 12R-30L

Taxiway N is primarily used as a crossing route for arrival operations that utilize Runway 12R-30L. Aircraft arriving at Runway 12R or Runway 30L utilize Taxiway N as an exit to travel to the north side of the airfield or to the terminal area. With Taxiway N providing a crossing at the High Energy Zone of the runway, it should be readjusted to mitigate this crossing and increase the safety during operations which require to move from Runway 12R-30L to the north or south portions of the airfield.

TAXIWAY N – ALTERNATIVE #1

Figure 5A-13: Taxiway N – Alternative #1



Source: CMT

Alternative #1 consists of removing Taxiway N between Taxiway D and Taxiway E. **Figure 5A-13** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-12.**

Table 5A-12: Taxiway N – Alternative #1 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, this alternative does not provide a 90° intersection with the runway, but it does eliminate the crossing outside the high-energy zone. The removal of Taxiway N will have a slight increase in the ROT for Runway 12R-30L (4.5 seconds) and in the taxi routing distance. The REDIM model was completed with the removal of Taxiway N, the results are shown in **Table 5A-13**.

Table 5A-13: Runway 12R-30L Impact without Taxiway N

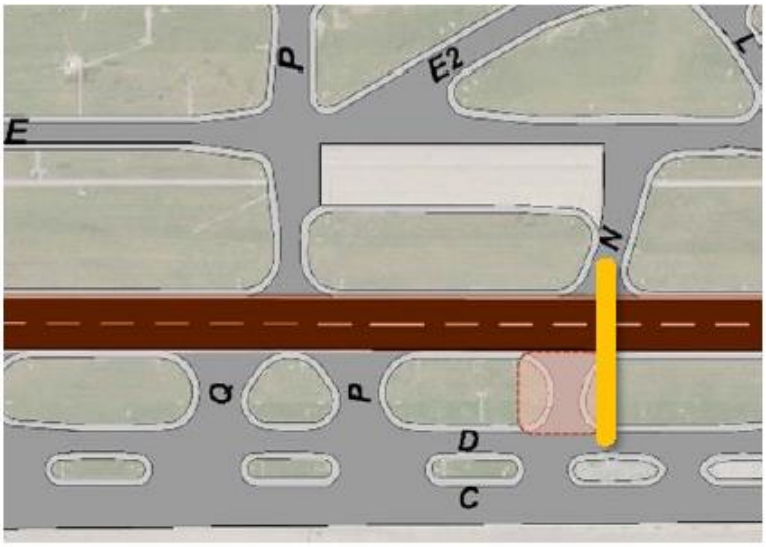
WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 12R (Northbound/Southbound)	55.0 / 50.3	Current 30L (Northbound/Southbound)	57.9 / 50.6
Future 12R (Northbound/Southbound)	59.5 / 54.1	Future 30L (Northbound/Southbound)	58.9 / 51.3
Net Change (Northbound/Southbound)	4.5 (8.2%) / 3.8 (7.6%)	Net Change (Northbound/Southbound)	1.0 (1.7%) / 0.7 (1.4%)

Source: CMT

It is important to mention that while Alternative #1 increases the ROT and taxi routing distance, it does eliminate the direct access and high-energy crossing concerns.

TAXIWAY N – ALTERNATIVE #2

Figure 5A-14: Taxiway N – Alternative #2



Source: CMT

Alternative #2 for Taxiway N consists of removing Taxiway N in between Taxiway D and Runway 12R-30L. This option also adds a 90° intersection with the runway which will run across Runway 12R-30L from Taxiway N, located north of the runway to Taxiway D. **Figure 5A-14** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-14**.

Table 5A-14: Taxiway N – Alternative #2 Evaluation

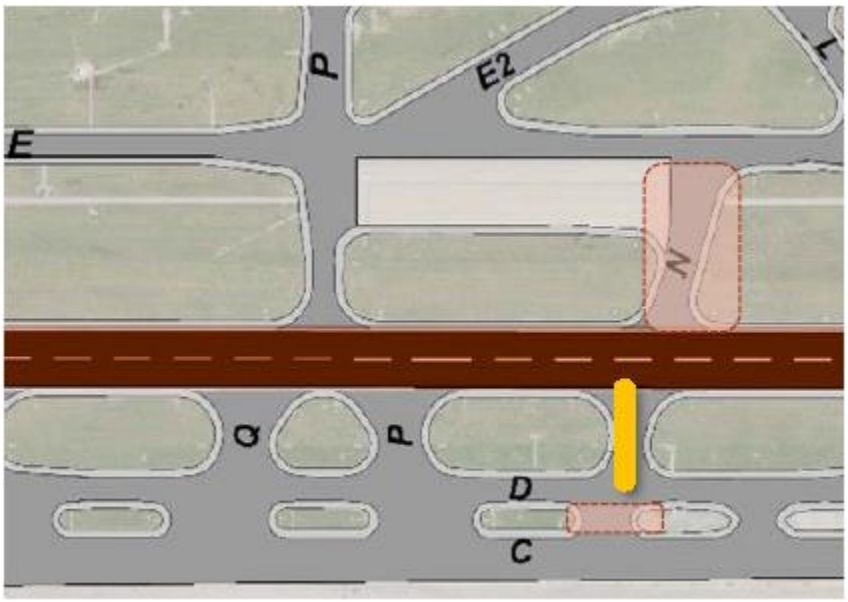
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, this alternative will eliminate the direct access from the apron and will not have a significant impact on ROT and taxi routing distance. However, the proposed new Taxiway N crossing is still inside the high-energy crossing of the runway.

TAXIWAY N – ALTERNATIVE #3

Figure 5A-15: Taxiway N – Alternative #3



Source: CMT

Alternative #3 for Taxiway N consists of removing the existing Taxiway N connector between Taxiway E and Runway 12R-30L and adding a 90° intersection with Runway 12R-30L and Taxiway D. **Figure 5A-15** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-15.**

Table 5A-15: Taxiway N – Alternative #3 Evaluation

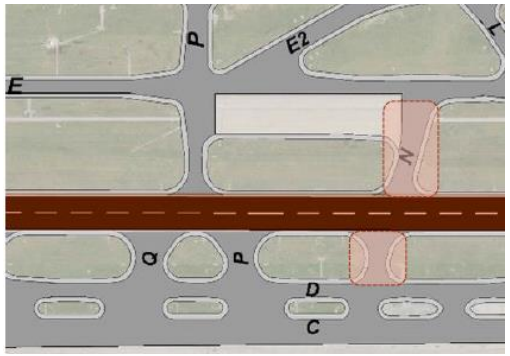
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of the existing Taxiway N connector between Taxiway E and Runway 12R-30L and replacing with a 90° intersection taxiway between Taxiway D and the runway, will eliminate the direct access from the apron. This alternative will influence the ROT with the closure of N north of Runway 12R-30L. This alternative also eliminates the high-energy crossing. **Figure 5A-16** shows a summary of the alternatives presented for Taxiway N.

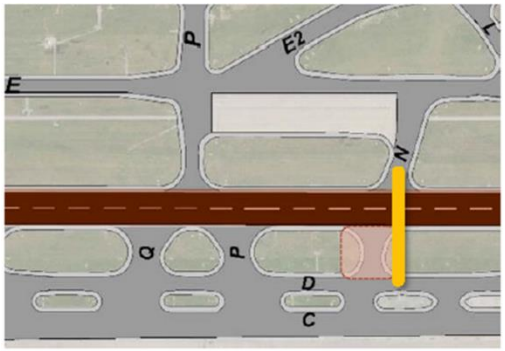
Figure 5A-16 : Taxiway N – Alternatives Summary

Alternative #1



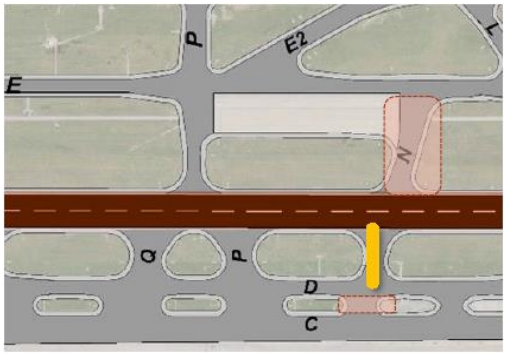
ASSESSMENT RITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

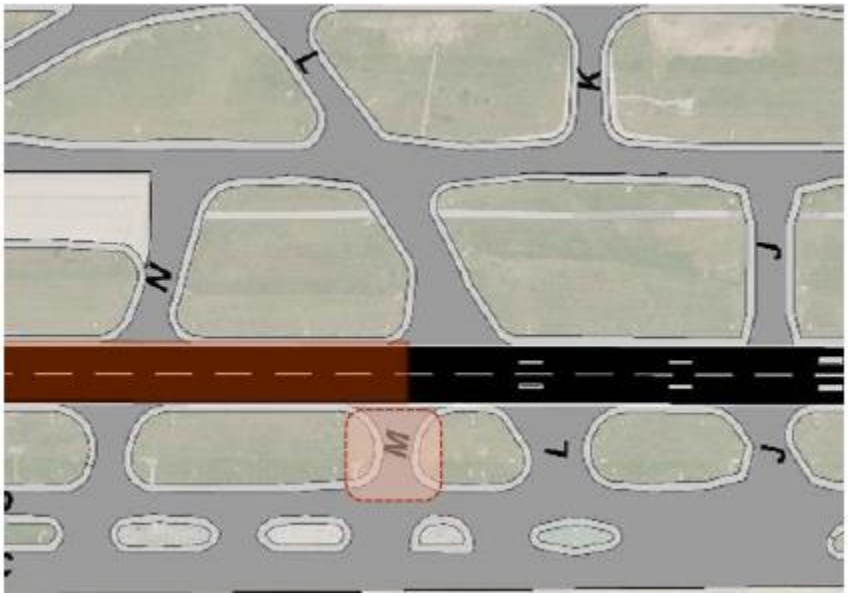
TAXIWAY M & TAXIWAY L

The previous chapter discussed how Taxiway M & L present the following geometric issues within Runway 12R-30L corridor:

- Direct access to Runway 12R-30L (Taxiway M)
- Nonstandard intersection with Runway 12R-30L
- Crossing at High Energy Zone of Runway 12R-30L (edge of Taxiway M)

TAXIWAY M & L – ALTERNATIVE #1

Figure 5A-17: Taxiway M & L – Alternative #1



Source: CMT

Alternative #1 for Taxiways M & L consists of removing Taxiway M connector between Taxiway D and Runway 12R-30L. **Figure 5A-17** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-16.**

Table 5A-16: Taxiway M & L – Alternative #1 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiway M will have a slight increase in the ROT for Runway 12R-30L. The REDIM model was completed with the removal of Taxiway N, the results are shown in **Table 5A-17**.

Table 5A-17: Runway 12R-30L Impact without Taxiway M

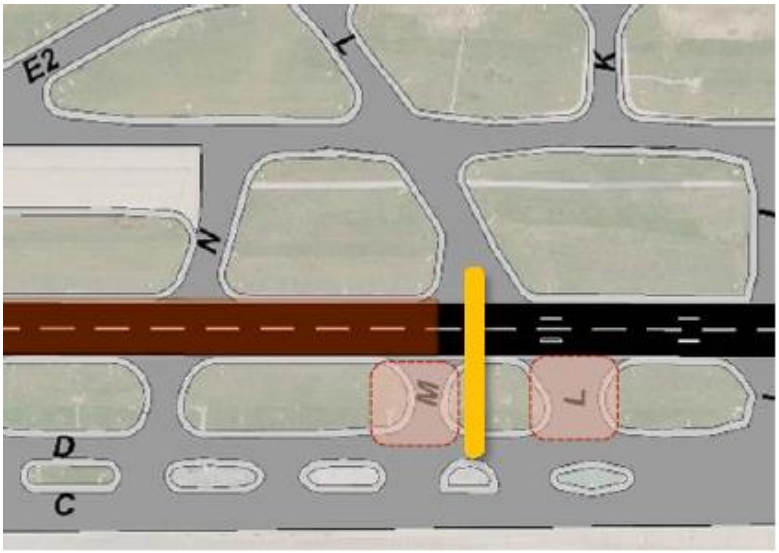
WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 12R (Northbound/Southbound)	55.0 / 50.3	Current 30L (Northbound/Southbound)	57.9 / 50.6
Future 12R (Northbound/Southbound)	60.3 / 52.8	Future 30L (Northbound/Southbound)	58.0 / 51.1
Net Change (Northbound/Southbound)	5.3 (9.6%) / 2.5 (5.0%)	Net Change (Northbound/Southbound)	0.1 (0.2%) / 0.5 (1.0%)

Source: CMT

It is important to mention that although Alternative #1 increases the ROT, it does eliminate the direct access and high-energy crossing concerns.

TAXIWAY M & L – ALTERNATIVE #2

Figure 5A-18: Taxiway M & L – Alternative #2



Source: CMT

Alternative #2 consists of removing the Taxiway M connector and Taxiway L connector between Taxiway D and Runway 12R-30L. This alternative also includes a new perpendicular connector between Taxiway D and Taxiway L, north of Runway 12R-30L. **Figure 5A-18** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A- 18.**

Table 5A- 18: Taxiway M & L – Alternative #2 Evaluation

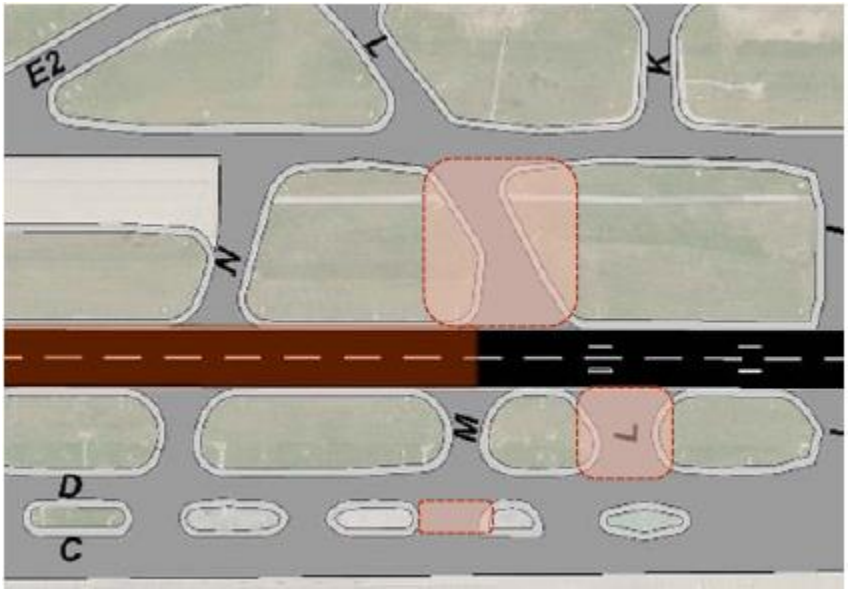
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiways M & L, and the addition of a perpendicular connector will eliminate the direct access and high-energy crossing concerns. This alternative will also comply with the 90° intersection with Runway 12R-30L. Providing the perpendicular crossing will decrease ROT and taxi routing distance.

TAXIWAY M & L – ALTERNATIVE #3

Figure 5A-19: Taxiway M & L – Alternative #3



Source: CMT

Alternative #3 consists of removing Taxiway L between Taxiway D and Taxiway E. This will remove a nonstandard angle crossing to Runway 12R-30L. **Figure 5A-19** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-19.**

Table 5A-19: Taxiway M & L – Alternative #3 Evaluation

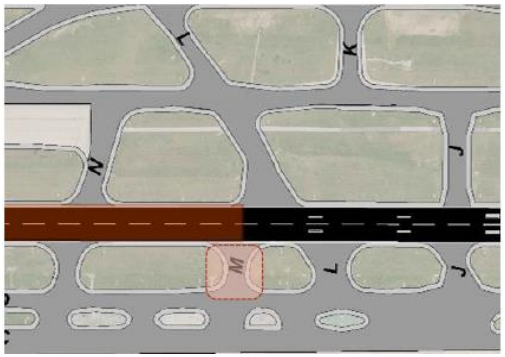
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiway L's connectors north and south of Runway 12R-30L to Taxiway E and Taxiway D, respectively, will eliminate the non-perpendicular crossing. However, there will be an impact to the ROT south of Runway 12R-30L split between existing Taxiway M and Taxiway L. **Figure 5A-20** shows a summary of the alternatives presented for Taxiway M & L.

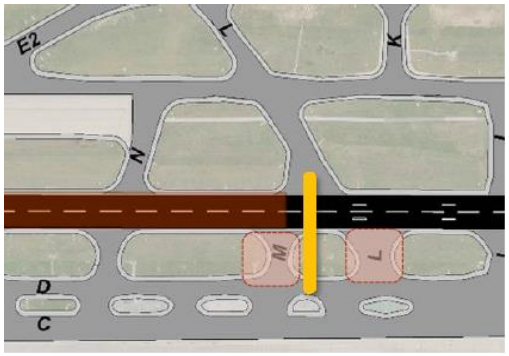
Figure 5A-20: Taxiway M & L – Alternatives Summary

Alternative #1



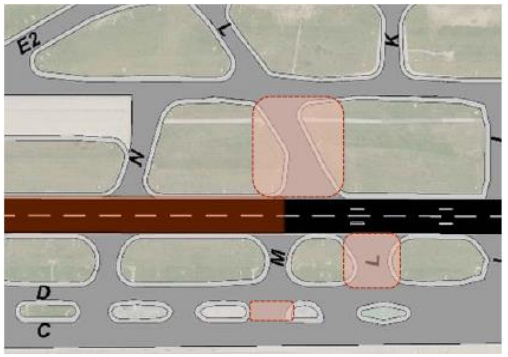
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

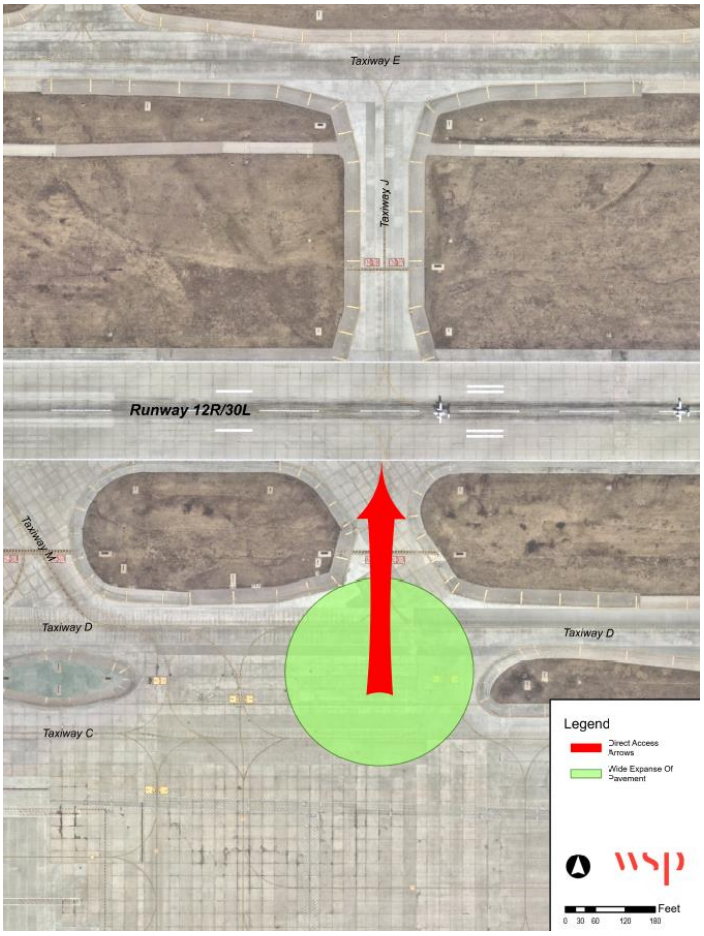
TAXIWAY J

The previous chapter discussed how Taxiway J presents the following geometric issues within Runway 12R-30L corridor:

- Direct access to Runway 12R-30L
- **Large Expanse of Pavement**: Large expanses of pavement can result in pilot disorientation/confusion and make it difficult to provide proper signage, marking and lighting. The intersection of Taxiway D, Taxiway J and the terminal apron creates a large expanse of pavement. While there is currently a green painted island delineating unusable pavement directly adjacent to Taxiway D, there is still a wide throat created by the Taxiway D, Taxiway J, terminal apron intersection that is immediately adjacent to Runway 12R-30L and also contributes to the direct access issue.

Figure 5A-21 shows the existing geometric issues found at Taxiway J. The alternatives identified to resolve these geometric issues are shown in *Section 5.17 – Taxiway Geometry Holistic Alternatives* as part of a comprehensive process to develop holistic alternatives for the whole airfield.

Figure 5A-21: Taxiway J Geometric Issues



Source: CMT, September 2020 (analysis).

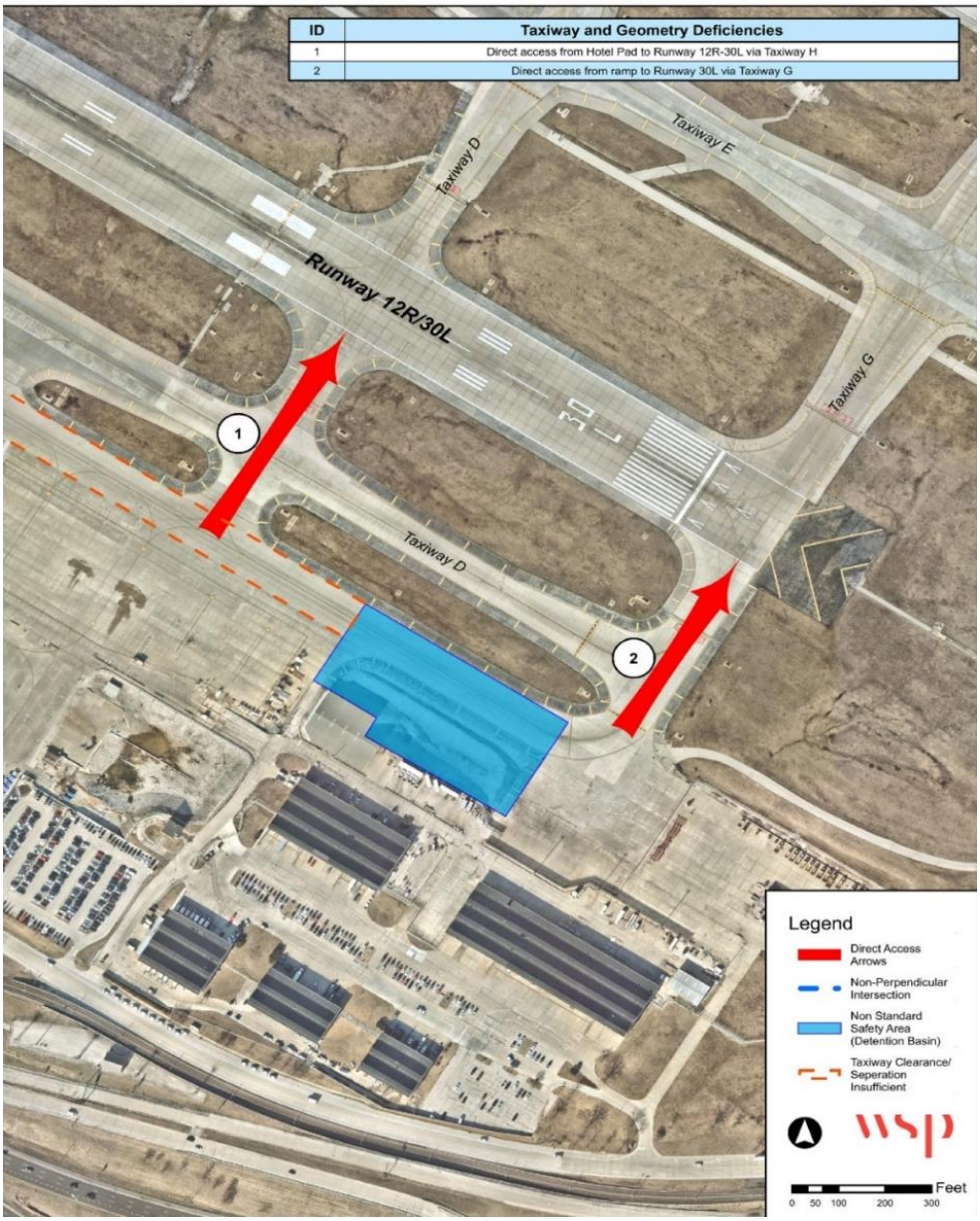
TAXIWAY H & TAXIWAY G

The previous chapter discussed how Taxiways H and G present the following geometric issue within Runway 12R-30L corridor:

- Direct access to Runway 30L

Figure 5A-22 depicts the non-standard geometry for taxiways H and G. The alternatives identified to solve these geometric issues are shown in *Section 5.17 – Taxiway Geometry Holistic Alternatives* as part of a comprehensive process to develop holistic alternatives for the whole airfield.

Figure 5A-22: Taxiways H and Gold Direct Access



Source: CMT, September 2020 (analysis).

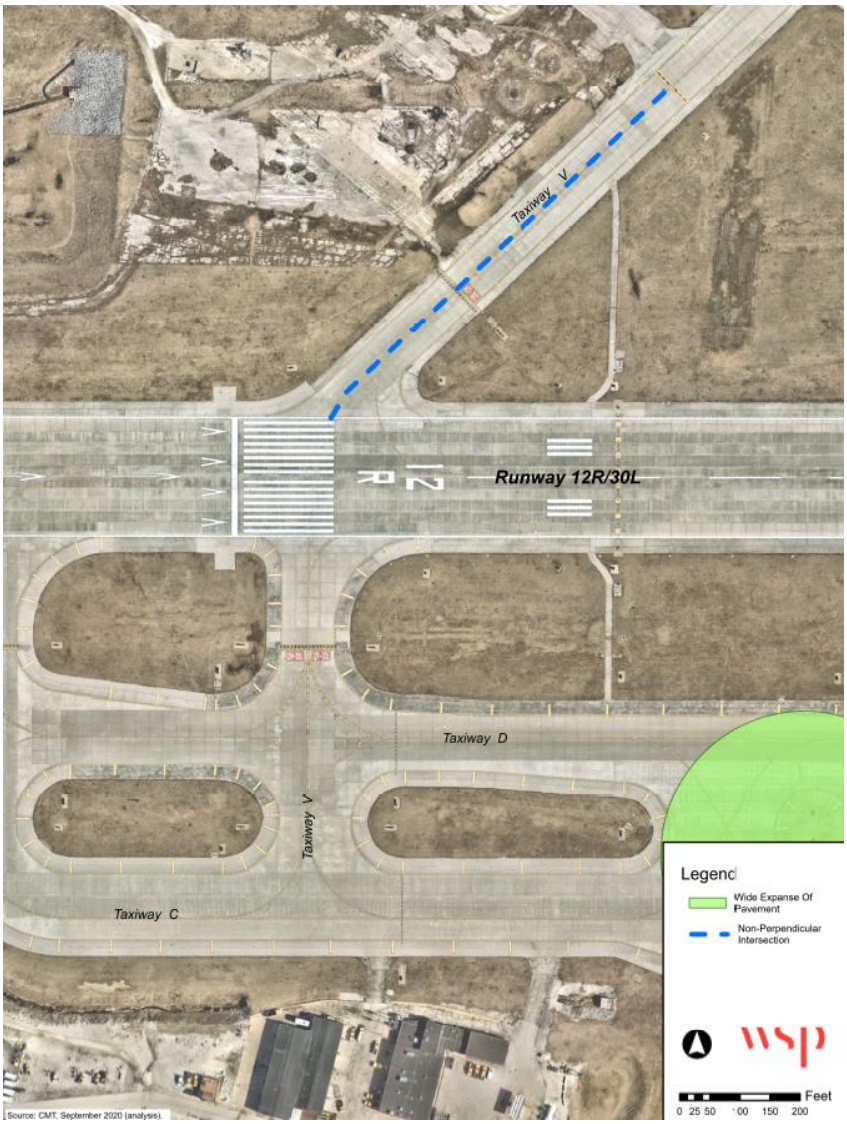
TAXIWAY V

The previous chapter discussed how Taxiway V presents the following geometric issue within Runway 12R-30L corridor:

- Nonstandard intersection with Runway 12R-30L: Taxiway V intersects Runway 12R-30L at an acute angle. This results in pilots at the runway hold line having a clear view of inbound traffic on Runway 12R, but a limited view of aircraft that may be departing Runway 30L or exiting via the Runway 12R threshold taxiways.

Figure 5A-23 shows the existing geometric issues found at Taxiway V. The alternatives identified to solve these geometric issues are shown in *Section 5.17 – Taxiway Geometry Holistic Alternatives* as part of a comprehensive process to develop holistic alternatives for the whole airfield.

Figure 5A-23: Taxiway V Geometric Issues



Source: CMT, September 2020 (analysis).

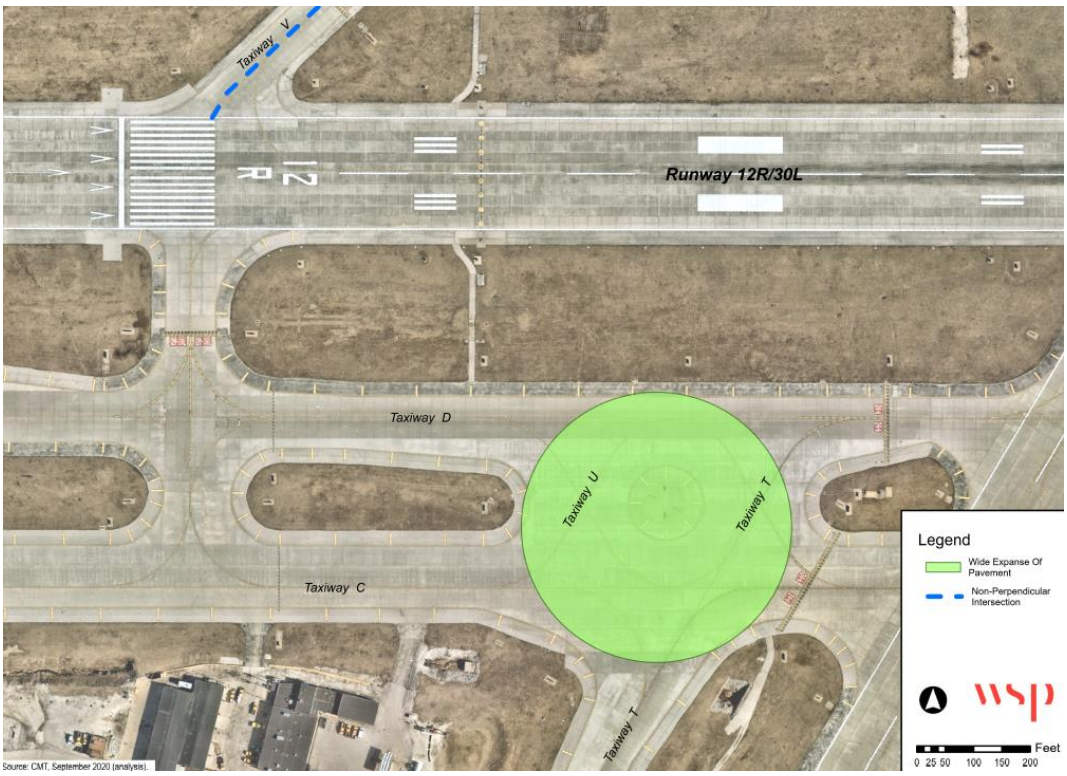
RUNWAY 12R-30L LARGE EXPANSE OF PAVEMENT

There are several areas directly adjacent to Runway 12R-30L that represent large expanses of pavement. Large expanses of pavement can result in pilot disorientation/confusion and make it difficult to provide proper signage, marking and lighting. This can be mitigated through the use of green painted islands in well lighted conditions, in-pavement lighting to provide clear delineation in darkness, or removal of the pavement to eliminate any ambiguity.

The intersection of Taxiways D, C, T, and U, which is adjacent to both Runways 6-24 and 12R-30L, is considered a large expanse of pavement. Based on FAA guidance, and especially because of its proximity to both runways, it is recommended that mitigating measures be implemented to clearly delineate these taxiway intersections. **Figure 5A-24** shows the large expanse of pavement originated from the intersection of Taxiways D, C, T, and U. The alternatives identified to solve these geometric issues are shown in *Section 5.17 – Taxiway Geometry Holistic Alternatives* as part of a comprehensive process to develop holistic alternatives for the whole airfield.

The intersection of Taxiway D, Taxiway J and the terminal apron also creates a large expanse of pavement. While there is currently a green painted island delineating unusable pavement directly adjacent to Taxiway D, there is still a wide throat created by the Taxiway D, Taxiway J, terminal apron intersection that is immediately adjacent to Runway 12R-30L and contributes to the direct access issue. **Figure 5A-21,** shown previously in this chapter in the Taxiway J section, shows this non-standard geometry.

Figure 5A-24: Expanse of Pavement at Intersection of Taxiways D, C, T & U



Source: CMT, September 2020 (analysis).

RUNWAY 12R-30L NONSTANDARD SAFETY AREAS – DIMENSION ANALYSIS

The objective of this analysis is to discuss non compliance with safety areas dimension requirements. Both the Runway Safety Area (RSA) and Runway Object Free Area (ROFA) on the Runway 12R end are penetrated by an Airfield Access Road, and do not meet FAA safety areas dimension standards. Beyond the Runway 12R end, there is 940 feet of full-width RSA available and 875 feet of full-width ROFA available. Both areas should meet the 1,000-foot beyond the runway end requirement. **Figure 5A-25** shows Runway's 12R safety areas.

As shown in the figure below, the 1,000-foot beyond the runway end requirement for the RSA and ROFA produces two road incompatibilities inside these safety areas: Airfield Service Road and small portion of Banshee Road inside the right corner of the OFA. *Section 5.23 – Runway Safety Areas and Runway Object Free Areas* takes and more in depth analysis of the incompatible objects inside these safety areas and potential mitigation alternatives. However, if relocation of these roads is not possible as a mitigation action, a possible alternative is to request a Modification of Standards (MOS) for these two roads which, if approved, will allow to maintain these roads inside Runway 12R safety areas as a long as an acceptable level of safety is reached.

Figure 5A-25: Runway 12R Safety Areas

Source: CMT, September 2020 (analysis).

RUNWAY 12L-30R CORRIDOR

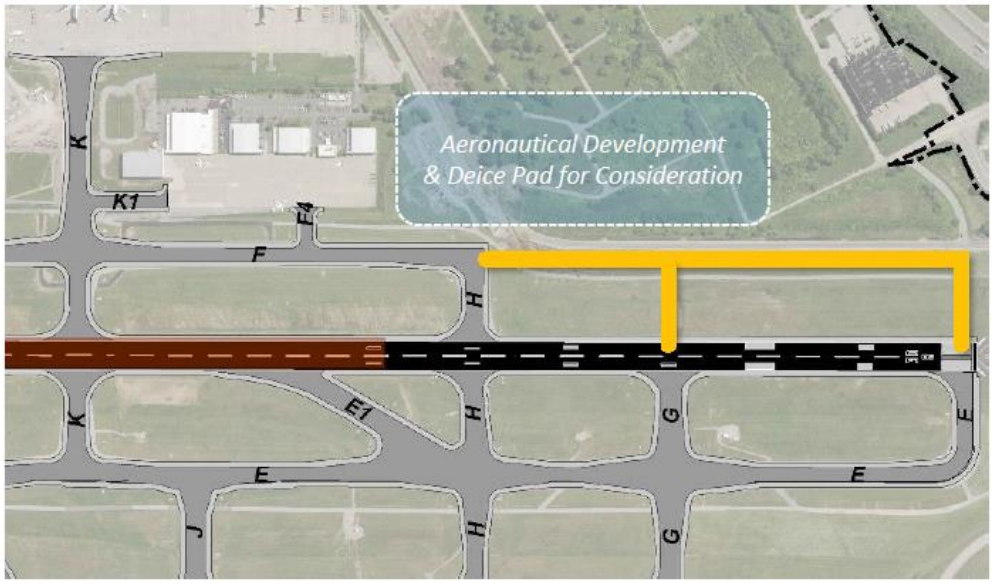
While Runway 12L-30R is not used as much as Runway 12R-30L, it still accounts for approximately 28% of STL's operations. Runway 12L is used for both arrivals and departures in Southeast flow while Runway 30R is used primarily for arrivals in Northwest flow. All of the design standards issues related to Runway 12L-30R occur in the middle third of the runway.

Taxiway F

While it has been determined that taxiway improvements at STL are not warranted based on requiring additional capacity, an extension of Taxiway F to the Runway 30R threshold was given additional consideration. Coordination with STL ATCT personnel indicated that aircraft originating from the north apron (i.e. Cargo and GA aircraft) are offered a departure on Runway 30R from Taxiway H. Aircraft that are unable to depart from the shorter runway length are instructed to cross Runway 30R and then depart from Runway 30L. Today, this occurrence is infrequent. However, to limit the number of runway crossings, the extension of Taxiway F should be planned for to minimize or eliminate these unnecessary crossings.

During 2019, 81% of aircraft coming from the north side of the airfield required the crossing of 30R to active departure runway 30L. In addition, it has been observed that the majority of operations requiring de-icing need to cross Runway 30R and 30L to dedicated de-ice pads. The alternative presented below proposes the long-term development of de-icing facilities for the air cargo and GA ramps in order to minimize unnecessary runway crossings.

Figure 5A-26: Taxiway F Extension Alternative



Source: CMT

A single alternative for the extension of Taxiway F and proposed De-ice Pad has been developed and is illustrated in **Figure 5A-26.** In addition to minimizing runway crossings for the operations discussed above, this alternative provides a full airfield crossing outside of the respective runway high-energy zones via Taxiway G. The evaluation of this alternative is presented in **Table 5A-20.**

Table 5A-20: Taxiway F Extension Alternative Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As seen on the figure above, the southeast extension of Taxiway F provides two 90° intersections with Runway 12L-30R, outside the high energy zone of this runway. In addition, there is no significant impact to the ROT or to the primary taxi routing distance.

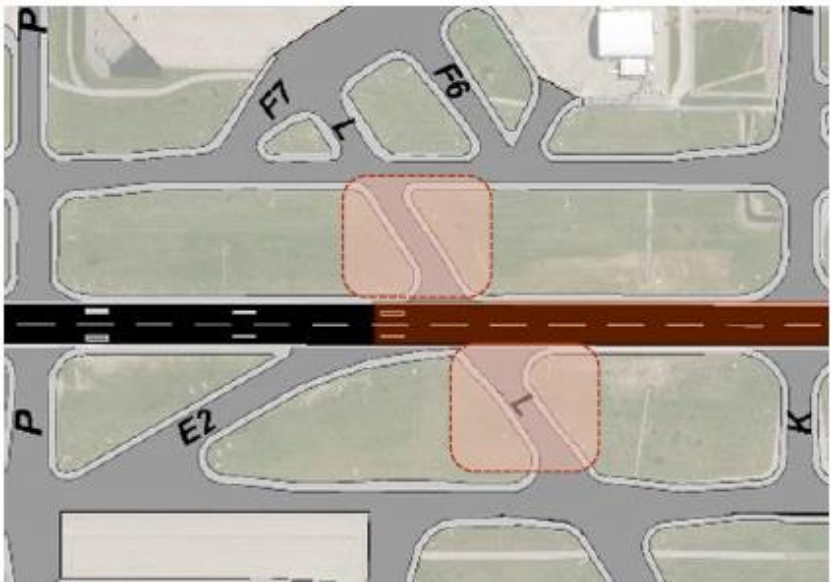
Taxiway L

The previous chapter discussed how Taxiway L presents the following geometric issues within the Runway 12L-30R corridor:

- Direct access to Runway 12L-30R: Taxiway L provide access from just outside Boeing's facility, and could be disorienting to an aircraft that has just entered the movement area.
- Crossing at High Energy Zone of Runway 12L-30R
- Nonstandard intersection with Runway 12L-30R: Taxiway L also intersects both Runway 12L-30R and Taxiway E at nonperpendicular intersections. These types of intersections may be confusing to pilots and also do not allow for a clear view in both directions of the runway.
- Proximity to High-Speed Exit (E 2): A high speed exit taxiway is defined as an acute-angled exit taxiway forming a 30-degree angle with the runway centerline, designed to allow an aircraft to exit a runway quickly without having to decelerate to typical taxi speed. In this scenario, taxiway L is in proximity to the high-speed exit E 2, which can be considered an unsafe environment for FAA. AC-13B describes that high-speed exit taxiways, may be located in the middle third of a provided there is no accompanying crossing taxiway associated with the exit taxiway.

TAXIWAY L – ALTERNATIVE #1

Figure 5A-27: Taxiway L – Alternative #1



Source: CMT

Alternative #1 for Taxiway L consists of removing Taxiway L between Taxiway F Taxiway E. **Figure 5A-27** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-21.**

Table 5A-21: Taxiway L – Alternative #1 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiway L will increase the ROT for Runway 12L-30R. The REDIM model was completed with the removal of Taxiway L, the results are shown in **Table 5A-22.**

Table 5A-22: Runway 12L-30R Impact without Taxiway L

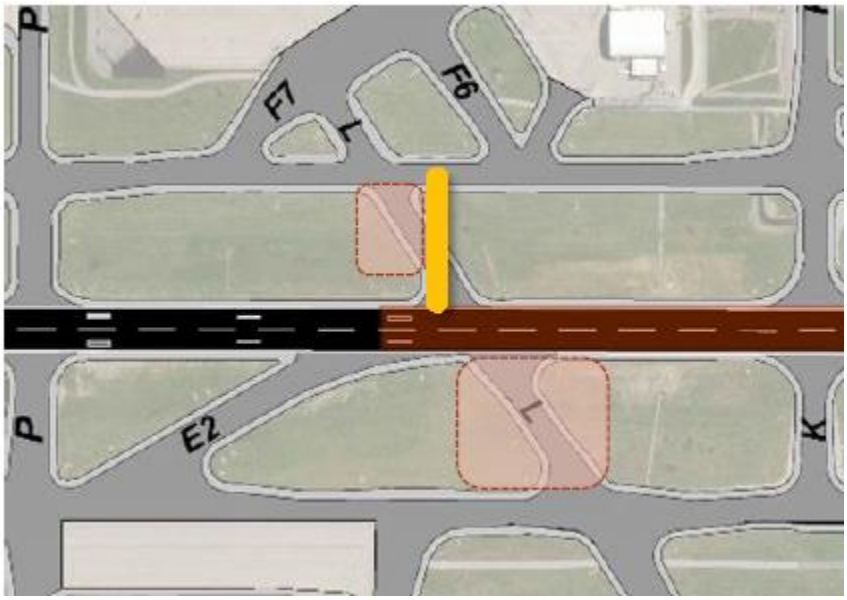
WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 12L (Northbound/Southbound)	55.9 / 48.6	Current 30R (Northbound)	54.4
Future 12L (Northbound/Southbound)	56.8 / 49.1	Future 30R (Northbound)	62.3
Net Change (Northbound/Southbound)	0.9 (1.6%) / 0.5 (1.0%)	Net Change (Northbound)	7.9 (14.5%)

Source: CMT

It is important to mention that although Alternative #1 increases the ROT, it does eliminate the direct access and high-energy crossing concerns. This alternative also resolves the proximity issue of Taxiway L and high-speed Taxiway E 2 intersection.

TAXIWAY L – ALTERNATIVE #2

Figure 5A-28: Taxiway L – Alternative #2



Source: CMT

Alternative #2 for Taxiway L consists of removing Taxiway L between Taxiway F and Taxiway E. This alternative also includes the addition of a perpendicular connector between Taxiway F and Runway 12L-30R. **Figure 5A-28** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-23**.

Table 5A-23: Taxiway L – Alternative #2 Evaluation

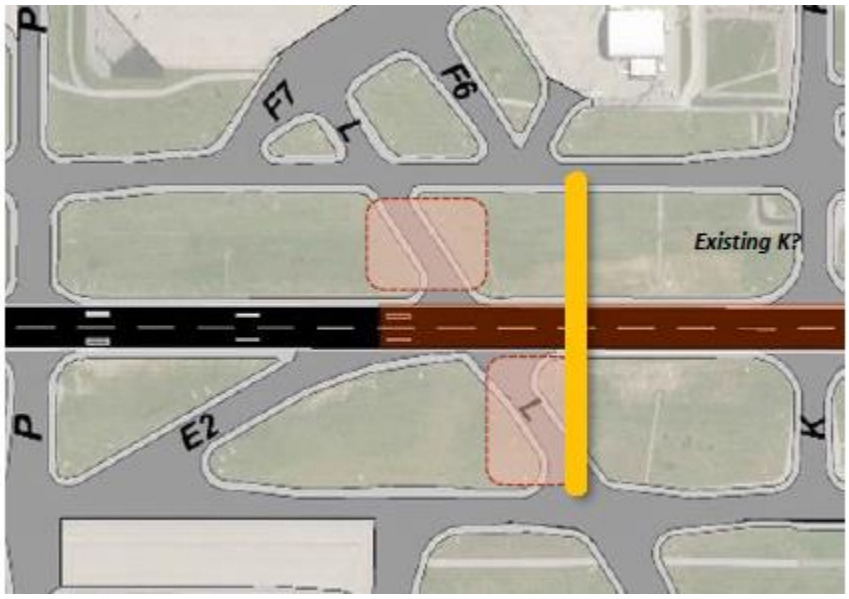
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, this alternative will provide a 90° intersection with the runway and it will eliminate the high-energy crossing. This also eliminates direct access to the runway from the apron. However, the modification and closure of these two sections of Taxiway L between E and F will cause an increase in taxi distance.

TAXIWAY L – ALTERNATIVE #3

Figure 5A-29: Taxiway L – Alternative #3



Source: CMT

Alternative #3 for Taxiway L consists of removing Taxiway L between Taxiway F and Taxiway E. This alternative realigns these taxiways as a perpendicular crossing through Runway 12L-30R from Taxiway F to Taxiway E. **Figure 5A-29** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-24.**

Table 5A-24: Taxiway L – Alternative #3 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

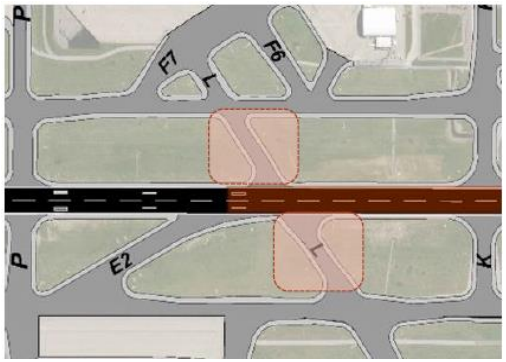
Source: CMT

As shown in the figure above, this alternative will provide a 90° intersection with the runway, but it does not address the high-energy crossing. This alternative also eliminates the direct access to the runway from the apron.

As mentioned previously, there is safety concern regarding the proximity of Taxiway L with the high-speed exit E 2. This alternative provides enhanced separation of Taxiway L from high-speed Taxiway E 2. It is also important to note that this alternative seeks to minimize impact to ROTs. **Figure 5A-30** shows a summary of the alternatives presented for Taxiway L.

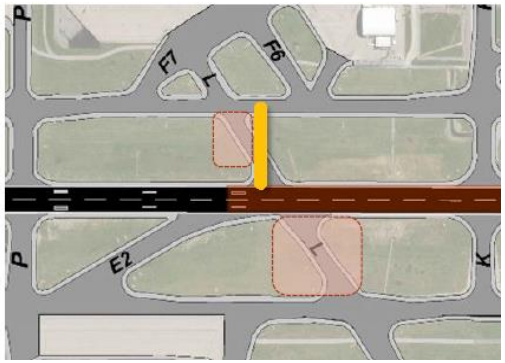
Figure 5A-30: Taxiway L – Alternatives Summary

Alternative #1



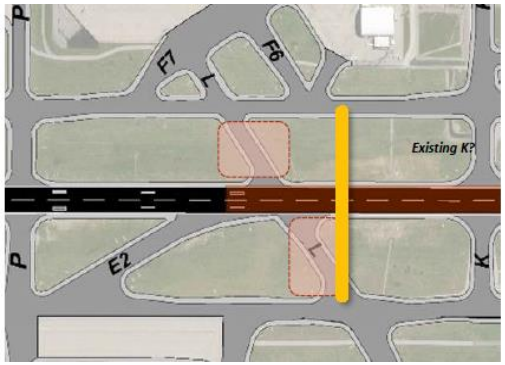
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

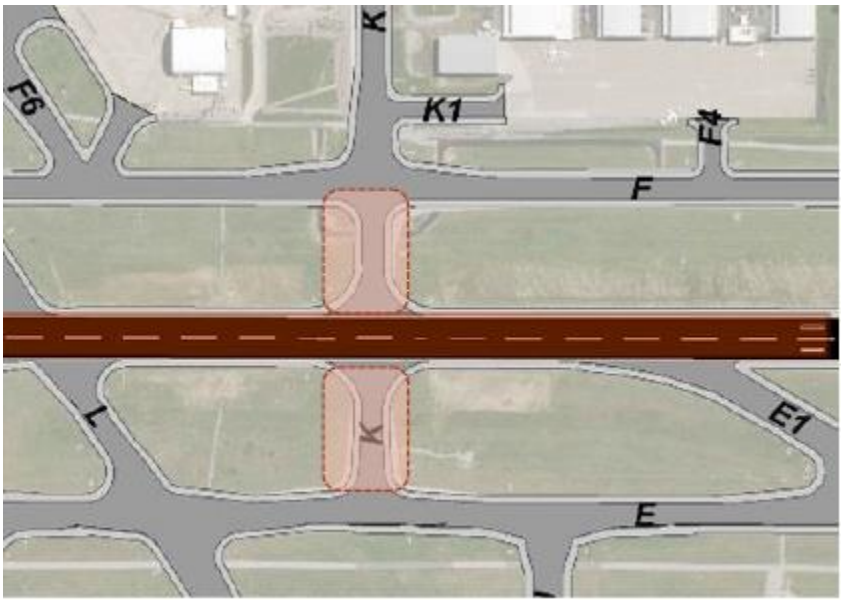
Taxiway K

The previous chapter discussed how Taxiway K presents the following geometric issues within the Runway 12L-30R corridor:

- Direct access to Runway 12L-30R: Taxiway K provide access from the UPS cargo apron.
- Crossing at High Energy Zone of Runway 12L-30R

TAXIWAY K – ALTERNATIVE #1

Figure 5A-31: Taxiway K – Alternative #1



Source: CMT

Alternative #1 for Taxiway K consists of removing the Taxiway K crossing between Taxiway F and Taxiway E. **Figure 5A-31** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-25.**

Table 5A-25: Taxiway K – Alternative #1 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiway K will negatively impact the ROT for Runway 12L-30R. With Taxiway K being located in the middle of the runway, it can be utilized by aircraft landing in both directions. The removal of it causes aircraft to then remain on the runway for a longer time and utilize the

next exit, therefore increasing the runway occupancy times. The REDIM model was completed with the removal of Taxiway K, the results are shown on **Table 5A-26.**

Table 5A-26: Runway 12L-30R Impact without Taxiway K

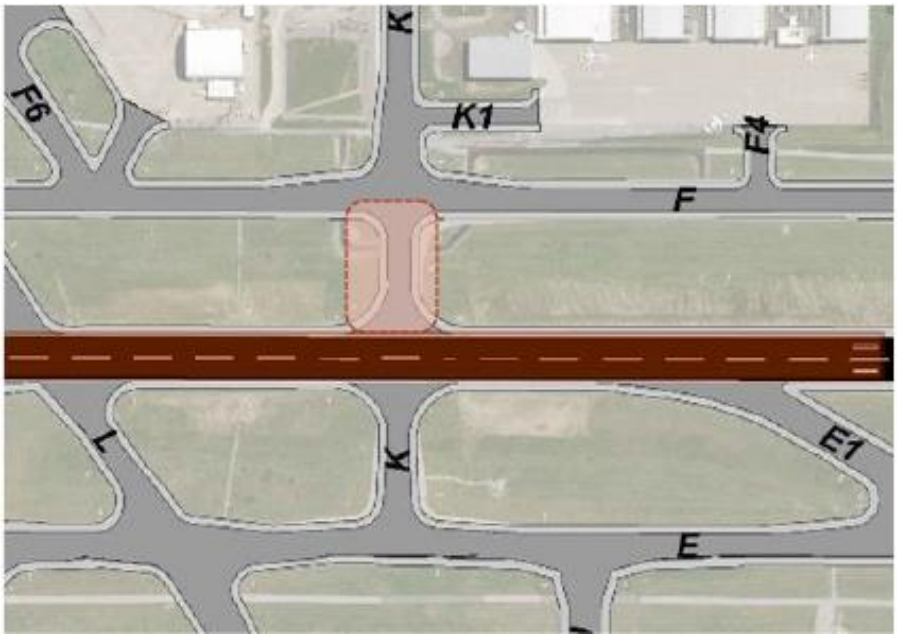
WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 12L (Northbound/Southbound)	55.9 / 48.6	Current 30R (Northbound/Southbound)	54.4 / 48.8
Future 12L (Northbound/Southbound)	6.3.2 / 49.1	Future 30R (Northbound/Southbound)	58.9 / 50.0
Net Change (Northbound/Southbound)	7.3 (13.1%) / 0.5 (1.0%)	Net Change (Northbound/Southbound)	4.5 (8.3%) / 1.2 (2.5%)

Source: CMT

It is important to mention that while Alternative #1 increases the ROT, it does eliminate the direct access and high-energy crossing concerns.

TAXIWAY K – ALTERNATIVE #2

Figure 5A-32: Taxiway K – Alternative #2



Source: CMT

Alternative #2 for Taxiway K consists of removing Taxiway K between Taxiway F and Runway 12L-30R. **Figure 5A-32** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-27.**

Table 5A-27: Taxiway K – Alternative #2 Evaluation

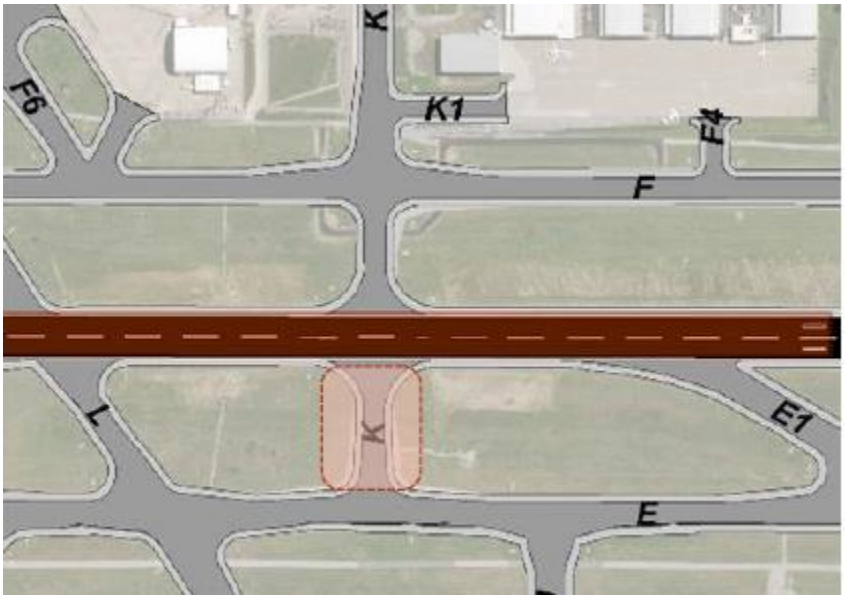
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, removing Taxiway K between Taxiway F and Runway 12L-30R will eliminate the high energy crossing and direct access concerns. However, aircraft landing either runway end that are northbound will see a negative impact to ROT and taxi routing distance; due to the positioning of exits south of Runway 12L-30R, southbound ROTs are not impacted with this alternative.

TAXIWAY K – ALTERNATIVE #3

Figure 5A-33: Taxiway K – Alternative #3



Source: CMT

Alternative #3 for Taxiway K consists of removing Taxiway K southbound connector between Runway 12L-30R and Taxiway E. **Figure 5A-33** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-28.**

Table 5A-28: Taxiway K – Alternative #3 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	

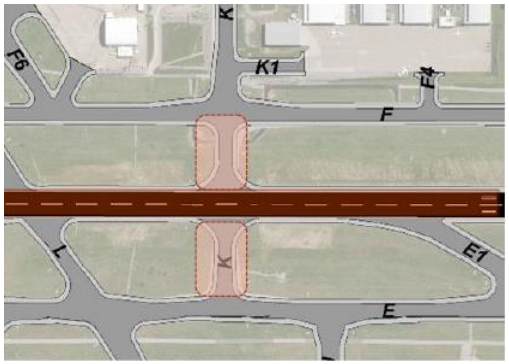
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, removing Taxiway K between Runway 12L-30R and Taxiway E will eliminate the high energy crossing, but it will not eliminate the direct access concern north of Runway 12L-30R. This alternative mitigates impact to ROT's northbound and has limited impact to southbound ROT's due to the presence of Taxiways L and E 1 in the immediate vicinity. **Figure 5A-34** shows a summary of the alternatives presented for Taxiway K.

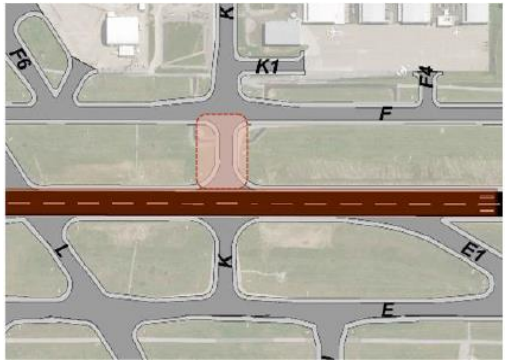
Figure 5A-34: Taxiway K – Alternatives Summary

Alternative #1



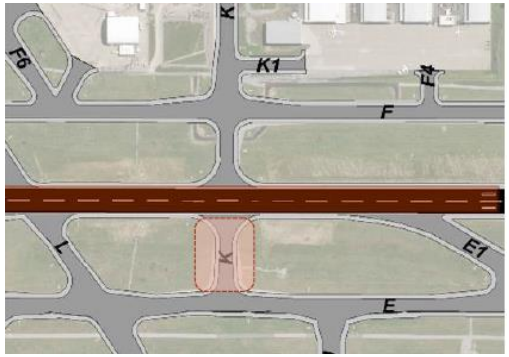
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

RUNWAY 6-24 CORRIDOR

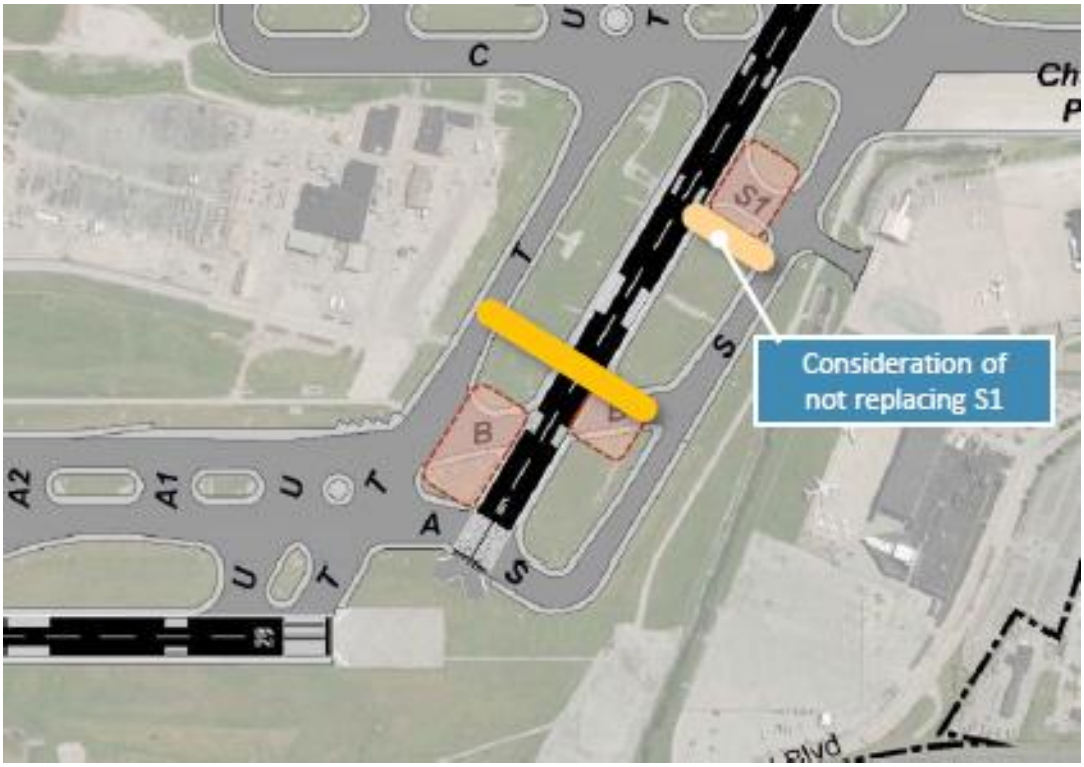
TAXIWAY B & TAXIWAY S 1

The previous chapter discussed how Taxiway S 1 presents a direct access issue to Runway 6-24 from the Jet Linx apron. The following alternatives seek to mitigate this non-standard geometry. In addition, both Taxiways B and S 1 present a non-standard intersection/crossing of Runway 6-24 due to the angle at which they cross the runway.

It is also important to note that, currently, Taxiway B is used as a crossing route by ATC personnel to move aircraft to and from Runway 11-29. Taxiway T and S are utilized to manage various flow configurations and provide options to accommodate arrivals or departures.

TAXIWAYS B & S 1 – ALTERNATIVE #1

Figure 5A-35: Taxiways B & S 1– Alternative #1



Source: CMT

Alternative #1 for Taxiways B & S 1 consists of removing the existing Taxiway B connectors on the east and west side of Runway 6-24 and replacing them with a perpendicular crossing from Taxiway T to Taxiway S. This alternative also includes realigning the existing Taxiway S 1 with a perpendicular connector south of its original positions to prevent a direct access issue. **Figure 5A-35** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-29.**

Table 5A-29: Taxiways B & S 1 – Alternative #1 Evaluation

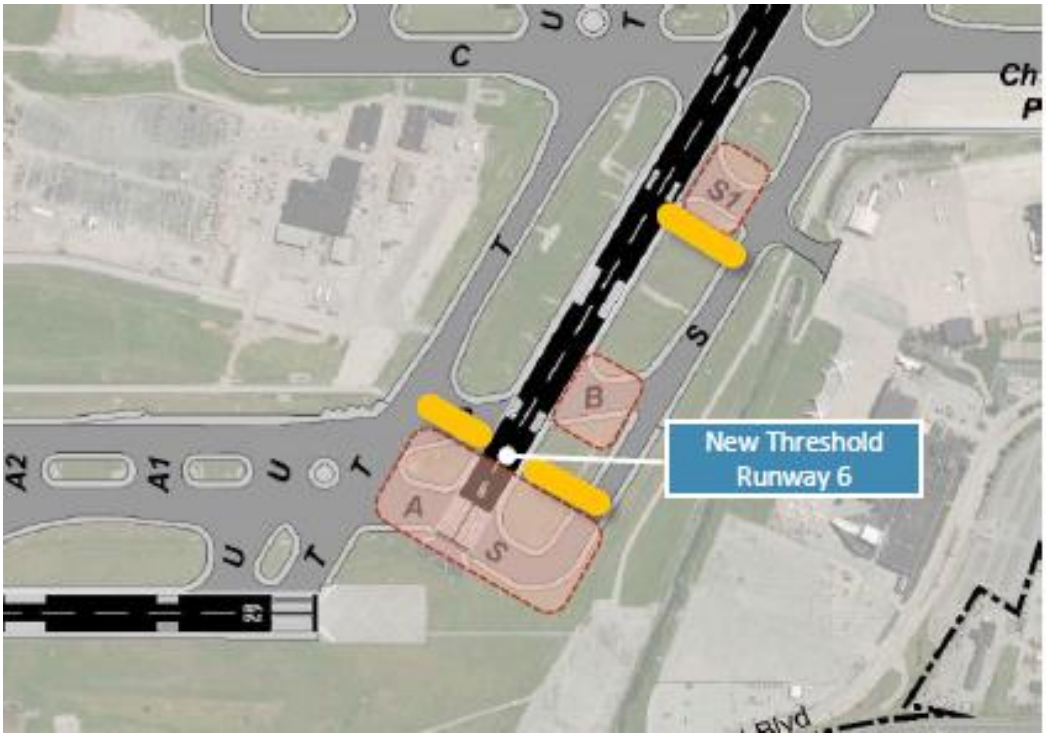
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the realignment of Taxiways B and S 1 into perpendicular connectors allow for 90° intersections to mitigate the nonstandard angle concern. This alternative also eliminates the direct access concern of Taxiway S 1. In addition, this alternative simplifies the geometry in the area where Taxiways T, A, and Runway 29 interact.

TAXIWAYS B & S 1 – ALTERNATIVE #2

Figure 5A-36: Taxiways B & S 1– Alternative #2



Source: CMT

Alternative #2 for Taxiways B & S 1 consists of relocating the Runway 6 threshold. This alternative removes the existing Taxiway B connectors on the east and west side of Runway 6-24 and replaces them with a perpendicular crossing between Taxiway T and Taxiway S. This alternative also includes realigning the existing Taxiway S 1 with a perpendicular connector south of its original position to mitigate the direct

access issue. **Figure 5A-36** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-30.**

Table 5A-30: Taxiways B & S 1 – Alternative #2 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

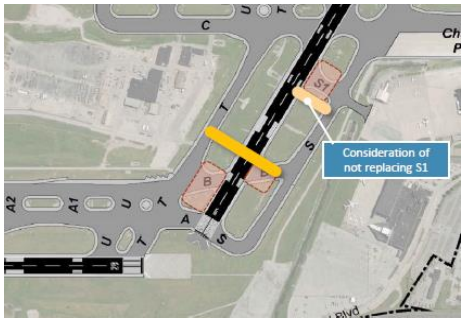
As shown in the figure above, the relocation of the Runway 6 threshold and the realignment of Taxiways B and S 1 allows for 90° intersections to mitigate nonstandard angles. This alternative also simplifies the geometry in the area where Taxiways T, A, and Runway 29 interact.

At this moment, Runway 6 threshold penetrates Runway 29 OFA and RSA. To mitigate this safety issue, the relocation of the Runway 6 threshold provides separation between Runway 6 and the associated safety areas of Runway 29. This alternative also eliminates the direct access concern of Taxiway S 1.

Figure 5A-37 shows a summary of the alternatives presented for Taxiway S.

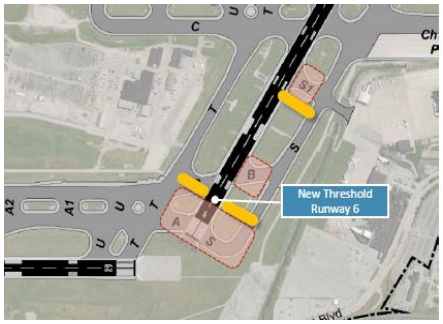
Figure 5A-37: Taxiway B & Taxiway S 1 – Alternatives Summary

Alternative #1



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

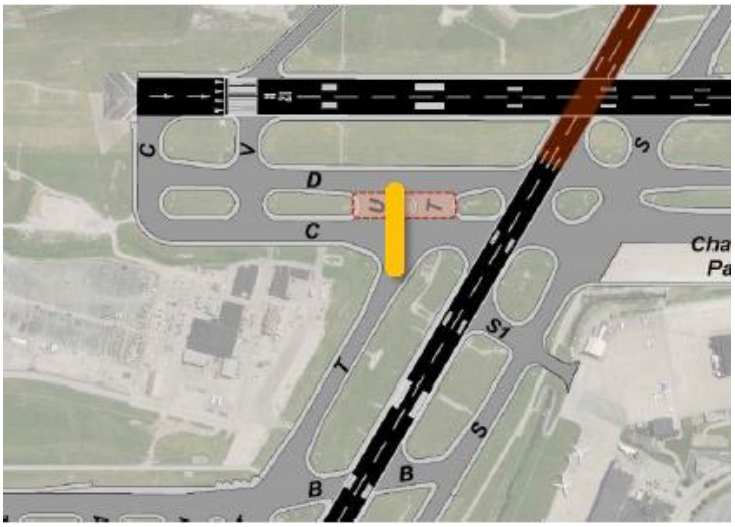
TAXIWAY T & U AT TAXIWAYS D & C

Taxiways T & U, located between Taxiway D & C, present the following geometric issue:

- Large expanse of pavement: large expanses of pavement can result in pilot disorientation/confusion and make it difficult to provide proper signage, marking and lighting.

TAXIWAYS T & U – ALTERNATIVE #1

Figure 5A-38: Taxiways T & U – Alternative #1



Source: CMT

Alternative #1 for Taxiways T & U consists of removing Taxiway U and Taxiway T between Taxiway D and Taxiway C and combining them into a single perpendicular connector from Taxiway D to Taxiway T. **Figure 5A-38** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A- 31.**

Table 5A- 31: Taxiway T & U – Alternative #1 Evaluation

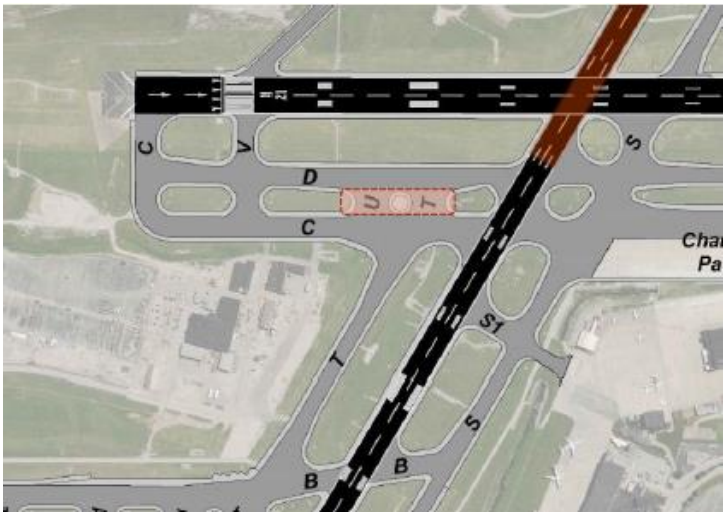
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	N/A
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, removing the existing Taxiway U and T connectors and combined them into a single perpendicular connector will allow to consolidate close proximity crossover taxiway connectors and maintain operational flexibility to accommodate taxi flows under the southeast flow configuration.

TAXIWAYS T & U – ALTERNATIVE #2

Figure 5A-39: Taxiways T & U – Alternative #2



Source: CMT

Alternative #2 for Taxiways T & U consists of removing Taxiway U and Taxiway T between Taxiway D and Taxiway C. **Figure 5A-39** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-32.**

Table 5A-32: Taxiway T & U – Alternative #2 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	N/A
Primary Taxi Routing (Distance)	

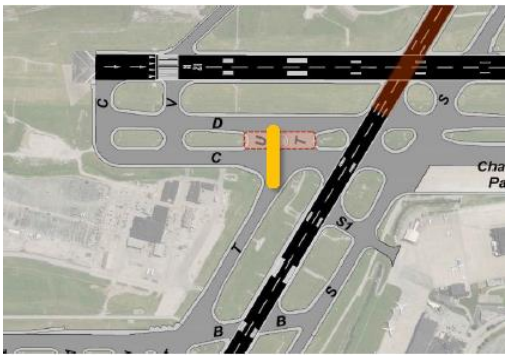
Source: CMT

As shown in the figure above, removing Taxiways U and T will eliminate the large area of pavement and may increase taxi distance for aircraft utilizing the Southeast flow. Taxiways U and T are currently used as a bypass by aircraft going from the terminal apron towards Runway 12R for departure, and by aircraft arriving at Runway 11 and taxiing towards the terminal apron.

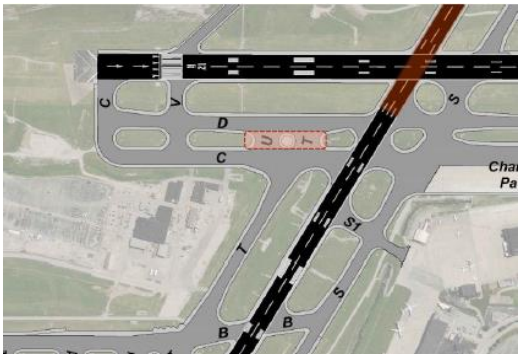
Figure 5A-40 shows a summary of the alternatives presented for Taxiway T & U.

Figure 5A-40: Taxiway T & Taxiway U – Alternatives Summary

Alternative #1



Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	N/A
Primary Taxi Routing (Distance)	

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	N/A
Primary Taxi Routing (Distance)	

Source: CMT

TAXIWAY P

The previous chapter discussed geometric issues associated with Taxiway P within Runway 6-24 corridor:

- Nonstandard intersection with Runway 6-24: Taxiway P intersects Runway 24 at a less than a 90° intersection. This results in pilots at the runway hold line having a clear view of inbound traffic on Runway 24, but a limited view of aircraft that may be departing Runway 6.

Figure 5A-41 shows the non-standard geometry at Taxiway P. The alternatives identified to solve these geometric issues are shown in *Section 5.17 – Taxiway Geometry Holistic Alternatives* as part of a comprehensive process to develop holistic alternatives for the whole airfield.

Figure 5A-41: Taxiway P Non-Perpendicular Intersection

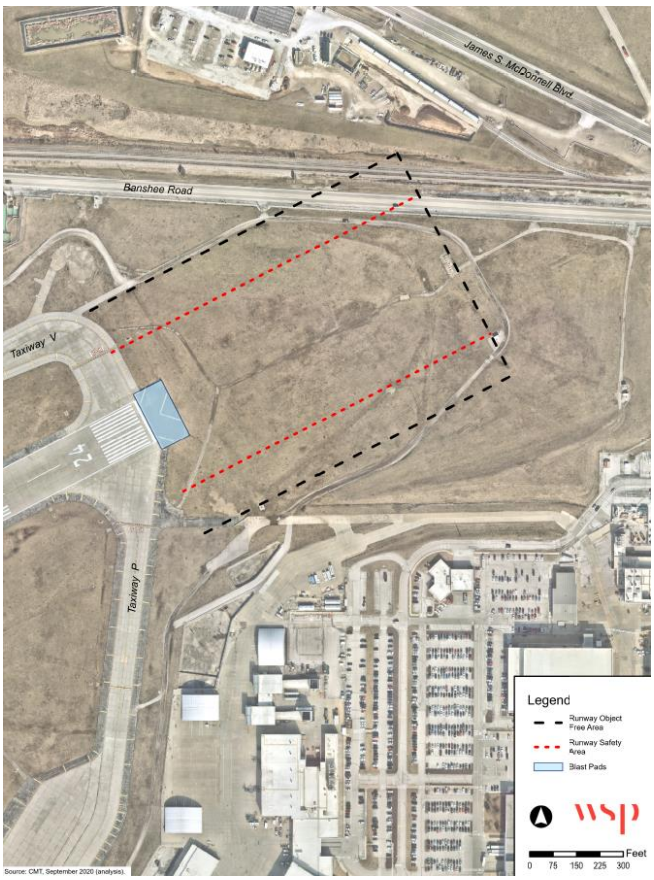
Source: CMT, September 2020 (analysis)

RUNWAY 6-24 NONSTANDARD SAFETY AREAS AND BLAST PAD – DIMENSION ANALYSIS

The objective of this analysis is to discuss non compliance with safety areas and blast pads dimension requirements. In addition to the non-perpendicular taxiway intersecting the Runway 24 end (Taxiway P), the RSA, ROFA, and Blast Pad do not meet dimension standards. Both the RSA and ROFA should be full-width for 1,000 feet beyond the runway end; they are currently full-width for 982 feet and 725 feet beyond the runway end, respectively. Additionally, the blast pad should be 200 feet long, but is only 100 feet long. These issues should be mitigated to improve runway end safety, especially in the event of an aircraft overrun. **Figure 5A-42** shows Runway's 24 safety areas.

As shown in the figure below, the 1,000-foot beyond the runway end requirement for the RSA and ROFA produces three major road incompatibibilities inside these safety areas: an airfield service road, a portion of Banshee Road inside the left corner of the RSA and OFA, and a small portion of a railroad inside the OFA. *Section 5.23 – Runway Safety Areas and Runway Object Free Areas* takes and more in depth analysis of the incompatible objects inside these safety areas and potential mitigation alternatives. However, if relocation of these roads is not possible as a mitigation action, a possible alternative is to request a MOS for Banshee Rd. and the raildorad, which, if approved, will allow to maintain these elements inside Runway 24 safety areas as a long as an acceptable level of safety is reached.

Figure 5A-42: Runway 24 Safety Areas



Source: CMT, September 2020 (analysis)

RUNWAY 6-24 LARGE EXPANSE OF PAVEMENT AND HOT SPOT

An airfield hot spot is a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary. STL has one FAA-identified hot spot, HS-1, for the turn from Taxiway F onto Taxiway S for aircraft accessing Runway 12L.

In addition, as depicted in the Facility Requirements chapter, there is a wide expanse of pavement at the intersection of Taxiways E, S, and R. Taxiway S leads to the Runway 12L threshold and Taxiway R provides access to Runway 12R-30L. Aircraft operating at this intersection have more than the maximum of three options, which may create confusion. The hot spot and the wide expanse of pavement are depicted in **Figure 5A-43**.

Figure 5A-43: Runway 6-24 Hot Spot and Large Expanse of Pavement

Source: CMT, September 2020 (analysis).

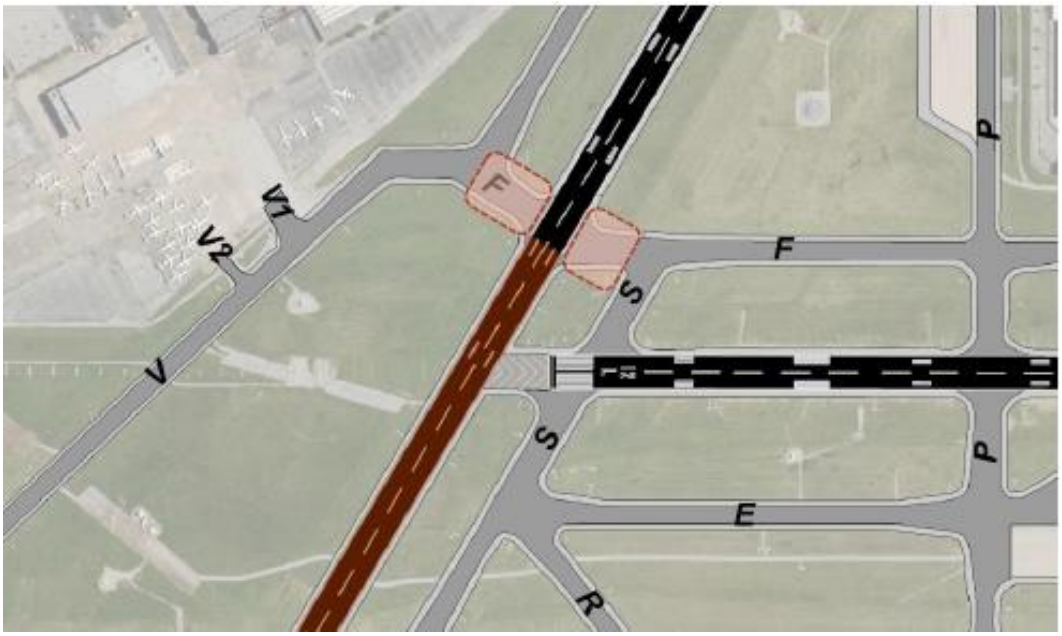
HOT SPOT #1

The identified hot spot (HS-1) is located on the turn from Taxiway F onto Taxiway S for aircraft accessing Runway 12L.

Records indicate that this intersection has been identified as a hot spot due to aircraft taxiing via Taxiway F westbound that are instructed to turn left on Taxiway S, sometimes miss the turn and enter Runway 6-24 without authorization.

HOT SPOT #1 – ALTERNATIVE #1

Figure 5A-44: Hot Spot #1 – Alternative #1



Source: CMT

Alternative #1 for Hot Spot #1 consists of removing Taxiway F between S and V. **Figure 5A-44** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-33.**

Table 5A-33: Hot Spot #1 – Alternative #1 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the removal of Taxiway F between V and S will increase the ROT for Runway 6-24. The results are shown in **Table 5A-34.**

Table 5A-34: Runway 6-24 Impact without Taxiway F

WEIGHTED AVG: RUNWAY OCCUPANCY TIME (ROT): ALL CONDITIONS (SECONDS & PERCENT INCERASE)			
Current 6 (Eastbound/Westbound)	59.1 / 67.7	Current 24 (Eastbound/Westbound)	54.8 / 55.3
Future 6 (Eastbound/Westbound)	80.0 / 96.2	Future 24 (Eastbound/Westbound)	55.0 / 57.1
Net Change (Eastbound/Westbound)	20.9 (35.4%) / 28.5 (42.1%)	Net Change (Eastbound/Westbound)	0.2 (0.4%) / 1.8 (3.3%)

Source: CMT

It is important to mention that while Alternative #1 increases the ROT, it does not affect overall airfield capacity. In addition, this alternative eliminates the Hot Spot #1 concern.

HOT SPOT #1 – ALTERNATIVE #2

Figure 5A-45: Hot Spot #1 – Alternative #2

Source: CMT

Alternative #2 for Hot Spot #1 consists of removing Taxiway F between Runway 6-24 and Taxiway S. This alternative would provide a perpendicular connector to Runway 6-24 north of Taxiway S. **Figure 5A-45** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-35.**

Table 5A-35: Hot Spot #1 – Alternative #2 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

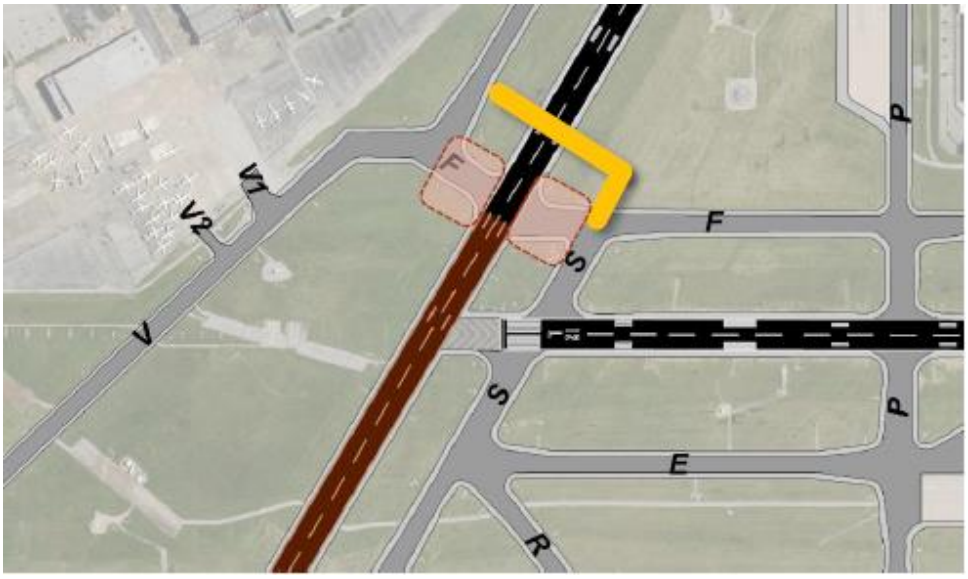
Source: CMT

As shown in the figure above, the addition of the perpendicular connector to allow taxiing from Runway 6-24 toward Taxiway S and Taxiway F will provide a crossing outside the high-energy zone of Runway 6-24. Another benefit from having this proposed perpendicular connector is supplying a turn during taxiing which forces pilots to reduce their speed before entering/exiting the runway. An added benefit from forcing pilots to reduce their speed before entering the runway is the mitigation of runway incursions. This improves the overall safety of the intersection.

The drawback of this alternative is that it reduces flexibility of routing aircraft for departure and has a limited impact to Runway 6-24 ROTs.

HOT SPOT #1 – ALTERNATIVE #3

Figure 5A-46: Hot Spot #1 – Alternative #3



Source: CMT

Alternative #3 for Hot Spot #1 consists of removing Taxiway F between S and V but adds a perpendicular crossing of Runway 6-24 north of Taxiway S. **Figure 5A-46** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-36.**

Table 5A-36: Hot Spot #1 – Alternative #3 Evaluation

ASSESSMENT CRITERIA	STOPLIGHT SCORE

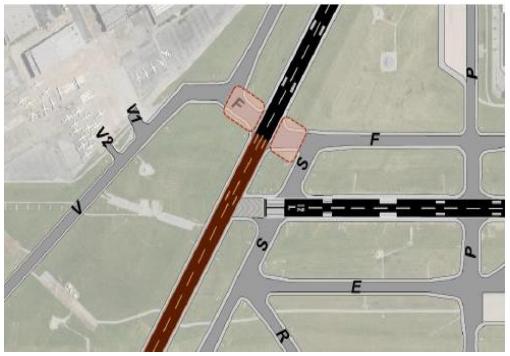
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the addition of the perpendicular crossing allows aircraft to exit the Runway 6-24 to Taxiway V and Taxiway S via Taxiway F. It also provides a 90° intersection and a crossing outside the high-energy zone of Runway 6-24. As discussed in the previous alternative, supplying a turn during taxiing forces pilots to reduce their speed before entering/exiting the runway and potentially helps to reduce runway incursions. This alternative also retains the connector capability across Runway 6-24 to Taxiway V. In addition, this alternative has a limited impact to Runway 6-24 ROTs and taxiway routing distance. **Figure 5A-47** shows a summary of the alternatives presented for Hotspot #1.

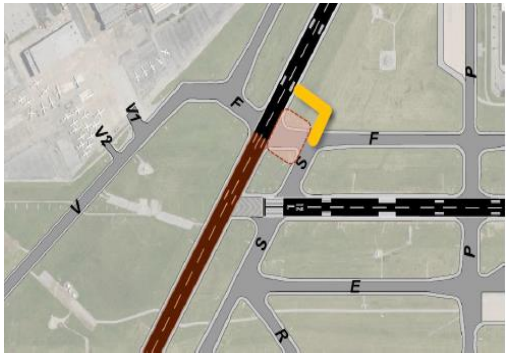
Figure 5A-47: Hotspot #1– Alternatives Summary

Alternative #1



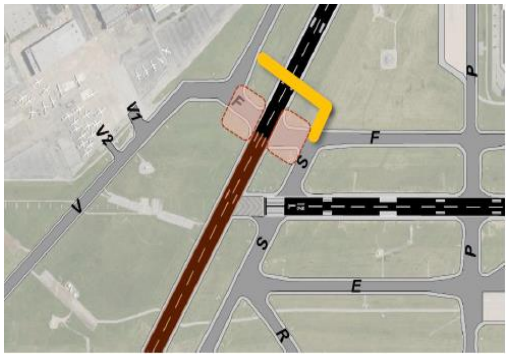
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

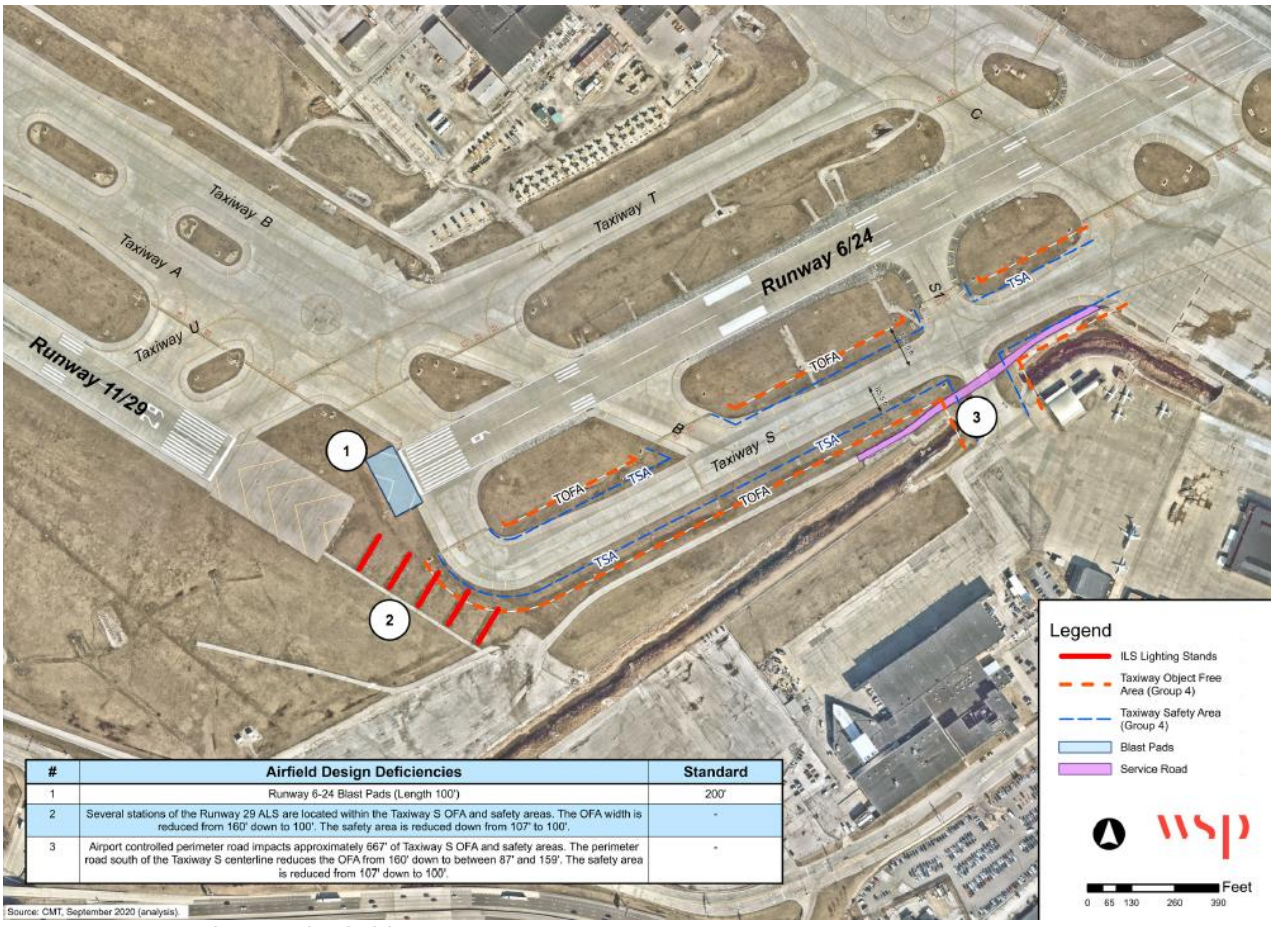
RUNWAY 6-24 AND 11-29 CORRIDOR

RUNWAY 6-24 NONSTANDARD SAFETY AREAS AND BLAST PAD

Both the Taxiway Object Free Area (TOFA) and Taxiway Safety Area (TSA) for Taxiway S are reduced from the standard size because of penetrations by the Runway 29 approach light system and the airport service road. These issues impact the level of safety for the type of aircraft operating on Taxiway S as they taxi to or from Runway 6-24.

Additionally, according to AC-13B, blast pad dimensions for ADG IV are required to be 200 feet long and 200 feet wide. At this moment, blast pads on Runway 6 are only 100 feet long and 200 feet wide. **Figure 5A-48** shows the geometry deficiencies at the Runway 6-24 and Runway 11-29 corridor.

Figure 5A-48: Taxiway S OFA and TSA



#	Airfield Design Deficiencies	Standard
1	Runway 6-24 Blast Pads (Length 100')	200'
2	Several stations of the Runway 29 ALS are located within the Taxiway S OFA and safety areas. The OFA width is reduced from 160' down to 100'. The safety area is reduced down from 107' to 100'.	-
3	Airport controlled perimeter road impacts approximately 667' of Taxiway S OFA and safety areas. The perimeter road south of the Taxiway S centerline reduces the OFA from 160' down to between 87' and 159'. The safety area is reduced from 107' down to 100'.	-

Source: CMT, September 2020 (analysis)

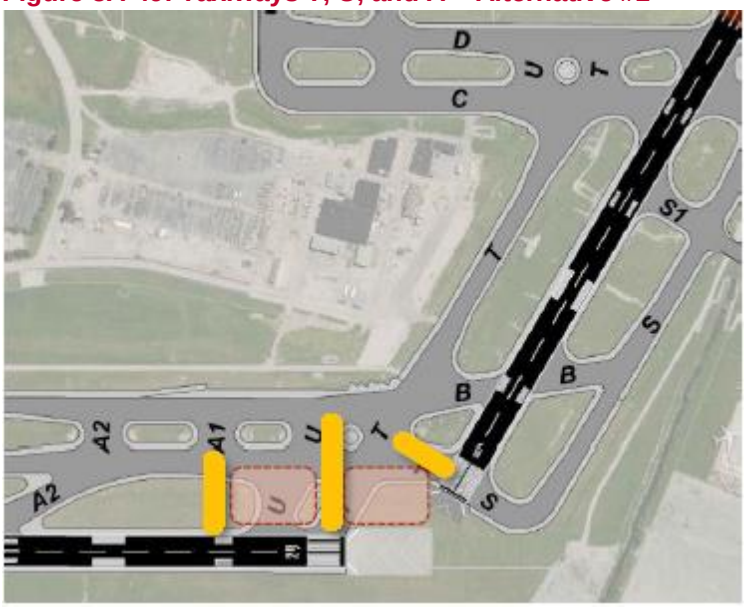
TAXIWAY T, U, & A

There is a large expanse of pavement at the intersection of Taxiways T, U, and A that falls within the corridor of both Runways 6-24 and 11-29. While there are some markings and taxiways signs located in the middle portion of this intersection to guide aircraft traffic during taxiing, a reconfiguration of the pavement or more visible markings are recommended to eliminate this wide area of pavement. This is of particular concern given this pavement's proximity to the Runway 6 and 29 ends.

In addition to the large expanse of pavement, Taxiways A, T, and U intersect Runway 11-29 at non-standard angles. Also, the area where these three taxiways intersect is primarily used by aircraft which land on Runway 11 and taxi to the southeast side of the airfield, and by aircraft which depart from Runway 29.

TAXIWAYS T, U, AND A – ALTERNATIVE #1

Figure 5A-49: Taxiways T, U, and A – Alternative #1



Source: CMT

Alternative #1 for Taxiways T, U, and A consists of realigning Taxiway U and Taxiway T to Runway 29 and realign Taxiway A connector to Runway 6 so that 90-degree intersections are created with the respective runway environments. **Figure 5A-49** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-37.**

Table 5A-37: Taxiways T, U, and A – Alternative #1 Evaluation

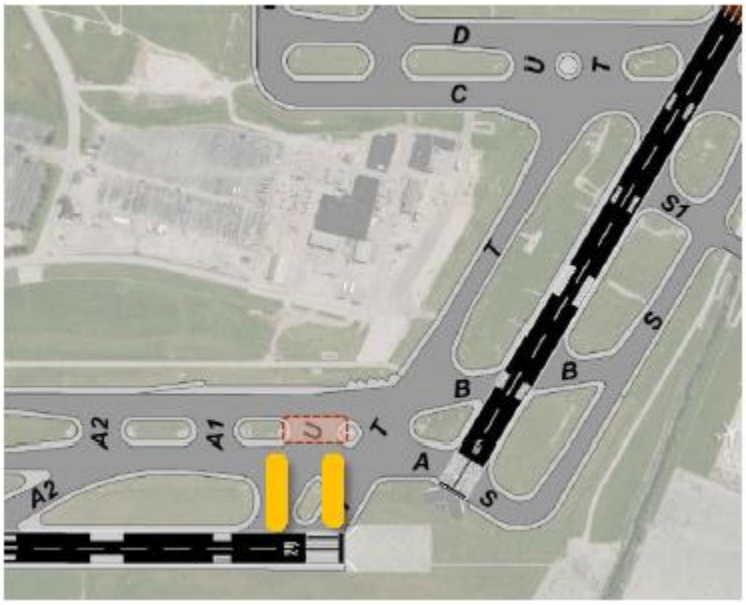
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the realignment of Taxiways T, U, and A creates 90° intersections with the runway to mitigate the nonstandard angles. This alternative has limited impact to Runway 11-29 ROTs.

TAXIWAYS T, U, AND A – ALTERNATIVE #2

Figure 5A-50: Taxiways T, U, and A – Alternative #2



Source: CMT

Alternative #2 for Taxiways T, U, and A consists of realigning Taxiway U and Taxiway T between Taxiway A and Runway 29. **Figure 5A-50** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-38.**

Table 5A-38: Taxiways T, U, and A – Alternative #2 Evaluation

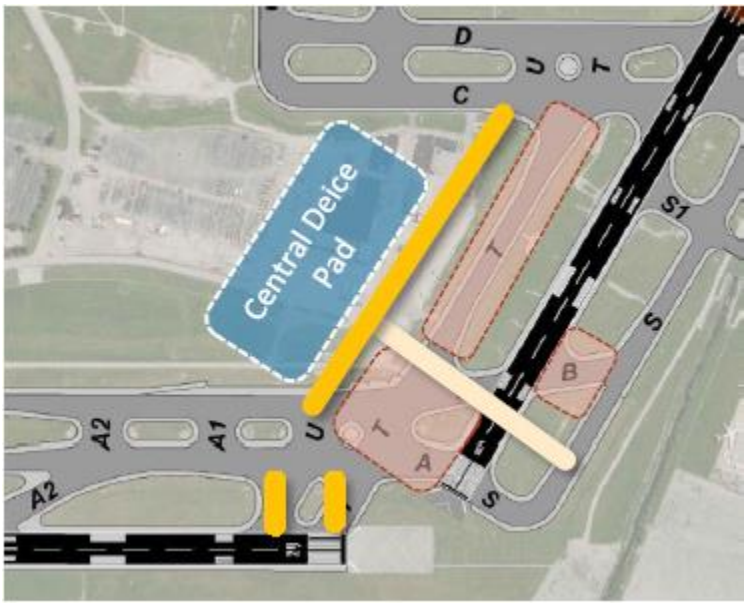
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the realignment of Taxiways T and U to create 90° intersections with the runway will mitigate the nonstandard angles. This alternative has limited impact to Runway 11-29 ROTs and provides a slight reduction in pavement area.

TAXIWAYS T, U, AND A – ALTERNATIVE #3

Figure 5A-51: Taxiways T, U, and A – Alternative #3



Source: CMT

Alternative #3 for Taxiways T, U, and A consists of removing Taxiway T pavement west of Runway 6-24, removing the Taxiway A connector to Runway 6, and removing Taxiway B east of Runway 6. This alternative proposes a new Taxiway U which will run from Taxiway C (west of Runway 6-24) south towards Taxiway B (north of Runway 11-29). This alternative adds a perpendicular taxiway which will cross Runway 6 from the new Taxiway U to Taxiway S. Finally, it straightens Taxiway U and T connectors to Runway 29. **Figure 5A-51** illustrates this alternative. The evaluation of this alternative is presented in **Table 5A-39.**

Table 5A-39: Taxiways T, U, and A – Alternative #3 Evaluation

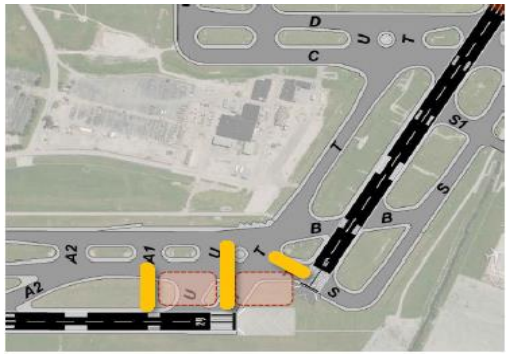
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

As shown in the figure above, the realignment of Taxiways T and U and the development of the new Taxiway U west of Runway 6-24, will allow for 90° intersections with the runway to mitigate the nonstandard angles. This alternative also provides additional depth along Runway 6-24 to resolve proximity concerns associated with Taxiway T, B, and A intersections. **Figure 5A-52** shows a summary of the alternatives presented for Taxiways T, U, & A.

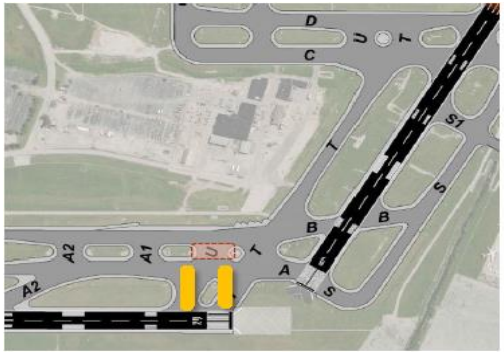
Figure 5A-52: Taxiways T, U, and A – Alternative Summary

Alternative #1



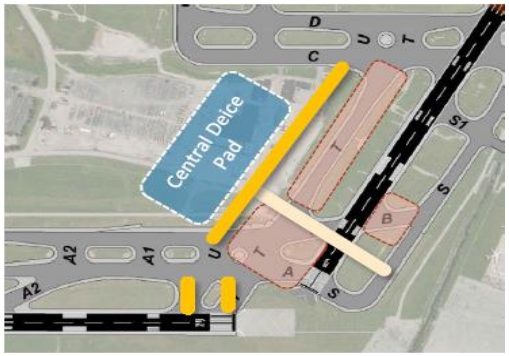
ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #2



ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Alternative #3

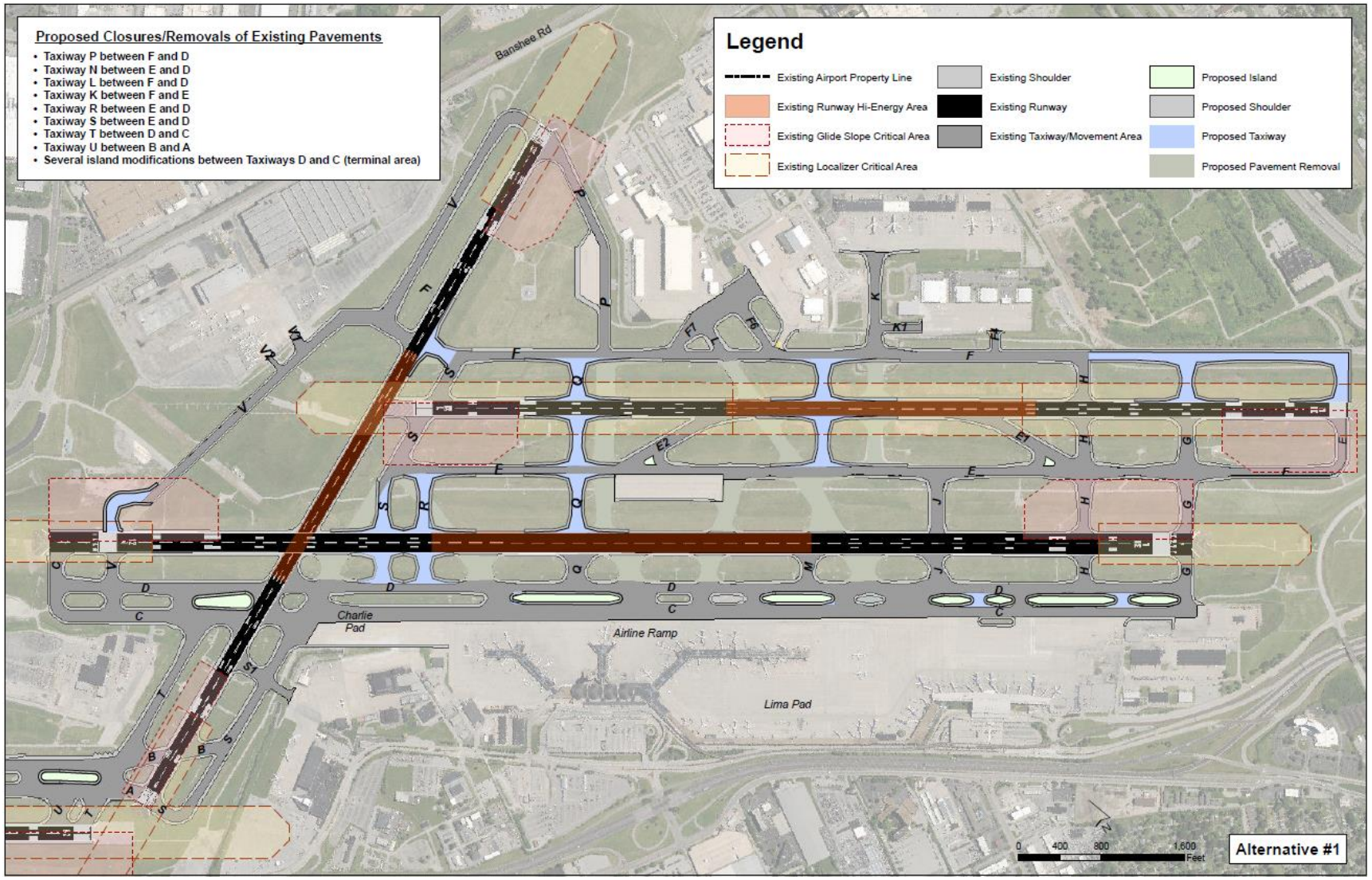


ASSESSMENT CRITERIA	STOPLIGHT SCORE
Provides a 90° Intersection	
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	
Primary Taxi Routing (Distance)	

Source: CMT

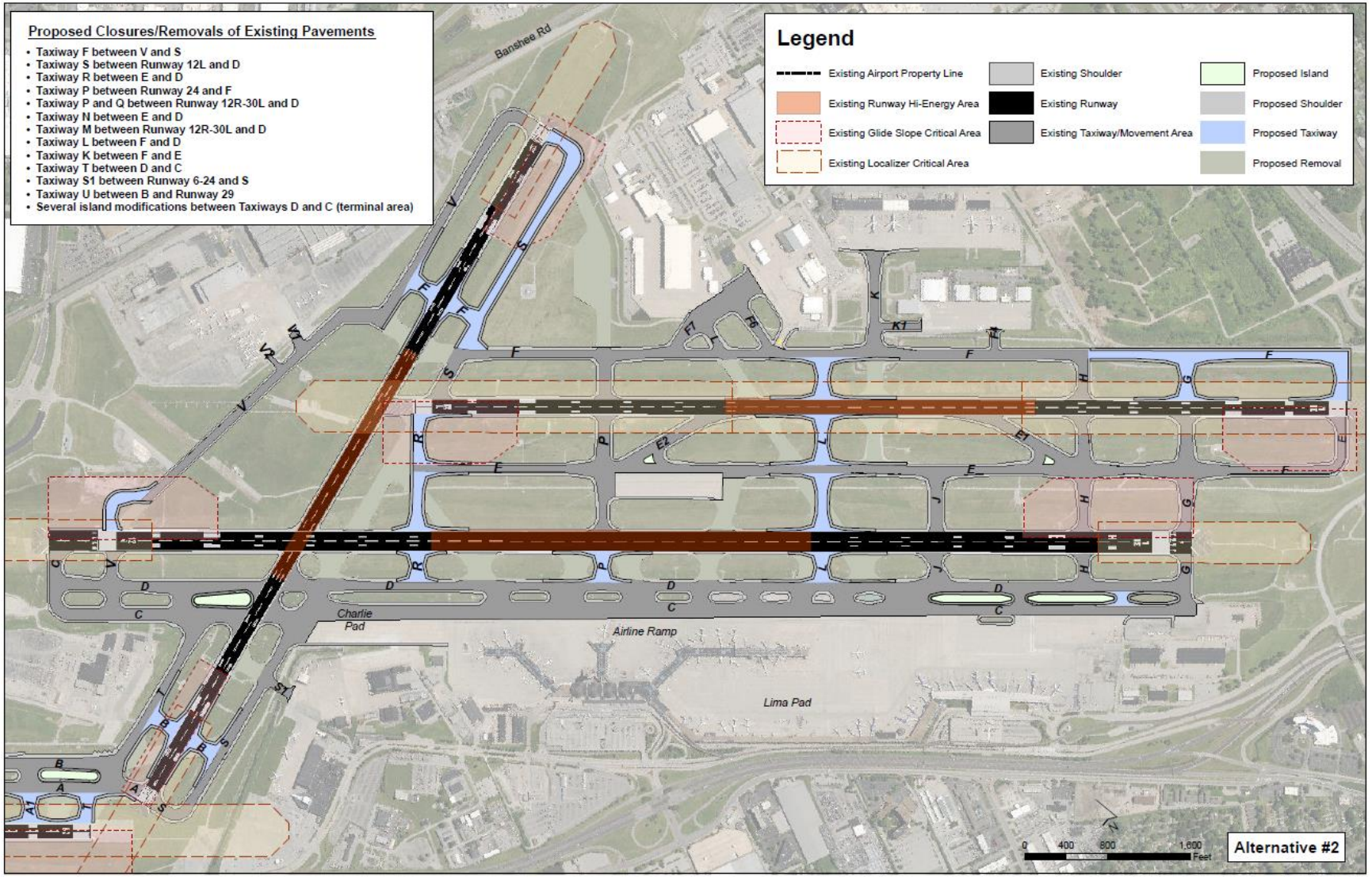
APPENDIX 5B – AIRFIELD LAYOUT ALTERNATIVES

Figure 5B-1: Airfield Layout Alternative 1



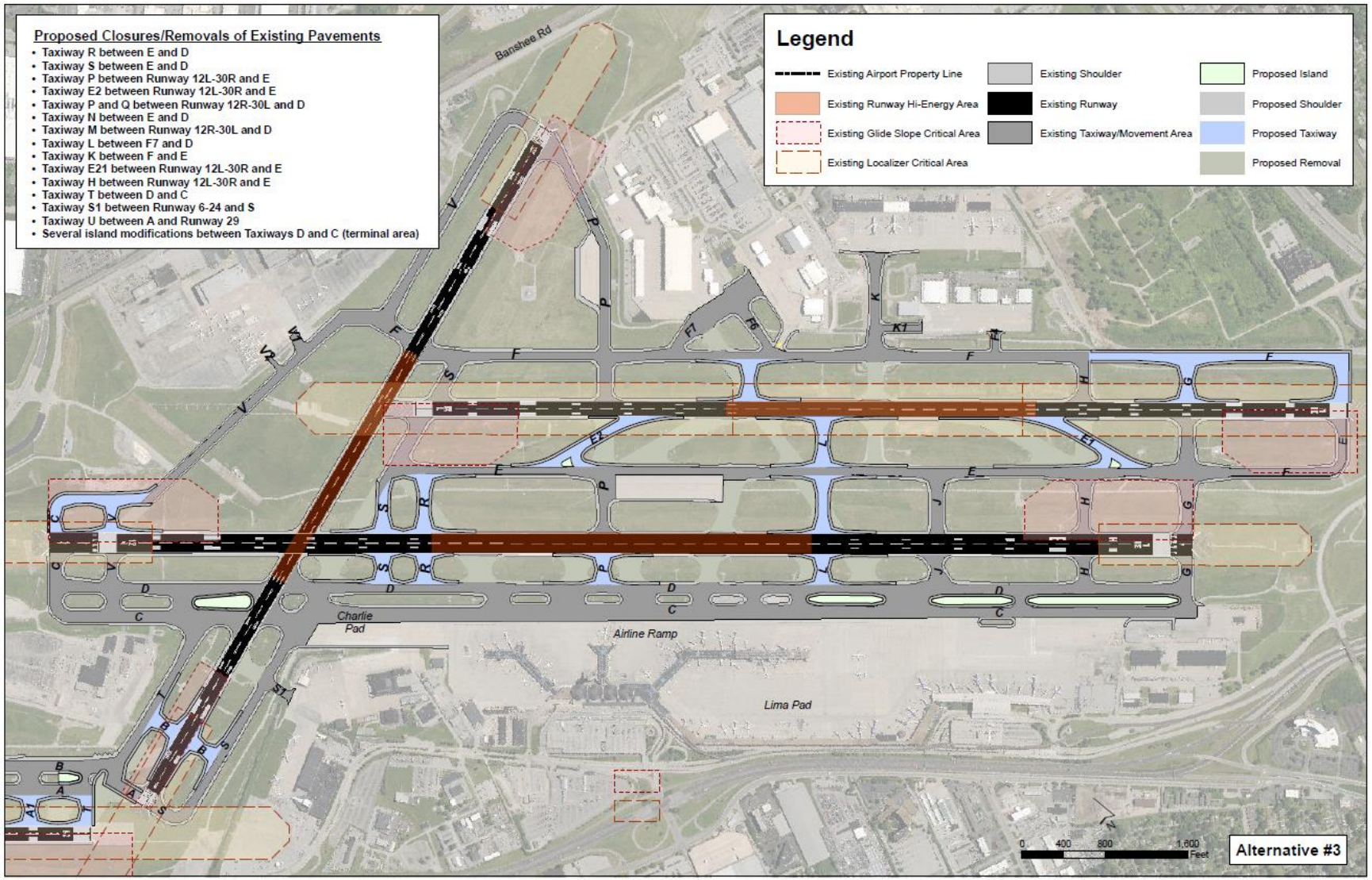
Source: CMT, 2021.

Figure 5B-2: Airfield Layout Alternative 2



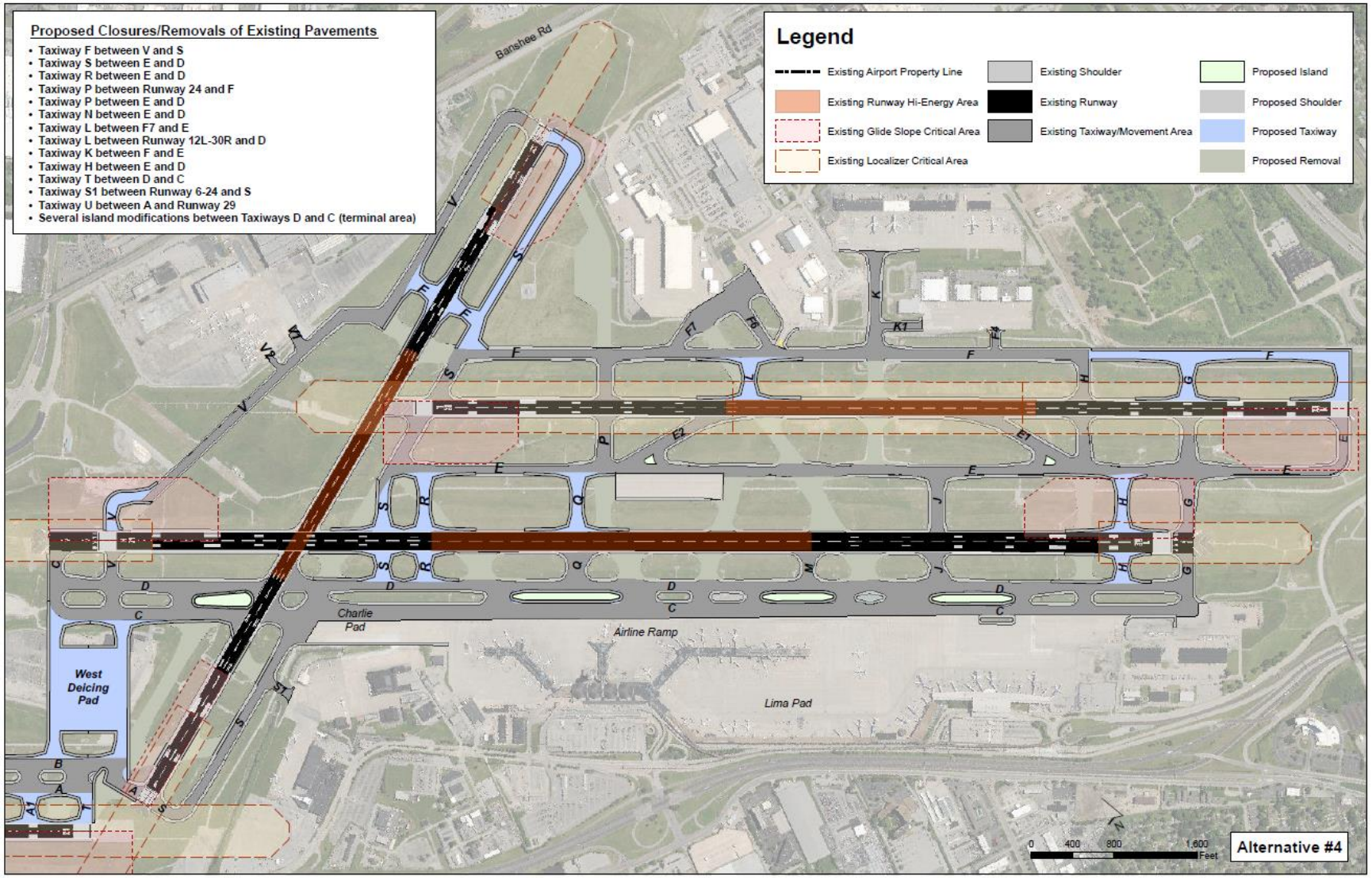
Source: CMT, 2021.

Figure 5B-3: Airfield Layout Alternative 3



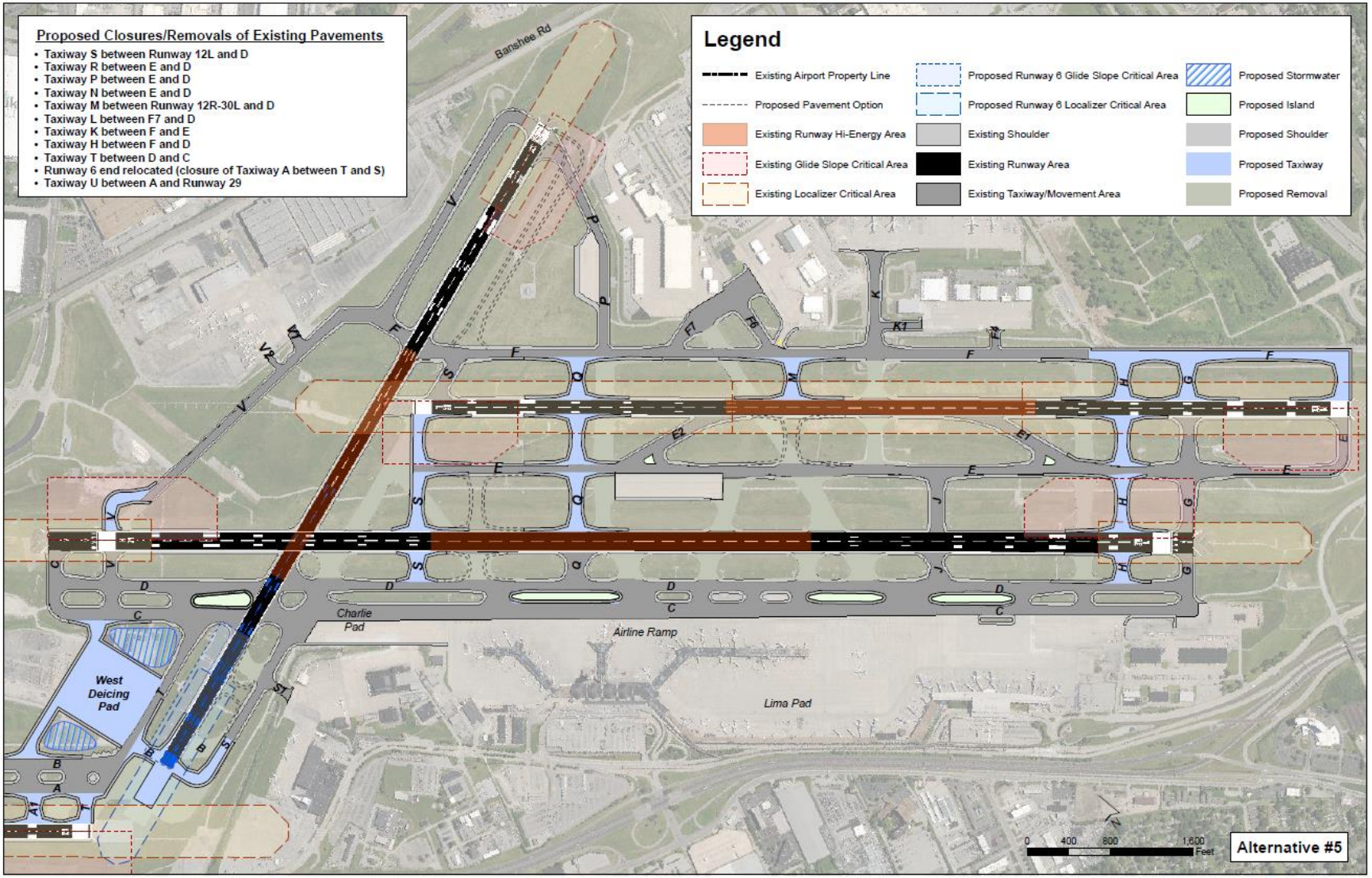
Source: CMT, 2021.

Figure 5B-4: Airfield Layout Alternative 4



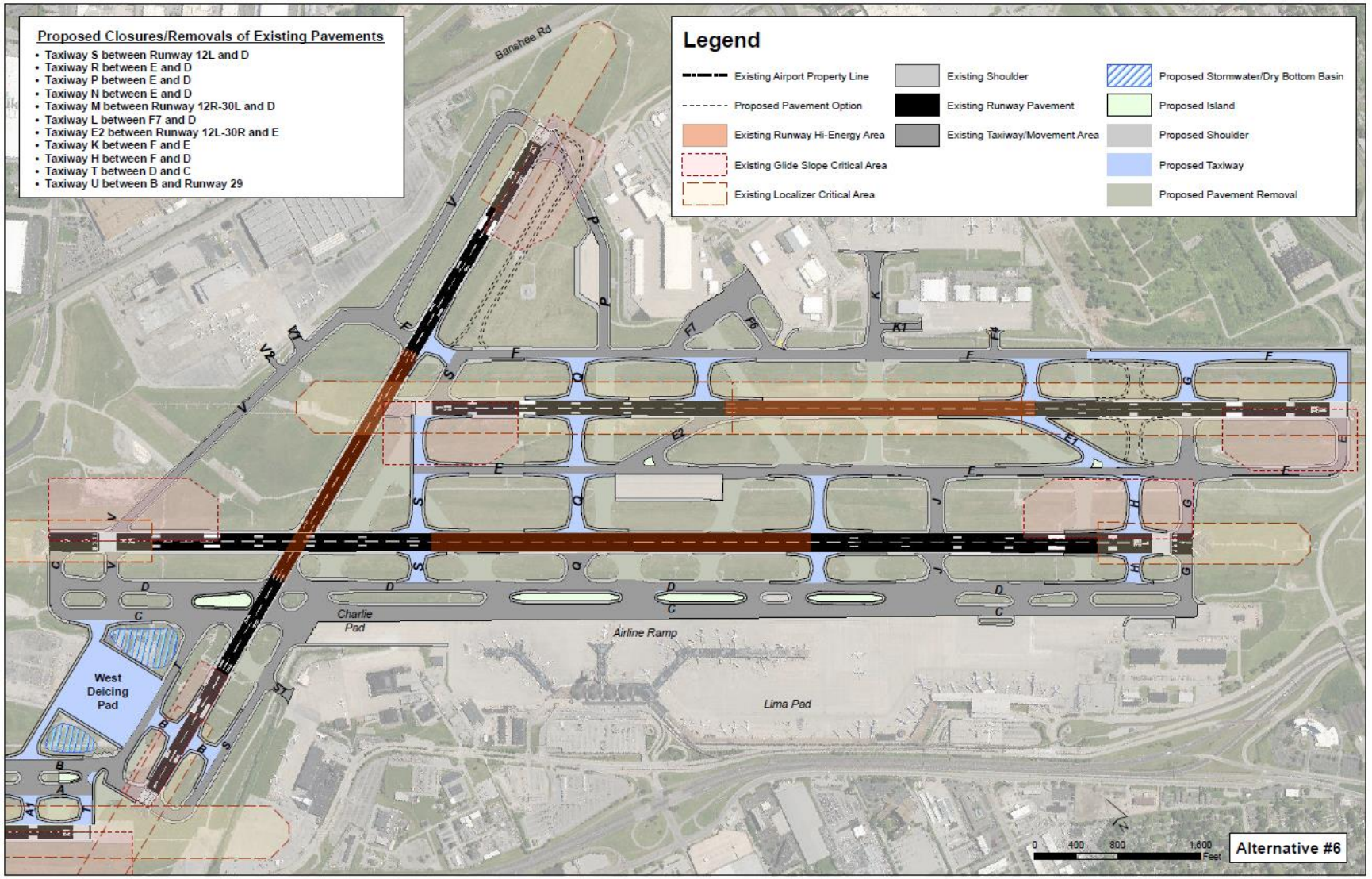
Source: CMT, 2021.

Figure 5B-5: Airfield Layout Alternative 5



Source: CMT, 2021.

Figure 5B-6: Airfield Layout Alternative 6



Source: CMT, 2021.

APPENDIX 5C – COMPARATIVE SAFETY ASSESSMENT

Memorandum

U.S. Department of Transportation
Federal Aviation Administration

Date: September 26, 2022

Subject: St. Louis Lambert International (STL)- St. Louis, MO

Aeronautical Study Number: 2022-ACE-3296-NRA

ALP UPDATE

From: Airports Airspace Specialist, ACE-620F Reply To: John D. Karrasch, ext 2617

To: Mr. Todd Madison, ACE

We have completed an airspace analysis of:

(STL) ALP Update. Safety Management System (Comparative Safety Assessment) for future Airport Layout Plan update of the airfield layout. The existing runway layout remains the same for the future condition. The taxiway layout has been updated. A new single passenger terminal building is shown for the future in the location of west Terminal 1, and the east Terminal 2 will not be a passenger terminal building in the future.

Our aeronautical study has determined that the proposed update will have an IFR Effect. We have no objection to the proposal provided the Airport does the following:

*** THERE IS NO IFR EFFECT to instrument approach procedures. The construction impact to the taxiway layout and future building will be provided when the NR/NRA for the actual construction is filed. Proponent must provide proposed relocation/location information of any equipment that will be relocated or added: Lighting Localizer, AWOS, PAPIs etc. Structures and/or construction equipment were not evaluated as part of this study. Obstructions must be surveyed and submitted IAW FAA specifications. Review of this ALP does not result in newly identified obstructions being added or removed from the obstruction database.

Future structures and/or construction equipment were not evaluated as part of this study. These must be submitted separately in accordance with 14 CFR Part 77.

This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making the determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA) and known natural objects within the affected area would have on the airport proposal. This aeronautical study was not circulated to the public for comments.

The FAA cannot prevent the construction of structures near an airport. The airport environs can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreements, or other means. This determination in no way preempts or waives any ordinances, laws, or regulations of any government body or agency.

This aeronautical study was not circulated to the public for comments.

FAA
Airports

FAA Form 5200-8, Safety Assessment Screening for Airport Planning and Development Projects (SAS-1)

ARP SMS ID: 2022ACE-STL-003

1. Project Location

LOCID: STL

Airport Name: St. Louis Lambert International Airport

Airport City, State: St. Louis, Missouri

Airport Sponsor Name: City of St. Louis, Missouri

Project Name & Description:
Airport Layout Plan Update

2. Safety Assessment Screening (SAS) – FAA Approval Action Type (Triggering Event)

A Safety Assessment (Form 5200-8, SAS-1) is necessary for these triggering event types.
Choose all applicable triggering events that apply (Reference current version 5200.11A, Par. 4-3):

- ☒ Airport Layout Plan
- ☐ Airport construction coordination, action, and approval
- ☐ Other airport changes not involving construction
- ☐ ARP requires a Safety Assessment

3. Safety Assessment (SA) – ARP System Safety Impact Checklist

Choose all that apply:

- ☒ **None** - An SRM panel is *not* required. No further review is necessary. **Proceed to Item 6.**
- ☐ The Proposed action may increase aviation safety risks, with existing controls in place.
- ☐ The Proposed action may adversely affect aviation operations with existing controls in place.
- ☐ The Proposed action may pose an immitigable effect on navigational aids.
- ☐ The Proposed action may impact TERPS surfaces.
- ☐ An aeronautical study (OE/AAA review) for this proposal indicates an objection to the proposal.
- ☐ Other safety impact (describe):

The Safety Impact Checklist indicates an SRM panel is warranted. Proceed to Item 4.

4. Safety Risk Management Panel

Date:

Identify the required FAA approval level for Item 7 (Reference current version 5200.11A Table 4-1). Attach copy of SRMP Report to this SAS-1 Form.

Highest Initial Risk Identified: ☐ Low ☐ Medium ☐ High

Highest Residual Risk Identified: ☐ Low ☐ Medium ☐ High

5. Airport Certification and Acceptance

As the airport sponsor or duly authorized representative, I hereby certify that I have reviewed and understand the Safety Assessment and Safety Risk Management processes and outcomes applied to this proposal and referenced in this Safety Assessment Screening form. I accept responsibility for the timely application of all mitigations measures identified in this assessment. I understand that the FAA considers acceptance of this assessment and its outcomes an obligation under Federal Grant assurances, regardless of FAA participation in the subject proposal. No measure contained in this assessment or its outcomes relieves the sponsor of its legal obligation under applicable FAA regulations and requirements.

Name: DANA RYAN

Title: AIRPORT PLANNING MANAGER

Signature: Dana Ryan Date: 7 June 2022

6. Aeronautical Study Data

Aeronautical Study (NRA) Number(s): 2022-ACE-3296-NRA

Determination Letter Date(s): September 26, 2022

7. FAA SA / SRM Approval

The proposed action was reviewed with respect to known hazards and existing controls. Potential hazards were evaluated with appropriate FAA personnel, airport operations and other aviation officials with safety responsibilities. SRM activities, when conducted, identified and evaluated hazards using procedures and processes in accordance with FAA Order 5200-11A. Documentation of SA and SRM process, when applicable, are retained with the FAA approval action documentation. All measures ensure that the project will not increase risk to the National Airspace System during the project life cycle and after the change associated with the project is complete.

Name: Jim Johnson

Title: Director, Central Region Airports Division

Signature: _____ Date:

Faith Group

ALP Comparative Safety Assessment (CSA)

St. Louis International Airport

Report Date: August 8, 2022

Final

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

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Section 1 Introduction

The St. Louis Lambert International Airport (STL/the Airport), owned by the City of St. Louis, is undergoing a thorough Airport Layout Plan (ALP) Update. One of the most important airfield issues to address is to bring the taxiway geometry into standards compliance and address identified hotspots. Further, additional dedicated aircraft deicing locations are being considered within the Comparative Safety Assessment (CSA) documentation.

The team for developing this CSA is comprised of the following consultants and stakeholders: Consultant Team:

- WSP – Prime Consultant
- Crawford, Murphy & Tilly (CMT)
- Faith Group (FG)
- City of St. Louis Airport Authority
- Federal Aviation Administration – Central Region (FAA Airports)
- Federal Aviation Administration – St. Louis Air Traffic Control Tower (FAA STL ATCT)
- Federal Aviation Administration – Runway Safety (FAA Runway Safety)

The team identified above is considered collectively the" Planning Team". The Planning Team developed the airfield alternatives, a process that concluded with the formal CSA documentation below. It should be noted that other stakeholders were invited to participate throughout the airfield planning process and the CSA workshop (i.e., users/pilots).

The ALP Update takes into consideration taxiway and pavement improvements based on their connection with and alignment to runways and ramps areas. The current Airport diagram is depicted in **Figure 1.**

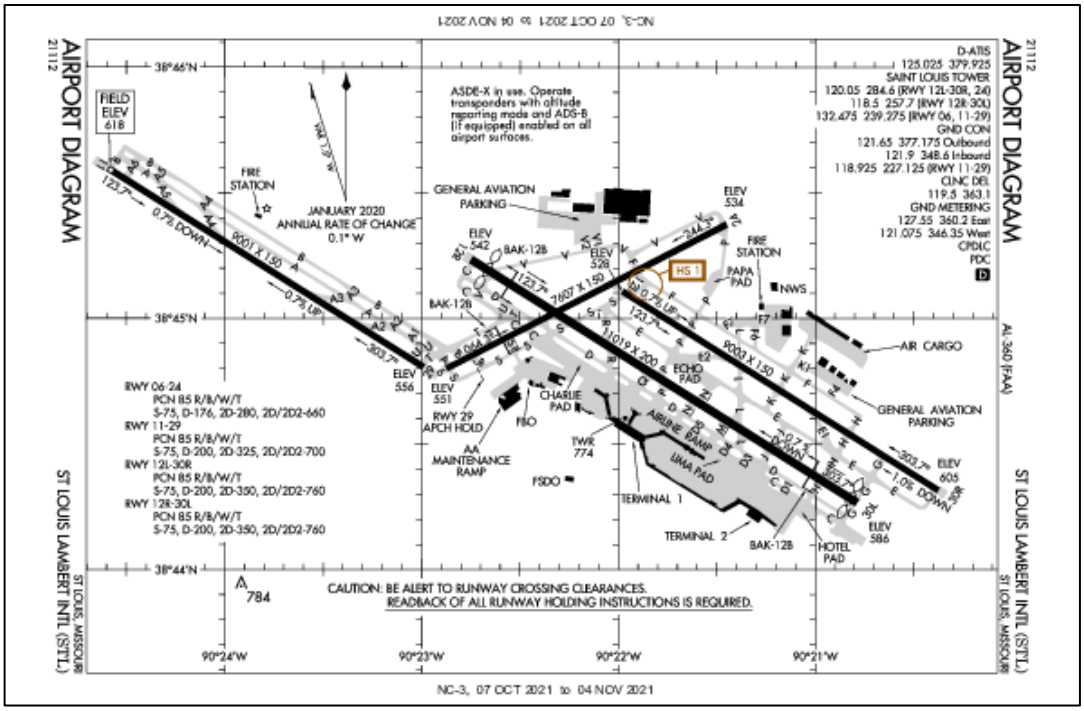


Figure 1 Airport Diagram

The CSA process and documentation (as executed) was intended to be used for comparing multiple alternatives before a preferred alternative is illustrated on the ALP Update. As part of the CSA process, hazards associated with each alternative being evaluated were identified, with the objective to build consensus around the least impactful or preferred alternative. The results of the CSA are contained herein.

1.1 Methodology

Recognizing that the overall airfield planning sequence for STL would be an iterative process, the Planning Team integrated elements of the CSA process into key milestones/decision points. This was done for several reasons:

- Apply a segmentation of airfield elements into areas of focus based on priorities (i.e., north/west airfield).
- Secure consensus on airfield adjustments with limited disagreement on solution.
- Prioritize airfield objectives based on stakeholder input (safety, standards, efficiency).
- Facilitate stakeholder engagement opportunities focused on airfield elements with a range of solutions.
- Build consensus towards a preferred solution that takes into consideration various perspectives
- Limit the number of decision points required during the final CSA engagement

The Planning Team found this approach to be helpful during an ALP Update initiative, as it would allow stakeholders to identify hazards and operational challenges as they assess baseline conditions, review alternatives, and build consensus through a series of engagements, rather than a single CSA workshop.

It should be noted that a Safety Risk Management Panel (SRMP) differs from a CSA in that it quantifies risk and potential frequency of these risks for the project being considered. The application of an SRMP over a CSA is dependent on several factors (non-standard conditions, disagreement on final solution, etc.), and is a process FAA can require if needed to finalize the preferred solution. In the case of the STL ALP Update, the CSA process resulted in consensus by all stakeholders, and application of design standards were implemented in the preferred airfield plan.

1.2 CSA Process

The first step in the CSA process is to describe the system/proposal being studied. A preliminary hazard/operational impacts list is then developed for consideration when each alternative is described/studied. A comparison of each alternative is then completed, which leads to the alternatives being ranked based on least risk. At this point, recommendations of the preferred alternative can be made.

> Per FAA Office of Airports Safety Management System (SMS) Desk Reference (Version 1, 6/1/12), a "*CSA provides decision makers with a listing of all potential hazards along with a risk assessment for each alternative hazard combination that is considered. It is used to rank the options for decision-making purposes. The CSA's broad scope is an excellent way to identify issues that may require more detailed hazard identification tools*."

During the airfield alternatives process, the Planning Team was able to apply FAA design standards as part of the solution, eliminating the need for a separate SRMP. Indeed, FAA design standards are predicated on limiting or eliminating risk related to airfield configuration (i.e., 90° intersections, 3-node taxiway intersections, restricting direct access from apron to runway, etc.).

This CSA was completed over several workshops/meetings and coordination calls between the Airport Authority, users/pilots, FAA, and other stakeholders. **Table 1** provides a list of meeting dates along with the meeting topic/focus. See **Appendix A** for presentation materials and meeting minutes, with participants.

Appendix B contains the detailed scoring matrix for six (6) draft alternatives. The draft alternatives were developed following Workshop #1 and consolidated solutions grouped into six (6) layouts with various configurations of the solutions. Each layout sought to prioritize objectives in different combinations. To aid in refining the airfield alternatives, stakeholders completed a scoring matrix for each alternative (documentation of pros/cons, areas of concern, hazards identified, etc.). Input received from the scoring matrix assisted the Planning Team in refining the airfield alternatives into two (2) layouts for further consideration.

Appendix C contains the presentation and meeting minutes specific to the September 2021 Airline/User Engagement.

The Planning Team met several times to identify and refine a variety of alternatives, in order to develop what is now the Preferred Airfield Alternative (to be shown on the ALP drawing set).

- The Planning Team met on November 19, 2020, for the first workshop (Meeting #1),
- On January 10, 2021, to review draft alternatives (Meeting #2),
- On March 5, 2021, for the second workshop (Meeting #3),
- On April 21, 2021, for the CSA (Meeting #4)
- On July 2021 for Airfield refinement alternatives (Meeting #5)
- On September 2021 for an engagement with airlines (Meeting #6)
- And on October 2021 to finalize the Preferred Airfield Alternative (Meeting #7).

Between the November 2020 and March 2021 meetings, the members of the Planning Team provided their individual thoughts as to how best address the issues listed in Section 3 of this document. These comments were incorporated into the alternatives and then presented for refinement during the March 2021 meeting.

Meeting Date	Meeting Topic/Focus
November 2020	Meeting #1: Workshop #1 – Initial Safety Risk Management Engagement
January 2021	Meeting #2: Draft Alternatives & Evaluation Criteria Workshop
March 2021	Meeting #3: Refinement Workshop
April 2021	Meeting #4: CSA Engagement*
July 2021	Meeting #5: Planning Team (Airfield Refinement)
September 2021	Meeting #6: Airline/User Engagement
October 2021	Meeting #7: Planning Team (Finalization of Preferred Airfield Plan)

Table 1 Meetings List

** For clarification purposes, several supporting documents within the appendices use slightly different terminology for the overall integration of the safety assessment concept within the planning process. Depending on where the planning team was in the overall alternatives process, references are made to Safety Risk Management (SRM), Safety Risk Assessment (SRA), and Comparative Safety Assessment (CSA). These terms were used interchangeably during the planning process, but the ultimate outcome was this CSA report and dedicated engagement in April 2021.*

Section 2 Describe the System

STL has four runways, three of which are generally oriented east/west; the crosswind runway is oriented southwest/northeast. The runways are:

- 12R-30L, 11,020' X 200'
- 12L-30R, 9,013' X 150'
- 11-29, 9,000' X 150'
- 6-24, 7,603' X 150'

All the runways have parallel taxiway systems supporting them, however, in the case of Runway 6-24, it is only a partial parallel taxiway system. All the runways have at least Category (CAT) I Instrument Landing System (ILS) approach capability, with Runways 11 and 12L-30R supporting CAT III ILS approaches. There is one designated hotspot located at the intersection of Taxiway F and Runway 24, as shown on the Airport Diagram (**Figure 2**).

The STL airfield is broken up into two areas: the West Airfield (also referred to as the Runway 11-29 complex), which meets current design standards, and the North Airfield, which has many geometric standards that have been implemented over decades of operation and standards changes.

The airport operates under several different flow configurations, depending on wind and weather conditions. During Visual Meteorological Conditions (VMC), Visual Flight Rules (VFR) are in effect. During VMC which occurs the majority of the time at STL, the following air traffic management procedures are utilized:

- Northwest Flow (55% of time):
  - Departures on Runway 30L & Runway 29
  - Arrivals on Runway 30R & Runway 29
- Southeast Flow (45% of time):
  - Departures on Runway 12R
  - Arrivals on Runway 12L & Runway 11
- Crosswind Runway 6-24 is used less than 1% of the time

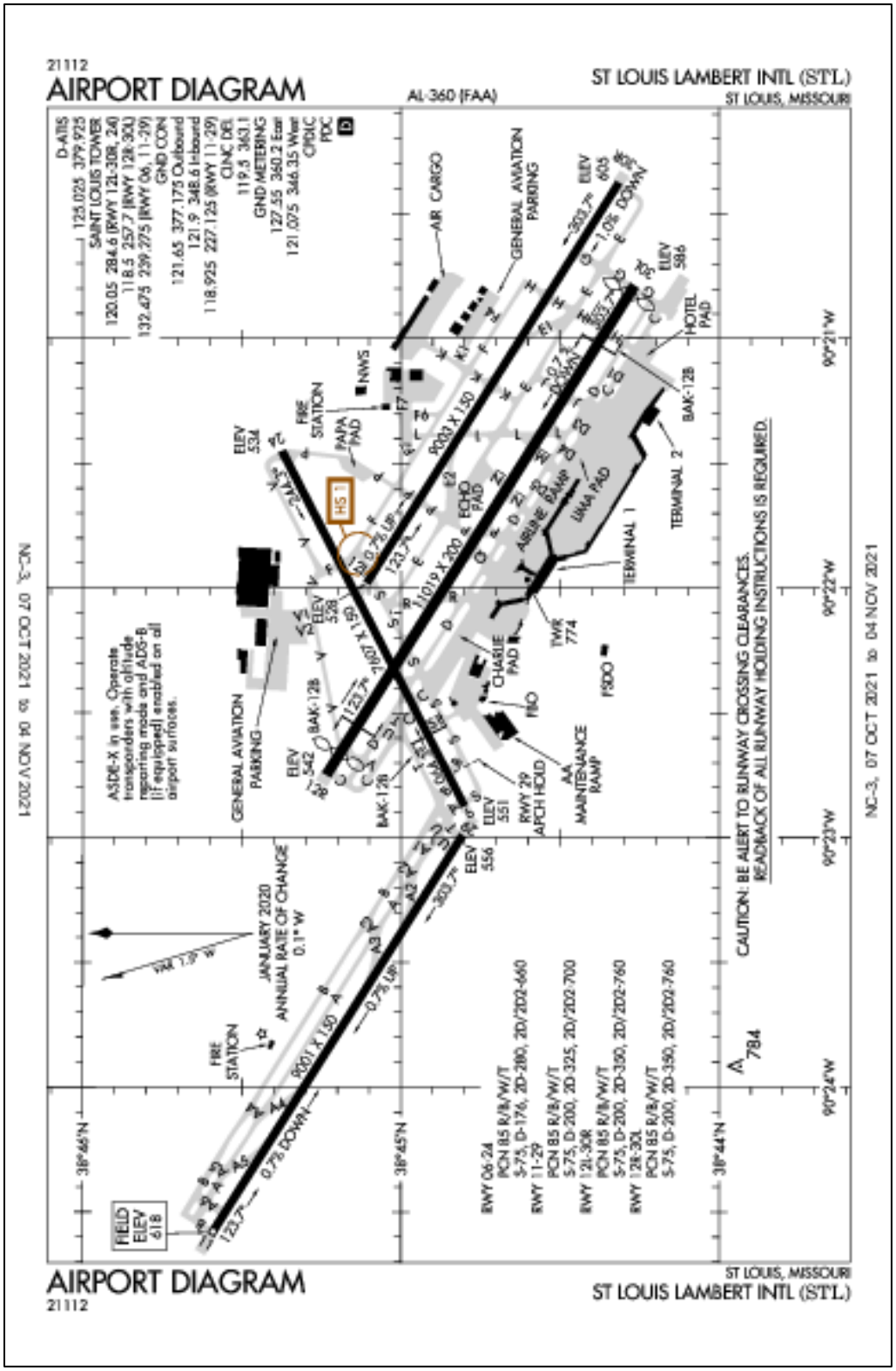


Figure 2 Airport Diagram

Section 3 Guiding Principles and Issues

3.1 Meeting #1 – Outcomes

The following subsections discuss the information presented during Workshop #1 on November 19, 2020. Workshop #1 focused on an initial Safety Risk Management Engagement which included a discussion on guiding principles, airfield design standards, definition of study areas, and a discussion of the Terminal Taxiway Corridor (C/D Discussion). This workshop also presented an identification of the various airfield issues.

Workshop #1 – *Initial Safety Risk Management Engagement* resulted in consensus between the Planning Team and the Airport on the following topics:

- Study ground rules and sequence of workshop steps
- Study guiding principles
- Airfield design standards & Terminal Taxiway Corridor (C/D) discussion
- Study area definition
- Alternatives evaluation criteria

The following subsections will discuss in further detail the most important outcomes of Meeting #1.

3.2 Guiding Principles

The airfield alternatives were developed by the Planning Team and analyzed to reach the following objectives:

- Bring the taxiway system into compliance with FAA Advisory Circular (AC) 150/5300-13B, Airport Design
- Maintain airfield capacity and efficiency
- Eliminate the hotspot
- Eliminate direct access from ramp to runway
- Address known taxiway needs (i.e., cross-field connectivity, operational restrictions)
- Reduce number of high-energy runways crossing locations

3.3 Study Area Definitions

To assess the airfield objectively and help understand how each area functions individually and collectively, the airfield assessment was conducted by area: North Airfield, West Airfield, and Terminal Core.

The following are the illustrations used during the first workshop (Meeting #1) to start the overall discussions. **Figure 3** depicts the areas assessed, **Figures 4** and **5** depict a detailed view of the North Airfield and West Airfield respectively, while **Figures 6** and **7** identify key issues in each area.

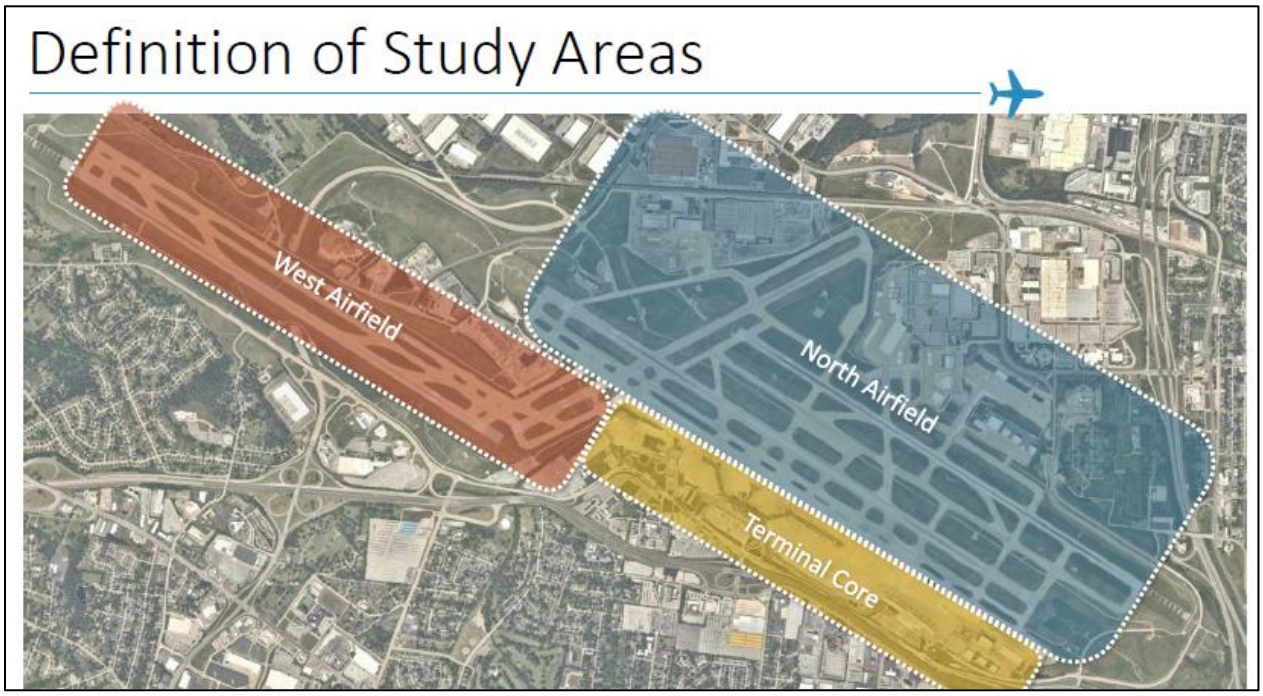


Figure 3 Definition of Study Areas

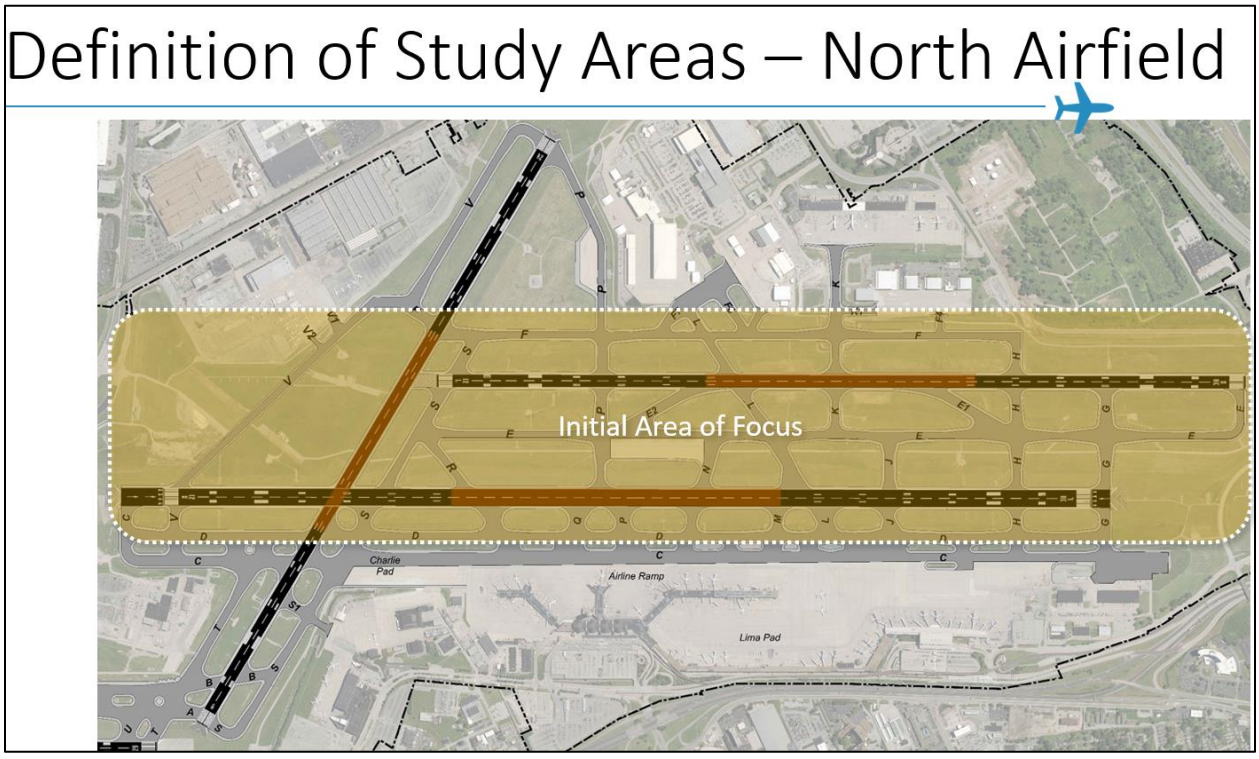


Figure 4 North Airfield Area

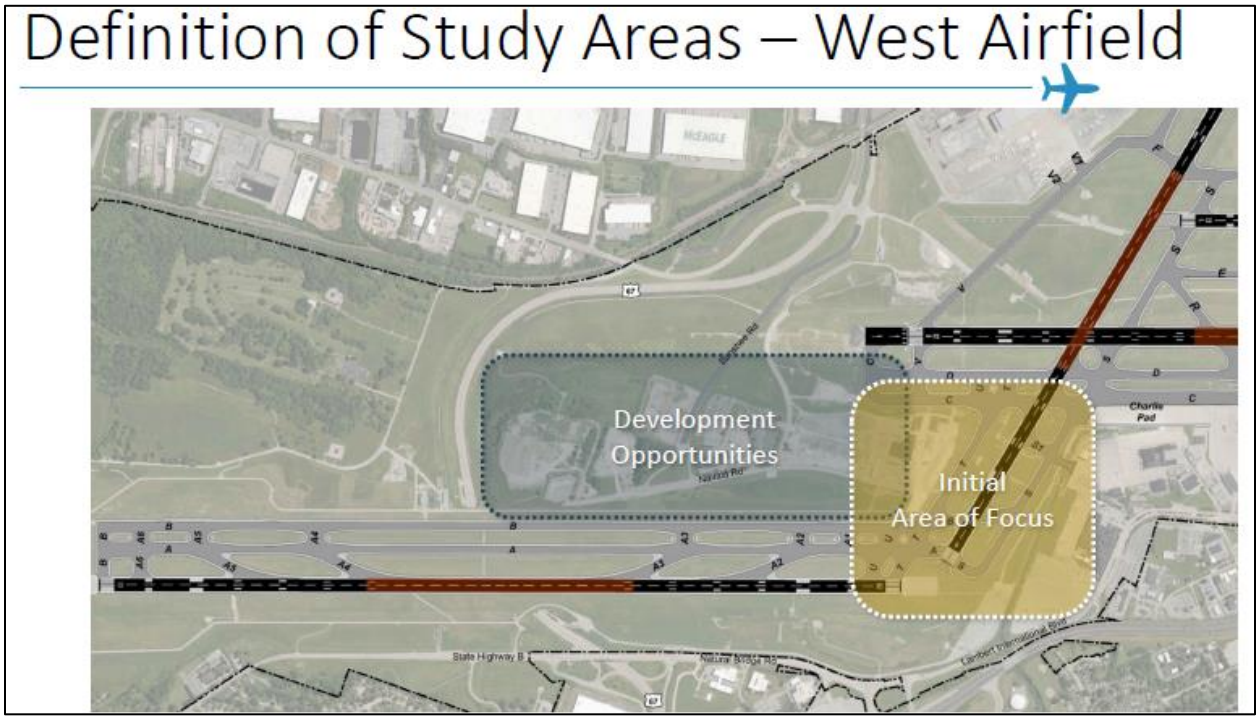


Figure 5 West Airfield Area

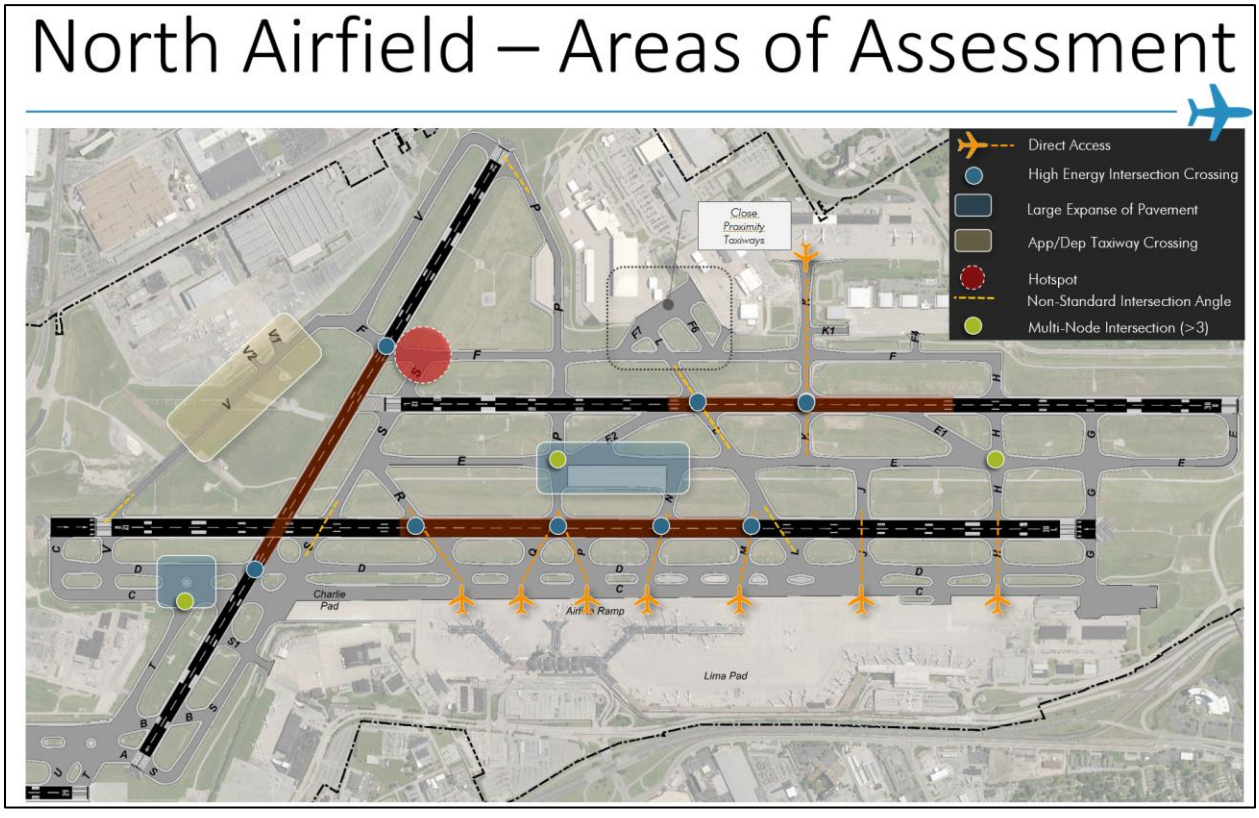


Figure 6 North Airfield – Areas of Assessment

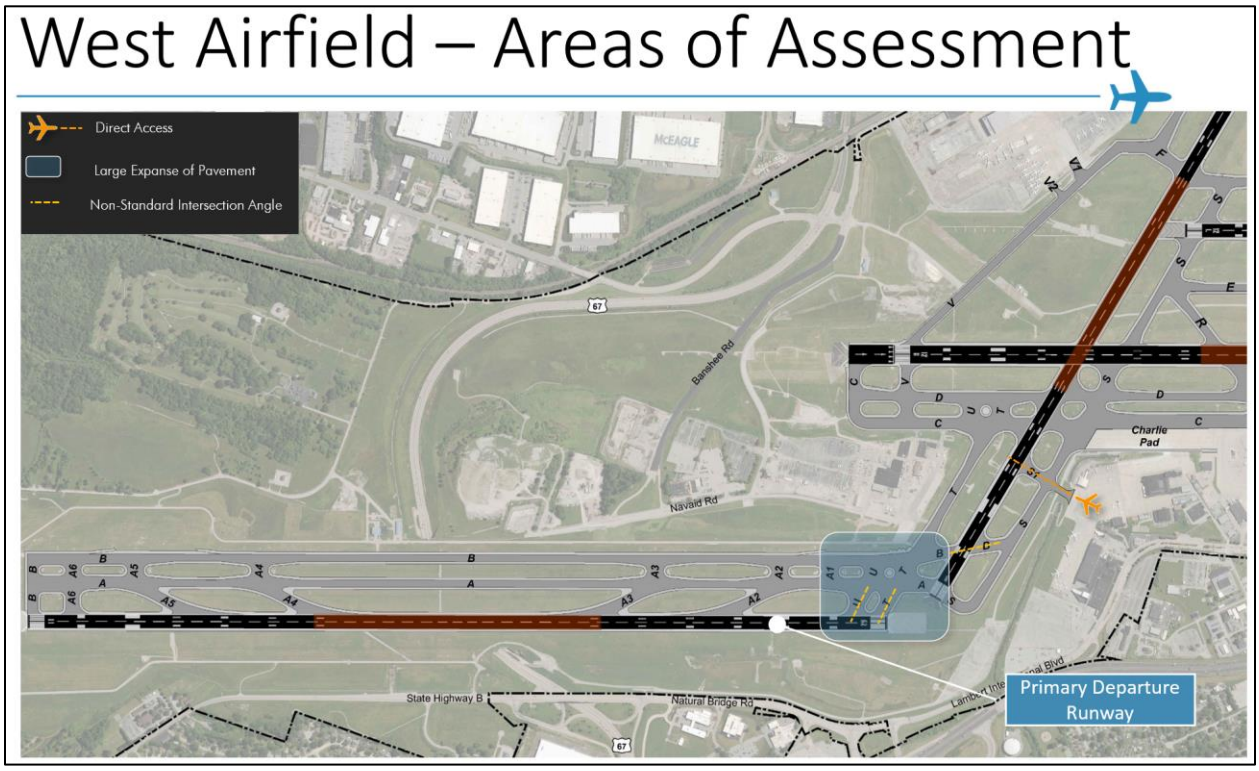


Figure 7 West Airfield - Areas of Assessment

3.4 Issues

The following key issues were identified:

- **Direct access from ramp areas to the runways**

  Direct access to both primary runways (12L-30R and 12R-30L), from the commercial ramp area and the northeast side of the field, creates significant safety issues, such as direct access to the high-energy zones (middle third) of the runways. In addition, there is a limited amount of space between the commercial ramp area and Runway 12R-30L, which creates a very short travel distance before aircraft enter the runway environment. Boeing Defense Space and Security facilities, commercial air cargo, and larger general aviation facilities are located on the northeast side of the airfield. It should also be noted that direct access to Runway 6 via Taxiway S1 was identified as an area for assessment.

- **High-energy zone crossings**

  Direct access and taxiway crossings in the high-energy zones of Runway 12R/L-30R/L were discussed at length with the airport staff and FAA ATCT representatives. Specifically, the existing airfield geometry conflicts with the current FAA airfield design standards, which were developed to address runway incursions by eliminating or reducing the number of high-energy crossing within an airfield system. High- energy zones are labeled as such given the speeds of commercial aircraft on the runway in those areas, whether taking off or landing. By reducing the number of high-energy runway crossings, the likelihood for incursions and catastrophic accidents is reduced.

- **Operational impacts**

  The potential operational impacts of any airfield geometry changes were also discussed at length. The Planning Team focused on finding a balance between improving the safety of the airfield, meeting standards, while still providing adequate taxiway access to and from the primary runways to ensure operational sustainability in the long term.

  Addressing the non-standard airfield geometry associated with non-standard intersection angles (45-degree or 90-degree) objectives.

- **Large expanse of pavement not meeting standards**

  Providing access to Runway 29 while eliminating the large expanse of pavement was also addressed. In accordance with FAA AC 150/5300-13B, the removal of large expanses of pavement as part of a taxiway system reduces the likelihood of runway or taxiway incursions by flight crews that might lose situational awareness.

3.5 Taxiways C/D Corridor Assessment

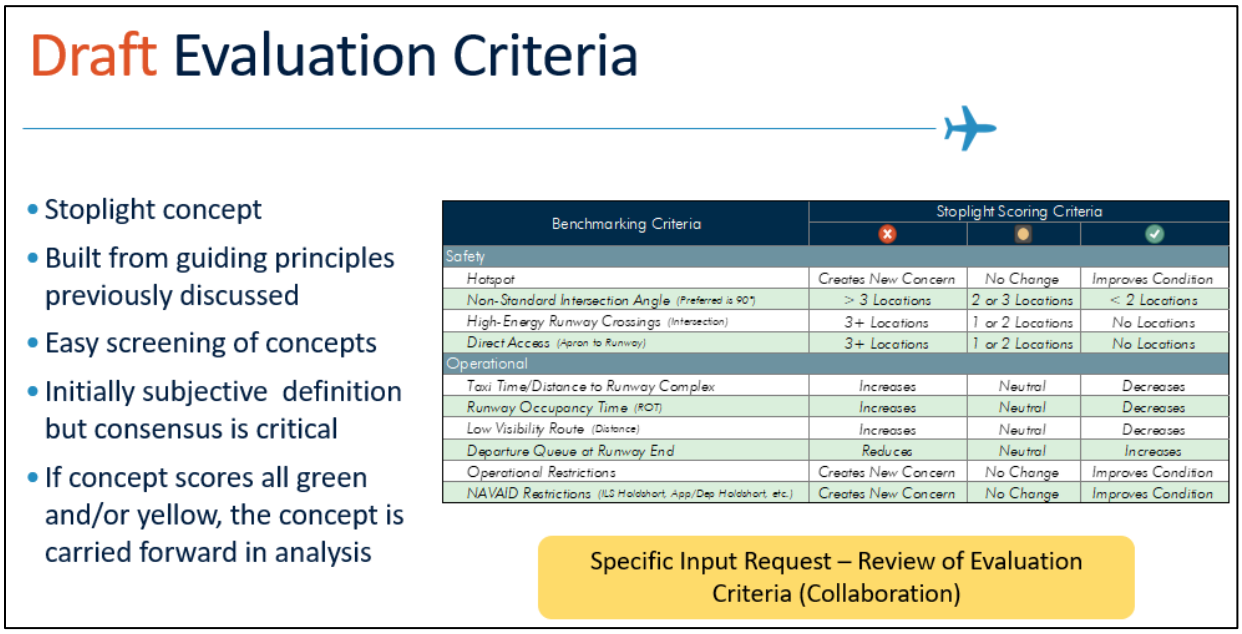
Early in the airfield alternatives evaluation, discussion was held on design standards for the Taxiways C/D corridor, regarding taxiway centerline separation, movement area designation, existing terminal gate pushback procedures, ATCT procedures, and long-term objectives. This corridor was blended with airfield assessment findings related to direct access, non-standard geometry, and multiple high-energy runway crossing points. Following initial discussions, the Planning Team separated the final Taxiways C/D corridor configuration from the overall airfield alternatives process, recognizing that other landside/terminal decisions could significantly influence the decision-making process. The Preferred Terminal Alternative had not been defined yet at the time of the initial airfield assessment.

The Taxiways C/D corridor assessment is being provided for reference in **Figure 8**, as part of the overall airfield alternatives process. Note that the final terminal outcome and how that plays a role in the airfield planning process is addressed in Section 8 – Conclusion.

Figure 8 Terminal Taxiways C/D Corridor Discussion

Section 4 Evaluation Criteria Workshop

The first workshop (Meeting #1) addressed the issues articulated in Section 3. The evaluation criteria for how to develop the ultimate preferred alternative were also discussed and agreed to by the Planning Team. A stop light evaluation was used to evaluate alternatives. The stop light method provides an objective and, in some cases, quantifiable, approach to the evaluation, as illustrated in **Figure 9**.



Benchmarking Criteria	Stoplight Scoring Criteria		
Safety			
Hotspot	Creates New Concern	No Change	Improves Condition
Non-Standard Intersection Angle (Preferred is 90°)	> 3 Locations	2 or 3 Locations	< 2 Locations
High-Energy Runway Crossings (Intersection)	3+ Locations	1 or 2 Locations	No Locations
Direct Access (Apron to Runway)	3+ Locations	1 or 2 Locations	No Locations
Operational			
Taxi Time/Distance to Runway Complex	Increases	Neutral	Decreases
Runway Occupancy Time (ROT)	Increases	Neutral	Decreases
Low Visibility Route (Distance)	Increases	Neutral	Decreases
Departure Queue at Runway End	Reduces	Neutral	Increases
Operational Restrictions	Creates New Concern	No Change	Improves Condition
NAVAID Restrictions (ILS Holdshort, App/Dep Holdshort, etc.)	Creates New Concern	No Change	Improves Condition

Figure 9 Draft Evaluation Criteria

The planning team brainstormed solutions to the issues articulated previously and compared them to the evaluation criteria. The specific areas of assessment for change are shown in **Figure 10**. Each location identified was assessed in isolation and holistically, relative to airfield connectivity. Meaning, if a taxiway element resulted in direct access but also provided cross-field connectivity, each of those factors were taken into consideration.

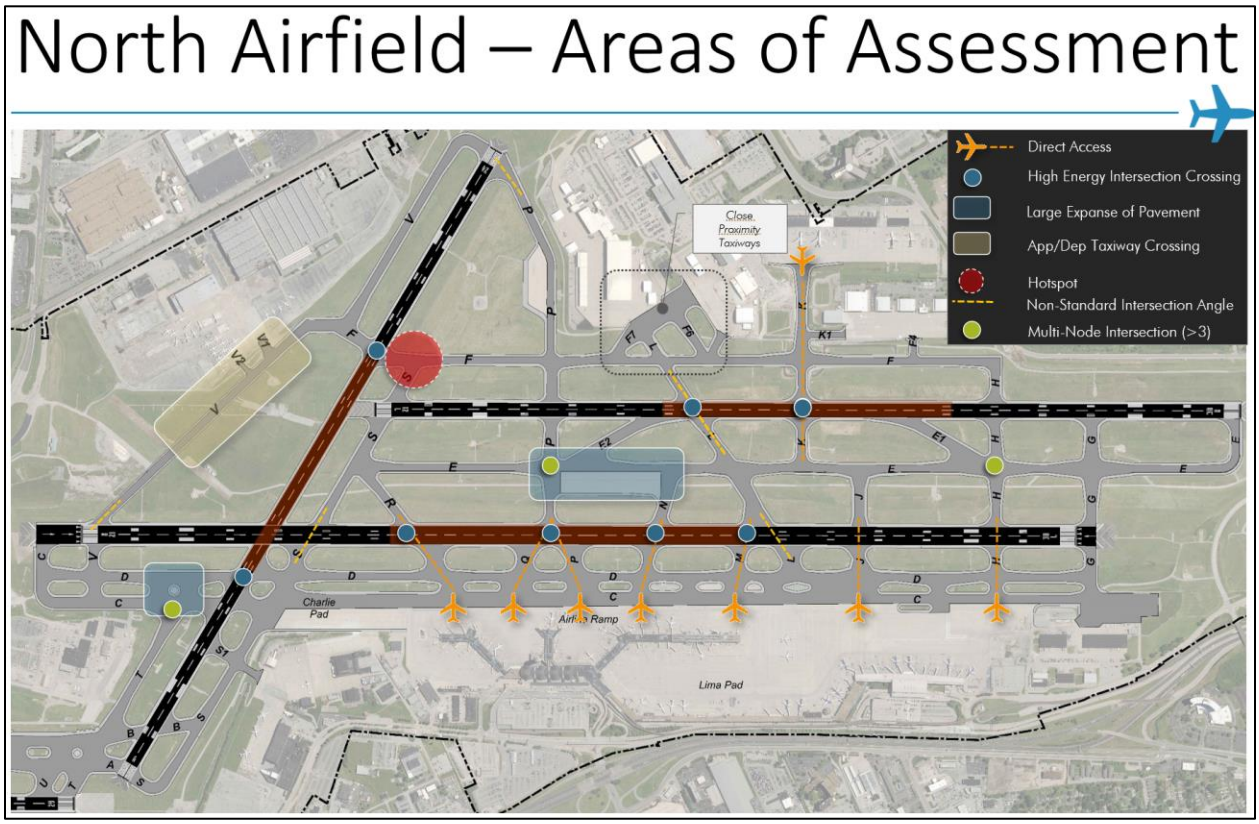


Figure 10 North Airfield - Areas of Assessment

In addition to safety issues, cross-field connectivity and its necessity were also discussed at length. This discussion helped demonstrate the overall need for operational sustainability (redundancy of taxi routes during different flow configurations, access to deice facilities located on the terminal apron, minimize impact of closed pavement or disabled aircraft), as illustrated on **Figures 11 and 12**.

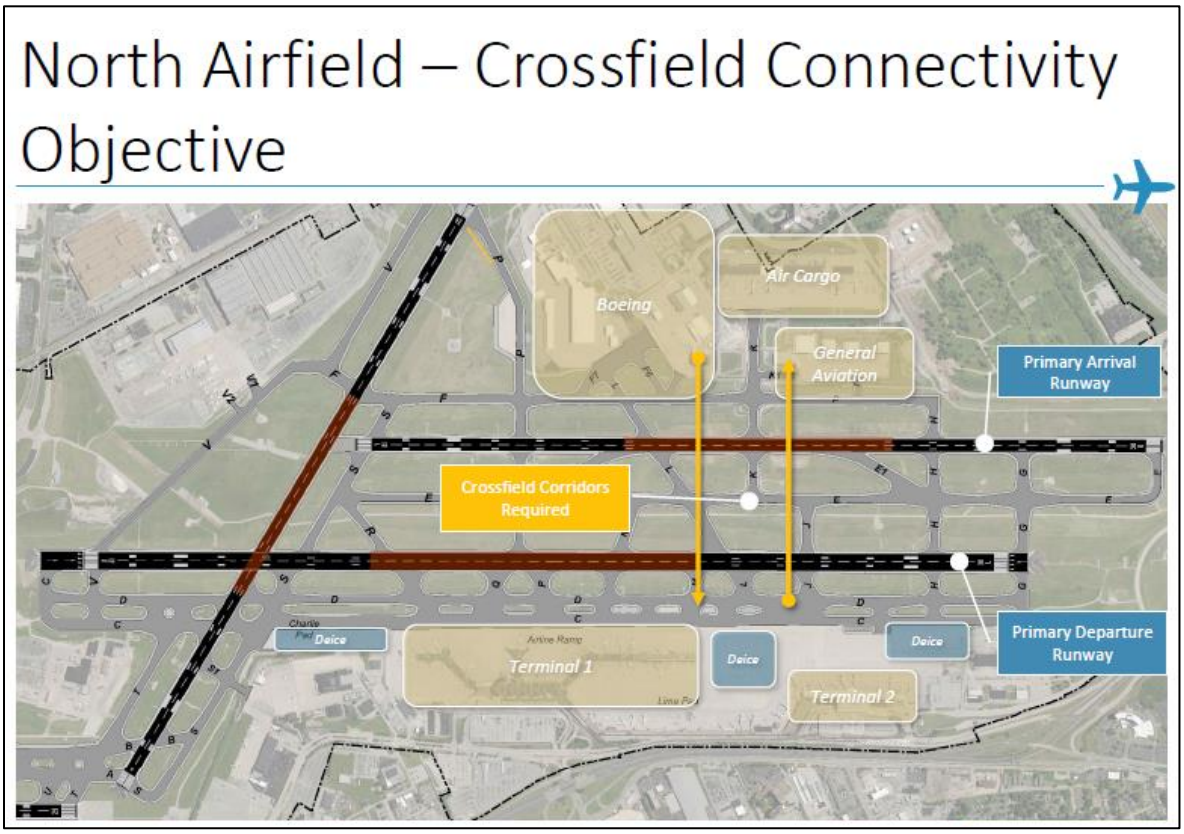


Figure 11 North Airfield - Crossfield Connectivity Issue

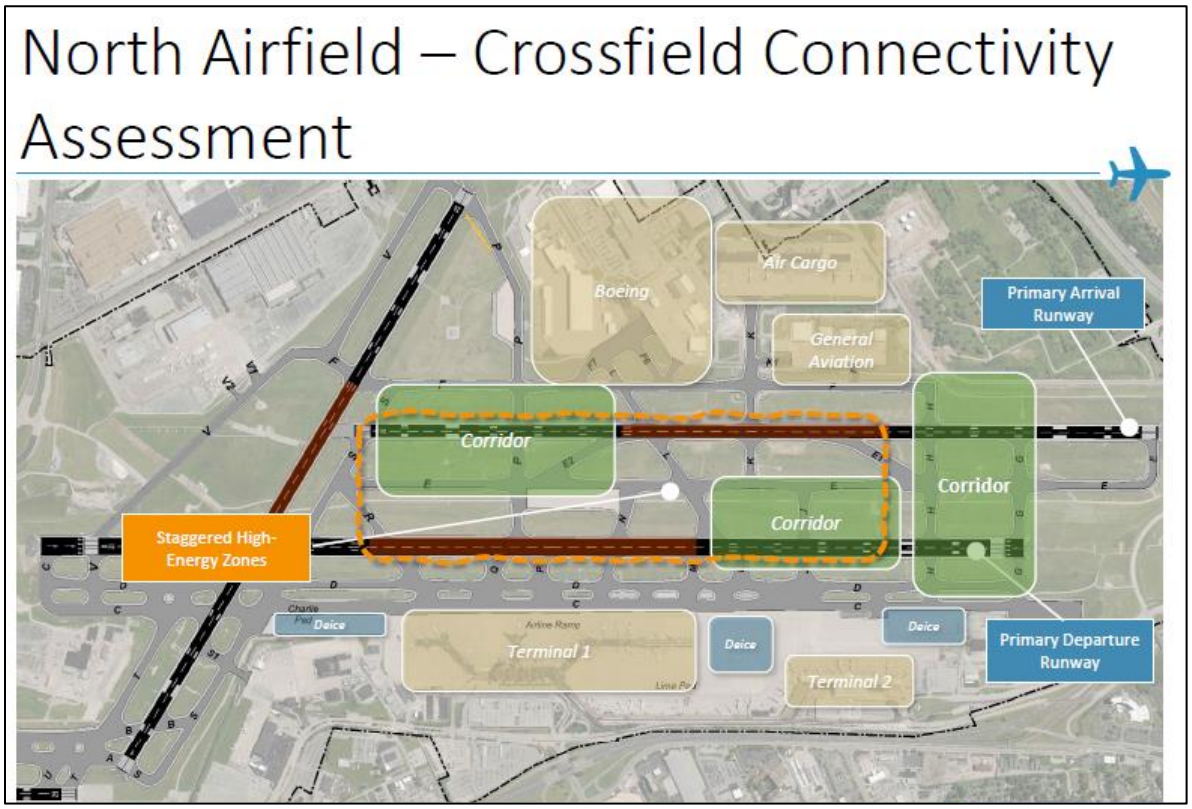


Figure 12 North Airfield - Crossfield Connectivity Assessment

Based on discussions held during Workshop #1 (Meeting #1), a high-level illustration was developed to show potential outcomes for further assessment (**Figure 13**).

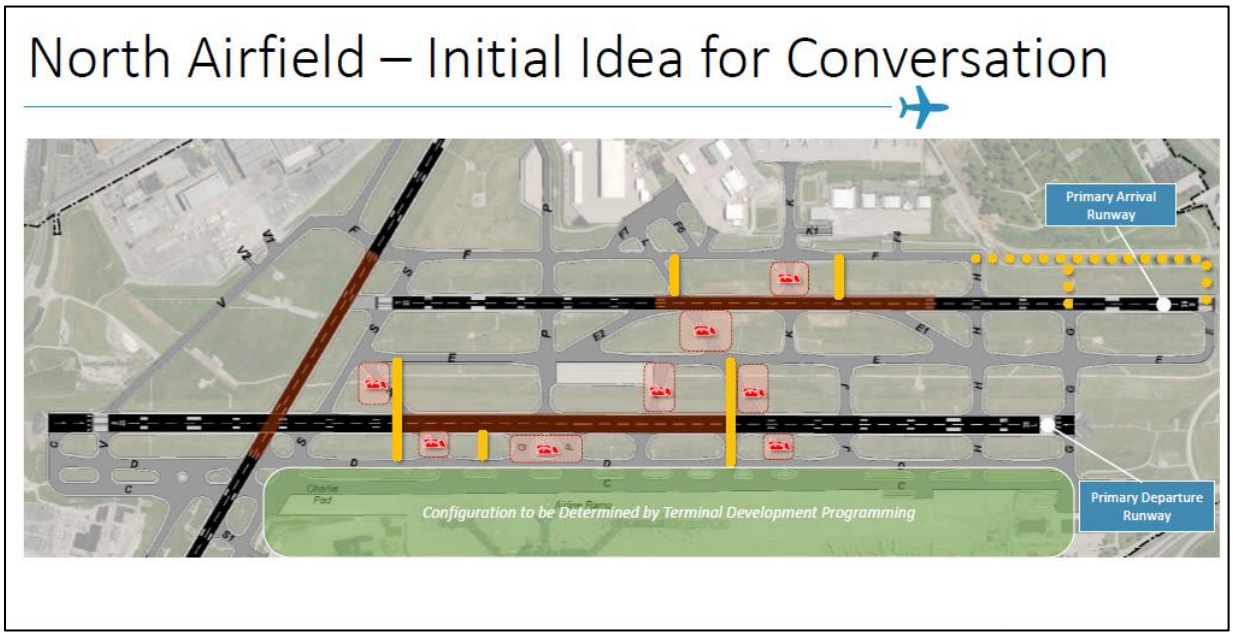


Figure 13 - Initial Idea for Conversion

The Planning Team took these potential solutions and individually marked up drawings showing ideal solutions from their individual perspectives. These ideas were provided and consolidated for the next workshop (Meeting #3), which took place in March 2021.

Section 5 Refinement Workshop

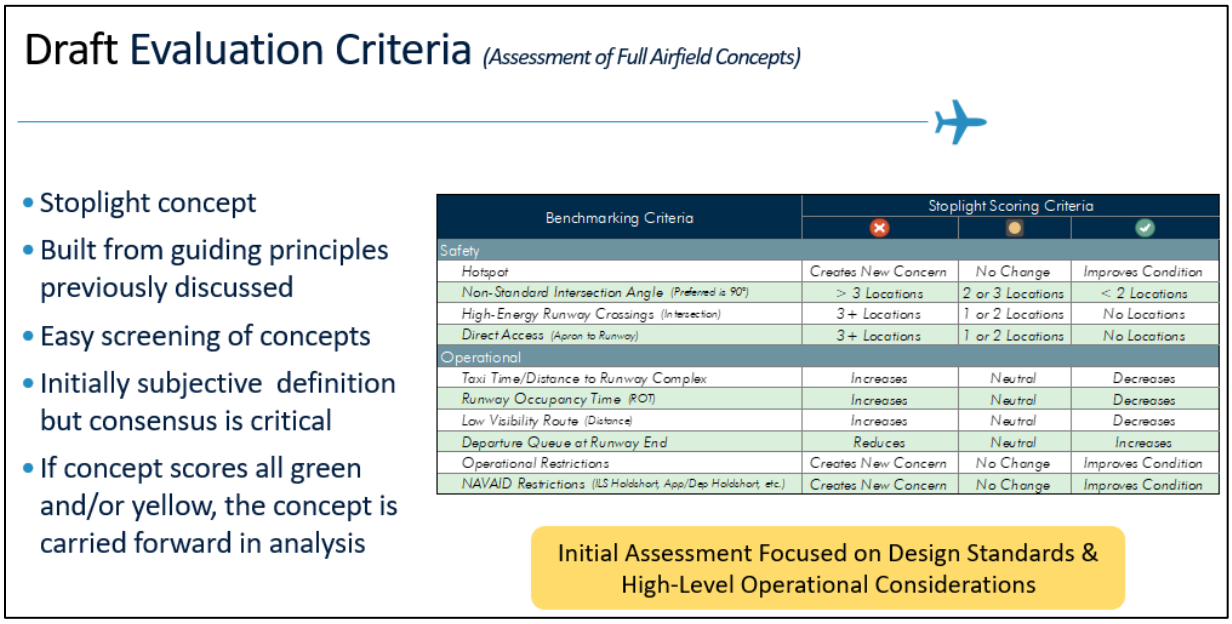
The Planning Team met to review and refine the alternatives on March 5, 2021 (Meeting #3). It should be noted that although airline representatives were invited to the Refinement Workshop (Meeting #3) through station manager contacts, no airline representatives joined the workshop session. To ensure adequate opportunity was provided for airline/user participation in the alternatives process, a dedicated airline/user stakeholder engagement was conducted on September 3, 2021 (Meeting #6), to solicit input and feedback on the draft Preferred Airfield Plan. Additional information on this engagement will be provided in Section 7.

Following the first workshop (Meeting #1), potential solutions were developed and presented for each area of the airfield in the Refinement Workshop (Meeting #3). The information presented in this section is intended to provide a high-level chronological progression of the airfield alternatives development and highlights of key discussion points. Meeting minutes from the Refinement Workshop (Meeting #3) are provided in **Appendix A**. It should be noted that during the presentation of alternatives, several discussions occurred, and the meeting minutes were developed to capture the key topics/decisions.

The evaluation criteria identified in **Figures 14 and 15** were applied during the Refinement Workshop (Meeting #3), including the initial criteria developed at the onset of the airfield planning process. Additional screening criteria were established for the Refinement Workshop (Meeting #3) to aid in the decision-making process.

A full copy of the Refinement Workshop (Meeting #3) presentation is included in **Appendix A**.

The solutions were presented by Airport area: North Airfield, West Airfield, and Terminal Area. The North Airfield was presented first.



Benchmarking Criteria	Stoplight Scoring Criteria		
Safety			
Hotspot	Creates New Concern	No Change	Improves Condition
Non-Standard Intersection Angle (Preferred is 90°)	> 3 Locations	2 or 3 Locations	< 2 Locations
High-Energy Runway Crossings (Intersection)	3+ Locations	1 or 2 Locations	No Locations
Direct Access (Apron to Runway)	3+ Locations	1 or 2 Locations	No Locations
Operational			
Taxi Time/Distance to Runway Complex	Increases	Neutral	Decreases
Runway Occupancy Time (ROT)	Increases	Neutral	Decreases
Low Visibility Route (Distance)	Increases	Neutral	Decreases
Departure Queue at Runway End	Reduces	Neutral	Increases
Operational Restrictions	Creates New Concern	No Change	Improves Condition
NAVAID Restrictions (ILS Holdshort, App/Dep Holdshort, etc.)	Creates New Concern	No Change	Improves Condition

Figure 14 Draft Evaluation Criteria

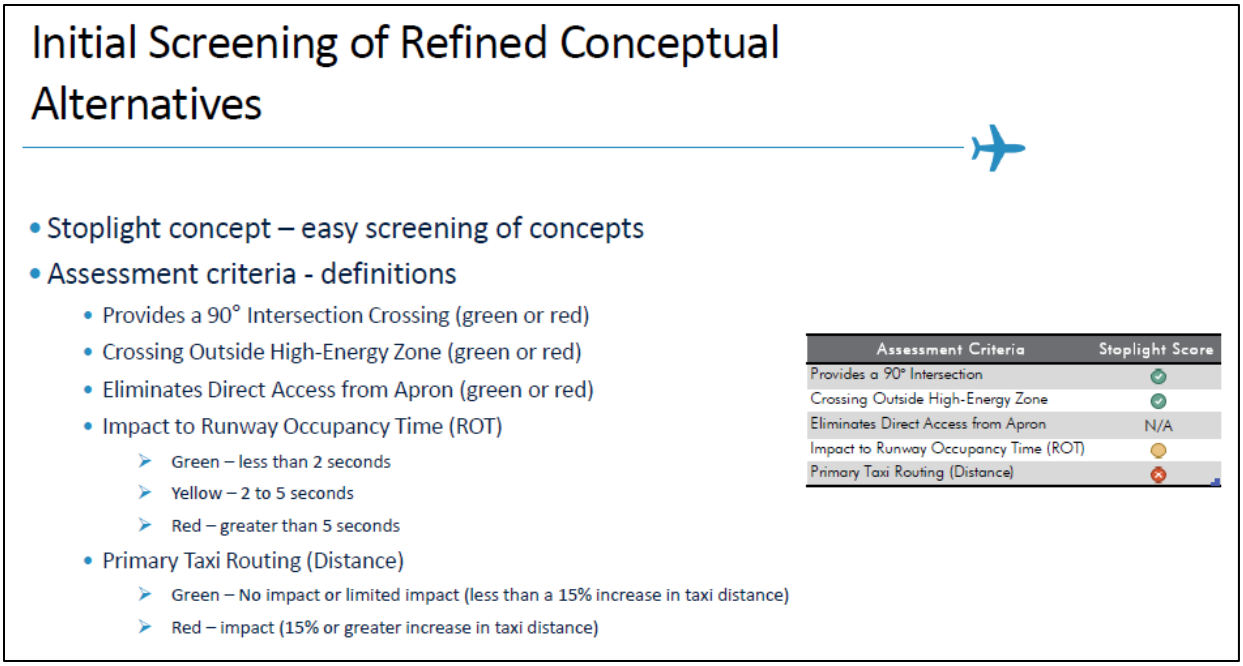


Figure 15 Initial Screening of Refined Conceptual Alternatives

To aid in understanding what issue(s) each alternative was solving, a call out was added to applicable slides. For example, the call out to the right indicates the taxiway's key issues were a non-90° intersection, direct access, and high-energy crossing point.

5.1 North Airfield Alternatives

5.1.1 Taxiway F Extension

For the North Airfield, the first area of concern was Taxiway F. A single solution was identified, which is an extension to Taxiway F to assist with operational flows and reduce runway crossings when Boeing, cargo, and GA aircraft need to depart Runway 30R from the full length. This alternative is depicted on **Figure 16** and was carried forward in the planning process.

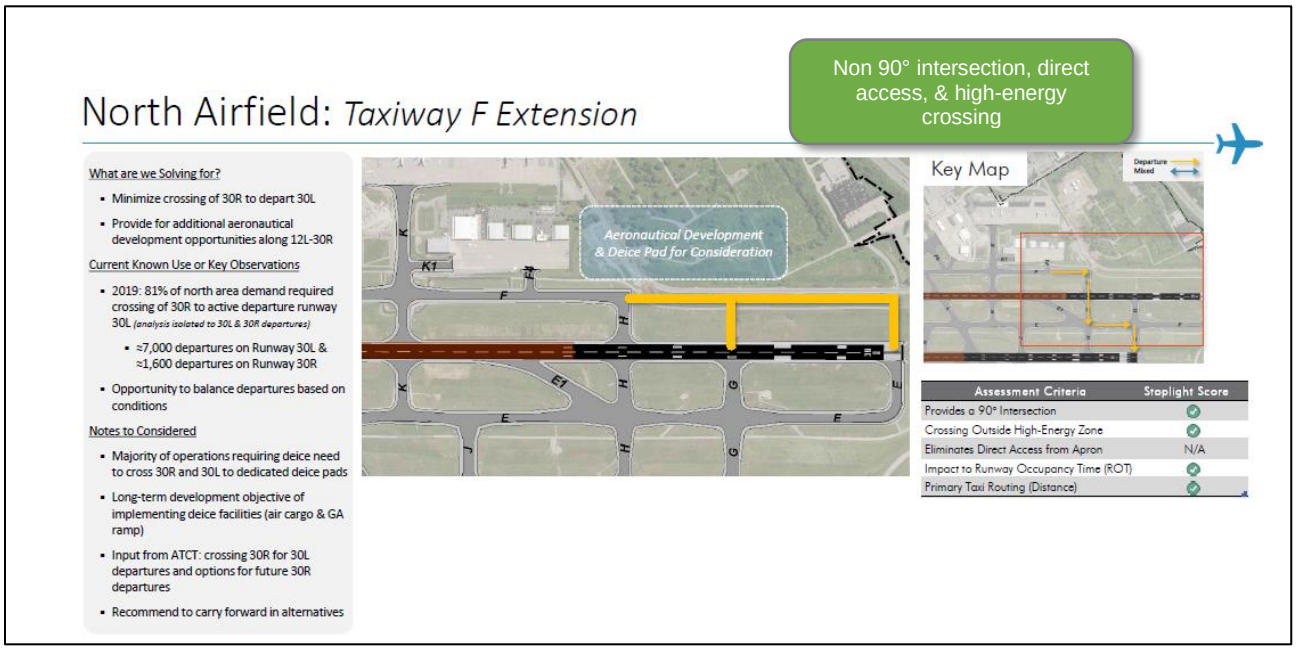


Figure 16 Taxiway F Extension

5.1.2 Hotspot #1

The next area of concern was Hotspot #1, at the intersection of Runway 6-24, Taxiway F and Taxiway S. Hotspot #1 is depicted on **Figure 17**.

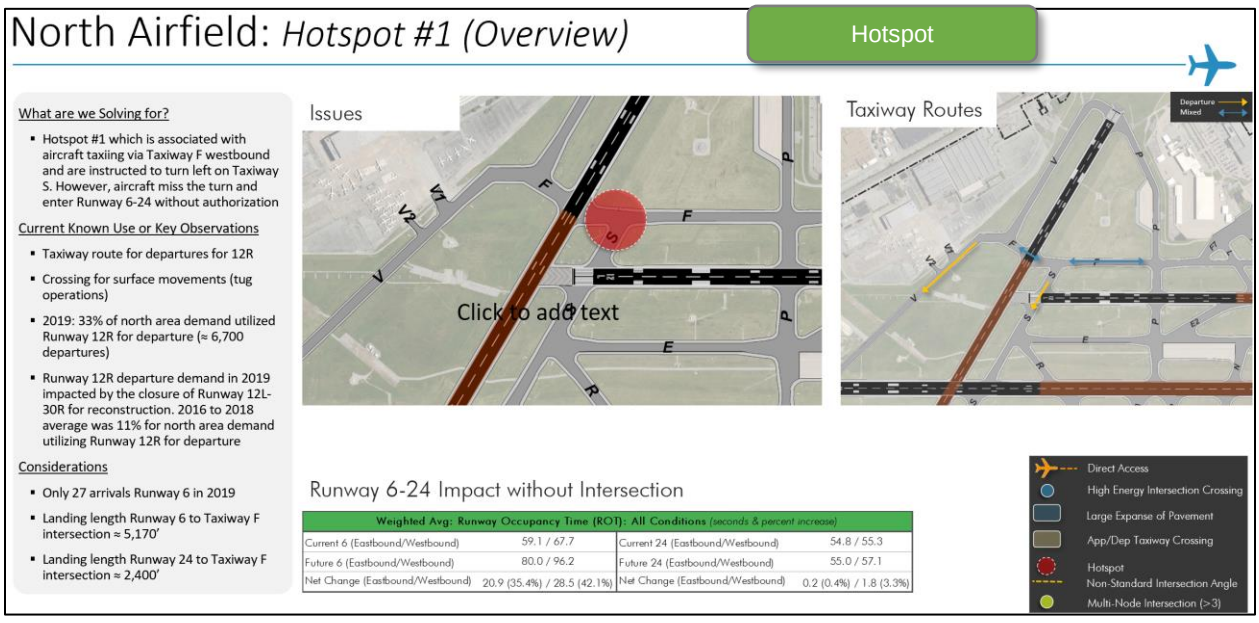


Figure 17 Hotspot #1 Overview

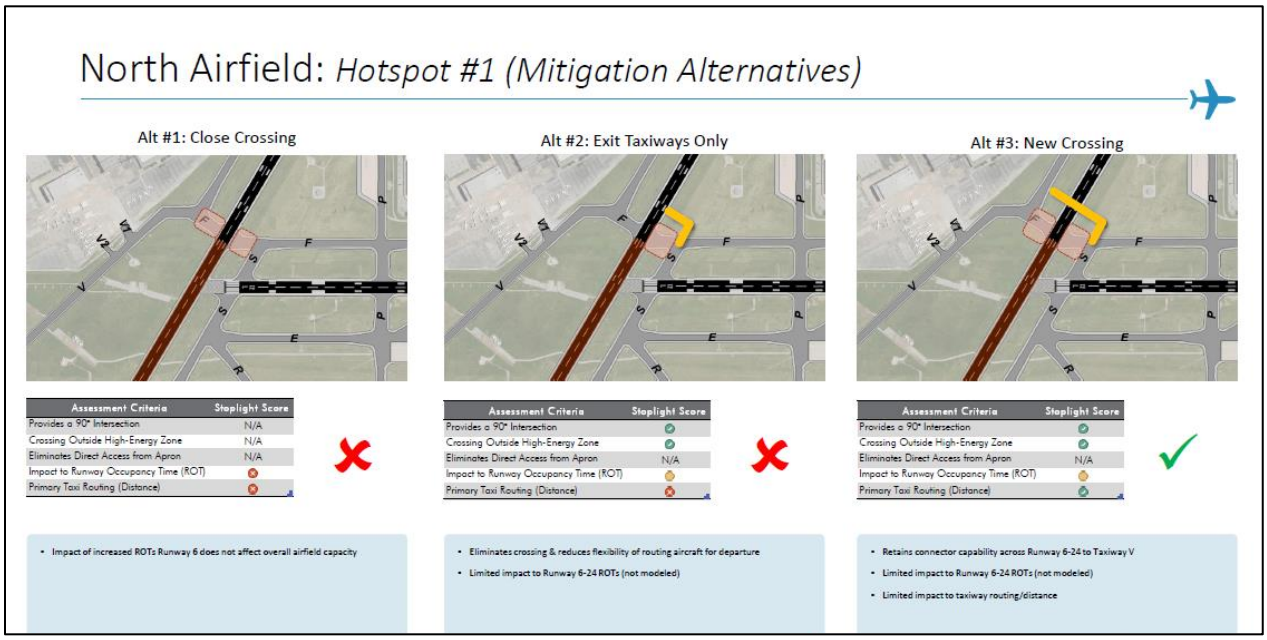


Figure 18 Hotspot #1 Alternatives

Three alternatives were considered for Hotspot #1:

- Alternative 1 proposes to close the crossing altogether,
- Alternative 2 (the initial recommended alternative) proposes to remove the existing east intersection between Runway 24 and Taxiway F, extend Taxiway S, and create a new east runway exit to Taxiway S.
- Alternative 3 reflects closure of the intersection between Taxiway F and Runway 24 and creates a new crossing. Post Meeting #3, the decision was made to retain the "core" Fox crossing.
    - Follow on discussion with STLAA and STL, ATCT identified the need to minimize changes to this intersection for operational reasons and to avoid implementation challenges. Therefore, Alternative 3 was developed.

5.1.3 Intersection of Taxiway S and Runway 12R-30L

Figures 19 and **20** provide an overview of the issues at the intersection of Taxiway S and Runway 12R-30L, and the two alternatives assessed:

- Alternative 1 proposes the realignment of Taxiway S as a single 90° connector from Runway 12L to Taxiway D.
- Alternative 2 proposes the realignment of Taxiway S to cross Runway 12L-30R at a 90° angle between Taxiway E and Taxiway D.

The Planning Team agreed on Alternative 2 which facilitates the accommodation of two taxiway connectors between 12R-30L & 12L-30R in proximity to the Runway 12L end. This allows additional flexibility for air traffic to manage airfield movements (specifically, additional crossing points for Runway 12R-30L & providing dual connectors to Taxiway E for departures on Runway 12L when in use).

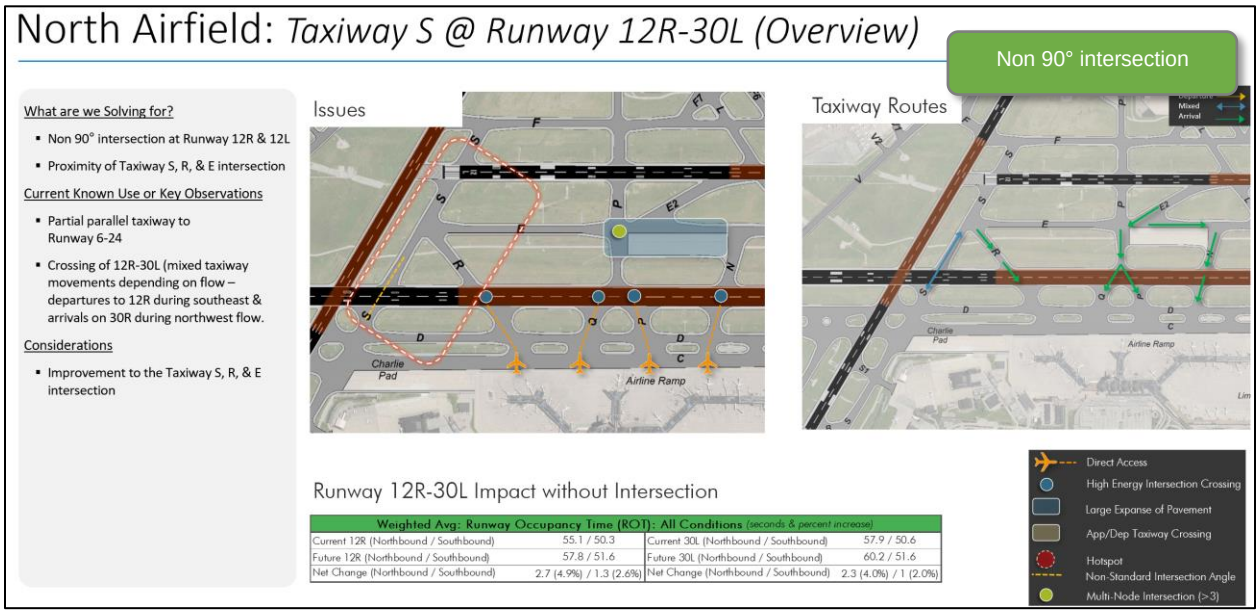


Figure 19 North Airfield: Taxiway S @ Runway 12R-30L (Overview)

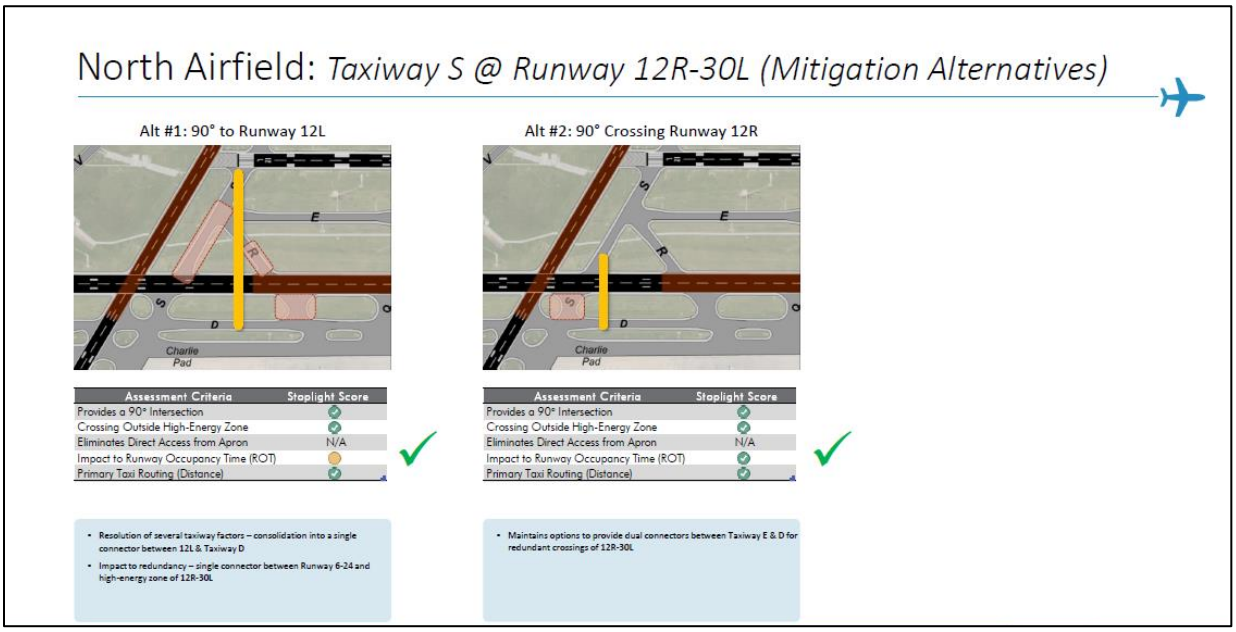


Figure 20 North Airfield: Taxiway S @ Runway 12R-30L Alternatives

5.1.4 Intersection of Taxiway R and Runway 12R-30L

Figures 21 and **22** provide an overview of the issues at the intersection of Taxiway R and Runway 12R-30L, and the three alternatives assessed:

- Alternative 1 proposes to close the runway crossing
- Alternative 2 proposes the realignment of Taxiway R as a 90° connector between Taxiway D and Taxiway E (outside the high-energy zone)
- Alternative 3 is similar to Alternative 2, but slightly to the east (inside the high-energy zone)

The Planning Team agreed on Alternative 2, to keep the proposed Taxiway R outside the high-energy zone.

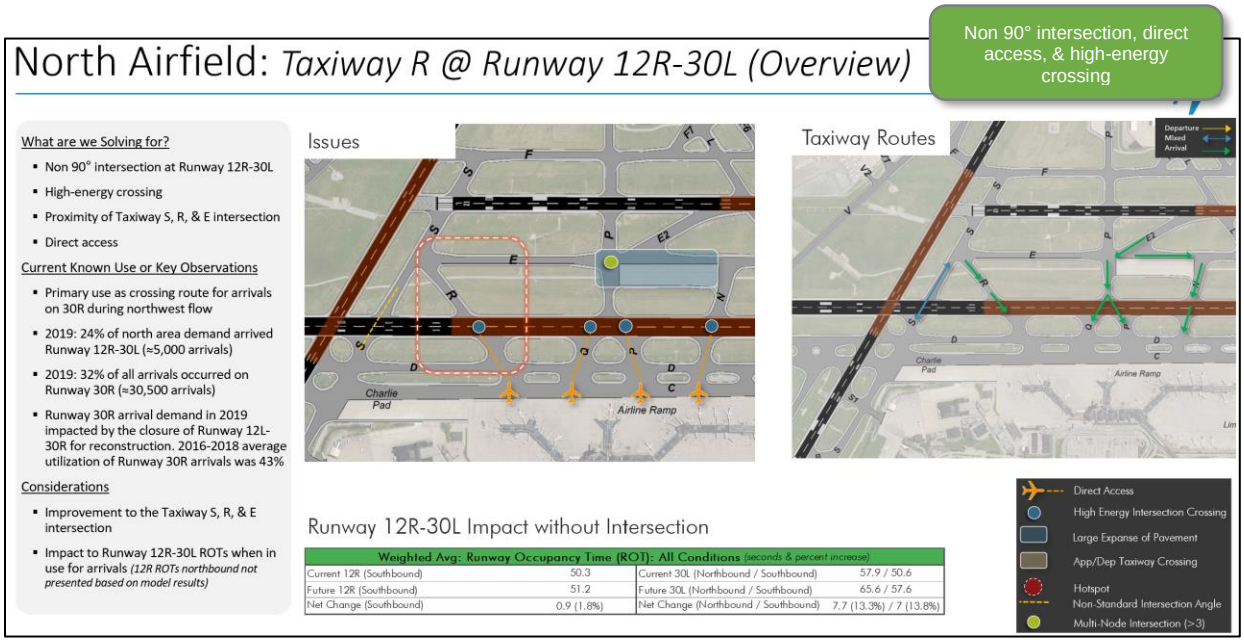


Figure 21 North Airfield: Taxiway R @ Runway 12R-30L (Overview)

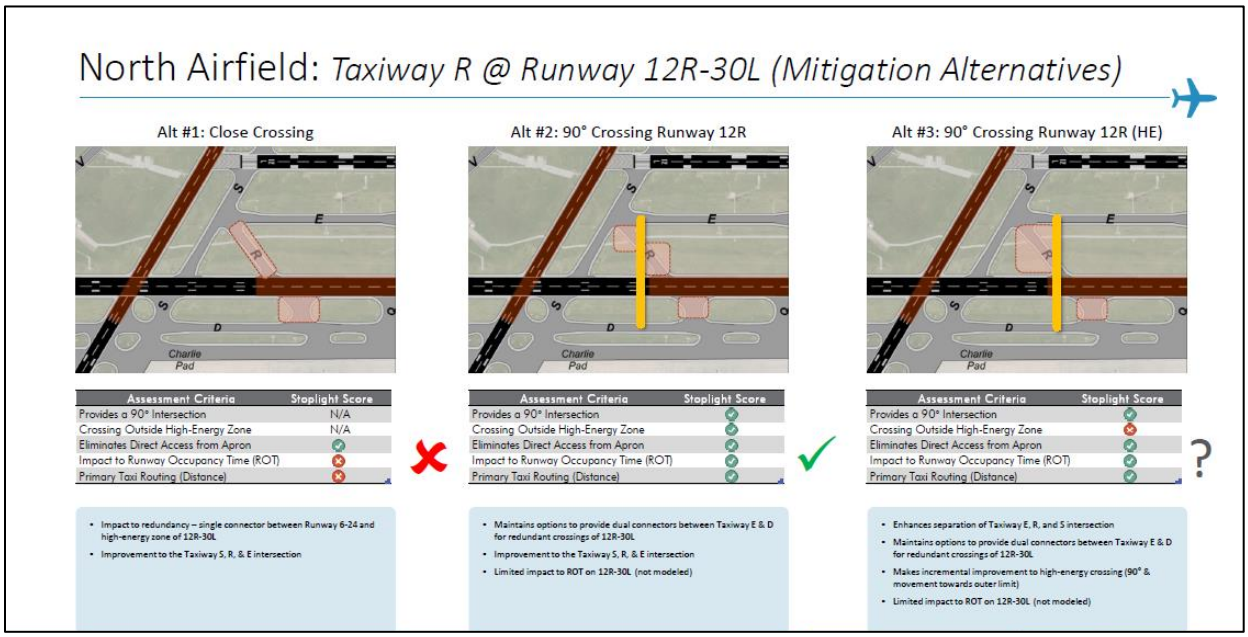


Figure 22 North Airfield: Taxiway R @ Runway 12R-30L Alternatives

5.1.5 Intersection of Taxiways P/Q and Runway 12R-30L

Figures 23 and **24** provide an overview of the issues at the intersection of Taxiways Q/P and Runway 12R-30L, and the three alternatives assessed:

- Alternative 1 proposes to close the runway crossings
- Alternative 2 proposes to extend Taxiway P south to Taxiway D, and close Taxiways P and Q between Taxiway D and Runway 12R-30L (the crossing would be inside the high-energy zone)
- Alternative 3 is similar to Alternative 2, it proposes to extend Taxiway Q north to Taxiway E (the crossing would be inside the high-energy zone)

The utilization of Taxiway P to manage air traffic flows under a variety of conditions was a primary area of concern by FAA ATCT, while maintaining a crossing within the high-energy zone was an area of concern by FAA Airports and the Airport. Recognizing this taxiway location was of critical importance, the Planning Team agreed to study the location further related to operational impacts associated with eliminating this crossing location holistically within the overall airfield.

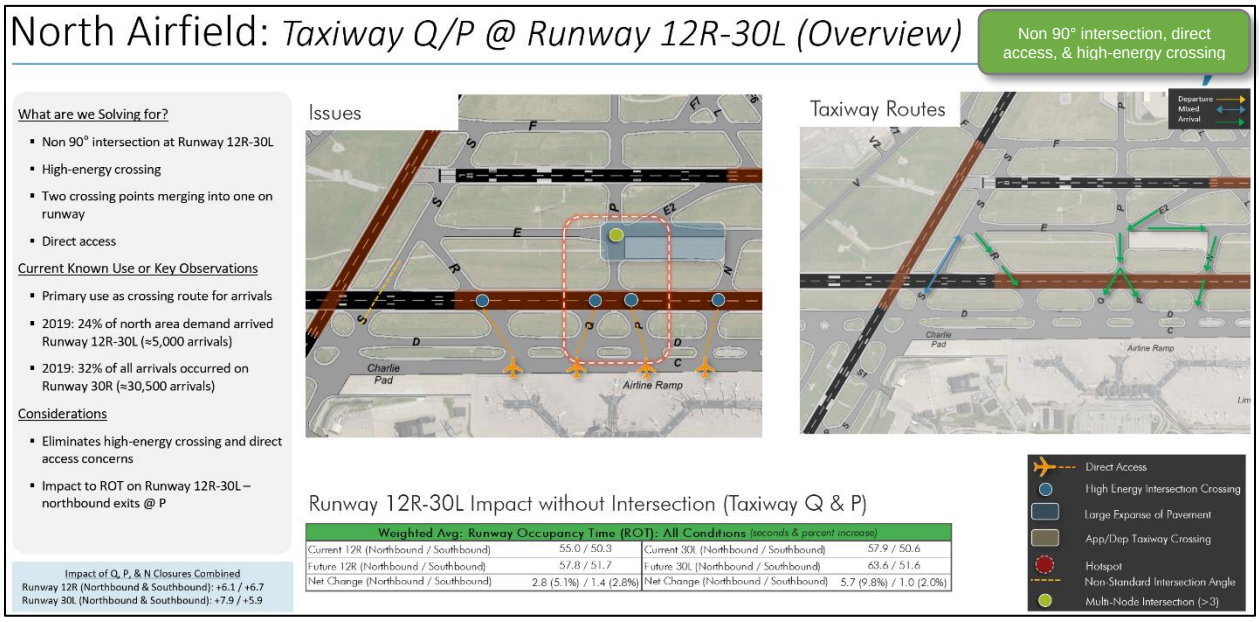


Figure 23 North Airfield: Taxiway Q/P @ Runway 12R-30L (Overview)

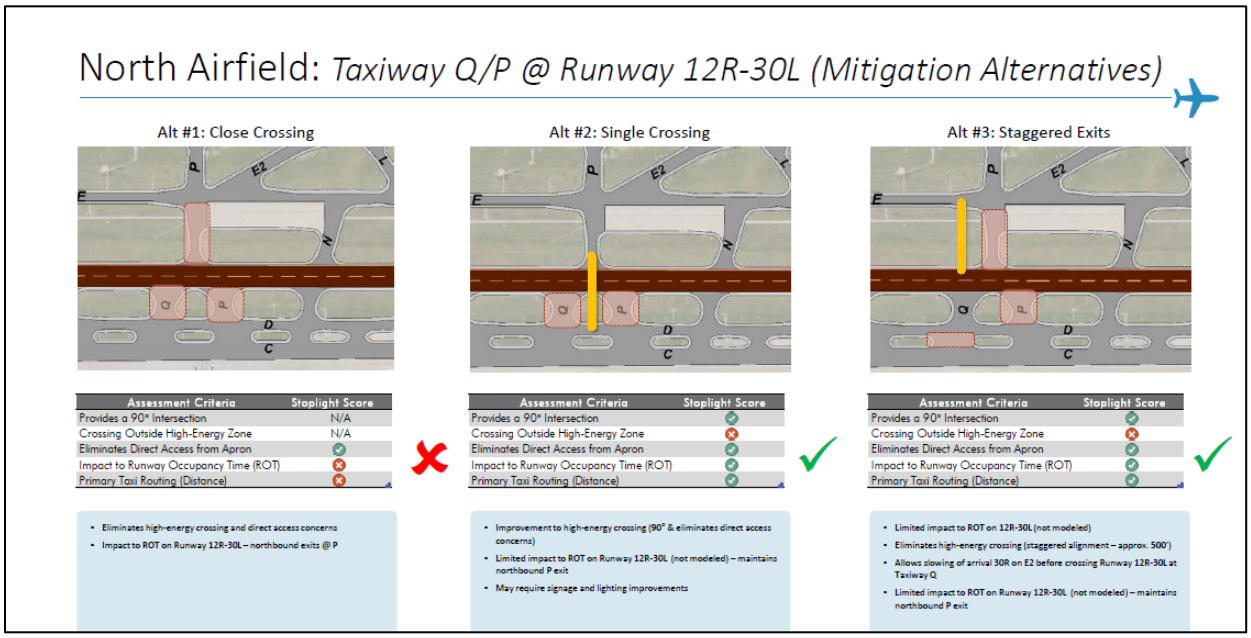
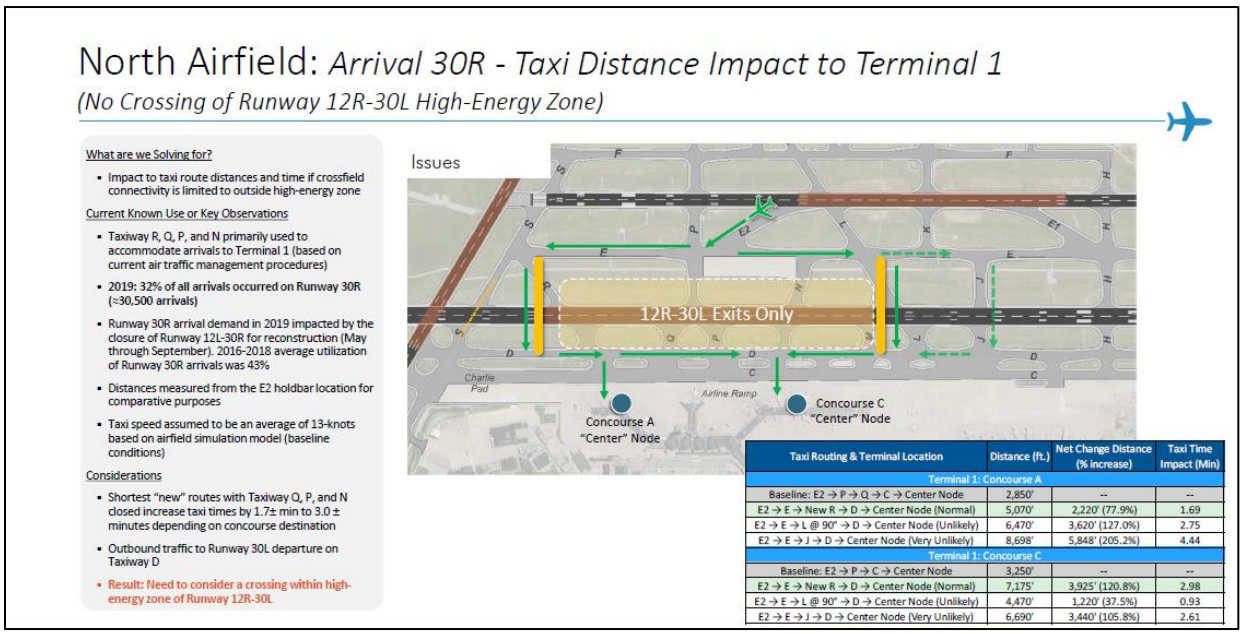


Figure 24 North Airfield: Taxiway Q/P @ Runway 12R-30L Alternatives

The Planning Team reviewed the operational impacts of the changes shown above and discussed the specifics of complete removal of all taxiway crossings/turn offs in the high-energy zone of Runway 12R-30L. Ultimately, at least one taxiway crossing would be needed within the Runway 12R-30L high-energy zone to provide operational flexibility, and to minimize operational impacts if no crossing location was available within the high-energy zone (taxi time increase associated with arrivals under the Northwest Flow configuration, which occurs primarily on Runway 30R). Under the scenario in which a crossing point was not available within the Runway 12R-30L high-energy zone, taxi times would increase between 1.7 minutes and 3.0 minutes, based on likely taxi routings (see **Figure 25**). This increase was considered substantial.



Taxi Routing & Terminal Location	Distance (ft.)	Net Change Distance (% increase)	Taxi Time Impact (Min)
Terminal 1: Concourse A			
Baseline: E2 → P → Q → C → Center Node	2,850'	--	--
E2 → E → New R → D → Center Node (Normal)	5,070'	2,220' (77.9%)	1.69
E2 → E → L @ 90° → D → Center Node (Unlikely)	6,470'	3,620' (127.0%)	2.75
E2 → E → J → D → Center Node (Very Unlikely)	8,698'	5,848' (205.2%)	4.44
Terminal 1: Concourse C			
Baseline: E2 → P → C → Center Node	3,250'	--	--
E2 → E → New R → D → Center Node (Normal)	7,175'	3,925' (120.8%)	2.98
E2 → E → L @ 90° → D → Center Node (Unlikely)	4,470'	1,220' (37.5%)	0.93
E2 → E → J → D → Center Node (Very Unlikely)	6,690'	3,440' (105.8%)	2.61

Figure 25 North Airfield: Arrival 30R - Taxi Distance Impact to Terminal 1

The Planning Team agreed that the final location for a relocated Taxiway P would be determined by additional Runway Exit Design Interactive Model (REDIM) analysis, which assesses optimal locations of runway exits based on several factors (aircraft fleet mix, runway utilization, weather conditions, etc.). The final preferred location for this crossing was determined to be on the same alignment as Taxiway Q, south of Runway 12R-30L, which is Alternative 3.

5.1.6 Intersection of Taxiway N and Runway 12R-30L

Figures 26 and **27** provide an overview of the issues at the intersection of Taxiway N and Runway 12R-30L, and the three alternatives assessed:

- Alternative 1 proposes to close the runway crossing
- Alternative 2 proposes to extend Taxiway N straight south to Taxiway D, and close the existing portion of Taxiway N between Taxiway D and Runway 12R-30L
- Alternative 3 proposes to close the portion of Taxiway N north of Runway 12R-30L

Alternatives 2 and 3 were selected to carry forward in the planning process. Subsequent dialog with FAA ATCT and the Airport indicated support in closing Taxiway N between Taxiway E & Runway 12R-30L (Alternative 3). Follow-on REDIM analysis supported the retention of Taxiway N as a southbound exit only (between Runway 12R-30L and Taxiway D).

The Planning Team selected Alternative 3.

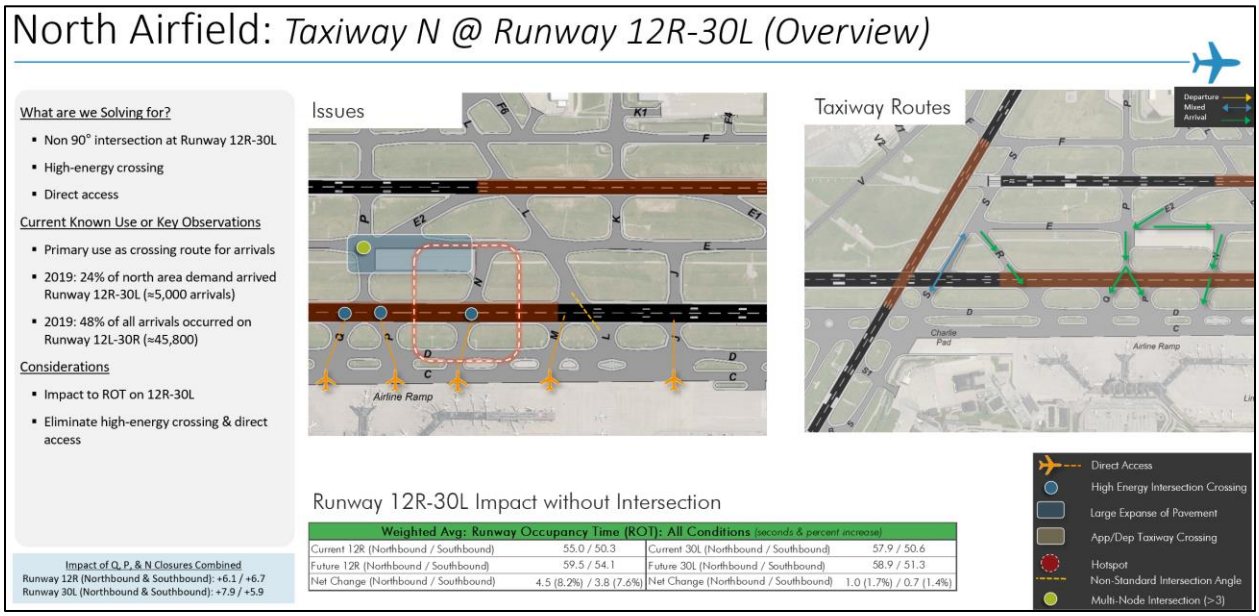


Figure 26 North Airfield: Taxiway N at Runway 12R-30L (Overview)

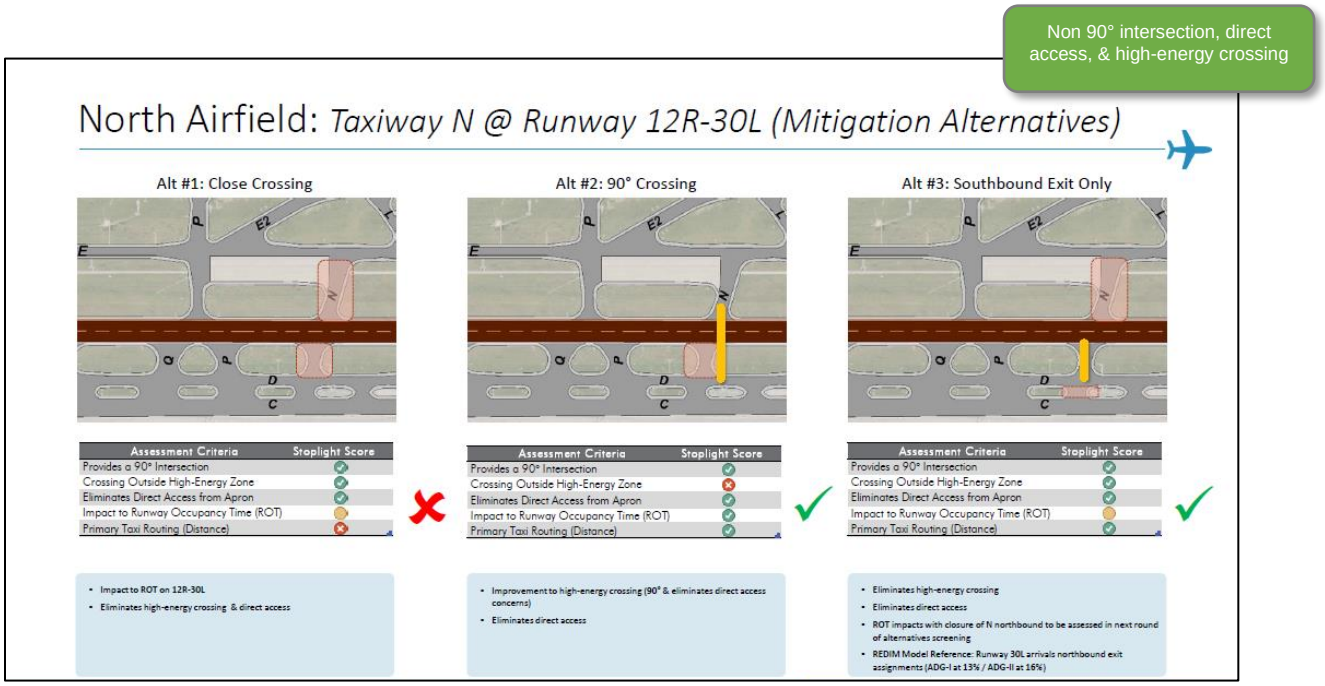


Figure 27 North Airfield: Taxiway N at Runway 12R-30L Alternative

5.1.7 Intersection of Taxiways M/L and Runway 12R-30L

Figures 28 and **29** provide an overview of the issues at the intersection of Taxiways M/L and Runway 12R-30L, and the three alternatives assessed:

- Alternative 1 proposes to close Taxiway M
- Alternative 2 proposes a single 90° crossing (close Taxiways M and L between Runway 12R-30L and Taxiway D)
- Alternative 3 proposes to close the Taxiway L crossing

While all three alternatives met criteria, significant discussion occurred regarding the need for the Taxiway L crossing at Runway 12R-30L (air traffic management & taxi times to Terminal 2). Based on the need identified by FAA ATCT and review of REDIM analysis for optimal exit locations for arrivals to Runway 12R, the planning team agreed to carry forward Alternative 2.

It is important to note that there were repeated discussions about the need to know where the future location of the Terminal Building would be (Terminal 2), and how the location of the future Terminal Building would need to be integrated with the layout and operation of the airfield, and vice versa.

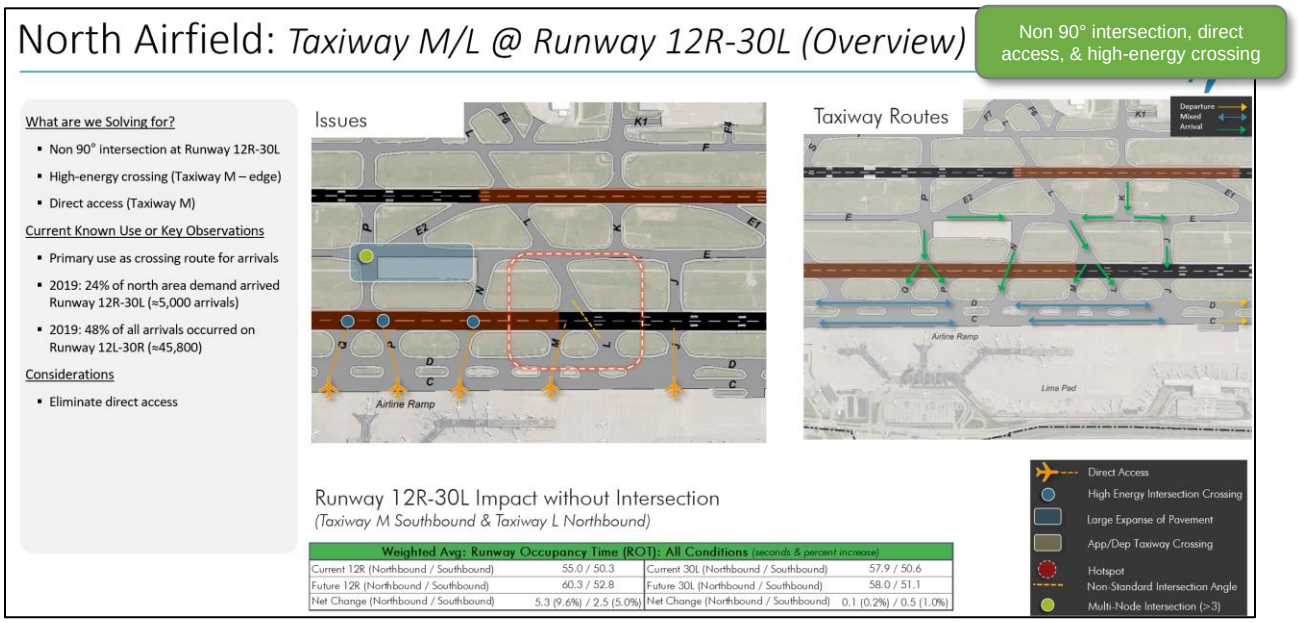


Figure 28 North Airfield: Taxiways M/L at Runway 12R-30L (Overview)

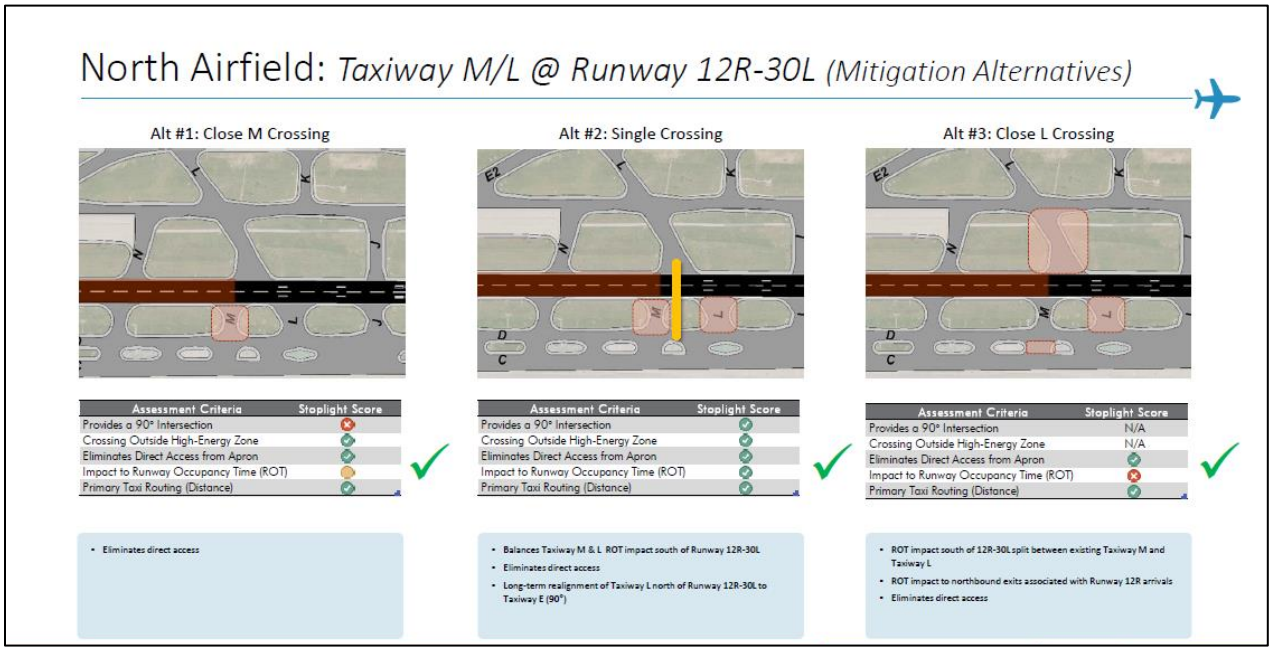


Figure 29 North Airfield: Taxiways M/L at Runway 12R-30L Alternatives

5.1.8 Intersection of Taxiway L and Runway 12L-30R

Figures 30 and **31** provide an overview of the issues at the intersection of Taxiway L and Runway 12L-30R, and the three alternatives assessed:

- Alternative 1 proposes to close Taxiway L between Taxiways E and F
- Alternative 2 proposes a single 90° connector north of Runway 12L-30R
- Alternative 3 proposes a 90° runway crossing between Taxiways E and F

The Planning Team discussed the need for Taxiway L on both sides of Runway 12L-30R, especially given that Runway 30R is the primary arrival runway under the Northwest Flow configuration. Significant conversation occurred regarding the need for a southbound runway exit prior to Taxiway E2. The Planning Team agreed that additional analysis was required to determine the preferred solution for this taxiway intersection, based on a variety of operational factors to consider.

Subsequent discussions identified a staggered taxiway connector system within the Taxiway L envelop that provides both northbound and southbound exit capabilities but eliminates the potential for a high-energy runway crossing. The preferred alternative for Taxiway L can be found in **Figure 50 - Preferred Airfield Alternative** of this document.

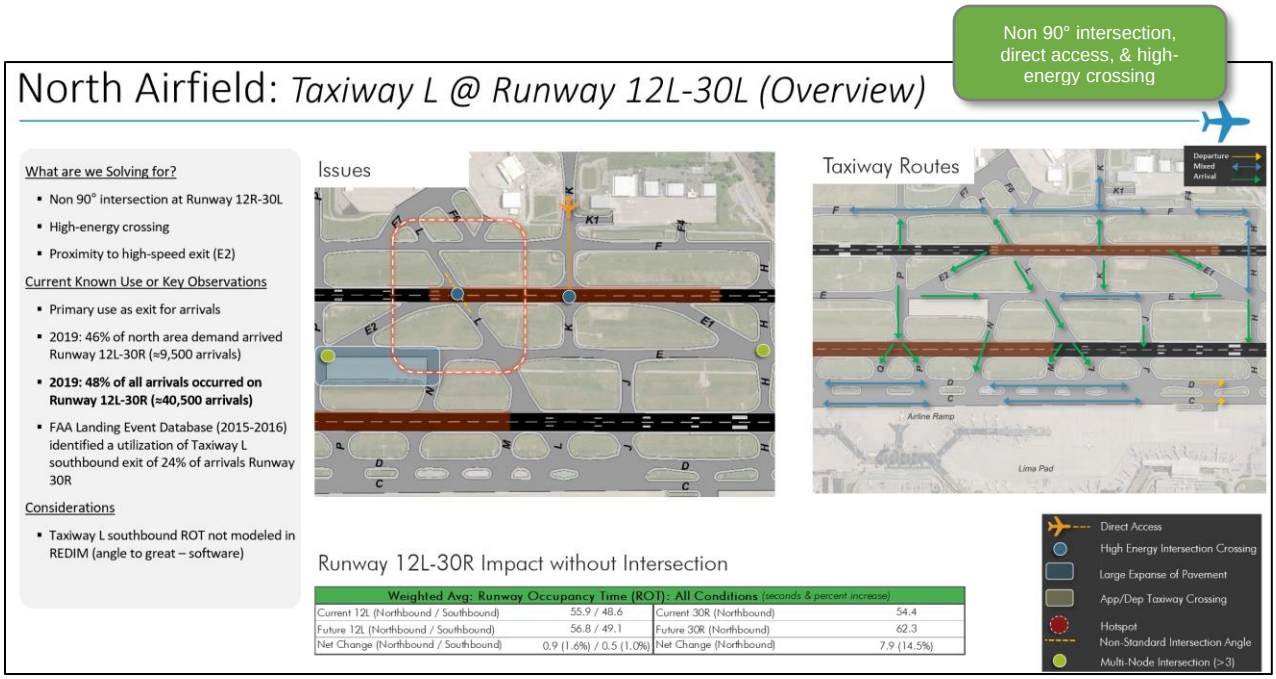


Figure 30 North Airfield: Taxiway L at Runway 12L-30R (Overview)

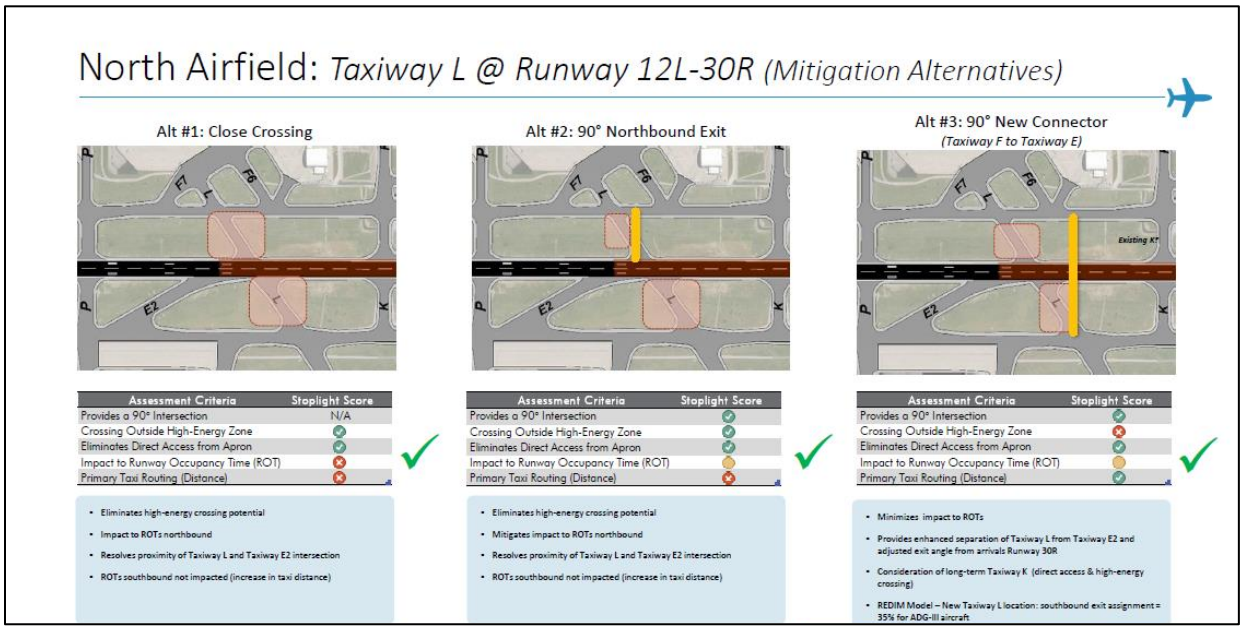


Figure 31 North Airfield: Taxiway L at Runway 12L-30L Alternatives

5.1.9 Intersection of Taxiway K and Runway 12L-30R

Figures 32 and **33** provide an overview of the issues at the intersection of Taxiway K and Runway 12L-30R, and the three alternatives assessed:

- Alternative 1 proposes to close Taxiway K between Taxiways E and F
- Alternative 2 proposes to close Taxiway K between Runway 12L-30R and Taxiway F
- Alternative 3 proposes to close Taxiway K between Runway 12L-30R and Taxiway E

The Taxiway K issues did not present an obvious solution (one that met the evaluation criteria well enough for further consideration). Ultimately, the Planning Team determined that optimizing the final location of Taxiway L and closing Taxiway K between Taxiway F and Taxiway E (Alternative 1) was the best solution. While Alternative 1 was initially identified as not feasible, discussion during Workshop #2 (Meeting #3), and subsequent conversations on the configuration of Taxiway L between Taxiway F and Taxiway E, resulted in Alternative 1 becoming the preferred alternative for this intersection. Additional information is presented in Section 7.

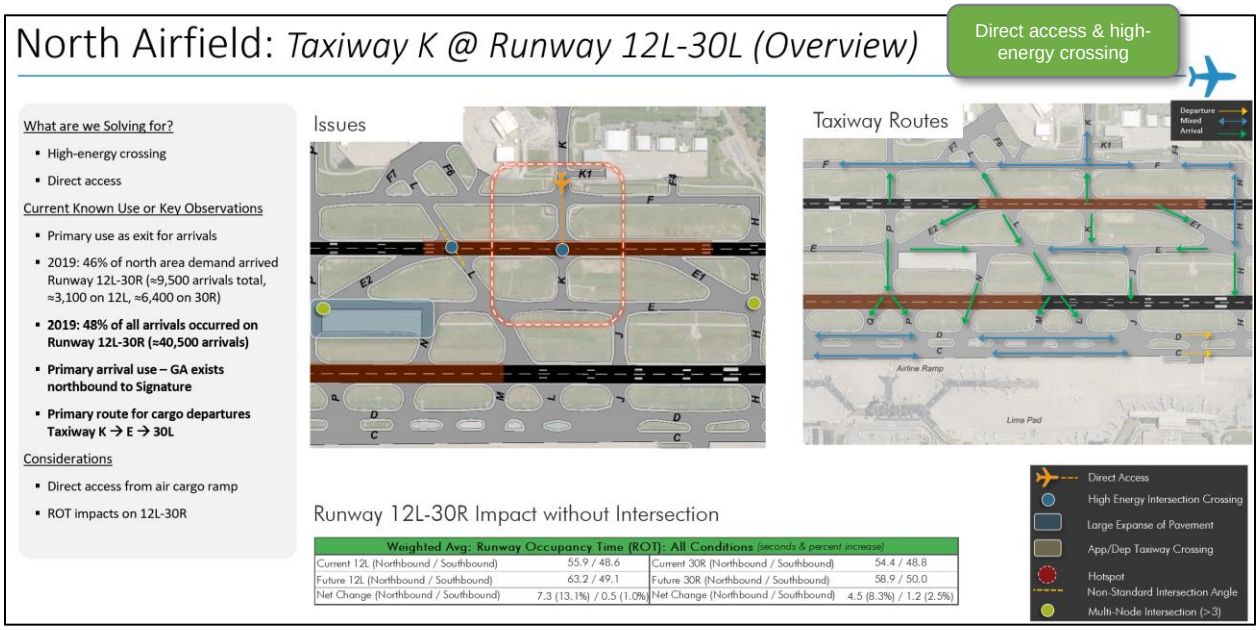


Figure 32 North Airfield: Taxiway K at Runway 12L-30R (Overview)

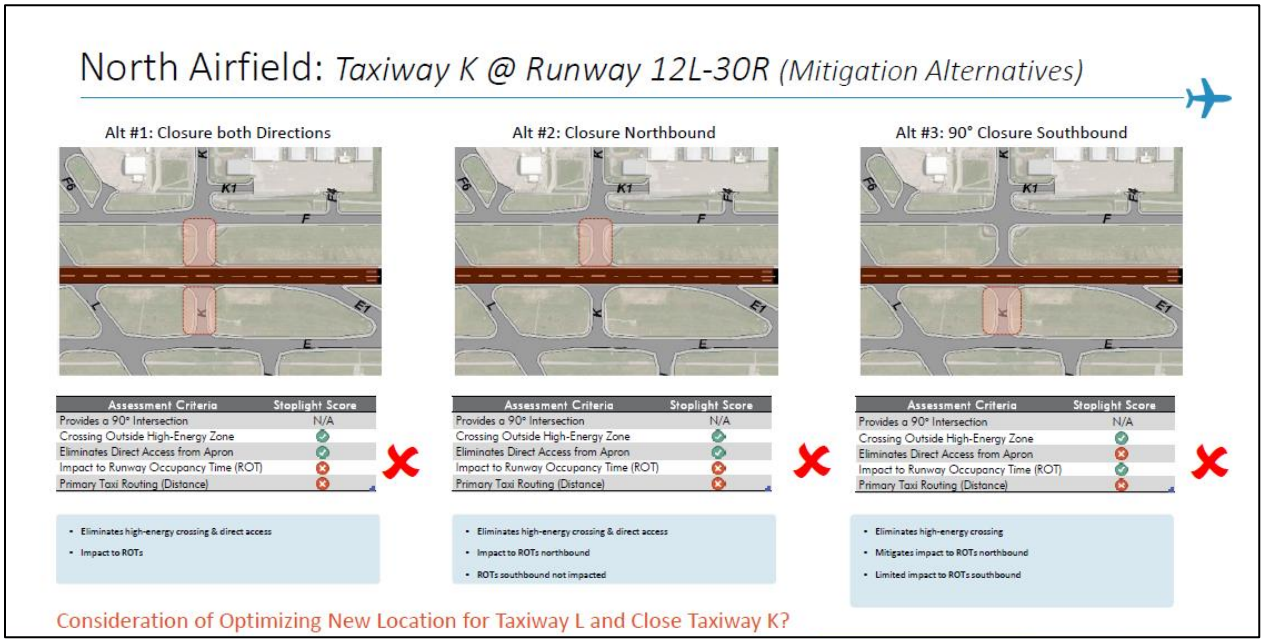


Figure 33 North Airfield: Taxiway K at Runway 12L-30L Alternatives

5.2 West Airfield Alternatives

5.2.1 Intersection of Taxiways T, U and A at Runway 29 End

Figures 34 and **35** provide an overview of the issues at the intersection of Taxiways T, U and A at the Runway 29 End, and the three alternatives assessed:

- Alternative 1 proposes to realign Taxiways T, U and A
- Alternative 2 proposes to realign Taxiways T and U
- Alternative 3 proposes to realign Taxiways T and U and extend Taxiway U

The three alternatives discussed met the evaluation criteria. The Planning Team determined that the preferred plan needed to include a new central deicing pad.

After further refinement, a hybrid of Alternatives 2 and 3 was selected.

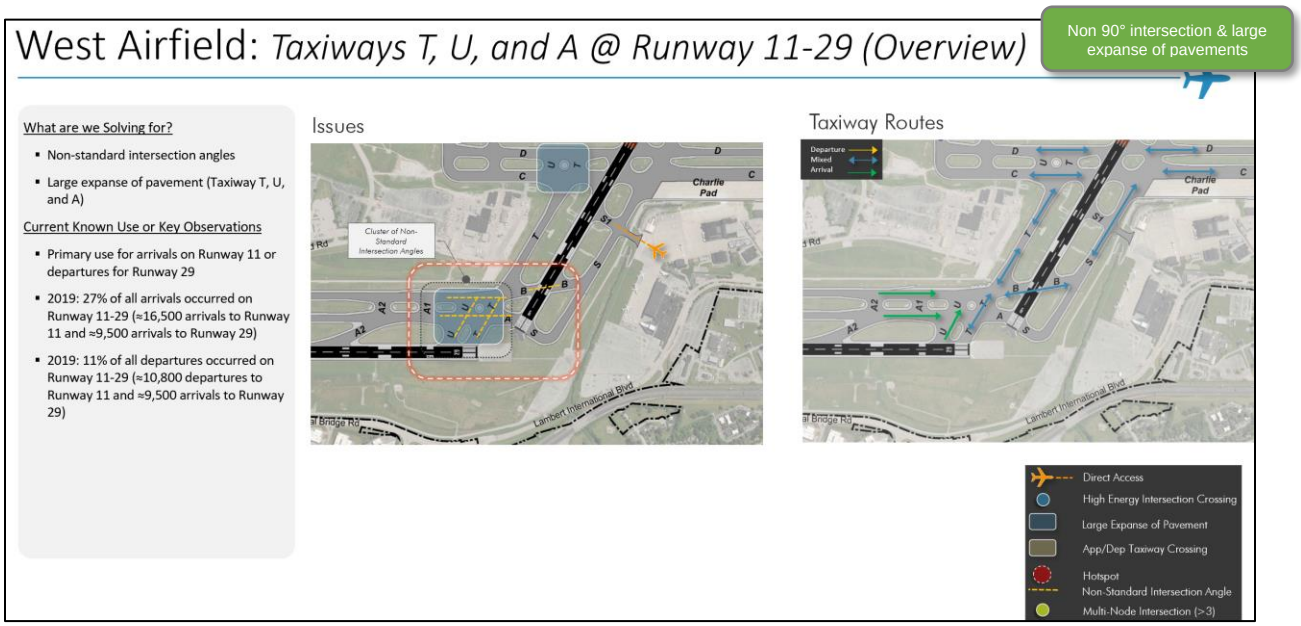


Figure 34 West Airfield: Taxiways T, U, and A at Runway 29 End (Overview)

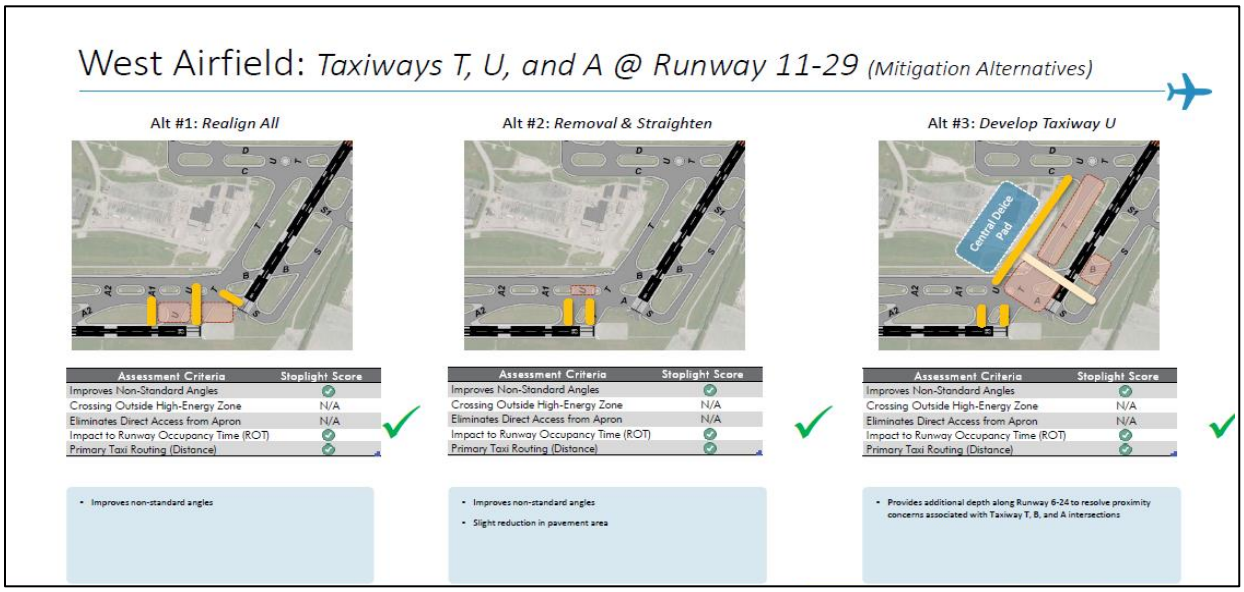


Figure 35 West Airfield: Taxiways T, U, and A at Runway 29 End Alternatives

5.2.2 Intersection of Taxiways B and S at Runway 6-24

Figures 36 and **37** provide an overview of the issues at the intersection of Taxiways B and S at Runway 6-24, and the two alternatives assessed:

- Alternative 1 proposes to realign Taxiway B as a 90-degree crossing, and shift Taxiway S1 south
- Alternative 2 proposes to relocate the Runway 6 end

The issues identified at this location include direct ramp to runway access at Taxiway S1 and Taxiway B non-perpendicular crossing of Runway 6-24. Both alternatives met the evaluation criteria; however, the Planning Team determined that shortening Runway 6 was not the desired outcome and Alternative 1 was preferred.

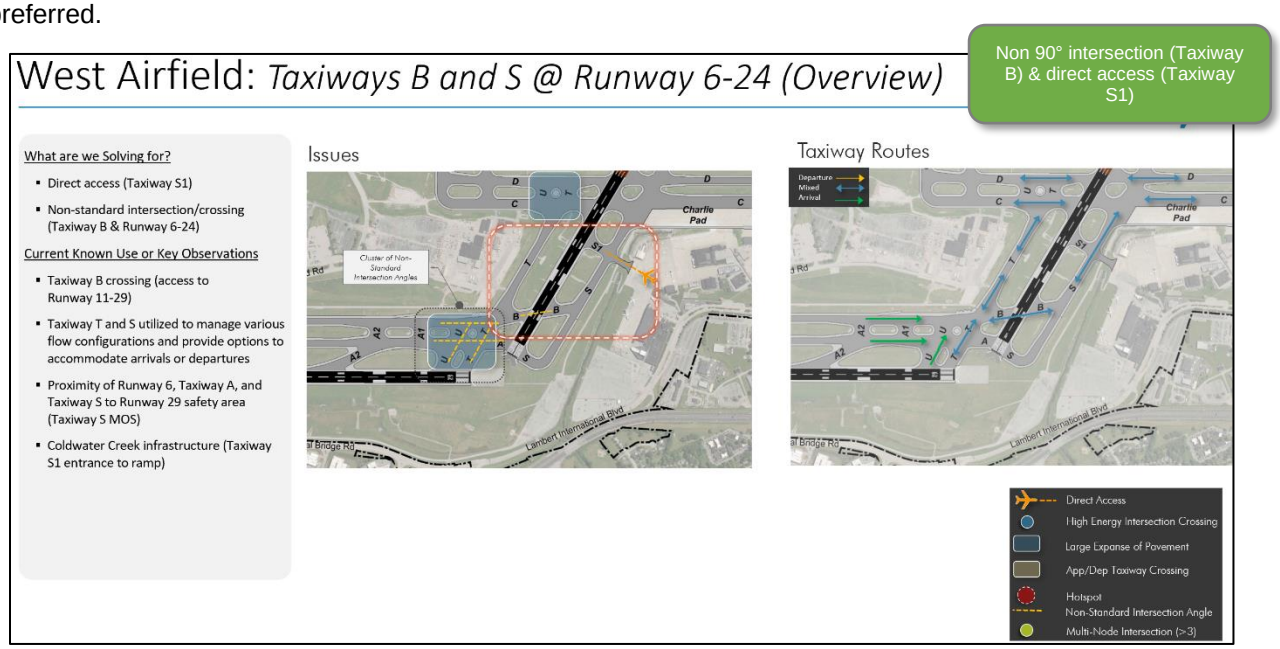


Figure 36 West Airfield: Taxiways B and S at Runway 6-24 (Overview)

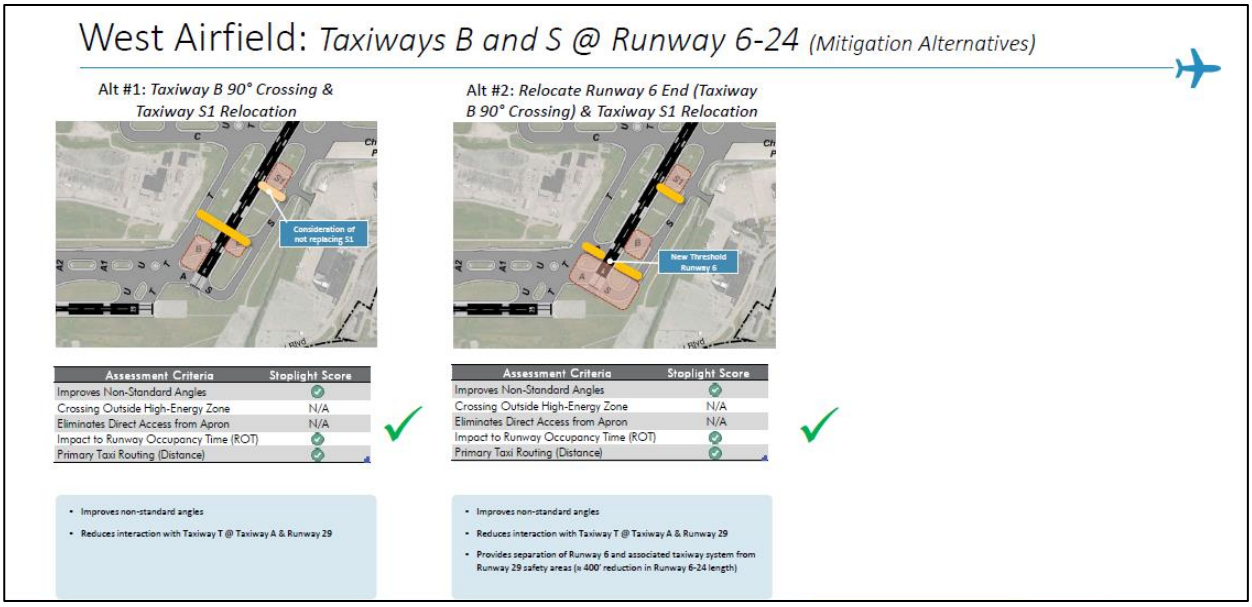


Figure 37 West Airfield: Taxiways B and S at Runway 6-24 Alternatives

5.2.3 Taxiways T and U between Taxiways C and D

Figures 38 and 39 provide an overview of the issues at Taxiways T and U between Taxiways C and D, and the two alternatives assessed:

- Alternative 1 proposes to extend Taxiway T to Taxiway D and close the Taxiways U and T connectors
- Alternative 2 proposes to close the Taxiways U and T connectors between Taxiways C and D

The issues identified at this location include large expanses of concrete and non-standard intersection angles. The Planning Team selected Alternative 1 as the preferred alternative.

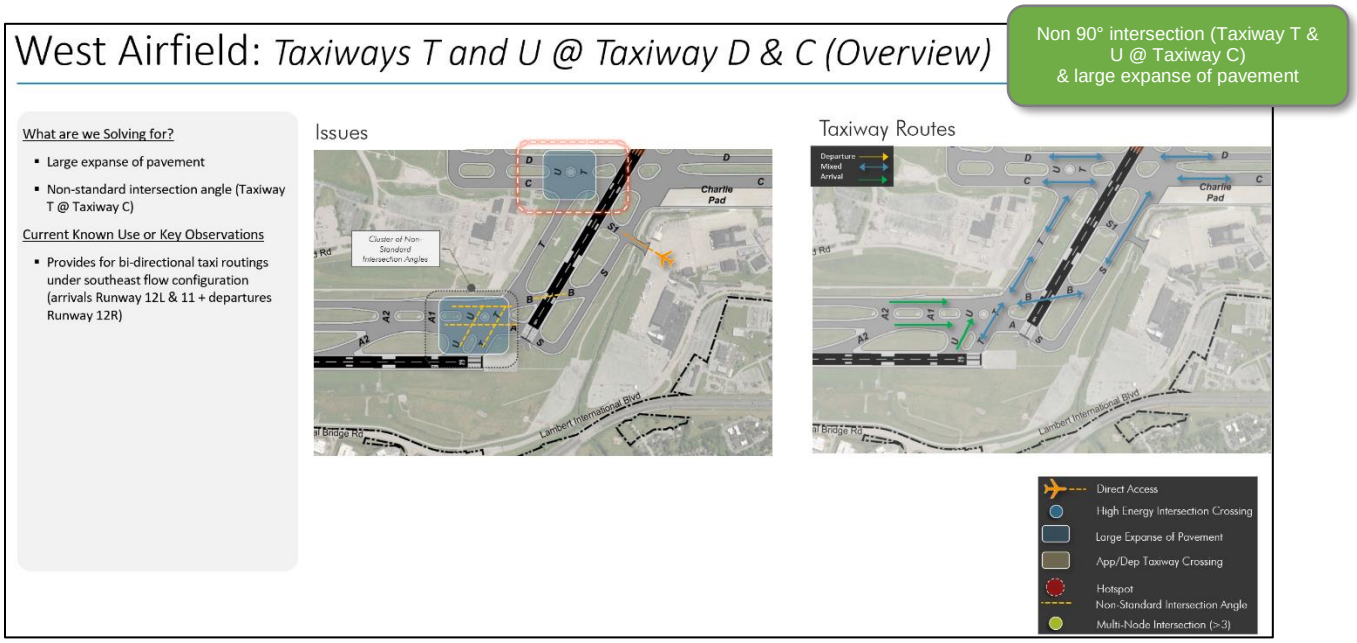


Figure 38 West Airfield: Taxiways T and U between Taxiways D & C (Overview)

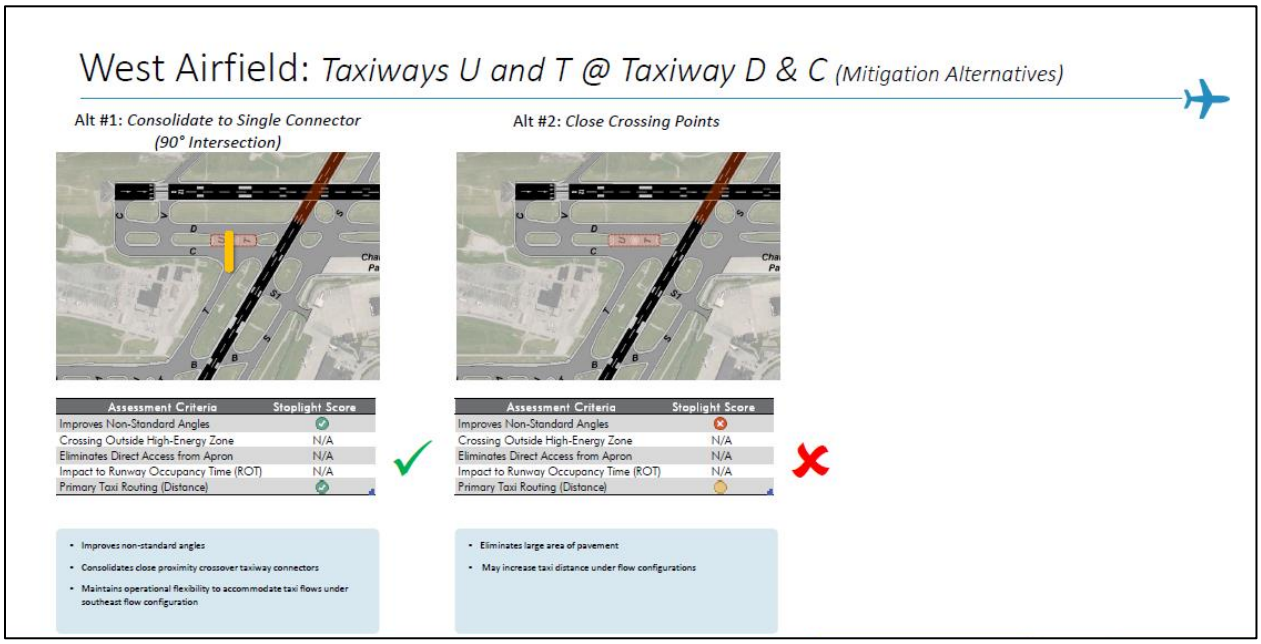


Figure 39 West Airfield: Taxiways T and U between Taxiways D & C Alternatives

This concluded the evaluation of alternatives to the challenges outlined for individual airfield areas at STL.

5.2.4 Consolidated Alternatives

The preferred alternatives selected during Workshop #2 (Meeting #3) were consolidated into six consolidated airfield alternatives, depicted in **Figure 40**.

Each member of the Planning Team scored each consolidated alternative. Final scores are noted on Figure 40. The top two consolidated airfield alternatives were retained for evaluation as part of the Comparative Safety Assessment (CSA), for a final preferred alternative determination.

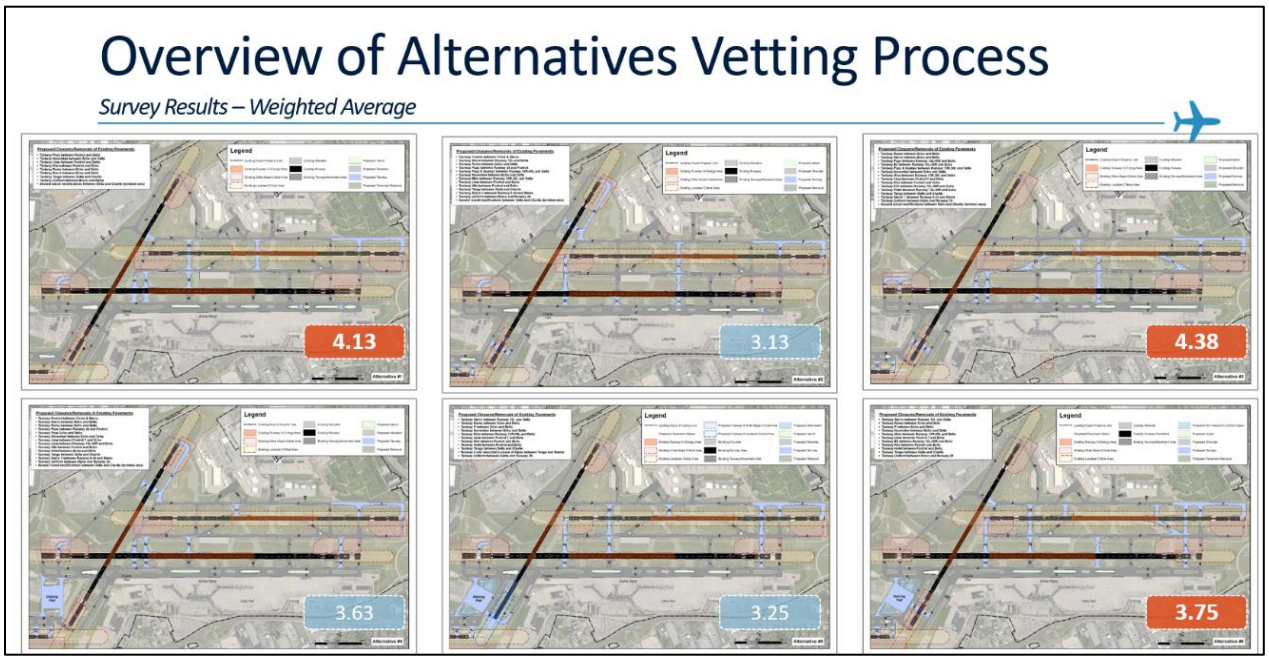


Figure 40 Consolidated Airfield Alternatives and Scoring

Section 6 The CSA Workshop

As described in the introduction, the CSA process is not approached as a strict Safety Risk Management Panel (SRMP) five-step effort. The CSA (as executed) is normally used for comparing multiple alternatives before they are finalized on the ALP; further, a CSA is also utilized when looking at major airfield construction that has multiple alternatives, to assess construction phasing. An SRMP is different from a CSA in that it quantifies risk and potential frequency of these risks. A CSA is meant to identify hazards associated with each alternative being evaluated and build consensus around the least impactful or preferred alternative. The CSA was held on April 21, 2021 (Meeting #4).

6.1 Final Two Alternatives

Section 6 presented issues and alternatives, as well as the preferred alternative for each airfield area being assessed. The two alternatives that obtained the highest score (4.38 and 4.13, as shown on Figure 40) are the final alternatives. These two final alternatives are depicted on **Figure 41**.

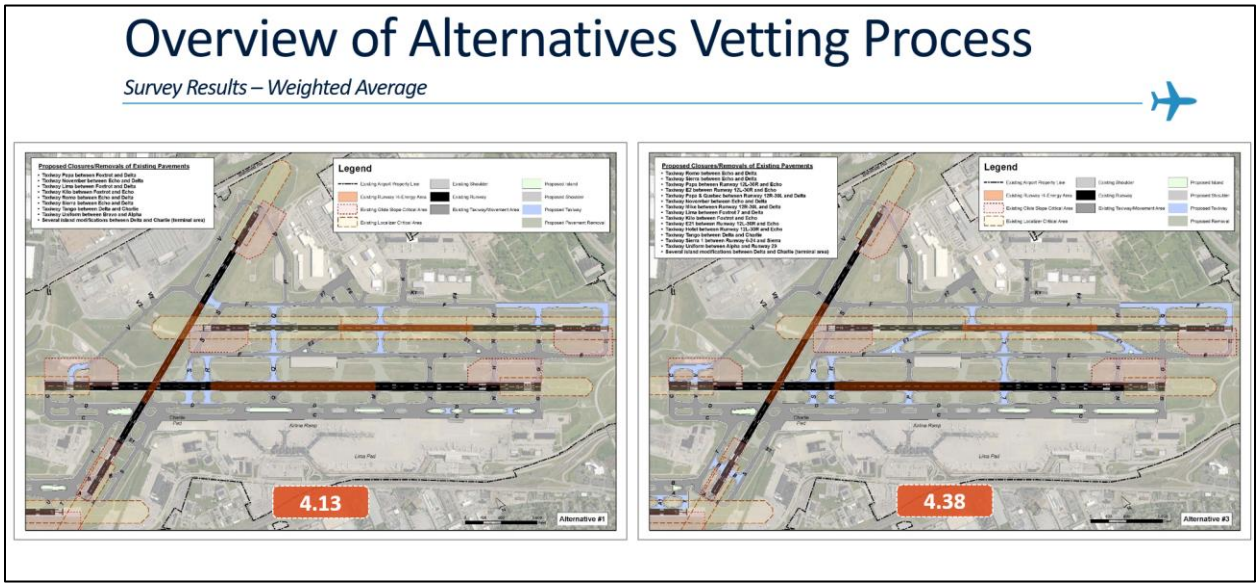


Figure 41 Final Airfield Alternatives Carried into CSA

Refer to **Appendix B** for the Planning Team's complete scoring results for each alternative. Scoring was conducted individually following the Refinement Workshop (Meeting #3).

6.1.1 Outstanding Decisions

There were also two outstanding decisions at the outcome of the evaluation of alternatives that required further discussions with stakeholders and collaboration in order to select a preferred alternative. **Figure 42** depicts the areas in question:

- Crossing point on Runway 12R-30L in the approximate location of existing Taxiway P or Q. Area of focus was associated with taxi times when landing on Runway 30R and taxi routes to the terminal core with and without a Taxiway P/Q crossing point (high-energy runway crossing).
- Highspeed exit location associated with landing on Runway 12L (existing Taxiway E1) and best location to consider in final preferred airfield configuration.

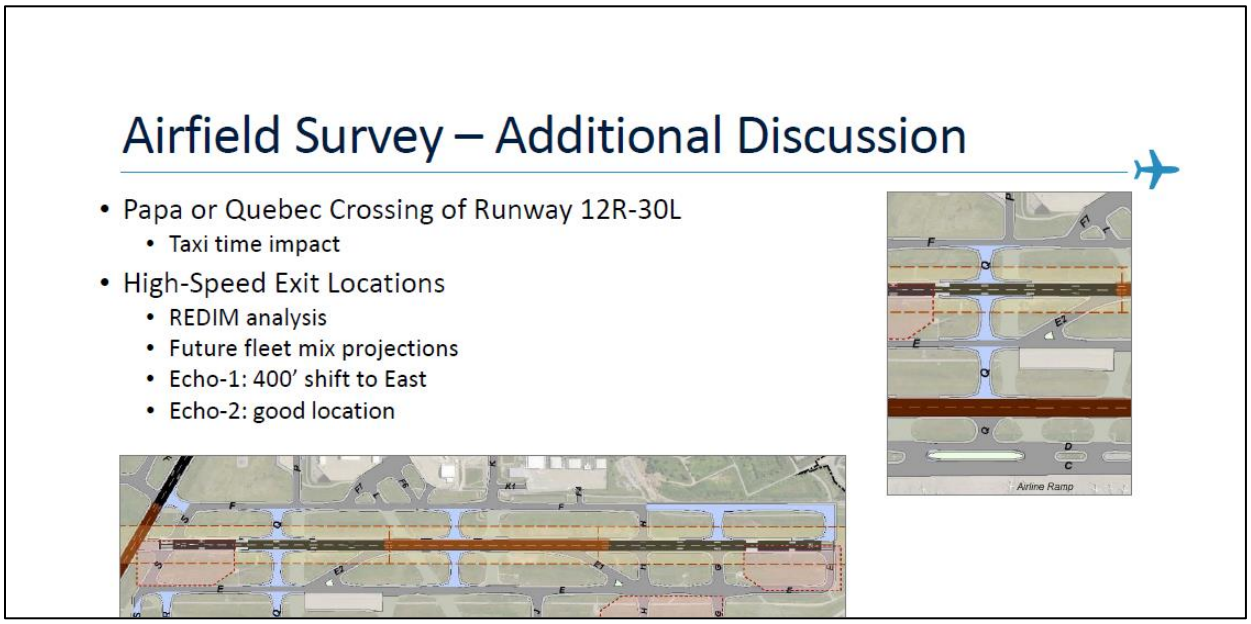


Figure 42 Airfield Survey - Additional Discussion

As identified in Section 5, the Planning Team determined that addressing the operational issues associated with the location of a Runway 12R-30L crossing (Taxiways P or Q location) needed to be carried forward for further discussion and decision-making (final preferred solution) . Alternative 3 (extension of Taxiway Q between Runway 12R-30L and closure of Taxiway P between Taxiways D and E) was selected at the outcome of additional analysis and discussion. Alternative 3 presented an acceptable Runway 12R-30L crossing within the high-energy zone. It should be noted that the consolidated airfield alternatives carried forward into the CSA included a significant improvement to the existing configuration of Taxiways Q & P (eliminates a dual taxiway crossing and eliminates direct access from the airline/commercial apron). This emphasizes the collaborative solution development and decision-making process the Planning Team engaged in to finalize an airfield solution that balanced various priorities/objectives.

As part of the Refinement Workshop (Meeting #3), the Planning Team held additional discussions regarding the location of high-speed exits associated with Runway 12L-30R. Results of additional REDIM analysis on the location of Taxiways E1 and E2 were discussed, and future aircraft fleet mix projections were cross-checked. Based on the refined analysis, the recommendation was made to relocate Taxiway E1, in order to maintain Runway Occupancy Times (ROTs) within an acceptable range (less than 50 seconds) and resolve the existing multi-node intersection at Taxiways E, E1 and H, as depicted on **Figure 43**.

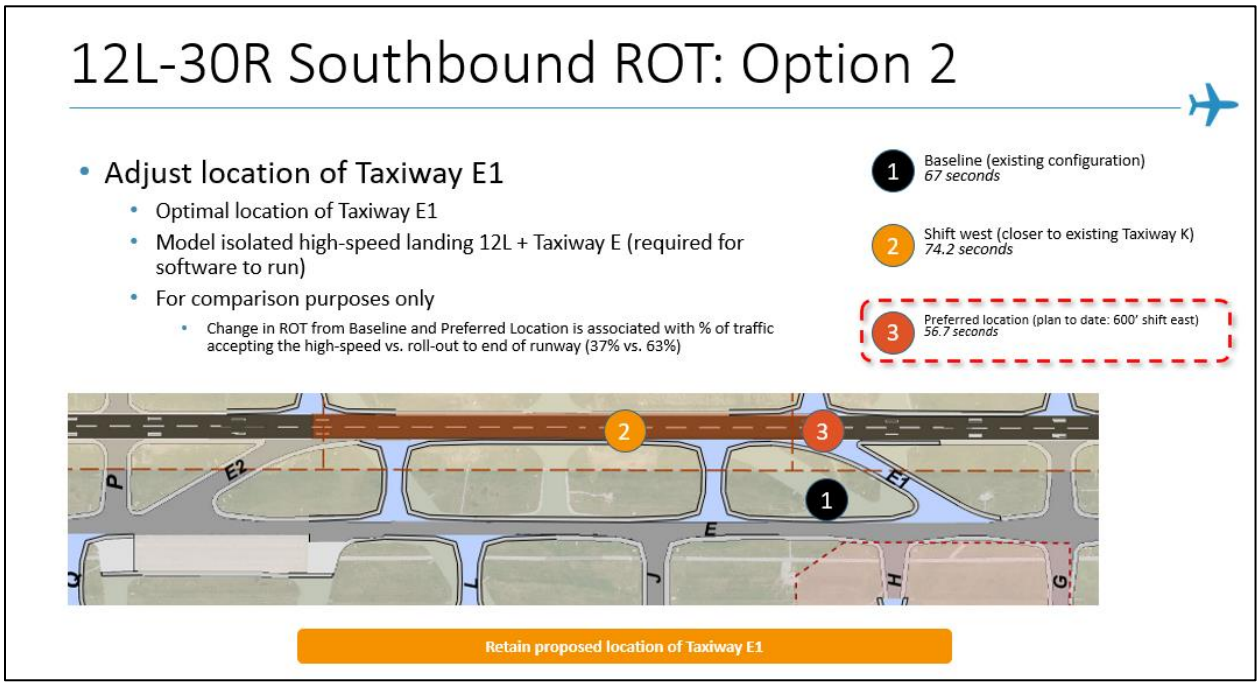


Figure 43 Runway 12L Highspeed Exit Location Analysis (E1)

6.1.2 Analysis by Quadrant

To facilitate a systemic dialog during the CSA engagement, the airfield was divided into four quadrants, to allow for detailed discussions focused on each quadrant. The proposed quadrants for the two preferred airfield alternatives are depicted in **Figures 44** and **45.**

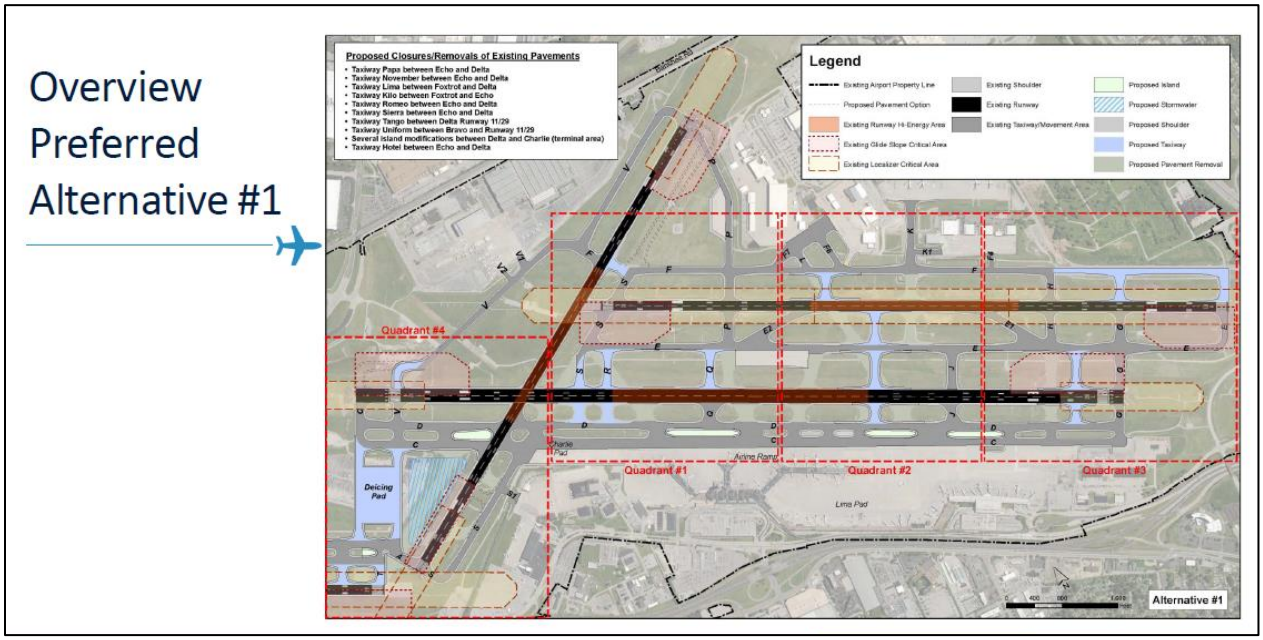


Figure 44 Preferred Alternative #1

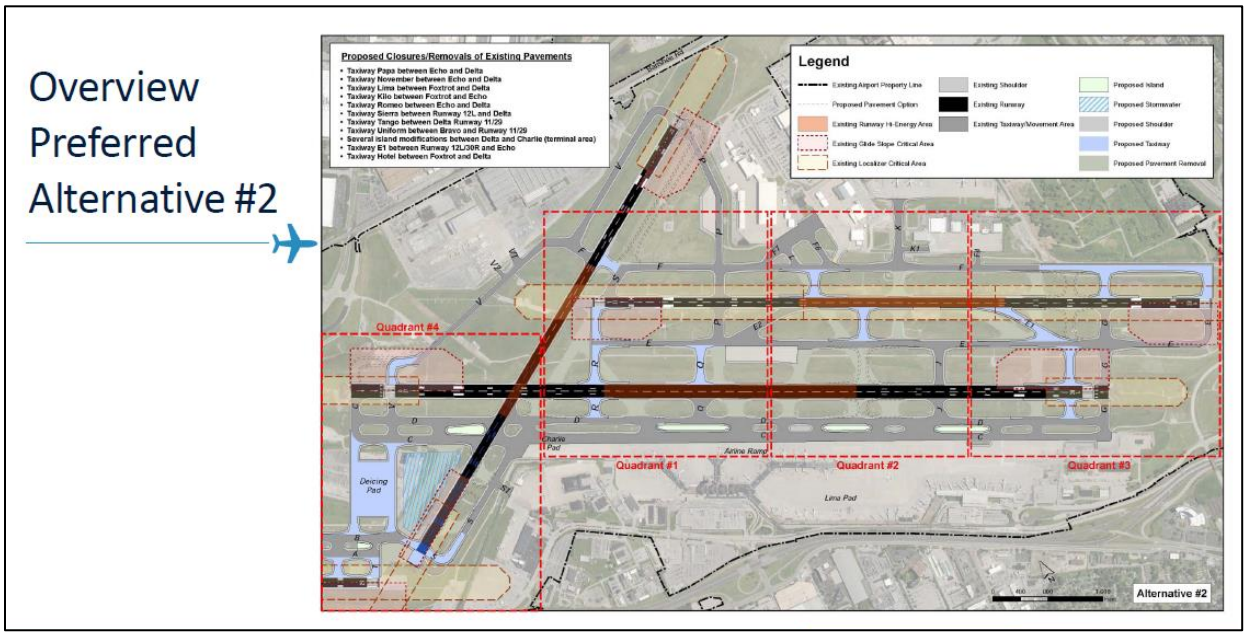


Figure 45 Preferred Alternative #2

Each quadrant was discussed and evaluated separately. A clear decision was made for only one quadrant; the other three quadrants required consolidation of both alternatives to address the issues, as seen by the CSA meeting participants. The decisions taken for each quadrant are summarized below. Bolded statements indicate the alternative that was chosen and if there are any specific caveats or additional study needs.

- Quadrant #1 (**Figure 46**):
  - Square up Taxiway F crossing at Runway 6-24.
  - It was confirmed that there is 500' centerline-to-centerline separation for Taxiways S and R (Alternative #1).
  - Taxiway Q crossing in the high-energy zone of Runway 12R-30L is a Hazard, but acceptable and subordinate to achieving operational efficiency when landing on Runway 30R (Note: both alternatives have the same condition at Taxiway Q).
  - Redundant taxiway crossings are more desirable. Two crossings at Taxiways S and R are preferred over just one crossing at Taxiway R. By having redundant taxiway crossings and access to Runway 12L, multiple crossings can occur simultaneously when departing Runway 12L, or additional crossing points for aircraft taxiing to the terminal core after arrival on Runway 12L-30R, for example.
  - **Alternative 1 was selected.**

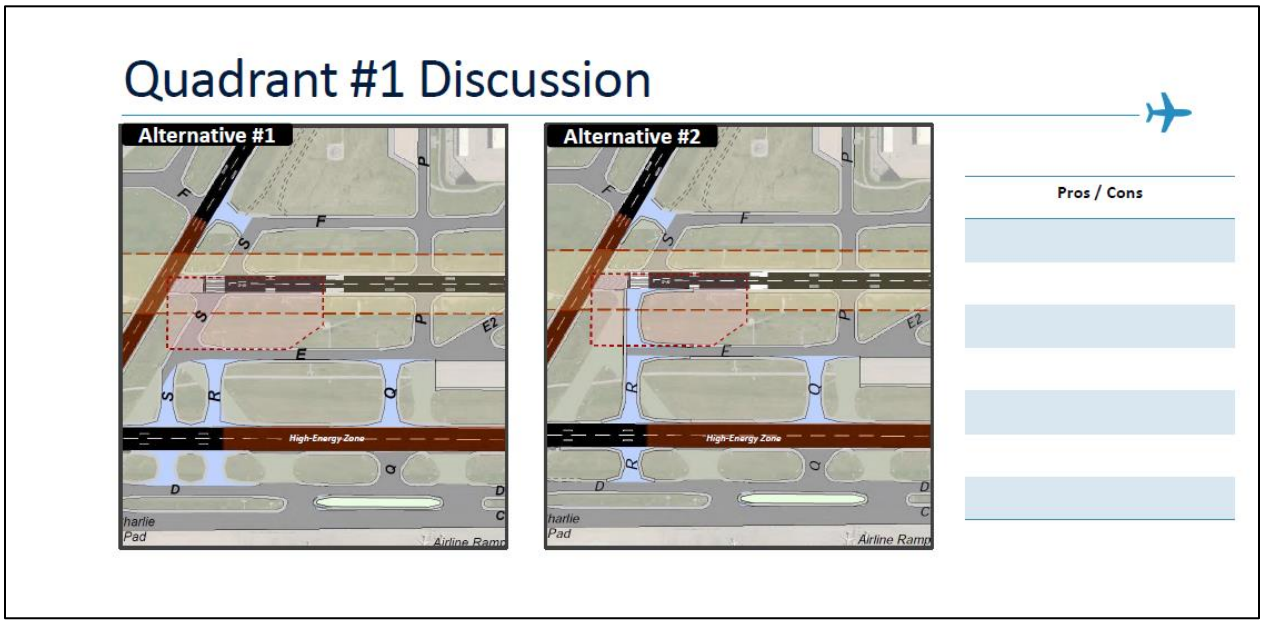


Figure 46 Quadrant #1 Discussion

- Quadrant #2 (**Figure 47**):
  - Add a turnoff east of Taxiway K, around the Taxiway F4 area (ATCT request). Note, subsequent discussions identified the preferred location of the additional taxiway connector noted in the CSA process associated with long-term solution associated with Taxiway L and Runway 12L-30R. See Figure 50.
  - **Alternative 1 was selected if Taxiway L southbound were adjusted (approximate location of current Taxiway L southbound exit)**.

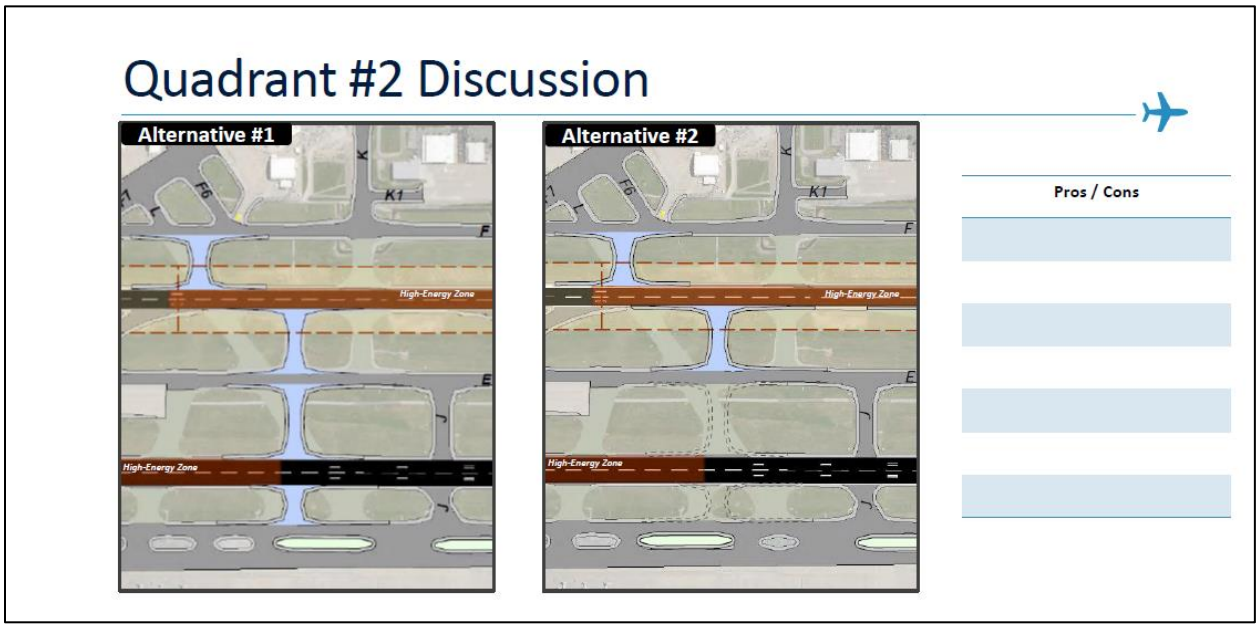


Figure 47 Quadrant #2 Discussion

- Quadrant #3 (**Figure 48**):
  - **Alternative 2 selected if Taxiway E1 can be shifted.**
  - Keep Taxiway H south of Taxiway E to cross Runway 12R-30L without restriction.
  - Taxiways C and D connections might need to move.
  - There is no need for Taxiway H northbound under Alternative #2.
  - Rework island at intersection of the airline/commercial ramp.

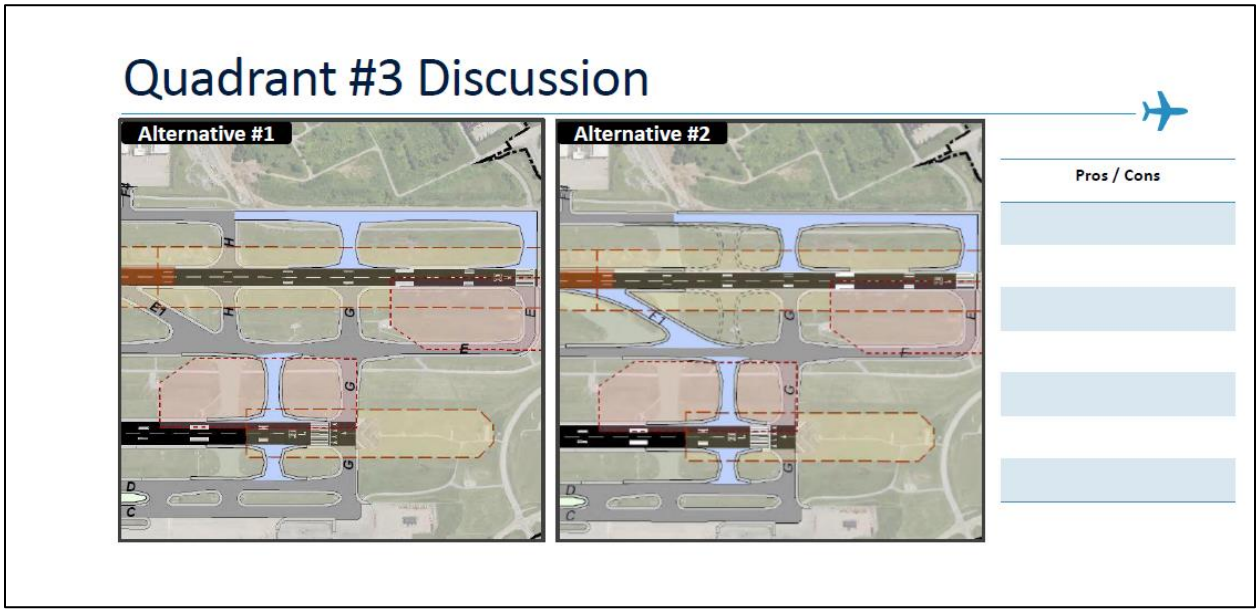


Figure 48 Quadrant #3 Discussion

- Quadrant #4
  - Approach departure surfaces are addressed in Alternative 2. There is currently a Modification to Standards (MOS) for Taxiway S. However, this MOS expired after 5 years and will need to be re-evaluated.
  - Runway 6 has an "End-Fire" glideslope antenna that needs special consideration. However, it is used infrequently.
  - Alternative 2 requires a shortening of Runway 6 to mitigate approach surfaces and safety areas penetrations. The question/need is to further study the approach surfaces and see if there are new impacts to the Runway 11-29 complex.
  - **Alternative 2 is preferred, but a dual path to Runway 29 must be provided that is free of operational restrictions (Runway 29 approach protection – aircraft are restricted from traversing the Runway 29 approach corridor when landing Runway 29). More study is required as removal of Taxiway B creates an operational restriction.**
  - The proposed deicing pad will result in movement areas immediately adjacent to non-movement areas. This can be addressed with a Memorandum of Understanding (MOU) with ATCT, or through subsequent design efforts to further refine and/or address the movement area vs. non-movement area strategy. Requires further study.
  - Confirm the overall need to shorten Runway 6-24 to eliminate the existing Taxiway S MOS and address Runway 29 approach restrictions (aircraft traversing the Runway 29 approach corridor). Subsequent discussion by STLAA leadership identified the decision to retain Runway 6-24 in its current configuration (no shortening of Runway 6). Additional coordination with FAA will be conducted regarding the Taxiway S MOS when appropriate.

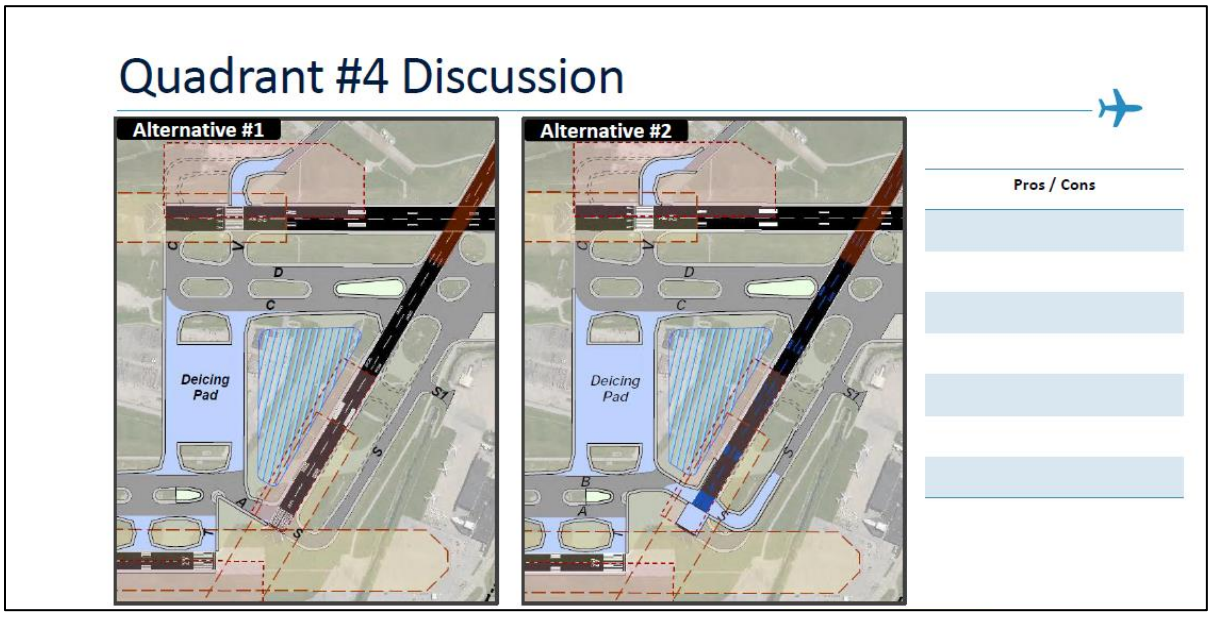


Figure 49 Quadrant #4 Discussion

One consolidated preferred airfield alternative was built to review for completeness. It is depicted in **Figure 50**.

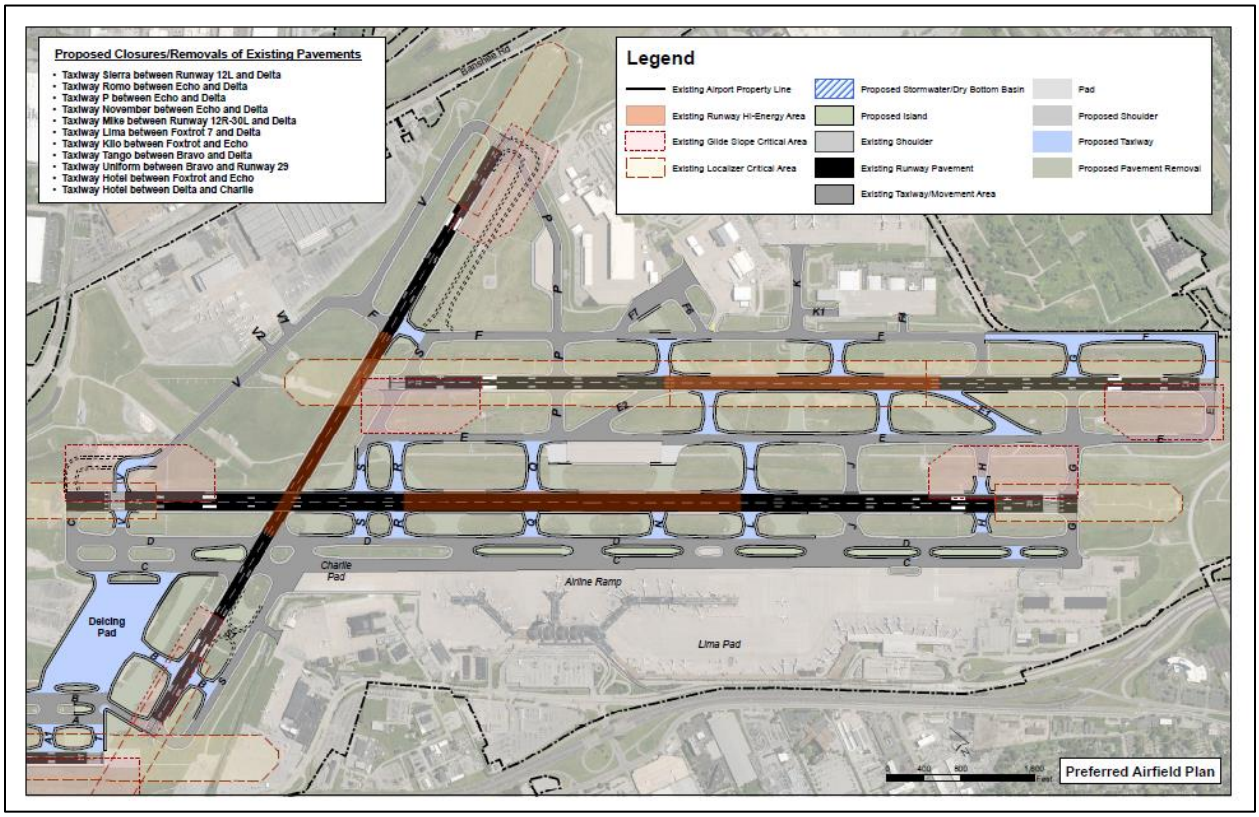


Figure 50 Preferred Airfield Alternative

6.2 Final Determination

The preferred airfield alternative presented one potential hazard for consideration in the final ALP review: the need for a runway crossing in the high-energy zone of Runway 12R-30L (Taxiway Q between Taxiway E and Taxiway D).

The preferred airfield alternative brings the airfield up to design standards, eliminates Hotspot #1, protects for long-term flexibility to accommodate future aircraft operations, and addresses the need for consolidated remote deicing facilities as part of the Airport's long-term vision. Ultimately, the preferred airfield alternative was a consolidation of several elements from the individual preferred alternatives presented during the CSA engagement (Meeting #3). Achieving consensus was an important component of the effort. However, it is not relayed as an outcome of any meeting or the CSA engagement.

As noted previously, following the CSA meeting (Meeting #3), a focused effort was made to hold a meeting with the airline/users to ensure adequate opportunity was supplied for their input. More information regarding that stakeholder engagement is presented in Section 7.

Section 7 Airline/ Users Workshop

While the Planning Team (airport, FAA, and consultants), tenants, and operators attending the meetings agreed with the preferred airfield alternative, additional briefings occurred between the Planning Team and the Airport stakeholders. Specifically, the Airline/User Engagement (Meeting #6), comprised principally of the pilot community, was held on September 3, 2021. This meeting provided an opportunity to present the airfield alternatives process (high-level), key outcomes of the CSA process, and to review the draft final preferred airfield alternative.

During the Airline/User Engagement (Meeting #6), several key observations were noted by the pilots (**Figures 51 and 52**) and discussed in detail:

- ROT is critical, specifically the need to keep ROTs under an average of 50 seconds, which allows entrail separation to decrease from 3 miles to 2.5 miles
- Preference for diagonal/high-speed exits compared to 90° exits
- Minimize risk of go-arounds, which are unplanned events in the National Airspace System
- Concern with exiting or crossing Runway 12R-30L with new grass islands between Taxiways D and C
    - Impact of new islands relative to stopping short of the Taxiway D intersection and creating a go-around event for the next arriving aircraft (taxiing aircraft tail in the safety area for Runway 12R-30L).
    - Impact to ROT with introduction of 90° exits and new islands.
- Taxi time impacts (every second counts)

Below are additional details regarding feedback received from the Airline/User Engagement (Meeting #6).

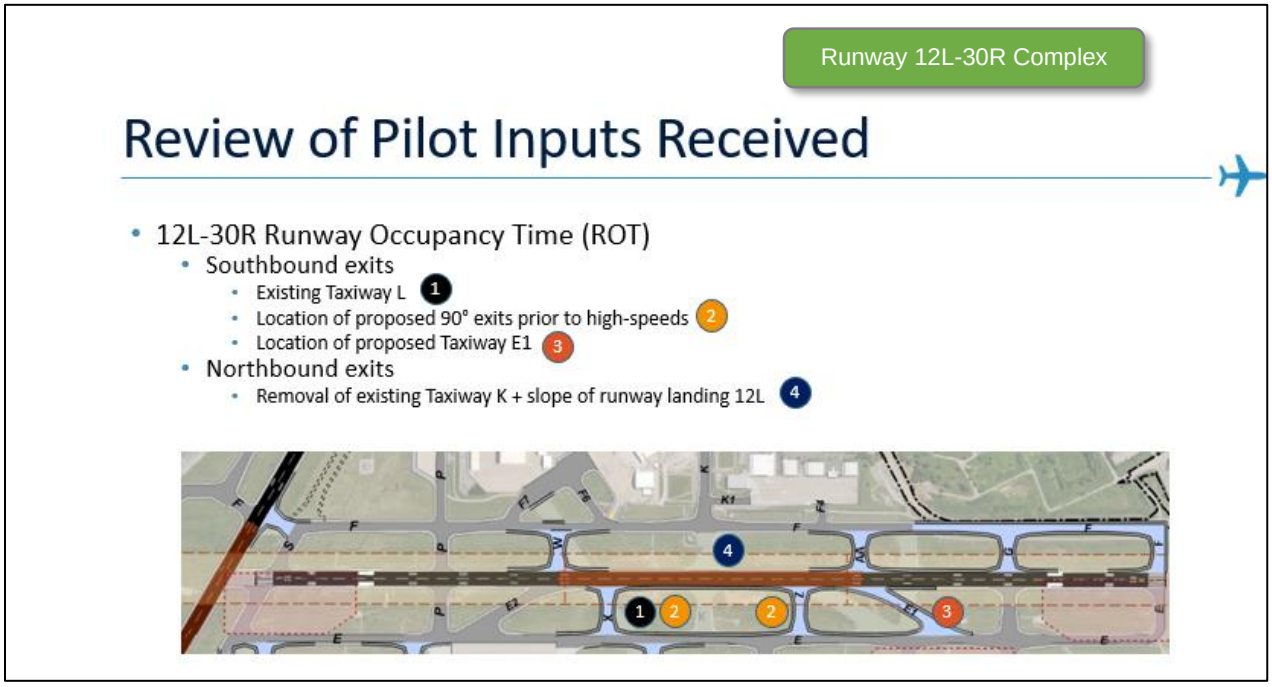


Figure 51 Review of Pilot Inputs Received

Several runs of the REDIM analysis were conducted to look at the location of northbound exits from Runway 12L-30R (a primary arrival runway) and the optimal location of southbound exits from Runway 12L-30R (including high-speed exits). Based on the airline/user input and additional REDIM analysis, a change to northbound exits from Runway 12L-30R was recommended (shift one exit closer to existing Taxiway K and retain existing Taxiway H between Taxiway F and Runway 12L-30R). No changes to the preferred airfield alternative associated with southbound exits from Runway 12L-30R were made based on the additional REDIM analysis conducted, which validated the proposed exits are in the optimal location.

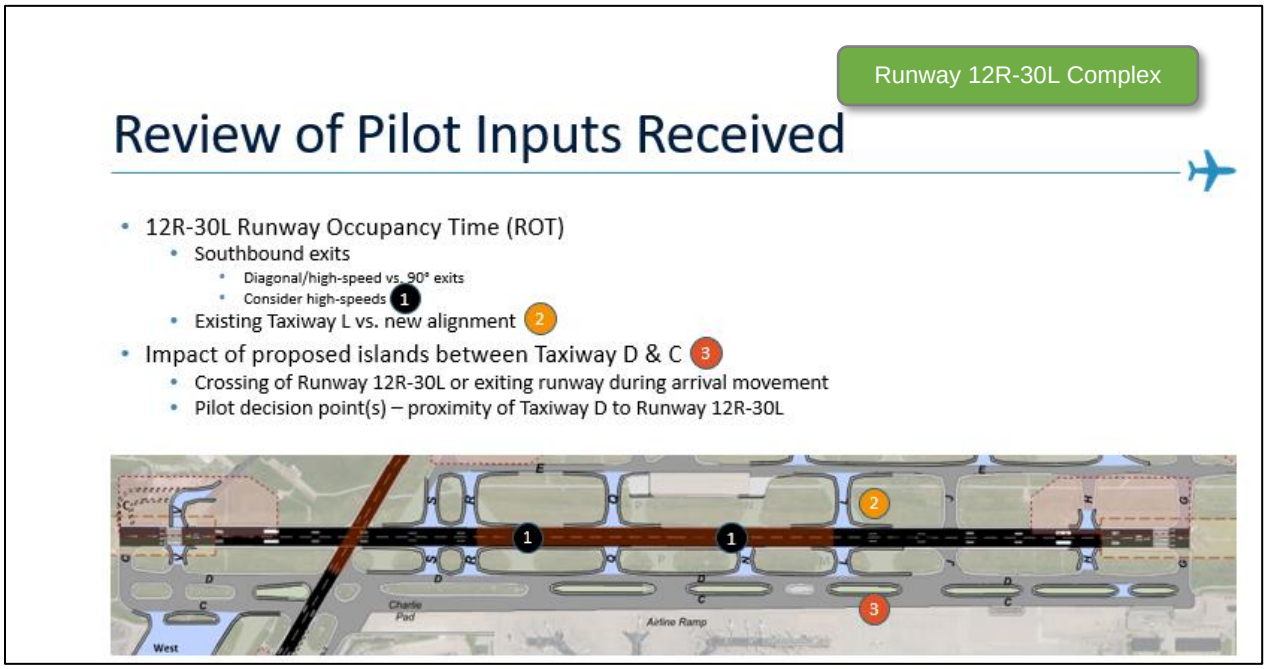


Figure 52 Review of Pilot Inputs Received

Additional analysis was conducted to understand the impacts associated with the introduction of high-speed exits southbound from Runway 12R-30L (serves as the primary departure runway). The introduction of high-speed exits created several challenges relative to proposed taxiway improvements and had minimal benefit to ROTs associated with arrivals on Runway 12R-30L. With regards to the introduction of new islands between Taxiway D and Taxiway C (eliminates direct access from the apron areas), additional discussions were held with FAA ATCT to understand operational procedures could be considered to alleviate the airline/user concerns. The islands will be implemented in full compliance with FAA design standards (markings, lighting, shoulders, etc.) to make the new islands stand out. Also, specific taxi instructions will be provided when existing or crossing Runway 12R-30L to minimize the potential for pilot confusion. Presentation materials for the October 2021 meeting (Meeting #7) with the Planning Team can be found in **Appendix C**.

Section 8 Conclusion

Recognizing the importance of the input received by the airline/user group, the Consultant Team conducted additional analysis to validate previous planning decisions and to assess concerns/recommendations offered by the airline/user group. To finalize the airfield planning decisions, an additional meeting was held with the Planning Team in October 2021 (Meeting #7).

It is important to note that during the development of the airfield alternatives, members of the Consultant Team were working through terminal needs and development concepts. Throughout the planning process, an understanding of the terminal direction was in place within the consultant management team to make sure the preferred airfield development plan would be compatible with the preferred terminal alternative. The Consultant Team understood that both the airfield and terminal represent significant infrastructure investments for the Airport and FAA throughout the planning period. The preferred airfield alternative presented in this section includes the preferred terminal alternative (new terminal concourse in the general location of Terminal 1 and closure of Terminal 2).

Overall, consensus was reached that the preferred airfield alternative allows the overall ALP study effort to move forward in such a way that it brings the airfield up to standards and protects for growth throughout the planning period (next 20 years). The improvements proposed within the preferred airfield alternative will be completed as targets of opportunities (e.g., when pavement fails and needs reconstruction).

The consensus for the preferred airfield alternative was reached through seven core meetings held with a wide range of stakeholders who have a vested interest in the STL airfield. Several other discussions occurred throughout the development of the preferred airfield alternative, as noted throughout this CSA documentation. **Figure 53** depicts the preferred airfield alternative.

It is important to note the Consultant Team also held discussions regarding the mitigation of direct access taxiways from the future West Deicing Pad to Runways 6 and 29 via Taxiways S2, T, and V, respectively, which are mitigated with islands and staggered offset connectors, as shown in **Figure 53**.

The preferred terminal location identified by STLAA leadership is depicted for reference, to illustrate that it provides continuity with the preferred airfield plan.

Section 9 Next Steps

- The final CSA report will be submitted to the FAA, where it will be circularized
- FAA Form 5200-8, *Safety Assessment Screening for Airport Planning and Development Projects (SAS-1),* will be completed and signed by the airport sponsor and submitted to the FAA for final approval

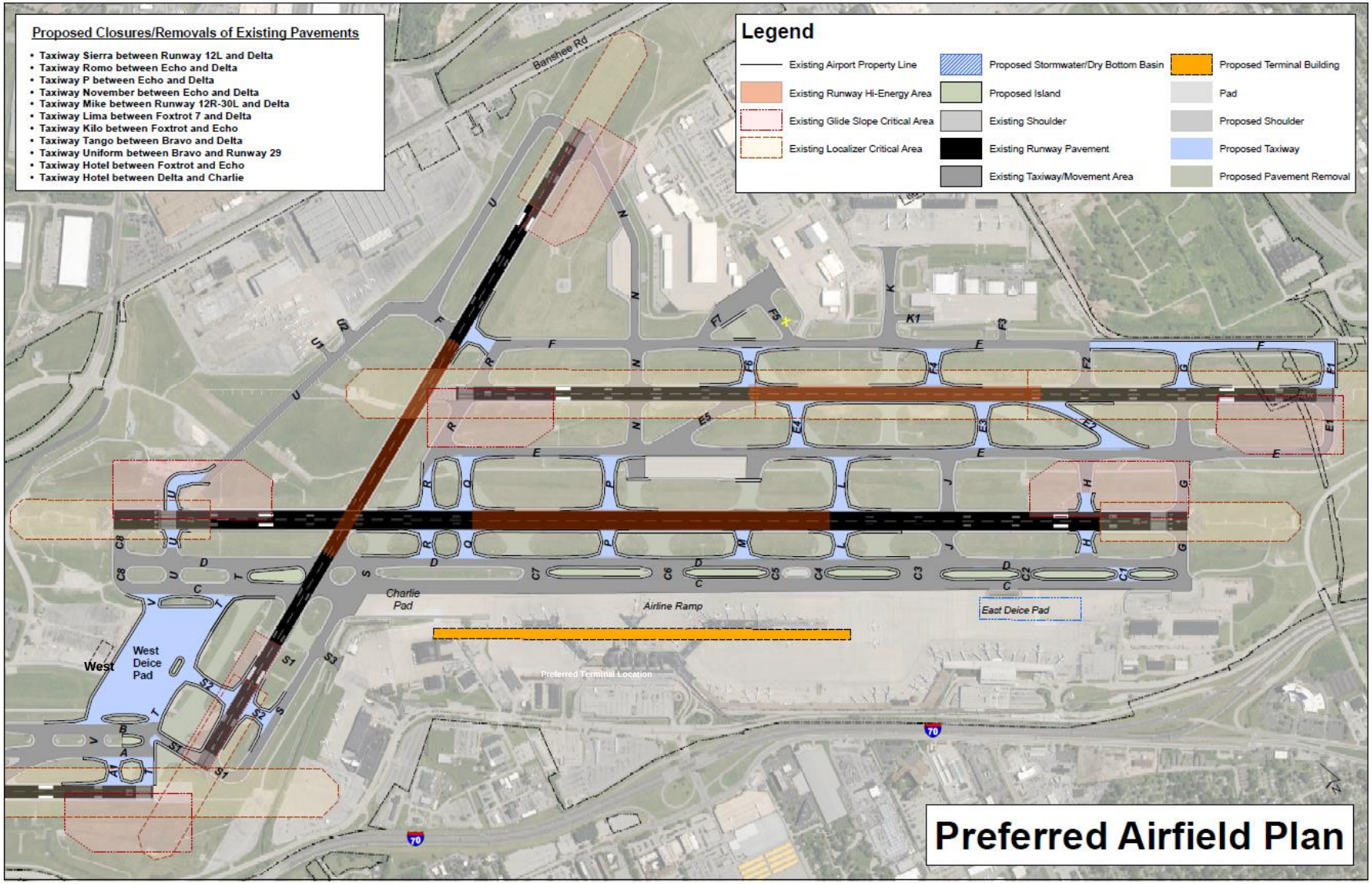


Figure 53 Preferred Airfield Plan

Faith Group

Appendix A Airfield Workshops & CSA Meeting Minutes including Participant List

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Workshop #1
November 2020

Airfield Safety Risk Management (SRM) Engagement #1

Meeting Minutes

Virtual Meeting-WebEx

1:00PM – 3:00PM (CDT)

November 19, 2020

IN ATTENDANCE

STLAA: Jerry Beckmann, Dana Ryan, Angel Ramos, Ron Stella, Jan Titus

FAA: Tom Frakes, Todd Madison, Jim McGhee, Mark Schenkelberg, Ryan Vogt, Tim McClaren

WSP: Eliane Grayer, Jennifer Kuchinski, John Van Woensel

CMT: Nick Brown, Angela Franklin, Doug Gregory, Haylee Koester, Ty Sander

Faith Group: Dave Fleet

MEETING AGENDA

Draft Guiding Principle

- Ron Stella: wants us to be considering cargo, deicing, connecting north & south development areas within the "North" airfield and identifying areas for growth.
- Ron Stella: make sure that undeveloped land is organized by use type and evaluate the current land use mix. Long-term land use planning should take into consideration airfield movement requirements as applicable (i.e. aircraft maintenance activities needing to cross the airfield).
- Ron Stella: wants to ensure that the location of islands between Taxiways "C" and "D" are considered in alternative planning
- General: expansion for growth and operational improvements are sought by participants

Airfield Design Standards

- Todd Madison: It is prudent to look at the difference between 13A and 13B, but does not know a release date of 13B
- Jerry Beckmann: need to look at the vehicle service road (VSR) next to Taxilane C
- Todd Madison: Taxiway V Approach/Departure marking and signage (impact of new -13B standards which are effective under EB99A for revised departure surface size). Additional analysis being conducted by MITRE at Core 30 airports regarding flight standards implementation and ATCT management. Additional exhibits to be provided to present options along Taxiway V based on EB99A criteria.

Northeast Airfield – Primary Taxiway Utilization

- General: revise exhibits to define high-energy zone (existing condition).
- General: recognition that the airfield alternatives process requires a balance of safety and efficiency when considering the various operational needs of the airfield.

West Airfield – Areas of Assessment

- Tom Frakes: One issue that would arise was on Taxiway T, pilots would taxi down Taxiway T and turn onto Runway 6 instead of Runway 29. This has not been an issue since nonstandard signs/markings have been put on the airfield. However, if there are any changes to this area, the nonstandard markings need to be considered.

North Airfield – Areas of Assessment

- Tom Frakes: Hot Spot is still an issue with people missing the turn onto Taxiway S
- Todd Madison: Pavement at end of 12L where it connects to Runway 6/24 is still there – unsure if that pavement needs to be connected? Chevrons have been put in to keep it from being utilized

North Airfield - Crossfield Connectivity

- Ron Stella: We need to determine why aircraft/vehicles are crossing the airfield and what the need is
- Ty Sander: what are the Maintenance options from the terminal to ATS?
    - Ron Stella: Tower has an arrangement with maintenance, the personnel are trained to maneuver in movement areas and utilize specific call signs. Roughly 10 movements a day.
- Dave Fleet: Winter Ops – Parallel runways (12R-30L & 12L-30R) high energy zones, do you flip flop for snow removal?
    - They close one runway to do snow removal, when completed they flip and close the other runway. Switch back and forth until it stops. They prioritize taxiways.
    - They clear runway 11/29 when precipitation stops.
- Tom Frakes: For daily maintenance and ARFF activities, we need to make sure there are adequate service roads
    - James McGhee: Small ARFF trucks can take smaller perimeter road, but really should not be driving on them because they are not paved.
- Ron Stella: Study vehicle runway incursions
- Doug Gregory: Have you noticed any issue with deicing and getting aircraft to the pads?
    - Cargo operations crossing the runway for deicing is an issue. Need to look at getting deicing to the North side or mitigate crossing both runways.

North Airfield – Initial Idea for Conversation

- Jerry Beckmann: Make sure we address the three-node intersections
- Todd Madison: if propose a taxiway crossing in a high energy zone, we need to prove why it is needed from efficiency, capacity and operational standpoints
- James: definition of high-energy area does not always match perceived risk level – keep-in mind when proposing runway crossings:
    - Rwy 12L operations: high-energy area from approach end to Twy H
    - Rwy 12R operations: high-energy area starts at Twy S

Workshop #1
November 2020

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Airfield Alternatives – Workshop #1

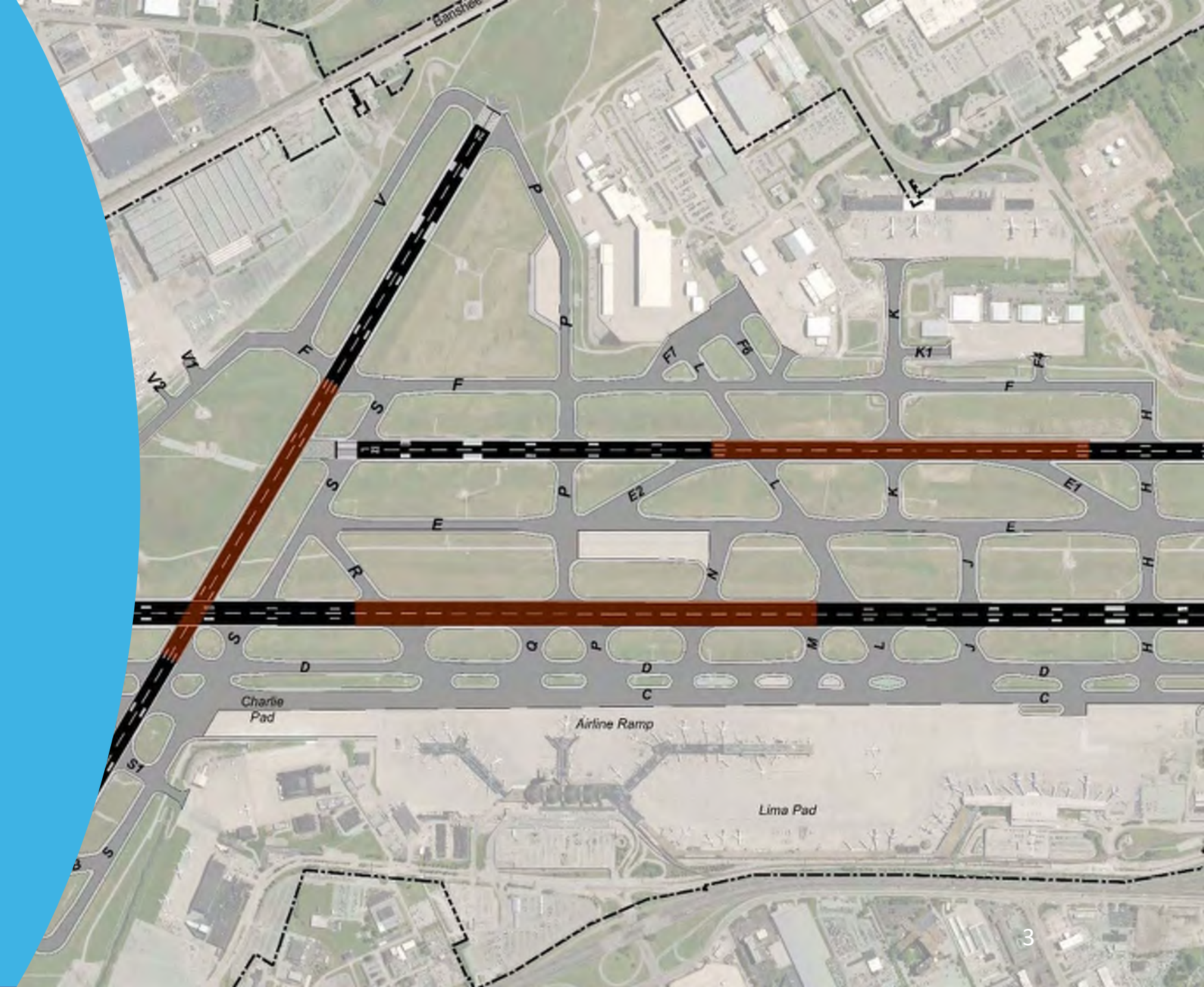
Initial Safety Risk Management (SRM) Engagement

Date: November 19, 2020

Agenda

- Introductions
- Schedule – Blocked Out 4 Hours
- Ground Rules
- Draft Guiding Principles
- Airfield Design Standards & Terminal Taxiway Corridor (C/D) Discussion
- Study Area Definition
- Draft Evaluation Criteria
- Taxiway Utilization – Baseline
- Initial Sketch Planning
- Open Dialog & Homework

Ground Rules & Draft Guiding Principles



Ground Rules

- No bad ideas / multiple viewpoints and experiences
- Recognition of competing priorities
- Team collaboration & initial consensus building
- Focused engagements
- Sequence of workshop steps
  - Establish guiding principles / evaluation criteria
  - Initial sketch planning results
  - Concept identification and refinement (up to 5)
  - Objective: Full SRA with no more than two preferred concepts

Draft Guiding Principle

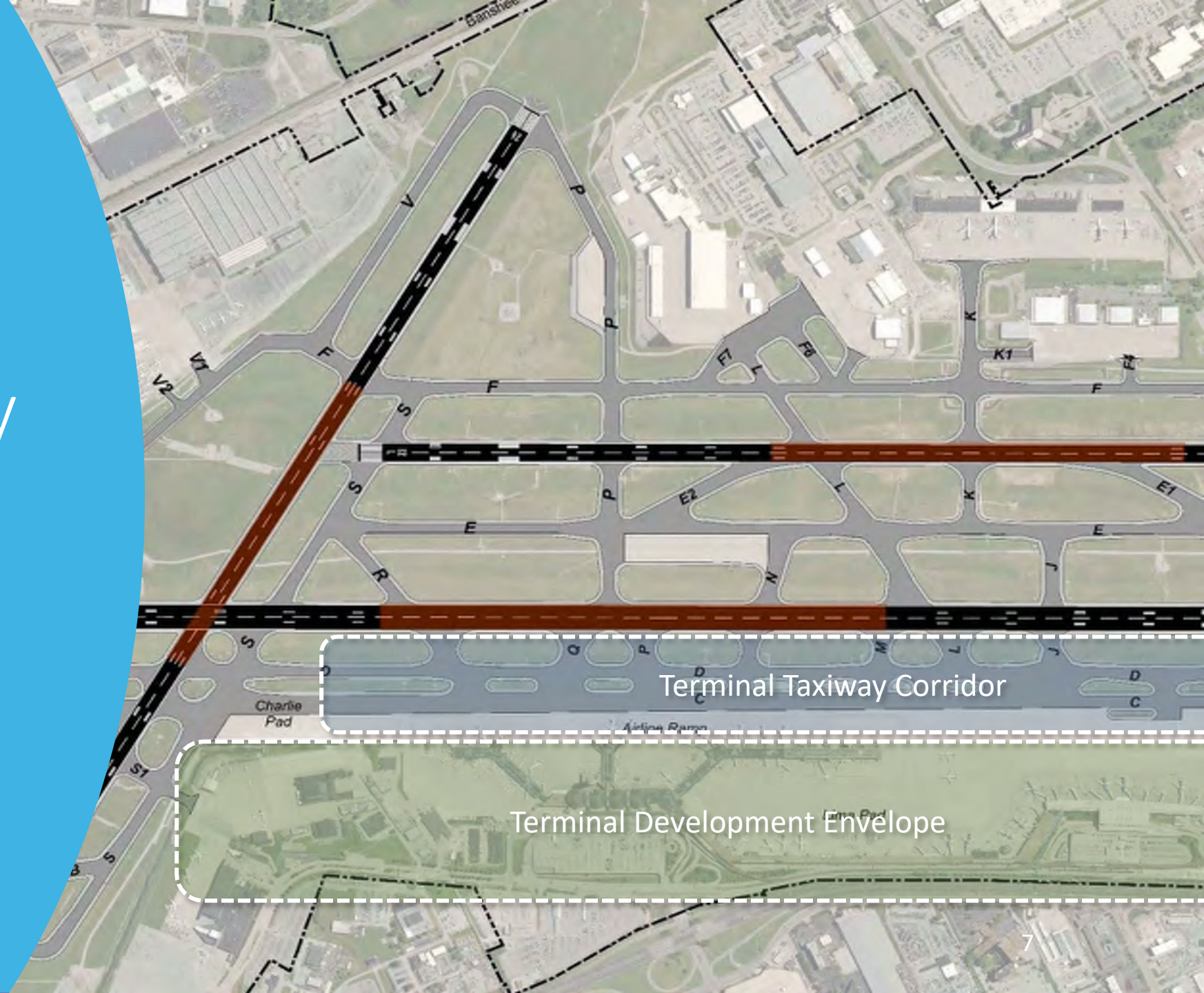
- Safety Benchmarking
  - Effectiveness in eliminating, reducing, or mitigating safety risk
  - Compliance with FAA airport design standards
  - Limits introduction of new risk factors
- Operational Benchmarking
  - Minimize impact to capacity *(doesn't result in a significant reduction in capacity)*
  - Provides operational efficiency / addresses operational issues
  - Provides for redundancy during runway closures
  - Flexibility to accommodate changes in aircraft fleet mix *(design group and/or other operational changes)*
  - Flexibility to accommodate irregular conditions *(SMGCS, winter ops, etc.)*

Draft Guiding Principle

Open Discussion

Additional Items to Consider	
Runway 12R-30L high-energy area (Length)	
Projected aircraft fleet mix	
Ideal separation for terminal area & Taxilane C	

Airfield Design Standards & Terminal Taxiway Corridor (C/D) Discussion



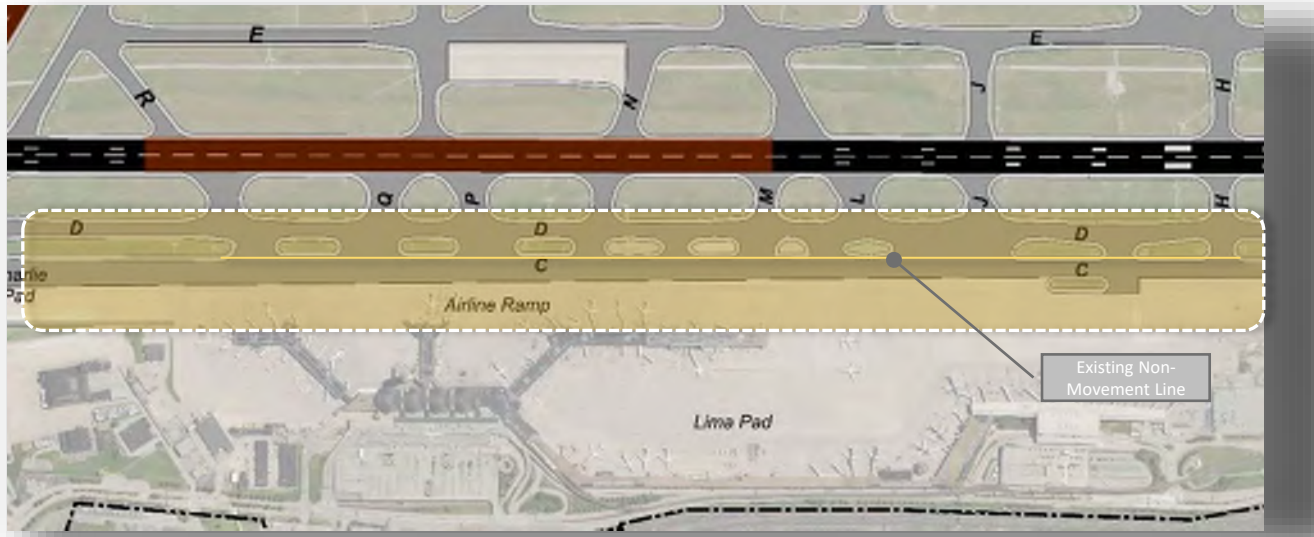
Airfield Design Standards

- FAA Advisory Circular -13A vs. Draft -13B
  - Memo being developed to assess airfield design drivers between guidance documents
  - Draft exhibits being developed to assist in understanding the opportunities/constraints
- Influence/balance of airfield and terminal area development limits
- Short and long-term objectives (ALP sets in motion a 20-year development strategy)

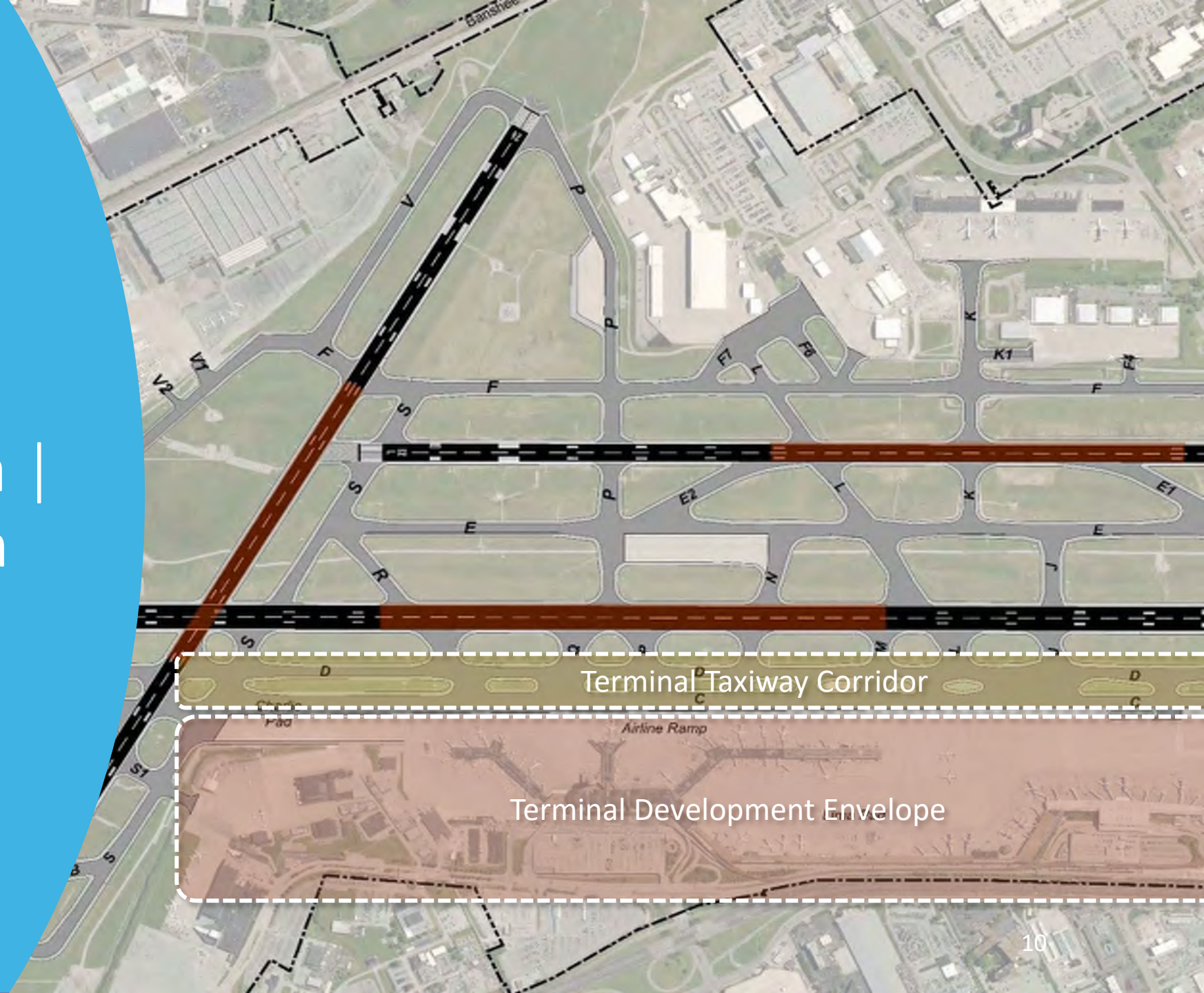
Terminal Taxiway Corridor (C/D) Discussion

- Movement vs. Non-Movement area designation
- Terminal pushback operations (existing constraints & future objectives)
- Aircraft Design Group (ADG) benchmarking & long-term planning
- Focus area for non-compliant airfield geometry & resolution priority

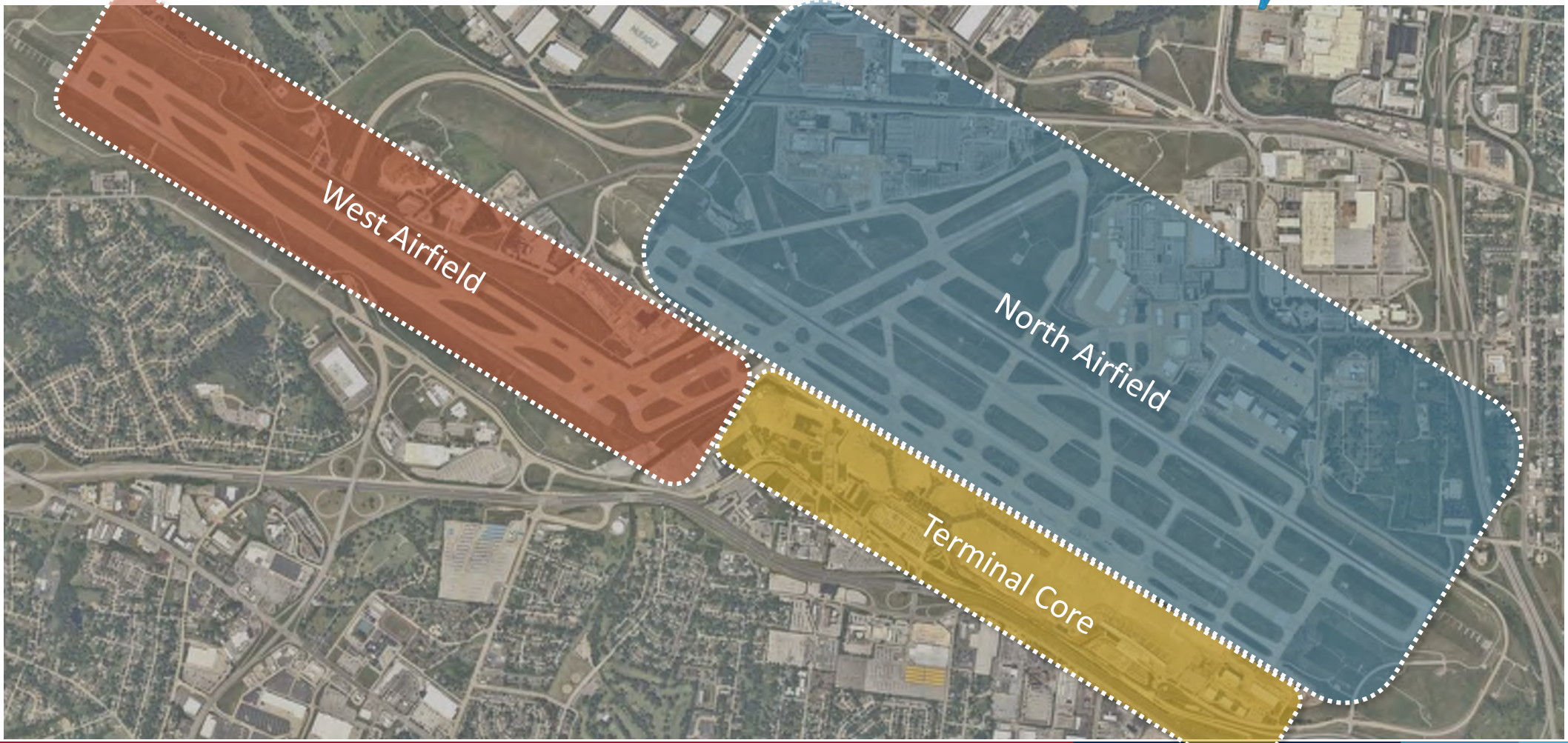
Specific Input Request – ATCT Positive Control Area



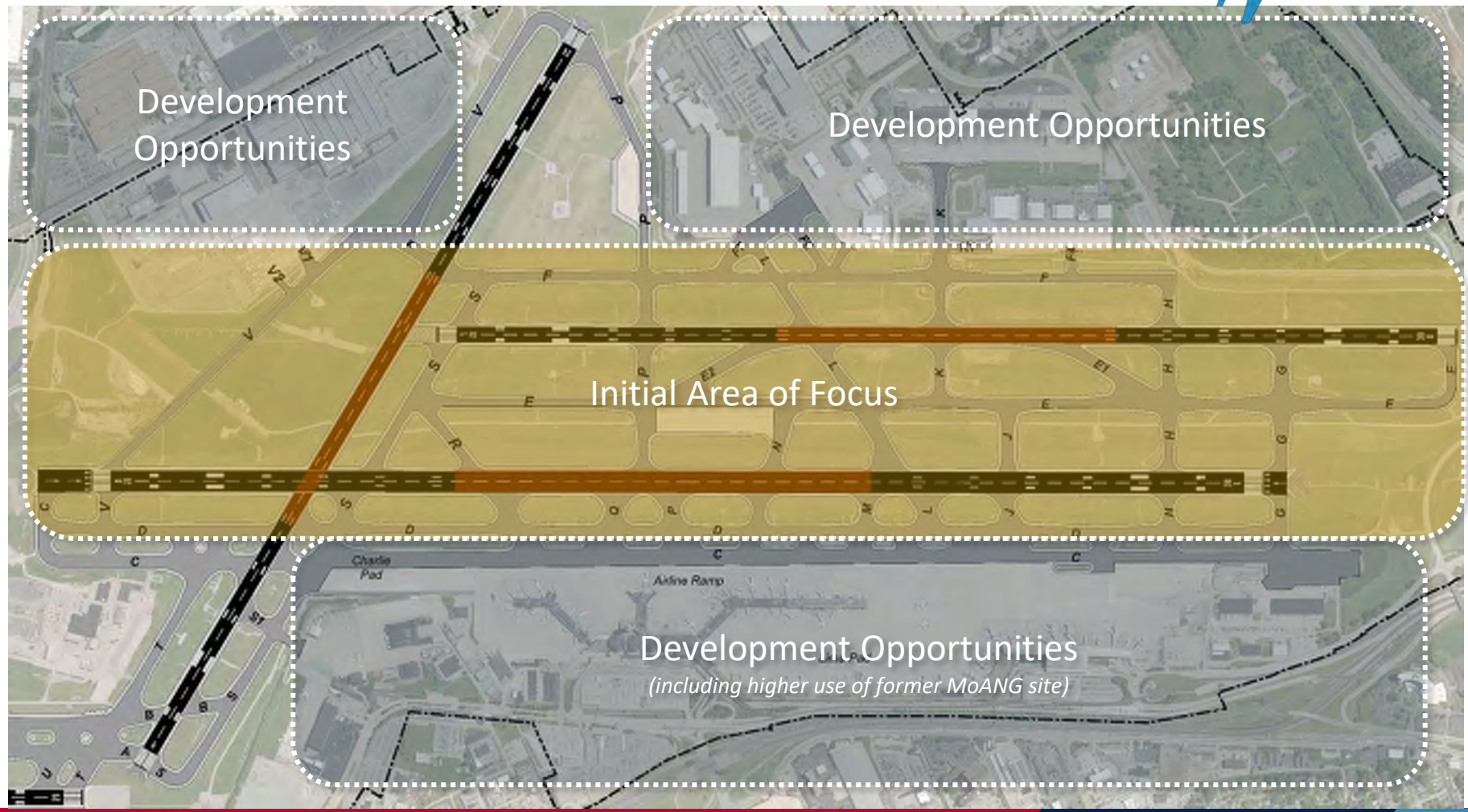
Study Area Definition | Draft Evaluation Criteria | Taxiway Utilization Baseline



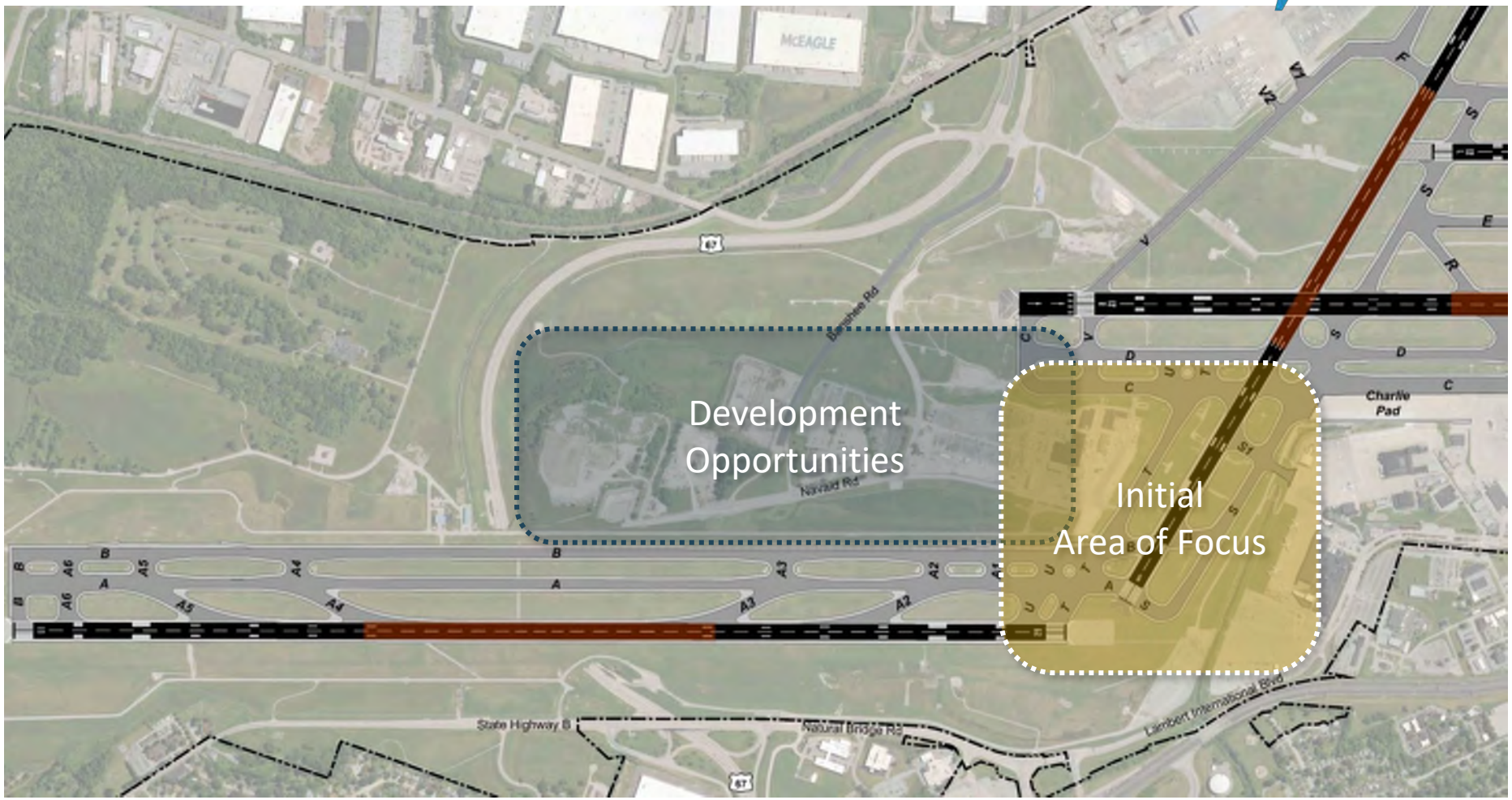
Definition of Study Areas



Definition of Study Areas – North Airfield



Definition of Study Areas – West Airfield



Draft Evaluation Criteria

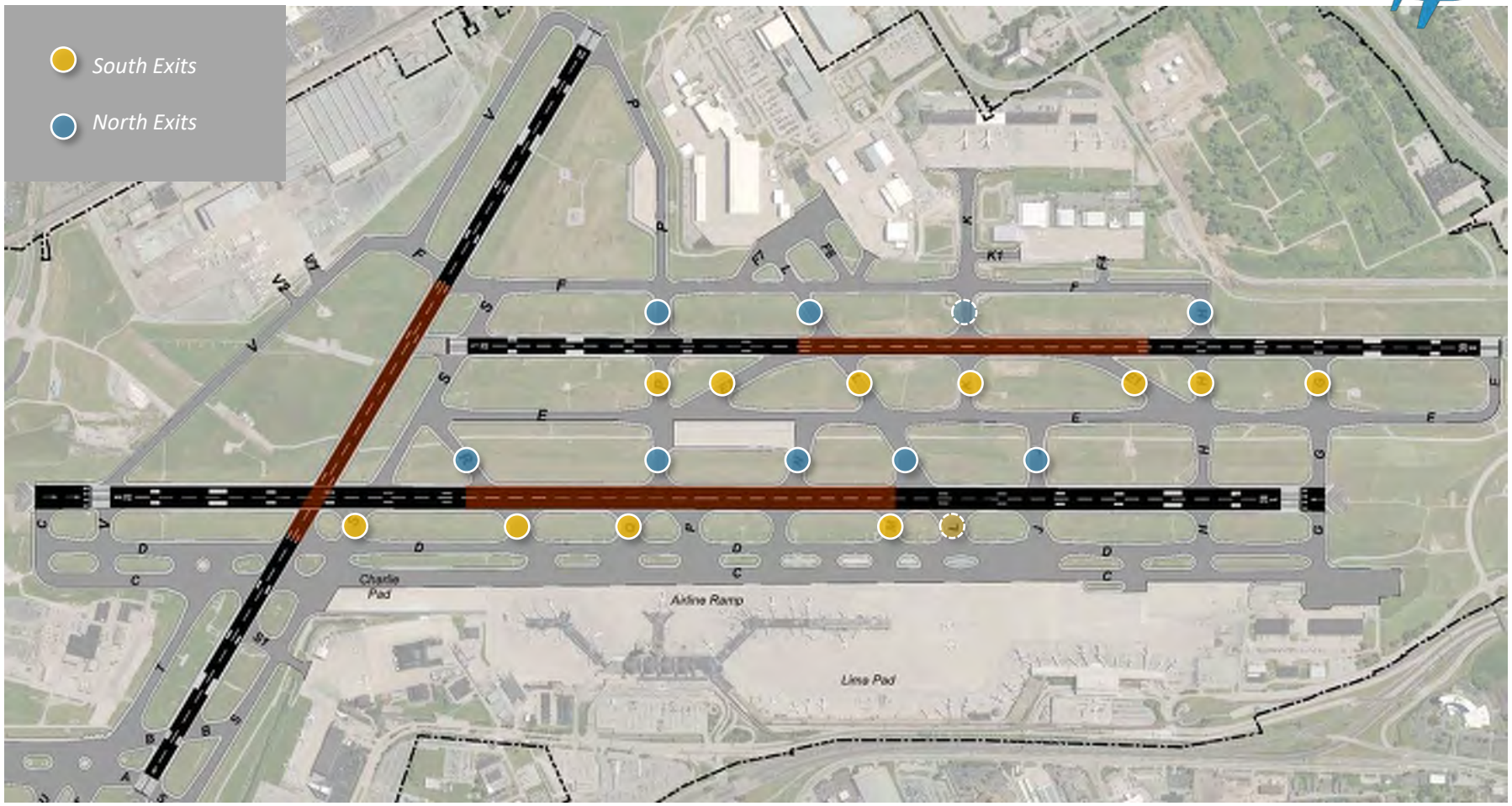
- Stoplight concept
- Built from guiding principles previously discussed
- Easy screening of concepts
- Initially subjective definition but consensus is critical
- If concept scores all green and/or yellow, the concept is carried forward in analysis

Benchmarking Criteria	Stoplight Scoring Criteria		
	✖	●	✔
Safety			
Hotspot	*Creates New Concern*	*No Change*	*Improves Condition*
Non-Standard Intersection Angle (Preferred is 90°)	*> 3 Locations*	*2 or 3 Locations*	*< 2 Locations*
High-Energy Runway Crossings (Intersection)	*3+ Locations*	*1 or 2 Locations*	*No Locations*
Direct Access (Apron to Runway)	*3+ Locations*	*1 or 2 Locations*	*No Locations*
Operational			
Taxi Time/Distance to Runway Complex	*Increases*	*Neutral*	*Decreases*
Runway Occupancy Time (ROT)	*Increases*	*Neutral*	*Decreases*
Low Visibility Route (Distance)	*Increases*	*Neutral*	*Decreases*
Departure Queue at Runway End	*Reduces*	*Neutral*	*Increases*
Operational Restrictions	*Creates New Concern*	*No Change*	*Improves Condition*
NAVAID Restrictions (ILS Holdshort, App/Dep Holdshort, etc.)	*Creates New Concern*	*No Change*	*Improves Condition*

Specific Input Request – Review of Evaluation Criteria (Collaboration)

Northeast Airfield – Primary Taxiway Utilization

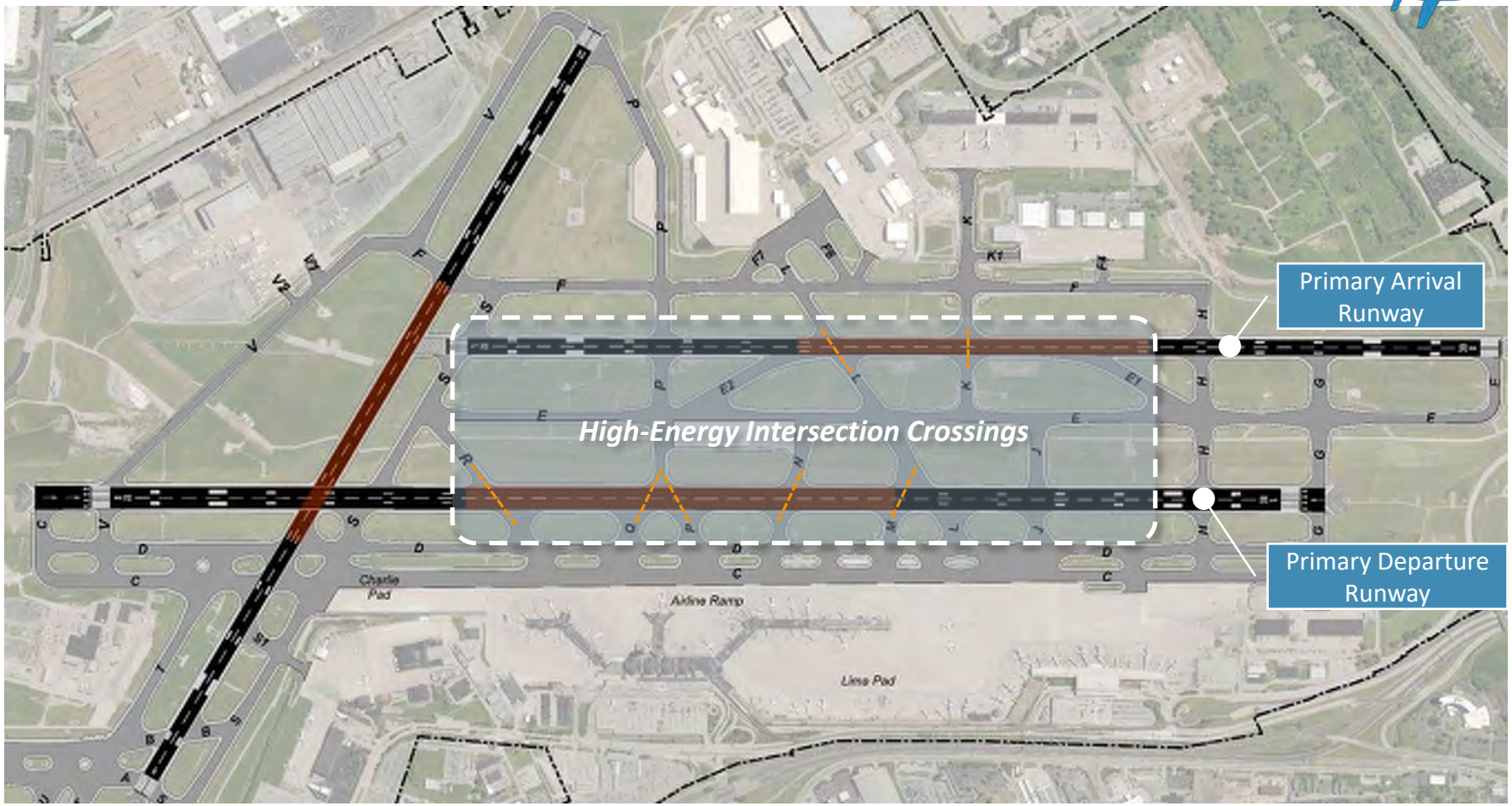
(Both Operational Flows – REDIM Analysis)



Observations & Frontline Input

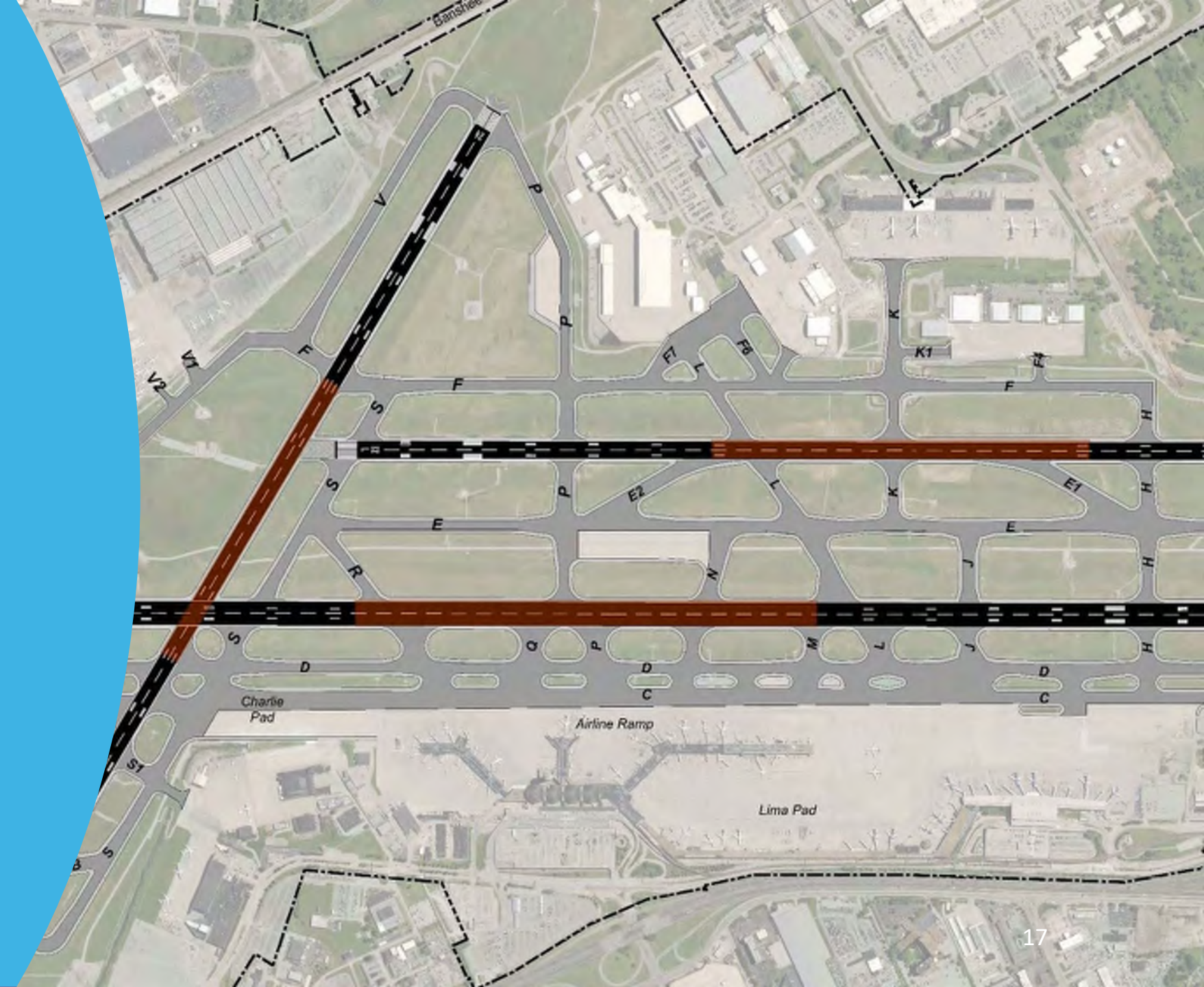
Northeast Airfield – Primary Taxiway Utilization

(Balance of Operational Flexibility & FAA Design Standards)

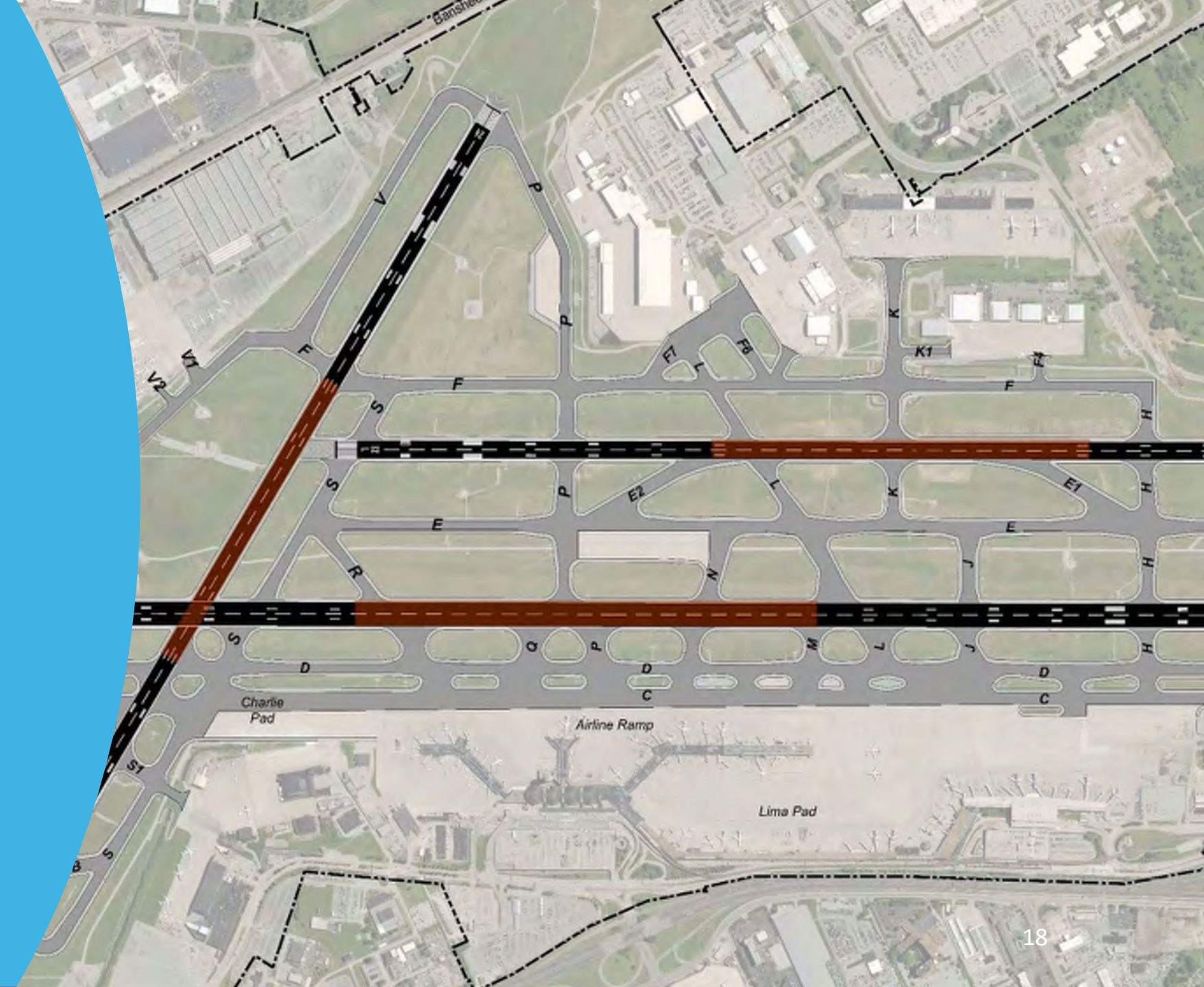


Key Observations & Collaboration on Overall Airfield Utilization

Break



Initial Sketch Planning

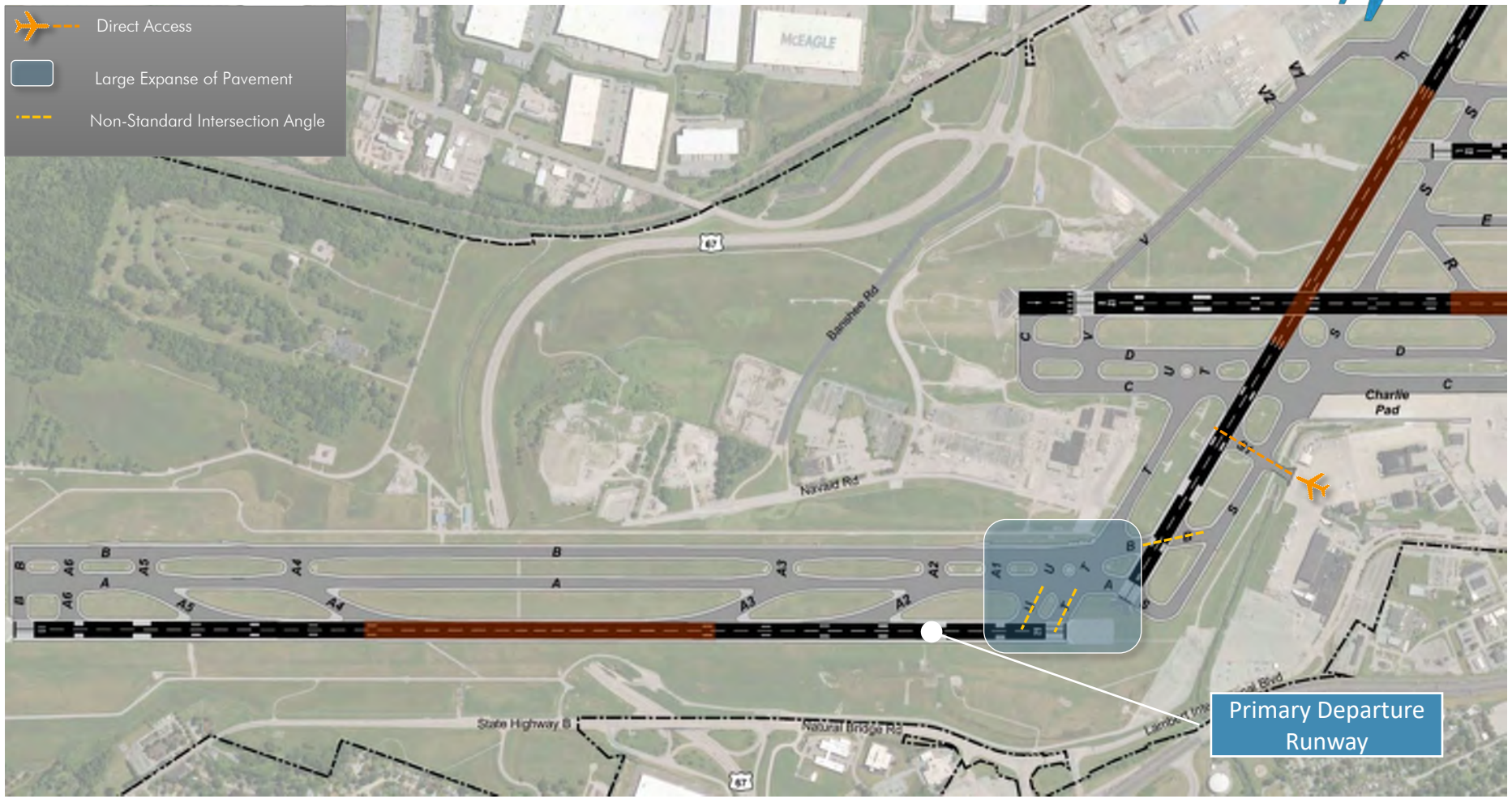


Initial Sketch Planning Exercise

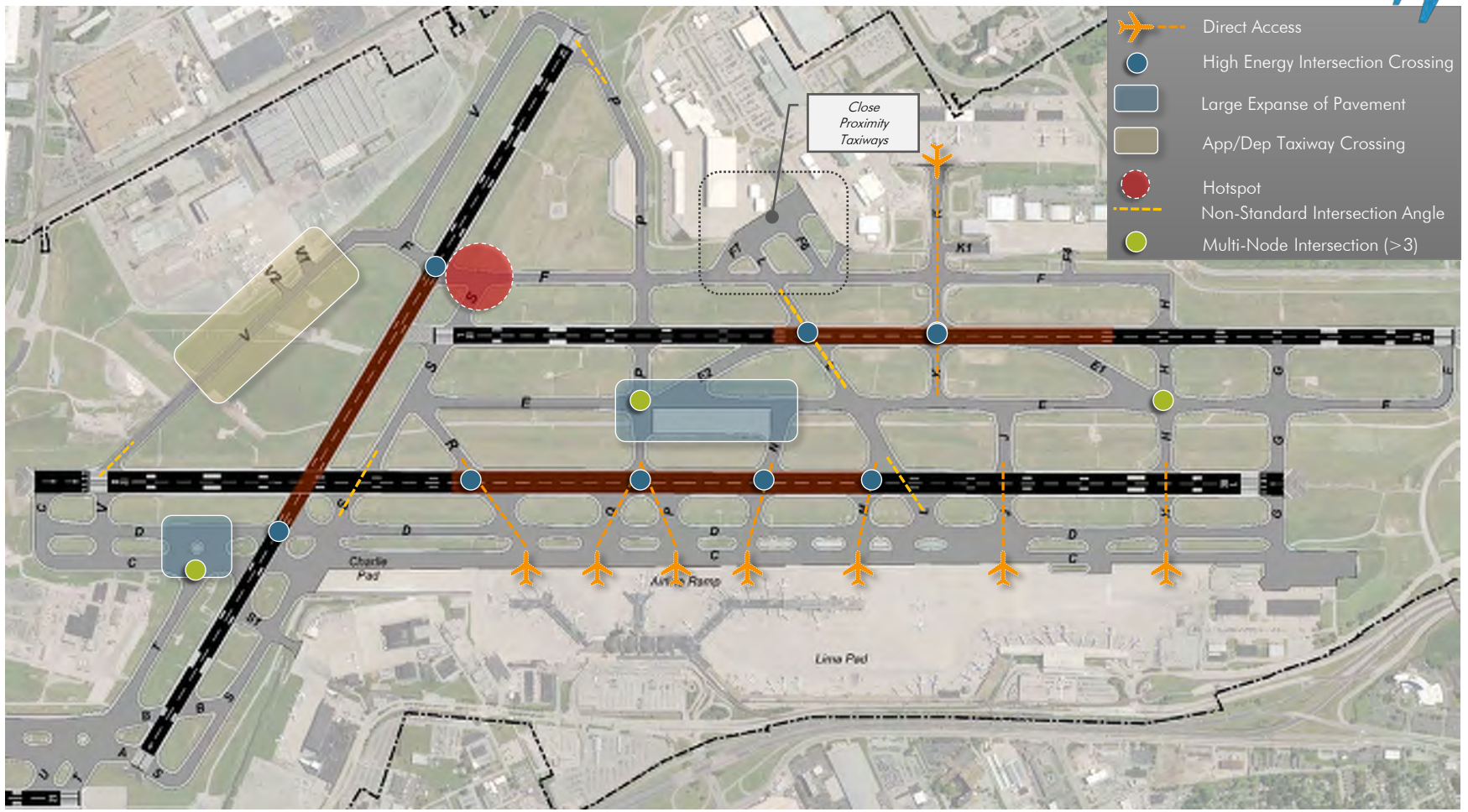
- Overview of non-compliant airfield geometry
- Opportunity to weigh in early in the alternatives process
- Brief history of concern/issue (round-robin)
- Goal is to brainstorm various concepts, areas of focus, prioritization of benchmarking criteria, etc.

Collaborative Input to Enhance End Product (ALP Approval)

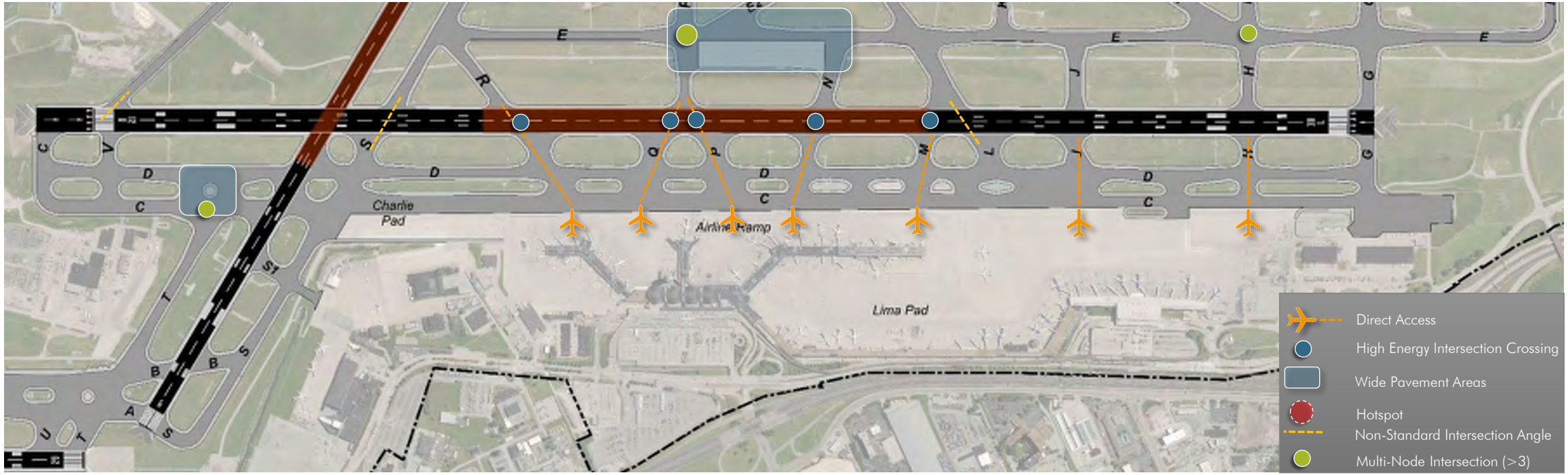
West Airfield – Areas of Assessment



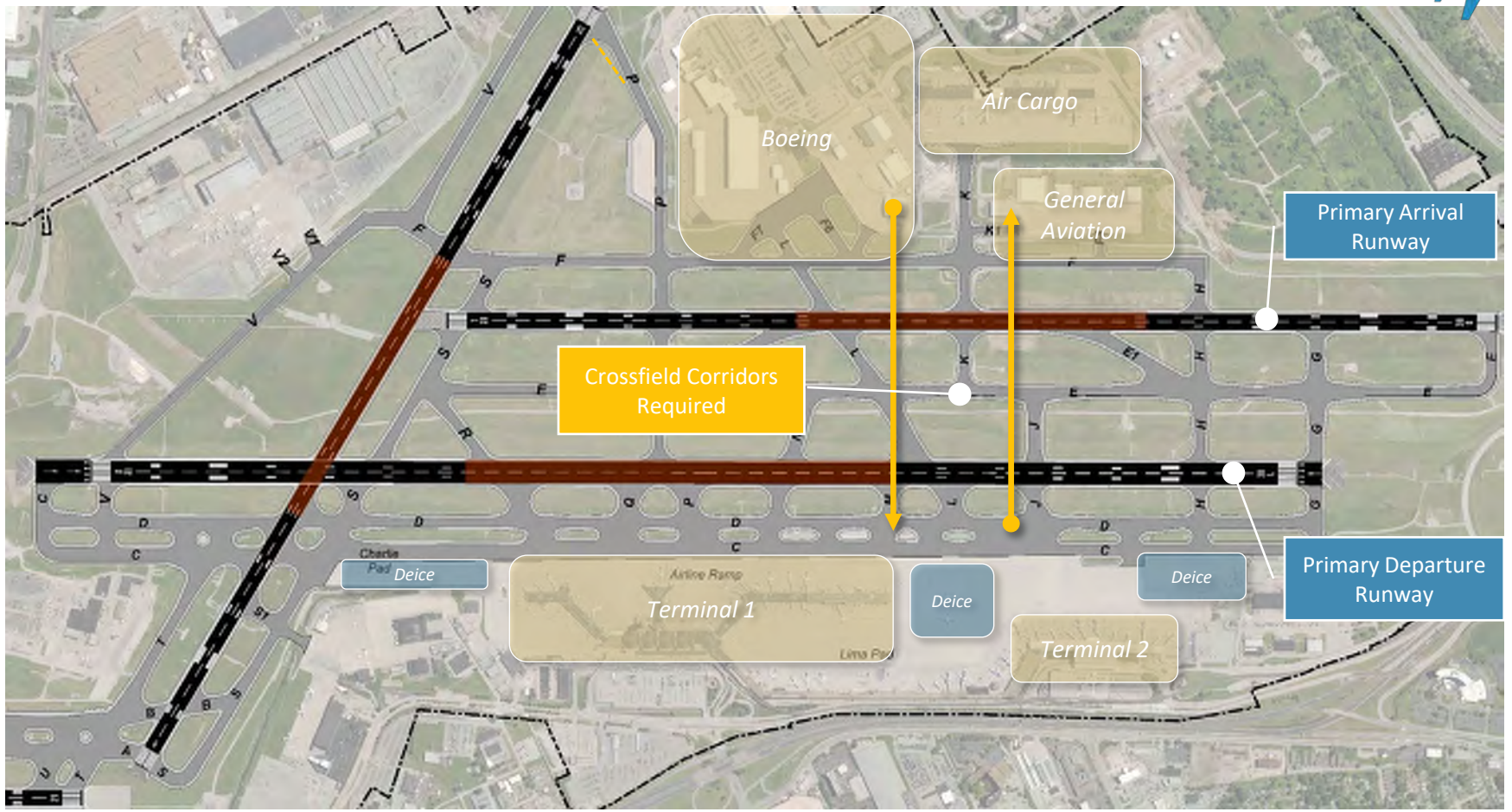
North Airfield – Areas of Assessment



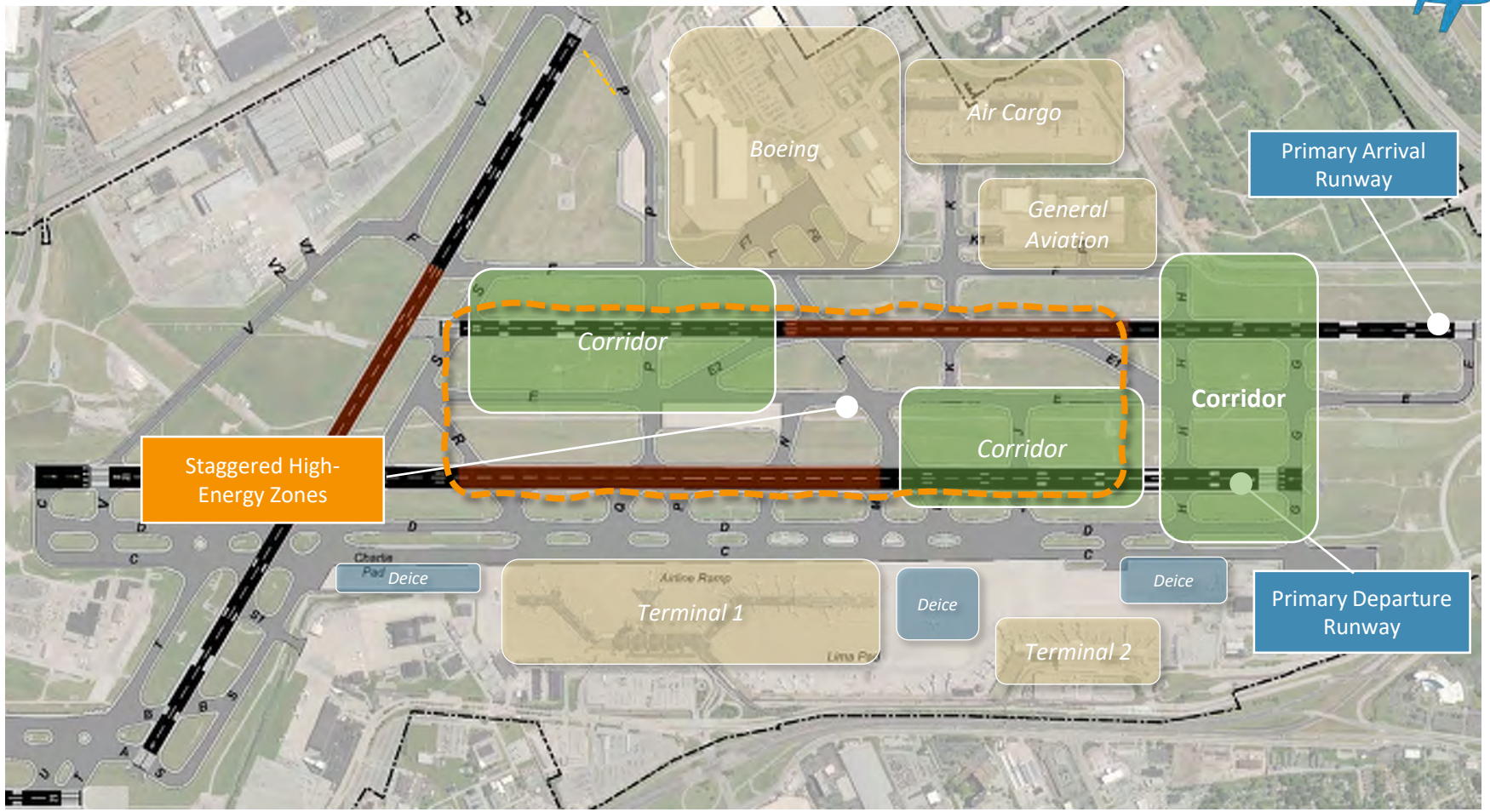
North Airfield (C/D Corridor) – Areas of Assessment



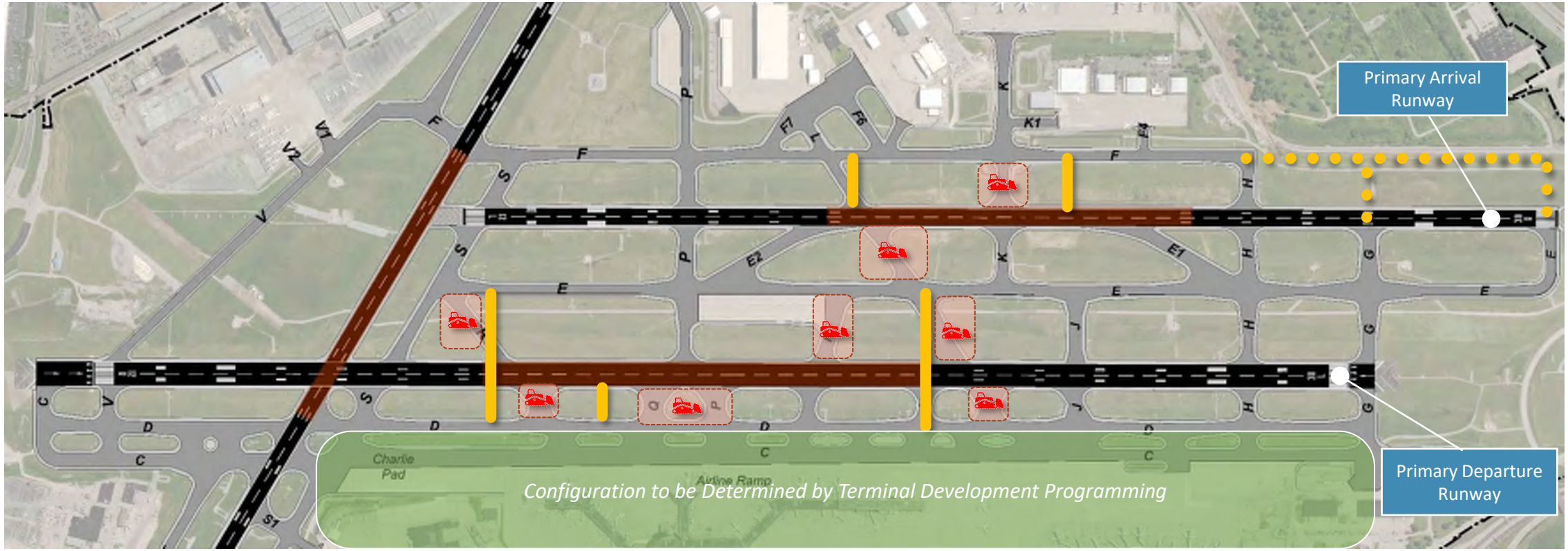
North Airfield – Crossfield Connectivity Objective



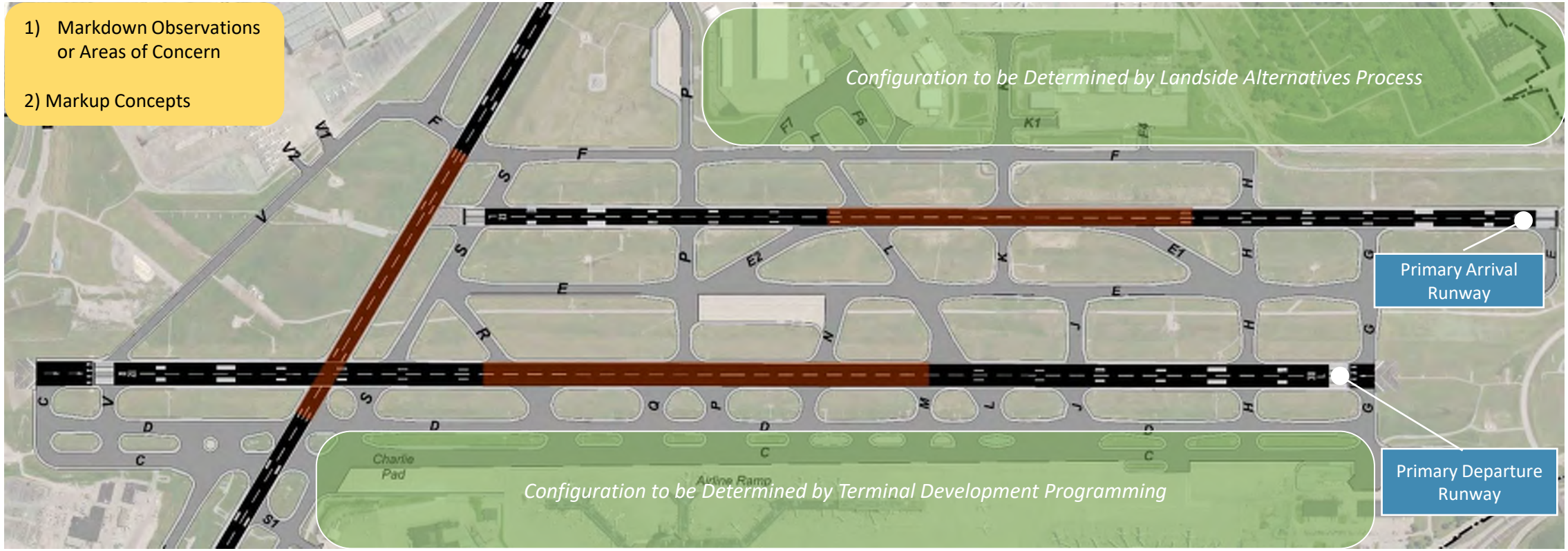
North Airfield – Crossfield Connectivity Assessment



North Airfield – Initial Idea for Conversation



North Airfield – Homework



Next Steps

- Consolidate input from workshop including homework assignment
- Finalize benchmarking criteria
- Selection of airport design standards (-13A vs. -13B)
- Establish planning parameters for terminal taxiway corridor (C/D)
- Develop initial set of airfield concepts for consideration (including benchmarking)
- Conduct follow-up stakeholder engagements to refine airfield concepts

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Thank You

Date: November 19, 2020

Draft Alternatives
January 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

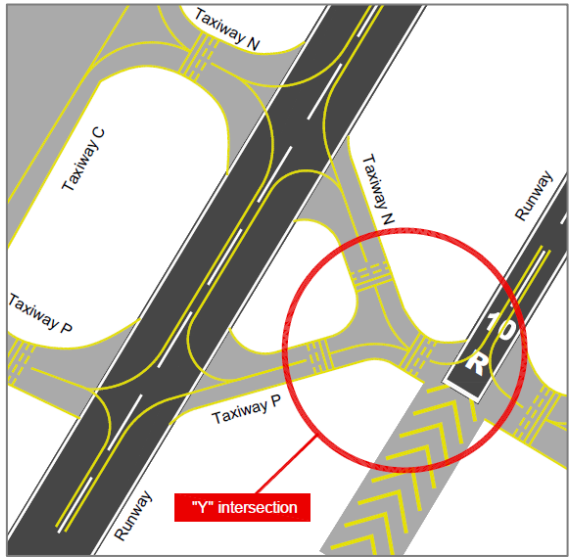
Airfield Alternatives

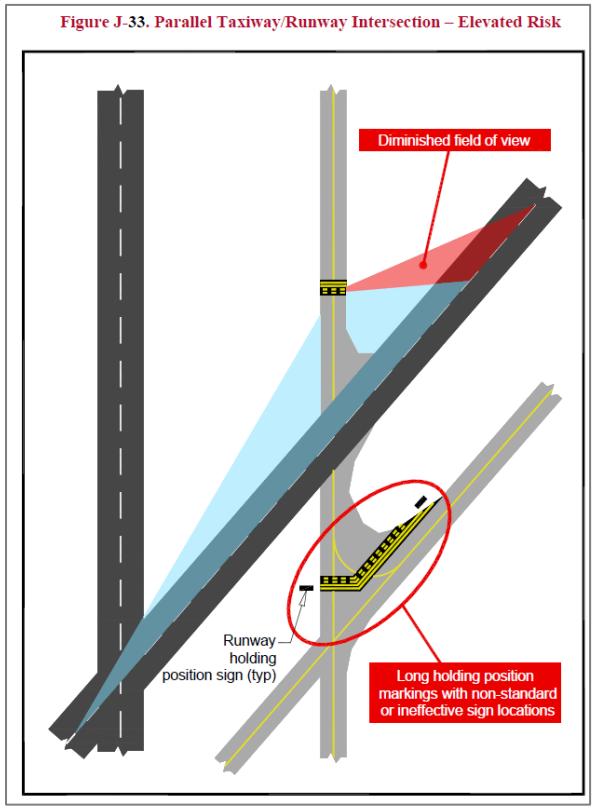
Initial Sketches

Date: January 15, 2021

Evaluation Criteria *(New 13B Considerations)*

- Wide Expanse of Pavement at Runway-Taxiway Interface
- Entrance Taxiway Intersecting Runway at Other Than a Right Angle
- Complex Runway-Taxiway and Taxiway-Taxiway Intersections
- Direct Access from the Apron to a Runway
- High-Speed Exit Crossing Another Taxiway
- High-speed exits leading directly into or across another runway
- Wide Expanse of Pavement at Apron-Taxiway Interface
- Short (stub) Taxiway Connection to a Runway
- Wide Expanse of Holding Bay Pavement
- Collocated High-speed Exit Taxiways
- Fillet pavement between Parallel Taxiways
- Aligned Taxiways
- Taxiway Connections to V-shaped Runways





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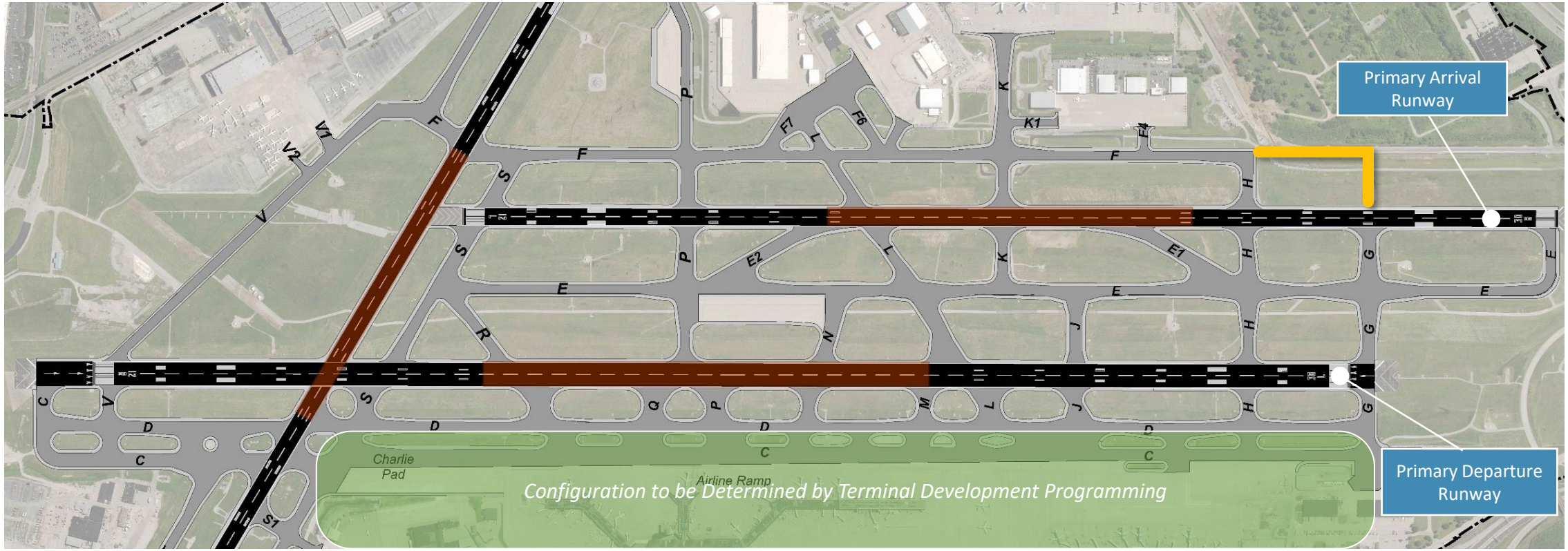
NAVAID Restrictions (ILS Holdshort, App/Dep Holdshort, etc.)	*Creates New Concern*	*No Change*	*Improves Condition*

Initial Assessment Focused on Design Standards & High-Level Operational Considerations

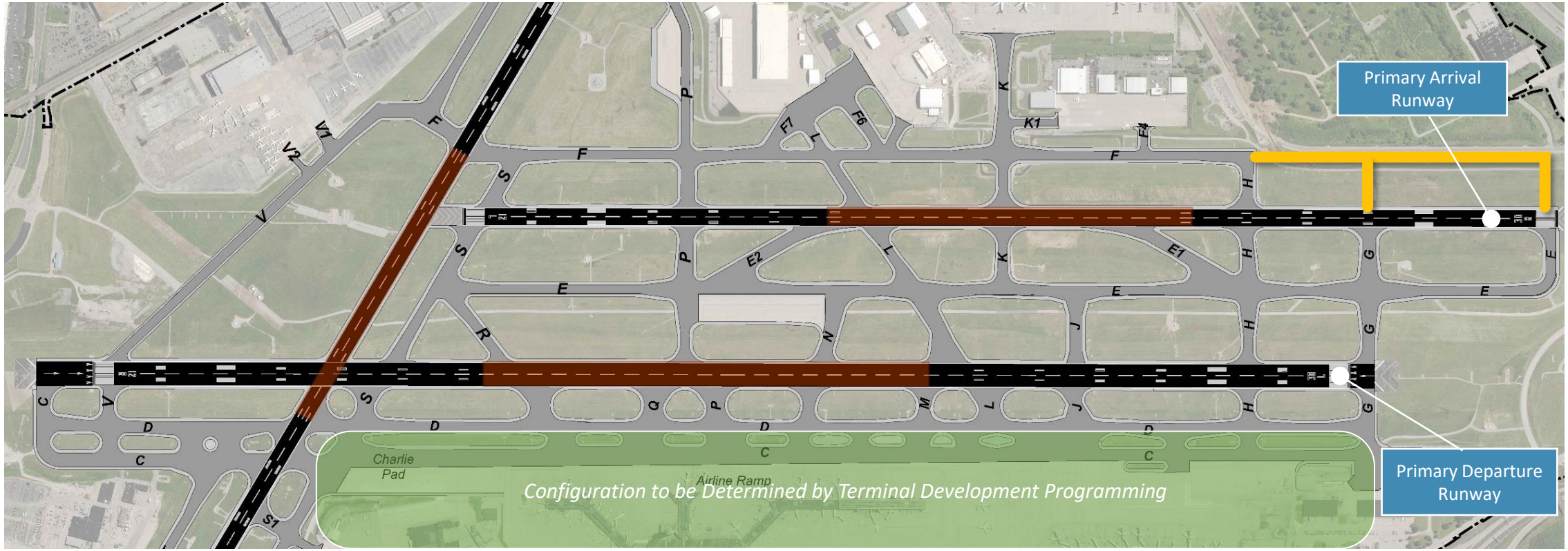
North Airfield – Alternatives

North Airfield – Taxiway F Extension

North Airfield – Partial Extension Taxiway F

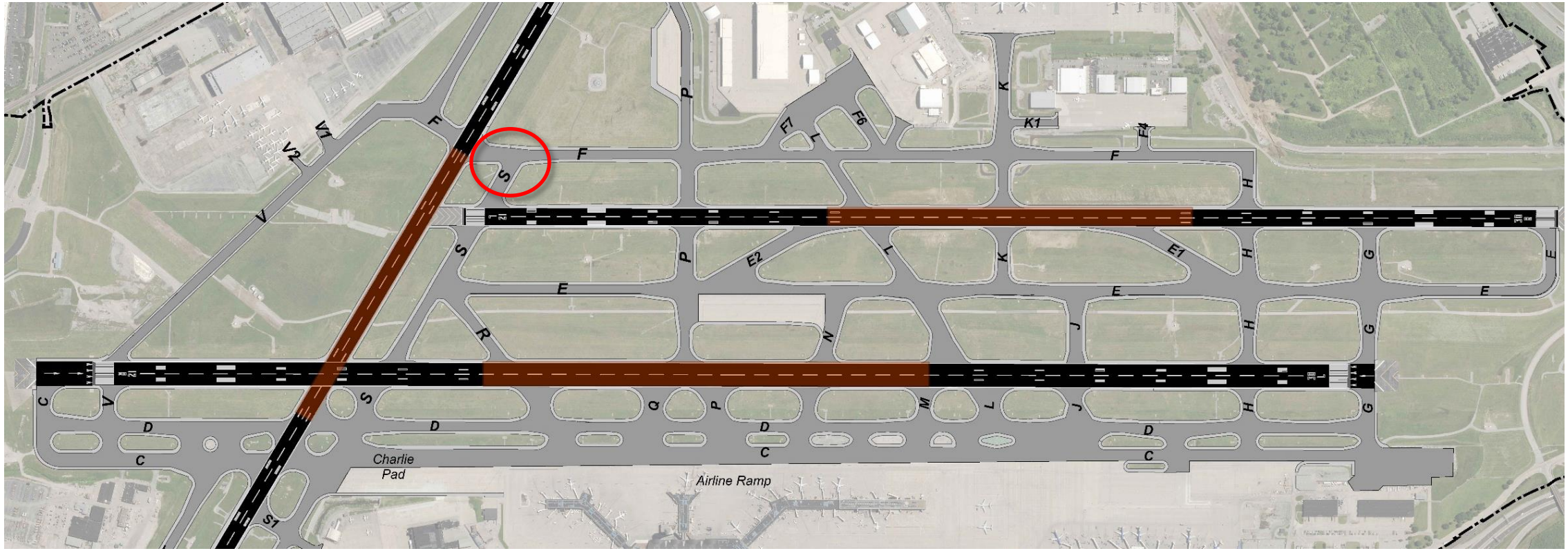


North Airfield – Full Length Parallel Taxiway F

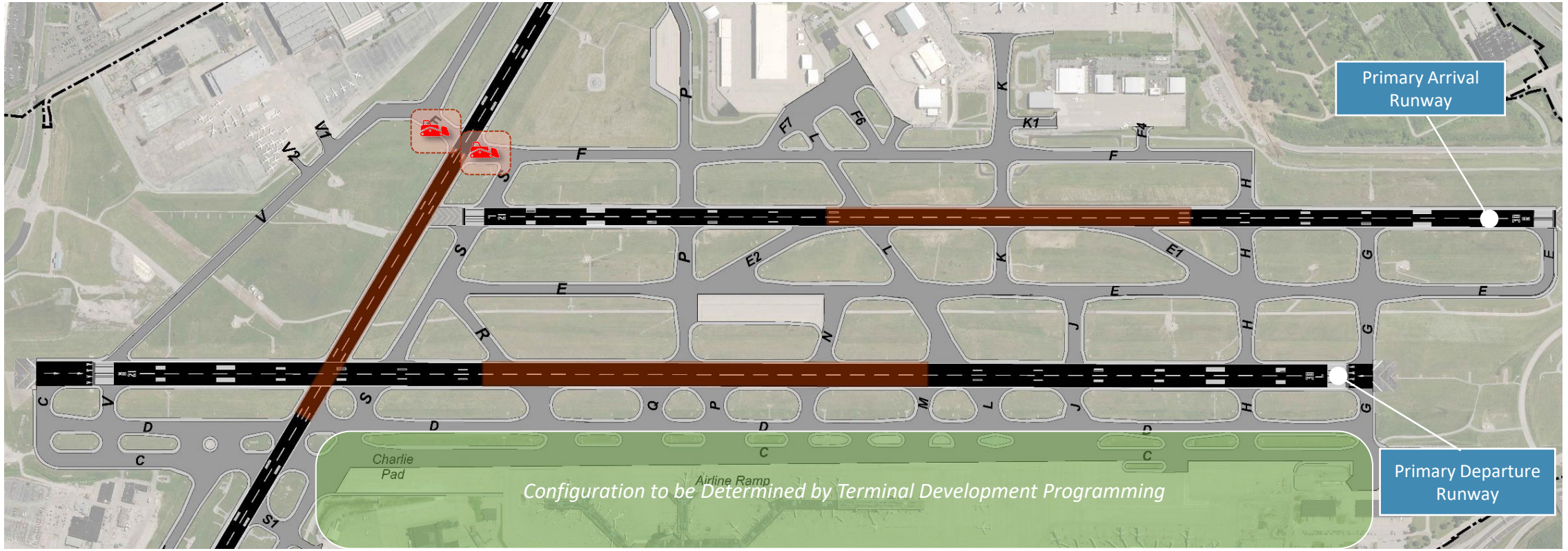


North Airfield – Hot Spot Alternatives

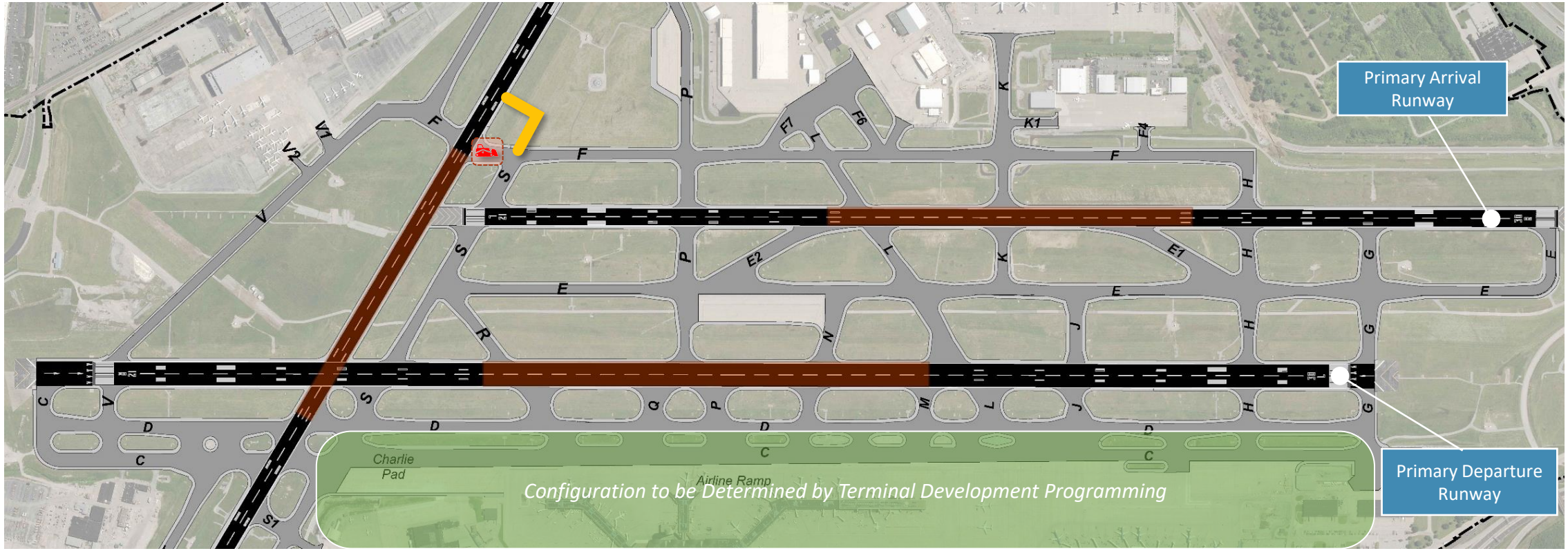
North Airfield – Existing Hot Spot



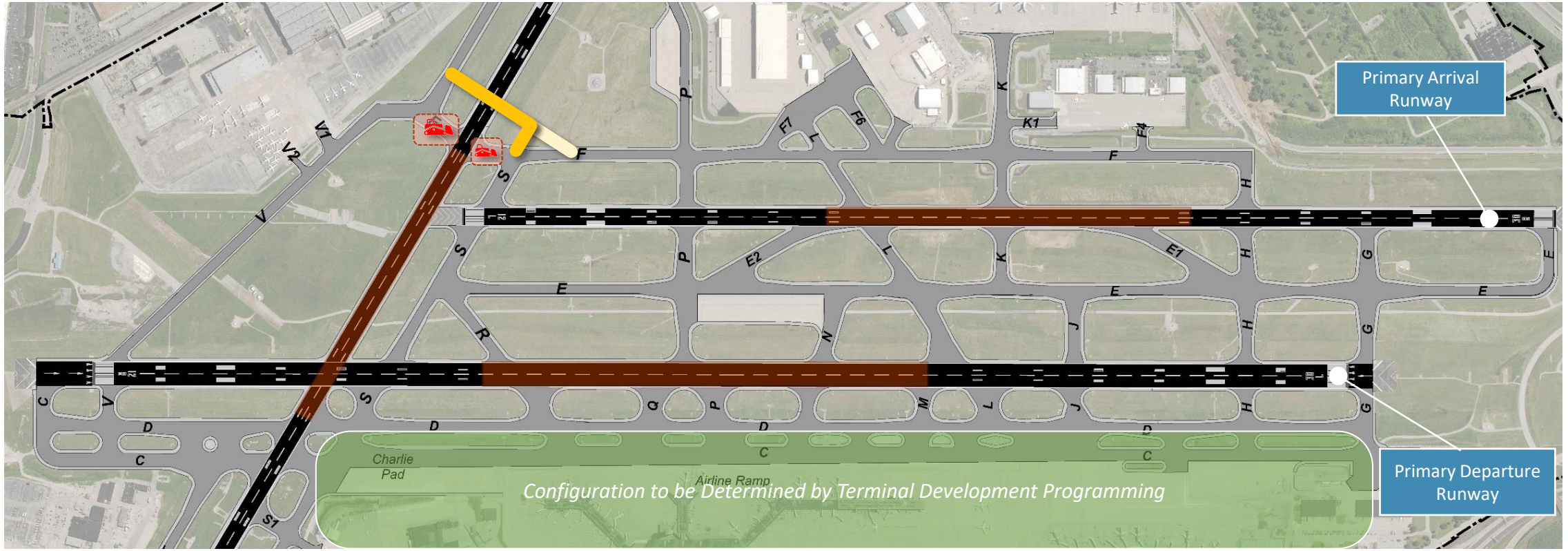
Hot Spot – Alt 1 *(Close Intersection)*



Hot Spot – Alt 2 *(Exit Taxiways Only)*



Hot Spot – Alt 3 *(New Crossing with Option to Realign F)*

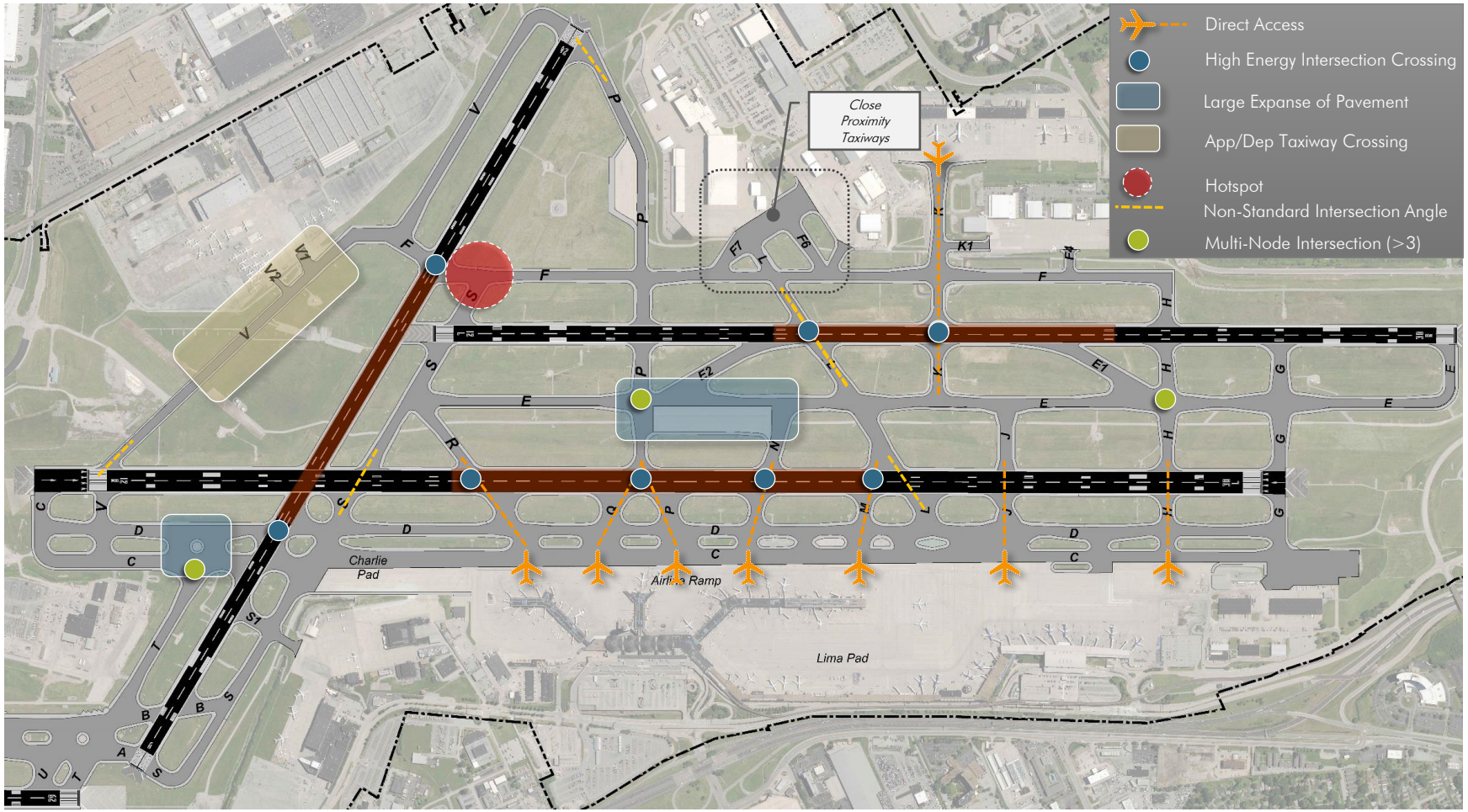


North Airfield – Composite Alternatives

North Airfield Alternatives

- Interchangeable with alternatives for:
  - Taxiway F Extension
  - Hot Spot
  - West Airfield
- Developed to address
  - Non-perpendicular runway crossings
  - High Energy Zone runway crossings
  - Direct Access
    - Direct access from Taxiways C/D addressed via terminal alternatives

North Airfield – Areas of Assessment



TAXIWAY	NON-PERPENDICULAR	HIGH ENERGY ZONE	Direct Access
H			X
J			X
K		X	X
L	X		
M	X	X	X
N	X	X	X
P	X	X	X
Q	X	X	X
R	X	X	X
S	X		
V	X		
C			

North Airfield – Alt 1 *(90°Intersections)*

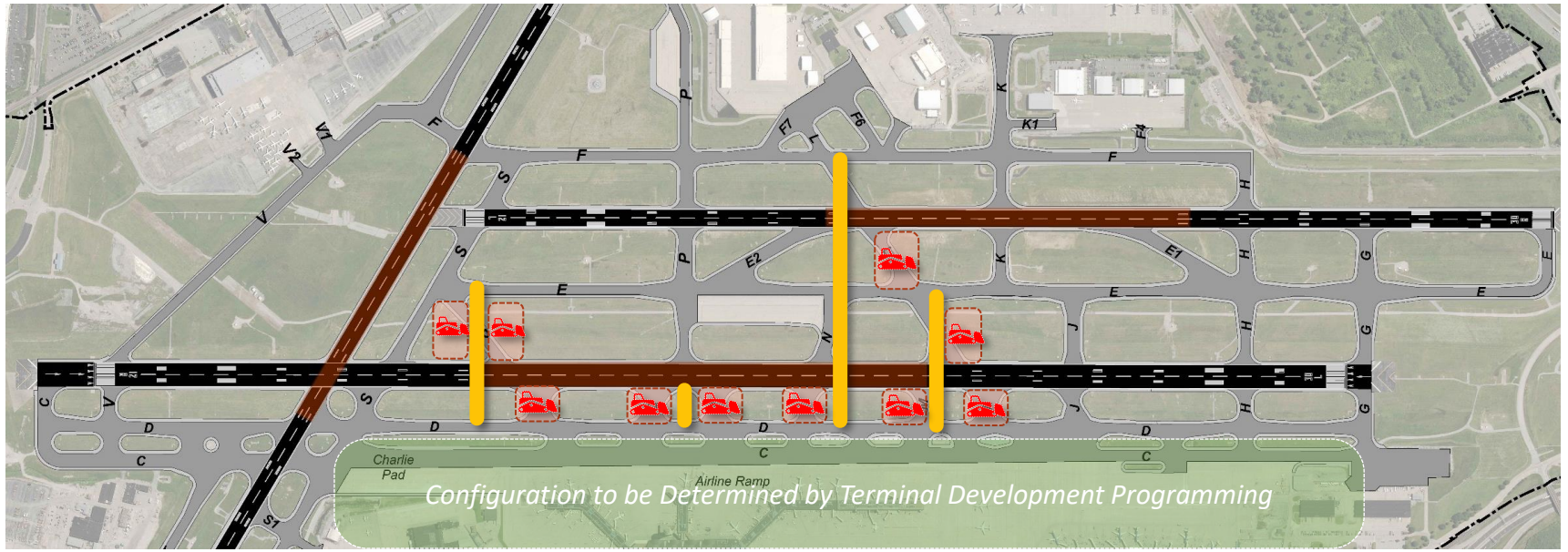
Initial Assessment Criteria

Taxi way	Non-Perpendicular	High Energy	Direct Access	Operational
K	-	✗	✗	–
L	✓	✗	✓	✗
M	✓	✓	✓	–
N	✓	✗	✓	–
P	✓	✗	✓	–
Q	✓	✗	✓	✗
R	✓	✓	✓	–

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted



Direct Access – H & J south of Taxiway D to be resolved via islands or offset Taxiway D/C connectors

North Airfield – Alt 2 *(90°Intersections only 12R/30L)*

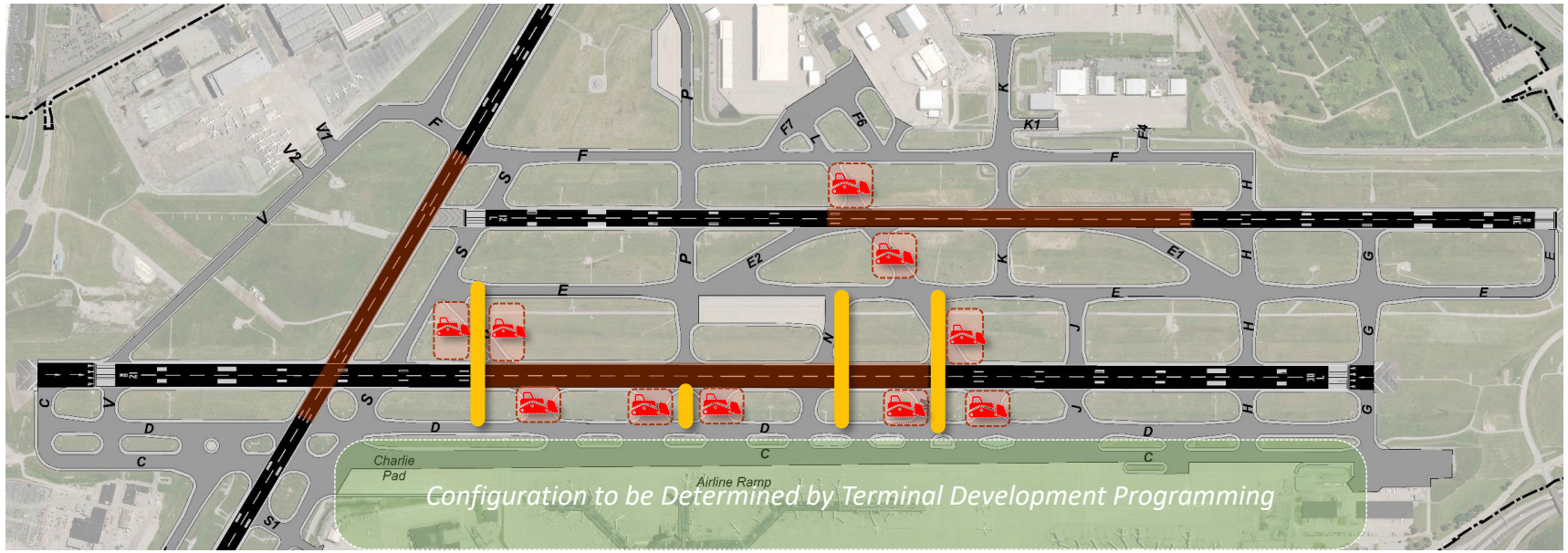
Initial Assessment Criteria

Taxi way	Non-Perpendicular	High Energy	Direct Access	Operational
K	-	✗	✗	–
L	✓	✓	-	✗
M	✓	✓	✓	–
N	✓	✗	✓	–
P	✓	✗	✓	–
Q	✓	✗	✓	✗
R	✓	✓	✓	–

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted



Direct Access – H & J south of Taxiway D to be resolved via islands or offset Taxiway D/C connectors

North Airfield – Alt 3 *(Protect High Energy Zones)*

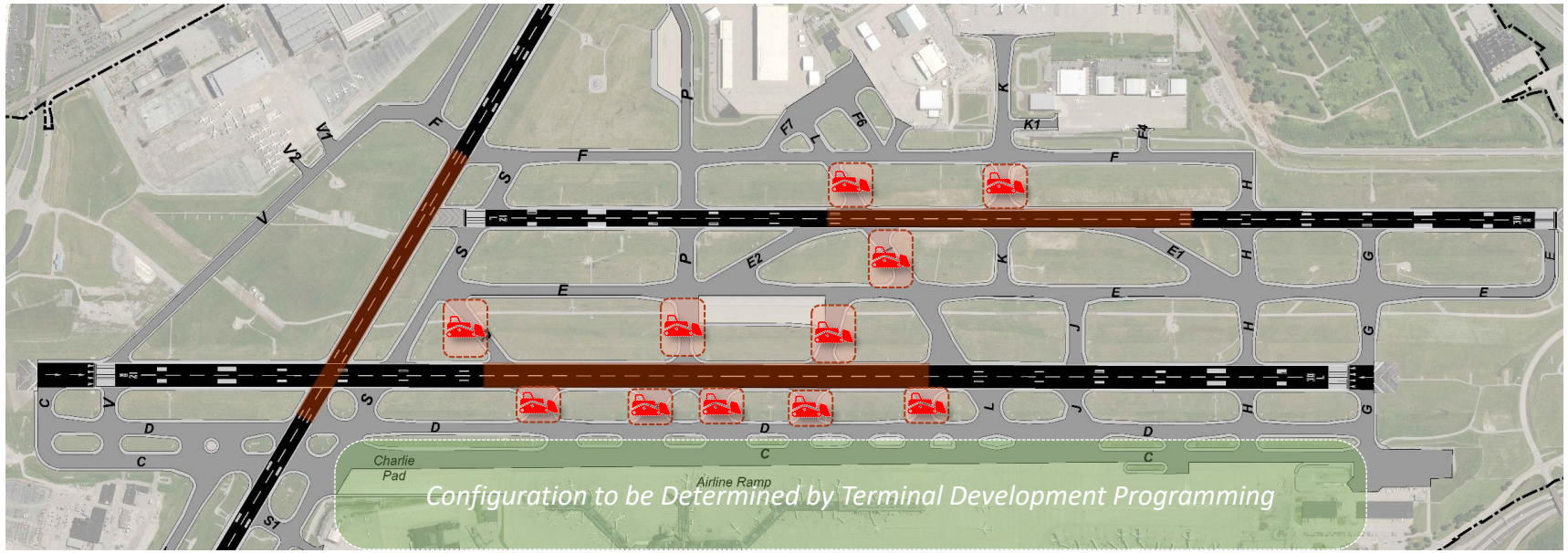
Initial Assessment Criteria

Taxi way	Non-Perpendicular	High Energy	Direct Access	Operational
K	-	✓	✓	✗
L	✗	✓	-	✗
M	✓	✓	✓	–
N	✓	✓	✓	✗
P	✓	✓	✓	✗
Q	✓	✓	✓	✗
R	✓	✓	✓	✗

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted



Direct Access – H & J south of Taxiway D to be resolved via islands or offset Taxiway D/C connectors

North Airfield – Alt 4 *(Composite)*

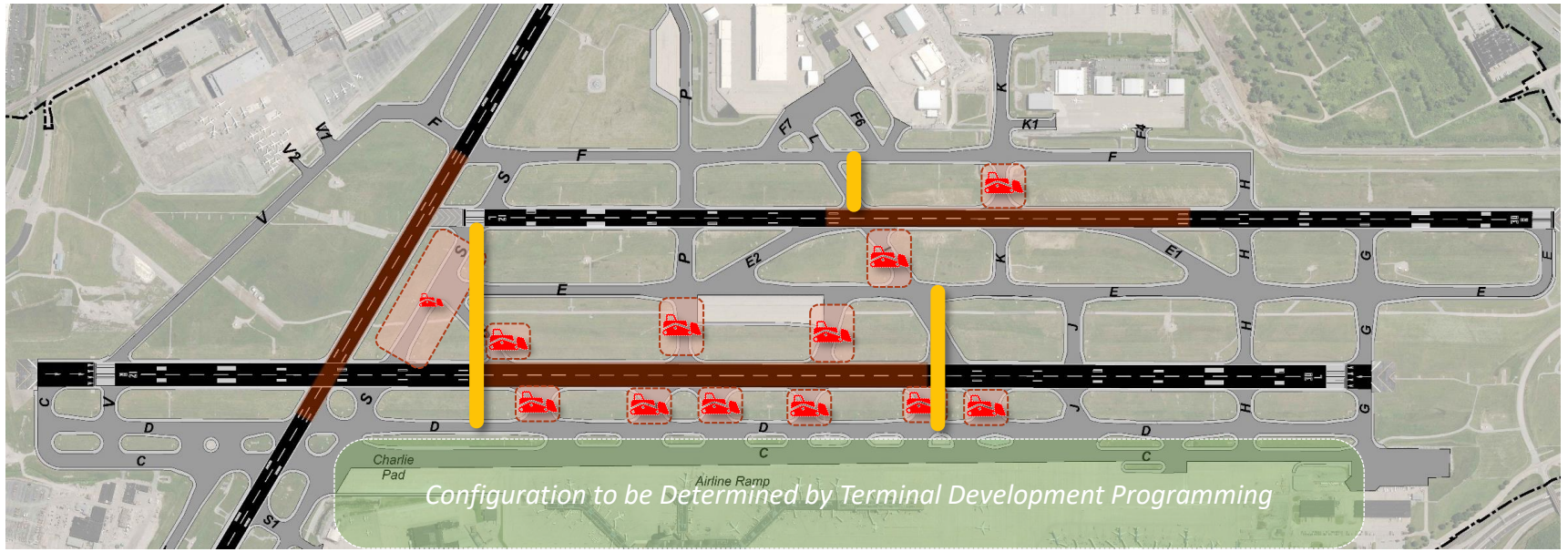
Initial Assessment Criteria

Taxi way	Non-Perpendicular	High Energy	Direct Access	Operational
K	-	✓	✓	–
L	✓	✓	-	–
M	✓	✓	✓	–
N	✓	✓	✓	✗
P	✓	✓	✓	✗
Q	✓	✓	✓	✗
R	✓	✓	✓	✗

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted



Direct Access – H & J south of Taxiway D to be resolved via islands or offset Taxiway D/C connectors

North Airfield – Alt 5 *(Composite)*

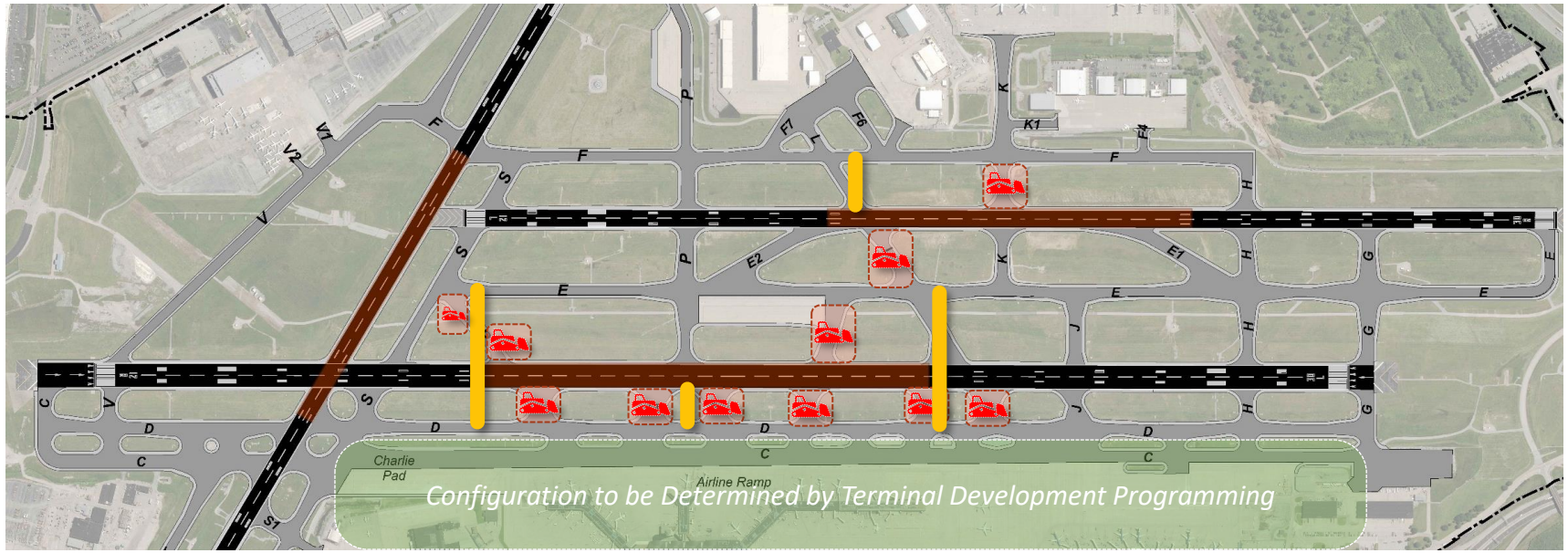
Initial Assessment Criteria

Taxi way	Non-Perpendicular	High Energy	Direct Access	Operational
K	-	✓	✓	–
L	✓	✓	-	–
M	✓	✓	✓	–
N	✓	✓	✓	✗
P	✓	✗	✓	–
Q	✓	✓	✓	✗
R	✓	✓	✓	✗

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted



Direct Access – H & J south of Taxiway D to be resolved via islands or offset Taxiway D/C connectors

North Airfield – Alt 6 *(Composite)*

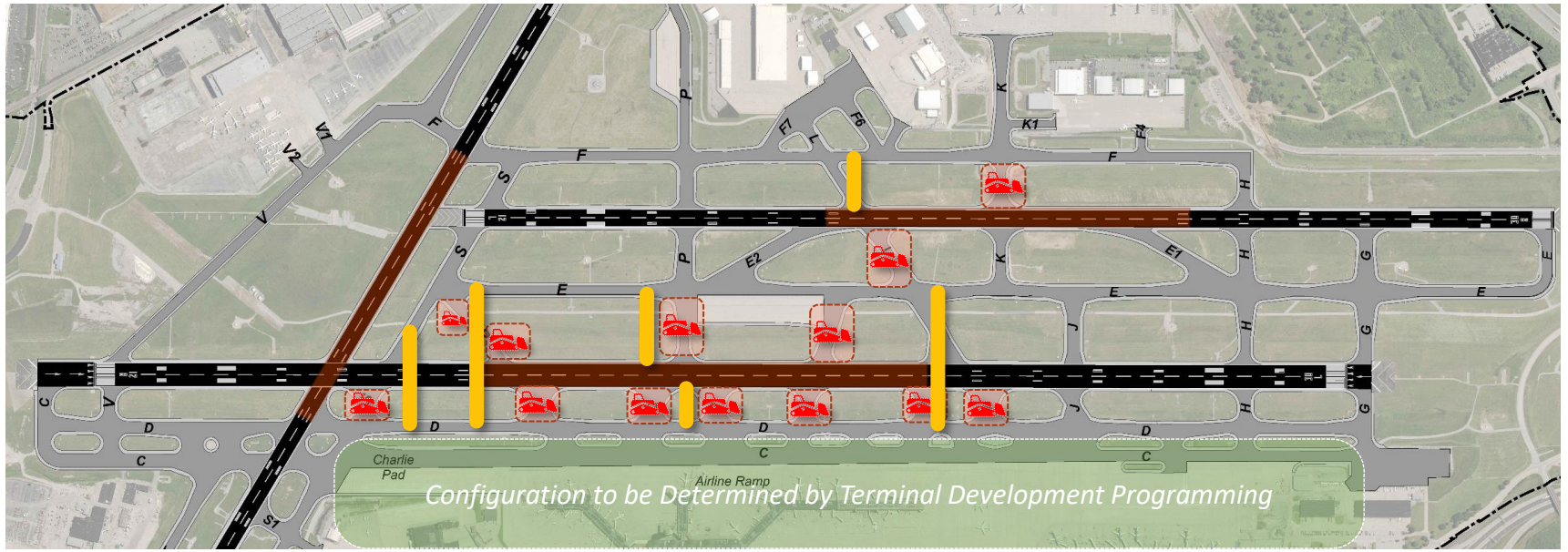
Initial Assessment Criteria

Taxi way	Non-Perpendicular	High Energy	Direct Access	Operational
K	-	✓	✓	–
L	✓	✓	-	–
M	✓	✓	✓	–
N	✓	✓	✓	✗
P	✓	✓	✓	✗
Q	✓	✓	✓	✗
R	✓	✓	✓	✗
S	✓	-	-	✓

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted



Direct Access – H & J south of Taxiway D to be resolved via islands or offset Taxiway D/C connectors

North Airfield – Alt 7 *(Composite)*

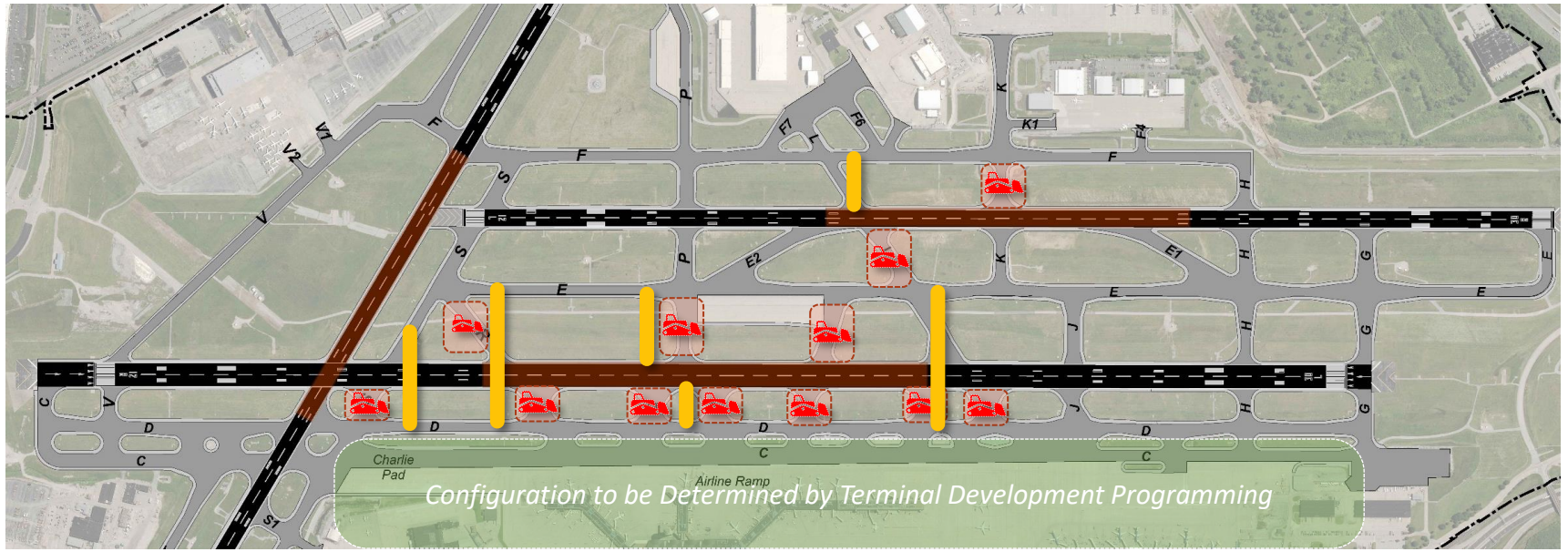
Initial Assessment Criteria

Taxi way	Non-Perpendicular	High Energy	Direct Access	Operational
K	-	✓	✓	–
L	✓	✓	-	–
M	✓	✓	✓	–
N	✓	✓	✓	✗
P	✓	✓	✓	✗
Q	✓	✓	✓	✗
R	✓	–	✓	✗
S	✓	-	-	✓

✓ Resolved

– Improved / Limited Impact

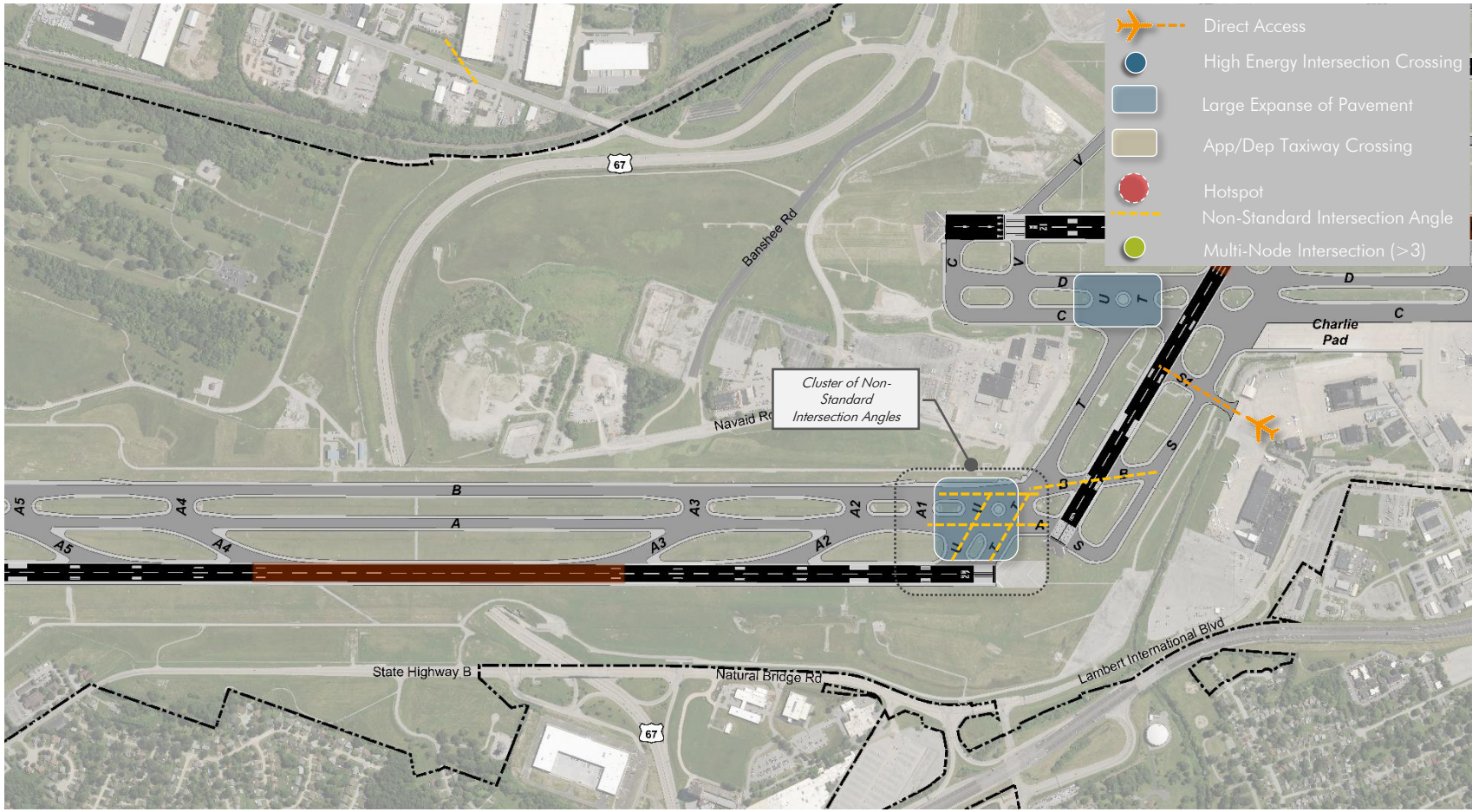
✗ No change/Deteriorated/Impacted



Direct Access – H & J south of Taxiway D to be resolved via islands or offset Taxiway D/C connectors

West Airfield – Alternatives

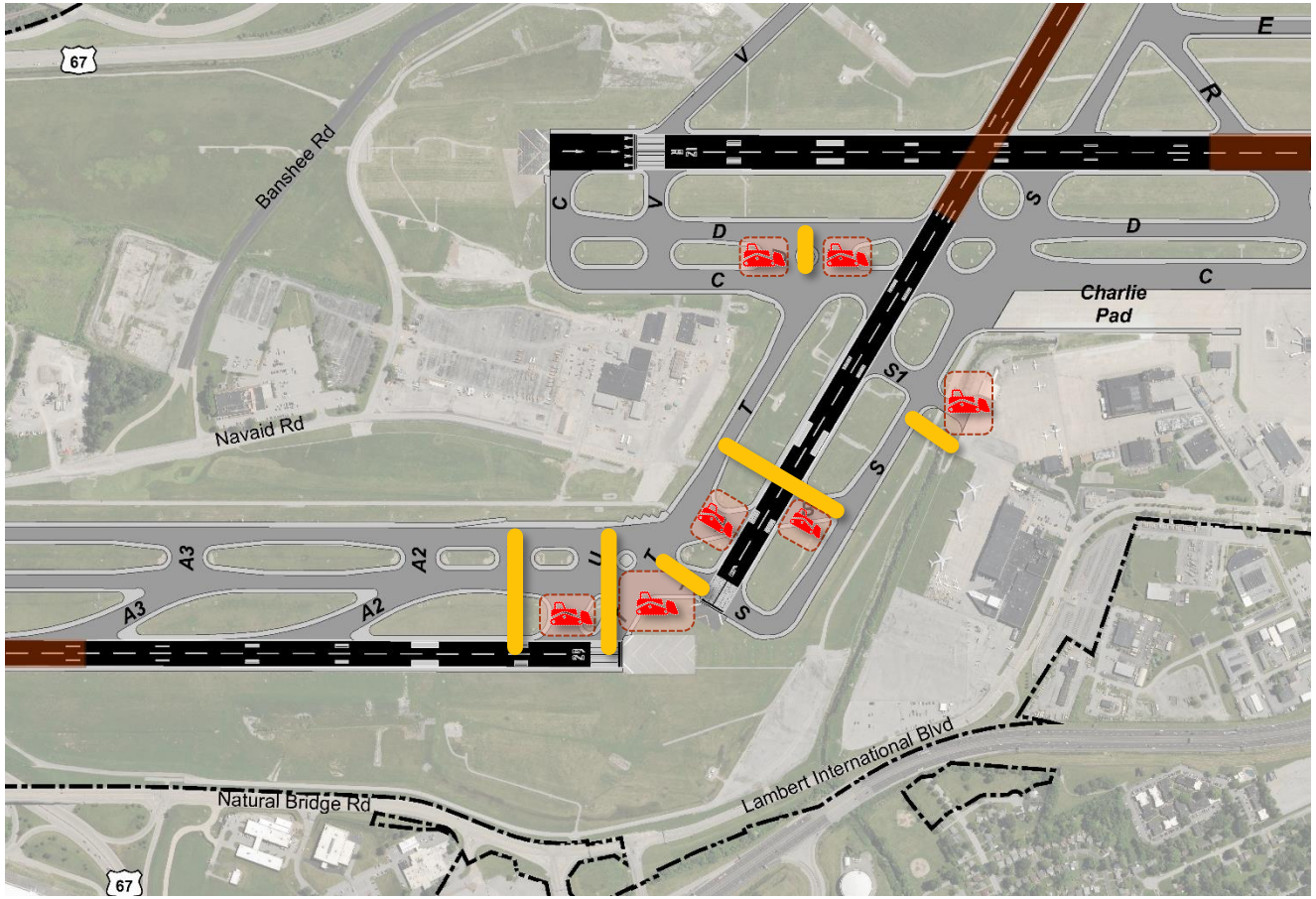
West Airfield – Areas of Assessment



Initial Assessment Criteria

Taxiway	Non-Perpendicular	Direct Access	Confusing Geometry	Operational
U@D			X	X
T@D			X	X
S1		X		X
B	X			X
A@6	X		X	X
T@29	X		X	X
U@29	X		X	X

West Airfield – Alt 1 *(Straighten & Realign All)*



Initial Assessment Criteria

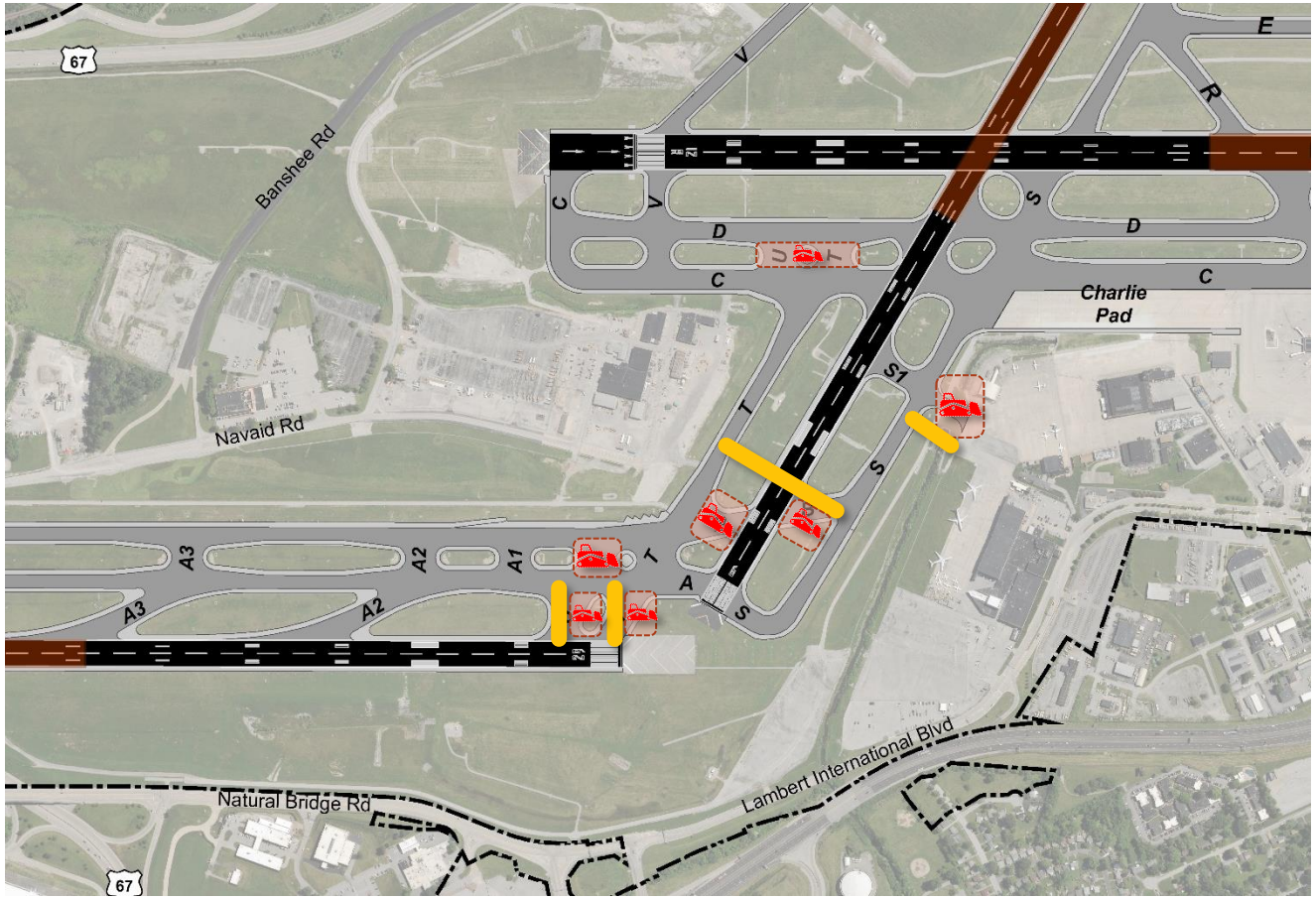
Taxiway	Non-Perpendicular	Direct Access	Confusing Geometry	Operational
U@D	-	-	✓	–
T@D	-	-	✓	–
S1	-	✓	-	–
B	✓	-	-	–
A@6	✓	-	–	–
T@29	✓	-	✓	–
U@29	✓	-		–

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted

West Airfield – Alt 2 *(Removal & Straighten)*



Initial Assessment Criteria

Taxiway	Non-Perpendicular	Direct Access	Confusing Geometry	Operational
U@D	-	-	✓	✗
T@D	-	-	✓	✗
S1	-	✓	-	–
B	✓	-	-	–
A@6	✗	-	–	–
T@29	✓	-	–	–
U@29	✓	-		–

✓ Resolved

– Improved / Limited Impact

✗ No change/Deteriorated/Impacted

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Thank You

Date: January 15, 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Workshop #2
March 2021

Airfield Alternatives 2nd Round

Meeting Minutes

Virtual Meeting - Zoom

March 5, 2021 12:30pm - 2:30pm (CDT)

IN-ATTENDANCE

FAA Airports: Todd Madison, Mark Schenkelberg, Mark Cozad

FAA Runway Safety Group: Tom Frakes,

FAA Air Traffic: Ryan Vogt, James McGee

STLAA: Jerry Beckmann, Dana Ryan, Ron Stella, Dave Kulinsky

WSP: John Van Woensel, Jennifer Kuchinski, Eliane Grayer

CMT: Doug Gregory, Nick Brown, Andy Bodine

Faith Group: Dave Fleet

MEETING AGENDA

Opening Discussion (Slide 1)

- Purpose of meeting is to introduce the team to various airfield alternatives

Evaluation Criteria (Slides 2-4)

- Doug Gregory explains:
    - Draft FAA Advisory Circular (AC) 150/5300-13B, Airport Design used as part of the airfield alternatives concepts
    - Stoplight concept to facilitate easy screening of concepts from an initial review perspective
    - Will settle on up to 5 airfield concepts for consideration and the end goal of witling down to 2 concepts for safety evaluation and eventual preferred alternative following safety screening.
    - Deeper explanation and definition of initial screening and assessment criteria

Airfield & Taxiway Utilization (Slides 5-7)

- Provide a high-level understanding of arrivals and departures and taxi routing when the airport is operating in certain flow configurations.
    - Northwest Flow – 55% of the time (Doug explains taxi routing)
    - Southeast Flow – 45% of the time (Doug explains taxi routing)

North Airfield – Taxiway Foxtrot Extension (Slide 9)

- Doug Gregory explains showing the extension of parallel Taxiway Foxtrot as full-length.
- Doug Gregory explains metrics behind usage of Taxiway Foxtrot (eliminates crossing the active arrival runway (30R) to depart 30L departure).
- Todd Madison said that in the previous master plan, Taxiway Foxtrot extension was a preferred alternative, but it required the relocation of McDonald Boulevard. Doug Gregory said that was still the case.
- Jerry Beckmann also said there's a possibility that McDonald Boulevard ends up being terminated at Scudder Boulevard depending on the outcome of various traffic studies.
- Doug Gregory asked if departures from North Airfield would be launched on 30R if Taxiway Foxtrot was extended. James McGee said it would provide that opportunity, but 30R is typically the arrival runway in the northwest flow. James also said heavy jets would likely not be taken to 30R because it would take 30L departures down for 3 minutes (due to wake turbulence rules).
- Tom Frakes asked James McGee about intersection departures on 30R at Hotel of GA aircraft coming from Signature FBO. Idea would be to eliminate crossings. They have used this in the past if they can be departed in a timely fashion. James McGee responded that there are intersection departures allowed when there is no potential for interference with 30R arrivals.

North Airfield – Hot Spot #1 (Slides 10-11)

- Doug Gregory: explanation of taxi routes and issues at the intersection defined as hot spot #1 which is the intersection of Taxiway Foxtrot with Runway 6/24
- Explanation of demand related to this intersection
- Doug Gregory explains the mitigation alternatives available
- Tom Frakes commented that he would prefer not to remove an exit and agrees that implementing a turn to cross Runway 6/24 may be able helpful in deterring pilots from encroaching on Runway 6/24. However, does not want 12R departures being taken across both parallels.
- Todd Madison asked if aircraft taxiing via Victor to 12R for departure take the intersection departure (enter the runway for departure at Victor) or if they cross 12R, join Delta to the end for a full-length departure (would introduce a runway crossing event to depart 12R). James McGee said that the Victor intersection departure is used consistently for activity from north cargo, Signature, and Boeing and believes that represents a better option than crossing the active runway for departure.

North Airfield – Taxiway Sierra & Runway 12R/30L (Slides 12-13)

- Doug Gregory: Explanation of overview, assumptions and alternatives at Sierra and Runway 12R/30L
- Tom Frakes defers to air traffic but prefers Alternative #1 "single direct shot" to Runway 12L from Delta. James McGee follows up and prefers option 2 because it may be more beneficial from an overall taxiway perspective.

North Airfield – Taxiway Romeo & Runway 12R/30L (Slides 14-15)

- Doug Gregory: Explanation of overview, assumptions and alternatives at Romeo and Runway 12R/30L
- James McGee says that they would love to have both Romeo and Sierra for operational flexibility particularly in the Northwest flow. Their preference is the third option even though Romeo would fall marginally in the high-energy zone. Feels that maybe separation distance on the second alternative may result in taxi restrictions.
- Tom Frakes said that on the previous intersection, if you put Sierra at a 90-degree crossing may result in a hold position marking on the straight section, but could be visually difficult as you make the turn from one portion of sierra on to the straight section.
- Tom Frakes agrees that both alternatives are viable given their negligible change in distance between each other.
- Jerry Beckmann mentioned that the airport is making a concerted effort to get the intersections to standards as part of the Runway 12R reconstruction and the ALP Update is part of that coordinated effort.

North Airfield – Taxiways Papa and Quebec & Runway 12R/30L (Slides 16-18)

- Doug Gregory: explanation of overview, assumptions, and alternatives related to Taxiways Papa and Quebec and Runway 12R/30L
- Doug Gregory explains Taxi distance impact to Terminal 1 when considering a holistic shift from Lima to Sierra.
- James McGee mentions that option #3 would satisfy several concerns, but south of Quebec, that island could be problematic for taxi routing. Doug mentioned it was intended to remove direct access via Quebec but could look at option to keep a connector while still addressing direct access.
- Tom Frakes could support either option but would worry about missing Papa and getting on E2 and incurring on the 12L.
- Todd Madison asked if there was consideration for Papa, Echo, Echo-2 was reviewed as a multi-node intersection (this also applies to Hotel, Echo, and Echo-1). Also asked about the holding bay within this alternative and how this intersection interacts. Doug Gregory explains that the bay was not considered as part of the analysis, but that multi-node characteristics were considered as part of this overall intersection.
- Todd Madison asked if Echo-2 meets the current design standards – or would there be an opportunity to reconstruct them and what would that look like? Would they line up with Quebec? A review of these locations and standards may be beneficial. FAA noted that when high speeds require reconstruction, design standards will need to be met.
    - Doug Gregory says analysis will be completed regarding existing versus new standard templates for high-speed exit taxiways
- Todd Madison does not understand why ROT on 12R/30L is a pertinent conversation when 12L/30R is used for arrivals (i.e. the exception, not the rule).

North Airfield – Taxiway November & Runway 12R/30L (Slides 19-20)

- Doug Gregory: explanation of overview, assumptions, and alternatives related to Taxiway November & Runway 12R/30L
- Tom Frakes defers to Airports and ATCT, but he questions the need for November at all. Doug Gregory explains that if they close the north segment of November, then it eliminates the crossing as opposed to the exit all-together.
- Todd Madison followed up by asking if there was an operational need for the taxiway at all. James said from a tower perspective that it is likely not needed. Mentions that it increases ROT in the event that 30L is used for arrivals, but again that's the exception from an operational perspective.
- Following input from the group, consensus was built around Alternative #1

North Airfield – Taxiway Mike & Lima & Runway 12R/30L (Slides 21-24)

- Doug Gregory: explanation of overview, assumptions, and alternatives related to Taxiway Lima, Mike & Runway 12L/30R
- Todd understands the need to look at these intersections and exit/crossing options in a holistic manner. Doug Gregory echoes the sentiment of maintaining access to T1 and T2. Ultimately this flavors how Lima may be addressed holistically.
- Tom Frakes says that all alternatives could be viable options but likes Alt. #2 for the 90-degree crossing that would be provided. He said ramp traffic should be considered within the context of deicing capabilities (Mike deice) adjacent to this area.
- Ryan Vogt and the tower prefer Atl. #1 for the exact reason that Tom Frakes mentioned. The primary reasoning was providing a 90-degree crossing.
- Doug Gregory explains utilization and demand for use of Taxiway Lima particularly as it relates to arrivals Runway 30R
- Todd Madison asks if landing 30R ROT is actually longer given the angle of existing Taxiway Lima (120° turn off the runway). Asked given the proximity to Echo-2, why have both?
- Ron mentioned positioning of these taxiways may be affected by the ultimate position of the terminal core.
- Tom Frakes prefers an alternative similar to Alt. #3 that would eliminate Lima both sides of 12R as well as Echo-2. Ron Stella asks about a potential combination of Alt 2 and 3 that may satisfy Tom Frakes's concerns. Will put together a combination that shows staggered exits.
- James McGee would prefer to create a 90-degree angle intersection with Lima and Runway 12L/30R due to size restrictions currently in place. Likes option #3 but could affect how Kilo operates. May provide an opportunity to remove Kilo north of Runway 12R to eliminate the crossing.

North Airfield – Taxiway Kilo & Runway 12L/30R (Slides 25-26)

- Doug Gregory: explanation of overview, assumptions, and alternatives related to Taxiway Kilo with Runway 12L/30R
- Tom Frakes asks if Kilo is removed, and Lima is straightened from Foxtrot to Delta if that had been considered.
    - Doug Gregory said that would be evaluated.
- James McGee said if you remove Taxiway K and you miss Lima on landing Runway 12L (the southeast flow), then you are all the way down to Hotel for arrivals heading to the north side of the airfield. One option may be to look at offsetting the Kilo to the east in an effort to reduce reliance on Lima. Given the number of exits on the south side of Runway 12L, there is a possibility of removing Kilo to the south of Runway 12L.
- Todd Madison wonders if any consideration given to Echo-1, Hotel and Echo and whether or not that was evaluated in terms of layout/expansive pavement.
    - Doug Gregory said new high speed exit template would be evaluated.

West Airfield – Taxiway Tango, Uniform, and Alpha & Runway 11/29 (Slides 28-29)

- Doug Gregory: explanation of overview, assumptions, and alternatives related to Taxiway Bravo, Tango, Uniform and Alpha with Runway 11/29
- James McGee mentions that in Option 3 that the taxiway south of Bravo crossing Runway 6/24 is in the RPZ for Runway 29 arrivals (Taxiway Alpha at Runway 6 and Taxiway Sierra between Taxiway Bravo and Runway 6).
- Tom Frakes stated that a few years ago, aircraft taxiing via Tango for departure Runway 29 would begin a turn left on Alpha which would result in runway incursion (not cleared to enter Runway 6). Following those events, enhanced marking, and signage improvement significantly reduced frequency of events (signage and marking are key). No specific alternative was identified as an issue.
- Todd Madison provided additional comment to consider impacts to the End-Fire Glideslope associated with Runway 6 during alternatives process

West Airfield – Taxiway Bravo and Sierra & Runway 6/24 (Slides 30-31)

- Doug Gregory: explanation of overview, assumptions, and alternatives related to Taxiway Bravo and Sierra with Runway 11/29
- Todd Madison asked if on Alt. 2 are Alpha and Sierra being shown as removal and Doug Gregory explained that is correct and would result in a new threshold for Runway 6.
- James McGee says that Sierra-1 could end up being necessary if there are arrivals for Runway 24. -800/-900 series 737's arriving Runway 24 is a possibility and having a taxiway similar to Sierra-1 would be beneficial.
- Todd Madison provided additional comment to consider impacts to the End-Fire Glideslope associated with Runway 6 during alternatives process

West Airfield – Taxiway Tango and Uniform @ Taxiway Delta and Charlie (Slides 32-33)

- Doug Gregory: explanation of overview, assumptions, and alternatives related to Taxiway Tango, Uniform at Taxiway Delta and Charlie
- James McGee mentions that in a southeast flow, departure Runway 12R, Runway 11 arrivals will taxi Tango → Charlie to the terminal. They'll use Uniform to transition to Charlie to bypass the departure and so maintaining this flexibility (maintaining a connection between Delta and Charlie) is key.

Next Steps (Slide 34)

- Doug Gregory explanation of upcoming tasks and steps
    - Refinement of alternatives
    - Use of new high-speed exit templates for Echo-1 and Echo-2
    - Additional alternatives for exit points from 12L/30R in the area of Kilo
    - Allocation of intersection concepts into airfield centric alternatives (up to 5 layouts if needed)
    - Analysis of impacts associated with airfield alternatives
    - Presentation of refined airfield alternatives with objective of paring down to 2 airfield layouts
    - Conduct SRA workshop
    - Selection of preferred airfield alternative
    - Integrate preferred airfield layout into draft Airport Layout Plan set

Workshop #2
March 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

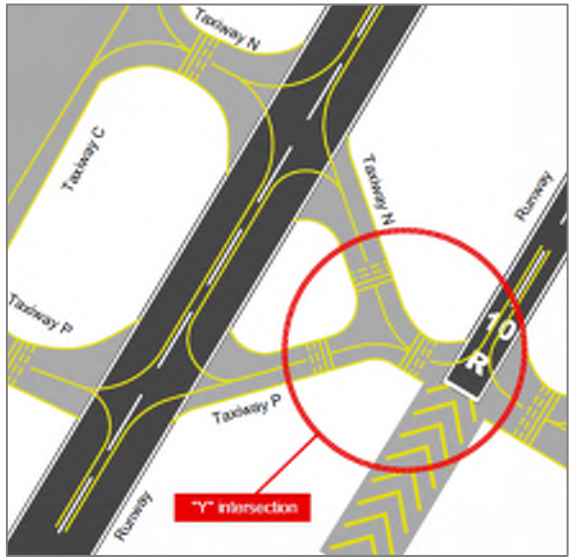
Airfield Alternatives

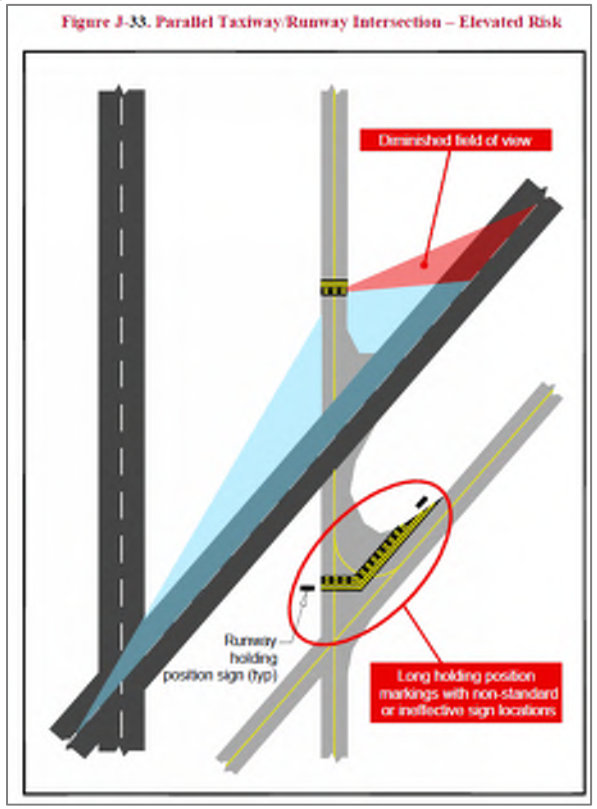
Workshop #2 (FAA & STLAA)

Date: March 5, 2021

Evaluation Criteria *(New 13B Considerations)*

- Wide Expanse of Pavement at Runway-Taxiway Interface
- Entrance Taxiway Intersecting Runway at Other Than a Right Angle
- Complex Runway-Taxiway and Taxiway-Taxiway Intersections
- Direct Access from the Apron to a Runway
- High-Speed Exit Crossing Another Taxiway
- High-speed exits leading directly into or across another runway
- Wide Expanse of Pavement at Apron-Taxiway Interface
- Short (stub) Taxiway Connection to a Runway
- Wide Expanse of Holding Bay Pavement
- Collocated High-speed Exit Taxiways
- Fillet pavement between Parallel Taxiways
- Aligned Taxiways
- Taxiway Connections to V-shaped Runways





Draft Evaluation Criteria *(Assessment of Full Airfield Concepts)*

- Stoplight concept
- Built from guiding principles previously discussed
- Easy screening of concepts
- Initially subjective definition but consensus is critical
- If concept scores all green and/or yellow, the concept is carried forward in analysis

Benchmarking Criteria	Stoplight Scoring Criteria		
	✖	●	✓
Safety			
Hotspot	*Creates New Concern*	*No Change*	*Improves Condition*
Non-Standard Intersection Angle (Preferred is 90°)	*> 3 Locations*	*2 or 3 Locations*	*< 2 Locations*
High-Energy Runway Crossings (Intersection)	*3+ Locations*	*1 or 2 Locations*	*No Locations*
Direct Access (Apron to Runway)	*3+ Locations*	*1 or 2 Locations*	*No Locations*
Operational			
Taxi Time/Distance to Runway Complex	*Increases*	*Neutral*	*Decreases*
Runway Occupancy Time (ROT)	*Increases*	*Neutral*	*Decreases*
Low Visibility Route (Distance)	*Increases*	*Neutral*	*Decreases*
Departure Queue at Runway End	*Reduces*	*Neutral*	*Increases*
Operational Restrictions	*Creates New Concern*	*No Change*	*Improves Condition*
NAVAID Restrictions (ILS Holdshort, App/Dep Holdshort, etc.)	*Creates New Concern*	*No Change*	*Improves Condition*

Initial Assessment Focused on Design Standards & High-Level Operational Considerations

Initial Screening of Refined Conceptual Alternatives

- Stoplight concept – easy screening of concepts
- Assessment criteria - definitions
  - Provides a 90° Intersection Crossing (green or red)
  - Crossing Outside High-Energy Zone (green or red)
  - Eliminates Direct Access from Apron (green or red)
  - Impact to Runway Occupancy Time (ROT)
    - Green – less than 2 seconds
    - Yellow – 2 to 5 seconds
    - Red – greater than 5 seconds
  - Primary Taxi Routing (Distance)
    - Green – No impact or limited impact (less than a 15% increase in taxi distance)
    - Red – impact (15% or greater increase in taxi distance)

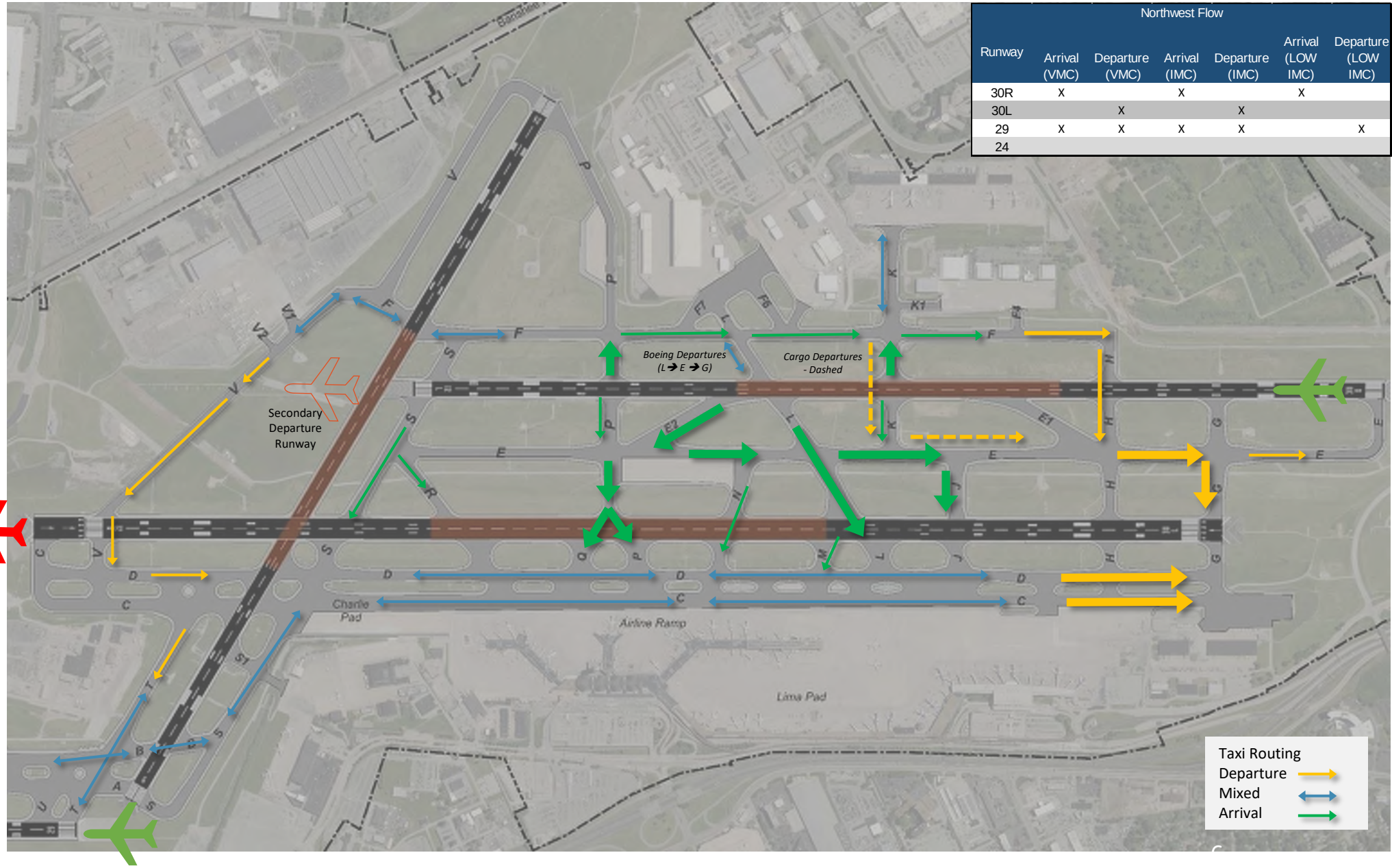
Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	✗

Airfield Utilization (Review)

Airfield & Taxiway Utilization

Northwest Flow - 55%

(VMC Conditions Shown)



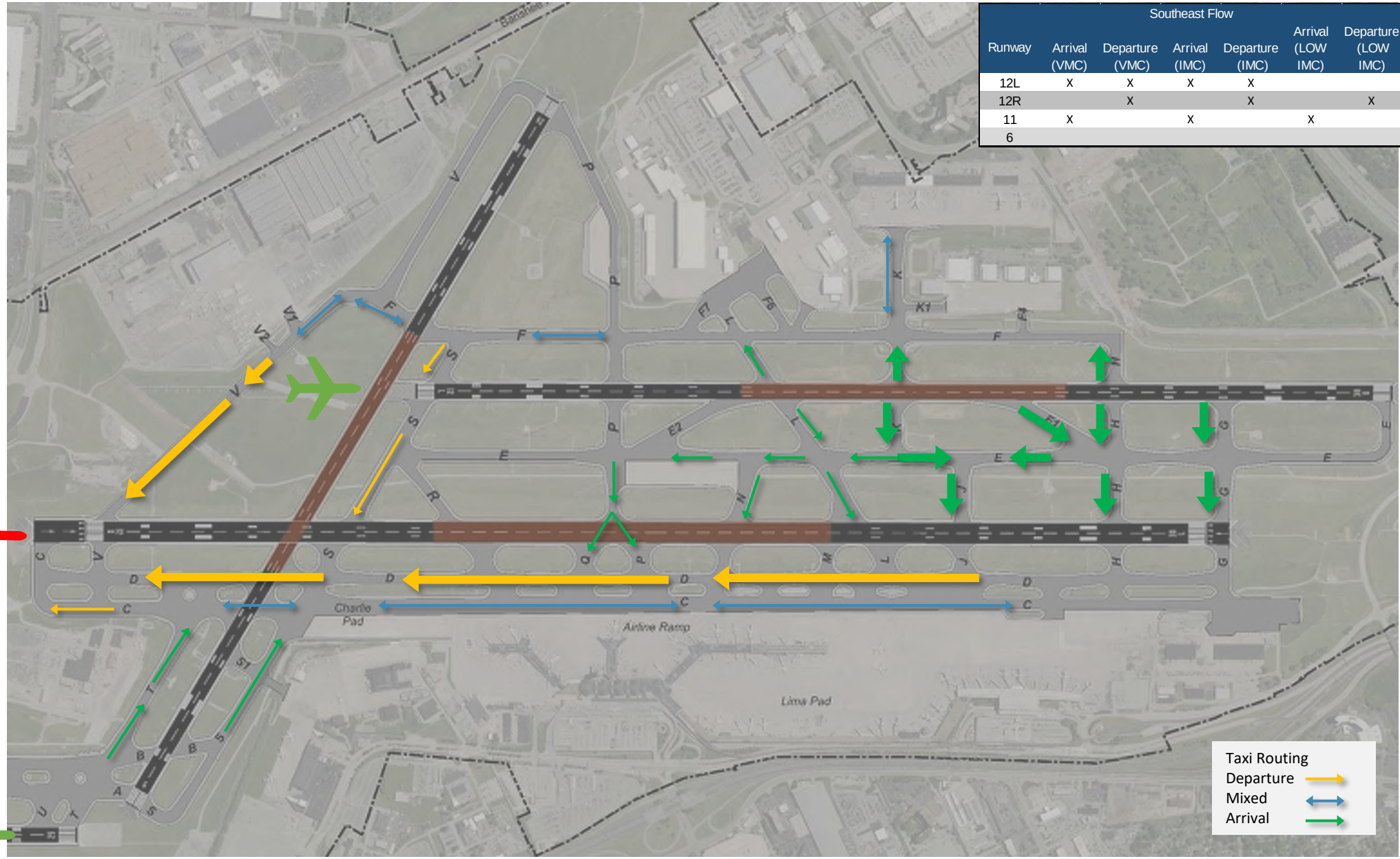
Northwest Flow

Runway	Arrival (VMC)	Departure (VMC)	Arrival (IMC)	Departure (IMC)	Arrival (LOW IMC)	Departure (LOW IMC)
30R	X		X		X	
30L		X		X		
29	X	X	X	X		X
24						

Airfield & Taxiway Utilization

Southeast Flow – 45%

(VMC Conditions Shown)



Southeast Flow						
Runway	Arrival (VMC)	Departure (VMC)	Arrival (IMC)	Departure (IMC)	Arrival (LOW IMC)	Departure (LOW IMC)
12L	X	X	X	X		
12R		X		X		X
11	X		X		X	
6						

North Airfield Alternatives for Consideration

North Airfield: *Taxiway F Extension*

What are we Solving for?

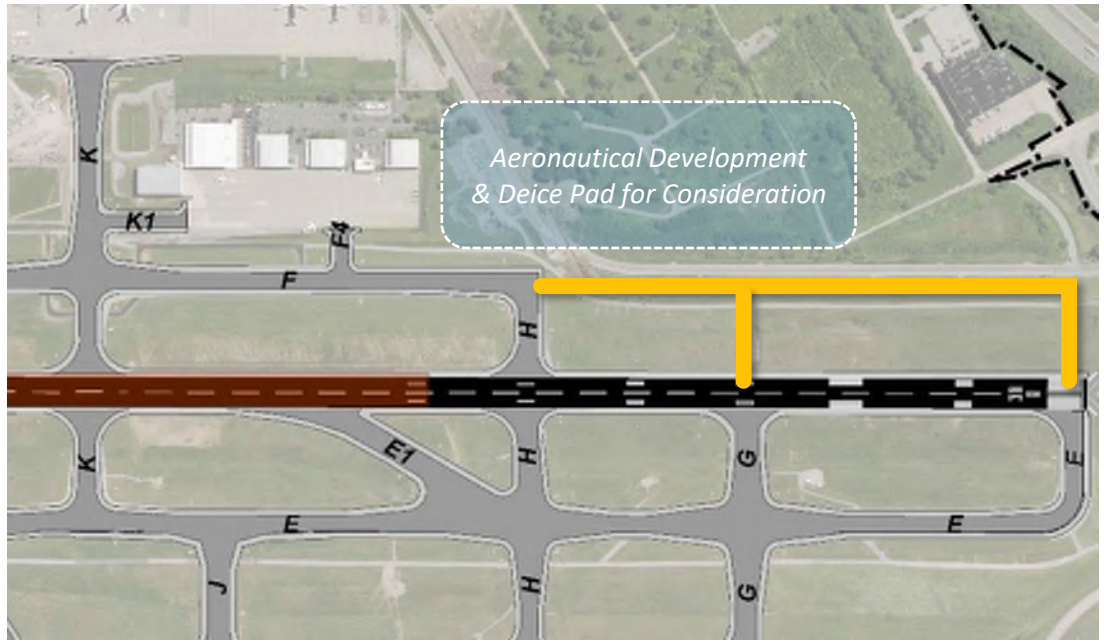
- Minimize crossing of 30R to depart 30L
- Provide for additional aeronautical development opportunities along 12L-30R

Current Known Use or Key Observations

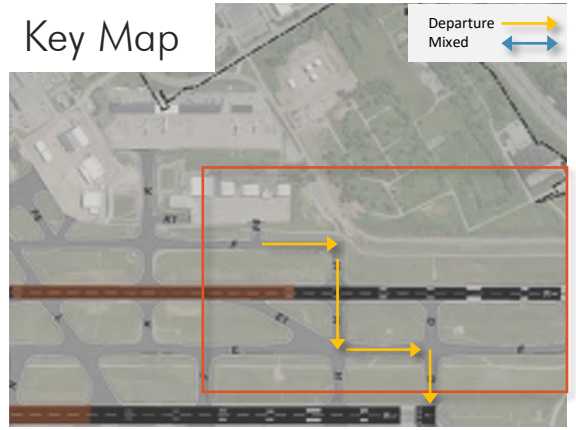
- 2019: 81% of north area demand required crossing of 30R to active departure runway 30L *(analysis isolated to 30L & 30R departures)*
  - ≈7,000 departures on Runway 30L & ≈1,600 departures on Runway 30R
- Opportunity to balance departures based on conditions

Notes to Considered

- Majority of operations requiring deice need to cross 30R and 30L to dedicated deice pads
- Long-term development objective of implementing deice facilities (air cargo & GA ramp)
- Input from ATCT: crossing 30R for 30L departures and options for future 30R departures
- Recommend to carry forward in alternatives



Key Map



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

North Airfield: *Hotspot #1 (Overview)*

What are we Solving for?

- Hotspot #1 which is associated with aircraft taxiing via Taxiway F westbound and are instructed to turn left on Taxiway S. However, aircraft miss the turn and enter Runway 6-24 without authorization

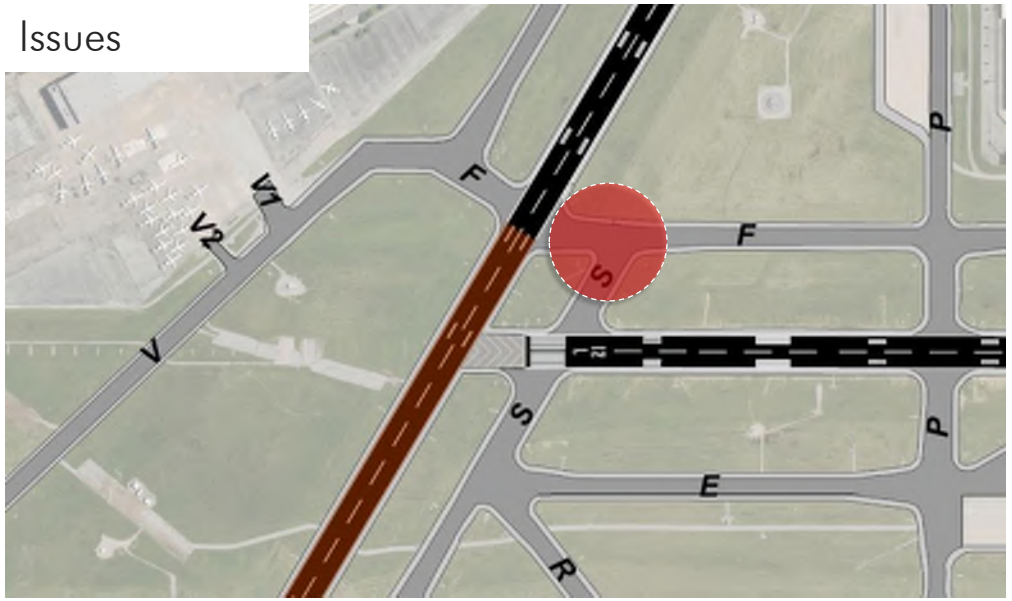
Current Known Use or Key Observations

- Taxiway route for departures for 12R
- Crossing for surface movements (tug operations)
- 2019: 33% of north area demand utilized Runway 12R for departure (≈ 6,700 departures)
- Runway 12R departure demand in 2019 impacted by the closure of Runway 12L-30R for reconstruction. 2016 to 2018 average was 11% for north area demand utilizing Runway 12R for departure

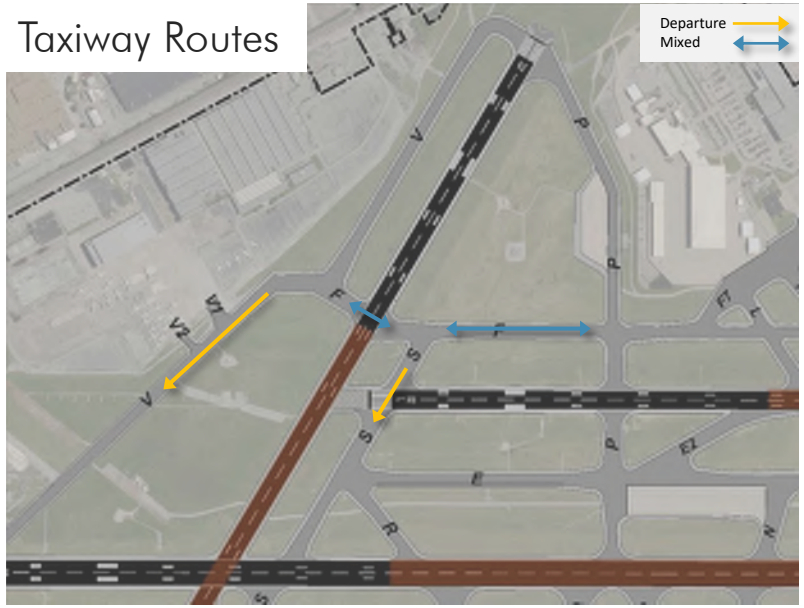
Considerations

- Only 27 arrivals Runway 6 in 2019
- Landing length Runway 6 to Taxiway F intersection ≈ 5,170'
- Landing length Runway 24 to Taxiway F intersection ≈ 2,400'

Issues

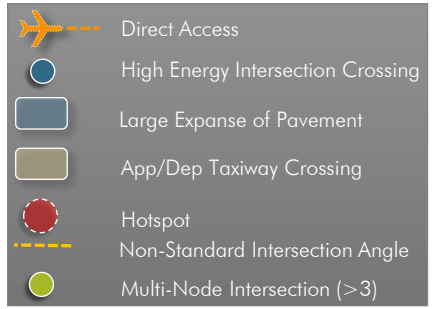


Taxiway Routes



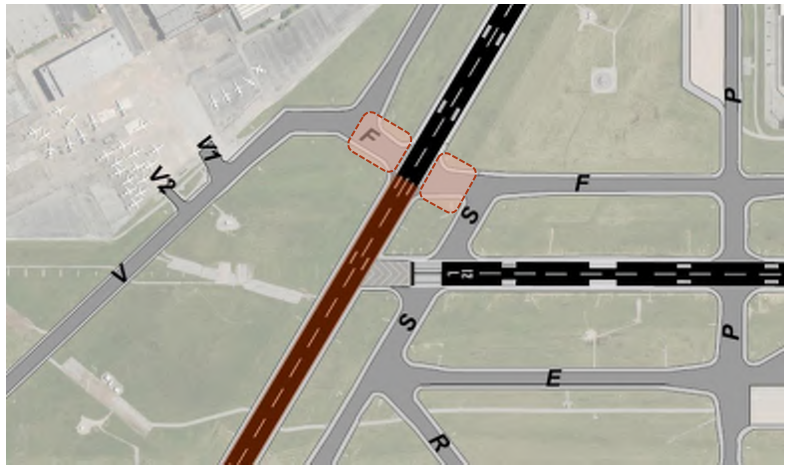
Runway 6-24 Impact without Intersection

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 6 (Eastbound/Westbound)	59.1 / 67.7	Current 24 (Eastbound/Westbound)	54.8 / 55.3
Future 6 (Eastbound/Westbound)	80.0 / 96.2	Future 24 (Eastbound/Westbound)	55.0 / 57.1
Net Change (Eastbound/Westbound)	20.9 (35.4%) / 28.5 (42.1%)	Net Change (Eastbound/Westbound)	0.2 (0.4%) / 1.8 (3.3%)



North Airfield: *Hotspot #1 (Mitigation Alternatives)*

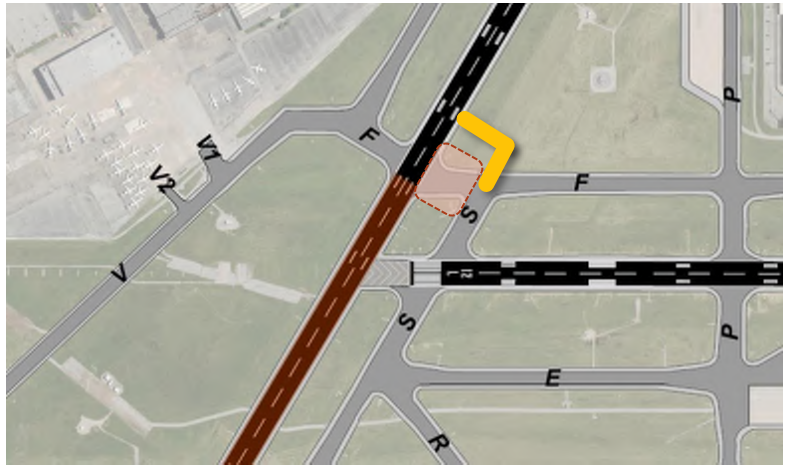
Alt #1: Close Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	⊗
Primary Taxi Routing (Distance)	⊗

- Impact of increased ROTs Runway 6 does not affect overall airfield capacity

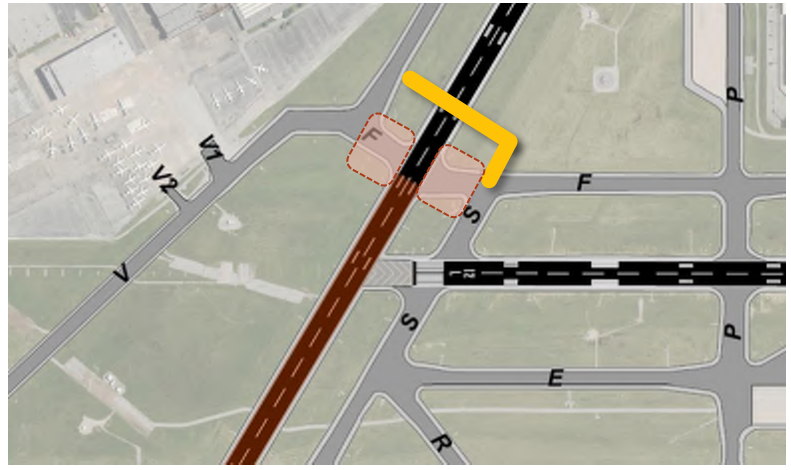
Alt #2: Exit Taxiways Only



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	⊗

- Eliminates crossing & reduces flexibility of routing aircraft for departure
- Limited impact to Runway 6-24 ROTs (not modeled)

Alt #3: New Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	✓

- Retains connector capability across Runway 6-24 to Taxiway V
- Limited impact to Runway 6-24 ROTs (not modeled)
- Limited impact to taxiway routing/distance

North Airfield: *Taxiway S @ Runway 12R-30L (Overview)*

What are we Solving for?

- Non 90° intersection at Runway 12R & 12L
- Proximity of Taxiway S, R, & E intersection

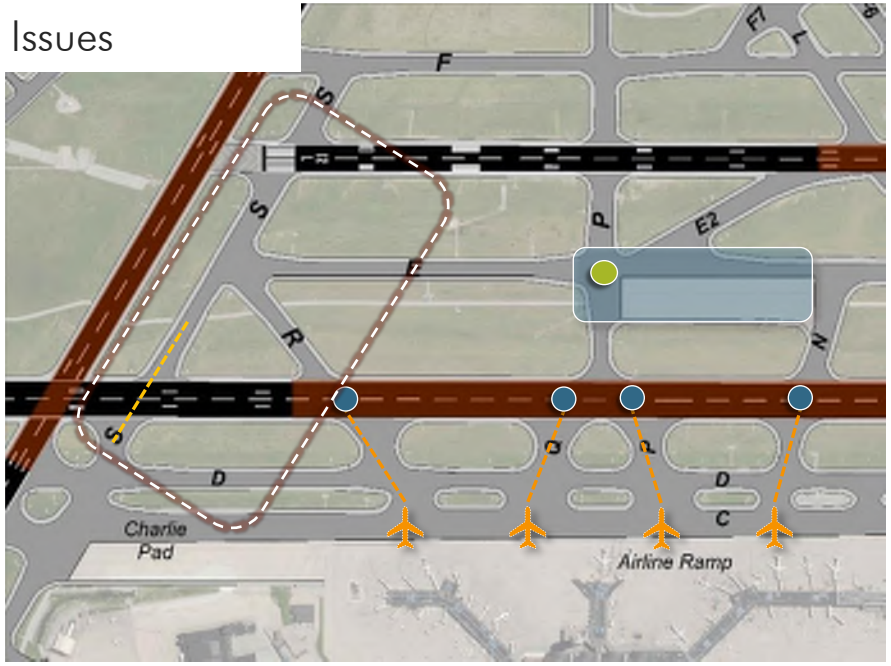
Current Known Use or Key Observations

- Partial parallel taxiway to Runway 6-24
- Crossing of 12R-30L (mixed taxiway movements depending on flow – departures to 12R during southeast & arrivals on 30R during northwest flow.

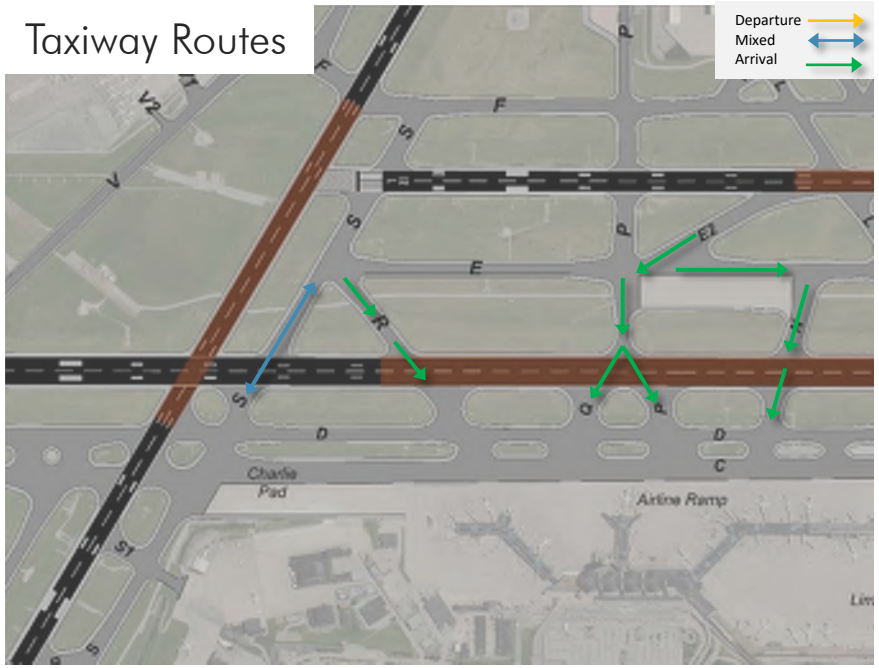
Considerations

- Improvement to the Taxiway S, R, & E intersection

Issues

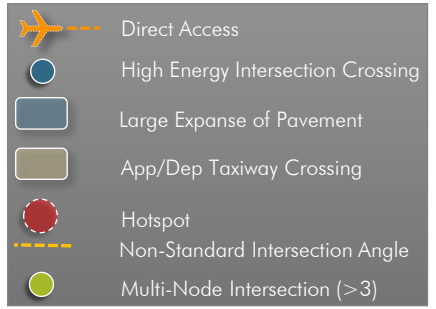


Taxiway Routes



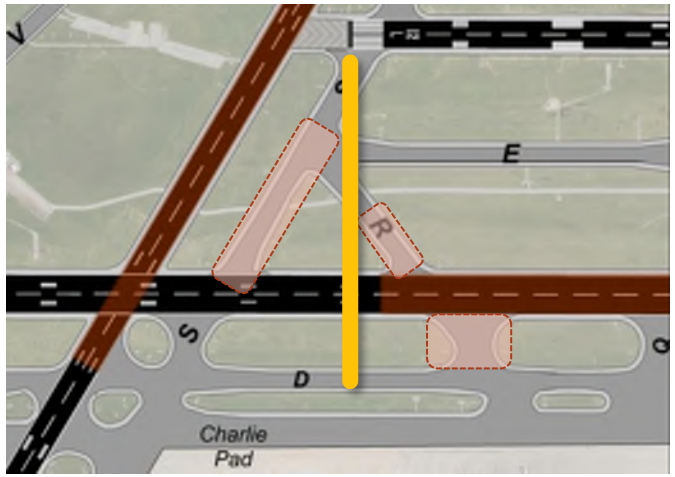
Runway 12R-30L Impact without Intersection

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 12R (Northbound / Southbound)	55.1 / 50.3	Current 30L (Northbound / Southbound)	57.9 / 50.6
Future 12R (Northbound / Southbound)	57.8 / 51.6	Future 30L (Northbound / Southbound)	60.2 / 51.6
Net Change (Northbound / Southbound)	2.7 (4.9%) / 1.3 (2.6%)	Net Change (Northbound / Southbound)	2.3 (4.0%) / 1 (2.0%)



North Airfield: *Taxiway S @ Runway 12R-30L (Mitigation Alternatives)*

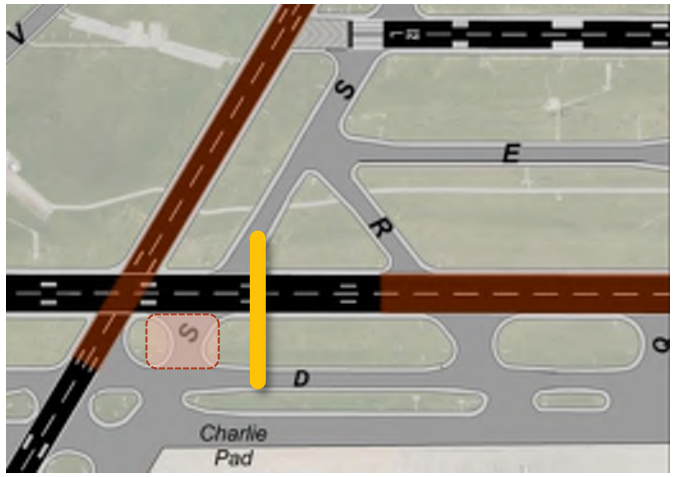
Alt #1: 90° to Runway 12L



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	●
Crossing Outside High-Energy Zone	●
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	●

- Resolution of several taxiway factors – consolidation into a single connector between 12L & Taxiway D
- Impact to redundancy – single connector between Runway 6-24 and high-energy zone of 12R-30L

Alt #2: 90° Crossing Runway 12R



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	●
Crossing Outside High-Energy Zone	●
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	●

- Maintains options to provide dual connectors between Taxiway E & D for redundant crossings of 12R-30L

North Airfield: *Taxiway R @ Runway 12R-30L (Overview)*

<u>What are we Solving for?</u>

- Non 90° intersection at Runway 12R-30L
- High-energy crossing
- Proximity of Taxiway S, R, & E intersection
- Direct access

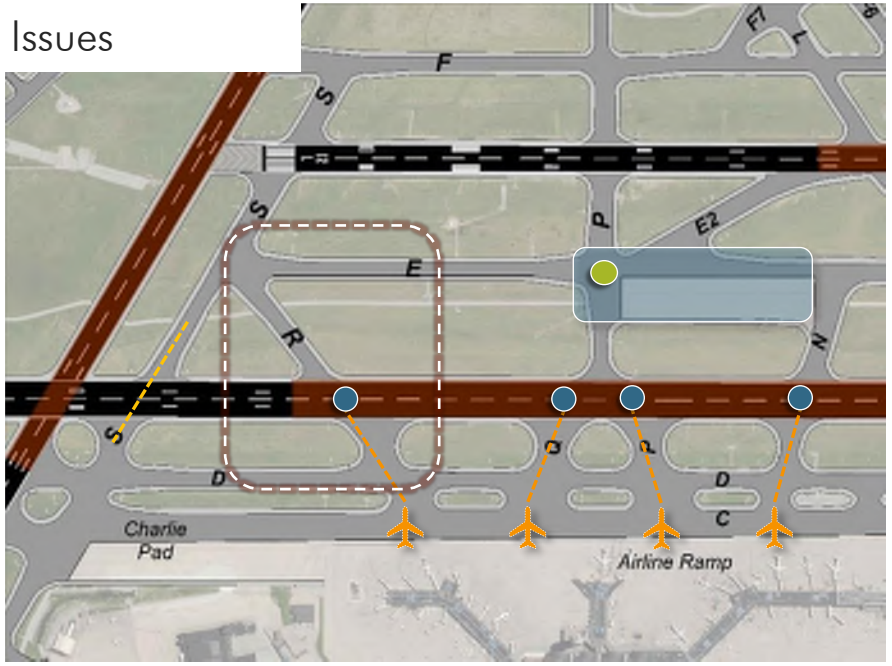
<u>Current Known Use or Key Observations</u>

- Primary use as crossing route for arrivals on 30R during northwest flow
- 2019: 24% of north area demand arrived Runway 12R-30L (≈5,000 arrivals)
- 2019: 32% of all arrivals occurred on Runway 30R (≈30,500 arrivals)
- Runway 30R arrival demand in 2019 impacted by the closure of Runway 12L-30R for reconstruction. 2016-2018 average utilization of Runway 30R arrivals was 43%

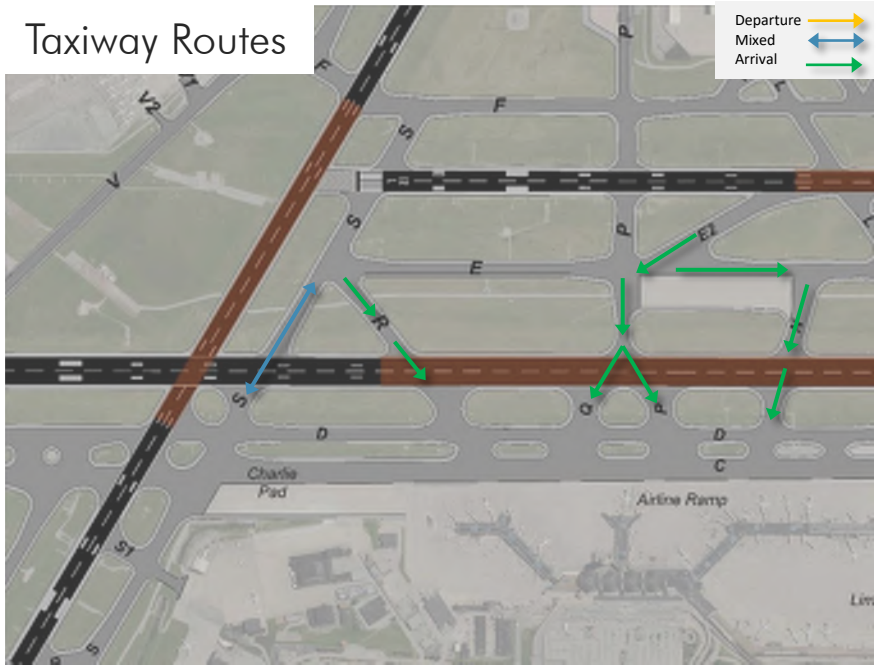
<u>Considerations</u>

- Improvement to the Taxiway S, R, & E intersection
- Impact to Runway 12R-30L ROTs when in use for arrivals *(12R ROTs northbound not presented based on model results)*

Issues

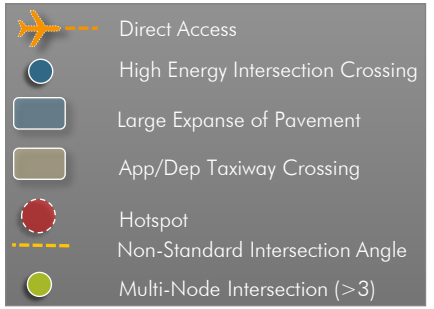


Taxiway Routes



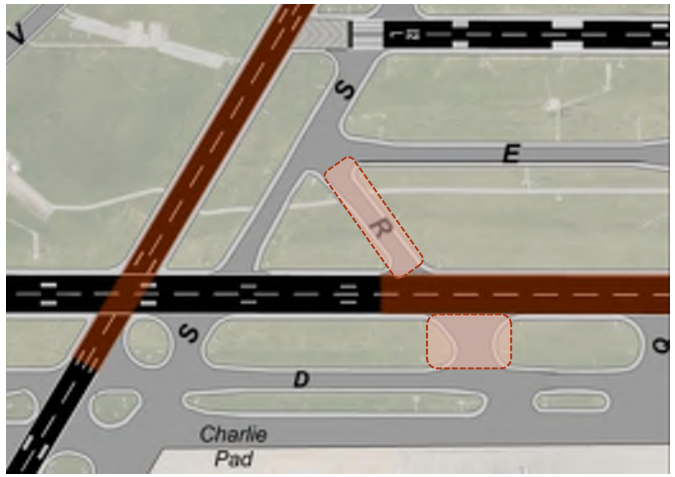
Runway 12R-30L Impact without Intersection

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 12R (Southbound)	50.3	Current 30L (Northbound / Southbound)	57.9 / 50.6
Future 12R (Southbound)	51.2	Future 30L (Northbound / Southbound)	65.6 / 57.6
Net Change (Southbound)	0.9 (1.8%)	Net Change (Northbound / Southbound)	7.7 (13.3%) / 7 (13.8%)



North Airfield: *Taxiway R @ Runway 12R-30L (Mitigation Alternatives)*

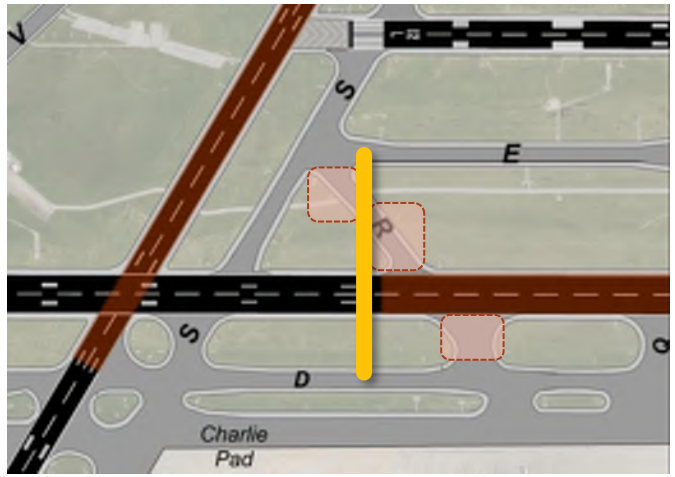
Alt #1: Close Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✗
Primary Taxi Routing (Distance)	✗

- Impact to redundancy – single connector between Runway 6-24 and high-energy zone of 12R-30L
- Improvement to the Taxiway S, R, & E intersection

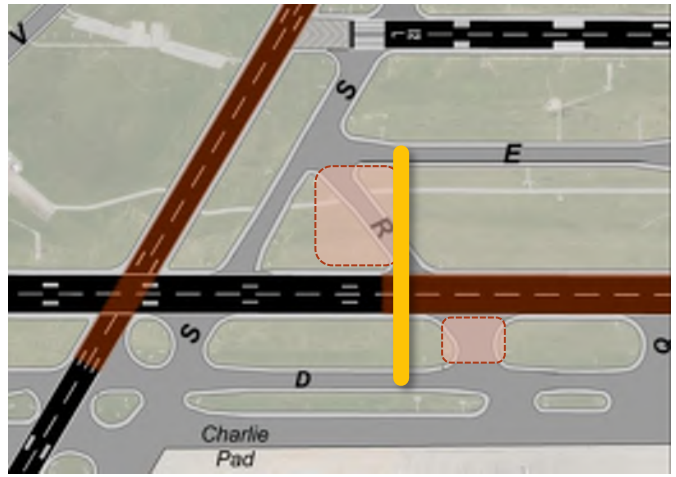
Alt #2: 90° Crossing Runway 12R



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Maintains options to provide dual connectors between Taxiway E & D for redundant crossings of 12R-30L
- Improvement to the Taxiway S, R, & E intersection
- Limited impact to ROT on 12R-30L (not modeled)

Alt #3: 90° Crossing Runway 12R (HE)



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✗
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Enhances separation of Taxiway E, R, and S intersection
- Maintains options to provide dual connectors between Taxiway E & D for redundant crossings of 12R-30L
- Makes incremental improvement to high-energy crossing (90° & movement towards outer limit)
- Limited impact to ROT on 12R-30L (not modeled)

North Airfield: *Taxiway Q/P @ Runway 12R-30L (Overview)*

What are we Solving for?

- Non 90° intersection at Runway 12R-30L
- High-energy crossing
- Two crossing points merging into one on runway
- Direct access

Current Known Use or Key Observations

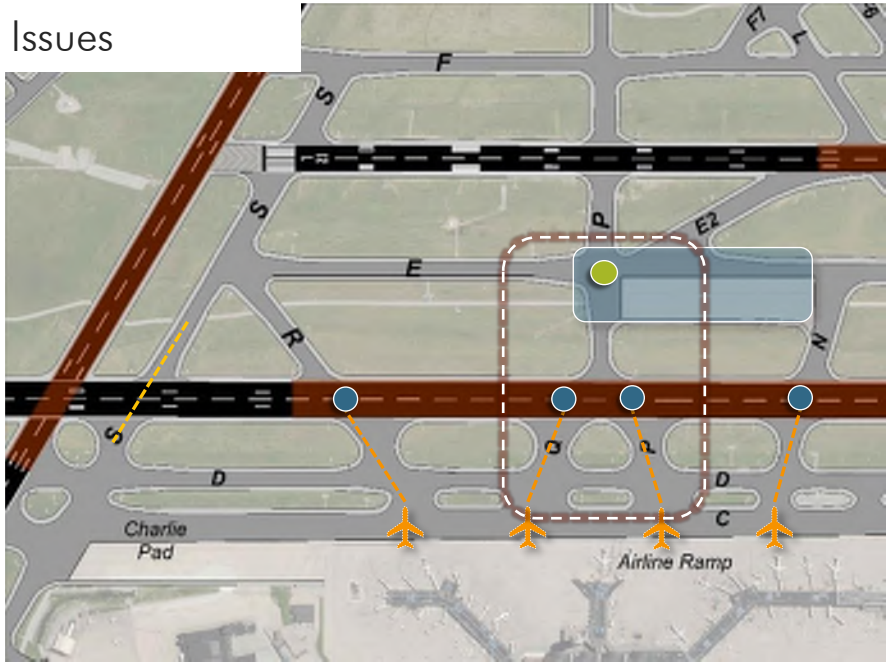
- Primary use as crossing route for arrivals
- 2019: 24% of north area demand arrived Runway 12R-30L (≈5,000 arrivals)
- 2019: 32% of all arrivals occurred on Runway 30R (≈30,500 arrivals)

Considerations

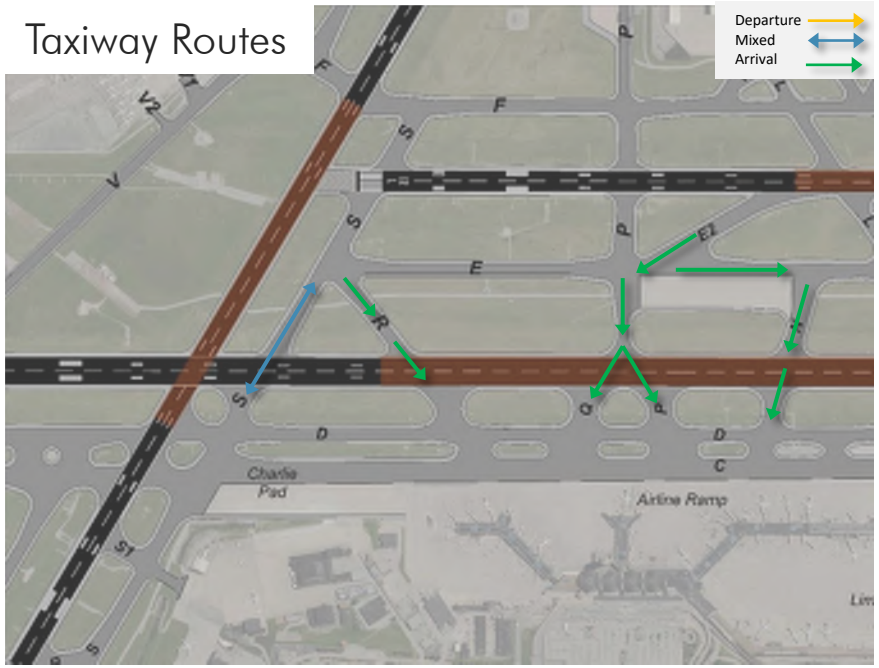
- Eliminates high-energy crossing and direct access concerns
- Impact to ROT on Runway 12R-30L – northbound exits @ P

Impact of Q, P, & N Closures Combined
Runway 12R (Northbound & Southbound): +6.1 / +6.7
Runway 30L (Northbound & Southbound): +7.9 / +5.9

Issues

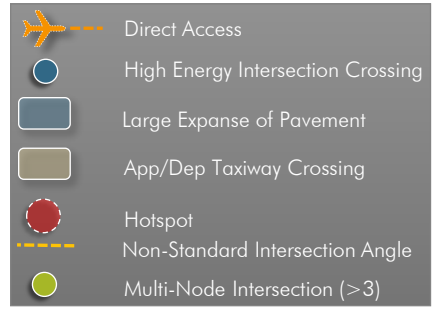


Taxiway Routes



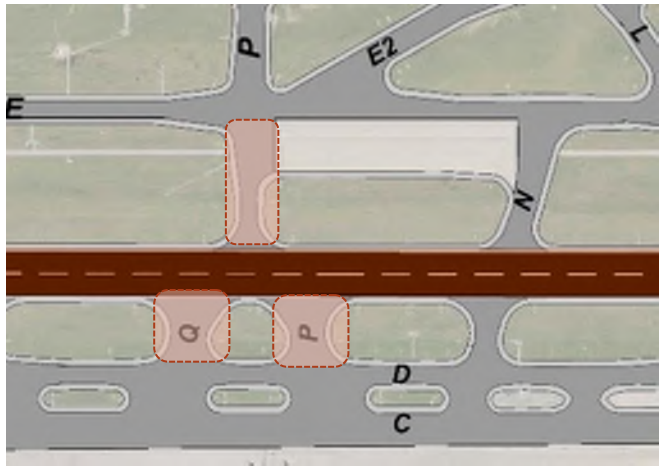
Runway 12R-30L Impact without Intersection (Taxiway Q & P)

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 12R (Northbound / Southbound)	55.0 / 50.3	Current 30L (Northbound / Southbound)	57.9 / 50.6
Future 12R (Northbound / Southbound)	57.8 / 51.7	Future 30L (Northbound / Southbound)	63.6 / 51.6
Net Change (Northbound / Southbound)	2.8 (5.1%) / 1.4 (2.8%)	Net Change (Northbound / Southbound)	5.7 (9.8%) / 1.0 (2.0%)



North Airfield: *Taxiway Q/P @ Runway 12R-30L (Mitigation Alternatives)*

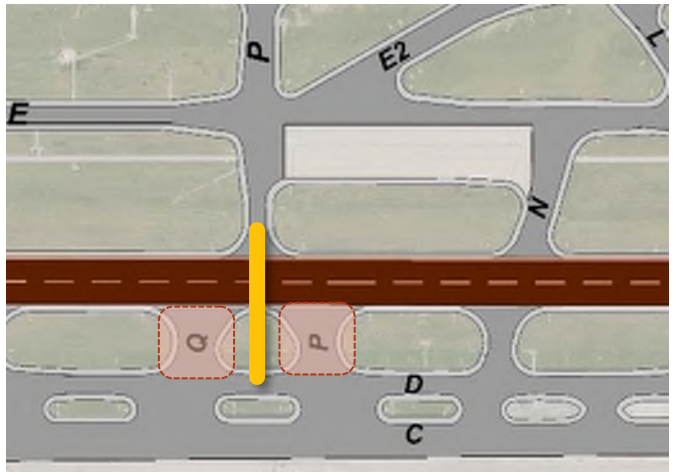
Alt #1: Close Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✗
Primary Taxi Routing (Distance)	✗

- Eliminates high-energy crossing and direct access concerns
- Impact to ROT on Runway 12R-30L – northbound exits @ P

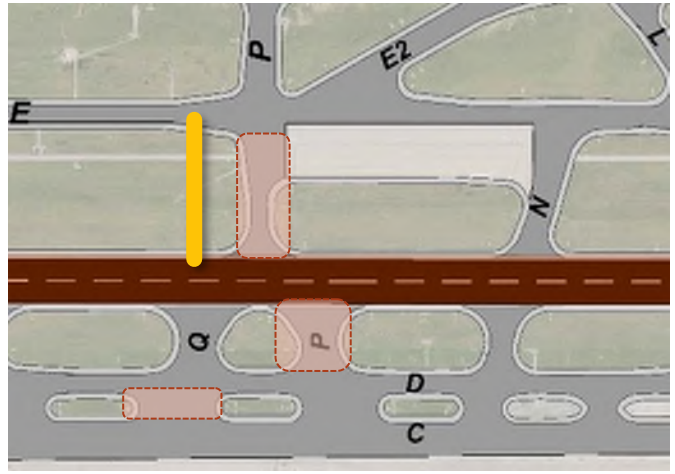
Alt #2: Single Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✗
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Improvement to high-energy crossing (90° & eliminates direct access concerns)
- Limited impact to ROT on Runway 12R-30L (not modeled) – maintains northbound P exit
- May require signage and lighting improvements

Alt #3: Staggered Exits



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✗
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Limited impact to ROT on 12R-30L (not modeled)
- Eliminates high-energy crossing (staggered alignment – approx. 500')
- Allows slowing of arrival 30R on E2 before crossing Runway 12R-30L at Taxiway Q
- Limited impact to ROT on Runway 12R-30L (not modeled) – maintains northbound P exit

North Airfield: *Arrival 30R - Taxi Distance Impact to Terminal 1*

(No Crossing of Runway 12R-30L High-Energy Zone)

What are we Solving for?

- Impact to taxi route distances and time if crossfield connectivity is limited to outside high-energy zone

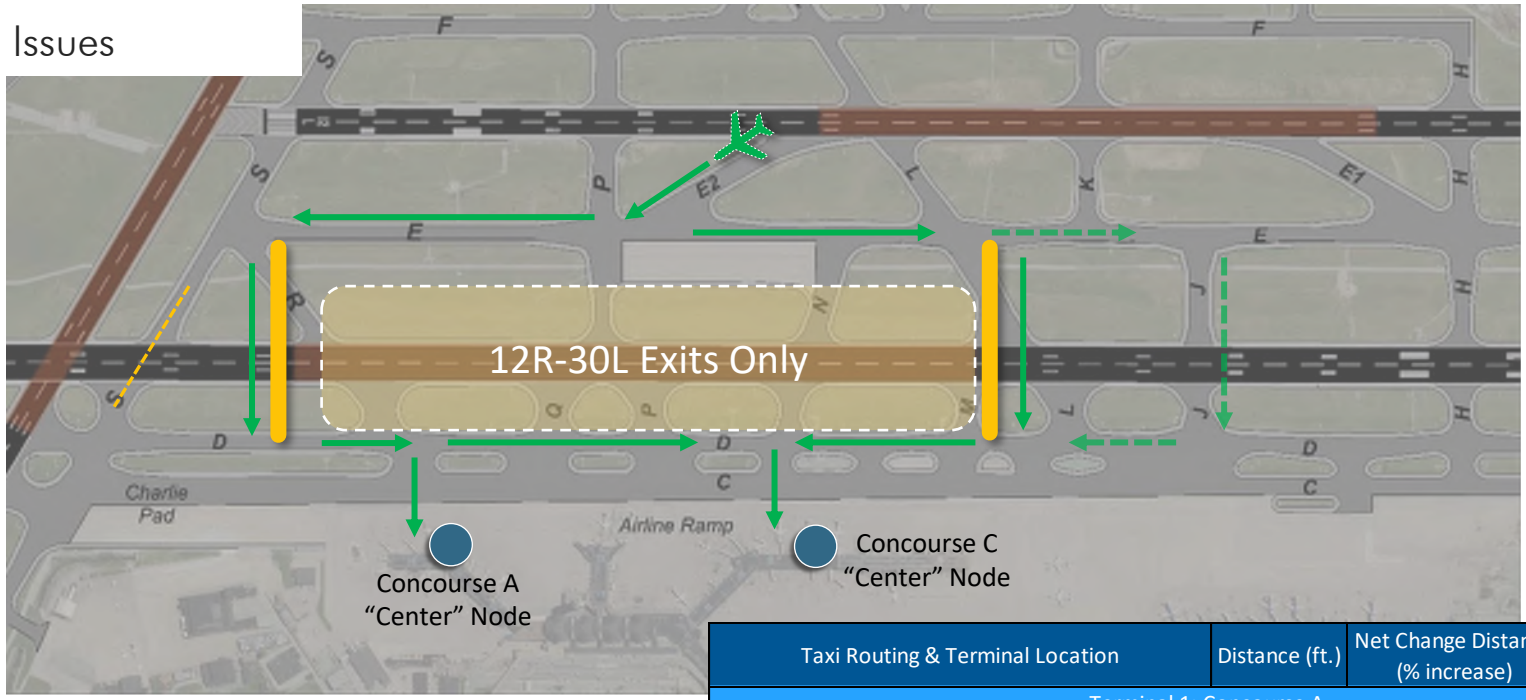
Current Known Use or Key Observations

- Taxiway R, Q, P, and N primarily used to accommodate arrivals to Terminal 1 (based on current air traffic management procedures)
- **2019: 32% of all arrivals occurred on Runway 30R (≈30,500 arrivals)**
- Runway 30R arrival demand in 2019 impacted by the closure of Runway 12L-30R for reconstruction (May through September). 2016-2018 average utilization of Runway 30R arrivals was 43%
- Distances measured from the E2 holdbar location for comparative purposes
- Taxi speed assumed to be an average of 13-knots based on airfield simulation model (baseline conditions)

Considerations

- Shortest "new" routes with Taxiway Q, P, and N closed increase taxi times by 1.7± min to 3.0 ± minutes depending on concourse destination
- Outbound traffic to Runway 30L departure on Taxiway D
- **Result: Need to consider a crossing within high-energy zone of Runway 12R-30L**

Issues



Taxi Routing & Terminal Location	Distance (ft.)	Net Change Distance (% increase)	Taxi Time Impact (Min)
Terminal 1: Concourse A			
Baseline: E2 → P → Q → C → Center Node	2,850'	--	--
E2 → E → New R → D → Center Node (Normal)	5,070'	2,220' (77.9%)	1.69
E2 → E → L @ 90° → D → Center Node (Unlikely)	6,470'	3,620' (127.0%)	2.75
E2 → E → J → D → Center Node (Very Unlikely)	8,698'	5,848' (205.2%)	4.44
Terminal 1: Concourse C			
Baseline: E2 → P → C → Center Node	3,250'	--	--
E2 → E → New R → D → Center Node (Normal)	7,175'	3,925' (120.8%)	2.98
E2 → E → L @ 90° → D → Center Node (Unlikely)	4,470'	1,220' (37.5%)	0.93
E2 → E → J → D → Center Node (Very Unlikely)	6,690'	3,440' (105.8%)	2.61

North Airfield: *Taxiway N @ Runway 12R-30L (Overview)*

<u>What are we Solving for?</u>

- Non 90° intersection at Runway 12R-30L
- High-energy crossing
- Direct access

<u>Current Known Use or Key Observations</u>

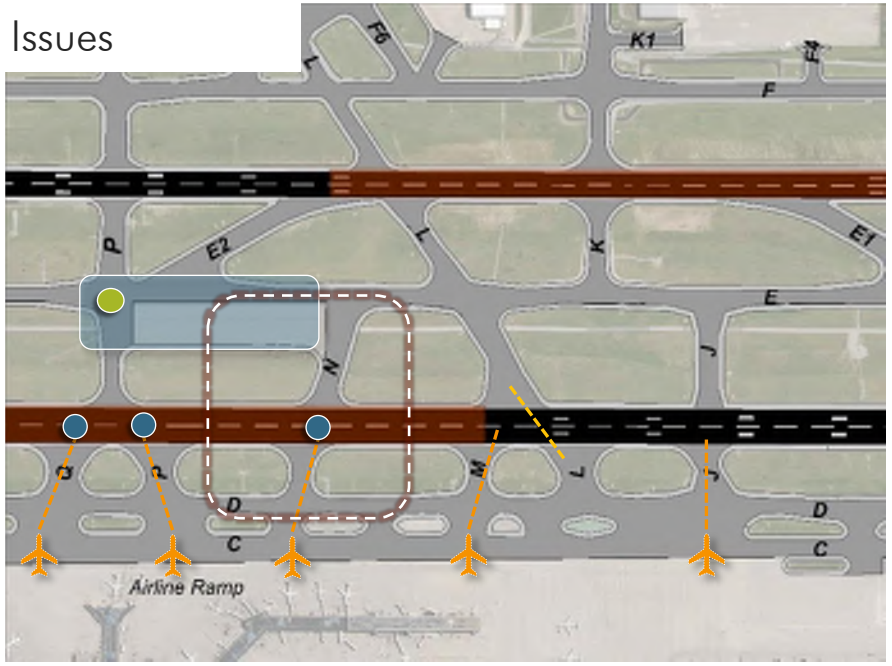
- Primary use as crossing route for arrivals
- 2019: 24% of north area demand arrived Runway 12R-30L (≈5,000 arrivals)
- 2019: 48% of all arrivals occurred on Runway 12L-30R (≈45,800)

<u>Considerations</u>

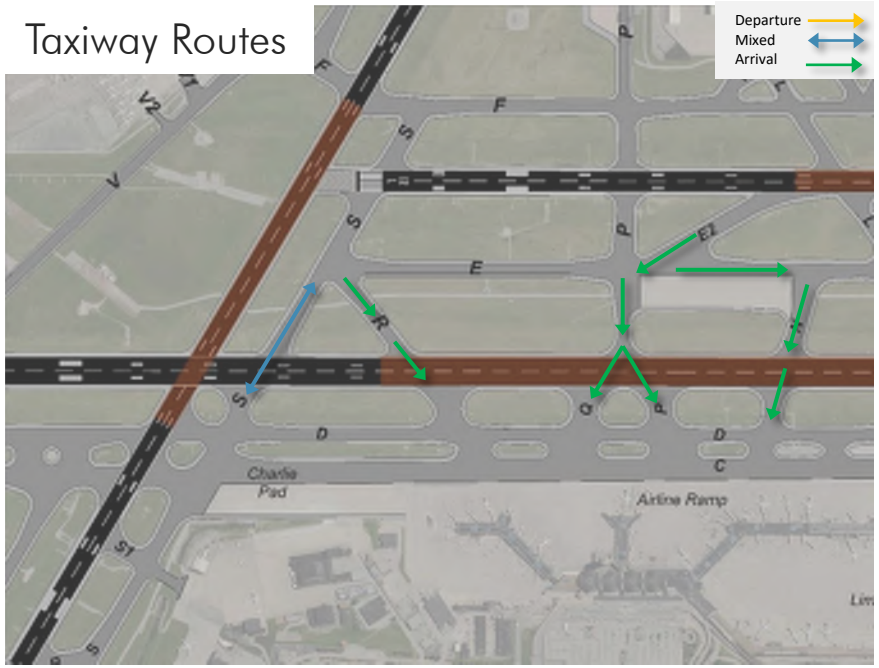
- Impact to ROT on 12R-30L
- Eliminate high-energy crossing & direct access

<u>Impact of Q, P, & N Closures Combined</u>
Runway 12R (Northbound & Southbound): +6.1 / +6.7
Runway 30L (Northbound & Southbound): +7.9 / +5.9

Issues

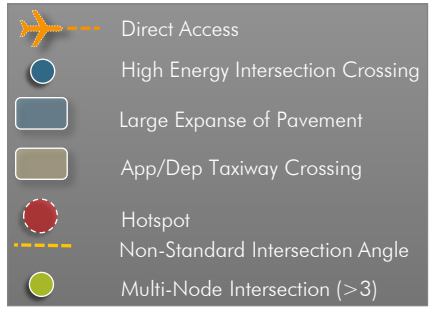


Taxiway Routes



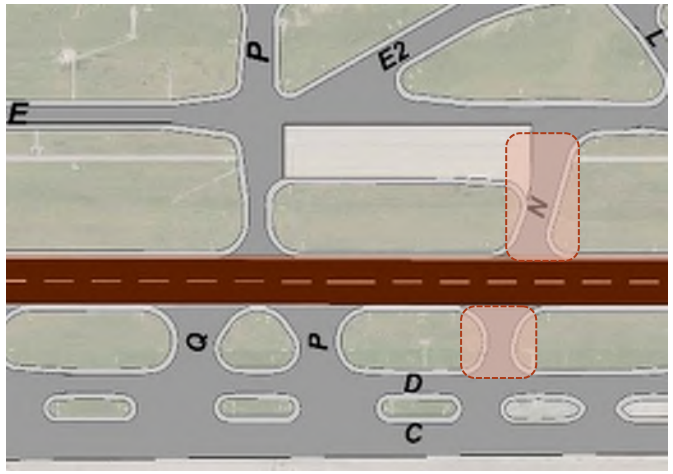
Runway 12R-30L Impact without Intersection

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 12R (Northbound / Southbound)	55.0 / 50.3	Current 30L (Northbound / Southbound)	57.9 / 50.6
Future 12R (Northbound / Southbound)	59.5 / 54.1	Future 30L (Northbound / Southbound)	58.9 / 51.3
Net Change (Northbound / Southbound)	4.5 (8.2%) / 3.8 (7.6%)	Net Change (Northbound / Southbound)	1.0 (1.7%) / 0.7 (1.4%)



North Airfield: *Taxiway N @ Runway 12R-30L (Mitigation Alternatives)*

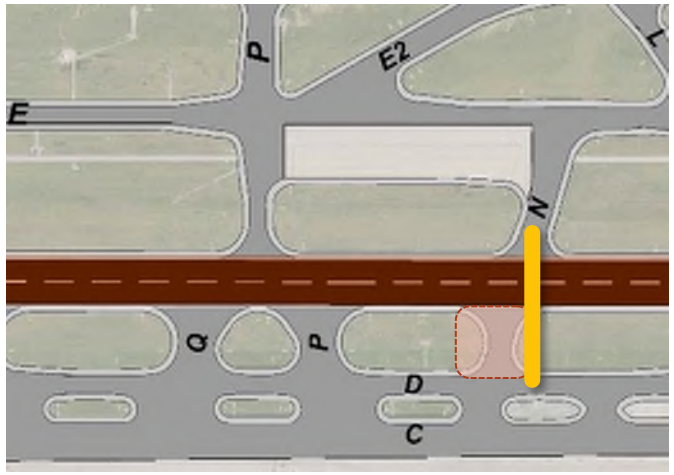
Alt #1: Close Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	✗

- Impact to ROT on 12R-30L
- Eliminates high-energy crossing & direct access

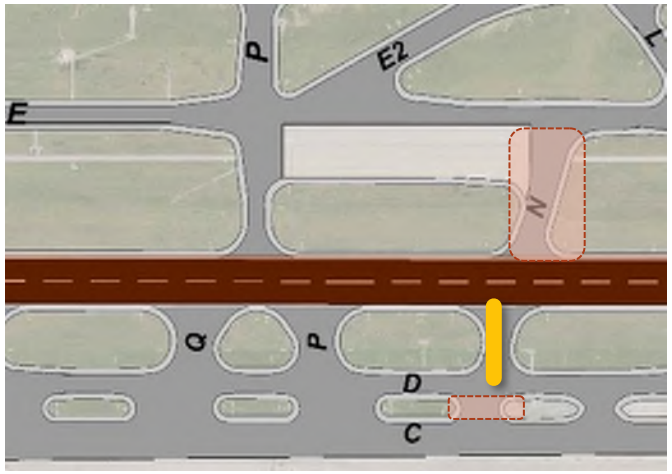
Alt #2: 90° Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✗
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Improvement to high-energy crossing (90° & eliminates direct access concerns)
- Eliminates direct access

Alt #3: Southbound Exit Only



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	✓

- Eliminates high-energy crossing
- Eliminates direct access
- ROT impacts with closure of N northbound to be assessed in next round of alternatives screening
- REDIM Model Reference: Runway 30L arrivals northbound exit assignments (ADG-I at 13% / ADG-II at 16%)

North Airfield: *Taxiway M/L @ Runway 12R-30L (Overview)*

What are we Solving for?

- Non 90° intersection at Runway 12R-30L
- High-energy crossing (Taxiway M – edge)
- Direct access (Taxiway M)

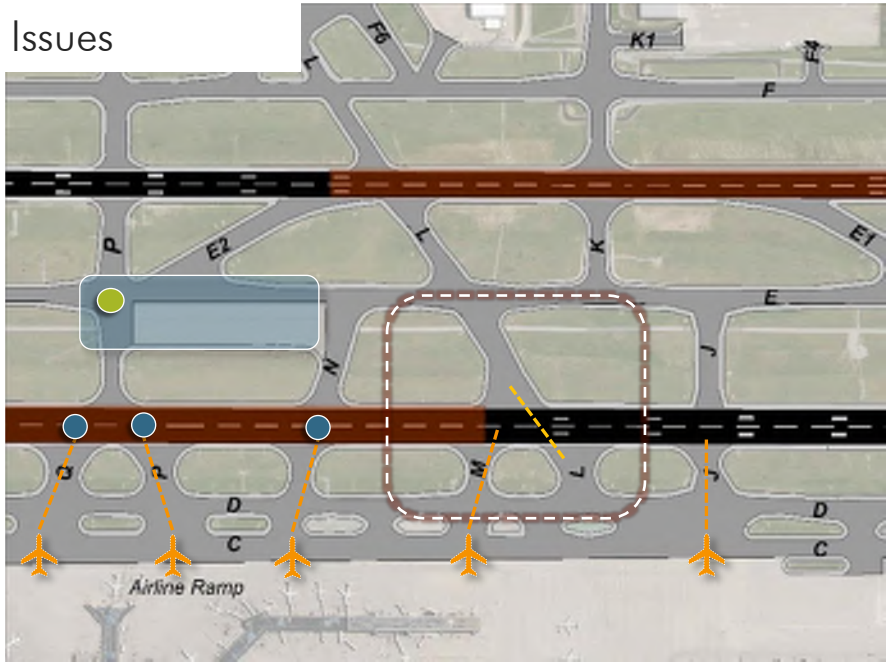
Current Known Use or Key Observations

- Primary use as crossing route for arrivals
- 2019: 24% of north area demand arrived Runway 12R-30L (≈5,000 arrivals)
- 2019: 48% of all arrivals occurred on Runway 12L-30R (≈45,800)

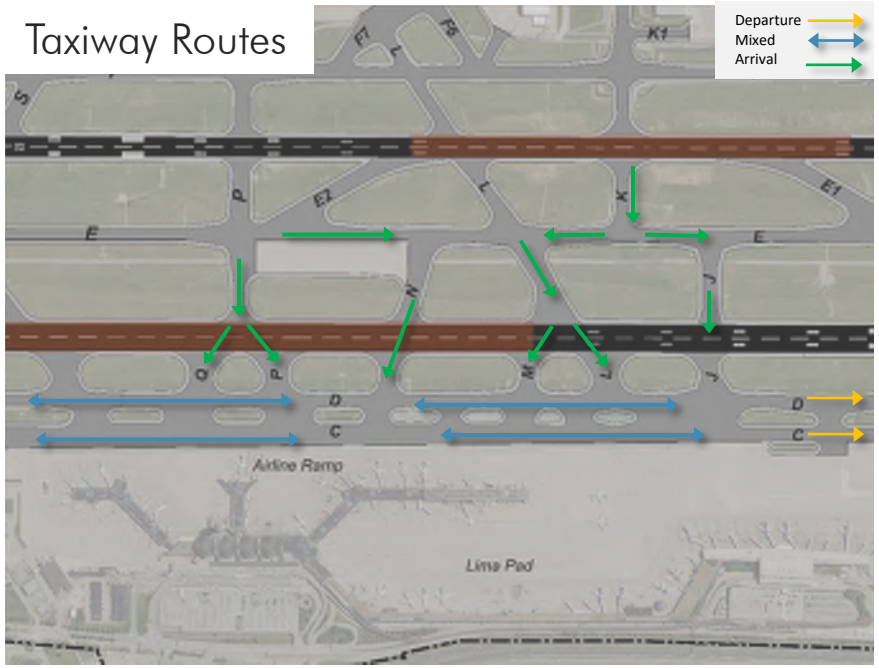
Considerations

- Eliminate direct access

Issues



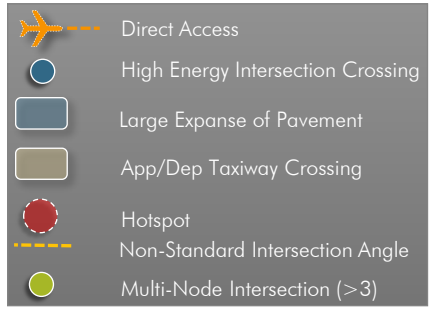
Taxiway Routes



Runway 12R-30L Impact without Intersection

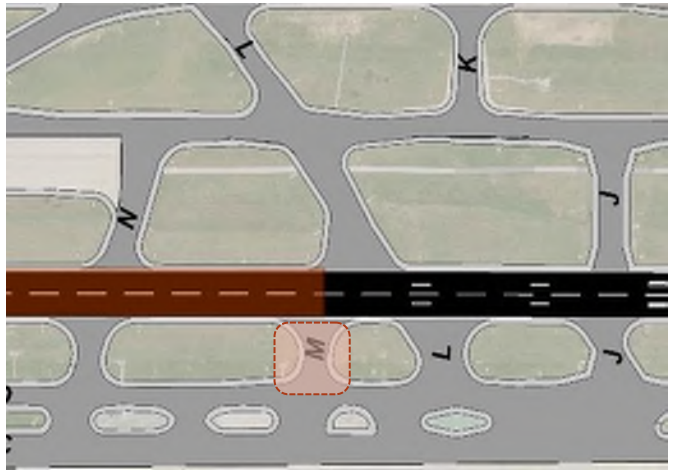
(Taxiway M Southbound & Taxiway L Northbound)

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 12R (Northbound / Southbound)	55.0 / 50.3	Current 30L (Northbound / Southbound)	57.9 / 50.6
Future 12R (Northbound / Southbound)	60.3 / 52.8	Future 30L (Northbound / Southbound)	58.0 / 51.1
Net Change (Northbound / Southbound)	5.3 (9.6%) / 2.5 (5.0%)	Net Change (Northbound / Southbound)	0.1 (0.2%) / 0.5 (1.0%)



North Airfield: *Taxiway M/L @ Runway 12R-30L (Mitigation Alternatives)*

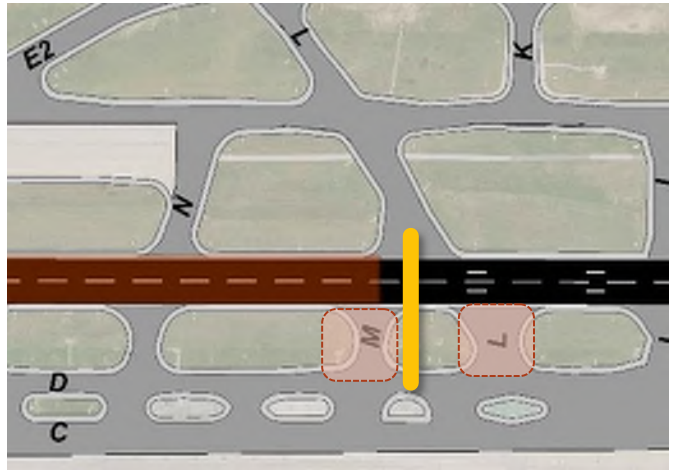
Alt #1: Close M Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✗
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	✓

- Eliminates direct access

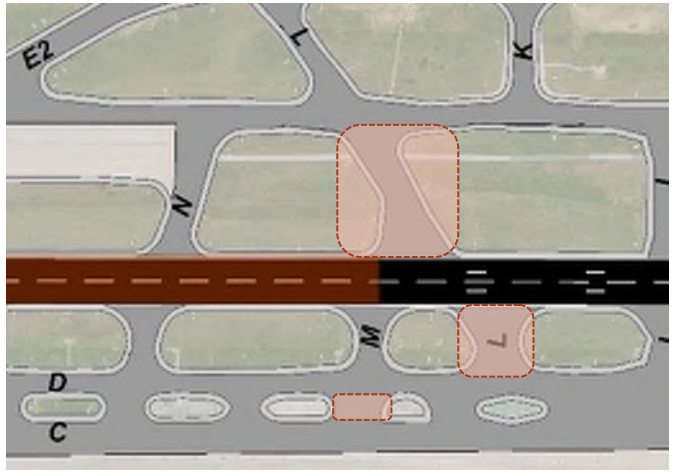
Alt #2: Single Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Balances Taxiway M & L ROT impact south of Runway 12R-30L
- Eliminates direct access
- Long-term realignment of Taxiway L north of Runway 12R-30L to Taxiway E (90°)

Alt #3: Close L Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✗
Primary Taxi Routing (Distance)	✓

- ROT impact south of 12R-30L split between existing Taxiway M and Taxiway L
- ROT impact to northbound exits associated with Runway 12R arrivals
- Eliminates direct access

North Airfield: *Taxiway L @ Runway 12L-30L (Overview)*

What are we Solving for?

- Non 90° intersection at Runway 12R-30L
- High-energy crossing
- Proximity to high-speed exit (E2)

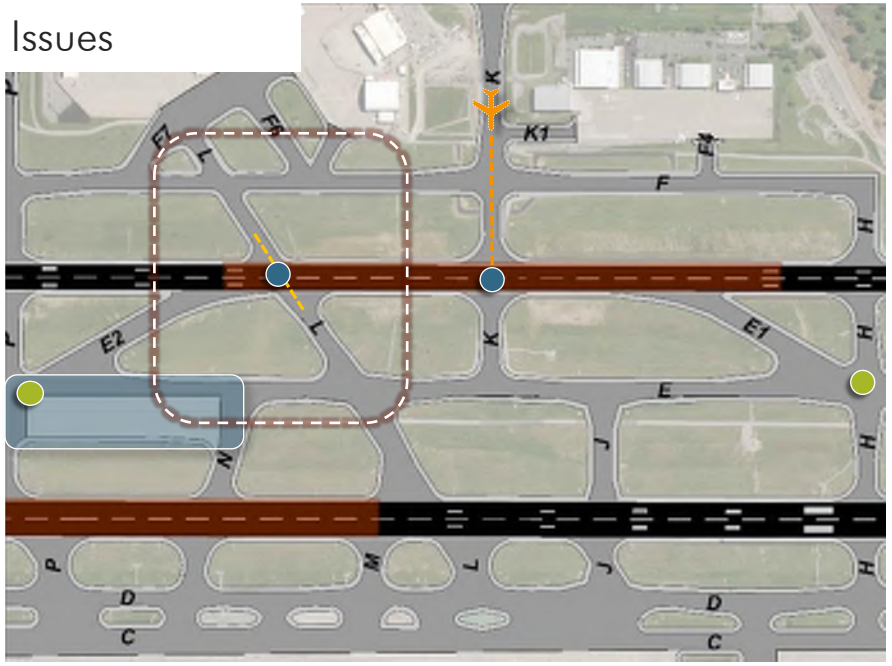
Current Known Use or Key Observations

- Primary use as exit for arrivals
- 2019: 46% of north area demand arrived Runway 12L-30R (≈9,500 arrivals)
- **2019: 48% of all arrivals occurred on Runway 12L-30R (≈40,500 arrivals)**
- FAA Landing Event Database (2015-2016) identified a utilization of Taxiway L southbound exit of 24% of arrivals Runway 30R

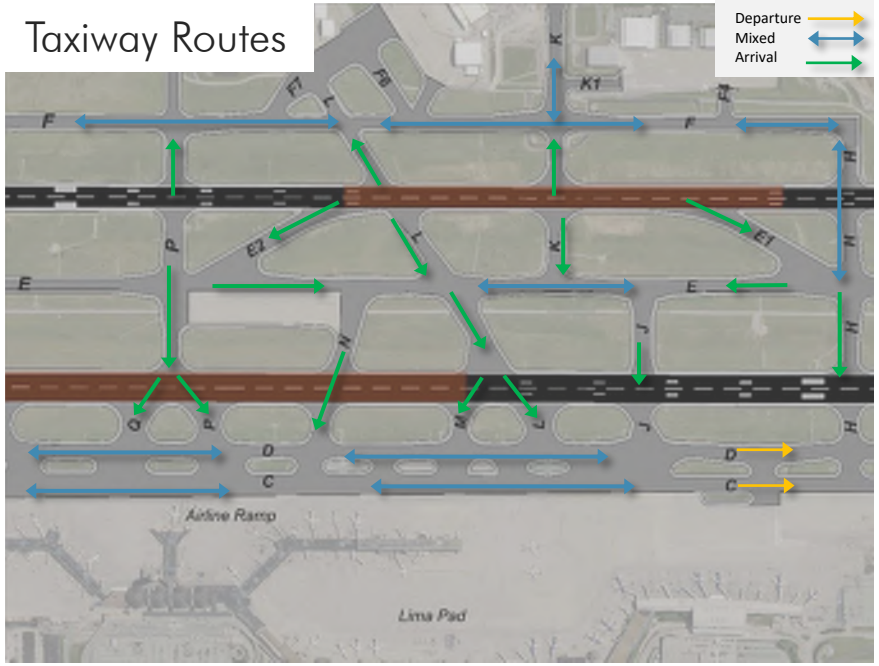
Considerations

- Taxiway L southbound ROT not modeled in REDIM (angle to great – software)

Issues

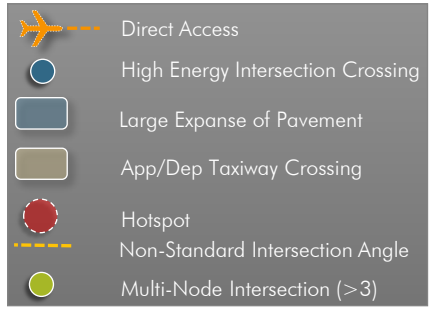


Taxiway Routes



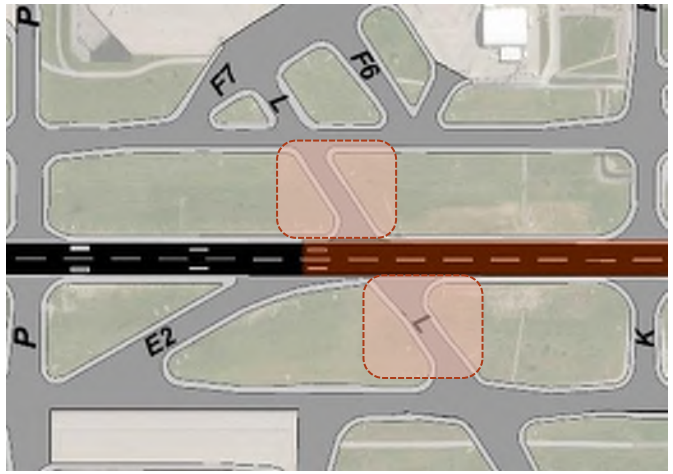
Runway 12L-30R Impact without Intersection

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 12L (Northbound / Southbound)	55.9 / 48.6	Current 30R (Northbound)	54.4
Future 12L (Northbound / Southbound)	56.8 / 49.1	Future 30R (Northbound)	62.3
Net Change (Northbound / Southbound)	0.9 (1.6%) / 0.5 (1.0%)	Net Change (Northbound)	7.9 (14.5%)



North Airfield: *Taxiway L @ Runway 12L-30R (Mitigation Alternatives)*

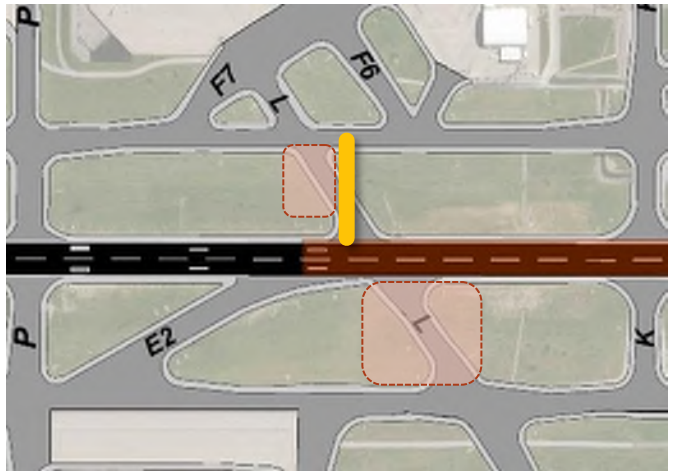
Alt #1: Close Crossing



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✗
Primary Taxi Routing (Distance)	✗

- Eliminates high-energy crossing potential
- Impact to ROTs northbound
- Resolves proximity of Taxiway L and Taxiway E2 intersection
- ROTs southbound not impacted (increase in taxi distance)

Alt #2: 90° Northbound Exit

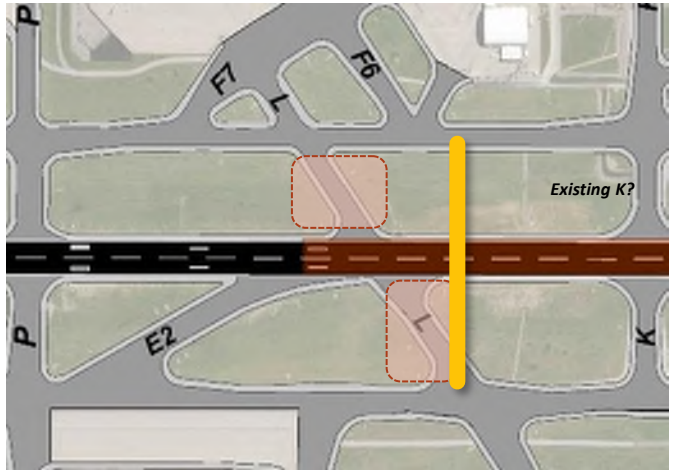


Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	✗

- Eliminates high-energy crossing potential
- Mitigates impact to ROTs northbound
- Resolves proximity of Taxiway L and Taxiway E2 intersection
- ROTs southbound not impacted (increase in taxi distance)

Alt #3: 90° New Connector

(Taxiway F to Taxiway E)



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	✓
Crossing Outside High-Energy Zone	✗
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	●
Primary Taxi Routing (Distance)	✓

- Minimizes impact to ROTs
- Provides enhanced separation of Taxiway L from Taxiway E2 and adjusted exit angle from arrivals Runway 30R
- Consideration of long-term Taxiway K (direct access & high-energy crossing)
- REDIM Model – New Taxiway L location: southbound exit assignment = 35% for ADG-III aircraft

North Airfield: *Taxiway K @ Runway 12L-30L (Overview)*

What are we Solving for?

- High-energy crossing
- Direct access

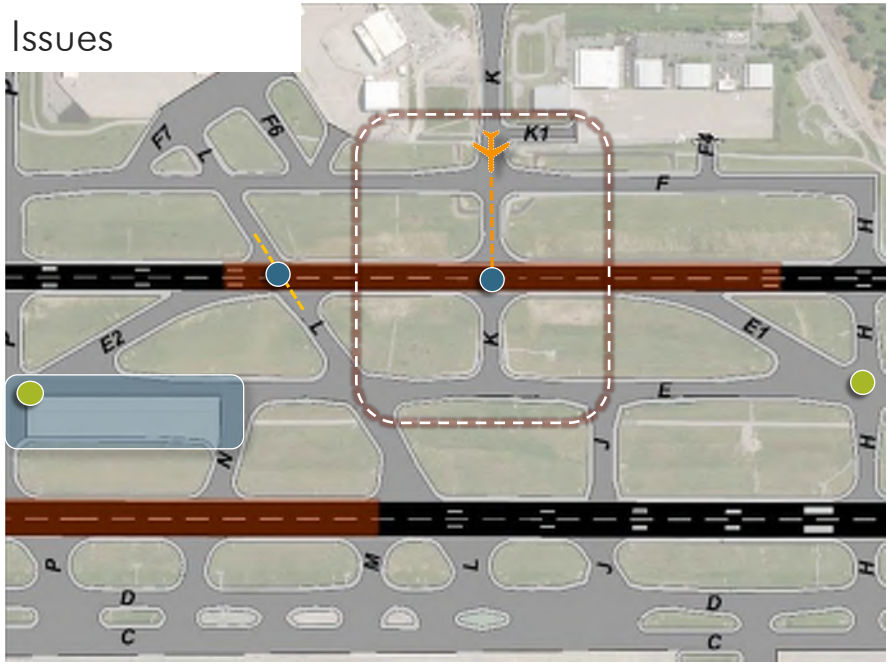
Current Known Use or Key Observations

- Primary use as exit for arrivals
- 2019: 46% of north area demand arrived Runway 12L-30R (≈9,500 arrivals total, ≈3,100 on 12L, ≈6,400 on 30R)
- **2019: 48% of all arrivals occurred on Runway 12L-30R (≈40,500 arrivals)**
- **Primary arrival use – GA exists northbound to Signature**
- **Primary route for cargo departures Taxiway K → E → 30L**

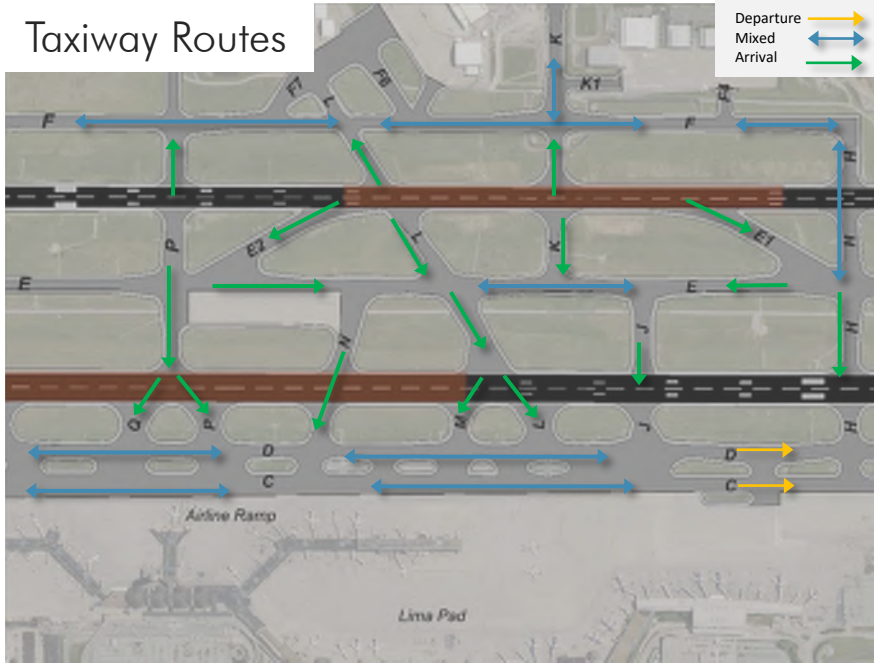
Considerations

- Direct access from air cargo ramp
- ROT impacts on 12L-30R

Issues

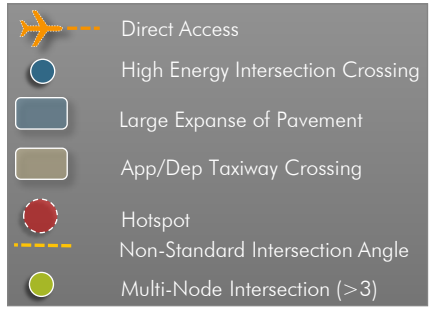


Taxiway Routes



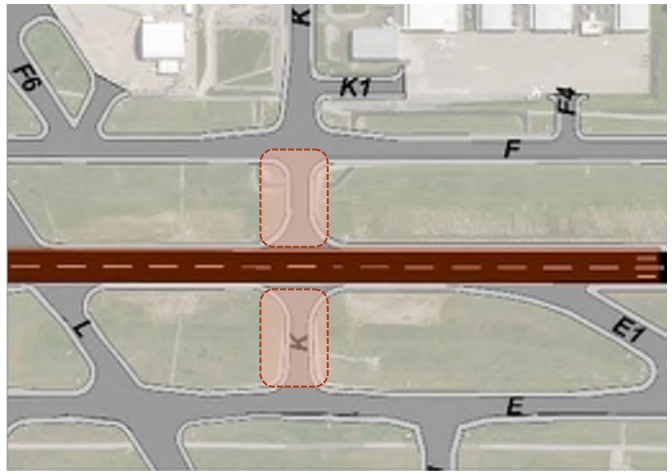
Runway 12L-30R Impact without Intersection

Weighted Avg: Runway Occupancy Time (ROT): All Conditions *(seconds & percent increase)*			
Current 12L (Northbound / Southbound)	55.9 / 48.6	Current 30R (Northbound / Southbound)	54.4 / 48.8
Future 12L (Northbound / Southbound)	63.2 / 49.1	Future 30R (Northbound / Southbound)	58.9 / 50.0
Net Change (Northbound / Southbound)	7.3 (13.1%) / 0.5 (1.0%)	Net Change (Northbound / Southbound)	4.5 (8.3%) / 1.2 (2.5%)



North Airfield: *Taxiway K @ Runway 12L-30R (Mitigation Alternatives)*

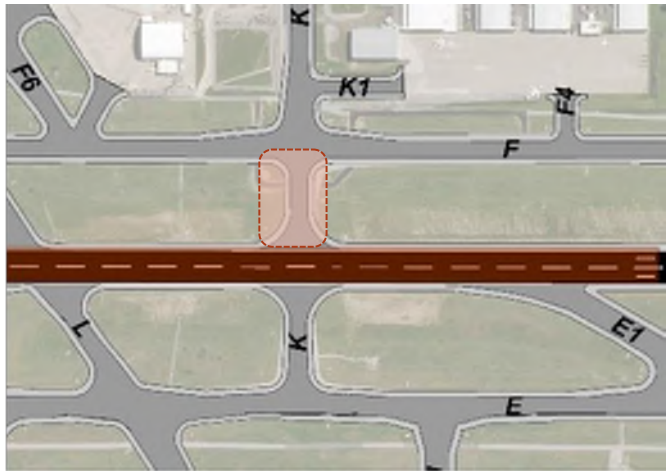
Alt #1: Closure both Directions



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✗
Primary Taxi Routing (Distance)	✗

- Eliminates high-energy crossing & direct access
- Impact to ROTs

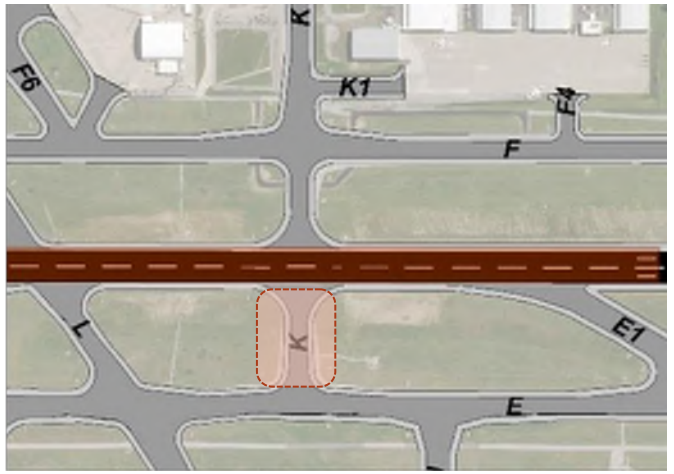
Alt #2: Closure Northbound



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✓
Impact to Runway Occupancy Time (ROT)	✗
Primary Taxi Routing (Distance)	✗

- Eliminates high-energy crossing & direct access
- Impact to ROTs northbound
- ROTs southbound not impacted

Alt #3: 90° Closure Southbound



Assessment Criteria	Stoplight Score
Provides a 90° Intersection	N/A
Crossing Outside High-Energy Zone	✓
Eliminates Direct Access from Apron	✗
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✗

- Eliminates high-energy crossing
- Mitigates impact to ROTs northbound
- Limited impact to ROTs southbound

Consideration of Optimizing New Location for Taxiway L and Close Taxiway K?

West Airfield – Alternatives

West Airfield: *Taxiways T, U, and A @ Runway 11-29 (Overview)*

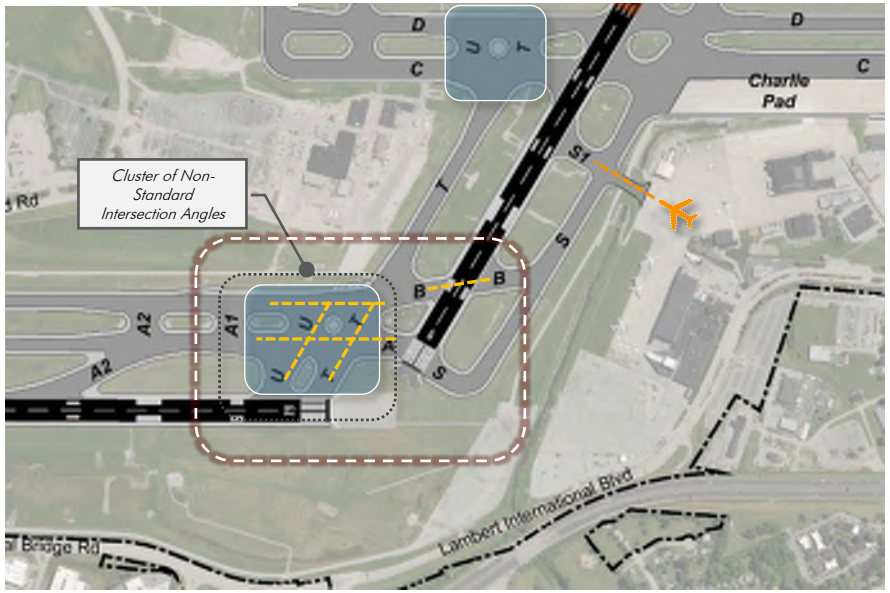
<u>What are we Solving for?</u>

- Non-standard intersection angles
- Large expanse of pavement (Taxiway T, U, and A)

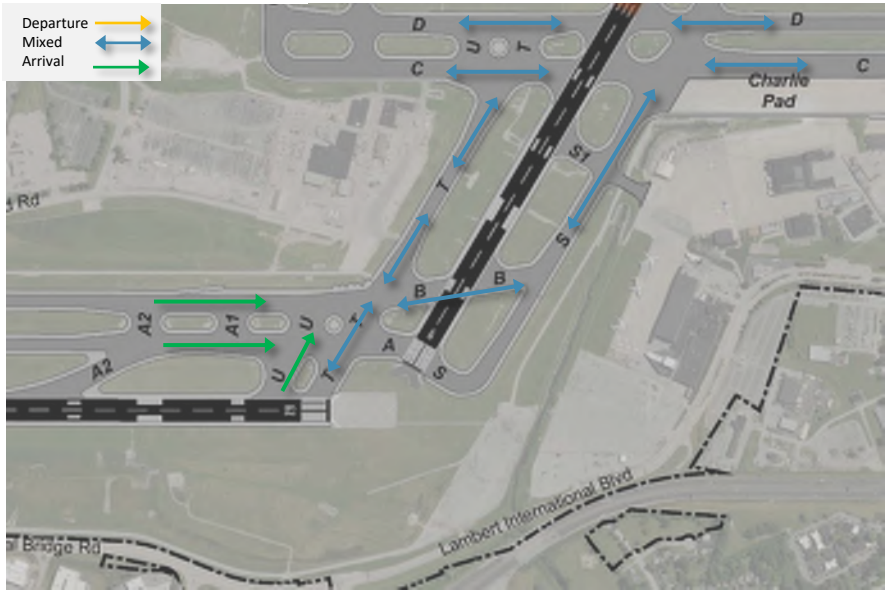
<u>Current Known Use or Key Observations</u>

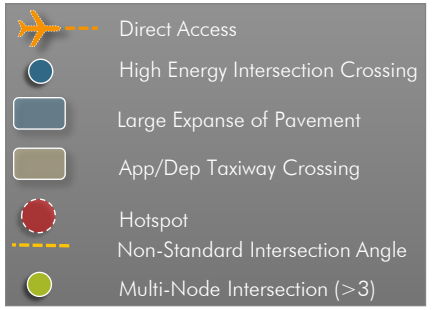
- Primary use for arrivals on Runway 11 or departures for Runway 29
- 2019: 27% of all arrivals occurred on Runway 11-29 (≈16,500 arrivals to Runway 11 and ≈9,500 arrivals to Runway 29)
- 2019: 11% of all departures occurred on Runway 11-29 (≈10,800 departures to Runway 11 and ≈9,500 arrivals to Runway 29)

Issues



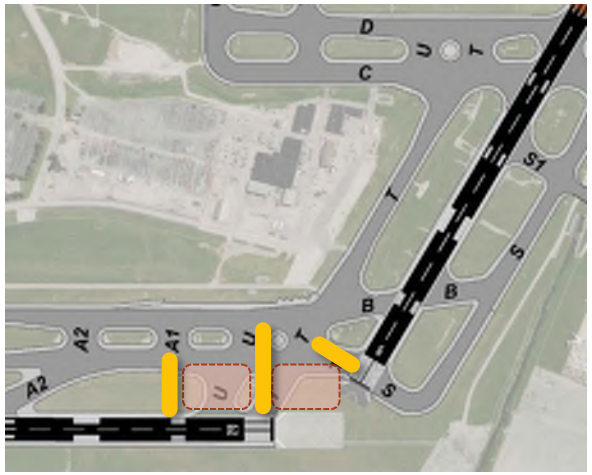
Taxiway Routes





West Airfield: *Taxiways T, U, and A @ Runway 11-29* *(Mitigation Alternatives)*

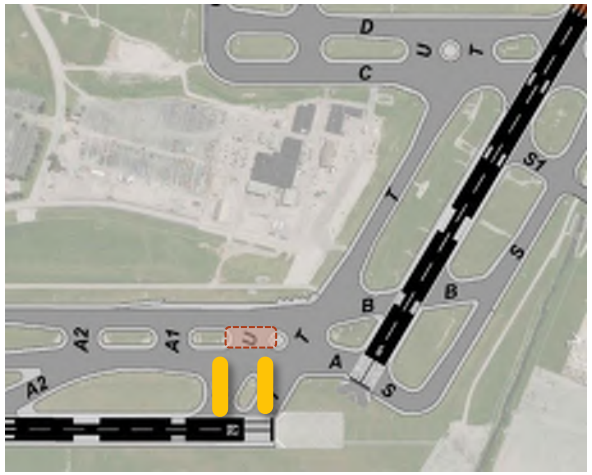
Alt #1: *Realign All*



Assessment Criteria	Stoplight Score
Improves Non-Standard Angles	✓
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Improves non-standard angles

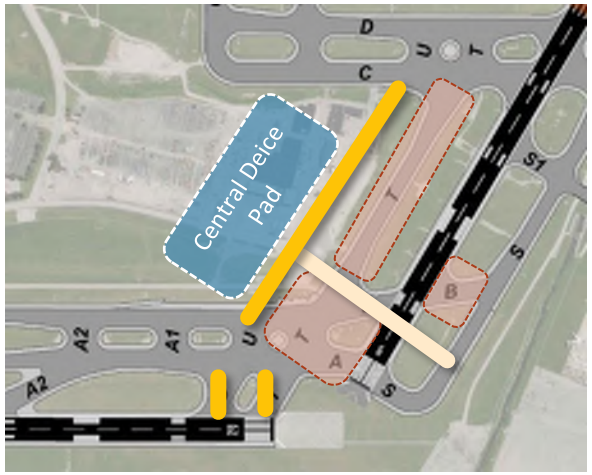
Alt #2: *Removal & Straighten*



Assessment Criteria	Stoplight Score
Improves Non-Standard Angles	✓
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Improves non-standard angles
- Slight reduction in pavement area

Alt #3: *Develop Taxiway U*



Assessment Criteria	Stoplight Score
Improves Non-Standard Angles	✓
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Provides additional depth along Runway 6-24 to resolve proximity concerns associated with Taxiway T, B, and A intersections

West Airfield: *Taxiways B and S @ Runway 6-24 (Overview)*

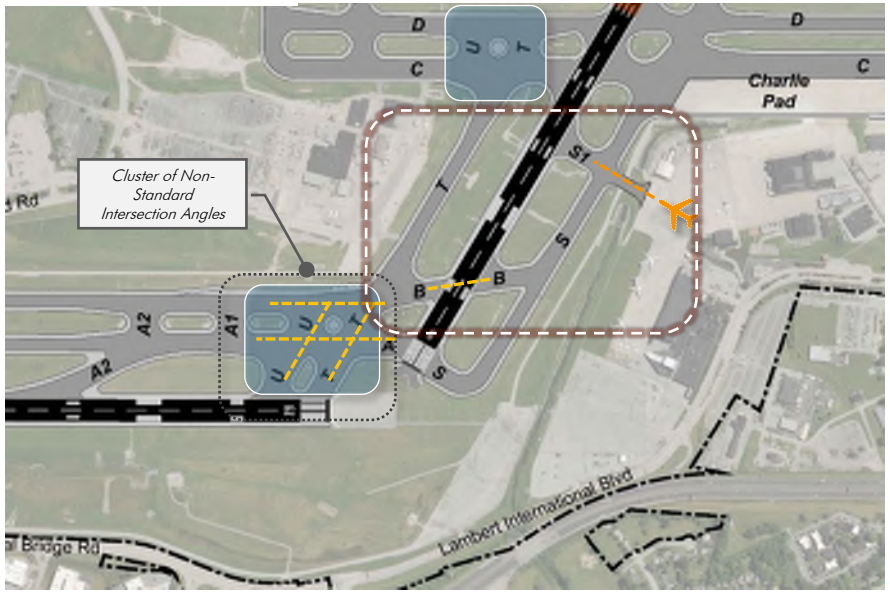
<u>What are we Solving for?</u>

- Direct access (Taxiway S1)
- Non-standard intersection/crossing (Taxiway B & Runway 6-24)

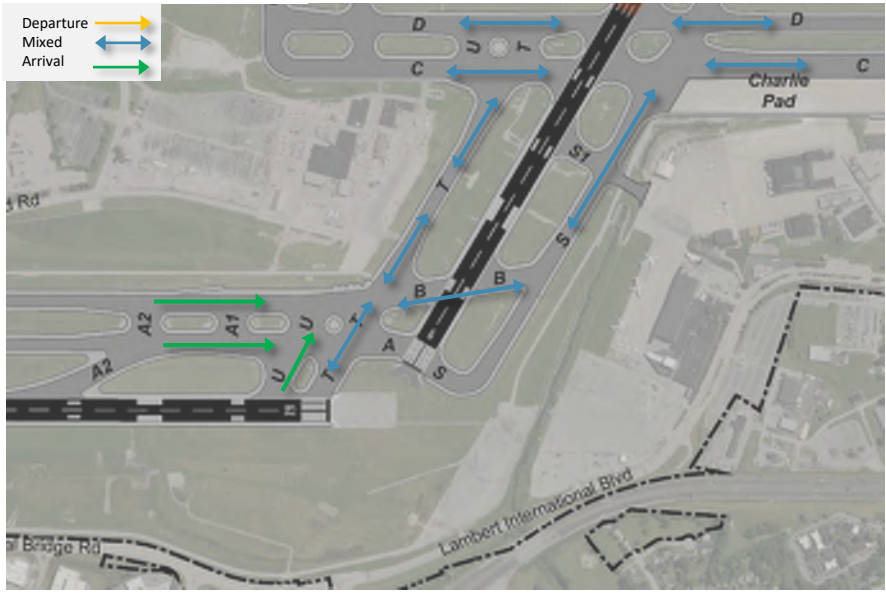
<u>Current Known Use or Key Observations</u>

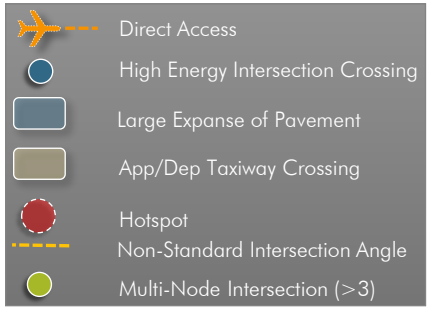
- Taxiway B crossing (access to Runway 11-29)
- Taxiway T and S utilized to manage various flow configurations and provide options to accommodate arrivals or departures
- Proximity of Runway 6, Taxiway A, and Taxiway S to Runway 29 safety area (Taxiway S MOS)
- Coldwater Creek infrastructure (Taxiway S1 entrance to ramp)

Issues



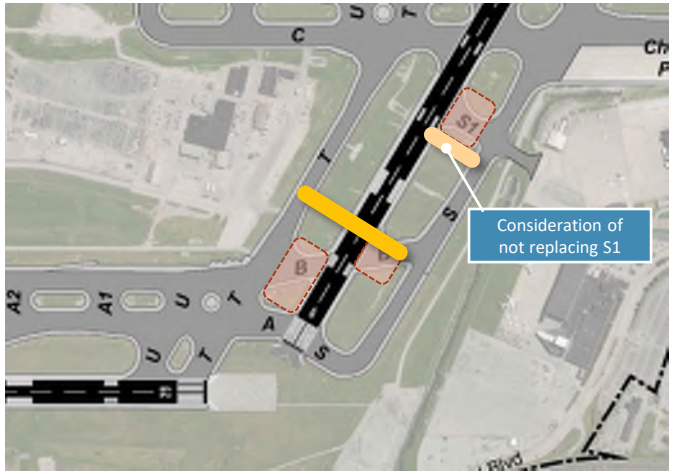
Taxiway Routes





West Airfield: *Taxiways B and S @ Runway 6-24* *(Mitigation Alternatives)*

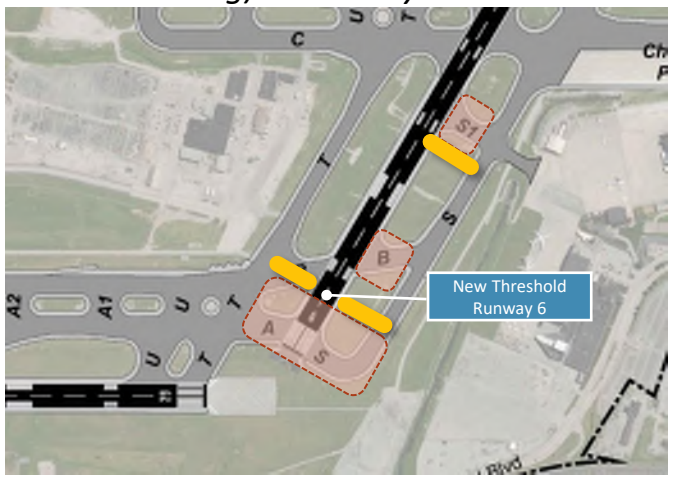
Alt #1: *Taxiway B 90° Crossing & Taxiway S1 Relocation*



Assessment Criteria	Stoplight Score
Improves Non-Standard Angles	✓
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Improves non-standard angles
- Reduces interaction with Taxiway T @ Taxiway A & Runway 29

Alt #2: *Relocate Runway 6 End (Taxiway B 90° Crossing) & Taxiway S1 Relocation*



Assessment Criteria	Stoplight Score
Improves Non-Standard Angles	✓
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	✓
Primary Taxi Routing (Distance)	✓

- Improves non-standard angles
- Reduces interaction with Taxiway T @ Taxiway A & Runway 29
- Provides separation of Runway 6 and associated taxiway system from Runway 29 safety areas (≈ 400’ reduction in Runway 6-24 length)

West Airfield: *Taxiways T and U @ Taxiway D & C (Overview)*

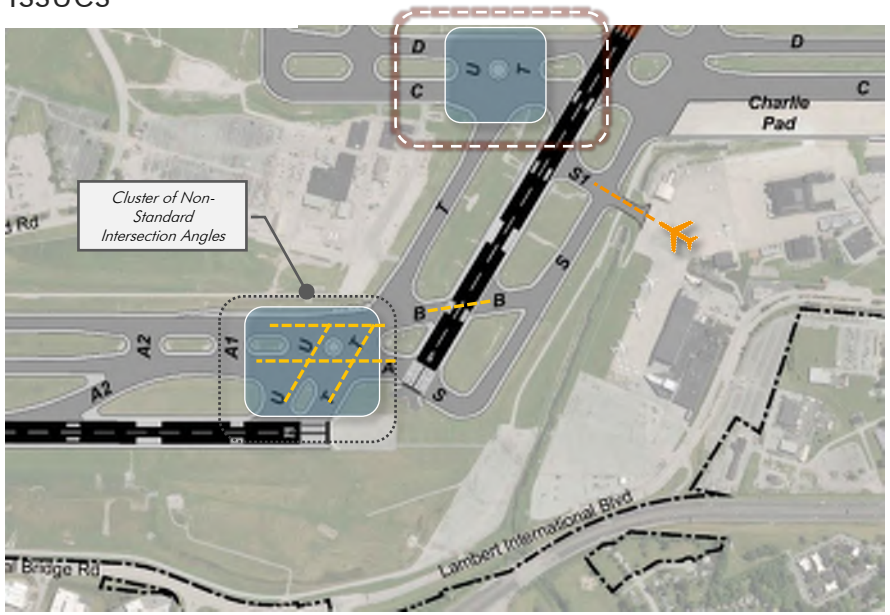
What are we Solving for?

- Large expanse of pavement
- Non-standard intersection angle (Taxiway T @ Taxiway C)

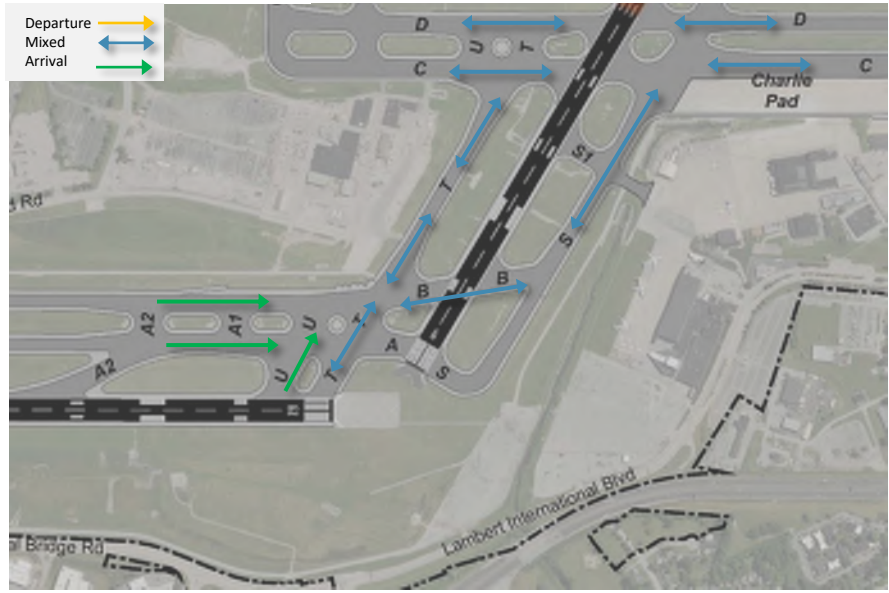
Current Known Use or Key Observations

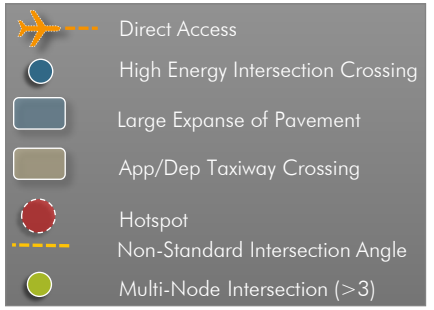
- Provides for bi-directional taxi routings under southeast flow configuration (arrivals Runway 12L & 11 + departures Runway 12R)

Issues



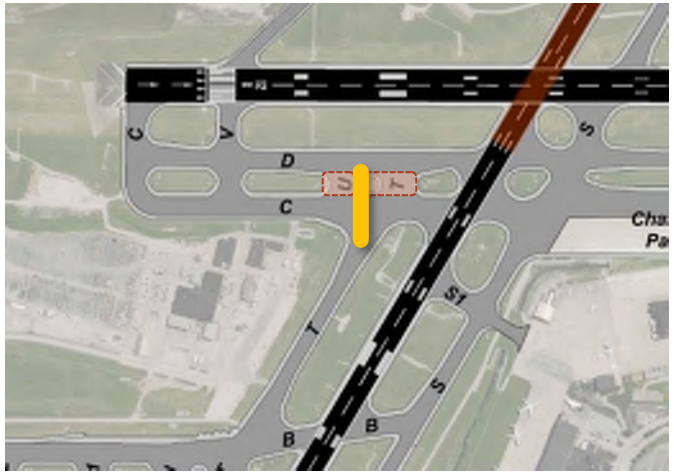
Taxiway Routes





West Airfield: *Taxiways U and T @ Taxiway D & C (Mitigation Alternatives)*

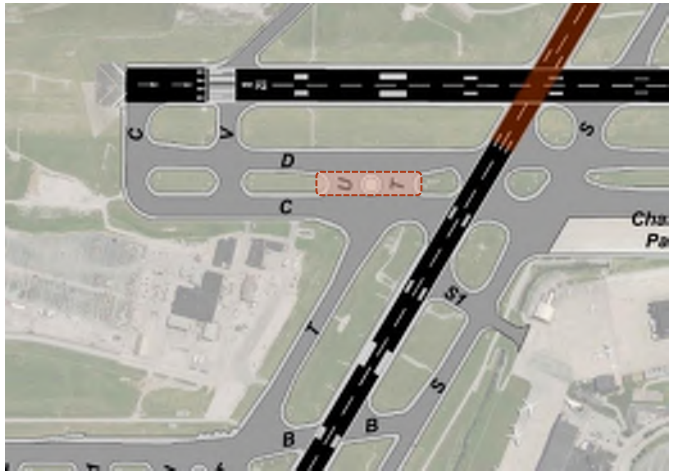
Alt #1: *Consolidate to Single Connector (90° Intersection)*



Assessment Criteria	Stoplight Score
Improves Non-Standard Angles	●
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	N/A
Primary Taxi Routing (Distance)	●

- Improves non-standard angles
- Consolidates close proximity crossover taxiway connectors
- Maintains operational flexibility to accommodate taxi flows under southeast flow configuration

Alt #2: *Close Crossing Points*



Assessment Criteria	Stoplight Score
Improves Non-Standard Angles	●
Crossing Outside High-Energy Zone	N/A
Eliminates Direct Access from Apron	N/A
Impact to Runway Occupancy Time (ROT)	N/A
Primary Taxi Routing (Distance)	●

- Eliminates large area of pavement
- May increase taxi distance under flow configurations

Next Steps

- Refinement of alternatives based on input received
- Allocation of intersection concepts into airfield centric alternatives (up to 5 layouts if needed)
- Analysis of impacts associated with airfield alternatives
- Presentation of refined airfield alternatives with objective of paring down to 2 airfield layouts
- Conduct SRA Workshop
- Selection of preferred airfield alternative
- Integrate preferred airfield layout into draft Airport Layout Plan (ALP) set

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Thank You

Date: January 15, 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Comparative Safety Assessment (CSA) Engagement April 2021

Airfield Alternatives Shortlist Workshop

Meeting Minutes

Virtual Meeting - Zoom

1:00pm – 4:00pm (CDT)

April 21, 2021

IN-ATTENDANCE

STLAA: Jerry Beckmann, Dana Ryan, Ron Stella, Jan Titus, Dave Kulinsky

FAA: Todd Madison (Airports) , Mark Schenkelberg (Airports), James McGhee (STL-ATCT), Ryan Vogt (STL-ATCT), Tom Frakes (Runway Safety)

WSP: John Van Woensel, Jennifer Kuchinski, Eliane Grayer

CMT: Doug Gregory, Nick Brown, Angie Franklin

Faith: Dave Fleet

The following minutes express our understanding of the items discussed. Please respond in writing within seven days of receipt if any changes are required.

MEETING AGENDA

Quadrant #1

- Todd Madison
  - Asked to confirm the separation between the proposed Taxiways S and R in Alternative 1.
    - ~550 feet, sufficient to meet full ADG IV requirements.
  - Confirm that no centerline offset exists in the proposed alignment of the Taxiway F crossing.
  - Must officially state for the record that Taxiway Q is a high-energy zone crossing as proposed but understand that is may be necessary for operational reasons and will need to be evaluated and documented
  - At first glance there is likely not much of a cost differential between Alternatives 1 and 2.
- Ron Stella
  - Is Taxiway Q needed for north exiting aircraft on 12R? Which is better for north exits, Taxiway Q or Taxiway N?
    - Additional REDIM information to be provided (Doug Gregory)
  - Supportive of relocating E2 when reconstructed if REDIM supports relocation.
  - Supports Alternative 1 as viable.

- Tom Frakes
    - Taxiway Q crossing is a concern. Prefers to relocate Exit E2 to avoid encouraging Taxiway Q crossings.
    - All alternatives presented are an improvement over existing condition.
- Mark Schenkelberg
    - From a phasing perspective, which taxiway is more critical, Taxiway S or Taxiway R if Alternative 1 is selected and implemented in phases?
        - Removing the odd angle of Taxiway R would be a greater benefit for air traffic and should be prioritized. – James McGhee
- Jennifer Kuchinski
    - Having both Taxiway S and R provides greater redundancy than a standalone Taxiway R.
- James McGhee
    - Alternative 1 is desired for flexibility reasons.
    - If future plans include the relocation of E2, that would also be beneficial for Air Traffic Reasons.
- Dave Fleet
    - Based on feedback, the group has coalesced around Alternative 1 being preferred.

Quadrant #2

- James McGhee
    - Proposes Alternative 1 as it straightens up the crossings and takes care of a lot of issues.
    - Would like to see an additional exit taxiway to the north east of existing Taxiway K equidistant as the proposed Taxiway L on the west.
    - Pushing aircraft to Taxiway H in northwest flow is not preferred.
    - The south portions (south of Taxiway E) are more important than that section between Taxiway E and 12L-30R.
- Ryan Vogt
    - Concerned about ROT and removing as many exits as are proposed and the resulting increase in ROT. Alternative 2 removes too many.
    - Supports the additional exit to the north per James McGhee's comments.
- Ron Stella
    - Unsure of the need of Taxiway L to the north.
- Doug Gregory
    - Should we shift the sections of south of Taxiway E to decouple the crossing of 12R-30L?
- Dave Fleet
    - Based on feedback, the group has coalesced around Alternative 1 with the proposed taxiway south of Taxiway E shifted further east.

Quadrant #3

- Todd Madison
  - Prioritize the location of E1 in optimal location for reducing ROT.
  - As shown, future H to the north of E would result in a 4-node intersection and not be compliant with taxiway design standards.
  - Also need to show the extension of Taxiway F with a curved outer corner so as to not look like a runway.
- Ron Stella
  - Issue with moving E1 with relocated Taxiway H as this will create the same issues that we are resolving with exiting on E2 to Q.
- James McGhee
  - Suggest leaving Taxiway H in existing location south of E with relocated E1 or further to the west. This would protect the 12R LOC Critical Area and have efficiency benefits.

Quadrant #4

- Todd Madison
  - Alternative 2 – Where do the approach/departure surfaces fall out on Taxiway T with the relocated threshold to Runway 6?
  - End-fire GS has special siting requirements that may interfere with the proposed retention basin.
- Ryan Vogt
  - The intersection of Taxiways V and T may cause situational awareness issues in Alternative 1. Aircraft taxiing south on V may mistake Runway 6 for Runway 29.
- James McGhee
  - Shortening of Runway 6 will cause issues with Runway 29 in RPZ.
  - Taxiway V on the north of 12R is good, but would like to see it extended to Runway end or inside 500’ of threshold so as to eliminate it as an intersection departure and wake-turbulence restrictions.
  - Is it possible to reorient the deicing pad based on the existing alignment of Taxiway T?
- Doug Gregory
  - We have an IOU on the Runway 6/Runway 29 end convergence and RPZ/surfaces interactions.
- Jennifer Kuchinski
  - Important to note that in the event the deicing pad is not constructed, there would be a single-point-of-access choke point at the Taxiway B Taxiway S intersection.

Comparative Safety Assessment (CSA) Engagement
April 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Airfield Alternatives

Safety Risk Assessment (SRA) Engagement

Date: April 21, 2021

Agenda

- Introductions and welcome
- Overview of the CSA Process for the meeting (Dave Fleet)
- Overview of the alternatives vetting process (Doug Gregory)
- Overview of the two alternatives for comparison (Doug Gregory)
- Break if needed
- Quadrant discussion: Alternative #1 and Alternative #2 side by side (Doug Gregory & Dave Fleet)
- Identification of preferred airfield configuration: key elements (Dave Fleet)
- Review preferred airfield configuration for safety and operational considerations (Dave Fleet)
- Address any issues raised, adjust as needed (Dave Fleet)
- Finalize and set action plan for any items needing follow up
- Next Steps

Overview of the CSA Process

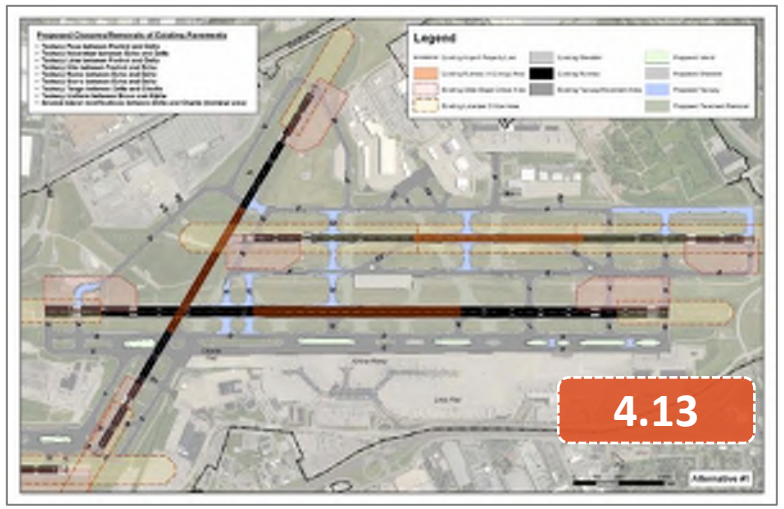
- Mr. Dave Fleet to provide opening remarks for today's meeting

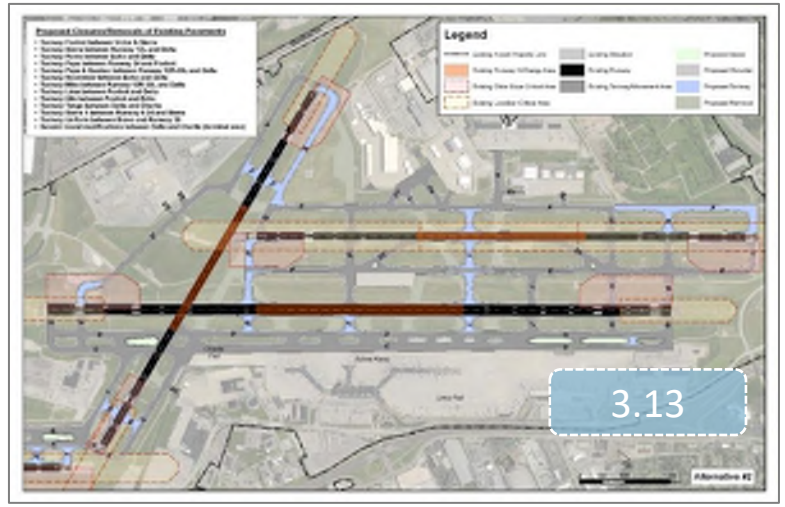
Overview of Alternatives Vetting Process

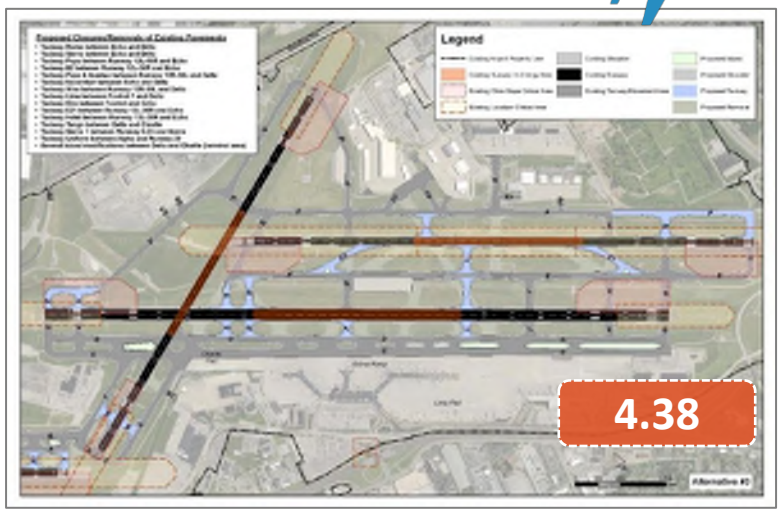
- Inventory – Workshop #1 (Airfield Utilization)
- Facility Requirements Presentation
- Airfield Alternatives Workshop #1
- Airfield Alternatives Workshop #2
- Airfield Concepts Survey
- Safety Risk Assessment Workshop (Today)

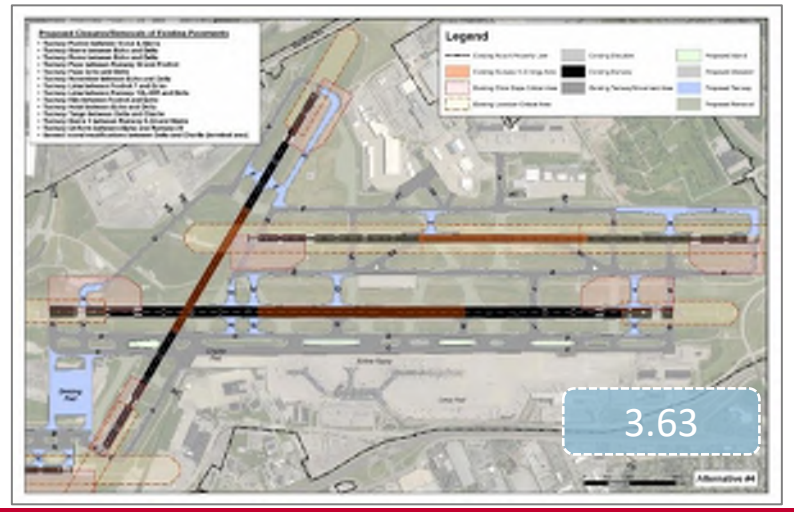
Overview of Alternatives Vetting Process

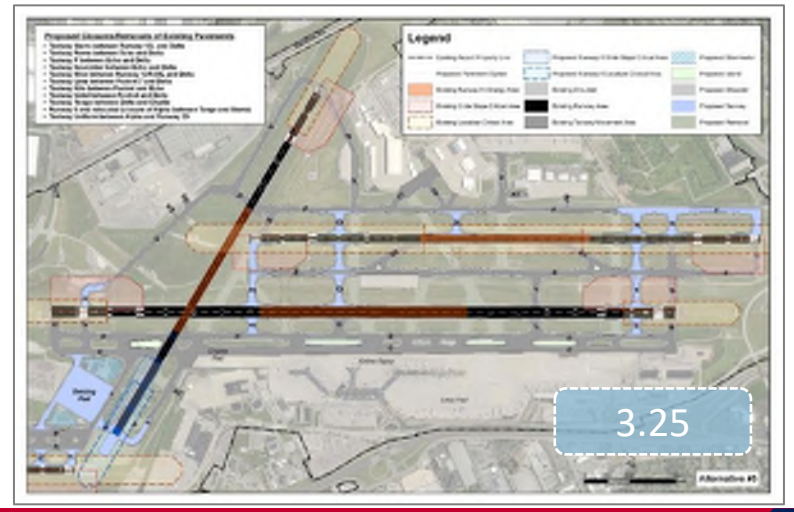
Survey Results – Weighted Average

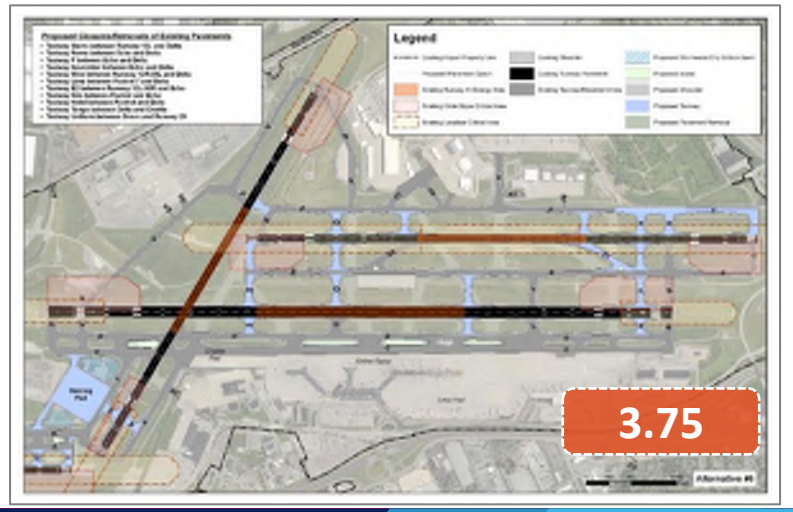






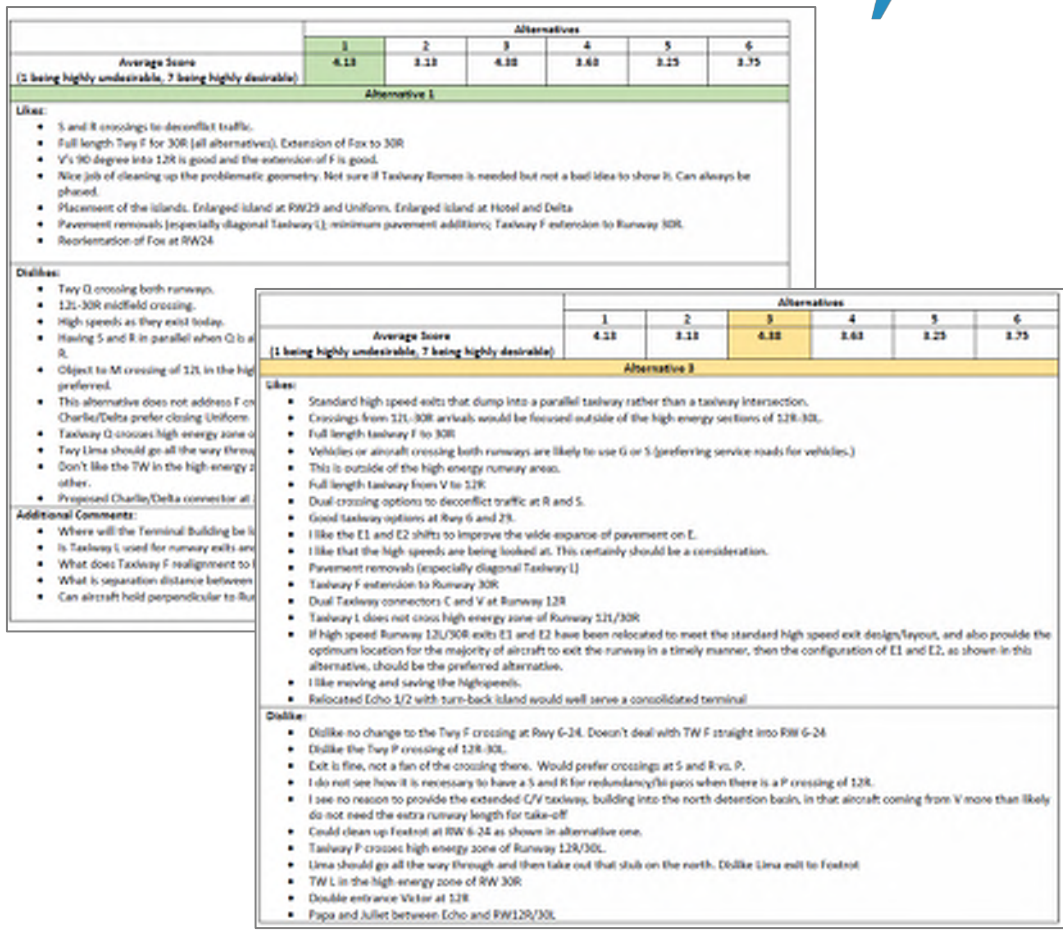






Airfield Survey – Results

- 8 Responses
  - Likes & Dislikes
  - Additional Comments
- Synopsis of ranking:
  - Top 3: Alternatives #1, #3, and #6
- Preferred Alternatives: Blend of survey results along with input received during previous workshops
- Takeaways:
  - Consensus on central deice pad (departures Runway 12R or Runway 11)
  - Consideration of Sierra extension to Runway 24
  - Discuss Foxtrot at Runway 24 intersection
  - Location of high-speed exits on Runway 12L-30R
  - Taxiway Quebec or Papa crossing at Runway 12R-30L



Average Score (1 being highly undesirable, 7 being highly desirable)	Alternatives 1	2	3	4	5	6
	4.13	3.13	4.38	3.63	3.25	3.75

Alternative 1

Likes:
- S and R crossings to deconflict traffic.
- Full length Twy F for 30R (all alternatives). Extension of Fox to 30R
- V's 90 degree into 12R is good and the extension of F is good.
- Nice job of cleaning up the problematic geometry. Not sure if Taxiway Romeo is needed but not a bad idea to show it. Can always be phased.
- Placement of the islands. Enlarged island at RW29 and Uniform. Enlarged island at Hotel and Delta
- Pavement removals (especially diagonal Taxiway L); minimum pavement additions; Taxiway F extension to Runway 30R
- Reorientation of Fox at RW24

Dislikes:
- Twy Q crossing both runways.
- 12L-30R midfield crossing.
- High speeds as they exist today.
- Having S and R in parallel when Q is a[t] R.
- Object to M crossing of 12L in the hig[h] preferred.
- This alternative does not address F cr[oss] Charlie/Delta prefer closing Uniform
- Taxiway Q crosses high energy zone o[f]
- Twy Lima should go all the way thro[ugh]
- Don't like the TW in the high energy [zone] other.
- Proposed Charlie/Delta connector at [...]

Additional Comments:
- Where will the Terminal Building be l[ocated]
- Is Taxiway L used for runway exits an[d]
- What does Taxiway F realignment to [...]
- What is separation distance between [...]
- Can aircraft hold perpendicular to Ru[nway]

Average Score (1 being highly undesirable, 7 being highly desirable)	Alternatives 1	2	3	4	5	6
	4.13	3.13	4.38	3.63	3.25	3.75

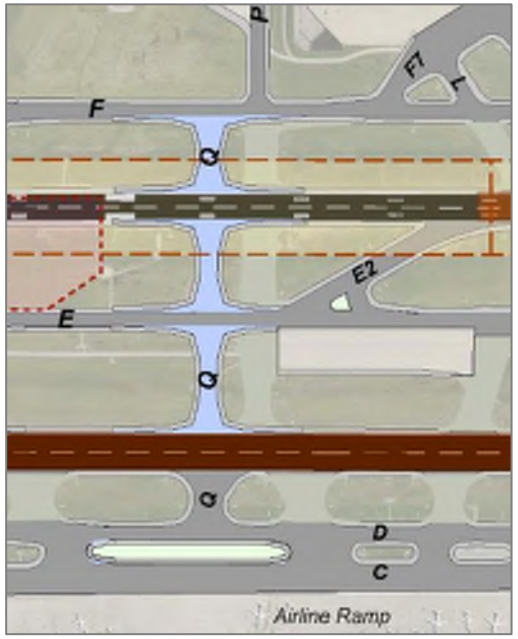
Alternative 3

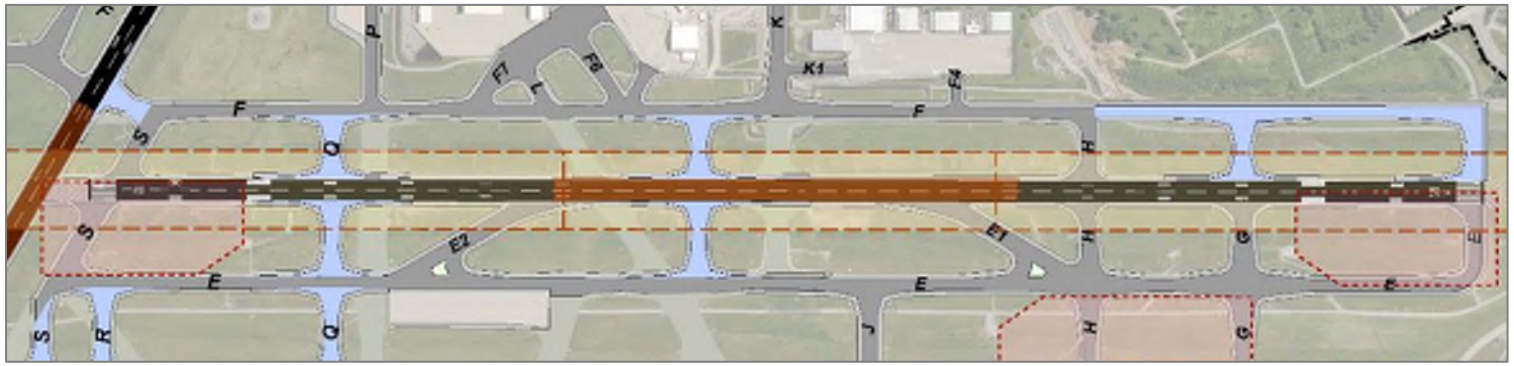
Likes:
- Standard high speed exits that dump into a parallel taxiway rather than a taxiway intersection.
- Crossings from 12L-30R arrivals would be focused outside of the high energy sections of 12R-30L.
- Full length taxiway F to 30R
- Vehicles or aircraft crossing both runways are likely to use G or S (preferring service roads for vehicles.)
- This is outside of the high energy runway areas.
- Full length taxiway from V to 12R
- Dual crossing options to deconflict traffic at R and S.
- Good taxiway options at Rwy 6 and 29.
- I like the E1 and E2 shifts to improve the wide expanse of pavement on E.
- I like that the high speeds are being looked at. This certainly should be a consideration.
- Pavement removals (especially diagonal Taxiway L)
- Taxiway F extension to Runway 30R
- Dual Taxiway connectors C and V at Runway 12R
- Taxiway L does not cross high energy zone of Runway 12L/30R
- If high speed Runway 12L/30R exits E1 and E2 have been relocated to meet the standard high speed exit design/layout, and also provide the optimum location for the majority of aircraft to exit the runway in a timely manner, then the configuration of E1 and E2, as shown in this alternative, should be the preferred alternative.
- I like moving and saving the highspeeds.
- Relocated Echo 1/2 with turn-back island would well serve a consolidated terminal

Dislike:
- Dislike no change to the Twy F crossing at Rwy 6-24. Doesn't deal with TW F straight into RW 6-24
- Dislike the Twy P crossing of 12R-30L.
- Exit is fine, not a fan of the crossing there. Would prefer crossings at S and R vs. P.
- I do not see how it is necessary to have a S and R for redundancy/hi pass when there is a P crossing of 12R.
- I see no reason to provide the extended C/V taxiway, building into the north detention basin, in that aircraft coming from V more than likely do not need the extra runway length for take-off
- Could clean up Foxtrot at RW 6-24 as shown in alternative one.
- Taxiway P crosses high energy zone of Runway 12R/30L.
- Lima should go all the way through and then take out that stub on the north. Dislike Lima exit to Foxtrot
- TW L in the high energy zone of RW 30R
- Double entrance Victor at 12R
- Papa and Juliet between Echo and RW12R/30L

Airfield Survey – Additional Discussion

- Papa or Quebec Crossing of Runway 12R-30L
  - Taxi time impact
- High-Speed Exit Locations
  - REDIM analysis
  - Future fleet mix projections
  - Echo-1: 400’ shift to East
  - Echo-2: good location





North Airfield: *Arrival 30R - Taxi Distance Impact to Terminal 1*

(No Crossing of Runway 12R-30L High-Energy Zone)

What are we Solving for?

- Impact to taxi route distances and time if crossfield connectivity is limited to outside high-energy zone

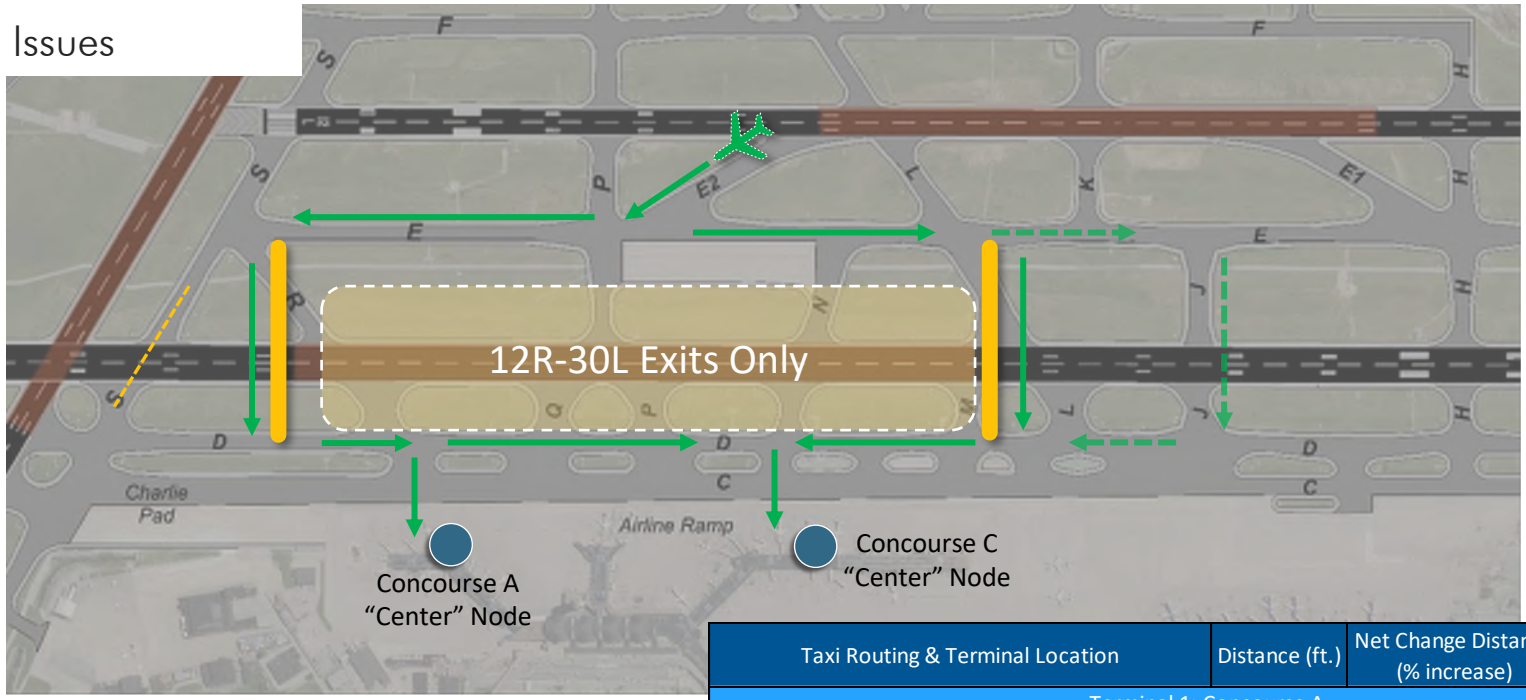
Current Known Use or Key Observations

- Taxiway R, Q, P, and N primarily used to accommodate arrivals to Terminal 1 (based on current air traffic management procedures)
- **2019: 32% of all arrivals occurred on Runway 30R (≈30,500 arrivals)**
- Runway 30R arrival demand in 2019 impacted by the closure of Runway 12L-30R for reconstruction (May through September). 2016-2018 average utilization of Runway 30R arrivals was 43%
- Distances measured from the E2 holdbar location for comparative purposes
- Taxi speed assumed to be an average of 13-knots based on airfield simulation model (baseline conditions)

Considerations

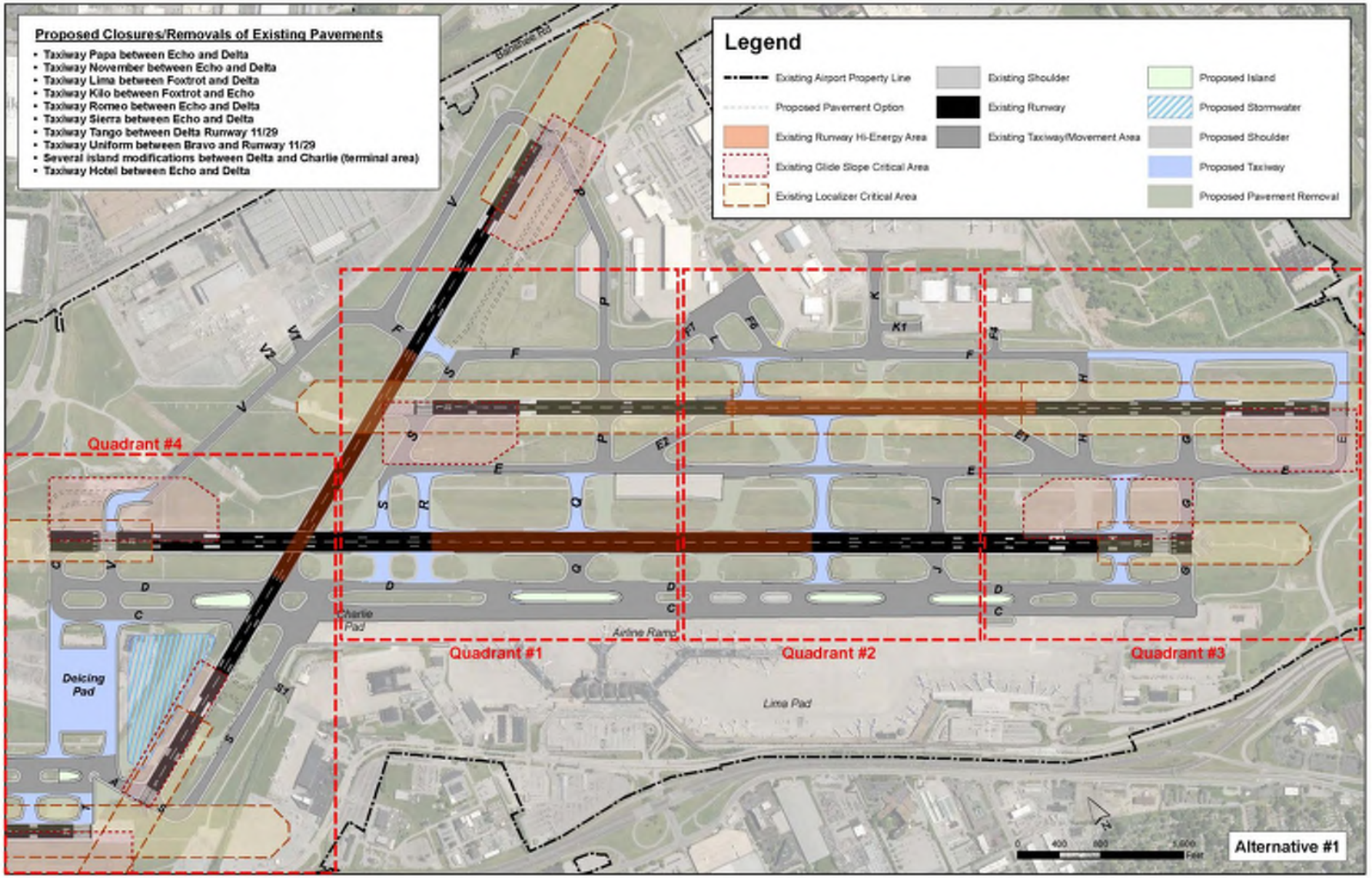
- Shortest "new" routes with Taxiway Q, P, and N closed increase taxi times by 1.7± min to 3.0 ± minutes depending on concourse destination
- Outbound traffic to Runway 30L departure on Taxiway D
- **Result: Need to consider a crossing within high-energy zone of Runway 12R-30L**

Issues

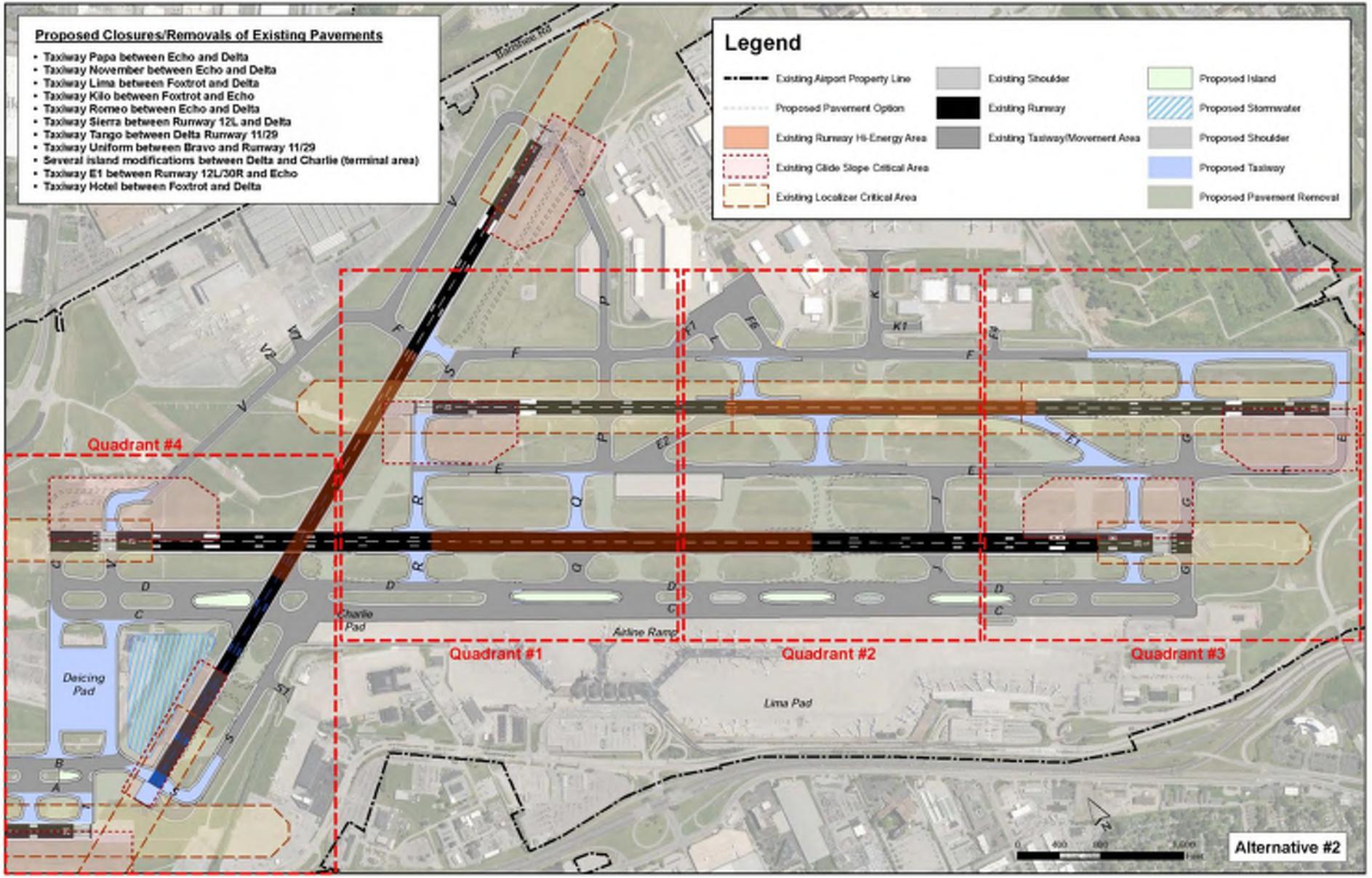


Taxi Routing & Terminal Location	Distance (ft.)	Net Change Distance (% increase)	Taxi Time Impact (Min)
Terminal 1: Concourse A			
Baseline: E2 → P → Q → C → Center Node	2,850'	--	--
E2 → E → New R → D → Center Node (Normal)	5,070'	2,220' (77.9%)	1.69
E2 → E → L @ 90° → D → Center Node (Unlikely)	6,470'	3,620' (127.0%)	2.75
E2 → E → J → D → Center Node (Very Unlikely)	8,698'	5,848' (205.2%)	4.44
Terminal 1: Concourse C			
Baseline: E2 → P → C → Center Node	3,250'	--	--
E2 → E → New R → D → Center Node (Normal)	7,175'	3,925' (120.8%)	2.98
E2 → E → L @ 90° → D → Center Node (Unlikely)	4,470'	1,220' (37.5%)	0.93
E2 → E → J → D → Center Node (Very Unlikely)	6,690'	3,440' (105.8%)	2.61

Overview Preferred Alternative #1



Overview Preferred Alternative #2

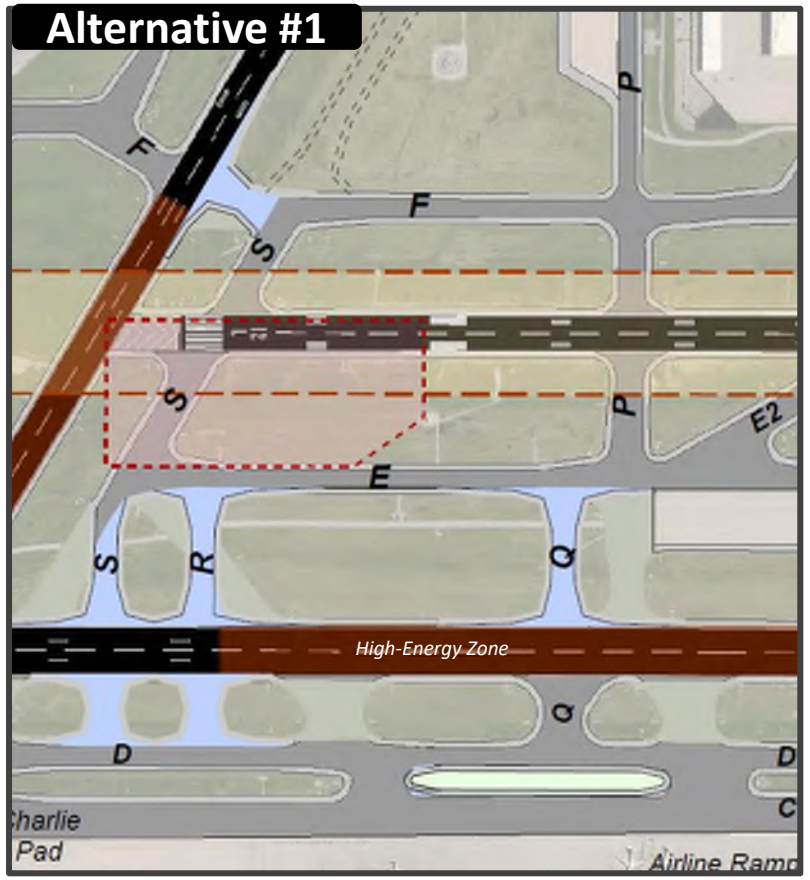


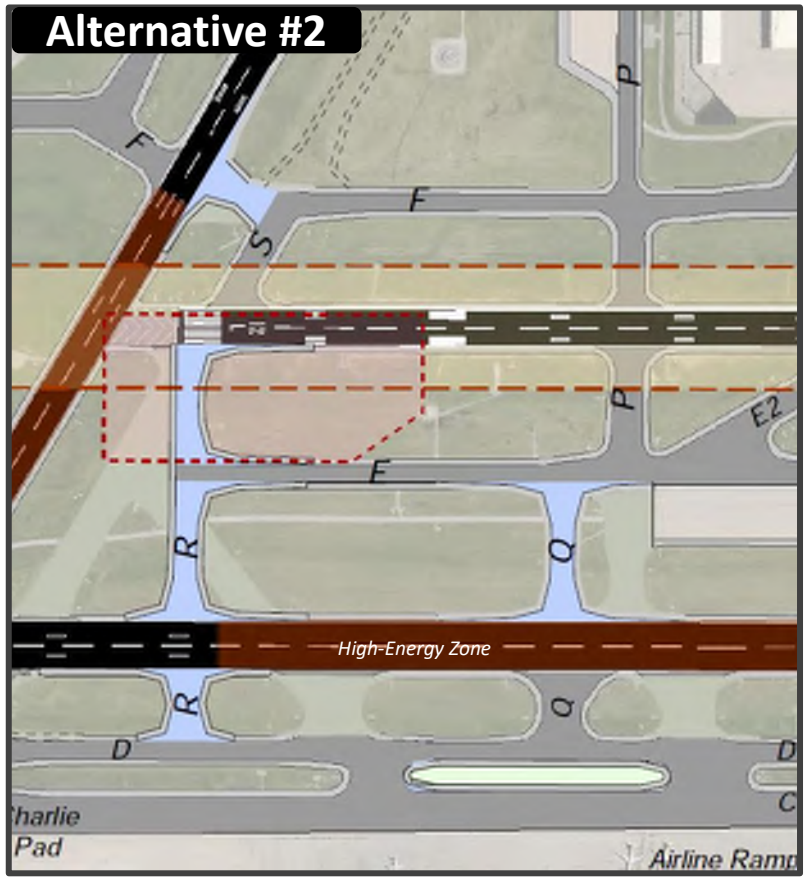
Break if Needed

Quadrant Discussion

- Open collaboration on proposed taxiway configurations identified in each preferred airfield layout
- Input and debate is critical – no idea is a bad idea
- Pre-COVID, this process would occur in person with sticky notes and dry eraser markers

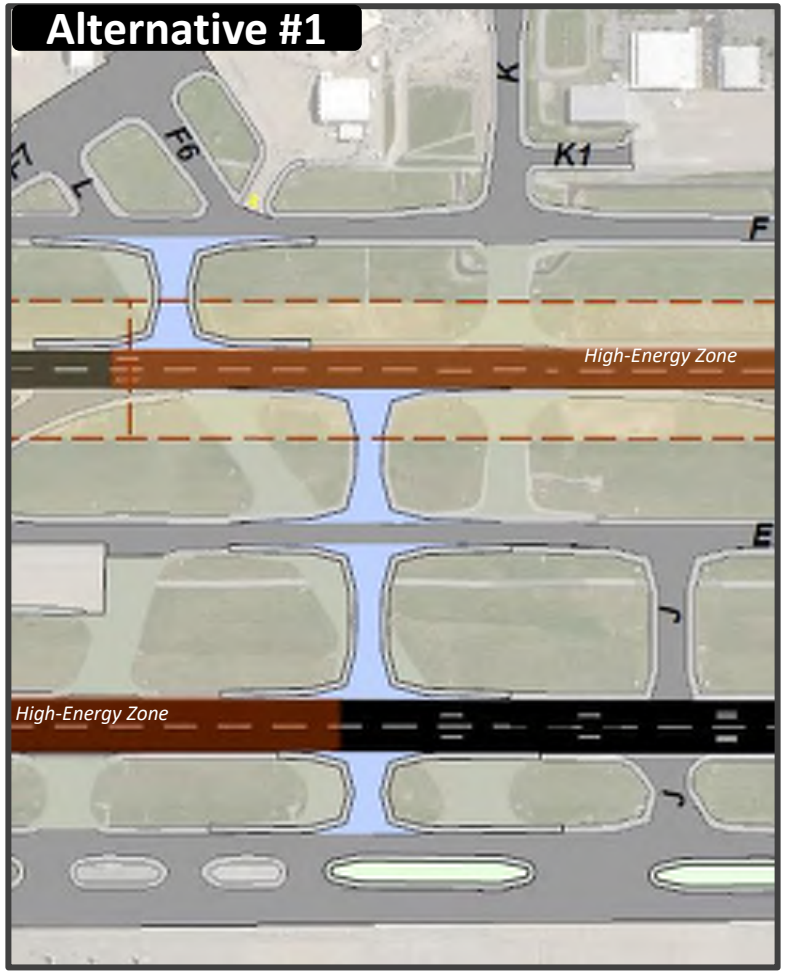
Quadrant #1 Discussion

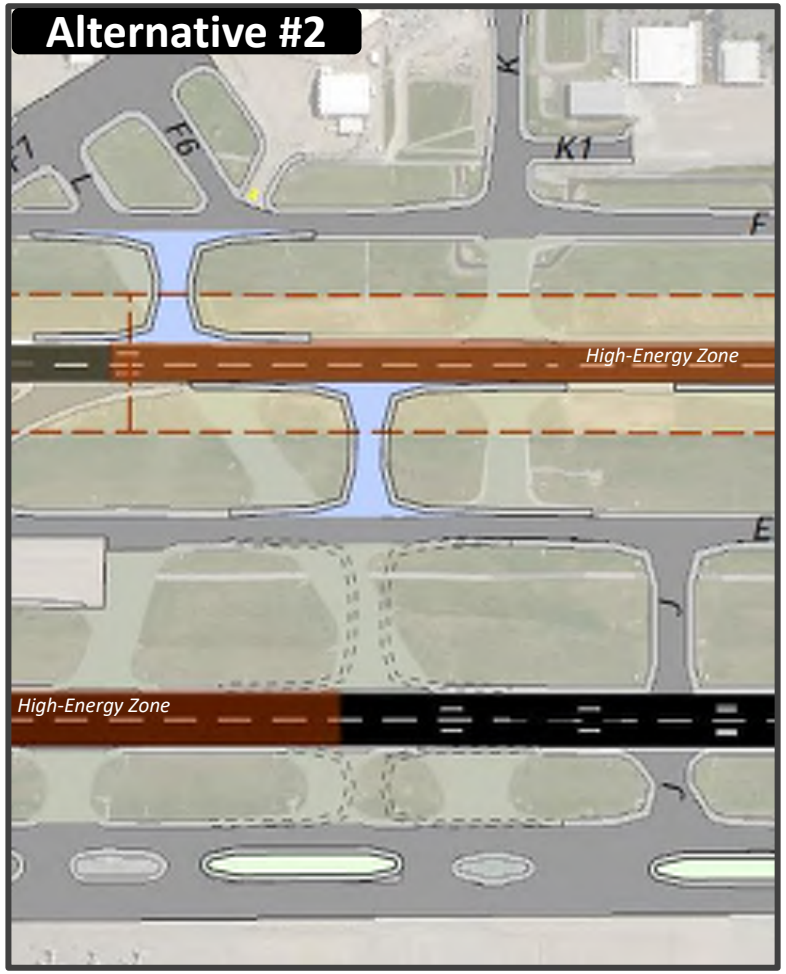




Pros / Cons

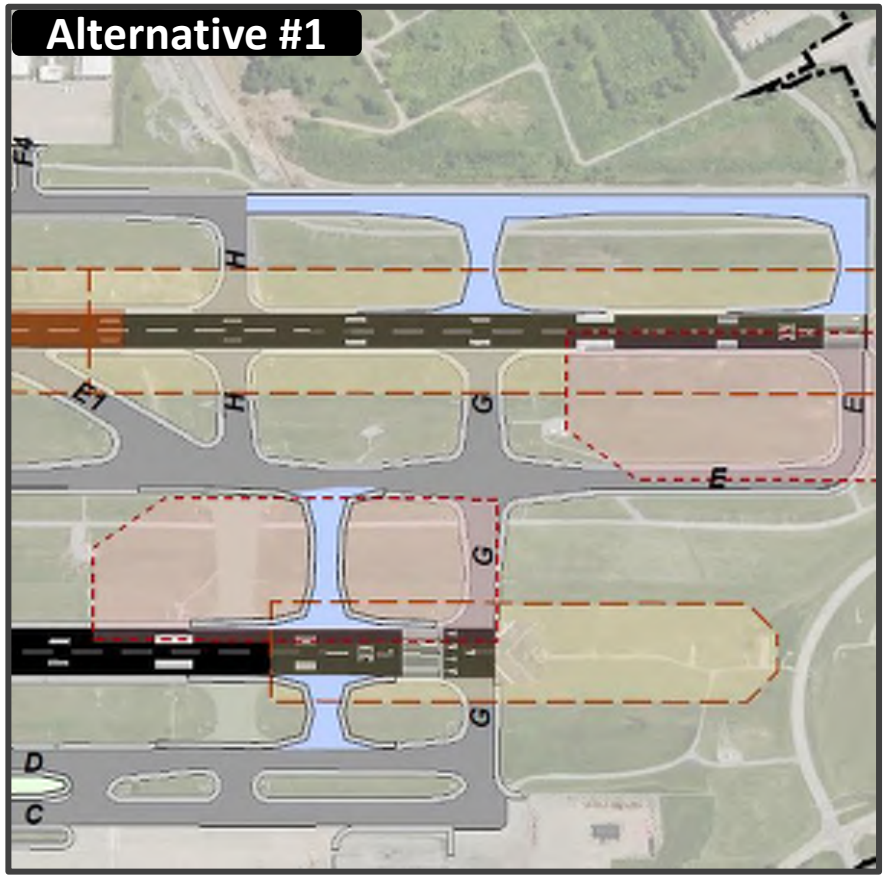
Quadrant #2 Discussion

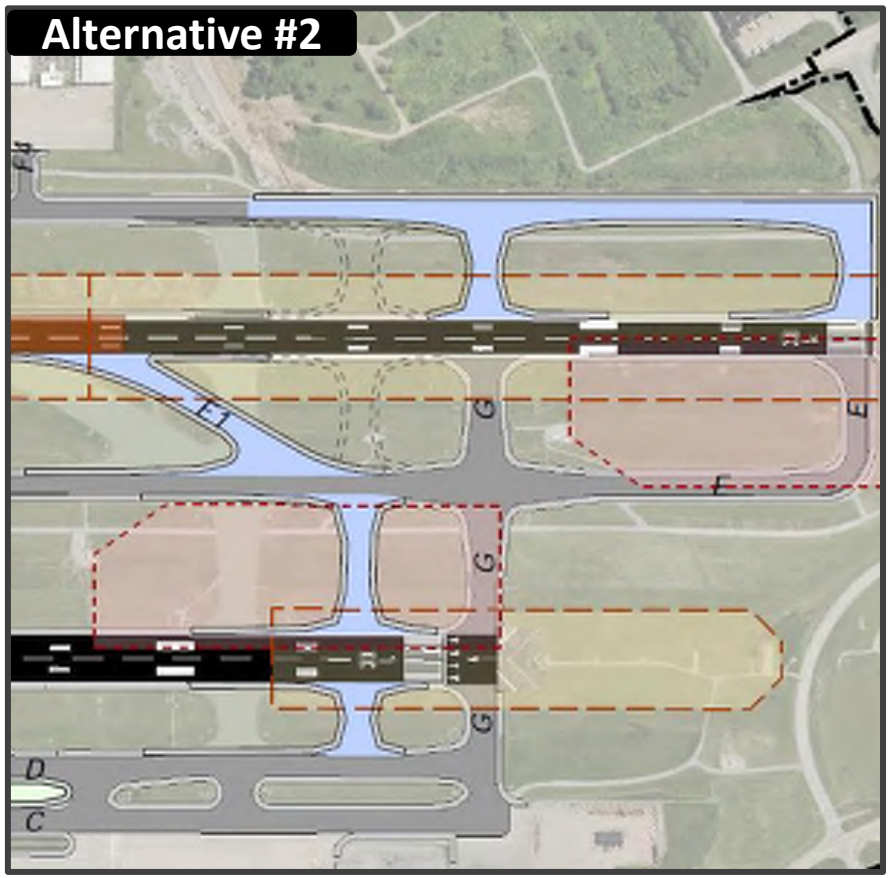




Pros / Cons

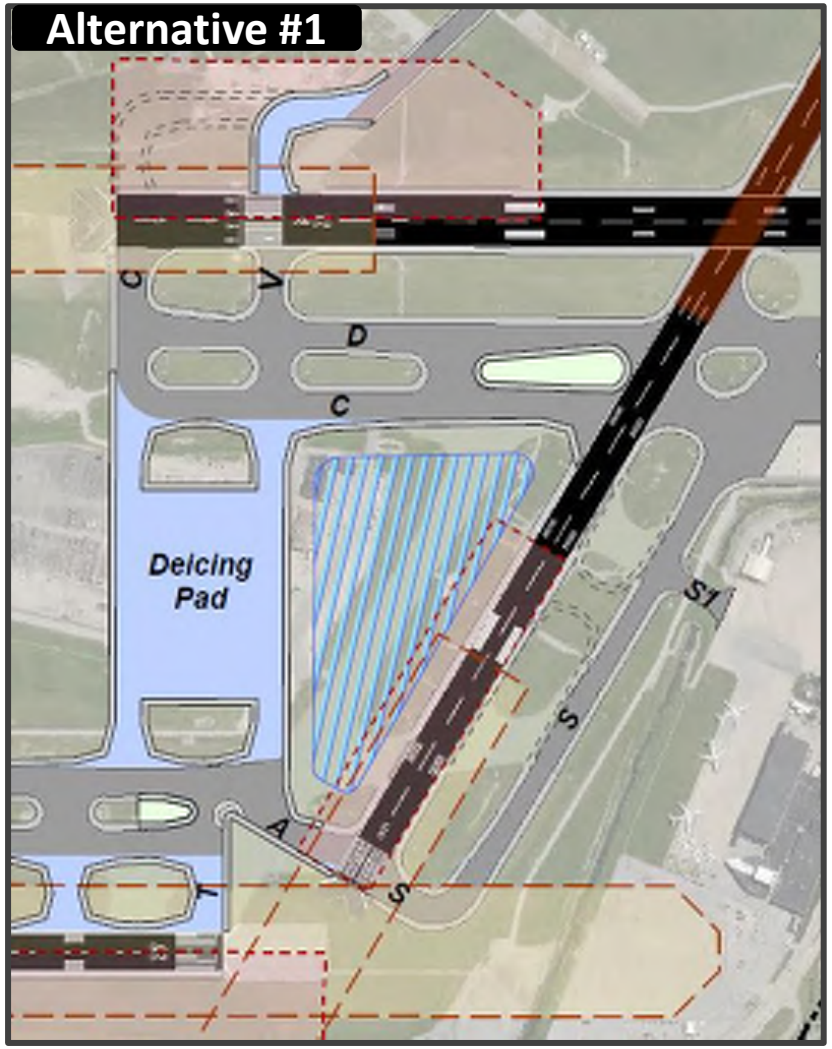
Quadrant #3 Discussion

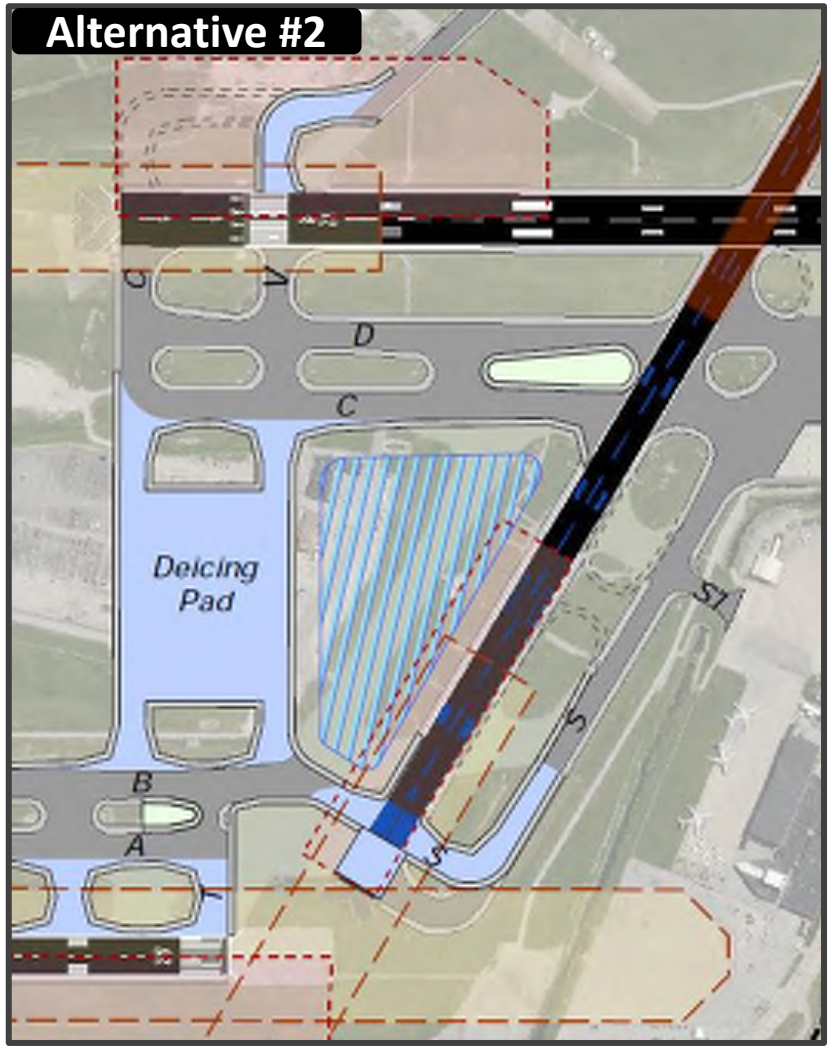




Pros / Cons

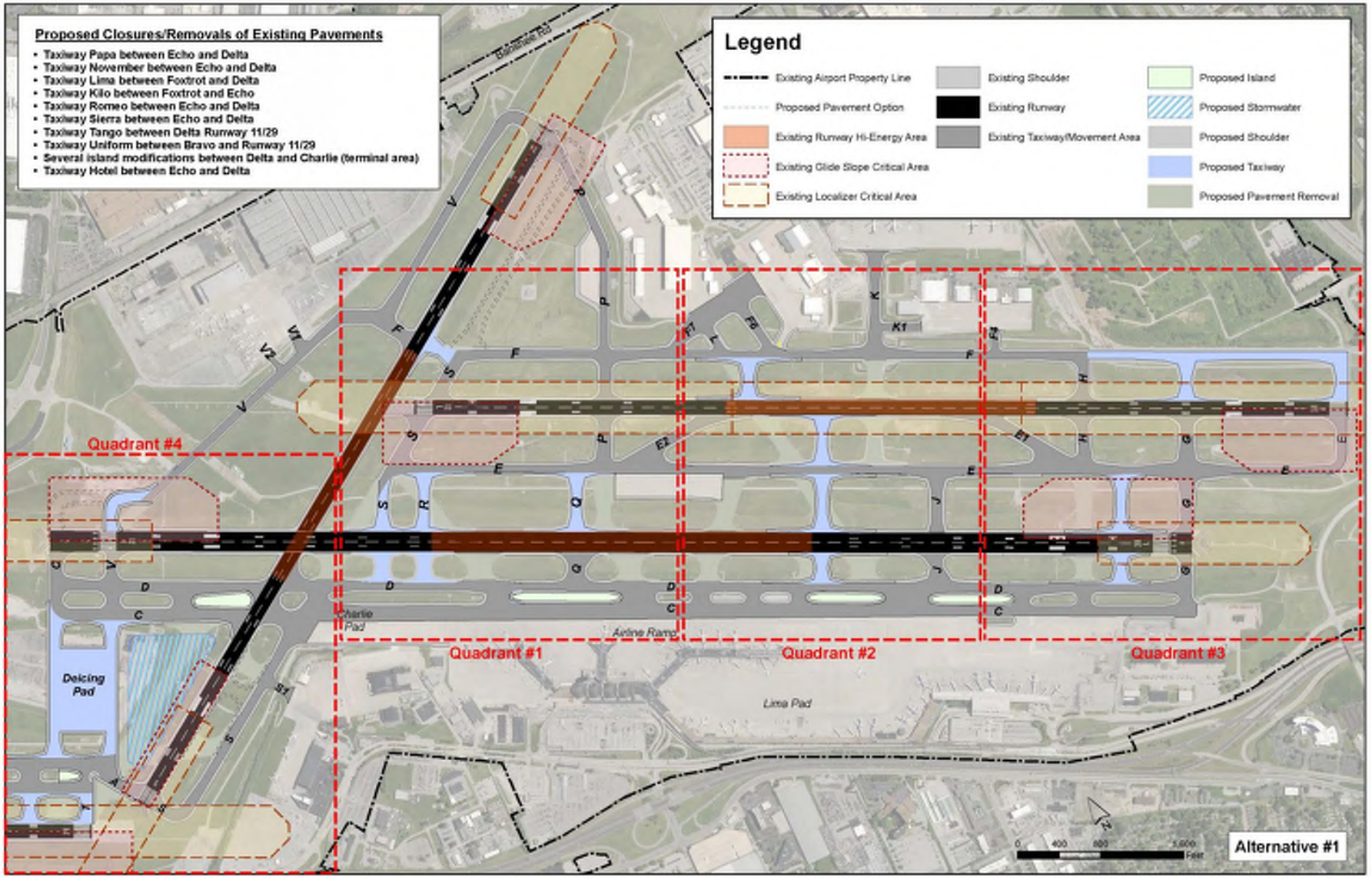
Quadrant #4 Discussion



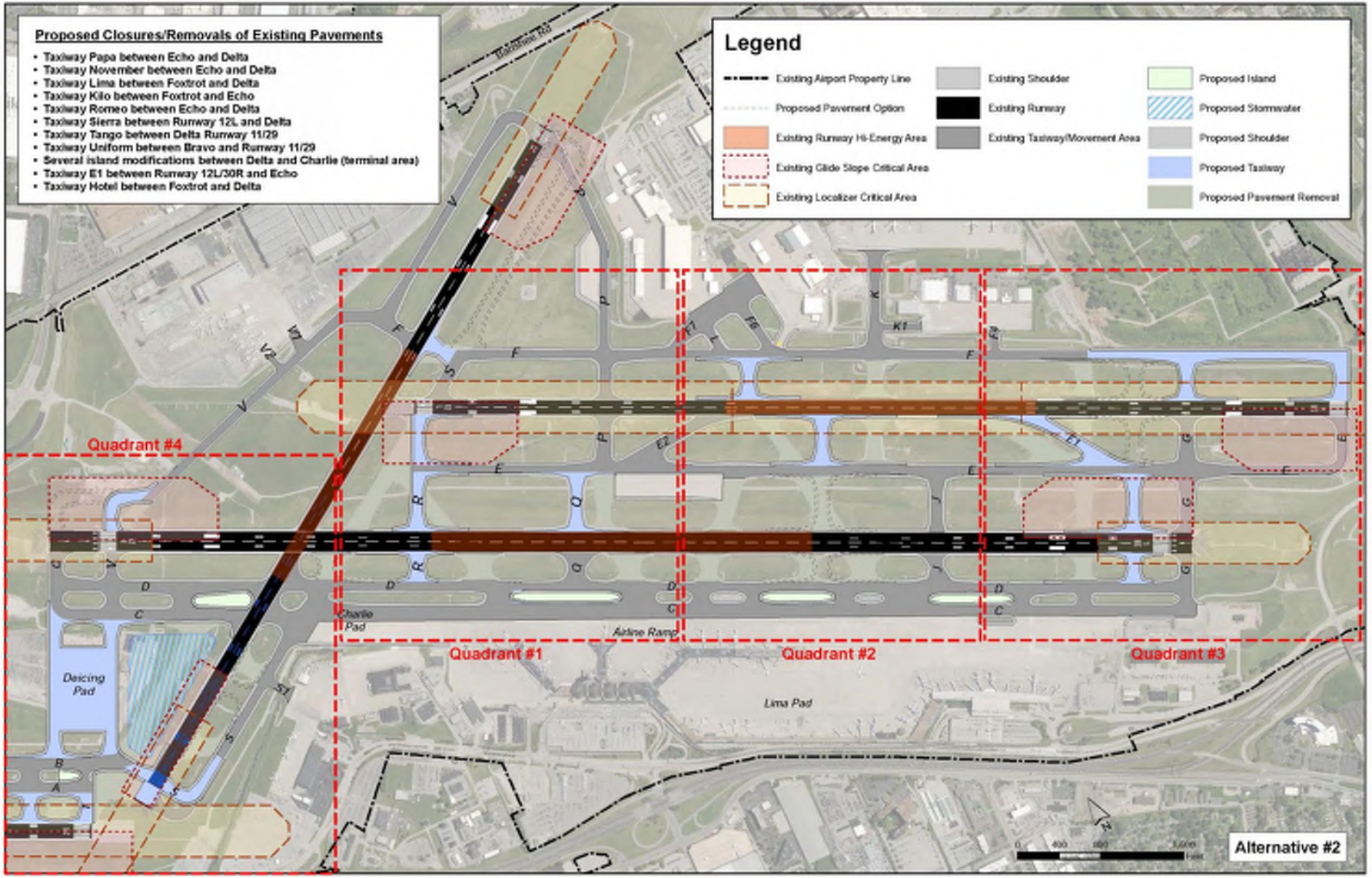


Pros / Cons

Recap Preferred Alternative #1



Recap Preferred Alternative #2



Identification of Preferred Airfield Configuration

Alternative #1 Elements	Alternative #2 Elements

15-Minute Break

Allows for Quick Build of Draft Preferred Airfield Layout

Review Preferred Airfield Configuration

Preferred Airfield Layout Placeholder

Safety Considerations	Operational Considerations

Address Any Issues Raised / Make Adjustments

Preferred Airfield Layout Placeholder

Issues	Adjustments

Set Action Plan | Next Steps

- Discuss any outstanding issues or concerns
- Identify action plan including follow-up if needed
- Next steps
  - Revise preferred airfield development layout
  - Distribute meeting minutes and final draft layout for comments
  - Integrate final airfield layout into Airport Layout Plan (ALP) drawing set
  - Coordinate with FAA stakeholders regarding SRMP of draft ALP set

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Open Discussion & Thank You

Date: April 21, 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Planning Team (Airfield Refinement) July 2021

Airfield Alternatives 2nd Round

Meeting Minutes

Virtual Meeting - Zoom

July 14, 2021 10:00am - 11:00pm (CDT)

IN-ATTENDANCE

FAA Airports: Todd Madison, Mark Schenkelberg, Mark Cozad, Rodney Joel, Nardos Wills, Timothy McClaran, Scott Tener, Jim Johnson, Ed Hyatt, Andrew Edgar

FAA Runway Safety Group: Tom Frakes

FAA Air Traffic: James McGee

STLAA: Jerry Beckmann, Dana Ryan, Ron Stella (recording viewer), Dave Kulinsky, Jay Christians, Jan Titus

WSP: John Van Woensel, Jennifer Kuchinski, Eliane Grayer

CMT: Doug Gregory, Esteban Aguirre, Andy Bodine

MEETING AGENDA

Opening Discussion (Slides 1-2)

- Purpose is to review stakeholder input with preferred airfield configuration.

Preferred Airfield Configuration (Slides 3-4)

- Doug Gregory explains:
  - That the preferred alternative presented looks very similar to the preferred alternatives identified by the stakeholder group.
  - Definition of additional elements considered.

REDIM Analysis Overview (Slide 5-6)

- Doug Gregory explains that:
  - The model considered historic runway utilization and demand splits specific to STL.
  - There are several outputs gathered from the REDIM analysis.
  - Certain assumptions were made as part of the REDIM modeling.

REDIM Analysis – Runway 12R (Slide 7)

- Doug Gregory shows and explains the findings of the Runway 12R REDIM analysis and compares those findings to the existing Taxiway exit locations from Runway 12R.
- Post-meeting comment received from Ron Stella suggests leaving Taxiway November in-place between Runway 12R and Taxiway Delta as a southbound exit due to support of REDIM Analysis which indicated a decrease in Runway 12R ROT (approximately 6 seconds under the landing 12R

flow) when maintaining November South was paired with the other suggested taxiway modifications.

- Post-meeting comment received from Ron Stella suggests removal of Taxiway November between Runway 12R and the southern edge of the Echo Pad. Similarly suggests removal of Taxiway Papa to the southern edge. Doing so will limit the amount of pavement removal and expand the limits of the Echo Pad.

REDIM Analysis – Runway 30L (Slide 8)

- Doug Gregory shows and explains the findings of the Runway 30L REDIM analysis and compares those findings to the existing Taxiway exit locations from Runway 30L.

REDIM Analysis – Runway 12L (Slide 9)

- Doug Gregory shows and explains the findings of the Runway 12L REDIM analysis and compares those findings to the existing Taxiway exit locations from Runway 12L.

REDIM Analysis – Runway 30R (Slide 10)

- Doug Gregory shows and explains the findings of the Runway 30R REDIM analysis and compares those findings to the existing Taxiway exit locations from Runway 30R.
- Jerry Beckmann wanted to highlight which crossings or taxiways the airport would not be maintaining as part of these new recommended exits. Doug Gregory went back to explain taxiways that are being recommended for removal or taxiways that are being proposed.
- Todd Madison questioned the geometry of Taxiway Echo 2 and whether it meets the current geometric requirements? Doug Gregory explained that the taxiway is compliant and that the only difference is the pavement edges and that there would be a desire to incorporate a painted grass island. Doug Gregory offered that he could PDF the layout and send to Todd Madison.

REDIM Analysis – Echo 1 (Slide 11-12)

- Doug Gregory shows and explains that Echo 1 is proposed to be shifted long-term for efficiency reasons.
- If Echo 1 was only shifted the difference between its current location and the location identified in the REDIM analysis, there are conflicts with Taxiway Hotel.
- Doug Gregory explains the model findings if Echo 1 was shifted an additional 85’ to the east from the REDIM recommendation.
- Rodney Joel asked about the fillet size of Taxiway Echo 1 as presented within the presentation. Doug Gregory said he would take that he would verify the fillet size and requirements.

Runway 12L-30R Configuration (Slide 13-14)

- Doug Gregory shows and explains the holistic modifications to the Runway 12L-30R configuration based upon the proposed taxiway modifications.

Runway 12L Configuration Runway Occupancy Time (ROT) Results (Slide 15)

- Doug Gregory explains the baseline ROTs and a comparison of the revised configuration ROTs.

Runway 30R Configuration ROT Results (Slide 16)

- Doug Gregory explains the baselines ROTs and a comparison of the revised configuration ROTS.
- Doug Gregory explains that there will be additional assessment of the +5.0 second ROT on the all-weather condition to understand impacts on a more granular level.

Taxiway L (Slides 17-18)

- Doug Gregory explanation of Taxiway L options and recap of previously communicated desire to use Taxiway L for ground traffic flexibility and support south runway exits.

Runway 6 and Runway 29 Envelope (Slides 19-20)

- Doug Gregory explains the interaction between Runway 29 and Runway 6. The intent was to clean up geometric standards at Runway 29 while considering the interaction with Runway 6.
- Todd Madison asked whether Runway 6 would be shortened as part of the preferred Runway 6 and 29 configurations. Doug Gregory confirmed Runway 6 would not be shortened and explained that a length reduction in the region of 7-800' would be necessary to clear the Runway 29 RPZ. The reduction was not acceptable to Airport Authority staff.
- Todd Madison asked about the placement of de-ice pads. Doug Gregory said that west de-ice pad would house approximately 14 aircraft and support departures in multiple flows. There are still considerations for an east de-ice pad in order to provide flexibility.
- Jerry Beckmann also said the proposed location of the west de-ice pad would require relocating the airport maintenance area. Jerry also said that a terminal alternative may be necessary to accommodate an east deice pad.
- Tom Frakes asks if equipment would be staged for de-ice equipment to avoid crossing Runway 6/24 to provide deicing services. Doug Gregory replied that equipment would be staged such that there are no unnecessary runway crossings.
- Tom Frakes said that it may be better to have Taxiway Tango separate from the de-ice pad to ensure clear flow and movement of aircrafts. He suggested identification of islands that can break up the pavements. Doug Gregory replied that this would be considered.

Deice Pad Analysis (Slides 21-23)

- Doug Gregory explained the steps taken to identify the de-ice pad sizing and requirements based on forecasts, design-day demand, and other seasonality adjustment factors.
- Post-meeting comment received from Ron Stella asked if a midfield de-ice pad between closely spaced parallels was feasible and if there was an example. Airport Planning reviewed large and medium-sized airports in North America. Detroit is the closest example – the airport has a de-ice pad between Runways 3L and 3R. Calgary and Vancouver also have midfield pads, but more widely spaced parallels.

Next Steps (Slides 24)

- Todd Madison asked about next steps regarding closing out the Safety Risk Management piece of the program. He lauded great participation from everyone except for the users/tenants of the airfield and asked about whether additional engagement may be necessary to involve the users and tenants.
- Doug Gregory said users were invited to the first SRM engagement and little participation was received. Jerry Beckmann and Dana Ryan are going to discuss and determine if there are any additional touchpoints needed.
- Mark Schenkelberg agreed that airfield user input would be an important piece of closing out the risk assessment piece of the work.

Action Items

- Doug Gregory offered that he could PDF the Echo 2 layout and send to Todd Madison.
- Doug Gregory explains that there will be additional assessment of Runway 30R with +5.0 second ROT on the all-weather condition to understand impacts on a more granular level.
- Doug Gregory stated that an alternative separating Taxiway Tango from the proposed western de-ice pad would be considered.
- Jerry Beckmann and Dana Ryan are going to discuss if there are any additional touchpoints needed with the airlines before finalizing the SRM piece of the program.

Planning Team (Airfield Refinement)
July 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Airfield Alternatives

Revised Preferred Airfield Configuration

REDIM Analysis – Output Results & Discussion

Date: July 14, 2021

Agenda

(Purpose and Outcome of this Meeting)

- Review stakeholder input associated with preferred airfield configuration
- Present additional REDIM analysis
- Discuss revised Echo-1 highspeed exit location
- Present revised Runway 12L-30R configuration
- Discuss Lima corridor (crossing of 12R-30L)
- Present revised Runway 6 & Runway 29 concept
- Review deice pad requirements

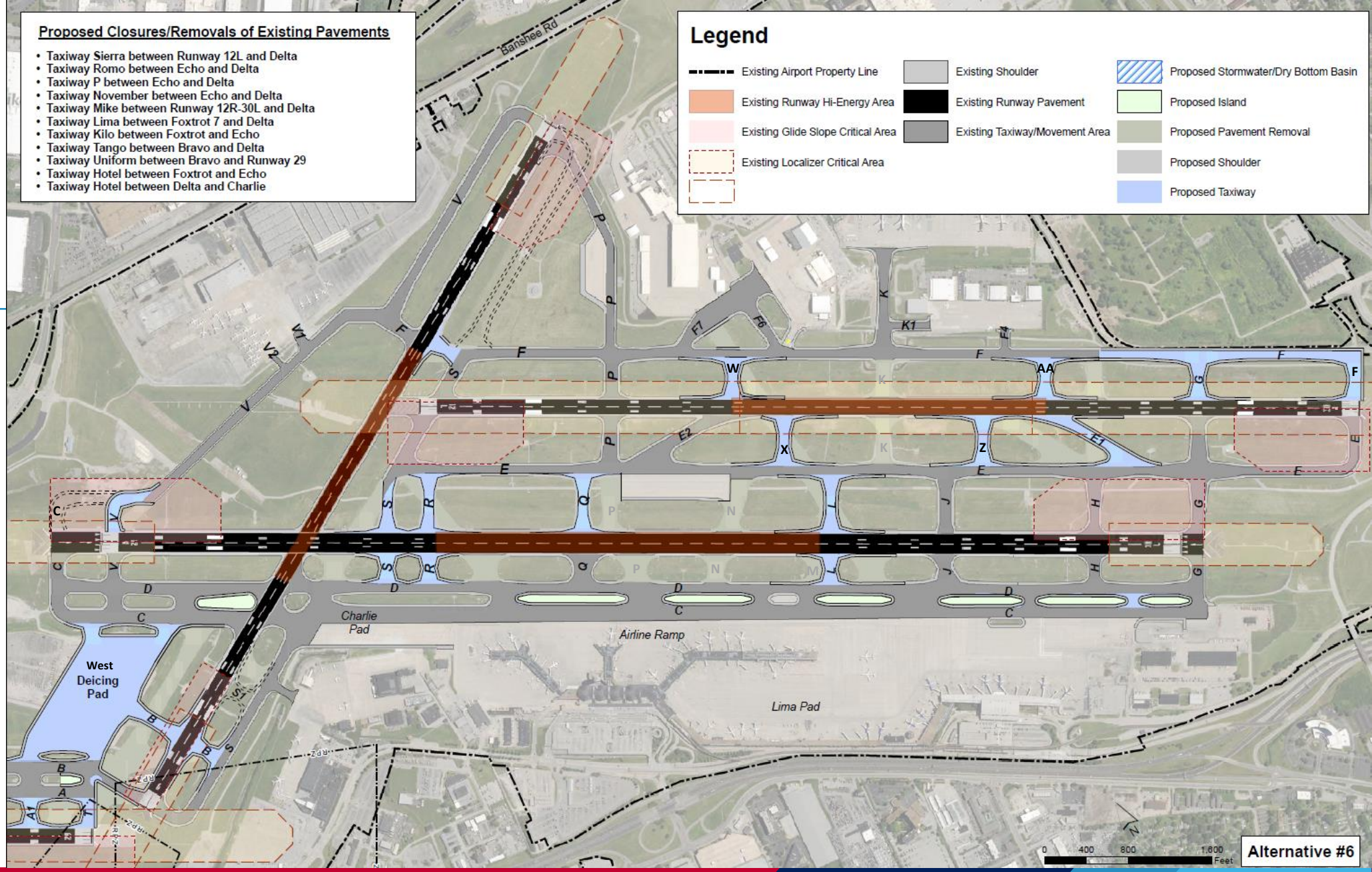
Initial Preferred Airfield Configuration

(Takeaways from Stakeholder Engagement)

- Consensus on majority of the recommended airfield configuration
- STL ATCT provided initial comments/concerns:
  - Runway 12L-30R northbound exits – additional need with removal of Kilo
  - Strong recommendation that a crossing of 12R-30L within the current Lima corridor be considered
  - Configuration of Runway 6, Runway 29, and proposed West Deice Pad be reassessed (multiple routes & impact of Runway 29 RPZ)
  - Location of proposed Echo-1 highspeed and new Hotel crossing of 12R-30L (impact of proposed Hotel being within the glideslope critical area of Runway 30L)
- STLAA Operations – additional justification for crossing of 12R-30L within the existing Lima corridor

Action Items: Additional REDIM analysis of Runway 12L-30R + assessment of Runway 6/Runway 29 development options

Preferred Airfield Configuration

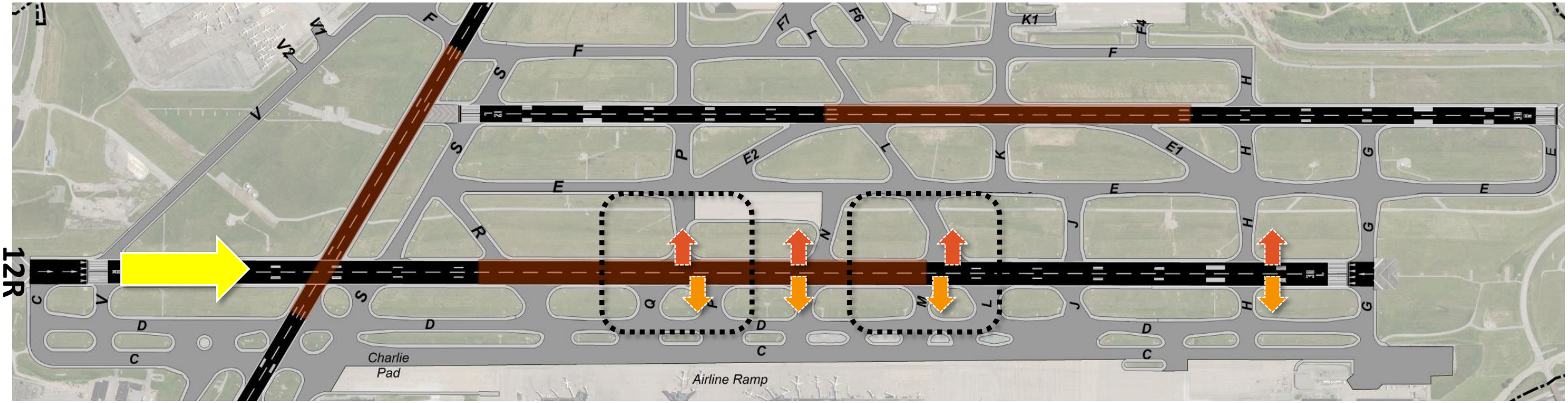


REDIM Analysis

REDIM Analysis – Overview

- Utilized existing and future fleet mix (2040)
- Model considers historic runway utilization and demand splits
  - Northbound exits - aircraft parking locations (cargo apron & GA/Corporate apron)
  - Southbound exits - terminal area
- Outputs
  - Distance from runway end (90° exit or 30° exit, which represents a high-speed)
  - Runway conditions (All / Dry / Wet)
- Runway 12R-30L modeled for all 90° exits
- Runway 12L-30R modeled for combination of 90° exits and 30° exits (southbound)
- Exit locations depicted in subsequent slides are based on All Weather conditions
  - The Arrows identify optimal locations from REDIM analysis

REDIM Analysis: Runway 12R



Optimal Northbound/Southbound Exit Locations

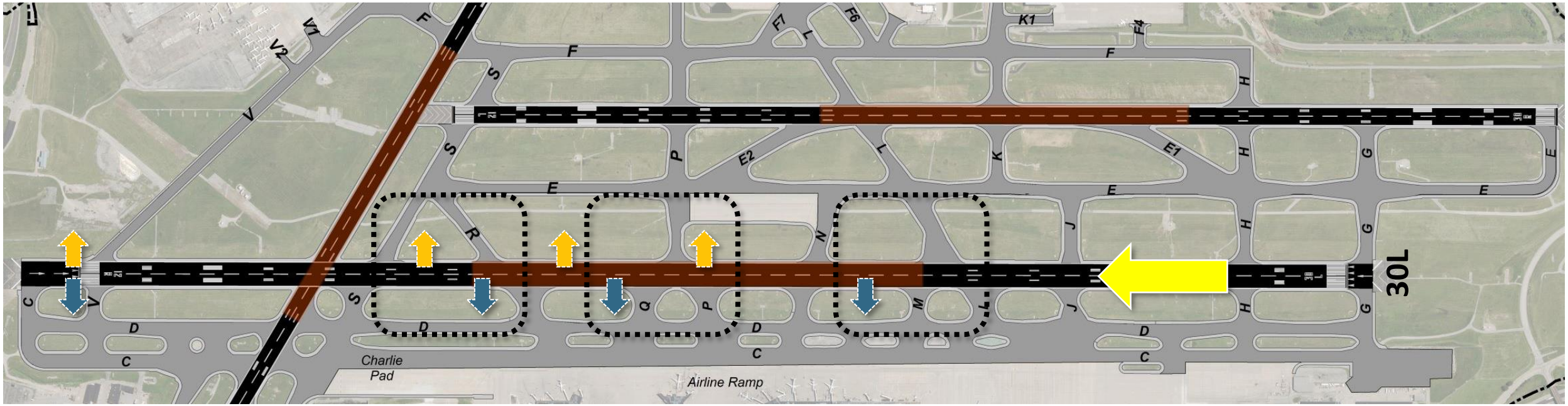
Runway 12R – Northbound Exit

Runway 12R – Southbound Exit

Proposed Taxiway

- Proposed Quebec crossing aligns well with REDIM output (general location of existing Quebec & Papa)
- **Decision Point: Existing November exit supported by REDIM analysis, however, support by all stakeholders to remove November long-term. Potential impact on ROTs without November or Lima**
- Consideration of new Lima crossing/exit based on REDIM analysis

REDIM Analysis: Runway 30L



Optimal Northbound/Southbound Exit Locations

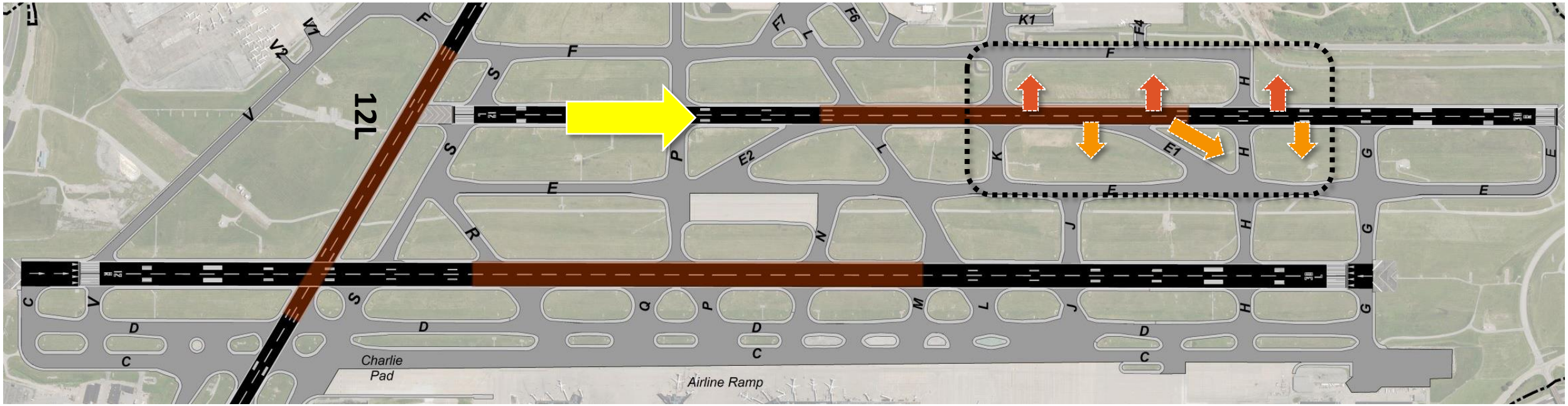
Runway 30L – Northbound Exit

Runway 30L – Southbound Exit

Proposed Taxiway

- Proposed Romeo & Sierra location aligns well with REDIM output
- Proposed Quebec crossing aligns well with REDIM output (general location of existing Quebec & Papa)
- Consideration of new Lima crossing/exit based on REDIM analysis

REDIM Analysis: Runway 12L



Optimal Northbound/Southbound Exit Locations

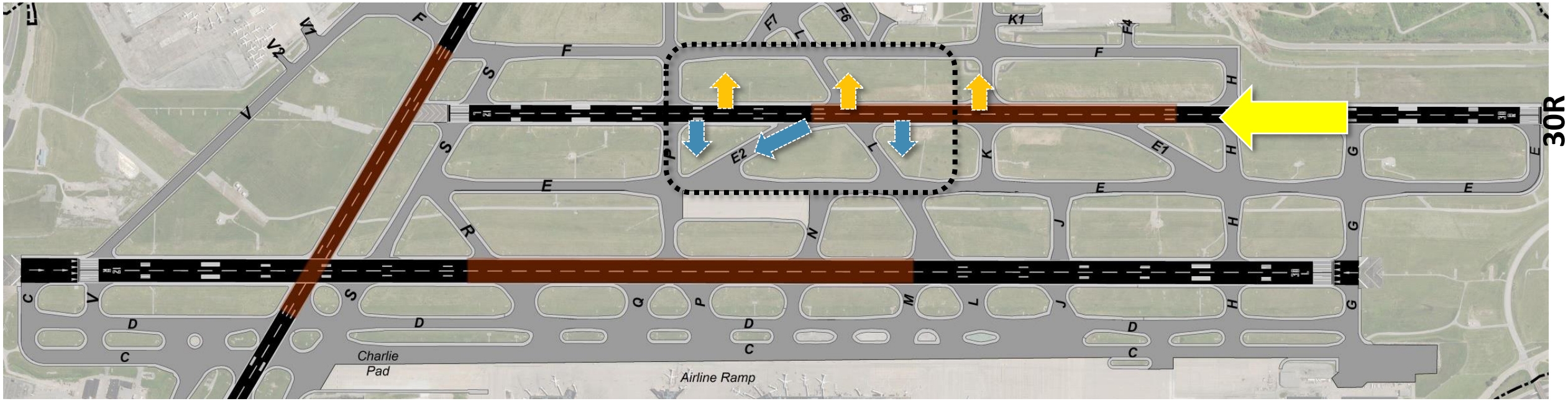
Runway 12L – Northbound Exit

Runway 12L – Southbound Exit

Proposed Taxiway

- Existing Kilo to be removed
- Consideration of new northbound exit landing 12L in general location of Foxtrot-4 (supported by REDIM and stakeholder engagement)
- Consideration of Juliet extension to Runway 12L to accommodate Southbound exits prior to Highspeed?
- Keep existing and proposed Golf (within proximity to REDIM output)
- Proposed Echo-1 highspeed to be assessed (interaction with “Hotel” crossing point)

REDIM Analysis: Runway 30R



Optimal Northbound/Southbound Exit Locations

Runway 30R – Northbound Exit

Runway 30R – Southbound Exit

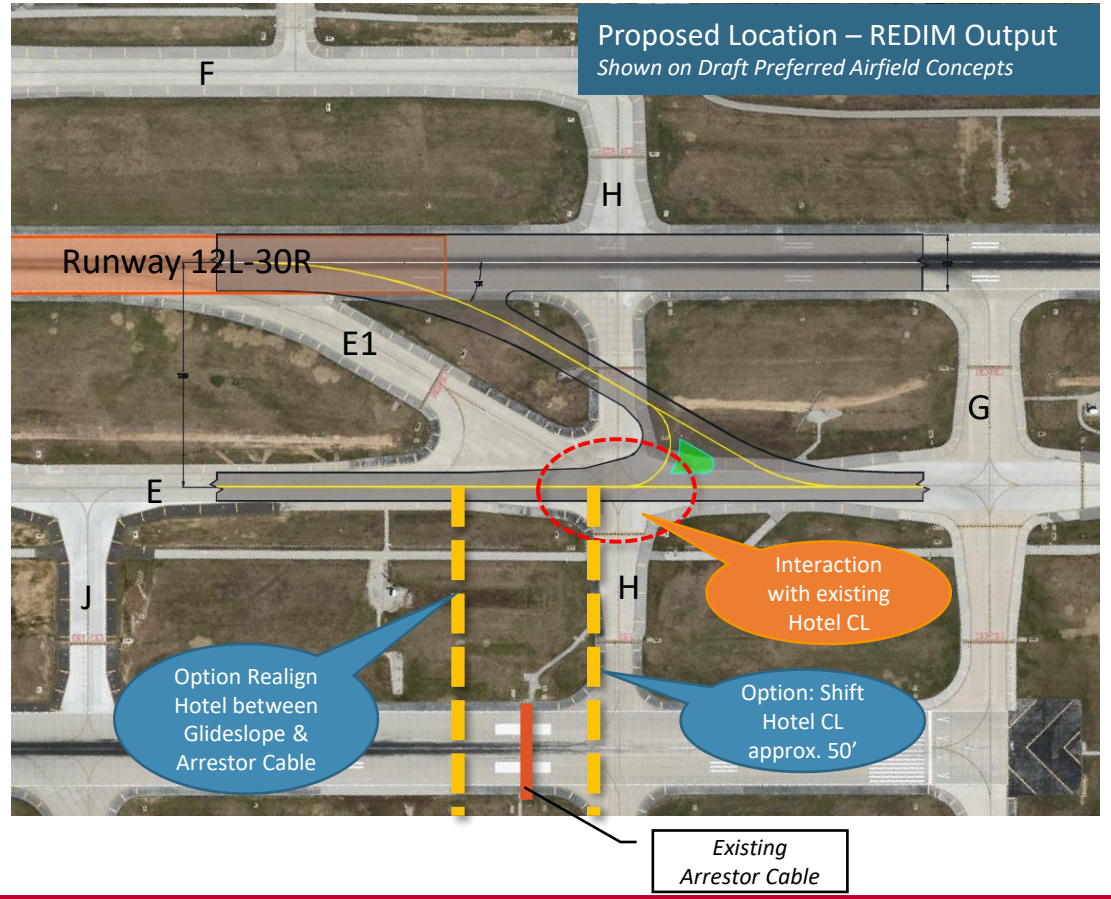
Proposed Taxiway

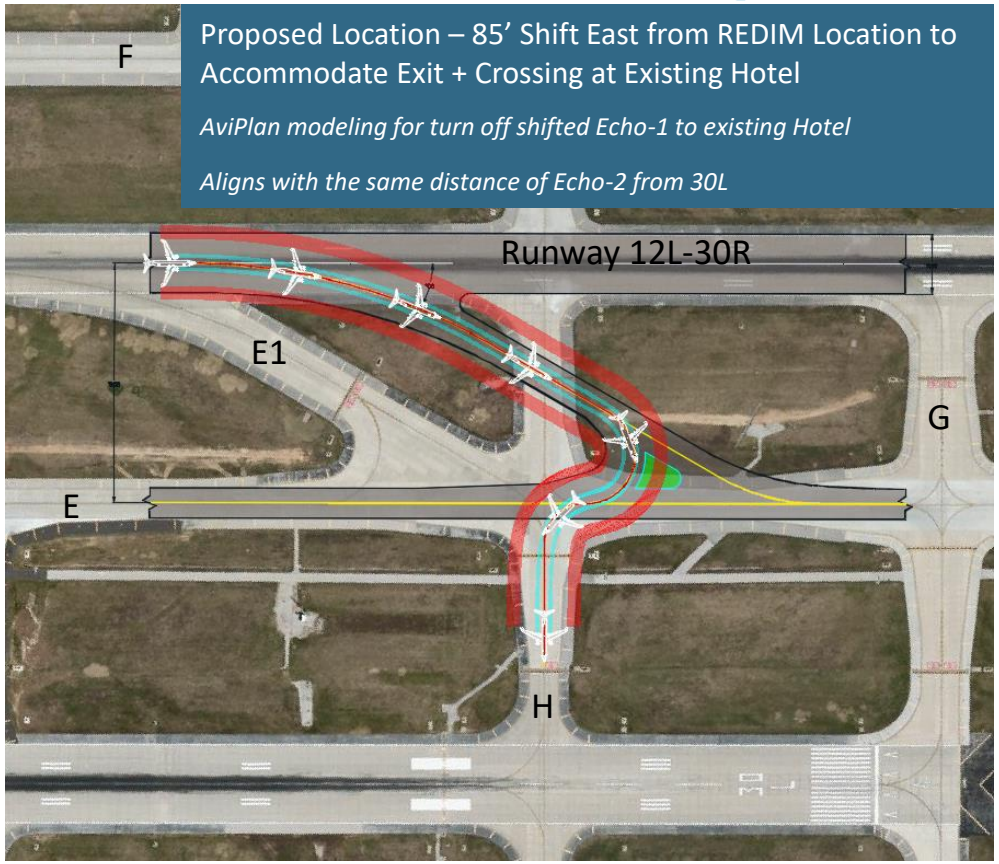
- Proposed "Lima" Northbound & Southbound landing Runway 30R aligns well with REDIM output (Existing Papa remains)
- Existing Kilo to be removed

High Speed Echo 1

Highspeed Echo-1 Location

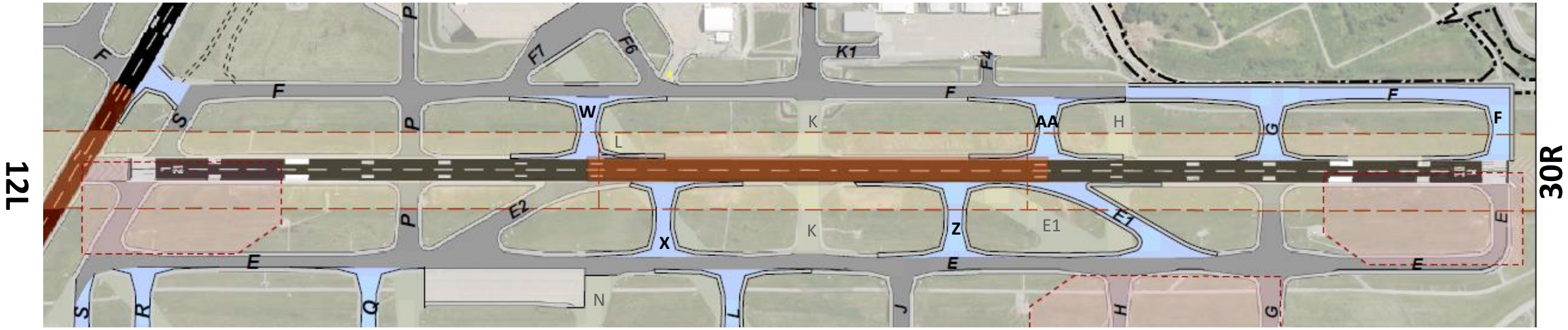
Interaction with Existing Hotel





Runway 12L-30R Configuration

Revised Runway 12L-30R Configuration



- Northbound Exits
  - Removal of existing Kilo impacted ROTs in both landing directions (GA/Corporate small/mid-sized jets)
  - Removal of existing Hotel in the landing Runway 12L direction added to the ROT impact
  - Adjusted location of northbound exits to balance ROT impact
- Southbound Exits
  - Removal of existing Kilo impacted ROTs in both landing directions (smaller commercial traffic)
  - Proposed two 90-degree exits prior to highspeed exits to minimize ROT impact
  - Minor adjustment to proposed location of Echo-1 to facilitate existing Hotel between Echo and Delta

Revised Runway 12L Configuration ROT Results

Southbound Exits

Original Baseline ROT	
All	**48.4**
Wet	54.5
Dry	47.6

Revised Configuration ROT	
All	**49.6**
Wet	56.5
Dry	48.7

+1.2 Seconds

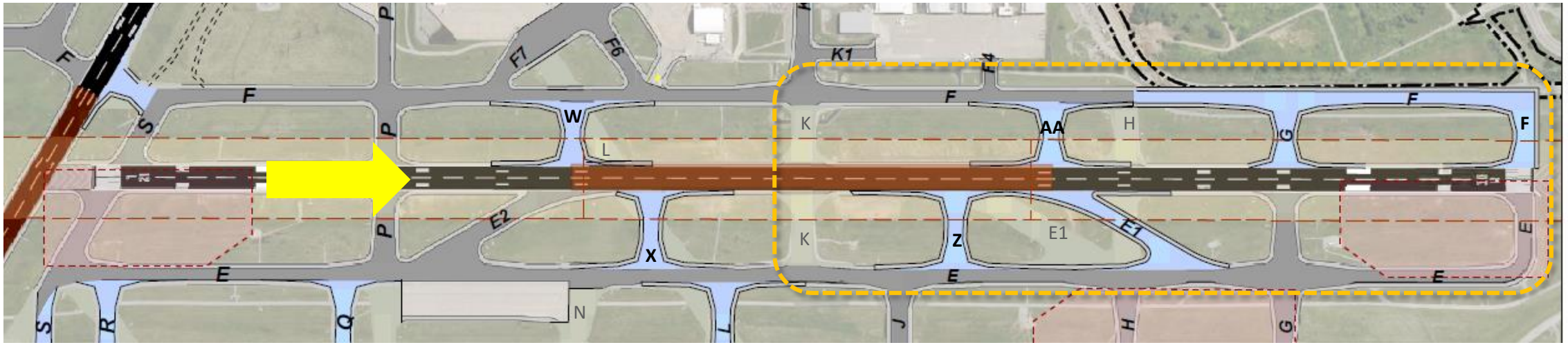
Northbound Exits

Original Baseline ROT	
All	**56.1**
Wet	59.2
Dry	55.7

Revised Configuration ROT	
All	**60.0**
Wet	64.2
Dry	58.4

+3.9 Seconds

12L



30R

Revised Runway 30R Configuration ROT Results

Southbound Exits

Original Baseline ROT	
All	**48.7**
Wet	55.8
Dry	47.8

Revised Configuration ROT	
All	**47.9**
Wet	53.4
Dry	47.1

-0.8 Seconds

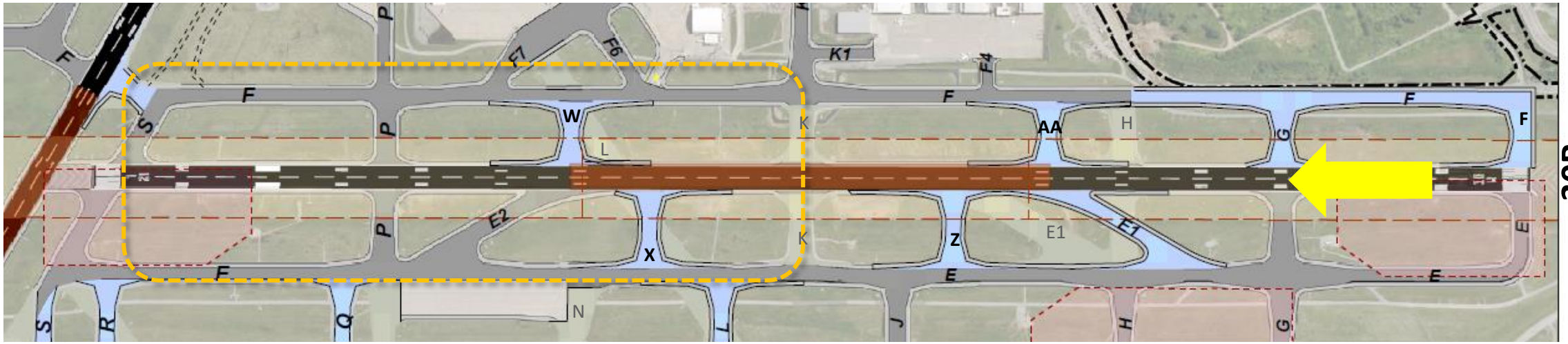
Northbound Exits

Original Baseline ROT	
All	**54.5**
Wet	59.9
Dry	53.7

Revised Configuration ROT	
All	**58.3**
Wet	62.1
Dry	57.5

+3.8 Seconds

12L



30R

Runway 12R-30L: Runway Occupancy Time (ROT Analysis)

Revised Runway 12R Configuration ROT Results

Southbound Exits

Original Baseline ROT	
All	**50.1**
Wet	54.8
Dry	49.5

Revised Configuration ROT	
All	**57.4**
Wet	59.8
Dry	57.1

+7.2 Seconds

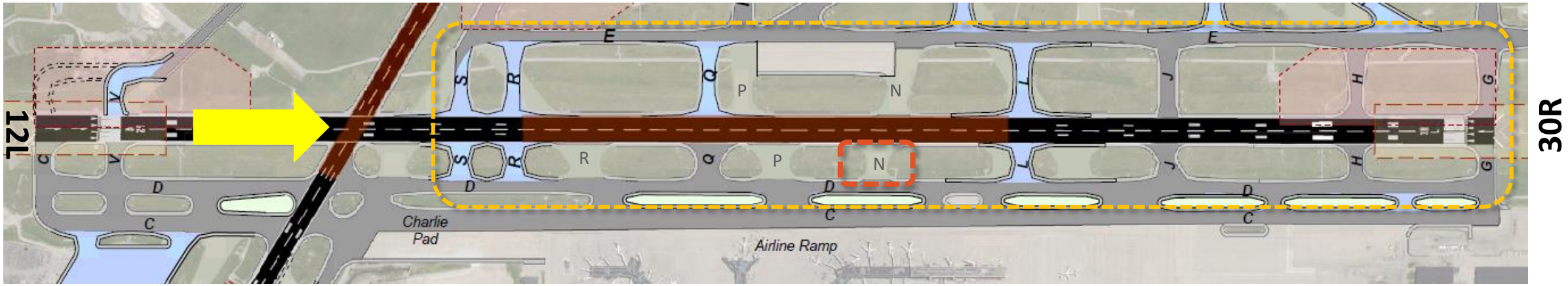
With November exit, ROT impact reduces to +1.8 seconds

Northbound Exits

Original Baseline ROT	
All	**56.1**
Wet	61.5
Dry	55.4

Revised Configuration ROT	
All	**62.5**
Wet	66.0
Dry	62.0

+6.4 Seconds



Revised Runway 30L Configuration ROT Results

Southbound Exits

Original Baseline ROT	
All	**50.4**
Wet	56.7
Dry	49.6

Revised Configuration ROT	
All	**54.0**
Wet	59.0
Dry	53.3

+3.6 Seconds

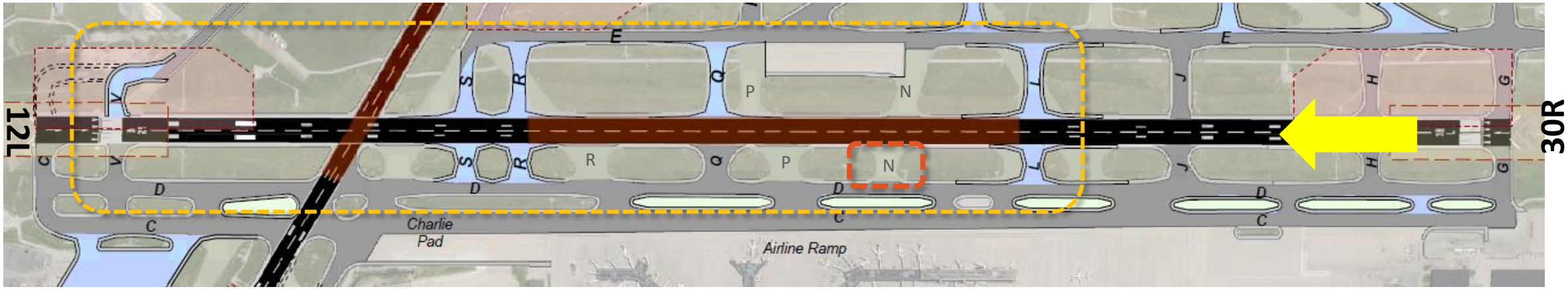
Northbound Exits

Original Baseline ROT	
All	**57.8**
Wet	64.2
Dry	57.0

Revised Configuration ROT	
All	**59.3**
Wet	64.6
Dry	58.6

+1.5 Seconds

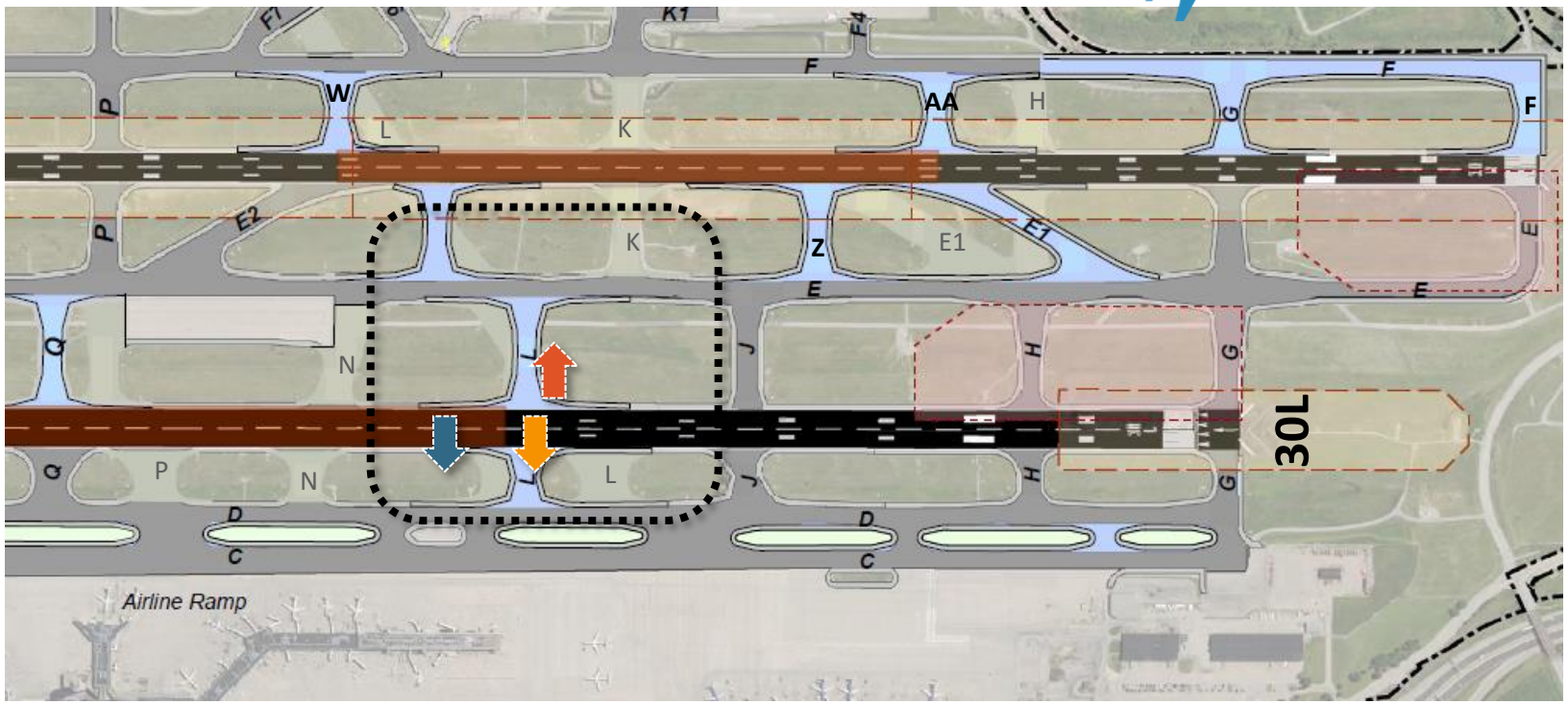
With November exit, ROT impact reduces to +2.4 seconds



Taxiway Lima

Lima Corridor Considerations (Exits & Crossing Point)

- STL ATCT strongly recommended the need for a Lima corridor crossing to maintain air traffic management flexibility (ability to stack aircraft at crossing points Juliet and Lima and minimize departure gaps while arriving 12L)
- General Lima location supported by REDIM analysis when arrivals are occurring Runway 12R-30L)
  - Example: Current reconstruction of Taxiway Delta west of Runway 6-24 results in change in arrival flows during SE operations (arrivals to Runway 12R)
- Integration of terminal development concepts: long-term flexibility to accommodate crossing from Runway 12L-30R



REDIM Results – Runway 12R-30L Arrivals

Runway 12R – Northbound Exit

Runway 12R – Southbound Exit

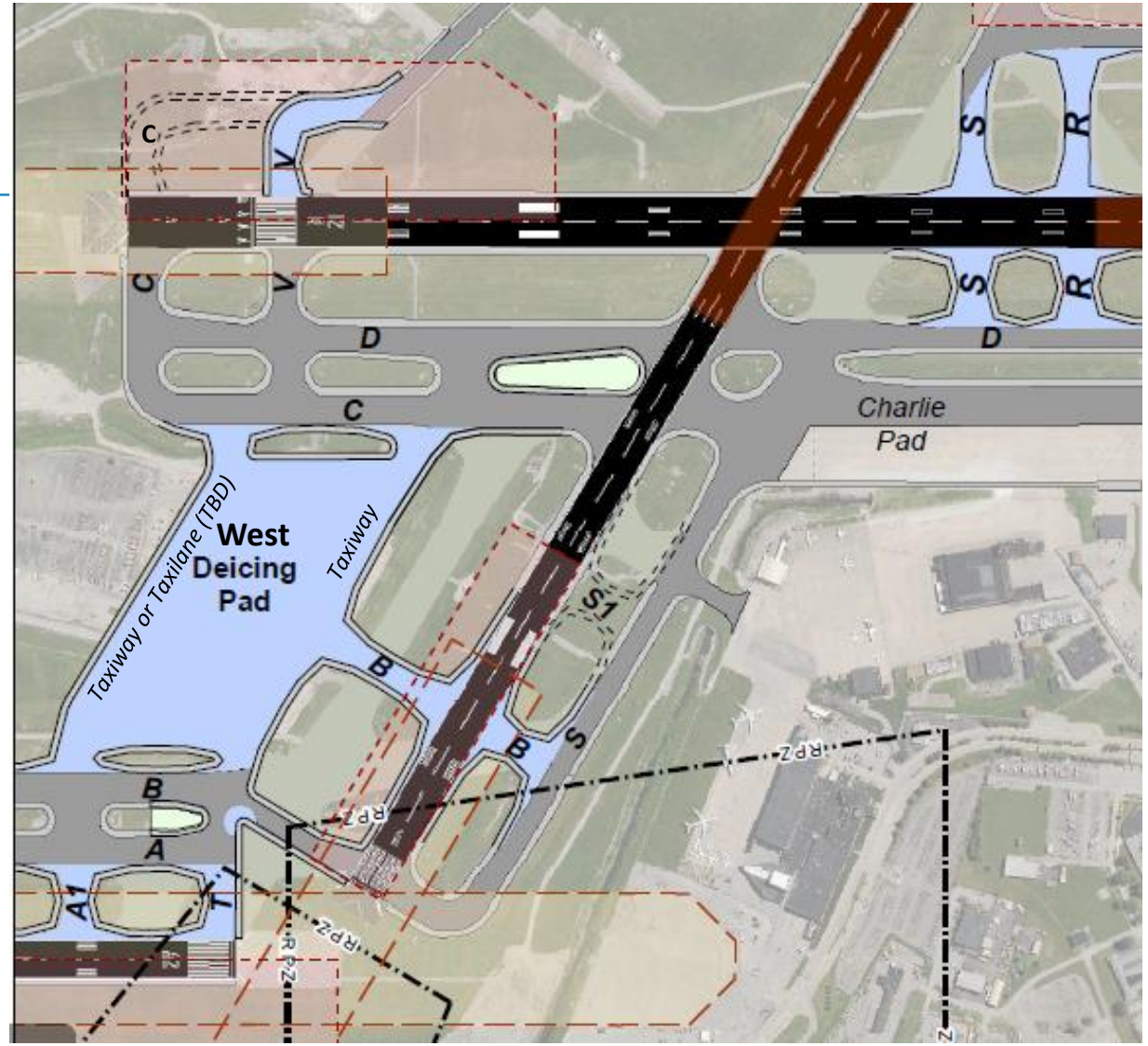
Runway 30L – Southbound Exit

Runway 6 & Runway 29 Quadrant

Runway 6 & Runway 29 Envelope

Revised Configuration

- STL ATCT identified concerns with draft configuration of Runway 6, Runway 29, West Deice Pad concept:
  - Existing Bravo crossing of Runway 6 to Taxiway Sierra provided for unrestricted operations (outside Runway 29 RPZ)
  - Need for independent access points to Runway 11-29 to maintain flexibility and mitigate risk of a single point of failure
- Support for reconfiguration of Runway 29 connectors
- Relocated existing Taxiway Tango between Taxiway Charlie and Taxiway Bravo to address complex geometry
- Proposed deice pad similar to previous design efforts with some adjustments to increase pad size and integration of new design standards
- Runway 6 crossing at end is at 90 degrees
- New Taxiway Bravo crossing at 90 degrees outside of Runway 29 RPZ (proposed taxiway names to be updated based on final configuration)
- Deice pad designed for 7 deice lanes, which can each stack 2 narrowbody aircraft. Each lane can flex to accommodate 1 widebody.

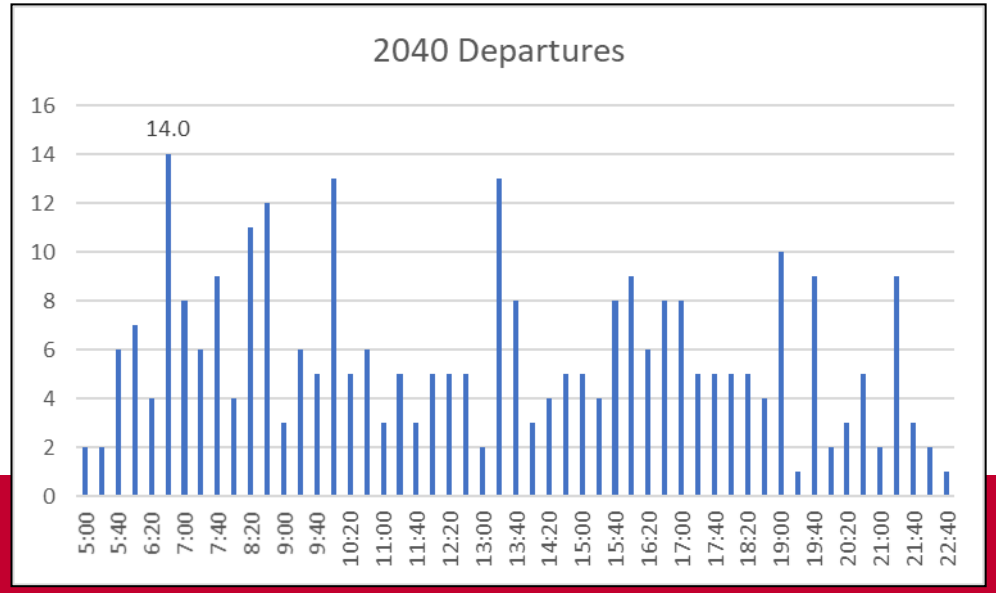


Deicing Pad Analysis

Deice Pad Analysis

- Design Day Flight Schedules (DDFS) developed under forecast effort (2019 & 2040)
- Seasonality adjustment to reflect primarily Dec/Jan/Feb timeframe
- Commercial fleet & GA/Cargo fleet analysis
- Included assessment of widebody aircraft to understand overall deice pad requirements
- Established a 20-minute rolling window to deice aircraft

Yr A/C Body	2017-2019 NB & WB		Yr A/C Body	2017-2019 Other	
Month	Depts	Seasonality Index	Month	Depts	Seasonality Index
1	12,515	0.93	1	5587	1.02
2	11,151	0.83	2	5103	0.93
3	13,670	1.02	3	5847	1.06
4	13,498	1.00	4	5478	1.00
5	13,840	1.03	5	5750	1.05
6	13,975	1.04	6	5641	1.03
7	14,255	1.06	7	5842	1.06
8	14,206	1.06	8	5846	1.06
9	13,466	1.00	9	5282	0.96
10	14,447	1.07	10	5292	0.96
11	13,018	0.97	11	5007	0.91
12	13,480	1.00	12	5227	0.95
Average	13,460	1.00	Average	5,492	1.00
Dec/Jan/Feb	12,382	0.92	Dec/Jan/Feb	5,306	0.97

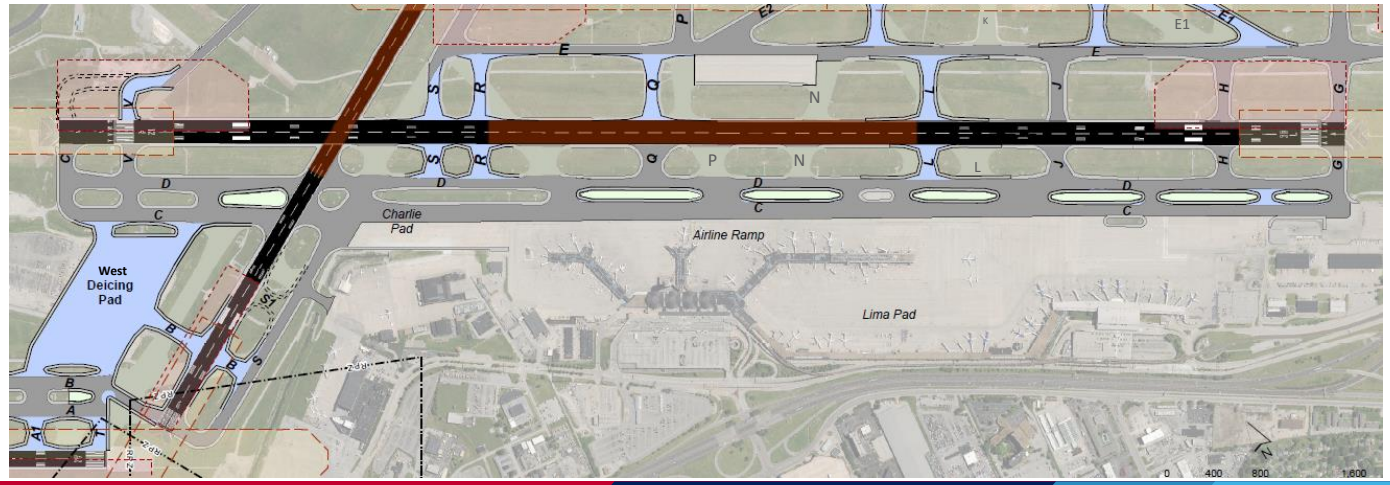


Deice Pad Analysis

- Average daily departures adjusted for seasonality
- Deice pad requirements (Commercial & Cargo/GA)
- West Pad – plan around 10 to 14 positions to accommodate peak windows based on 2040 DDFS
  - West Pad – support Runway 29 departures in NW flow & Runway 12R departures in SE flow
  - East Pad (TBD) – support Runway 30L departures in NW flow
  - Integration of terminal development concepts
- North Pad – consideration of existing north cargo apron collection plan, GA/FBO collection options, and long-term land use development strategies

Average Daily Departures: Adjusted for Seasonality (widebody = 2)	2019 Baseline	2040 Forecast
Commercial	240	283
Cargo	7	9

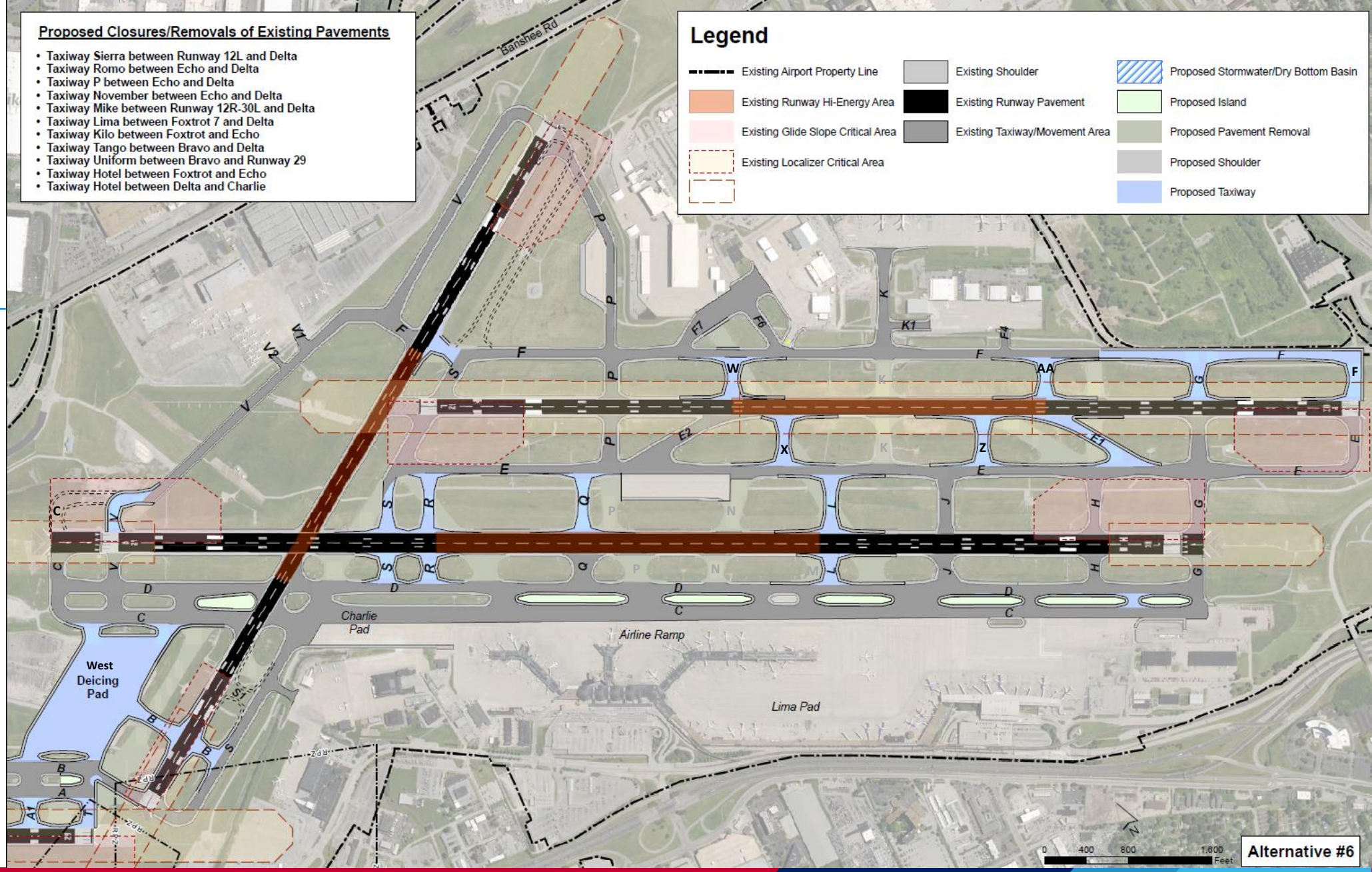
Deicing Pads Needed: Adjusted for Seasonality	2019 Baseline	2040 Forecast
Commercial	13	14
Cargo/GA	2	2+1 reserved area



Next Steps

- STLAA review of revised preferred airfield configuration
- Stakeholder engagement with FAA (Airports & STL ATCT): 7/14/2021
- Finalize deicing plan (pad locations)
- Finalize terminal core taxiway/taxilane configuration *(subject to terminal development selection)*
- Integrate preferred airfield plan into draft ALP sheet for coordination with FAA Airports

Preferred Airfield Configuration



Questions / Open Discussion

Planing Team (Finalization of Preferred Airfield Plan)
October 2021

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Preferred Airfield Configuration *(Long-Term)*

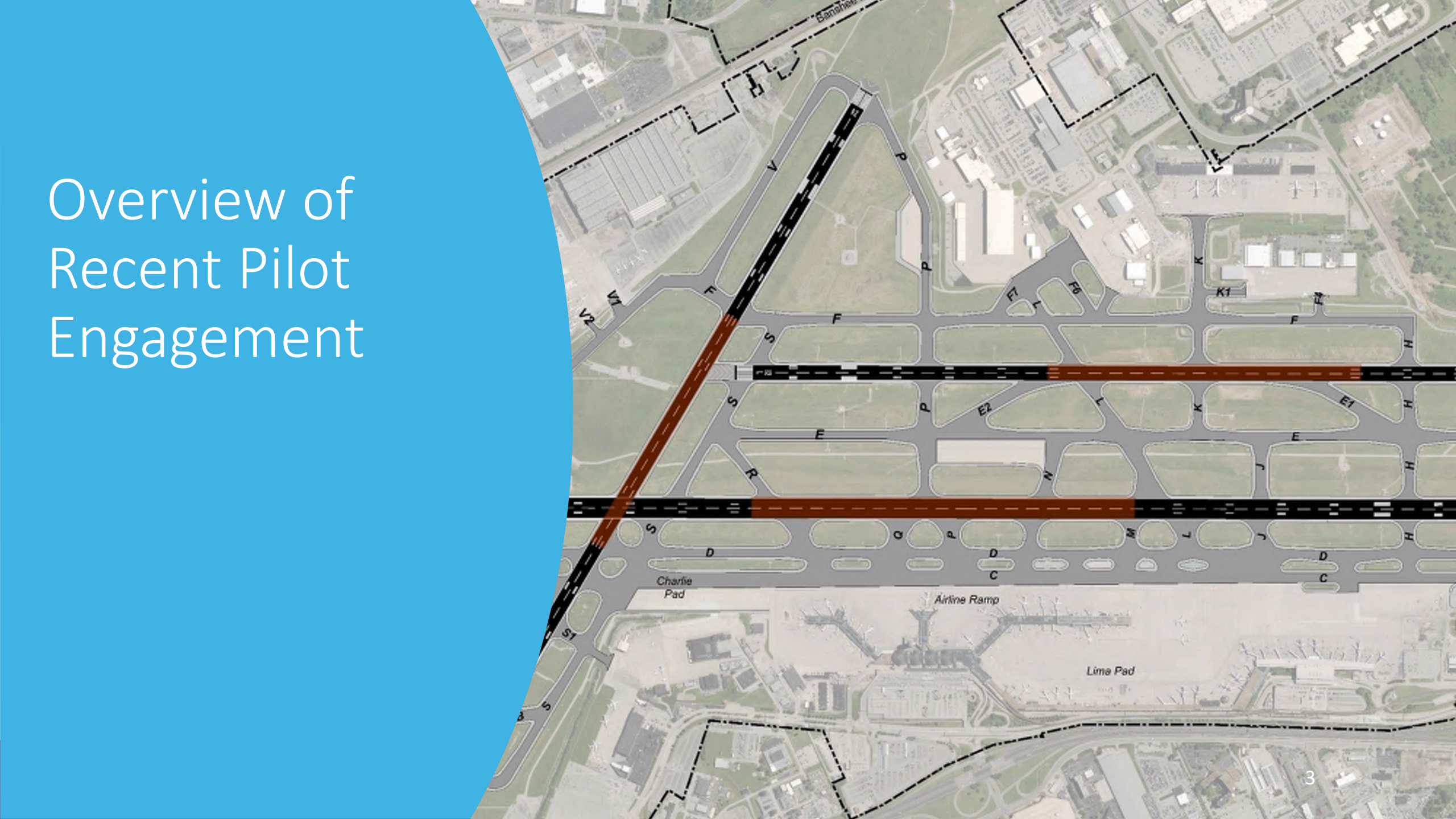
Final Strategy for Review & Concurrence

Date: October 12, 2021

Agenda

- Overview of recent pilot engagement
- Review of input received
  - 12L-30R Runway Occupancy Time (ROT)
  - 12R-30L Runway Occupancy Time (ROT)
  - 12R-30L Exit Locations & New Islands
- Analysis completed / due diligence
- Revised airfield plan
- Next steps & open discussion

Overview of Recent Pilot Engagement



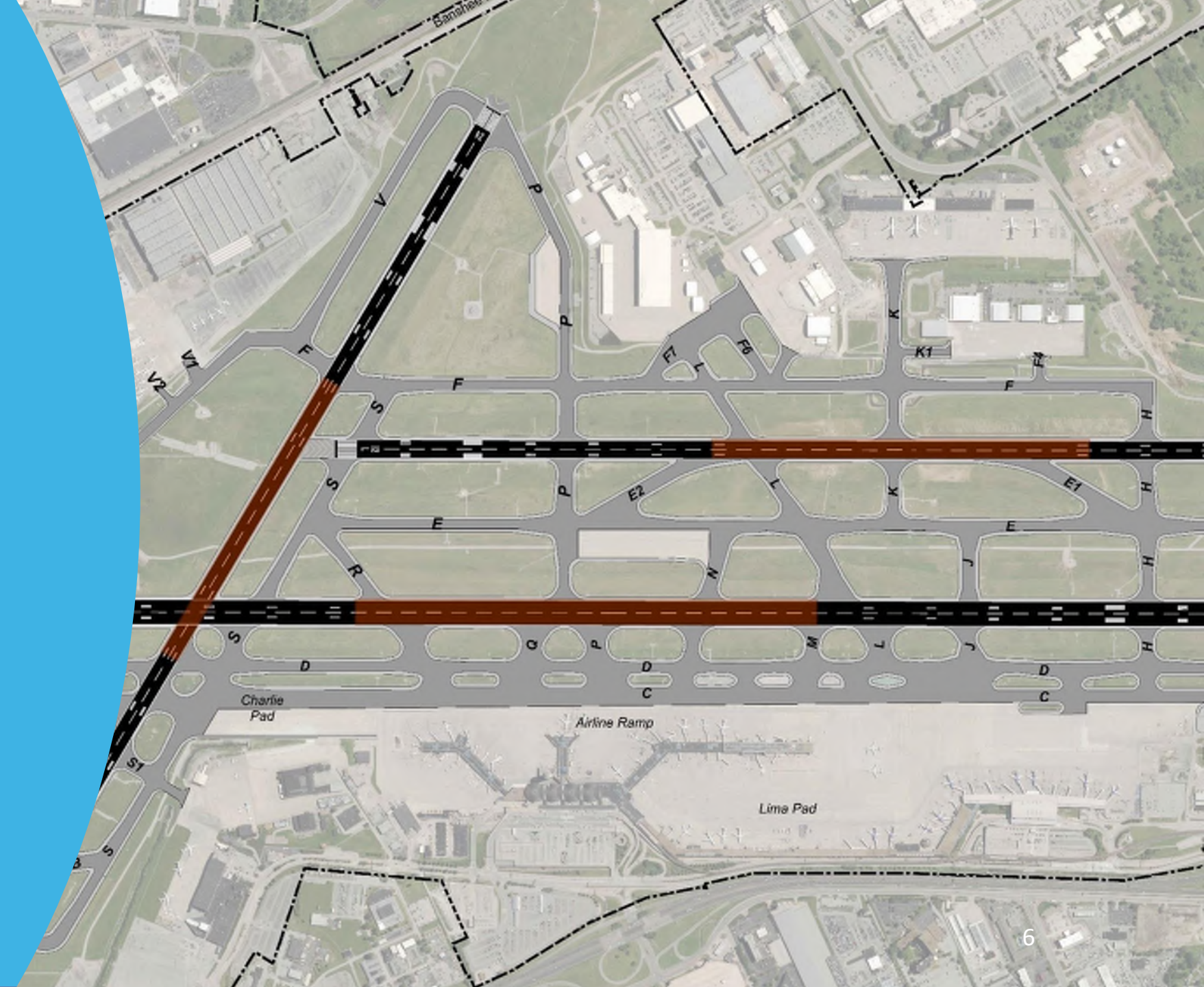
Overview of Recent Pilot Engagement

- Additional outreach to pilot group per FAA Airports request
- Airline & GA/Corporate participation
  - Southwest Airlines
  - Boeing
  - Jetlinx
  - Enterprise (EHI)
- Overview of ALP study & key objective to bring airfield into FAA design standards
- Review of study process to date
- Presented preferred airfield developed to date

Overview of Recent Stakeholder Engagement

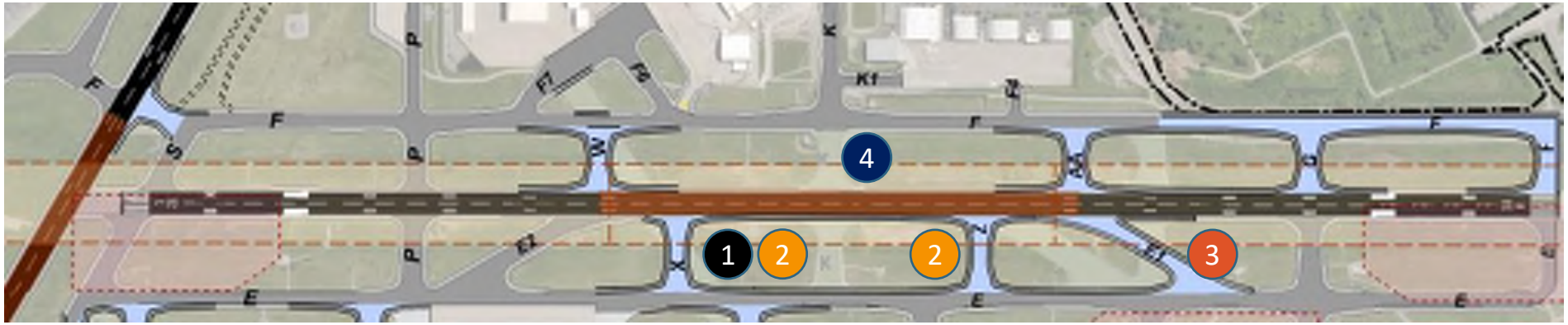
- Key observations
  - Runway Occupancy Time (ROT) is critical. Specifically, the need to keep under an average ROT of 50 seconds which allows entrail separation to decrease from 3 miles to 2.5 miles
  - Preference for diagonal/high-speed exits over 90° exits
  - Minimize risk of go-arounds which are unplanned events in the NAS
  - Concern with exiting or crossing Runway 12R-30L with new grass islands between Taxiway D and C
  - Taxi time impacts (every second counts)

Review of Pilot Inputs Received



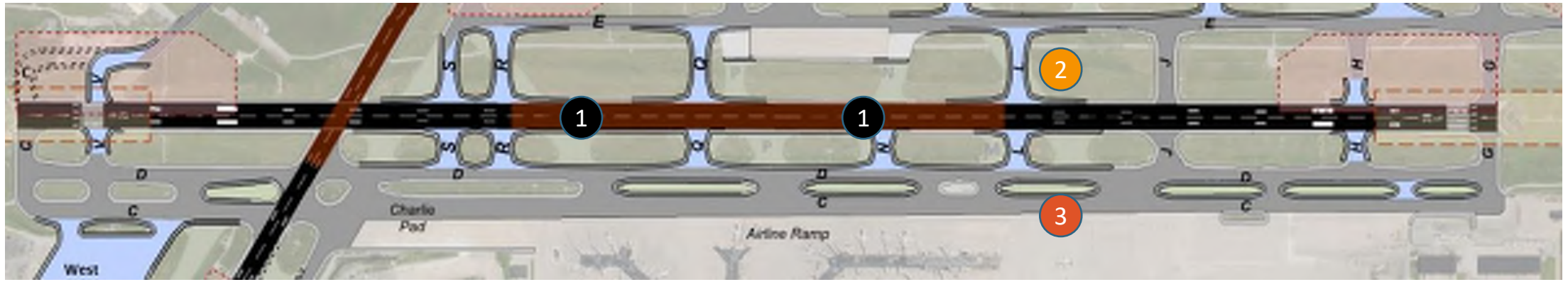
Review of Pilot Inputs Received

- 12L-30R Runway Occupancy Time (ROT)
  - Southbound exits
    - Existing Taxiway L 1
    - Location of proposed 90° exits prior to high-speeds 2
    - Location of proposed Taxiway E1 3
  - Northbound exits
    - Removal of existing Taxiway K + slope of runway landing 12L 4

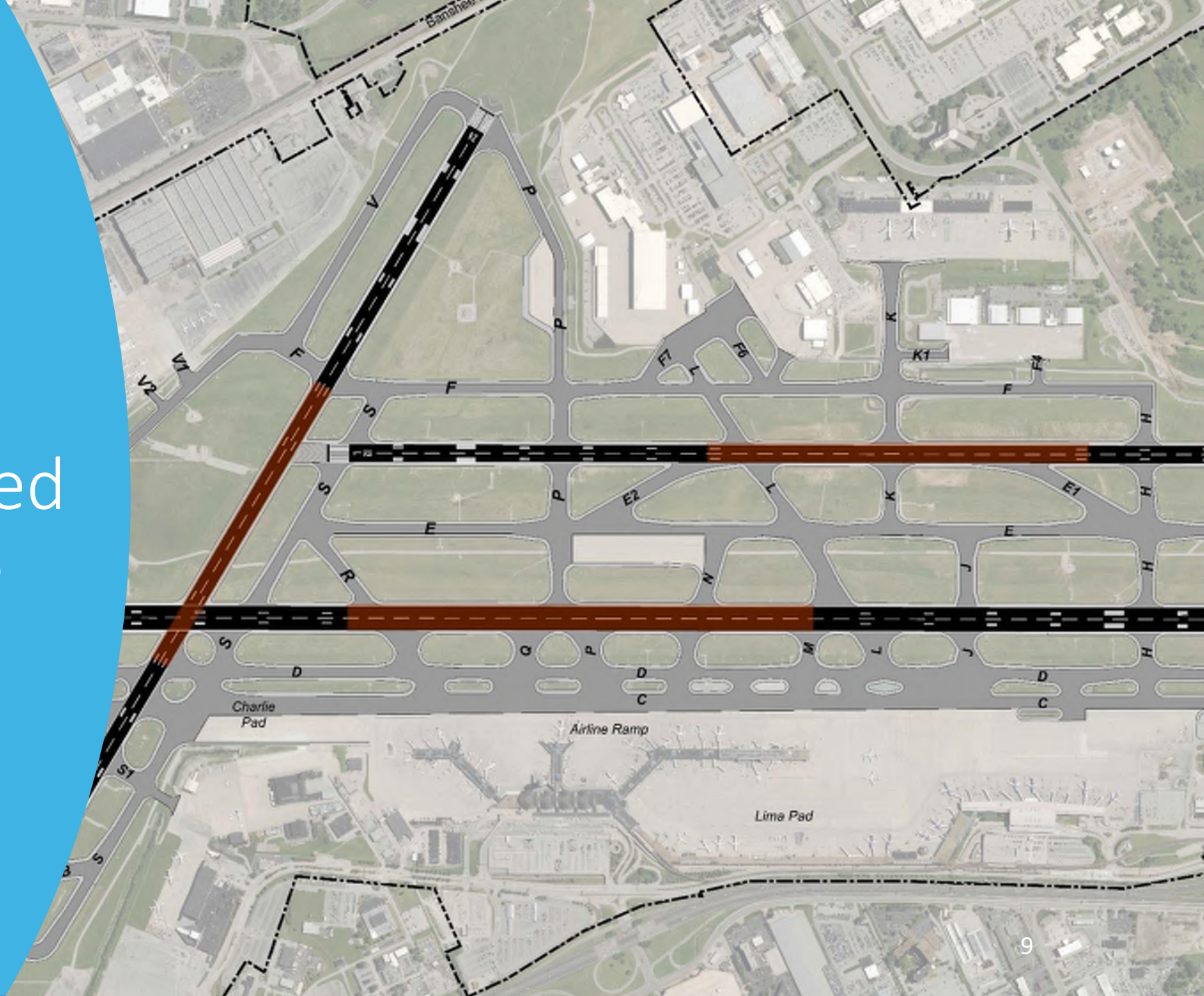


Review of Pilot Inputs Received

- 12R-30L Runway Occupancy Time (ROT)
  - Southbound exits
    - Diagonal/high-speed vs. 90° exits
    - Consider high-speeds 1
  - Existing Taxiway L vs. new alignment 2
- Impact of proposed islands between Taxiway D & C 3
  - Crossing of Runway 12R-30L or exiting runway during arrival movement
  - Pilot decision point(s) – proximity of Taxiway D to Runway 12R-30L



Analysis Completed + Due Diligence



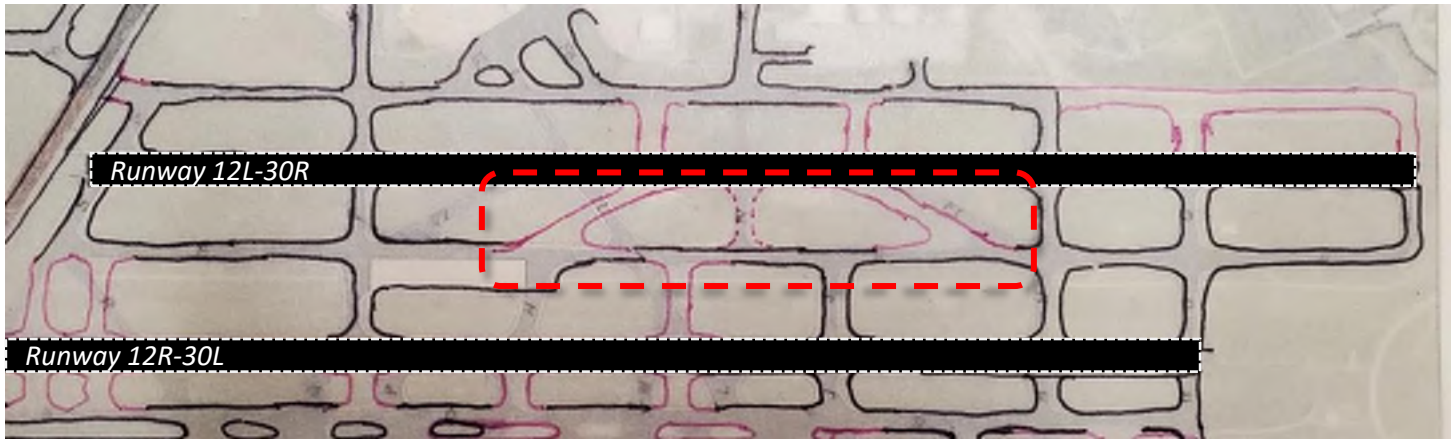
Runway 12L-30R Considerations

Based on Pilot Input

- 12L-30R Runway Occupancy Time (ROT)
  - Southbound exits
    1) Removal of proposed 90° & replaced with high-speed exits closer to existing Taxiway K (+ retain Taxiway K south)
    2) Retain existing Taxiway E1 & E2 locations
    3) Optimize location of Taxiway E1 recognizing long-term terminal location
  - Northbound exits
    1) Adjust proposed 90° exits between Taxiway P & Taxiway H
    2) Assess location of 90° exit landing Runway 12L

12L-30R Southbound ROT: Option 1

- Removal of proposed 90° & replaced with high-speed exits closer to existing Taxiway K (+ retain Taxiway K south)



Southbound Exits (12L)

Original Baseline ROT	
All	**48.4**
Wet	54.5
Dry	47.6

Revised Configuration ROT	
All	**51.3**
Wet	50.5
Dry	52.4

+2.9 Seconds

Southbound Exits (30R)

Original Baseline ROT	
All	**48.9**
Wet	55.7
Dry	48.0

Revised Configuration ROT	
All	**55.5**
Wet	61.1
Dry	54.7

+6.6 Seconds

No further consideration of this option
Significant impact both in terms of ROT increase + 50 second ROT objective for reduced arrival separation

12L-30R Southbound ROT: Option 2

- Adjust location of Taxiway E1
  - Optimal location of Taxiway E1
  - Model isolated high-speed landing 12L + Taxiway E (required for software to run)
  - For comparison purposes only
    - Change in ROT from Baseline and Preferred Location is associated with % of traffic accepting the high-speed vs. roll-out to end of runway (37% vs. 63%)

1 Baseline (existing configuration)
67 seconds

2 Shift west (closer to existing Taxiway K)
74.2 seconds

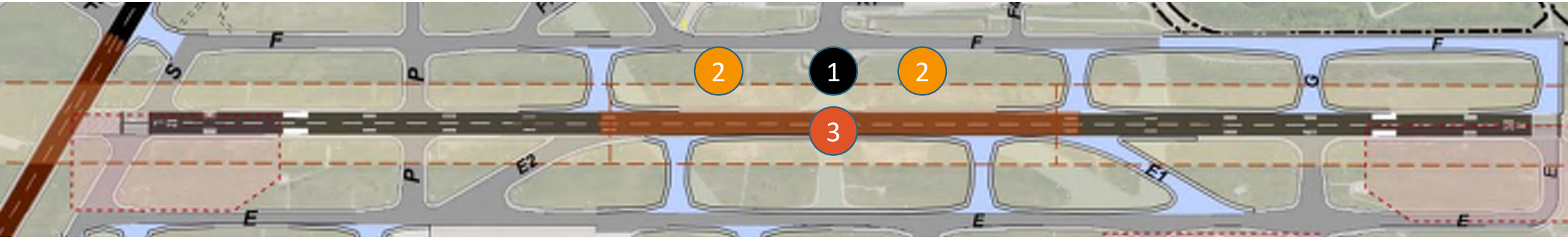
3 Preferred location (plan to date: 600’ shift east)
56.7 seconds

Retain proposed location of Taxiway E1

12L-30R Northbound ROT Options

- Northbound exit model
  - 1 Removal of existing Taxiway K *(specifically landing 12L)*
  - 2 Consideration of high-speed exits
  - 3 Optimal location of 90° exits

1. Removal of Taxiway K required to eliminate direct access from apron to runway
2. High-speeds are not supported given the amount of northbound traffic coupled with cost implications.
3. Assessed adjustments to location of 90° exits northbound



12L-30R Northbound ROT: Adjust Exit Locations

1. Adjust exits landing 12L to provide an option just past existing Taxiway K
2. Keep existing Taxiway H northbound exit open
3. Retain 90° northbound exit in the proximity of existing Taxiway L for landing 30R

Northbound Exits (12L)

Original Baseline ROT	
All	**55.6**
Wet	58.4
Dry	55.2

Revised Configuration ROT	
All	**54.3**
Wet	58.5
Dry	53.7

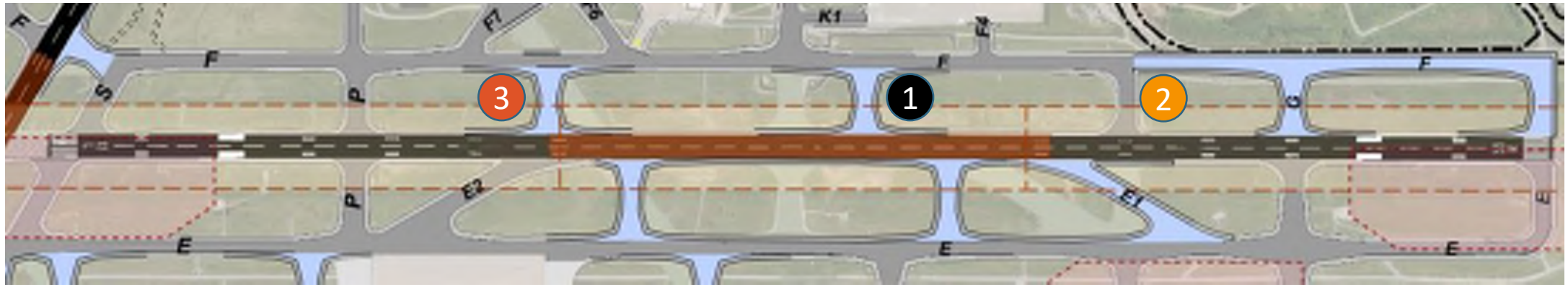
-1.3 Seconds

Northbound Exits (30R)

Original Baseline ROT	
All	**54.5**
Wet	59.9
Dry	53.7

Revised Configuration ROT	
All	**55.9**
Wet	60.0
Dry	55.3

+1.4 Seconds

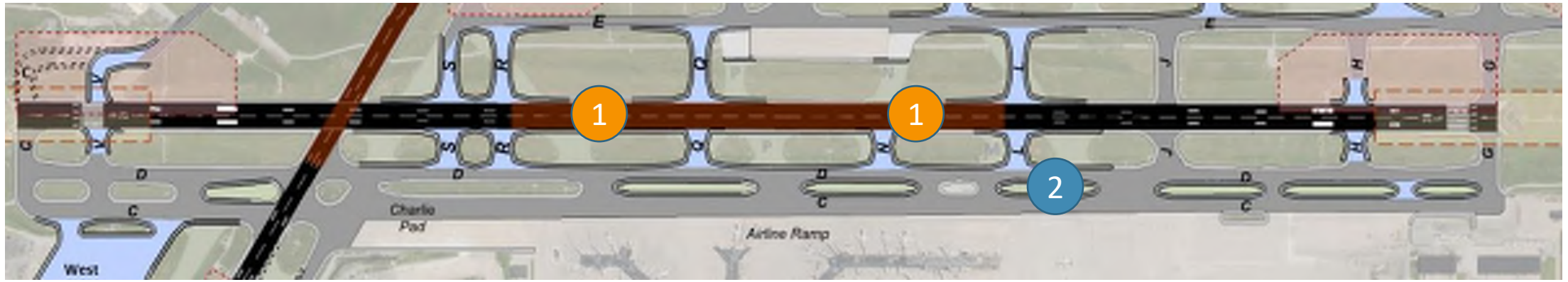


Revised northbound exit plan as noted above

Runway 12R-30L Considerations

Based on Pilot Input

1. 12R-30L Runway Occupancy Time (ROT)
   - Southbound exits: Consider high-speed for both direction of travel
   - Existing Taxiway L vs. new alignment *(no change in proposed alignment per FAA design standards)*
2. Impact of proposed islands between Taxiway D & C
   - Crossing of Runway 12R-30L or exiting runway during arrival movement
   - Pilot decision point(s) – proximity of Taxiway D to Runway 12R-30L



12R-30L Southbound ROT: High-Speed Concept

- Single high-speed configuration results in optimal location in the proximity of existing Taxiway P/Q intersection
- Impact to proposed configuration of Taxiway R replacement & existing Taxiway N (south exit)

Southbound Exits (12R)

Preferred Plan ROT w/ N South	
All	**52.1**
Wet	56.8
Dry	51.4

HS Configuration ROT	
All	**49.8**
Wet	56.1
Dry	49.6

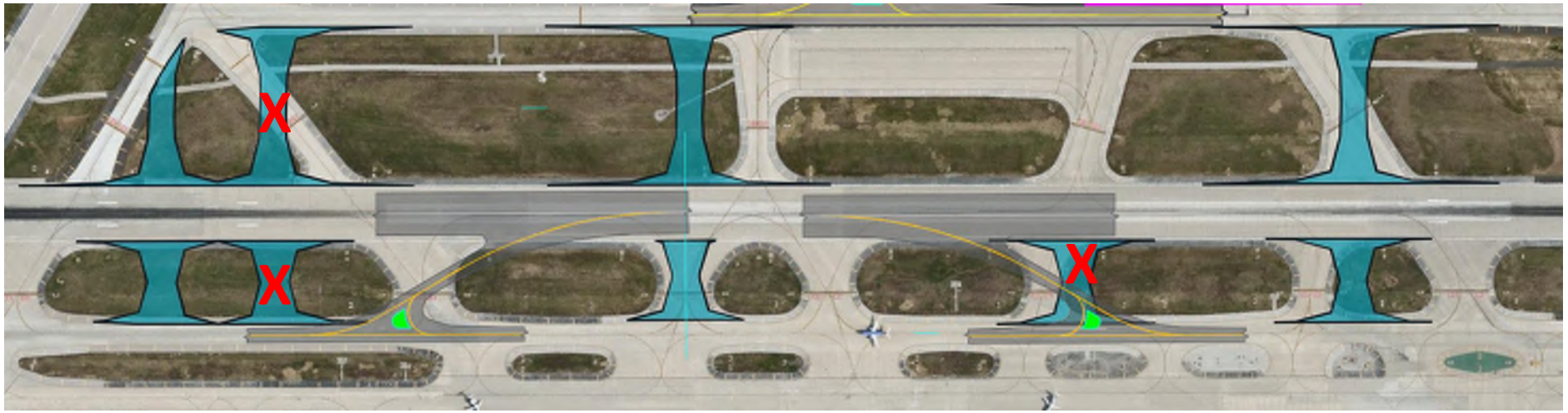
-2.3 Seconds

Southbound Exits (30L)

Preferred Plan ROT w/ N South	
All	**53.0**
Wet	58.0
Dry	52.3

HS Configuration ROT	
All	**52.0**
Wet	59.4
Dry	53.5

-1.0 Seconds



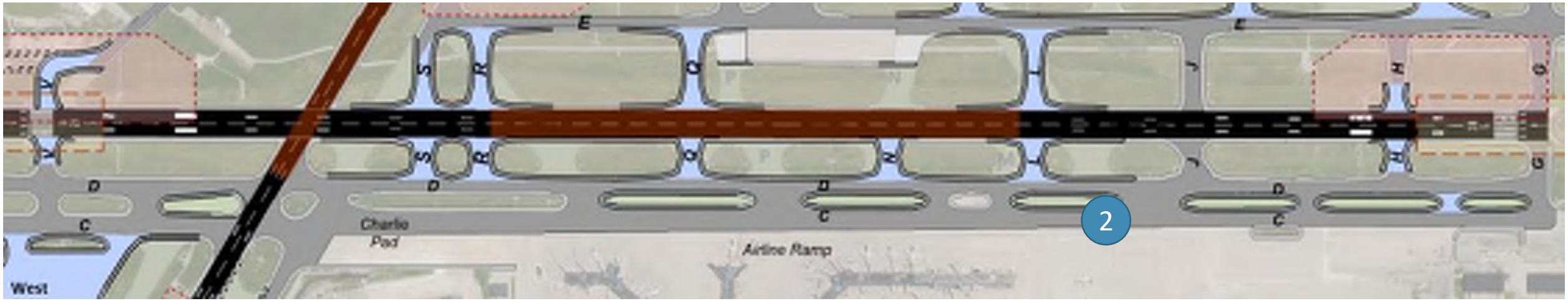
- Limited improvement in ROT
- Operational impacts
- Impact to proposed Taxiway R & Existing Taxiway N
- Cost of high-speeds
- Justification required

No further consideration of high-speed exits from Runway 12R-30L

Review of Pilot Input Received

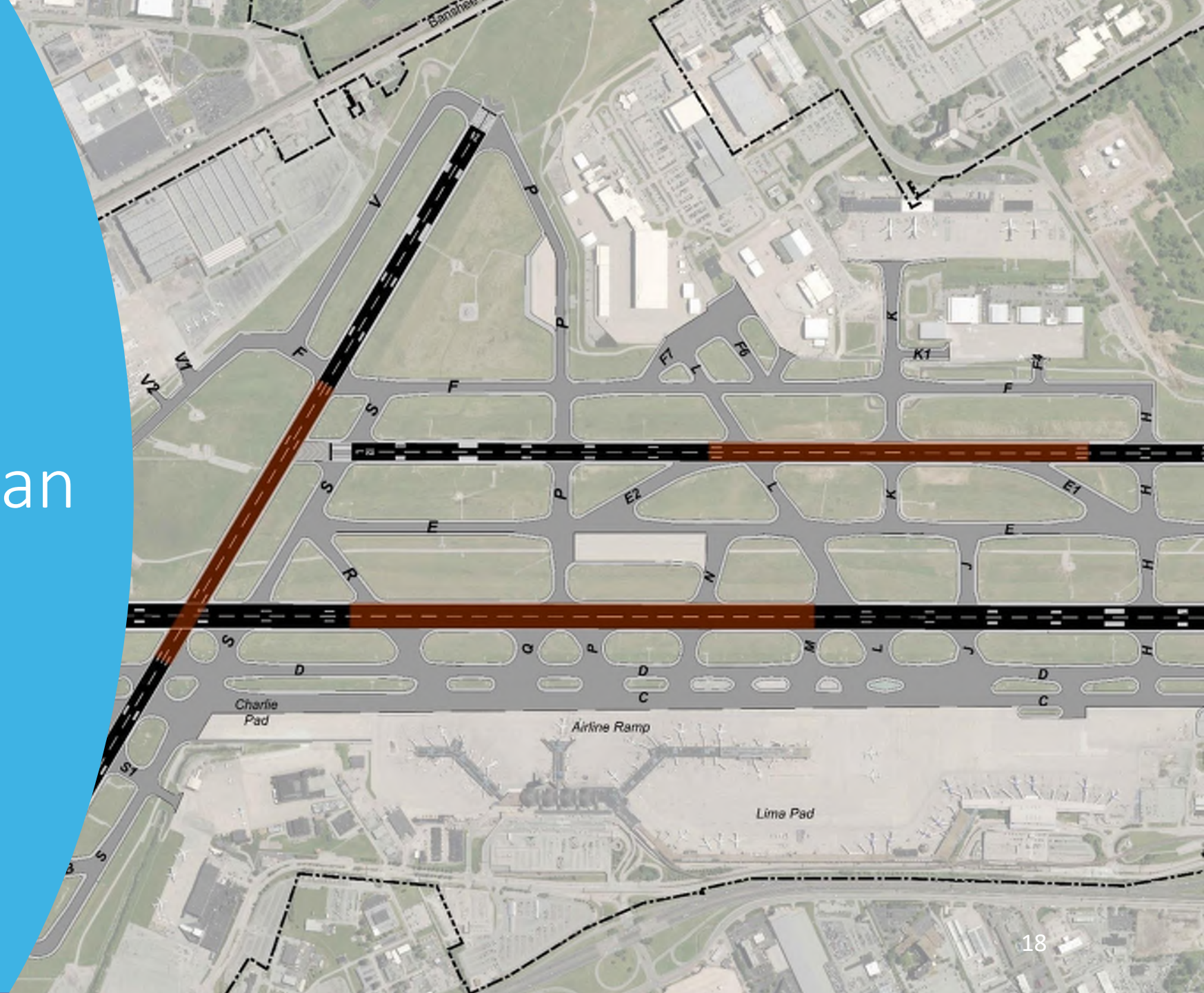
2 Impact of proposed islands between Taxiway D & C

- Change location of islands to south of Taxiway C
  - Insufficient depth to accommodate with existing and long-term terminal envelope
  - Creates additional operational challenges and chokepoints
- Operational procedure with ATCT – turning instruction onto Taxiway D provided as part of the landing rollout or crossing movement *(coordinated with STL ATCT that this is an acceptable practice)*

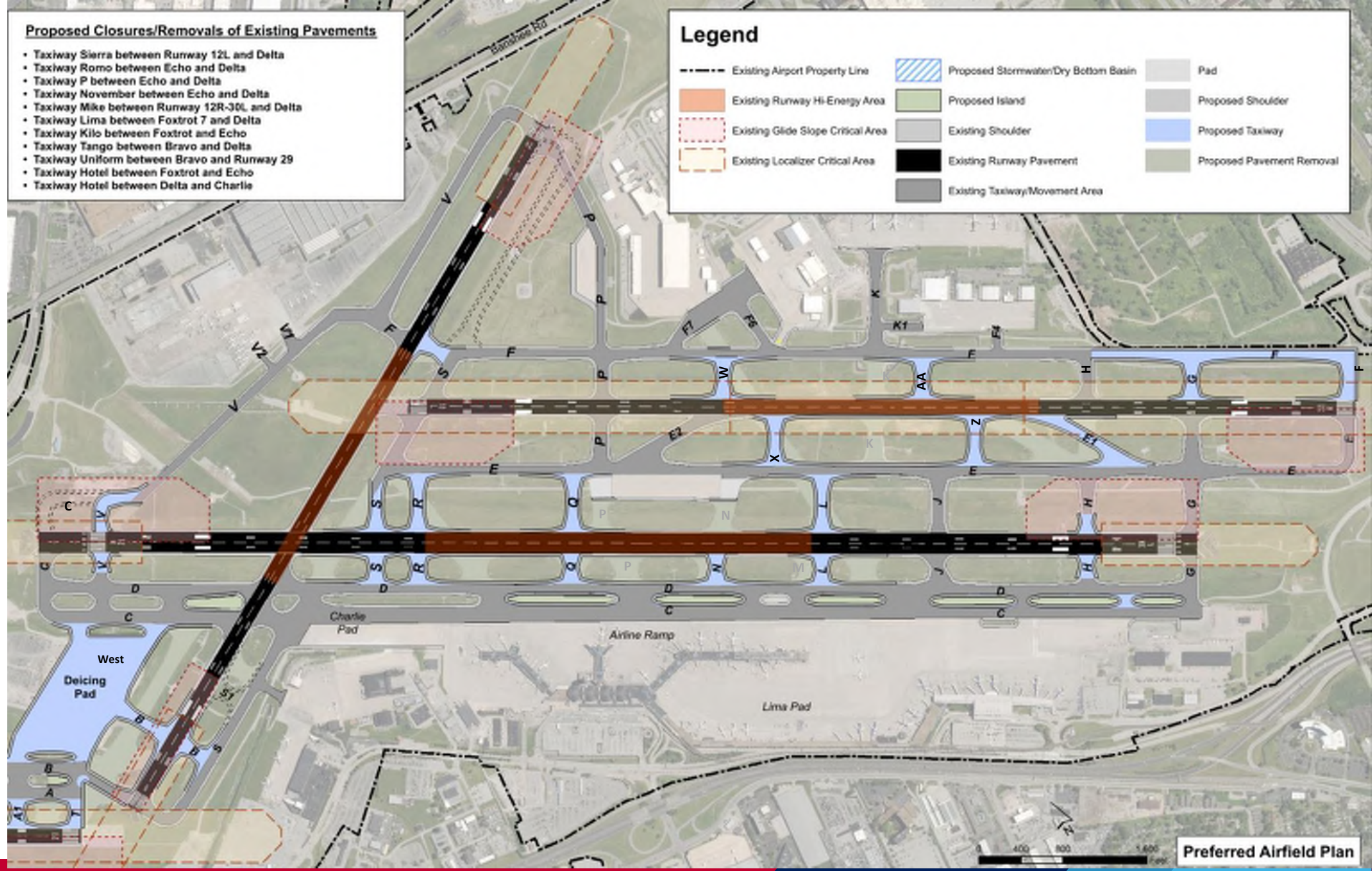


Retain proposed island strategy – address concern through ATCT operational procedures

Revised Airfield Plan + Next Steps



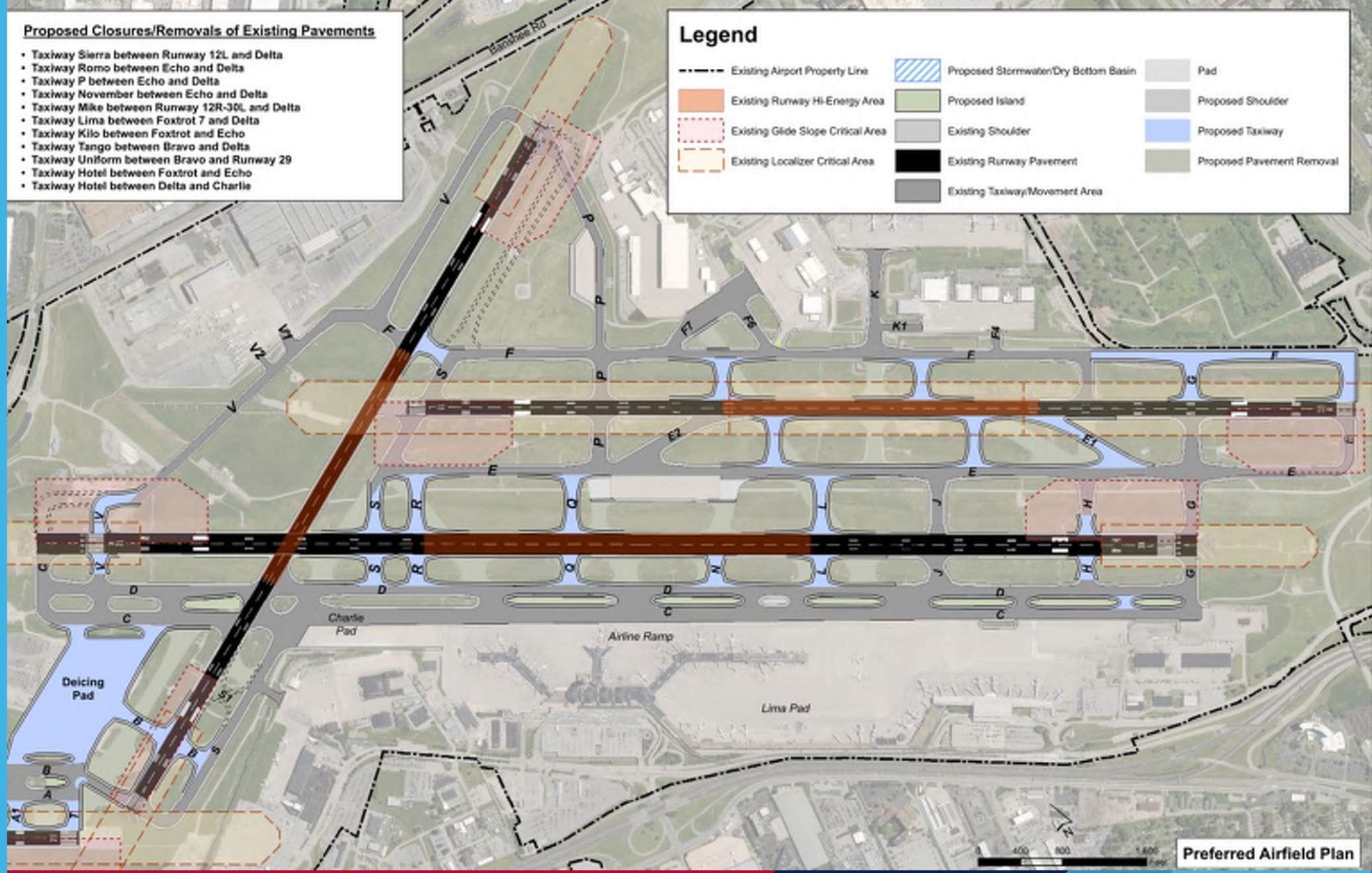
Preferred Airfield Configuration



Open Discussion| Next Steps

- Concurrence on preferred airfield plan
- Provide responses to pilot input received
- Finalize preferred airfield plan:
  - Minor adjustments for additional aeronautical land uses (if needed)
  - Identification of final deice pad strategy
  - Integrate preferred terminal development concept
  - Submit Comparative Safety Assessment (CSA) report
- Integrate final airfield layout into Airport Layout Plan (ALP) drawing set
- Coordinate with FAA stakeholders regarding ALP review/approval process

Thank You


Proposed Closures/Removals of Existing Pavements
• Taxiway Sierra between Runway 12L and Delta
• Taxiway Romo between Echo and Delta
• Taxiway P between Echo and Delta
• Taxiway November between Echo and Delta
• Taxiway Mike between Runway 12R-30L and Delta
• Taxiway Lima between Foxtrot 7 and Delta
• Taxiway Kilo between Foxtrot and Echo
• Taxiway Tango between Bravo and Delta
• Taxiway Uniform between Bravo and Runway 29
• Taxiway Hotel between Foxtrot and Echo
• Taxiway Hotel between Delta and Charlie
Legend
Existing Airport Property Line
Existing Runway Hi-Energy Area
Existing Glide Slope Critical Area
Existing Localizer Critical Area
Proposed Stormwater/Dry Bottom Basin
Proposed Island
Existing Shoulder
Existing Runway Pavement
Existing Taxiway/Movement Area
Pad
Proposed Shoulder
Proposed Taxiway
Proposed Pavement Removal
Banshee Rd
Charlie Pad
Airline Ramp
Deicing Pad
Lima Pad
Preferred Airfield Plan

Appendix B Detailed Scoring Matrix for Draft Alternatives

Respondent ID	Collector ID	Rate your preference for Alternative #1STL Alt1		Rate your preference for Alternative #2Alternative #2		Rate your preference for Alternative #3Alternative #3		Rate your preference for Alternative #4Alternative #4		Rate your preference for Alternative #5Alternative #5		Rate your preference for Alternative #6Alternative #6		Please provide any additional comments or input on the six alternatives presented. If there are specific elements from the alternatives you prefer, please include those below, as we will assess the need to create "blended" alternatives based on input received.	Please provide your name (allows for follow up coordination if needed)
		Response	Please identify any likes or dislikes on this alternative:	Response	Please identify any likes or dislikes on this alternative:	Response	Please identify any likes or dislikes on this alternative:	Response	Please identify any likes or dislikes on this alternative:	Response	Please identify any likes or dislikes on this alternative:	Response	Please identify any likes or dislikes on this alternative:	Open-Ended Response	Name
12556150036	402718218	4	Like the S and R crossings to deconflict traffic. Like the full length Twy F for 30R (all alternatives) Dislike the Twy Q crossing both runways. Dislike the 12L-30R midfiled crossing. Dislike the high speeds as they exist today.	3	Dislike midfield L full length crossing in the mid point of 12L-30R. Dislike mulit-node taxiways at the "high speed" exits as it exists today. Like the Twy F crossing at 6-24 change.	7 - Highly Preferred	Likes: Standard high speed exits that dump into a parallel taxiway rather than a taxiway intersection. Crossings from 12L-30R arrivals would be focused outside of the high energy sections of 12R-30L. Full length taxiway F to 30R. Vehicles or aircraft crossing both runways are likely to use G or S (preferring service roads for vehicles.) This is outside of the high energy runway areas. Full length taxiway from V to 12R. Dual crossing options to deconflict traffic at R and S. Good taxiway options at Rwy 6 and 29. Dislike no change to the Twy F crossing at Rwy 6-24. Dislike the Twy P crossing of 12R-30L. Exit is fine, not a fan of the crossing there. Would prefer crossings at S and R vs. P. From a Runway Safety perspective this is by far the best alternative in my opinion while allowing for efficient traffic movement.	5	Most comments found elsewhere. Will defer to airports on the deice pad comments. This location works well for departures on 12R or 29 but would be difficult if those were not available for whatever reason.	3	Like the shortening of Rwy 6. Dislike the high speed locations, the straight crossings at Q,	4	Dislike Twy Q straight crossing of both runways	Prefer: Standard High Speed exits not ending in a taxiway intersection. Full length Twy F to 30R. Avoiding high energy runway crossings. Full length TWY from Twy V to 12R. Increased separation between the entrances to Rwy 29 and Rwy 6. Dual crossing points for 12L/30R arrivals to cross the inner parallel while keeping them out of the high energy portions of the runway. Improved crossing of Rwy 6-24 at Twy F be requiring a turn as in alternative 2 and 4.. Limit midfield straight Twy crossing opportunities across both runways for vehicles..	Tom Frakes
12555935498	402718218	4	There are components of each "Alternative" that are good and bad. In Alt 1, V's 90 degree into 12R is good and the extension of F is good. What is object to is having S and R in parallel when Q is also providing a by-pass for 12R crossings. If you keep Q, there is no need for a redundancy to S with R. I also object to M crossing of 12L in the high energy zone. It would seem to me shifting it west out of the high energy zone is achievable and preferred. This alternative does not address F crossing at 6-24 or any of the U/T and A/B issues at 29 and 6 ends.	4	This alt does not address the wide expanses of pavements at L and E2/P or E1/H. I also question if the B crossing at 6 impacts the Fire-end glide slope. Does this crossing really provide that much benefit when an aircraft could just roll out a little more to exit the runway? The A1/T corrections at 29, V 90 degree and F crossing at 6-24 are good. I would think that when it comes time to reconstruct P near Boeing that the S extension makes sense for future development.	4	I do not see how it is necessary to have a S and R for redundancy/bi-pass when there is a P crossing of 12R. I like the E1 and E2 shifts to improve the wide expanse of pavement on E. I see no reason to provide the extended C/V taxiway, building into the north detention basin, in that aircraft coming from V more than likely do not need the extra runway length for take-off	4	this alt duplicates S and R even though a crossing twy (Q) exists and does not address the wide expanse of pavements at E2/P at E or E1/H at E. This alt's deicing pad makes sense for a deicing pad layout but cutting access to Rwy 11-29 with only B for a through-taxiway seems to create unnecessary risk	3	this alt improves on the wide expanse of pavements along E, does not create unnecessary duplicate by-pass taxiways with S and R while still keeping one exit taxiway for 12R that also serves as a crossfield taxiway (for N/S traffic). The deicing pad's orientation is not conducive with the prevailing winds and to minimize pad paving but that can be tweaked in design. the shortening of Rwy 6 end makes sense to clear it from Rwy 11-29. If the Deicing pad can be moved further to the west perhaps a traditional GSCA can be provided at the Rwy 6 end instead of the hard to service fire-end GS. The F crossing at 6-24 is not fixed here.	5	the M, H taxiways on the north side of 12L are superior over the previous alternative, the L taxiway from E to D is superior over the previous alternative.		Jennifer Kuchinski
12552022112	402718218	6	Does a nice job of cleaning up the problematic geometry. Not sure if Taxiway Romeo is needed but not a bad idea to show it. Can always be phased. I like the placement of the islands.	4	The extension of Taxiway Sierra should be looked at but due to NAVAIDS, may not be practicable. The relocation of Taxiway Foxtrot depends on the extension of Taxiway Sierra. Prefer alternative one for Foxtrot. I like the cleanup of the taxiway connections on the RW29 end. Not sure if the bypass is needed but can be shown as for future use if needed.	5	I like that the high speeds are being looked at. This certainly should be a consideration. Could clean up Foxtrot at RW 6-24 as shown in alternative one.	4	Glad to see a deicing pad shown. I think one should be in the final blended alternative.	4	This could be a better orientation for the deicing pad but it includes an acute angle taxiway connector into Taxiway Bravo.	4	Not sure if the additional connector from Sierra to Tango is needed but can be shown if needed in the future. Interesting that only one of the high speeds is looked at. This could be a good alternative but would need to see a taxiway analysis on where they should be placed. Likes – pavement removals (especially diagonal Taxiway L); single perpendicular Taxiway S to Runway 12L; Taxiway F extension to Runway 30R; If high speed Runway 12L/30R exit E1 has been relocated to meet the standard high speed exit design/layout, and also provides the optimum location for the majority of aircraft to exit the runway in a timely manner, then the configuration of E1, as shown in this alternative, should be the preferred alternative provided the future Taxiway H does not create more than a three node intersection with Taxiway E. Questions – Where will the Terminal Building be located?; Will Taxiway B negatively affect the operation of the End-Fire Glide Slope?; Will future Taxiway S replace Taxiway P to Runway 24 in order to allow Boeing expansion (landside need vs airside need)? Dislikes – Taxiway Q crosses high energy zone of Runway 12R/30L; future Taxiway H connectors from Runway 12L/30R to Taxiways E and F are not needed because they are located in close proximity to Taxiway G and would have low use.	4	Some comments apply to more than one alternative but are not repeated for each alternative. Definitely agree that the final result will be a blended alternative. It would be helpful to know what the final terminal development will look like. If the west terminal is more fully utilized, it could result in a higher utilization of RW 11-29. I did not rank the alternatives 1-6 because I think each one poses interesting considerations. I ranked one the highest because I saw it first and thought it did a good job of cleaning up the geometry.	Mark Schenkelberg, FAA Airports Division
12549886097	402718218	6	Likes – pavement removals (especially diagonal Taxiway L); minimum pavement additions; Taxiway F extension to Runway 30R. Questions – Where will the Terminal Building be located?; Is Taxiway L used for runway exits and not aircraft crossing Runway 12L/30R within high energy zone?; What does Taxiway F realignment to Runway 6/24 resolve (millions were spent to mitigate the Hot Spot)?; What is separation distance between dual Taxiways S and R, and are there any aircraft restrictions for simultaneous use?; Can aircraft hold perpendicular to Runway 12R on Taxiway V? Dislikes – Taxiway Q crosses high energy zone of Runway 12R/30L.	5	Likes – pavement removals (especially diagonal Taxiway L); single perpendicular Taxiway R to Runway 12L; Taxiway F extension to Runway 30R. Questions – Where will the Terminal Building be located?; Is Taxiway L used for runway exits and not aircraft crossing Runway 12L/30R within high energy zone?; What does Taxiway F relocation crossing Runway 6/24 resolve (millions were spent to mitigate the Hot Spot)?; Is Taxiway S to Runway 24 that replaces Taxiway P allow future development for Boeing (landside need vs airside need)?; Can aircraft hold perpendicular to Runway 12R on Taxiway V? Dislikes – Taxiway P crosses high energy zone of Runway 12R/30L.	5	Likes – pavement removals (especially diagonal Taxiway L); Taxiway F extension to Runway 30R; dual Taxiway connectors C and V at Runway 12R; Taxiway L does not cross high energy zone of Runway 12L/30R; If high speed Runway 12L/30R exits E1 and E2 have been relocated to meet the standard high speed exit design/layout, and also provide the optimum location for the majority of aircraft to exit the runway in a timely manner, then the configuration of E1 and E2, as shown in this alternative, should be the preferred alternative. Questions – Where will the Terminal Building be located?; Can aircraft hold perpendicular to Runway 12R on dual Taxiway connectors C and V?; What is separation distance between dual Taxiways S and R, and are there any aircraft restrictions for simultaneous use? Dislikes – Taxiway P crosses high energy zone of Runway 12R/30L.	4	Likes – pavement removals (especially diagonal Taxiway L); Taxiway F extension to Runway 30R; Taxiway L does not cross high energy zone of Runway 12L/30R; Questions – Where will the Terminal Building be located?; Can aircraft hold perpendicular to Runway 12R on Taxiway connector V?; What is separation distance between dual Taxiways S and R, and are there any aircraft restrictions for simultaneous use?; What does Taxiway F relocation crossing Runway 6/24 resolve (millions were spent to mitigate the Hot Spot)?; Is Taxiway S to Runway 24 that replaces Taxiway P allow future development for Boeing (landside need vs airside need)?; Why does Taxiway H need to be relocated? Dislikes – Taxiway Q crosses high energy zone of Runway 12R/30L.	3	Likes – pavement removals (especially diagonal Taxiway L); single perpendicular Taxiway S to Runway 12L; Taxiway F extension to Runway 30R. Questions – Where will the Terminal Building be located?; Is future Taxiway M used for runway exits and not aircraft crossing Runway 12L/30R within high energy zone?; Can aircraft hold perpendicular to Runway 12R on Taxiway V?; Is it feasible to relocate the end of Runway 6 and not have negative operational impacts from the layout of the Runway 6 approach/departure surfaces, as well as the operation of the End-Fire Glide Slope (can the glide slope be relocated)?; Will future Taxiway S replace Taxiway P to Runway 24 in order to allow Boeing expansion (landside need vs airside need)?; Why does Taxiway H need to be relocated? Dislikes – Taxiway Q crosses high energy zone of Runway 12R/30L; future Taxiway R crosses high energy zone of Runway 12R/30L.	4	Please see comments for each alternative.	Todd Madison
12539528421	402718218	6	Twy Lima should go all the way through	2	I like the west airfield	4	Lima should go all the way through and then take out that stub on the north	1 - Not at all preferred	New Hotel will slow all airport operations from snow removal to crossing aircraft Best deicing pad. need to spread the highspeeds like in #3. Keep the TW F dogleg and take out the TW S extension (it's just need operationally needed). if we did	4	3	1 - Not at all preferred	I like the deicing pad		Lima should be a straight shot and the deicing pad is nice.	David Kulinsky
12539509639	402718218	3	Don't like the TW in the high energy zone of RW 30R. Same for TW Q. it is access from one RW straight to the high energy zone of the other.	2	Dislike the extension of extension of TW S. Dislike TW L across both parallels and in the high energy zone. I like the new dogleg of TW F.	4	Two dislikes, doesn't deal with TW F straight into RW 6-24; TW L in the high energy zone of RW 30R. I like moving and saving the highspeeds.	4	that, it's a 5 or 6.	2	Doesn't deal with TW F, highspeeds in high energy zone, and this is worst deicing orientation for flow.	5	if the deicing pad were like #4; this would be a 6. TW Q is an issue; but there's nothing direct from the ramps.	See my suggested changes in each alternative.	Dave Fleet - Faith Group

Appendix C Airline/User Meeting Presentation & Minutes

Preferred Airfield Configuration – Pilot/User Engagement

Meeting Minutes

Virtual Meeting - Zoom

September 3, 2021, 11:00am - 12:15pm (CDT)

IN-ATTENDANCE

STLAA: Jerry Beckmann (phone), Dana Ryan, Ron Stella, Jay Christians, Jan Titus

WSP: Jennifer Kuchinski, Eliane Grayer

CMT: Doug Gregory

Pilot/Users: Steve Testerman (EHI), Dan Draeger (Boeing), John Kloppenburg (Boeing), Gary McMullin (SWA), Greg Gorlich (SWA), Scott DeHart (SWA), Trey Turner (SWA), Kurt Vitense (EHI), Rick Dalton (SWA), Todd Moehlmann (Jetlinx)

MEETING MINUTES

Opening Remarks

- Dana Ryan provided introduction including history of the airfield development. Desire is to bring taxiway system into current standards. Today's meeting is to seek input from the pilot community: anything we missed; what are we doing right or wrong; areas we might need to take a look at again.
- Asked the question "Is the current airfield confusing"?
    - Several participants indicated that the airfield isn't confusing, provides great flexibility to accommodate change, and that it is easy to navigate.
        - Gary (SWA) -taxiway system is pretty standard as compared to other airports, well-marked, easy to use, crossing runways is not a concern
        - Dan (Boeing) – taxiway set up is very useful for non-traditional aircraft activities, very flexible from manufacturer's perspective
        - Kurt (EHI) – from GA/Business, not confusing, fly all over world. North side of field seems very intuitive

Overview of Key Airfield Planning Objectives (Slides 3 – 6)

- Doug Gregory explained the various objectives, no questions asked, or input received

Overview of the Alternatives Vetting Process (Slides 7 – 12)

- Doug Gregory explained the alternatives process to date including the engagement of several stakeholders/contributors and that the process is iterative in nature as consensus is built.
- Conversation/Input received
    - Greg Gorlich – how does removing R not increase ROT? Doug explained the stoplight criteria used (less than 2 second = green, if between 2-5 seconds was yellow) per the REDIM software. Greg: Seconds count in a 2.5 mile vs 3 mile final separation so might

want to check these stop light scoring results. Greg notes that ATC may be only thinking about current operations, but WN is thinking that these might impact future traffic

- Greg McMullin – technically can't use a backwards 90-degree turn without ATC clearance. FAA is removing a lot of taxiways in system and replacing with reflectors in painted green islands. Islands with unlit reflectors increase risk (error in FAA safety risk assessment) because pilots can't see them to the last minute.
- The current taxiway at STL is one of more efficient Boeing operates at – would prefer to see it similar as is now in future
- Scott DeHart – one second less on ROT is a difference maker. STL needs more diagonal taxiway – helps reduce ROT. 90-degree taxiways increase time on runway, increases go-arounds which increases hazards in NAS, increases need for separation on final – don't see how 90s is a good idea, would prefer to see more diagonals (high speeds). HS/Diagonals are safer, might be contrary to Airports Division but work very well
- Ron Stella – 12L was looked at extensively for HS – clarify if pilots want north or more south exits?
  - Input received was both should be considered; focus was on minimizing ROT and limiting impact to taxi times

Review Preferred Airfield Configuration + Open Discussion (Slides 13 – 15)

- Doug Gregory walked through the airfield quadrants
  - Taxiway F at Runway 6-24 + long-term extension of Taxiway S to Runway 24 (no objection/input)
  - Presented Runway 12L-30R configuration and then the 12R-30L configuration (resulted in a blend of conversation/input received)
    - Gary McMullin – no problems with proposal, want efficient taxi times to/from runways – believe that this configuration will increase taxi times and will be a large cost burden (operational for SWA). Most pilots exit at L, very efficient – more so than making hard turns at E.
      - Always used old K to turn to Signature (when Midcoast) – rolling down to AA would be too long – too much ROT (previous experience before SWA)
      - WN does not apply aggressively on brakes – try to keep exits where they are today
    - Runway 12L-30R Input
      - Kurt Vitense – uses K every time, very seldom go long to existing H. Could see a high-speed starting at existing K and dumping out near F4 would be helpful if have to get rid of crossing of K at 12L
      - Scott DeHart – look at what did in LAS for location of diagonals (High Speed). Just replacing with 90's is not necessarily a solution or safe
      - Steve Testerman – uses a lot of high speed at LAS (Harry Reid) – could see them beneficial at STL.
      - Doug Gregory interpretation: look at X and Z to see if need to be high speed vs 90s – run REDIM for consideration

- Gary McMullin - Southbound at L or new X – prefer to keep L as a diagonal since all pilots are used to it and very efficient – find L in current state is very important to current operations. If go to E2 instead of L, increases taxi by 30 seconds and multiplied over 200 ops would be a large cost impact
- Steve Testerman – 11/29 offers a lot of exits at high speed
- Dan Draeger – exit at P going west, would exit at G going east – but typically would leave at H. Lima is extremely efficient to get to E for 30L departures – proposed changes are not a large impact but might increase time on runway
- Boeing – Removal of L between Taxiway F and ramp is a non-starter. Must have another exit option outside of F6 & F7
- Doug Gregory – will revisit 12L-30R based upon input – will present to FAA

▪ Runway 12R-30L Input

- Gary McMullin / Scott DeHart – entire runway is high energy zone – what is shown is not real in length (FAA defines as middle 1/3, ATC defines as first 2/3 of runway), islands also present problems to pilots in that have to turn quickly on to Delta (but which way because not yet talking to ground control) – and tail is still in RSA – automatic go-around for aircraft behind them. Would prefer diagonal to clear runway and knowing that aircraft is clear of RSA, pilot will just taxi on to parallel to make sure clear of RSA.
- Scott DeHart – pilot will get deviation demerit if clear RSA and turn on parallel without ground control, if pilot waits for clearance to turn left or right on parallel may very well still have tail in RSA; puts pilot in no win.
- Request was made to think through conflict points not just in terms of traffic flows but also pinch-points where the pilot must make a choice either with/without ATCT approval.

o Runway 6 & Runway 29 configuration presented – no input received, or concerns expressed.

- Post-meeting takeaway/actions: several points brought up regarding FAA design standards and experiences at other airports in the NAS are outside STLAA control (use of 90-degree connectors vs. more diagonal or high-speed exits). Understand concern with proposed islands between Taxiway D and Taxiway C relative to pilot decision-making (if not in contact with ground control), however mitigating direct access from aprons to runways is one of FAA's highest priorities at STL (current guidance is to follow design standards).
  - Debrief with FAA stakeholders
  - Assess changes to Runway 12L-30R configuration (high-speed exit strategy)
  - Assess distance from Runway 12R-30L and Taxiway D to understand impact of additional islands proposed

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Preferred Airfield Configuration *(Long-Term)*

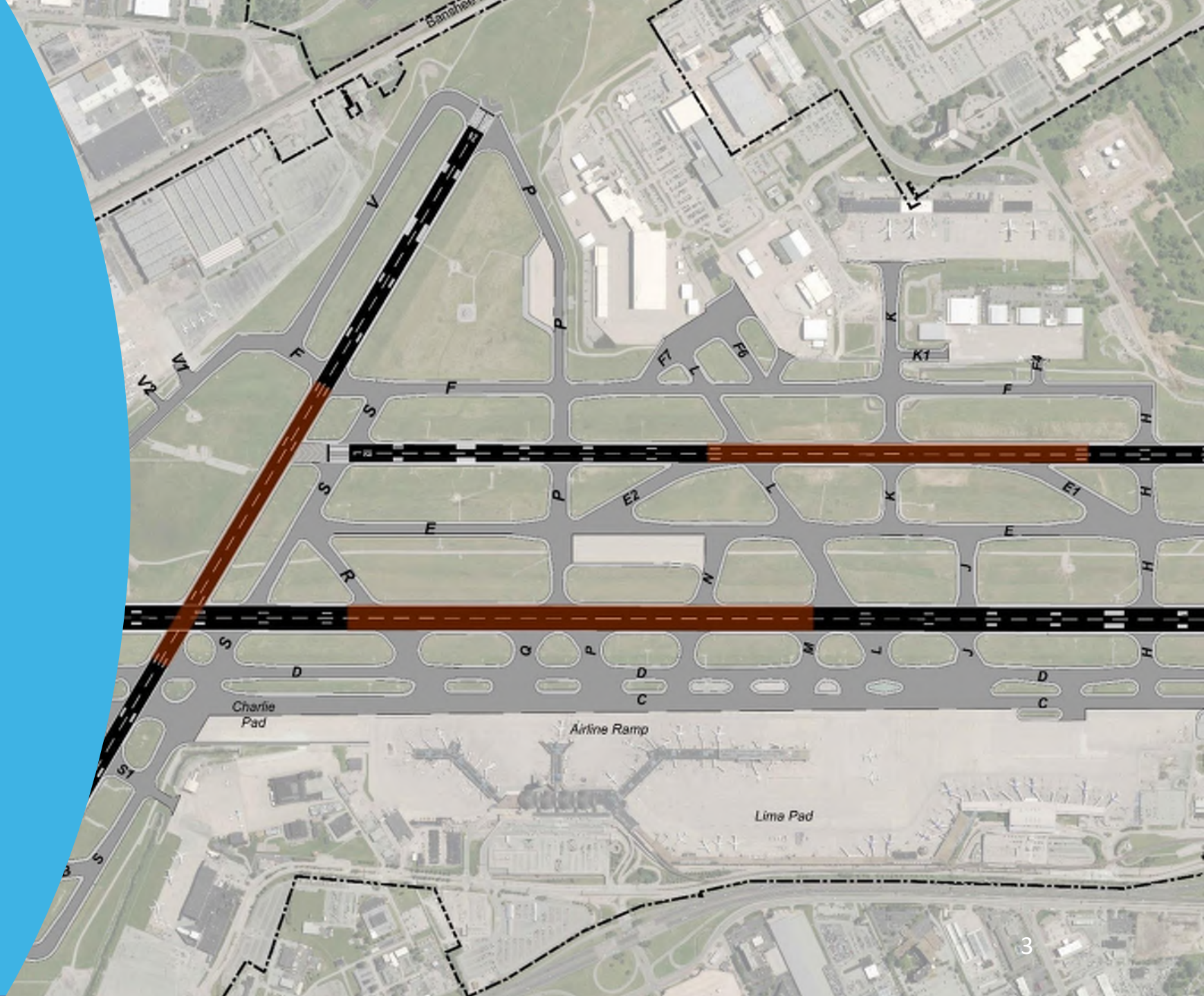
Pilot/User Outreach Engagement

Date: September 3, 2021

Agenda

- Introductions and welcome
- Overview of key airfield planning objectives
- Overview of the alternatives vetting process
- Review preferred airfield configuration
- Next steps & open discussion

Overview of Key Airfield Planning Objectives

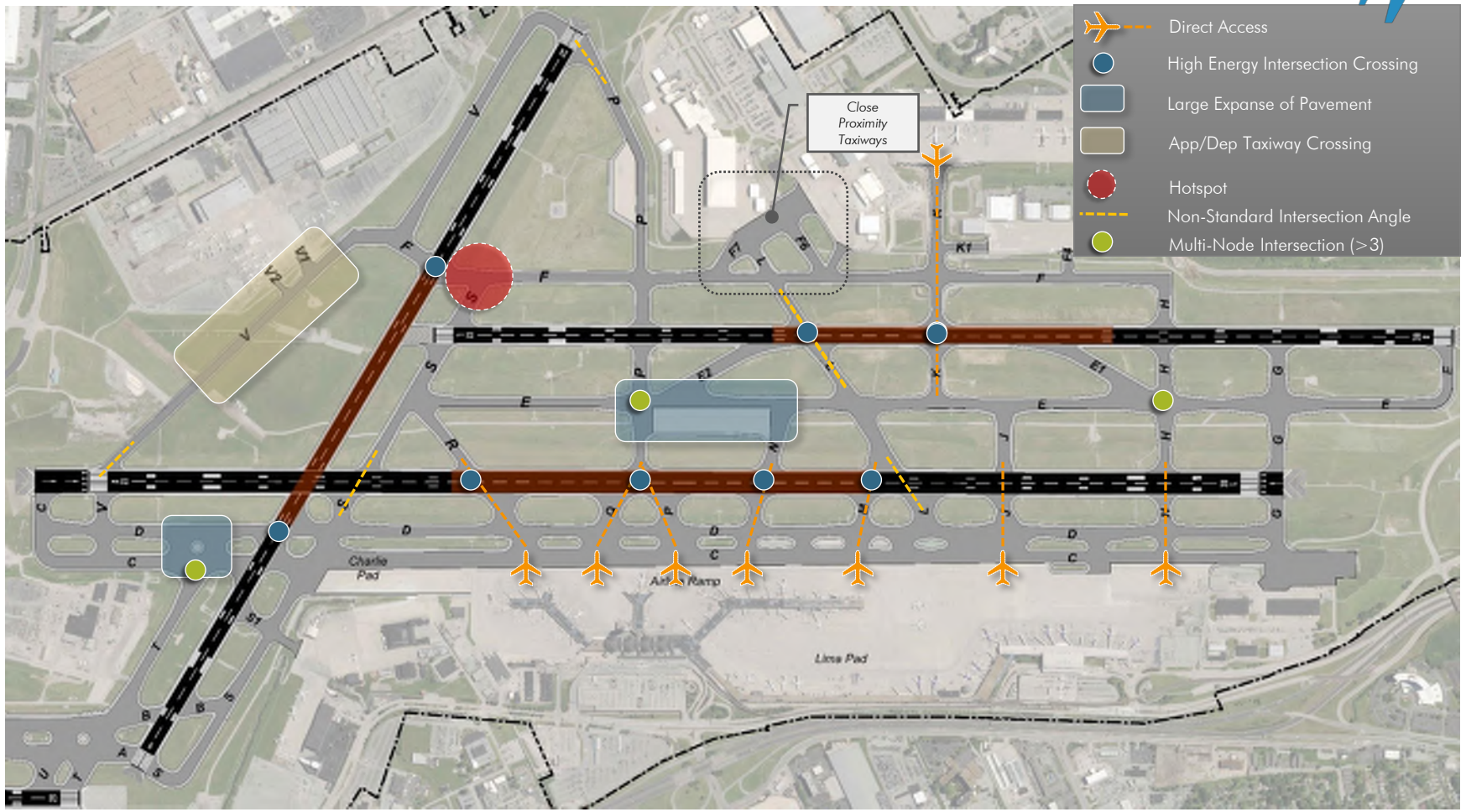


Airfield Planning Objectives

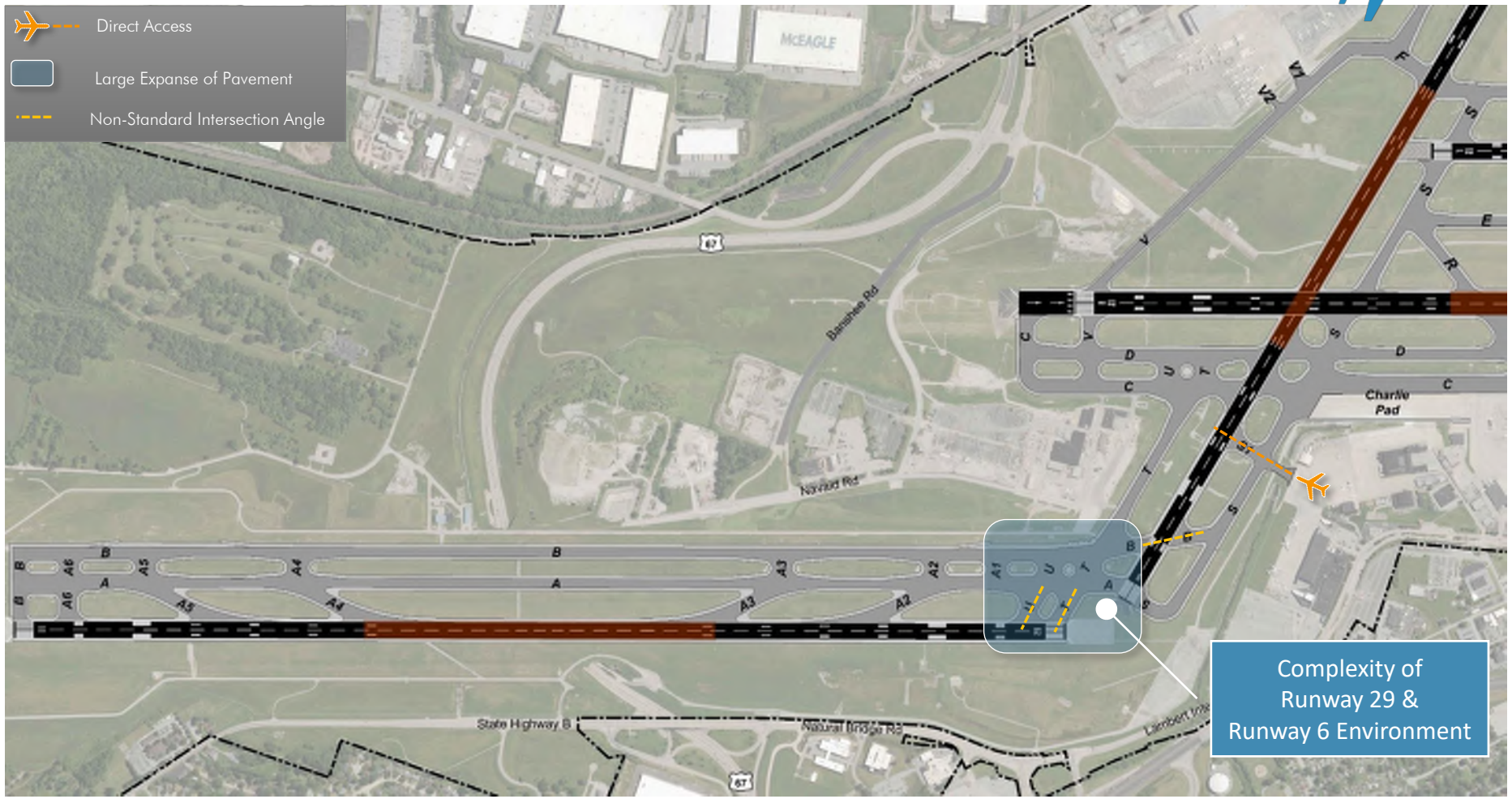
- Long-term development strategy:
  - Runway system capacity
  - Runway length
- FAA airfield design standards (safety enhancement focused)
- Safety Benchmarking:
  - Effectiveness in eliminating, reducing, or mitigating safety risk
  - Compliance with FAA airport design standards
  - Limit introduction of new risk factors
- Operational Benchmarking:
  - Minimize impact to capacity *(doesn't result in a significant reduction in capacity)*
  - Provides operational efficiency / addresses operational issues
  - Provides for redundancy during runway/taxiway closures
  - Flexibility to accommodate changes in aircraft fleet mix *(design group and/or other operational changes)*
  - Flexibility to accommodate irregular conditions *(SMGCS, winter ops, etc.)*

Benchmarking Criteria	Stoplight Scoring Criteria		
	✖	●	✔
Safety			
Hotspot	Creates New Concern	No Change	Improves Condition
Non-Standard Intersection Angle (Preferred is 90°)	> 3 Locations	2 or 3 Locations	< 2 Locations
High-Energy Runway Crossings (Intersection)	3+ Locations	1 or 2 Locations	No Locations
Direct Access (Apron to Runway)	3+ Locations	1 or 2 Locations	No Locations
Operational			
Taxi Time/Distance to Runway Complex	Increases	Neutral	Decreases
Runway Occupancy Time (ROT)	Increases	Neutral	Decreases
Low Visibility Route (Distance)	Increases	Neutral	Decreases
Departure Queue at Runway End	Reduces	Neutral	Increases
Operational Restrictions	Creates New Concern	No Change	Improves Condition
NAVAID Restrictions (ILS Holdshort, App/Dep Holdshort, etc.)	Creates New Concern	No Change	Improves Condition

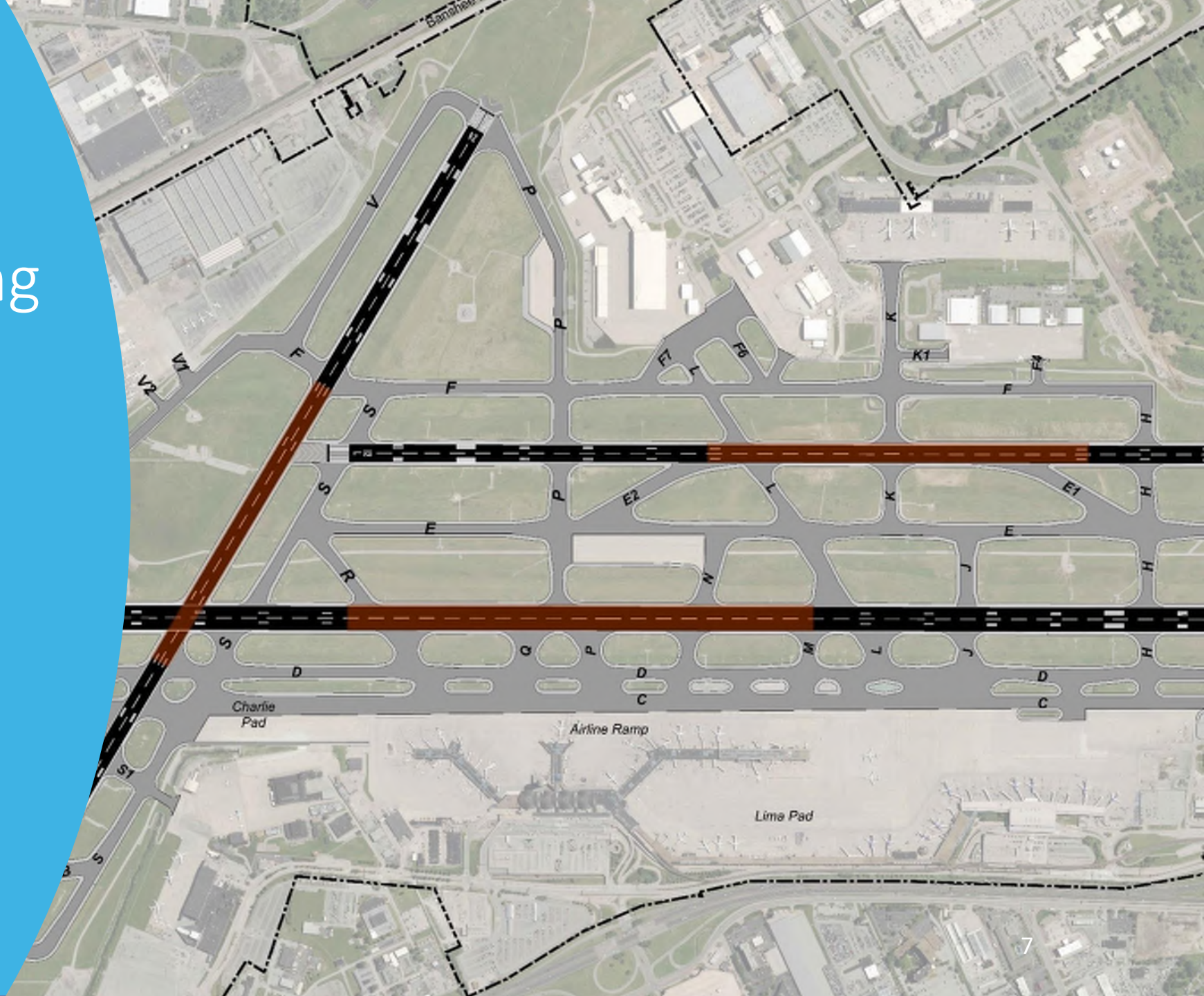
North Airfield – Areas of Assessment



West Airfield – Areas of Assessment

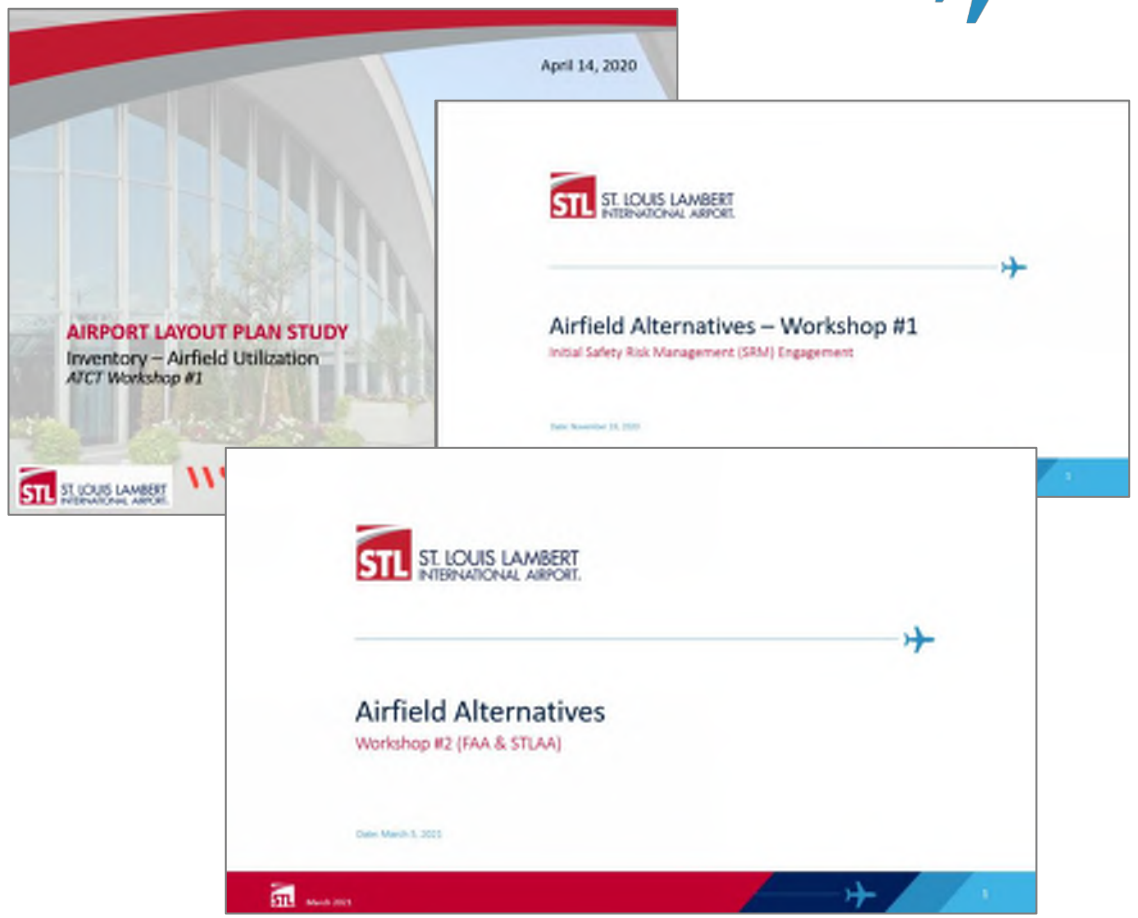


Overview of the Alternatives Vetting Process



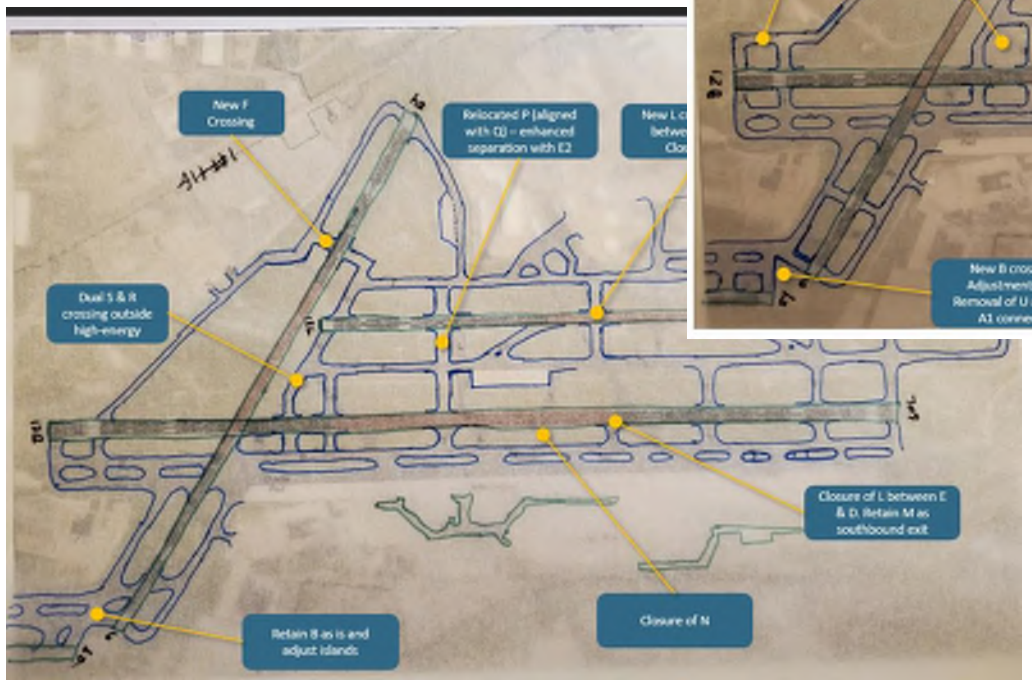
Overview of Alternatives Vetting Process

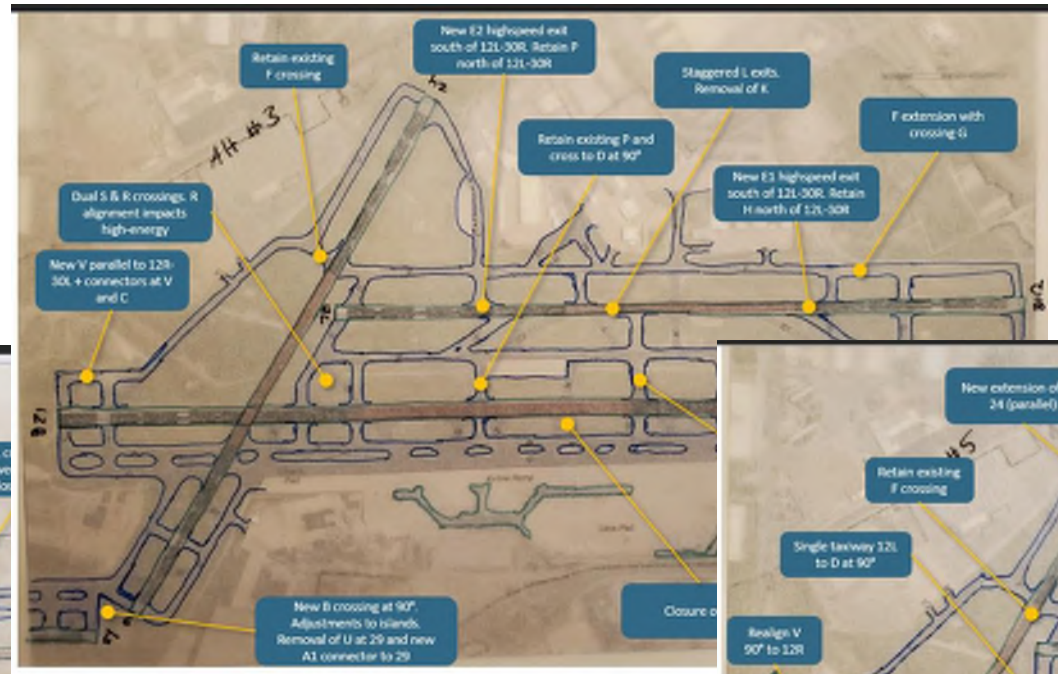
- Inventory – Workshop #1 (Airfield Utilization)
- Facility Requirements Presentation
- Airfield Alternatives Workshop #1
- Airfield Alternatives Workshop #2
- Airfield Concepts Survey *(FAA & STLAA)*
- Safety Risk Assessment Workshop
- Refinement of Preferred Airfield Configuration
- Pilot/User Focused Touchpoint (Today)

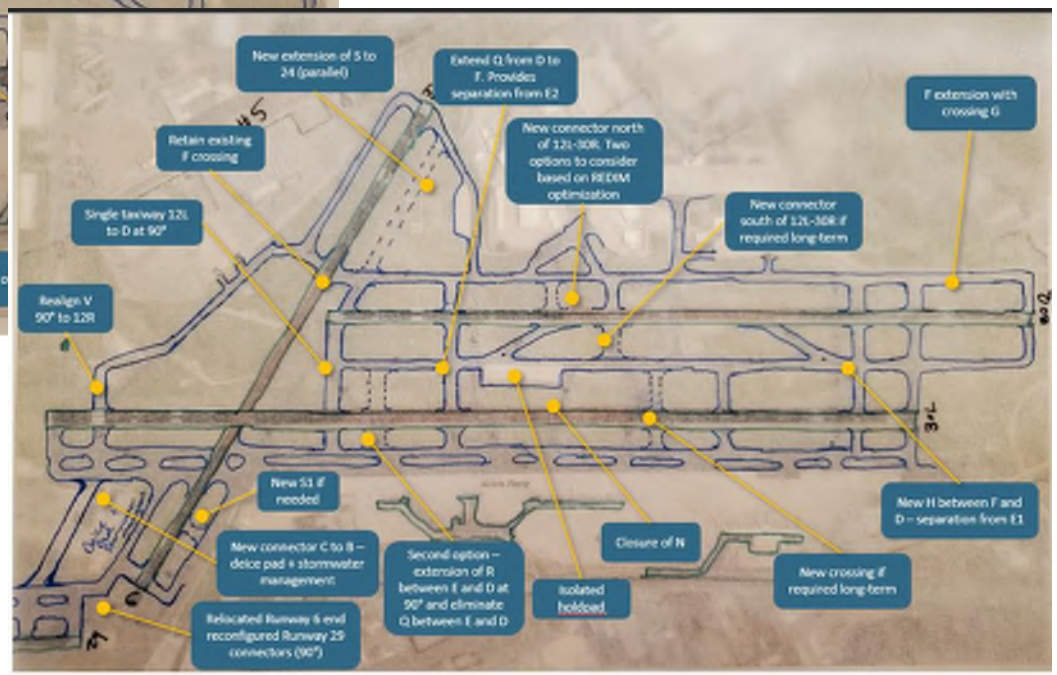


Overview of Alternatives Vetting Process

Sketch Planning Examples

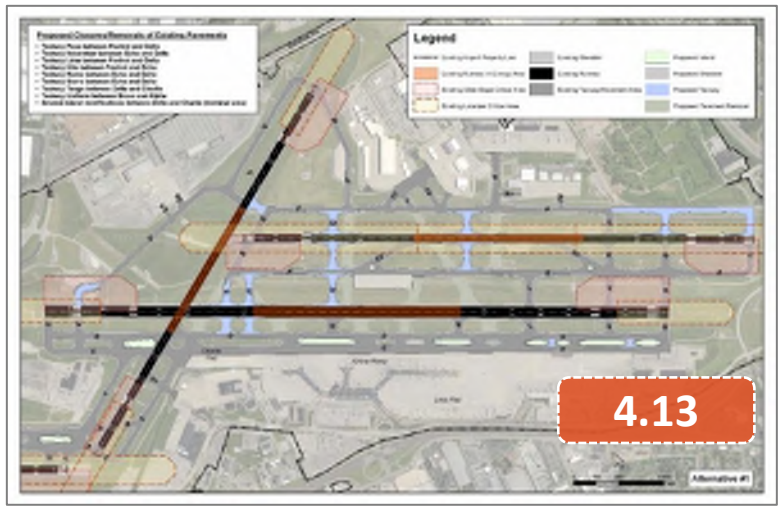


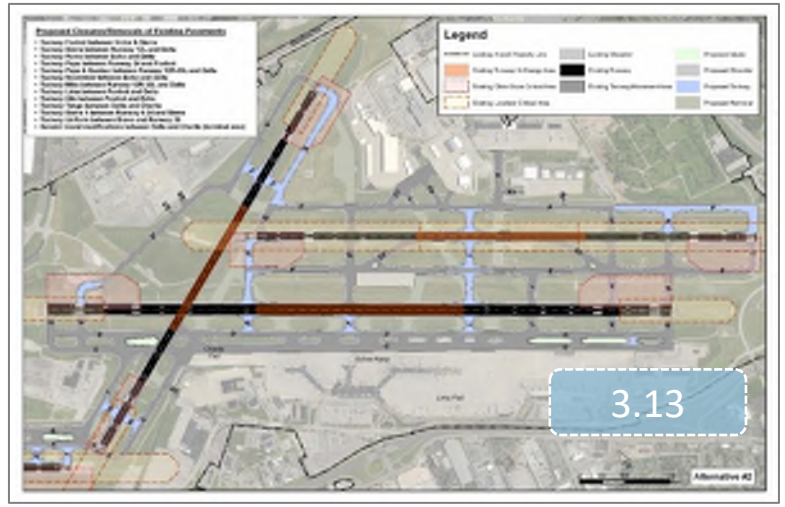


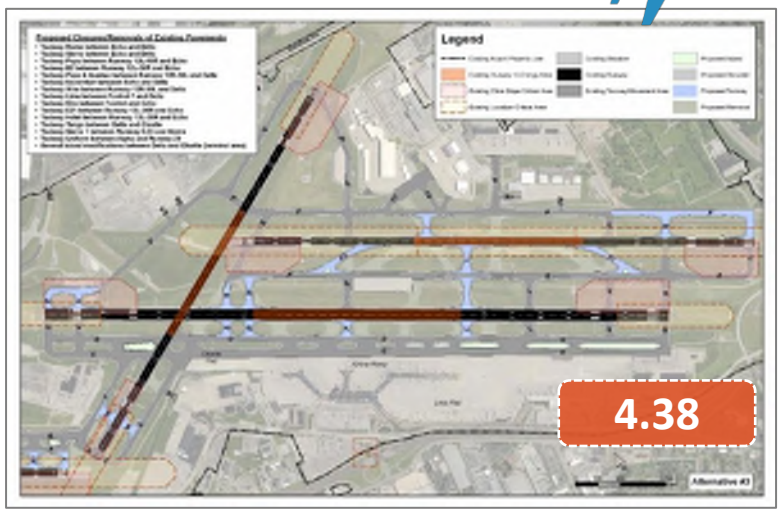


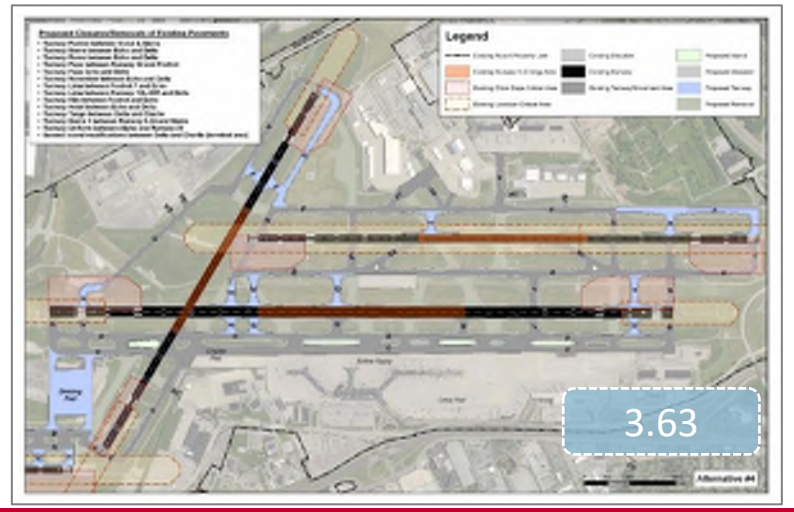
Overview of Alternatives Vetting Process

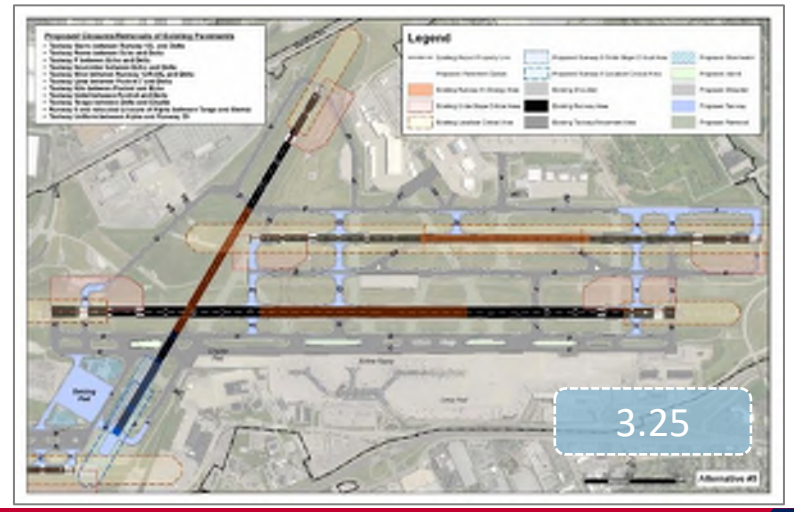
Survey Results – Weighted Average

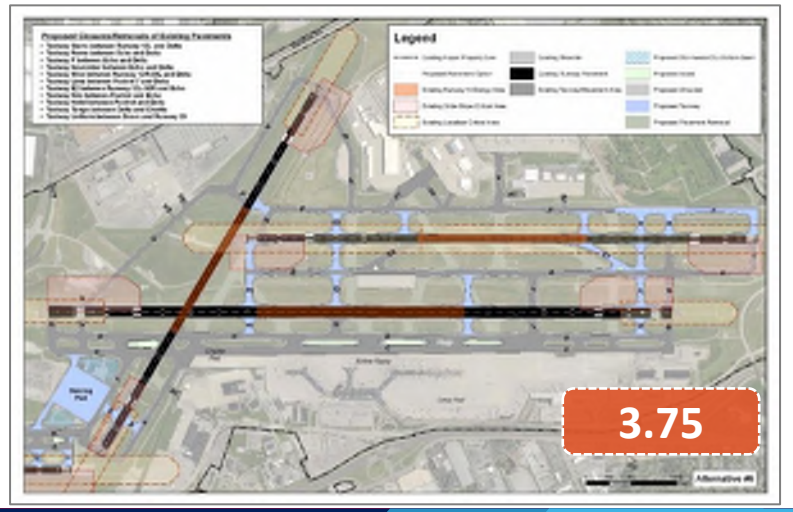






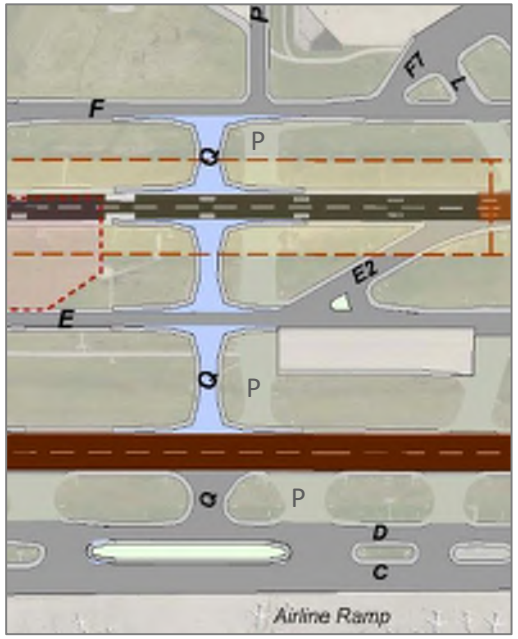


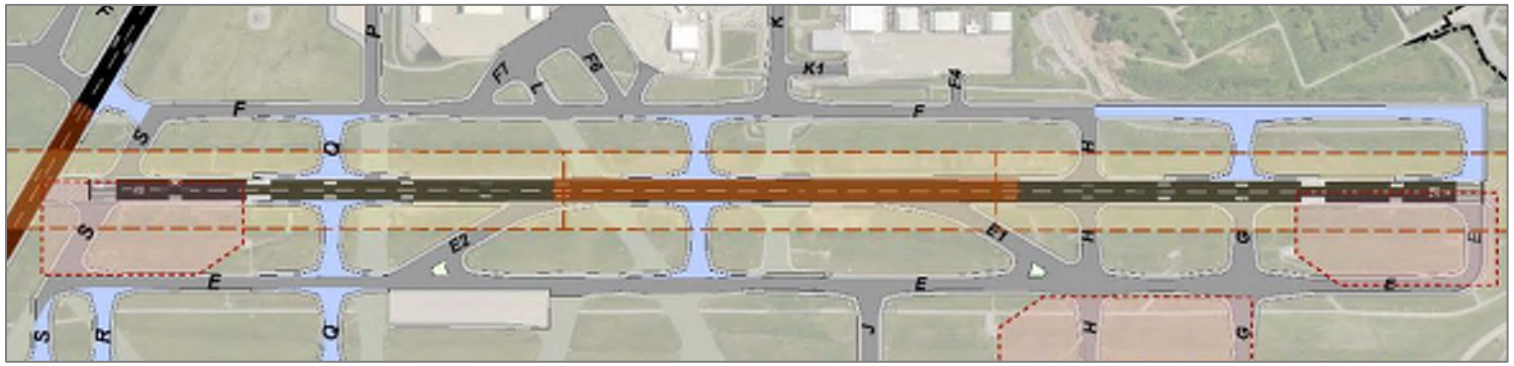




Additional Discussion & Analysis

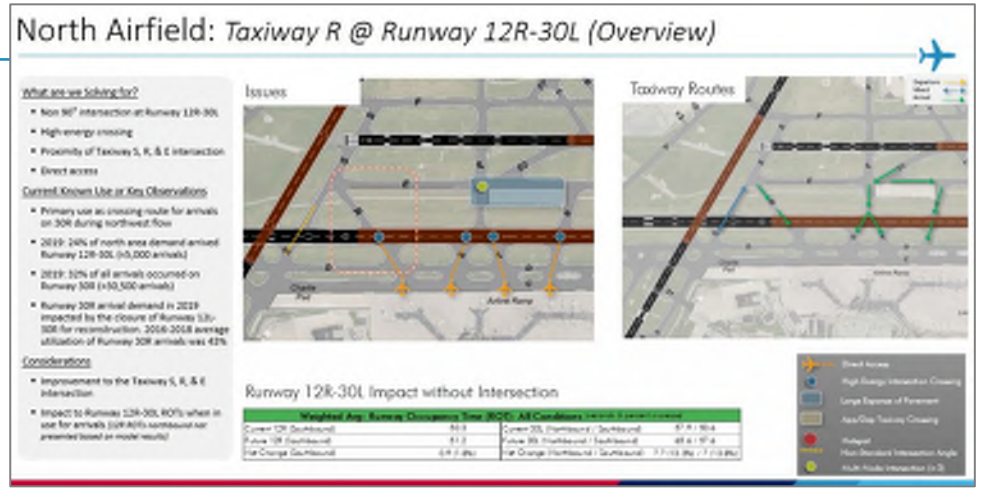
- Taxiways Papa or Quebec Crossing of Runway 12R-30L
- High-Speed Exit Locations for Runway 12L-30R
- Northbound exits from Runway 12R-30L *(cargo & general aviation)*
- Number of Runway 12R-30L crossings *(operational factors & redundancy)*
- Refinement of Runway 29 & Runway 6 long-term plan

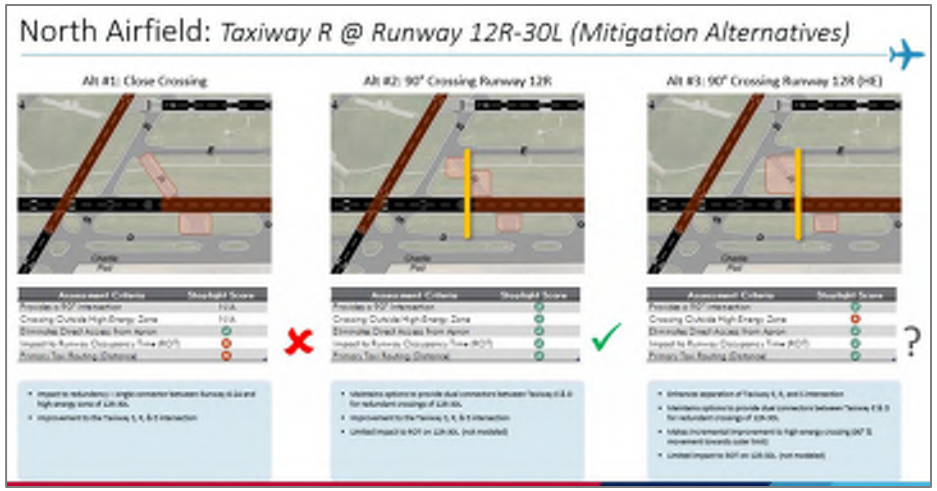




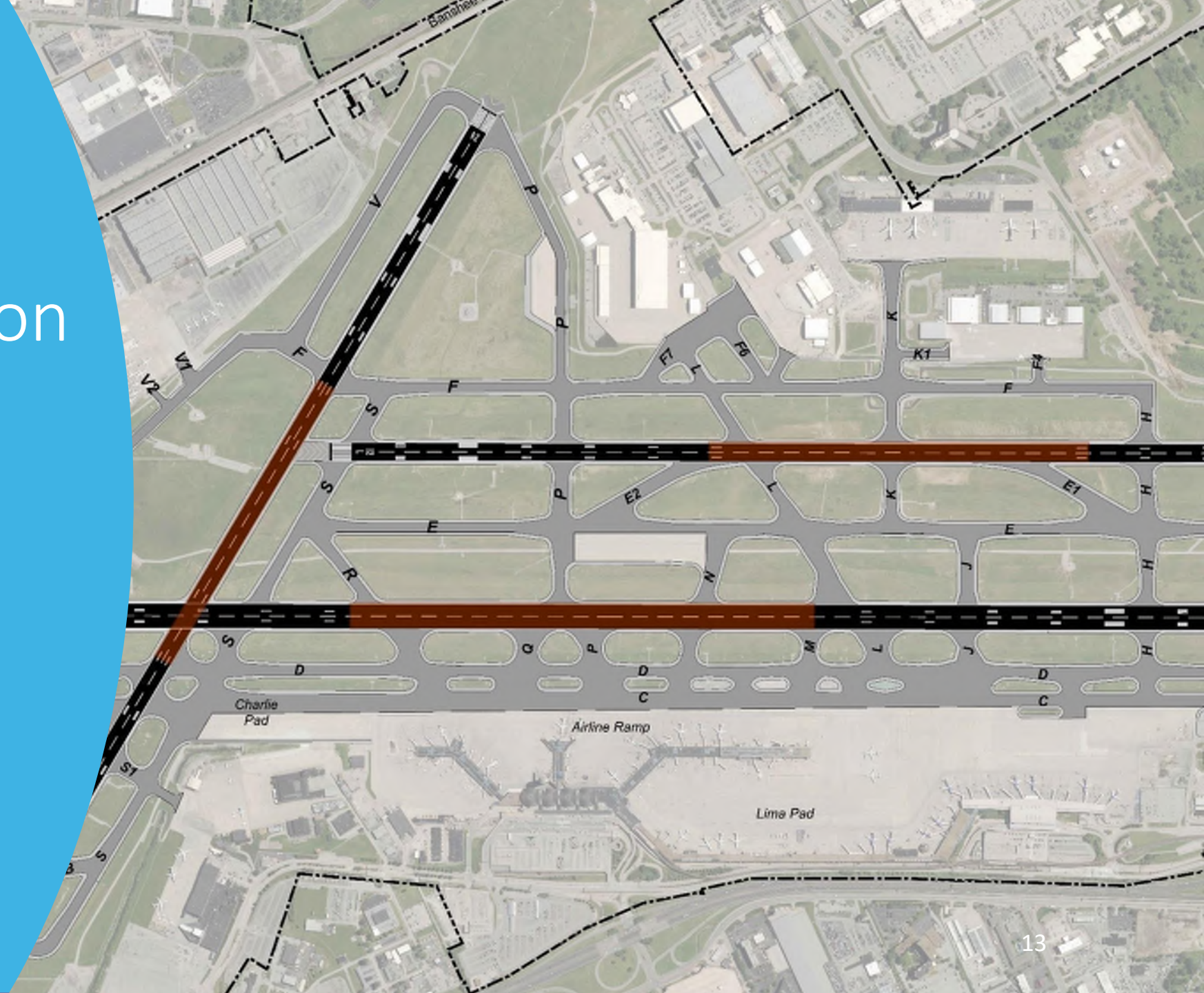
Inputs Throughout Process

- Data & Analytics:
  - Operational data (2016-2019)
  - Wind and weather (10-years history)
  - FAA landing event database
  - FAA REDIM Software
    (Runway Exit Design Interactive Model)
- Stakeholders:
  - STLAA leadership
  - FAA partners
    - Central Region (Airports)
    - STL ATCT leadership
    - Runway Safety
    - Certification
  - Users
- Iterative analysis and consensus building

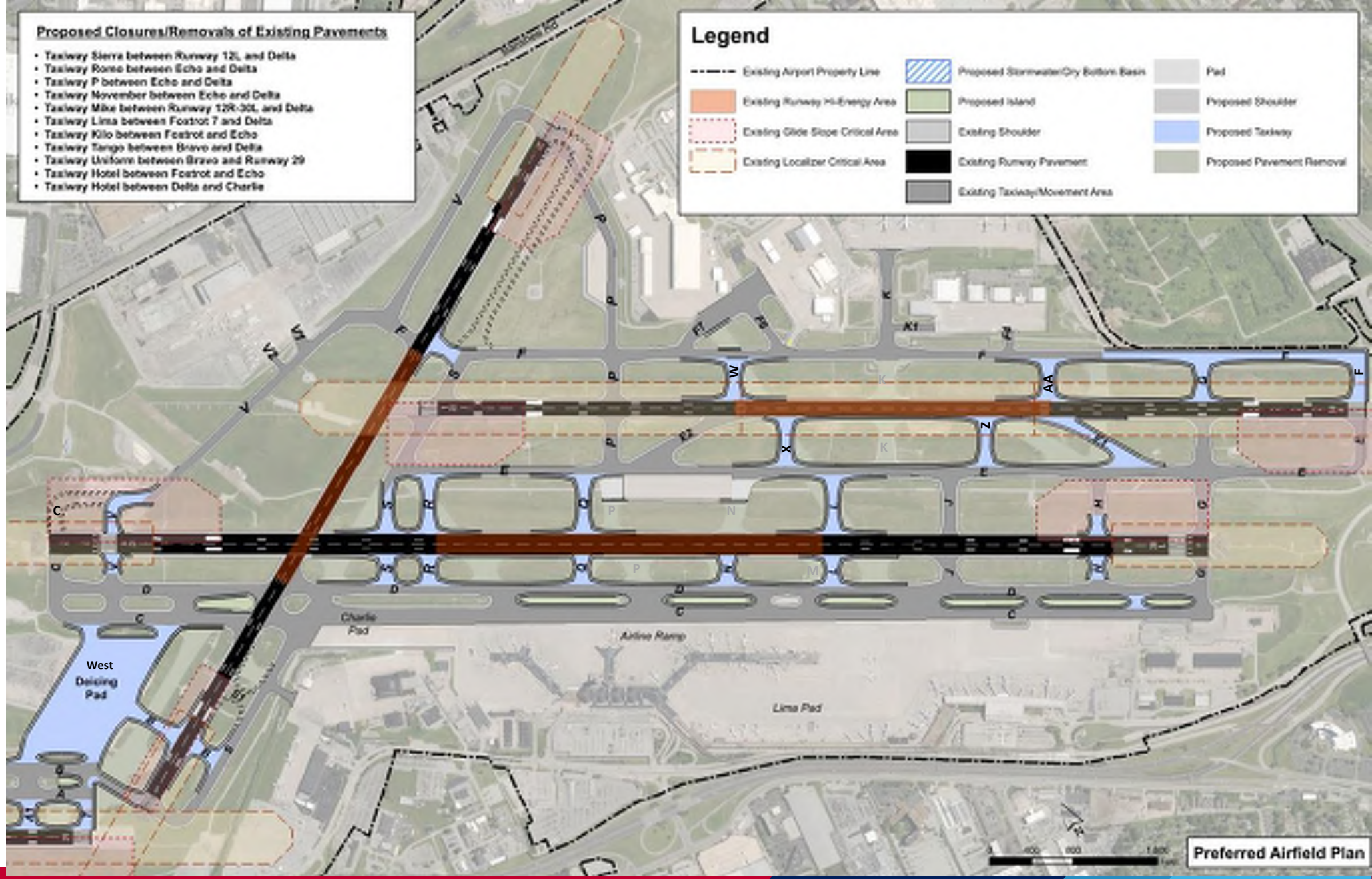




Review Preferred Airfield Configuration + Open Discussion & Next Steps



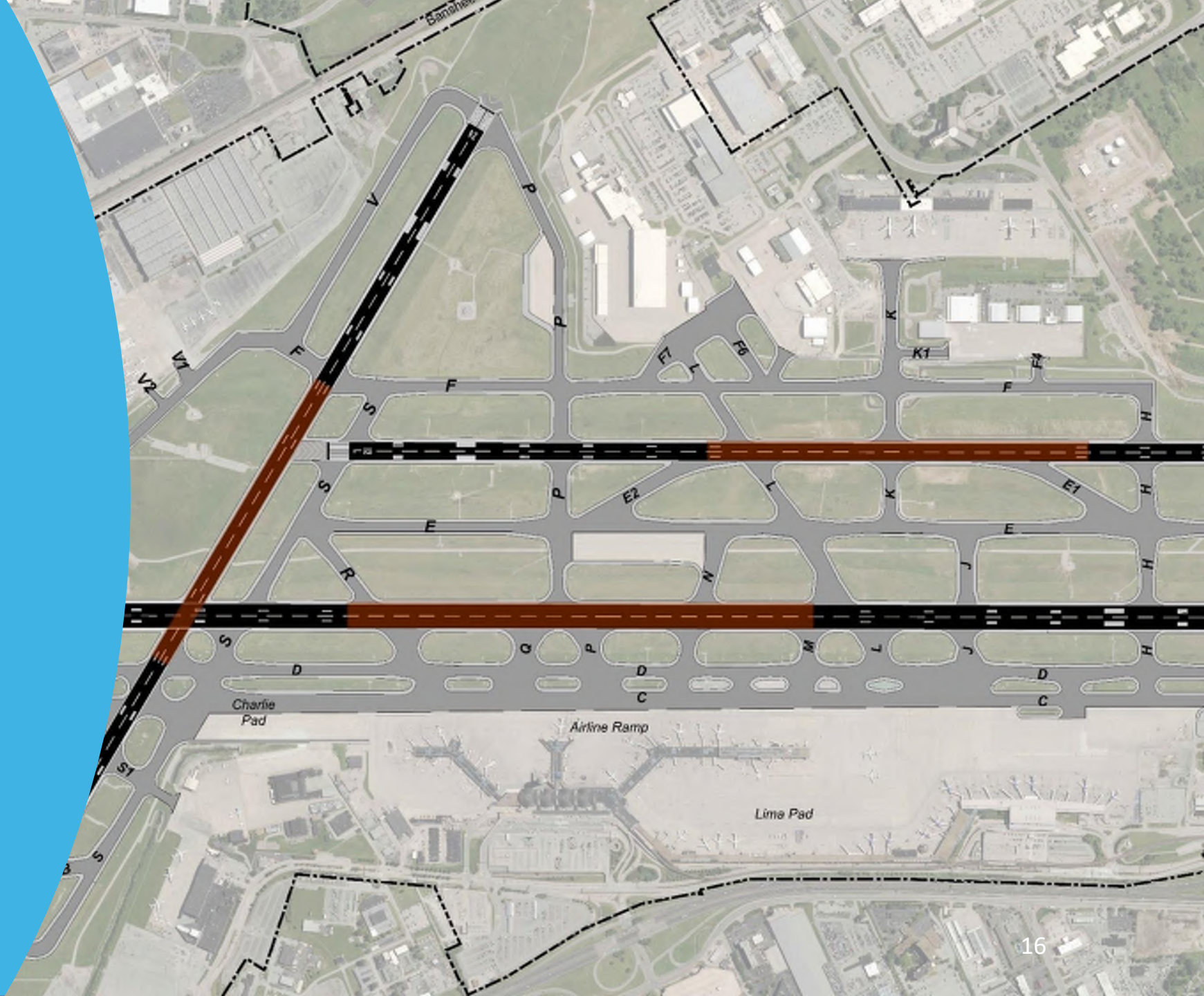
Preferred Airfield Configuration



Open Discussion| Next Steps

- Discuss any outstanding issues or concerns brought up today
- Changes will occur over time and tied to other infrastructure initiatives
- Next steps:
  - Finalize preferred airfield plan:
    - Minor adjustments for additional aeronautical land uses (if needed)
    - Identification of final deice pad strategy
  - Integrate final airfield layout into Airport Layout Plan (ALP) drawing set
  - Coordinate with FAA stakeholders regarding ALP review/approval process

Thank You



APPENDIX 5D – OBSTACLE ACTION PLAN

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT®

OBSTACLE ACTION PLAN

MARCH 2023 – FINAL DRAFT

CONTRACT NUMBER: PSA 1241

wsp

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1. INTRODUCTION

The Federal Aviation Administration (FAA) recommends that airport sponsors develop an Obstacle Action Plan (OAP) to ensure unmitigated obstacles are prioritized to be removed or mitigated to the greatest extent possible. This OAP will serve as a guiding document for the FAA Central Region's use in reviewing the obstacles within the approach and departure surfaces at St. Louis Lambert International Airport (STL), and working with the St. Louis Airport Authority (STLAA) to keep the surfaces as clear as practicable. The approach and departure surfaces are required to be maintained as noted in *Advisory Circular 150/5300-13A, Airport Design* and *FAA Order 8260.3B, The United States Standard for Terminal Instruments Procedures (TERPS).*

FAA has the ability to hold the airport sponsor responsible for clearing their approach and departure surfaces whenever practicable under Federal Aviation Regulation (FAR) Part 139, and through the following Grant Assurances:

1. **Grant Assurance 19 (Operations and Maintenance)** - the airport shall be operated in a safe and serviceable condition and in accordance with appropriate minimum standards required by applicable agencies.
2. **Grant Assurance 20 (Hazard Removal)** - an airport sponsor must also take appropriate action to ensure that terminal airspace will be adequately cleared and protected by removing, lowering, lighting or otherwise mitigating existing airport hazards and by preventing the establishment of future hazards.
3. **Grant Assurance 21 (Compatible Land Use)** - an airport sponsor must take appropriate action, to the extent practicable, including the adoption of zoning laws, to restrict the use of land adjacent to the airport to uses compatible with normal airport operations.
4. **Grant Assurance 29 (Airport Layout Plan [ALP])** - the sponsor must keep the ALP up to date (obstacles are generally shown on the ALP plan and profile sheets).

FAA will work with the STLAA to ensure that they develop a plan to remove or mitigate obstacles and hazards to air navigation. If the airport has unmitigated obstacles, the sponsor is expected to show, in their OAP, how each surface will be cleared and maintained, as well as the timeline for each clearing/mitigation. This OAP will also include a review of all approach and departure surfaces, even if a runway is clear of obstacles.

This OAP will be submitted to FAA using the OE/AAA system, requesting concurrence on the clearing plan through each FAA Line of Business (LOB) review. Along with this OAP, an obstacle disposition data table is included in the upcoming ALP report, showing the planned actions for each obstacle.

2. AIRPORT & OBSTACLE DATA SUBMITTAL & APPROVAL

The obstacle data included in this OAP and on STL's ALP has been submitted to FAA and the National Geodetic Survey (NGS) through the Airport Data and Information Portal (ADIP). STL's data was submitted as part of a "Safety Critical Data Collection, Not Including Design Data" project, which is typically used for data submittals that are part of ALP or Master Plan Updates. A summary of the steps included in the ADIP project are as follows:

1. Statement of Work (SOW)
    - Project Summary and Objective
    - Features Classes to be Included in Data Submittal
2. Imagery Plan
3. Survey & Quality Control Plan
4. Imagery Collection Flight
5. Imagery Data Submittal
6. Field Surveys
7. Survey Data Submittal (including Features Identified in SOW)
8. Final Report
    - Raw Survey Data
    - FAA Forms
    - Field Sketches
    - Photographs of Surveyed Points

Following submission to the FAA's ADIP, the data was forwarded to the National Geodetic Survey (NGS) for verification and validation. As a result of the in-depth validation process, users have high confidence in the integrity of the data set. The following techniques are used in the NGS verification process[1]:

- Compare a sample of the data set points with samples from an independent measurement system.
- Use photogrammetric analysis, combined with the provided ground observational data, to resample the data set.

[1] https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-18B-chg1-consolidated.pdf

- Compare the submitted data sets with existing data sets.
- Conduct reasonability checks to make sure the data sets do not violate known properties.

The data that was submitted and approved as part of STL's ADIP project is what FAA considers "Safety Critical". Advisory Circular 150/5300-18B, *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards,* states that Safety Critical Data "is critical for safe flight operations encompassing the approach, landing, takeoff, and departure of aircraft." The following feature classes are considered "Safety Critical Data":

- NAVAIDs
- Obstacles
- Runway Ends
- Touchdown Lift Off Areas
- Airport Control Points (specifically Airport Elevation, Touchdown Zone Elevation, Displaced Threshold, Stopway Ends)
- Runways
- Stopways
- Taxiways
- Visual Aids

3. APPROACH AND DEPARTURE SURFACES

Documenting obstacles to air navigation requires identifying and mapping approach and departure surfaces for the intended level of service associated with each runway end at STL. Validating the dimensions of each surface is critical for identifying potential obstacles. The following surfaces will be defined in this section:

- Part 77 Approach Surface
- Threshold Siting Surface
- TERPS Departure Surface
- TERPS Visual Segment (Obstacle Clearance Surface – OCS)
- TERPS Glidepath Qualification Standards (GQS)

The Part 77 Approach Surface is longitudinally centered on the extended runway centerline and extends outward and upward from each end of the primary surface. Each runway end at STL has at least a Category (CAT) I precision instrument approach procedure resulting in the same dimensions and slope for all eight (8) runway ends. The inner edge of the approach surface is the same width as the primary surface and expands uniformly to a width of 16,000 feet, while the surface extends to a horizontal distance of 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1. The outer width of the approach surface is predicated on the dimensional standards previously described, resulting in an outer width of 50,000 feet.

The TERPS Departure Surface starts at the departure end of the runway end elevation and matches the width of the useable runway. The most up-to-date departure dimensional standards provided by the FAA's July 24th, 2020 Memorandum titled *Engineering Brief No. 99A, Changes to Tables 3-2 and 3-4 of Advisory Circular 150/5300-13A, Airport Design* as shown below in **Figure 1**.

The updated Approach and Departure Standards table has standard runway dimensions for all departure runway ends with instrument operations. All runway ends at STL, therefore, have Departure Surface dimensions reflected in Row 7 of the table, (500' – ½ Runway Width) x 7,512' x 12,152' x 6,160' with a slope of 40 to 1. The dimensional standards represented by B x C x D x E are illustrated in **Figure 2**.

Figure 1: EB99A - Approach and Departure Standards Table

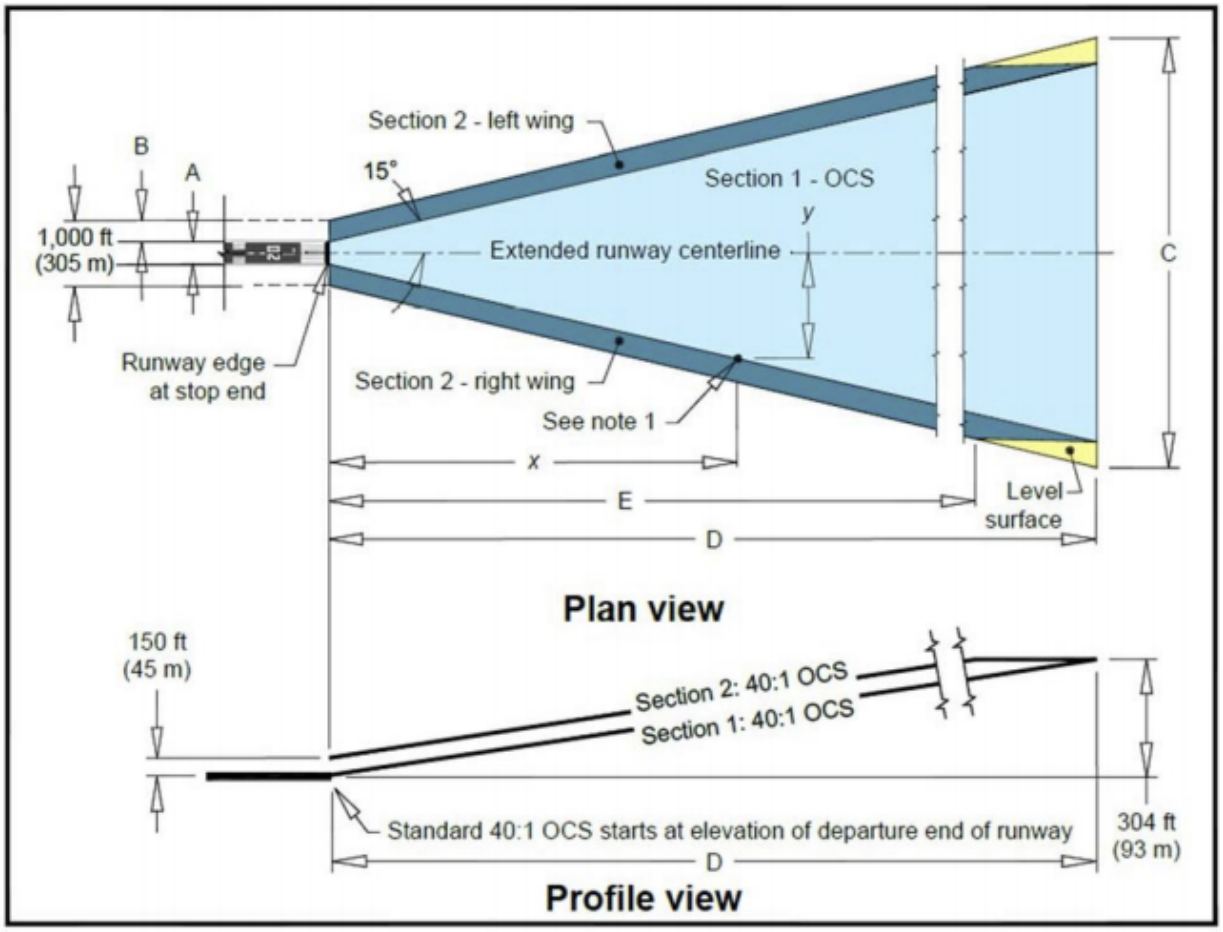
Table 3-2. Approach and Departure Standards Table [1, 2]

Runway Type		DIMENSIONAL STANDARDS* Feet (Meters)					Slope
		A	B	C	D	E	
1	Approach end of runways expected to serve small airplanes with approach speeds less than 50 knots. (Visual runways only, day/night).	0 (0)	120 (37)	300 (91)	500 (152)	2,500 (762)	15:1
2	Approach end of runways expected to serve small airplanes with approach speeds of 50 knots or more. (Visual runways only, day/night).	0 (0)	250 (76)	700 (213)	2,250 (686)	2,750 (838)	20:1
3	Approach end of runway expected to serve large airplanes. (Visual runways only, day/night).	0 (0)	400 (122)	1,000 (305)	1,500 (457)	8,500 (2591)	20:1
4	Approach end of runways expected to accommodate instrument approaches having visibility greater than or equal to 3/4 statute mile. [3]	200 (61)	400 (122)	3,400 (1036)	10,000 [4] (3048)	0 (0)	20:1
5	Approach end of runways expected to accommodate instrument approaches having visibility minimums less than 3/4 statute mile.	200 (61)	800 (244)	3,400 (1036)	10,000[4] (3048)	0	34:1
6 [5]	Approach end of runways expected to accommodate instrument approaches with vertical guidance.	0 (0)	Runway Width + 200 (61)	1520 (463)	10,000 [4] (3048)	0 (0)	30:1
7	Departure runway ends used for any instrument operations.	Runway Width (RW)	500 (152) – ½ RW	7,512 (2290)	12,152 (3704)	6,160 (1878)	40:1

* The letters are keyed to those shown in Figure 3-2 of AC 150/5300-13A. For Row 7, refer to Figure 1 of this Engineering Brief

Source: FAA AC 150/5300-13A

Figure 2: Instrument Departure Runway Obstacle Clearance Surface



Note 1: The half-width of Section 1 is calculated by the formula:
Section $1_{\text{Half Width}}$ = (1/2 RWY Width) + (Tan 15° * X), where X = distance from stop end.

Source: Engineering Brief No. 99A

The Approach and Departure Standards table contains a range of Threshold Siting surfaces that vary in size and slope depending on the type of instrument approach, approach minimums, and the size of the critical aircraft. Runways 12R, 30L, 12L, 30R, 11, 29, and 6 all have instrument approaches with visibility minimums less than ¾ statute mile that align with Row 5 of the Approach and Departure Standards table, more specifically dimensions of 800' x 3,400' x 10,000' with a slope of 34 to 1. Runway 24 has instrument approaches with visibility minimums equal to ¾ statute mile, which aligns with Row 4, 400' x 3,400' x 10,000' with a slope of 20 to 1.

The *U.S. Department of Transportation Order 8260.3E: United States Standard for Terminal Instrument Procedures (TERPS*) provides methods for designing and evaluating interment flight procedures (IFPs). The TERPS Visual Surface is associated with the Straight-in Visual area referenced in the document. To calculate the dimensions of the surface, apply the formula referenced in **Figure 3**. Distance, or "d" in the

formula, is the Runway Center Line (RCL) from origin area extended 10,000'. From here, we can calculate "*W*" is 3,400'. The slope is 34:1, as the approach is straight-in visual area.

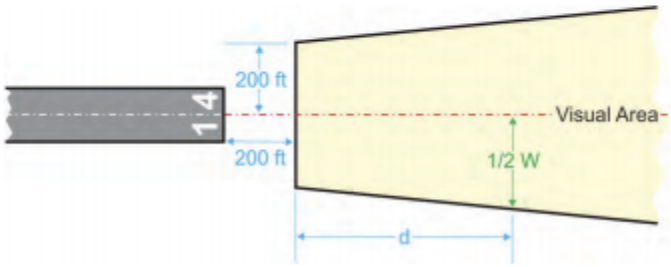
Figure 3: TERPS Formula

Formula 3-3-1. Visual Area ½ Width

$$^1/_2\, W = (0.15 \times d) + 200$$

Where:
½W = Perpendicular distance (feet) RCL to area edge
d = Distance (feet) measured along RCL from area origin

Figure 3-3-2. Circling and Straight-In Visual Area



The TERPS GQS uses instrument approaches with vertical guidance corresponding to Row 6 of the Approach and Departure Standards table, requiring dimensional standards of the specific Runway Width +200' x 1,520' x 10,000'. Each of the runways' specific dimensions can be found in **Table 1**.

Table 1: St. Louis Lambert International Airport Runway Matrix

Runway End	Design RRC	Runway End/DT Elev.(s)	Lowest Visibility (SM)	Part 77 Approach (200' from runway end)	Threshold Siting*	Departure Surface (departure end TODA or clearway)		TERPS Visual (200' from threshold)	TERPS GQS (TSS Table 3-2) (0' - starts at TODA)	VGSI Surface	Approach Light Plane
						Dim A (Runway Width)	Dim B, C, D, E (Slope)				
12R	D - IV	541.2' (End) 539.6'' (DT)	PIR - CAT I (200-1/2)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	800’ x 3,400’ x 10,000’ (34:1)	200'	(500' – 100’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	400' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes
30L	D - IV	585.3' (End) 582.3' (DT)	PIR - CAT I (200-1/2)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	800’ x 3,400’ x 10,000’ (34:1)	200'	(500' – 100’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	400' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes
12L	D - IV	527.7'	PIR - CAT II/IIIC (200-1/2)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	800’ x 3,400’ x 10,000’ (34:1)	150'	(500' – 75’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	350' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes
30R	D - IV	604.3'	PIR - CAT II/IIIC (200-1/2)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	800’ x 3,400’ x 10,000’ (34:1)	150'	(500' – 75’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	350' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes
11	D - IV	616.8'	PIR - CAT II/IIIC (200-1/2)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	800’ x 3,400’ x 10,000’ (34:1)	150'	(500' – 75’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	350' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes
29	D - IV	555.2	PIR - CAT I (200-1/2)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	800’ x 3,400’ x 10,000’ (34:1)	150'	(500' – 75’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	350' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes
6	D - IV	550.6'	PIR - CAT I (200-1/2)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	800’ x 3,400’ x 10,000’ (34:1)	150'	(500' – 75’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	350' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes
24	D - IV	533.3'	PIR - CAT I (200-3/4)	1,000' x 16,000' x 50,000' 50:1 for 10,000 and 40:1 for 40,000	400’ x 3,400’ x 10,000’ (20:1)	150'	(500' – 75’) x 7,512' x 12,152' x 6,160' (40:1)	400' x 3,400' x 10,000' (Slope 34:1)	350' x 1,520' x 10,000' (Slope 30:1 Row 6)	4-box PAPI @ 3 degrees	Yes

Source: CMT, 2021

It is important to note in the draft *Advisory Circular 150/5300-13B, Airport Design,* the TERPS GQS will be replaced with the TERPS Vertical Guidance Surface (VGS). The dimensions stay the same, except for adding 200' to the Runway Ends. The three tables in *Advisory Circular 150/5300-13B* replacing the Approach and Departure Standards table are shown in Tables 2, 3 and 4.

Table 2: Visual and Daytime IFR Circling Obstacle Clearance Surfaces

OCS	Runway Type	Dimensional Standards Feet (Meters)				Slope
		A	B	C	D	
OCS 1	Approach end of runways serving small airplanes with approach speeds less than 50 knots.	120 (37)	300 (91)	500 (152)	2,500 (762)	15:1
OCS 2	Approach end of runways serving small airplanes with approach speeds of 50 knots or more.	250 (76)	700 (213)	2,250 (686)	2,750 (838)	20:1
OCS 3	Approach end of runway serving large airplanes	400 (122)	1,000 (305)	1,500 (457)	8,500 (2591)	20:1

Note 1: Table is applicable to visual day or night runways and day-time only circling. For runway ends authorized for night circling, see Table 3-2.
Note 2: Refer to the published instrument approach charts to determine if circling is available.
Note 3: Approach surface begins at the runway threshold.

Source: FAA, Draft Advisory Circular 150/5300-13B, July 20, 2020

Table 3: Non-Precision and Nighttime IFR Circling Obstacle Clearance Surfaces

OCS	Runway Type	Visibility minimums	Dimensional Standards Feet (Meters)				Slope
			A	B	C	D	
OCS 4	Approach end of runways that supports nighttime IFR circling procedures and procedures only providing lateral guidance (VOR, NDB, LNAV, LP, and LOC).	≥ ¾ statute mile	200 (61)	400 (122)	3,400 (1036)	10,000 (3048)	20:1
		< ¾ statute mile	200 (61)	400 (122)	3,400 (1036)	10,000 (3048)	34:1

Note 1: See Appendix L for acronym list on IFR procedure names.
Note 2: Dimension A is relative to the runway threshold.
Note 3: Refer to the published instrument approach charts to determine if nighttime circling is available.
Note 4: See Table 3-6 for standards for instrument approach procedures.
Note 5: Table represents the TERPS visual portion of the final approach segment.
Note 6: Table is applicable to circling approaches that are available at night. For day-time only circling, refer to the applicable approach surface from Table 3-1.
Note 7: For airport planning purposes. Final visibility minimums is determined by Flight Procedures evaluating criteria in FAA Order 8260.3 and FAA Order 8260.58. Flight Procedures conducts a full IFP evaluation via an aeronautical study.
Note 8: Marking and lighting of obstacle penetrations to this surface or the use of a Visual Guidance Lighting System (VGLS) may mitigate displacement of the threshold. Contact the Flight Procedures Team if existing obstacles penetrate this surface.
Note 9: 10,000 feet (3048 m) represents a nominal value for planning purposes. The length is dependent on the Visual Descent Point (VDP) location.

Source: FAA, Draft Advisory Circular 150/5300-13B, July 20, 2020

Table 4: APV and PA Instrument Runway Obstacle Clearance Surfaces

OCS	Runway Type	Visibility	Dimensional Standards Ft (M)				Slope
		Minimums	A	B	C	D[7]	
OCS 5	Approach end of runways providing ILS, MMLS, PAR, and LDA with glidepath, LPV, LNAV/VNAV, RNP, or GLS.	≥ ¾ statute mile	200 (61)	400 (122)	3,400 (1036)	10,000 (3048)	20:1
		< ¾ statute mile	200 (61)	400 (122)	3,400 (1036)	10,000 (3048)	34:1
OCS 6	Approach end of runways providing ILS, MMLS, PAR, and LDA with glidepath, LPV, LNAV/VNAV, RNP, or GLS.	All	0	Runway Width	1,520 (463)	10,000 (3048)	30:1

Note 1: See Appendix L for acronym list on IFR procedure names.
Note 2: Dimension A is relative to the runway threshold.
Note 3: See Table 3-6 for standards for instrument approach procedures.
Note 4: OCS 5 represents the TERPS visual portion of the final approach segment. OCS 6 represents the TERPS Vertical Guidance Surface (VGS). Both surfaces apply for APV and PA procedures. Contact the Flight Procedures Team if existing obstacles penetrate this surface.
Note 5: For airport planning purposes. Final visibility minimums are determined by Flight Procedures evaluating criteria in FAA Order 8260.3 and FAA Order 8260.58. Flight Procedures conducts a full IFP evaluation via an aeronautical study.
Note 6: The FAA assesses TERPS final approach segment OCS criteria (i.e. W, X, Y surfaces) for all runway ends authorized for ILS, MMLS, PAR, and LDA with glide slope, LPV, and GLS procedures. Refer to FAA Order 8260.3 for additional information on TERPS surfaces.
Note 7: 10,000 feet (3048 m) represents a nominal value for planning purposes. The actual length is dependent on the precision final approach fix.

Source: FAA, Draft Advisory Circular 150/5300-13B, July 20, 2020

Note: Add 200' to runway width for OCS 6, Column B

4. STL OBSTACLE TABLES

On June 2, 2020, Quantum Spatial (now NV5) conducted the Aeronautical Obstacle Survey for the STL ALP and ADIP submittal. The airspace analysis for vertically guided operations for Runways 6-24, 11-29, 12L-30R, and 12R-30L were conducted in compliance with ADIP policies and the following Advisory Circulars pertaining to data collection requirements and the verification process by the FAA and National Geodetic Survey (NGS):

- AC 150/5300-16A "General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey"
- AC 150/5300-17C, Change 1 "Standards for Using Remote Sensing Technologies in Airport Surveys"
- AC 150/5300-18B, Change 1 "Survey and Data Standards for Submission of Aeronautical Data Using Airports GIS

The surveyed area includes all obstacle surfaces at STL with the control datums in North American Datum of 1983/2011 (NAD 83(2011)), in the MO State Plane Coordinate System, East Zone, in US survey feet for horizontal datum and North American Vertical Datum of 1988 (NAVD 88) for vertical datum. The obstacle data uploaded to the ADIP system satisfies the requirements of AC 150/5300-18B, 2.7.1.2 Analysis of Existing Runways 6-24, 11-29, 12L-30R, and 12R-30L with Vertically Guided Operations, which included the following:

- **Vertically Guided Runway Primary Surface (VGRPS)**: The VRGPS is a 1,000-foot wide rectangular surface (500 feet either side of runway centerline) longitudinally centered on the runway centerline. The VGRPS also extends 200 feet beyond each runway end. The surface elevation of any point within the VGRPS is the same as the runway centerline elevation beam at the selected point (follows the runway centerline contour). The elevation of any point within the 200-foot VGRPS extension areas is equal to the runway end elevation on the side to which the extension applies.
- **Vertically Guided Primary Connection Surface (VGPCS)**: The VGPCS is a set of 500-foot wide lateral extensions of the VGRPS surface (one on each side of the runway) and is used to connect the VGRPS with the Vertically Guided Approach Transitional Surface. The VGPCS starts along the outer edges of the VGRPS surface, and extends out laterally 500 feet. The VGPCS also extends 200 feet beyond each runway end. The surface elevation of any point within the VGPCS is the same as the runway centerline elevation abeam the selected point (follows the runway centerline contour). The elevation of any point within the 200-foot VGPCS extension areas is equal to the runway end elevation on the side to which the extension applies.
- **Vertically Guided Approach Transitional Surface (VGATS):** The VGATS is a 3,000-foot wide, 20:1 (5%) sloping surface that extends outward from the outer edges of the VGPCS (from runway end to runway end) and along the VGAS tapered boundary, to a point 4,000 feet abeam the runway centerline. The VGATS surface starts at the airport elevation along the VGPCS/VGATS edge, and

rises abeam the runway centerline. The VGATS surface starts at the airport elevation along the VGPCS/VGATS edge (or imaginary extended edge for tapered area) and rises 150 feet above airport elevation abeam the runway centerline. Because the VGATS surface starts at airport elevation, the boundaries between this surface and the VGPCS and VGAS surfaces will likely not be seamless in three dimensions

- **Vertically Guided Approach Surface (VGAS):** The VGAS is a 40:1 (2.5%) sloping surface that is longitudinally centered on the extended runway centerline. It begins at the runway end, and extends outward towards the final approach course for a total horizontal distance of 20,200 feet. The surface is 2,000 feet wide (1000 feet either side of centerline) at the runway end, and expands to a width of 8,000 feet at 10,200 feet from runway end. From 10,200 to 20,200 feet from the runway end, the surface is 8,000 feet wide (4,000 feet either side) and parallel to the runway centerline extended. The surface begins at the runway end elevation and rises towards the final approach course
- **Vertically Guided Protection Surface (VGPS):** The VGPS is a 62.5:1 sloping surface longitudinally centered on the runway centerline extended. The surface begins at the runway end and extends outward towards the final approach course for a distance of 6,000 feet. The surface is 400 feet wide at the runway end (200 feet either side of centerline) and expands to a final width of 1217.6 feet. The Surface overlaps the VRGPS for 200 feet.
- **Vertically Guided Horizontal Surface (VGHS):** The VGHS is a horizontal plane established 150 feet above the established airport elevation. The perimeter of the VGHS is drawn by scribing 10,000-foot arcs from the center of each end of the VGRPS. Tangential lines connect the arcs and complete the identification area.
- **Vertically Guided Conical Surface (VGCS)**: The VGCS is a sloping surface, extending upward and outward from the outer limits of the VGHS for a horizontal distance of 7,000 feet. The slope of the VGCS is 20:1 (5%) measured in the vertical plane. At the outer edge of the surface, the elevation of the VGCS is 500 feet above the airport elevation.

In addition to the ADIP data submittal for the vertically guided surfaces, the obstacle data was also analyzed against the Part 77 Approach, TERPS Departure, Threshold Siting, TERPS Visual, and TERPS GQS surfaces. Each point with its own Surface Elevation (MSL) and Penetration/Clearance (ft) is documented. The obstacles identified are identified starting at “0001”.

During the analysis, road elevations are established using ground elevation data available through aerial mapping or public sources and include an additional 10-foot, 15-foot, or 17-foot adjustment for service roads, public roads, and highways respectively.

5. PRIORITY OBSTRUCTIONS

During the review and analysis of the obstacle data, the obstacles were categorized as Priority 1, Priority 2, or Priority 3 obstructions:

- Priority 1 – TERPS Visual, TERPS GQS, Threshold Siting Surface Penetrations
- Priority 2 – Departure Surface Penetrations of 35 feet or more
- Priority 3 – All Other Departure Surface and Part 77 Perpetrations

The Priority 1 and 2 obstructions are highlighted in **Tables 5** and **6** and are categorized as such because of the impact that they can have on instrument approach and departure procedures. Priority 3 obstructions tend to have less of an impact on procedures, and these are included in the ALP obstruction tables and as an appendix to the ALP narrative report.

6. SUMMARY AND NEXT STEPS

There are 137 Priority 1 obstructions and seven Priority 2 obstructions, which are depicted in **Exhibits 1.1-1** through **1.4-1** and **2.1-1** through **2.2-1**. Seven of the Priority 1 obstructions are trees located on airport property and can be considered for removal. Twenty of the Priority 1 obstructions are runway lights and are considered Fixed by Function. A mitigation plan is presented in **Tables 5** and **6** including the type of obstruction, the amount of penetration, applicable airspace impact, and the type of mitigation action to occur. Additional fields are provided to document the action taken and the date of mitigation for tracking purposes. Additionally, any tree removal using federal funds, or where FAA has authority under Section 163, will be reviewed for adherence to NEPA requirements.

Table 5: Priority 1 Obstructions

Priority 1 Obstruction Penetrations											
Object ID	Object Description	Runway End	Object Elevation (MSL)	Surface Elevation (MSL)	Surface Penetrated	Surface Slope	Penetration Amount	On/Off Airport	Mitigation Plan	Comments	Date Mitigated
25	Runway Light	11	619.2	617.1	TERPS/TSS	34:1	2.1	On	TBD (Fixed by Function)		
26	Runway Light	11	619.5	617.1	TERPS/TSS	34:1	2.4	On	TBD (Fixed by Function)		
27	Runway Light	11	619.2	617.1	TERPS/TSS	34:1	2.1	On	TBD (Fixed by Function)		
344	Runway Light	6	555.8	555.6	TERPS/TSS	34:1	0.2	On	TBD (Fixed by Function)		
345	Runway Light	6	555.5	554.5	TERPS/TSS	34:1	1.0	On	TBD (Fixed by Function)		
349	Runway Light	6	555.9	554.1	TERPS/TSS	34:1	1.8	On	TBD (Fixed by Function)		
350	Runway Light	6	555.9	553.0	TERPS/TSS	34:1	2.9	On	TBD (Fixed by Function)		
351	Runway Light	6	555.8	555.1	TERPS/TSS	34:1	0.7	On	TBD (Fixed by Function)		
353	Runway Light	6	551.9	551.2	TERPS/TSS	34:1	0.7	On	TBD (Fixed by Function)		
354	Runway Light	6	555.8	553.6	TERPS/TSS	34:1	2.2	On	TBD (Fixed by Function)		
355	Runway Light	6	555.7	551.5	TERPS/TSS	34:1	4.2	On	TBD (Fixed by Function)		
356	Runway Light	6	555.8	552.7	TERPS/TSS	34:1	3.1	On	TBD (Fixed by Function)		
360	Post	6	551.7	551.1	TERPS/TSS	34:1	0.6	On	Airspace Study		
364	Runway Light	6	555.9	551.0	TERPS/TSS	34:1	4.9	On	TBD (Fixed by Function)		
365	Runway Light	6	555.8	552.0	TERPS/TSS	34:1	3.8	On	TBD (Fixed by Function)		
366	Runway Light	6	555.9	551.6	TERPS/TSS	34:1	4.3	On	TBD (Fixed by Function)		
1102	Tree	12R	682.5	679.6	TERPS/TSS	34:1	2.9	Off	Airspace Study		
1125	Tree	12R	653.8	648.1	TERPS/TSS	34:1	5.7	Off	Airspace Study		
1872	Sign	12L	532.2	530.8	TERPS/TSS	34:1	1.4	On	Remove/Airspace Study		
2477	Runway Light	30R	605.5	604.6	TERPS/TSS	34:1	1.0	On	TBD (Fixed by Function)		
2478	Runway Light	30R	605.4	604.6	TERPS/TSS	34:1	0.8	On	TBD (Fixed by Function)		
2479	Runway Light	30R	605.7	604.6	TERPS/TSS	34:1	1.1	On	TBD (Fixed by Function)		
2561	Tree	30L	674.9	668.9	TERPS/TSS	34:1	6.0	On	N/A – Removed	Removed	12/2/2022
2609	Tree	30L	685.1	674.8	TERPS/TSS	34:1	10.3	On	N/A – Removed	Removed	12/2/2022
2613	Tree	30L	683.5	675.4	TERPS/TSS	34:1	8.0	On	Remove/Airspace Study		
2621	Tree	30L	683.1	676.3	TERPS/TSS	34:1	6.8	On	Remove/Airspace Study		
2623	Tree	30L	677.2	676.7	TERPS/TSS	34:1	0.6	On	Remove/Airspace Study		
2632	Tree	30L	684.7	677.3	TERPS/TSS	34:1	7.4	On	Remove/Airspace Study		
2636	Tree	30L	693.0	678.0	TERPS/TSS	34:1	14.9	On	N/A – Removed	Removed	12/2/2022
4371	Tree	12R	647.7	647.3	TERPS/TSS	34:1	0.4	Off	TBD		
5682	Runway Light	30L	589.9	588.4	TERPS/TSS	34:1	1.5	On	TBD (Fixed by Function)		
7000	Tree	6	670.5	667.1	TERPS/TSS	34:1	3.4	Off	Airspace Study		
7043	Tree	6	667.3	664.2	TERPS/TSS	34:1	3.0	Off	Airspace Study		
7067	Tree	6	684.1	662.9	TERPS/TSS	34:1	21.2	Off	Airspace Study		
7100	Tree	6	678.9	659.8	TERPS/TSS	34:1	19.1	Off	Airspace Study		
7101	Tree	6	667.6	659.8	TERPS/TSS	34:1	7.8	Off	Airspace Study		

Priority 1 Obstruction Penetrations											
Object ID	Object Description	Runway End	Object Elevation (MSL)	Surface Elevation (MSL)	Surface Penetrated	Surface Slope	Penetration Amount	On/Off Airport	Mitigation Plan	Comments	Date Mitigated
7109	Tree	6	662.2	659.0	TERPS/TSS	34:1	3.3	Off	Airspace Study		
7111	Tree	6	667.8	658.8	TERPS/TSS	34:1	9.0	Off	Airspace Study		
7115	Tree	6	668.9	658.4	TERPS/TSS	34:1	10.5	Off	Airspace Study		
7117	Tree	6	668.6	658.0	TERPS/TSS	34:1	10.5	Off	Airspace Study		
7119	Tree	6	663.4	657.9	TERPS/TSS	34:1	5.5	Off	Airspace Study		
7139	Tree	6	661.4	655.7	TERPS/TSS	34:1	5.6	Off	Airspace Study		
7145	Tree	6	663.4	655.5	TERPS/TSS	34:1	7.9	Off	Airspace Study		
7146	Tree	6	660.4	655.4	TERPS/TSS	34:1	4.9	Off	Airspace Study		
7147	Tree	6	663.1	655.1	TERPS/TSS	34:1	7.9	Off	Airspace Study		
7148	Tree	6	660.8	654.9	TERPS/TSS	34:1	5.8	Off	Airspace Study		
7152	Tree	6	666.2	654.6	TERPS/TSS	34:1	11.6	Off	Airspace Study		
7156	Tree	6	668.7	654.2	TERPS/TSS	34:1	14.5	Off	Airspace Study		
7157	Tree	6	664.1	654.2	TERPS/TSS	34:1	9.9	Off	Airspace Study		
7158	Tree	6	664.1	654.1	TERPS/TSS	34:1	10.0	Off	Airspace Study		
7159	Tree	6	655.6	654.1	TERPS/TSS	34:1	1.6	Off	Airspace Study		
7161	Tree	6	664.5	653.9	TERPS/TSS	34:1	10.6	Off	Airspace Study		
7162	Tree	6	670.6	653.9	TERPS/TSS	34:1	16.7	Off	Airspace Study		
7170	Tree	6	661.2	653.3	TERPS/TSS	34:1	7.9	Off	Airspace Study		
7171	Tree	6	657.1	653.2	TERPS/TSS	34:1	3.9	Off	Airspace Study		
7173	Tree	6	667.9	653.1	TERPS/TSS	34:1	14.9	Off	Airspace Study		
7179	Tree	6	674.4	652.4	TERPS/TSS	34:1	22.0	Off	Airspace Study		
7180	Tree	6	658.8	652.2	TERPS/TSS	34:1	6.6	Off	Airspace Study		
7182	Tree	6	654.2	652.2	TERPS/TSS	34:1	2.0	Off	Airspace Study		
7183	Tree	6	658.4	652.2	TERPS/TSS	34:1	6.2	Off	Airspace Study		
7187	Tree	6	655.6	652.0	TERPS/TSS	34:1	3.6	Off	Airspace Study		
7197	Tree	6	658.0	651.4	TERPS/TSS	34:1	6.7	Off	Airspace Study		
7198	Tree	6	658.4	651.2	TERPS/TSS	34:1	7.2	Off	Airspace Study		
7200	Tree	6	673.0	650.9	TERPS/TSS	34:1	22.1	Off	Airspace Study		
7202	Tree	6	654.8	650.8	TERPS/TSS	34:1	4.0	Off	Airspace Study		
7206	Tree	6	659.5	650.5	TERPS/TSS	34:1	9.1	Off	Airspace Study		
7207	Tree	6	659.2	650.1	TERPS/TSS	34:1	9.1	Off	Airspace Study		
7209	Tree	6	655.7	649.8	TERPS/TSS	34:1	5.9	Off	Airspace Study		
7211	Tree	6	653.0	649.8	TERPS/TSS	34:1	3.2	Off	Airspace Study		
7212	Tree	6	657.9	649.8	TERPS/TSS	34:1	8.1	Off	Airspace Study		
7213	Tree	6	660.3	649.7	TERPS/TSS	34:1	10.5	Off	Airspace Study		
7214	Tree	6	653.2	649.7	TERPS/TSS	34:1	3.5	Off	Airspace Study		
7216	Tree	6	655.8	649.6	TERPS/TSS	34:1	6.2	Off	Airspace Study		

Priority 1 Obstruction Penetrations											
Object ID	Object Description	Runway End	Object Elevation (MSL)	Surface Elevation (MSL)	Surface Penetrated	Surface Slope	Penetration Amount	On/Off Airport	Mitigation Plan	Comments	Date Mitigated
7220	Tree	6	659.3	648.8	TERPS/TSS	34:1	10.5	Off	Airspace Study		
7221	Tree	6	649.8	648.7	TERPS/TSS	34:1	1.0	Off	Airspace Study		
7224	Tree	6	656.5	648.5	TERPS/TSS	34:1	7.9	Off	Airspace Study		
7226	Tree	6	658.5	648.2	TERPS/TSS	34:1	10.3	Off	Airspace Study		
7231	Tree	6	662.8	647.4	TERPS/TSS	34:1	15.4	Off	Airspace Study		
7232	Tree	6	655.3	647.4	TERPS/TSS	34:1	7.9	Off	Airspace Study		
7234	Tree	6	658.9	647.3	TERPS/TSS	34:1	11.6	Off	Airspace Study		
7236	Tree	6	658.6	647.0	TERPS/TSS	34:1	11.7	Off	Airspace Study		
7238	Tree	6	671.3	646.9	TERPS/TSS	34:1	24.4	Off	Airspace Study		
7240	Tree	6	659.8	646.4	TERPS/TSS	34:1	13.4	Off	Airspace Study		
7246	Tree	6	653.1	645.7	TERPS/TSS	34:1	7.3	Off	Airspace Study		
7263	Tree	6	662.0	644.3	TERPS/TSS	34:1	17.8	Off	Airspace Study		
7264	Tree	6	654.3	644.2	TERPS/TSS	34:1	10.0	Off	Airspace Study		
7271	Tree	6	662.7	643.4	TERPS/TSS	34:1	19.3	Off	Airspace Study		
7273	Tree	6	643.6	643.3	TERPS/TSS	34:1	0.4	Off	Airspace Study		
7277	Tree	6	651.6	642.8	TERPS/TSS	34:1	8.8	Off	Airspace Study		
7285	Tree	6	652.3	642.4	TERPS/TSS	34:1	9.9	Off	Airspace Study		
7286	Tree	6	646.5	642.2	TERPS/TSS	34:1	4.3	Off	Airspace Study		
7293	Tree	6	653.3	641.7	TERPS/TSS	34:1	11.6	Off	Airspace Study		
7294	Tree	6	646.5	641.7	TERPS/TSS	34:1	4.9	Off	Airspace Study		
7297	Tree	6	653.0	641.2	TERPS/TSS	34:1	11.8	Off	Airspace Study		
7298	Tree	6	643.3	641.2	TERPS/TSS	34:1	2.1	Off	Airspace Study		
7307	Tree	6	660.3	640.9	TERPS/TSS	34:1	19.4	Off	Airspace Study		
7317	Tree	6	661.1	640.3	TERPS/TSS	34:1	20.8	Off	Airspace Study		
7325	Tree	6	643.5	639.6	TERPS/TSS	34:1	3.9	Off	Airspace Study		
7330	Tree	6	641.1	639.0	TERPS/TSS	34:1	2.1	Off	Airspace Study		
7338	Tree	6	644.0	638.3	TERPS/TSS	34:1	5.6	Off	Airspace Study		
7340	Tree	6	642.6	637.8	TERPS/TSS	34:1	4.8	Off	Airspace Study		
7342	Tree	6	652.6	637.3	TERPS/TSS	34:1	15.2	Off	Airspace Study		
7344	Tree	6	653.8	637.0	TERPS/TSS	34:1	16.7	Off	Airspace Study		
7349	Tree	6	653.3	636.7	TERPS/TSS	34:1	16.7	Off	Airspace Study		
7356	Tree	6	649.6	635.1	TERPS/TSS	34:1	14.5	Off	Airspace Study		
7358	Tree	6	659.0	635.0	TERPS/TSS	34:1	24.0	Off	Airspace Study		
7364	Tree	6	657.3	634.1	TERPS/TSS	34:1	23.2	Off	Airspace Study		
7365	Tree	6	636.4	634.1	TERPS/TSS	34:1	2.3	Off	Airspace Study		
7368	Tree	6	645.1	633.8	TERPS/TSS	34:1	11.3	Off	Airspace Study		
7373	Tree	6	657.8	633.4	TERPS/TSS	34:1	24.3	Off	Airspace Study		

Priority 1 Obstruction Penetrations											
Object ID	Object Description	Runway End	Object Elevation (MSL)	Surface Elevation (MSL)	Surface Penetrated	Surface Slope	Penetration Amount	On/Off Airport	Mitigation Plan	Comments	Date Mitigated
7389	Tree	6	644.9	632.0	TERPS/TSS	34:1	12.9	Off	Airspace Study		
7392	Tree	6	645.0	631.3	TERPS/TSS	34:1	13.6	Off	Airspace Study		
7393	Tree	6	631.1	631.1	TERPS/TSS	34:1	0.1	Off	Airspace Study		
7402	Tree	6	646.9	630.3	TERPS/TSS	34:1	16.6	Off	Airspace Study		
7404	Tree	6	645.0	629.7	TERPS/TSS	34:1	15.3	Off	Airspace Study		
7405	Tree	6	633.3	629.7	TERPS/TSS	34:1	3.5	Off	Airspace Study		
7410	Tree	6	647.8	628.9	TERPS/TSS	34:1	18.9	Off	Airspace Study		
7411	Tree	6	639.0	628.5	TERPS/TSS	34:1	10.5	Off	Airspace Study		
7412	Tree	6	645.3	628.3	TERPS/TSS	34:1	16.9	Off	Airspace Study		
7417	Tree	6	636.1	627.9	TERPS/TSS	34:1	8.2	Off	Airspace Study		
7422	Tree	6	637.8	627.0	TERPS/TSS	34:1	10.7	Off	Airspace Study		
7424	Tree	6	641.2	626.8	TERPS/TSS	34:1	14.4	Off	Airspace Study		
7426	Tree	6	646.6	626.5	TERPS/TSS	34:1	20.1	Off	Airspace Study		
7431	Tree	6	645.3	625.8	TERPS/TSS	34:1	19.5	Off	Airspace Study		
7433	Tree	6	641.1	625.5	TERPS/TSS	34:1	15.6	Off	Airspace Study		
7434	Tree	6	642.0	625.3	TERPS/TSS	34:1	16.7	Off	Airspace Study		
7437	Tree	6	631.8	624.8	TERPS/TSS	34:1	6.9	Off	Airspace Study		
7444	Tree	6	630.4	623.7	TERPS/TSS	34:1	6.7	Off	Airspace Study		
7692	Tree	6	608.6	596.9	TERPS/TSS	34:1	11.7	Off	Airspace Study		
7697	Tree	6	601.1	596.4	TERPS/TSS	34:1	4.7	Off	Airspace Study		
7700	Tree	6	602.2	596.1	TERPS/TSS	34:1	6.1	Off	Airspace Study		
7701	Tree	6	604.7	595.9	TERPS/TSS	34:1	8.8	Off	Airspace Study		
8130	Runway Light	24	535.3	533.2	TSS	20:1	2.1	On	TBD (Fixed by Function)		
12477	Service Road	6	556.0	552.6	TERPS/TSS	34:1	3.3	On	Airspace Study		
12478	Service Road	6	556.0	552.7	TERPS/TSS	34:1	3.3	On	Airspace Study		
12479	Service Road	6	556.1	552.9	TERPS/TSS	34:1	3.2	On	Airspace Study		
12480	Service Road	6	556.5	553.5	TERPS/TSS	34:1	2.9	On	Airspace Study		

Source: CMT Analysis, 2022

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Figure 1.1-1

Runway 6 Priority 1 Obstacles

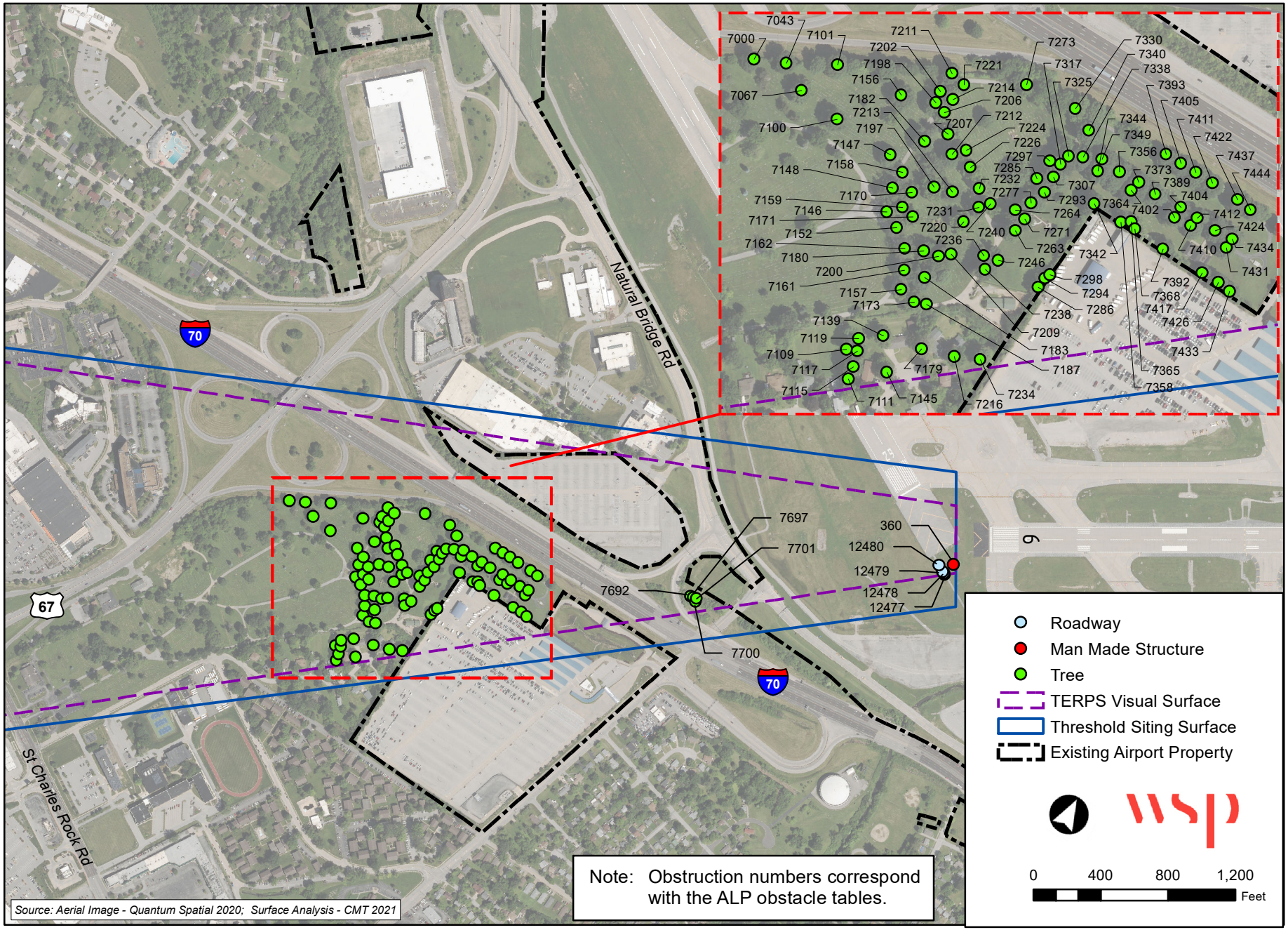

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Figure 1.2-1

Runway 12L Priority 1 Obstacles

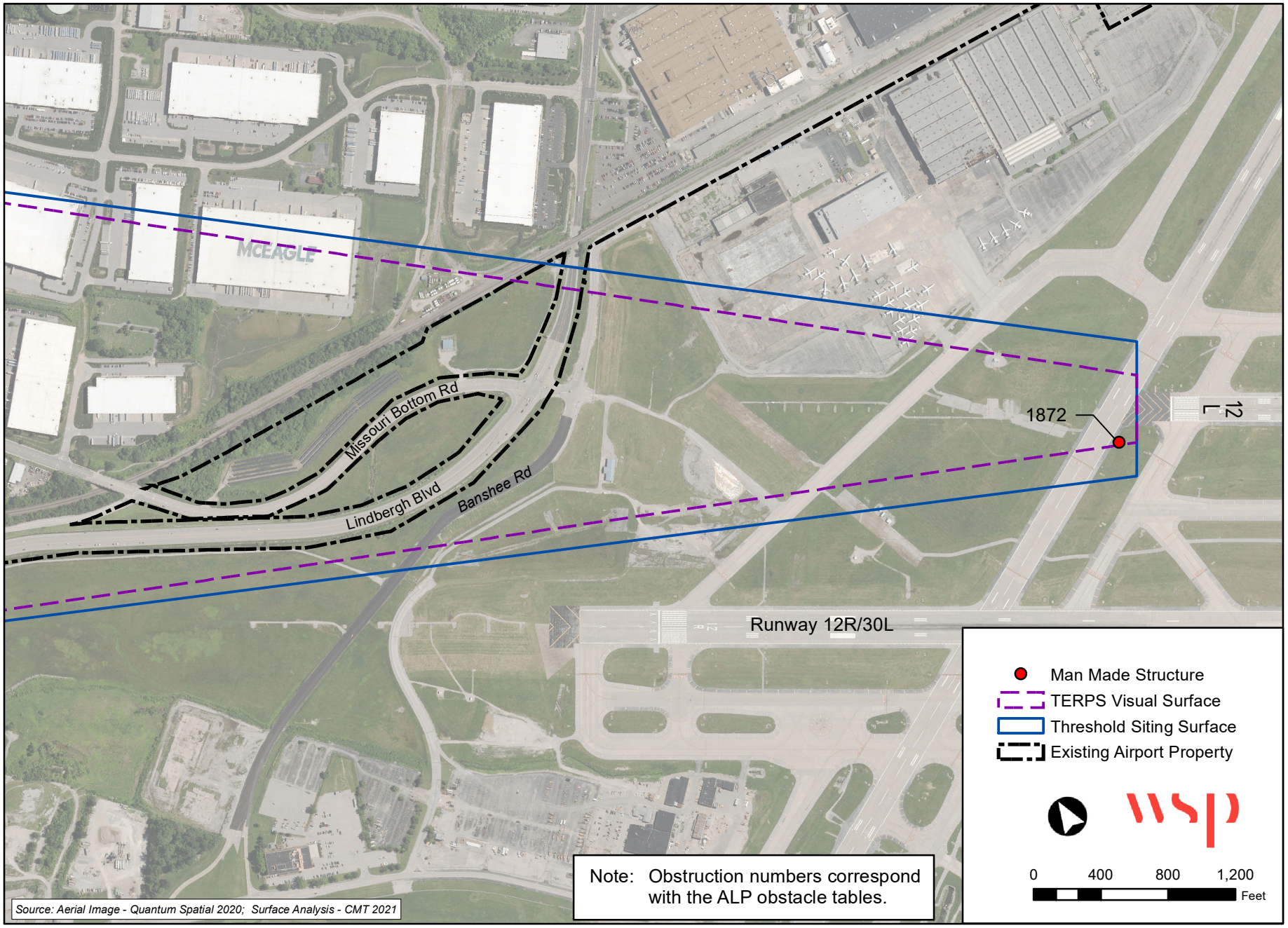

Figure 1.3-1

Runway 12R Priority 1 Obstacles

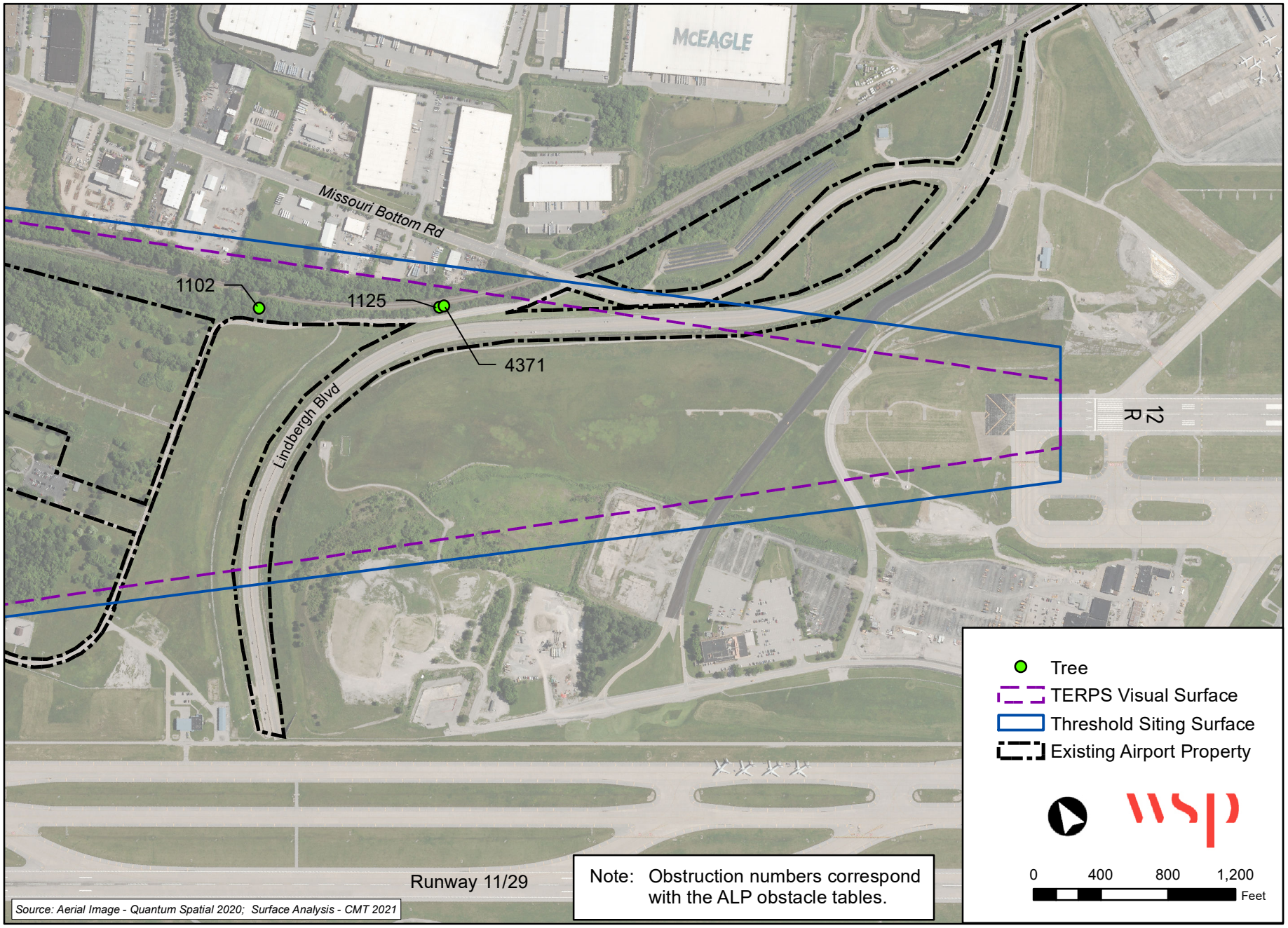

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Figure 1.4-1

Runway 30L Priority 1 Obstacles

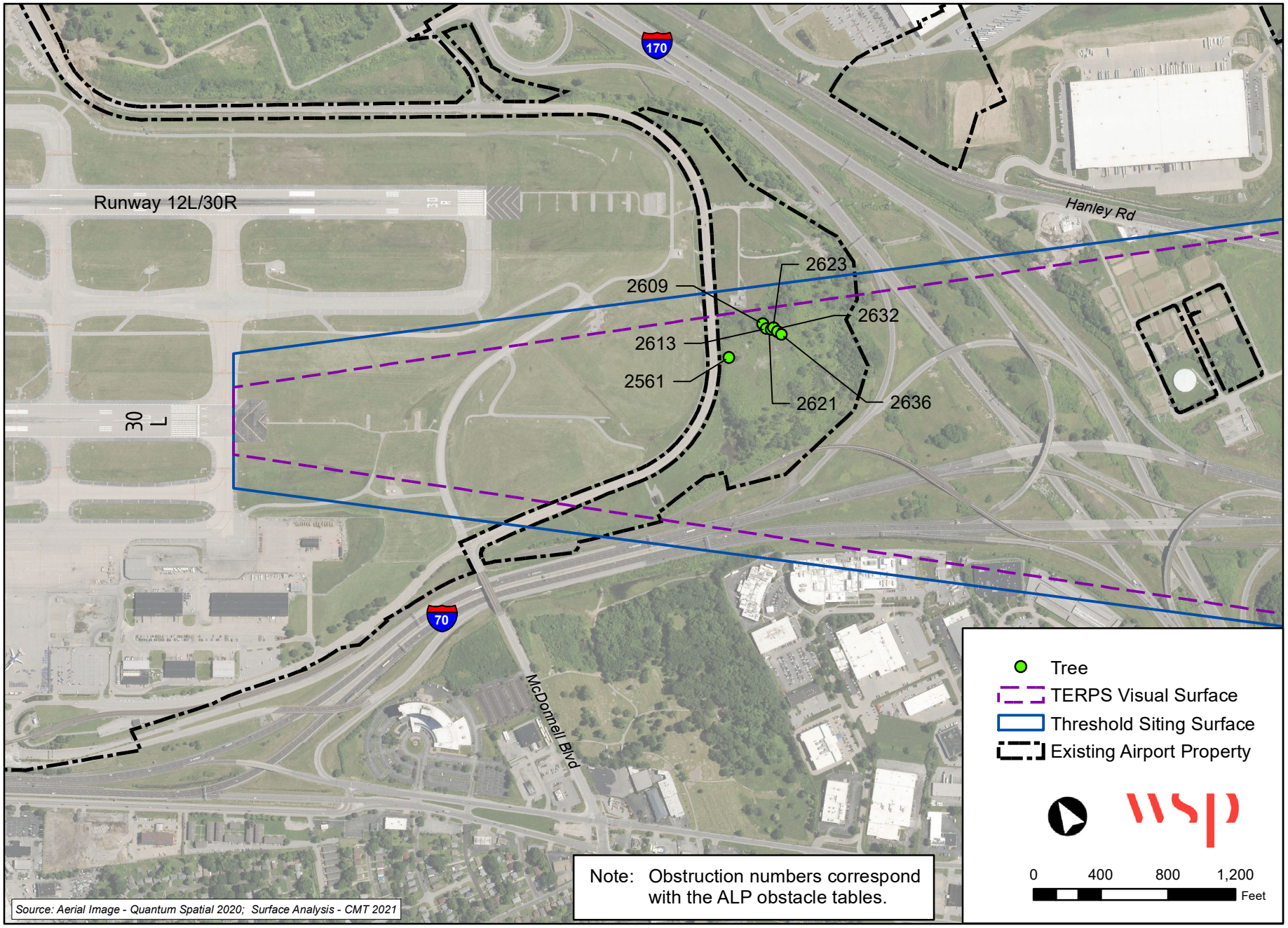

Table 6: Priority 2 Obstructions

Priority 2 Obstruction Penetrations											
Object ID	Object Description	Runway End	Object Elevation (MSL)	Surface Elevation (MSL)	Surface Penetrated	Surface Slope	Penetration Amount	On/Off Airport	Mitigation Plan	Comments	Date mitigated
1117	Tree	12R	683.5	645.7	Departure	40:1	37.8	Off	Airspace Study		
1127	Tree	12R	658.9	621.6	Departure	40:1	37.3	Off	Airspace Study		
1118	Tree	12R	681.9	645.3	Departure	40:1	36.6	Off	Airspace Study		
1143	Tree	12R	654.3	618.1	Departure	40:1	36.2	Off	Airspace Study		
791	Tree	29	687.0	651.0	Departure	40:1	36.0	Off	Airspace Study		
653	Tree	29	675.9	640.6	Departure	40:1	35.3	Off	Airspace Study		
1008	Air Traffic Control Tower	29	772.3	719.9	Departure	40:1	52.5	On	Light		

Source: CMT Analysis, 2022

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Figure 2.1-1

Runway 11 Priority 2 Obstacles

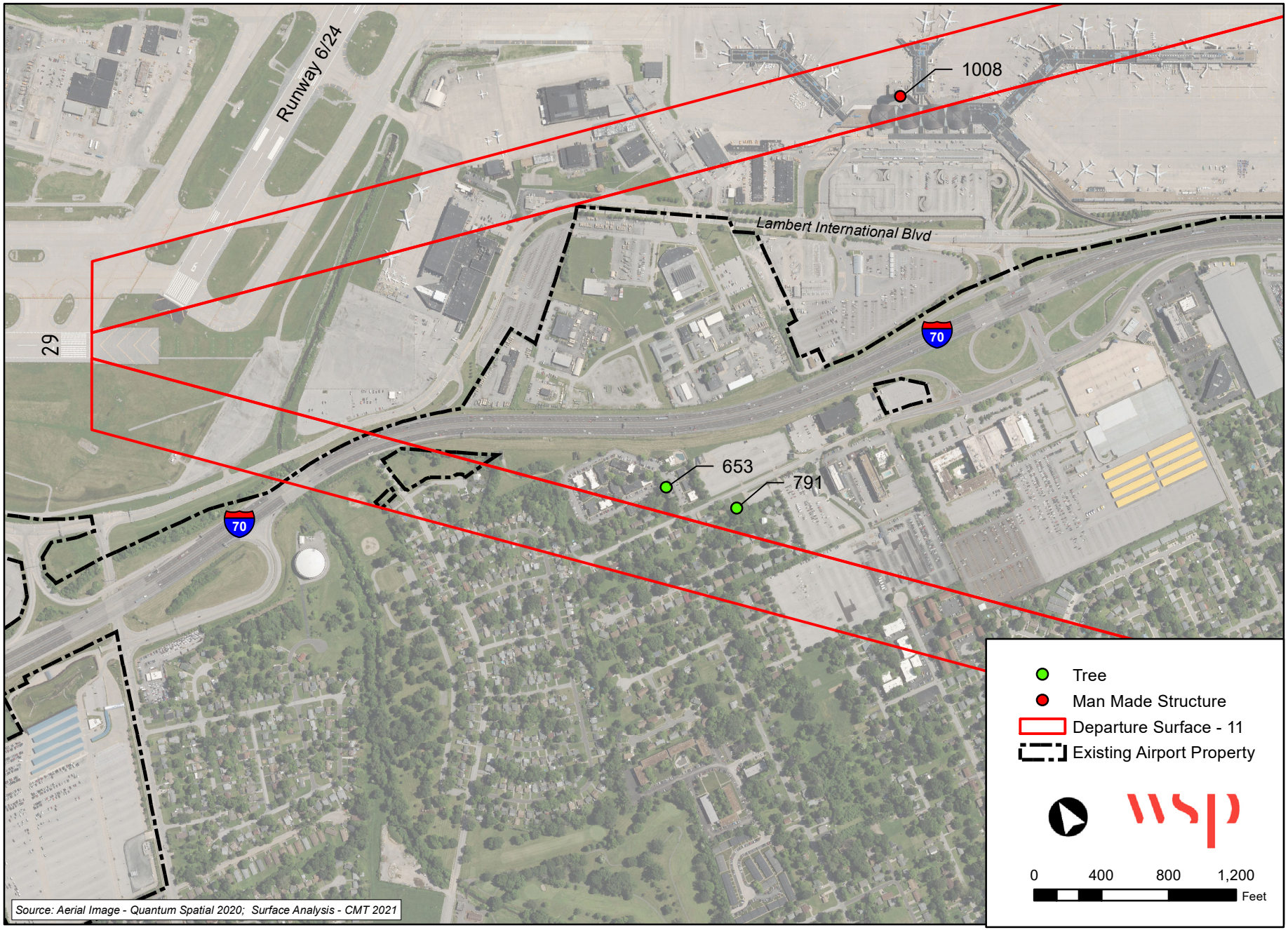

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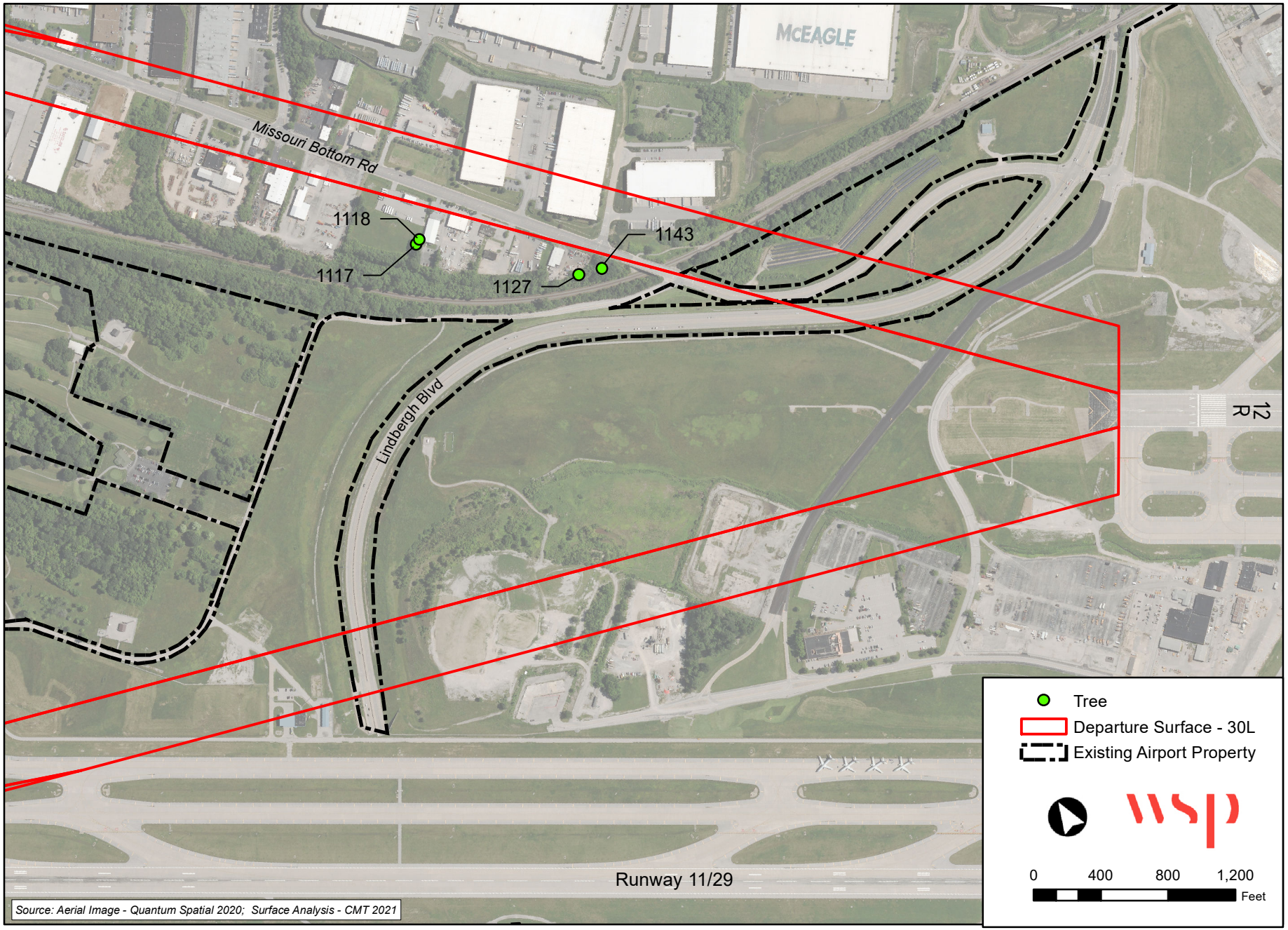
Figure 2.2-1

Runway 30L Priority 2 Obstacles



APPENDIX A – PRIORITY 3 OBSTRUCTIONS

Runway 11 Inner Approach (Existing)

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	ThreshTo Be Studiedd Siting Surface Elevation (MSL)	ThreshTo Be Studiedd Siting Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
2	Tree	655.0	659.3	-4.2	678.6	-23.6	-	-	-	-	-	-	-	-	No Action
3	LLWAS	647.5	654.2	-6.7	707.8	-60.3	-	-	-	-	-	-	-	-	Fixed by Function
4	OL on Localizer	631.3	634.5	-3.2	643.9	-12.6	642.8	-11.5	-	-	681.2	-49.8	642.8	-11.5	Fixed by Function
6	Building	626.7	633.2	-6.5	642.3	-15.6	640.9	-14.2	-	-	679.1	-52.4	640.9	-14.2	No Action
7	Runway Light	618.1	627.0	-8.9	634.6	-16.5	631.8	-13.7	640.5	-22.4	669.2	-51.1	631.8	-13.7	Fixed by Function
8	Runway Light	618.6	627.0	-8.4	634.6	-15.9	631.8	-13.2	640.5	-21.8	669.2	-50.6	631.8	-13.2	Fixed by Function
9	Runway Light	618.1	627.0	-9.0	634.6	-16.5	631.8	-13.8	640.5	-22.4	669.2	-51.2	631.8	-13.8	Fixed by Function
10	Runway Light	619.3	625.0	-5.7	632.1	-12.8	628.9	-9.6	637.2	-17.9	666.0	-46.7	628.9	-9.6	Fixed by Function
11	Runway Light	618.5	625.0	-6.5	632.1	-13.5	628.9	-10.3	637.2	-18.6	666.0	-47.5	628.9	-10.3	Fixed by Function
12	Runway Light	619.0	625.0	-6.0	632.1	-13.0	628.9	-9.8	637.2	-18.1	666.0	-47.0	628.9	-9.8	Fixed by Function
13	Runway Light	619.4	623.0	-3.6	629.6	-10.2	625.9	-6.5	633.8	-14.4	662.8	-43.4	625.9	-6.5	Fixed by Function
14	Runway Light	618.4	623.0	-4.6	629.6	-11.2	625.9	-7.5	633.8	-15.4	662.8	-44.4	625.9	-7.5	Fixed by Function
15	Runway Light	618.9	623.0	-4.1	629.6	-10.7	625.9	-7.0	633.8	-14.9	662.8	-43.9	625.9	-7.0	Fixed by Function
16	Runway Light	619.4	623.0	-3.6	629.6	-10.2	625.9	-6.5	633.8	-14.4	662.8	-43.4	625.9	-6.5	Fixed by Function
17	Runway Light	619.4	623.0	-3.6	629.6	-10.2	625.9	-6.5	633.8	-14.4	662.8	-43.4	625.9	-6.5	Fixed by Function
18	Runway Light	619.8	621.0	-1.2	627.1	-7.3	623.0	-3.2	630.5	-10.7	659.6	-39.9	623.0	-3.2	Fixed by Function
19	Runway Light	619.8	621.0	-1.2	627.1	-7.3	623.0	-3.2	630.5	-10.7	659.6	-39.9	623.0	-3.2	Fixed by Function
20	Runway Light	619.7	621.0	-1.4	627.1	-7.4	623.0	-3.3	630.5	-10.8	659.6	-40.0	623.0	-3.3	Fixed by Function
21	Fence	612.8	619.9	-7.1	749.4	-136.6	-	-	-	-	-	-	-	-	No Action
22	Runway Light	619.4	619.0	0.4	624.6	-5.2	620.1	-0.6	627.2	-7.7	656.4	-37.0	620.1	-0.6	Fixed by Function
23	Runway Light	618.8	619.0	-0.2	624.6	-5.8	620.1	-1.3	627.2	-8.4	656.4	-37.6	620.1	-1.3	Fixed by Function
24	Runway Light	619.4	619.0	0.4	624.6	-5.2	620.1	-0.6	627.2	-7.7	656.4	-37.0	620.1	-0.6	Fixed by Function
25	Runway Light	619.2	617.0	2.2	622.1	-2.9	617.1	2.1	623.8	-4.7	653.2	-34.1	617.1	2.1	Fixed by Function
26	Runway Light	619.5	617.0	2.5	622.1	-2.5	617.1	2.4	623.8	-4.3	653.2	-33.7	617.1	2.4	Fixed by Function
27	Runway Light	619.2	617.0	2.2	622.1	-2.9	617.1	2.1	623.8	-4.6	653.2	-34.1	617.1	2.1	Fixed by Function
39	Sign	616.8	-	-	-	-	-	-	-	-	640.2	-23.4	-	-	Fixed by Function
40	Sign	615.5	-	-	-	-	-	-	-	-	636.4	-20.9	-	-	Fixed by Function
9563	Street Sign	616.8	632.9	-16.1	642.0	-25.2	640.5	-23.7	650.4	-33.5	678.7	-61.8	640.5	-23.7	No Action
9564	Street Sign	614.6	638.4	-23.8	648.8	-34.2	648.5	-33.9	659.4	-44.8	687.3	-72.8	648.5	-33.9	No Action
9746	Localizer	619.8	633.9	-14.1	643.1	-23.4	641.9	-22.1	651.9	-32.1	680.2	-60.4	641.9	-22.1	Fixed by Function
9747	Localizer	620.3	633.9	-13.6	643.1	-22.9	641.9	-21.6	651.9	-31.6	680.2	-59.9	641.9	-21.6	Fixed by Function
10556	Service Road	610.0	619.6	-9.6	750.6	-140.5	-	-	-	-	-	-	-	-	No Action
10557	Service Road	611.2	622.2	-11.1	711.2	-100.0	624.8	-13.6	-	-	-	-	-	-	No Action
10558	Service Road	611.2	633.6	-22.4	658.1	-47.0	641.5	-30.3	-	-	679.7	-68.5	-	-	No Action
10559	Service Road	611.4	634.6	-23.2	644.0	-32.7	642.9	-31.6	-	-	681.3	-69.9	-	-	No Action
10560	Service Road	611.5	635.5	-24.0	645.2	-33.6	644.3	-32.7	-	-	682.7	-71.2	644.3	-32.7	No Action
10561	Service Road	611.9	637.8	-25.9	648.1	-36.1	647.7	-35.7	658.5	-46.5	686.5	-74.5	647.7	-35.7	No Action
10562	Service Road	619.9	638.2	-18.3	648.6	-28.7	648.3	-28.4	659.1	-39.3	687.1	-67.2	648.3	-28.4	No Action
10566	Service Road	620.0	632.7	-12.7	641.7	-21.7	640.2	-20.2	650.0	-30.0	678.3	-58.3	640.2	-20.2	No Action
10567	Service Road	620.0	637.8	-17.8	648.1	-28.1	647.7	-27.7	658.5	-38.5	686.4	-66.4	647.7	-27.7	No Action
10568	Service Road	620.0	635.4	-15.4	645.1	-25.1	644.2	-24.2	-	-	682.7	-62.7	644.2	-24.2	No Action
10569	Service Road	620.0	634.7	-14.7	644.1	-24.1	643.1	-23.1	-	-	681.4	-61.4	-	-	No Action
10570	Service Road	620.0	633.6	-13.6	658.1	-38.1	641.5	-21.5	-	-	679.7	-59.7	-	-	No Action
10571	Service Road	620.0	632.5	-12.5	699.1	-79.1	-	-	-	-	-	-	-	-	No Action
10572	Service Road	620.0	631.7	-11.7	740.5	-120.5	-	-	-	-	-	-	-	-	No Action
10573	Service Road	620.0	624.9	-4.9	708.1	-88.1	-	-	-	-	-	-	-	-	No Action
10574	Service Road	620.0	622.3	-2.3	748.3	-128.3	-	-	-	-	-	-	-	-	No Action
10579	Service Road	591.8	657.9	-66.1	673.2	-81.4	-	-	-	-	-	-	-	-	No Action
10580	Service Road	591.1	658.0	-66.9	673.3	-82.2	-	-	-	-	-	-	-	-	No Action
10581	Service Road	590.0	658.2	-68.2	673.6	-83.6	677.7	-87.7	-	-	719.1	-129.1	-	-	No Action
10583	Service Road	590.0	658.6	-68.6	674.1	-84.1	678.2	-88.2	-	-	719.6	-129.6	678.2	-88.2	No Action
10584	Service Road	585.5	662.6	-77.1	679.1	-93.6	684.2	-98.7	699.8	-114.3	726.1	-140.6	684.2	-98.7	No Action
10585	Service Road	575.8	664.0	-88.3	680.9	-105.1	686.3	-110.5	702.2	-126.4	728.4	-152.6	686.3	-110.5	No Action
10586	Service Road	572.2	666.0	-93.9	683.4	-111.2	689.2	-117.0	705.5	-133.4	731.6	-159.4	689.2	-117.0	No Action
10588	Service Road	580.0	662.6	-82.6	679.1	-99.1	684.1	-104.1	699.8	-119.8	726.0	-146.0	684.1	-104.1	No Action
10590	Service Road	581.0	668.4	-87.4	686.4	-105.4	692.7	-111.7	709.5	-128.5	735.4	-154.4	692.7	-111.7	No Action
10591	Service Road	580.0	661.7	-81.7	678.0	-98.0	682.8	-102.8	-	-	724.6	-144.6	682.8	-102.8	No Action
10592	Service Road	580.0	666.8	-86.8	684.4	-104.4	690.4	-110.4	-	-	732.8	-152.8	690.4	-110.4	No Action
10593	Service Road	580.0	667.5	-87.5	685.2	-105.2	691.4	-111.4	-	-	733.9	-153.9	-	-	No Action
10594	Service Road	580.0	667.8	-87.8	685.6	-105.6	691.9	-111.9	-	-	-	-	-	-	No Action
10597	Service Road	575.5	662.2	-86.6	715.2	-139.7	-	-	-	-	-	-	-	-	No Action
10598	Service Road	580.0	661.3	-81.3	677.5	-97.5	-	-	-	-	-	-	-	-	No Action
10599	Service Road	580.0	661.2	-81.2	677.4	-97.4	682.1	-102.1	-	-	-	-	-	-	No Action
10600	Service Road	580.0	661.2	-81.2	677.4	-97.4	682.1	-102.1	-	-	723.9	-143.9	-	-	No Action
10601	Service Road	540.0	646.8	-106.7	728.0	-188.0	-	-	-	-	-	-	-	-	No Action
10602	Service Road	564.7	655.5	-90.7	720.8	-156.1	-	-	-	-	-	-	-	-	No Action
10603	Service Road	566.2	655.3	-89.1	672.1	-105.9	673.3	-107.2	-	-	-	-	-	-	No Action
10604	Service Road	566.1	655.2	-89.1	669.9	-103.7	673.3	-107.2	-	-	-	-	-	-	No Action
10605	Service Road	566.4	655.4	-89.0	670.1	-103.6	673.6	-107.1	-	-	714.6	-148.1	-	-	No Action
10606	Service Road	568.6	655.7	-87.2	670.5	-102.0	674.1	-105.5	-	-	715.1	-146.5	674.1	-105.5	No Action
11045	Interstate	572.5	676.8	-104.3	696.8	-124.4	705.0	-132.5	723.5	-151.0	748.7	-176.2	705.0	-132.5	No Action
11046	Interstate	567.0	673.1	-106.1	692.3	-125.3	699.7	-132.7	717.4	-150.4	742.9	-175.9	699.7	-132.7	No Action
11049	Interstate	567.0	666.9	-99.9	684.5	-117.5	690.5	-123.5	-	-	733.0	-166.0	690.5	-123.5	No Action
11051	Interstate	573.4	665.8	-92.5	683.1	-109.8	688.9	-115.6	-	-	731.2	-157.9	-	-	No Action
11052	Interstate	574.0	665.5	-91.5	682.7	-108.7	688.4	-114.3	-	-	-	-	-	-	No Action
11099	Road	585.0	671.3	-86.3	690.0	-105.0	697.0	-112.0	714.3	-129.3	740.0	-155.0	697.0	-112.0	No Action
11100	Road	575.0	667.6	-92.6	685.4	-110.4	691.5	-116.5	708.2	-133.2	734.1	-159.1	691.5	-116.5	No Action
11101	Road	585.1	664.3	-79.2	681.2	-96.1	686.7	-101.5	702.7	-117.5	728.8	-143.7	686.7	-101.5	No Action
11102	Road	590.8	662.0	-71.3	678.4	-87.6	683.3	-92.5	-	-	725.1	-134.4	683.3	-92.5	No Action
11104	Road	595.0	661.0	-66.0	677.1	-82.1	681.8	-86.8	-	-	723.5	-128.5	-	-	No Action
11105	Road	595.3	660.5	-65.2	676.5	-81.1	681.1	-85.7	-	-	-	-	-	-	No Action
11106	Road	597.0	660.2	-63.1	676.0	-79.0	-	-	-	-	-	-	-	-	No Action
11110	Road	565.0	-	-	709.0	-144.0	-	-	-	-	-	-	-	-	No Action
11111	Road	585.0	688.0	-103.0	710.8	-125.8	-	-	-	-	-	-	-	-	No Action
11112	Road	584.1	693.7	-109.6	718.0	-133.9	-	-	-	-	775.7	-191.7	-	-	No Action
11113	Road	584.1	694.9	-110.8	719.5	-135.4	731.7	-147.5	-	-	777.7	-193.5	-	-	No Action
11114	Road	585.0	699.0	-114.0	724.6	-139.6	737.6	-152.6	-	-	784.2	-199.2	737.6	-152.6	No Action
11115	Road	565.9	706.0	-140.0	733.3	-167.4	747.9	-182.0	772.0	-206.1	795.3	-229.4	747.9	-182.0	No Action
11119	Road	538.3	707.6	-169.3	735.4	-197.1	750.3	-212.0	774.8	-236.5	797.9	-259.6	750.3	-212.0	No Action
11135	Road	585.0	689.3	-104.3	712.4	-127.4	723.3	-138.3	-	-	768.6	-183.6	723.3	-138.3	No Action
11136	Road	585.0	690.7	-105.7	714.3	-129.3	725.5	-140.5	-	-	771.0	-186.0	-	-	No Action
11137	Road	585.0	690.9	-105.9	714.5	-129.5	-	-	-	-	771.3	-186.3	-	-	No Action
11138	Road	578.8	692.7	-113.8	716.7	-137.9	-	-	-	-	-	-	-	-	No Action
11139	Road	572.1	-	-	717.8	-145.7	-	-	-	-	-	-	-	-	No Action

Table title: Runway 11 Existing Obstruction Table – Inner Portion of the Approach Surface

Runway 29 Inner Approach (Existing)

Runway 29 Existing Obstruction Table – Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Surface Elevation (MSL)	TERPS Penetration/ Clearance (ft)	Disposition
337	Runway Light	555.9	-	-	557.9	-2.1	-	-	558.8	-3.0	-	-	595.6	-39.7	No Action
338	Runway Light	555.9	-	-	557.9	-2.1	-	-	558.8	-3.0	-	-	595.6	-39.7	No Action
339	Runway Light	555.6	-	-	557.9	-2.3	-	-	558.8	-3.2	-	-	595.6	-40.0	No Action
343	Sign	553.0	555.2	-2.2	615.1	-62.0	555.2	-2.2	-	-	-	-	-	-	No Action
344	Runway Light	555.8	555.4	0.4	560.4	-4.6	555.5	0.3	562.2	-6.4	555.5	0.3	598.8	-43.0	To Be Studied
345	Runway Light	555.5	555.4	0.2	560.4	-4.9	555.5	0.1	562.2	-6.6	555.5	0.1	598.8	-43.2	To Be Studied
346	Runway Light	555.8	555.4	0.4	560.4	-4.6	555.5	0.3	562.2	-6.4	555.5	0.3	598.8	-43.0	To Be Studied
347	Runway Light	555.7	556.5	-0.8	561.8	-6.2	557.1	-1.4	564.0	-8.4	557.1	-1.4	600.6	-44.9	No Action
348	Sign	552.2	556.5	-4.4	603.7	-51.5	557.1	-5.0	-	-	-	-	-	-	No Action
349	Runway Light	555.9	557.4	-1.5	562.9	-7.0	558.4	-2.5	565.5	-9.6	558.4	-2.5	602.0	-46.1	No Action
350	Runway Light	555.9	557.4	-1.5	562.9	-7.0	558.4	-2.5	565.5	-9.6	558.4	-2.5	602.0	-46.1	No Action
351	Runway Light	555.8	557.4	-1.6	562.9	-7.1	558.4	-2.6	565.5	-9.7	558.4	-2.6	602.0	-46.2	No Action
353	Runway Light	551.9	558.7	-6.7	564.6	-12.6	560.3	-8.4	567.7	-15.8	560.3	-8.4	604.1	-52.1	No Action
354	Runway Light	555.8	559.4	-3.5	565.4	-9.6	561.3	-5.5	568.8	-13.0	561.3	-5.5	605.2	-49.3	No Action
355	Runway Light	555.7	559.4	-3.6	565.4	-9.7	561.3	-5.6	568.8	-13.1	561.3	-5.6	605.2	-49.4	No Action
356	Runway Light	555.8	559.4	-3.5	565.4	-9.6	561.3	-5.5	568.8	-13.0	561.3	-5.5	605.2	-49.3	No Action
359	Post	551.3	561.3	-10.0	567.9	-16.5	564.2	-12.9	572.1	-20.8	564.2	-12.9	608.3	-57.0	No Action
360	Post	551.7	561.3	-9.6	567.9	-16.2	564.2	-12.5	572.1	-20.4	564.2	-12.5	608.3	-56.6	No Action
361	Post	551.5	561.3	-9.8	567.9	-16.4	564.2	-12.7	572.1	-20.6	564.2	-12.7	608.3	-56.8	No Action
362	Post	551.8	561.3	-9.6	567.9	-16.1	564.3	-12.5	572.1	-20.3	564.3	-12.5	608.3	-56.5	No Action
363	Post	551.9	561.3	-9.5	567.9	-16.0	564.3	-12.4	572.1	-20.3	564.3	-12.4	608.3	-56.5	No Action
364	Runway Light	555.9	561.5	-5.5	568.0	-12.1	564.4	-8.5	572.3	-16.4	564.4	-8.5	608.5	-52.6	No Action
365	Runway Light	555.8	561.5	-5.6	568.0	-12.2	564.4	-8.6	572.3	-16.5	564.4	-8.6	608.5	-52.7	No Action
366	Runway Light	555.9	561.5	-5.5	568.0	-12.1	564.4	-8.5	572.3	-16.4	564.4	-8.5	608.5	-52.6	No Action
367	Runway Light	555.9	561.5	-5.5	568.0	-12.1	564.4	-8.5	572.3	-16.4	564.4	-8.5	608.5	-52.6	No Action
368	Runway Light	555.9	561.5	-5.5	568.0	-12.1	564.4	-8.5	572.3	-16.4	564.4	-8.5	608.5	-52.6	No Action
369	Runway Light	556.4	563.6	-7.1	570.7	-14.2	567.5	-11.1	575.8	-19.4	567.5	-11.1	611.9	-55.4	No Action
370	Runway Light	556.4	563.6	-7.1	570.7	-14.2	567.5	-11.1	575.8	-19.4	567.5	-11.1	611.9	-55.4	No Action
371	Runway Light	556.4	563.6	-7.1	570.7	-14.2	567.5	-11.1	575.8	-19.4	567.5	-11.1	611.9	-55.4	No Action
372	Runway Light	556.6	565.7	-9.1	573.3	-16.7	570.6	-14.0	579.3	-22.7	570.6	-14.0	615.2	-58.6	No Action
373	Runway Light	556.6	565.7	-9.1	573.3	-16.7	570.6	-14.0	579.3	-22.8	570.6	-14.0	615.2	-58.7	No Action
374	Runway Light	556.5	565.7	-9.2	573.3	-16.8	570.6	-14.1	579.3	-22.8	570.6	-14.1	615.2	-58.7	No Action
376	Pole Light	571.2	575.0	-3.8	659.1	-88.0	-	-	-	-	-	-	-	-	No Action
378	Pole Light	573.2	576.5	-3.2	641.2	-67.9	-	-	-	-	-	-	-	-	No Action
379	Pole Light	572.6	576.8	-4.2	598.0	-25.4	586.9	-14.3	-	-	-	-	-	-	No Action
380	Pole Light	572.2	577.1	-5.0	587.6	-15.5	587.4	-15.3	-	-	587.4	-15.3	633.5	-61.4	No Action
381	Pole Light	574.8	578.3	-3.5	647.3	-72.5	-	-	-	-	-	-	-	-	No Action
382	Pole Light	574.4	578.4	-4.1	611.3	-37.0	589.4	-15.0	-	-	-	-	-	-	No Action
383	Pole Light	575.1	579.4	-4.3	612.8	-37.7	590.8	-15.7	-	-	-	-	-	-	No Action
384	Pole Light	574.6	580.0	-5.4	596.7	-22.1	591.6	-17.0	-	-	-	-	-	-	No Action
385	Pole Light	573.8	580.3	-6.6	591.7	-17.9	592.2	-18.4	-	-	592.2	-18.4	638.7	-64.9	No Action
386	Pole Light	577.1	580.9	-3.8	615.7	-38.6	593.1	-16.0	-	-	-	-	-	-	No Action
387	Pole Light	577.5	582.1	-4.6	593.8	-16.3	594.7	-17.3	-	-	-	-	-	-	No Action
388	Pole Light	574.7	582.2	-7.5	594.0	-19.3	594.9	-20.2	-	-	594.9	-20.2	641.7	-67.0	No Action
389	Pole Light	575.5	582.3	-6.8	594.1	-18.6	595.1	-19.6	-	-	-	-	641.8	-66.3	No Action
391	Pole Light	576.2	583.8	-7.6	595.9	-19.8	597.2	-21.1	-	-	-	-	-	-	No Action
392	Pole Light	576.9	583.9	-7.0	596.1	-19.2	597.4	-20.5	-	-	597.4	-20.5	644.3	-67.4	No Action
393	Pole Light	575.8	584.8	-9.0	597.2	-21.4	598.7	-22.9	-	-	598.7	-22.9	645.7	-70.0	No Action
395	Pole Light	577.6	584.9	-7.3	597.4	-19.8	598.9	-21.3	-	-	598.9	-21.3	646.0	-68.3	No Action
396	Pole	580.9	585.0	-4.1	660.2	-79.3	-	-	-	-	-	-	-	-	No Action
397	Pole Light	595.7	585.4	10.3	598.0	-2.3	599.6	-3.9	-	-	-	-	-	-	To Be Studied
399	Road Sign	581.3	585.7	-4.4	598.3	-17.0	600.0	-18.7	-	-	-	-	-	-	No Action
404	Pole Light	577.3	586.8	-9.5	599.7	-22.5	601.7	-24.4	-	-	601.7	-24.4	649.0	-71.7	No Action
406	Pole Light	577.6	587.5	-10.0	600.7	-23.1	602.8	-25.2	-	-	602.8	-25.2	650.2	-72.6	No Action
410	Building	590.8	590.7	0.2	604.6	-13.8	607.4	-16.6	-	-	-	-	655.2	-64.4	To Be Studied
411	Tree	581.5	590.8	-9.3	613.2	-31.8	607.5	-26.1	-	-	-	-	-	-	No Action
412	Tree	581.6	591.4	-9.8	616.0	-34.4	-	-	-	-	-	-	-	-	No Action
414	Tree	593.3	591.9	1.4	609.2	-16.0	609.1	-15.9	-	-	-	-	-	-	To Be Studied
415	Tree	595.6	592.0	3.7	619.0	-23.3	-	-	-	-	-	-	-	-	To Be Studied
416	Tree	597.8	592.1	5.7	629.2	-31.4	-	-	-	-	-	-	-	-	To Be Studied
417	Tree	595.3	592.4	2.8	626.3	-31.1	-	-	-	-	-	-	-	-	To Be Studied
418	Tree	589.8	592.4	-2.6	620.2	-30.4	-	-	-	-	-	-	-	-	No Action
419	Tree	599.3	592.5	6.8	610.2	-10.9	610.0	-10.7	-	-	-	-	-	-	To Be Studied
420	Building	598.3	593.1	5.2	607.6	-9.3	610.9	-12.6	625.0	-26.7	610.9	-12.6	659.0	-60.7	To Be Studied
421	Tree	590.6	593.1	-2.6	607.7	-17.1	611.0	-20.4	-	-	-	-	-	-	No Action
423	Tree	592.1	593.8	-1.7	608.5	-16.4	612.0	-19.8	-	-	-	-	-	-	No Action
425	Tree	585.8	594.9	-9.1	609.8	-24.0	613.6	-27.7	-	-	-	-	-	-	No Action
426	Tree	587.1	595.7	-8.7	610.9	-23.9	614.8	-27.8	-	-	-	-	-	-	No Action
427	Tree	588.0	596.4	-8.5	612.7	-24.7	-	-	-	-	-	-	-	-	No Action
428	Tree	608.1	596.9	11.2	627.6	-19.5	-	-	-	-	-	-	-	-	To Be Studied
430	Tree	606.2	597.6	8.6	617.6	-11.3	-	-	-	-	-	-	-	-	To Be Studied
433	Building	604.5	598.1	6.4	613.9	-9.4	618.4	-13.9	-	-	-	-	667.1	-62.6	To Be Studied
434	Tree	591.5	598.4	-6.9	614.2	-22.7	-	-	-	-	-	-	-	-	No Action
435	Utility Pole	591.5	598.6	-7.1	643.2	-51.8	-	-	-	-	-	-	-	-	No Action
436	Tree	589.4	598.6	-9.2	616.8	-27.4	-	-	-	-	-	-	-	-	No Action
438	Tree	616.9	598.8	18.1	614.7	2.2	619.3	-2.4	-	-	-	-	-	-	To Be Studied
440	Tree	598.5	599.0	-0.5	640.6	-42.2	-	-	-	-	-	-	-	-	No Action
441	Tree	589.8	599.2	-9.4	650.5	-60.7	-	-	-	-	-	-	-	-	No Action
442	Tree	621.1	599.5	21.7	619.0	2.1	-	-	-	-	-	-	-	-	To Be Studied
443	Utility Pole	599.6	599.7	-0.1	615.8	-16.2	620.6	-21.0	-	-	-	-	-	-	No Action
445	Billboard	592.1	600.0	-7.9	616.3	-24.1	621.1	-29.0	-	-	-	-	-	-	No Action
450	Utility Pole	602.4	601.3	1.1	617.9	-15.4	623.0	-20.6	-	-	623.0	-20.6	672.2	-69.7	To Be Studied
453	Utility Pole	602.2	601.6	0.6	644.0	-41.8	-	-	-	-	-	-	-	-	To Be Studied
454	Tree	594.4	601.8	-7.4	618.5	-24.1	623.7	-29.3	-	-	623.7	-29.3	672.9	-78.5	No Action
455	Tree	608.6	601.8	6.8	628.5	-19.8	-	-	-	-	-	-	-	-	To Be Studied
456	Tree	593.9	602.0	-8.1	618.7	-24.8	-	-	-	-	-	-	-	-	No Action
457	Tree	603.5	602.6	0.8	621.5	-18.0	-	-	-	-	-	-	-	-	To Be Studied
459	Tree	616.4	602.7	13.7	619.6	-3.2	-	-	-	-	-	-	-	-	To Be Studied
460	Tree	593.7	602.7	-9.0	619.6	-25.9	625.0	-31.3	-	-	-	-	674.3	-80.6	No Action
461	Tree	619.9	603.0	16.9	620.0	-0.1	-	-	-	-	-	-	-	-	To Be Studied
462	Tree	602.7	603.0	-0.3	649.1	-46.5	-	-	-	-	-	-	-	-	No Action
464	Utility Pole	595.2	603.2	-8.0	643.1	-47.9	-	-	-	-	-	-	-	-	No Action
465	Tree	598.8	603.3	-4.5	620.3	-21.6	625.9	-27.1	-	-	-	-	-	-	No Action
468	Tree	615.5	603.5	12.0	620.6	-5.1	626.2	-10.7	-	-	-	-	-	-	To Be Studied
470	Pole Light	596.9	603.6	-6.7	620.8	-23.9	626.4	-29.5	-	-	626.4	-29.5	675.8	-79.0	No Action
471	Tree	594.8	603.7	-8.8	633.8	-39.0	-	-	-	-	-	-	-	-	No Action
472	Tree	626.5	603.7	22.8	639.7	-13.2	-	-	-	-	-	-	-	-	To Be Studied
473	Utility Pole	605.5	603.8	1.8	630.9	-25.3	-	-	-	-	-	-	-	-	To Be Studied
474	Tree	603.5	603.8	-0.3	621.0	-17.6	626.7	-23.2	-	-	-	-	-	-	No Action
475	Utility Pole	596.7	603.8	-7.1	621.1	-24.3	626.8	-30.0	643.0	-46.2	626.8	-30.0	676.2	-79.5	No Action
476	Tree	625.7	603.9	21.9	621.1	4.7	-	-	-	-	-	-	-	-	To Be Studied
478	Tree	594.6	604.1	-9.4	621.3	-26.7	-	-	-	-	-	-	-	-	No Action
480	Tree	597.2	604.2	-7.0	621.5	-24.3	627.3	-30.1	-	-	-	-	-	-	No Action
482	Tree	631.9	604.3	27.5	635.2	-3.3	-	-	-	-	-	-	-	-	To Be Studied
484	Tree	624.9	604.4	20.5	621.8	3.1	-	-	-	-	-	-	-	-	To Be Studied
485	Pole Light	602.6	604.5	-1.9	621.9	-19.2	627.7	-25.1	-	-	-	-	-	-	No Action
486	Tree	596.9	604.5	-7.6	621.9	-25.0	-	-	-	-	-	-	-	-	No Action
487	Tree	639.9	604.6	35.3	621.9	17.9	627.8	12.1	-	-	-	-	-	-	To Be Studied
488	Pole Light	597.8	604.6	-6.8	622.0	-24.2	-	-	-	-	-	-	-	-	No Action
490	Tree	636.7	604.8	31.9	642.2	-5.5	-	-	-	-	-	-	-	-	To Be Studied
492	Tree	622.7	604.8	17.9	622.3	0.4	628.2	-5.5	-	-	-	-	-	-	To Be Studied
493	Pole Light	595.0	604.9	-9.9	622.3	-27.3	628.2	-33.3	-	-	628.2	-33.3	677.8	-82.8	No Action
494	Tree	612.5	604.9	7.6	622.4	-9.9	-	-	-	-	-	-	-	-	To Be Studied
496	Utility Pole	610.0	605.0	5.0	622.5	-12.5	628.4	-18.5	644.9	-34.9	628.4	-18.5	678.0	-68.1	To Be Studied
497	Tree	624.2	605.2	19.1	622.7	1.5	628.7	-4.4	-	-	-	-	-	-	To Be Studied
499	Tree	619.7	605.4	14.4	623.0	-3.2	629.0	-9.3	-	-	-	-	-	-	To Be Studied
501	Tree	597.9	605.4	-7.5	631.0	-33.0	-	-	-	-	-	-	-	-	No Action
503	Tree	614.9	605.5	9.5	623.1	-8.1	-	-	-	-	-	-	-	-	To Be Studied
506	Tree	630.2	605.6	24.7	638.0	-7.7	-	-	-	-	-	-	-	-	To Be Studied
507	Pole Light	601.7	605.7	-4.0	623.4	-21.7	629.5	-27.8	-	-	629.5	-27.8	679.2	-77.5	No Action
508	Tree	616.4	605.8	10.6	623.5	-7.1	629.7	-13.2	-	-	-	-	-	-	To Be Studied
509	Tree	605.7	605.9	-0.1	623.6	-17.9	-	-	-	-	-	-	-	-	No Action
511	Utility Pole	609.8	606.0	3.8	623.8	-14.0	-	-	-	-	-	-	-	-	To Be Studied
512	Utility Pole	617.2	606.0	11.2	623.8	-6.6	630.0	-12.7	-	-	630.0	-12.7	679.7	-62.5	To Be Studied
513	Utility Pole	605.4	606.2	-0.9	624.0	-18.7	-	-	-	-	-	-	-	-	No Action
514	Tree	600.6	606.3	-5.7	637.7	-37.2	-	-	-	-	-	-	-	-	No Action
515	Tree	607.0	606.5	0.5	624.4	-17.4	-	-	-	-	-	-	-	-	To Be Studied
517	Tree	632.5	606.6	26.0	640.2	-7.7	-	-	-	-	-	-	-	-	To Be Studied
518	Tree	616.1	606.6	9.5	624.5	-8.4	-	-	-	-	-	-	-	-	To Be Studied
519	Tree	631.5	606.6	24.9	624.5	6.9	-	-	-	-	-	-	-	-	To Be Studied
520	Pole Light	608.8	606.6	2.2	624.5	-15.7	630.8	-22.0	-	-	-	-	680.7	-71.9	To Be Studied
524	Utility Pole	627.1	607.1	20.0	625.1	2.0	631.5	-4.4	-	-	631.5	-4.4	681.4	-54.3	To Be Studied
525	Utility Pole	607.5	607.1	0.4	625.1	-17.6	-	-	-	-	-	-	-	-	To Be Studied
526	Pole Light	603.9	607.2	-3.4	626.7	-22.8	-	-	-	-	-	-	-	-	No Action
527	Pole Light	613.7	607.3	6.4	625.4	-11.7	631.8	-18.2	-	-	-	-	-	-	To Be Studied
528	Tree	618.8	607.5	11.2	643.1	-24.3	-	-	-	-	-	-	-	-	To Be Studied
529	Tree	599.9	607.6	-7.7	625.7	-25.8	632.2	-32.3	-	-	632.2	-32.3	682.2	-82.3	No Action
530	Tree	601.6	607.7	-6.0	625.9	-24.2	632.4	-30.7	-	-	632.4	-30.7	682.3	-80.7	No Action
531	Tree	606.0	607.7	-1.7	625.9	-19.9	632.4	-26.4	-	-	632.4	-26.4	682.4	-76.4	No Action
532	Tree	603.6	607.9	-4.2	626.1	-22.4	632.6	-29.0	-	-	632.6	-29.0	682.6	-79.0	No Action
533	Utility Pole	636.7	608.2	28.5	626.5	10.2	633.1	3.5	-	-	-	-	-	-	To Be Studied
534	Utility Pole	608.7	608.4	0.3	626.7	-18.0	633.4	-24.7	-	-	-	-	-	-	To Be Studied
537	Tree	608.3	608.5	-0.2	626.9	-18.6	633.6	-25.3	650.7	-42.4	633.6	-25.3	683.7	-75.3	No Action
538	Utility Pole	634.0	608.6	25.5	627.0	7.1	-	-	-	-	-	-	-	-	To Be Studied
539	Tree	604.4	608.6	-4.2	643.7	-39.4	-	-	-	-	-	-	-	-	No Action
540	Tree	602.6	608.7	-6.1	627.2	-24.5	-	-	-	-	-	-	-	-	No Action
541	Billboard	606.5	608.8	-2.3	627.3	-20.8	634.1	-27.6	-	-	-	-	684.2	-77.6	No Action
542	Building	602.6	608.8	-6.2	627.3	-24.6	-	-	-	-	-	-	-	-	No Action
544	Billboard	606.3	609.0	-2.7	627.5	-21.2	634.4	-28.0	-	-	-	-	684.5	-78.1	No Action
546	Tree	600.9	609.2	-8.3	641.7	-40.8	-	-	-	-	-	-	-	-	No Action
549	Tree	617.3	609.5	7.9	628.1	-10.8	-	-	-	-	-	-	-	-	To Be Studied
551	Building	608.9	609.6	-0.8	628.3	-19.5	635.3	-26.4	-	-	635.3	-26.4	685.5	-76.6	No Action
552	Tree	600.9	609.7	-8.7	640.3	-39.4	-	-	-	-	-	-	-	-	No Action
554	Pole Light	609.2	610.1	-0.9	628.9	-19.7	-	-	-	-	-	-	-	-	No Action
555	Tree	630.1	610.2	19.9	628.9	1.1	-	-	-	-	-	-	-	-	To Be Studied
556	Tree	600.6	610.2	-9.6	636.8	-36.1	-	-	-	-	-	-	-	-	No Action
557	Building	606.1	610.3	-4.3	629.1	-23.1	636.3	-30.2	-	-	-	-	-	-	No Action
559	Tree	618.6	610.6	8.0	629.5	-10.9	636.7	-18.1	-	-	-	-	687.0	-68.4	To Be Studied
560	Tree	603.0	610.7	-7.7	636.1	-33.1	-	-	-	-	-	-	-	-	No Action
561	Tree	620.8	610.8	10.0	629.8	-9.0	-	-	-	-	-	-	-	-	To Be Studied
562	Building	604.1	610.9	-6.8	629.9	-25.8	637.1	-33.0	-	-	637.1	-33.0	687.5	-83.4	No Action
563	Tree	606.1	611.6	-5.5	630.7	-24.6	-	-	-	-	-	-	-	-	No Action
564	Building	606.7	611.7	-5.0	630.9	-24.2	-	-	-	-	-	-	-	-	No Action
565	Building	607.3	611.8	-4.4	631.0	-23.6	-	-	-	-	-	-	-	-	No Action
566	Building	608.8	-	-	651.0	-42.2	-	-	-	-	-	-	-	-	No Action
567	Tree	620.2	611.9	8.4	631.1	-10.9	638.6	-18.3	-	-	-	-	689.0	-68.8	To Be Studied
572	Tree	608.3	612.3	-4.1	631.7	-23.4	639.2	-31.0	-	-	-	-	689.8	-81.5	No Action
573	Road Sign	607.0	612.4	-5.5	631.8	-24.8	-	-	-	-	-	-	-	-	No Action
575	Tree	645.6	612.7	32.8	632.2	13.4	639.8	5.7	-	-	-	-	-	-	To Be Studied
576	Building	609.0	612.9	-3.9	632.4	-23.4	-	-	-	-	-	-	-	-	No Action
577	Pole Light	610.9	612.9	-2.1	632.4	-21.6	-	-	-	-	-	-	-	-	No Action
578	Tree	613.8	613.0	0.8	632.5	-18.7	-	-	-	-	-	-	-	-	To Be Studied
579	Utility Pole	625.1	613.0	12.1	632.5	-7.4	640.2	-15.1	-	-	-	-	-	-	To Be Studied
581	Building	606.5	613.4	-7.0	633.1	-26.6	640.9	-34.4	-	-	-	-	-	-	No Action
583	Tree	612.0	613.6	-1.7	633.3	-21.3	641.1	-29.2	-	-	-	-	-	-	No Action
584	Tree	649.1	613.7	35.3	633.4	15.6	-	-	-	-	-	-	-	-	To Be Studied
586	Tree	641.7	613.8	27.9	633.6	8.2	-	-	-	-	-	-	-	-	To Be Studied
589	Tree	610.7	614.1	-3.4	633.8	-23.1	641.8	-31.1	-	-	-	-	-	-	No Action
590	Tree	605.7	614.1	-8.4	633.8	-28.1	641.8	-36.1	660.0	-54.3	641.8	-36.1	692.5	-86.8	No Action
592	Building	605.1	614.1	-9.0	633.9	-28.8	641.8	-36.8	-	-	-	-	692.6	-87.5	No Action
596	Tree	614.2	614.5	-0.3	634.3	-20.1	642.4	-28.2	-	-	-	-	-	-	No Action
597	Building	610.2	614.5	-4.4	634.4	-24.2	-	-	-	-	-	-	-	-	No Action

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-11-29(2) - 11-29 Inner P77 (3)
LAYOUT: 11-29 Inner (1)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:40 AM
XREF DWG:

0 1 2 THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

wsp

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport St. Louis, Missouri

Runway 11/29 Obstruction Tables Inner Portion (Existing/Future)

SCALE AS NOTED | JOB NO. 20042701.00 | DATE 2/2023 | SHEET 39 OF 59 SHEETS

Runway 29 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Surface Elevation (MSL)	TERPS Penetration/ Clearance (ft)	Disposition
600	Tree	609.6	615.0	-5.4	635.0	-25.4	643.1	-33.5	661.5	-51.9	643.1	-33.5	694.0	-84.4	No Action
601	Building	611.1	-	-	645.5	-34.4	-	-	-	-	-	-	-	-	No Action
603	Tree	615.7	615.1	0.6	635.2	-19.5	643.3	-27.6	-	-	-	-	-	-	To Be Studied
604	Tree	612.2	615.6	-3.5	635.8	-23.6	644.1	-31.9	-	-	-	-	-	-	No Action
605	Tree	659.7	615.7	44.0	635.9	23.8	644.2	15.5	-	-	-	-	-	-	To Be Studied
606	Building	607.1	615.7	-8.6	635.9	-28.8	644.2	-37.1	-	-	-	-	-	-	No Action
607	Pole Light	609.1	615.9	-6.8	636.2	-27.1	-	-	-	-	-	-	-	-	No Action
608	Tree	614.8	616.4	-1.6	636.7	-21.9	645.2	-30.4	-	-	-	-	-	-	No Action
611	Tree	643.5	616.6	26.9	637.0	6.5	-	-	-	-	-	-	-	-	To Be Studied
612	Tree	628.5	616.6	11.9	637.0	-8.5	645.5	-17.0	-	-	645.5	-17.0	696.6	-68.1	To Be Studied
614	Utility Pole	617.4	616.8	0.6	637.3	-19.9	645.8	-28.4	-	-	-	-	696.9	-79.5	To Be Studied
615	Tree	630.7	616.8	13.9	637.3	-6.5	645.8	-15.1	-	-	-	-	696.9	-66.2	To Be Studied
616	Building	610.7	616.9	-6.2	637.3	-26.6	-	-	-	-	-	-	-	-	No Action
617	Tree	645.8	-	-	646.0	-0.1	-	-	-	-	-	-	-	-	No Action
619	Tree	649.3	617.1	32.2	637.7	11.7	-	-	-	-	-	-	-	-	To Be Studied
620	Tree	609.6	617.1	-7.5	637.7	-28.0	646.3	-36.6	-	-	-	-	-	-	No Action
622	Tree	653.1	617.3	35.8	637.9	15.2	646.5	6.5	-	-	-	-	-	-	To Be Studied
624	Tree	638.2	617.4	20.8	638.1	0.1	-	-	-	-	-	-	-	-	To Be Studied
625	Tree	608.8	617.5	-8.7	638.2	-29.3	646.8	-38.0	-	-	-	-	-	-	No Action
626	Tree	662.6	617.7	44.9	638.4	24.2	-	-	-	-	-	-	-	-	To Be Studied
628	Building	609.0	617.8	-8.8	638.5	-29.5	647.3	-38.3	666.2	-57.2	647.3	-38.3	698.5	-89.5	No Action
629	Building	609.9	617.8	-7.9	638.5	-28.6	647.3	-37.3	-	-	-	-	-	-	No Action
630	Tree	641.1	618.0	23.1	638.8	2.3	-	-	-	-	-	-	-	-	To Be Studied
631	Tree	611.9	618.2	-6.3	639.0	-27.1	-	-	-	-	-	-	-	-	No Action
632	Tree	640.7	618.2	22.5	639.0	1.7	647.9	-7.2	-	-	-	-	-	-	To Be Studied
633	Tree	639.1	-	-	646.1	-6.9	-	-	-	-	-	-	-	-	No Action
634	Tree	622.9	618.3	4.6	639.2	-16.2	648.1	-25.1	667.1	-44.2	648.1	-25.1	699.4	-76.4	To Be Studied
635	Tree	648.2	-	-	660.8	-12.6	-	-	-	-	-	-	-	-	No Action
637	Tree	646.4	618.5	28.0	639.4	7.1	648.3	-1.8	667.4	-20.9	648.3	-1.8	699.6	-53.2	To Be Studied
639	Tree	611.2	618.6	-7.4	639.5	-28.3	648.5	-37.3	-	-	-	-	699.8	-88.6	No Action
640	Tree	618.0	618.7	-0.7	639.6	-21.6	648.5	-30.6	667.6	-49.7	648.5	-30.6	699.9	-81.9	No Action
641	Tree	622.3	618.7	3.6	639.6	-17.3	648.6	-26.3	667.7	-45.4	648.6	-26.3	699.9	-77.6	To Be Studied
642	Tree	657.1	618.7	38.5	639.6	17.5	-	-	-	-	-	-	-	-	To Be Studied
643	Tree	626.2	618.7	7.5	639.7	-13.5	648.6	-22.4	-	-	648.6	-22.4	700.0	-73.8	To Be Studied
644	Tree	644.5	618.7	25.8	639.7	4.9	648.6	-4.1	-	-	-	-	-	-	To Be Studied
645	Tree	643.6	618.8	24.9	639.7	3.9	-	-	-	-	-	-	-	-	To Be Studied
646	Tree	644.3	-	-	647.1	-2.8	-	-	-	-	-	-	-	-	No Action
647	Tree	643.9	618.9	25.0	639.9	4.0	648.9	-5.0	668.1	-24.2	648.9	-5.0	700.3	-56.4	To Be Studied
648	Tree	663.1	619.0	44.1	640.0	23.1	-	-	-	-	-	-	-	-	To Be Studied
649	Tree	620.3	619.1	1.2	640.1	-19.8	649.2	-28.8	-	-	649.2	-28.8	700.5	-80.2	To Be Studied
651	Tree	646.3	619.4	26.9	640.5	5.8	649.6	-3.3	668.8	-22.6	649.6	-3.3	701.0	-54.8	To Be Studied
652	Tree	638.6	619.4	19.2	640.5	-1.9	649.6	-11.0	-	-	-	-	701.1	-62.4	To Be Studied
653	Tree	675.9	619.4	56.4	640.6	35.3	-	-	-	-	-	-	-	-	To Be Studied
655	Tree	615.9	619.5	-3.6	640.6	-24.7	649.8	-33.8	669.1	-53.1	649.8	-33.8	701.2	-85.3	No Action
656	Road Sign	614.2	619.5	-5.3	640.7	-26.5	649.8	-35.6	-	-	-	-	-	-	No Action
657	Tree	633.0	619.6	13.4	640.8	-7.7	-	-	-	-	-	-	-	-	To Be Studied
658	Tree	628.4	619.7	8.8	640.8	-12.4	650.0	-21.6	-	-	-	-	701.5	-73.0	To Be Studied
659	Tree	628.1	619.7	8.4	640.9	-12.8	-	-	-	-	-	-	-	-	To Be Studied
661	Tree	654.2	619.8	34.4	641.0	13.2	-	-	-	-	-	-	-	-	To Be Studied
662	Tree	616.6	619.8	-3.1	641.0	-24.4	650.2	-33.6	-	-	-	-	-	-	No Action
663	Tree	654.6	619.9	34.8	641.1	13.5	-	-	-	-	-	-	-	-	To Be Studied
664	Tree	632.5	620.0	12.5	641.2	-8.7	650.5	-18.0	669.8	-37.3	650.5	-18.0	702.0	-69.5	To Be Studied
665	Tree	649.3	620.0	29.4	641.2	8.1	-	-	-	-	-	-	-	-	To Be Studied
666	Tree	614.7	620.0	-5.3	641.2	-26.6	650.5	-35.8	-	-	-	-	702.0	-87.3	No Action
667	Tree	617.4	620.0	-2.6	641.3	-23.9	650.5	-33.1	-	-	-	-	-	-	No Action
668	Tree	629.8	620.1	9.7	641.4	-11.6	650.7	-20.8	670.1	-40.2	650.7	-20.8	702.2	-72.4	To Be Studied
669	Tree	636.9	620.1	16.8	641.4	-4.5	650.7	-13.7	670.1	-33.1	650.7	-13.7	702.2	-65.3	To Be Studied
671	Tree	640.2	-	-	641.9	-1.7	-	-	-	-	-	-	-	-	No Action
672	Tree	617.9	620.2	-2.3	641.6	-23.6	-	-	-	-	-	-	-	-	No Action
673	Tree	654.1	620.2	33.8	641.6	12.5	-	-	-	-	-	-	-	-	To Be Studied
674	Tree	611.9	620.3	-8.4	641.6	-29.7	650.9	-39.0	670.4	-58.4	650.9	-39.0	702.5	-90.5	No Action
675	Tree	649.1	620.3	28.9	641.6	7.5	-	-	-	-	-	-	-	-	To Be Studied
676	Tree	658.5	620.3	38.1	641.7	16.8	-	-	-	-	-	-	-	-	To Be Studied
677	Building	610.4	620.3	-9.9	641.7	-31.3	651.0	-40.6	-	-	651.0	-40.6	702.6	-92.1	No Action
678	Tree	618.2	620.4	-2.2	641.8	-23.6	-	-	-	-	-	-	-	-	No Action
679	Utility Pole	615.1	620.4	-5.3	641.8	-26.7	651.2	-36.0	-	-	-	-	702.7	-87.6	No Action
680	Tree	618.7	620.6	-1.9	642.0	-23.3	651.4	-32.7	670.8	-52.2	651.4	-32.7	702.9	-84.3	No Action
681	Tree	613.1	620.7	-7.5	642.1	-28.9	651.5	-38.3	-	-	-	-	703.1	-89.9	No Action
682	Tree	620.1	620.7	-0.5	642.1	-22.0	-	-	-	-	-	-	-	-	No Action
683	Tree	653.8	620.7	33.2	642.1	11.7	-	-	-	-	-	-	-	-	To Be Studied
686	Tree	619.8	620.8	-1.0	642.3	-22.4	-	-	-	-	-	-	-	-	No Action
687	Tree	643.6	620.8	22.8	642.3	1.3	-	-	-	-	-	-	-	-	To Be Studied
688	Building	616.2	620.9	-4.6	642.3	-26.1	651.8	-35.6	671.3	-55.1	651.8	-35.6	703.4	-87.2	No Action
690	Tree	616.6	621.0	-4.4	642.5	-25.9	651.9	-35.4	671.5	-54.9	651.9	-35.4	703.6	-87.0	No Action
691	Tree	634.0	621.0	13.0	642.5	-8.5	652.0	-17.9	671.5	-37.5	652.0	-17.9	703.6	-69.6	To Be Studied
692	Tree	633.6	621.0	12.7	642.5	-8.9	-	-	-	-	-	-	-	-	To Be Studied
693	Tree	640.3	-	-	651.4	-11.0	-	-	-	-	-	-	-	-	No Action
694	Utility Pole	615.7	621.3	-5.6	642.8	-27.2	652.4	-36.7	-	-	-	-	704.0	-88.4	No Action
697	Tree	615.0	621.6	-6.6	643.3	-28.3	652.9	-37.9	672.6	-57.6	652.9	-37.9	704.6	-89.6	No Action
698	Tree	623.2	621.7	1.5	643.4	-20.2	653.0	-29.8	-	-	653.0	-29.8	704.7	-81.5	To Be Studied
699	Tree	613.5	621.7	-8.3	643.4	-30.0	-	-	-	-	-	-	-	-	No Action
701	Tree	659.9	-	-	644.0	15.9	-	-	-	-	-	-	-	-	To Be Studied
702	Tree	614.3	622.0	-7.7	643.7	-29.5	-	-	-	-	-	-	-	-	No Action
703	Tree	620.2	622.2	-1.9	644.0	-23.8	653.7	-33.5	673.5	-53.3	653.7	-33.5	705.5	-85.3	No Action
704	Tree	631.1	622.2	8.9	644.1	-12.9	653.8	-22.7	-	-	-	-	705.6	-74.5	To Be Studied
705	Tree	613.3	622.3	-9.0	644.1	-30.8	-	-	-	-	-	-	-	-	No Action
707	Utility Pole	616.9	622.3	-5.4	644.1	-27.3	653.9	-37.0	673.7	-56.8	653.9	-37.0	705.7	-88.8	No Action
708	Tree	614.7	622.4	-7.7	644.2	-29.5	654.0	-39.3	-	-	654.0	-39.3	705.8	-91.1	No Action
709	Tree	628.3	622.5	5.8	644.4	-16.0	654.1	-25.8	-	-	-	-	706.0	-77.7	To Be Studied
710	Tree	635.6	622.5	13.1	644.4	-8.7	654.2	-18.5	-	-	-	-	-	-	To Be Studied
711	Tree	633.7	622.6	11.2	644.5	-10.7	654.3	-20.5	-	-	-	-	706.1	-72.4	To Be Studied
712	Tree	649.8	-	-	658.7	-8.9	-	-	-	-	-	-	-	-	No Action
713	Antenna	622.0	622.7	-0.7	644.6	-22.7	654.5	-32.5	674.4	-52.4	654.5	-32.5	706.3	-84.3	No Action
714	Tree	615.9	622.7	-6.9	644.7	-28.8	-	-	-	-	-	-	-	-	No Action
715	Tree	648.7	622.8	25.9	644.7	3.9	654.6	-5.9	-	-	-	-	-	-	To Be Studied
716	Tree	620.9	622.8	-1.9	644.8	-23.9	654.7	-33.8	-	-	-	-	706.6	-85.6	No Action
717	Tree	642.6	622.9	19.7	644.8	-2.3	654.7	-12.2	-	-	-	-	706.6	-64.0	To Be Studied
718	Pole Light	620.4	622.9	-2.4	644.9	-24.4	-	-	-	-	-	-	-	-	No Action
719	Tree	639.7	622.9	16.8	644.9	-5.2	654.8	-15.0	-	-	-	-	706.7	-66.9	To Be Studied
721	Tree	641.1	-	-	651.2	-10.1	-	-	-	-	-	-	-	-	No Action
722	Tree	626.5	623.2	3.3	645.3	-18.8	655.3	-28.8	-	-	-	-	707.2	-80.7	To Be Studied
723	Tree	647.9	623.2	24.7	645.3	2.6	655.3	-7.3	-	-	-	-	707.2	-59.3	To Be Studied
724	Tree	630.2	623.2	6.9	645.3	-15.1	655.3	-25.1	675.3	-45.1	655.3	-25.1	707.2	-77.0	To Be Studied
725	Tree	648.9	623.3	25.5	645.4	3.4	655.4	-6.5	-	-	-	-	-	-	To Be Studied
727	Tree	652.2	623.4	28.8	645.5	6.7	655.5	-3.3	-	-	-	-	-	-	To Be Studied
729	Billboard	641.3	623.5	17.8	645.7	-4.4	655.7	-14.4	-	-	655.7	-14.4	707.7	-66.3	To Be Studied
731	Tree	637.5	623.7	13.8	645.9	-8.4	-	-	-	-	-	-	-	-	To Be Studied
732	Tree	631.7	623.7	7.9	645.9	-14.3	656.0	-24.3	-	-	-	-	-	-	To Be Studied
733	Tree	647.5	623.7	23.7	645.9	1.5	-	-	-	-	-	-	-	-	To Be Studied
734	Tree	647.3	624.1	23.2	646.3	1.0	-	-	-	-	-	-	-	-	To Be Studied
735	Tree	639.3	624.1	15.2	646.4	-7.1	656.6	-17.2	676.7	-37.4	656.6	-17.2	708.6	-69.2	To Be Studied
736	Building	616.7	624.2	-7.5	646.5	-29.8	656.6	-40.0	676.8	-60.2	656.6	-40.0	708.7	-92.0	No Action
738	Utility Pole	631.3	624.2	7.1	646.6	-15.2	-	-	-	-	-	-	-	-	To Be Studied
739	Tree	636.2	624.3	11.9	646.6	-10.4	-	-	-	-	-	-	-	-	To Be Studied
740	Tree	640.5	624.3	16.2	646.6	-6.1	656.8	-16.3	677.0	-36.5	656.8	-16.3	708.9	-68.4	To Be Studied
741	Tree	637.7	624.3	13.3	646.7	-9.0	656.9	-19.2	677.1	-39.5	656.9	-19.2	709.0	-71.3	To Be Studied
743	Building	619.1	624.5	-5.4	646.9	-27.8	-	-	-	-	-	-	-	-	No Action
744	Tree	616.0	624.5	-8.5	646.9	-30.9	657.2	-41.2	-	-	-	-	-	-	No Action
746	Tree	655.7	-	-	670.2	-14.5	-	-	-	-	-	-	-	-	No Action
747	Tree	639.9	624.7	15.2	647.2	-7.3	657.5	-17.5	677.8	-37.9	657.5	-17.5	709.6	-69.7	To Be Studied
748	Tree	654.0	624.8	29.2	647.2	6.7	-	-	-	-	-	-	-	-	To Be Studied
749	Pole Light	628.9	624.9	4.0	647.4	-18.5	657.7	-28.8	-	-	657.7	-28.8	709.9	-81.0	To Be Studied
750	Pole Light	650.5	625.0	25.5	647.5	2.9	657.9	-7.4	-	-	-	-	-	-	To Be Studied
751	Tree	644.9	625.1	19.8	647.7	-2.7	-	-	-	-	-	-	-	-	To Be Studied
752	Tree	649.4	625.2	24.2	647.8	1.7	-	-	-	-	-	-	-	-	To Be Studied
753	Tree	638.4	625.2	13.2	647.8	-9.4	658.2	-19.8	678.6	-40.2	658.2	-19.8	710.4	-72.0	To Be Studied
754	Utility Pole	621.5	625.3	-3.8	647.9	-26.4	658.3	-36.8	678.7	-57.2	658.3	-36.8	710.4	-88.9	No Action
756	Tree	655.0	-	-	657.8	-2.8	-	-	-	-	-	-	-	-	No Action
757	Tree	667.0	-	-	679.3	-12.2	-	-	-	-	-	-	-	-	No Action
758	Tree	644.5	-	-	648.2	-3.7	-	-	-	-	-	-	-	-	No Action
759	Building	621.1	625.5	-4.4	648.2	-27.1	658.6	-37.5	679.1	-58.0	658.6	-37.5	710.9	-89.8	No Action
760	Utility Pole	621.8	625.6	-3.9	648.3	-26.5	658.8	-37.0	679.2	-57.5	658.8	-37.0	711.0	-89.2	No Action
761	Tree	653.6	625.7	27.9	648.4	5.2	-	-	-	-	-	-	-	-	To Be Studied
762	Building	619.4	625.7	-6.4	648.4	-29.1	-	-	-	-	-	-	-	-	No Action
763	Tree	640.1	625.8	14.3	648.5	-8.4	-	-	-	-	-	-	-	-	To Be Studied
764	Tree	670.5	-	-	681.4	-10.9	-	-	-	-	-	-	-	-	No Action
765	Tree	648.6	-	-	648.7	-0.1	-	-	-	-	-	-	-	-	No Action
766	Tree	671.0	626.0	45.0	648.8	22.2	-	-	-	-	-	-	-	-	To Be Studied
767	Tree	672.9	-	-	666.2	6.7	-	-	-	-	-	-	-	-	To Be Studied
768	Pole Light	649.1	626.3	22.8	649.1	0.0	659.8	-10.7	-	-	659.8	-10.7	712.1	-63.0	To Be Studied
769	Tree	669.2	-	-	676.4	-7.1	-	-	-	-	-	-	-	-	No Action
770	Tree	659.8	-	-	655.1	4.7	-	-	-	-	-	-	-	-	To Be Studied
772	Tree	667.2	626.6	40.7	649.5	17.8	-	-	-	-	-	-	-	-	To Be Studied
773	Tree	665.6	626.7	38.9	649.7	15.9	-	-	-	-	-	-	-	-	To Be Studied
774	Tree	617.8	626.8	-9.0	649.7	-32.0	660.5	-42.7	681.2	-63.4	660.5	-42.7	712.9	-95.1	No Action
775	Utility Pole	620.7	626.8	-6.1	649.8	-29.1	660.5	-39.8	681.2	-60.5	660.5	-39.8	712.9	-92.2	No Action
776	Tree	669.5	-	-	670.2	-0.7	-	-	-	-	-	-	-	-	No Action
777	Tree	662.2	-	-	659.5	2.7	-	-	-	-	-	-	-	-	To Be Studied
779	Utility Pole	635.5	627.2	8.3	650.3	-14.8	661.2	-25.6	-	-	-	-	-	-	To Be Studied
780	Tree	654.2	-	-	650.3	3.8	-	-	-	-	-	-	-	-	To Be Studied
781	Pole Light	651.6	627.3	24.3	650.4	1.2	661.3	-9.7	-	-	-	-	713.7	-62.1	To Be Studied
782	Tree	617.5	627.3	-9.8	650.4	-32.9	661.3	-43.8	682.1	-64.6	661.3	-43.8	713.7	-96.2	No Action
783	Tree	658.1	627.4	30.7	650.5	7.6	-	-	-	-	-	-	-	-	To Be Studied
786	Tree	664.9	627.6	37.4	650.7	14.2	-	-	-	-	-	-	-	-	To Be Studied
788	Tree	628.1	627.6	0.5	650.8	-22.7	661.7	-33.6	682.6	-54.5	661.7	-33.6	714.2	-86.1	To Be Studied
789	Tree	659.0	-	-	654.0	4.9	-	-	-	-	-	-	-	-	To Be Studied
790	Tree	682.4	627.7	54.7	650.9	31.5	-	-	-	-	-	-	-	-	To Be Studied
791	Tree	687.0	627.8	59.2	651.0	36.0	-	-	-	-	-	-	-	-	To Be Studied
792	Tree	618.6	627.9	-9.2	651.1	-32.5	662.1	-43.4	-	-	-	-	714.6	-95.9	No Action
794	Tree	624.2	627.9	-3.8	651.2	-27.0	662.2	-38.0	683.1	-58.9	662.2	-38.0	714.7	-90.5	No Action
795	Tree	684.5	628.0	56.6	651.2	33.3	-	-	-	-	-	-	-	-	To Be Studied
796	Tree	660.3	-	-	658.2	2.1	-	-	-	-	-	-	-	-	To Be Studied
797	Utility Pole	627.1	628.1	-1.0	651.4	-24.3	662.4	-35.3	-	-	662.4	-35.3	714.9	-87.8	No Action
798	Tree	625.1	628.1	-3.0	651.4	-26.3	662.5	-37.4	683.5	-58.3	662.5	-37.4	715.0	-89.9	No Action
799	Tree	647.1	-	-	651.5	-4.4	-	-	-	-	-	-	-	-	No Action
800	Tree	684.6	-	-	690.1	-5.5	-	-	-	-	-	-	-	-	No Action
801	Building	619.1	628.3	-9.2	651.6	-32.5	-	-	-	-	-	-	-	-	No Action
802	Tree	672.5	628.3	44.2	651.6	20.9	-	-	-	-	-	-	-	-	To Be Studied
803	Tree	621.4	628.5	-7.0	651.8	-30.4	662.9	-41.5	684.0	-62.5	662.9	-41.5	715.5	-94.1	No Action
804	Tree	674.2	-	-	652.0	22.2	-	-	-	-	-	-	-	-	To Be Studied
805	Pole Light	653.6	628.7	24.9	652.1	1.5	663.3	-9.7	-	-	663.3	-9.7	715.9	-62.3	To Be Studied
806	Tree	678.2	628.7	49.5	652.1	26.0	-	-	-	-	-	-	-	-	To Be Studied
807	Tree	678.1	628.7	49.4	652.2	25.9	-	-	-	-	-	-	-	-	To Be Studied
808	Tree	682.7	628.7	53.9	652.2	30.5	-	-	-	-	-	-	-	-	To Be Studied
809	Billboard	625.3	629.0	-3.7	652.5	-27.2	663.7	-38.4	-	-	663.7	-38.4	716.4	-91.1	No Action
810	Tree	679.1	629.3	49.8	652.9	26.1	-	-	-	-	-	-	-	-	To Be Studied
811	Tree	656.3	-	-	653.0	3.3	-	-	-	-	-	-	-	-	To Be Studied
812	Utility Pole	629.0	629.5	-0.5	653.2	-24.2	664.5	-35.5	-	-	664.5	-35.5	717.2	-88.3	No Action
813	Pole Light	653.6	629.6	24.0	653.3	0.3	664.6	-11.1	-	-	664.6	-11.1	717.4	-63.8	To Be Studied
814	Tree	645.6	629.7	15.9	653.4	-7.8	-	-	-	-	-	-	-	-	To Be Studied
815	Tree	670.6	629.8	40.8	653.6	17.0	-	-	-	-	-	-	-	-	To Be Studied
816	Pole Light	636.2	629.9	6.3	653.6	-17.4	665.0	-28.8	-	-	665.0	-28.8	717.8	-81.6	To Be Studied

Runway 29 Inner Approach (Existing)

Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Surface Elevation (MSL)	TERPS Penetration/ Clearance (ft)	Disposition
817	Tree	642.7	629.9	12.8	653.6	-11.0	-	-	-	-	-	-	-	-	To Be Studied
818	Tree	685.9	-	-	700.7	-14.8	-	-	-	-	-	-	-	-	No Action
819	Tree	659.6	630.3	29.3	654.2	5.4	-	-	-	-	-	-	-	-	To Be Studied
821	Utility Pole	644.2	630.4	13.8	654.2	-10.0	665.8	-21.6	-	-	-	-	718.6	-74.4	To Be Studied
822	Tree	660.6	-	-	654.3	6.3	-	-	-	-	-	-	-	-	To Be Studied
823	Tree	666.5	-	-	654.6	11.9	-	-	-	-	-	-	-	-	To Be Studied
824	Pole Light	658.8	630.7	28.1	654.6	4.1	666.2	-7.5	-	-	-	-	719.1	-60.3	To Be Studied
825	Tree	658.0	630.8	27.2	654.8	3.2	-	-	-	-	-	-	-	-	To Be Studied
826	Pole Light	654.6	630.9	23.7	654.9	-0.3	666.5	-11.9	-	-	666.5	-11.9	719.4	-64.8	To Be Studied
827	Tree	662.2	-	-	655.0	7.2	-	-	-	-	-	-	-	-	To Be Studied
828	Building	634.1	-	-	655.0	-20.9	-	-	-	-	-	-	-	-	No Action
829	Building	637.3	631.1	6.2	655.1	-17.9	-	-	-	-	-	-	-	-	To Be Studied
830	Tree	652.3	631.1	21.2	655.1	-2.8	-	-	-	-	-	-	-	-	To Be Studied
832	Building	636.7	631.3	5.4	655.3	-18.7	-	-	-	-	-	-	-	-	To Be Studied
833	Tree	680.6	-	-	655.6	25.0	-	-	-	-	-	-	-	-	To Be Studied
834	Tree	659.2	631.6	27.6	655.7	3.4	-	-	-	-	-	-	-	-	To Be Studied
835	Tree	627.3	631.6	-4.3	655.8	-28.5	667.5	-40.3	-	-	-	-	720.5	-93.3	No Action
837	Tree	650.5	631.6	18.9	655.8	-5.3	-	-	-	-	-	-	-	-	To Be Studied
838	Tree	674.5	-	-	657.0	17.5	-	-	-	-	-	-	-	-	To Be Studied
840	Tree	652.9	631.9	21.0	656.2	-3.2	-	-	-	-	-	-	-	-	To Be Studied
841	Tree	625.4	631.9	-6.6	656.2	-30.8	668.1	-42.7	-	-	-	-	721.1	-95.7	No Action
842	Pole Light	655.5	632.0	23.5	656.3	-0.8	668.1	-12.6	-	-	668.1	-12.6	721.2	-65.7	To Be Studied
843	Tree	669.4	-	-	656.3	13.1	-	-	-	-	-	-	-	-	To Be Studied
844	Building	635.1	-	-	656.5	-21.4	-	-	-	-	-	-	-	-	No Action
845	Tree	661.8	632.2	29.6	656.5	5.2	-	-	-	-	-	-	-	-	To Be Studied
846	Tree	623.7	632.2	-8.5	656.6	-32.9	668.5	-44.8	-	-	-	-	721.6	-97.9	No Action
847	Building	636.3	632.3	4.1	656.6	-20.3	-	-	-	-	-	-	-	-	To Be Studied
848	Pole Light	643.6	632.4	11.2	656.8	-13.2	-	-	-	-	-	-	-	-	To Be Studied
849	Tree	624.7	632.4	-7.8	656.8	-32.2	668.8	-44.1	-	-	668.8	-44.1	721.9	-97.2	No Action
851	Tree	633.7	632.8	0.9	657.2	-23.6	669.3	-35.6	-	-	-	-	722.4	-88.8	To Be Studied
852	Tree	680.0	-	-	657.3	22.7	-	-	-	-	-	-	-	-	To Be Studied
853	Tree	653.8	633.1	20.7	657.6	-3.9	669.8	-16.0	-	-	-	-	-	-	To Be Studied
854	Tree	646.0	-	-	658.1	-12.1	-	-	-	-	-	-	-	-	No Action
855	Tree	626.1	633.3	-7.2	657.9	-31.8	670.1	-44.0	-	-	670.1	-44.0	723.3	-97.2	No Action
856	Tree	658.5	633.3	25.1	658.0	0.5	-	-	-	-	-	-	-	-	To Be Studied
857	Tree	658.6	-	-	658.0	0.6	-	-	-	-	-	-	-	-	To Be Studied
858	Tree	645.6	-	-	658.1	-12.5	-	-	-	-	-	-	-	-	No Action
859	Utility Pole	647.3	633.5	13.8	658.2	-10.8	670.4	-23.1	-	-	670.4	-23.1	723.6	-76.3	To Be Studied
860	Tree	660.0	633.6	26.5	658.2	1.8	-	-	-	-	-	-	-	-	To Be Studied
861	Tree	652.5	633.6	18.8	658.3	-5.8	-	-	-	-	-	-	-	-	To Be Studied
862	Tree	626.7	633.7	-7.0	658.4	-31.7	670.7	-44.0	-	-	670.7	-44.0	723.9	-97.2	No Action
863	Tree	671.4	-	-	666.9	4.5	-	-	-	-	-	-	-	-	To Be Studied
864	Pole Light	638.4	-	-	658.7	-20.3	-	-	-	-	-	-	-	-	No Action
865	Tree	660.8	634.0	26.8	658.7	2.0	-	-	-	-	-	-	-	-	To Be Studied
866	Pole Light	661.5	634.0	27.5	658.8	2.7	671.1	-9.6	-	-	-	-	724.4	-62.9	To Be Studied
867	Pole Light	658.5	634.0	24.5	658.8	-0.3	671.1	-12.6	-	-	671.1	-12.6	724.4	-65.9	To Be Studied
868	Tree	628.3	634.0	-5.8	658.8	-30.6	671.2	-42.9	-	-	671.2	-42.9	724.5	-96.2	No Action
869	Billboard	647.5	634.1	13.3	658.9	-11.5	671.3	-23.8	-	-	671.3	-23.8	724.6	-77.1	To Be Studied
870	Building	630.3	634.2	-3.9	659.0	-28.7	671.4	-41.1	-	-	671.4	-41.1	724.7	-94.4	No Action
871	Tree	660.8	634.2	26.6	659.0	1.8	-	-	-	-	-	-	-	-	To Be Studied
872	Tree	645.8	634.4	11.4	659.3	-13.5	-	-	-	-	-	-	-	-	To Be Studied
873	Tree	634.9	634.4	0.5	659.3	-24.4	671.8	-36.8	694.0	-59.0	671.8	-36.8	725.1	-90.2	To Be Studied
874	Tree	646.4	634.5	11.9	659.4	-13.0	671.8	-25.4	-	-	671.8	-25.4	725.2	-78.7	To Be Studied
875	Tree	626.3	634.6	-8.3	659.5	-33.2	671.9	-45.6	694.2	-67.9	671.9	-45.6	725.3	-99.0	No Action
876	Tree	650.0	634.7	15.4	659.6	-9.6	-	-	-	-	-	-	-	-	To Be Studied
877	Pole Light	647.9	634.8	13.2	659.7	-11.8	672.2	-24.3	694.5	-46.5	672.2	-24.3	725.6	-77.7	To Be Studied
878	Utility Pole	631.9	634.9	-3.0	659.9	-28.1	672.5	-40.6	694.8	-62.9	672.5	-40.6	725.9	-94.0	No Action
879	Tree	654.1	634.9	19.2	659.9	-5.9	-	-	-	-	-	-	-	-	To Be Studied
880	Pole Light	646.0	634.9	11.1	660.0	-13.9	672.5	-26.5	694.8	-48.8	672.5	-26.5	725.9	-79.9	To Be Studied
881	Pole Light	662.0	635.1	26.9	660.2	1.8	672.7	-10.7	-	-	672.7	-10.7	726.2	-64.2	To Be Studied
882	Pole Light	639.7	635.2	4.5	660.3	-20.6	672.9	-33.2	695.2	-55.5	672.9	-33.2	726.3	-86.6	To Be Studied
883	Tree	626.2	635.2	-9.0	660.3	-34.1	672.9	-46.7	695.3	-69.1	672.9	-46.7	726.4	-100.2	No Action
884	Tree	658.5	-	-	660.3	-1.8	-	-	-	-	-	-	-	-	No Action
885	Pole Light	666.4	635.2	31.2	660.3	6.1	-	-	-	-	-	-	-	-	To Be Studied
886	Building	633.8	635.3	-1.5	660.4	-26.6	673.1	-39.2	-	-	673.1	-39.2	726.5	-92.7	No Action
887	Tree	655.1	-	-	660.6	-5.5	-	-	-	-	-	-	-	-	No Action
888	Utility Pole	642.3	635.5	6.8	660.7	-18.4	673.3	-31.0	695.7	-53.4	673.3	-31.0	726.8	-84.5	To Be Studied
890	Utility Pole	630.4	635.6	-5.2	660.8	-30.4	673.5	-43.1	695.9	-65.6	673.5	-43.1	727.0	-96.6	No Action
891	Pole Light	627.2	635.9	-8.7	661.1	-33.9	673.9	-46.7	696.4	-69.2	673.9	-46.7	727.4	-100.2	No Action
892	Tree	650.2	-	-	661.2	-11.0	-	-	-	-	-	-	-	-	No Action
893	Tree	644.5	636.0	8.5	661.3	-16.7	674.0	-29.5	-	-	674.0	-29.5	727.6	-83.1	To Be Studied
894	Pole Light	649.5	636.1	13.4	661.4	-11.9	674.2	-24.7	-	-	674.2	-24.7	727.8	-78.3	To Be Studied
895	Tree	643.2	636.4	6.8	661.8	-18.6	674.7	-31.5	-	-	674.7	-31.5	728.3	-85.1	To Be Studied
896	Pole Light	664.7	636.5	28.1	661.9	2.7	-	-	-	-	-	-	-	-	To Be Studied
897	Utility Pole	658.4	636.7	21.7	662.2	-3.8	675.1	-16.7	697.7	-39.4	675.1	-16.7	728.7	-70.3	To Be Studied
898	Tree	647.3	636.8	10.5	662.3	-15.0	675.2	-27.9	-	-	675.2	-27.9	728.9	-81.6	To Be Studied
899	Building	637.4	636.8	0.6	662.3	-24.9	675.3	-37.8	-	-	-	-	728.9	-91.5	To Be Studied
900	Pole Light	668.7	636.9	31.8	662.4	6.2	675.4	-6.7	-	-	675.4	-6.7	729.1	-60.4	To Be Studied
901	Pole Light	640.3	637.0	3.3	662.6	-22.3	675.6	-35.3	-	-	675.6	-35.3	729.3	-88.9	To Be Studied
902	Billboard	661.3	637.2	24.1	662.8	-1.5	675.8	-14.5	-	-	675.8	-14.5	729.5	-68.2	To Be Studied
903	Tree	648.2	637.2	11.0	662.8	-14.6	675.9	-27.6	-	-	675.9	-27.6	729.6	-81.3	To Be Studied
904	Tree	633.2	637.3	-4.1	662.9	-29.7	675.9	-42.7	-	-	675.9	-42.7	729.6	-96.4	No Action
905	Tree	633.0	637.4	-4.4	663.0	-30.0	676.1	-43.1	-	-	676.1	-43.1	729.8	-96.8	No Action
906	Tree	648.5	637.4	11.1	663.0	-14.6	676.1	-27.6	-	-	676.1	-27.6	729.8	-81.3	To Be Studied
907	Building	656.8	637.5	19.4	663.1	-6.3	676.2	-19.4	699.0	-42.2	676.2	-19.4	729.9	-73.1	To Be Studied
908	Pole Light	636.9	637.6	-0.6	663.2	-26.3	676.3	-39.4	699.2	-62.2	676.3	-39.4	730.1	-93.2	No Action
909	Pole Light	667.6	637.6	30.0	663.2	4.3	676.3	-8.8	-	-	-	-	730.1	-62.5	To Be Studied
910	Utility Pole	660.8	637.7	23.1	663.5	-2.6	676.6	-15.8	-	-	676.6	-15.8	730.4	-69.5	To Be Studied
911	Tree	629.3	637.8	-8.5	663.5	-34.2	676.7	-47.4	-	-	676.7	-47.4	730.4	-101.2	No Action
912	Pole	649.6	637.8	11.8	663.6	-14.0	676.7	-27.1	-	-	-	-	730.5	-80.9	To Be Studied
913	Tree	633.9	637.9	-4.0	663.6	-29.7	676.8	-42.9	-	-	676.8	-42.9	730.6	-96.7	No Action
914	Pole Light	636.9	637.9	-1.0	663.7	-26.8	676.9	-40.0	-	-	676.9	-40.0	730.7	-93.8	No Action
915	Pole Light	639.7	638.0	1.8	663.7	-24.0	676.9	-37.2	699.8	-60.1	676.9	-37.2	730.7	-91.0	To Be Studied
916	Utility Pole	649.7	638.0	11.7	663.8	-14.1	677.0	-27.3	-	-	677.0	-27.3	730.8	-81.1	To Be Studied
917	Tree	633.7	638.0	-4.3	663.8	-30.1	677.0	-43.3	-	-	677.0	-43.3	730.8	-97.1	No Action
918	Billboard	678.5	638.1	40.3	663.9	14.5	677.1	1.3	-	-	677.1	1.3	731.0	-52.5	To Be Studied
919	Tree	632.8	638.2	-5.4	664.1	-31.2	677.3	-44.5	-	-	677.3	-44.5	731.1	-98.3	No Action
920	Utility Pole	667.5	638.3	29.2	664.1	3.3	677.4	-9.9	-	-	-	-	731.2	-63.8	To Be Studied
921	Tree	635.6	638.3	-2.8	664.2	-28.6	677.5	-41.9	-	-	677.5	-41.9	731.3	-95.7	No Action
922	Tree	634.4	638.4	-4.0	664.3	-29.9	677.5	-43.1	-	-	677.5	-43.1	731.4	-97.0	No Action
923	Tree	634.6	638.5	-3.8	664.4	-29.7	677.7	-43.0	700.7	-66.1	677.7	-43.0	731.5	-96.9	No Action
924	Building	674.4	638.5	35.9	664.4	10.0	677.7	-3.3	-	-	677.7	-3.3	731.5	-57.1	To Be Studied
925	Tree	631.3	638.5	-7.3	664.4	-33.2	677.8	-46.5	700.8	-69.5	677.8	-46.5	731.6	-100.4	No Action
926	Tree	631.0	638.6	-7.5	664.5	-33.4	677.8	-46.8	700.8	-69.8	677.8	-46.8	731.7	-100.6	No Action
927	Tree	636.2	638.6	-2.4	664.5	-28.4	677.9	-41.7	-	-	677.9	-41.7	731.7	-95.6	No Action
928	Tree	636.2	638.6	-2.4	664.5	-28.4	677.9	-41.7	-	-	677.9	-41.7	731.7	-95.6	No Action
929	Pole Light	646.6	638.7	7.9	664.7	-18.1	678.0	-31.5	-	-	678.0	-31.5	731.9	-85.3	To Be Studied
930	Tree	633.8	638.8	-5.0	664.8	-31.0	678.1	-44.3	-	-	678.1	-44.3	732.0	-98.2	No Action
931	Tree	643.4	638.8	4.6	664.8	-21.3	678.2	-34.7	-	-	678.2	-34.7	732.1	-88.6	To Be Studied
932	Pole Light	664.3	638.8	25.5	664.8	-0.5	-	-	-	-	-	-	-	-	To Be Studied
933	Tree	631.2	638.9	-7.8	665.0	-33.8	678.4	-47.2	-	-	678.4	-47.2	732.3	-101.1	No Action
934	Tree	633.3	639.0	-5.7	665.0	-31.7	678.4	-45.1	-	-	678.4	-45.1	732.3	-99.1	No Action
935	Tree	633.6	639.2	-5.6	665.2	-31.6	678.7	-45.1	-	-	-	-	732.6	-99.0	No Action
936	Tree	663.3	639.2	24.1	665.3	-2.0	678.8	-15.5	-	-	678.8	-15.5	732.7	-69.4	To Be Studied
937	Tree	631.3	639.3	-8.0	665.3	-34.1	678.8	-47.5	-	-	678.8	-47.5	732.8	-101.5	No Action
938	Pole Light	649.2	639.4	9.8	665.5	-16.3	679.0	-29.8	702.2	-53.0	679.0	-29.8	733.0	-83.8	To Be Studied
939	Tree	631.7	639.5	-7.8	665.7	-34.0	679.2	-47.5	-	-	679.2	-47.5	733.2	-101.5	No Action
940	Flagpole	645.7	639.6	6.2	665.7	-20.0	679.3	-33.5	-	-	679.3	-33.5	733.3	-87.5	To Be Studied
941	Tree	647.4	639.6	7.8	665.8	-18.4	679.3	-31.9	702.6	-55.1	679.3	-31.9	733.3	-85.9	To Be Studied
942	Tree	636.9	639.6	-2.7	665.8	-28.9	679.4	-42.5	-	-	679.4	-42.5	733.4	-96.5	No Action
943	Pole Light	649.5	639.6	9.9	665.8	-16.3	679.4	-29.9	702.6	-53.1	679.4	-29.9	733.4	-83.9	To Be Studied
944	Utility Pole	636.8	-	-	665.9	-29.0	-	-	-	-	-	-	-	-	No Action
945	Pole Light	650.9	-	-	666.0	-15.1	-	-	-	-	-	-	-	-	No Action
946	Building	641.9	639.8	2.1	666.0	-24.1	679.6	-37.7	-	-	679.6	-37.7	733.7	-91.8	To Be Studied
947	Tree	631.3	639.8	-8.5	666.1	-34.7	679.7	-48.3	-	-	679.7	-48.3	733.7	-102.4	No Action
948	Tree	638.2	639.9	-1.7	666.1	-28.0	679.7	-41.6	-	-	-	-	733.8	-95.6	No Action
949	Billboard	661.2	640.1	21.2	666.3	-5.1	680.0	-18.8	703.3	-42.1	680.0	-18.8	734.1	-72.8	To Be Studied
950	Flagpole	647.6	640.1	7.5	666.5	-18.8	680.1	-32.5	-	-	680.1	-32.5	734.2	-86.6	To Be Studied
951	Pole Light	647.0	640.4	6.7	666.8	-19.7	680.5	-33.5	-	-	680.5	-33.5	734.6	-87.5	To Be Studied
952	Tree	645.2	640.6	4.6	667.0	-21.8	680.7	-35.6	-	-	680.7	-35.6	734.9	-89.7	To Be Studied
953	Building	662.3	640.6	21.7	667.0	-4.7	680.8	-18.5	704.2	-41.9	680.8	-18.5	734.9	-72.6	To Be Studied
954	Pole Light	638.1	640.6	-2.5	667.0	-29.0	680.8	-42.7	704.2	-66.2	680.8	-42.7	735.0	-96.9	No Action
955	Pole Light	654.8	640.6	14.2	667.1	-12.3	680.8	-26.0	-	-	680.8	-26.0	735.0	-80.2	To Be Studied
956	Tree	636.2	641.0	-4.8	667.5	-31.4	681.4	-45.2	-	-	681.4	-45.2	735.6	-99.4	No Action
957	Utility Pole	634.2	641.1	-6.9	667.6	-33.4	-	-	-	-	-	-	-	-	No Action
958	Pole Light	653.7	641.2	12.6	667.7	-14.0	681.6	-27.9	-	-	681.6	-27.9	735.8	-82.1	To Be Studied
959	Building	636.3	641.3	-5.0	667.9	-31.6	681.8	-45.5	-	-	681.8	-45.5	736.0	-99.7	No Action
960	Tree	677.3	641.4	35.9	668.1	9.2	682.0	-4.7	705.6	-28.3	682.0	-4.7	736.3	-59.0	To Be Studied
961	Tree	649.4	641.5	7.8	668.2	-18.8	682.2	-32.8	-	-	682.2	-32.8	736.4	-87.1	To Be Studied
962	Flagpole	655.7	641.7	14.0	668.4	-12.7	682.4	-26.7	-	-	682.4	-26.7	736.7	-81.0	To Be Studied
963	Tree	644.8	641.8	3.0	668.5	-23.7	682.5	-37.7	706.2	-61.4	682.5	-37.7	736.8	-92.0	To Be Studied
964	Pole Light	640.6	641.8	-1.2	668.5	-27.9	682.5	-42.0	706.2	-65.6	682.5	-42.0	736.8	-96.2	No Action
965	Utility Pole	661.1	641.8	19.3	668.6	-7.5	-	-	-	-	-	-	-	-	To Be Studied
966	Tree	639.8	641.9	-2.1	668.6	-28.8	682.7	-42.9	706.3	-66.5	682.7	-42.9	737.0	-97.2	No Action
967	Tree	671.8	641.9	29.8	668.7	3.1	682.7	-11.0	-	-	682.7	-11.0	737.0	-65.3	To Be Studied
968	Pole Light	653.4	642.0	11.4	668.8	-15.4	682.9	-29.5	-	-	682.9	-29.5	737.2	-83.8	To Be Studied
969	Tree	639.4	642.1	-2.7	668.9	-29.5	683.0	-43.6	-	-	683.0	-43.6	737.3	-97.9	No Action
970	Tree	649.9	642.1	7.8	668.9	-19.0	683.0	-33.2	706.7	-56.9	683.0	-33.2	737.3	-87.5	To Be Studied
971	Tree	639.3	642.1	-2.8	668.9	-29.6	683.0	-43.7	706.8	-67.4	683.0	-43.7	737.4	-98.0	No Action
972	Pole Light	653.3	-	-	669.1	-15.8	-	-	-	-	-	-	-	-	No Action
973	Pole	632.5	642.3	-9.8	669.1	-36.6	683.3	-50.8	707.0	-74.5	683.3	-50.8	737.6	-105.1	No Action
974	Tree	657.9	642.4	15.6	669.2	-11.3	683.4	-25.4	707.1	-49.2	683.4	-25.4	737.7	-79.8	To Be Studied
975	Utility Pole	635.9	642.6	-6.7	669.5	-33.6	-	-	-	-	-	-	-	-	No Action
976	Building	661.0	642.6	18.4	669.6	-8.6	683.8	-22.8	-	-	683.8	-22.8	738.2	-77.2	To Be Studied
977	Pole Light	649.4	642.7	6.7	669.7	-20.2	683.9	-34.5	-	-	-	-	738.3	-88.9	To Be Studied
978	Pole Light	648.5	643.5	5.1	670.6	-22.1	685.0	-36.5	709.0	-60.5	685.0	-36.5	739.5	-91.0	To Be Studied
979	Tree	666.8	643.6	23.3	670.8	-3.9	685.2	-18.3	-	-	685.2	-18.3	739.7	-72.8	To Be Studied
980	Tree	667.5	643.7	23.8	670.9	-3.4	685.3	-17.8	-	-	685.3	-17.8	739.8	-72.4	To Be Studied
981	Flagpole	635.9	643.7	-7.8	670.9	-35.0	-	-	-	-	-	-	-	-	No Action
982	Flagpole	641.1	643.8	-2.7	671.1	-30.0	-	-	-	-	-	-	-	-	No Action
983	Utility Pole	652.8	643.9	8.9	671.1	-18.4	-	-	-	-	-	-	-	-	To Be Studied
984	Pole Light	646.8	644.0	2.8	671.3	-24.5	685.8	-39.0	-	-	685.8	-39.0	740.4	-93.6	To Be Studied
985	Flagpole	636.0	644.0	-8.0	671.3	-35.3	-	-	-	-	-	-	-	-	No Action
986	Tree	659.0	644.0	14.9	671.3	-12.4	685.9	-26.9	-	-	685.9	-26.9	740.4	-81.4	To Be Studied
987	Tree	664.0	644.0	19.9	671.3	-7.4	685.9	-21.9	-	-	685.9	-21.9	740.4	-76.5	To Be Studied
988	Pole Light	638.6	644.1	-5.5	671.4	-32.8	686.0	-47.4	710.1	-71.5	686.0	-47.4	740.5	-101.9	No Action
989	Billboard	651.8	644.2	7.6	671.5	-19.7	686.0	-34.3	710.2	-58.4	686.0	-34.3	740.6	-88.8	To Be Studied
990	Tree	663.8	644.3	19.5	671.7	-7.8	686.3	-22.4	-	-	686.3	-22.4	740.9	-77.0	To Be Studied
991	Pole Light	643.7	644.5	-0.7	671.9	-28.1	686.5	-42.8	710.7	-66.9	686.5	-42.8	741.1	-97.4	No Action
992	Pole Light	649.7	644.5	5.2	671.9	-22.2	686.5	-36.8	-	-	-	-	741.2	-91.4	To Be Studied
993	Utility Pole	638.5	645.0	-6.4	672.5	-33.9	687.2	-48.7	711.5	-72.9	687.2	-48.7	741.9	-103.4	No Action
994	Billboard	637.0	645.0	-8.0	672.5	-35.5	687.3	-50.2	-	-	687.3	-50.2	741.9	-104.9	No Action
995	Pole Light	649.8	645.0	4.8	672.5	-22.7	687.3	-37.4	711.5	-61.7	687.3	-37.4	741.9	-92.1	To Be Studied
996	Utility Pole	661.0	645.0	16.0	672.6	-11.6	-	-	-	-	-	-	-	-	To Be Studied
997	Pole Light	649.5	645.3	4.2	672.9	-23.4	687.7	-38.2	-	-	687.7	-38.2	742.4	-92.9	To Be Studied
998	Billboard	663.1	645.8	17.3	673.5	-10.5	688.4	-25.4	-	-	688.4	-25.4	743.2	-80.2	To Be Studied
999	Tree	647.7	646.0	1.7	673.8	-26.1	688.7	-41.1	-	-	688.7	-41.1	743.6	-95.9	To Be Studied
1000	Pole Light	641.8	646.0	-4.2	673.8	-32.0	688.8	-46.9	-	-	688.8	-46.9	743.6	-101.8	No Action
1001	Tree	660.5	646.1	14.3	673.9	-13.5	688.9	-28.5	-	-	688.9	-28.5	743.8	-83.3	To Be Studied
1002	Pole Light	653.2	646.3	6.9	674.2	-20.9	689.2	-36.0	-	-	-	-	744.0	-90.8	To Be Studied
1003	Utility Pole	644.3	646.4	-2.1	674.3	-30.0	-	-	-	-	-	-	-	-	No Action
1004	Pole Light	650.5	646.4	4.1	674.3	-23.7	689.3	-38.8	-	-	689.3	-38.8	744.2	-93.6	To Be Studied

Runway 29 Inner Approach (Existing)

LEGEND

1. Numbers shown in red are a penetration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-11-29(2) - 11-29 Inner P77 (3)
LAYOUT: 29 Inner (2)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:40 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 11/29 Obstruction Tables Inner Portion (Existing/Future)

SCALE AS NOTED
JOB NO. 20042701.00
DATE 2/2023
SHEET 40 OF 59 SHEETS

Runway 29 Inner Approach (Existing)

Runway 29 Existing Obstruction Table – Inner Portion of the Approach Surface			Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS		
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition
1005	Pole Light	655.4	646.6	8.9	674.5	-19.1	-	-	-	-	-	-	-	-	To Be Studied
1006	Utility Pole	641.8	647.2	-5.4	675.3	-33.5	690.5	-48.7	-	-	690.5	-48.7	745.5	-103.7	No Action
1007	Tree	653.5	647.2	6.3	675.3	-21.8	690.5	-37.0	-	-	690.5	-37.0	745.5	-92.0	To Be Studied
1008	Control_Tower	772.3	-	-	719.9	52.5	-	-	-	-	-	-	-	-	To Be Studied
1009	Tree	658.1	647.4	10.7	675.5	-17.4	690.8	-32.7	-	-	690.8	-32.7	745.8	-87.7	To Be Studied
1010	Pole Light	651.3	647.6	3.7	675.7	-24.5	691.0	-39.8	-	-	691.0	-39.8	746.0	-94.8	To Be Studied
1011	Pole Light	650.9	-	-	676.2	-25.2	-	-	-	-	-	-	-	-	No Action
1012	Utility Pole	662.7	647.9	14.8	676.2	-13.5	691.6	-28.9	-	-	-	-	746.6	-83.9	To Be Studied
1013	Tree	644.0	648.2	-4.2	676.5	-32.6	692.0	-48.0	-	-	692.0	-48.0	747.1	-103.1	No Action
1014	Tree	659.8	648.2	11.5	676.6	-16.8	692.1	-32.3	-	-	692.1	-32.3	747.1	-87.4	To Be Studied
1015	Utility Pole	654.8	648.5	6.3	676.9	-22.1	-	-	-	-	-	-	-	-	To Be Studied
1016	Utility Pole	642.7	648.7	-5.9	677.1	-34.4	692.7	-49.9	-	-	692.7	-49.9	747.8	-105.1	No Action
1017	Tree	655.3	648.7	6.7	677.1	-21.8	692.7	-37.3	-	-	692.7	-37.3	747.8	-92.5	To Be Studied
1018	Flagpole	655.0	648.8	6.2	677.2	-22.3	692.8	-37.8	-	-	692.8	-37.8	748.0	-93.0	To Be Studied
1019	Pole Light	648.5	649.0	-0.4	677.5	-28.9	693.1	-44.5	718.1	-69.6	693.1	-44.5	748.3	-99.7	No Action
1020	Tree	646.5	649.1	-2.5	677.6	-31.1	693.2	-46.7	-	-	693.2	-46.7	748.4	-101.9	No Action
1021	Tree	651.3	649.1	2.3	677.6	-26.3	693.3	-41.9	-	-	693.3	-41.9	748.5	-97.1	To Be Studied
1022	Tree	657.2	649.3	7.9	677.9	-20.8	693.6	-36.4	-	-	693.6	-36.4	748.8	-91.7	To Be Studied
1023	Tree	657.3	649.3	8.0	677.9	-20.6	693.6	-36.3	-	-	693.6	-36.3	748.9	-91.5	To Be Studied
1024	Flagpole	656.3	649.5	6.9	678.1	-21.8	693.8	-37.5	-	-	693.8	-37.5	749.1	-92.7	To Be Studied
1025	Tree	660.6	649.5	11.1	678.2	-17.6	693.9	-33.3	-	-	693.9	-33.3	749.1	-88.6	To Be Studied
1026	Tree	661.2	649.5	11.6	678.2	-17.1	694.0	-32.8	-	-	694.0	-32.8	749.2	-88.1	To Be Studied
1027	Pole Light	659.3	649.7	9.5	678.4	-19.2	-	-	-	-	-	-	749.5	-90.2	To Be Studied
1028	Tree	650.0	649.8	0.2	678.5	-28.5	694.3	-44.3	-	-	694.3	-44.3	749.6	-99.6	To Be Studied
1029	Tree	682.7	649.8	32.8	678.6	4.1	694.4	-11.7	-	-	-	-	749.7	-67.0	To Be Studied
1030	Tree	645.2	650.0	-4.8	678.8	-33.5	694.6	-49.4	-	-	694.6	-49.4	749.9	-104.7	No Action
1031	Utility Pole	647.6	650.0	-2.4	678.8	-31.2	-	-	-	-	-	-	-	-	No Action
1032	Utility Pole	640.8	650.1	-9.3	678.9	-38.1	694.7	-54.0	-	-	-	-	750.1	-109.3	No Action
1033	Flagpole	655.4	650.1	5.2	679.0	-23.6	694.8	-39.4	-	-	694.8	-39.4	750.2	-94.8	To Be Studied
1034	Tree	668.8	650.2	18.6	679.0	-10.2	694.9	-26.1	-	-	694.9	-26.1	750.3	-81.4	To Be Studied
1035	Tree	642.5	650.2	-7.7	679.1	-36.6	695.0	-52.4	-	-	695.0	-52.4	750.3	-107.8	No Action
1036	Tree	641.2	650.6	-9.4	679.5	-38.4	695.5	-54.3	-	-	695.5	-54.3	750.9	-109.7	No Action
1037	Tree	657.7	650.7	7.0	679.7	-22.0	695.7	-38.0	-	-	695.7	-38.0	751.1	-93.4	To Be Studied
1038	Tree	648.3	650.8	-2.5	679.8	-31.5	695.8	-47.5	-	-	695.8	-47.5	751.2	-102.9	No Action
1039	Flagpole	655.4	650.9	4.6	679.9	-24.4	695.9	-40.5	-	-	695.9	-40.5	751.3	-95.9	To Be Studied
1040	Tree	642.4	651.1	-8.7	680.2	-37.8	696.3	-53.8	-	-	-	-	751.7	-109.3	No Action
1041	Tree	642.7	651.2	-8.5	680.3	-37.6	696.4	-53.7	721.9	-79.2	696.4	-53.7	751.9	-109.2	No Action
1042	Pole Light	656.8	651.2	5.5	680.3	-23.6	-	-	-	-	-	-	-	-	To Be Studied
1043	Tree	652.7	651.6	1.1	680.8	-28.1	697.0	-44.3	-	-	-	-	752.5	-99.8	To Be Studied
1044	Tree	642.6	651.8	-9.2	681.0	-38.4	-	-	-	-	-	-	752.7	-110.2	No Action
1045	Tree	646.1	651.9	-5.8	681.2	-35.1	697.5	-51.3	723.1	-77.0	697.5	-51.3	753.0	-106.9	No Action
1046	Tree	670.5	653.2	17.4	682.8	-12.2	-	-	-	-	-	-	-	-	To Be Studied
1047	Tree	665.5	653.7	11.8	683.5	-17.9	-	-	-	-	-	-	-	-	To Be Studied
1048	Tree	654.1	654.4	-0.3	684.3	-30.2	-	-	-	-	-	-	756.9	-102.8	No Action
1049	Pole	645.6	655.1	-9.5	685.2	-39.6	702.2	-56.6	728.4	-82.9	702.2	-56.6	758.1	-112.6	No Action
7848	Post	549.4	563.4	-14.0	570.5	-21.1	567.3	-17.9	575.5	-26.1	567.3	-17.9	611.6	-62.2	No Action
7854	Post	549.6	563.4	-13.7	570.5	-20.8	567.3	-17.6	575.5	-25.9	567.3	-17.6	611.6	-61.9	No Action
7856	Post	548.2	565.5	-17.3	573.1	-24.9	570.3	-22.2	579.0	-30.8	570.3	-22.2	614.9	-66.8	No Action
7860	Post	550.0	563.4	-13.4	570.5	-20.4	567.3	-17.2	575.5	-25.5	567.3	-17.2	611.6	-61.6	No Action
7863	Post	548.2	565.5	-17.3	573.1	-24.9	570.3	-22.2	579.0	-30.8	570.3	-22.2	614.9	-66.8	No Action
7865	Post	547.7	567.6	-19.9	575.7	-28.0	573.4	-25.7	582.5	-34.8	573.4	-25.7	618.2	-70.6	No Action
7866	Runway Light	556.5	567.8	-11.2	575.9	-19.4	573.7	-17.2	582.8	-26.3	573.7	-17.2	618.6	-62.0	No Action
7867	Post	548.8	565.5	-16.7	573.1	-24.3	570.3	-21.6	579.0	-30.3	570.3	-21.6	614.9	-66.2	No Action
7869	Sign	549.4	564.8	-15.4	572.2	-22.8	569.4	-20.0	577.9	-28.5	569.4	-20.0	613.9	-64.5	No Action
7870	Post	547.5	567.6	-20.0	575.7	-28.1	573.4	-25.8	582.5	-34.9	573.4	-25.8	618.2	-70.7	No Action
7871	Runway Light	556.5	567.8	-11.3	575.9	-19.4	573.7	-17.2	582.8	-26.3	573.7	-17.2	618.6	-62.1	No Action
7872	Post	544.6	569.5	-25.0	578.1	-33.6	576.3	-31.7	585.8	-41.2	576.3	-31.7	621.4	-76.8	No Action
7873	Runway Light	558.4	569.9	-11.5	578.5	-20.1	576.8	-18.4	586.3	-27.9	576.8	-18.4	621.9	-63.5	No Action
7875	Post	548.4	567.6	-19.2	575.7	-27.3	573.4	-25.0	582.5	-34.1	573.4	-25.0	618.3	-69.8	No Action
7879	Runway Light	556.5	567.8	-11.3	575.9	-19.5	573.7	-17.2	582.8	-26.4	573.7	-17.2	618.6	-62.1	No Action
7881	Post	545.7	569.5	-23.9	578.2	-32.5	576.3	-30.6	585.8	-40.1	576.3	-30.6	621.4	-75.7	No Action
7883	Runway Light	558.4	569.9	-11.5	578.5	-20.1	576.8	-18.4	586.3	-27.9	576.8	-18.4	621.9	-63.5	No Action
7885	Runway Light	559.9	572.0	-12.1	581.2	-21.3	579.9	-20.0	589.8	-29.9	579.9	-20.0	625.3	-65.4	No Action
7887	Post	546.7	569.6	-22.9	578.2	-31.5	576.4	-29.7	585.9	-39.2	576.4	-29.7	621.5	-74.8	No Action
7888	Runway Light	559.9	572.0	-12.1	581.2	-21.3	579.9	-20.0	589.8	-29.9	579.9	-20.0	625.3	-65.4	No Action
7889	Runway Light	558.5	569.9	-11.4	578.5	-20.0	576.8	-18.3	586.3	-27.8	576.8	-18.3	621.9	-63.4	No Action
7890	Runway Light	559.9	572.0	-12.1	581.2	-21.3	579.9	-20.0	589.8	-29.9	579.9	-20.0	625.3	-65.4	No Action
7891	Runway Light	559.9	572.0	-12.1	581.2	-21.3	579.9	-20.0	589.8	-29.9	579.9	-20.0	625.3	-65.4	No Action
7892	Runway Light	559.9	572.0	-12.1	581.2	-21.3	579.9	-20.0	589.8	-29.9	579.9	-20.0	625.3	-65.4	No Action
7895	Sign	549.1	561.0	-11.9	681.9	-132.8	-	-	-	-	-	-	-	-	No Action
7896	Sign	549.7	565.7	-16.0	618.8	-69.1	570.7	-21.0	-	-	-	-	-	-	No Action
9292	Pole Light	647.9	634.8	13.2	659.7	-11.8	672.2	-24.3	694.5	-46.5	672.2	-24.3	725.6	-77.7	To Be Studied
9296	Building	662.3	640.6	21.7	667.0	-4.7	680.8	-18.5	704.2	-41.9	680.8	-18.5	734.9	-72.6	To Be Studied
9297	Billboard	651.8	644.2	7.6	671.5	-19.7	686.0	-34.3	710.2	-58.4	686.0	-34.3	740.6	-88.8	To Be Studied
9466	Pole Util	610.0	605.0	5.0	622.5	-12.5	628.4	-18.5	644.9	-34.9	628.4	-18.5	678.0	-68.1	To Be Studied
9467	Pole Util	617.2	606.0	11.2	623.8	-6.6	630.0	-12.7	-	-	630.0	-12.7	679.7	-62.5	To Be Studied
9470	Building	609.0	617.8	-8.8	638.5	-29.5	647.3	-38.3	666.2	-57.2	647.3	-38.3	698.5	-89.5	No Action
9473	Antenna	622.0	622.7	-0.7	644.6	-22.7	654.5	-32.5	674.4	-52.4	654.5	-32.5	706.3	-84.3	No Action
9475	Pole Util	618.9	629.7	-10.7	653.3	-34.4	664.7	-45.8	686.0	-67.1	664.7	-45.8	717.4	-98.5	No Action
9476	Pole Util	621.5	633.1	-11.5	657.6	-36.1	669.7	-48.2	691.6	-70.1	669.7	-48.2	722.9	-101.4	No Action
9481	Building	656.8	637.5	19.4	663.1	-6.3	676.2	-19.4	699.0	-42.2	676.2	-19.4	729.9	-73.1	To Be Studied
9483	Pole Light	631.8	644.7	-13.0	672.2	-40.4	686.9	-55.1	-	-	686.9	-55.1	741.5	-109.8	No Action
9484	Pole Light	634.5	647.6	-13.1	675.8	-41.3	691.1	-56.6	715.9	-81.4	691.1	-56.6	746.1	-111.7	No Action
9486	Pole Util	624.3	634.9	-10.6	659.9	-35.6	672.4	-48.1	694.7	-70.4	672.4	-48.1	725.8	-101.5	No Action
9487	Pole Light	639.7	635.2	4.5	660.3	-20.6	672.9	-33.2	695.2	-55.5	672.9	-33.2	726.3	-86.6	To Be Studied
9490	Pole Light	638.1	640.6	-2.5	667.0	-29.0	680.8	-42.7	704.2	-66.2	680.8	-42.7	735.0	-96.9	No Action
9491	Pole Light	640.6	641.8	-1.2	668.5	-27.9	682.5	-42.0	706.2	-65.6	682.5	-42.0	736.8	-96.2	No Action
9493	Pole Light	637.3	647.6	-10.3	675.8	-38.5	691.1	-53.8	715.9	-78.6	691.1	-53.8	746.1	-108.8	No Action
9497	Pole Light	637.9	650.1	-12.2	678.9	-41.1	694.8	-56.9	720.1	-82.2	694.8	-56.9	750.1	-112.3	No Action
9498	Pole Light	643.0	653.6	-10.5	683.3	-40.2	699.9	-56.8	725.8	-82.8	699.9	-56.8	755.7	-112.6	No Action
9502	Flagpole	647.6	640.1	7.5	666.5	-18.8	680.1	-32.5	-	-	680.1	-32.5	734.2	-86.6	To Be Studied
9503	Pole Light	631.1	644.1	-13.0	671.4	-40.3	685.9	-54.8	-	-	685.9	-54.8	740.5	-109.4	No Action
9504	Pole Util	633.0	646.1	-13.1	673.9	-40.9	688.9	-55.9	-	-	688.9	-55.9	743.7	-110.7	No Action
9506	Pole Light	631.5	645.6	-14.1	673.3	-41.8	688.2	-56.7	712.6	-81.1	688.2	-56.7	742.9	-111.4	No Action
9509	Pole Light	635.2	649.6	-14.4	678.3	-43.1	694.1	-58.9	719.2	-84.0	694.1	-58.9	749.3	-114.1	No Action
9522	Tree	632.5	620.0	12.5	641.2	-8.7	650.5	-18.0	669.8	-37.3	650.5	-18.0	702.0	-69.5	To Be Studied
9533	Tree	630.2	623.2	6.9	645.3	-15.1	655.3	-25.1	675.3	-45.1	655.3	-25.1	707.2	-77.0	To Be Studied
9538	Tree	628.1	627.6	0.5	650.8	-22.7	661.7	-33.6	682.6	-54.5	661.7	-33.6	714.2	-86.1	To Be Studied
9539	Tree	617.8	626.8	-9.0	649.7	-32.0	660.5	-42.7	681.2	-63.4	660.5	-42.7	712.9	-95.1	No Action
9540	Tree	623.5	634.5	-11.0	659.4	-35.9	671.8	-48.3	694.0	-70.5	671.8	-48.3	725.1	-101.6	No Action
9554	Tree	639.3	642.1	-2.8	668.9	-29.6	683.0	-43.7	706.8	-67.4	683.0	-43.7	737.4	-98.0	No Action
9556	Tree	638.2	649.5	-11.3	678.2	-40.0	693.9	-55.8	-	-	693.9	-55.8	749.2	-111.0	No Action
9559	Tree	642.3	652.6	-10.4	682.1	-39.8	698.5	-56.3	724.3	-82.0	698.5	-56.3	754.2	-111.9	No Action
9589	Tree	636.7	604.8	31.9	642.2	-5.5	-	-	-	-	-	-	-	-	To Be Studied
9624	Tree	671.4	-	-	666.9	4.5	-	-	-	-	-	-	-	-	To Be Studied
9752	Tree	629.3	637.8	-8.5	663.5	-34.2	676.7	-47.4	-	-	676.7	-47.4	730.4	-101.2	No Action
9754	Tree	633.0	637.4	-4.4	663.0	-30.0	676.1	-43.1	-	-	676.1	-43.1	729.8	-96.8	No Action
9758	Tree	627.2	639.4	-12.2	665.5	-38.3	679.0	-51.8	702.2	-75.0	679.0	-51.8	733.0	-105.8	No Action
10331	Sign	549.7	565.7	-16.0	618.8	-69.1	570.7	-21.0	-	-	-	-	-	-	No Action
10430	Post	551.9	561.3	-9.5	567.9	-16.0	564.3	-12.4	572.1	-20.3	564.3	-12.4	608.3	-56.5	No Action
10626	Service Road	550.0	568.4	-18.4	680.2	-130.2	-	-	-	-	-	-	-	-	No Action
10627	Service Road	543.2	570.2	-27.1	638.1	-94.9	-	-	-	-	-	-	-	-	No Action
10628	Service Road	542.2	572.0	-29.8	581.2	-39.0	579.9	-37.7	-	-	-	-	-	-	No Action
10629	Service Road	542.2	572.1	-30.0	581.4	-39.2	580.1	-37.9	-	-	-	-	625.5	-83.4	No Action
10630	Service Road	542.1	572.3	-30.2	581.6	-39.5	580.3	-38.2	-	-	580.3	-38.2	625.8	-83.7	No Action
10631	Service Road	542.1	573.1	-31.0	582.6	-40.5	581.5	-39.4	591.7	-49.6	581.5	-39.4	627.1	-85.0	No Action
10634	Service Road	548.7	567.2	-18.5	579.5	-30.8	572.9	-24.2	-	-	-	-	617.7	-69.0	No Action
10635	Service Road	548.8	567.5	-18.7	575.5	-26.8	573.2	-24.5	-	-	573.2	-24.5	618.1	-69.3	No Action
10636	Service Road	548.5	568.5	-19.9	576.8	-28.3	574.7	-26.2	584.0	-35.5	574.7	-26.2	619.7	-71.2	No Action
10637	Service Road	551.8	555.8	-4.0	690.8	-139.0	-	-	-	-	-	-	-	-	No Action
10640	Service Road	550.0	559.8	-9.8	650.4	-100.4	-	-	-	-	-	-	-	-	No Action
10643	Service Road	547.6	573.5	-25.9	583.1	-35.5	582.1	-34.5	592.4	-44.7	582.1	-34.5	627.7	-80.1	No Action
10644	Service Road	549.5	574.2	-24.7	584.0	-34.5	583.2	-33.7	593.6	-44.1	583.2	-33.7	628.9	-79.4	No Action
10645	Service Road	547.3	575.4	-28.1	585.5	-38.1	584.9	-37.6	-	-	584.9	-37.6	630.8	-83.4	No Action
10646	Service Road	547.0	575.7	-28.7	585.8	-38.8	585.3	-38.3	-	-	-	-	631.2	-84.2	No Action
10647	Service Road	546.4	576.0	-29.6	586.2	-39.8	585.8	-39.4	-	-	-	-	-	-	No Action
10648	Service Road	544.6	577.7	-33.1	629.3	-84.7	588.3	-43.7	-	-	-	-	-	-	No Action
10649	Service Road	542.6	579.3	-36.7	671.2	-128.7	-	-	-	-	-	-	-	-	No Action
10889	Interstate	617.0	650.3	-33.3	679.2	-62.2	695.1	-78.1	720.4	-103.4	695.1	-78.1	750.4	-133.4	No Action
10890	Interstate	617.0	647.0	-30.0	675.1	-58.1	690.3	-73.3	714.9	-97.9	690.3	-73.3	745.2	-128.2	No Action
10891	Interstate	602.8	625.1	-22.3	647.6	-44.8	657.9	-55.2	678.3	-75.5	657.9	-55.2	710.1	-107.3	No Action
10892	Interstate	611.8	630.4	-18.5	654.2	-42.4	665.8	-53.9	687.2	-75.4	665.8	-53.9	718.6	-106.8	No Action
10893	Interstate	564.4	588.9	-24.5	602.3	-37.9	604.7	-40.3	-	-	604.7	-40.3	652.3	-87.9	No Action
10894	Interstate	563.8	590.7	-26.9	604.6	-40.8	607.4	-43.6	-	-	607.4	-43.6	655.2	-91.4	No Action
10895	Interstate	567.0	595.4	-28.4	610.5	-43.5	614.4	-47.4	-	-	614.4	-47.4	662.8	-95.8	No Action
10896	Interstate	563.5	592.0	-28.5	606.2	-42.7	609.3	-45.8	-	-	-	-	657.3	-93.8	No Action
10897	Interstate	563.2	588.0	-24.8	601.2	-38.0	603.4	-40.2	-	-	-	-	650.9	-87.7	No Action
10898	Interstate	559.3	585.1	-25.8	597.6	-38.3	599.2	-39.9	-	-	-	-	-	-	No Action
10899	Interstate	559.4	587.8	-28.4	601.0	-41.6	603.1	-43.8	-	-	-	-	-	-	No Action
10900	Interstate	557.0	582.8	-25.8	623.3	-66.3	595.8	-38.8	-	-	-	-	-	-	No Action
10901	Interstate	558.5	585.6	-27.2	619.9	-61.4	600.0	-41.5	-	-	-	-	-	-	No Action
10902	Interstate	557.0	581.2	-24.2	669.6	-112.6	-	-	-	-	-	-	-	-	No Action
10903	Interstate	557.0	578.8	-21.8	671.6	-114.6	-	-	-	-	-	-	-	-	No Action
10955	Road	575.9	640.2	-64.3	666.6	-90.7	-	-	-	-	-	-	-	-	No Action
10956	Road	580.3	635.4	-55.1	660.5	-80.2	673.1	-92.8	-	-	-	-	-	-	No Action
10957	Road	581.0	635.4	-54.4	660.6	-79.6	673.2	-92.2	-	-	-	-	726.7	-145.7	No Action
10958	Road	585.0	638.1	-53.1	663.9	-78.9	677.1	-92.1	-	-	-	-	730.9	-145.9	No Action
10959	Road	585.0	638.1	-53.1	663.9	-78.9	677.2	-92.2	-	-	-	-	-	-	No Action
10960	Road	585.0	638.1	-53.1	663.9	-78.9	677.1	-92.1	-	-	677.1	-92.1	730.9	-145.9	No Action
10961	Road	586.1	635.4	-49.3	660.5	-74.5	673.2	-87.1	-	-	673.2	-87.1	726.6	-140.6	No Action
10962	Road	572.6	620.6	-48.0	642.1	-69.4	-	-	-	-	-	-	-	-	No Action
10963	Road	572.2	-	-	641.8	-69.6	-	-	-	-	-	-	-	-	No Action
10964	Road	579.7	622.3	-42.6	644.1	-64.4	653.8	-74.1	-	-	-	-	-	-	No Action
10965	Road	585.0	622.4	-37.4	644.3	-59.3	654.1	-69.1	-	-	-	-	705.9	-120.9	No Action
10966	Road	578.6	625.1	-46.5	647.6	-69.0	658.0	-79.4	-	-	-	-	-	-	No Action
10967	Road	586.3	622.4	-36.1	644.3	-58.0	654.1	-67.7	-	-	654.1	-67.7	705.9	-119.6	No Action
10968	Road	585.0	626.8	-41.8	649.7	-64.7	660.4	-75.4	-	-	660.4	-75.4	712.8	-127.8	No Action
10969	Road	585.0	630.9	-45.9	654.9	-69.9	666.5	-81.5	-	-	666.5	-81.5	719.4	-134.4	No Action
10970	Road	590.9	610.1	-19.2	628.9	-38.0	-	-	-	-	-	-	-	-	No Action
10971	Road	580.2	603.6	-23.4	620.7	-40.5	-	-	-	-	-	-	-	-	No Action
10972	Road	580.0	603.7	-23.7	620.9	-40.9	626.6	-46.6	-	-	-	-	-	-	No Action
10973	Road	575.0	602.0	-27.0	618.7	-43.7	624.0	-49.0	-	-	-	-	-	-	No Action
10974	Road	570.4	600.9	-30.5	617.4	-47.0	622.4	-52.0	-	-	-	-	671.5	-101.1	No Action
10975	Road	567.3	600.6	-33.3	617.0	-49.7	622.0	-54.7	-	-	622.0	-54.7	671.1	-103.7	No Action
10976	Road	562.7	598.2	-35.6	614.0	-51.4	618.5	-55.8	633.6	-70.9	618.5	-55.8	667.3	-104.6	No Action
10977	Road	564.3	599.5	-35.2	615.7	-51.4	620.4	-56.1	635.8	-71.5	620.4	-56.1	669.4	-105.1	No Action
10978	Road	559.5	595.4	-35.8	610.4	-50.9	614.3	-54.7	628.8	-69.3	614.3	-54.7	662.7	-103.1	No Action
10979	Road	585.0	614.7	-29.7	634.7	-49.7	642.7	-57.7	661.1	-76.1	642.7	-57.7	693.6	-108.6	No Action
10980	Road	564.2	591.0	-26.8	605.1	-40.8	607.9	-43.7	621.6	-57.4	607.9	-43.7	655.8	-91.5	No Action
10981	Road	565.0	594.6	-29.6	609.5	-44.5	613.1	-48.1	627.5	-62.5	613.1	-48.1	661.4	-96.4	No Action
10982	Road	618.5	645.1	-26.7	672.7	-54.2	687.4	-69.0	711.8	-93.3	687.4	-69.0	742.1	-123.7	No Action
10984	Road	589.7	638.3	-48.6	664.1	-74.5	677.4	-87.7	-	-	677.4	-87.7	731.2	-141.5	No Action
10985	Road	580.4	641.2	-60.8	667.8	-87.4	681.7	-101.3	-	-	-	-	735.9	-155.6	No Action
10986	Road	625.0	631.2	-6.2	655.3	-30.3	667.1	-42.1	-	-	667.1	-42.1	720.0	-95.0	No Action
10987	Road	614.4	628.4	-14.0	651.8	-37.3	662.8	-48.4	-	-	-	-	715.4	-101.0	No Action
10988	Road	612.3	627.2	-14.8	650.2	-37.9	661.0	-48.7	-	-	-	-	-	-	No Action
10989	Road	606.0	621.5	-15.5	643.2	-37.2	-	-	-	-	-	-	-	-	No Action
10990	Road	605.3	-	-	642.4	-37.1	-	-	-	-	-	-	-	-	No Action
10991	Road	578.9	-	-	658.4	-79.6	-	-	-	-	-	-	-	-	No Action
10992	Road	579.6	634.2	-54.6	659.1	-79.5	-	-	-	-	-	-	-	-	No Action
10993	Road	559.4	585.0	-25.7	597.5	-38.2	599.1	-39.7	-	-	599.1	-39.7	646.1	-86.8	No Action
10994	Road	557.3	583.4	-26.2	595.5	-38.2	596.7	-39.5	-	-	-	-	643.6	-86.3	No Action

Runway 29 Inner Approach (Existing)

Runway 29 Existing Obstruction Table – Inner Portion of the Approach Surface			Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS		
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition
10995	Road	555.0	581.7	-26.7	593.4	-38.4	594.2	-39.2	-	-	-	-	-	-	No Action
10996	Road	555.0	579.1	-24.1	627.6	-72.6	590.4	-35.4	-	-	-	-	-	-	No Action
10997	Road	555.0	574.9	-19.9	674.9	-119.9	-	-	-	-	-	-	-	-	No Action
10998	Road	594.9	625.4	-30.5	648.0	-53.2	658.5	-63.6	678.9	-84.0	658.5	-63.6	710.7	-115.8	No Action
10999	Road	590.8	629.8	-38.9	653.5	-62.6	664.9	-74.0	686.1	-95.3	664.9	-74.0	717.6	-126.8	No Action
11000	Road	595.0	617.6	-22.6	638.3	-43.3	647.0	-52.0	666.0	-71.0	647.0	-52.0	698.3	-103.3	No Action
11001	Road	603.6	627.6	-23.9	650.7	-47.1	661.6	-58.0	682.5	-78.9	661.6	-58.0	714.1	-110.5	No Action
11002	Road	605.0	633.6	-28.6	658.3	-53.3	670.5	-65.5	692.6	-87.6	670.5	-65.5	723.8	-118.8	No Action

Runway 29 P77 Approach (Existing)

Runway 29 Existing Obstruction Table – Part 77 Approach and Runway Departure Surface			Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition
1050	Tree	653.4	655.2	-1.8	685.3	-31.9	702.3	-48.9	-	-	758.3	-104.9	-	-	No Action
1051	Tree	652.1	655.3	-3.2	685.4	-33.3	702.4	-50.3	-	-	758.4	-106.3	702.4	-50.3	No Action
1052	Building	673.1	655.3	17.7	685.5	-12.4	702.5	-29.4	-	-	758.5	-85.4	702.5	-29.4	To Be Studied
1053	Building	693.7	655.6	38.1	685.8	7.9	702.9	-9.2	-	-	758.9	-65.2	702.9	-9.2	To Be Studied
1054	Tree	647.6	656.3	-8.7	686.7	-39.1	703.9	-56.3	-	-	760.1	-112.4	703.9	-56.3	No Action
1055	Tree	650.0	656.4	-6.3	686.8	-36.7	704.0	-54.0	-	-	760.1	-110.1	-	-	No Action
1056	Tree	651.2	657.0	-5.7	687.5	-36.3	704.9	-53.6	-	-	761.1	-109.8	-	-	No Action
1057	Tree	650.7	658.5	-7.9	689.4	-38.8	707.1	-56.5	-	-	763.5	-112.9	-	-	No Action
1058	Tree	650.4	659.5	-9.2	690.7	-40.4	708.6	-58.3	-	-	765.2	-114.8	708.6	-58.3	No Action
1059	Tree	650.4	660.0	-9.5	691.2	-40.8	709.3	-58.9	-	-	765.9	-115.4	709.3	-58.9	No Action
1060	Building	682.4	660.1	22.3	691.4	-9.0	709.5	-27.1	736.8	-54.3	766.1	-83.7	709.5	-27.1	To Be Studied
1061	Tree	694.4	-	-	691.9	2.5	-	-	-	-	-	-	-	-	To Be Studied
1062	Tree	651.4	660.7	-9.4	692.2	-40.8	710.4	-59.0	-	-	767.1	-115.7	710.4	-59.0	No Action
1063	Tree	689.5	-	-	692.6	-3.1	-	-	-	-	-	-	-	-	No Action
1064	Billboard	664.5	661.0	3.5	692.6	-28.0	710.8	-46.3	-	-	767.5	-103.0	710.8	-46.3	To Be Studied
1068	Tree	668.7	670.0	-1.4	703.9	-35.2	-	-	-	-	-	-	-	-	No Action
1069	Tree	691.9	670.3	21.6	704.1	-12.2	-	-	-	-	-	-	-	-	To Be Studied
1071	Tree	697.5	-	-	705.5	-8.0	-	-	-	-	-	-	-	-	No Action
1072	Tree	680.4	671.8	8.6	706.0	-25.7	-	-	-	-	-	-	-	-	To Be Studied
1075	Tree	705.1	-	-	708.7	-3.5	-	-	-	-	-	-	-	-	No Action
1076	Tree	673.9	675.2	-1.3	710.3	-36.4	-	-	-	-	-	-	-	-	No Action
1080	Tree	670.8	678.3	-7.5	714.2	-43.4	-	-	-	-	795.2	-124.4	-	-	No Action
1081	Tree	671.8	678.8	-7.0	714.8	-43.0	-	-	-	-	-	-	-	-	No Action
1082	Tree	704.4	-	-	714.8	-10.4	-	-	-	-	-	-	-	-	No Action
1083	Tree	678.4	680.9	-2.5	717.4	-39.0	-	-	-	-	-	-	-	-	No Action
1084	Tree	676.9	682.4	-5.6	719.4	-42.5	-	-	-	-	801.8	-124.9	-	-	No Action
1086	Tree	678.1	686.3	-8.2	724.2	-46.1	748.0	-69.9	-	-	808.0	-129.9	748.0	-69.9	No Action
1088	Tree	685.9	688.0	-2.1	726.4	-40.5	-	-	-	-	-	-	-	-	No Action
1089	Tree	684.7	688.7	-4.0	727.2	-42.5	-	-	-	-	-	-	-	-	No Action
1090	Tree	700.1	692.1	8.0	731.4	-31.3	756.5	-56.4	-	-	817.1	-117.1	756.5	-56.4	To Be Studied
1091	Tree	691.8	692.9	-1.1	732.5	-40.7	757.8	-66.0	-	-	818.5	-126.7	757.8	-66.0	No Action
1092	Tree	693.3	695.3	-1.9	735.4	-42.1	761.2	-67.9	-	-	822.2	-128.9	761.2	-67.9	No Action
1093	Light Pole	713.5	709.4	4.1	753.1	-39.6	-	-	-	-	844.8	-131.3	-	-	To Be Studied
1094	Light Pole	703.6	710.6	-7.0	754.6	-50.9	-	-	-	-	-	-	-	-	No Action
9510	Light Pole	644.1	657.7	-13.6	688.4	-44.3	705.9	-61.8	732.6	-88.6	762.2	-118.1	705.9	-61.8	No Action

LEGEND

1. Numbers shown in red are a penetration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-11-29(2) - 11-29 Inner P77 (3)
LAYOUT: 11-29 Inner P77 (3)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:40 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT
WSP
CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 11/29 Obstruction Tables Inner Portion & Part 77 (Existing/Future)

Runway 6 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
335	Runway Light	564.1	564.2	-0.1	572.6	-8.5	570.6	-6.5	579.9	-15.8	598.4	-34.3	570.6	-6.5	Fixed by Function
336	Post	550.4	563.9	-13.5	572.3	-21.9	570.2	-19.8	579.4	-29.1	597.9	-47.6	570.2	-19.8	No Action
337	Runway Light	555.9	555.7	0.1	562.0	-6.1	558.1	-2.2	565.8	-9.9	584.8	-29.0	558.1	-2.2	Fixed by Function
338	Runway Light	555.9	555.0	0.8	563.3	-7.5	557.1	-1.2	564.6	-8.7	583.7	-27.8	557.1	-1.2	Fixed by Function
339	Runway Light	555.6	554.3	1.3	573.1	-17.5	556.0	-0.4	-	-	582.6	-27.0	556.0	-0.4	Fixed by Function
340	Runway Light	559.8	559.8	0.0	567.1	-7.4	564.1	-4.4	572.6	-12.8	591.4	-31.6	564.1	-4.4	Fixed by Function
341	Post	550.0	559.6	-9.6	566.8	-16.8	563.8	-13.8	572.2	-22.2	591.0	-41.0	563.8	-13.8	No Action
344	Runway Light	555.8	554.0	1.8	559.8	-4.1	555.6	0.2	562.9	-7.1	582.1	-26.3	555.6	0.2	Fixed by Function
345	Runway Light	555.5	553.3	2.2	559.0	-3.4	554.5	1.0	561.7	-6.2	581.0	-25.4	554.5	1.0	Fixed by Function
346	Runway Light	555.8	554.7	1.1	560.7	-4.9	556.6	-0.8	564.1	-8.3	583.2	-27.4	556.6	-0.8	Fixed by Function
347	Runway Light	555.7	555.4	0.2	561.6	-6.0	557.7	-2.0	565.3	-9.6	584.4	-28.7	557.7	-2.0	Fixed by Function
348	Sign	552.2	-	-	584.8	-32.6	-	-	-	-	-	-	-	-	Fixed by Function
349	Runway Light	555.9	553.0	2.9	558.6	-2.7	554.1	1.8	561.2	-5.3	580.4	-24.5	554.1	1.8	Fixed by Function
350	Runway Light	555.9	552.3	3.6	557.7	-1.8	553.0	2.9	560.0	-4.1	579.3	-23.4	553.0	2.9	Fixed by Function
351	Runway Light	555.8	553.7	2.1	559.4	-3.7	555.1	0.7	562.4	-6.6	581.6	-25.8	555.1	0.7	Fixed by Function
353	Runway Light	551.9	551.0	0.9	556.1	-4.2	551.2	0.7	558.0	-6.0	577.3	-25.4	551.2	0.7	Fixed by Function
354	Runway Light	555.8	552.7	3.1	558.2	-2.4	553.6	2.2	560.7	-4.9	580.0	-24.1	553.6	2.2	Fixed by Function
355	Runway Light	555.7	551.3	4.5	556.4	-0.7	551.5	4.2	558.3	-2.6	577.7	-22.0	551.5	4.2	Fixed by Function
356	Runway Light	555.8	552.0	3.8	557.4	-1.6	552.7	3.1	559.6	-3.8	578.9	-23.1	552.7	3.1	Fixed by Function
359	Post	551.3	551.6	-0.3	566.4	-15.1	552.1	-0.8	559.0	-7.7	578.3	-27.0	552.1	-0.8	No Action
360	Post	551.7	550.9	0.8	561.6	-9.9	551.1	0.6	557.8	-6.1	577.2	-25.5	551.1	0.6	To Be Studied
361	Post	551.5	551.3	0.2	564.0	-12.5	551.6	-0.1	558.4	-6.9	577.8	-26.2	551.6	-0.1	To Be Studied
362	Post	551.8	-	-	556.8	-5.0	-	-	556.6	-4.8	576.1	-24.3	-	-	No Action
363	Post	551.9	-	-	559.3	-7.4	-	-	557.2	-5.4	576.6	-24.8	-	-	No Action
364	Runway Light	555.9	550.9	5.1	563.8	-7.8	551.0	4.9	557.7	-1.8	577.1	-21.2	551.0	4.9	Fixed by Function
365	Runway Light	555.8	551.6	4.3	568.7	-12.9	552.0	3.8	558.9	-3.1	578.2	-22.4	552.0	3.8	Fixed by Function
366	Runway Light	555.9	551.3	4.7	566.6	-10.7	551.6	4.3	558.4	-2.4	577.7	-21.8	551.6	4.3	Fixed by Function
367	Runway Light	555.9	-	-	558.9	-2.9	-	-	556.5	-0.6	576.0	-20.0	-	-	Fixed by Function
368	Runway Light	555.9	-	-	561.4	-5.4	-	-	557.1	-1.2	576.5	-20.6	-	-	Fixed by Function
369	Runway Light	556.4	-	-	599.4	-42.9	-	-	-	-	-	-	-	-	Fixed by Function
370	Runway Light	556.4	-	-	604.4	-47.9	-	-	-	-	-	-	-	-	Fixed by Function
371	Runway Light	556.4	-	-	594.5	-38.1	-	-	-	-	-	-	-	-	Fixed by Function
6741	Tree	644.4	650.4	-6.0	680.5	-36.0	697.4	-53.0	-	-	736.1	-91.7	697.4	-53.0	No Action
6742	Light Pole	641.4	650.4	-9.0	680.4	-39.0	697.4	-56.0	-	-	736.1	-94.7	697.4	-56.0	No Action
6743	Tree	650.2	650.4	-0.2	680.4	-30.2	697.3	-47.2	-	-	736.1	-85.9	697.3	-47.2	No Action
6744	Tree	644.7	650.3	-5.6	680.3	-35.6	697.2	-52.5	-	-	736.0	-91.3	697.2	-52.5	No Action
6745	Tree	643.2	650.2	-7.1	680.2	-37.0	697.1	-53.9	-	-	735.8	-92.6	697.1	-53.9	No Action
6746	Utility Pole	640.3	650.2	-9.9	680.2	-39.9	697.1	-56.8	723.2	-83.0	735.8	-95.5	697.1	-56.8	No Action
6747	Tree	650.0	650.0	0.0	680.0	-30.0	696.8	-46.8	-	-	735.5	-85.5	696.8	-46.8	No Action
6748	Light Pole	640.0	650.0	-9.9	679.9	-39.8	696.7	-56.7	-	-	735.4	-95.3	696.7	-56.7	No Action
6749	Building	696.4	649.9	46.4	679.8	16.5	696.7	-0.3	-	-	735.3	-39.0	696.7	-0.3	To Be Studied
6752	Tree	648.1	649.6	-1.5	679.4	-31.3	-	-	-	-	-	-	-	-	No Action
6753	Tree	651.0	649.4	1.6	679.2	-28.2	695.9	-44.9	-	-	734.5	-83.5	695.9	-44.9	To Be Studied
6754	Building	669.1	649.4	19.7	679.2	-10.1	-	-	-	-	-	-	-	-	To Be Studied
6755	Tree	641.9	649.2	-7.3	678.9	-37.0	695.5	-53.7	721.5	-79.7	734.1	-92.3	695.5	-53.7	No Action
6756	Light Pole	641.4	648.9	-7.5	678.5	-37.2	695.1	-53.8	-	-	733.7	-92.3	-	-	No Action
6757	Tree	658.4	648.9	9.5	678.5	-20.2	695.1	-36.7	-	-	733.6	-75.3	695.1	-36.7	To Be Studied
6758	Tree	649.8	648.8	1.0	678.4	-28.6	-	-	-	-	-	-	-	-	To Be Studied
6759	Tree	642.9	648.7	-5.9	678.4	-35.5	694.9	-52.0	720.8	-77.9	733.4	-90.5	694.9	-52.0	No Action
6760	Tree	651.1	648.7	2.4	678.3	-27.2	-	-	-	-	-	-	-	-	To Be Studied
6761	Tree	654.6	648.6	6.0	678.2	-23.6	-	-	-	-	-	-	-	-	To Be Studied
6762	Tree	673.6	648.5	25.1	678.0	-4.4	694.5	-20.9	-	-	733.0	-59.4	694.5	-20.9	To Be Studied
6763	Tree	639.5	648.4	-8.9	677.9	-38.4	694.4	-54.9	-	-	732.9	-93.4	694.4	-54.9	No Action
6764	Billboard	640.2	-	-	677.8	-37.6	-	-	-	-	-	-	-	-	No Action
6765	Tree	654.4	648.2	6.2	677.7	-23.3	-	-	-	-	-	-	-	-	To Be Studied
6766	Tree	648.8	648.2	0.6	677.7	-28.9	694.1	-45.3	-	-	732.6	-83.8	694.1	-45.3	To Be Studied
6767	Tree	638.9	648.1	-9.2	677.6	-38.6	-	-	-	-	-	-	-	-	No Action
6768	Tree	654.5	648.0	6.5	677.5	-22.9	693.9	-39.3	-	-	732.3	-77.7	693.9	-39.3	To Be Studied
6769	Light Pole	641.1	647.9	-6.9	677.4	-36.3	693.7	-52.7	-	-	732.2	-91.1	693.7	-52.7	No Action
6770	Tree	638.9	647.9	-9.0	677.3	-38.4	-	-	-	-	-	-	-	-	No Action
6771	Tree	639.3	647.8	-8.5	677.2	-37.9	693.6	-54.3	719.3	-80.0	732.0	-92.7	693.6	-54.3	No Action
6772	Tree	656.0	647.7	8.4	677.0	-21.0	693.3	-37.3	-	-	731.7	-75.7	693.3	-37.3	To Be Studied
6773	Tree	643.1	647.5	-4.4	676.9	-33.7	693.2	-50.0	-	-	731.5	-88.4	693.2	-50.0	No Action
6774	Light Pole	637.9	647.5	-9.6	676.8	-38.9	693.1	-55.2	-	-	731.5	-93.5	693.1	-55.2	No Action
6775	Tree	644.2	647.5	-3.3	676.8	-32.6	693.1	-48.9	718.7	-74.5	731.4	-87.2	693.1	-48.9	No Action
6776	Tree	638.0	647.3	-9.3	676.6	-38.5	692.8	-54.8	-	-	731.2	-93.1	692.8	-54.8	No Action
6777	Tree	641.3	647.3	-6.0	676.6	-35.3	-	-	-	-	-	-	-	-	No Action
6778	Tree	641.7	647.3	-5.6	676.5	-34.8	692.8	-51.1	718.4	-76.7	731.1	-89.4	692.8	-51.1	No Action
6779	Tree	637.6	647.3	-9.7	676.5	-38.9	-	-	-	-	-	-	-	-	No Action
6780	Tree	655.0	647.3	7.7	676.5	-21.6	692.8	-37.8	718.4	-63.4	731.1	-76.2	692.8	-37.8	To Be Studied
6781	Tree	640.0	647.2	-7.1	676.4	-36.4	-	-	-	-	-	-	-	-	No Action
6782	Tree	639.7	647.1	-7.4	676.2	-36.6	692.4	-52.8	718.0	-78.3	730.7	-91.1	692.4	-52.8	No Action
6783	Tree	639.6	647.0	-7.5	676.2	-36.6	-	-	-	-	-	-	-	-	No Action
6784	Tree	661.4	-	-	676.1	-14.7	-	-	-	-	-	-	-	-	No Action
6785	Tree	650.2	646.9	3.3	676.0	-25.9	-	-	-	-	-	-	-	-	To Be Studied
6786	Tree	649.5	646.9	2.6	676.0	-26.5	692.1	-42.7	-	-	730.4	-80.9	692.1	-42.7	To Be Studied
6787	Tree	639.8	646.8	-7.1	676.0	-36.2	-	-	-	-	-	-	-	-	No Action
6788	Tree	644.2	646.8	-2.7	675.9	-31.8	692.1	-47.9	-	-	730.4	-86.2	692.1	-47.9	No Action
6789	Tree	658.1	646.5	11.6	675.6	-17.5	691.6	-33.5	-	-	729.9	-71.8	691.6	-33.5	To Be Studied
6790	Tree	655.5	646.5	9.1	675.5	-20.0	691.6	-36.1	-	-	729.8	-74.3	691.6	-36.1	To Be Studied
6791	Light Pole	644.9	646.5	-1.6	675.5	-30.6	691.6	-46.7	717.0	-72.2	729.8	-84.9	691.6	-46.7	No Action
6792	Tree	658.0	646.4	11.6	675.4	-17.4	691.4	-33.4	716.9	-58.9	729.7	-71.7	691.4	-33.4	To Be Studied
6793	Utility Pole	640.7	646.4	-5.6	675.4	-34.7	691.4	-50.7	716.9	-76.1	729.7	-88.9	691.4	-50.7	No Action
6794	Tree	642.7	646.3	-3.6	675.3	-32.6	691.4	-48.6	-	-	729.6	-86.8	691.4	-48.6	No Action
6795	Tree	638.8	646.1	-7.3	675.0	-36.2	691.0	-52.2	-	-	729.2	-90.4	-	-	No Action
6796	Tree	663.6	646.0	17.6	675.0	-11.4	690.9	-27.3	-	-	729.1	-65.5	690.9	-27.3	To Be Studied
6797	Tree	640.9	646.0	-5.1	674.9	-34.0	-	-	-	-	-	-	-	-	No Action
6798	Tree	639.3	645.9	-6.7	674.9	-35.6	690.8	-51.5	-	-	729.0	-89.7	690.8	-51.5	No Action
6799	Tree	641.3	645.7	-4.4	674.6	-33.3	-	-	-	-	-	-	-	-	No Action
6800	Tree	639.7	645.7	-6.0	674.6	-34.9	-	-	-	-	728.6	-88.9	-	-	No Action
6801	Tree	669.5	645.7	23.8	674.5	-5.0	-	-	-	-	-	-	-	-	To Be Studied
6802	Tree	640.4	645.6	-5.2	674.4	-34.0	690.3	-49.9	-	-	728.4	-88.0	-	-	No Action
6803	Tree	641.3	645.5	-4.2	674.3	-33.0	-	-	-	-	-	-	-	-	No Action
6804	Light Pole	640.0	645.4	-5.3	674.1	-34.1	690.0	-49.9	-	-	728.0	-88.0	690.0	-49.9	No Action
6805	Tree	636.5	645.3	-8.8	674.1	-37.6	-	-	-	-	-	-	-	-	No Action
6806	Tree	639.8	645.3	-5.5	674.1	-34.3	689.9	-50.1	-	-	728.0	-88.2	-	-	No Action
6807	Tree	641.2	645.3	-4.1	674.0	-32.9	-	-	-	-	727.9	-86.7	-	-	No Action
6808	Tree	639.9	645.2	-5.3	673.9	-34.0	689.7	-49.8	-	-	727.8	-87.9	-	-	No Action
6809	Tree	645.6	645.2	0.4	673.9	-28.3	689.7	-44.1	-	-	727.7	-82.2	-	-	To Be Studied
6810	Tree	638.5	645.1	-6.6	673.8	-35.3	689.6	-51.1	-	-	727.7	-89.2	689.6	-51.1	No Action
6811	Tree	649.0	645.1	3.9	673.8	-24.8	689.6	-40.5	-	-	727.6	-78.6	689.6	-40.5	To Be Studied
6812	Tree	658.0	645.0	13.1	673.7	-15.6	689.4	-31.3	714.6	-56.5	727.4	-69.4	689.4	-31.3	To Be Studied
6813	Tree	656.3	644.9	11.3	673.6	-17.3	689.3	-33.0	-	-	727.4	-71.1	689.3	-33.0	To Be Studied
6814	Light Pole	637.2	644.9	-7.8	673.6	-36.4	689.3	-52.1	-	-	727.3	-90.2	689.3	-52.1	No Action
6815	Tree	640.4	644.9	-4.5	673.5	-33.2	689.2	-48.9	-	-	727.3	-86.9	689.2	-48.9	No Action
6816	Tree	656.0	644.8	11.2	673.4	-17.4	689.1	-33.1	-	-	727.1	-71.1	689.1	-33.1	To Be Studied
6817	Tree	636.9	644.8	-7.9	673.4	-36.5	689.0	-52.2	714.2	-77.3	727.1	-90.2	689.0	-52.2	No Action
6818	Tree	643.4	644.7	-1.3	673.3	-29.9	689.0	-45.6	-	-	727.0	-83.6	689.0	-45.6	No Action
6819	Tree	642.4	644.7	-2.2	673.3	-30.8	688.9	-46.5	-	-	726.9	-84.5	-	-	No Action
6820	Tree	643.7	644.6	-0.9	673.2	-29.4	688.8	-45.1	-	-	726.8	-83.1	688.8	-45.1	No Action
6821	Tree	643.7	644.6	-0.9	673.2	-29.4	688.8	-45.1	-	-	726.8	-83.1	688.8	-45.1	No Action
6822	Tree	649.4	644.6	4.8	673.2	-23.8	688.8	-39.4	-	-	726.8	-77.4	688.8	-39.4	To Be Studied
6823	Tree	642.7	644.6	-1.9	673.2	-30.4	688.8	-46.1	-	-	726.8	-84.1	688.8	-46.1	No Action
6824	Light Pole	638.4	644.6	-6.2	673.2	-34.8	-	-	-	-	-	-	-	-	No Action
6825	Tree	654.1	644.6	9.5	673.1	-19.1	688.8	-34.7	-	-	726.8	-72.7	688.8	-34.7	To Be Studied
6826	Tree	646.6	644.6	2.1	673.1	-26.5	688.8	-42.1	-	-	726.7	-80.1	688.8	-42.1	To Be Studied
6827	Tree	640.5	644.5	-4.0	673.1	-32.6	688.7	-48.2	-	-	726.7	-86.2	688.7	-48.2	No Action
6828	Tree	635.7	644.5	-8.8	673.1	-37.4	688.7	-53.0	-	-	726.7	-91.0	-	-	No Action
6829	Tree	660.5	644.5	16.0	673.1	-12.5	688.7	-28.1	713.8	-53.2	726.7	-66.1	688.7	-28.1	To Be Studied
6830	Tree	651.9	644.5	7.4	673.0	-21.1	688.7	-36.7	-	-	726.6	-74.7	688.7	-36.7	To Be Studied
6831	Tree	640.0	644.5	-4.5	673.0	-33.0	688.6	-48.6	-	-	726.6	-86.6	688.6	-48.6	No Action
6832	Tree	642.4	644.4	-2.0	673.0	-30.5	688.6	-46.2	-	-	726.5	-84.1	688.6	-46.2	No Action
6833	Tree	641.7	644.2	-2.5	672.7	-31.0	688.3	-46.6	-	-	726.2	-84.5	688.3	-46.6	No Action
6834	Tree	641.5	644.2	-2.7	672.6	-31.2	688.2	-46.7	-	-	726.1	-84.7	688.2	-46.7	No Action
6835	Tree	640.1	644.2	-4.1	672.6	-32.5	688.2	-48.1	-	-	726.1	-86.0	688.2	-48.1	No Action
6836	Tree	641.2	644.2	-3.0	672.6	-31.4	688.2	-47.0	713.2	-72.0	726.1	-84.9	688.2	-47.0	No Action
6837	Tree	639.5	644.1	-4.6	672.6	-33.1	688.1	-48.6	-	-	726.0	-86.6	688.1	-48.6	No Action
6838	Tree	648.4	644.1	4.3	672.6	-24.1	688.1	-39.7	-	-	726.0	-77.6	-	-	To Be Studied
6839	Tree	652.5	644.1	8.4	672.5	-20.0	688.1	-35.5	-	-	726.0	-73.5	688.1	-35.5	To Be Studied
6840	Tree	646.5	644.1	2.4	672.5	-26.1	688.1	-41.6	713.1	-66.6	726.0	-79.5	688.1	-41.6	To Be Studied
6841	Tree	639.5	644.1	-4.5	672.5	-33.0	688.0	-48.5	-	-	726.0	-86.4	688.0	-48.5	No Action
6842	Tree	635.9	644.0	-8.1	672.4	-36.6	687.9	-52.1	-	-	725.8	-90.0	687.9	-52.1	No Action
6843	Light Pole	638.6	643.9	-5.3	672.4	-33.7	687.9	-49.2	712.8	-74.2	725.8	-87.1	687.9	-49.2	No Action
6844	Tree	652.4	643.9	8.5	672.4	-19.9	687.9	-35.4	712.8	-60.4	725.8	-73.4	687.9	-35.4	To Be Studied
6845	Tree	650.9	643.9	7.0	672.3	-21.4	687.8	-36.9	-	-	725.7	-74.8	687.8	-36.9	To Be Studied
6846	Tree	659.6	643.8	15.8	672.2	-12.6	687.7	-28.1	712.6	-53.0	725.6	-66.0	687.7	-28.1	To Be Studied
6847	Tree	644.9	643.8	1.1	672.1	-27.2	687.6	-42.7	-	-	725.5	-80.6	687.6	-42.7	To Be Studied
6848	Tree	638.1	643.6	-5.5	672.0	-33.9	687.4	-49.3	712.3	-74.2	725.3	-87.2	687.4	-49.3	No Action
6849	Light Pole	638.8	643.4	-4.6	671.6	-32.8	687.0	-48.2	-	-	724.9	-86.1	687.0	-48.2	No Action
6850	Tree	635.3	643.2	-7.9	671.5	-36.1	686.8	-51.5	711.6	-76.3	724.6	-89.3	686.8	-51.5	No Action
6851	Tree	645.4	642.7	2.7	670.8	-25.4	686.0	-40.7	-	-	723.8	-78.4	686.0	-40.7	To Be Studied
6852	Tree	639.5	642.7	-3.1	670.8	-31.2	686.0	-46.5	-	-	723.7	-84.2	686.0	-46.5	No Action
6853	Tree	652.4	642.6	9.8	670.7	-18.3	685.9	-33.5	710.7	-58.2	723.7	-71.3	685.9	-33.5	To Be Studied
6854	Light Pole	638.8	642.6	-3.8	670.6	-31.8	685.8	-47.1	-	-	723.6	-84.8	685.8	-47.1	No Action
6855	Tree	635.9	642.6	-6.7	670.6	-34.8	685.8	-50.0	710.5	-74.6	723.6	-87.7	685.8	-50.0	No Action
6856	Light Pole	635.5	642.5	-7.1	670.6	-35.1	-	-	-	-	-	-	-	-	No Action
6857	Tree	641.3	642.5	-1.2	670.6	-29.3	685.7	-44.4	710.4	-69.1	723.5	-82.2	685.7	-44.4	No Action
6858	Tree	641.5	642.4	-0.9	670.4	-28.9	685.5	-44.1	-	-	723.3	-81.8	685.5	-44.1	No Action
6859	Tree	638.6	642.2	-3.6	670.1	-31.5	685.2	-46.7	-	-	722.9	-84.3	685.2	-46.7	No Action
6860	Tree	647.3	642.0	5.4	669.9	-22.6	684.9	-37.6	709.5	-62.2	722.6	-75.3	684.9	-37.6	To Be Studied
6861	Tree	643.2	641.9	1.4	669.8	-26.5	684.8	-41.6	709.4	-66.1	722.5	-79.2	684.8	-41.6	To Be Studied
6862	Tree	632.9	641.9	-9.0	669.7	-36.9	684.8	-51.9	709.4	-76.5	722.4	-89.6	684.8	-51.9	No Action
6863	Tree	651.9	641.8	10.0	669.7	-17.8	684.8	-32.9	709.3	-57.4	722.4	-70.5	684.8	-32.9	To Be Studied
6864	Tree	632.7	641.6	-8.8	669.4	-36.6	684.4	-51.6	708.8	-76.1	722.0	-89.2	684.4	-51.6	No Action
6865	Tree	642.4	641.5	0.9	669.3	-26.9	684.3	-41.9	-	-	721.9	-79.5	684.3	-41.9	To Be Studied
6866	Tree	634.3	641.5	-7.3	669.3	-35.1	684.3	-50.0	708.8	-74.5	721.9	-87.6	684.3	-50.0	No Action
6867	Tree	639.5	641.5	-2.0	669.3	-29.8	684.2	-44.8	708.7	-69.2	721.8	-82.4	684.2	-44.8	No Action
6868	Light Pole	635.7	641.4	-5.7	669.2	-33.5	684.1	-48.4	-	-	721.7	-86.0	684.1	-48.4	No Action
6869	Tree	640.5	641.4	-0.8	669.1	-28.6	684.1	-43.5	708.5	-68.0	721.7	-81.1	684.1	-43.5	No Action
6870	Tree	632.9	641.2	-8.3	668.9	-36.1	683.8	-51.0	708.3	-75.4	721.4	-88.5	683.8	-51.0	No Action
6871	Tree	635.3	640.9	-5.6	668.6	-33.3	683.4	-48.1	707.8	-72.5	721.0	-85.7	683.4	-48.1	No Action
6872	Tree	648.4	640.9	7.6	668.5	-20.1	683.3	-34.9	707.7	-59.2	720.9	-72.4	683.3	-34.9	To Be Studied
6873	Tree	641.7	640.7	1.1	668.3	-26.5	683.0	-41.3	-	-	720.5	-78.8	683.0	-41.3	To Be Studied
6874	Tree	642.2	640.6	1.5	668.2	-26.0	683.0	-40.8	707.3	-65.1	720.5	-78.3	683.0	-40.8	To Be Studied
6875	Tree	632.0	640.4	-8.4	667.9	-35.9	682.7	-50.7	706.9	-74.9	720.1	-88.1	682.7	-50.7	No Action
6876	Tree	641.7	640.3	1.4	667.8	-26.1	682.5	-40.8	706.7	-65.0	719.9	-78.2	682.5	-40.8	To Be Studied
6877	Light Pole	640.7	640.2	0.5	667.6	-27.0	682.3	-41.7	-	-	719.8	-79.1	682.3	-41.7	To Be Studied
6878	Tree	652.4	640.1	12.3	667.6	-15.2	682.2	-29.9	-	-	719.6	-67.3	682.2	-29.9	To Be Studied
6879	Tree	676.0	640.1	36.0	667.5	8.5	682.2	-6.1	706.4	-30.3	719.6	-43.5	682.2	-6.1	To Be Studied
6880	Tree	632.9	639.9	-7.0	667.2	-34.4	681.8	-49.0	-	-	719.2	-86.4	681.8	-49.0	No Action
6881	Tree	658.1	639.7	18.4	667.0	-8.9	681.6	-23.5	705.7	-47.6	718.9	-60.9	681.6	-23.5	To Be Studied
6882	Tree	634.4	639.6	-5.2	666.9	-32.6	681.5	-47.1	705.6	-71.2	718.8	-84.5	681.5	-47.1	No Action
6883	Tree	640.1	639.6	0.5	666.9	-26.8	681.4	-41.3	-	-	718.8	-78.7	681.4	-41.3	To Be Studied
6884	Tree	644.8	639.5	5.4	666.8	-21.9	681.3	-36.5	705.4	-60.5	718.6	-73.8	681.3	-36.5	To Be Studied
6885	Tree	668.2	639.4	28.8	666.7	1.6	681.2	-12.9	705.2	-37.0	718.5	-50.3	681.2	-12.9	To Be Studied
6886	Tree	632.7	639.3	-6.6	666.5	-33.8	681.0	-48.3	-	-	718.3	-85.6	681.0	-48.3	No Action
6887	Tree	631.0	639.3	-8.3	666.5	-35.5	681.0	-50.0	-	-	718.3	-87.3	681.0	-50.0	No Action
6888	Tree	635.2	639.2	-4.0	666.4	-31.2	680.9	-45.7	704.9	-69.7	718.2	-83.0	680.9	-45.7	No Action
6889	Tree	638.0	639.1	-1.1	666.3	-28.3	680.8	-42.8	-	-	718.1	-80.1	680.8	-42.8	No Action
6890	Light Pole	637.0	639.0	-2.0	666.1	-29.1	680.5	-43.6	704.5	-67.5	717.8	-80.8	680.5	-43.6	No Action
6891	Tree	638.1	638.8	-0.7	666.0	-27.8	680.4	-42.2	704.3	-66.2	717.6	-79.5	680.4	-42.2	No Action

Runway 6 Inner Approach (Existing)

Runway 6 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
6892	Tree	643.7	638.8	4.9	665.9	-22.3	680.3	-36.6	704.3	-60.6	717.6	-73.9	680.3	-36.6	To Be Studied
6893	Tree	645.2	638.8	6.4	665.9	-20.8	680.3	-35.1	-	-	717.6	-72.4	680.3	-35.1	To Be Studied
6894	Tree	638.0	638.8	-0.8	665.9	-27.9	680.3	-42.3	-	-	717.6	-79.6	680.3	-42.3	No Action
6895	Tree	630.6	638.8	-8.2	665.9	-35.3	680.3	-49.7	704.2	-73.6	717.5	-86.9	680.3	-49.7	No Action
6896	Tree	651.3	638.7	12.5	665.8	-14.6	680.2	-28.9	704.1	-52.9	717.5	-66.2	680.2	-28.9	To Be Studied
6897	Tree	646.8	638.7	8.1	665.8	-19.0	680.1	-33.3	704.1	-57.3	717.4	-70.6	680.1	-33.3	To Be Studied
6898	Tree	644.4	638.5	5.9	665.5	-21.1	679.8	-35.4	703.7	-59.3	717.0	-72.7	679.8	-35.4	To Be Studied
6899	Tree	637.3	638.4	-1.1	665.4	-28.1	679.7	-42.4	703.5	-66.2	716.9	-79.6	679.7	-42.4	No Action
6900	Tree	629.1	638.4	-9.3	665.4	-36.3	679.6	-50.6	703.5	-74.4	716.9	-87.8	679.6	-50.6	No Action
6901	Tree	635.2	638.4	-3.2	665.4	-30.2	679.6	-44.5	-	-	716.8	-81.7	679.6	-44.5	No Action
6902	Tree	643.4	638.3	5.1	665.3	-21.9	679.6	-36.2	703.5	-60.1	716.8	-73.4	679.6	-36.2	To Be Studied
6903	Tree	646.5	638.3	8.2	665.3	-18.8	679.5	-33.0	-	-	716.7	-70.2	679.5	-33.0	To Be Studied
6904	Tree	643.1	638.2	4.9	665.1	-22.0	679.3	-36.2	-	-	716.5	-73.4	679.3	-36.2	To Be Studied
6905	Tree	642.6	638.1	4.5	665.0	-22.5	679.2	-36.7	703.1	-60.5	716.4	-73.8	679.2	-36.7	To Be Studied
6906	Tree	640.5	638.0	2.5	664.9	-24.5	679.2	-38.7	-	-	716.3	-75.8	679.2	-38.7	To Be Studied
6907	Tree	643.8	638.0	5.8	664.9	-21.1	679.1	-35.3	702.9	-59.1	716.2	-72.5	679.1	-35.3	To Be Studied
6908	Tree	638.3	638.0	0.4	664.9	-26.6	679.1	-40.7	702.9	-64.5	716.2	-77.9	679.1	-40.7	To Be Studied
6909	Tree	632.8	637.8	-5.0	664.7	-31.9	678.8	-46.0	702.6	-69.8	716.0	-83.2	678.8	-46.0	No Action
6910	Tree	632.7	637.8	-5.1	664.7	-32.0	678.8	-46.1	-	-	715.9	-83.3	678.8	-46.1	No Action
6911	Tree	632.6	637.7	-5.2	664.6	-32.0	678.7	-46.2	702.5	-69.9	715.8	-83.3	678.7	-46.2	No Action
6912	Tree	644.6	637.6	7.0	664.5	-19.8	678.6	-34.0	702.3	-57.7	715.7	-71.1	678.6	-34.0	To Be Studied
6913	Tree	628.5	637.6	-9.1	664.4	-36.0	678.6	-50.1	-	-	715.7	-87.2	678.6	-50.1	No Action
6914	Tree	642.6	637.5	5.1	664.3	-21.7	678.4	-35.8	702.1	-59.5	715.5	-72.9	678.4	-35.8	To Be Studied
6915	Tree	643.4	637.5	6.0	664.2	-20.8	678.3	-34.9	702.0	-58.6	715.4	-72.0	678.3	-34.9	To Be Studied
6916	Tree	633.3	637.5	-4.1	664.2	-30.9	678.3	-45.0	702.0	-68.7	715.4	-82.1	678.3	-45.0	No Action
6917	Tree	651.6	637.4	14.2	664.2	-12.6	678.2	-26.6	701.9	-50.3	715.3	-63.7	678.2	-26.6	To Be Studied
6918	Tree	642.7	637.1	5.6	663.8	-21.1	677.8	-35.1	701.4	-58.7	714.8	-72.1	677.8	-35.1	To Be Studied
6919	Tree	646.1	637.0	9.0	663.7	-17.7	677.7	-31.6	701.3	-55.3	714.7	-68.7	677.7	-31.6	To Be Studied
6920	Tree	629.9	637.0	-7.0	663.7	-33.7	677.6	-47.7	701.2	-71.3	714.7	-84.7	677.6	-47.7	No Action
6921	Tree	635.8	636.8	-1.0	663.4	-27.6	677.3	-41.5	700.9	-65.1	714.3	-78.5	677.3	-41.5	No Action
6922	Tree	634.0	636.7	-2.8	663.4	-29.4	677.3	-43.3	700.8	-66.9	714.3	-80.3	677.3	-43.3	No Action
6923	Tree	627.9	636.7	-8.9	663.3	-35.5	677.3	-49.4	-	-	714.3	-86.4	677.3	-49.4	No Action
6924	Light Pole	634.3	636.7	-2.4	663.2	-28.9	677.1	-42.8	-	-	714.1	-79.8	677.1	-42.8	No Action
6925	Tree	626.9	636.6	-9.7	663.2	-36.3	677.1	-50.2	-	-	714.1	-87.2	677.1	-50.2	No Action
6926	Tree	659.9	636.5	23.3	663.1	-3.2	677.0	-17.1	700.5	-40.6	713.9	-54.1	677.0	-17.1	To Be Studied
6927	Tree	643.4	636.3	7.1	662.8	-19.4	676.6	-33.2	700.0	-56.7	713.5	-70.1	676.6	-33.2	To Be Studied
6928	Tree	632.4	636.1	-3.8	662.6	-30.2	676.4	-44.0	-	-	713.3	-81.0	-	-	No Action
6929	Light Pole	629.6	636.0	-6.4	662.4	-32.8	676.1	-46.6	-	-	713.0	-83.5	676.1	-46.6	No Action
6930	Tree	630.4	636.0	-5.5	662.4	-32.0	676.1	-45.7	-	-	713.0	-82.6	676.1	-45.7	No Action
6931	Tree	628.9	635.9	-7.0	662.3	-33.4	676.0	-47.1	699.4	-70.5	712.9	-84.0	676.0	-47.1	No Action
6932	Tree	638.7	635.7	3.1	662.0	-23.3	675.7	-36.9	699.0	-60.3	712.5	-73.8	675.7	-36.9	To Be Studied
6933	Tree	653.5	635.5	18.0	661.8	-8.3	675.5	-22.0	698.8	-45.3	712.3	-58.8	675.5	-22.0	To Be Studied
6934	Tree	638.8	635.2	3.6	661.4	-22.6	675.0	-36.2	-	-	711.8	-73.0	675.0	-36.2	To Be Studied
6935	Tree	656.8	635.2	21.6	661.4	-4.6	675.0	-18.2	698.2	-41.4	711.8	-55.0	675.0	-18.2	To Be Studied
6936	Tree	628.9	635.2	-6.3	661.4	-32.5	-	-	-	-	-	-	-	-	No Action
6937	Tree	649.3	635.0	14.2	661.2	-12.0	674.8	-25.5	-	-	711.5	-62.3	674.8	-25.5	To Be Studied
6938	Tree	657.0	634.9	22.0	661.1	-4.1	674.6	-17.6	697.8	-40.8	711.4	-54.4	674.6	-17.6	To Be Studied
6939	Tree	655.8	634.9	20.9	661.0	-5.2	674.5	-18.7	697.7	-41.9	711.3	-55.5	674.5	-18.7	To Be Studied
6940	Tree	644.0	634.8	9.2	660.9	-16.9	674.4	-30.4	697.6	-53.6	711.1	-67.2	674.4	-30.4	To Be Studied
6941	Tree	661.5	634.7	26.8	660.7	0.7	674.2	-12.7	-	-	710.9	-49.5	674.2	-12.7	To Be Studied
6942	Tree	656.0	634.6	21.4	660.7	-4.7	674.2	-18.1	697.3	-41.3	710.9	-54.8	674.2	-18.1	To Be Studied
6943	Tree	626.1	634.6	-8.5	660.6	-34.5	674.1	-48.0	-	-	710.8	-84.7	674.1	-48.0	No Action
6944	Tree	638.5	634.5	4.0	660.5	-22.0	673.9	-35.5	697.0	-58.6	710.6	-72.2	673.9	-35.5	To Be Studied
6945	Tree	638.2	634.4	3.7	660.4	-22.3	673.9	-35.7	697.0	-58.8	710.6	-72.4	673.9	-35.7	To Be Studied
6946	Tree	651.3	634.4	16.9	660.4	-9.1	673.8	-22.5	696.9	-45.6	710.5	-59.2	673.8	-22.5	To Be Studied
6947	Tree	626.6	634.2	-7.5	660.1	-33.5	673.5	-46.9	-	-	710.2	-83.5	673.5	-46.9	No Action
6948	Tree	631.3	634.1	-2.8	660.0	-28.7	673.4	-42.0	-	-	710.0	-78.7	673.4	-42.0	No Action
6949	Road Sign	627.6	634.1	-6.4	660.0	-32.4	673.3	-45.7	-	-	710.0	-82.4	673.3	-45.7	No Action
6950	Tree	631.5	634.1	-2.5	660.0	-28.5	-	-	-	-	-	-	-	-	No Action
6951	Tree	625.8	634.1	-8.3	660.0	-34.2	673.3	-47.5	696.3	-70.6	710.0	-84.2	673.3	-47.5	No Action
6952	Light Pole	629.9	634.0	-4.2	659.9	-30.1	673.2	-43.4	-	-	709.9	-80.0	673.2	-43.4	No Action
6953	Light Pole	635.1	634.0	1.2	659.9	-24.7	673.2	-38.0	696.2	-61.0	709.8	-74.7	673.2	-38.0	To Be Studied
6954	Tree	662.5	633.9	28.6	659.8	2.7	673.1	-10.6	-	-	709.8	-47.3	673.1	-10.6	To Be Studied
6955	Tree	626.6	633.5	-6.9	659.3	-32.7	672.5	-45.9	-	-	709.1	-82.5	672.5	-45.9	No Action
6956	Tree	631.6	633.5	-1.9	659.2	-27.7	672.4	-40.9	695.3	-63.8	709.0	-77.4	672.4	-40.9	No Action
6957	Light Pole	628.4	633.3	-5.0	659.1	-30.7	672.2	-43.9	-	-	708.8	-80.5	672.2	-43.9	No Action
6958	Tree	651.2	633.3	17.9	659.1	-7.8	672.2	-21.0	-	-	708.8	-57.6	672.2	-21.0	To Be Studied
6960	Tree	629.3	633.1	-3.8	658.8	-29.5	671.9	-42.7	-	-	708.4	-79.2	671.9	-42.7	No Action
6961	Tree	655.1	633.0	22.1	658.7	-3.6	671.8	-16.7	694.7	-39.5	708.4	-53.3	671.8	-16.7	To Be Studied
6962	Tree	637.4	633.0	4.4	658.7	-21.3	671.8	-34.4	-	-	708.3	-70.9	671.8	-34.4	To Be Studied
6963	Tree	646.6	632.9	13.7	658.5	-11.9	671.6	-25.0	-	-	708.1	-61.5	671.6	-25.0	To Be Studied
6964	Tree	659.7	632.5	27.2	658.0	1.7	671.0	-11.3	693.7	-34.0	707.5	-47.7	671.0	-11.3	To Be Studied
6965	Tree	644.6	632.3	12.4	657.7	-13.1	670.7	-26.0	-	-	707.1	-62.5	670.7	-26.0	To Be Studied
6966	Tree	650.4	632.2	18.2	657.6	-7.3	670.6	-20.2	-	-	707.0	-56.6	670.6	-20.2	To Be Studied
6967	Tree	643.3	632.1	11.2	657.6	-14.2	670.5	-27.1	-	-	706.9	-63.6	670.5	-27.1	To Be Studied
6968	Light Pole	626.4	632.1	-5.6	657.5	-31.1	670.4	-44.0	-	-	706.8	-80.4	670.4	-44.0	No Action
6969	Tree	663.2	632.0	31.1	657.5	5.7	670.4	-7.2	693.0	-29.8	706.8	-43.6	670.4	-7.2	To Be Studied
6970	Tree	628.8	631.9	-3.1	657.3	-28.5	-	-	-	-	-	-	-	-	No Action
6971	Tree	638.6	631.9	6.7	657.2	-18.6	670.1	-31.5	692.7	-54.1	706.5	-67.9	670.1	-31.5	To Be Studied
6972	Tree	645.8	631.8	14.0	657.2	-11.4	670.0	-24.3	-	-	706.4	-60.6	670.0	-24.3	To Be Studied
6973	Tree	629.0	631.7	-2.7	657.1	-28.1	-	-	-	-	-	-	-	-	No Action
6974	Tree	626.8	631.7	-4.9	657.0	-30.2	669.9	-43.1	-	-	706.2	-79.4	669.9	-43.1	No Action
6975	Tree	656.4	631.6	24.7	657.0	-0.6	669.8	-13.4	692.3	-35.9	706.1	-49.7	669.8	-13.4	To Be Studied
6976	Light Pole	623.8	631.5	-7.7	656.8	-33.0	669.5	-45.8	-	-	705.9	-82.1	669.5	-45.8	No Action
6977	Tree	637.8	631.4	6.4	656.7	-18.9	669.4	-31.7	692.0	-54.2	705.8	-68.0	669.4	-31.7	To Be Studied
6978	Tree	664.5	631.3	33.2	656.6	8.0	669.3	-4.7	691.8	-27.2	705.6	-41.1	669.3	-4.7	To Be Studied
6979	Tree	650.3	631.2	19.1	656.4	-6.1	669.1	-18.8	691.5	-41.2	705.4	-55.1	669.1	-18.8	To Be Studied
6980	Tree	644.1	631.1	12.9	656.3	-12.3	669.0	-25.0	-	-	705.3	-61.2	669.0	-25.0	To Be Studied
6981	Tree	657.7	631.1	26.6	656.3	1.4	669.0	-11.3	-	-	705.3	-47.6	669.0	-11.3	To Be Studied
6982	Tree	637.8	631.1	6.7	656.3	-18.5	669.0	-31.1	691.4	-53.6	705.2	-67.4	669.0	-31.1	To Be Studied
6983	Tree	662.7	631.0	31.7	656.2	6.6	668.8	-6.1	691.2	-28.5	705.1	-42.4	668.8	-6.1	To Be Studied
6984	Tree	637.1	631.0	6.1	656.1	-19.1	668.8	-31.7	-	-	705.1	-68.0	668.8	-31.7	To Be Studied
6985	Tree	635.0	631.0	4.0	656.1	-21.1	668.8	-33.8	-	-	705.0	-70.1	668.8	-33.8	To Be Studied
6986	Tree	665.7	630.9	34.8	656.0	9.6	668.7	-3.0	-	-	704.9	-39.3	668.7	-3.0	To Be Studied
6987	Tree	636.8	630.7	6.1	655.8	-19.0	668.4	-31.6	-	-	704.6	-67.9	668.4	-31.6	To Be Studied
6988	Light Pole	624.8	630.7	-5.9	655.8	-30.9	668.4	-43.5	-	-	704.6	-79.8	668.4	-43.5	No Action
6989	Light Pole	621.7	630.6	-8.9	655.7	-34.0	668.3	-46.6	-	-	704.5	-82.8	-	-	No Action
6990	Tree	628.3	630.6	-2.3	655.6	-27.4	668.2	-39.9	-	-	704.4	-76.1	-	-	No Action
6991	Tree	624.4	630.5	-6.1	655.5	-31.2	668.1	-43.7	-	-	704.3	-79.9	668.1	-43.7	No Action
6992	Tree	656.9	630.5	26.4	655.5	1.4	668.0	-11.2	690.4	-33.5	704.2	-47.4	668.0	-11.2	To Be Studied
6994	Tree	641.1	630.4	10.7	655.5	-14.4	-	-	-	-	-	-	-	-	To Be Studied
6995	Pole	644.4	630.4	14.0	655.4	-11.0	668.0	-23.6	-	-	704.2	-59.8	668.0	-23.6	To Be Studied
6996	Tree	634.4	630.2	4.2	655.2	-20.7	667.6	-33.2	689.9	-55.5	703.8	-69.4	667.6	-33.2	To Be Studied
6998	Tree	632.5	629.9	2.6	654.8	-22.3	667.2	-34.7	-	-	703.4	-70.8	-	-	To Be Studied
7000	Tree	670.5	629.8	40.6	654.7	15.8	667.1	3.4	689.3	-18.8	703.2	-32.8	667.1	3.4	To Be Studied
7001	Tree	656.9	629.7	27.2	654.5	2.3	666.9	-10.0	689.0	-32.2	703.0	-46.1	666.9	-10.0	To Be Studied
7002	Tree	661.0	629.6	31.4	654.4	6.6	666.7	-5.8	688.9	-27.9	702.8	-41.9	666.7	-5.8	To Be Studied
7004	Tree	642.0	629.4	12.6	654.1	-12.1	666.4	-24.4	-	-	702.5	-60.5	666.4	-24.4	To Be Studied
7005	Tree	630.4	629.3	1.1	654.0	-23.7	666.3	-36.0	-	-	702.4	-72.0	666.3	-36.0	To Be Studied
7006	Tree	647.6	629.3	18.3	654.0	-6.4	-	-	-	-	-	-	-	-	To Be Studied
7007	Tree	661.3	629.3	32.1	654.0	7.3	-	-	-	-	-	-	-	-	To Be Studied
7008	Tree	622.0	629.2	-7.3	654.0	-32.0	666.2	-44.2	-	-	702.3	-80.3	666.2	-44.2	No Action
7009	Tree	638.4	629.2	9.1	653.9	-15.6	666.2	-27.8	-	-	702.2	-63.9	666.2	-27.8	To Be Studied
7010	Tree	641.9	629.1	12.8	653.8	-11.9	666.0	-24.1	688.1	-46.2	702.0	-60.2	666.0	-24.1	To Be Studied
7011	Tree	638.1	629.1	9.0	653.8	-15.7	666.0	-27.9	688.1	-50.0	702.0	-64.0	666.0	-27.9	To Be Studied
7012	Tree	644.2	629.0	15.1	653.7	-9.5	665.9	-21.7	687.9	-43.8	701.9	-57.8	665.9	-21.7	To Be Studied
7013	Tree	650.7	629.0	21.7	653.7	-3.0	665.9	-15.2	-	-	-	-	-	-	To Be Studied
7014	Tree	633.7	629.0	4.7	653.6	-20.0	665.8	-32.2	-	-	701.8	-68.2	665.8	-32.2	To Be Studied
7015	Tree	650.5	629.0	21.5	653.6	-3.1	-	-	-	-	-	-	-	-	To Be Studied
7016	Tree	644.4	628.9	15.5	653.6	-9.2	665.8	-21.4	-	-	701.8	-57.4	665.8	-21.4	To Be Studied
7017	Tree	650.2	628.9	21.3	653.5	-3.4	665.7	-15.6	-	-	701.7	-51.6	-	-	To Be Studied
7018	Tree	647.5	628.9	18.6	653.5	-6.0	665.7	-18.2	-	-	701.7	-54.2	665.7	-18.2	To Be Studied
7020	Tree	644.6	628.8	15.8	653.4	-8.8	665.6	-21.0	687.6	-42.9	701.6	-56.9	665.6	-21.0	To Be Studied
7021	Tree	622.4	628.8	-6.3	653.4	-30.9	665.6	-43.1	-	-	701.6	-79.1	665.6	-43.1	No Action
7022	Tree	642.5	628.8	13.7	653.4	-10.9	-	-	-	-	-	-	-	-	To Be Studied
7023	Tree	619.9	628.7	-8.8	653.3	-33.4	665.4	-45.5	-	-	701.4	-81.5	665.4	-45.5	No Action
7024	Tree	626.6	628.6	-2.0	653.2	-26.6	665.3	-38.7	-	-	701.3	-74.7	665.3	-38.7	No Action
7025	Tree	648.0	628.6	19.3	653.2	-5.2	-	-	-	-	-	-	-	-	To Be Studied
7026	Tree	629.7	628.6	1.0	653.2	-23.5	665.3	-35.7	-	-	701.3	-71.6	665.3	-35.7	To Be Studied
7027	Tree	647.2	628.6	18.6	653.2	-5.9	-	-	-	-	-	-	-	-	To Be Studied
7028	Tree	647.4	628.5	18.9	653.0	-5.7	665.1	-17.8	-	-	701.1	-53.7	-	-	To Be Studied
7029	Tree	640.0	628.4	11.6	653.0	-12.9	665.1	-25.0	-	-	701.0	-61.0	-	-	To Be Studied
7030	Tree	636.0	628.3	7.7	652.8	-16.8	664.9	-28.9	686.8	-50.8	700.8	-64.8	664.9	-28.9	To Be Studied
7031	Tree	640.9	628.3	12.6	652.7	-11.8	664.8	-23.9	-	-	700.7	-59.8	-	-	To Be Studied
7032	Tree	634.7	628.2	6.4	652.7	-18.0	664.8	-30.1	-	-	700.7	-66.0	664.8	-30.1	To Be Studied
7033	Tree	644.9	628.2	16.7	652.7	-7.8	664.7	-19.8	-	-	700.7	-55.7	664.7	-19.8	To Be Studied
7034	Tree	625.8	628.2	-2.4	652.7	-26.9	664.7	-38.9	-	-	700.6	-74.9	664.7	-38.9	No Action
7035	Tree	634.2	628.2	6.0	652.6	-18.4	664.7	-30.4	-	-	700.6	-66.4	664.7	-30.4	To Be Studied
7036	Tree	639.3	628.2	11.1	652.6	-13.3	664.7	-25.4	-	-	700.6	-61.3	664.7	-25.4	To Be Studied
7038	Tree	650.8	628.0	22.8	652.4	-1.6	664.4	-13.6	686.2	-35.4	700.3	-49.4	664.4	-13.6	To Be Studied
7039	Tree	641.3	628.0	13.3	652.4	-11.1	664.4	-23.1	-	-	700.2	-59.0	664.4	-23.1	To Be Studied
7040	Light Pole	626.6	627.9	-1.4	652.3	-25.8	-	-	-	-	-	-	-	-	No Action
7041	Tree	648.5	627.9	20.6	652.3	-3.8	664.3	-15.8	686.1	-37.6	700.2	-51.7	664.3	-15.8	To Be Studied
7042	Light Pole	630.1	627.9	2.2	652.3	-22.2	664.3	-34.2	686.1	-56.0	700.2	-70.1	664.3	-34.2	To Be Studied
7043	Tree	667.3	627.9	39.4	652.3	15.0	664.2	3.0	686.1	-18.8	700.1	-32.9	664.2	3.0	To Be Studied
7044	Tree	657.3	627.9	29.4	652.3	5.0	-	-	-	-	-	-	-	-	To Be Studied
7045	Tree	643.7	627.8	16.0	652.1	-8.4	664.1	-20.3	-	-	699.9	-56.2	664.1	-20.3	To Be Studied
7046	Tree	646.7	627.7	19.0	652.0	-5.4	664.0	-17.3	-	-	699.8	-53.2	664.0	-17.3	To Be Studied
7047	Tree	622.8	627.6	-4.9	652.0	-29.2	663.9	-41.1	685.7	-62.9	699.7	-77.0	663.9	-41.1	No Action
7048	Tree	641.0	627.6	13.4	651.9	-10.9	663.8	-22.9	-	-	699.7	-58.7	663.8	-22.9	To Be Studied
7049	Tree	642.0	627.6	14.4	651.9	-9.9	663.8	-21.8	-	-	699.7	-57.7	663.8	-21.8	To Be Studied
7050	Tree	648.7	627.5	21.1	651.8	-3.1	663.7	-15.0	-	-	699.5	-50.9	663.7	-15.0	To Be Studied
7051	Tree	637.5	627.5	10.0	651.8	-14.3	663.7	-26.2	-	-	699.5	-62.0	663.7	-26.2	To Be Studied
7052	Tree	620.6	627.5	-6.9	651.8	-31.2	663.7	-43.1	-	-	699.5	-78.9	-	-	No Action
7053	Light Pole	626.8	627.5	-0.7	651.7	-24.9	663.6	-36.8	685.3	-58.5	699.4	-72.6	663.6	-36.8	No Action
7054	Tree	650.5	627.4	23.1	651.7	-1.2	663.5	-13.0	685.3	-34.8	699.4	-48.9	663.5	-13.0	To Be Studied
7055	Tree	617.6	627.4	-9.8	651.7	-34.1	663.5	-45.9	-	-	699.3	-81.7	663.5	-45.9	No Action
7056	Tree	655.8	627.4	28.4	651.7	4.2	663.5	-7.7	685.2	-29.4	699.3	-43.5	663.5	-7.7	To Be Studied
7057	Tree	630.8	627.4	3.4	651.6	-20.8	-	-	-	-	-	-	-	-	To Be Studied
7058	Tree	621.5	627.3	-5.8	651.5	-30.0	663.3	-41.9	685.0	-63.5	699.1	-77.7	663.3	-41.9	No Action
7059	Tree	623.4	627.3	-3.9	651.5	-28.1	663.3	-39.9	-	-	699.1	-75.7	663.3	-39.9	No Action
7060	Tree	654.0	627.3	26.7	651.5	2.5	663.3	-9.3	-	-	699.1	-45.1	663.3	-9.3	To Be Studied
7061	Tree	677.8	627.2	50.5	651.4	26.3	-	-	-	-	-	-	-	-	To Be Studied
7062	Tree	634.0	627.2	6.8	651.4	-17.4	663.2	-29.2	-	-	699.0	-65.0	663.2	-29.2	To Be Studied
7064	Tree	626.7	627.2	-0.5	651.4	-24.7	663.2	-36.5	-	-	699.0	-72.3	663.2	-36.5	No Action
7065	Tree	625.8	627.0	-1.3	651.2	-25.5	663.0	-37.2	-	-	698.8	-73.0	663.0	-37.2	No Action
7066	Tree	636.5	627.0	9.5	651.2	-14.7	663.0	-26.4	684.6	-48.1	698.7	-62.2	663.0	-26.4	To Be Studied
7067	Tree	684.1	627.0	57.1	651.1	33.0	662.9	21.2	684.6	-0.5	698.7	-14.6	662.9	21.2	To Be Studied
7068	Tree	632.7	626.9	5.8	651.0	-18.3	662.8	-30.1	-	-	698.6	-65.8	662.8	-30.1	To Be Studied
7069	Tree	625.4	626.9	-1.5	651.0	-25.6	662.8	-37.4	-	-	698.5	-73.1	662.8	-37.4	No Action
7070	Tree	625.2	626.9	-1.7	651.0	-25.8	-	-	-	-	-	-	-	-	No Action
7071	Tree	623.8	626.7	-2.9	650.8	-27.0	662.6	-38.7	684.1	-60.3	698.3	-74.4	662.6	-38.7	No Action
7072	Tree	645.6	626.7	18.9	650.8	-5.1	662.5	-16.9	684.1	-38.4	698.2	-52.6	662.5	-16.9	To Be Studied
7073	Tree	636.9	626.7	10.3	650.7	-13.8	662.5	-25.5	-	-	698.2	-61.2	662.5	-25.5	To Be Studied
7074	Tree	628.6	626.6	2.0	650.6	-22.0	662.3	-33.7	-	-	698.0	-69.4	662.3	-33.7	To Be Studied
7075	Tree	643.7	626.6	17.2	650.6	-6.9	662.3	-18.6	-	-	698.0	-54.3	662.3	-18.6	To Be Studied
7076	Tree	641.4	626.5	14.9	650.5	-9.1	662.2	-20.8	683.7	-42.3	697.9	-56.5	662.2	-20.8	To Be Studied
7077	Tree	652.9	626.4	26.5	650.4	2.5	-	-	-	-	-	-	-	-	To Be Studied
7078	Tree	632.6	626.3	6.3	650.3	-17.6	661.9	-29.3	-	-	697.6	-64.9	661.9	-29.3	To Be Studied
7079	Tree	617.7	626.2	-8.5	650.2	-32.5	-	-	-	-	-	-	-	-	No Action
7080	Tree	627.0	626.2	0.8	650.2	-23.1	661.8	-34.7	-	-	697.4	-70.4	-	-	To Be Studied
7081	Tree	634.5	626.2	8.3	650.1	-15.7	661.7	-27.3	-	-	697.4	-62.9	-	-	To Be Studied

Runway 6 Inner Approach (Existing)

LEGEND
1. Numbers shown in red are a penetration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-6-24(4) - 6-24 Inner P77 (4)
LAYOUT: 6 Inner (1)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:41 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

wsp

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 6 Obstruction Tables Inner Portion (Existing/Future)

SCALE AS NOTED
JOB NO. 20042701.00
DATE 2/2023

Runway 6 Inner Approach (Existing)

Runway 6 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
7082	Tree	660.2	626.0	34.2	649.9	10.3	661.4	-1.2	-	-	-	-	-	-	To Be Studied
7083	Tree	628.6	626.0	2.6	649.9	-21.3	661.4	-32.9	-	-	697.1	-68.5	661.4	-32.9	To Be Studied
7084	Tree	656.5	625.9	30.6	649.8	6.7	661.4	-4.9	682.8	-26.3	697.0	-40.5	661.4	-4.9	To Be Studied
7085	Tree	653.5	625.9	27.6	649.8	3.7	661.4	-7.8	-	-	697.0	-43.4	661.4	-7.8	To Be Studied
7086	Tree	657.5	625.9	31.5	649.8	7.7	661.3	-3.9	682.8	-25.3	697.0	-39.5	661.3	-3.9	To Be Studied
7087	Tree	625.5	625.9	-0.3	649.7	-24.2	661.3	-35.7	-	-	696.9	-71.3	661.3	-35.7	No Action
7088	Tree	625.5	625.8	-0.3	649.7	-24.2	661.2	-35.7	-	-	696.8	-71.3	661.2	-35.7	No Action
7089	Tree	640.7	625.8	14.9	649.6	-9.0	661.2	-20.5	-	-	696.8	-56.1	661.2	-20.5	To Be Studied
7090	Tree	652.7	625.6	27.1	649.4	3.3	-	-	-	-	-	-	-	-	To Be Studied
7091	Tree	639.2	625.6	13.7	649.4	-10.1	660.8	-21.6	-	-	696.4	-57.2	-	-	To Be Studied
7092	Tree	671.2	625.5	45.6	649.3	21.8	-	-	-	-	-	-	-	-	To Be Studied
7093	Tree	639.4	625.5	13.8	649.3	-10.0	660.8	-21.4	-	-	696.4	-57.0	660.8	-21.4	To Be Studied
7094	Tree	652.6	625.4	27.2	649.1	3.5	660.5	-7.9	-	-	696.1	-43.5	-	-	To Be Studied
7095	Tree	659.9	625.3	34.6	649.0	10.9	-	-	-	-	-	-	-	-	To Be Studied
7096	Utility Pole	622.0	-	-	648.8	-26.8	-	-	-	-	-	-	-	-	No Action
7097	Tree	664.6	625.1	39.5	648.8	15.8	-	-	-	-	-	-	-	-	To Be Studied
7098	Tree	634.3	625.1	9.2	648.8	-14.5	660.1	-25.8	-	-	695.7	-61.4	660.1	-25.8	To Be Studied
7099	Tree	639.9	-	-	648.7	-8.8	-	-	-	-	-	-	-	-	No Action
7100	Tree	678.9	624.9	54.0	648.5	30.4	659.8	19.1	681.0	-2.2	695.3	-16.4	659.8	19.1	To Be Studied
7101	Tree	667.6	624.8	42.7	648.5	19.1	659.8	7.8	681.0	-13.4	695.3	-27.7	659.8	7.8	To Be Studied
7102	Tree	653.4	624.8	28.6	648.4	5.0	-	-	-	-	-	-	-	-	To Be Studied
7103	Tree	649.5	624.8	24.8	648.4	1.2	-	-	-	-	-	-	-	-	To Be Studied
7104	Tree	651.5	624.7	26.8	648.3	3.2	659.6	-8.1	680.8	-29.3	695.1	-43.6	659.6	-8.1	To Be Studied
7105	Tree	659.1	624.7	34.3	648.3	10.8	-	-	-	-	-	-	-	-	To Be Studied
7106	Tree	648.8	-	-	657.6	-8.8	-	-	-	-	-	-	-	-	No Action
7107	Utility Pole	622.6	624.6	-2.0	648.2	-25.6	659.4	-36.8	-	-	694.9	-72.3	659.4	-36.8	No Action
7108	Tree	653.0	-	-	649.9	3.1	-	-	-	-	-	-	-	-	To Be Studied
7109	Tree	662.2	624.3	37.9	647.8	14.5	659.0	3.3	-	-	694.4	-32.2	659.0	3.3	To Be Studied
7110	Tree	658.1	624.2	33.9	647.7	10.4	658.8	-0.7	-	-	694.3	-36.2	658.8	-0.7	To Be Studied
7111	Tree	667.8	624.2	43.6	647.7	20.1	658.8	9.0	-	-	694.2	-26.4	658.8	9.0	To Be Studied
7112	Tree	657.7	624.2	33.6	647.6	10.1	658.8	-1.0	-	-	694.2	-36.4	-	-	To Be Studied
7113	Tree	647.0	624.1	22.9	647.5	-0.5	658.7	-11.7	-	-	694.1	-47.1	658.7	-11.7	To Be Studied
7114	Tree	657.3	623.9	33.3	647.3	9.9	658.4	-1.2	679.5	-22.2	693.8	-36.5	658.4	-1.2	To Be Studied
7115	Tree	668.9	623.9	45.0	647.3	21.6	658.4	10.5	-	-	693.8	-24.9	658.4	10.5	To Be Studied
7116	Building	617.3	623.8	-6.6	647.2	-30.0	-	-	-	-	-	-	-	-	No Action
7117	Tree	668.6	623.7	44.9	647.0	21.6	658.0	10.5	-	-	693.4	-24.8	658.0	10.5	To Be Studied
7118	Light Pole	617.6	-	-	647.0	-29.3	-	-	-	-	-	-	-	-	No Action
7119	Tree	663.4	623.6	39.8	646.9	16.5	657.9	5.5	-	-	693.3	-29.8	657.9	5.5	To Be Studied
7120	Tree	625.9	623.5	2.5	646.7	-20.8	-	-	-	-	-	-	-	-	To Be Studied
7121	Tree	643.0	623.4	19.5	646.7	-3.7	657.7	-14.7	678.6	-35.7	693.0	-50.1	657.7	-14.7	To Be Studied
7122	Tree	665.4	623.4	42.0	646.7	18.7	-	-	-	-	-	-	-	-	To Be Studied
7123	Tree	633.2	623.4	9.8	646.7	-13.4	657.6	-24.4	-	-	693.0	-59.7	657.6	-24.4	To Be Studied
7124	Tree	672.9	623.2	49.7	646.4	26.4	657.4	15.5	-	-	692.7	-19.8	-	-	To Be Studied
7125	Tree	626.8	623.2	3.6	646.3	-19.5	657.3	-30.5	678.2	-51.4	692.6	-65.8	657.3	-30.5	To Be Studied
7127	Tree	617.0	623.0	-6.0	646.1	-29.1	-	-	-	-	-	-	-	-	No Action
7128	Tree	666.1	622.9	43.2	646.0	20.1	656.9	9.2	-	-	692.1	-26.0	-	-	To Be Studied
7129	Tree	641.4	622.9	18.5	646.0	-4.6	656.8	-15.5	677.7	-36.3	692.1	-50.7	656.8	-15.5	To Be Studied
7130	Tree	653.9	622.6	31.3	645.7	8.3	656.5	-2.5	-	-	-	-	-	-	To Be Studied
7131	Tree	638.4	622.6	15.8	645.7	-7.2	656.5	-18.0	677.2	-38.8	691.7	-53.2	656.5	-18.0	To Be Studied
7132	Tree	652.8	-	-	645.6	7.2	-	-	-	-	-	-	-	-	To Be Studied
7134	Tree	649.7	622.4	27.3	645.4	4.3	656.2	-6.5	-	-	-	-	-	-	To Be Studied
7135	Tree	659.0	622.4	36.5	645.4	13.5	656.2	2.8	-	-	691.4	-32.4	-	-	To Be Studied
7136	Tree	635.4	-	-	646.5	-11.1	-	-	-	-	-	-	-	-	No Action
7137	Light Pole	614.4	622.2	-7.8	645.2	-30.8	655.9	-41.5	676.6	-62.2	691.1	-76.7	655.9	-41.5	No Action
7138	Tree	624.4	622.2	2.2	645.1	-20.8	655.9	-31.5	-	-	691.0	-66.7	655.9	-31.5	To Be Studied
7139	Tree	661.4	622.1	39.2	645.0	16.3	655.7	5.6	-	-	690.9	-29.5	655.7	5.6	To Be Studied
7141	Tree	658.6	-	-	644.9	13.7	-	-	-	-	-	-	-	-	To Be Studied
7142	Tree	655.9	622.0	34.0	644.9	11.1	-	-	-	-	-	-	-	-	To Be Studied
7143	Tree	656.6	622.0	34.7	644.8	11.8	655.5	1.1	-	-	-	-	-	-	To Be Studied
7144	Tree	649.0	621.9	27.0	644.8	4.2	655.5	-6.5	676.1	-27.2	690.6	-41.6	655.5	-6.5	To Be Studied
7145	Tree	663.4	621.9	41.4	644.8	18.6	655.5	7.9	-	-	690.6	-27.2	655.5	7.9	To Be Studied
7146	Tree	660.4	621.9	38.5	644.8	15.6	655.4	4.9	676.1	-15.7	690.6	-30.2	655.4	4.9	To Be Studied
7147	Tree	663.1	621.7	41.4	644.5	18.6	655.1	7.9	675.7	-12.7	690.2	-27.2	655.1	7.9	To Be Studied
7148	Tree	660.8	621.6	39.2	644.3	16.4	654.9	5.8	675.5	-14.7	690.0	-29.2	654.9	5.8	To Be Studied
7149	Tree	635.8	-	-	644.2	-8.5	-	-	-	-	-	-	-	-	No Action
7150	Tree	642.9	621.4	21.5	644.2	-1.3	654.7	-11.8	675.3	-32.4	689.8	-46.9	654.7	-11.8	To Be Studied
7151	Tree	642.7	621.4	21.3	644.2	-1.5	654.7	-12.0	675.2	-32.5	689.8	-47.1	654.7	-12.0	To Be Studied
7152	Tree	666.2	621.3	44.9	644.0	22.2	654.6	11.6	675.1	-8.9	689.6	-23.4	654.6	11.6	To Be Studied
7154	Tree	643.1	621.2	22.0	643.9	-0.7	654.4	-11.2	674.8	-31.7	689.4	-46.2	654.4	-11.2	To Be Studied
7155	Utility Pole	618.4	621.2	-2.8	643.9	-25.5	654.3	-36.0	-	-	689.4	-71.0	654.3	-36.0	No Action
7156	Tree	668.7	621.1	47.6	643.7	24.9	654.2	14.5	674.7	-6.0	689.2	-20.6	654.2	14.5	To Be Studied
7157	Tree	664.1	621.1	43.1	643.7	20.4	654.2	9.9	-	-	689.2	-25.1	654.2	9.9	To Be Studied
7158	Tree	664.1	621.0	43.1	643.6	20.4	654.1	10.0	674.6	-10.5	689.1	-25.0	654.1	10.0	To Be Studied
7159	Tree	655.6	621.0	34.7	643.6	12.0	654.1	1.6	674.5	-18.9	689.1	-33.4	654.1	1.6	To Be Studied
7160	Tree	612.3	621.0	-8.7	643.6	-31.4	-	-	-	-	-	-	-	-	No Action
7161	Tree	664.5	620.9	43.7	643.5	21.0	653.9	10.6	-	-	688.9	-24.4	653.9	10.6	To Be Studied
7162	Tree	670.6	620.9	49.7	643.5	27.1	653.9	16.7	674.3	-3.8	688.9	-18.3	653.9	16.7	To Be Studied
7163	Tree	616.8	620.8	-4.0	643.4	-26.6	-	-	-	-	-	-	-	-	No Action
7165	Tree	631.8	-	-	643.3	-11.6	-	-	-	-	-	-	-	-	No Action
7166	Tree	657.9	620.7	37.2	643.3	14.7	653.6	4.3	-	-	688.6	-30.7	-	-	To Be Studied
7167	Tree	637.6	-	-	643.1	-5.5	-	-	-	-	-	-	-	-	No Action
7168	Tree	653.1	620.5	32.6	643.1	10.0	653.4	-0.3	-	-	688.4	-35.3	-	-	To Be Studied
7169	Tree	640.7	620.5	20.2	643.0	-2.3	653.3	-12.6	673.7	-33.0	688.3	-47.6	653.3	-12.6	To Be Studied
7170	Tree	661.2	620.4	40.8	642.9	18.3	653.3	7.9	673.6	-12.4	688.2	-27.0	653.3	7.9	To Be Studied
7171	Tree	657.1	620.3	36.7	642.8	14.2	653.2	3.9	673.5	-16.4	688.1	-31.0	653.2	3.9	To Be Studied
7173	Tree	667.9	620.3	47.6	642.8	25.2	653.1	14.9	-	-	688.0	-20.0	653.1	14.9	To Be Studied
7174	Tree	619.7	620.1	-0.4	642.5	-22.8	652.8	-33.1	-	-	687.7	-68.0	652.8	-33.1	No Action
7176	Tree	630.8	620.0	10.8	642.4	-11.6	652.7	-21.9	-	-	687.5	-56.8	652.7	-21.9	To Be Studied
7177	Tree	649.3	620.0	29.3	642.4	6.9	652.6	-3.3	672.8	-23.6	687.5	-38.2	652.6	-3.3	To Be Studied
7178	Tree	616.7	619.9	-3.3	642.3	-25.6	-	-	-	-	-	-	-	-	No Action
7179	Tree	674.4	619.8	54.5	642.2	32.2	652.4	22.0	-	-	687.3	-12.9	652.4	22.0	To Be Studied
7180	Tree	658.8	619.7	39.1	642.0	16.8	652.2	6.6	672.4	-13.6	687.1	-28.2	652.2	6.6	To Be Studied
7181	Tree	632.2	619.7	12.5	642.0	-9.8	-	-	-	-	-	-	-	-	To Be Studied
7182	Tree	654.2	619.7	34.5	642.0	12.2	652.2	2.0	672.4	-18.2	687.0	-32.8	652.2	2.0	To Be Studied
7183	Tree	658.4	619.7	38.7	642.0	16.4	652.2	6.2	-	-	687.0	-28.6	652.2	6.2	To Be Studied
7184	Tree	625.0	619.7	5.4	642.0	-16.9	652.1	-27.1	-	-	687.0	-61.9	652.1	-27.1	To Be Studied
7185	Light Pole	611.6	619.6	-8.1	641.9	-30.4	-	-	-	-	-	-	-	-	No Action
7186	Tree	636.5	619.6	16.9	641.9	-5.4	652.1	-15.5	672.2	-35.7	686.9	-50.4	652.1	-15.5	To Be Studied
7187	Tree	655.6	619.6	36.1	641.8	13.8	652.0	3.6	-	-	686.8	-31.2	652.0	3.6	To Be Studied
7188	Tree	628.5	619.5	9.0	641.8	-13.3	-	-	-	-	-	-	-	-	To Be Studied
7189	Tree	646.1	619.4	26.7	641.7	4.5	-	-	-	-	-	-	-	-	To Be Studied
7190	Tree	651.7	619.4	32.2	641.7	10.0	651.8	-0.1	-	-	686.6	-34.9	651.8	-0.1	To Be Studied
7191	Tree	626.2	619.3	6.9	641.5	-15.4	651.6	-25.5	-	-	686.4	-60.3	651.6	-25.5	To Be Studied
7192	Tree	626.8	619.2	7.6	641.4	-14.6	651.5	-24.7	671.6	-44.8	686.3	-59.5	651.5	-24.7	To Be Studied
7193	Tree	650.3	619.2	31.1	641.4	8.9	651.5	-1.1	671.6	-21.3	686.2	-35.9	651.5	-1.1	To Be Studied
7194	Tree	634.0	619.2	14.8	641.4	-7.4	-	-	-	-	-	-	-	-	To Be Studied
7195	Tree	650.9	619.2	31.8	641.4	9.6	-	-	-	-	-	-	-	-	To Be Studied
7196	Tree	650.8	619.2	31.6	641.3	9.4	651.4	-0.6	671.5	-20.7	686.2	-35.4	651.4	-0.6	To Be Studied
7197	Tree	658.0	619.1	38.9	641.3	16.7	651.4	6.7	671.4	-13.4	686.1	-28.1	651.4	6.7	To Be Studied
7198	Tree	658.4	619.0	39.4	641.2	17.2	651.2	7.2	671.3	-12.9	685.9	-27.6	651.2	7.2	To Be Studied
7199	Tree	644.9	619.0	25.9	641.1	3.7	651.1	-6.3	-	-	685.9	-41.0	-	-	To Be Studied
7200	Tree	673.0	618.8	54.2	640.9	32.1	650.9	22.1	671.0	2.1	685.7	-12.6	650.9	22.1	To Be Studied
7201	Tree	620.1	618.8	1.4	640.9	-20.7	-	-	-	-	-	-	-	-	To Be Studied
7202	Tree	654.8	618.7	36.0	640.8	13.9	650.8	4.0	670.8	-16.1	685.5	-30.8	650.8	4.0	To Be Studied
7203	Tree	656.9	618.7	38.3	640.7	16.2	-	-	-	-	-	-	-	-	To Be Studied
7204	Tree	643.6	618.6	25.1	640.6	3.0	650.6	-6.9	-	-	685.3	-41.6	650.6	-6.9	To Be Studied
7205	Tree	613.2	618.6	-5.4	640.6	-27.4	650.5	-37.4	670.5	-57.4	685.2	-72.1	650.5	-37.4	No Action
7206	Tree	659.5	618.5	41.0	640.5	19.0	650.5	9.1	670.4	-10.9	685.1	-25.6	650.5	9.1	To Be Studied
7207	Tree	659.2	618.3	40.9	640.2	19.0	650.1	9.1	670.0	-10.8	684.8	-25.6	650.1	9.1	To Be Studied
7208	Tree	609.6	618.2	-8.6	640.1	-30.6	-	-	-	-	-	-	-	-	No Action
7209	Tree	655.7	618.1	37.6	640.0	15.7	649.8	5.9	669.7	-14.0	684.5	-28.8	649.8	5.9	To Be Studied
7210	Tree	641.6	618.1	23.5	640.0	1.6	649.8	-8.2	-	-	-	-	-	-	To Be Studied
7211	Tree	653.0	618.0	34.9	640.0	13.0	649.8	3.2	669.7	-16.7	684.4	-31.5	649.8	3.2	To Be Studied
7212	Tree	657.9	618.0	39.8	640.0	17.9	649.8	8.1	669.7	-11.8	684.4	-26.5	649.8	8.1	To Be Studied
7213	Tree	660.3	618.0	42.2	639.9	20.3	649.7	10.5	669.6	-9.4	684.4	-24.1	649.7	10.5	To Be Studied
7214	Tree	653.2	618.0	35.2	639.9	13.3	649.7	3.5	669.6	-16.4	684.3	-31.1	649.7	3.5	To Be Studied
7215	Tree	619.2	618.0	1.2	639.8	-20.6	-	-	-	-	-	-	-	-	To Be Studied
7216	Tree	655.8	617.9	37.9	639.8	16.0	649.6	6.2	-	-	684.2	-28.4	649.6	6.2	To Be Studied
7217	Tree	611.9	617.8	-6.0	639.7	-27.8	-	-	-	-	-	-	-	-	No Action
7218	Utility Pole	611.5	617.7	-6.2	639.5	-28.0	649.2	-37.7	-	-	683.8	-72.3	649.2	-37.7	No Action
7219	Tree	631.5	617.4	14.2	639.1	-7.6	648.8	-17.3	-	-	-	-	-	-	To Be Studied
7220	Tree	659.3	617.4	41.9	639.1	20.2	648.8	10.5	668.5	-9.2	683.3	-24.0	648.8	10.5	To Be Studied
7221	Tree	649.8	617.3	32.4	639.1	10.7	648.7	1.0	668.5	-18.7	683.3	-33.5	648.7	1.0	To Be Studied
7222	Tree	638.4	617.3	21.1	639.0	-0.6	648.7	-10.2	-	-	683.2	-44.8	-	-	To Be Studied
7223	Tree	644.4	617.3	27.1	639.0	5.3	648.7	-4.3	-	-	-	-	-	-	To Be Studied
7224	Tree	656.5	617.2	39.3	638.9	17.6	648.5	7.9	668.2	-11.8	683.0	-26.6	648.5	7.9	To Be Studied
7225	Tree	619.6	616.9	2.7	638.6	-19.0	648.2	-28.6	-	-	682.6	-63.0	648.2	-28.6	To Be Studied
7226	Tree	658.5	616.9	41.5	638.6	19.9	648.2	10.3	667.8	-9.4	682.6	-24.2	648.2	10.3	To Be Studied
7227	Light Pole	610.9	616.8	-6.0	638.4	-27.6	-	-	-	-	-	-	-	-	No Action
7228	Tree	646.7	616.8	29.9	638.4	8.3	647.9	-1.2	-	-	682.4	-35.7	647.9	-1.2	To Be Studied
7229	Tree	614.2	616.8	-2.6	638.3	-24.1	647.9	-33.7	667.5	-53.3	682.3	-68.1	647.9	-33.7	No Action
7230	Tree	619.7	616.6	3.1	638.2	-18.5	647.7	-28.0	-	-	-	-	-	-	To Be Studied
7231	Tree	662.8	616.4	46.3	637.9	24.8	647.4	15.4	667.0	-4.2	681.8	-19.1	647.4	15.4	To Be Studied
7232	Tree	655.3	616.4	38.8	637.9	17.3	647.4	7.9	666.9	-11.7	681.8	-26.5	647.4	7.9	To Be Studied
7233	Light Pole	606.8	616.4	-9.6	637.9	-31.1	647.3	-40.5	666.9	-60.1	681.8	-75.0	647.3	-40.5	No Action
7234	Tree	658.9	616.4	42.5	637.9	21.0	647.3	11.6	-	-	681.7	-22.8	647.3	11.6	To Be Studied
7235	Tree	613.4	616.4	-3.0	637.9	-24.5	647.3	-33.9	-	-	681.7	-68.3	-	-	No Action
7236	Tree	658.6	616.2	42.5	637.6	21.0	647.0	11.7	666.5	-7.9	681.4	-22.7	647.0	11.7	To Be Studied
7237	Light Pole	608.5	616.1	-7.6	637.5	-29.0	-	-	-	-	-	-	-	-	No Action
7238	Tree	671.3	616.1	55.2	637.5	33.8	646.9	24.4	-	-	681.2	-10.0	646.9	24.4	To Be Studied
7239	Tree	637.6	616.1	21.6	637.5	0.2	646.9	-9.2	666.4	-28.7	681.2	-43.6	646.9	-9.2	To Be Studied
7240	Tree	659.8	615.8	44.1	637.1	22.7	646.4	13.4	665.8	-6.0	680.7	-20.9	646.4	13.4	To Be Studied
7241	Tree	617.3	615.5	1.9	636.7	-19.4	646.0	-28.6	665.3	-48.0	680.3	-62.9	646.0	-28.6	To Be Studied
7242	Tree	608.7	615.4	-6.7	636.7	-28.0	645.9	-37.2	665.3	-56.6	680.2	-71.5	645.9	-37.2	No Action
7243	Light Pole	605.7	615.4	-9.7	636.7	-31.0	645.9	-40.2	665.3	-59.6	680.2	-74.5	645.9	-40.2	No Action
7244	Tree	615.1	615.4	-0.3	636.6	-21.5	645.9	-30.7	-	-	680.2	-65.0	645.9	-30.7	No Action
7245	Utility Pole	605.7	615.3	-9.6	636.5	-30.9	645.7	-40.1	-	-	680.0	-74.4	645.7	-40.1	No Action
7246	Tree	653.1	615.3	37.8	636.5	16.5	645.7	7.3	665.1	-12.0	680.0	-26.9	645.7	7.3	To Be Studied
7247	Tree	639.9	615.3	24.6	636.5	3.3	645.7	-5.9	-	-	680.0	-40.1	645.7	-5.9	To Be Studied
7248	Light Pole	605.7	615.1	-9.4	636.3	-30.6	645.5	-39.8	-	-	679.7	-74.0	645.5	-39.8	No Action
7249	Tree	611.3	615.1	-3.8	636.2	-25.0	645.4	-34.1	-	-	679.7	-68.4	645.4	-34.1	No Action
7250	Utility Pole	605.2	615.0	-9.8	636.2	-31.0	645.3	-40.1	-	-	679.5	-74.4	645.3	-40.1	No Action
7251	Tree	624.0	614.9	9.1	636.0	-12.0	645.1	-21.1	-	-	679.3	-55.4	645.1	-21.1	To Be Studied
7252	Tree	626.1	614.8	11.3	635.9	-9.8	645.0	-18.9	664.3	-38.2	679.2	-53.2	645.0	-18.9	To Be Studied
7253	Tree	613.9	614.7	-0.8	635.8	-21.9	644.9	-31.0	-	-	679.1	-65.2	644.9	-31.0	No Action
7254	Tree	614.5	614.7	-0.2	635.8	-21.3	644.8	-30.3	664.1	-49.6	679.0	-64.5	644.8	-30.3	No Action
7255	Light Pole	609.0	614.6	-5.6	635.7	-26.7	-	-	-	-	-	-	-	-	No Action
7256	Light Pole	606.8	614.6	-7.8	635.6	-28.8	644.6	-37.9	-	-	678.8	-72.1	644.6	-37.9	No Action
7257	Tree	633.0	614.5	18.5	635.6	-2.5	644.6	-11.6	-	-	678.8	-45.8	644.6	-11.6	To Be Studied
7258	Light Pole	606.2	614.5	-8.4	635.5	-29.4	644.6	-38.4	-	-	678.8	-72.6	-	-	No Action
7259	Tree	637.4	614.4	23.0	635.4	2.0	644.5	-7.1	663.6	-26.2	678.6	-41.2	644.5	-7.1	To Be Studied
7260	Tree	607.6	614.4	-6.8	635.4	-27.8	644.4	-36.8	-	-	-	-	-	-	No Action
7261	Tree	623.9	614.3	9.6	635.3	-11.4	644.3	-20.4	-	-	678.5	-54.6	644.3	-20.4	To Be Studied
7262	Tree	629.4	614.3	15.1	635.3	-5.9	644.3	-14.9	-	-	678.5	-49.0	644.3	-14.9	To Be Studied
7263	Tree	662.0	614.3	47.7	635.3	26.7	644.3	17.8	663.4	-1.4	678.4	-16.4	644.3	17.8	To Be Studied
7264	Tree	654.3	614.3	40.0	635.2	19.0	644.2	10.0	663.4	-9.1	678.4	-24.1	644.2	10.0	To Be Studied
7265	Tree	636.1	614.1	22.0	635.1	1.0	644.0	-7.9	663.2	-27.1	678.2	-42.1	644.0	-7.9	To Be Studied
7266	Tree	608.0	614.1	-6.1	635.1	-27.1	644.0	-36.0	663.2	-55.1	678.2	-70.2	644.0	-36.0	No Action
7267	Tree	635.4	614.0	21.4	634.9	0.5	643.9	-8.5	663.0	-27.6	678.0	-42.6	643.9	-8.5	To Be Studied
7268	Tree	628.1	613.9	14.3	634.7	-6.6	643.6	-15.5	-	-	-	-	-	-	To Be Studied
7270	Tree	624.8	613.8	11.0	634.6	-9.8	643.5	-18.7	-	-	677.6	-52.8	643.5	-18.7	To Be Studied
7271	Tree	662.7	613.7	49.0	634.5	28.2	643.4	19.3	662.4	0.3	677.5	-14.8	643.4	19.3	To Be Studied

Runway 6 Inner Approach (Existing)

Runway 6 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
7272	Tree	612.9	613.6	-0.7	634.4	-21.5	643.3	-30.4	-	-	677.4	-64.4	643.3	-30.4	No Action
7273	Tree	643.6	613.6	30.0	634.4	9.2	643.3	0.4	662.3	-18.7	677.3	-33.7	643.3	0.4	To Be Studied
7274	Tree	625.6	613.5	12.1	634.3	-8.7	643.1	-17.5	-	-	-	-	-	-	To Be Studied
7275	Tree	614.6	613.5	1.1	634.3	-19.7	643.1	-28.5	662.1	-47.5	677.2	-62.5	643.1	-28.5	To Be Studied
7276	Tree	627.1	613.4	13.7	634.2	-7.1	643.0	-15.9	662.0	-34.9	677.0	-49.9	643.0	-15.9	To Be Studied
7277	Tree	651.6	613.3	38.3	634.1	17.6	642.8	8.8	661.8	-10.2	676.9	-25.2	642.8	8.8	To Be Studied
7278	Tree	623.5	613.3	10.3	634.0	-10.4	642.7	-19.2	-	-	676.8	-53.2	642.7	-19.2	To Be Studied
7279	Light Pole	607.2	613.2	-6.0	633.9	-26.7	642.7	-35.5	-	-	676.7	-69.5	642.7	-35.5	No Action
7280	Light Pole	605.4	613.2	-7.8	633.9	-28.5	-	-	-	-	-	-	-	-	No Action
7281	Light Pole	610.8	613.2	-2.4	633.8	-23.1	642.6	-31.8	-	-	-	-	-	-	No Action
7282	Tree	614.5	613.1	1.4	633.8	-19.3	642.6	-28.0	-	-	676.6	-62.0	642.6	-28.0	To Be Studied
7283	Tree	618.4	613.1	5.3	633.7	-15.4	642.5	-24.1	661.4	-43.0	676.5	-58.1	642.5	-24.1	To Be Studied
7284	Tree	621.1	613.0	8.1	633.7	-12.6	642.4	-21.3	661.3	-40.2	676.4	-55.3	642.4	-21.3	To Be Studied
7285	Tree	652.3	613.0	39.3	633.6	18.6	642.4	9.9	661.2	-9.0	676.3	-24.1	642.4	9.9	To Be Studied
7286	Tree	646.5	612.9	33.6	633.6	13.0	642.2	4.3	-	-	676.2	-29.7	642.2	4.3	To Be Studied
7287	Tree	636.9	612.9	24.0	633.5	3.4	642.2	-5.3	-	-	676.2	-39.3	642.2	-5.3	To Be Studied
7288	Tree	631.3	612.9	18.5	633.5	-2.2	642.1	-10.8	661.0	-29.7	676.1	-44.8	642.1	-10.8	To Be Studied
7289	Tree	614.8	612.7	2.1	633.3	-18.5	642.0	-27.1	660.8	-46.0	675.9	-61.1	642.0	-27.1	To Be Studied
7290	Tree	641.3	612.7	28.6	633.2	8.1	641.9	-0.6	660.7	-19.4	675.8	-34.5	641.9	-0.6	To Be Studied
7291	Tree	624.3	612.6	11.7	633.2	-8.9	641.8	-17.5	660.7	-36.3	675.8	-51.4	641.8	-17.5	To Be Studied
7292	Tree	615.5	612.6	2.9	633.1	-17.6	641.7	-26.2	660.5	-45.0	675.6	-60.1	641.7	-26.2	To Be Studied
7293	Tree	653.3	612.6	40.7	633.1	20.2	641.7	11.6	660.5	-7.2	675.6	-22.4	641.7	11.6	To Be Studied
7294	Tree	646.5	612.5	34.0	633.1	13.5	641.7	4.9	-	-	675.6	-29.0	641.7	4.9	To Be Studied
7295	Tree	607.0	612.4	-5.4	632.9	-25.9	641.5	-34.5	-	-	675.4	-68.4	641.5	-34.5	No Action
7296	Tree	610.7	612.4	-1.7	632.9	-22.2	641.4	-30.7	660.2	-49.5	675.4	-64.7	641.4	-30.7	No Action
7297	Tree	653.0	612.2	40.8	632.7	20.3	641.2	11.8	660.0	-7.0	675.1	-22.1	641.2	11.8	To Be Studied
7298	Tree	643.3	612.2	31.1	632.7	10.7	641.2	2.1	-	-	675.1	-31.8	641.2	2.1	To Be Studied
7299	Tree	623.0	612.1	10.8	632.6	-9.6	641.1	-18.1	659.8	-36.9	675.0	-52.0	641.1	-18.1	To Be Studied
7300	Tree	625.0	612.1	12.9	632.5	-7.5	641.1	-16.0	659.8	-34.8	674.9	-49.9	641.1	-16.0	To Be Studied
7301	Tree	605.1	612.1	-6.9	632.5	-27.4	641.0	-35.9	-	-	674.9	-69.7	641.0	-35.9	No Action
7302	Light Pole	609.3	612.1	-2.7	632.5	-23.1	641.0	-31.6	-	-	674.8	-65.5	641.0	-31.6	No Action
7303	Tree	626.4	612.1	14.3	632.5	-6.1	641.0	-14.6	659.7	-33.3	674.8	-48.4	641.0	-14.6	To Be Studied
7304	Tree	606.5	612.1	-5.5	632.5	-26.0	641.0	-34.4	659.7	-53.2	674.8	-68.3	641.0	-34.4	No Action
7305	Tree	619.4	612.0	7.3	632.5	-13.1	640.9	-21.6	-	-	674.8	-55.5	640.9	-21.6	To Be Studied
7306	Tree	607.3	612.0	-4.7	632.4	-25.1	640.9	-33.6	-	-	674.8	-67.5	640.9	-33.6	No Action
7307	Tree	660.3	612.0	48.3	632.4	27.9	640.9	19.4	659.6	0.7	674.8	-14.5	640.9	19.4	To Be Studied
7308	Tree	608.9	612.0	-3.0	632.4	-23.4	640.9	-31.9	-	-	674.7	-65.8	640.9	-31.9	No Action
7309	Tree	608.7	611.9	-3.2	632.3	-23.6	640.7	-32.0	-	-	674.6	-65.9	640.7	-32.0	No Action
7310	Tree	607.2	611.9	-4.7	632.3	-25.0	640.7	-33.5	-	-	674.6	-67.3	640.7	-33.5	No Action
7311	Tree	606.4	611.8	-5.4	632.2	-25.8	640.6	-34.2	659.3	-52.9	674.5	-68.0	640.6	-34.2	No Action
7312	Light Pole	610.1	611.8	-1.7	632.2	-22.1	640.6	-30.5	-	-	674.5	-64.3	640.6	-30.5	No Action
7313	Tree	602.4	611.7	-9.3	632.0	-29.7	640.5	-38.1	-	-	674.3	-71.9	640.5	-38.1	No Action
7314	Tree	617.7	611.7	6.0	632.0	-14.3	640.4	-22.8	659.1	-41.4	674.2	-56.6	640.4	-22.8	To Be Studied
7315	Tree	638.5	611.6	26.9	631.9	6.6	640.3	-1.8	658.9	-20.4	674.1	-35.6	640.3	-1.8	To Be Studied
7316	Tree	608.1	611.6	-3.5	631.9	-23.8	640.3	-32.2	-	-	674.1	-66.0	640.3	-32.2	No Action
7317	Tree	661.1	611.6	49.5	631.9	29.2	640.3	20.8	658.9	2.2	674.1	-13.0	640.3	20.8	To Be Studied
7318	Tree	635.3	611.6	23.8	631.9	3.5	640.2	-4.9	658.9	-23.5	674.0	-38.7	640.2	-4.9	To Be Studied
7319	Light Pole	606.3	611.6	-5.3	631.9	-25.6	-	-	-	-	-	-	-	-	No Action
7320	Tree	620.2	611.4	8.9	631.6	-11.4	640.0	-19.7	658.5	-38.3	673.7	-53.5	640.0	-19.7	To Be Studied
7321	Tree	631.9	611.4	20.5	631.6	0.3	639.9	-8.1	658.5	-26.6	673.7	-41.8	639.9	-8.1	To Be Studied
7322	Tree	638.2	611.3	26.9	631.5	6.7	639.9	-1.7	658.4	-20.2	673.6	-35.4	639.9	-1.7	To Be Studied
7323	Tree	630.3	611.3	19.0	631.5	-1.3	639.8	-9.6	658.4	-28.1	673.6	-43.4	639.8	-9.6	To Be Studied
7324	Light Pole	602.4	611.2	-8.8	631.4	-28.9	639.7	-37.2	-	-	673.4	-71.0	639.7	-37.2	No Action
7325	Tree	643.5	611.1	32.4	631.3	12.2	639.6	3.9	658.1	-14.6	673.3	-29.8	639.6	3.9	To Be Studied
7326	Tree	602.6	611.1	-8.5	631.3	-28.6	639.5	-36.9	-	-	673.3	-70.6	639.5	-36.9	No Action
7327	Tree	609.0	611.1	-2.1	631.2	-22.3	639.5	-30.5	658.0	-49.1	673.3	-64.3	639.5	-30.5	No Action
7328	Tree	613.5	610.9	2.6	631.0	-17.5	639.2	-25.8	657.7	-44.2	672.9	-59.5	639.2	-25.8	To Be Studied
7329	Light Pole	603.5	610.8	-7.3	630.9	-27.4	639.1	-35.7	657.6	-54.1	672.8	-69.4	639.1	-35.7	No Action
7330	Tree	641.1	610.7	30.4	630.8	10.3	639.0	2.1	657.4	-16.3	672.7	-31.6	639.0	2.1	To Be Studied
7331	Tree	617.5	610.7	6.9	630.7	-13.2	638.9	-21.4	657.4	-39.8	672.6	-55.1	638.9	-21.4	To Be Studied
7333	Light Pole	606.7	610.6	-3.9	630.7	-24.0	638.9	-32.2	657.3	-50.6	672.6	-65.8	638.9	-32.2	No Action
7334	Tree	613.2	610.6	2.6	630.6	-17.4	638.8	-25.6	657.2	-44.0	672.4	-59.3	638.8	-25.6	To Be Studied
7335	Tree	613.3	610.4	2.9	630.4	-17.1	638.5	-25.2	656.9	-43.6	672.1	-58.8	638.5	-25.2	To Be Studied
7336	Tree	621.1	610.3	10.8	630.2	-9.2	638.4	-17.3	656.7	-35.6	672.0	-50.9	638.4	-17.3	To Be Studied
7337	Tree	606.2	610.3	-4.1	630.2	-24.1	638.3	-32.2	656.7	-50.5	672.0	-65.8	638.3	-32.2	No Action
7338	Tree	644.0	610.2	33.7	630.2	13.7	638.3	5.6	656.7	-12.7	671.9	-28.0	638.3	5.6	To Be Studied
7339	Tree	615.8	610.1	5.7	630.0	-14.2	638.0	-22.2	656.3	-40.6	671.6	-55.9	638.0	-22.2	To Be Studied
7340	Tree	642.6	609.9	32.7	629.8	12.9	637.8	4.8	656.1	-13.4	671.4	-28.7	637.8	4.8	To Be Studied
7341	Light Pole	607.6	609.8	-2.1	629.6	-22.0	-	-	-	-	-	-	-	-	No Action
7342	Tree	652.6	609.6	43.0	629.4	23.2	637.3	15.2	655.6	-3.0	670.9	-18.3	637.3	15.2	To Be Studied
7343	Tree	635.0	609.4	25.6	629.2	5.8	637.1	-2.1	655.3	-20.3	670.6	-35.6	637.1	-2.1	To Be Studied
7344	Tree	653.8	609.4	44.4	629.1	24.7	637.0	16.7	655.2	-1.4	670.5	-16.8	637.0	16.7	To Be Studied
7345	Building	601.0	609.3	-8.3	629.0	-28.0	636.8	-35.9	655.0	-54.1	670.4	-69.4	636.8	-35.9	No Action
7346	Tree	621.3	609.2	12.1	628.9	-7.6	636.8	-15.5	654.9	-33.6	670.3	-49.0	636.8	-15.5	To Be Studied
7347	Light Pole	608.0	609.2	-1.2	628.9	-20.9	636.7	-28.8	-	-	670.2	-62.3	636.7	-28.8	No Action
7348	Building	609.8	609.1	0.7	628.8	-19.0	636.7	-26.8	-	-	670.2	-60.3	636.7	-26.8	To Be Studied
7349	Tree	653.3	609.1	44.2	628.8	24.5	636.7	16.7	654.8	-1.5	670.2	-16.8	636.7	16.7	To Be Studied
7350	Tree	622.2	609.1	13.1	628.7	-6.5	636.5	-14.4	654.7	-32.5	670.0	-47.8	636.5	-14.4	To Be Studied
7351	Tree	622.7	608.9	13.8	628.5	-5.8	636.3	-13.6	654.4	-31.7	669.7	-47.0	636.3	-13.6	To Be Studied
7352	Tree	624.3	608.7	15.6	628.3	-4.0	636.1	-11.8	654.1	-29.8	669.5	-45.2	636.1	-11.8	To Be Studied
7353	Light Pole	605.9	608.6	-2.7	628.2	-22.3	635.9	-30.0	653.9	-48.1	669.3	-63.5	635.9	-30.0	No Action
7354	Tree	635.3	608.5	26.8	628.0	7.3	635.7	-0.5	653.7	-18.5	669.1	-33.9	635.7	-0.5	To Be Studied
7356	Tree	649.6	608.1	41.5	627.5	22.1	635.1	14.5	653.1	-3.4	668.5	-18.9	635.1	14.5	To Be Studied
7357	Light Pole	607.2	608.1	-0.9	627.5	-20.3	635.1	-27.9	-	-	-	-	-	-	No Action
7358	Tree	659.0	608.0	51.0	627.4	31.6	635.0	24.0	652.9	6.1	668.4	-9.3	635.0	24.0	To Be Studied
7359	Tree	601.3	608.0	-6.7	627.4	-26.1	635.0	-33.7	-	-	668.3	-67.1	635.0	-33.7	No Action
7360	Tree	598.2	607.7	-9.5	627.0	-28.8	634.5	-36.3	-	-	667.8	-69.6	634.5	-36.3	No Action
7361	Tree	600.7	607.6	-7.0	626.9	-26.3	634.4	-33.8	-	-	667.7	-67.1	634.4	-33.8	No Action
7362	Tree	602.2	607.5	-5.3	626.8	-24.6	634.3	-32.1	652.1	-49.9	667.6	-65.4	634.3	-32.1	No Action
7363	Building	600.8	607.5	-6.6	626.7	-25.9	634.2	-33.4	652.0	-51.2	667.5	-66.7	634.2	-33.4	No Action
7364	Tree	657.3	607.4	49.9	626.7	30.7	634.1	23.2	651.9	5.4	667.4	-10.1	634.1	23.2	To Be Studied
7365	Tree	636.4	607.4	29.0	626.6	9.7	634.1	2.3	651.9	-15.5	667.4	-31.0	634.1	2.3	To Be Studied
7368	Tree	645.1	607.2	37.9	626.4	18.7	633.8	11.3	651.5	-6.5	667.0	-22.0	633.8	11.3	To Be Studied
7369	Tree	606.8	607.2	-0.4	626.4	-19.6	633.8	-27.0	-	-	667.0	-60.3	633.8	-27.0	No Action
7370	Light Pole	602.9	607.1	-4.2	626.3	-23.4	633.7	-30.8	651.4	-48.5	666.9	-64.0	633.7	-30.8	No Action
7371	Light Pole	603.7	-	-	648.5	-44.7	-	-	-	-	-	-	-	-	No Action
7372	Tree	624.0	607.0	16.9	626.2	-2.2	633.6	-9.6	651.3	-27.3	666.8	-42.8	633.6	-9.6	To Be Studied
7373	Tree	657.8	606.9	50.8	626.1	31.7	633.4	24.3	651.1	6.6	666.6	-8.9	633.4	24.3	To Be Studied
7374	Tree	619.6	606.9	12.7	626.0	-6.4	633.3	-13.7	651.0	-31.4	666.5	-47.0	633.3	-13.7	To Be Studied
7375	Tree	597.4	606.8	-9.4	625.9	-28.5	633.2	-35.8	-	-	666.4	-69.0	633.2	-35.8	No Action
7376	Tree	616.7	606.6	10.1	625.7	-8.9	633.0	-16.3	650.6	-33.9	666.2	-49.4	633.0	-16.3	To Be Studied
7377	Light Pole	603.9	606.6	-2.7	625.6	-21.8	632.9	-29.1	650.6	-46.7	666.1	-62.2	632.9	-29.1	No Action
7378	Tree	607.3	606.5	0.7	625.6	-18.3	632.9	-25.6	650.5	-43.2	666.0	-58.8	632.9	-25.6	To Be Studied
7380	Light Pole	598.6	606.5	-7.9	625.5	-26.9	632.8	-34.2	650.4	-51.8	665.9	-67.3	632.8	-34.2	No Action
7381	Tree	613.4	606.3	7.1	625.3	-11.9	632.5	-19.1	650.1	-36.7	665.6	-52.2	632.5	-19.1	To Be Studied
7382	Tree	626.1	606.3	19.8	625.3	0.9	632.5	-6.4	650.1	-23.9	665.6	-39.5	632.5	-6.4	To Be Studied
7383	Light Pole	606.4	606.2	0.2	625.2	-18.8	632.4	-26.0	-	-	665.5	-59.1	632.4	-26.0	To Be Studied
7384	Tree	598.1	606.2	-8.1	625.2	-27.1	632.4	-34.3	649.9	-51.9	665.5	-67.4	632.4	-34.3	No Action
7385	Tree	611.4	606.2	5.2	625.1	-13.7	632.3	-21.0	649.9	-38.5	665.5	-54.1	632.3	-21.0	To Be Studied
7386	Tree	616.5	606.1	10.4	625.1	-8.5	632.3	-15.7	649.8	-33.3	665.4	-48.8	632.3	-15.7	To Be Studied
7387	Tree	606.6	606.0	0.7	624.8	-18.2	632.0	-25.4	649.5	-42.9	665.1	-58.5	632.0	-25.4	To Be Studied
7389	Tree	644.9	605.9	38.9	624.8	20.1	632.0	12.9	649.5	-4.6	665.1	-20.2	632.0	12.9	To Be Studied
7391	Light Pole	603.4	605.7	-2.3	624.5	-21.1	631.6	-28.2	-	-	664.6	-61.3	631.6	-28.2	No Action
7392	Tree	645.0	605.5	39.5	624.3	20.7	631.3	13.6	648.7	-3.8	664.4	-19.4	631.3	13.6	To Be Studied
7393	Tree	631.1	605.3	25.8	624.1	7.1	631.1	0.1	648.5	-17.3	664.1	-32.9	631.1	0.1	To Be Studied
7395	Light Pole	604.0	605.3	-1.3	625.4	-21.4	-	-	-	-	-	-	-	-	No Action
7396	Tree	607.7	605.1	2.6	623.8	-16.0	630.7	-23.0	648.1	-40.3	663.7	-56.0	630.7	-23.0	To Be Studied
7397	Tree	625.7	604.9	20.8	623.6	2.1	630.5	-4.8	647.8	-22.1	663.5	-37.8	630.5	-4.8	To Be Studied
7399	Billboard	598.3	604.8	-6.5	623.4	-25.1	630.3	-32.0	-	-	-	-	-	-	No Action
7400	Tree	625.8	604.8	21.0	623.4	2.4	630.3	-4.5	-	-	663.3	-37.5	630.3	-4.5	To Be Studied
7402	Tree	646.9	604.8	42.1	623.4	23.5	630.3	16.6	647.6	-0.7	663.2	-16.4	630.3	16.6	To Be Studied
7403	Tree	617.7	604.5	13.1	623.1	-5.4	629.9	-12.3	-	-	662.8	-45.2	629.9	-12.3	To Be Studied
7404	Tree	645.0	604.4	40.6	622.9	22.1	629.7	15.3	647.0	-2.0	662.6	-17.6	629.7	15.3	To Be Studied
7405	Tree	633.3	604.4	28.8	622.9	10.3	629.7	3.5	647.0	-13.7	662.6	-29.4	629.7	3.5	To Be Studied
7406	Tree	612.4	604.3	8.1	622.7	-10.3	629.5	-17.1	-	-	662.4	-50.0	629.5	-17.1	To Be Studied
7407	Tree	610.9	604.0	6.9	622.4	-11.5	629.1	-18.2	-	-	661.9	-51.0	629.1	-18.2	To Be Studied
7408	Light Pole	602.5	604.0	-1.5	622.3	-19.9	629.1	-26.6	-	-	661.9	-59.4	629.1	-26.6	No Action
7410	Tree	647.8	603.9	43.9	622.2	25.6	628.9	18.9	646.0	1.8	661.7	-14.0	628.9	18.9	To Be Studied
7411	Tree	639.0	603.5	35.4	621.8	17.1	628.5	10.5	645.5	-6.5	661.2	-22.3	628.5	10.5	To Be Studied
7412	Tree	645.3	603.5	41.8	621.7	23.5	628.3	16.9	645.4	-0.1	661.1	-15.9	628.3	16.9	To Be Studied
7413	Light Pole	603.3	603.4	-0.1	621.7	-18.4	-	-	-	-	-	-	-	-	No Action
7414	Building	610.0	603.4	6.6	621.6	-11.7	628.2	-18.2	-	-	661.0	-51.0	628.2	-18.2	To Be Studied
7415	Tree	596.1	603.3	-7.2	621.5	-25.4	628.1	-32.0	645.1	-49.0	660.9	-64.8	628.1	-32.0	No Action
7417	Tree	636.1	603.2	33.0	621.4	14.8	627.9	8.2	-	-	660.6	-24.5	627.9	8.2	To Be Studied
7418	Tree	598.6	603.2	-4.6	621.3	-22.8	627.9	-29.3	644.9	-46.3	660.6	-62.1	627.9	-29.3	No Action
7419	Utility Pole	604.1	-	-	653.3	-49.3	-	-	-	-	-	-	-	-	No Action
7421	Tree	595.0	602.7	-7.7	620.8	-25.8	627.3	-32.2	644.1	-49.1	659.9	-64.9	627.3	-32.2	No Action
7422	Tree	637.8	602.6	35.2	620.6	17.1	627.0	10.7	643.9	-6.1	659.7	-21.9	627.0	10.7	To Be Studied
7423	Tree	595.9	602.5	-6.7	620.6	-24.7	627.0	-31.1	643.8	-48.0	659.6	-63.8	627.0	-31.1	No Action
7424	Tree	641.2	602.4	38.8	620.4	20.8	626.8	14.4	643.6	-2.4	659.4	-18.2	626.8	14.4	To Be Studied
7425	Light Pole	601.7	602.3	-0.6	620.3	-18.6	626.6	-24.9	643.4	-41.7	659.2	-57.5	626.6	-24.9	No Action
7426	Tree	646.6	602.2	44.3	620.2	26.4	626.5	20.1	-	-	659.1	-12.6	626.5	20.1	To Be Studied
7427	Building	593.3	602.2	-8.9	620.1	-26.8	626.5	-33.1	-	-	-	-	-	-	No Action
7428	Utility Pole	601.3	-	-	646.9	-45.6	-	-	-	-	-	-	-	-	No Action
7429	Tree	600.4	602.1	-1.7	620.0	-19.6	626.3	-25.9	643.1	-42.7	658.9	-58.6	626.3	-25.9	No Action
7430	Light Pole	599.9	601.9	-2.0	619.7	-19.8	626.0	-26.1	642.7	-42.8	658.5	-58.7	626.0	-26.1	No Action
7431	Tree	645.3	601.7	43.6	619.6	25.8	625.8	19.5	642.5	2.8	658.4	-13.0	625.8	19.5	To Be Studied
7432	Tree	592.7	601.7	-9.0	619.5	-26.8	625.7	-33.0	642.4	-49.7	658.3	-65.6	625.7	-33.0	No Action
7433	Tree	641.1	601.6	39.6	619.3	21.8	625.5	15.6	-	-	658.1	-16.9	625.5	15.6	To Be Studied
7434	Tree	642.0	601.4	40.6	619.1	22.9	625.3	16.7	641.9	0.1	657.8	-15.8	625.3	16.7	To Be Studied
7435	Tree	622.5	601.2	21.3	637.3	-14.8	-	-	-	-	-	-	-	-	To Be Studied
7437	Tree	631.8	601.1	30.7	618.7	13.0	624.8	6.9	641.4	-9.6	657.3	-25.5	624.8	6.9	To Be Studied
7438	Tree	600.5	601.1	-0.6	618.7	-18.2	624.8	-24.3	-	-	657.3	-56.8	624.8	-24.3	No Action
7439	Tree	619.3	601.1	18.2	631.3	-12.0	-	-	-	-	-	-	-	-	To Be Studied
7441	Tree	617.1	600.8	16.3	627.2	-10.1	-	-	-	-	-	-	-	-	To Be Studied
7442	Utility Pole	596.9	600.5	-3.6	633.6	-36.7	-	-	-	-	-	-	-	-	No Action
7443	Tree	616.3	600.4	15.9	617.8	-1.6	623.8	-7.5	-	-	656.1	-39.9	623.8	-7.5	To Be Studied
7444	Tree	630.4	600.3	30.1	617.7	12.6	623.7	6.7	640.1	-9.7	656.0	-25.6	623.7	6.7	To Be Studied
7445	Tree	621.3	600.2	21.0	632.3	-11.1	-	-	-	-	-	-	-	-	To Be Studied
7446	Tree	612.4	600.2	12.2	619.9	-7.6	-	-	-	-	-	-	-	-	To Be Studied
7447	Tree	592.9	600.0	-7.2	617.4	-24.6	623.3	-30.4	639.6	-46.8	655.6	-62.7	623.3	-30.4	No Action
7448	Tree	617.6	599.9	17.7	629.5	-12.0	-	-	-	-	-	-	-	-	To Be Studied
7449	Tree	603.2	599.7	3.4	617.1	-13.9	622.9	-19.7	639.1	-36.0	655.2	-52.0	622.9	-19.7	To Be Studied
7450	Tree	618.9	599.7	19.3	617.0	1.9	622.8	-3.8	-	-	655.1	-36.1	622.8	-3.8	To Be Studied
7451	Tree	620.9	599.7	21.3	619.5	1.4	-	-	-	-	-	-	-	-	To Be Studied
7452	Tree	608.8	599.5	9.3	616.8	-8.0	-	-	-	-	-	-	-	-	To Be Studied
7453	Light Pole	597.1	599.5	-2.3	616.7	-19.6	622.4	-25.3	-	-	654.7	-57.6	622.4	-25.3	No Action
7454	Tree	614.3	599.4	14.9	639.3	-25.0	-	-	-	-	-	-	-	-	To Be Studied
7455	Tree	593.6	599.3	-5.8	629.4	-35.9	-	-	-	-	-	-	-	-	No Action
7456	Tree	614.8	599.2	15.6	620.0	-5.2	-	-	-	-	-	-	-	-	To Be Studied
7457	Tree	613.8	599.2	14.5	616.4	-2.7	-	-	-	-	-	-	-	-	To Be Studied
7458	Tree	620.3	599.1	21.2	616.2	4.0	-	-	-	-	-	-	-	-	To Be Studied
7459	Tree	590.1	599.1	-9.0	616.2	-26.2	621.9	-31.8	-	-	654.1	-64.0	621.9	-31.8	No Action
7460	Tree	619.3	598.9	20.4	641.4	-22.0	-	-	-	-	-	-	-	-	To Be Studied
7461	Tree	626.7	598.8	27.9	615.9	10.9	-	-	-	-	-	-	-	-	To Be Studied
7462	Tree	608.6	598.8	9.8	624.0	-15.4	-	-	-	-	-	-	-	-	To Be Studied
7463	Tree	619.3	598.8	20.5	615.8	3.4	621.4	-2.2	-	-	-	-	-	-	To Be Studied
7464	Tree	605.6	598.7	6.9	615.8	-10.2	621.3	-15.7	637.4	-31.8	653.5	-47.9	621.3	-15.7	To Be Studied
7465	Tree	591.1	598.7	-7.6	615.8	-24.7	621.3	-30.2	637.4	-46.3	653.5	-62.4	621.3	-30.2	No Action
7466	Tree	593.4	598.6	-5.1	615.6	-22.2	621.1	-27.7	637.2	-43.8	653.3	-59.9	621.1	-27.7	No Action
7467	Tree	617.3	598.5	18.8	615.6	1.7	621.1	-3.8	637.1	-19.8	653.2	-35.9	621.1	-3.8	To Be Studied
7468	Tree	604.4	598.4	6.0	619.0	-14.5	-	-	-	-	-	-	-	-	To Be Studied

LEGEND
1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-6-24(4) - 6-24 Inner P77 (4)
LAYOUT: 6 Inner (2)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:41 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 6 Obstruction Tables Inner Portion (Existing/Future)

SCALE	AS NOTED	JOB NO.	20042701.00
DATE	2/2023		
SHEET	43	OF 59	SHEETS

Runway 6 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
7469	Light Pole	595.4	598.4	-3.0	615.4	-20.0	620.9	-25.5	-	-	653.0	-57.6	620.9	-25.5	No Action
7471	Tree	591.3	598.4	-7.0	615.3	-24.0	620.8	-29.5	636.9	-45.5	653.0	-61.6	620.8	-29.5	No Action
7472	Tree	616.9	598.3	18.5	615.3	1.6	-	-	-	-	-	-	-	-	To Be Studied
7473	Flagpole	603.6	598.2	5.4	615.1	-11.5	620.6	-16.9	-	-	-	-	-	-	To Be Studied
7474	Tree	603.3	598.2	5.2	615.1	-11.8	-	-	-	-	-	-	-	-	To Be Studied
7475	Tree	608.6	598.0	10.7	614.9	-6.2	-	-	-	-	-	-	-	-	To Be Studied
7476	Tree	591.2	597.9	-6.7	614.7	-23.5	-	-	-	-	-	-	-	-	No Action
7477	Flagpole	603.7	597.8	5.9	614.7	-11.0	620.0	-16.4	-	-	-	-	-	-	To Be Studied
7480	Tree	590.4	597.4	-7.0	645.3	-54.9	-	-	-	-	-	-	-	-	No Action
7482	Tree	605.7	597.3	8.4	626.2	-20.5	-	-	-	-	-	-	-	-	To Be Studied
7485	Light Pole	593.3	597.2	-3.9	613.9	-20.5	619.1	-25.8	-	-	651.1	-57.7	619.1	-25.8	No Action
7487	Light Pole	589.5	597.0	-7.5	613.7	-24.1	618.8	-29.3	-	-	650.8	-61.3	618.8	-29.3	No Action
7488	Tree	613.1	597.0	16.1	613.6	-0.6	-	-	-	-	-	-	-	-	To Be Studied
7490	Light Pole	595.8	596.8	-1.0	613.4	-17.6	618.6	-22.7	-	-	-	-	-	-	No Action
7492	Tree	591.1	596.8	-5.6	613.3	-22.2	618.5	-27.3	-	-	-	-	-	-	No Action
7493	Tree	602.1	596.5	5.6	614.9	-12.8	-	-	-	-	-	-	-	-	To Be Studied
7494	Tree	611.0	596.1	14.9	612.5	-1.5	617.5	-6.5	-	-	-	-	-	-	To Be Studied
7496	Tree	611.0	596.1	14.9	624.5	-13.4	-	-	-	-	-	-	-	-	To Be Studied
7497	Tree	597.2	596.0	1.2	612.4	-15.2	-	-	-	-	-	-	-	-	To Be Studied
7498	Tree	604.0	595.9	8.2	632.1	-28.1	-	-	-	-	-	-	-	-	To Be Studied
7499	Light Pole	587.7	595.8	-8.2	612.2	-24.5	617.1	-29.4	-	-	648.9	-61.2	617.1	-29.4	No Action
7500	Tree	620.2	595.8	24.4	612.1	8.1	-	-	-	-	-	-	-	-	To Be Studied
7501	Tree	600.3	595.7	4.6	622.5	-22.1	-	-	-	-	-	-	-	-	To Be Studied
7502	Tree	598.1	595.7	2.4	638.2	-40.1	-	-	-	-	-	-	-	-	To Be Studied
7503	Tree	600.8	595.7	5.1	629.4	-28.6	-	-	-	-	-	-	-	-	To Be Studied
7505	Tree	613.5	595.5	18.0	611.8	1.7	-	-	-	-	-	-	-	-	To Be Studied
7506	Tree	595.9	595.4	0.6	617.6	-21.6	-	-	-	-	-	-	-	-	To Be Studied
7507	Tree	620.0	595.4	24.6	611.6	8.4	616.4	3.6	-	-	-	-	-	-	To Be Studied
7508	Tree	592.8	595.3	-2.5	631.6	-38.8	-	-	-	-	-	-	-	-	No Action
7509	Light Pole	588.6	595.3	-6.7	611.5	-22.9	616.3	-27.7	-	-	648.1	-59.5	616.3	-27.7	No Action
7510	Tree	614.1	595.0	19.1	611.2	3.0	-	-	-	-	-	-	-	-	To Be Studied
7511	Light Pole	593.4	595.0	-1.6	611.1	-17.7	615.8	-22.4	-	-	-	-	-	-	No Action
7512	Tree	615.4	594.9	20.5	611.1	4.4	-	-	-	-	-	-	-	-	To Be Studied
7513	Tree	611.3	594.9	16.4	611.0	0.3	615.7	-4.4	-	-	-	-	-	-	To Be Studied
7514	Road Sign	587.0	594.8	-7.7	610.9	-23.8	615.6	-28.5	630.9	-43.9	647.3	-60.2	615.6	-28.5	No Action
7515	Tree	619.6	594.8	24.8	610.8	8.7	615.5	4.0	-	-	-	-	-	-	To Be Studied
7516	Tree	604.2	594.7	9.5	610.7	-6.5	615.4	-11.2	-	-	-	-	-	-	To Be Studied
7518	Light Pole	585.1	594.6	-9.5	610.7	-25.6	615.3	-30.2	630.6	-45.5	647.0	-61.9	615.3	-30.2	No Action
7519	Tree	600.2	594.6	5.6	610.6	-10.4	615.3	-15.1	-	-	-	-	-	-	To Be Studied
7520	Light Pole	589.2	594.5	-5.3	610.5	-21.3	615.1	-25.9	-	-	646.8	-57.6	615.1	-25.9	No Action
7521	Tree	616.9	594.4	22.5	610.4	6.5	-	-	-	-	-	-	-	-	To Be Studied
7522	Billboard	593.4	594.3	-1.0	649.4	-56.1	-	-	-	-	-	-	-	-	No Action
7523	Tree	617.3	594.2	23.1	610.1	7.1	614.7	2.5	-	-	-	-	-	-	To Be Studied
7527	Tree	608.2	593.9	14.3	609.8	-1.6	-	-	-	-	-	-	-	-	To Be Studied
7528	Tree	608.4	593.9	14.5	609.8	-1.4	614.3	-5.9	-	-	-	-	-	-	To Be Studied
7529	Light Pole	586.3	593.9	-7.6	609.7	-23.4	614.2	-27.9	-	-	645.8	-59.5	614.2	-27.9	No Action
7531	Tree	584.4	593.7	-9.3	609.5	-25.1	614.0	-29.5	629.1	-44.7	645.5	-61.1	614.0	-29.5	No Action
7532	Tree	589.9	593.6	-3.7	609.4	-19.5	613.8	-24.0	628.9	-39.1	645.4	-55.5	613.8	-24.0	No Action
7533	Tree	590.1	593.6	-3.4	609.3	-19.2	613.8	-23.6	628.8	-38.7	645.3	-55.1	613.8	-23.6	No Action
7534	Light Pole	599.7	593.5	6.2	647.7	-48.0	-	-	-	-	-	-	-	-	To Be Studied
7535	Light Pole	588.1	593.4	-5.3	609.1	-21.1	613.5	-25.5	-	-	645.0	-57.0	613.5	-25.5	No Action
7536	Tree	615.6	593.4	22.2	609.1	6.5	613.5	2.1	-	-	-	-	-	-	To Be Studied
7537	Tree	587.0	593.4	-6.3	609.1	-22.1	613.5	-26.4	628.5	-41.5	645.0	-57.9	613.5	-26.4	No Action
7538	Tree	587.5	593.3	-5.8	609.0	-21.5	613.4	-25.9	-	-	-	-	-	-	No Action
7539	Tree	592.8	593.3	-0.5	609.0	-16.2	613.4	-20.6	628.4	-35.6	644.9	-52.0	613.4	-20.6	No Action
7540	Tree	591.8	593.3	-1.5	609.0	-17.2	613.3	-21.6	628.4	-36.6	644.8	-53.1	613.3	-21.6	No Action
7541	Tree	587.4	593.3	-5.8	609.0	-21.5	613.3	-25.9	-	-	-	-	-	-	No Action
7542	Tree	590.1	593.2	-3.2	608.9	-18.9	613.3	-23.2	628.3	-38.2	644.8	-54.7	613.3	-23.2	No Action
7543	Tree	590.5	593.1	-2.6	608.8	-18.2	613.1	-22.6	628.1	-37.6	644.6	-54.1	613.1	-22.6	No Action
7544	Tree	586.8	593.1	-6.3	608.8	-21.9	613.1	-26.3	628.1	-41.3	644.6	-57.7	613.1	-26.3	No Action
7545	Tree	595.2	593.0	2.2	608.6	-13.4	613.0	-17.7	627.9	-32.7	644.4	-49.2	613.0	-17.7	To Be Studied
7546	Tree	587.6	593.0	-5.4	608.6	-21.0	612.9	-25.3	627.9	-40.3	644.4	-56.7	612.9	-25.3	No Action
7547	Tree	601.6	593.0	8.6	608.6	-7.0	612.9	-11.3	627.9	-26.3	644.3	-42.8	612.9	-11.3	To Be Studied
7548	Tree	616.4	592.9	23.5	608.5	7.9	612.8	3.6	-	-	-	-	-	-	To Be Studied
7549	Tree	594.0	592.9	1.1	608.5	-14.5	612.8	-18.8	627.8	-33.8	644.2	-50.3	612.8	-18.8	To Be Studied
7550	Tree	583.2	592.8	-9.5	608.3	-25.1	612.6	-29.4	627.5	-44.3	644.0	-60.8	612.6	-29.4	No Action
7551	Tree	594.0	592.7	1.4	608.2	-14.2	612.5	-18.4	627.4	-33.3	643.9	-49.8	612.5	-18.4	To Be Studied
7552	Tree	584.3	592.6	-8.3	608.1	-23.8	612.3	-28.1	627.2	-43.0	643.7	-59.5	612.3	-28.1	No Action
7553	Road Sign	585.6	592.4	-6.9	607.9	-22.4	612.1	-26.5	627.0	-41.4	643.5	-57.9	612.1	-26.5	No Action
7554	Tree	589.0	592.4	-3.4	607.9	-18.9	612.1	-23.1	627.0	-37.9	643.5	-54.4	612.1	-23.1	No Action
7555	Tree	586.7	592.4	-5.7	607.9	-21.2	612.1	-25.3	626.9	-40.2	643.4	-56.7	612.1	-25.3	No Action
7556	Tree	634.9	592.4	42.5	607.9	27.1	612.0	22.9	-	-	-	-	-	-	To Be Studied
7558	Tree	586.4	592.3	-5.9	607.7	-21.4	611.8	-25.5	626.7	-40.3	643.2	-56.9	611.8	-25.5	No Action
7559	Tree	593.9	592.2	1.7	607.7	-13.8	611.8	-17.9	626.6	-32.7	643.2	-49.3	611.8	-17.9	To Be Studied
7560	Light Pole	589.5	592.2	-2.7	607.7	-18.2	611.8	-22.3	-	-	643.1	-53.7	611.8	-22.3	No Action
7561	Light Pole	586.1	592.2	-6.1	607.7	-21.5	611.8	-25.7	626.6	-40.5	643.1	-57.0	611.8	-25.7	No Action
7562	Light Pole	584.0	592.1	-8.1	626.8	-42.9	-	-	-	-	-	-	-	-	No Action
7563	Tree	592.7	592.1	0.6	607.5	-14.8	611.6	-18.9	626.4	-33.7	642.9	-50.3	611.6	-18.9	To Be Studied
7565	Tree	590.4	592.0	-1.6	607.3	-17.0	611.4	-21.0	626.2	-35.8	642.7	-52.4	611.4	-21.0	No Action
7566	Tree	628.8	591.8	37.0	607.1	21.7	611.1	17.6	-	-	-	-	-	-	To Be Studied
7567	Tree	610.0	591.7	18.3	607.1	2.9	611.1	-1.1	-	-	-	-	-	-	To Be Studied
7568	Tree	587.8	591.7	-3.9	607.0	-19.2	611.1	-23.3	625.8	-38.0	642.4	-54.6	611.1	-23.3	No Action
7569	Tree	618.7	591.7	27.0	607.0	11.7	611.0	7.7	-	-	-	-	-	-	To Be Studied
7570	Light Pole	582.2	591.7	-9.4	607.0	-24.7	611.0	-28.8	625.7	-43.5	642.3	-60.0	611.0	-28.8	No Action
7571	Tree	594.8	591.5	3.3	606.7	-11.9	610.7	-15.9	625.3	-30.6	641.9	-47.1	610.7	-15.9	To Be Studied
7572	Tree	589.6	591.4	-1.8	606.6	-17.0	610.5	-21.0	625.2	-35.6	641.8	-52.2	610.5	-21.0	No Action
7573	Tree	597.4	591.4	6.1	606.6	-9.1	610.5	-13.1	625.2	-27.7	641.8	-44.3	610.5	-13.1	To Be Studied
7574	Tree	617.3	591.1	26.2	606.3	11.0	610.2	7.1	-	-	-	-	-	-	To Be Studied
7575	Light Pole	587.6	591.0	-3.4	606.1	-18.5	610.0	-22.4	-	-	641.2	-53.6	610.0	-22.4	No Action
7576	Tree	585.4	590.9	-5.5	606.0	-20.7	609.9	-24.5	624.4	-39.1	641.0	-55.7	609.9	-24.5	No Action
7577	Tree	599.7	590.9	8.8	606.0	-6.3	609.8	-10.1	624.4	-24.7	641.0	-41.3	609.8	-10.1	To Be Studied
7578	Tree	593.2	590.8	2.4	605.8	-12.7	609.7	-16.5	624.2	-31.0	640.8	-47.6	609.7	-16.5	To Be Studied
7579	Light Pole	582.7	590.7	-8.0	605.8	-23.1	609.6	-26.9	-	-	-	-	-	-	No Action
7580	Light Pole	584.1	590.6	-6.5	605.6	-21.5	609.4	-25.3	623.9	-39.8	640.6	-56.4	609.4	-25.3	No Action
7581	Tree	585.4	590.6	-5.3	605.6	-20.3	609.4	-24.1	623.9	-38.6	640.6	-55.2	609.4	-24.1	No Action
7584	Tree	583.4	590.1	-6.7	605.0	-21.6	608.7	-25.3	623.1	-39.7	639.8	-56.4	608.7	-25.3	No Action
7585	Tree	626.3	589.9	36.4	604.8	21.5	608.4	17.9	-	-	-	-	-	-	To Be Studied
7586	Light Pole	589.3	589.8	-0.5	604.6	-15.4	608.3	-19.0	-	-	639.3	-50.0	608.3	-19.0	No Action
7587	Light Pole	586.1	589.8	-3.7	604.6	-18.5	608.2	-22.1	622.6	-36.5	639.3	-53.2	608.2	-22.1	No Action
7588	Tree	614.9	589.8	25.2	604.6	10.4	608.2	6.8	-	-	639.2	-24.3	-	-	To Be Studied
7589	Tree	628.0	589.5	38.5	604.2	23.8	607.8	20.2	-	-	638.8	-10.8	-	-	To Be Studied
7590	Tree	615.2	589.1	26.1	603.8	11.4	607.3	7.9	-	-	638.2	-23.0	-	-	To Be Studied
7591	Light Pole	581.4	589.1	-7.7	637.3	-56.0	-	-	-	-	-	-	-	-	No Action
7592	Light Pole	580.0	589.0	-9.0	603.6	-23.6	607.0	-27.0	-	-	-	-	-	-	No Action
7593	Tree	622.4	589.0	33.4	603.6	18.8	607.0	15.4	-	-	638.0	-15.6	-	-	To Be Studied
7595	Light Pole	587.9	588.7	-0.8	603.3	-15.4	606.7	-18.7	-	-	637.6	-49.6	606.7	-18.7	No Action
7596	Tree	629.7	588.6	41.1	603.2	26.6	606.5	23.2	-	-	637.4	-7.7	-	-	To Be Studied
7598	Tree	616.2	588.0	28.2	602.3	13.9	605.5	10.6	-	-	636.4	-20.2	-	-	To Be Studied
7600	Light Pole	583.5	587.8	-4.3	602.1	-18.6	605.3	-21.7	-	-	636.1	-52.5	605.3	-21.7	No Action
7601	Light Pole	579.0	587.6	-8.6	617.3	-38.3	-	-	-	-	-	-	-	-	No Action
7602	Light Pole	585.8	587.4	-1.6	601.6	-15.8	604.7	-18.9	618.6	-32.8	635.5	-49.6	604.7	-18.9	No Action
7604	Billboard	584.5	587.3	-2.8	601.5	-17.0	604.6	-20.1	-	-	635.3	-50.8	604.6	-20.1	No Action
7606	Tree	587.6	587.2	0.4	601.3	-13.8	604.4	-16.8	618.2	-30.6	635.1	-47.5	604.4	-16.8	To Be Studied
7607	Tree	586.1	586.8	-0.8	600.9	-14.9	603.9	-17.8	-	-	634.6	-48.5	603.9	-17.8	No Action
7608	Tree	581.9	586.7	-4.8	600.7	-18.8	603.6	-21.7	617.4	-35.5	634.3	-52.4	603.6	-21.7	No Action
7609	Light Pole	583.4	586.6	-3.3	600.6	-17.3	603.5	-20.2	617.3	-33.9	634.2	-50.8	603.5	-20.2	No Action
7611	Tree	576.9	586.5	-9.6	600.6	-23.6	603.5	-26.5	-	-	634.1	-57.2	603.5	-26.5	No Action
7613	Light Pole	586.7	586.2	0.5	600.1	-13.5	602.9	-16.3	616.6	-29.9	633.5	-46.9	602.9	-16.3	To Be Studied
7614	Tree	576.7	586.2	-9.5	600.1	-23.4	602.9	-26.2	-	-	633.5	-56.8	602.9	-26.2	No Action
7615	Tree	586.8	586.1	0.7	600.0	-13.2	602.8	-16.0	-	-	633.4	-46.6	602.8	-16.0	To Be Studied
7616	Building	587.2	585.9	1.2	646.9	-59.8	-	-	-	-	-	-	-	-	To Be Studied
7618	Runway Light	579.8	585.9	-6.1	599.8	-20.0	602.6	-22.7	616.1	-36.3	633.1	-53.3	602.6	-22.7	Fixed by Function
7619	Tree	578.7	585.9	-7.2	599.8	-21.1	602.5	-23.8	616.1	-37.4	633.1	-54.4	602.5	-23.8	No Action
7620	Tree	592.6	585.8	6.8	599.6	-7.0	602.3	-9.8	-	-	632.9	-40.3	602.3	-9.8	To Be Studied
7623	Tree	591.9	585.6	6.3	599.3	-7.5	602.0	-10.1	-	-	632.5	-40.6	602.0	-10.1	To Be Studied
7626	Tree	592.5	585.5	7.0	599.2	-6.8	601.9	-9.4	-	-	632.4	-39.9	601.9	-9.4	To Be Studied
7628	Tree	587.6	585.4	2.2	599.1	-11.5	601.8	-14.2	-	-	632.3	-44.7	601.8	-14.2	To Be Studied
7629	Tree	592.0	585.3	6.7	599.0	-7.0	601.6	-9.6	-	-	632.1	-40.1	601.6	-9.6	To Be Studied
7630	Pole	575.9	585.1	-9.2	639.8	-63.9	-	-	-	-	-	-	-	-	No Action
7631	Tree	583.8	585.0	-1.2	598.6	-14.8	601.2	-17.4	-	-	631.6	-47.8	601.2	-17.4	No Action
7632	Building	589.6	585.0	4.6	606.1	-16.5	601.1	-11.5	-	-	-	-	-	-	To Be Studied
7633	Tree	580.4	585.0	-4.6	598.6	-18.2	601.1	-20.7	-	-	631.6	-51.2	601.1	-20.7	No Action
7634	Tree	581.2	584.8	-3.6	598.4	-17.2	600.9	-19.7	-	-	631.3	-50.1	600.9	-19.7	No Action
7635	Light Pole	585.6	584.7	0.9	598.2	-12.6	600.7	-15.1	614.1	-28.5	631.1	-45.5	600.7	-15.1	To Be Studied
7636	Tree	613.8	584.5	29.3	598.0	15.8	600.4	13.4	-	-	-	-	-	-	To Be Studied
7638	Light Pole	575.1	584.4	-9.3	643.8	-68.7	-	-	-	-	-	-	-	-	No Action
7639	Tree	621.7	584.3	37.3	597.8	23.8	600.2	21.4	-	-	-	-	-	-	To Be Studied
7640	Parking Lot	577.3	584.2	-6.9	631.5	-54.2	-	-	-	-	-	-	-	-	No Action
7642	Tree	609.9	584.1	25.9	597.5	12.5	599.8	10.1	-	-	-	-	-	-	To Be Studied
7643	Tree	595.3	584.1	11.2	597.5	-2.2	599.8	-4.5	-	-	-	-	-	-	To Be Studied
7644	Tree	594.5	584.0	10.5	601.7	-7.2	599.7	-5.2	-	-	-	-	-	-	To Be Studied
7645	Tree	574.9	583.9	-9.1	597.3	-22.4	599.6	-24.7	612.8	-37.9	629.9	-55.0	599.6	-24.7	No Action
7647	Tree	579.6	583.8	-4.2	597.1	-17.5	599.4	-19.8	-	-	629.6	-50.0	599.4	-19.8	No Action
7648	Tree	608.4	583.7	24.6	597.0	11.3	599.3	9.1	-	-	-	-	-	-	To Be Studied
7649	Tree	581.8	583.7	-1.9	644.3	-62.5	-	-	-	-	-	-	-	-	No Action
7650	Tree	612.4	583.6	28.7	596.9	15.4	599.2	13.2	-	-	-	-	-	-	To Be Studied
7651	Tree	581.4	583.6	-2.1	642.6	-61.2	-	-	-	-	-	-	-	-	No Action
7652	Tree	606.5	583.5	23.1	596.7	9.8	598.9	7.6	-	-	-	-	-	-	To Be Studied
7653	Tree	596.1	583.5	12.7	596.7	-0.6	598.9	-2.8	612.0	-15.9	629.1	-33.0	598.9	-2.8	To Be Studied
7654	Tree	602.2	583.5	18.8	596.7	5.5	598.9	3.3	-	-	-	-	-	-	To Be Studied
7655	Tree	581.1	583.4	-2.3	638.9	-57.8	-	-	-	-	-	-	-	-	No Action
7658	Tree	576.9	583.3	-6.5	635.6	-58.7	-	-	-	-	-	-	-	-	No Action
7659	Road Sign	592.6	583.3	9.3	596.5	-3.9	598.7	-6.0	-	-	-	-	-	-	To Be Studied
7660	Tree	576.6	583.3	-6.7	632.9	-56.4	-	-	-	-	-	-	-	-	No Action
7661	Tree	575.9	583.3	-7.4	596.5	-20.6	598.6	-22.7	-	-	628.8	-52.9	598.6	-22.7	No Action
7662	Tree	574.6	583.2	-8.6	596.4	-21.8	598.6	-24.0	-	-	628.8	-54.2	598.6	-24.0	No Action
7663	Tree	576.6	583.2	-6.6	629.9	-53.3	-	-	-	-	-	-	-	-	No Action
7664	Tree	574.7	583.2	-8.5	596.4	-21.7	598.6	-23.8	-	-	628.8	-54.1	598.6	-23.8	No Action
7665	Tree	576.7	583.2	-6.5	627.3	-50.6	-	-	-	-	-	-	-	-	No Action
7666	Street Sign	575.0	583.2	-8.2	657.9	-82.9	-	-	-	-	-	-	-	-	No Action
7667	Tree	586.2	583.2	3.0	596.4	-10.1	598.5	-12.3	611.6	-25.3	628.7	-42.5	598.5	-12.3	To Be Studied
7668	Tree	576.8	583.2	-6.3	624.3	-47.5	-	-	-	-	-	-	-	-	No Action
7669	Tree	612.8	583.2	29.6	597.4	15.4	598.5	14.3	-	-	-	-	-	-	To Be Studied
7670	Tree	581.8	583.1	-1.3	596.3	-14.4	598.4	-16.6	-	-	628.6	-46.8	598.4	-16.6	No Action
7672	Tree	582.2	583.0	-0.8	596.2	-13.9	598.3	-16.1	-	-	628.5	-46.3	598.3	-16.1	No Action
7673	Tree	594.6	583.0	11.7	596.1	-1.4	598.2	-3.5	-	-	628.4	-33.7	598.2	-3.5	To Be Studied
7674	Tree	587.5	583.0	4.6	596.1	-8.6	598.2	-10.7	611.2	-23.7	628.3	-40.8	598.2	-10.7	To Be Studied
7676	Road Sign	573.8	582.9	-9.1	596.0	-22.2	598.1	-24.3	611.1	-37.3	628.3	-54.5	598.1	-24.3	No Action
7677	Tree	588.3	582.8	5.4	595.9	-7.6	598.0	-9.7	-	-	628.2	-39.9	598.0	-9.7	To Be Studied
7678	Tree	588.5	582.8	5.7	595.9	-7.4	598.0	-9.5	610.9	-22.4	628.1	-39.6	598.0	-9.5	To Be Studied
7679	Road Sign	582.7	582.8	-0.1	625.0	-42.3	-	-	-	-	-	-	-	-	No Action
7680	Tree	615.7	582.8	32.9	607.0	8.6	597.9	17.8	-	-	-	-	-	-	To Be Studied
7681	Street Sign	573.2	582.7	-9.6	595.8	-22.6	597.9	-24.7	-	-	628.0	-54.8	-	-	No Action
7682	Tree	582.0	582.7	-0.7	595.7	-13.8	597.8	-15.8	-	-	627.9	-45.9	597.8	-15.8	No Action
7683	Runway Light	575.9	582.7	-6.8	595.7	-19.8	597.7	-21.8	610.7	-34.8	627.9	-52.0	597.7	-21.8	Fixed by Function
7685	Tree	594.0	582.5	11.5	595.5	-1.5	597.6	-3.5	-	-	627.7	-33.7	597.6	-3.5	To Be Studied
7686	Tree	588.3	582.4	5.9	595.4	-7.1	597.4	-9.1	-	-	627.5	-39.2	597.4	-9.1	To Be Studied
7687	Tree	589.0	582.4	6.5	595.4	-6.4	597.4	-8.4	610.3	-21.3	627.5	-38.5	597.4	-8.4	To Be Studied
7688	Street Sign	572.6	582.3	-9.7	595.3	-22.7	597.3	-24.6	-	-	-	-	-	-	No Action
7690	Tree	588.1	582.1	6.0	595.1	-6.9	597.0	-8.8	-	-	627.1	-38.9	597.0	-8.8	To Be Studied
7691	Tree	587.8	582.1	5.7	595.0	-7.2	597.0	-9.1	-	-	627.0	-39.2	597.0	-9.1	To Be Studied
7692	Tree	608.6	582.1	26.5	595.0	13.6	596.9	11.7	-	-	627.0	-18.4	596.9	11.7	To Be Studied

Runway 6 Inner Approach (Existing)

Runway 6 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
7693	Street Sign	573.7	582.1	-8.4	595.0	-21.3	596.9	-23.2	-	-	-	-	-	-	No Action
7694	Tree	588.3	582.0	6.3	594.9	-6.6	596.8	-8.5	-	-	626.8	-38.5	596.8	-8.5	To Be Studied
7697	Tree	601.1	581.8	19.3	594.6	6.5	596.4	4.7	-	-	626.5	-25.4	596.4	4.7	To Be Studied
7698	Road Sign	580.4	581.7	-1.4	594.5	-14.2	596.3	-16.0	609.1	-28.7	626.4	-46.0	596.3	-16.0	No Action
7700	Tree	602.2	581.5	20.7	594.3	7.9	596.1	6.1	-	-	626.1	-23.9	596.1	6.1	To Be Studied
7701	Tree	604.7	581.4	23.3	594.1	10.6	595.9	8.8	-	-	625.9	-21.2	595.9	8.8	To Be Studied
7702	Tree	593.4	581.3	12.1	594.0	-0.6	595.8	-2.4	-	-	625.8	-32.4	595.8	-2.4	To Be Studied
7705	Tree	616.4	581.1	35.3	593.8	22.7	595.5	21.0	-	-	-	-	-	-	To Be Studied
7706	Tree	591.1	581.1	10.0	593.7	-2.6	595.4	-4.3	-	-	625.3	-34.3	595.4	-4.3	To Be Studied
7708	Light Pole	582.8	581.0	1.7	593.7	-10.9	595.3	-12.6	608.0	-25.2	625.3	-42.5	595.3	-12.6	To Be Studied
7709	Tree	587.3	580.9	6.4	593.5	-6.2	595.2	-7.9	-	-	625.1	-37.8	595.2	-7.9	To Be Studied
7710	Tree	584.2	580.8	3.4	593.4	-9.2	595.1	-10.9	-	-	625.0	-40.8	595.1	-10.9	To Be Studied
7714	Tree	588.2	580.6	7.6	593.1	-4.9	594.7	-6.5	-	-	624.6	-36.4	594.7	-6.5	To Be Studied
7715	Road Sign	576.8	580.5	-3.7	600.1	-23.3	594.6	-17.8	-	-	-	-	-	-	No Action
7716	Fence	575.2	580.4	-5.3	635.1	-59.9	-	-	-	-	-	-	-	-	No Action
7717	Tree	574.3	580.4	-6.1	592.9	-18.6	594.5	-20.2	-	-	624.3	-50.0	594.5	-20.2	No Action
7719	Tree	586.0	580.4	5.7	592.8	-6.8	594.4	-8.3	-	-	624.2	-38.2	594.4	-8.3	To Be Studied
7720	Tree	588.0	580.3	7.7	592.7	-4.7	594.2	-6.2	-	-	624.1	-36.0	594.2	-6.2	To Be Studied
7721	Tree	578.3	580.2	-1.9	592.6	-14.4	594.1	-15.8	-	-	623.9	-45.7	594.1	-15.8	No Action
7722	Tree	571.4	580.2	-8.8	592.6	-21.2	594.1	-22.7	-	-	-	-	-	-	No Action
7723	Tree	586.3	580.1	6.1	592.6	-6.3	594.0	-7.8	-	-	623.9	-37.6	594.0	-7.8	To Be Studied
7725	Light Pole	581.4	579.9	1.5	592.2	-10.9	593.7	-12.3	606.1	-24.7	623.5	-42.1	593.7	-12.3	To Be Studied
7726	Tree	573.7	579.9	-6.1	592.2	-18.5	593.6	-19.9	-	-	623.4	-49.7	593.6	-19.9	No Action
7727	Tree	583.2	579.8	3.4	592.1	-8.9	593.5	-10.3	-	-	623.3	-40.1	593.5	-10.3	To Be Studied
7728	Fence	572.8	579.7	-6.9	592.0	-19.2	593.4	-20.6	-	-	623.1	-50.4	-	-	No Action
7729	Tree	580.6	579.7	0.9	592.0	-11.4	593.3	-12.8	-	-	623.1	-42.5	593.3	-12.8	To Be Studied
7730	Tree	574.9	579.6	-4.8	591.9	-17.0	593.3	-18.4	-	-	623.0	-48.2	593.3	-18.4	No Action
7732	Traffic Light/Signal	577.1	579.4	-2.3	591.6	-14.5	593.0	-15.8	605.3	-28.1	622.7	-45.5	593.0	-15.8	No Action
7733	Tree	584.0	579.4	4.6	591.6	-7.6	592.9	-8.9	-	-	622.6	-38.6	592.9	-8.9	To Be Studied
7735	Fence	570.2	579.3	-9.1	591.5	-21.3	592.8	-22.6	-	-	622.5	-52.3	592.8	-22.6	No Action
7736	Tree	586.6	579.2	7.5	591.3	-4.7	592.6	-5.9	-	-	622.3	-35.6	592.6	-5.9	To Be Studied
7737	Light Pole	574.6	579.1	-4.6	591.3	-16.7	592.5	-18.0	-	-	-	-	-	-	No Action
7739	Tree	590.1	578.9	11.3	591.0	-0.8	592.2	-2.0	-	-	621.8	-31.7	592.2	-2.0	To Be Studied
7742	Tree	585.1	578.7	6.4	590.7	-5.6	591.9	-6.8	-	-	621.6	-36.4	-	-	To Be Studied
7743	Light Pole	579.7	578.6	1.1	590.6	-10.9	591.7	-12.1	603.9	-24.2	621.4	-41.7	591.7	-12.1	To Be Studied
7744	Tree	575.2	578.6	-3.4	590.6	-15.4	591.7	-16.5	-	-	-	-	-	-	No Action
7745	Tree	582.9	578.5	4.3	590.6	-7.7	591.7	-8.8	-	-	621.3	-38.4	-	-	To Be Studied
7746	Tree	577.8	578.5	-0.7	590.5	-12.6	591.6	-13.8	-	-	621.2	-43.4	591.6	-13.8	No Action
7747	Tree	580.6	578.4	2.2	590.3	-9.8	591.4	-10.8	-	-	621.0	-40.4	-	-	To Be Studied
7748	Traffic Light/Signal	576.9	578.3	-1.4	590.2	-13.3	591.3	-14.4	603.4	-26.5	620.9	-44.0	591.3	-14.4	No Action
7749	Traffic Light/Signal	575.4	578.3	-2.9	590.2	-14.8	591.3	-15.9	603.4	-28.0	620.9	-45.4	591.3	-15.9	No Action
7750	Tree	585.9	578.2	7.7	590.2	-4.3	591.2	-5.3	-	-	620.8	-34.9	-	-	To Be Studied
7751	Tree	582.0	578.2	3.8	590.1	-8.1	591.2	-9.2	-	-	-	-	-	-	To Be Studied
7752	Tree	584.0	577.9	6.1	589.7	-5.7	590.7	-6.7	-	-	620.3	-36.2	-	-	To Be Studied
7753	Street Sign	570.8	577.8	-7.1	589.7	-18.9	590.7	-19.9	602.7	-31.9	620.2	-49.4	590.7	-19.9	No Action
7754	Tree	571.4	577.8	-6.4	589.6	-18.2	590.5	-19.1	-	-	620.1	-48.7	590.5	-19.1	No Action
7759	Runway Light	577.0	576.6	0.4	588.1	-11.1	588.8	-11.8	600.6	-23.6	618.2	-41.2	588.8	-11.8	Fixed by Function
7760	Tree	566.4	576.3	-9.9	590.8	-24.4	588.4	-22.0	-	-	-	-	-	-	No Action
7761	Tree	569.6	576.3	-6.7	600.4	-30.9	588.3	-18.8	-	-	-	-	-	-	No Action
7762	Tree	567.0	576.0	-9.0	602.5	-35.5	587.9	-20.9	-	-	-	-	-	-	No Action
7763	Road Sign	576.2	575.8	0.4	587.1	-10.9	587.6	-11.4	599.2	-23.0	616.9	-40.7	587.6	-11.4	To Be Studied
7764	Tree	566.5	575.7	-9.2	598.5	-32.0	587.5	-21.1	-	-	-	-	-	-	No Action
7765	Tree	574.2	575.7	-1.4	607.2	-33.0	587.4	-13.2	-	-	-	-	-	-	No Action
7766	Tree	578.6	575.4	3.1	601.6	-23.1	587.1	-8.5	-	-	-	-	-	-	To Be Studied
7767	Tree	583.3	575.3	8.0	612.6	-29.3	586.9	-3.6	-	-	-	-	-	-	To Be Studied
7768	Tree	570.3	575.2	-4.9	606.8	-36.5	586.7	-16.4	-	-	-	-	-	-	No Action
7770	Light Pole	576.2	575.0	1.2	586.2	-10.0	586.5	-10.3	-	-	615.7	-39.5	586.5	-10.3	To Be Studied
7771	Light Pole	586.5	575.0	11.5	660.5	-74.0	-	-	-	-	-	-	-	-	To Be Studied
7772	Tree	565.3	574.8	-9.5	622.7	-57.3	586.2	-20.9	-	-	-	-	-	-	No Action
7773	Tree	572.4	574.8	-2.4	610.5	-38.1	586.1	-13.8	-	-	-	-	-	-	No Action
7776	Tree	578.5	574.5	3.9	619.9	-41.4	585.8	-7.3	-	-	-	-	-	-	To Be Studied
7777	Traffic Light/Signal	568.3	574.3	-6.0	585.3	-17.0	585.5	-17.2	596.8	-28.5	614.6	-46.3	585.5	-17.2	No Action
7778	Tree	580.7	574.2	6.5	615.6	-35.0	585.3	-4.6	-	-	-	-	-	-	To Be Studied
7779	Light Pole	575.1	574.1	1.0	585.0	-9.9	585.2	-10.1	-	-	614.2	-39.1	585.2	-10.1	To Be Studied
7780	Tree	581.2	574.1	7.1	623.5	-42.3	585.1	-3.9	-	-	-	-	-	-	To Be Studied
7781	Tree	566.9	573.8	-6.8	635.6	-68.6	-	-	-	-	-	-	-	-	No Action
7782	Light Pole	573.6	573.8	-0.1	584.6	-11.0	584.6	-11.0	595.8	-22.2	613.6	-40.0	584.6	-11.0	No Action
7783	Traffic Light/Signal	566.6	573.3	-6.7	584.0	-17.4	583.9	-17.3	-	-	612.9	-46.3	583.9	-17.3	No Action
7784	Tree	564.1	573.3	-9.1	642.8	-78.7	-	-	-	-	-	-	-	-	No Action
7785	Tree	566.0	573.2	-7.2	648.4	-82.4	-	-	-	-	-	-	-	-	No Action
7786	Traffic Light/Signal	567.6	572.8	-5.3	583.4	-15.8	583.3	-15.7	-	-	612.2	-44.6	583.3	-15.7	No Action
7787	Tree	565.4	572.8	-7.5	652.3	-87.0	-	-	-	-	-	-	-	-	No Action
7788	Tree	569.2	572.7	-3.6	641.3	-72.2	-	-	-	-	-	-	-	-	No Action
7789	Tree	566.1	572.6	-6.5	660.7	-94.5	-	-	-	-	-	-	-	-	No Action
7790	Runway Light	572.5	572.6	-0.1	583.1	-10.7	583.0	-10.5	593.9	-21.5	611.8	-39.4	583.0	-10.5	Fixed by Function
7791	Tree	571.8	572.6	-0.8	647.4	-75.6	-	-	-	-	-	-	-	-	No Action
7793	Tree	566.6	572.5	-5.9	664.4	-97.8	-	-	-	-	-	-	-	-	No Action
7794	Tree	564.3	572.4	-8.1	652.2	-87.9	-	-	-	-	-	-	-	-	No Action
7795	Tree	564.7	572.3	-7.6	664.2	-99.5	-	-	-	-	-	-	-	-	No Action
7796	Tree	562.9	572.0	-9.1	665.5	-102.6	-	-	-	-	-	-	-	-	No Action
7797	Tree	563.7	571.9	-8.2	659.0	-95.3	-	-	-	-	-	-	-	-	No Action
7798	Tree	564.7	571.7	-7.1	663.1	-98.4	-	-	-	-	-	-	-	-	No Action
7799	Tree	568.2	571.6	-3.4	666.7	-98.5	-	-	-	-	-	-	-	-	No Action
7803	Light Pole	574.0	571.1	2.9	581.3	-7.3	580.7	-6.8	-	-	-	-	-	-	To Be Studied
7805	Light Pole	574.8	571.1	3.7	608.3	-33.4	580.7	-5.9	-	-	-	-	-	-	To Be Studied
7806	Road Sign	574.0	570.5	3.4	588.3	-14.4	579.9	-5.9	-	-	-	-	-	-	To Be Studied
7810	Road Sign	560.3	569.5	-9.2	642.1	-81.8	-	-	-	-	-	-	-	-	No Action
7811	Light Pole	572.5	569.3	3.2	618.2	-45.7	578.1	-5.6	-	-	-	-	-	-	To Be Studied
7812	Light Pole	573.2	568.9	4.3	649.9	-76.7	-	-	-	-	-	-	-	-	To Be Studied
7813	Runway Light	568.9	568.6	0.3	578.2	-9.3	577.1	-8.2	587.3	-18.4	605.5	-36.6	577.1	-8.2	Fixed by Function
7814	Runway Light	568.9	568.6	0.3	578.2	-9.3	577.1	-8.2	587.3	-18.4	605.5	-36.6	577.1	-8.2	Fixed by Function
7815	Runway Light	568.9	568.6	0.3	578.2	-9.3	577.1	-8.2	587.3	-18.4	605.5	-36.6	577.1	-8.2	Fixed by Function
7816	Light Pole	570.4	567.2	3.2	658.3	-87.9	-	-	-	-	-	-	-	-	To Be Studied
7820	Pole	559.5	562.1	-2.6	632.2	-72.7	567.5	-8.0	-	-	-	-	-	-	No Action
7854	Post	549.6	-	-	596.3	-46.7	-	-	-	-	-	-	-	-	No Action
7860	Post	550.0	-	-	591.4	-41.4	-	-	-	-	-	-	-	-	No Action
9899	Light Pole	612.5	623.8	-11.3	647.1	-34.7	658.2	-45.7	-	-	693.5	-81.1	658.2	-45.7	No Action
9908	Light Pole	634.4	648.5	-14.0	678.0	-43.6	694.5	-60.1	720.4	-85.9	733.0	-98.5	694.5	-60.1	No Action
9926	Tree	633.5	646.3	-12.8	675.3	-41.8	691.3	-57.8	716.8	-83.2	729.5	-96.0	691.3	-57.8	No Action
9927	Tree	636.5	646.6	-10.0	675.6	-39.1	691.7	-55.2	717.2	-80.7	729.9	-93.4	691.7	-55.2	No Action
9929	Tree	630.7	644.9	-14.2	673.5	-42.8	689.2	-58.5	714.4	-83.7	727.2	-96.5	689.2	-58.5	No Action
9930	Light Pole	629.8	644.2	-14.4	672.7	-42.9	688.2	-58.4	-	-	726.2	-96.4	688.2	-58.4	No Action
9932	Tree	639.5	650.5	-11.0	680.5	-41.0	697.4	-58.0	-	-	736.2	-96.7	697.4	-58.0	No Action
9933	Tree	636.9	650.4	-13.5	680.5	-43.5	697.4	-60.5	-	-	736.1	-99.2	697.4	-60.5	No Action
9937	Tree	635.0	647.6	-12.6	676.9	-41.9	693.2	-58.2	718.9	-83.9	731.6	-96.6	693.2	-58.2	No Action
9939	Light Pole	637.4	649.2	-11.9	679.0	-41.6	695.6	-58.3	721.7	-84.3	734.2	-96.9	695.6	-58.3	No Action
9942	Tree	639.5	650.5	-11.0	680.6	-41.1	697.5	-58.0	723.7	-84.3	736.2	-96.8	697.5	-58.0	No Action
9962	Pole Util	633.7	647.8	-14.1	677.1	-43.4	693.5	-59.8	719.2	-85.5	731.9	-98.2	693.5	-59.8	No Action
9975	Tree	636.6	649.7	-13.1	679.5	-42.9	696.3	-59.7	722.4	-85.8	734.9	-98.3	696.3	-59.7	No Action
9982	Tree	627.3	641.0	-13.7	668.6	-41.3	683.5	-56.2	707.9	-80.6	721.0	-93.7	683.5	-56.2	No Action
9987	Tree	626.5	638.8	-12.3	666.0	-39.4	680.4	-53.8	704.3	-77.8	717.6	-91.1	680.4	-53.8	No Action
9988	Tree	625.4	636.7	-11.4	663.3	-38.0	677.2	-51.9	700.8	-75.4	714.2	-88.9	677.2	-51.9	No Action
10179	Tree	601.3	608.0	-6.7	627.4	-26.1	635.0	-33.7	-	-	668.3	-67.1	635.0	-33.7	No Action
10326	Light Pole	634.1	646.4	-12.3	675.5	-41.4	691.5	-57.4	717.0	-82.9	729.7	-95.6	691.5	-57.4	No Action
10327	Light Pole	633.9	647.0	-13.1	676.2	-42.3	692.4	-58.5	-	-	730.7	-96.8	692.4	-58.5	No Action
10390	Tree	615.0	626.8	-11.9	651.0	-36.0	662.7	-47.7	-	-	698.4	-83.5	662.7	-47.7	No Action
10392	Tree	628.4	642.1	-13.7	670.0	-41.6	685.1	-56.7	709.7	-81.3	722.8	-94.4	685.1	-56.7	No Action
10397	Tree	635.1	647.7	-12.6	677.1	-42.0	693.4	-58.3	719.1	-84.0	731.8	-96.7	693.4	-58.3	No Action
10607	Service Road	560.0	575.9	-15.9	665.7	-105.7	-	-	-	-	-	-	-	-	No Action
10608	Service Road	560.0	575.4	-15.4	622.1	-62.1	-	-	-	-	-	-	-	-	No Action
10609	Service Road	560.0	574.9	-14.9	585.9	-25.9	586.2	-26.2	-	-	-	-	-	-	No Action
10610	Service Road	560.0	574.6	-14.6	585.6	-25.6	585.9	-25.9	-	-	615.0	-55.0	-	-	No Action
10611	Service Road	560.0	574.5	-14.5	585.5	-25.5	585.7	-25.7	-	-	614.8	-54.8	585.7	-25.7	No Action
10612	Service Road	560.0	573.9	-13.9	584.7	-24.7	584.8	-24.8	596.1	-36.1	613.9	-53.9	584.8	-24.8	No Action
10613	Service Road	560.0	575.9	-15.9	587.2	-27.2	587.7	-27.7	599.4	-39.4	617.0	-57.0	587.7	-27.7	No Action
10614	Service Road	565.6	578.7	-13.1	590.8	-25.2	591.9	-26.4	604.1	-38.5	621.6	-56.0	591.9	-26.4	No Action
10615	Service Road	570.0	579.3	-9.3	591.5	-21.5	592.9	-22.9	-	-	622.6	-52.6	592.9	-22.9	No Action
10616	Service Road	570.0	579.5	-9.5	591.7	-21.7	593.0	-23.0	-	-	622.7	-52.7	-	-	No Action
10617	Service Road	570.0	579.7	-9.7	592.0	-22.0	593.4	-23.4	-	-	-	-	-	-	No Action
10618	Service Road	571.2	579.9	-8.7	616.8	-45.5	-	-	-	-	-	-	-	-	No Action
10619	Service Road	571.7	580.4	-8.7	662.0	-90.3	-	-	-	-	-	-	-	-	No Action
10620	Service Road	555.3	571.6	-16.3	581.9	-26.6	581.5	-26.2	592.3	-36.9	610.2	-54.9	581.5	-26.2	No Action
10621	Service Road	552.9	569.9	-17.0	579.8	-26.8	579.0	-26.1	-	-	607.5	-54.6	579.0	-26.1	No Action
10622	Service Road	552.6	569.7	-17.1	579.4	-26.8	578.6	-26.0	-	-	607.1	-54.5	-	-	No Action
10623	Service Road	552.1	569.3	-17.2	579.0	-26.9	578.1	-26.0	-	-	-	-	-	-	No Action
10624	Service Road	550.0	566.8	-16.8	632.3	-82.3	574.4	-24.4	-	-	-	-	-	-	No Action
10625	Service Road	550.0	564.3	-14.3	675.3	-125.3	-	-	-	-	-	-	-	-	No Action
10632	Service Road	550.0	556.1	-6.1	645.0	-95.0	558.6	-8.6	-	-	-	-	-	-	No Action
10633	Service Road	549.4	554.1	-4.7	683.8	-134.4	-	-	-	-	-	-	-	-	No Action
10638	Service Road	550.6	561.2	-10.6	568.9	-18.2	566.2	-15.6	574.9	-24.3	593.6	-43.0	566.2	-15.6	No Action
10639	Service Road	550.0	560.3	-10.3	567.7	-17.7	564.8	-14.8	-	-	592.1	-42.1	564.8	-14.8	No Action
10641	Service Road	550.0	559.9	-9.9	574.1	-24.1	564.3	-14.3	-	-	591.6	-41.6	-	-	No Action
10642	Service Road	550.0	560.0	-10.0	573.1	-23.1	564.4	-14.4	-	-	591.7	-41.7	564.4	-14.4	No Action
10904	Interstate	574.8	577.0	-2.1	664.8	-90.0	-	-	-	-	-	-	-	-	No Action
10905	Interstate	571.3	574.9	-3.6	666.5	-95.2	-	-	-	-	-	-	-	-	No Action
10906	Interstate	575.1	579.4	-4.3	662.9	-87.8	-	-	-	-	-	-	-	-	No Action
10907	Interstate	561.4	580.8	-19.4	615.7	-54.3	595.0	-33.6	-	-	-	-	-	-	No Action
10908	Interstate	569.8	583.1	-13.2	613.0	-43.2	598.3	-28.5	-	-	-	-	-	-	No Action
10909	Interstate	577.0	584.2	-7.2	597.7	-20.7	600.1	-23.1	-	-	-	-	-	-	No Action
10910	Interstate	575.1	582.2	-7.2	595.2	-20.1	597.1	-22.0	-	-	-	-	-	-	No Action
10911	Interstate	577.0	584.3	-7.3	597.8	-20.8	600.2	-23.2	-	-	630.5	-53.5	-	-	No Action
10912	Interstate	577.0	586.4	-9.4	600.4	-23.4	603.2	-26.2	-	-	633.9	-56.9	-	-	No Action
10913	Interstate	577.0	585.3	-8.3	599.0	-22.0	601.7	-24.7	-	-	632.1	-55.1	601.7	-24.7	No Action
10914	Interstate	572.2	587.6	-15.4	601.9	-29.6	605.0	-32.7	-	-	635.8	-63.5	605.0	-32.7	No Action
10915	Interstate	567.0	590.5	-23.5	605.6	-38.6	609.3	-42.3	623.8	-56.8	640.5	-73.5	609.3	-42.3	No Action
10916	Interstate	571.0	578.4	-7.4	618.5	-47.5	591.5	-20.5	-	-	-	-	-	-	No Action
10917	Interstate	561.7	580.2	-18.5	592.6	-30.9	594.1	-32.4	-	-	-	-	-	-	No Action
10918	Interstate	577.0	582.3	-5.3	595.2	-18.2	597.1	-20.1	-	-	627.2	-50.2	-	-	No Action
10919	Interstate	577.0	583.0	-6.0	596.1	-19.1	598.2	-21.2	-	-	628.4	-51.4	598.2	-21.2	No Action
10920	Interstate	577.0	584.0	-7.0	597.3	-20.3	599.7	-22.7	612.9	-35.9	630.0	-53.0	599.7	-22.7	No Action
10921	Interstate	567.0	592.8	-25.8	608.4	-41.4	612.7	-45.7	627.6	-60.6	644.1	-77.1	612.7	-45.7	No Action
10922	Interstate	570.5	600.3	-29.8	617.7	-47.2	623.6	-53.1	640.0	-69.5	656.0	-85.5	623.6	-53.1	No Action
10923	Interstate	573.3	603.0	-29.6	621.1	-47.8	627.6	-54.3	644.5	-71.2	660.3	-87.0	627.6	-54.3	No Action
10924	Interstate	577.0	612.1	-35.1	632.5	-55.5	641.0	-64.0	659.7	-82.7	674.9	-97.9	641.0	-64.0	No Action
10925	Interstate	577.0	615.0	-38.0	636.1	-59.1	645.3	-68.3	664.5	-87.5	679.5	-102.5	645.3	-68.3	No Action
10926	Interstate	577.0	624.9	-47.9	648.5	-71.5	659.8	-82.8	-	-	695.3	-118.3	659.8	-82.8	No Action
10927	Interstate	573.0	627.7	-54.7	652.1	-79.1	664.0	-91.0	-	-	699.8	-126.8	664.0	-91.0	No Action
10928	Interstate	577.0	619.4	-42.4	641.7	-64.7	651.8	-74.8	-	-	686.6	-109.6	-	-	No Action
10929	Interstate	578.4	618.8	-40.4	640.9	-62.5	650.8	-72.5	-	-	-	-	-	-	No Action
10930	Interstate	577.0	617.4	-40.4	639.1	-62.1	-	-	-	-	-	-	-	-	No Action
10931	Interstate	577.0	-	-	639.4	-62.4	-	-	-	-	-	-	-	-	No Action
10932	Interstate	580.6	616.0	-35.4	637.4	-56.8	646.8	-66.2	-	-	-	-	-	-	No Action
10933	Interstate	579.6	615.5	-35.9	636.8	-57.2	646.0	-66.4	-	-	680.3	-100.7	-	-	No Action
10934	Interstate	577.0	614.8	-37.8	635.9	-58.9	645.0	-68.0	-	-	679.2	-102.2	645.0	-68.0	No Action
10935	Interstate	585.0	625.1	-40.1	648.8	-63.8	-	-	-	-	-	-	-	-	No Action
10936	Interstate	587.0	-	-	647.6	-60.6	-	-	-	-	-	-	-	-	No Action
10937	Interstate	583.2	-	-	642.3	-59.0	-	-	-	-	-	-	-	-	No Action
10938	Interstate	577.0	619.1	-42.1	641.3	-64.3	-	-	-	-	-	-	-	-	No Action
10939	Interstate	588.6	-	-	649.8	-61.2	-	-	-	-	-	-	-	-	No Action
11006	Interstate	587.0	623.7	-36.7	647.1	-60.1	658.1	-71.1	679.1	-92.1	693.5	-106.5	658.1	-71.1	No Action
11007	Road	555.0	567.0	-12.0	673.1	-118.1	-	-	-	-	-	-	-	-	No Action
11008	Road	558.2	569.4	-11.2	629.3	-71.1	578.2	-20.0	-	-	-	-	-	-	No Action

Runway 6 Inner Approach (Existing)

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-6-24(4) - 6-24 Inner P77 (4)
LAYOUT: 6 Inner (3)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:41 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 6 Obstruction Tables Inner Portion (Existing/Future)

SCALE	AS NOTED
JOB NO.	20042701.00
DATE	2/2023

Runway 6 P77 Approach (Existing)

Runway 6 Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Surface Elevation (MSL)	TERPS Penetration/ Clearance (ft)	Disposition
6525	Tree	717.4	720.5	-3.2	768.1	-50.8	800.5	-83.1	-	-	848.1	-130.7	800.5	-83.1	No Action
6526	Tree	717.1	720.4	-3.3	767.9	-50.8	800.2	-83.1	-	-	847.8	-130.7	800.2	-83.1	No Action
6527	Tree	712.5	720.0	-7.5	767.5	-55.0	-	-	-	-	-	-	-	-	No Action
6528	Tree	717.7	719.8	-2.0	767.2	-49.5	799.4	-81.6	-	-	846.9	-129.2	799.4	-81.6	No Action
6529	Tree	719.0	719.6	-0.6	767.0	-48.0	799.2	-80.2	839.0	-120.0	846.7	-127.7	799.2	-80.2	No Action
6530	Tree	725.1	719.5	5.6	766.9	-41.8	799.0	-73.9	838.8	-113.7	846.5	-121.4	799.0	-73.9	To Be Studied
6531	Tree	728.3	719.3	8.9	766.6	-38.4	798.7	-70.4	-	-	846.2	-117.9	798.7	-70.4	To Be Studied
6532	Tree	710.5	719.0	-8.5	766.2	-55.7	798.2	-87.7	-	-	845.7	-135.2	798.2	-87.7	No Action
6533	Tree	713.6	717.8	-4.2	764.7	-51.1	796.4	-82.8	-	-	843.7	-130.1	796.4	-82.8	No Action
6534	Tree	726.7	717.7	9.0	764.7	-37.9	796.4	-69.7	-	-	843.7	-116.9	796.4	-69.7	To Be Studied
6535	Tree	710.3	717.4	-7.0	764.2	-53.9	795.8	-85.5	835.2	-124.9	843.1	-132.7	795.8	-85.5	No Action
6536	Tree	714.8	717.1	-2.3	763.8	-49.1	795.4	-80.6	834.7	-119.9	842.6	-127.8	795.4	-80.6	No Action
6537	Tree	728.6	716.7	11.9	763.4	-34.8	794.9	-66.3	-	-	842.0	-113.4	794.9	-66.3	To Be Studied
6538	Tree	718.6	716.6	2.0	763.3	-44.7	794.8	-76.1	-	-	841.9	-123.3	794.8	-76.1	To Be Studied
6539	Tree	708.2	716.5	-8.4	763.2	-55.0	794.6	-86.5	833.8	-125.7	841.8	-133.6	794.6	-86.5	No Action
6540	Tree	723.2	716.5	6.6	763.1	-40.0	794.6	-71.4	-	-	841.7	-118.5	794.6	-71.4	To Be Studied
6541	Tree	709.6	716.5	-6.9	763.1	-53.5	794.6	-85.0	833.8	-124.2	841.7	-132.1	794.6	-85.0	No Action
6542	Tree	712.5	716.3	-3.8	762.9	-50.4	794.3	-81.8	-	-	841.4	-128.9	794.3	-81.8	No Action
6543	Tree	730.0	716.2	13.8	762.7	-32.7	794.1	-64.1	-	-	841.2	-111.2	794.1	-64.1	To Be Studied
6544	Tree	706.9	715.7	-8.9	762.1	-55.3	793.4	-86.6	832.5	-125.6	840.4	-133.6	793.4	-86.6	No Action
6545	Tree	712.1	715.5	-3.4	761.9	-49.8	793.1	-81.0	-	-	840.1	-128.0	793.1	-81.0	No Action
6546	Tree	713.2	715.4	-2.1	761.7	-48.5	792.9	-79.7	-	-	839.9	-126.6	792.9	-79.7	No Action
6547	Tree	711.0	715.2	-4.2	761.5	-50.5	792.7	-81.7	-	-	839.7	-128.6	792.7	-81.7	No Action
6548	Tree	713.2	715.0	-1.7	761.2	-48.0	792.3	-79.1	-	-	839.2	-126.0	792.3	-79.1	No Action
6549	Tree	714.9	714.8	0.1	761.0	-46.1	792.1	-77.2	-	-	839.0	-124.1	792.1	-77.2	To Be Studied
6550	Tree	708.7	714.6	-5.9	760.7	-52.0	791.7	-83.0	-	-	838.6	-129.9	791.7	-83.0	No Action
6551	Tree	714.0	714.2	-0.3	760.2	-46.3	791.2	-77.2	-	-	838.0	-124.1	791.2	-77.2	No Action
6552	Tree	715.4	713.9	1.6	759.8	-44.4	790.7	-75.3	-	-	837.5	-122.0	790.7	-75.3	To Be Studied
6553	Tree	716.7	713.0	3.7	758.7	-42.0	789.4	-72.7	-	-	836.1	-119.4	789.4	-72.7	To Be Studied
6554	Tree	712.7	712.5	0.2	758.1	-45.4	788.6	-75.9	-	-	835.2	-122.5	788.6	-75.9	To Be Studied
6555	Tree	718.6	712.4	6.2	758.0	-39.4	788.5	-70.0	-	-	835.1	-116.6	788.5	-70.0	To Be Studied
6556	Tree	720.0	712.1	7.9	757.6	-37.6	788.1	-68.1	-	-	834.6	-114.7	788.1	-68.1	To Be Studied
6557	Tree	705.1	711.9	-6.8	757.3	-52.2	787.7	-82.6	-	-	834.3	-129.2	787.7	-82.6	No Action
6558	Tree	705.8	711.6	-5.8	757.0	-51.2	787.4	-81.6	825.7	-119.8	833.9	-128.1	787.4	-81.6	No Action
6559	Tree	717.3	711.5	5.9	756.8	-39.5	787.1	-69.8	-	-	833.6	-116.3	787.1	-69.8	To Be Studied
6560	Tree	712.0	711.3	0.7	756.5	-44.6	786.8	-74.9	-	-	833.3	-121.3	786.8	-74.9	To Be Studied
6561	Tree	709.7	710.9	-1.2	756.1	-46.4	786.3	-76.6	-	-	832.7	-123.1	786.3	-76.6	No Action
6562	Tree	707.0	710.8	-3.8	756.0	-49.0	786.2	-79.2	824.3	-117.3	832.6	-125.6	786.2	-79.2	No Action
6563	Tree	706.5	710.8	-4.2	755.9	-49.4	786.1	-79.6	-	-	832.5	-126.0	786.1	-79.6	No Action
6564	Tree	705.0	709.8	-4.7	754.7	-49.7	784.7	-79.6	822.6	-117.5	831.0	-125.9	784.7	-79.6	No Action
6565	Tree	709.0	708.9	0.1	753.6	-44.6	783.4	-74.3	821.1	-112.0	829.5	-120.5	783.4	-74.3	To Be Studied
6566	Tree	696.2	705.7	-9.5	749.6	-53.4	778.7	-82.4	-	-	824.4	-128.2	778.7	-82.4	No Action
6567	Tree	698.1	702.6	-4.5	745.7	-47.6	774.1	-76.0	810.5	-112.4	819.4	-121.3	774.1	-76.0	No Action
6568	Tree	707.4	701.2	6.2	744.0	-36.6	772.1	-64.7	808.3	-100.9	817.3	-109.9	772.1	-64.7	To Be Studied
6569	Tree	698.1	701.1	-2.9	743.8	-45.7	771.9	-73.7	808.0	-109.9	817.0	-118.9	771.9	-73.7	No Action
6570	Tree	710.4	700.4	10.0	742.9	-32.6	770.8	-60.5	806.9	-96.5	815.9	-105.5	770.8	-60.5	To Be Studied
6571	Tree	694.4	698.2	-3.8	740.2	-45.9	767.7	-73.3	803.3	-108.9	812.5	-118.1	767.7	-73.3	No Action
6572	Tree	689.9	697.9	-8.0	739.8	-49.9	767.2	-77.3	802.7	-112.8	811.9	-122.0	767.2	-77.3	No Action
6573	Tree	692.9	696.7	-3.9	738.4	-45.5	765.5	-72.6	800.8	-107.9	810.1	-117.2	765.5	-72.6	No Action
6574	Tree	692.0	696.5	-4.6	738.1	-46.1	765.2	-73.2	800.4	-108.5	809.7	-117.8	765.2	-73.2	No Action
6575	Tree	695.6	695.1	0.5	736.3	-40.7	763.1	-67.4	798.1	-102.4	807.5	-111.8	763.1	-67.4	To Be Studied
6576	Tree	702.9	694.7	8.2	735.8	-32.9	762.5	-59.6	797.4	-94.5	806.8	-103.9	762.5	-59.6	To Be Studied
6577	Tree	692.1	693.0	-0.9	733.7	-41.7	760.0	-67.9	-	-	804.1	-112.1	760.0	-67.9	No Action
6578	Tree	689.6	692.8	-3.1	733.4	-43.8	759.7	-70.0	-	-	803.8	-114.1	759.7	-70.0	No Action
6579	Tree	705.4	692.0	13.4	732.5	-27.1	758.5	-53.1	792.9	-87.5	802.5	-97.1	758.5	-53.1	To Be Studied
6580	Tree	683.3	691.9	-8.6	732.3	-49.0	758.4	-75.1	-	-	802.4	-119.1	758.4	-75.1	No Action
6581	Tree	687.0	691.8	-4.8	732.2	-45.2	758.2	-71.2	792.5	-105.5	802.1	-115.2	758.2	-71.2	No Action
6582	Tree	705.3	691.6	13.6	732.0	-26.7	758.0	-52.7	792.3	-87.0	802.0	-96.7	758.0	-52.7	To Be Studied
6583	Tree	683.5	691.6	-8.1	731.9	-48.4	757.9	-74.4	-	-	801.9	-118.4	757.9	-74.4	No Action
6584	Tree	685.2	691.3	-6.1	731.6	-46.4	757.5	-72.3	791.7	-106.6	801.4	-116.3	757.5	-72.3	No Action
6585	Tree	680.7	690.6	-9.9	730.7	-50.0	756.5	-75.8	790.6	-109.9	800.3	-119.6	756.5	-75.8	No Action
6586	Utility Pole	685.1	-	-	730.7	-45.6	-	-	-	-	-	-	-	-	No Action
6587	Utility Pole	685.2	690.2	-5.0	730.2	-45.0	755.9	-70.7	789.9	-104.7	799.6	-114.5	755.9	-70.7	No Action
6588	Tree	693.5	688.4	5.1	728.0	-34.5	753.2	-59.7	786.9	-93.4	796.8	-103.3	753.2	-59.7	To Be Studied
6589	Utility Pole	689.2	688.2	1.0	727.8	-38.6	753.0	-63.8	786.7	-97.4	796.5	-107.3	753.0	-63.8	To Be Studied
6591	Utility Pole	687.7	687.8	-0.1	727.2	-39.5	-	-	-	-	795.8	-108.2	-	-	No Action
6593	Tree	692.9	687.4	5.5	726.7	-33.8	751.8	-58.8	785.2	-92.3	795.2	-102.3	751.8	-58.8	To Be Studied
6595	Tree	697.6	687.3	10.3	726.6	-29.0	751.6	-54.0	785.1	-87.5	795.0	-97.4	751.6	-54.0	To Be Studied
6598	Tree	697.8	686.8	11.0	726.0	-28.2	750.9	-53.1	784.3	-86.5	794.3	-96.5	750.9	-53.1	To Be Studied
6600	Utility Pole	688.8	686.4	2.4	725.4	-36.6	750.2	-61.4	-	-	793.5	-104.7	750.2	-61.4	To Be Studied
6601	Utility Pole	695.6	686.3	9.2	725.4	-29.8	750.2	-54.6	-	-	793.5	-97.9	750.2	-54.6	To Be Studied
6602	Tree	677.2	686.3	-9.1	725.3	-48.1	750.1	-72.9	783.3	-106.2	793.4	-116.2	750.1	-72.9	No Action
6604	Building	692.5	685.3	7.2	724.1	-31.6	748.7	-56.2	781.8	-89.3	791.9	-99.4	748.7	-56.2	To Be Studied
6605	Utility Pole	675.8	685.3	-9.5	724.1	-48.3	-	-	-	-	791.8	-116.0	-	-	No Action
6607	Utility Pole	695.8	684.7	11.0	723.4	-27.6	747.9	-52.1	-	-	790.9	-95.2	747.9	-52.1	To Be Studied
6608	Tree	703.3	684.7	18.6	723.3	-20.0	747.8	-44.5	780.7	-77.4	790.9	-87.5	747.8	-44.5	To Be Studied
6610	Tree	711.9	684.5	27.4	723.1	-11.2	747.5	-35.6	780.4	-68.5	790.6	-78.7	747.5	-35.6	To Be Studied
6611	Utility Pole	688.2	684.5	3.7	723.1	-34.9	747.5	-59.3	-	-	790.5	-102.4	747.5	-59.3	To Be Studied
6617	Tree	712.7	683.9	28.8	722.3	-9.7	746.6	-34.0	779.4	-66.8	789.6	-76.9	746.6	-34.0	To Be Studied
6618	Building	679.0	683.6	-4.6	722.0	-43.0	746.2	-67.2	779.0	-100.0	789.2	-110.2	746.2	-67.2	No Action
6621	Utility Pole	692.6	683.3	9.2	721.6	-29.0	745.7	-53.2	-	-	788.7	-96.1	745.7	-53.2	To Be Studied
6622	Tree	675.5	683.3	-7.8	721.6	-46.1	745.7	-70.3	778.4	-102.9	788.6	-113.2	745.7	-70.3	No Action
6623	Utility Pole	687.2	683.3	4.0	721.5	-34.3	745.7	-58.4	-	-	788.6	-101.3	745.7	-58.4	To Be Studied
6624	Tree	694.8	683.2	11.6	721.5	-26.7	745.6	-50.8	778.3	-83.5	788.5	-93.7	745.6	-50.8	To Be Studied
6625	Utility Pole	684.5	683.0	1.5	721.2	-36.7	745.3	-60.8	-	-	788.1	-103.6	745.3	-60.8	To Be Studied
6626	Steeple	709.1	683.0	26.1	721.2	-12.1	745.3	-36.2	777.9	-68.8	788.1	-79.1	745.3	-36.2	To Be Studied
6627	Utility Pole	686.9	681.6	5.3	719.4	-32.6	743.2	-56.3	-	-	785.9	-99.0	743.2	-56.3	To Be Studied
6628	Utility Pole	671.7	681.3	-9.6	719.1	-47.4	742.8	-71.1	-	-	785.4	-113.7	742.8	-71.1	No Action
6630	Tree	698.6	681.0	17.6	718.8	-20.2	742.4	-43.8	774.6	-76.1	785.0	-86.4	742.4	-43.8	To Be Studied
6631	Tree	702.2	680.7	21.5	718.3	-16.1	741.9	-39.7	774.1	-71.9	784.5	-82.3	741.9	-39.7	To Be Studied
6632	Utility Pole	673.0	680.6	-7.7	718.2	-45.3	741.8	-68.8	-	-	784.4	-111.4	741.8	-68.8	No Action
6634	Tree	702.4	680.4	22.0	718.0	-15.6	741.5	-39.1	773.6	-71.2	784.0	-81.6	741.5	-39.1	To Be Studied
6635	Tree	699.8	680.2	19.7	717.7	-17.8	741.1	-41.3	773.2	-73.4	783.6	-83.8	741.1	-41.3	To Be Studied
6636	Tree	671.1	679.2	-8.1	716.5	-45.3	739.8	-68.6	771.6	-100.5	782.1	-111.0	739.8	-68.6	No Action
6637	Utility Pole	676.7	679.0	-2.3	716.2	-39.5	739.4	-62.7	-	-	781.7	-105.1	739.4	-62.7	No Action
6638	Steeple	691.1	678.8	12.3	715.9	-24.8	739.1	-48.0	770.9	-79.8	781.4	-90.3	739.1	-48.0	To Be Studied
6639	Tree	689.9	678.7	11.3	715.8	-25.8	738.9	-49.0	770.7	-80.7	781.2	-91.3	738.9	-49.0	To Be Studied
6643	Tree	689.9	678.0	11.9	715.0	-25.1	738.0	-48.1	769.6	-79.7	780.2	-90.3	738.0	-48.1	To Be Studied
6644	Tree	718.2	677.9	40.3	714.9	3.3	737.9	-19.6	-	-	780.1	-61.9	737.9	-19.6	To Be Studied
6647	Tree	689.7	677.7	12.0	714.6	-24.9	737.5	-47.8	769.1	-79.4	779.7	-90.0	737.5	-47.8	To Be Studied
6650	Tree	685.4	677.4	7.9	714.2	-28.9	737.1	-51.7	768.6	-83.3	779.3	-93.9	737.1	-51.7	To Be Studied
6653	Tree	683.2	677.3	5.9	714.0	-30.9	736.9	-53.7	768.4	-85.2	779.0	-95.8	736.9	-53.7	To Be Studied
6657	Tree	685.5	676.6	8.9	713.2	-27.7	735.8	-50.3	767.2	-81.7	777.9	-92.4	735.8	-50.3	To Be Studied
6658	Tree	685.6	676.5	9.1	713.1	-27.5	735.7	-50.1	767.1	-81.5	777.8	-92.2	735.7	-50.1	To Be Studied
6660	Utility Pole	666.7	676.1	-9.4	712.5	-45.8	735.1	-68.4	-	-	777.1	-110.4	735.1	-68.4	No Action
6661	Tree	680.6	676.0	4.6	712.4	-31.8	735.0	-54.4	766.2	-85.6	777.0	-96.3	735.0	-54.4	To Be Studied
6665	Tree	672.7	675.3	-2.6	711.5	-38.8	733.9	-61.2	765.0	-92.3	775.8	-103.1	733.9	-61.2	No Action
6668	Utility Pole	666.4	673.3	-6.9	709.1	-42.7	731.0	-64.6	-	-	772.7	-106.3	-	-	No Action
6669	Utility Pole	670.5	671.8	-1.3	707.2	-36.7	-	-	-	-	770.3	-99.8	-	-	No Action
6670	Utility Pole	663.9	670.2	-6.3	705.1	-41.2	-	-	-	-	-	-	-	-	No Action
6671	Utility Pole	661.1	668.2	-7.2	702.7	-41.7	-	-	-	-	-	-	-	-	No Action
6672	Utility Pole	667.9	665.4	2.4	699.3	-31.4	-	-	-	-	-	-	-	-	To Be Studied
6673	Tree	655.4	665.2	-9.8	698.9	-43.5	719.1	-63.7	-	-	759.7	-104.3	719.1	-63.7	No Action
6674	Utility Pole	661.4	-	-	698.6	-37.2	-	-	-	-	-	-	-	-	No Action
6675	Utility Pole	667.0	664.3	2.7	697.8	-30.8	-	-	-	-	-	-	-	-	To Be Studied
6676	Tree	671.4	664.0	7.4	697.4	-26.0	-	-	-	-	-	-	-	-	To Be Studied
6677	Tree	665.9	663.6	2.2	697.0	-31.1	-	-	-	-	-	-	-	-	To Be Studied
6678	Tree	668.9	663.5	5.4	696.8	-27.9	-	-	-	-	-	-	-	-	To Be Studied
6679	Utility Pole	664.8	-	-	696.6	-31.8	-	-	-	-	-	-	-	-	No Action
6680	Tree	663.6	663.1	0.5	696.3	-32.8	-	-	-	-	-	-	-	-	To Be Studied
6681	Tree	666.9	663.1	3.9	696.3	-29.3	-	-	-	-	-	-	-	-	To Be Studied
6682	Tree	661.9	662.7	-0.7	695.8	-33.8	-	-	-	-	-	-	-	-	No Action
6683	Building	655.1	661.4	-6.3	694.2	-39.1	-	-	-	-	-	-	-	-	No Action
6684	Utility Pole	662.3	-	-	694.0	-31.7	-	-	-	-	-	-	-	-	No Action
6685	Tree	667.1	661.2	5.9	693.9	-26.9	-	-	-	-	-	-	-	-	To Be Studied
6686	Tree	657.3	660.9	-3.6	693.5	-36.2	-	-	-	-	-	-	-	-	No Action
6687	Cell Tower	655.9	660.4	-4.5	692.9	-37.0	712.0	-56.1	-	-	752.0	-96.1	712.0	-56.1	No Action
6688	Light Pole	650.0	659.3	-9.3	691.6	-41.6	-	-	-	-	-	-	-	-	No Action
6689	Light Pole	650.3	656.6	-6.3	688.2	-37.9	-	-	-	-	-	-	-	-	No Action
6690	Tree	650.1	656.4	-6.3	688.0	-37.9	706.2	-56.1	-	-	745.7	-95.6	-	-	No Action
6691	Light Pole	648.8	656.0	-7.2	687.5	-38.7	-	-	-	-	-	-	-	-	No Action
6694	Tree	648.4	655.6	-7.2	687.0	-38.6	-	-	-	-	-	-	-	-	No Action
6695	Tree	648.5	655.5	-7.0	686.8	-38.3	-	-	-	-	-	-	-	-	No Action
6696	Tree	700.3	-	-	686.3	14.1	-	-	-	-	-	-	-	-	To Be Studied
6697	Tree	667.9	655.0	12.9	686.2	-18.3	704.2	-36.3	-	-	743.5	-75.6	704.2	-36.3	To Be Studied
6699	Building	703.5	654.9	48.6	686.0	17.5	703.9	-0.4	-	-	743.2	-39.7	703.9	-0.4	To Be Studied
6700	Tree	656.5	654.7	1.9	685.7	-29.2	-	-	-	-	-	-	-	-	To Be Studied
6704	Tree	663.4	653.9	9.6	684.7	-21.3	702.4	-39.0	-	-	741.6	-78.2	-	-	To Be Studied
6713	Tree	666.7	652.7	14.0	683.3	-16.6	700.7	-34.0	727.4	-60.7	739.7	-73.1	700.7	-34.0	To Be Studied
6717	Tree	659.0	652.5	6.5	683.1	-24.1	-	-	-	-	-	-	-	-	To Be Studied
6718	Tree	661.4	652.5	8.9	683.1	-21.7	700.5	-39.1	727.1	-65.7	739.5	-78.1	700.5	-39.1	To Be Studied
6719	Tree	667.8	652.5	15.3	683.0	-15.2	700.4	-32.6	-	-	739.4	-71.6	700.4	-32.6	To Be Studied
6722	Tree	689.0	652.3	36.6	682.9	6.1	700.2	-11.2	-	-	739.2	-50.2	700.2	-11.2	To Be Studied
6723	Tree	668.1	652.3	15.8	682.8	-14.7	-	-	-	-	739.2	-71.1	-	-	To Be Studied
6724	Tree	657.1	652.3	4.8	682.7	-25.7	700.1	-43.0	726.7	-69.6	739.0	-82.0	700.1	-43.0	To Be Studied
6727	Tree	661.3	652.0	9.3	682.4	-21.1	699.6	-38.3	-	-	738.6	-77.3	699.6	-38.3	To Be Studied
6731	Tree	646.1	651.8	-5.6	682.1	-36.0	-	-	-	-	738.3	-92.1	-	-	No Action
6732	Tree	649.2	651.8	-2.5	682.1	-32.9	699.3	-50.1	-	-	738.2	-89.0	-	-	No Action
6733	Tree	646.2	651.5	-5.3	681.8	-35.6	699.0	-52.8	-	-	737.9	-91.6	699.0	-52.8	No Action
6734	Tree	644.5	651.4	-6.8	681.6	-37.1	-	-	-	-	-	-	-	-	No Action
6735	Tree	655.0	651.0	3.9	681.2	-26.3	698.3	-43.3	-	-	737.1	-82.1	698.3	-43.3	To Be Studied
6736	Tree	642.7	651.0	-8.3	681.2	-38.5	698.3	-55.5	-	-	737.1	-94.4	698.3	-55.5	No Action
6737	Tree	643.4	651.0	-7.6	681.2	-37.7	-	-	-	-	737.0	-93.6	-	-	No Action
6738	Tree	643.3	650.9	-7.6	681.0	-37.7	-	-	-	-	-	-	-	-	No Action
6739	Tree	692.0	650.8	41.1	681.0	11.0	698.0	-6.0	-	-	736.8	-44.8	698.0	-6.0	To Be Studied
9915	Utility Pole	638.8	655.7	-16.9	687.1	-48.3	705.1	-66.4	732.4	-93.7	744.5	-105.8	705.1	-66.4	No Action
9934	Tree	637.5	650.9	-13.4	681.0	-43.6	698.1	-60.6	-	-	736.9	-99.4	698.1	-60.6	No Action
9943	Tree	637.2	651.2	-14.0	681.4	-44.2	698.5	-61.3	724.9	-87.7	737.3	-100.1	698.5	-61.3	No Action
9944	Tree	639.4	652.2	-12.8	682.7	-43.3	700.0	-60.6	726.6	-87.2	739.0	-99.6	700.0	-60.6	No Action
9949	Tree	637.5	652.0	-14.5	682.4	-45.0	699.7	-62.2	726.2	-88.8	738.6	-101.2	699.7	-62.2	No Action
9957	Tree	657.1	652.3	4.8	682.7	-25.7	700.1	-43.0	726.7	-69.6	739.0	-82.0	700.1	-43.0	To Be Studied

Runway 24 Inner Approach (Existing)

Runway 6 Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
11009	Road	562.0	571.5	-9.5	581.8	-19.8	581.4	-19.4	-	-	-	-	-	-	No Action
11010	Road	562.4	572.0	-9.6	582.3	-19.9	582.0	-19.6	-	-	610.8	-48.4	-	-	No Action
11011	Road	562.8	572.3	-9.5	582.7	-19.9	582.4	-19.7	-	-	611.3	-48.5	582.4	-19.7	No Action
11012	Road	560.3	575.8	-15.5	587.2	-26.8	587.7	-27.4	-	-	617.0	-56.7	587.7	-27.4	No Action
11013	Road	557.8	576.6	-18.7	588.1	-30.2	588.8	-30.9	-	-	618.1	-60.3	-	-	No Action
11014	Road	556.3	578.2	-21.9	590.1	-33.8	591.2	-34.9	-	-	-	-	-	-	No Action
11015	Road	564.9	574.0	-9.2	584.9	-20.1	585.1	-20.2	596.3	-31.5	614.1	-49.3	585.1	-20.2	No Action
11016	Road	565.0	578.3	-13.3	590.2	-25.2	591.3	-26.3	603.4	-38.4	620.9	-55.9	591.3	-26.3	No Action
11017	Road	575.0	580.5	-5.5	593.0	-18.0	594.5	-19.5	607.1	-32.1	624.4	-49.4	594.5	-19.5	No Action
11018	Road	575.3	581.3	-6.0	594.0	-18.7	595.7	-20.5	-	-	625.7	-50.4	595.7	-20.5	No Action
11019	Road	576.4	581.4	-5.0	594.1	-17.7	595.9	-19.4	-	-	625.9	-49.4	-	-	No Action
11020	Road	578.8	581.6	-2.8	594.4	-15.6	596.2	-17.4	-	-	-	-	-	-	No Action
11021	Road	580.0	581.6	-1.7	614.7	-34.8	596.2	-16.3	-	-	-	-	-	-	No Action
11022	Road	581.5	582.1	-0.6	660.5	-79.0	-	-	-	-	-	-	-	-	No Action
11023	Road	576.7	597.6	-21.0	647.7	-71.0	-	-	-	-	-	-	-	-	No Action
11024	Road	575.0	596.9	-21.9	613.6	-38.6	-	-	-	-	-	-	-	-	No Action
11025	Road	575.0	595.3	-20.3	611.5	-36.5	616.3	-41.3	-	-	-	-	-	-	No Action
11026	Road	575.0	591.2	-16.2	606.4	-31.4	610.3	-35.3	-	-	641.5	-66.5	-	-	No Action
11027	Road	575.0	589.4	-14.4	604.2	-29.2	607.7	-32.7	-	-	638.7	-63.7	607.7	-32.7	No Action
11028	Road	555.0	584.3	-29.3	658.8	-103.8	-	-	-	-	-	-	-	-	No Action
11029	Road	565.0	587.5	-22.5	607.8	-42.8	604.8	-39.8	-	-	-	-	-	-	No Action
11030	Road	565.0	587.7	-22.7	602.0	-37.0	605.2	-40.2	-	-	-	-	-	-	No Action
11031	Road	565.0	590.4	-25.4	605.4	-40.4	609.2	-44.2	-	-	640.3	-75.3	-	-	No Action
11032	Road	565.0	591.6	-26.6	606.8	-41.8	610.8	-45.8	-	-	642.1	-77.1	610.8	-45.8	No Action
11033	Road	605.0	621.1	-16.1	643.8	-38.8	654.2	-49.2	674.7	-69.7	689.3	-84.3	654.2	-49.2	No Action
11034	Road	597.2	616.2	-19.0	637.7	-40.5	647.1	-49.9	666.7	-69.4	681.5	-84.3	647.1	-49.9	No Action
11035	Road	600.9	621.4	-20.5	644.1	-43.2	654.7	-53.8	-	-	689.7	-88.8	654.7	-53.8	No Action
11036	Road	602.5	622.0	-19.5	644.9	-42.4	655.6	-53.1	-	-	690.7	-88.2	-	-	No Action
11037	Road	575.0	599.3	-24.3	616.6	-41.6	622.3	-47.3	638.5	-63.5	654.5	-79.5	622.3	-47.3	No Action
11038	Road	608.8	625.8	-17.0	649.6	-40.8	661.2	-52.3	682.6	-73.7	696.8	-87.9	661.2	-52.3	No Action
11039	Road	581.0	601.1	-20.1	644.8	-63.8	-	-	-	-	-	-	-	-	No Action
12027	Interstate	576.0	630.1	-54.1	655.1	-79.1	667.6	-91.6	-	-	-	-	-	-	No Action
12028	Interstate	580.0	633.3	-53.3	659.0	-79.0	672.1	-92.1	-	-	-	-	-	-	No Action
12029	Interstate	577.0	632.3	-55.3	657.8	-80.8	670.7	-93.7	-	-	707.1	-130.1	-	-	No Action
12030	Interstate	605.2	640.8	-35.6	668.5	-63.2	-	-	-	-	-	-	-	-	No Action
12031	Interstate	598.7	637.6	-38.9	664.4	-65.7	-	-	-	-	-	-	-	-	No Action
12032	Interstate	598.6	638.7	-40.1	665.8	-67.1	680.1	-81.5	-	-	-	-	-	-	No Action
12033	Interstate	612.6	-	-	674.4	-61.8	-	-	-	-	-	-	-	-	No Action
12034	Interstate	612.0	-	-	679.9	-67.9	-	-	-	-	-	-	-	-	No Action
12035	Interstate	612.6	645.6	-33.0	674.4	-61.8	-	-	-	-	-	-	-	-	No Action
12036	Interstate	614.0	643.8	-29.8	672.1	-58.2	-	-	-	-	725.5	-111.5	-	-	No Action
12037	Interstate	614.0	643.7	-29.7	672.1	-58.1	687.5	-73.5	-	-	725.4	-111.4	-	-	No Action
12038	Interstate	599.2	638.8	-39.7	666.0	-66.8	680.3	-81.2	-	-	717.6	-118.4	-	-	No Action
12039	Interstate	613.4	643.3	-29.9	671.6	-58.2	687.0	-73.6	-	-	724.8	-111.4	687.0	-73.6	No Action
12040	Interstate	607.0	641.6	-34.5	669.4	-62.3	684.4	-77.3	-	-	722.0	-114.9	684.4	-77.3	No Action
12041	Road	575.0	-	-	659.1	-84.1	-	-	-	-	-	-	-	-	No Action
12042	Road	576.3	634.4	-58.1	660.4	-84.2	-	-	-	-	-	-	-	-	No Action
12043	Road	585.0	637.3	-52.3	664.0	-79.0	678.1	-93.1	-	-	715.2	-130.2	678.1	-93.1	No Action
12044	Road	585.0	636.3	-51.3	662.8	-77.8	676.6	-91.6	-	-	713.5	-128.5	-	-	No Action
12045	Road	585.0	636.2	-51.2	662.6	-77.6	676.4	-91.4	-	-	-	-	-	-	No Action
12051	Road	595.2	648.0	-52.8	677.4	-82.2	693.8	-98.6	-	-	732.2	-137.0	693.8	-98.6	No Action
12056	Road	612.8	646.6	-33.8	675.7	-62.9	691.8	-79.0	717.2	-104.4	730.0	-117.2	691.8	-79.0	No Action
12124	Road	614.6	642.2	-27.6	670.1	-55.6	685.2	-70.7	709.8	-95.3	722.9	-108.4	685.2	-70.7	No Action
12125	Road	613.2	637.4	-24.2	664.1	-50.9	678.2	-65.0	701.9	-88.7	715.3	-102.1	678.2	-65.0	No Action
12126	Road	608.6	631.5	-22.8	656.7	-48.1	669.5	-60.9	692.0	-83.4	705.8	-97.2	669.5	-60.9	No Action
12474	Interstate	591.6	-	-	658.3	-66.7	-	-	-	-	-	-	-	-	No Action
12477	Service Road	556.0	552.0	4.0	579.7	-23.8	552.6	3.3	-	-	-	-	552.6	3.3	To Be Studied
12478	Service Road	556.0	552.0	4.0	577.0	-21.0	552.7	3.3	-	-	578.9	-22.9	552.7	3.3	To Be Studied
12479	Service Road	556.1	552.2	4.0	572.3	-16.2	552.9	3.2	559.9	-3.8	579.2	-23.1	552.9	3.2	To Be Studied
12480	Service Road	556.5	552.6	3.8	558.1	-1.7	553.5	2.9	560.6	-4.1	579.9	-23.4	553.5	2.9	To Be Studied
12481	Service Road	554.6	550.6	4.0	624.2	-69.6	-	-	-	-	-	-	-	-	To Be Studied

Runway 24 P77 Approach (Existing)

Runway 24 Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
8331	Power Transmission Pylon	650.7	660.1	-9.3	696.9	-46.2	-	-	-	-	-	-	-	-	No Action
8332	Tree	661.3	666.1	-4.8	704.4	-43.1	865.4	-204.1	761.4	-100.1	773.8	-112.5	728.6	-67.3	No Action
8333	Power Transmission Pylon	659.5	667.8	-8.4	706.6	-47.1	869.7	-210.3	-	-	776.5	-117.1	731.2	-71.7	No Action
8334	Tree	670.3	671.3	-1.0	710.9	-40.6	878.3	-208.0	770.0	-99.7	782.0	-111.7	736.2	-66.0	No Action
8335	Tree	663.5	672.8	-9.2	712.7	-49.2	882.0	-218.5	772.4	-108.9	784.4	-120.8	738.4	-74.9	No Action
8336	Tree	666.0	674.2	-8.2	714.5	-48.5	885.6	-219.6	774.8	-108.8	786.7	-120.6	740.5	-74.5	No Action
8337	Tree	670.5	674.7	-4.2	715.1	-44.6	886.8	-216.3	775.6	-105.1	787.4	-116.9	741.2	-70.7	No Action
8338	Power Transmission Pylon	666.9	675.6	-8.7	716.3	-49.4	889.1	-222.2	777.1	-110.2	788.9	-122.0	742.6	-75.7	No Action
8339	Tree	670.1	676.5	-6.4	717.5	-47.4	891.5	-221.3	778.7	-108.6	790.4	-120.3	744.0	-73.8	No Action
8340	Tree	677.6	677.0	0.5	718.1	-40.5	892.7	-215.2	779.6	-102.0	791.2	-113.6	744.7	-67.1	To Be Studied
8341	Tree	667.9	677.8	-9.8	719.0	-51.1	894.6	-226.6	-	-	792.4	-124.5	745.8	-77.9	No Action
8342	Tree	671.2	679.0	-7.8	720.6	-49.4	897.7	-226.5	782.9	-111.7	794.4	-123.2	747.6	-76.4	No Action
8343	Tree	679.0	686.4	-7.4	729.8	-50.8	916.1	-237.1	-	-	806.2	-127.2	758.5	-79.5	No Action
8344	Tree	681.4	687.5	-6.1	731.2	-49.8	919.0	-237.6	-	-	808.0	-126.6	760.1	-78.7	No Action
8345	Tree	685.8	691.5	-5.8	736.2	-50.5	928.9	-243.2	803.7	-117.9	814.4	-128.6	766.0	-80.2	No Action
8346	Tree	687.8	694.4	-6.6	739.8	-52.0	936.1	-248.3	808.5	-120.7	819.0	-131.2	770.2	-82.4	No Action
8347	Tree	701.9	709.5	-7.7	758.7	-56.9	974.0	-272.1	-	-	843.1	-141.2	792.5	-90.6	No Action
8348	Tree	702.3	710.6	-8.3	760.1	-57.8	976.7	-274.3	-	-	844.9	-142.5	794.1	-91.7	No Action
8349	Tree	712.2	711.2	1.0	760.9	-48.7	978.2	-266.0	-	-	845.8	-133.6	795.0	-82.8	To Be Studied
8350	Tree	717.2	722.5	-5.2	774.9	-57.7	1006.3	-289.1	-	-	863.8	-146.6	811.5	-94.3	No Action
8351	Tree	716.3	725.2	-8.9	778.3	-62.1	1013.1	-296.8	859.8	-143.5	868.1	-151.8	815.5	-99.2	No Action
9825	Tree	717.9	729.3	-11.5	783.5	-65.6	1023.4	-305.6	-	-	874.7	-156.9	821.6	-103.7	No Action
9841	Pole	625.1	646.3	-21.2	679.7	-54.6	816.0	-190.9	728.4	-103.3	742.2	-117.1	699.6	-74.5	No Action
9855	Utility Pole	614.0	644.8	-30.8	677.8	-63.8	812.1	-198.1	725.8	-111.8	739.7	-125.7	697.3	-83.3	No Action
9856	Billboard	620.4	647.2	-26.9	680.8	-60.5	818.2	-197.8	729.9	-109.5	743.6	-123.2	700.9	-80.5	No Action

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-6-24(4) - 6-24 Inner P77 (4)
LAYOUT: 6-24 Inner P77 (4)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:41 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 6/24 Obstruction Tables Inner Portion & Part 77 (Existing/Future)

SCALE	AS NOTED	JOB NO. 20042701.00
DATE	2/2023	
SHEET	45 OF 59	SHEETS

Runway 24 Inner Approach (Existing)

Runway 24 Existing Obstruction Table Inner Portion of the Approach Surface															
			Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition
8130	Runway Light	535.3	533.2	2.1	538.3	-2.9	533.2	2.1	539.9	-4.6	561.5	-26.2	533.2	2.1	Fixed by Function
8131	Miscellaneous Utility	535.0	533.3	1.7	639.8	-104.8	-	-	-	-	-	-	-	-	To Be Studied
8138	Runway Light	536.6	537.2	-0.7	543.2	-6.7	543.2	-6.6	546.5	-10.0	567.9	-31.3	539.1	-2.5	Fixed by Function
8144	Fence	538.1	539.0	-0.9	662.6	-124.6	-	-	-	-	-	-	-	-	No Action
8150	Pole	540.4	540.1	0.3	646.4	-105.9	-	-	-	-	-	-	-	-	To Be Studied
8152	Runway Light	539.4	541.2	-1.8	548.2	-8.8	553.2	-13.8	553.2	-13.8	574.3	-34.8	545.0	-5.6	Fixed by Function
8155	Fence	540.3	541.9	-1.6	621.8	-81.6	-	-	-	-	-	-	-	-	No Action
8161	Post	544.0	543.8	0.2	552.2	-8.3	559.6	-15.7	-	-	578.4	-34.4	548.8	-4.8	To Be Studied
8162	Fence	541.3	543.9	-2.6	594.4	-53.1	-	-	-	-	-	-	-	-	No Action
8164	Post	544.1	544.2	-0.1	551.9	-7.8	560.5	-16.5	-	-	579.0	-34.9	549.3	-5.2	No Action
8166	Billboard	550.3	544.6	5.6	616.2	-65.9	-	-	-	-	-	-	-	-	To Be Studied
8168	Bush	537.3	545.2	-7.9	641.3	-104.1	-	-	-	-	-	-	-	-	No Action
8169	Runway Light	544.2	545.2	-1.0	553.2	-9.0	563.2	-18.9	559.9	-15.6	580.6	-36.4	550.8	-6.6	Fixed by Function
8170	Bush	537.4	545.2	-7.9	640.4	-103.1	-	-	-	-	-	-	-	-	No Action
8172	Bush	538.7	545.4	-6.7	638.5	-99.8	-	-	-	-	-	-	-	-	No Action
8174	Fence	541.8	546.0	-4.2	565.7	-23.9	-	-	-	-	-	-	-	-	No Action
8175	Bush	537.6	546.0	-8.3	606.0	-68.4	-	-	-	-	-	-	-	-	No Action
8177	Street Sign	543.5	546.6	-3.1	560.2	-16.7	-	-	-	-	-	-	-	-	No Action
8181	Street Sign	542.1	547.2	-5.0	573.8	-31.7	-	-	-	-	-	-	-	-	No Action
8182	Bush	537.8	547.2	-9.4	590.7	-52.9	-	-	-	-	-	-	-	-	No Action
8183	Bush	538.3	547.9	-9.6	579.8	-41.4	-	-	-	-	-	-	-	-	No Action
8184	Fence	545.0	548.0	-3.0	556.7	-11.7	570.2	-25.2	-	-	585.1	-40.1	555.0	-10.0	No Action
8189	Runway Light	548.9	549.2	-0.3	558.2	-9.3	573.1	-24.2	566.5	-17.6	587.0	-38.1	556.7	-7.8	Fixed by Function
8190	Runway Light	550.2	549.2	1.0	558.2	-8.0	573.2	-23.0	566.5	-16.3	587.0	-36.8	556.7	-6.5	Fixed by Function
8191	Runway Light	549.9	549.2	0.7	558.2	-8.3	573.2	-23.3	566.5	-16.6	587.0	-37.1	556.7	-6.8	Fixed by Function
8192	Pole	549.1	549.2	-0.1	558.3	-9.1	573.2	-24.1	566.6	-17.4	587.1	-37.9	556.8	-7.6	No Action
8193	Post	550.7	549.4	1.3	558.4	-7.7	573.6	-22.9	566.8	-16.1	587.3	-36.6	557.0	-6.3	To Be Studied
8194	Street Sign	548.8	549.4	-0.6	558.4	-9.6	573.6	-24.8	566.8	-18.0	587.3	-38.5	557.0	-8.2	No Action
8195	Miscellaneous Utility	549.2	549.5	-0.4	558.6	-9.5	574.0	-24.8	567.1	-17.9	587.6	-38.4	557.2	-8.0	No Action
8199	OI On Localizer	555.4	551.0	4.4	560.5	-5.1	577.6	-22.2	569.5	-14.1	589.9	-34.5	559.4	-4.0	Fixed by Function
8200	OI On Localizer	555.5	551.0	4.5	560.5	-4.9	577.6	-22.1	569.5	-14.0	589.9	-34.4	559.4	-3.8	Fixed by Function
8201	Building	542.3	551.2	-8.9	654.4	-112.1	-	-	-	-	-	-	-	-	No Action
8203	Building	558.1	551.4	6.8	560.9	-2.8	578.6	-20.4	-	-	590.5	-32.4	559.9	-1.8	To Be Studied
8205	Bollard	551.4	551.7	-0.3	561.3	-10.0	579.4	-28.0	-	-	591.0	-39.6	560.4	-9.0	No Action
8206	Bollard	551.5	551.7	-0.3	561.3	-9.9	579.4	-28.0	-	-	591.0	-39.6	560.4	-8.9	No Action
8207	Pole	556.9	551.8	5.1	561.4	-4.5	579.6	-22.7	570.8	-13.9	591.1	-34.2	560.5	-3.6	To Be Studied
8208	Utility Box	555.1	551.8	3.3	561.5	-6.4	579.7	-24.6	-	-	591.2	-36.1	560.6	-5.5	To Be Studied
8209	Transformer	550.3	551.8	-1.6	561.5	-11.2	579.7	-29.4	-	-	591.2	-40.9	560.6	-10.3	No Action
8210	Transformer	550.3	551.9	-1.7	561.6	-11.4	580.0	-29.7	-	-	591.4	-41.1	560.8	-10.5	No Action
8211	Bollard	552.4	552.0	0.4	561.7	-9.3	580.2	-27.8	-	-	591.5	-39.1	560.9	-8.5	To Be Studied
8212	Bush	544.8	552.0	-7.2	561.7	-16.9	580.2	-35.4	571.2	-26.4	591.5	-46.7	560.9	-16.0	No Action
8213	Bollard	552.5	552.1	0.4	561.8	-9.3	580.3	-27.8	-	-	591.6	-39.1	561.0	-8.4	To Be Studied
8214	Bollard	552.4	552.1	0.3	561.8	-9.4	580.4	-28.0	-	-	591.6	-39.2	561.0	-8.6	To Be Studied
8215	Bush	543.1	552.2	-9.2	562.0	-18.9	580.7	-37.6	-	-	591.8	-48.8	561.1	-18.1	No Action
8217	Fence	556.6	552.3	4.2	562.1	-5.6	581.0	-24.4	571.7	-15.2	592.0	-35.5	561.3	-4.8	To Be Studied
8219	Bush	544.1	552.4	-8.3	562.2	-18.1	581.2	-37.1	571.9	-27.8	592.2	-48.0	561.5	-17.3	No Action
8222	Runway Light	553.1	553.2	-0.2	563.2	-10.2	583.2	-30.1	573.2	-20.1	593.4	-40.3	562.6	-9.5	Fixed by Function
8223	Bush	544.2	553.5	-9.3	563.5	-19.3	583.8	-39.6	573.6	-29.4	593.8	-49.6	563.0	-18.8	No Action
8224	Dirt Pile	549.1	553.6	-4.5	585.1	-35.9	-	-	-	-	-	-	-	-	No Action
8230	Fence	558.9	554.2	4.7	564.5	-5.6	585.7	-26.8	574.9	-15.9	595.0	-36.1	564.1	-5.2	To Be Studied
8232	Bush	547.6	554.4	-6.8	564.7	-17.1	586.1	-38.5	575.1	-27.6	595.3	-47.7	564.3	-16.7	No Action
8233	Dirt Pile	546.6	554.6	-8.1	565.0	-18.4	-	-	-	-	-	-	-	-	No Action
8235	Bush	547.2	555.2	-8.0	565.7	-18.5	588.1	-41.0	576.5	-29.3	596.6	-49.4	565.5	-18.4	No Action
8236	Street Sign	556.3	555.4	0.9	565.9	-9.7	588.5	-32.3	576.8	-20.5	596.8	-40.6	565.8	-9.5	To Be Studied
8238	Fence	557.0	556.1	0.9	566.9	-9.9	590.5	-33.4	578.1	-21.0	598.1	-41.1	566.9	-9.9	To Be Studied
8239	Transformer	554.9	556.5	-1.6	627.2	-72.4	-	-	-	-	-	-	-	-	No Action
8243	Transformer	554.4	556.8	-2.4	634.9	-80.5	-	-	-	-	-	-	-	-	No Action
8245	Building	560.9	557.0	3.8	631.3	-70.4	-	-	-	-	-	-	-	-	To Be Studied
8247	Pole	565.2	557.3	8.0	628.1	-62.9	-	-	-	-	-	-	-	-	To Be Studied
8249	Building	561.8	557.4	4.5	622.3	-60.5	-	-	-	-	-	-	-	-	To Be Studied
8254	Fence	553.5	558.5	-5.1	569.9	-16.4	596.5	-43.0	582.1	-28.6	601.9	-48.5	570.4	-17.0	No Action
8255	Flagpole	555.1	558.6	-3.5	570.0	-14.8	-	-	-	-	602.0	-46.9	-	-	No Action
8271	Fence	551.3	560.9	-9.6	572.9	-21.6	602.5	-51.2	586.1	-34.7	605.8	-54.4	574.0	-22.6	No Action
8276	Railroad Crossing Bar	561.4	568.9	-7.5	582.9	-21.5	622.4	-61.0	599.3	-38.0	618.5	-57.1	585.7	-24.3	No Action
8277	Railroad Crossing Bar	564.7	572.9	-8.2	587.9	-23.2	632.4	-67.7	-	-	624.9	-60.2	591.6	-26.9	No Action
8278	Utility Pole	568.3	577.0	-8.8	593.0	-24.7	642.7	-74.4	-	-	631.5	-63.2	597.6	-29.4	No Action
8280	Utility Pole	568.7	578.5	-9.8	594.8	-26.2	-	-	-	-	633.8	-65.1	-	-	No Action
8282	Tree	572.0	579.0	-7.0	595.5	-23.5	647.6	-75.6	616.2	-44.1	634.6	-62.6	600.5	-28.5	No Action
8283	Tree	575.4	579.0	-3.6	595.5	-20.0	647.7	-72.2	616.2	-40.7	634.6	-59.2	600.5	-25.1	No Action
8284	Tree	581.0	579.2	1.8	595.7	-14.7	648.2	-67.2	616.5	-35.5	634.9	-53.9	600.8	-19.8	To Be Studied
8285	Tree	574.3	579.6	-5.3	596.2	-21.9	649.0	-74.8	617.1	-42.8	635.5	-61.2	601.4	-27.1	No Action
8286	Tree	573.1	579.6	-6.5	596.3	-23.1	649.2	-76.1	617.2	-44.1	635.6	-62.5	601.5	-28.3	No Action
8287	Tree	577.5	579.7	-2.2	596.4	-18.9	649.5	-71.9	617.4	-39.8	635.8	-58.2	601.6	-24.1	No Action
8288	Tree	579.8	579.7	0.1	596.4	-16.6	649.5	-69.7	617.4	-37.6	635.8	-56.0	601.6	-21.8	To Be Studied
8289	Tree	578.7	579.8	-1.1	596.4	-17.7	649.5	-70.8	617.4	-38.7	635.8	-57.1	601.6	-22.9	No Action
8290	Tree	579.0	579.8	-0.8	596.5	-17.5	649.7	-70.7	617.6	-38.6	635.9	-56.9	601.8	-22.8	No Action
8291	Tree	581.6	580.0	1.6	596.8	-15.1	650.2	-68.6	617.9	-36.3	636.3	-54.6	602.1	-20.4	To Be Studied
8292	Tree	579.0	580.2	-1.2	597.0	-18.0	650.7	-71.6	618.2	-39.2	636.6	-57.5	602.3	-23.3	No Action
8293	Tree	584.9	580.3	4.6	597.1	-12.2	650.8	-66.0	618.3	-33.5	636.7	-51.8	602.4	-17.6	To Be Studied
8294	Tree	572.6	580.3	-7.7	597.1	-24.5	650.9	-78.3	618.4	-45.8	636.7	-64.1	602.5	-29.9	No Action
8295	Tree	577.9	580.3	-2.4	597.1	-19.3	651.0	-73.1	618.4	-40.5	636.7	-58.8	602.5	-24.6	No Action
8296	Tree	582.2	580.5	1.6	597.4	-15.2	651.5	-69.3	618.7	-36.6	637.1	-54.9	602.8	-20.6	To Be Studied
8297	Tree	581.0	580.6	0.3	597.5	-16.6	651.7	-70.7	618.9	-37.9	637.2	-56.2	602.9	-22.0	To Be Studied
8298	Tree	586.7	580.8	5.9	597.8	-11.1	652.2	-65.5	619.2	-32.5	637.5	-50.8	603.2	-16.5	To Be Studied
8299	Tree	572.0	580.8	-8.9	597.8	-25.8	652.2	-80.3	-	-	637.5	-65.6	603.2	-31.3	No Action
8300	Tree	572.8	580.9	-8.1	597.9	-25.1	652.4	-79.6	619.3	-46.6	637.6	-64.9	603.3	-30.6	No Action
8301	Tree	574.0	580.9	-7.0	597.9	-23.9	652.4	-78.5	-	-	637.7	-63.7	603.4	-29.4	No Action
8302	Tree	573.3	581.1	-7.8	598.1	-24.8	652.8	-79.5	-	-	637.9	-64.7	603.6	-30.3	No Action
8303	Tree	573.3	581.5	-8.2	598.6	-25.3	653.8	-80.5	620.3	-47.0	638.6	-65.2	604.2	-30.9	No Action
8304	Tree	573.5	581.5	-8.1	598.7	-25.2	654.0	-80.5	-	-	638.7	-65.2	604.3	-30.8	No Action
8305	Tree	580.1	581.8	-1.8	599.0	-19.0	654.7	-74.7	620.9	-40.8	639.2	-59.1	604.7	-24.6	No Action
8306	Tree	573.5	582.3	-8.7	599.6	-26.0	655.8	-82.3	-	-	639.8	-66.3	605.3	-31.8	No Action
8307	Tree	574.5	582.6	-8.1	600.0	-25.5	656.7	-82.2	-	-	640.4	-65.9	605.9	-31.4	No Action
8308	Tree	573.6	582.8	-9.2	600.2	-26.6	657.1	-83.5	622.5	-48.9	640.7	-67.1	606.1	-32.5	No Action
8309	Tree	575.2	583.2	-8.0	600.7	-25.6	658.1	-83.0	623.2	-48.0	641.3	-66.1	606.7	-31.5	No Action
8310	Tree	577.7	584.1	-6.4	601.8	-24.1	660.3	-82.6	624.6	-46.9	642.7	-65.0	608.0	-30.3	No Action
8311	Tree	576.1	584.1	-8.0	601.9	-25.7	660.4	-84.2	624.7	-48.5	642.7	-66.6	608.0	-31.9	No Action
8312	Tree	577.1	584.3	-7.2	602.1	-25.0	660.9	-83.8	-	-	643.1	-65.9	608.3	-31.2	No Action
8313	Tree	579.7	585.1	-5.4	603.1	-23.4	662.8	-83.1	-	-	644.3	-64.6	609.4	-29.7	No Action
8314	Tree	582.4	585.5	-3.1	603.6	-21.2	663.8	-81.4	627.0	-44.6	644.9	-62.5	610.0	-27.7	No Action
8315	Tree	578.1	585.6	-7.4	603.7	-25.6	664.1	-85.9	627.1	-49.0	645.1	-67.0	610.2	-32.1	No Action
8316	Tree	577.4	585.9	-8.5	604.1	-26.7	664.9	-87.5	627.7	-50.3	645.7	-68.3	610.7	-33.3	No Action
8317	Tree	577.5	586.6	-9.2	605.0	-27.6	666.7	-89.3	628.9	-51.5	646.8	-69.4	611.8	-34.3	No Action
8318	Tree	579.1	587.5	-8.4	606.1	-27.0	668.9	-89.8	630.4	-51.2	648.2	-69.1	613.1	-33.9	No Action
8319	Tree	584.3	589.3	-5.1	608.4	-24.1	673.4	-89.2	-	-	651.1	-66.8	615.7	-31.5	No Action
8320	Tree	583.0	591.8	-8.9	611.5	-28.6	679.7	-96.7	637.6	-54.6	655.1	-72.1	619.4	-36.4	No Action
8321	Tree	582.3	592.2	-9.8	611.9	-29.6	680.5	-98.2	638.1	-55.8	655.6	-73.3	619.9	-37.5	No Action
8322	Tree	583.3	592.2	-9.0	612.0	-28.8	680.7	-97.4	638.2	-55.0	655.7	-72.5	620.0	-36.7	No Action
8323	Tree	591.3	594.7	-3.5	615.1	-23.9	686.9	-95.7	-	-	659.7	-68.5	623.6	-32.4	No Action
8324	Tree	589.7	595.0	-5.3	615.5	-25.8	687.7	-98.0	-	-	660.2	-70.5	624.1	-34.4	No Action
8325	Tree	592.5	595.1	-2.6	615.6	-23.1	687.8	-95.3	643.0	-50.4	660.3	-67.8	624.2	-31.7	No Action
8326	Tree	588.4	597.5	-9.1	618.7	-30.3	-	-	-	-	-	-	-	-	No Action
8327	Tree	588.1	597.7	-9.6	618.9	-30.7	694.4	-106.3	-	-	664.5	-76.4	628.1	-39.9	No Action
8328	Tree	592.3	600.8	-8.5	622.8	-30.5	-	-	-	-	-	-	-	-	No Action
8329	Tree	601.9	608.3	-6.4	632.1	-30.2	-	-	-	-	-	-	-	-	No Action
8330	Cell Tower	622.0	623.8	-1.8	651.6	-29.6	-	-	-	-	-	-	-	-	No Action
9844	Fence	551.9	550.4	1.5	559.8	-7.8	576.2	-24.3	568.6	-16.6	589.0	-37.0	558.5	-6.6	To Be Studied
9857	Pole Util	597.4	625.2	-27.8	653.3	-55.8	763.1	-165.7	-	-	708.4	-111.0	668.5	-71.0	No Action
10406	Post	550.7	549.4	1.3	558.4	-7.7	573.6	-22.9	566.8	-16.1	587.3	-36.6	557.0	-6.3	To Be Studied
10431	Service Road	540.0	533.2	6.8	637.2	-97.2	-	-	-	-	-	-	-	-	To Be Studied
10432	Service Road	541.7	-	-	563.4	-21.7	-	-	536.7	5.0	-	-	-	-	To Be Studied
10433	Service Road	541.8	-	-	558.7	-16.9	-	-	537.1	4.7	558.8	-17.0	-	-	To Be Studied
10434	Service Road	542.3	-	-	537.4	5.0	-	-	538.8	3.6	560.4	-18.1	-	-	To Be Studied
10435	Service Road	540.7	533.2	7.5	656.5	-115.8	-	-	-	-	-	-	-	-	To Be Studied
10436	Service Road	541.1	534.3	6.8	668.5	-127.4	-	-	-	-	-	-	-	-	To Be Studied
10437	Service Road	542.8	535.4	7.4	667.5	-124.7	-	-	-	-	-	-	-	-	To Be Studied
10438	Service Road	555.2	549.5	5.7	558.6	-3.4	-	-	-	-	-	-	-	-	To Be Studied
10439	Service Road	555.9	550.1	5.7	559.4	-3.5	-	-	-	-	588.5	-32.6	-	-	To Be Studied
10440	Service Road	556.2	550.4	5.8	559.7	-3.6	576.2	-20.0	-	-	589.0	-32.8	558.5	-2.3	To Be Studied
10441	Service Road	558.3	552.5	5.8	562.3	-4.1	581.3	-23.1	572.0	-13.7	592.2	-34.0	561.5	-3.3	To Be Studied
10442	Service Road	558.5	552.4	6.1	562.2	-3.7	581.2	-22.7	571.9	-13.4	592.1	-33.7	561.4	-3.0	To Be Studied
10443	Service Road	548.8	548.0	0.9	556.7	-7.8	570.1	-21.2	564.5	-15.6	585.0	-36.2	554.9	-6.1	To Be Studied
10444	Service Road	545.3	545.8	-0.5	553.9	-8.7	564.6	-19.3	-	-	581.5	-36.3	551.7	-6.4	No Action
10719	Service Road	553.8	561.2	-7.4	573.2	-19.4	603.1	-49.3	586.5	-32.7	606.2	-52.4	574.3	-20.5	No Action
10720	Service Road	557.0	559.5	-2.4	571.0	-14.0	598.8	-41.8	-	-	603.4	-46.4	571.8	-14.8	No Action
10721	Service Road	557.4	559.3	-1.9	570.8	-13.4	-	-	-	-	603.1	-45.7	-	-	No Action
10722	Service Road	558.3	558.6	-0.3	570.0	-11.7	-	-	-	-	-	-	-	-	No Action
10725	Road	545.0	539.7	5.3	664.0	-119.0	-	-	-	-	-	-	-	-	To Be Studied
10726	Road	550.2	547.5	2.7	556.1	-5.9	-	-	-	-	-	-	-	-	To Be Studied
10727	Road	550.5	547.7	2.8	556.4	-5.8	-	-	-	-	584.7	-34.1	-	-	To Be Studied
10728	Road	550.7	547.9	2.8	556.6	-5.9	569.9	-19.2	-	-	584.9	-34.3	554.8	-4.1	To Be Studied
10729	Road	555.0	550.3	4.7	559.6	-4.6	575.9	-20.9	568.3	-13.3	588.8	-33.8	558.3	-3.3	To Be Studied
10730	Road	557.8	558.3	-0.6	569.6	-11.9	596.0	-38.2	581.7	-24.0	601.6	-43.8	570.1	-12.4	No Action
10731	Road	550.4	568.2	-17.7	582.0	-31.5	620.6	-70.1	598.1	-47.7	617.3	-66.9	584.6	-34.2	No Action
10732	Road	545.0	574.5	-29.5	589.8	-44.8	636.3	-91.3	-	-	627.4	-82.4	593.9	-48.9	No Action
10733	Road	545.0	574.9	-29.9	590.4	-45.4	-	-	-	-	628.1	-83.1	-	-	No Action
10734	Road	545.0	575.7	-30.7	591.4	-46.4	-	-	-	-	-	-	-	-	No Action
10735	Road	545.0	575.8	-30.8	634.0	-89.0	-	-	-	-	-	-	-	-	No Action
10736	Road	545.5	571.6	-26.1	586.2	-40.7	629.1	-83.6	603.8	-58.3	622.8	-77.3	589.6	-44.2	No Action
10737	Road	546.2	567.4	-21.2	581.0	-34.8	618.7	-72.4	596.9	-50.6	616.1	-69.9	583.5	-37.3	No Action
10738	Road	545.0	557.3	-12.3	649.3	-104.3	-	-	-	-	-	-	-	-	No Action
10739	Road	545.0	560.0	-15.0	571.7	-26.7	-	-	-	-	-	-	-	-	No Action
10740	Road	545.0	561.0	-16.0	573.0	-28.0	-	-	-	-	605.9	-60.9	-	-	No Action
10741	Road	545.0	561.3	-16.3	573.3	-28.3	603.3	-58.3	-	-	606.3	-61.3	574.4	-29.4	No Action
10742	Road	545.0	563.3	-18.3	575.8	-30.8	608.3	-63.3	590.0	-45.0	609.5	-64.5	577.4	-32.4	No Action
10743	Road	532.9	582.8	-49.9	628.1	-95.2	-	-	-	-	-	-	-	-	No Action
10744	Road	532.7	581.7	-49.0	598.9	-66.1	-	-	-	-	-	-	-	-	No Action
10745	Road	533.2	579.0	-45.8	595.5	-62.3	-	-	-	-	634.7	-101.4	-	-	No Action
10746	Road	534.6	578.4	-43.8	594.7	-60.1	646.1	-111.5	-	-	633.7	-99.0	599.7	-65.0	No Action
10747	Road	545.0	567.5	-22.5	640.9	-95.9	-	-	-	-	-	-	-	-	No Action
10748	Road	545.0	567.1	-22.1	580.6	-35.6	-	-	-	-	-	-	-	-	No Action
10749	Road	545.0	567.2	-22.2	580.7	-35.7	-	-	-	-	615.8	-70.8	-	-	No Action
10750	Road	545.0	567.2	-22.2	580.8	-35.8	618.2	-73.2	-	-	615.8	-70.8	583.2	-38.2	No Action
10751	Road	545.0	567.2	-22.2	580.7	-35.7	618.1	-73.1	596.5	-51.5	615.8	-70.8	583.2	-38.2	No Action
10752	Road	543.6	570.0	-26.3	584.2	-40.6	625.0	-81.4	601.1	-57.5	620.2	-76.6	587.2	-43.6	No Action
10753	Road	535.0	575.2	-40.2	590.8	-55.8	638.2	-103.2	609.9	-74.9	628.6	-93.6	595.0	-60.0	No Action
10754	Road	538.3	577.6	-39.3	632.5	-94.2	-	-	-	-	-	-	-	-	No Action
10755	Road	535.0	579.9	-44.9	596.6	-61.6	-	-	-	-	-	-	-	-	No Action
10756	Railroad	553.0	542.7	10.3	661.5	-108.5	-	-	-	-	-	-	-	-	To Be Studied
10757	Railroad	555.7	550.0	5.8	559.2	-3.5	-	-	-	-	-	-	-	-	To Be Studied
10758	Railroad	557.0	550.5	6.5	559.8	-2.8	-	-	-	-	589.1	-32.1	-	-	To Be Studied
10759	Railroad	556.8	550.8	6.1	560.2	-3.3	577.1	-20.2	-	-	589.5	-32.7	559.0	-2.2	To Be Studied
10760	Railroad	557.7	553.7	4.1	563.8	-6.0	584.3	-26.5	573.9	-16.2	594.1	-36.4	563.3	-5.5	To Be Studied
10761	Railroad	560.8	562.0	-1.2	574.2	-13.4	605.1	-44.3	587.8	-27.0	607.4	-46.6	575.5	-14.7	No Action
10762	Railroad	556.5	558.1	-1.6	569.4	-12.8	595.4	-38.9	581.4	-24.9	601.3	-44.7	569.8	-13.3	No Action
10763	Railroad	558.9	556.8	2.1	567.7	-8.9	592.1	-33.3	-	-	599.1	-40.3	567.9	-9.0	To Be Studied
10764	Railroad	558.5	556.6	1.9	567.5	-9.0	-	-	-	-	598.9	-40.4	-	-	To Be Studied
10765	Railroad	557.6	556.1	1.4	566.9	-9.3	-	-	-	-	-	-	-	-	To Be Studied
10766	Railroad	554.7	553.7	1.0	652.4	-97.7	-	-	-	-	-	-	-	-	To Be Studied
10767	Railroad	553.0	572.3	-19.3	587.1	-34.1	630.8	-77.8	605.0	-52.0	623.9	-70.9	590.7	-37.7	No Action
10768	Railroad	549.8	577.0	-27.3	593.0	-43.2	642.7	-92.9	612.9	-63.1	631.4	-81.7	597.6	-47.9	No Action
10769	Railroad	547.1	578.9	-31.8	595.4	-48.3	647.4	-100.3	616.0	-68.9	634.5	-87.4	600.4	-53.3	No Action

Runway 24 Inner Approach (Existing)

Runway 24 Existing Obstruction Table Inner Portion of the Approach Surface															
			Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition
10770	Railroad	544.9	580.3	-35.4	597.1	-52.2	650.9	-105.9	618.3	-73.4	636.7	-91.7	602.4	-57.5	No Action
10771	Railroad	545.4	576.1	-30.7	591.9	-46.5	640.4	-95.0	611.4	-66.0	630.0	-84.6	596.3	-50.9	No Action
10772	Railroad	544.0	577.5	-33.5	593.7	-49.7	644.0	-100.0	613.7	-69.7	632.3	-88.3	598.4	-54.4	No Action
10773	Railroad	553.0	580.9	-27.9	597.9	-44.9	652.4	-99.4	-	-	637.7	-84.7	603.3	-50.3	No Action
10774	Railroad	553.0	583.1	-30.1	600.6	-47.6	-	-	-	-	641.2	-88.2	-	-	No Action
10775	Railroad	553.0	585.1	-32.1	603.1	-50.1	662.8	-109.8	-	-	644.3	-91.3	609.4	-56.4	No Action
10776	Railroad	552.7	588.3	-35.6	607.1	-54.4	-	-	-	-	649.5	-96.7	-	-	No Action
10777	Railroad	551.2	588.6	-37.5	607.5	-56.4	671.8	-120.6	-	-	650.0	-98.8	614.7	-63.5	No Action
10778	Railroad	550.2	592.1	-41.9	611.9	-61.6	-	-	-	-	655.5	-105.3	-	-	No Action
10779	Railroad	553.0	592.6	-39.6	612.5	-59.5	-	-	-	-	-	-	-	-	No Action
10780	Railroad	553.0	593.4	-40.4	619.4	-66.4	-	-	-	-	-	-	-	-	No Action
10781	Railroad	553.0	596.2	-43.2	617.0	-64.0	-	-	-	-	-	-	-	-	No Action
10782	Railroad	550.2	601.0	-50.7	623.0	-72.7	-	-	-	-	-	-	-	-	No Action
10783	Railroad	550.4	-	-	624.3	-73.8	-	-	-	-	-	-	-	-	No Action
10784	Railroad	543.0	577.2	-34.2	593.2	-50.2	643.1	-100.1	613.2	-70.2	631.7	-88.7	597.9	-54.9	No Action
10785	Railroad	543.0	578.8	-35.8	595.2	-52.2	647.1	-104.1	615.8	-72.8	634.3	-91.3	600.2	-57.2	No Action
10786	Railroad	537.9	580.3	-42.3	597.1	-59.1	650.8	-112.9	-	-	636.6	-98.7	602.4	-64.5	No Action
10787	Railroad	534.9	582.0	-47.1	599.2	-64.4	655.1	-120.3	-	-	639.4	-104.5	604.9	-70.1	No Action
10788	Railroad	535.0	582.6	-47.7	600.0	-65.0	-	-	-	-	640.4	-105.4	-	-	No Action
10789	Railroad	537.7	581.0	-43.4	598.0	-60.4	-	-	-	-	637.9	-100.2	-	-	No Action
10790	Railroad	537.0	584.2	-47.1	601.9	-64.9	-	-	-	-	-	-	-	-	No Action
10791	Railroad	535.3	585.4	-50.2	603.5	-68.3	-	-	-	-	-	-	-	-	No Action
10792	Railroad	536.2	586.4	-50.2	625.2	-89.0	-	-	-	-	-	-	-	-	No Action
10793	Railroad	537.8	585.0	-47.2	626.3	-88.5	-	-	-	-	-	-	-	-	No Action
11285	Interstate	567.0	-	-	659.8	-92.8	-	-	-	-	-	-	-	-	No Action
11288	Interstate	561.0	631.5	-70.5	661.2	-100.2	-	-	-	-	-	-	-	-	No Action
11327	Road	536.8	-	-	629.1	-92.3	-	-	-	-	-	-	-	-	No Action
11328	Road	537.9	607.2	-69.3	630.8	-92.9	-	-	-	-	-	-	-	-	No Action
11329	Road	540.0	607.2	-67.3	630.8	-90.8	-	-	-	-	679.7	-139.7	-	-	No Action
11330	Road	539.8	606.0	-66.2	629.3	-89.5	715.2	-175.4	-	-	677.8	-138.0	640.3	-100.5	No Action
11331	Road	542.2	612.2	-70.0	637.1	-94.9	-	-	-	-	687.7	-145.5	-	-	No Action
11332	Road	544.1	614.3	-70.2	639.7	-95.6	736.0	-191.9	-	-	691.1	-146.9	652.5	-108.4	No Action
11333	Road	545.0	624.8	-79.8	652.7	-107.7	762.1	-217.1	692.5	-147.5	707.7	-162.7	667.8	-122.8	No Action
11334	Road	539.5	601.2	-61.7	623.2	-83.7	703.0	-163.5	653.1	-113.6	670.0	-130.5	633.1	-93.6	No Action
11339	Road	545.0	625.9	-80.9	654.2	-109.2	765.0	-220.0	-	-	709.6	-164.6	669.6	-124.6	No Action
11340	Road	545.0	623.6	-78.6	651.2	-106.2	-	-	-	-	705.8	-160.8	-	-	No Action
11341	Road	545.0	619.0	-74.0	645.5	-100.5	-	-	-	-	-	-	-	-	No Action
11342	Road	542.4	-	-	642.1	-99.7	-	-	-	-	-	-	-	-	No Action
11347	Railroad	553.0	-	-	654.4	-101.4	-	-	-	-	-	-	-	-	No Action
11348	Railroad	553.0	-	-	655.7	-102.7	-	-	-	-	-	-	-	-	No Action
11428	Road	555.0	632.3	-77.3	662.2	-107.2	-	-	-	-	719.8	-164.8	-	-	No Action
11430	Road	551.8	631.6	-79.8	661.2	-109.4	779.0	-227.2	-	-	718.6	-166.8	677.8	-126.0	No Action
11431	Road	548.3	630.2	-81.8	659.5	-111.2	-	-	-	-	716.3	-168.0	-	-	No Action
11432	Road	545.0	627.7	-82.7	656.5	-111.5	-	-	-	-	-	-	-	-	No Action
11433	Road	545.0	-	-	653.9	-108.9	-	-	-	-	-	-	-	-	No Action

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-6-24(4) - 6-24 Inner P77 (4)
LAYOUT: 24 Inner (5)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:41 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT. WSP CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 6/24 Obstruction Tables Inner Portion (Existing/Future)

SCALE AS NOTED | JOB NO. 20042701.00
DATE 2/2023
SHEET **46** OF **59** SHEETS

Runway 12R Inner Approach (Existing)

Runway 12R Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
1101	Tree	686.2	-	-	653.7	32.4	-	-	-	-	-	-	-	-	To Be Studied
1102	Tree	682.5	627.2	55.3	653.7	28.8	679.6	2.9	-	-	729.9	-47.4	679.6	2.9	To Be Studied
1104	Tree	682.2	626.8	55.4	653.3	28.9	679.1	3.1	-	-	729.3	-47.1	-	-	To Be Studied
1105	Tree	673.2	626.6	46.6	653.0	20.2	678.8	-5.6	-	-	729.0	-55.8	-	-	To Be Studied
1107	Tree	682.6	626.2	56.4	652.5	30.1	678.1	4.4	-	-	728.3	-45.7	-	-	To Be Studied
1108	Tree	674.8	626.1	48.7	652.4	22.4	678.1	-3.3	-	-	728.2	-53.4	678.1	-3.3	To Be Studied
1109	Tree	679.1	625.4	53.7	651.5	27.6	677.0	2.1	-	-	727.1	-47.9	-	-	To Be Studied
1114	Tree	673.6	623.3	50.3	648.9	24.7	673.9	-0.3	-	-	723.6	-50.1	-	-	To Be Studied
1116	Tree	672.7	620.8	51.9	645.8	26.9	670.3	2.4	-	-	719.7	-47.0	-	-	To Be Studied
1117	Tree	683.5	620.8	62.8	645.7	37.8	670.2	13.3	-	-	719.6	-36.1	-	-	To Be Studied
1118	Tree	681.9	620.4	61.4	645.3	36.6	-	-	-	-	719.1	-37.2	-	-	To Be Studied
1125	Tree	653.8	605.7	48.0	626.9	26.9	648.1	5.7	-	-	695.6	-41.8	648.1	5.7	To Be Studied
1127	Tree	658.9	601.5	57.4	621.6	37.3	641.9	17.0	-	-	688.8	-29.9	-	-	To Be Studied
1132	Tree	649.0	599.4	49.5	619.0	29.9	-	-	-	-	-	-	-	-	To Be Studied
1134	Tree	651.9	599.2	52.6	618.8	33.1	-	-	-	-	-	-	-	-	To Be Studied
1135	Tree	651.5	599.0	52.5	618.5	33.0	-	-	-	-	-	-	-	-	To Be Studied
1137	Tree	651.2	599.0	52.2	618.4	32.8	-	-	-	-	-	-	-	-	To Be Studied
1140	Tree	648.0	598.8	49.2	618.2	29.7	-	-	-	-	-	-	-	-	To Be Studied
1143	Tree	654.3	598.7	55.6	618.1	36.2	-	-	-	-	-	-	-	-	To Be Studied
1145	Tree	650.8	598.6	52.2	617.9	32.8	-	-	-	-	-	-	-	-	To Be Studied
1175	Tree	647.5	-	-	654.1	-6.6	-	-	-	-	-	-	-	-	No Action
1201	Tree	649.5	-	-	646.9	2.6	-	-	-	-	-	-	-	-	To Be Studied
1208	Tree	657.3	-	-	660.7	-3.4	-	-	-	-	-	-	-	-	No Action
1267	Tree	632.1	584.0	48.2	634.0	-1.9	-	-	-	-	-	-	-	-	To Be Studied
1287	Tree	629.8	-	-	639.1	-9.3	-	-	-	-	-	-	-	-	No Action
3439	Tree	645.5	641.3	4.3	671.4	-25.8	700.3	-54.8	-	-	752.4	-106.8	700.3	-54.8	To Be Studied
3441	Tree	677.7	641.2	36.5	671.3	6.4	700.3	-22.6	714.5	-36.8	752.3	-74.6	700.3	-22.6	To Be Studied
3442	Tree	642.5	641.2	1.3	671.3	-28.7	700.2	-57.7	-	-	752.3	-109.7	700.2	-57.7	To Be Studied
3444	Tree	634.0	641.1	-7.1	671.1	-37.1	700.1	-66.1	-	-	752.1	-118.1	700.1	-66.1	No Action
3447	Tree	673.8	641.1	32.7	671.1	2.7	700.0	-26.2	714.2	-40.4	752.0	-78.2	700.0	-26.2	To Be Studied
3449	Pole	642.2	641.0	1.2	671.0	-28.8	699.9	-57.8	-	-	751.9	-109.7	699.9	-57.8	To Be Studied
3451	Tree	631.8	641.0	-9.2	671.0	-39.2	-	-	-	-	751.9	-120.1	-	-	No Action
3452	Tree	651.6	640.9	10.6	670.9	-19.4	699.9	-48.3	-	-	751.8	-100.3	699.8	-48.3	To Be Studied
3453	Tree	674.3	640.8	33.5	670.7	3.6	699.6	-25.3	713.8	-39.5	751.6	-77.3	699.6	-25.3	To Be Studied
3456	Tree	654.1	640.6	13.5	670.6	-16.4	699.4	-45.3	-	-	751.3	-97.2	699.4	-45.3	To Be Studied
3459	Tree	686.1	640.5	45.6	670.4	15.7	699.2	-13.1	713.3	-27.2	751.1	-65.0	699.2	-13.1	To Be Studied
3464	Tree	677.6	640.4	37.2	670.3	7.4	699.1	-21.4	-	-	751.0	-73.3	699.1	-21.4	To Be Studied
3465	Tree	652.3	640.4	11.9	670.3	-17.9	699.0	-46.7	-	-	751.0	-98.6	699.0	-46.7	To Be Studied
3470	Pole	643.8	640.3	3.4	670.2	-26.4	698.9	-55.2	-	-	750.9	-107.1	698.9	-55.2	To Be Studied
3472	Tree	658.6	640.2	18.4	670.0	-11.4	698.7	-40.2	712.8	-54.2	750.6	-92.0	698.7	-40.2	To Be Studied
3474	Tree	678.4	640.1	38.3	669.9	8.5	698.6	-20.2	712.6	-34.3	750.5	-72.1	698.6	-20.2	To Be Studied
3476	Tree	674.5	640.0	34.5	669.8	4.7	698.5	-24.0	712.5	-38.0	750.4	-75.9	698.5	-24.0	To Be Studied
3478	Tree	666.2	640.0	26.3	669.7	-3.5	698.4	-32.2	712.4	-46.2	750.3	-84.1	698.4	-32.2	To Be Studied
3484	Pole	647.2	639.7	7.5	669.3	-22.1	698.0	-50.8	-	-	749.8	-102.6	698.0	-50.8	To Be Studied
3485	Tree	678.9	639.7	39.2	669.3	9.5	698.0	-19.1	711.9	-33.0	749.8	-70.9	698.0	-19.1	To Be Studied
3491	Pole	655.9	639.3	16.6	668.9	-13.0	697.5	-41.6	711.3	-55.4	749.2	-93.4	697.5	-41.6	To Be Studied
3492	Tree	660.5	639.3	21.2	668.9	-8.4	697.4	-36.9	711.3	-50.8	749.2	-88.7	697.4	-36.9	To Be Studied
3500	Pole	650.6	639.0	11.6	668.5	-17.9	697.0	-46.4	710.8	-60.2	748.7	-98.2	697.0	-46.4	To Be Studied
3503	Tree	642.0	638.8	3.2	668.3	-26.3	696.7	-54.7	-	-	748.5	-106.5	696.7	-54.7	To Be Studied
3512	Tree	636.7	638.5	-1.8	667.9	-31.2	696.3	-59.6	-	-	747.9	-111.3	696.3	-59.6	No Action
3517	Pole	655.0	638.4	16.6	667.7	-12.7	696.1	-41.1	709.8	-54.7	747.8	-92.7	696.1	-41.1	To Be Studied
3526	Tree	632.5	638.0	-5.5	667.3	-34.8	695.5	-63.1	-	-	747.1	-114.7	695.5	-63.1	No Action
3531	Pole	650.1	637.7	12.3	666.9	-16.9	695.1	-45.1	708.7	-58.6	746.7	-96.6	695.1	-45.1	To Be Studied
3539	Tree	649.9	637.3	12.6	666.4	-16.5	694.5	-44.6	-	-	746.0	-96.2	694.5	-44.6	To Be Studied
3541	Tree	668.6	637.1	31.5	666.2	2.5	694.2	-25.6	-	-	745.7	-77.1	694.2	-25.6	To Be Studied
3547	Tree	627.9	636.8	-9.0	665.8	-37.9	693.8	-65.9	-	-	745.3	-117.4	693.8	-65.9	No Action
3549	Pole	648.7	636.7	11.9	665.7	-17.0	693.7	-45.0	707.0	-58.4	745.1	-96.5	693.7	-45.0	To Be Studied
3551	Tree	657.5	636.6	20.9	665.5	-8.1	693.5	-36.0	-	-	744.9	-87.5	693.5	-36.0	To Be Studied
3558	Tree	670.6	636.3	34.3	665.2	5.5	693.1	-22.4	-	-	744.5	-73.9	693.1	-22.4	To Be Studied
3572	Pole	649.7	635.8	13.9	664.5	-14.8	692.3	-42.5	705.5	-55.7	743.6	-93.9	692.3	-42.5	To Be Studied
3574	Tree	669.1	635.7	33.4	664.4	4.7	692.2	-23.1	-	-	743.5	-74.4	692.2	-23.1	To Be Studied
3581	Tree	642.1	635.5	6.7	664.1	-22.0	691.8	-49.7	704.9	-62.8	743.1	-101.0	691.8	-49.7	To Be Studied
3591	Tree	659.9	635.0	24.9	663.5	-3.6	691.2	-31.2	-	-	742.4	-82.5	691.2	-31.2	To Be Studied
3595	Pole	652.5	634.8	17.7	663.2	-10.7	690.8	-38.3	703.8	-51.3	742.0	-89.5	690.8	-38.3	To Be Studied
3603	Tree	650.5	634.3	16.2	662.6	-12.1	690.1	-39.6	-	-	741.2	-90.7	690.1	-39.6	To Be Studied
3606	Tree	624.6	634.1	-9.5	662.4	-37.7	689.8	-65.1	-	-	740.9	-116.3	689.8	-65.1	No Action
3607	Tree	630.4	634.0	-3.6	662.2	-31.8	689.6	-59.2	-	-	740.7	-110.3	689.6	-59.2	No Action
3609	Tree	642.2	633.9	8.3	662.2	-19.9	689.5	-47.3	-	-	740.6	-98.4	689.5	-47.3	To Be Studied
3613	Tree	642.2	633.8	8.4	662.0	-19.8	689.4	-47.2	-	-	740.5	-98.3	689.4	-47.2	To Be Studied
3614	Pole	645.2	633.8	11.4	662.0	-16.8	689.3	-44.1	702.1	-56.9	740.4	-95.2	689.3	-44.1	To Be Studied
3617	Tree	638.2	633.7	4.4	661.9	-23.7	689.2	-51.1	-	-	740.3	-102.2	689.2	-51.1	To Be Studied
3625	Pole	645.6	633.2	12.4	661.3	-15.6	688.5	-42.9	701.2	-55.5	739.5	-93.9	688.5	-42.8	To Be Studied
3628	Tree	668.9	633.2	35.8	661.2	7.7	688.4	-19.5	-	-	739.4	-70.5	688.4	-19.5	To Be Studied
3641	Tree	663.9	632.6	31.3	660.5	3.4	687.6	-23.6	-	-	738.5	-74.6	687.6	-23.6	To Be Studied
3647	Pole	643.5	632.3	11.1	660.2	-16.7	687.2	-43.7	-	-	738.1	-94.6	687.2	-43.7	To Be Studied
3648	Tree	622.8	632.3	-9.5	660.1	-37.3	687.2	-64.3	-	-	738.0	-115.2	687.2	-64.3	No Action
3656	Pole	624.5	631.8	-7.3	659.5	-35.0	686.4	-61.9	-	-	737.3	-112.8	686.4	-61.9	No Action
3658	Pole	640.6	631.5	9.1	659.1	-18.5	685.9	-45.4	-	-	736.7	-96.2	685.9	-45.4	To Be Studied
3664	Tree	666.4	630.8	35.6	658.3	8.2	684.9	-18.5	-	-	735.6	-69.2	684.9	-18.5	To Be Studied
3666	Tree	625.1	630.7	-5.6	658.1	-33.0	684.8	-59.7	-	-	735.4	-110.3	684.8	-59.7	No Action
3670	Pole	652.0	630.4	21.6	657.7	-5.7	684.3	-32.3	-	-	735.0	-83.0	684.3	-32.3	To Be Studied
3683	Pole	635.9	629.8	6.2	657.0	-21.0	683.4	-47.5	-	-	734.0	-98.0	-	-	To Be Studied
3688	Pole	630.8	629.6	1.2	656.8	-26.0	683.2	-52.4	-	-	733.8	-102.9	683.2	-52.4	To Be Studied
3694	Tree	669.1	629.4	39.6	656.5	12.5	682.9	-13.9	-	-	733.5	-64.4	-	-	To Be Studied
3709	Pole	652.4	629.0	23.4	656.0	-3.6	-	-	-	-	732.8	-80.4	-	-	To Be Studied
3713	Tree	653.6	628.9	24.8	655.8	-2.2	682.1	-28.5	-	-	732.6	-78.9	682.1	-28.5	To Be Studied
3728	Tree	643.1	628.5	14.6	655.3	-12.2	681.5	-38.4	-	-	731.9	-88.8	681.5	-38.4	To Be Studied
3733	Tree	623.6	628.4	-4.8	655.2	-31.7	681.4	-57.8	-	-	731.8	-108.2	681.4	-57.8	No Action
3736	Pole	629.2	-	-	655.2	-26.0	-	-	-	-	-	-	-	-	No Action
3750	Tree	624.6	627.9	-3.3	654.6	-30.0	680.7	-56.1	-	-	731.0	-106.4	680.7	-56.1	No Action
3755	Tree	618.9	627.9	-9.0	654.6	-35.7	680.6	-61.7	-	-	730.9	-112.0	-	-	No Action
3758	Tree	633.3	627.7	5.6	654.4	-21.0	680.4	-47.1	-	-	730.7	-97.4	680.4	-47.1	To Be Studied
3760	Pole	665.9	-	-	654.3	11.6	-	-	-	-	-	-	-	-	To Be Studied
3780	Tree	619.0	626.8	-7.8	653.3	-34.3	679.1	-60.1	-	-	729.3	-110.3	679.1	-60.1	No Action
3786	Pole	663.2	-	-	692.0	-28.9	-	-	-	-	-	-	-	-	No Action
3801	Pole	632.0	-	-	652.2	-20.3	-	-	-	-	-	-	-	-	No Action
3807	Tree	650.2	625.7	24.4	651.9	-1.7	677.5	-27.3	-	-	727.5	-77.4	677.5	-27.3	To Be Studied
3823	Pole	624.9	624.4	0.5	650.3	-25.4	675.6	-50.7	-	-	725.5	-100.6	675.6	-50.7	To Be Studied
3825	Light Pole	625.9	624.4	1.5	650.3	-24.4	675.6	-49.7	-	-	725.5	-99.6	675.6	-49.7	To Be Studied
3830	Pole	632.7	624.0	8.6	649.8	-17.1	-	-	-	-	-	-	-	-	To Be Studied
3848	Pole	613.1	623.0	-9.9	648.6	-35.4	-	-	-	-	-	-	-	-	No Action
3859	Tree	653.2	622.7	30.5	648.1	5.1	673.0	-19.8	-	-	722.6	-69.4	673.0	-19.8	To Be Studied
3864	Tree	668.6	622.5	46.2	647.8	20.8	672.7	-4.0	-	-	722.3	-53.7	672.7	-4.0	To Be Studied
3877	Tree	631.5	622.0	9.5	647.2	-15.7	-	-	-	-	-	-	-	-	To Be Studied
3879	Tree	643.6	621.9	21.7	647.1	-3.5	671.8	-28.2	-	-	721.4	-77.8	671.8	-28.2	To Be Studied
3894	Pole	649.3	-	-	677.9	-28.6	-	-	-	-	-	-	-	-	No Action
3899	Tree	659.7	621.1	38.6	646.1	13.6	-	-	-	-	720.1	-60.4	-	-	To Be Studied
3900	Building	630.3	-	-	646.1	-15.8	-	-	-	-	-	-	-	-	No Action
3901	Tree	614.4	621.1	-6.7	646.1	-31.7	670.6	-56.2	-	-	720.1	-105.7	670.6	-56.2	No Action
3904	Tree	618.7	621.0	-2.3	646.0	-27.2	670.5	-51.8	-	-	719.9	-101.2	670.5	-51.8	No Action
3905	Tree	613.6	620.9	-7.3	645.9	-32.2	670.4	-56.8	-	-	719.8	-106.2	670.4	-56.8	No Action
3913	Tree	642.6	620.7	22.0	645.6	-3.0	670.0	-27.4	-	-	719.4	-76.8	670.0	-27.4	To Be Studied
3915	Tree	662.1	620.6	41.6	645.4	16.7	669.9	-7.7	-	-	719.3	-57.1	-	-	To Be Studied
3919	Tree	652.6	-	-	645.1	7.5	-	-	-	-	-	-	-	-	To Be Studied
3922	Tree	612.5	620.2	-7.8	645.0	-32.6	669.4	-56.9	-	-	718.7	-106.3	669.4	-56.9	No Action
3929	Tree	652.4	-	-	648.2	4.3	-	-	-	-	-	-	-	-	To Be Studied
3931	Tree	652.1	-	-	644.6	7.5	-	-	-	-	-	-	-	-	To Be Studied
3932	Tree	627.7	619.9	7.8	644.6	-16.9	-	-	-	-	718.2	-90.5	-	-	To Be Studied
3933	Tree	621.6	619.8	1.8	644.5	-22.9	668.8	-47.2	-	-	718.1	-96.5	668.8	-47.2	To Be Studied
3943	Tree	646.1	-	-	644.1	1.9	-	-	-	-	-	-	-	-	To Be Studied
3945	Tree	638.1	619.5	18.6	644.1	-6.0	668.3	-30.2	-	-	717.6	-79.5	668.3	-30.2	To Be Studied
3946	Tree	639.9	619.4	20.5	644.0	-4.1	-	-	-	-	717.4	-77.6	-	-	To Be Studied
3947	Building	637.1	619.4	17.8	644.0	-6.8	-	-	-	-	717.4	-80.3	-	-	To Be Studied
3948	Tree	650.1	-	-	645.1	4.9	-	-	-	-	-	-	-	-	To Be Studied
3950	Tree	651.6	-	-	643.8	7.8	-	-	-	-	-	-	-	-	To Be Studied
3951	Tree	649.4	-	-	643.8	5.7	-	-	-	-	-	-	-	-	To Be Studied
3952	Tree	652.0	-	-	643.8	8.2	-	-	-	-	-	-	-	-	To Be Studied
3954	Pole	630.9	-	-	643.7	-12.8	-	-	-	-	-	-	-	-	No Action
3957	Light Pole	618.2	619.1	-0.9	643.7	-25.5	667.8	-49.6	-	-	717.0	-98.8	667.8	-49.6	No Action
3958	Tree	640.6	619.1	21.4	643.6	-3.1	-	-	-	-	717.0	-76.4	-	-	To Be Studied
3964	Tree	640.9	-	-	643.6	-2.6	-	-	-	-	-	-	-	-	No Action
3966	Building	614.0	619.0	-5.0	643.5	-29.5	-	-	-	-	716.8	-102.7	-	-	No Action
3967	Tree	638.8	-	-	643.5	-4.7	-	-	-	-	-	-	-	-	No Action
3968	Tree	651.5	-	-	643.5	8.0	-	-	-	-	-	-	-	-	To Be Studied
3970	Tree	651.6	-	-	643.4	8.2	-	-	-	-	-	-	-	-	To Be Studied
3972	Tree	647.4	-	-	643.4	4.0	-	-	-	-	-	-	-	-	To Be Studied
3973	Tree	646.7	618.9	27.8	643.3	3.3	-	-	-	-	716.6	-69.9	-	-	To Be Studied
3976	Tree	641.4	-	-	643.2	-1.7	-	-	-	-	-	-	-	-	No Action
3981	Tree	624.7	618.6	6.1	643.0	-18.3	667.0	-42.3	-	-	716.2	-91.5	667.0	-42.3	To Be Studied
3993	Tree	637.1	618.5	18.6	642.8	-5.7	666.8	-29.7	-	-	715.9	-78.8	-	-	To Be Studied
3995	Tree	609.6	618.4	-8.9	642.8	-33.2	666.7	-57.2	-	-	715.9	-106.3	666.7	-57.2	No Action
3999	Fence	611.4	618.3	-6.9	642.7	-31.2	-	-	-	-	715.7	-104.3	-	-	No Action
4003	Tree	650.3	618.2	32.1	642.5	7.8	666.4	-16.1	-	-	715.5	-65.2	-	-	To Be Studied
4006	Tree	628.0	618.1	9.9	642.4	-14.4	666.3	-38.3	-	-	715.4	-87.4	-	-	To Be Studied
4011	Tree	644.8	617.9	26.9	642.1	2.7	666.0	-21.2	-	-	715.1	-70.2	-	-	To Be Studied
4018	Tree	634.6	-	-	641.8	-7.2	-	-	-	-	-	-	-	-	No Action
4024	Tree	607.9	617.5	-9.7	641.7	-33.8	665.4	-57.5	-	-	714.5	-106.6	665.4	-57.6	No Action
4025	Pole	640.7	-	-	667.5	-26.8	-	-	-	-	-	-	-	-	No Action
4027	Tree	642.5	617.4	25.1	641.5	1.0	-	-	-	-	-	-	-	-	To Be Studied
4034	Tree	630.7	617.1	13.6	641.1	-10.4	664.7	-34.1	-	-	713.7	-83.0	-	-	To Be Studied
4052	Fence	611.6	616.1	-4.6	639.9	-28.3	663.4	-51.8	-	-	712.2	-100.6	-	-	No Action
4055	Tree	634.9	616.0	18.9	639.7	-4.8	663.1	-28.3	-	-	711.9	-77.1	-	-	To Be Studied
4057	Tree	618.8	615.9	2.9	639.6	-20.8	663.0	-44.2	-	-	711.9	-93.1	663.0	-44.2	To Be Studied
4063	Tree	618.2	615.6	2.6	639.2	-21.0	662.6	-44.3	-	-	711.4	-93.1	662.6	-44.3	To Be Studied
4066	Tree	626.4	615.5	11.0	639.1	-12.6	662.4	-35.9	-	-	711.1	-84.7	-	-	To Be Studied
4070	Tree	606.1	615.2	-9.1	638.8	-32.7	662.0	-55.9	-	-	710.8	-104.6	662.0	-55.9	No Action
4071	Tree	606.7	615.2	-8.6	638.8	-32.1	662.0	-55.4	-	-	710.7	-104.1	662.0	-55.4	No Action
4072	Tree	626.0	615.2	10.7	638.8	-12.8	662.0	-36.1	-	-	710.7	-84.8	662.0	-36.1	To Be Studied
4077	Building	625.7	-	-	638.6	-12.9	-	-	-	-	-	-	-	-	No Action
4084	Tree	624.6	614.8	9.7	638.3	-13.7	661.5	-36.9	-	-	710.1	-85.6	-	-	To Be Studied
4089	Tree	608.2	614.6	-6.4	638.0	-29.8	661.1	-52.9	-	-	709.7	-101.5	661.1	-52.9	No Action
4104	Pole	640.1	-	-	658.2	-18.1	-	-	-	-	-	-	-	-	No Action
4110	Pole	640.5	-	-	651.7	-11.2	-	-	-	-	-	-	-	-	No Action
4111	Light Pole	612.2	613.9	-1.7	637.1	-24.9	660.1	-47.9	-	-	708.7	-96.5	660.1	-47.9	No Action
4113	Tree	646.6	613.9	32.7	637.1	9.5	660.1	-13.5	-	-	708.6	-62.1	660.1	-13.5	To Be Studied
4114	Tree	641.5	613.9	27.6	637.1	4.4	660.1	-18.6	-	-	708.6	-67.2	660.1	-18.6	To Be Studied
4115	Tree	630.1	613.8	16.2	637.0	-7.0	660.0	-29.9	-	-	708.6	-78.5	660.0	-29.9	To Be Studied
4116	Tree	625.9	613.8	12.1	637.0	-11.1	659.9	-34.0	-	-	708.5	-82.6	659.9	-34.0	To Be Studied
4118	Tree	643.0	613.7	29.3	636.8	6.2	659.8	-16.8	-	-	708.3	-65.3	-	-	To Be Studied
4121	Tree	623.5	613.5	10.0	636.6	-13.1	659.5	-36.0	-	-	708.0	-84.5	659.5	-36.0	To Be Studied
4126	Tree	607.1	613.4	-6.3	636.5	-29.4	659.4	-52.3	-	-	707.9	-100.8	659.4	-52.3	No Action
4133	Tree	610.8	613.2	-2.4	636.2	-25.4	-	-	-	-	-	-	-	-	No Action
4134	Tree	623.4	613.1	10.3	636.2	-12.7	659.0	-35.5	-	-	707.4	-84.0	659.0	-35.5	To Be Studied
4141	Tree	636.4	612.9	23.4	635.9	0.5	658.6	-22.3	-	-	707.1	-70.7	-	-	To Be Studied
4142	Tree	616.2	612.9	3.4	635.8	-19.6	658.6	-42.3	-	-	707.0	-90.7	658.5	-42.3	To Be Studied
4146	Fence	607.2	612.7	-5.5	635.6	-28.4	-	-	-	-	-	-	-	-	No Action
4161	Tree	602.4	612.0	-9.6	634.8	-32.3	657.3	-54.9	-	-	705.6	-103.2	657.3	-54.9	No Action
4164	Tree	639.3	612.0	27.4	634.7	4.6	657.2	-17.9	-	-	705.5	-66.2	-	-	To Be Studied
4166	Building	615.5	-	-	634.6	-19.1	-	-	-	-	-	-	-	-	No Action
4173	Building	610.6	611.6	-1.0	634.2	-23.6	-	-	-	-	705.0	-94.3	-	-	No Action
4177	Tree	632.1	611.4	20.6	634.0	-1.9	656.4	-24.4	-	-	704.7	-72.6	656.4	-24.4	To Be Studied
4185	Tree	622.9	611.2	11.8	633.7	-10.7	656.0	-33.1	-	-	704.3	-81.3	656.0	-33.1	To Be Studied

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

Runway 12R Inner Approach (Existing)

Runway 12R Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
4189	Tree	602.5	611.0	-8.5	633.5	-31.0	655.8	-53.3	-	-	704.0	-101.5	655.8	-53.3	No Action
4193	Tree	601.6	610.9	-9.3	633.3	-31.8	655.7	-54.1	-	-	703.8	-102.2	655.7	-54.1	No Action
4201	Pole	632.6	-	-	647.8	-15.2	-	-	-	-	-	-	-	-	No Action
4204	Tree	623.6	610.5	13.1	632.8	-9.2	655.1	-31.4	-	-	703.2	-79.6	-	-	To Be Studied
4206	Tree	609.9	610.4	-0.5	632.8	-22.8	655.0	-45.0	-	-	703.1	-93.2	655.0	-45.1	No Action
4213	Tree	626.5	610.2	16.3	632.5	-6.0	654.6	-28.1	-	-	702.7	-76.2	654.6	-28.1	To Be Studied
4219	Tree	619.6	610.1	9.5	632.3	-12.8	654.5	-34.9	-	-	702.5	-83.0	-	-	To Be Studied
4222	Tree	625.1	610.0	15.1	632.2	-7.2	654.4	-29.3	-	-	702.4	-77.4	-	-	To Be Studied
4223	Tree	603.4	610.0	-6.6	632.2	-28.9	654.3	-51.0	-	-	702.4	-99.0	654.3	-51.0	No Action
4224	Tree	601.6	610.0	-8.3	632.2	-30.6	654.3	-52.7	-	-	702.4	-100.7	-	-	No Action
4235	Tree	602.0	609.7	-7.7	631.8	-29.8	653.8	-51.8	-	-	701.9	-99.9	653.8	-51.8	No Action
4238	Tree	612.8	609.6	3.3	631.7	-18.9	653.7	-40.9	-	-	701.7	-88.9	653.7	-40.9	To Be Studied
4250	Tree	615.9	609.4	6.5	631.5	-15.5	653.4	-37.5	-	-	701.4	-85.5	653.4	-37.5	To Be Studied
4258	Light Pole	610.6	609.0	1.6	631.0	-20.4	652.9	-42.3	-	-	700.9	-90.2	652.9	-42.3	To Be Studied
4260	Tree	601.4	609.0	-7.7	631.0	-29.6	652.9	-51.5	-	-	700.8	-99.5	652.9	-51.5	No Action
4262	Tree	648.4	609.0	39.5	630.9	17.5	652.8	-4.4	-	-	700.8	-52.3	652.8	-4.4	To Be Studied
4265	Tree	600.3	608.9	-8.6	630.9	-30.6	652.8	-52.5	-	-	700.7	-100.4	652.8	-52.5	No Action
4266	Pole	628.8	-	-	643.2	-14.4	-	-	-	-	-	-	-	-	No Action
4267	Tree	599.6	608.8	-9.2	630.8	-31.2	652.6	-53.0	-	-	700.5	-100.9	652.6	-53.0	No Action
4269	Tree	632.9	608.8	24.1	630.7	2.1	652.6	-19.7	-	-	700.5	-67.6	-	-	To Be Studied
4271	Tree	620.6	608.8	11.9	630.7	-10.1	652.5	-31.9	-	-	700.4	-79.8	652.5	-31.9	To Be Studied
4273	Tree	614.7	608.7	5.9	630.7	-16.0	652.5	-37.8	-	-	700.4	-85.7	652.5	-37.8	To Be Studied
4282	Tree	622.6	608.4	14.1	630.3	-7.7	652.0	-29.5	-	-	699.9	-77.3	-	-	To Be Studied
4283	Tree	609.9	608.4	1.6	630.2	-20.3	651.9	-42.0	-	-	699.8	-89.9	-	-	To Be Studied
4301	Tree	608.1	607.7	0.4	629.3	-21.2	650.9	-42.8	-	-	698.7	-90.6	650.9	-42.8	To Be Studied
4305	Tree	601.2	607.5	-6.3	629.1	-27.9	650.7	-49.5	-	-	698.4	-97.2	-	-	No Action
4315	Pole	623.3	-	-	637.9	-14.7	-	-	-	-	-	-	-	-	No Action
4316	Tree	628.8	607.1	21.7	628.7	0.1	650.1	-21.3	-	-	697.8	-69.0	-	-	To Be Studied
4322	Tree	612.1	607.1	5.1	628.6	-16.4	650.0	-37.9	-	-	697.7	-85.6	650.0	-37.9	To Be Studied
4324	Tree	608.2	606.9	1.2	628.4	-20.2	649.8	-41.7	-	-	697.5	-89.3	649.8	-41.7	To Be Studied
4326	Tree	599.4	606.9	-7.4	628.3	-28.9	649.7	-50.3	-	-	697.4	-98.0	649.7	-50.3	No Action
4328	Pole	602.6	606.7	-4.1	628.1	-25.5	649.5	-46.9	-	-	697.2	-94.6	649.5	-46.9	No Action
4339	Tree	610.9	606.2	4.7	627.5	-16.6	648.8	-37.8	-	-	696.4	-85.4	-	-	To Be Studied
4340	Tree	622.2	606.2	16.0	627.5	-5.3	648.8	-26.6	-	-	696.4	-74.2	-	-	To Be Studied
4341	Tree	613.0	606.2	6.8	627.5	-14.5	648.8	-35.7	-	-	696.3	-83.3	648.8	-35.7	To Be Studied
4342	Tree	643.0	606.2	36.8	627.4	15.6	648.7	-5.7	-	-	696.3	-53.3	-	-	To Be Studied
4349	Tree	628.3	605.9	22.4	627.1	1.2	648.3	-20.0	-	-	695.9	-67.6	648.3	-20.0	To Be Studied
4359	Tree	642.4	605.6	36.8	626.7	15.7	647.8	-5.4	-	-	695.3	-52.9	-	-	To Be Studied
4361	Tree	649.6	605.5	44.1	626.6	23.0	647.7	1.9	-	-	695.2	-45.6	-	-	To Be Studied
4363	Tree	619.8	605.4	14.4	626.5	-6.7	647.6	-27.8	-	-	695.1	-75.3	-	-	To Be Studied
4369	Tree	607.8	605.3	2.5	626.3	-18.5	647.4	-39.6	-	-	694.9	-87.1	-	-	To Be Studied
4370	Pole	623.9	-	-	631.9	-8.0	-	-	-	-	-	-	-	-	No Action
4371	Tree	647.7	605.2	42.5	626.2	21.4	647.3	0.4	-	-	694.7	-47.1	647.3	0.4	To Be Studied
4372	Tree	638.7	605.2	33.5	626.2	12.5	647.3	-8.5	-	-	694.7	-56.0	647.3	-8.5	To Be Studied
4375	Pole	650.6	-	-	684.6	-34.1	-	-	-	-	-	-	-	-	No Action
4376	Tree	617.7	605.0	12.7	626.0	-8.3	647.0	-29.3	-	-	694.5	-76.8	647.0	-29.3	To Be Studied
4379	Pole	619.0	604.9	14.0	625.9	-7.0	-	-	-	-	-	-	-	-	To Be Studied
4380	Tree	616.7	604.9	11.8	625.9	-9.2	646.9	-30.2	-	-	694.3	-77.6	646.9	-30.2	To Be Studied
4382	Tree	606.8	604.9	2.0	625.8	-19.0	646.8	-40.0	-	-	694.2	-87.4	646.8	-40.0	To Be Studied
4383	Tree	611.2	-	-	625.8	-14.6	-	-	-	-	-	-	-	-	No Action
4384	Pole	616.1	604.8	11.3	625.7	-9.6	646.7	-30.6	-	-	694.1	-78.0	646.7	-30.6	To Be Studied
4385	Tree	596.6	604.8	-8.2	625.7	-29.1	-	-	-	-	-	-	-	-	No Action
4388	Tree	611.6	604.6	7.0	625.5	-13.9	646.4	-34.9	-	-	693.8	-82.2	646.4	-34.9	To Be Studied
4390	Tree	643.9	604.6	39.3	625.5	18.5	646.4	-2.5	-	-	693.8	-49.9	646.4	-2.5	To Be Studied
4395	Tree	633.8	604.3	29.5	625.1	8.7	646.0	-12.1	-	-	693.3	-59.5	-	-	To Be Studied
4396	Tree	596.0	604.3	-8.3	625.0	-29.1	645.9	-49.9	-	-	693.2	-97.3	645.9	-49.9	No Action
4397	Tree	598.8	604.2	-5.4	625.0	-26.2	645.9	-47.0	-	-	693.2	-94.4	645.9	-47.0	No Action
4412	Tree	615.3	603.4	11.9	624.0	-8.7	644.7	-29.3	-	-	691.9	-76.6	-	-	To Be Studied
4413	Tree	617.6	603.3	14.3	623.9	-6.3	644.6	-26.9	-	-	691.8	-74.1	-	-	To Be Studied
4414	Pole	637.0	603.3	33.7	623.9	13.1	-	-	-	-	-	-	-	-	To Be Studied
4415	Tree	595.4	603.3	-7.9	623.8	-28.5	-	-	-	-	-	-	-	-	No Action
4416	Tree	594.8	603.3	-8.5	623.8	-29.0	644.5	-49.7	-	-	691.7	-96.9	644.5	-49.7	No Action
4419	Tree	609.0	603.2	5.8	623.7	-14.7	644.4	-35.4	-	-	691.6	-82.6	644.4	-35.4	To Be Studied
4421	Fence	596.3	603.1	-6.9	623.6	-27.4	-	-	-	-	-	-	-	-	No Action
4423	Light Pole	613.9	603.1	10.8	623.6	-9.7	644.2	-30.3	-	-	691.4	-77.5	644.2	-30.3	To Be Studied
4424	Tree	609.4	603.1	6.4	623.5	-14.1	644.1	-34.7	-	-	691.3	-81.9	-	-	To Be Studied
4426	Tree	595.3	603.0	-7.7	623.5	-28.2	644.1	-48.8	-	-	691.3	-96.0	644.1	-48.8	No Action
4429	Tree	624.4	602.9	21.5	623.4	1.0	-	-	-	-	-	-	-	-	To Be Studied
4430	Tree	615.5	602.9	12.6	623.4	-7.9	643.9	-28.4	-	-	691.1	-75.6	-	-	To Be Studied
4432	Tree	596.7	602.8	-6.0	623.2	-26.5	643.7	-47.0	-	-	690.9	-94.1	-	-	No Action
4436	Tree	614.0	602.6	11.4	623.0	-9.0	643.5	-29.5	-	-	690.6	-76.6	643.5	-29.5	To Be Studied
4437	Tree	627.4	602.6	24.8	623.0	4.5	-	-	-	-	-	-	-	-	To Be Studied
4440	Tree	606.2	602.6	3.6	622.9	-16.8	643.4	-37.2	-	-	690.5	-84.4	-	-	To Be Studied
4442	Pole	625.8	-	-	625.6	0.2	-	-	-	-	-	-	-	-	To Be Studied
4454	Tree	619.2	602.3	16.9	622.6	-3.4	643.0	-23.8	-	-	690.1	-70.9	643.0	-23.8	To Be Studied
4459	Fence	597.2	602.1	-4.9	622.3	-25.1	-	-	-	-	-	-	-	-	No Action
4460	Tree	637.2	602.1	35.2	622.3	14.9	642.7	-5.5	-	-	689.8	-52.5	-	-	To Be Studied
4461	Tree	606.3	602.1	4.2	622.3	-16.0	642.7	-36.4	-	-	689.7	-83.5	642.7	-36.4	To Be Studied
4465	Tree	598.7	602.0	-3.3	622.2	-23.5	642.6	-43.9	-	-	689.6	-90.9	-	-	No Action
4466	Tree	632.7	601.9	30.7	622.2	10.5	-	-	-	-	-	-	-	-	To Be Studied
4480	Tree	597.0	601.5	-4.6	621.7	-24.7	641.9	-45.0	-	-	688.9	-92.0	-	-	No Action
4485	Tree	636.3	601.5	34.8	621.6	14.7	-	-	-	-	-	-	-	-	To Be Studied
4497	Tree	628.6	601.1	27.5	621.1	7.5	-	-	-	-	-	-	-	-	To Be Studied
4498	Fence	596.9	601.1	-4.2	621.1	-24.1	-	-	-	-	-	-	-	-	No Action
4504	Tree	627.0	600.9	26.1	620.8	6.1	641.0	-14.0	-	-	687.9	-60.9	-	-	To Be Studied
4510	Tree	618.0	600.8	17.2	620.7	-2.7	-	-	-	-	-	-	-	-	To Be Studied
4511	Tree	622.1	600.7	21.4	620.6	1.5	640.6	-18.5	-	-	687.5	-65.4	-	-	To Be Studied
4512	Tree	600.1	600.7	-0.5	620.6	-20.4	640.6	-40.5	-	-	687.5	-87.4	640.6	-40.5	No Action
4527	Tree	640.5	600.4	40.1	620.2	20.2	640.2	0.2	-	-	687.1	-46.6	-	-	To Be Studied
4529	Fence	598.0	600.4	-2.4	620.2	-22.2	-	-	-	-	-	-	-	-	No Action
4532	Tree	595.0	600.3	-5.3	620.1	-25.1	640.1	-45.1	-	-	686.9	-92.0	-	-	No Action
4533	Tree	625.1	600.3	24.8	620.1	5.0	640.0	-15.0	-	-	686.9	-61.8	-	-	To Be Studied
4536	Pole	629.9	-	-	647.3	-17.4	-	-	-	-	-	-	-	-	No Action
4541	Pole	603.5	600.1	3.4	619.9	-16.4	639.8	-36.3	-	-	686.7	-83.1	639.8	-36.3	To Be Studied
4546	Tree	634.6	600.0	34.5	619.8	14.8	639.7	-5.1	-	-	686.5	-51.9	-	-	To Be Studied
4547	Tree	625.0	600.0	25.0	619.8	5.3	639.7	-14.7	-	-	686.5	-61.5	-	-	To Be Studied
4548	Fence	598.9	600.0	-1.1	619.7	-20.9	-	-	-	-	-	-	-	-	No Action
4552	Tree	612.0	599.9	12.1	619.6	-7.6	-	-	-	-	-	-	-	-	To Be Studied
4556	Tree	635.1	599.8	35.4	619.4	15.7	639.3	-4.2	-	-	686.1	-50.9	-	-	To Be Studied
4558	Tree	628.7	599.7	29.0	619.4	9.3	639.2	-10.5	-	-	686.0	-57.3	639.2	-10.5	To Be Studied
4560	Tree	631.3	599.7	31.7	619.3	12.0	-	-	-	-	-	-	-	-	To Be Studied
4563	Tree	629.1	599.7	29.4	619.3	9.8	-	-	-	-	-	-	-	-	To Be Studied
4569	Tree	628.5	599.4	29.1	619.0	9.5	638.8	-10.3	-	-	-	-	-	-	To Be Studied
4576	Tree	620.9	599.4	21.5	619.0	1.9	638.7	-17.9	-	-	685.5	-64.6	638.7	-17.9	To Be Studied
4579	Tree	609.0	599.3	9.6	618.9	-9.9	638.6	-29.7	-	-	685.3	-76.4	-	-	To Be Studied
4582	Pole	631.8	-	-	657.7	-25.9	-	-	-	-	-	-	-	-	No Action
4583	Tree	636.9	599.3	37.7	618.8	18.1	638.5	-1.6	-	-	685.2	-48.3	-	-	To Be Studied
4587	Tree	639.9	599.2	40.7	618.7	21.2	638.5	1.4	-	-	685.2	-45.3	-	-	To Be Studied
4589	Pole	626.0	599.2	26.8	618.7	7.3	-	-	-	-	-	-	-	-	To Be Studied
4591	Tree	606.8	599.2	7.7	618.7	-11.9	638.4	-31.6	-	-	685.1	-78.3	-	-	To Be Studied
4597	Traffic Light/Signal	617.0	-	-	633.2	-16.2	-	-	-	-	-	-	-	-	No Action
4599	Tree	601.8	599.0	2.8	618.5	-16.7	638.2	-36.4	-	-	684.8	-83.0	-	-	To Be Studied
4603	Pole	620.5	598.9	21.5	618.4	2.1	-	-	-	-	-	-	-	-	To Be Studied
4605	Tree	614.9	598.9	16.0	618.3	-3.5	638.0	-23.1	-	-	684.7	-69.8	638.0	-23.1	To Be Studied
4612	Street Sign	605.6	-	-	648.8	-43.2	-	-	-	-	-	-	-	-	No Action
4624	Tree	589.4	598.6	-9.2	618.0	-28.6	-	-	-	-	-	-	-	-	No Action
4628	Tree	613.4	598.5	14.8	617.9	-4.5	637.5	-24.1	-	-	684.1	-70.7	-	-	To Be Studied
4629	Tree	590.0	598.5	-8.5	617.9	-27.9	-	-	-	-	-	-	-	-	No Action
4631	Tree	607.6	598.4	9.2	617.8	-10.1	637.3	-29.7	-	-	683.9	-76.3	637.3	-29.7	To Be Studied
4632	Tree	603.1	598.4	4.7	617.8	-14.7	637.3	-34.2	-	-	683.9	-80.8	637.3	-34.2	To Be Studied
4633	Tree	615.5	-	-	622.6	-7.1	-	-	-	-	-	-	-	-	No Action
4635	Tree	596.3	598.3	-2.1	617.7	-21.4	637.2	-40.9	-	-	683.8	-87.5	-	-	No Action
4641	Traffic Light/Signal	617.1	-	-	624.1	-7.0	-	-	-	-	-	-	-	-	No Action
4646	Tree	619.3	598.1	21.2	617.4	1.9	-	-	-	-	-	-	-	-	To Be Studied
4649	Tree	636.4	598.0	38.4	617.2	19.2	-	-	-	-	-	-	-	-	To Be Studied
4651	Tree	627.2	598.0	29.2	617.2	10.0	636.6	-9.4	-	-	683.2	-56.0	-	-	To Be Studied
4653	Tree	620.6	597.9	22.7	617.1	3.5	-	-	-	-	-	-	-	-	To Be Studied
4654	Street Sign	593.4	597.9	-4.5	617.1	-23.7	636.6	-43.1	-	-	683.1	-89.7	636.6	-43.1	No Action
4655	Tree	590.9	597.8	-7.0	617.0	-26.1	636.5	-45.6	-	-	683.0	-92.1	-	-	No Action
4658	Tree	624.9	597.8	27.1	617.0	8.0	636.4	-11.5	-	-	682.9	-58.0	636.4	-11.5	To Be Studied
4659	Traffic Light/Signal	612.7	-	-	643.5	-30.8	-	-	-	-	-	-	-	-	No Action
4661	Street Sign	593.1	597.8	-4.7	616.9	-23.9	636.4	-43.3	-	-	682.9	-89.8	636.4	-43.3	No Action
4665	Tree	602.8	597.7	5.1	616.8	-14.1	-	-	-	-	-	-	-	-	To Be Studied
4668	Tree	595.9	597.7	-1.8	616.8	-20.9	-	-	-	-	-	-	-	-	No Action
4670	Tree	632.9	597.6	35.3	616.8	16.1	636.2	-3.3	-	-	682.6	-49.8	-	-	To Be Studied
4671	Tree	592.5	597.6	-5.1	616.7	-24.2	-	-	-	-	-	-	-	-	No Action
4672	Tree	608.7	597.5	11.1	616.6	-8.0	-	-	-	-	-	-	-	-	To Be Studied
4675	Tree	630.8	597.5	33.4	616.5	14.3	-	-	-	-	-	-	-	-	To Be Studied
4676	Tree	601.6	597.5	4.1	616.5	-14.9	635.9	-34.3	-	-	682.4	-80.8	635.9	-34.3	To Be Studied
4677	Tree	643.5	597.4	46.1	616.5	27.0	635.8	7.7	-	-	682.3	-38.8	-	-	To Be Studied
4680	Billboard	603.8	-	-	641.8	-38.0	-	-	-	-	-	-	-	-	No Action
4688	Tree	635.1	597.2	37.9	616.2	18.9	-	-	-	-	-	-	-	-	To Be Studied
4689	Light Pole	620.4	597.2	23.3	616.2	4.3	635.5	-15.0	-	-	681.9	-61.5	635.5	-15.0	To Be Studied
4690	Tree	589.9	597.2	-7.2	616.2	-26.2	-	-	-	-	-	-	-	-	No Action
4691	Tree	612.8	597.2	15.7	616.2	-3.4	635.5	-22.6	-	-	681.9	-69.1	635.5	-22.6	To Be Studied
4695	Tree	590.4	597.0	-6.6	616.0	-25.6	635.3	-44.9	-	-	-	-	-	-	No Action
4697	Tree	603.6	596.9	6.7	615.8	-12.2	-	-	-	-	-	-	-	-	To Be Studied
4698	Tree	639.3	596.9	42.4	615.8	23.5	635.0	4.2	-	-	681.4	-42.2	-	-	To Be Studied
4703	Tree	591.5	596.7	-5.3	615.7	-24.2	-	-	-	-	-	-	-	-	No Action
4704	Tree	630.9	596.7	34.2	615.6	15.3	634.8	-3.9	-	-	681.1	-50.3	-	-	To Be Studied
4707	Tree	590.5	596.6	-6.1	615.5	-25.0	-	-	-	-	-	-	-	-	No Action
4712	Tree	624.4	596.5	27.9	615.3	9.0	634.5	-10.1	-	-	680.8	-56.5	-	-	To Be Studied
4713	Tree	628.9	596.5	32.4	615.3	13.6	634.5	-5.6	-	-	680.8	-51.9	-	-	To Be Studied
4717	Tree	591.8	596.4	-4.6	615.2	-23.4	634.3	-42.5	-	-	-	-	-	-	No Action
4719	Street Sign	604.2	596.3	7.9	615.2	-11.0	-	-	-	-	-	-	-	-	To Be Studied
4724	Street Sign	604.9	596.2	8.7	615.0	-10.0	-	-	-	-	-	-	-	-	To Be Studied
4726	Tree	613.5	596.2	17.4	614.9	-1.4	-	-	-	-	-	-	-	-	To Be Studied
4728	Tree	605.2	596.1	9.2	614.8	-9.6	-	-	-	-	-	-	-	-	To Be Studied
4735	Tree	627.8	595.9	31.9	614.6	13.2	633.6	-5.8	-	-	679.9	-52.1	-	-	To Be Studied
4737	Tree	587.3	595.8	-8.5	614.5	-27.2	-	-	-	-	-	-	-	-	No Action
4739	Tree	631.8	595.8	36.0	614.4	17.3	633.4	-1.6	-	-	679.7	-47.9	-	-	To Be Studied
4741	Tree	607.7	595.7	12.0	614.4	-6.7	633.4	-25.7	-	-	679.6	-71.9	-	-	To Be Studied
4744	Tree	591.4	595.6	-4.2	614.3	-22.9	-	-	-	-	-	-	-	-	No Action
4746	Tree	619.1	595.6	23.5	614.2	4.9	-	-	-	-	-	-	-	-	To Be Studied
4748	Billboard	604.2	-	-	635.0	-30.8	-	-	-	-	-	-	-	-	No Action
4750	Tree	611.6	595.4	16.2	614.0	-2.3	-	-	-	-	-	-	-	-	To Be Studied
4752	Bridge	602.6	595.3	7.3	613.9	-11.2	-	-	-	-	-	-	-	-	To Be Studied
4762	Tree	627.3	595.0	32.3	613.4	13.9	632.2	-5.0	-	-	678.4	-51.1	-	-	To Be Studied
4765	Tree	608.5	594.9	13.6	613.3	-4.9	632.1	-23.6	-	-	678.2	-69.8	-	-	To Be Studied
4767	Tree	615.0	594.7	20.3	613.1	1.9	631.9	-16.9	-	-	678.0	-63.0	-	-	To Be Studied
4768	Tree	605.5	594.7	10.8	613.1	-7.6	631.8	-26.3	-	-	677.9	-72.5	-	-	To Be Studied
4773	Bridge	604.0	-	-	628.0	-24.0	-	-	-	-	-	-	-	-	No Action
4774	Tree	605.0	594.3	10.7	612.6	-7.6	631.2	-26.2	-	-	677.3	-72.3	-	-	To Be Studied
4778	Street Sign	604.8	594.1	10.7	625.1	-20.3	-	-	-	-	-	-	-	-	To Be Studied
4779	Tree	637.7	594.0	43.7	612.3	25.4	630.9	6.8	-	-	676.9	-39.2	-	-	To Be Studied
4780	Tree	619.1	593.9	25.2	612.1	7.0	630.7	-11.6	-	-	676.7	-57.6	-	-	To Be Studied
4783	Tree	621.8	593.7	28.1	611.9	9.9	630.4	-8.6	-	-	676.4	-54.6	-	-	To Be Studied
4784	Tree	608.7	593.7	15.0	611.8	-3.1	630.3	-21.6	-	-	676.3	-67.6	-	-	To Be Studied
4786	Tree	618.3	593.5	24.8	611.6	6.7	630.1	-11.8	-	-	676.1	-57.8	-	-	To Be Studied
4787	Tree	635.8	593.5	42.3	611.6	24.2	630.1	5.7	-	-	676.0	-40.3	-	-	To Be Studied
4788	Tree	621.5	593.3	28.3	611.3	10.2	629.7	-8.2	-	-	675.7	-54.2	-	-	To Be Studied
4790	Tree	591.1	593.2	-2.0	611.2	-20.0	629.6	-38.5	-	-	-	-	-	-	No Action

Runway 12R Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
4793	Tree	594.6	592.8	1.8	610.8	-16.2	629.1	-34.5	-	-	-	-	-	-	To Be Studied
4796	Street Sign	601.3	592.7	8.7	610.5	-9.2	628.8	-27.5	-	-	674.7	-73.4	-	-	To Be Studied
4797	Tree	619.6	592.5	27.1	610.3	9.3	628.6	-9.0	-	-	674.4	-54.8	-	-	To Be Studied
4798	Bridge	602.8	592.4	10.4	610.2	-7.4	-	-	-	-	-	-	-	-	To Be Studied
4801	Street Sign	602.0	592.3	9.7	610.1	-8.1	628.3	-26.3	-	-	674.1	-72.1	-	-	To Be Studied
4802	Tree	604.1	592.1	12.0	609.9	-5.8	628.1	-24.0	-	-	673.9	-69.8	-	-	To Be Studied
4804	Tree	606.2	591.9	14.4	609.6	-3.3	627.7	-21.5	-	-	-	-	-	-	To Be Studied
4805	Bridge	601.3	591.8	9.5	621.6	-20.3	-	-	-	-	-	-	-	-	To Be Studied
4810	Misc	601.0	591.5	9.5	609.1	-8.1	627.1	-26.1	-	-	672.9	-71.8	-	-	To Be Studied
4818	Street Sign	602.9	590.7	12.2	608.1	-5.2	626.0	-23.1	-	-	-	-	-	-	To Be Studied
4821	Pole	608.6	590.5	18.0	607.9	0.7	625.7	-17.1	-	-	-	-	-	-	To Be Studied
4824	Vertical Point	596.5	589.9	6.5	607.1	-10.7	624.8	-28.4	-	-	670.3	-73.9	-	-	To Be Studied
4829	Tree	592.2	589.5	2.7	625.0	-32.8	-	-	-	-	-	-	-	-	To Be Studied
4834	Bridge	597.4	589.2	8.3	615.5	-18.0	-	-	-	-	-	-	-	-	To Be Studied
4836	Traffic Light/Signal	612.9	589.1	23.8	606.2	6.8	-	-	-	-	-	-	-	-	To Be Studied
4837	Traffic Light/Signal	611.9	589.0	22.9	606.0	5.9	623.5	-11.6	-	-	-	-	-	-	To Be Studied
4838	Tree	603.6	588.9	14.7	621.4	-17.8	-	-	-	-	-	-	-	-	To Be Studied
4840	Tree	619.7	-	-	632.9	-13.1	-	-	-	-	-	-	-	-	No Action
4842	Street Sign	598.2	588.8	9.4	611.8	-13.6	-	-	-	-	-	-	-	-	To Be Studied
4845	Pole	605.4	588.4	16.9	612.5	-7.2	-	-	-	-	-	-	-	-	To Be Studied
4846	Tree	598.4	588.4	10.0	630.5	-32.1	-	-	-	-	-	-	-	-	To Be Studied
4858	Pole	604.1	587.6	16.5	610.5	-6.3	-	-	-	-	-	-	-	-	To Be Studied
4862	Street Sign	593.8	587.5	6.4	604.1	-10.2	621.3	-27.4	-	-	666.5	-72.6	-	-	To Be Studied
4880	Tree	601.1	586.3	14.7	632.3	-31.3	-	-	-	-	-	-	-	-	To Be Studied
4881	Tree	612.8	586.3	26.4	628.4	-15.7	-	-	-	-	-	-	-	-	To Be Studied
4882	Tree	609.0	586.3	22.7	619.5	-10.6	-	-	-	-	-	-	-	-	To Be Studied
4887	Tree	604.5	586.0	18.6	622.5	-18.0	-	-	-	-	-	-	-	-	To Be Studied
4890	Tree	599.1	585.8	13.3	631.2	-32.1	-	-	-	-	-	-	-	-	To Be Studied
4893	Tree	600.1	585.7	14.4	622.4	-22.3	-	-	-	-	-	-	-	-	To Be Studied
4894	Tree	596.1	585.6	10.5	618.1	-22.0	-	-	-	-	-	-	-	-	To Be Studied
4901	Tree	601.1	585.4	15.7	629.0	-27.9	-	-	-	-	-	-	-	-	To Be Studied
4909	Tree	604.8	585.2	19.6	617.4	-12.6	-	-	-	-	-	-	-	-	To Be Studied
4910	Tree	600.9	585.1	15.8	631.9	-30.9	-	-	-	-	-	-	-	-	To Be Studied
4915	Tree	599.8	585.1	14.8	627.6	-27.8	-	-	-	-	-	-	-	-	To Be Studied
4921	Tree	594.9	584.9	10.0	624.2	-29.3	-	-	-	-	-	-	-	-	To Be Studied
4925	Tree	598.6	584.7	13.8	629.3	-30.7	-	-	-	-	-	-	-	-	To Be Studied
4927	Tree	602.6	584.7	17.9	614.9	-12.3	-	-	-	-	-	-	-	-	To Be Studied
4929	Tree	592.7	584.6	8.1	622.1	-29.4	-	-	-	-	-	-	-	-	To Be Studied
4931	Tree	622.9	-	-	637.2	-14.2	-	-	-	-	-	-	-	-	No Action
4935	Tree	596.6	584.4	12.2	626.6	-29.9	-	-	-	-	-	-	-	-	To Be Studied
4936	Tree	601.3	584.4	16.9	617.9	-16.6	-	-	-	-	-	-	-	-	To Be Studied
4943	Tree	592.7	584.1	8.6	617.6	-25.0	-	-	-	-	-	-	-	-	To Be Studied
4954	Tree	593.4	583.7	9.7	625.4	-32.0	-	-	-	-	-	-	-	-	To Be Studied
4959	Tree	599.3	583.5	15.8	633.4	-34.1	-	-	-	-	-	-	-	-	To Be Studied
4960	Tree	597.4	583.5	13.8	617.1	-19.8	-	-	-	-	-	-	-	-	To Be Studied
4966	Tree	600.8	583.4	17.4	629.1	-28.3	-	-	-	-	-	-	-	-	To Be Studied
4969	Tree	591.9	583.3	8.6	618.9	-26.9	-	-	-	-	-	-	-	-	To Be Studied
4973	Tree	595.6	583.2	12.4	615.2	-19.5	-	-	-	-	-	-	-	-	To Be Studied
4978	Tree	596.9	583.1	13.8	627.2	-30.3	-	-	-	-	-	-	-	-	To Be Studied
4980	Tree	599.8	583.1	16.8	633.9	-34.1	-	-	-	-	-	-	-	-	To Be Studied
4986	Tree	598.8	582.9	16.0	620.4	-21.5	-	-	-	-	-	-	-	-	To Be Studied
4992	Tree	591.7	582.7	9.0	615.8	-24.2	-	-	-	-	-	-	-	-	To Be Studied
4993	Tree	617.3	582.7	34.6	632.6	-15.3	-	-	-	-	-	-	-	-	To Be Studied
4994	Tree	603.0	582.7	20.4	624.0	-21.0	-	-	-	-	-	-	-	-	To Be Studied
5005	Tree	588.4	582.3	6.2	619.9	-31.5	-	-	-	-	-	-	-	-	To Be Studied
5007	Tree	587.7	582.2	5.5	613.7	-26.0	-	-	-	-	-	-	-	-	To Be Studied
5008	Tree	601.3	582.2	19.1	630.0	-28.7	-	-	-	-	-	-	-	-	To Be Studied
5015	Tree	600.3	582.0	18.3	634.3	-34.0	-	-	-	-	-	-	-	-	To Be Studied
5018	Tree	583.5	582.0	1.5	620.2	-36.7	-	-	-	-	-	-	-	-	To Be Studied
5025	Tree	592.4	581.8	10.6	633.7	-41.3	-	-	-	-	-	-	-	-	To Be Studied
5026	Tree	601.8	581.8	20.0	626.0	-24.1	-	-	-	-	-	-	-	-	To Be Studied
5034	Tree	588.2	581.6	6.6	631.0	-42.8	-	-	-	-	-	-	-	-	To Be Studied
5037	Tree	593.9	581.5	12.4	626.6	-32.7	-	-	-	-	-	-	-	-	To Be Studied
5044	Tree	592.4	581.3	11.1	632.1	-39.7	-	-	-	-	-	-	-	-	To Be Studied
5046	Tree	600.8	581.2	19.7	635.8	-34.9	-	-	-	-	-	-	-	-	To Be Studied
5061	Billboard	574.2	580.8	-6.5	613.1	-38.9	-	-	-	-	-	-	-	-	No Action
5075	Tree	574.7	580.1	-5.4	632.7	-57.9	-	-	-	-	-	-	-	-	No Action
5077	Tree	576.9	580.0	-3.1	637.1	-60.1	-	-	-	-	-	-	-	-	No Action
5085	Tree	574.5	579.7	-5.3	634.5	-60.1	-	-	-	-	-	-	-	-	No Action
5088	Tree	577.1	579.6	-2.5	634.3	-57.3	-	-	-	-	-	-	-	-	No Action
5093	Street Sign	573.4	579.2	-5.8	593.8	-20.3	609.1	-35.7	-	-	653.3	-79.8	-	-	No Action
5095	Tree	574.8	579.1	-4.3	637.0	-62.2	-	-	-	-	-	-	-	-	No Action
5099	Tree	573.6	578.8	-5.2	639.9	-66.3	-	-	-	-	-	-	-	-	No Action
5108	Tree	569.6	578.3	-8.7	640.4	-70.8	-	-	-	-	-	-	-	-	No Action
5137	Runway Light	572.7	576.2	-3.5	589.9	-17.3	604.6	-31.9	606.1	-33.4	648.4	-75.7	604.6	-31.9	Fixed by Function
5146	Tree	567.3	575.4	-8.1	588.9	-21.7	603.4	-36.2	-	-	647.1	-79.8	603.4	-36.2	No Action
5156	Tree	570.8	574.4	-3.6	587.7	-16.9	602.0	-31.2	-	-	645.6	-74.7	602.0	-31.2	No Action
5173	Street Sign	568.3	572.8	-4.4	627.0	-58.7	-	-	-	-	-	-	-	-	No Action
5179	Runway Light	571.8	572.4	-0.6	585.2	-13.4	599.0	-27.2	599.7	-28.0	642.3	-70.5	599.0	-27.2	Fixed by Function
5181	Pole	586.2	571.9	14.2	609.4	-23.2	598.3	-12.2	-	-	-	-	-	-	To Be Studied
5183	Tree	570.1	571.8	-1.7	615.7	-45.6	598.2	-28.1	-	-	-	-	-	-	No Action
5184	Tree	567.0	571.8	-4.8	628.6	-61.6	-	-	-	-	-	-	-	-	No Action
5185	Tree	566.1	571.7	-5.6	609.3	-43.2	598.0	-31.9	-	-	-	-	-	-	No Action
5188	Tree	563.5	571.5	-8.0	626.9	-63.4	-	-	-	-	-	-	-	-	No Action
5191	Tree	583.6	571.3	12.2	620.4	-36.8	597.5	-13.9	-	-	-	-	-	-	To Be Studied
5193	Pole	564.1	571.0	-6.9	592.1	-27.9	597.0	-32.9	-	-	640.1	-76.0	-	-	No Action
5194	Tree	570.7	571.0	-0.2	620.3	-49.6	596.9	-26.2	-	-	-	-	-	-	No Action
5195	Fence	562.3	570.9	-8.6	618.0	-55.7	596.9	-34.6	-	-	-	-	-	-	No Action
5197	Tree	574.7	570.7	4.0	621.6	-47.0	596.5	-21.8	-	-	-	-	-	-	To Be Studied
5200	Tree	568.1	570.4	-2.3	621.5	-53.4	596.1	-28.1	-	-	-	-	-	-	No Action
5201	Tree	568.5	570.2	-1.8	624.5	-56.0	-	-	-	-	-	-	-	-	No Action
5202	Tree	587.4	570.1	17.3	637.4	-50.0	-	-	-	-	-	-	-	-	To Be Studied
5204	Tree	570.4	570.1	0.2	624.3	-53.9	-	-	-	-	-	-	-	-	To Be Studied
5205	Tree	565.5	569.9	-4.4	627.3	-61.8	-	-	-	-	-	-	-	-	No Action
5206	Tree	567.0	569.7	-2.6	627.7	-60.7	-	-	-	-	-	-	-	-	No Action
5208	Tree	568.8	569.2	-0.4	631.4	-62.6	-	-	-	-	-	-	-	-	No Action
5211	Runway Light	571.8	568.8	3.0	580.7	-8.9	593.7	-22.0	593.7	-22.0	636.5	-64.8	593.7	-22.0	Fixed by Function
5212	Tree	565.6	568.7	-3.1	632.6	-67.0	-	-	-	-	-	-	-	-	No Action
5214	Tree	575.9	568.1	7.8	636.5	-60.7	-	-	-	-	-	-	-	-	To Be Studied
5217	Tree	573.4	567.8	5.5	638.5	-65.1	-	-	-	-	-	-	-	-	To Be Studied
5219	Tree	572.6	567.4	5.3	642.4	-69.8	-	-	-	-	-	-	-	-	To Be Studied
5222	Tree	565.4	567.2	-1.8	647.0	-81.6	-	-	-	-	-	-	-	-	No Action
5223	Tree	560.7	567.2	-6.5	638.3	-77.7	-	-	-	-	-	-	-	-	No Action
5224	Tree	564.9	566.9	-2.0	646.0	-81.1	-	-	-	-	-	-	-	-	No Action
5225	Tree	577.7	566.6	11.1	649.6	-71.9	-	-	-	-	-	-	-	-	To Be Studied
5226	Tree	566.4	566.4	0.0	644.8	-78.3	-	-	-	-	-	-	-	-	To Be Studied
5228	Tree	572.8	566.1	6.7	648.1	-75.3	-	-	-	-	-	-	-	-	To Be Studied
5233	Tree	564.5	565.7	-1.1	648.6	-84.0	-	-	-	-	-	-	-	-	No Action
5238	Runway Light	570.0	565.2	4.8	576.1	-6.1	588.4	-18.4	587.7	-17.7	630.8	-60.8	588.4	-18.4	Fixed by Function
5246	Street Sign	557.9	563.8	-5.9	574.5	-16.6	586.5	-28.6	585.5	-27.6	628.7	-70.8	586.5	-28.6	No Action
5258	Tree	553.7	562.9	-9.2	615.3	-61.7	585.1	-31.4	-	-	-	-	-	-	No Action
5266	Tree	553.6	562.0	-8.4	627.1	-73.5	583.8	-30.1	-	-	-	-	-	-	No Action
5269	Gate	565.2	561.7	3.5	571.9	-6.7	583.4	-18.2	-	-	625.3	-60.1	583.4	-18.2	To Be Studied
5270	Tree	553.4	561.5	-8.1	631.1	-77.7	583.0	-29.6	-	-	-	-	-	-	No Action
5271	Tree	551.6	561.5	-9.9	622.0	-70.4	583.0	-31.4	-	-	-	-	-	-	No Action
5272	Tree	576.0	561.1	14.9	615.4	-39.4	582.4	-6.4	-	-	-	-	-	-	To Be Studied
5273	Runway Light	567.2	561.0	6.3	570.9	-3.7	582.2	-15.0	580.7	-13.5	624.1	-56.9	582.2	-15.0	Fixed by Function
5274	Tree	567.3	561.0	6.4	625.5	-58.1	582.2	-14.9	-	-	-	-	-	-	To Be Studied
5275	Tree	554.3	560.9	-6.6	636.6	-82.2	-	-	-	-	-	-	-	-	No Action
5276	Post	555.7	560.8	-5.1	570.7	-15.0	582.0	-26.3	580.4	-24.8	623.8	-68.1	582.0	-26.3	No Action
5279	Tree	552.6	560.6	-8.0	633.1	-80.5	581.7	-29.1	-	-	-	-	-	-	No Action
5280	Tree	552.8	560.5	-7.7	612.8	-60.0	581.6	-28.8	-	-	-	-	-	-	No Action
5282	Tree	551.5	560.4	-8.9	622.5	-71.0	581.4	-29.9	-	-	-	-	-	-	No Action
5283	Tree	552.8	560.3	-7.5	644.2	-91.4	-	-	-	-	-	-	-	-	No Action
5284	Gate	554.4	560.0	-5.6	569.7	-15.3	580.8	-26.4	579.1	-24.7	622.5	-68.1	580.8	-26.4	No Action
5285	Gate	553.9	560.0	-6.1	569.7	-15.8	580.8	-26.9	579.1	-25.2	622.5	-68.6	580.8	-26.9	No Action
5286	Tree	552.3	559.7	-7.5	649.7	-97.4	-	-	-	-	-	-	-	-	No Action
5287	Fence	558.5	559.7	-1.1	569.3	-10.7	580.3	-21.8	578.6	-20.0	622.0	-63.5	580.3	-21.8	No Action
5290	Fence	558.2	559.3	-1.1	568.9	-10.7	579.8	-21.6	578.0	-19.8	621.5	-63.3	579.8	-21.6	No Action
5291	Fence	559.5	559.3	0.1	568.9	-9.4	579.8	-20.4	578.0	-18.5	621.5	-62.0	579.8	-20.4	To Be Studied
5292	Tree	551.5	559.1	-7.6	656.2	-104.7	-	-	-	-	-	-	-	-	No Action
5294	Post	563.6	559.0	4.7	568.4	-4.8	579.3	-15.7	577.4	-13.8	620.9	-57.3	579.3	-15.7	To Be Studied
5295	Tree	551.1	558.9	-7.8	659.0	-107.9	-	-	-	-	-	-	-	-	No Action
5296	Fence	557.9	558.6	-0.7	567.9	-10.1	578.8	-20.9	576.8	-18.9	620.3	-62.5	578.8	-20.9	No Action
5300	Fence	559.5	558.1	1.4	567.4	-7.9	578.1	-18.6	-	-	619.6	-60.1	578.1	-18.6	To Be Studied
5304	Localizer	558.2	557.6	0.5	566.7	-8.6	577.3	-19.2	575.2	-17.0	618.8	-60.6	577.3	-19.2	Fixed by Function
5305	Localizer	558.2	557.6	0.5	566.7	-8.6	577.3	-19.2	575.2	-17.0	618.8	-60.6	577.3	-19.2	Fixed by Function
5306	Fence	551.7	557.2	-5.5	566.2	-14.5	576.7	-25.0	574.5	-22.8	618.1	-66.4	576.7	-25.0	No Action
5307	Fence	557.4	556.9	0.6	608.7	-51.3	576.2	-18.8	-	-	-	-	-	-	To Be Studied
5308	Fence	556.2	556.7	-0.5	565.6	-9.3	576.0	-19.7	573.6	-17.4	617.3	-61.0	576.0	-19.7	No Action
5310	Runway Light	562.9	556.6	6.4	565.4	-2.5	575.8	-12.8	573.4	-10.5	617.1	-54.1	575.8	-12.8	Fixed by Function
5315	Fence	555.8	555.6	0.2	661.1	-105.3	-	-	-	-	-	-	-	-	To Be Studied
5316	Fence	554.2	555.3	-1.1	572.0	-17.8	573.9	-19.7	-	-	615.0	-60.8	573.9	-19.7	No Action
5320	Fence	553.4	554.1	-0.7	610.5	-57.1	572.1	-18.7	-	-	-	-	-	-	No Action
5321	Transformer	547.7	554.0	-6.3	594.0	-46.3	572.0	-24.3	-	-	612.9	-65.2	-	-	No Action
5322	Transformer	547.7	553.8	-6.1	595.1	-47.4	571.7	-24.0	-	-	612.6	-65.0	-	-	No Action
5323	Guardrail	567.1	553.8	13.3	653.9	-86.8	-	-	-	-	-	-	-	-	To Be Studied
5324	Building	555.6	553.7	1.9	588.0	-32.4	571.5	-15.9	-	-	612.4	-56.9	-	-	To Be Studied
5326	Box	552.4	553.5	-1.2	596.8	-44.5	571.3	-18.9	-	-	612.2	-59.8	-	-	No Action
5327	Fence	552.9	552.7	0.2	635.7	-82.8	570.1	-17.2	-	-	-	-	-	-	To Be Studied
5330	Runway Light	557.1	552.2	4.9	559.9	-2.8	569.3	-12.2	566.1	-9.0	610.0	-53.0	569.3	-12.2	Fixed by Function
5332	Fence	554.1	550.8	3.3	664.3	-110.2	-	-	-	-	-	-	-	-	To Be Studied
5333	Transformer	548.8	550.8	-1.9	614.5	-65.6	567.2	-18.4	-	-	-	-	-	-	No Action
5334	Box	552.5	550.7	1.8	611.1	-58.6	567.2	-14.7	-	-	-	-	-	-	To Be Studied
5337	Building	555.9	550.1	5.8	613.7	-57.8	566.3	-10.4	-	-	-	-	-	-	To Be Studied
5338	Box	551.3	549.7	1.6	556.8	-5.6	565.7	-14.4	-	-	606.1	-54.8	565.7	-14.4	To Be Studied
5359	Sign	541.9	-	-	651.5	-109.6	549.6	-7.6	-	-	-	-	-	-	No Action
5360	Sign	541.4	-	-	606.7	-65.4	549.2	-7.9	-	-	588.2	-46.9	-	-	No Action
5364	Sign	539.6	-	-	-	-	542.3	-2.7	-	-	-	-	-	-	No Action
5376	Sign	540.7	-	-	-	-	-	-	-	-	568.3	-27.5	-	-	No Action
8451	Street Sign	623.7	637.7	-13.9	666.9	-43.1	695.0	-71.3	708.6	-84.8	746.6	-122.9	695.0	-71.3	No Action
8571	Tree	648.4	609.0	39.5	630.9	17.5	652.8	-4.4	-	-	700.8	-52.3	652.8	-4.4	To Be Studied
8873	Tree	624.9	635.5	-10.6	664.1	-39.3	691.9	-67.0	705.0	-80.1	743.2	-118.3	691.9	-67.0	No Action
8878	Tree	625.4	639.0	-13.5	668.5	-43.0	696.9	-71.5	710.7	-85.3	748.7	-123.3	696.9	-71.5	No Action
8879	Tree	624.8	639.0	-14.2	668.5	-43.7	697.0	-72.1	710.8	-85.9	748.7	-123.9	697.0	-72.1	No Action
8880	Tree	624.7	638.4	-13.7	667.7	-43.0	696.1	-71.4	709.7	-85.0	747.7	-123.0	696.1	-71.4	No Action
8881	Tree	624.6	638.7	-14.1	668.1	-43.5	696.5	-72.0	710.3	-85.7	748.2	-123.7	696.5	-72.0	No Action
8882	Tree	627.2	637.7	-10.5	666.9	-39.6	695.1	-67.8	708.6	-81.4	746.6	-119.4	695.1	-67.8	No Action
10475	Service Road	550.0	555.2	-5.2	662.9	-112.9	-	-	-	-	-	-	-	-	No Action
10476	Service Road	550.0	555.6	-5.6	642.4	-92.4	574.3	-24.3	-	-	-	-	-	-	No Action
10477	Service Road	553.2	549.4	3.7	668.4	-115.2	-	-	-	-	-	-	-	-	To Be Studied
10478	Service Road	552.8	550.8	2.1	648.9	-96.1	567.2	-14.4	-	-	-	-	-	-	To Be Studied
10480	Service Road	552.7	553.5	-0.7	604.9	-52.1	571.2	-18.5	-	-	612.1	-59.4	-	-	No Action
10481	Service Road	554.3	554.4	0.0	577.5	-23.1	572.5	-18.2	-	-	613.5	-59.2	572.5	-18.2	No Action
10484	Service Road	554.5	554.7	-0.2	563.0	-8.5	573.0	-18.5	-	-	614.0	-59.5	573.0	-18.5	No Action
10485	Service Road	555.3	555.0	0.3	563.4	-8.2	573.5	-18.2	570.8	-15.5	614.6	-59.3	573.5	-18.2	To Be Studied
10487	Service Road	560.0	559.0	1.0	568.4	-8.4	579.3	-19.3	577.5	-17.5	620.9	-60.9	579.3	-19.3	To Be Studied
10489	Service Road	560.0	555.0	5.0	563.4	-3.4	573.4	-13.4	570.7	-10.7	614.5	-54.5	573.4	-13.4	To Be Studied
10490	Service Road	558.5	558.7	-0.2	568.0	-9.6	578.8	-20.4	576.9	-18.4	620.4	-61.9	578.8	-20.4	No Action
10491	Service Road	554.8	553.0	1.8	560.9	-6.1	570.5	-15.7	567.4	-12.6	611.3	-56.5	570.5	-15.7	To Be Studied
10492	Service Road	550.0	544.9	5.1	672.7	-122.7	-	-	-	-	-	-	-	-	To Be Studied
10493	Service Road	550.0	546.7	3.3	654.3	-104.3	561.2	-11.2	-	-	-	-	-	-	To Be Studied

Runway 12R Inner Approach (Existing)

Runway 12R Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
10494	Service Road	551.8	550.1	1.6	606.4	-54.6	566.3	-14.5	-	-	606.8	-55.0	-	-	To Be Studied
10495	Service Road	553.2	550.0	3.2	581.6	-28.5	566.1	-12.9	-	-	606.5	-53.4	566.1	-12.9	To Be Studied
10496	Service Road	554.5	550.0	4.5	557.1	-2.7	566.0	-11.6	-	-	606.5	-52.0	566.1	-11.6	To Be Studied
10497	Service Road	553.7	552.2	1.5	560.0	-6.3	569.4	-15.7	-	-	610.2	-56.5	569.4	-15.7	To Be Studied
10498	Service Road	552.8	551.6	1.2	580.1	-27.3	568.5	-15.7	-	-	609.2	-56.4	568.5	-15.7	To Be Studied
10499	Service Road	551.5	557.4	-6.0	574.5	-23.0	577.0	-25.6	-	-	618.4	-67.0	577.0	-25.6	No Action
10500	Service Road	551.9	557.6	-5.7	566.7	-14.8	577.3	-25.4	-	-	618.8	-66.9	577.3	-25.4	No Action
10501	Service Road	552.5	555.6	-3.1	564.2	-11.6	574.3	-21.8	-	-	615.5	-63.0	574.3	-21.8	No Action
10502	Service Road	552.3	553.9	-1.7	577.8	-25.6	571.9	-19.7	-	-	612.9	-60.6	571.9	-19.7	No Action
10503	Service Road	550.1	556.7	-6.6	603.3	-53.3	576.0	-25.9	-	-	617.3	-67.2	-	-	No Action
10505	Service Road	569.3	561.2	8.1	571.2	-1.9	582.6	-13.3	581.2	-11.9	624.5	-55.2	582.6	-13.3	To Be Studied
10508	Service Road	560.0	566.0	-6.0	577.2	-17.2	589.6	-29.6	589.1	-29.1	632.1	-72.1	589.6	-29.6	No Action
10512	Service Road	586.1	618.8	-32.7	643.3	-57.2	667.3	-81.2	677.2	-91.1	716.5	-130.4	667.3	-81.2	No Action
10514	Service Road	589.2	605.4	-16.2	626.4	-37.3	647.5	-58.4	-	-	695.0	-105.8	647.5	-58.4	No Action
10515	Service Road	599.4	605.9	-6.4	627.1	-27.6	648.3	-48.8	-	-	695.8	-96.4	-	-	No Action
10516	Service Road	600.0	605.9	-5.9	627.1	-27.1	-	-	-	-	695.8	-95.8	-	-	No Action
10517	Service Road	597.2	599.5	-2.2	620.3	-23.1	-	-	-	-	-	-	-	-	No Action
10518	Service Road	597.6	599.6	-2.0	619.3	-21.6	-	-	-	-	-	-	-	-	No Action
10519	Service Road	598.0	618.3	-20.3	642.6	-44.6	666.6	-68.6	676.3	-78.3	715.7	-117.7	666.6	-68.6	No Action
10520	Service Road	597.3	626.7	-29.4	653.2	-55.8	678.9	-81.6	690.3	-93.0	729.1	-131.8	678.9	-81.6	No Action
10525	Service Road	595.8	631.2	-35.4	658.7	-62.9	685.5	-89.7	697.8	-102.0	736.2	-140.5	685.5	-89.7	No Action
10526	Service Road	593.9	632.8	-38.9	660.7	-66.8	687.9	-93.9	-	-	738.8	-144.9	687.9	-93.9	No Action
10528	Service Road	590.0	632.7	-42.7	660.7	-70.7	687.8	-97.8	-	-	738.7	-148.7	-	-	No Action
10529	Service Road	587.1	632.6	-45.5	660.5	-73.4	-	-	-	-	738.5	-151.4	-	-	No Action
10530	Service Road	586.9	632.5	-45.6	660.4	-73.5	-	-	-	-	-	-	-	-	No Action
10531	Service Road	586.0	-	-	659.7	-73.7	-	-	-	-	-	-	-	-	No Action
10532	Service Road	625.5	640.0	-14.5	669.8	-44.2	698.5	-73.0	712.5	-86.9	750.3	-124.8	698.5	-73.0	No Action
10534	Service Road	607.3	-	-	667.9	-60.6	-	-	-	-	-	-	-	-	No Action
11149	Railroad	593.0	600.5	-7.5	620.4	-27.4	640.4	-47.4	-	-	687.3	-94.3	640.4	-47.4	No Action
11151	Railroad	593.0	594.6	-1.6	613.0	-20.0	631.7	-38.7	-	-	677.8	-84.8	-	-	No Action
11152	Railroad	593.0	594.1	-1.1	612.3	-19.3	630.9	-37.9	-	-	-	-	-	-	No Action
11153	Railroad	593.0	590.6	2.4	628.9	-35.9	-	-	-	-	-	-	-	-	To Be Studied
11172	Road	555.0	-	-	654.0	-99.0	-	-	-	-	-	-	-	-	No Action
11173	Road	559.8	627.9	-68.1	654.6	-94.8	-	-	-	-	-	-	-	-	No Action
11174	Road	565.0	628.1	-63.1	654.9	-89.9	-	-	-	-	731.3	-166.3	-	-	No Action
11175	Road	565.0	628.1	-63.1	654.9	-89.9	681.0	-116.0	-	-	731.4	-166.4	-	-	No Action
11177	Road	565.0	628.2	-63.2	655.0	-90.0	681.1	-116.1	-	-	731.5	-166.5	681.1	-116.1	No Action
11178	Road	568.9	626.3	-57.4	652.6	-83.7	678.3	-109.4	689.6	-120.7	728.4	-159.5	678.3	-109.4	No Action
11183	Road	575.0	620.9	-45.9	645.9	-70.9	670.4	-95.4	680.7	-105.7	719.9	-144.9	670.4	-95.4	No Action
11184	Road	577.9	609.5	-31.6	631.7	-53.7	653.7	-75.7	661.7	-83.8	701.7	-123.7	653.7	-75.7	No Action
11185	Road	565.0	578.4	-13.4	592.8	-27.8	607.9	-42.9	-	-	652.0	-87.0	607.9	-42.9	No Action
11186	Road	565.0	572.0	-7.0	584.7	-19.7	598.4	-33.4	-	-	641.6	-76.6	-	-	No Action
11187	Road	560.0	569.5	-9.5	597.4	-37.3	594.8	-34.8	-	-	637.8	-77.8	-	-	No Action
11188	Road	555.0	564.6	-9.6	630.4	-75.4	587.6	-32.6	-	-	-	-	-	-	No Action
11189	Road	555.0	561.9	-6.9	656.4	-101.4	-	-	-	-	-	-	-	-	No Action
11204	Road	575.0	554.1	20.9	663.9	-88.9	-	-	-	-	-	-	-	-	To Be Studied
11205	Road	575.0	554.9	20.1	643.4	-68.4	573.4	1.6	-	-	-	-	-	-	To Be Studied
11206	Road	575.0	556.5	18.5	603.4	-28.4	575.7	-0.7	-	-	617.0	-42.0	-	-	To Be Studied
11207	Road	575.0	557.5	17.5	574.5	0.5	577.1	-2.1	-	-	618.5	-43.5	577.1	-2.1	To Be Studied
11208	Road	575.0	557.8	17.2	566.9	8.1	577.5	-2.5	-	-	619.0	-44.0	577.5	-2.5	To Be Studied
11211	Road	571.8	559.5	12.3	569.1	2.7	580.1	-8.3	578.3	-6.5	621.8	-49.9	580.1	-8.3	To Be Studied
11213	Road	565.0	563.8	1.2	574.5	-9.5	586.4	-21.4	585.5	-20.5	628.6	-63.6	586.4	-21.4	To Be Studied
11215	Road	564.7	568.3	-3.6	580.1	-15.4	593.1	-28.3	593.0	-28.3	635.9	-71.1	593.1	-28.3	No Action
11216	Road	565.0	571.8	-6.8	584.4	-19.4	598.1	-33.1	-	-	641.3	-76.3	598.1	-33.1	No Action
11217	Road	565.0	572.8	-7.8	585.7	-20.7	599.6	-34.6	-	-	642.9	-77.9	-	-	No Action
11218	Road	565.0	573.2	-8.2	595.6	-30.6	600.2	-35.2	-	-	643.6	-78.6	-	-	No Action
11219	Road	565.0	574.0	-9.0	617.7	-52.7	601.4	-36.4	-	-	-	-	-	-	No Action
11220	Road	567.3	574.8	-7.5	644.0	-76.8	-	-	-	-	-	-	-	-	No Action
11237	Road	631.2	639.9	-8.7	669.6	-38.4	698.2	-67.1	712.2	-81.0	750.1	-118.9	698.2	-67.1	No Action
11242	Road	630.0	636.4	-6.4	665.2	-35.2	693.1	-63.1	706.4	-76.4	744.5	-114.5	693.1	-63.1	No Action
11243	Road	625.0	633.0	-8.0	661.0	-36.0	688.2	-63.2	700.8	-75.8	739.1	-114.1	688.2	-63.2	No Action
11244	Road	605.0	594.3	10.7	612.6	-7.6	631.3	-26.3	-	-	677.4	-72.4	631.3	-26.3	To Be Studied
11245	Road	602.0	589.9	12.1	607.1	-5.1	624.8	-22.8	-	-	670.3	-68.3	-	-	To Be Studied
11247	Road	601.6	588.0	13.6	604.7	-3.1	622.0	-20.4	-	-	-	-	-	-	To Be Studied
11248	Road	589.7	591.4	-1.7	609.0	-19.3	-	-	-	-	-	-	-	-	No Action
11249	Road	575.0	578.7	-3.7	593.1	-18.1	608.3	-33.3	-	-	652.4	-77.4	-	-	No Action
11250	Road	575.0	575.3	-0.3	616.2	-41.2	603.3	-28.3	-	-	-	-	-	-	No Action
11251	Road	570.4	572.4	-2.0	646.3	-76.0	-	-	-	-	-	-	-	-	No Action
11283	Road	605.0	596.5	8.5	623.1	-18.1	-	-	-	-	-	-	-	-	To Be Studied

Runway 12R Inner Approach (Existing)

Runway 12R Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
3437	Tree	635.6	641.5	-5.9	671.6	-36.0	700.6	-65.0	-	-	752.7	-117.1	700.6	-65.0	No Action
3439	Tree	645.5	641.3	4.3	671.4	-25.8	700.3	-54.8	-	-	752.4	-106.8	700.3	-54.8	To Be Studied
3442	Tree	642.5	641.2	1.3	671.3	-28.7	700.2	-57.7	-	-	752.3	-109.7	700.2	-57.7	To Be Studied
8373	Tree	690.0	643.6	46.3	674.3	15.7	703.8	-13.8	-	-	756.2	-66.2	703.8	-13.8	To Be Studied
8378	Tree	703.1	650.0	53.1	682.3	20.8	713.2	-10.1	-	-	766.3	-63.2	713.2	-10.1	To Be Studied
8468	Tree	645.1	656.4	-11.3	690.3	-45.1	722.6	-77.5	739.8	-94.7	776.5	-131.4	722.6	-77.5	No Action
8479	Tree	639.3	649.5	-10.2	681.7	-42.4	712.5	-73.2	728.4	-89.1	765.6	-126.3	712.5	-73.2	No Action
8484	Tree	633.6	646.7	-13.1	678.1	-44.6	708.3	-74.8	723.6	-90.1	761.0	-127.5	708.3	-74.8	No Action
8498	Tree	704.1	645.2	58.9	676.3	27.8	706.1	-2.0	721.2	-17.1	758.7	-54.6	706.1	-2.0	To Be Studied
8513	Tree	642.9	654.2	-11.3	687.5	-44.7	719.4	-76.5	-	-	773.0	-130.2	719.4	-76.5	No Action
8514	Tree	638.6	650.0	-11.4	682.3	-43.7	713.2	-74.6	-	-	766.4	-127.7	713.2	-74.6	No Action
8875	Tree	628.0	642.1	-14.1	672.4	-44.4	701.6	-73.6	716.0	-88.0	753.8	-125.7	701.6	-73.6	No Action

Runway 12R P77 Approach (Existing)

LEGEND

1. Numbers shown in red are a penetration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12R30L - 12R-30L P77 (2)
***LAYOUT:* 12R Inner P77 (2)**
***UPDATE BY:* Mike Wilson**
SURVEY BOOK #
DATE: 12/14/2022 10:37 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS				REVISIONS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 12R Obstruction Tables Inner Portion & Part 77 (Existing/Future)

SCALE	AS NOTED	JOB NO. 20042701.00
DATE	2/2023	
SHEET **48** OF **59** SHEETS		

Runway 12R Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
1097	Tree	701.5	645.3	56.2	676.4	25.1	706.3	-4.8	721.3	-19.8	758.8	-57.3	706.3	-4.8	To Be Studied
1098	Tree	704.1	645.2	58.9	676.3	27.8	706.1	-2.0	721.2	-17.1	758.7	-54.6	706.1	-2.0	To Be Studied
1099	Tree	702.6	643.1	59.5	673.6	29.0	703.0	-0.4	717.6	-15.0	755.2	-52.6	703.0	-0.4	To Be Studied
2720	Tree	668.6	672.7	-4.1	710.7	-42.1	746.6	-78.0	-	-	802.6	-134.0	746.6	-78.0	No Action
2721	Tree	662.8	672.5	-9.7	710.4	-47.6	746.3	-83.4	-	-	802.3	-139.4	746.3	-83.4	No Action
2722	Tree	664.2	672.4	-8.2	710.3	-46.0	746.1	-81.9	-	-	802.1	-137.8	746.1	-81.9	No Action
2723	Tree	667.2	671.7	-4.5	709.4	-42.2	745.0	-77.9	-	-	800.9	-133.8	745.0	-77.9	No Action
2724	Tree	702.0	671.3	30.7	708.9	-6.9	744.5	-42.5	-	-	800.3	-98.3	744.5	-42.5	To Be Studied
2725	Tree	702.2	671.0	31.2	708.6	-6.3	744.1	-41.9	-	-	799.9	-97.7	744.1	-41.9	To Be Studied
2726	Tree	664.0	671.0	-6.9	708.5	-44.5	744.0	-80.0	-	-	799.8	-135.8	744.0	-80.0	No Action
2727	Tree	661.5	670.8	-9.4	708.3	-46.8	743.8	-82.3	-	-	799.6	-138.1	-	-	No Action
2728	Tree	660.6	670.5	-9.9	707.9	-47.3	743.3	-82.7	-	-	799.0	-138.5	743.3	-82.7	No Action
2729	Tree	673.3	670.4	2.9	707.8	-34.5	743.2	-69.9	-	-	798.9	-125.6	743.2	-69.9	To Be Studied
2730	Tree	661.8	670.3	-8.5	707.7	-45.9	743.1	-81.3	763.0	-101.2	798.8	-137.0	743.1	-81.3	No Action
2731	Tree	660.3	670.1	-9.8	707.5	-47.1	742.8	-82.4	762.7	-102.3	798.5	-138.1	742.8	-82.4	No Action
2732	Tree	669.9	669.1	0.8	706.2	-36.3	741.3	-71.4	761.0	-91.1	796.9	-127.0	741.3	-71.4	To Be Studied
2733	Tree	665.2	669.0	-3.9	706.1	-40.9	741.1	-76.0	760.8	-95.7	796.7	-131.5	741.1	-76.0	No Action
2734	Tree	665.2	668.1	-3.0	705.0	-39.8	739.8	-74.7	-	-	795.3	-130.1	739.8	-74.7	No Action
2735	Tree	666.2	668.1	-2.0	704.9	-38.8	739.8	-73.7	-	-	795.2	-129.1	739.8	-73.7	No Action
2736	Tree	666.9	668.0	-1.2	704.8	-38.0	739.7	-72.8	759.2	-92.3	795.1	-128.2	739.7	-72.8	No Action
2737	Tree	670.7	667.7	2.9	704.5	-33.8	739.3	-68.6	-	-	794.6	-124.0	739.3	-68.6	To Be Studied
2738	Tree	665.8	667.7	-1.9	704.4	-38.6	739.2	-73.4	-	-	794.5	-128.8	739.2	-73.4	No Action
2739	Tree	706.1	666.9	39.1	703.5	2.6	738.1	-32.0	-	-	793.4	-87.3	738.1	-32.0	To Be Studied
2740	Tree	664.0	666.7	-2.6	703.1	-39.1	737.7	-73.6	756.9	-92.9	792.9	-128.9	737.7	-73.6	No Action
2741	Tree	657.7	666.4	-8.8	702.8	-45.1	737.3	-79.7	756.5	-98.8	792.5	-134.9	737.3	-79.7	No Action
2742	Tree	664.8	666.3	-1.5	702.7	-37.9	737.1	-72.4	-	-	792.4	-127.6	737.1	-72.4	No Action
2743	Tree	666.1	666.1	0.0	702.4	-36.3	736.8	-70.7	-	-	792.0	-125.9	736.8	-70.7	To Be Studied
2744	Tree	666.9	666.1	0.8	702.4	-35.5	736.8	-69.9	-	-	792.0	-125.1	-	-	To Be Studied
2745	Tree	665.6	665.7	-0.1	701.9	-36.3	736.3	-70.7	-	-	791.4	-125.8	736.3	-70.7	No Action
2746	Tree	661.3	665.6	-4.3	701.8	-40.5	736.1	-74.9	755.2	-93.9	791.3	-130.0	736.2	-74.9	No Action
2747	Tree	661.3	665.5	-4.2	701.6	-40.4	735.9	-74.7	-	-	791.0	-129.8	-	-	No Action
2749	Tree	655.7	665.3	-9.6	701.5	-45.7	735.7	-80.0	754.7	-99.0	790.8	-135.1	735.7	-80.0	No Action
2753	Tree	655.7	665.1	-9.4	701.2	-45.5	735.4	-79.7	754.3	-98.6	790.4	-134.7	735.4	-79.7	No Action
2754	Tree	659.5	664.9	-5.5	700.9	-41.5	735.1	-75.7	754.0	-94.6	790.2	-130.7	735.1	-75.7	No Action
2755	Tree	658.1	664.9	-6.8	700.9	-42.8	735.0	-76.9	-	-	790.1	-132.0	735.0	-76.9	No Action
2757	Tree	670.7	664.6	6.0	700.6	-29.9	734.7	-64.0	753.5	-82.9	789.7	-119.0	734.7	-64.0	To Be Studied
2758	Tree	666.8	664.6	2.3	700.5	-33.7	734.6	-67.8	753.4	-86.6	789.6	-122.8	734.6	-67.8	To Be Studied
2760	Tree	656.6	664.5	-7.9	700.4	-43.9	734.5	-78.0	753.4	-96.8	789.5	-132.9	734.5	-78.0	No Action
2761	Tree	663.5	664.5	-1.0	700.4	-36.9	734.5	-71.0	753.3	-89.8	789.5	-125.9	734.5	-71.0	No Action
2762	Tree	674.0	664.4	9.6	700.3	-26.3	734.4	-60.4	-	-	789.4	-115.4	-	-	To Be Studied
2765	Utility Pole	658.3	664.4	-6.0	700.2	-41.9	-	-	-	-	789.2	-130.9	-	-	No Action
2767	Tree	657.8	664.1	-6.2	699.9	-42.0	733.9	-76.0	-	-	788.8	-130.9	733.9	-76.0	No Action
2768	Tree	657.0	664.0	-7.1	699.8	-42.8	733.8	-76.8	752.5	-95.5	788.7	-131.7	733.8	-76.8	No Action
2769	Tree	662.1	663.8	-1.7	699.5	-37.4	733.4	-71.3	752.1	-90.0	788.3	-126.2	733.4	-71.3	No Action
2775	Tree	686.0	663.5	22.5	699.2	-13.2	733.0	-47.1	-	-	787.9	-101.9	-	-	To Be Studied
2776	Tree	667.8	663.5	4.3	699.1	-31.3	733.0	-65.2	751.6	-83.8	787.8	-120.0	733.0	-65.2	To Be Studied
2777	Tree	655.0	663.4	-8.4	699.0	-44.0	732.8	-77.8	-	-	787.7	-132.7	732.8	-77.9	No Action
2778	Tree	683.2	663.3	19.8	699.0	-15.8	732.8	-49.6	-	-	787.6	-104.5	732.8	-49.6	To Be Studied
2779	Tree	656.8	663.3	-6.5	698.9	-42.1	732.7	-75.9	-	-	787.5	-130.8	732.7	-75.9	No Action
2781	Tree	679.8	662.9	16.9	698.4	-18.6	732.1	-52.4	-	-	786.9	-107.1	732.1	-52.4	To Be Studied
2782	Tree	683.1	662.9	20.2	698.4	-15.3	732.1	-49.0	750.6	-67.5	786.9	-103.8	732.1	-49.0	To Be Studied
2783	Tree	674.4	662.8	11.6	698.3	-23.9	732.1	-57.6	750.5	-76.1	786.8	-112.4	732.1	-57.6	To Be Studied
2784	Tree	683.1	662.8	20.3	698.3	-15.2	732.0	-48.9	750.5	-67.4	786.8	-103.7	732.0	-48.9	To Be Studied
2785	Tree	658.9	662.8	-3.9	698.2	-39.3	-	-	-	-	786.7	-127.8	-	-	No Action
2788	Tree	670.3	662.6	7.6	698.1	-27.8	731.7	-61.5	750.2	-79.9	786.5	-116.2	731.7	-61.5	To Be Studied
2789	Tree	653.2	662.6	-9.5	698.0	-44.9	731.7	-78.6	-	-	786.5	-133.3	731.7	-78.6	No Action
2790	Tree	675.1	662.6	12.5	698.0	-22.9	731.7	-56.6	-	-	786.4	-111.3	-	-	To Be Studied
2791	Tree	653.9	662.5	-8.6	697.9	-44.0	731.6	-77.7	-	-	786.3	-132.4	731.6	-77.6	No Action
2793	Tree	654.7	662.3	-7.6	697.6	-43.0	731.3	-76.6	-	-	786.0	-131.3	731.3	-76.6	No Action
2795	Tree	665.0	662.3	2.7	697.6	-32.6	731.2	-66.2	749.6	-84.6	785.9	-120.9	731.2	-66.2	To Be Studied
2796	Tree	671.2	662.2	9.0	697.5	-26.4	731.1	-60.0	-	-	785.8	-114.6	731.1	-60.0	To Be Studied
2797	Utility Pole	659.4	662.2	-2.7	697.5	-38.0	-	-	-	-	785.7	-126.3	-	-	No Action
2799	Tree	671.0	662.1	8.9	697.4	-26.4	731.0	-60.0	-	-	785.7	-114.7	731.0	-60.0	To Be Studied
2803	Tree	662.5	662.0	0.5	697.3	-34.8	730.8	-68.4	-	-	785.5	-123.0	730.8	-68.4	To Be Studied
2804	Tree	686.7	662.0	24.7	697.3	-10.6	730.8	-44.2	749.1	-62.5	785.5	-98.8	730.8	-44.2	To Be Studied
2807	Tree	684.7	662.0	22.7	697.2	-12.6	-	-	-	-	785.4	-100.8	-	-	To Be Studied
2810	Tree	665.2	661.8	3.3	697.1	-31.9	730.6	-65.4	748.9	-83.7	785.2	-120.1	730.6	-65.4	To Be Studied
2818	Tree	651.9	661.4	-9.5	696.5	-44.6	729.9	-78.0	-	-	784.5	-132.6	729.9	-78.0	No Action
2820	Tree	684.7	661.3	23.5	696.4	-11.6	729.8	-45.0	-	-	784.3	-99.6	729.8	-45.0	To Be Studied
2827	Tree	672.8	661.1	11.7	696.1	-23.3	729.4	-56.6	747.6	-74.8	784.0	-111.2	729.4	-56.6	To Be Studied
2829	Tree	677.7	661.0	16.6	696.1	-18.4	729.4	-51.7	-	-	783.9	-106.3	729.4	-51.7	To Be Studied
2832	Tree	669.1	660.9	8.2	695.9	-26.8	729.2	-60.1	-	-	783.8	-114.7	729.2	-60.1	To Be Studied
2834	Tree	655.7	660.9	-5.2	695.9	-40.2	729.2	-73.5	-	-	783.7	-128.1	729.2	-73.5	No Action
2836	Tree	653.0	660.9	-7.8	695.9	-42.8	729.2	-76.1	-	-	783.7	-130.6	729.2	-76.1	No Action
2839	Tree	654.2	660.7	-6.6	695.7	-41.5	729.0	-74.8	747.0	-92.9	783.5	-129.3	729.0	-74.8	No Action
2840	Tree	660.5	660.7	-0.3	695.7	-35.2	729.0	-68.5	-	-	783.5	-123.0	729.0	-68.5	No Action
2844	Tree	657.6	660.6	-3.0	695.5	-37.9	728.7	-71.1	-	-	783.2	-125.6	728.7	-71.1	No Action
2845	Tree	667.0	660.5	6.5	695.4	-28.4	728.6	-61.6	746.6	-79.6	783.1	-116.1	728.6	-61.6	To Be Studied
2849	Tree	654.5	660.3	-5.9	695.2	-40.7	728.4	-73.9	-	-	782.8	-128.4	728.4	-73.9	No Action
2850	Tree	650.9	660.3	-9.4	695.2	-44.2	-	-	-	-	782.8	-131.8	-	-	No Action
2852	Tree	653.4	660.2	-6.8	695.1	-41.7	728.2	-74.8	746.2	-92.8	782.7	-129.2	728.2	-74.8	No Action
2853	Tree	665.3	660.2	5.1	695.1	-29.7	728.2	-62.9	746.2	-80.8	782.7	-117.3	728.2	-62.9	To Be Studied
2854	Tree	668.2	660.2	8.0	695.1	-26.9	728.2	-60.0	-	-	782.6	-114.5	-	-	To Be Studied
2855	Tree	658.7	660.2	-1.5	695.0	-36.3	728.2	-69.5	-	-	782.6	-123.9	728.2	-69.5	No Action
2856	Utility Pole	658.4	-	-	694.9	-36.5	-	-	-	-	-	-	-	-	No Action
2857	Tree	698.2	660.1	38.2	694.9	3.4	-	-	-	-	782.4	-84.2	-	-	To Be Studied
2858	Tree	685.4	660.1	25.4	694.8	-9.4	-	-	-	-	782.4	-97.0	-	-	To Be Studied
2862	Tree	654.1	660.0	-5.9	694.8	-40.7	727.9	-73.8	-	-	782.3	-128.2	727.9	-73.8	No Action
2865	Tree	676.7	659.9	16.8	694.7	-18.0	727.8	-51.1	745.7	-69.0	782.2	-105.5	727.8	-51.1	To Be Studied
2866	Tree	671.9	659.9	12.1	694.6	-22.7	727.7	-55.8	-	-	782.0	-110.1	727.7	-55.8	To Be Studied
2867	Tree	675.1	659.8	15.3	694.6	-19.5	727.6	-52.5	-	-	782.0	-106.9	727.6	-52.5	To Be Studied
2869	Tree	656.2	659.7	-3.4	694.4	-38.1	727.4	-71.2	-	-	781.8	-125.5	727.4	-71.2	No Action
2871	Tree	649.7	659.5	-9.7	694.1	-44.4	727.1	-77.4	-	-	781.5	-131.7	727.1	-77.4	No Action
2872	Tree	676.8	659.4	17.3	694.1	-17.3	727.1	-50.3	744.9	-68.1	781.4	-104.6	727.1	-50.3	To Be Studied
2876	Tree	650.4	659.2	-8.8	693.8	-43.4	726.7	-76.3	-	-	781.1	-130.7	726.8	-76.3	No Action
2878	Tree	669.7	658.9	10.8	693.5	-23.7	726.3	-56.6	744.0	-74.3	780.6	-110.9	726.3	-56.6	To Be Studied
2879	Tree	680.8	658.9	21.9	693.5	-12.6	726.3	-45.5	-	-	780.6	-99.8	726.3	-45.5	To Be Studied
2880	Tree	658.0	658.9	-0.9	693.4	-35.4	726.2	-68.3	-	-	780.5	-122.5	726.2	-68.3	No Action
2881	Tree	660.7	658.9	1.8	693.4	-32.7	726.2	-65.5	743.9	-83.2	780.5	-119.8	726.2	-65.5	To Be Studied
2884	Tree	662.9	658.6	4.3	693.0	-30.1	725.8	-62.9	-	-	780.1	-117.2	725.8	-62.9	To Be Studied
2887	Tree	649.4	658.5	-9.1	692.9	-43.5	725.7	-76.3	-	-	779.9	-130.5	725.7	-76.3	No Action
2888	Tree	651.8	658.5	-6.7	692.9	-41.1	725.7	-73.9	-	-	779.9	-128.1	725.7	-73.9	No Action
2889	Tree	679.7	658.4	21.2	692.8	-13.1	725.5	-45.9	-	-	779.7	-100.1	725.5	-45.9	To Be Studied
2890	Tree	676.9	658.4	18.5	692.8	-15.9	725.5	-48.6	-	-	779.7	-102.8	725.5	-48.6	To Be Studied
2891	Tree	681.7	658.4	23.3	692.8	-11.1	725.5	-43.9	-	-	779.7	-98.1	725.5	-43.9	To Be Studied
2895	Tree	653.2	658.2	-5.1	692.5	-39.4	725.3	-72.1	-	-	779.4	-126.3	725.3	-72.1	No Action
2897	Tree	651.7	658.1	-6.4	692.4	-40.6	725.0	-73.3	-	-	779.2	-127.5	725.0	-73.3	No Action
2898	Tree	668.0	658.0	10.0	692.3	-24.3	725.0	-57.0	-	-	779.2	-111.1	725.0	-57.0	To Be Studied
2899	Tree	674.1	658.0	16.0	692.3	-18.2	725.0	-50.9	742.5	-68.4	779.2	-105.1	725.0	-50.9	To Be Studied
2900	Tree	653.4	658.0	-4.6	692.2	-38.8	724.9	-71.5	-	-	779.0	-125.6	724.9	-71.5	No Action
2908	Tree	652.1	657.8	-5.7	692.0	-39.9	724.6	-72.5	-	-	778.7	-126.6	724.6	-72.5	No Action
2913	Tree	684.1	657.7	26.4	691.9	-7.8	724.5	-40.3	-	-	778.6	-94.5	724.5	-40.3	To Be Studied
2918	Tree	677.2	657.5	19.6	691.7	-14.5	724.2	-47.1	741.7	-64.5	778.3	-101.2	724.2	-47.1	To Be Studied
2921	Tree	672.3	657.4	14.9	691.5	-19.3	724.1	-51.8	-	-	778.2	-105.9	724.1	-51.8	To Be Studied
2923	Tree	670.1	657.4	12.7	691.5	-21.4	724.0	-53.9	-	-	778.1	-108.0	724.0	-53.9	To Be Studied
2925	Tree	659.3	657.3	2.0	691.4	-32.1	723.9	-64.6	-	-	778.0	-118.7	723.9	-64.6	To Be Studied
2927	Antenna	705.6	657.3	48.4	691.4	14.3	-	-	-	-	777.9	-72.3	-	-	To Be Studied
2934	Tree	680.1	657.2	22.9	691.3	-11.2	723.8	-43.7	741.1	-61.1	777.8	-97.8	723.8	-43.7	To Be Studied
2938	Tree	666.3	657.1	9.3	691.1	-24.8	723.6	-57.2	-	-	777.6	-111.3	723.6	-57.2	To Be Studied
2940	Tree	690.1	657.1	33.1	691.1	-1.0	723.5	-33.4	-	-	777.6	-87.5	723.5	-33.4	To Be Studied
2943	Tree	675.0	657.0	18.1	691.0	-15.9	723.4	-48.4	740.7	-65.7	777.4	-102.4	723.4	-48.4	To Be Studied
2946	Tree	657.5	656.9	0.6	690.9	-33.4	723.3	-65.8	-	-	777.3	-119.8	723.3	-65.8	To Be Studied
2947	Tree	666.8	656.9	10.0	690.9	-24.0	723.3	-56.5	-	-	777.3	-110.5	723.3	-56.5	To Be Studied
2950	Tree	647.8	656.8	-9.0	690.8	-43.0	723.2	-75.4	-	-	777.2	-129.4	723.2	-75.4	No Action
2955	Antenna	706.0	656.8	49.2	690.7	15.2	-	-	-	-	777.1	-71.1	-	-	To Be Studied
2957	Antenna	647.7	656.7	-9.0	690.7	-43.0	723.1	-75.4	-	-	777.1	-129.4	723.1	-75.4	No Action
2958	Tree	670.0	656.7	13.3	690.7	-20.7	723.1	-53.1	-	-	777.0	-107.1	723.1	-53.1	To Be Studied
2961	Tree	678.7	656.5	22.2	690.4	-11.7	722.8	-44.1	-	-	776.7	-98.0	722.8	-44.1	To Be Studied
2964	Tree	650.2	656.5	-6.3	690.4	-40.2	722.7	-72.5	-	-	776.6	-126.4	722.7	-72.5	No Action
2966	Tree	650.7	656.4	-5.7	690.3	-39.6	722.6	-71.9	-	-	776.6	-125.8	722.6	-71.9	No Action
2970	Tree	655.7	656.3	-0.7	690.2	-34.5	722.5	-66.8	-	-	776.4	-120.8	722.5	-66.8	No Action
2971	Tree	673.0	656.3	16.7	690.1	-17.2	722.4	-49.5	-	-	776.4	-103.4	722.4	-49.5	To Be Studied
2974	Tree	647.7	656.2	-8.6	690.1	-42.4	722.4	-74.7	-	-	776.3	-128.6	722.4	-74.7	No Action
2979	Tree	657.2	656.1	1.1	689.9	-32.7	722.1	-64.9	-	-	776.0	-118.8	722.1	-64.9	To Be Studied
2982	Tree	654.0	655.9	-1.9	689.7	-35.7	721.9	-67.9	-	-	775.8	-121.8	721.9	-67.9	No Action
2984	Tree	680.0	655.9	24.1	689.6	-9.6	721.8	-41.8	-	-	775.7	-95.7	721.8	-41.8	To Be Studied
2986	Antenna	647.8	655.8	-8.0	689.6	-41.7	721.7	-73.9	738.8	-91.0	775.6	-127.8	721.7	-73.9	No Action
2987	Tree	647.2	655.8	-8.6	689.5	-42.3	721.7	-74.5	-	-	775.6	-128.4	721.7	-74.5	No Action
2988	Tree	675.0	655.8	19.2	689.5	-14.5	721.7	-46.7	-	-	775.5	-100.6	721.7	-46.7	To Be Studied
2989	Tree	652.1	655.7	-3.6	689.4	-37.3	721.6	-69.5	-	-	775.4	-123.3	721.6	-69.5	No Action
2990	Tree	661.8	655.7	6.2	689.4	-27.5	721.5	-59.7	-	-	775.4	-113.5	721.5	-59.7	To Be Studied
2991	Tree	679.9	655.5	24.4	689.2	-9.3	721.3	-41.4	-	-	775.2	-95.3	721.3	-41.4	To Be Studied
2993	Building	645.5	655.5	-10.0	689.1	-43.6	-	-	-	-	775.1	-129.6	-	-	No Action
2994	Tree	645.9	655.5	-9.6	689.1	-43.2	721.2	-75.4	-	-	775.1	-129.2	721.2	-75.4	No Action
2995	Tree	687.4	655.4	31.9	689.1	-1.7	721.1	-33.8	-	-	775.0	-87.6	721.2	-33.8	To Be Studied
3001	Tree	660.5	655.3	5.2	688.9	-28.4	721.0	-60.5	-	-	774.8	-114.3	721.0	-60.5	To Be Studied
3003	Tree	680.9	655.2	25.7	688.8	-7.9	720.8	-39.9	-	-	774.6	-93.7	720.8	-39.9	To Be Studied
3009	Tree	647.0	655.1	-8.0	688.6	-41.6	720.6	-73.6	-	-	774.4	-127.4	720.6	-73.6	No Action
3010	Tree	646.3	655.0	-8.8	688.6	-42.3	720.6	-74.3	-	-	774.4	-128.1	720.6	-74.3	No Action
3015	Antenna	705.4	-	-	688.4	17.0	-	-	-	-	-	-	-	-	To Be Studied
3017	Tree	645.9	654.9	-9.0	688.4	-42.5	720.4	-74.5	-	-	774.2	-128.3	720.4	-74.5	No Action
3018	Tree	651.7	654.9	-3.2	688.4	-36.7	720.3	-68.7	-	-	774.1	-122.4	720.4	-68.7	No Action
3020	Tree	654.5	654.8	-0.3	688.2	-33.7	720.2	-65.7	737.1	-82.6	773.9	-119.4	720.2	-65.7	No Action
3022	Tree	664.7	654.7	10.0	688.2	-23.5	720.1	-55.4	-	-	773.9	-109.2	720.1	-55.4	To Be Studied
3023	Tree	670.5	654.7	15.8	688.2	-17.7	720.1	-49.6	-	-	773.9	-103.4	720.1	-49.6	To Be Studied
3026	Antenna	647.8	654.6	-6.9	688.1	-40.3	720.0	-72.2	736.9	-89.1	773.7	-126.0	720.0	-72.2	No Action
3027	Tree	679.1	654.6	24.5	688.1	-9.0	720.0	-40.9	-	-	773.7	-94.6	720.0	-40.9	To Be Studied
3033	Tree	644.9	654.6	-9.6	688.0	-43.1	719.9	-75.0	-	-	773.6	-128.7	719.9	-75.0	No Action
3034	Tree	668.2	654.5	13.7	687.9	-19.7	719.8	-51.6	-	-	773.5	-105.4	719.8	-51.6	To Be Studied
3036	Tree	673.3	654.5	18.8	687.9	-14.6	719.8	-46.4	-	-	773.5	-100.2	719.8	-46.4	To Be Studied
3043	Tree	644.7	654.2	-9.5	687.6	-42.9	719.4	-74.7	736.2	-91.5	773.1	-128.4	719.4	-74.7	No Action
3045	Tree	664.3	654.2	10.1	687.5	-23.2	719.3	-55.1	-	-	773.0	-108.7	719.4	-55.1	To Be Studied
3047	Antenna	705.4	654.2	51.2	687.5	17.9	-	-	-	-	773.0	-67.6	-	-	To Be Studied
3049	Tree	644.3	654.1	-9.8	687.4	-43.1	719.2	-74.9	-	-	772.8	-128.5	719.2	-74.9	No Action
3050	Tree	678.7	654.0	24.6	687.3	-8.6	719.1	-40.4	-	-	772.7	-94.1	719.1	-40.4	To Be Studied
3051	Tree	683.6	654.0	29.6	687.2	-3.6	719.0	-35.4	-	-	772.6	-89.0	719.0	-35.4	To Be Studied
3053	Tree	652.7	653.9	-1.2	687.1	-34.5	718.9	-66.2	-	-	772.5	-119.9	718.9	-66.2	No Action
3055	Tree	679.5	653.9	25.6	687.1	-7.6	718.8	-39.4	-	-	772.5	-93.0	718.8	-39.4	To Be Studied
3065	Tree	674.8	653.6	21.3	686.8	-11.9	718.4	-43.6	-	-	772.0	-97.2	718.4	-43.6	To Be Studied
3066	Tree	680.8	653.5	27.3	686.7	-5.9	718.4	-37.5	-	-	772.0	-91.1	718.4	-37.5	To Be Studied
3070	Tree	683.6	653.4	30.2	686.5	-2.9	718.2	-34.6	-	-	771.8	-88.2	718.2	-34.6	To Be Studied
3071	Tree	675.4	653.3	22.1	686.4	-11.0	718.1	-42.6	-	-	771.6	-96.2	718.1	-42.7	To Be Studied
3075	Tree	678.7	653.2	25.5	686.3	-7.6	717.9	-39.2	-	-	771.4	-92.8	717.9	-39.2	To Be Studied
3076	Light Pole	651.1	653.2	-2.0	686.3	-35.1	717.9	-66.7	734.4	-83.3	771.4	-120.3	717.9	-66.7	No Action
3077	Tree	659.1	653.2	5.9	686.2	-27.2	717.8	-58.8	734.4	-75.4	Clearance	-112.3	717.8	-58.8	To Be Studied
3080	Tree	656.7	653.1	3.6	686.1	-29.5	717.7	-61.1	-	-	771.3	-114.6	717.7	-61.1	To Be Studied
3083	Tree	662.4	653.0	9.4	686.0	-23.6	717.5	-55.1	-	-	771.0	-108.6	717.5	-55.1	To Be Studied
3085	Tree	645.8	652.8	-7.0	685.8	-40.0	717.3	-71.5	-	-	770.8	-125.0	717.3	-71.5	No Action
3089	Tree	675.9	652.7	23.2	685.6	-9.7	717.1	-41.2	-	-	770.6	-94.7	717.1	-41.2	To Be Studied
3090	Tree	643.8	652.6	-8.8	685.5	-41.7	716.9	-73.2	-	-	770.4	-126.6	716.9	-73.2	No Action

Runway 12R P77 Approach (Existing)

Runway 12R Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
3091	Tree	644.4	652.5	-8.1	685.5	-41.0	716.9	-72.5	-	-	770.4	-126.0	716.9	-72.5	No Action
3092	Tree	667.5	652.5	15.0	685.4	-17.9	716.9	-49.4	-	-	770.4	-102.8	716.9	-49.4	To Be Studied
3093	Tree	649.2	652.5	-3.3	685.4	-36.2	716.8	-67.7	-	-	770.3	-121.1	716.8	-67.7	No Action
3095	Tree	664.0	652.4	11.5	685.3	-21.3	716.8	-52.8	-	-	770.2	-106.2	716.8	-52.8	To Be Studied
3097	Tree	690.6	652.3	38.3	685.2	5.4	716.6	-26.0	-	-	770.0	-79.4	716.6	-26.0	To Be Studied
3100	Tree	678.6	652.2	26.3	685.1	-6.5	716.5	-37.9	-	-	769.9	-91.3	716.5	-37.9	To Be Studied
3101	Tree	697.2	652.2	45.0	685.1	12.2	716.5	-19.2	-	-	769.9	-72.7	716.5	-19.2	To Be Studied
3102	Tree	644.1	652.2	-8.2	685.1	-41.0	716.5	-72.4	-	-	769.9	-125.8	716.5	-72.4	No Action
3103	Tree	662.8	652.2	10.6	685.1	-22.2	716.4	-53.6	-	-	769.9	-107.0	716.4	-53.6	To Be Studied
3108	Tree	681.4	652.1	29.3	684.9	-3.5	716.2	-34.8	-	-	769.6	-88.2	716.2	-34.8	To Be Studied
3111	Tree	642.6	652.0	-9.5	684.8	-42.2	716.2	-73.6	-	-	769.6	-127.0	716.2	-73.6	No Action
3114	Tree	681.6	652.0	29.6	684.8	-3.2	716.1	-34.5	732.5	-50.9	769.5	-87.9	716.1	-34.5	To Be Studied
3115	Tree	678.3	651.9	26.4	684.7	-6.4	716.0	-37.7	-	-	769.4	-91.1	716.0	-37.7	To Be Studied
3116	Tree	669.7	651.9	17.9	684.6	-14.9	715.9	-46.2	732.3	-62.5	769.3	-99.6	715.9	-46.2	To Be Studied
3118	Tree	687.5	651.9	35.7	684.6	2.9	715.9	-28.4	-	-	769.3	-81.7	715.9	-28.4	To Be Studied
3120	Tree	672.7	651.8	20.9	684.5	-11.8	715.8	-43.1	-	-	769.2	-96.5	715.8	-43.1	To Be Studied
3122	Tree	654.8	651.7	3.2	684.4	-29.5	715.7	-60.8	-	-	769.0	-114.2	715.7	-60.8	To Be Studied
3124	Tree	682.0	651.7	30.4	684.4	-2.3	715.6	-33.6	-	-	769.0	-87.0	715.6	-33.6	To Be Studied
3127	Tree	656.7	651.6	5.1	684.3	-27.6	715.6	-58.8	-	-	768.9	-112.2	715.6	-58.8	To Be Studied
3128	Tree	673.3	651.6	21.7	684.3	-11.0	715.6	-42.3	731.8	-58.5	768.9	-95.6	715.6	-42.3	To Be Studied
3133	Tree	643.7	651.5	-7.8	684.2	-40.5	715.4	-71.7	-	-	768.8	-125.1	715.4	-71.7	No Action
3134	Tree	641.9	651.5	-9.6	684.2	-42.3	715.4	-73.5	-	-	768.8	-126.9	715.4	-73.5	No Action
3140	Tree	642.5	651.4	-9.0	684.1	-41.6	715.3	-72.8	-	-	768.6	-126.1	715.3	-72.8	No Action
3146	Tree	642.3	651.4	-9.1	684.0	-41.7	715.2	-72.9	-	-	768.5	-126.2	715.2	-72.9	No Action
3148	Tree	642.1	651.3	-9.2	683.9	-41.8	715.1	-73.0	-	-	768.4	-126.3	715.1	-73.0	No Action
3152	Tree	642.7	651.3	-8.5	683.8	-41.1	715.0	-72.3	-	-	768.3	-125.6	715.0	-72.3	No Action
3155	Tree	652.7	651.2	1.5	683.7	-31.1	714.9	-62.2	-	-	768.2	-115.5	714.9	-62.2	To Be Studied
3157	Tree	685.2	651.0	34.2	683.5	1.7	714.6	-29.4	-	-	767.9	-82.7	714.7	-29.4	To Be Studied
3158	Tree	647.8	651.0	-3.2	683.5	-35.7	714.6	-66.8	-	-	767.9	-120.1	714.6	-66.8	No Action
3162	Tree	642.8	650.8	-8.0	683.3	-40.5	714.4	-71.6	-	-	767.7	-124.8	714.4	-71.6	No Action
3163	Tree	692.8	650.8	42.0	683.3	9.5	714.4	-21.6	-	-	767.6	-74.8	714.4	-21.6	To Be Studied
3166	Tree	654.3	650.8	3.6	683.3	-28.9	714.3	-60.0	-	-	767.6	-113.2	714.3	-60.0	To Be Studied
3167	Tree	681.2	650.8	30.5	683.2	-2.0	714.3	-33.1	-	-	767.5	-86.3	714.3	-33.1	To Be Studied
3168	Tree	689.8	650.7	39.1	683.2	6.6	714.3	-24.4	-	-	767.5	-77.7	714.3	-24.4	To Be Studied
3170	Utility Pole	641.1	650.7	-9.6	683.2	-42.1	714.2	-73.1	730.3	-89.2	767.5	-126.4	714.2	-73.1	No Action
3172	Tree	651.0	650.7	0.4	683.1	-32.1	714.2	-63.1	-	-	767.4	-116.4	714.2	-63.1	To Be Studied
3173	Tree	685.6	650.7	34.9	683.1	2.5	714.2	-28.6	-	-	767.4	-81.8	714.2	-28.6	To Be Studied
3176	Tree	663.5	650.6	12.9	683.0	-19.5	714.1	-50.6	730.1	-66.6	767.3	-103.8	714.1	-50.6	To Be Studied
3179	Tree	656.5	650.5	6.0	682.9	-26.4	713.9	-57.4	730.0	-73.4	767.1	-110.6	713.9	-57.4	To Be Studied
3180	Tree	684.7	650.5	34.2	682.9	1.8	713.9	-29.3	-	-	767.1	-82.5	713.9	-29.3	To Be Studied
3184	Tree	671.9	650.4	21.5	682.8	-10.9	713.8	-41.9	-	-	767.0	-95.1	713.8	-41.9	To Be Studied
3189	Tree	687.8	650.3	37.5	682.7	5.1	713.6	-25.9	-	-	766.8	-79.0	713.7	-25.9	To Be Studied
3190	Light Pole	661.9	650.3	11.6	682.7	-20.7	713.6	-51.7	729.6	-67.7	766.8	-104.9	713.6	-51.7	To Be Studied
3193	Tree	676.1	650.2	25.9	682.5	-6.4	713.5	-37.3	729.4	-53.3	766.6	-90.5	713.5	-37.3	To Be Studied
3195	Tree	659.6	650.2	9.4	682.5	-22.9	713.4	-53.8	-	-	766.6	-107.0	713.4	-53.8	To Be Studied
3196	Tree	651.2	650.2	1.1	682.5	-31.2	713.4	-62.2	-	-	766.6	-115.3	713.4	-62.2	To Be Studied
3199	Tree	703.1	650.0	53.1	682.3	20.8	713.2	-10.1	-	-	766.3	-63.2	713.2	-10.1	To Be Studied
3203	Tree	648.8	649.9	-1.0	682.1	-33.2	713.0	-64.1	-	-	766.1	-117.2	713.0	-64.1	No Action
3211	Tree	659.6	649.7	9.9	681.9	-22.3	712.8	-53.1	728.7	-69.1	765.9	-106.2	712.8	-53.1	To Be Studied
3212	Tree	682.0	649.7	32.3	681.9	0.1	712.8	-30.8	-	-	765.9	-83.9	712.8	-30.8	To Be Studied
3215	Tree	681.7	649.7	32.0	681.8	-0.2	712.7	-31.0	-	-	765.8	-84.1	712.7	-31.0	To Be Studied
3216	Tree	645.0	649.6	-4.6	681.8	-36.8	712.6	-67.6	-	-	765.7	-120.7	712.6	-67.6	No Action
3219	Utility Pole	662.7	-	-	681.6	-19.0	-	-	-	-	-	-	-	-	No Action
3221	Tree	674.3	649.4	24.9	681.6	-7.3	712.3	-38.0	728.2	-53.9	765.4	-91.1	712.3	-38.0	To Be Studied
3222	Light Pole	661.3	649.4	11.9	681.5	-20.2	712.3	-51.0	728.2	-66.8	765.4	-104.0	712.3	-51.0	To Be Studied
3225	Tree	672.0	649.2	22.8	681.2	-9.3	711.9	-40.0	-	-	765.0	-93.0	711.9	-40.0	To Be Studied
3226	Tree	641.5	649.1	-7.6	681.2	-39.7	711.9	-70.4	727.7	-86.2	764.9	-123.4	711.9	-70.4	No Action
3228	Building	639.2	649.1	-9.9	681.2	-42.0	711.9	-72.7	727.7	-88.5	764.9	-125.7	711.9	-72.7	No Action
3231	Tree	663.2	648.8	14.4	680.8	-17.6	711.4	-48.2	-	-	764.4	-101.2	711.4	-48.2	To Be Studied
3233	Tree	656.0	648.8	7.2	680.7	-24.8	711.4	-55.4	727.1	-71.1	764.3	-108.4	711.4	-55.4	To Be Studied
3235	Tree	681.0	648.7	32.3	680.7	0.4	711.3	-30.2	-	-	764.3	-83.2	711.3	-30.2	To Be Studied
3237	Tree	672.4	648.6	23.8	680.6	-8.2	711.2	-38.8	-	-	764.2	-91.7	711.2	-38.8	To Be Studied
3240	Building	641.2	648.6	-7.4	680.5	-39.3	711.1	-69.9	726.8	-85.6	764.1	-122.8	711.1	-69.9	No Action
3241	Tree	640.2	648.5	-8.3	680.4	-40.2	710.9	-70.7	-	-	763.9	-123.7	710.9	-70.7	No Action
3242	Tree	640.7	648.5	-7.8	680.4	-39.7	710.9	-70.3	-	-	763.9	-123.2	710.9	-70.3	No Action
3243	Tree	674.1	648.4	25.7	680.3	-6.2	710.9	-36.8	-	-	763.8	-89.7	710.9	-36.8	To Be Studied
3245	Tree	649.7	648.4	1.3	680.2	-30.5	710.8	-61.1	-	-	763.7	-114.0	710.8	-61.1	To Be Studied
3249	Tree	639.4	648.3	-8.9	680.1	-40.8	710.7	-71.3	-	-	763.6	-124.2	-	-	No Action
3250	Tree	640.5	648.2	-7.8	680.1	-39.6	710.6	-70.1	-	-	763.5	-123.0	-	-	No Action
3252	Tree	639.9	648.1	-8.2	679.9	-40.0	710.4	-70.5	726.0	-86.1	763.3	-123.4	710.4	-70.5	No Action
3259	Tree	638.9	647.8	-9.0	679.6	-40.7	710.0	-71.1	-	-	762.9	-124.0	710.0	-71.1	No Action
3260	Tree	642.6	647.8	-5.2	679.6	-37.0	710.0	-67.4	-	-	762.9	-120.3	710.0	-67.4	No Action
3261	Tree	639.5	647.8	-8.4	679.6	-40.1	710.0	-70.5	725.5	-86.1	762.9	-123.4	710.0	-70.5	No Action
3262	Tree	675.8	647.8	28.0	679.5	-3.7	710.0	-34.1	-	-	762.8	-87.0	710.0	-34.1	To Be Studied
3266	Tree	669.0	647.6	21.5	679.2	-10.2	709.6	-40.6	-	-	762.4	-93.4	709.6	-40.6	To Be Studied
3268	Tree	676.9	647.5	29.4	679.1	-2.2	709.4	-32.5	-	-	762.3	-85.4	709.5	-32.5	To Be Studied
3270	Tree	654.7	647.4	7.3	679.0	-24.3	709.3	-54.7	-	-	762.1	-107.5	709.3	-54.7	To Be Studied
3273	Tree	676.0	647.3	28.7	678.9	-2.9	709.2	-33.2	-	-	762.0	-86.0	709.2	-33.2	To Be Studied
3276	Tree	645.2	647.2	-2.0	678.8	-33.6	709.1	-63.9	-	-	761.8	-116.7	709.1	-63.9	No Action
3278	Tree	683.7	647.1	36.6	678.7	5.1	708.9	-25.2	-	-	761.7	-78.0	708.9	-25.2	To Be Studied
3280	Tree	708.7	647.1	61.6	678.6	30.1	708.9	-0.2	-	-	761.7	-52.9	708.9	-0.2	To Be Studied
3282	Utility Pole	650.6	647.0	3.6	678.5	-27.9	708.7	-58.2	724.1	-73.5	761.5	-110.9	708.7	-58.2	To Be Studied
3283	Tree	666.7	647.0	19.7	678.5	-11.8	708.7	-42.0	-	-	761.5	-94.8	708.7	-42.0	To Be Studied
3284	Tree	664.8	646.9	17.9	678.4	-13.6	708.6	-43.8	-	-	761.4	-96.6	708.6	-43.9	To Be Studied
3287	Tree	687.8	646.8	41.0	678.3	9.5	708.4	-20.7	-	-	761.2	-73.4	708.5	-20.7	To Be Studied
3289	Tree	670.2	646.8	23.4	678.2	-8.1	708.4	-38.3	723.8	-53.6	761.2	-91.0	708.4	-38.3	To Be Studied
3291	Tree	684.4	646.7	37.7	678.2	6.3	708.3	-23.9	-	-	761.1	-76.7	708.3	-23.9	To Be Studied
3295	Tree	637.1	646.7	-9.5	678.1	-40.9	708.3	-71.1	-	-	761.0	-123.8	708.3	-71.1	No Action
3296	Tree	689.6	646.6	42.9	678.1	11.5	708.2	-18.7	-	-	760.9	-71.4	708.2	-18.7	To Be Studied
3297	Tree	658.6	646.6	12.0	678.0	-19.4	708.1	-49.5	-	-	760.8	-102.2	708.1	-49.5	To Be Studied
3299	Tree	636.9	646.5	-9.6	677.9	-41.0	708.0	-71.1	-	-	760.7	-123.8	-	-	No Action
3300	Tree	638.3	646.5	-8.2	677.8	-39.6	708.0	-69.7	-	-	760.7	-122.4	708.0	-69.7	No Action
3301	Tree	641.4	646.4	-5.0	677.8	-36.4	707.9	-66.5	723.1	-81.7	760.6	-119.1	707.9	-66.5	No Action
3302	Tree	653.0	646.4	6.7	677.8	-24.7	707.9	-54.8	-	-	760.5	-107.5	707.9	-54.8	To Be Studied
3303	Tree	677.8	646.4	31.4	677.8	0.0	707.9	-30.1	-	-	760.5	-82.7	707.9	-30.1	To Be Studied
3306	Tree	684.6	646.3	38.3	677.7	6.9	707.8	-23.2	-	-	760.4	-75.8	707.8	-23.2	To Be Studied
3308	Tree	643.9	646.3	-2.3	677.6	-33.7	707.7	-63.8	-	-	760.3	-116.4	707.7	-63.8	No Action
3309	Utility Pole	657.8	-	-	677.6	-19.8	-	-	-	-	-	-	-	-	No Action
3310	Tree	664.7	646.2	18.5	677.5	-12.8	707.5	-42.9	-	-	760.2	-95.5	707.5	-42.9	To Be Studied
3312	Tree	647.7	646.0	1.7	677.3	-29.6	707.4	-59.7	-	-	760.0	-112.3	-	-	To Be Studied
3313	Tree	663.1	646.0	17.1	677.3	-14.2	707.3	-44.2	-	-	760.0	-96.8	707.3	-44.2	To Be Studied
3314	Tree	676.8	646.0	30.8	677.3	-0.4	707.3	-30.5	-	-	760.0	-83.1	707.3	-30.5	To Be Studied
3315	Tree	677.8	645.9	31.9	677.2	0.6	707.2	-29.4	722.4	-44.6	759.8	-82.0	707.2	-29.4	To Be Studied
3318	Tree	674.8	645.8	29.0	677.1	-2.2	707.1	-32.2	-	-	759.7	-84.8	707.1	-32.2	To Be Studied
3321	Tree	657.7	645.7	11.9	676.9	-19.3	706.9	-49.2	-	-	759.5	-101.8	706.9	-49.2	To Be Studied
3324	Tree	637.7	645.7	-7.9	676.8	-39.1	706.8	-69.1	-	-	759.4	-121.7	706.8	-69.1	No Action
3325	Tree	679.1	645.6	33.5	676.8	2.3	706.7	-27.6	-	-	759.3	-80.2	706.7	-27.6	To Be Studied
3327	Tree	662.1	645.6	16.5	676.7	-14.6	706.7	-44.6	-	-	759.2	-97.1	706.7	-44.6	To Be Studied
3328	Tree	648.5	645.6	2.9	676.7	-28.2	706.6	-58.2	-	-	759.2	-110.7	706.6	-58.2	To Be Studied
3329	Tree	684.6	645.5	39.1	676.6	8.0	706.5	-21.9	-	-	759.1	-74.5	-	-	To Be Studied
3330	Tree	671.3	645.5	25.8	676.6	-5.3	706.5	-35.2	-	-	759.1	-87.8	706.5	-35.2	To Be Studied
3331	Tree	683.3	645.4	37.9	676.5	6.8	706.4	-23.1	-	-	758.9	-75.6	706.4	-23.1	To Be Studied
3335	Tree	686.1	645.3	40.8	676.4	9.7	706.2	-20.2	-	-	758.8	-72.7	706.2	-20.2	To Be Studied
3336	Tree	669.6	645.3	24.3	676.4	-6.8	706.2	-36.6	-	-	758.8	-89.2	706.2	-36.6	To Be Studied
3337	Tree	674.9	645.3	29.6	676.3	-1.4	706.2	-31.3	-	-	758.7	-83.8	706.2	-31.3	To Be Studied
3338	Tree	637.5	645.2	-7.8	676.3	-38.8	706.2	-68.7	-	-	758.7	-121.2	706.2	-68.7	No Action
3340	Tree	641.1	645.2	-4.1	676.2	-35.1	706.1	-65.0	-	-	758.6	-117.5	706.1	-65.0	No Action
3341	Tree	653.2	645.2	8.0	676.2	-23.1	706.1	-52.9	-	-	758.6	-105.4	706.1	-52.9	To Be Studied
3344	Tree	637.6	645.0	-7.4	676.0	-38.4	705.8	-68.2	-	-	758.3	-120.7	705.8	-68.2	No Action
3345	Tree	636.7	645.0	-8.3	676.0	-39.3	705.8	-69.1	-	-	758.3	-121.6	705.8	-69.1	No Action
3347	Tree	641.1	644.9	-3.8	675.9	-34.8	705.7	-64.6	-	-	758.2	-117.1	705.7	-64.6	No Action
3350	Tree	655.4	644.8	10.6	675.8	-20.4	705.5	-50.1	-	-	758.0	-102.6	705.5	-50.1	To Be Studied
3355	Tree	676.7	644.6	32.1	675.5	1.2	705.2	-28.5	720.1	-43.4	757.6	-80.9	705.2	-28.5	To Be Studied
3356	Tree	677.9	644.5	33.4	675.4	2.5	705.1	-27.2	720.0	-42.0	757.5	-79.6	705.1	-27.2	To Be Studied
3357	Tree	676.1	644.4	31.7	675.3	0.8	705.0	-28.9	-	-	757.4	-81.3	705.0	-28.9	To Be Studied
3360	Utility Pole	656.8	644.3	12.4	675.2	-18.4	-	-	-	-	757.3	-100.5	-	-	To Be Studied
3362	Tree	639.4	644.3	-4.9	675.1	-35.7	704.8	-65.4	719.6	-80.2	757.2	-117.8	704.8	-65.4	No Action
3364	Tree	635.2	644.2	-9.0	675.1	-39.9	704.7	-69.5	-	-	757.1	-121.9	704.7	-69.5	No Action
3365	Tree	683.9	644.2	39.8	675.0	8.9	704.6	-20.7	719.4	-35.5	757.0	-73.1	704.6	-20.7	To Be Studied
3367	Tree	700.1	644.1	56.0	674.9	25.2	704.5	-4.4	-	-	756.9	-56.8	704.5	-4.4	To Be Studied
3370	Tree	648.7	644.1	4.6	674.9	-26.2	704.5	-55.8	-	-	756.9	-108.2	704.5	-55.8	To Be Studied
3372	Tree	667.0	644.0	23.0	674.8	-7.8	704.3	-37.3	719.1	-52.1	756.7	-89.7	704.3	-37.3	To Be Studied
3374	Tree	662.6	644.0	18.6	674.7	-12.1	704.3	-41.7	719.1	-56.5	756.6	-94.1	704.3	-41.7	To Be Studied
3377	Tree	639.6	643.9	-4.2	674.6	-35.0	704.1	-64.5	-	-	756.5	-116.9	704.1	-64.5	No Action
3379	Tree	684.7	643.8	40.9	674.5	10.2	704.0	-19.3	718.8	-34.1	756.4	-71.7	704.0	-19.3	To Be Studied
3380	Tree	645.0	643.8	1.2	674.5	-29.5	704.0	-59.0	718.8	-73.7	756.4	-111.4	704.0	-59.0	To Be Studied
3381	Tree	646.0	643.7	2.3	674.4	-28.4	703.9	-57.9	-	-	756.3	-110.3	703.9	-57.9	To Be Studied
3383	Tree	643.3	643.7	-0.4	674.4	-31.1	703.9	-60.6	-	-	756.2	-112.9	703.9	-60.6	No Action
3384	Utility Pole	655.8	643.7	12.1	674.4	-18.6	703.9	-48.1	-	-	756.2	-100.5	-	-	To Be Studied
3385	Tree	674.8	643.7	31.1	674.3	0.5	703.9	-29.0	718.6	-43.8	756.2	-81.4	703.9	-29.0	To Be Studied
3386	Tree	690.0	643.6	46.3	674.3	15.7	703.8	-13.8	-	-	756.2	-66.2	703.8	-13.8	To Be Studied
3387	Tree	683.3	643.6	39.7	674.3	9.0	703.8	-20.5	718.5	-35.2	756.1	-72.8	703.8	-20.5	To Be Studied
3389	Tree	666.5	643.6	22.9	674.2	-7.7	703.7	-37.2	718.4	-51.9	756.1	-89.6	703.7	-37.2	To Be Studied
3390	Tree	636.6	643.5	-6.9	674.2	-37.6	703.7	-67.1	-	-	756.0	-119.4	703.7	-67.1	No Action
3391	Utility Pole	655.9	643.5	12.4	674.1	-18.3	703.6	-47.7	718.3	-62.4	755.9	-100.0	703.6	-47.7	To Be Studied
3393	Tree	639.5	643.4	-3.9	674.0	-34.5	703.5	-64.0	718.2	-78.7	755.8	-116.3	703.5	-64.0	No Action
3394	Tree	644.0	643.4	0.7	674.0	-30.0	703.5	-59.4	-	-	755.8	-111.7	703.5	-59.4	To Be Studied
3398	Tree	677.0	643.1	33.9	673.6	3.4	703.0	-26.0	717.6	-40.6	755.3	-78.3	703.0	-26.0	To Be Studied
3399	Tree	638.7	643.1	-4.4	673.6	-34.9	703.0	-64.3	-	-	755.3	-116.6	703.0	-64.3	No Action
3400	Tree	686.6	643.1	43.6	673.6	13.0	703.0	-16.4	717.6	-31.0	755.2	-68.6	703.0	-16.4	To Be Studied
3402	Tree	687.3	643.0	44.3	673.6	13.7	702.9	-15.6	717.5	-30.2	755.2	-67.9	702.9	-15.6	To Be Studied
3403	Tree	674.6	643.0	31.5	673.5	1.0	702.9	-28.4	717.5	-42.9	755.2	-80.6	702.9	-28.4	To Be Studied
3404	Tree	649.2	643.0	6.1	673.5	-24.4	702.9	-53.7	-	-	755.2	-106.0	702.9	-53.7	To Be Studied
3405	Tree	676.5	642.9	33.6	673.4	3.1	702.8	-26.3	-	-	755.0	-78.5	-	-	To Be Studied
3406	Tree	678.5	642.9	35.6	673.4	5.1	702.8	-24.3	717.3	-38.8	755.0	-76.5	702.8	-24.3	To Be Studied
3407	Tree	682.4	642.9	39.5	673.4	9.0	702.7	-20.3	717.3	-34.9	754.9	-72.5	702.7	-20.3	To Be Studied
3408	Tree	664.8	642.8	22.0	673.3	-8.5	702.7	-37.8	717.2	-52.4	754.9	-90.1	702.7	-37.8	To Be Studied
3409	Tree	646.7	642.7	4.0	673.2	-26.5	702.5	-55.8	-	-	754.7	-108.0	702.5	-55.8	To Be Studied
3411	Tree	636.0	642.7	-6.7	673.1	-37.1	702.4	-66.4	-	-	754.6	-118.6	702.4	-66.4	No Action
3412	Tree	658.9	642.6	16.3	673.0	-14.1	702.3	-43.4	-	-	754.5	-95.6	702.3	-43.4	To Be Studied
3413	Tree	654.9	642.5	12.3	672.9	-18.1	702.2	-47.3	-	-	754.4	-99.5	702.2	-47.3	To Be Studied
3414	Tree	678.4	642.5	35.9	672.9	5.5	702.2	-23.8	716.7	-38.3	754.4	-76.0	702.2	-23.8	To Be Studied
3415	Tree	684.6	642.4	42.2	672.7	11.8	702.0	-17.4	716.4	-31.9	754.1	-69.6	702.0	-17.4	To Be Studied
3416	Utility Pole	649.3	642.4	7.0	672.7	-23.4	701.9	-52.6	-	-	754.1	-104.8	701.9	-52.6	To Be Studied
3419	Utility Pole	645.4	642.2	3.1	672.6	-27.2	701.8	-56.4	-	-	753.9	-108.5	701.8	-56.4	To Be Studied
3420	Tree	637.4	642.2	-4.9	672.6	-35.2	701.8	-64.4	-	-	753.9	-116.6	701.8	-64.4	No Action
3421	Tree	657.3	642.2	15.1	672.5	-15.2	701.7	-44.4	716.1	-58.8	753.9	-96.5	701.7	-44.4	To Be Studied
3422	Tree	655.1	642.1	13.0	672.4	-17.3	701.6	-46.5	-	-	753.7	-98.6	-	-	To Be Studied
3423	Tree	685.8	642.0	43.8	672.3	13.5	701.5	-15.6	715.8	-30.0	753.6	-67.8	701.5	-15.6	To Be Studied
3424	Tree	635.4	642.0	-6.6	672.3	-36.9	701.5	-66.0	-	-	753.6	-118.2	701.5	-66.0	No Action
3425	Tree	646.0	642.0	4.0	672.2	-26.3	701.3	-55.4	-	-	753.5	-107.5	701.3	-55.4	To Be Studied
3426	Tree	665.4	641.9	23.5	672.2	-6.8	701.3	-35.9	-	-	753.4	-88.0	701.3	-35.9	To Be Studied
3427	Tree	645.2	641.9	3.3	672.2	-26.9	701.3	-56.1	-	-	753.4	-108.2	701.3	-56.1	To Be Studied
3428	Tree	632.2	641.9	-9.7	672.1	-39.9	701.2	-69.0	-	-	753.3	-121.1	701.2	-69.0	No Action
3430	Tree	643.9	641.7	2.2	671.9	-28.0	701.0	-57.1	-	-	753.1	-109.2	701.0	-57.1	To Be Studied
3431	Utility Pole	646.0	641.7	4.3	671.9	-25.8	701.0	-54.9	-	-	753.0	-107.0	701.0	-54.9	To Be Studied
3432	Tree	667.6	641.7	25.9	671.9	-4.2	700.9	-33.3	715.3	-47.6	753.0	-85.4	700.9	-33.3	To Be Studied
3433	Tree	642.1	641.7	0.4	671.9	-29.8	700.9	-58.9	715.3	-73.2	753.0	-111.0	700.9	-58.9	To Be Studied
3434	Tree	650.3	641.7	8.6	671.8	-21.5	700.9	-50.6	-	-	753.0	-102.7	700.9	-50.6	To Be Studied
3435	Tree	637.5	641.6	-4.2	671.8	-34.3	700.9	-63.4	715.2	-77.7	752.9	-115.5	700.9	-63.4	No Action
3436	Tree	648.1	641.6	6.5	671.8	-23.6	700.8	-52.7	-	-	752.9	-104.8	700.8	-52.7	To Be Studied

Runway 12R P77 Approach (Existing)

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12R30L - 12R-30L P77 (2)
LAYOUT: 12 P77 (3)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:37 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

wsp

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 12R Obstruction Tables Part 77 (Existing/Future)

SCALE AS NOTED
JOB NO. 20042701.00
DATE 2/2023
SHEET 49 OF 59 SHEETS

Runway 30L Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
2544	Fence	618.1	637.0	-18.9	655.0	-36.9	664.2	-46.1	-	-	700.3	-82.2	-	-	No Action
2554	Bush	628.7	639.4	-10.7	658.0	-29.3	667.8	-39.1	-	-	704.1	-75.4	667.8	-39.1	No Action
2556	Tree	662.8	639.7	23.0	658.4	4.4	668.2	-5.5	-	-	704.7	-41.9	668.2	-5.5	To Be Studied
2557	Tree	637.0	639.9	-2.9	658.6	-21.6	668.5	-31.5	-	-	705.0	-68.0	668.5	-31.5	No Action
2558	Tree	637.0	640.1	-3.1	658.9	-21.8	668.8	-31.8	-	-	705.3	-68.3	-	-	No Action
2559	Bush	635.7	640.1	-4.4	658.9	-23.2	668.8	-33.1	-	-	705.3	-69.6	668.8	-33.1	No Action
2560	Tree	666.3	640.1	26.2	658.9	7.4	668.8	-2.5	-	-	705.3	-39.0	668.8	-2.5	To Be Studied
2561	Tree	674.9	640.2	34.7	658.9	15.9	668.9	6.0	-	-	705.4	-30.5	668.9	6.0	To Be Studied
2562	Tree	636.0	640.3	-4.3	659.1	-23.1	669.1	-33.1	-	-	705.6	-69.6	669.1	-33.1	No Action
2563	Bush	633.5	640.4	-6.9	659.2	-25.8	669.2	-35.8	-	-	705.7	-72.3	669.2	-35.8	No Action
2564	Tree	635.1	640.4	-5.3	659.3	-24.2	669.3	-34.2	-	-	705.8	-70.7	-	-	No Action
2566	Tree	665.7	640.6	25.1	659.5	6.2	669.5	-3.8	-	-	706.1	-40.4	669.5	-3.8	To Be Studied
2567	Tree	627.6	640.7	-13.1	659.6	-32.0	669.7	-42.1	-	-	706.2	-78.6	669.7	-42.1	No Action
2568	Tree	653.5	640.7	12.8	659.6	-6.1	669.7	-16.2	-	-	706.2	-52.7	669.7	-16.2	To Be Studied
2570	Bush	634.9	640.9	-6.0	659.8	-24.9	669.9	-35.1	-	-	706.5	-71.6	669.9	-35.1	No Action
2571	Bush	633.4	640.9	-7.5	659.8	-26.4	669.9	-36.5	-	-	706.5	-73.1	669.9	-36.5	No Action
2572	Tree	660.3	641.1	19.2	660.1	0.3	670.3	-9.9	-	-	706.8	-46.5	670.3	-9.9	To Be Studied
2573	Tree	666.1	641.2	24.9	660.2	5.9	670.3	-4.3	-	-	706.9	-40.9	670.3	-4.3	To Be Studied
2575	Tree	631.4	641.3	-9.9	660.4	-29.0	670.6	-39.2	-	-	707.2	-75.8	670.6	-39.2	No Action
2578	Tree	666.5	641.6	24.9	660.7	5.8	670.9	-4.4	-	-	707.6	-41.1	670.9	-4.4	To Be Studied
2579	Tree	635.9	641.6	-5.6	660.7	-24.8	670.9	-35.0	-	-	707.6	-71.7	670.9	-35.0	No Action
2582	Tree	668.7	641.9	26.8	661.1	7.6	671.4	-2.7	-	-	708.1	-39.4	671.4	-2.7	To Be Studied
2585	Tree	628.9	642.0	-13.1	661.2	-32.3	671.6	-42.6	-	-	708.3	-79.4	671.6	-42.6	No Action
2587	Tree	637.5	642.1	-4.6	661.3	-23.8	671.7	-34.2	-	-	708.4	-70.9	671.7	-34.2	No Action
2588	Tree	639.1	642.1	-3.0	661.4	-22.3	671.8	-32.7	-	-	708.5	-69.4	-	-	No Action
2589	Tree	666.7	642.2	24.5	661.5	5.2	671.9	-5.2	-	-	708.6	-41.9	671.9	-5.2	To Be Studied
2591	Tree	634.3	642.6	-8.3	662.0	-27.7	672.5	-38.2	-	-	709.3	-75.0	672.5	-38.2	No Action
2593	Bush	633.2	642.7	-9.5	662.0	-28.9	672.6	-39.4	-	-	709.3	-76.2	672.6	-39.4	No Action
2595	Tree	631.0	642.8	-11.8	662.2	-31.2	672.8	-41.7	-	-	709.6	-78.6	672.8	-41.7	No Action
2596	Tree	661.0	642.8	18.1	662.2	-1.3	672.8	-11.8	-	-	709.6	-48.6	672.8	-11.8	To Be Studied
2599	Tree	631.4	643.2	-11.8	662.7	-31.3	673.3	-41.9	-	-	710.2	-78.8	673.3	-41.9	No Action
2600	Tree	647.4	643.2	4.1	662.8	-15.4	673.4	-26.0	-	-	710.2	-62.9	673.4	-26.0	To Be Studied
2601	Bush	634.1	643.2	-9.1	662.8	-28.6	673.4	-39.2	-	-	710.3	-76.1	673.4	-39.2	No Action
2602	Tree	659.8	643.3	16.6	662.8	-3.0	673.4	-13.6	-	-	710.3	-50.5	673.4	-13.6	To Be Studied
2604	Tree	672.8	643.5	29.3	663.1	9.7	673.8	-1.0	-	-	710.7	-37.9	673.8	-1.0	To Be Studied
2605	Tree	664.6	643.6	21.0	663.2	1.4	673.9	-9.3	-	-	710.8	-46.2	673.9	-9.3	To Be Studied
2606	Tree	639.1	644.0	-4.8	663.7	-24.6	674.5	-35.4	-	-	711.5	-72.3	-	-	No Action
2607	Tree	639.7	644.0	-4.3	663.8	-24.1	674.6	-34.9	-	-	711.6	-71.9	674.6	-34.9	No Action
2609	Tree	685.1	644.2	40.9	663.9	21.2	674.8	10.3	-	-	711.7	-26.6	674.8	10.3	To Be Studied
2610	Bush	639.7	644.2	-4.5	664.0	-24.3	674.8	-35.2	-	-	711.8	-72.1	674.8	-35.2	No Action
2611	Tree	640.5	644.4	-3.8	664.2	-23.7	675.1	-34.5	-	-	712.1	-71.5	675.1	-34.5	No Action
2612	Tree	649.2	644.5	4.7	664.4	-15.2	675.3	-26.1	-	-	712.3	-63.1	675.3	-26.1	To Be Studied
2613	Tree	683.5	644.6	38.8	664.5	19.0	675.4	8.0	-	-	712.5	-29.0	675.4	8.0	To Be Studied
2615	Tree	672.3	644.8	27.6	664.7	7.7	675.7	-3.3	-	-	712.7	-40.4	675.7	-3.3	To Be Studied
2616	Tree	632.6	644.9	-12.2	664.8	-32.2	675.8	-43.2	-	-	712.9	-80.2	675.8	-43.2	No Action
2619	Tree	673.1	645.1	28.1	665.1	8.1	676.1	-3.0	-	-	713.2	-40.1	676.1	-3.0	To Be Studied
2620	Tree	637.5	645.2	-7.6	665.2	-27.7	676.3	-38.7	-	-	713.4	-75.8	676.3	-38.7	No Action
2621	Tree	683.1	645.2	37.9	665.2	17.9	676.3	6.8	-	-	713.4	-30.3	676.3	6.8	To Be Studied
2622	Tree	661.3	645.3	16.0	665.3	-4.0	676.4	-15.1	-	-	713.5	-52.2	676.4	-15.1	To Be Studied
2623	Tree	677.2	645.5	31.8	665.5	11.7	676.7	0.6	-	-	713.8	-36.6	676.7	0.6	To Be Studied
2624	Bush	640.2	645.5	-5.3	665.6	-25.4	676.7	-36.5	-	-	713.8	-73.7	676.7	-36.5	No Action
2626	Tree	656.0	645.6	10.4	665.8	-9.7	676.9	-20.9	-	-	714.1	-58.1	-	-	To Be Studied
2628	Tree	669.0	645.7	23.3	665.9	3.1	677.1	-8.0	-	-	714.3	-45.2	677.1	-8.0	To Be Studied
2631	Tree	634.6	645.9	-11.3	666.1	-31.5	677.3	-42.7	-	-	714.5	-80.0	677.3	-42.7	No Action
2632	Tree	684.7	645.9	38.8	666.1	18.6	677.3	7.4	-	-	714.6	-29.8	677.3	7.4	To Be Studied
2633	Tree	653.5	646.0	7.5	666.3	-12.7	677.5	-24.0	-	-	714.7	-61.2	-	-	To Be Studied
2636	Tree	693.0	646.4	46.6	666.7	26.3	678.0	14.9	-	-	715.3	-22.3	678.0	14.9	To Be Studied
2637	Tree	674.6	646.4	28.2	666.7	7.9	678.1	-3.5	-	-	715.3	-40.7	678.1	-3.5	To Be Studied
2638	Bush	632.3	646.4	-14.2	666.7	-34.5	678.1	-45.8	-	-	715.3	-83.1	678.1	-45.8	No Action
2639	Tree	637.0	646.5	-9.5	666.9	-29.8	678.2	-41.2	-	-	715.5	-78.5	678.2	-41.2	No Action
2641	Tree	656.1	646.6	9.6	666.9	-10.8	678.3	-22.2	-	-	715.6	-59.5	-	-	To Be Studied
2642	Tree	639.0	646.6	-7.7	667.0	-28.1	678.4	-39.4	-	-	715.7	-76.7	-	-	No Action
2643	Tree	632.1	646.7	-14.6	667.1	-35.0	-	-	-	-	-	-	-	-	No Action
2644	Tree	646.4	646.8	-0.4	667.2	-20.8	678.6	-32.2	-	-	715.9	-69.5	678.6	-32.2	No Action
2645	Tree	653.5	646.9	6.6	667.3	-13.9	678.8	-25.3	-	-	716.1	-62.6	-	-	To Be Studied
2646	Tree	644.1	647.1	-2.9	667.6	-23.4	679.0	-34.9	-	-	716.4	-72.2	679.0	-34.9	No Action
2647	Tree	654.9	647.2	7.7	667.7	-12.8	679.2	-24.3	-	-	716.5	-61.6	-	-	To Be Studied
2649	Bush	635.2	647.2	-12.0	667.8	-32.5	679.3	-44.1	-	-	716.7	-81.4	679.3	-44.1	No Action
2650	Tree	648.6	647.2	1.3	667.8	-19.2	679.3	-30.7	-	-	716.7	-68.1	-	-	To Be Studied
2651	Tree	642.9	647.3	-4.4	667.8	-24.9	679.3	-36.4	-	-	716.7	-73.8	679.3	-36.4	No Action
2652	Tree	646.2	647.3	-1.1	667.8	-21.6	679.3	-33.2	-	-	716.7	-70.5	679.3	-33.2	No Action
2653	Tree	643.5	647.3	-3.8	667.8	-24.3	679.4	-35.8	-	-	716.7	-73.2	-	-	No Action
2654	Tree	639.6	647.4	-7.8	668.0	-28.4	679.6	-39.9	-	-	-	-	-	-	No Action
2655	Tree	633.4	647.5	-14.0	668.0	-34.6	679.6	-46.2	-	-	717.0	-83.6	-	-	No Action
2656	Tree	640.8	647.5	-6.8	668.2	-27.4	679.7	-39.0	-	-	717.2	-76.4	679.7	-39.0	No Action
2658	Tree	643.4	647.7	-4.3	668.3	-24.9	680.0	-36.5	-	-	717.4	-73.9	680.0	-36.5	No Action
2659	Tree	652.4	647.7	4.7	668.4	-16.0	680.0	-27.6	-	-	717.4	-65.0	-	-	To Be Studied
2661	Tree	649.6	647.8	1.8	668.5	-18.9	680.1	-30.5	-	-	717.6	-67.9	-	-	To Be Studied
2662	Tree	639.6	647.8	-8.3	668.5	-28.9	680.1	-40.6	-	-	717.6	-78.0	680.1	-40.6	No Action
2663	Tree	656.3	647.8	8.4	668.5	-12.3	680.2	-23.9	-	-	717.6	-61.3	680.2	-23.9	To Be Studied
2665	Bush	636.5	647.9	-11.4	668.6	-32.1	680.2	-43.7	-	-	717.7	-81.2	680.2	-43.7	No Action
2667	Tree	640.3	648.2	-7.9	668.9	-28.6	680.7	-40.3	-	-	718.2	-77.8	-	-	No Action
2668	Tree	641.7	648.2	-6.5	669.0	-27.3	680.7	-39.0	-	-	718.2	-76.5	-	-	No Action
2669	Tree	637.3	648.2	-10.9	669.0	-31.7	680.7	-43.4	-	-	718.2	-80.9	680.7	-43.4	No Action
2670	Tree	642.0	648.2	-6.3	669.0	-27.1	680.8	-38.8	-	-	718.3	-76.3	680.8	-38.8	No Action
2671	Tree	636.7	648.4	-11.7	669.2	-32.5	681.0	-44.3	-	-	718.5	-81.8	681.0	-44.3	No Action
2674	Tree	656.1	648.7	7.4	669.6	-13.5	681.4	-25.3	-	-	718.9	-62.8	-	-	To Be Studied
2676	Tree	675.8	649.1	26.7	670.1	5.7	682.1	-6.3	698.3	-22.5	719.7	-43.9	682.1	-6.3	To Be Studied
2677	Tree	656.2	649.6	6.6	670.8	-14.5	682.8	-26.6	-	-	720.5	-64.3	682.8	-26.6	To Be Studied
2678	Tree	679.9	649.8	30.1	671.0	8.9	683.0	-3.2	-	-	720.7	-40.9	683.0	-3.2	To Be Studied
2679	Tree	666.5	649.8	16.7	671.0	-4.4	683.0	-16.5	699.5	-32.9	720.7	-54.2	683.0	-16.5	To Be Studied
2680	Tree	664.7	650.0	14.7	671.3	-6.6	683.4	-18.7	-	-	721.1	-56.4	683.4	-18.7	To Be Studied
2681	Tree	675.5	650.1	25.3	671.4	4.1	683.6	-8.1	700.0	-24.6	721.3	-45.8	683.6	-8.1	To Be Studied
2682	Tree	638.8	650.2	-11.4	671.5	-32.7	683.7	-44.8	-	-	721.4	-82.6	683.7	-44.8	No Action
2683	Tree	668.6	650.3	18.3	671.5	-3.0	683.7	-15.1	-	-	721.5	-52.9	683.7	-15.1	To Be Studied
2684	Tree	659.9	650.6	9.3	672.0	-12.1	684.2	-24.3	700.8	-40.9	722.0	-62.1	684.2	-24.3	To Be Studied
2685	Tree	659.0	650.7	8.3	672.1	-13.1	684.4	-25.4	701.0	-42.0	722.2	-63.2	684.4	-25.4	To Be Studied
2686	Tree	665.7	650.8	14.8	672.3	-6.6	684.5	-18.9	-	-	722.4	-56.7	684.5	-18.9	To Be Studied
2688	Tree	637.1	650.9	-13.8	672.4	-35.3	684.7	-47.6	-	-	722.6	-85.4	-	-	No Action
2689	Tree	663.5	651.0	12.5	672.5	-9.0	684.8	-21.3	701.4	-38.0	722.6	-59.2	684.8	-21.3	To Be Studied
2690	Tree	677.1	651.0	26.1	672.5	4.6	684.8	-7.7	-	-	722.6	-45.6	684.8	-7.7	To Be Studied
2691	Tree	668.7	651.3	17.4	672.9	-4.1	685.3	-16.5	702.0	-33.3	723.2	-54.4	685.3	-16.5	To Be Studied
2692	Tree	665.8	651.4	14.4	673.0	-7.1	685.4	-19.6	-	-	723.3	-57.5	685.4	-19.6	To Be Studied
2693	Tree	664.7	651.5	13.2	673.1	-8.4	685.6	-20.8	-	-	723.5	-58.8	685.6	-20.8	To Be Studied
2694	Tree	652.0	651.6	0.5	673.2	-21.2	685.7	-33.6	-	-	723.6	-71.6	685.7	-33.6	To Be Studied
2695	Tree	657.0	651.6	5.4	673.2	-16.3	685.7	-28.7	-	-	723.6	-66.7	685.7	-28.7	To Be Studied
2696	Tree	668.6	652.0	16.6	673.7	-5.1	686.3	-17.7	703.1	-34.5	724.2	-55.6	686.3	-17.7	To Be Studied
2697	Tree	662.8	652.2	10.6	673.9	-11.1	686.5	-23.7	703.4	-40.6	724.5	-61.7	686.5	-23.7	To Be Studied
2698	Tree	664.1	652.6	11.5	674.5	-10.4	687.2	-23.1	-	-	725.3	-61.2	687.2	-23.1	To Be Studied
2700	Tree	650.4	654.0	-3.6	676.2	-25.9	689.2	-38.9	-	-	727.4	-77.1	689.2	-38.9	No Action
2701	Tree	640.6	654.7	-14.1	677.1	-36.5	690.2	-49.6	-	-	728.5	-88.0	690.2	-49.6	No Action
2702	Power Transmission Line	661.0	679.6	-18.6	708.3	-47.3	726.9	-65.9	-	-	768.4	-107.4	-	-	No Action
2703	Power Transmission Line	669.8	681.7	-11.9	710.9	-41.1	730.0	-60.2	-	-	771.8	-101.9	730.0	-60.2	No Action
2704	Power Transmission Pylon	683.1	683.5	-0.5	713.2	-30.1	732.7	-49.6	-	-	774.7	-91.6	732.7	-49.6	No Action
5651	Sign	582.9	-	-	-	-	-	-	-	-	603.5	-20.5	-	-	Fixed by Function
5652	Sign	583.8	-	-	-	-	-	-	-	-	603.5	-19.7	-	-	Fixed by Function
5668	Sign	582.6	-	-	661.9	-79.3	584.0	-1.4	-	-	-	-	-	-	Fixed by Function
5670	Sign	589.1	-	-	651.1	-62.0	584.2	4.9	-	-	-	-	-	-	Fixed by Function
5672	Sign	584.5	-	-	695.7	-111.2	584.4	0.1	-	-	-	-	-	-	Fixed by Function
5682	Runway Light	589.9	585.4	4.4	590.4	-0.6	588.4	1.5	592.1	-2.3	617.9	-28.0	588.4	1.5	Fixed by Function
5687	Runway Light	594.1	589.3	4.8	595.3	-1.3	594.1	0.0	598.6	-4.6	624.1	-30.1	594.1	0.0	Fixed by Function
5693	Runway Light	597.6	593.3	4.4	600.3	-2.7	600.0	-2.3	605.3	-7.6	630.5	-32.8	600.0	-2.3	Fixed by Function
5698	Fence	599.0	596.8	2.2	704.8	-105.8	-	-	-	-	-	-	-	-	To Be Studied
5699	Runway Light	602.1	597.3	4.8	605.3	-3.2	605.8	-3.8	612.0	-9.9	636.9	-34.8	605.8	-3.8	Fixed by Function
5700	Runway Light	601.2	597.3	3.9	605.3	-4.1	605.9	-4.6	612.0	-10.7	636.9	-35.7	605.9	-4.6	Fixed by Function
5701	Runway Light	600.7	597.3	3.4	605.3	-4.6	605.9	-5.1	612.0	-11.3	636.9	-36.2	605.9	-5.1	Fixed by Function
5705	Fence	608.1	599.2	8.9	695.7	-87.5	-	-	-	-	-	-	-	-	To Be Studied
5707	Building	601.0	599.4	1.6	636.2	-35.2	609.0	-8.0	-	-	-	-	-	-	To Be Studied
5708	Utility Box	598.1	600.0	-1.9	631.1	-33.0	609.8	-11.7	-	-	-	-	-	-	No Action
5709	Pole	611.1	600.2	10.9	626.9	-15.8	610.2	0.9	-	-	-	-	-	-	To Be Studied
5710	Building	601.5	600.2	1.3	633.5	-32.0	610.2	-8.7	-	-	-	-	-	-	To Be Studied
5712	Runway Light	603.0	601.7	1.3	610.8	-7.8	612.3	-9.3	619.3	-16.3	643.9	-40.9	612.3	-9.3	Fixed by Function
5713	Utility Box	596.9	601.8	-4.9	611.0	-14.1	612.5	-15.6	619.5	-22.6	644.1	-47.2	612.5	-15.6	No Action
5714	Post	594.6	601.9	-7.3	611.0	-16.5	612.6	-18.0	619.6	-25.0	644.2	-49.6	612.6	-18.0	Fixed by Function
5716	Navaid	603.7	603.3	0.3	612.9	-9.2	614.7	-11.1	622.0	-18.4	646.6	-42.9	614.7	-11.1	Fixed by Function
5717	Navaid	603.7	603.4	0.3	612.9	-9.2	614.7	-11.1	622.1	-18.4	646.6	-42.9	614.7	-11.1	Fixed by Function
5723	Street Sign	601.4	604.2	-2.7	613.9	-12.4	615.9	-14.5	623.4	-21.9	647.8	-46.4	615.9	-14.5	No Action
5724	Street Sign	599.3	604.2	-4.8	613.9	-14.6	615.9	-16.6	623.4	-24.1	647.8	-48.5	615.9	-16.6	No Action
5727	Post	601.4	605.2	-3.7	615.2	-13.7	617.4	-16.0	625.1	-23.7	649.5	-48.0	617.4	-16.0	Fixed by Function
5728	Runway Light	608.7	605.3	3.4	615.3	-6.6	617.6	-8.9	625.3	-16.6	649.7	-41.0	617.6	-8.9	Fixed by Function
5739	Fence	625.7	606.9	18.9	687.3	-61.6	-	-	-	-	-	-	-	-	To Be Studied
5743	Building	620.0	608.3	11.7	681.3	-61.3	-	-	-	-	-	-	-	-	To Be Studied
5750	Runway Light	609.4	609.5	-0.1	620.6	-11.1	623.8	-14.4	632.3	-22.9	656.4	-47.0	623.8	-14.4	Fixed by Function
5753	Fence	618.2	609.7	8.5	653.8	-35.6	624.1	-5.9	-	-	-	-	-	-	To Be Studied
5760	Transformer	610.8	610.7	0.1	662.2	-51.4	-	-	-	-	-	-	-	-	To Be Studied
5762	Utility Box	611.8	610.9	0.8	643.8	-32.0	625.9	-14.1	-	-	-	-	-	-	To Be Studied
5764	Electric Box	609.5	611.1	-1.5	658.1	-48.5	626.1	-16.5	-	-	-	-	-	-	No Action
5765	Post	612.9	611.1	1.7	622.6	-9.7	626.2	-13.3	-	-	659.0	-46.1	-	-	Fixed by Function
5767	Misc Utility	613.8	611.3	2.4	655.4	-41.7	626.5	-12.7	-	-	-	-	-	-	To Be Studied
5772	Fence	619.6	611.7	7.9	645.9	-26.3	627.1	-7.5	-	-	-	-	-	-	To Be Studied
5776	Street Sign	622.3	613.4	8.9	654.1	-31.8	629.6	-7.2	-	-	-	-	-	-	To Be Studied
5779	Street Sign	623.3	614.0	9.4	674.9	-51.5	-	-	-	-	-	-	-	-	To Be Studied
5780	Fence	620.4	614.2	6.1	636.2	-15.8	630.8	-10.4	-	-	-	-	-	-	To Be Studied
5783	Street Sign	619.5	614.9	4.6	636.1	-16.6	631.7	-12.3	-	-	-	-	-	-	To Be Studied
5784	Fence	616.2	616.1	0.1	628.8	-12.6	633.5	-17.2	-	-	666.9	-50.7	-	-	To Be Studied
5789	Tree	621.7	617.0	4.8	687.7	-65.9	-	-	-	-	-	-	-	-	To Be Studied
5791	Tree	624.2	617.4	6.8	688.8	-64.6	-	-	-	-	-	-	-	-	To Be Studied
5792	Street Sign	614.8	617.4	-2.7	630.5	-15.7	635.5	-20.7	-	-	669.1	-54.3	-	-	No Action
5793	Runway Light	615.0	617.5	-2.5	630.6	-15.5	635.6	-20.5	645.6	-30.6	669.2	-54.1	635.6	-20.5	Fixed by Function
5795	Tree	621.5	617.7	3.8	687.3	-65.8	-	-	-	-	-	-	-	-	To Be Studied
5796	Tree	624.9	617.9	7.0	681.4	-56.4	-	-	-	-	-	-	-	-	To Be Studied
5797	Fence	618.9	617.9	1.0	631.1	-12.2	636.1	-17.2	-	-	669.8	-50.9	-	-	To Be Studied
5798	Street Sign	612.3	618.0	-5.6	631.2	-18.8	636.2	-23.9	-	-	-	-	-	-	No Action
5799	Tree	618.0	618.2	-0.2	677.2	-59.2	-	-	-	-	-	-	-	-	No Action
5800	Tree	624.4	618.5	5.9	680.2	-55.7	-	-	-	-	-	-	-	-	To Be Studied
5801	Tree	614.7	619.1	-4.4	673.5	-58.8	-	-	-	-	-	-	-	-	No Action
5804	Tree	619.5	619.7	-0.2	669.2	-49.7	-	-	-	-	-	-	-	-	No Action
5805	Tree	620.4	619.7	0.6	673.2	-52.9	-	-	-	-	-	-	-	-	To Be Studied
5806	Tree	621.5	619.8	1.6	670.7	-49.3	-	-	-	-	-	-	-	-	To Be Studied
5807	Tree	619.1	619.9	-0.8	667.9	-48.7	-	-	-	-	-	-	-	-	No Action
5808	Tree	618.4	620.0	-1.7	669.8	-51.5	-	-	-	-	-	-	-	-	No Action
5809	Tree	636.3	620.0	16.3	661.1	-24.8	-	-	-	-	-	-	-	-	To Be Studied
5810	Tree	619.7	620.2	-0.4	669.3	-49.6	-	-	-	-	-	-	-	-	No Action
5811	Fence	617.3	620.2	-2.9	634.0	-16.7	639.6	-22.2	-	-	673.5	-56.2	639.6	-22.2	No Action
5812	Tree	613.3	620.6	-7.3	666.5	-53.2	-	-	-	-	-	-	-	-	No Action
5813	Tree	615.7	620.8	-5.1	657.6	-41.9	-	-	-	-	-	-	-	-	No Action
5814	Tree	616.6	620.9	-4.3	663.5	-46.9	-	-	-	-	-	-	-	-	No Action
5815	Tree	615.7	621.1	-5.4	661.4	-45.7	-	-	-	-	-	-	-	-	No Action
5816	Pole	629.9	621.3	8.6	674.3	-44.4	-	-	-	-	-	-	-	-	To Be Studied
5817	Runway Light	614.6	621.3	-6.7	635.3	-20.7	641.1	-26.5	652.0	-37.3	675.2	-60.6	641.1	-26.5	Fixed by Function
5818	Tree	612.3	621.4	-9.0	658.1	-45.7	-	-	-	-	-	-	-	-	No Action
5820	Tree	614.9	622.3	-7.4	654.1	-39.2	-	-	-	-	-	-	-	-	No Action

Runway 30L Inner Approach (Existing)

Runway 30L Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
5821	Tree	615.8	622.4	-6.6	638.1	-22.3	642.8	-27.0	-	-	-	-	-	-	No Action
5822	Fence	617.1	622.8	-5.6	637.2	-20.0	643.3	-26.1	-	-	677.5	-60.4	643.3	-26.1	No Action
5826	Pole	630.7	625.0	5.7	646.1	-15.4	-	-	-	-	-	-	-	-	To Be Studied
5828	Fence	616.9	625.5	-8.6	640.6	-23.7	647.4	-30.5	-	-	682.0	-65.1	647.4	-30.5	No Action
5832	Pole	623.3	628.1	-4.8	643.8	-20.5	651.1	-27.8	-	-	-	-	-	-	No Action
5840	Road Sign	634.1	630.8	3.3	647.3	-13.2	655.2	-21.1	-	-	-	-	-	-	To Be Studied
5842	Billboard	629.7	631.4	-1.7	647.9	-18.3	656.0	-26.3	-	-	691.3	-61.7	656.0	-26.3	No Action
5896	Light Pole	630.5	634.2	-3.7	651.4	-20.9	660.1	-29.6	-	-	695.8	-65.3	-	-	No Action
5914	Light Pole	630.2	634.7	-4.5	652.1	-21.9	-	-	-	-	-	-	-	-	No Action
5991	Fence	627.5	636.7	-9.3	654.6	-27.2	663.8	-36.4	677.7	-50.2	699.9	-72.4	663.8	-36.4	No Action
6010	Fence	629.2	637.2	-8.0	655.2	-26.0	664.5	-35.3	678.4	-49.3	700.6	-71.4	664.5	-35.3	No Action
6014	Billboard	668.2	637.3	30.9	664.4	3.8	-	-	-	-	-	-	-	-	To Be Studied
6018	Fence	630.0	637.3	-7.4	655.4	-25.4	664.7	-34.7	678.7	-48.7	700.9	-70.9	664.7	-34.7	No Action
6027	Road Sign	631.8	637.6	-5.8	655.7	-23.9	665.0	-33.3	-	-	701.2	-69.4	-	-	No Action
6077	Tree	646.4	638.8	7.6	665.2	-18.9	-	-	-	-	-	-	-	-	To Be Studied
6092	Tree	654.1	639.1	15.0	665.2	-11.1	-	-	-	-	-	-	-	-	To Be Studied
6099	Tree	635.9	639.2	-3.2	657.7	-21.8	667.4	-31.5	681.8	-45.8	703.8	-67.9	667.4	-31.5	No Action
6102	Tree	636.7	639.2	-2.5	657.7	-21.1	667.5	-30.8	-	-	703.8	-67.2	667.5	-30.8	No Action
6109	Tree	657.5	-	-	670.7	-13.2	-	-	-	-	-	-	-	-	No Action
6110	Tree	655.9	639.3	16.5	664.2	-8.4	-	-	-	-	-	-	-	-	To Be Studied
6118	Bush	635.8	639.5	-3.7	658.1	-22.3	668.0	-32.1	682.4	-46.5	704.4	-68.5	668.0	-32.1	No Action
6126	Tree	657.5	639.6	17.9	664.3	-6.8	-	-	-	-	-	-	-	-	To Be Studied
6128	Tree	646.7	639.6	7.1	658.2	-11.5	-	-	-	-	-	-	-	-	To Be Studied
6129	Tree	642.3	639.6	2.7	658.2	-16.0	668.1	-25.8	682.5	-40.2	704.5	-62.2	668.1	-25.8	To Be Studied
6133	Bush	634.4	639.7	-5.3	658.3	-24.0	668.2	-33.8	682.6	-48.3	704.6	-70.2	668.2	-33.8	No Action
6135	Tree	652.8	639.8	13.0	658.5	-5.7	-	-	-	-	-	-	-	-	To Be Studied
6140	Bush	637.4	639.8	-2.4	658.5	-21.1	668.4	-31.0	682.9	-45.4	704.8	-67.4	668.4	-31.0	No Action
6142	Tree	639.5	639.9	-0.3	658.5	-19.0	668.4	-28.9	682.9	-43.4	704.9	-65.3	668.4	-28.9	No Action
6143	Tree	645.4	639.9	5.5	658.6	-13.2	-	-	-	-	-	-	-	-	To Be Studied
6147	Tree	658.6	640.0	18.6	661.4	-2.8	-	-	-	-	-	-	-	-	To Be Studied
6150	Tree	664.4	640.0	24.3	658.8	5.6	668.7	-4.3	683.2	-18.8	705.1	-40.8	668.7	-4.3	To Be Studied
6153	Tree	652.2	640.1	12.1	658.8	-6.6	-	-	-	-	-	-	-	-	To Be Studied
6157	Tree	658.0	640.1	17.9	658.8	-0.8	668.8	-10.7	683.3	-25.2	705.3	-47.2	668.8	-10.7	To Be Studied
6162	Tree	647.0	640.1	6.9	658.9	-11.9	-	-	-	-	-	-	-	-	To Be Studied
6165	Tree	646.3	640.2	6.1	659.0	-12.7	668.9	-22.6	683.4	-37.1	705.4	-59.1	668.9	-22.6	To Be Studied
6167	Tree	631.8	640.2	-8.5	659.0	-27.3	669.0	-37.2	-	-	705.5	-73.7	669.0	-37.2	No Action
6170	Tree	656.1	640.3	15.8	659.1	-3.0	669.1	-13.0	683.7	-27.5	705.6	-49.5	669.1	-13.0	To Be Studied
6172	Tree	653.3	640.4	12.9	659.2	-5.9	-	-	-	-	-	-	-	-	To Be Studied
6173	Tree	660.7	640.4	20.3	659.2	1.5	669.2	-8.5	683.8	-23.1	705.7	-45.0	669.2	-8.5	To Be Studied
6178	Tree	638.9	640.5	-1.6	659.4	-20.5	669.4	-30.5	684.0	-45.1	705.9	-67.0	669.4	-30.5	No Action
6179	Bush	633.5	640.5	-7.0	659.4	-25.9	669.4	-35.9	684.0	-50.5	705.9	-72.4	669.4	-35.9	No Action
6182	Tree	655.5	640.5	14.9	659.4	-3.9	669.4	-14.0	684.0	-28.6	706.0	-50.5	669.4	-14.0	To Be Studied
6186	Tree	657.7	640.6	17.1	659.5	-1.7	669.5	-11.8	684.1	-26.4	706.1	-48.3	669.5	-11.8	To Be Studied
6188	Bush	637.1	640.7	-3.6	659.6	-22.5	669.7	-32.6	684.3	-47.2	706.2	-69.1	669.7	-32.6	No Action
6193	Bush	636.0	640.8	-4.8	659.7	-23.8	669.8	-33.8	684.5	-48.5	706.4	-70.4	669.8	-33.8	No Action
6202	Tree	659.8	641.0	18.8	660.0	-0.2	670.1	-10.3	684.8	-25.0	706.7	-46.9	670.1	-10.3	To Be Studied
6203	Tree	638.8	641.0	-2.2	660.0	-21.2	670.2	-31.4	-	-	706.7	-68.0	670.2	-31.4	No Action
6206	Tree	650.4	641.1	9.3	660.1	-9.7	670.3	-19.9	685.0	-34.6	706.9	-56.5	670.3	-19.9	To Be Studied
6207	Bush	637.9	641.1	-3.3	660.1	-22.3	670.3	-32.4	685.0	-47.1	706.9	-69.0	670.3	-32.4	No Action
6212	Bush	634.0	641.3	-7.3	660.3	-26.3	670.5	-36.5	685.2	-51.2	707.1	-73.1	670.5	-36.5	No Action
6226	Tree	663.4	641.6	21.8	660.7	2.7	671.0	-7.5	685.8	-22.3	707.6	-44.2	671.0	-7.5	To Be Studied
6227	Bush	637.6	641.6	-4.0	660.7	-23.2	671.0	-33.4	685.8	-48.2	707.7	-70.1	671.0	-33.4	No Action
6229	Tree	658.0	641.7	16.4	660.8	-2.8	671.1	-13.1	686.0	-27.9	707.8	-49.8	671.1	-13.1	To Be Studied
6230	Bush	634.0	641.7	-7.7	660.8	-26.9	671.1	-37.1	686.0	-52.0	707.8	-73.8	671.1	-37.1	No Action
6233	Bush	638.0	641.8	-3.9	661.0	-23.1	671.4	-33.4	686.2	-48.3	708.0	-70.1	671.4	-33.4	No Action
6234	Bush	632.9	641.9	-8.9	661.0	-28.1	671.4	-38.4	-	-	708.1	-75.1	671.4	-38.4	No Action
6239	Tree	663.6	642.0	21.6	661.2	2.4	671.6	-7.9	686.4	-22.8	708.3	-44.7	671.6	-7.9	To Be Studied
6243	Tree	670.2	642.1	28.1	661.4	8.8	671.8	-1.5	686.7	-16.4	708.5	-38.3	671.8	-1.5	To Be Studied
6247	Tree	642.6	642.2	0.4	661.5	-18.8	671.9	-29.2	686.8	-44.2	708.6	-66.0	671.9	-29.2	To Be Studied
6249	Tree	638.5	642.3	-3.8	661.6	-23.1	672.0	-33.5	686.9	-48.4	708.7	-70.2	672.0	-33.5	No Action
6260	Tree	643.4	642.8	0.5	662.2	-18.9	672.8	-29.4	687.8	-44.5	709.6	-66.2	672.8	-29.4	To Be Studied
6262	Tree	646.4	642.8	3.5	662.3	-15.9	672.8	-26.4	687.8	-41.5	709.6	-63.3	672.8	-26.4	To Be Studied
6263	Bush	636.7	643.0	-6.3	662.5	-25.8	673.1	-36.3	688.1	-51.4	709.9	-73.2	673.1	-36.3	No Action
6265	Bush	636.0	643.0	-7.0	662.5	-26.5	673.1	-37.1	688.1	-52.1	709.9	-73.9	673.1	-37.1	No Action
6266	Bush	637.1	643.1	-5.9	662.6	-25.4	673.2	-36.0	-	-	710.0	-72.9	673.2	-36.0	No Action
6271	Light Pole	634.9	643.3	-8.4	662.9	-27.9	673.5	-38.6	-	-	710.4	-75.5	673.5	-38.6	No Action
6272	Tree	636.7	643.3	-6.7	662.9	-26.2	673.5	-36.9	688.6	-52.0	710.4	-73.7	673.5	-36.9	No Action
6273	Tree	637.7	643.3	-5.7	662.9	-25.2	673.5	-35.9	688.7	-51.0	710.4	-72.7	673.5	-35.9	No Action
6274	Tree	640.5	643.4	-2.8	663.0	-22.4	673.6	-33.1	688.8	-48.2	710.5	-70.0	673.6	-33.1	No Action
6275	Bush	636.1	643.5	-7.3	663.1	-26.9	673.7	-37.6	688.9	-52.8	710.6	-74.5	673.7	-37.6	No Action
6276	Bush	636.0	643.5	-7.5	663.1	-27.1	673.8	-37.8	-	-	710.7	-74.7	673.8	-37.8	No Action
6279	Bush	635.5	643.6	-8.1	663.2	-27.7	673.9	-38.4	-	-	710.8	-75.3	673.9	-38.4	No Action
6283	Building	641.9	643.9	-2.1	663.6	-21.8	-	-	-	-	-	-	-	-	No Action
6287	Tree	664.7	644.2	20.5	664.0	0.7	674.8	-10.1	690.1	-25.4	711.8	-47.1	674.8	-10.1	To Be Studied
6288	Tree	661.4	644.2	17.2	664.0	-2.6	674.8	-13.5	690.1	-28.8	711.8	-50.4	674.8	-13.5	To Be Studied
6291	Bush	635.0	644.4	-9.3	664.2	-29.2	675.1	-40.0	690.4	-55.4	712.1	-77.1	675.1	-40.0	No Action
6292	Tree	659.0	644.5	14.5	664.3	-5.3	675.2	-16.2	690.6	-31.6	712.2	-53.2	675.2	-16.2	To Be Studied
6293	Bush	640.6	644.5	-3.9	664.3	-23.7	675.2	-34.6	690.6	-50.0	712.2	-71.6	675.2	-34.6	No Action
6297	Tree	670.8	644.6	26.2	664.4	6.3	675.4	-4.6	690.8	-20.0	712.4	-41.6	675.4	-4.6	To Be Studied
6298	Bush	635.8	644.6	-8.8	664.5	-28.6	675.4	-39.6	690.8	-55.0	712.5	-76.6	675.4	-39.6	No Action
6299	Light Pole	636.3	644.6	-8.3	664.5	-28.2	675.4	-39.1	-	-	712.5	-76.1	-	-	No Action
6301	Bush	635.6	644.6	-9.0	664.5	-28.9	675.5	-39.8	690.9	-55.2	712.5	-76.9	675.5	-39.8	No Action
6302	Tree	657.4	644.7	12.8	664.6	-7.1	675.5	-18.1	690.9	-33.5	712.6	-55.1	675.5	-18.1	To Be Studied
6303	Tree	661.0	644.7	16.3	664.6	-3.6	675.5	-14.6	691.0	-30.0	712.6	-51.6	675.5	-14.6	To Be Studied
6304	Tree	636.4	644.7	-8.3	664.6	-28.2	675.6	-39.1	691.0	-54.6	712.6	-76.2	675.6	-39.1	No Action
6306	Tree	658.0	644.8	13.2	664.7	-6.7	675.7	-17.7	691.1	-33.1	712.7	-54.8	675.7	-17.7	To Be Studied
6307	Tree	674.5	644.8	29.7	664.7	9.7	675.7	-1.2	691.1	-16.7	712.8	-38.3	675.7	-1.2	To Be Studied
6308	Tree	657.5	645.0	12.5	664.9	-7.5	675.9	-18.5	691.4	-33.9	713.0	-55.6	675.9	-18.5	To Be Studied
6309	Tree	659.0	645.0	14.0	665.0	-5.9	676.0	-17.0	691.5	-32.4	713.1	-54.1	676.0	-17.0	To Be Studied
6312	Tree	648.4	645.1	3.3	665.1	-16.7	676.2	-27.7	691.7	-43.2	713.3	-64.9	676.2	-27.7	To Be Studied
6313	Bush	638.1	645.1	-7.0	665.1	-27.0	676.2	-38.1	-	-	713.3	-75.2	676.2	-38.1	No Action
6314	Tree	656.0	645.1	10.9	665.2	-9.1	676.2	-20.2	691.7	-35.7	713.3	-57.3	676.2	-20.2	To Be Studied
6318	Bush	636.2	645.3	-9.2	665.4	-29.2	676.5	-40.3	692.0	-55.9	713.6	-77.5	676.5	-40.3	No Action
6319	Tree	655.5	645.4	10.2	665.5	-9.9	676.6	-21.0	692.1	-36.6	713.7	-58.2	676.6	-21.0	To Be Studied
6323	Tree	653.8	645.5	8.3	665.7	-11.9	676.8	-23.0	692.4	-38.6	713.9	-60.2	676.8	-23.0	To Be Studied
6324	Bush	642.1	645.5	-3.4	665.7	-23.6	676.8	-34.7	692.4	-50.3	714.0	-71.9	676.8	-34.7	No Action
6325	Bush	638.9	645.6	-6.7	665.7	-26.8	676.8	-37.9	-	-	714.0	-75.1	676.8	-37.9	No Action
6326	Tree	669.2	645.6	23.6	665.7	3.5	676.9	-7.6	692.5	-23.2	714.1	-44.8	676.9	-7.6	To Be Studied
6328	Tree	645.6	645.6	-0.1	665.8	-20.2	676.9	-31.4	692.5	-47.0	714.1	-68.5	676.9	-31.4	No Action
6330	Tree	656.0	645.7	10.3	665.9	-9.8	677.0	-21.0	692.6	-36.6	714.2	-58.2	677.0	-21.0	To Be Studied
6334	Tree	664.5	645.8	18.7	666.0	-1.5	677.2	-12.7	692.8	-28.3	714.4	-49.9	677.2	-12.7	To Be Studied
6335	Tree	654.0	645.9	8.1	666.1	-12.1	677.3	-23.3	692.9	-38.9	714.5	-60.5	677.3	-23.3	To Be Studied
6338	Tree	641.4	645.9	-4.6	666.2	-24.8	677.4	-36.0	693.0	-51.7	714.6	-73.2	677.4	-36.0	No Action
6339	Tree	657.7	646.0	11.7	666.2	-8.5	677.4	-19.8	693.1	-35.4	714.7	-57.0	677.4	-19.8	To Be Studied
6341	Tree	656.4	646.0	10.4	666.3	-9.9	677.5	-21.1	693.2	-36.8	714.7	-58.3	677.5	-21.1	To Be Studied
6343	Tree	658.4	646.1	12.3	666.3	-8.0	677.6	-19.2	693.3	-34.9	714.8	-56.5	677.6	-19.2	To Be Studied
6344	Tree	655.0	646.1	8.9	666.4	-11.4	677.6	-22.7	693.3	-38.4	714.9	-59.9	677.6	-22.7	To Be Studied
6348	Tree	660.5	646.4	14.1	666.7	-6.2	678.0	-17.5	693.7	-33.3	715.3	-54.8	678.0	-17.5	To Be Studied
6349	Tree	664.7	646.4	18.3	666.7	-2.0	678.0	-13.3	693.7	-29.1	715.3	-50.6	678.0	-13.3	To Be Studied
6352	Tree	660.1	646.5	13.6	666.8	-6.7	678.2	-18.1	693.9	-33.8	715.4	-55.3	678.2	-18.1	To Be Studied
6355	Bush	637.4	646.5	-9.2	666.9	-29.5	678.3	-40.9	694.0	-56.6	715.6	-78.2	678.3	-40.9	No Action
6357	Bush	639.1	646.6	-7.5	667.0	-27.9	678.4	-39.2	-	-	715.7	-76.5	678.4	-39.2	No Action
6359	Tree	663.4	646.7	16.7	667.1	-3.7	678.5	-15.1	694.3	-30.9	715.8	-52.4	678.5	-15.1	To Be Studied
6362	Bush	638.9	647.0	-8.1	667.5	-28.6	678.9	-40.0	694.8	-55.9	716.2	-77.4	678.9	-40.0	No Action
6363	Tree	669.0	647.0	22.0	667.5	1.6	678.9	-9.9	694.8	-25.8	716.3	-47.2	678.9	-9.9	To Be Studied
6365	Tree	661.6	647.1	14.5	667.7	-6.1	679.1	-17.5	695.0	-33.4	716.5	-54.9	679.1	-17.5	To Be Studied
6367	Bush	638.4	647.2	-8.8	667.7	-29.3	679.2	-40.8	695.1	-56.7	716.6	-78.2	679.2	-40.8	No Action
6368	Tree	658.3	647.2	11.1	667.7	-9.4	679.2	-20.9	695.1	-36.9	716.6	-58.3	679.2	-20.9	To Be Studied
6373	Tree	645.8	647.3	-1.5	667.8	-22.1	679.4	-33.6	695.3	-49.5	716.8	-71.0	679.4	-33.6	No Action
6374	Building	659.1	647.4	11.8	667.9	-8.8	-	-	-	-	-	-	-	-	To Be Studied
6375	Bush	640.6	647.4	-6.8	668.0	-27.4	679.5	-38.9	-	-	716.9	-76.3	679.5	-38.9	No Action
6376	Tree	653.6	647.4	6.2	668.0	-14.4	679.5	-25.9	695.5	-41.8	716.9	-63.3	679.5	-25.9	To Be Studied
6380	Light Pole	640.7	647.6	-6.9	668.2	-27.5	679.8	-39.1	-	-	717.2	-76.6	679.8	-39.1	No Action
6382	Tree	664.7	647.7	17.0	668.4	-3.6	680.0	-15.2	696.0	-31.2	717.4	-52.7	680.0	-15.2	To Be Studied
6384	Tree	669.0	647.7	21.3	668.4	0.6	680.0	-11.0	696.0	-27.0	717.4	-48.5	680.0	-11.0	To Be Studied
6385	Tree	668.6	647.7	20.9	668.4	0.2	680.0	-11.4	696.0	-27.4	717.4	-48.8	680.0	-11.4	To Be Studied
6386	Tree	659.7	647.7	11.9	668.4	-8.7	680.0	-20.4	696.0	-36.4	717.5	-57.8	680.0	-20.4	To Be Studied
6390	Bush	638.4	647.8	-9.5	668.5	-30.1	680.2	-41.8	696.2	-57.8	717.6	-79.2	680.2	-41.8	No Action
6394	Tree	651.6	648.0	3.6	668.7	-17.1	680.4	-28.7	696.4	-44.8	717.8	-66.2	680.4	-28.7	To Be Studied
6395	Tree	649.3	648.0	1.3	668.7	-19.4	680.4	-31.1	696.4	-47.1	717.8	-68.5	680.4	-31.1	To Be Studied
6396	Tree	671.9	648.0	23.9	668.7	3.2	680.4	-8.5	696.4	-24.6	717.8	-46.0	680.4	-8.5	To Be Studied
6398	Tree	660.7	648.1	12.7	668.8	-8.1	680.5	-19.8	696.6	-35.9	718.0	-57.3	680.5	-19.8	To Be Studied
6403	Tree	659.7	648.3	11.4	669.1	-9.4	680.9	-21.1	697.0	-37.2	718.4	-58.6	680.9	-21.1	To Be Studied
6404	Tree	670.3	648.4	21.9	669.2	1.1	681.0	-10.7	697.1	-26.8	718.5	-48.2	681.0	-10.7	To Be Studied
6406	Tree	653.4	648.4	5.0	669.2	-15.8	681.0	-27.6	697.1	-43.7	718.5	-65.1	681.0	-27.6	To Be Studied
6407	Tree	666.5	648.4	18.1	669.2	-2.7	681.0	-14.5	697.2	-30.6	718.5	-52.0	681.0	-14.5	To Be Studied
6408	Tree	664.0	648.4	15.5	669.3	-5.3	681.1	-17.1	697.2	-33.2	718.6	-54.6	681.1	-17.1	To Be Studied
6409	Tree	675.7	648.5	27.2	669.3	6.4	681.1	-5.4	697.2	-21.6	718.6	-43.0	681.1	-5.4	To Be Studied
6410	Tree	665.5	648.5	17.0	669.4	-3.9	681.2	-15.7	697.3	-31.8	718.7	-53.2	681.2	-15.7	To Be Studied
6411	Tree	661.4	648.6	12.8	669.5	-8.1	681.3	-19.9	697.5	-36.1	718.8	-57.5	681.3	-19.9	To Be Studied
6412	Tree	666.7	648.6	18.1	669.5	-2.8	681.3	-14.6	697.5	-30.8	718.9	-52.2	681.3	-14.6	To Be Studied
6418	Tree	661.7	648.9	12.8	669.9	-8.2	681.8	-20.1	698.0	-36.3	719.4	-57.7	681.8	-20.1	To Be Studied
6419	Tree	663.2	649.0	14.2	670.0	-6.8	681.9	-18.7	698.2	-35.0	719.5	-56.3	681.9	-18.7	To Be Studied
6420	Tree	670.5	649.0	21.5	670.0	0.5	681.9	-11.4	698.2	-27.6	719.5	-49.0	681.9	-11.4	To Be Studied
6421	Tree	657.8	649.0	8.8	670.0	-12.2	681.9	-24.1	698.2	-40.4	719.5	-61.7	681.9	-24.1	To Be Studied
6422	Tree	667.2	649.0	18.1	670.0	-2.9	681.9	-14.8	698.2	-31.0	719.5	-52.4	681.9	-14.8	To Be Studied
6423	Tree	671.7	649.0	22.7	670.0	1.7	681.9	-10.2	698.2	-26.5	719.6	-47.8	681.9	-10.2	To Be Studied
6425	Tree	662.9	649.3	13.7	670.3	-7.4	682.3	-19.3	698.6	-35.6	719.9	-57.0	682.3	-19.3	To Be Studied
6426	Tree	669.1	649.3	19.8	670.3	-1.2	682.3	-13.2	698.6	-29.5	719.9	-50.8	682.3	-13.2	To Be Studied
6430	Tree	663.4	649.5	14.0	670.6	-7.1	682.6	-19.1	698.9	-35.5	720.2	-56.8	682.6	-19.1	To Be Studied
6431	Tree	658.0	649.6	8.4	670.7	-12.7	682.8	-24.7	699.1	-41.1	720.4	-62.4	682.8	-24.7	To Be Studied
6433	Tree	664.6	649.7	14.9	670.8	-6.2	682.9	-18.3	699.3	-34.6	720.5	-55.9	682.9	-18.3	To Be Studied
6436	Tree	668.4	649.9	18.4	671.1	-2.8	683.2	-14.9	699.6	-31.3	720.9	-52.6	683.2	-14.9	To Be Studied
6441	Tree	662.7	650.3	12.4	671.6	-8.9	683.7	-21.1	700.2	-37.6	721.5	-58.8	683.7	-21.1	To Be Studied
6442	Tree	654.1	650.4	3.7	671.8	-17.7	684.0	-29.9	700.5	-46.4	721.8	-67.7	684.0	-29.9	To Be Studied
6443	Tree	660.7	650.6	10.2	671.9	-11.2	684.2	-23.5	700.8	-40.0	722.0	-61.3	684.2	-23.5	To Be Studied
6445	Tree	668.6	650.6	18.0	672.0	-3.4	684.2	-15.6	700.8	-32.2	722.0	-53.4	684.2	-15.6	To Be Studied
6446	Tree	650.4	650.7	-0.3	672.1	-21.7	684.3	-34.0	700.9	-50.6	722.2	-71.8	684.3	-34.0	No Action
6448	Tree	651.4	650.7	0.7	672.1	-20.7	684.4	-33.0	701.0	-49.6	722.2	-70.8	684.4	-33.0	To Be Studied
6449	Tree	651.7	650.8	0.9	672.2	-20.5	684.5	-32.8	701.1	-49.4	722.3	-70.6	684.5	-32.8	To Be Studied
6450	Tree	658.6	650.8	7.8	672.2	-13.6	684.5	-25.9	701.1	-42.5	722.3	-63.7	684.5	-25.9	To Be Studied
6454	Tree	660.1	651.0	9.1	672.5	-12.4	684.9	-24.8	701.5	-41.4	722.7	-62.6	684.9	-24.8	To Be Studied
6455	Tree	652.1	651.2	1.0	672.7	-20.6	685.0	-32.9	701.7	-49.6	722.9	-70.8	685.0	-32.9	To Be Studied
6456	Tree	657.9	651.3	6.6	672.8	-14.9	685.2	-27.3	701.9	-44.0	723.1	-65.2	685.2	-27.3	To Be Studied
6457	Tree	659.1	651.3	7.8	672.8	-13.7	685.2	-26.1	701.9	-42.8	723.1	-64.0	685.2	-26.1	To Be Studied
6459	Tree	651.4	651.3	0.1	672.9	-21.5	685.3	-33.9	702.0	-50.6	723.2	-71.8	685.3	-33.9	To Be Studied
6461	Tree	659.4	651.5	7.9	673.1	-13.7	685.5	-26.2	702.3	-42.9	723.4	-64.1	685.5	-26.2	To Be Studied
6465	Tree	656.2	651.6	4.5	673.3	-17.1	685.8	-29.6	702.5	-46.4	723.7	-67.5	685.8	-29.6	To Be Studied
6466	Tree	660.6	651.8	8.8	673.4	-12.8	686.0	-25.3	702.7	-42.1	723.9	-63.3	686.0	-25.3	To Be Studied
6467	Tree	670.4	651.9	18.5	673.6	-3.2	686.1	-15.7	702.9	-32.5	724.1	-53.7	686.1	-15.7	To Be Studied
6469	Tree	644.2	652.0	-7.8	673.7	-29.5	686.3	-42.0	703.1	-58.9	724.3	-80.0	686.3	-42.0	No Action
6471	Tree	663.1	652.2	10.9	673.9	-10.8	686.5	-23.4	703.4	-40.3	724.5	-61.4	686.5	-23.4	To Be Studied
6472	Tree	662.9	652.2	10.7	674.0	-11.1	686.6	-23.7	703.4	-40.6	724.6	-61.7	686.6	-23.7	To Be Studied
6473	Tree	659.4	652.6	6.8	674.5	-15.1	687.2	-27.8	704.1	-44.7	725.2	-65.8	687.2	-27.8	To Be Studied
6475	Tree	657.9	652.7	5.2	674.7	-16.7	687.4	-29.5	704.4	-46.5	725.5	-67.5	687.4	-29.5	To Be Studied
6476	Tree	655.8	652.9	2.9	674.8	-19.0	687.6	-31.8	704.6	-48.8	725.6	-69.9	687.6	-31.8	To Be Studied
6477	Tree	651.4	653.1	-1.7	675.1	-23.7	687.9	-36.5	705.0	-53.6	726.0	-74.6	687.9	-36.5	No Action
6478	Tree	655.9	653.2	2.6	675.2	-19.4	688.1	-32.2	705.2	-49.3	726.2	-70.3	688.1	-32.2	To Be Studied
6480	Tree	649.7	653.5	-3.8	675.6	-25.9	688.5	-38.8	705.6	-55.9	726.7	-76.9	688.5	-38.8	To Be Studied
6481	Tree	648.8	653.5	-4.7	675.7	-26.9	688.6	-39.8	705.7	-56.9	726.7	-77.9	688.6	-39.8	To Be Studied
6482	Tree	648.5	653.5	-5.1	675.7	-27.2	688.6	-40.1	705.7	-57.2	726.7	-78.3	688.6	-40.1	To Be Studied
6483	Tree	647.0	653.7	-6.7	675.9	-28.8	688.8	-41.7	706.0	-58.9	727.0	-79.9	688.8	-41.7	To Be Studied

Runway 30L Inner Approach (Existing)

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12R30L - 12R-30L P77 (2)
LAYOUT: 30L Inner (1)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:37 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

wsp

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 30L Obstruction Tables Inner Portion (Existing/Future)

SCALE	AS NOTED	JOB NO. 20042701.00
DATE	2/2023	
SHEET 50 OF 59 SHEETS		

Runway 30L Inner Approach (Existing)

Runway 30L Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
6485	Tree	649.4	654.0	-4.6	676.2	-26.8	689.2	-39.8	706.4	-57.0	727.4	-78.0	689.2	-39.8	No Action
6487	Tree	652.4	654.0	-1.6	676.2	-23.8	689.2	-36.9	706.5	-54.1	727.5	-75.1	689.2	-36.9	No Action
6489	Tree	652.2	654.5	-2.3	676.8	-24.6	689.9	-37.7	707.2	-55.1	728.2	-76.0	689.9	-37.7	No Action
6490	Tree	650.4	654.6	-4.3	677.0	-26.6	690.1	-39.8	707.5	-57.1	728.4	-78.1	690.1	-39.8	No Action
6491	Building	668.7	655.7	13.0	678.3	-9.7	-	-	-	-	-	-	-	-	To Be Studied
6492	Light Pole	652.2	655.9	-3.7	678.6	-26.4	692.0	-39.8	709.6	-57.4	730.5	-78.3	692.0	-39.8	No Action
6493	Building	668.6	658.3	10.2	681.7	-13.1	695.6	-27.0	-	-	734.4	-65.8	-	-	To Be Studied
6494	Light Pole	660.5	661.4	-0.9	683.5	-23.0	700.1	-39.6	-	-	739.3	-78.7	700.1	-39.6	No Action
6495	Tree	654.4	661.9	-7.4	686.1	-31.6	700.8	-46.4	-	-	740.0	-85.6	700.8	-46.4	No Action
6496	Light Pole	667.4	667.9	-0.4	693.6	-26.2	709.6	-42.2	729.6	-62.2	749.6	-82.2	709.6	-42.2	No Action
6497	Tree	670.5	668.3	2.0	694.3	-23.9	710.5	-40.0	-	-	750.6	-80.1	-	-	To Be Studied
6498	Billboard	659.0	668.5	-9.5	694.4	-35.4	710.6	-51.5	-	-	750.7	-91.6	710.6	-51.5	No Action
6499	Tree	674.8	668.7	6.1	694.6	-19.8	710.8	-36.0	-	-	750.9	-76.1	-	-	To Be Studied
6500	Light Pole	666.3	669.2	-2.9	695.5	-29.2	711.6	-45.3	-	-	751.8	-85.4	711.6	-45.3	To Be Studied
6501	Tree	672.4	670.2	2.2	696.5	-24.1	-	-	-	-	-	-	-	-	To Be Studied
6502	Tree	668.9	670.6	-1.7	697.0	-28.1	-	-	-	-	-	-	-	-	No Action
6503	Tree	671.1	670.6	0.5	697.1	-25.9	-	-	-	-	-	-	-	-	To Be Studied
6504	Light Pole	679.0	680.5	-1.6	709.4	-30.5	728.2	-49.3	-	-	769.8	-90.9	728.2	-49.3	No Action
6505	Light Pole	673.8	682.0	-2.3	711.3	-31.5	730.5	-50.7	753.2	-73.4	772.2	-92.5	730.5	-50.7	No Action
8357	Light Pole	673.8	682.0	-2.3	711.3	-31.5	730.5	-50.7	753.2	-73.4	772.2	-92.5	730.5	-50.7	No Action
8536	Tree	646.4	642.8	3.5	662.3	-15.9	672.8	-26.4	687.8	-41.5	709.6	-63.3	672.8	-26.4	To Be Studied
10650	Service Road	590.0	585.3	4.7	718.8	-128.8	-	-	-	-	-	-	-	-	To Be Studied
10651	Service Road	600.0	593.3	6.7	681.9	-81.9	599.9	0.1	-	-	-	-	-	-	To Be Studied
10652	Service Road	601.2	597.4	3.8	627.8	-26.6	606.0	-4.8	-	-	637.1	-35.9	-	-	To Be Studied
10653	Service Road	600.0	597.9	2.1	607.0	-7.0	606.7	-6.7	-	-	637.8	-37.8	606.7	-6.7	To Be Studied
10654	Service Road	600.0	598.3	1.7	606.5	-6.5	607.3	-7.3	613.6	-13.6	638.4	-38.4	607.3	-7.3	To Be Studied
10655	Service Road	609.3	604.1	5.2	624.7	-15.4	615.9	-6.6	-	-	647.8	-38.5	-	-	To Be Studied
10656	Service Road	610.0	605.6	4.4	615.7	-5.7	618.1	-8.1	-	-	650.2	-40.2	-	-	To Be Studied
10657	Service Road	612.1	609.0	3.2	619.9	-7.8	623.0	-10.9	631.4	-19.3	655.5	-43.4	623.0	-10.9	To Be Studied
10660	Service Road	609.5	624.1	-14.5	638.8	-29.3	645.2	-35.7	654.6	-47.1	679.7	-70.1	645.2	-35.7	No Action
10663	Service Road	620.0	630.1	-10.1	646.3	-26.3	654.0	-34.0	666.6	-46.6	689.2	-69.2	654.0	-34.0	No Action
10665	Service Road	600.8	589.2	11.6	716.4	-115.6	-	-	-	-	-	-	-	-	To Be Studied
10666	Service Road	603.7	592.8	10.9	713.0	-109.3	-	-	-	-	-	-	-	-	To Be Studied
10667	Service Road	608.2	598.8	9.4	674.5	-66.3	-	-	-	-	-	-	-	-	To Be Studied
10668	Service Road	610.0	610.8	-0.8	658.5	-48.5	-	-	-	-	-	-	-	-	No Action
10669	Service Road	610.0	612.2	-2.2	656.6	-46.6	-	-	-	-	-	-	-	-	No Action
10670	Service Road	610.0	614.5	-4.5	626.8	-16.8	631.1	-21.1	640.6	-30.6	664.3	-54.3	631.1	-21.1	No Action
10671	Service Road	611.2	624.5	-13.4	639.4	-28.2	645.9	-34.7	-	-	-	-	-	-	No Action
10672	Service Road	610.0	617.9	-7.9	688.9	-78.9	-	-	-	-	-	-	-	-	No Action
10674	Service Road	610.0	622.6	-12.6	684.4	-74.4	-	-	-	-	-	-	-	-	No Action
10675	Service Road	610.0	624.9	-14.9	682.1	-72.1	-	-	-	-	-	-	-	-	No Action
10690	Service Road	626.7	608.4	18.3	698.0	-71.3	-	-	-	-	-	-	-	-	To Be Studied
10691	Service Road	620.0	607.7	12.3	662.7	-42.7	621.1	-1.1	-	-	-	-	-	-	To Be Studied
10693	Service Road	611.1	606.7	4.4	623.5	-12.4	619.6	-8.6	-	-	651.9	-40.8	-	-	To Be Studied
10694	Service Road	610.0	606.3	3.7	616.5	-6.5	619.0	-9.0	-	-	651.2	-41.2	619.0	-9.0	To Be Studied
10695	Service Road	605.5	605.9	-0.4	616.1	-10.6	618.5	-13.0	626.3	-20.8	650.7	-45.1	618.5	-13.0	No Action
10696	Service Road	600.0	606.7	-6.7	617.0	-17.0	619.6	-19.6	627.6	-27.6	651.9	-51.9	619.6	-19.6	No Action
10697	Service Road	610.0	610.1	-0.1	621.3	-11.3	624.7	-14.7	633.3	-23.3	657.4	-47.4	624.7	-14.7	No Action
10699	Service Road	610.0	614.6	-4.6	627.0	-17.0	631.4	-21.4	-	-	664.6	-54.6	631.4	-21.4	No Action
10700	Service Road	610.0	617.8	-7.8	631.0	-21.0	636.0	-26.0	-	-	669.7	-59.7	-	-	No Action
10701	Service Road	610.0	619.5	-9.5	633.1	-23.1	638.5	-28.5	-	-	-	-	-	-	No Action
10702	Service Road	610.0	620.8	-10.8	645.1	-35.1	-	-	-	-	-	-	-	-	No Action
10704	Service Road	600.0	641.3	-41.3	660.3	-60.3	670.6	-70.6	-	-	707.2	-107.2	-	-	No Action
10705	Service Road	602.9	641.3	-40.4	660.3	-59.5	-	-	-	-	-	-	-	-	No Action
10709	Service Road	600.3	641.3	-41.0	660.3	-60.0	-	-	-	-	-	-	-	-	No Action
10711	Service Road	600.0	641.3	-41.3	666.4	-66.4	-	-	-	-	-	-	-	-	No Action
10716	Service Road	570.0	-	-	672.2	-102.2	-	-	-	-	-	-	-	-	No Action
10718	Service Road	570.0	651.3	-81.3	671.9	-101.9	-	-	-	-	-	-	-	-	No Action
10807	Interstate	557.0	-	-	678.1	-121.1	-	-	-	-	-	-	-	-	No Action
10808	Interstate	557.0	656.5	-99.5	679.3	-122.3	-	-	-	-	-	-	-	-	No Action
10810	Interstate	547.9	657.4	-109.6	680.5	-132.7	-	-	-	-	733.0	-185.1	-	-	No Action
10811	Interstate	547.0	657.6	-110.6	680.7	-133.7	694.5	-147.5	-	-	733.1	-186.1	-	-	No Action
10812	Interstate	557.0	660.4	-103.4	684.3	-127.3	698.7	-141.7	-	-	737.8	-180.8	698.7	-141.7	No Action
10813	Interstate	555.2	658.5	-103.2	681.9	-126.6	695.8	-140.6	-	-	734.6	-179.4	695.8	-140.6	No Action
10819	Interstate	576.3	659.6	-83.3	683.2	-106.9	697.4	-121.1	715.7	-139.5	736.4	-160.1	697.4	-121.1	No Action
10820	Interstate	598.0	655.9	-57.9	678.6	-80.6	692.0	-94.0	709.6	-111.6	730.5	-132.5	692.0	-94.0	No Action
10823	Interstate	607.4	648.4	-41.0	669.2	-61.8	681.0	-73.6	697.2	-89.7	718.5	-111.1	681.0	-73.6	No Action
10824	Interstate	607.0	656.1	-49.1	678.8	-71.8	692.3	-85.3	709.9	-102.9	730.8	-123.8	692.3	-85.3	No Action
10825	Interstate	611.9	644.1	-32.2	663.9	-52.0	674.7	-62.8	-	-	711.7	-99.8	674.7	-62.8	No Action
10826	Interstate	611.1	637.8	-26.6	655.9	-44.8	665.3	-54.2	-	-	701.5	-90.4	665.3	-54.2	No Action
10827	Interstate	617.0	632.6	-15.6	649.5	-32.5	657.8	-40.8	-	-	693.3	-76.3	-	-	No Action
10828	Interstate	614.0	637.3	-23.3	655.3	-41.4	664.6	-50.7	-	-	700.7	-86.8	-	-	No Action
10829	Interstate	617.0	634.8	-17.8	652.2	-35.2	661.0	-44.0	-	-	-	-	-	-	No Action
10830	Interstate	617.0	630.3	-13.3	646.6	-29.6	654.4	-37.4	-	-	-	-	-	-	No Action
10831	Interstate	617.0	628.9	-11.9	644.8	-27.8	-	-	-	-	-	-	-	-	No Action
10832	Interstate	617.0	632.3	-15.3	649.0	-32.0	-	-	-	-	-	-	-	-	No Action
10833	Interstate	617.0	628.5	-11.5	678.7	-61.7	-	-	-	-	-	-	-	-	No Action
10834	Interstate	617.0	625.0	-8.0	682.1	-65.1	-	-	-	-	-	-	-	-	No Action
10844	Road	615.0	637.6	-22.6	669.9	-54.9	-	-	-	-	-	-	-	-	No Action
10846	Road	615.0	637.7	-22.7	653.9	-40.9	-	-	-	-	-	-	-	-	No Action
10847	Road	615.0	637.8	-22.8	656.0	-41.0	665.5	-50.5	-	-	-	-	-	-	No Action
10849	Road	615.0	637.9	-22.9	656.0	-41.0	665.5	-50.5	-	-	701.7	-86.7	-	-	No Action
10851	Road	622.9	638.0	-15.1	654.2	-33.3	665.7	-42.8	-	-	701.9	-79.0	665.7	-42.8	No Action
10852	Road	635.0	638.3	-3.3	656.6	-21.6	666.2	-31.2	680.4	-45.4	702.5	-67.5	666.2	-31.2	No Action
10853	Road	625.0	636.6	-11.6	654.5	-29.5	663.7	-38.7	677.5	-52.5	699.7	-74.7	663.7	-38.7	No Action
10854	Road	623.6	628.8	-5.3	644.7	-21.2	652.2	-28.6	664.5	-40.9	687.2	-63.7	652.2	-28.6	No Action
10857	Road	619.3	620.4	-1.1	634.2	-14.9	639.8	-20.5	-	-	673.7	-54.5	639.8	-20.5	No Action
10858	Road	622.8	617.4	5.4	630.4	-7.6	635.3	-12.5	-	-	668.9	-46.1	-	-	To Be Studied
10859	Road	623.9	616.6	7.3	629.4	-5.5	634.2	-10.3	-	-	-	-	-	-	To Be Studied
10860	Road	625.0	614.6	10.4	653.4	-28.4	631.3	-6.3	-	-	-	-	-	-	To Be Studied
10862	Road	632.8	611.2	21.6	695.3	-62.5	-	-	-	-	-	-	-	-	To Be Studied
10871	Railroad	613.0	641.2	-28.2	660.2	-47.2	670.4	-57.4	685.1	-72.1	707.0	-94.0	670.4	-57.4	No Action
10872	Railroad	615.3	632.8	-17.5	649.7	-34.4	658.0	-42.7	-	-	693.6	-78.3	658.0	-42.7	No Action
10873	Railroad	620.0	629.0	-9.0	644.9	-24.9	652.4	-32.4	-	-	687.5	-67.5	-	-	No Action
10874	Railroad	623.0	626.2	-3.2	641.4	-18.4	648.3	-25.3	-	-	-	-	-	-	No Action
10875	Railroad	623.0	625.7	-2.7	640.9	-17.9	-	-	-	-	-	-	-	-	No Action
10876	Railroad	623.0	619.1	3.9	687.7	-64.7	-	-	-	-	-	-	-	-	To Be Studied
11008	Railroad	633.0	667.8	-34.8	693.2	-60.2	709.2	-76.2	729.1	-96.1	749.1	-116.1	709.2	-76.2	No Action
11541	Interstate	557.0	-	-	688.4	-131.4	-	-	-	-	-	-	-	-	No Action
11542	Interstate	553.6	-	-	689.7	-136.1	-	-	-	-	-	-	-	-	No Action
11543	Interstate	557.0	665.7	-108.7	690.8	-133.8	-	-	-	-	-	-	-	-	No Action
11544	Interstate	552.8	667.3	-114.7	693.1	-140.3	-	-	-	-	-	-	-	-	No Action
11545	Interstate	563.3	667.3	-104.0	692.9	-129.6	-	-	-	-	748.8	-185.5	-	-	No Action
11546	Interstate	553.7	670.1	-116.4	696.6	-142.7	-	-	-	-	733.3	-179.6	-	-	No Action
11547	Interstate	557.0	671.0	-114.0	697.5	-140.5	714.3	-157.3	-	-	754.7	-197.7	-	-	No Action
11549	Interstate	566.1	667.8	-101.6	693.4	-127.3	709.5	-143.3	-	-	749.4	-183.3	-	-	No Action
11550	Interstate	572.2	669.4	-97.2	695.5	-123.3	711.8	-139.7	-	-	752.0	-179.9	711.8	-139.7	No Action
11551	Interstate	557.0	673.2	-116.2	700.3	-143.3	717.5	-160.5	-	-	758.2	-201.2	717.5	-160.5	No Action
11560	Interstate	567.0	675.4	-108.4	703.0	-136.0	720.7	-153.7	742.2	-175.2	761.7	-194.7	720.7	-153.7	No Action
11564	Interstate	562.3	681.5	-119.2	710.8	-148.3	729.7	-167.4	752.3	-190.0	771.4	-209.1	729.7	-167.4	No Action
11566	Interstate	557.9	680.3	-122.4	709.2	-151.3	727.9	-170.1	750.3	-192.5	769.5	-211.6	727.9	-170.1	No Action
11567	Interstate	576.0	667.3	-91.5	693.1	-117.1	709.0	-133.0	728.9	-152.9	749.0	-173.0	709.0	-133.0	No Action
11572	Interstate	567.0	674.6	-107.6	702.0	-135.0	719.5	-152.5	740.7	-173.7	760.3	-193.3	719.5	-152.5	No Action
11573	Interstate	567.0	673.2	-106.2	700.3	-133.3	717.5	-150.5	738.5	-171.5	758.2	-191.2	717.5	-150.5	No Action
11577	Interstate	614.1	678.5	-64.4	706.9	-92.8	725.3	-111.2	747.3	-133.2	766.6	-152.5	725.3	-111.2	No Action
11579	Interstate	610.7	673.9	-63.2	701.1	-90.4	718.4	-107.8	739.6	-128.9	759.2	-148.5	718.4	-107.8	No Action
11592	Interstate	577.0	681.1	-104.1	710.1	-133.1	729.1	-152.1	751.6	-174.6	770.7	-193.7	729.1	-152.1	No Action
11637	Road	538.5	-	-	703.0	-164.4	-	-	-	-	-	-	-	-	No Action
11638	Road	525.0	-	-	679.8	-154.8	-	-	-	-	-	-	-	-	No Action
11639	Road	615.0	657.9	-32.9	681.2	-56.2	-	-	-	-	-	-	-	-	No Action
11640	Road	619.2	664.5	-45.4	689.4	-70.2	-	-	-	-	744.3	-125.1	-	-	No Action
11641	Road	615.7	665.5	-49.9	690.7	-75.0	706.2	-90.5	-	-	745.9	-130.2	706.2	-90.5	No Action
11642	Road	617.9	665.6	-47.8	690.8	-72.9	706.3	-88.5	-	-	746.0	-128.2	-	-	No Action
11643	Road	621.1	-	-	688.6	-67.5	-	-	-	-	-	-	-	-	No Action
11644	Road	605.0	-	-	699.2	-94.2	-	-	-	-	-	-	-	-	No Action
11645	Road	605.0	672.2	-67.2	688.9	-93.9	-	-	-	-	-	-	-	-	No Action
11646	Road	603.4	676.2	-72.8	704.0	-100.6	-	-	-	-	762.9	-159.5	-	-	No Action
11647	Road	603.3	676.3	-73.0	704.1	-100.8	722.0	-118.7	-	-	763.1	-159.7	-	-	No Action
11648	Road	598.7	679.5	-80.8	708.1	-109.4	-	-	-	-	-	-	-	-	No Action
11649	Road	595.0	-	-	714.7	-119.7	-	-	-	-	-	-	-	-	No Action
11675	Road	574.2	684.6	-110.4	714.5	-140.3	734.2	-160.0	-	-	776.4	-202.1	734.2	-160.0	No Action
11676	Road	566.0	683.7	-117.8	713.4	-147.5	733.0	-167.0	-	-	775.0	-209.0	-	-	No Action
11677	Road	557.2	683.1	-125.9	712.7	-155.5	-	-	-	-	774.0	-216.8	-	-	No Action
11683	Road	544.2	682.3	-138.1	711.7	-167.5	-	-	-	-	-	-	-	-	No Action
11687	Road	545.0	-	-	698.9	-153.9	-	-	-	-	-	-	-	-	No Action
11688	Road	545.0	677.0	-132.0	705.0	-160.0	-	-	-	-	-	-	-	-	No Action
11689	Road	552.3	677.5	-125.2	705.7	-153.3	-	-	-	-	765.0	-212.7	-	-	No Action
11690	Road	558.8	678.8	-120.0	707.2	-148.4	725.6	-166.8	-	-	767.0	-208.2	-	-	No Action
11691	Road	569.1	678.5	-109.4	706.8	-137.7	725.2	-156.1	-	-	766.5	-197.4	725.2	-156.1	No Action
11695	Road	535.6	-	-	709.9	-174.3	-	-	-	-	-	-	-	-	No Action

Runway 30L P77 Approach (Existing)

Runway 30L Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance/ Clearance (ft)	
2705	Power Transmission Pylon	688.3	688.6	-0.4	719.6	-31.3	740.2	-51.9	764.2	-75.9	782.8	-94.5	740.2	-51.9	No Action
6509	Power Transmission Pylon	696.5	697.5	-1.0	730.6	-34.1	753.1	-56.7	-	-	796.9	-100.4	753.1	-56.7	No Action
6510	Pole Light	693.3	697.6	-4.3	730.8	-37.5	-	-	-	-	797.2	-103.9	-	-	No Action
6511	Pole Light	702.0	702.8	-0.8	737.3	-35.3	761.0	-59.0	787.8	-85.8	805.4	-103.4	761.0	-59.0	No Action
8397	Power Transmission Pylon	677.9	691.1	-13.2	722.6	-44.7	743.8	-65.9	768.3	-90.4	786.7	-108.8	743.8	-65.9	No Action
8553	Power Transmission Pylon	675.5	692.0	-16.6	723.8	-48.3	745.1	-69.7	769.8	-94.4	788.2	-112.7	745.1	-69.7	No Action
8900	Power Transmission Line	664.6	691.3	-26.7	722.9	-58.3	744.1	-79.5	768.6	-104.0	787.0	-122.5	744.1	-79.5	No Action
8901	Power Transmission Line	667.8	696.3	-28.5	729.1	-61.3	751.4	-83.6	-	-	795.0	-127.2	751.4	-83.6	No Action

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert2020\DrawSheets
FILE: STL 20217 ALP Obs Tables Ex-12R30L - 12R-30L P77. (2)
LAYOUT: 30L Inner P77 (2)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 12/14/2022 10:37 AM
XREF DWG:

THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

REVISIONS				REVISIONS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 30L Obstruction Tables Inner Portion & Part 77 (Existing/Future)

SCALE AS NOTED
DATE 2/2023
JOB NO. 20042701.00
SHEET 51 OF 59 SHEETS

Runway 12L Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
1449	Tree	649.9	627.6	22.2	657.7	-7.8	674.7	-24.8	700.9	-51.0	729.6	-79.7	674.7	-24.8	To Be Studied
1450	Tree	651.1	627.6	23.5	657.7	-6.6	674.6	-23.5	700.9	-49.8	729.6	-78.4	674.6	-23.5	To Be Studied
1451	Tree	631.5	627.6	3.9	657.7	-26.2	674.6	-43.1	700.9	-69.4	729.5	-98.1	674.6	-43.1	To Be Studied
1452	Tree	620.3	627.6	-7.3	657.6	-37.3	674.6	-54.3	700.8	-80.5	729.5	-109.2	674.6	-54.3	No Action
1453	Tree	637.9	627.5	10.3	657.6	-19.7	674.5	-36.7	700.8	-62.9	729.5	-91.6	674.5	-36.7	To Be Studied
1454	Tree	628.3	627.5	0.8	657.6	-29.3	674.5	-46.2	700.8	-72.5	729.4	-101.1	674.5	-46.2	To Be Studied
1455	Tree	658.1	627.5	30.6	657.6	0.6	674.5	-16.4	700.7	-42.6	729.4	-71.3	674.5	-16.4	To Be Studied
1456	Tree	654.9	627.5	27.5	657.5	-2.6	674.4	-19.5	700.6	-45.7	729.3	-74.4	674.4	-19.5	To Be Studied
1457	Tree	621.4	627.3	-5.9	657.3	-35.9	674.2	-52.8	700.4	-79.0	729.1	-107.7	674.2	-52.8	No Action
1458	Tree	624.0	627.3	-3.3	657.3	-33.2	674.2	-50.1	700.3	-76.3	729.0	-105.0	674.2	-50.1	No Action
1459	Utility Pole	630.4	627.3	3.1	657.3	-26.8	674.1	-43.7	700.3	-69.9	729.0	-98.6	674.1	-43.7	To Be Studied
1460	Tree	634.1	627.2	6.9	657.1	-23.0	674.0	-39.9	700.2	-66.1	728.9	-94.8	674.0	-39.9	To Be Studied
1461	Tree	651.7	627.2	24.6	657.1	-5.4	674.0	-22.3	700.2	-48.4	728.9	-77.1	674.0	-22.3	To Be Studied
1462	Tree	620.3	627.1	-6.8	657.1	-36.8	673.9	-53.6	700.1	-79.8	728.8	-108.5	673.9	-53.6	No Action
1463	Tree	649.7	627.1	22.5	657.1	-7.4	673.9	-24.3	700.1	-50.4	728.8	-79.1	673.9	-24.3	To Be Studied
1464	Tree	622.5	627.1	-4.6	657.0	-34.5	673.9	-51.3	700.0	-77.5	728.7	-106.2	673.9	-51.3	No Action
1465	Tree	644.0	627.0	16.9	657.0	-13.0	673.8	-29.8	699.9	-55.9	728.6	-84.6	673.8	-29.8	To Be Studied
1466	Tree	643.9	627.0	16.9	656.9	-13.1	673.7	-29.9	699.9	-56.0	728.6	-84.7	673.7	-29.9	To Be Studied
1467	Tree	630.9	627.0	3.9	656.9	-26.0	673.7	-42.8	699.8	-68.9	728.5	-97.6	673.7	-42.8	To Be Studied
1468	Tree	620.4	626.9	-6.5	656.8	-36.4	673.6	-53.2	699.8	-79.4	728.5	-108.1	673.6	-53.2	No Action
1469	Tree	648.9	626.9	22.0	656.8	-7.8	673.6	-24.6	699.7	-50.8	728.4	-79.5	673.6	-24.6	To Be Studied
1470	Tree	631.5	626.9	4.6	656.8	-25.3	673.6	-42.1	699.7	-68.2	728.4	-96.9	673.5	-42.1	To Be Studied
1471	Tree	649.4	626.8	22.5	656.7	-7.4	673.5	-24.1	699.6	-50.2	728.3	-79.0	673.5	-24.1	To Be Studied
1472	Tree	628.7	626.8	1.9	656.7	-28.0	673.5	-44.8	699.6	-70.9	728.3	-99.6	673.5	-44.8	To Be Studied
1473	Tree	618.5	626.7	-8.1	656.5	-38.0	673.3	-54.7	699.3	-80.8	728.1	-109.5	673.3	-54.7	No Action
1474	Tree	655.8	626.6	29.1	656.5	-0.7	673.2	-17.4	699.3	-43.5	728.0	-72.2	673.2	-17.4	To Be Studied
1475	Tree	645.4	626.6	18.8	656.5	-11.0	673.2	-27.8	699.3	-53.9	728.0	-82.6	673.2	-27.8	To Be Studied
1476	Tree	639.9	626.5	13.4	656.3	-16.4	673.0	-33.1	699.1	-59.2	727.8	-87.9	673.0	-33.1	To Be Studied
1477	Tree	630.0	626.5	3.5	656.2	-26.3	672.9	-43.0	699.0	-69.0	727.7	-97.7	672.9	-43.0	To Be Studied
1479	Tree	638.0	626.4	11.6	656.1	-18.1	672.8	-34.8	698.8	-60.8	727.6	-89.6	672.8	-34.8	To Be Studied
1480	Tree	632.4	626.4	6.0	656.1	-23.7	672.8	-40.4	698.8	-66.4	727.6	-95.2	672.8	-40.4	To Be Studied
1482	Tree	620.4	626.3	-5.9	656.0	-35.6	672.7	-52.3	698.7	-78.3	727.5	-107.0	672.7	-52.3	No Action
1484	Tree	639.0	626.2	12.8	655.9	-16.9	672.6	-33.6	698.6	-59.5	727.3	-88.3	672.6	-33.6	To Be Studied
1485	Tree	652.2	626.2	26.0	655.9	-3.7	672.6	-20.4	698.6	-46.3	727.3	-75.1	672.6	-20.4	To Be Studied
1486	Tree	624.8	626.2	-1.4	655.9	-31.1	672.5	-47.8	698.5	-73.7	727.3	-102.5	672.5	-47.8	No Action
1487	Tree	629.2	626.1	3.1	655.8	-26.6	672.5	-43.2	698.4	-69.2	727.2	-98.0	672.5	-43.2	To Be Studied
1491	Tree	619.8	626.0	-6.2	655.7	-35.9	672.3	-52.5	698.2	-78.4	727.0	-107.2	672.3	-52.5	No Action
1494	Tree	628.9	625.9	3.0	655.5	-26.7	672.1	-43.2	698.1	-69.2	726.8	-97.9	672.1	-43.2	To Be Studied
1495	Tree	648.9	625.9	23.0	655.5	-6.7	672.1	-23.3	698.0	-49.2	726.8	-78.0	672.1	-23.3	To Be Studied
1496	Tree	625.3	625.8	-0.5	655.5	-30.2	672.0	-46.7	697.9	-72.6	726.7	-101.4	672.0	-46.7	No Action
1497	Tree	636.7	625.8	10.9	655.4	-18.7	671.9	-35.3	697.8	-61.2	726.6	-90.0	671.9	-35.3	To Be Studied
1499	Tree	646.7	625.7	21.0	655.3	-8.6	671.9	-25.2	697.8	-51.0	726.6	-79.8	671.9	-25.2	To Be Studied
1500	Tree	645.2	625.7	19.4	655.3	-10.1	671.9	-26.7	697.7	-52.6	726.5	-81.4	671.9	-26.7	To Be Studied
1502	Tree	622.0	625.6	-3.6	655.2	-33.2	671.7	-49.7	697.6	-75.5	726.4	-104.3	671.7	-49.7	No Action
1506	Tree	646.0	625.5	20.5	655.0	-9.0	671.5	-25.5	697.3	-51.3	726.1	-80.1	671.5	-25.5	To Be Studied
1507	Tree	632.5	625.4	7.0	655.0	-22.5	671.4	-39.0	697.3	-64.8	726.1	-93.6	671.4	-39.0	To Be Studied
1508	Tree	639.7	625.4	14.3	654.9	-15.2	671.4	-31.7	697.2	-57.5	726.0	-86.4	671.4	-31.7	To Be Studied
1509	Tree	653.7	625.3	28.4	654.8	-1.1	671.2	-17.6	697.0	-43.4	725.9	-72.2	671.2	-17.6	To Be Studied
1511	Tree	624.7	625.3	-0.6	654.7	-30.1	671.2	-46.5	697.0	-72.3	725.8	-101.1	671.2	-46.5	No Action
1513	Tree	629.0	625.2	3.8	654.7	-25.7	671.1	-42.1	696.9	-67.9	725.8	-96.7	671.1	-42.1	To Be Studied
1518	Tree	621.7	625.0	-3.3	654.4	-32.7	670.8	-49.1	696.5	-74.9	725.4	-103.7	670.8	-49.1	No Action
1519	Tree	651.3	625.0	26.3	654.4	-3.1	670.8	-19.5	696.5	-45.3	725.4	-74.1	670.8	-19.5	To Be Studied
1521	Tree	651.0	625.0	26.1	654.4	-3.4	670.8	-19.7	696.5	-45.5	725.4	-74.3	670.8	-19.7	To Be Studied
1523	Tree	625.3	624.9	0.4	654.3	-29.0	670.7	-45.4	696.4	-71.1	725.3	-100.0	670.7	-45.4	To Be Studied
1526	Tree	647.9	624.7	23.2	654.0	-6.1	670.4	-22.4	696.0	-48.1	724.9	-77.0	670.4	-22.4	To Be Studied
1527	Tree	646.0	624.7	21.4	654.0	-8.0	670.3	-24.3	696.0	-50.0	724.9	-78.8	670.3	-24.3	To Be Studied
1528	Tree	629.6	624.7	4.9	654.0	-24.4	670.3	-40.7	696.0	-66.4	724.8	-95.2	670.3	-40.7	To Be Studied
1529	Tree	636.9	624.7	12.3	654.0	-17.1	670.3	-33.4	696.0	-59.0	724.8	-87.9	670.3	-33.4	To Be Studied
1530	Utility Pole	624.4	624.5	-0.2	653.8	-29.5	670.1	-45.8	695.8	-71.4	724.6	-100.3	670.1	-45.7	No Action
1531	Tree	644.5	624.5	20.0	653.8	-9.2	670.1	-25.5	695.7	-51.2	724.6	-80.0	670.1	-25.5	To Be Studied
1532	Tree	625.6	624.5	1.1	653.7	-28.1	670.0	-44.4	695.6	-70.0	724.5	-98.9	670.0	-44.4	To Be Studied
1534	Tree	616.0	624.4	-8.3	653.6	-37.6	669.9	-53.8	695.5	-79.5	724.4	-108.4	669.9	-53.8	No Action
1535	Tree	623.9	624.4	-0.4	653.6	-29.7	669.8	-45.9	695.5	-71.6	724.4	-100.4	669.8	-45.9	No Action
1536	Tree	641.9	624.3	17.6	653.5	-11.6	669.8	-27.9	695.4	-53.5	724.3	-82.4	669.8	-27.9	To Be Studied
1538	Tree	625.0	624.2	0.8	653.4	-28.4	669.6	-44.6	695.2	-70.2	724.1	-99.1	669.6	-44.6	To Be Studied
1539	Tree	640.0	-	-	653.4	-13.4	-	-	-	-	-	-	-	-	No Action
1542	Tree	651.0	623.9	27.1	653.1	-2.0	669.2	-18.2	694.8	-43.7	723.7	-72.6	669.2	-18.2	To Be Studied
1543	Tree	656.5	-	-	653.1	3.5	-	-	-	-	-	-	-	-	To Be Studied
1545	Tree	632.8	623.9	8.9	653.0	-20.2	669.2	-36.4	694.7	-61.9	723.6	-90.8	669.2	-36.4	To Be Studied
1547	Tree	645.0	623.8	21.1	653.0	-8.0	669.1	-24.1	694.6	-49.6	723.5	-78.6	669.1	-24.1	To Be Studied
1551	Tree	634.9	623.7	11.2	652.8	-17.9	668.9	-34.0	694.4	-59.5	723.3	-88.4	668.9	-34.0	To Be Studied
1552	Tree	627.4	623.7	3.7	652.7	-25.4	668.8	-41.5	694.3	-67.0	723.2	-95.9	668.8	-41.5	To Be Studied
1554	Tree	630.9	623.5	7.4	652.5	-21.6	668.5	-37.7	694.0	-63.1	722.9	-92.1	668.5	-37.7	To Be Studied
1556	Tree	646.4	623.4	23.0	652.5	-6.0	668.5	-22.1	693.9	-47.5	722.9	-76.5	668.5	-22.1	To Be Studied
1558	Tree	653.9	623.4	30.5	652.4	1.5	668.4	-14.5	693.8	-40.0	722.8	-68.9	668.4	-14.5	To Be Studied
1560	Tree	637.4	623.2	14.2	652.2	-14.8	668.1	-30.8	693.5	-56.2	722.5	-85.2	668.1	-30.8	To Be Studied
1563	Tree	646.0	623.1	22.9	652.0	-6.0	668.0	-22.0	693.3	-47.3	722.3	-76.3	668.0	-22.0	To Be Studied
1564	Tree	641.5	623.0	18.5	652.0	-10.4	667.9	-26.4	693.3	-51.7	722.3	-80.7	667.9	-26.4	To Be Studied
1567	Tree	627.4	622.9	4.5	651.8	-24.4	667.7	-40.3	693.0	-65.6	722.0	-94.6	667.7	-40.3	To Be Studied
1568	Tree	647.4	622.8	24.6	651.7	-4.3	667.6	-20.2	692.9	-45.5	721.9	-74.5	667.6	-20.2	To Be Studied
1571	Tree	640.2	622.8	17.4	651.6	-11.5	667.5	-27.4	692.8	-52.7	721.8	-81.7	667.5	-27.4	To Be Studied
1573	Tree	638.4	622.7	15.6	651.6	-13.2	667.5	-29.1	692.8	-54.4	721.8	-83.4	667.5	-29.1	To Be Studied
1576	Tree	631.1	622.5	8.6	651.3	-20.2	667.1	-36.0	692.4	-61.3	721.4	-90.3	667.1	-36.0	To Be Studied
1577	Tree	618.3	622.4	-4.2	651.2	-32.9	667.0	-48.7	692.3	-74.0	721.3	-103.0	667.0	-48.7	No Action
1578	Tree	643.7	622.4	21.2	651.2	-7.5	667.0	-23.3	692.3	-48.6	721.3	-77.6	667.0	-23.3	To Be Studied
1579	Tree	634.2	622.4	11.8	651.2	-16.9	667.0	-32.8	692.2	-58.0	721.3	-87.0	667.0	-32.8	To Be Studied
1580	Tree	633.2	622.3	10.9	651.0	-17.8	666.8	-33.6	692.0	-58.8	721.0	-87.9	666.8	-33.6	To Be Studied
1581	Tree	619.8	622.2	-2.5	650.9	-31.2	666.7	-47.0	691.9	-72.2	721.0	-101.2	666.7	-47.0	No Action
1582	Tree	645.2	622.2	22.9	650.9	-5.8	666.7	-21.6	691.9	-46.8	721.0	-75.8	666.7	-21.6	To Be Studied
1583	Tree	648.6	622.2	26.4	650.9	-2.3	666.7	-18.1	691.9	-43.3	720.9	-72.3	666.7	-18.1	To Be Studied
1587	Tree	628.5	621.9	6.6	650.5	-22.0	666.2	-37.7	691.4	-62.8	720.4	-91.9	666.2	-37.7	To Be Studied
1588	Tree	636.2	621.8	14.3	650.5	-14.3	666.1	-30.0	691.3	-55.1	720.3	-84.2	666.1	-30.0	To Be Studied
1589	Tree	639.2	621.8	17.4	650.4	-11.2	666.1	-26.9	691.2	-52.0	720.2	-81.1	666.1	-26.9	To Be Studied
1592	Tree	633.4	621.6	11.8	650.2	-16.8	665.9	-32.4	690.9	-57.5	720.0	-86.6	665.9	-32.4	To Be Studied
1593	Tree	628.6	621.6	7.0	650.2	-21.6	665.8	-37.2	690.9	-62.3	720.0	-91.4	665.8	-37.2	To Be Studied
1594	Tree	621.0	621.5	-0.5	650.1	-29.1	665.7	-44.7	690.8	-69.7	719.8	-98.8	665.7	-44.7	No Action
1596	Building	621.2	621.4	-0.2	649.9	-28.7	665.5	-44.3	-	-	719.6	-98.4	665.5	-44.3	No Action
1598	Tree	658.0	621.4	36.7	649.9	8.2	665.4	-7.4	690.5	-32.5	719.6	-61.6	665.4	-7.4	To Be Studied
1599	Tree	647.0	621.3	25.7	649.8	-2.7	665.3	-18.3	690.4	-43.3	719.5	-72.4	665.3	-18.3	To Be Studied
1601	Tree	659.1	621.1	38.0	649.5	9.6	665.1	-5.9	690.0	-30.9	719.1	-60.0	665.1	-5.9	To Be Studied
1602	Tree	633.3	621.0	12.3	649.4	-16.1	664.9	-31.7	689.9	-56.6	719.0	-85.7	664.9	-31.7	To Be Studied
1604	Tree	645.4	621.0	24.4	649.4	-4.0	664.9	-19.5	689.8	-44.4	719.0	-73.5	664.9	-19.5	To Be Studied
1605	Tree	616.9	620.9	-4.0	649.3	-32.4	664.8	-47.9	689.8	-72.9	718.9	-102.0	664.8	-47.9	No Action
1607	Tree	615.5	620.9	-5.3	649.3	-33.7	664.7	-49.2	689.7	-74.1	718.8	-103.2	664.7	-49.2	No Action
1608	Tree	619.1	620.9	-1.8	649.2	-30.1	664.7	-45.6	689.6	-70.5	718.8	-99.7	664.7	-45.6	No Action
1609	Utility Pole	620.0	620.8	-0.8	649.2	-29.2	664.6	-44.6	-	-	718.7	-98.7	664.6	-44.6	No Action
1610	Tree	629.9	620.7	9.2	649.0	-19.1	664.5	-34.6	689.4	-59.5	718.5	-88.6	664.5	-34.6	To Be Studied
1611	Building	621.1	620.6	0.5	648.9	-27.8	-	-	-	-	-	-	-	-	To Be Studied
1612	Tree	626.0	620.6	5.4	648.9	-22.9	664.4	-38.3	689.2	-63.2	718.4	-92.3	664.4	-38.3	To Be Studied
1614	Tree	647.0	620.6	26.4	648.9	-1.9	664.3	-17.3	689.1	-42.2	718.3	-71.3	664.3	-17.3	To Be Studied
1615	Tree	644.5	620.6	24.0	648.9	-4.3	664.3	-19.8	689.1	-44.6	718.3	-73.8	664.3	-19.7	To Be Studied
1617	Tree	612.2	620.5	-8.3	648.7	-36.5	664.1	-51.9	-	-	718.1	-105.9	664.1	-51.9	No Action
1621	Tree	640.2	620.2	20.0	648.4	-8.2	663.8	-23.5	688.6	-48.3	717.8	-77.5	663.8	-23.5	To Be Studied
1623	Tree	631.9	620.1	11.9	648.2	-16.3	663.5	-31.6	688.3	-56.4	717.5	-85.6	663.5	-31.6	To Be Studied
1626	Tree	625.6	620.0	5.6	648.2	-22.6	663.5	-37.9	688.2	-62.6	717.4	-91.8	663.5	-37.9	To Be Studied
1627	Tree	641.9	620.0	21.9	648.2	-6.3	663.4	-21.5	688.2	-46.3	717.4	-75.5	663.4	-21.5	To Be Studied
1628	Tree	617.3	619.8	-2.5	648.0	-30.6	663.2	-45.9	-	-	717.2	-99.8	663.2	-45.9	No Action
1629	Tree	627.6	619.8	7.8	647.9	-20.3	663.1	-35.6	687.9	-60.3	717.1	-89.5	663.1	-35.6	To Be Studied
1631	Tree	643.1	619.8	23.3	647.9	-4.8	663.1	-20.0	687.8	-44.8	717.0	-74.0	663.1	-20.0	To Be Studied
1632	Tree	630.5	619.8	10.7	647.9	-17.4	663.1	-32.6	687.8	-57.3	717.0	-86.6	663.1	-32.6	To Be Studied
1634	Tree	621.9	619.6	2.4	647.6	-25.7	662.8	-40.9	687.5	-65.5	716.7	-94.8	662.8	-40.9	To Be Studied
1636	Tree	642.4	619.4	23.0	647.4	-5.1	662.6	-20.2	687.3	-44.9	716.5	-74.1	662.6	-20.2	To Be Studied
1638	Tree	641.6	619.4	22.2	647.4	-5.8	662.5	-20.9	687.2	-45.6	716.4	-74.8	662.5	-20.9	To Be Studied
1639	Tree	634.5	619.4	15.1	647.4	-12.9	662.5	-28.0	687.1	-52.7	716.4	-81.9	662.5	-28.0	To Be Studied
1644	Tree	627.0	619.2	7.8	647.2	-20.2	662.3	-35.3	686.9	-59.9	716.2	-89.2	662.3	-35.3	To Be Studied
1645	Tree	638.4	619.1	19.2	647.1	-8.7	662.2	-23.8	686.8	-48.4	716.0	-77.7	662.2	-23.8	To Be Studied
1648	Tree	639.2	619.0	20.2	646.9	-7.7	661.9	-22.7	686.5	-47.3	715.8	-76.6	661.9	-22.7	To Be Studied
1649	Tree	639.0	618.9	20.1	646.8	-7.8	661.9	-22.8	-	-	715.7	-76.7	661.9	-22.8	To Be Studied
1650	Tree	641.9	618.8	23.1	646.7	-4.8	661.7	-19.8	-	-	715.5	-73.7	661.7	-19.8	To Be Studied
1655	Tree	622.9	618.6	4.3	646.4	-23.5	661.4	-38.5	685.9	-63.0	715.2	-92.3	661.4	-38.5	To Be Studied
1657	Tree	633.1	618.5	14.5	646.3	-13.3	661.3	-28.2	685.8	-52.7	715.1	-82.0	661.3	-28.2	To Be Studied
1658	Tree	634.1	618.5	15.6	646.3	-12.2	661.3	-27.2	685.8	-51.6	715.0	-80.9	661.3	-27.2	To Be Studied
1659	Tree	608.6	618.4	-9.8	646.2	-37.6	661.1	-52.5	685.5	-76.9	714.8	-106.2	661.1	-52.5	No Action
1660	Tree	629.2	618.4	10.8	646.1	-16.9	661.1	-31.9	-	-	714.8	-85.6	661.1	-31.9	To Be Studied
1661	Tree	636.2	618.4	17.8	646.1	-9.9	661.0	-24.8	-	-	714.8	-78.6	661.0	-24.8	To Be Studied
1662	Tree	620.5	618.3	2.2	646.0	-25.5	660.9	-40.4	685.3	-64.8	714.6	-94.1	660.9	-40.4	To Be Studied
1663	Tree	617.5	618.2	-0.8	646.0	-28.5	660.9	-43.4	-	-	714.6	-97.1	660.9	-43.4	No Action
1664	Tree	631.7	618.2	13.4	645.9	-14.3	660.8	-29.2	685.3	-53.6	714.6	-82.9	660.8	-29.2	To Be Studied
1665	Tree	638.8	618.2	20.6	645.9	-7.1	660.8	-22.0	685.2	-46.4	714.5	-75.7	660.8	-22.0	To Be Studied
1666	Tree	625.0	618.1	6.9	645.8	-20.8	660.7	-35.7	-	-	714.4	-89.4	660.7	-35.7	To Be Studied
1668	Tree	642.5	618.1	24.5	645.8	-3.2	660.6	-18.1	685.0	-42.5	714.3	-71.8	660.6	-18.1	To Be Studied
1669	Tree	645.7	618.0	27.7	645.7	0.0	660.5	-14.8	684.9	-39.2	714.2	-68.5	660.5	-14.8	To Be Studied
1670	Tree	624.6	617.9	6.7	645.5	-20.9	660.4	-35.8	684.7	-60.1	714.1	-89.4	660.4	-35.8	To Be Studied
1671	Tree	630.5	617.9	12.6	645.5	-15.0	660.4	-29.8	-	-	714.0	-83.5	660.4	-29.8	To Be Studied
1672	Tree	615.8	617.9	-2.1	645.5	-29.7	660.3	-44.6	-	-	714.0	-98.2	660.3	-44.6	No Action
1673	Utility Pole	619.9	617.9	2.1	645.5	-25.6	660.3	-40.4	-	-	714.0	-94.1	660.3	-40.4	To Be Studied
1675	Tree	631.0	617.7	13.3	645.3	-14.3	660.1	-29.1	-	-	713.7	-82.7	660.1	-29.1	To Be Studied
1676	Tree	620.4	617.7	2.7	645.2	-24.9	660.0	-39.7	684.3	-64.0	713.7	-93.3	660.0	-39.7	To Be Studied
1679	Tree	624.1	617.5	6.6	645.0	-20.9	659.8	-35.6	-	-	713.4	-89.3	659.8	-35.6	To Be Studied
1680	Tree	621.1	617.5	3.7	645.0	-23.9	659.7	-38.6	-	-	713.4	-92.2	659.7	-38.6	To Be Studied
1682	Tree	625.5	617.4	8.1	645.0	-19.4	659.7	-34.1	683.9	-58.4	713.3	-87.8	659.7	-34.1	To Be Studied
1684	Tree	636.6	617.3	19.3	644.8	-8.2	659.5	-22.9	-	-	713.2	-76.5	659.5	-22.9	To Be Studied
1685	Utility Pole	621.8	617.3	4.5	644.8	-23.0	659.5	-37.7	-	-	713.1	-91.3	659.5	-37.7	To Be Studied
1686	Tree	641.8	617.0	24.7	644.5	-2.7	659.1	-17.3	683.3	-41.5	712.7	-70.9	659.1	-17.3	To Be Studied
1687	Tree	610.5	617.0	-6.6	644.4	-34.0	659.1	-48.6	-	-	712.7	-102.2	659.1	-48.6	No Action
1688	Tree	641.1	617.0	24.2	644.4	-3.2	659.0	-17.9	-	-	712.6	-71.4	659.0	-17.9	To Be Studied
1689	Tree	647.4	617.0	30.4	644.3	3.0	659.0	-11.6	683.1	-35.8	712.5	-65.2	659.0	-11.6	To Be Studied
1690	Tree	619.5	616.9	2.6	644.3	-24.8	658.9	-39.4	683.1	-63.6	712.5	-93.0	658.9	-39.4	To Be Studied
1691	Tree	644.9	616.9	28.0	644.3	0.6	658.9	-14.0	683.0	-38.2	712.4	-67.6	658.9	-14.0	To Be Studied
1693	Tree	619.9	616.7	3.2	644.0	-24.1	658.5	-38.7	682.6	-62.8	712.0	-92.2	658.5	-38.7	To Be Studied
1694	Tree	637.8	616.6	21.2	644.0	-6.2	658.5	-20.7	682.6	-44.8	712.0	-74.2	658.5	-20.7	To Be Studied
1695	Tree	614.1	616.6	-2.6	643.9	-29.9	658.4	-44.4	682.5	-68.5	712.0	-97.9	658.4	-44.4	No Action
1696	Tree	640.5	616.5	24.0	643.8	-3.3	658.3	-17.8	682.4	-41.9	711.9	-71.3	658.3	-17.8	To Be Studied
1697	Tree	638.9	616.4	22.5	643.6	-4.7	658.1	-19.2	682.1	-43.3	711.6	-72.7	658.1	-19.2	To Be Studied
1698	Tree	610.7	616.2	-5.5	643.4	-32.7	657.8	-47.1	681.8	-71.1	711.3	-100.6	657.8	-47.1	No Action
1699	Tree	644.6	616.1	28.5	643.3	1.3	657.8	-13.2	681.8	-37.2	711.2	-66.6	657.8	-13.2	To Be Studied
1700	Tree	619.2	616.1	3.1	643.3	-24.1	657.7	-38.5	681.7	-62.5	711.2	-92.0	657.7	-38.5	To Be Studied
1702	Tree	612.7	615.9	-3.2	643.1	-30.3	657.5	-44.7	681.4	-68.7	710.9	-98.2	657.5	-44.7	No Action
1703	Utility Pole	618.7	615.9	2.8	643.0	-24.3	657.4	-38.7	-	-	710.8	-92.1	657.4	-38.7	To Be Studied
1704	Utility Pole	615.5	615.9	-0.4	643.0	-27.5	657.4	-41.9	-	-	710.8	-95.3	657.3	-41.9	No Action
1705	Utility Pole	615.7	615.8	-0.1	642.9	-27.2	657.2	-41.5	-	-	710.7	-94.9	657.2	-41.5	No Action
1706	Utility Pole	610.0	615.8	-5.8	642.8	-32.9	657.2	-47.2	-	-	710.6	-100.6	657.2	-47.2	No Action
1707	Tree	614.5	615.6	-1.1	642.7	-28.2	657.0	-42.5	681.0	-66.4	710.4	-95.9	657.0	-42.5	No Action
1708	Utility Pole	617.1	615.6	1.5	642.6	-25.5	656.9	-39.8	-	-	710.3	-93.2	656.9	-39.8	To Be Studied
1709	Tree	623.4	615.5	7.8	642.6	-19.2	656.9	-33.5	680.8	-57.4	710.3	-86.9	656.9	-33.5	To Be Studied
1710	Tree	614.7	615.5	-0.9	642.6	-27.9	656.9	-42.2	680.7	-66.1	710.2	-95.6	656.9	-42.2	No Action
1711	Tree	614.0	615.5	-1.5	642.5	-28.5	656.8	-42.8	-	-	710.2	-96.2	656.8	-42.8	No Action
1713	Utility Pole	619.3	615.3	4.0	642.3	-23.0	656.5	-37.2	-	-	709.9	-90.6	-	-	To Be Studied
1714	Tree	626.0	615.3	10.7	642.3	-16.3	656.5	-30.6	-	-	709.9	-83.9	656.5	-30.6	To Be Studied
1715	Tree	626.1	615.2	10.9	642.1	-16.1	656.4	-30.3	-	-	709.7	-83.6	656.4	-30.3	To Be Studied

Runway 12L Inner Approach (Existing)

Runway 12L Existing Obstruction Table
Inner Portion of the Approach Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	VASI Surface Elevation (MSL)	VASI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
1717	Tree	615.8	615.0	0.7	641.9	-26.2	656.1	-40.4	-	-	709.5	-93.7	656.1	-40.4	To Be Studied
1718	Tree	628.6	615.0	13.6	641.9	-13.3	656.1	-27.5	679.9	-51.3	709.4	-80.8	656.1	-27.5	To Be Studied
1719	Tree	608.2	615.0	-6.8	641.9	-33.7	656.1	-47.9	679.9	-71.6	709.4	-101.2	656.1	-47.9	No Action
1720	Tree	614.8	614.7	0.0	641.6	-26.8	655.7	-40.9	679.4	-64.7	709.0	-94.2	655.7	-40.9	To Be Studied
1721	Tree	619.9	614.7	5.2	641.5	-21.6	655.6	-35.8	679.3	-59.5	708.9	-89.0	655.6	-35.8	To Be Studied
1722	Tree	612.7	614.6	-2.0	641.4	-28.8	655.5	-42.9	679.3	-66.6	708.8	-96.1	655.5	-42.9	No Action
1723	Tree	625.5	614.3	11.2	641.1	-15.5	655.1	-29.5	678.7	-53.2	708.3	-82.8	655.1	-29.5	To Be Studied
1724	Tree	619.9	614.3	5.6	641.1	-21.2	655.1	-35.2	678.7	-58.8	708.3	-88.4	655.1	-35.2	To Be Studied
1726	Tree	636.3	614.2	22.1	640.9	-4.6	654.9	-18.6	678.5	-42.2	708.1	-71.8	654.9	-18.6	To Be Studied
1727	Tree	613.2	614.0	-0.8	640.7	-27.5	654.6	-41.5	678.2	-65.1	707.8	-94.7	654.6	-41.5	No Action
1728	Tree	622.8	614.0	8.8	640.6	-17.8	654.6	-31.8	678.2	-55.4	707.8	-85.0	654.6	-31.8	To Be Studied
1729	Utility Pole	606.7	614.0	-7.3	640.6	-33.9	654.6	-47.8	-	-	707.7	-101.0	654.5	-47.8	No Action
1730	Tree	625.2	613.9	11.2	640.6	-15.4	654.5	-29.4	678.1	-52.9	707.7	-82.5	654.5	-29.4	To Be Studied
1731	Tree	609.6	613.9	-4.3	640.5	-30.9	654.5	-44.9	678.1	-68.4	707.7	-98.1	654.5	-44.9	No Action
1732	Tree	611.1	613.9	-2.7	640.5	-29.4	654.4	-43.3	678.0	-66.9	707.6	-96.5	654.4	-43.3	No Action
1733	Utility Pole	607.6	613.8	-6.1	640.4	-32.7	654.3	-46.6	-	-	707.4	-99.8	-	-	No Action
1734	Utility Pole	617.1	613.8	3.3	640.3	-23.3	654.3	-37.2	-	-	707.4	-90.3	-	-	To Be Studied
1735	Tree	621.0	613.7	7.3	640.2	-19.3	654.1	-33.1	677.7	-56.7	707.3	-86.3	654.1	-33.1	To Be Studied
1736	Tree	626.1	613.7	12.4	640.2	-14.1	654.1	-28.0	677.7	-51.5	707.3	-81.2	654.1	-28.0	To Be Studied
1737	Tree	604.8	613.7	-8.9	640.2	-35.4	654.1	-49.3	677.6	-72.8	707.3	-102.5	654.1	-49.3	No Action
1738	Tree	618.5	613.6	5.0	640.1	-21.5	654.0	-35.4	677.5	-58.9	707.1	-88.5	654.0	-35.4	To Be Studied
1739	Tree	621.2	613.5	7.8	640.0	-18.8	653.9	-32.6	677.3	-56.1	707.0	-85.7	653.8	-32.6	To Be Studied
1740	Tree	607.7	613.3	-5.5	639.8	-32.0	653.6	-45.8	677.0	-69.3	706.7	-98.9	653.6	-45.8	No Action
1741	Tree	622.5	613.2	9.3	639.7	-17.1	653.5	-30.9	676.9	-54.4	706.6	-84.0	653.5	-30.9	To Be Studied
1742	Tree	629.1	613.0	16.1	639.4	-10.4	653.2	-24.1	-	-	706.3	-77.2	653.2	-24.1	To Be Studied
1743	Tree	607.1	612.9	-5.8	639.3	-32.2	653.0	-45.9	676.4	-69.3	706.1	-99.0	653.0	-45.9	No Action
1744	Tree	618.0	612.8	5.3	639.1	-21.1	652.8	-34.8	676.2	-58.1	705.9	-87.8	652.8	-34.8	To Be Studied
1745	Tree	644.7	612.5	32.2	638.8	5.9	652.4	-7.7	-	-	705.5	-60.8	652.4	-7.7	To Be Studied
1746	Utility Pole	606.3	612.4	-6.0	638.6	-32.3	652.2	-45.9	-	-	705.2	-98.9	652.2	-45.9	No Action
1747	Tree	627.6	612.3	15.4	638.5	-10.8	652.1	-24.4	-	-	705.0	-77.4	652.1	-24.4	To Be Studied
1748	Tank	606.6	612.1	-5.5	638.3	-31.7	651.8	-45.2	-	-	704.8	-98.2	651.8	-45.2	No Action
1749	Tree	625.5	612.0	13.5	638.2	-12.6	651.7	-26.1	-	-	704.6	-79.1	651.7	-26.1	To Be Studied
1750	Tree	624.0	612.0	12.0	638.1	-14.1	651.6	-27.6	-	-	704.5	-80.6	651.6	-27.6	To Be Studied
1751	Tree	624.1	611.9	12.2	638.0	-13.9	651.5	-27.4	-	-	704.4	-80.3	651.5	-27.4	To Be Studied
1752	Tank	608.9	611.8	-3.0	638.0	-29.1	651.5	-42.6	-	-	704.4	-95.5	651.4	-42.6	No Action
1753	Tank	606.5	611.6	-5.2	637.7	-31.2	651.1	-44.6	-	-	704.0	-97.5	651.1	-44.6	No Action
1754	Tree	604.2	611.6	-7.4	637.6	-33.5	651.1	-46.9	-	-	703.9	-99.8	651.1	-46.9	No Action
1755	Tree	623.7	611.5	12.2	637.5	-13.8	650.9	-27.2	-	-	703.8	-80.1	650.9	-27.2	To Be Studied
1756	Light Pole	603.1	611.4	-8.3	637.4	-34.3	650.8	-47.7	-	-	703.7	-100.6	650.8	-47.7	No Action
1757	Light Pole	606.3	611.3	-5.0	637.3	-31.0	650.7	-44.4	-	-	703.5	-97.2	650.7	-44.4	No Action
1758	Tree	626.6	611.3	15.3	637.3	-10.7	650.7	-24.1	-	-	703.5	-76.9	650.7	-24.1	To Be Studied
1759	Utility Pole	617.5	611.3	6.3	637.2	-19.7	650.6	-33.0	-	-	703.4	-85.9	-	-	To Be Studied
1760	Tree	606.7	610.9	-4.2	636.8	-30.1	650.1	-43.4	-	-	702.9	-96.2	650.1	-43.4	No Action
1761	Utility Pole	613.4	610.7	2.7	636.6	-23.1	649.8	-36.4	-	-	702.6	-89.2	-	-	To Be Studied
1762	Tank	611.1	610.6	0.4	636.4	-25.4	649.7	-38.6	-	-	702.4	-91.4	649.7	-38.6	To Be Studied
1763	Tree	631.2	610.5	20.7	636.2	-5.0	649.4	-18.2	-	-	702.2	-71.0	649.4	-18.2	To Be Studied
1764	Tree	621.3	610.0	11.3	635.6	-14.3	648.7	-27.4	-	-	701.4	-80.1	648.7	-27.4	To Be Studied
1765	Utility Pole	606.7	609.7	-3.0	635.2	-28.6	648.3	-41.6	-	-	700.9	-94.2	648.3	-41.6	No Action
1766	Tree	629.2	609.6	19.6	635.2	-6.0	648.2	-19.0	-	-	700.8	-71.6	648.2	-19.0	To Be Studied
1767	Utility Pole	619.3	609.3	10.1	634.7	-15.4	647.7	-28.3	-	-	700.2	-80.9	-	-	To Be Studied
1768	Tree	606.1	609.2	-3.1	634.7	-28.6	647.6	-41.5	-	-	700.2	-94.1	647.6	-41.5	No Action
1769	Light Pole	599.7	609.2	-9.5	634.6	-35.0	647.6	-47.9	-	-	700.1	-100.5	647.6	-47.9	No Action
1770	Tree	599.9	608.5	-8.6	633.7	-33.9	646.5	-46.6	-	-	699.0	-99.1	646.5	-46.6	No Action
1771	Tree	599.5	608.1	-8.5	633.2	-33.7	645.9	-46.4	-	-	698.3	-98.8	645.9	-46.4	No Action
1772	Utility Pole	609.6	608.0	1.6	633.2	-23.6	645.8	-36.2	-	-	698.2	-88.6	-	-	To Be Studied
1773	Utility Pole	598.4	607.9	-9.5	633.1	-34.7	645.7	-47.3	-	-	698.1	-99.7	645.7	-47.3	No Action
1774	Tree	621.7	607.8	13.9	632.9	-11.2	645.5	-23.8	-	-	697.9	-76.2	645.5	-23.8	To Be Studied
1775	Tree	605.1	607.4	-2.3	632.4	-27.3	644.9	-39.9	-	-	697.3	-92.2	644.9	-39.9	No Action
1776	Utility Pole	606.0	607.4	-1.3	632.3	-26.3	644.9	-38.8	-	-	697.2	-91.2	644.9	-38.8	No Action
1777	Tree	599.0	607.3	-8.3	632.3	-33.3	644.8	-45.8	-	-	697.2	-98.1	644.8	-45.8	No Action
1778	Utility Pole	605.8	607.2	-1.4	632.1	-26.3	644.6	-38.8	-	-	696.9	-91.1	644.6	-38.8	No Action
1779	Utility Pole	609.3	607.1	2.2	632.0	-22.7	644.5	-35.2	-	-	696.8	-87.5	-	-	To Be Studied
1780	Tree	599.2	606.7	-7.5	631.5	-32.3	643.9	-44.7	-	-	696.2	-97.0	643.9	-44.7	No Action
1781	Tree	597.8	606.2	-8.4	630.9	-33.1	643.2	-45.4	-	-	695.4	-97.6	643.2	-45.4	No Action
1782	Utility Pole	598.5	605.5	-7.0	630.0	-31.5	642.1	-43.6	-	-	694.2	-95.8	642.1	-43.6	No Action
1783	Building	611.9	-	-	629.7	-17.7	-	-	-	-	-	-	-	-	No Action
1784	Utility Pole	607.2	605.0	2.2	629.4	-22.2	641.4	-34.2	-	-	693.5	-86.3	-	-	To Be Studied
1785	Utility Pole	606.7	604.9	1.8	629.3	-22.6	641.3	-34.6	-	-	693.3	-86.6	-	-	To Be Studied
1786	Utility Pole	608.2	604.8	3.4	629.1	-20.9	641.1	-32.9	-	-	693.1	-84.9	-	-	To Be Studied
1787	Utility Pole	598.7	604.6	-5.9	628.9	-30.2	640.8	-42.1	-	-	692.9	-94.2	-	-	No Action
1788	Utility Pole	603.5	603.0	0.4	626.9	-23.5	638.5	-35.0	-	-	690.3	-86.8	-	-	To Be Studied
1789	Utility Pole	609.9	602.9	7.0	626.7	-16.8	638.2	-28.4	-	-	690.0	-80.1	-	-	To Be Studied
1791	Utility Pole	604.2	601.7	2.5	625.3	-21.1	-	-	-	-	-	-	-	-	To Be Studied
1792	Utility Pole	610.3	601.7	8.6	625.2	-15.0	636.5	-26.2	-	-	688.1	-77.9	636.5	-26.2	To Be Studied
1793	Utility Pole	609.3	601.4	8.0	624.9	-15.5	-	-	-	-	-	-	-	-	To Be Studied
1794	Utility Pole	591.7	601.1	-9.4	624.5	-32.8	-	-	-	-	-	-	-	-	No Action
1795	Traffic Light/Signal	592.5	600.8	-8.3	624.2	-31.6	635.3	-42.7	656.3	-63.7	686.8	-94.2	635.3	-42.7	No Action
1796	Traffic Light/Signal	593.1	600.6	-7.4	623.8	-30.7	634.8	-41.7	655.8	-62.7	686.3	-93.2	634.8	-41.7	No Action
1798	Light Pole	592.7	599.8	-7.1	622.9	-30.2	633.8	-41.1	654.6	-61.9	685.2	-92.5	633.8	-41.1	No Action
1799	Building	612.0	-	-	636.4	-24.4	-	-	-	-	-	-	-	-	No Action
1800	Utility Pole	598.8	599.4	-0.6	622.4	-23.5	-	-	-	-	-	-	-	-	No Action
1801	Utility Pole	605.0	598.5	6.5	621.3	-16.2	-	-	-	-	-	-	-	-	To Be Studied
1802	Utility Pole	617.3	598.3	19.0	621.1	-3.7	-	-	-	-	-	-	-	-	To Be Studied
1803	Traffic Light/Signal	593.9	598.3	-4.4	621.0	-27.2	631.5	-37.7	652.0	-58.2	682.7	-88.9	631.5	-37.7	No Action
1804	Tree	593.8	598.3	-4.5	621.0	-27.2	-	-	-	-	-	-	-	-	No Action
1805	Traffic Light/Signal	595.3	598.2	-2.9	620.8	-25.5	631.3	-36.0	651.8	-56.5	682.5	-87.2	631.3	-36.0	No Action
1807	Utility Pole	600.8	598.0	2.8	620.6	-19.9	-	-	-	-	-	-	-	-	To Be Studied
1808	Utility Pole	598.5	597.6	0.9	620.2	-21.6	-	-	-	-	-	-	-	-	To Be Studied
1809	Utility Pole	605.2	597.3	7.9	619.8	-14.6	-	-	-	-	-	-	-	-	To Be Studied
1810	Utility Pole	592.3	596.8	-4.5	619.2	-26.8	-	-	-	-	-	-	-	-	No Action
1811	Light Pole	590.5	596.7	-6.2	619.0	-28.5	629.2	-38.7	649.4	-58.9	680.2	-89.7	629.2	-38.7	No Action
1812	Light Pole	591.0	596.3	-5.3	618.5	-27.5	628.6	-37.6	648.7	-57.7	679.5	-88.5	628.6	-37.6	No Action
1814	Utility Pole	608.9	-	-	634.5	-25.6	-	-	-	-	-	-	-	-	No Action
1815	Utility Pole	609.6	-	-	627.2	-17.6	-	-	-	-	-	-	-	-	No Action
1816	Utility Pole	609.8	-	-	644.7	-34.9	-	-	-	-	-	-	-	-	No Action
1818	Tree	597.9	593.6	4.3	615.1	-17.2	-	-	-	-	-	-	-	-	To Be Studied
1819	Tree	602.9	593.5	9.4	615.0	-12.1	-	-	-	-	-	-	-	-	To Be Studied
1820	Utility Pole	616.4	-	-	659.7	-43.3	-	-	-	-	-	-	-	-	No Action
1821	Light Pole	607.5	-	-	614.0	-6.5	-	-	-	-	-	-	-	-	No Action
1824	Utility Pole	596.0	-	-	632.9	-36.9	-	-	-	-	-	-	-	-	No Action
1826	Utility Pole	585.5	-	-	624.2	-38.7	-	-	-	-	-	-	-	-	No Action
1827	Pole	575.2	579.4	-4.2	597.3	-22.1	603.7	-28.5	-	-	652.5	-77.3	-	-	No Action
1830	Fence	544.0	553.9	-9.9	565.5	-21.5	566.3	-22.2	-	-	611.8	-67.8	566.3	-22.2	No Action
1831	Pole	544.2	550.0	-5.8	607.3	-63.1	-	-	-	-	-	-	-	-	No Action
1832	Fence	540.8	549.8	-9.0	618.5	-77.7	-	-	-	-	-	-	-	-	No Action
1833	Solar Panels	540.3	549.6	-9.3	616.3	-76.0	-	-	-	-	-	-	-	-	No Action
1834	Pole	548.2	549.2	-1.1	626.8	-78.6	-	-	-	-	-	-	-	-	No Action
1835	Pole	545.6	549.2	-3.6	624.5	-79.0	-	-	-	-	-	-	-	-	No Action
1836	Pole	541.4	549.0	-7.7	622.8	-81.4	-	-	-	-	-	-	-	-	No Action
1837	Runway Light	538.0	547.5	-9.5	557.5	-19.5	556.9	-18.8	567.4	-29.4	601.6	-63.6	556.9	-18.8	Fixed by Function
1838	Antenna	539.1	546.8	-7.7	556.6	-17.5	555.8	-16.7	566.2	-27.1	600.4	-61.3	555.8	-16.7	Fixed by Function
1839	Runway Light	538.5	545.5	-7.0	555.0	-16.5	553.9	-15.4	564.1	-25.6	598.4	-59.9	553.9	-15.4	Fixed by Function
1840	Localizer	537.0	545.1	-8.1	554.4	-17.4	553.2	-16.2	563.3	-26.3	597.7	-60.7	553.2	-16.2	Fixed by Function
1841	Localizer	537.0	545.1	-8.1	554.4	-17.5	553.2	-16.3	563.3	-26.4	597.7	-60.7	553.2	-16.3	Fixed by Function
1842	Street_Sign	535.2	545.0	-9.8	554.4	-19.2	553.2	-18.0	-	-	597.6	-62.4	-	-	No Action
1843	Pole	542.7	544.8	-2.1	554.1	-11.4	552.9	-10.2	-	-	597.3	-54.6	552.8	-10.2	No Action
1844	Util Box	537.4	544.6	-7.2	553.8	-16.4	552.5	-15.1	-	-	596.9	-59.5	552.5	-15.1	No Action
1845	Antenna	540.9	544.3	-3.4	553.4	-12.6	552.1	-11.2	562.0	-21.2	596.4	-55.6	552.1	-11.2	Fixed by Function
1846	Pole	550.2	544.2	6.0	553.4	-3.1	552.0	-1.8	-	-	596.4	-46.1	552.0	-1.8	To Be Studied
1847	Building	542.5	544.1	-1.6	553.2	-10.7	551.8	-9.3	-	-	596.2	-53.7	551.8	-9.3	No Action
1848	Runway Light	536.3	543.5	-7.3	552.5	-16.2	551.0	-14.7	560.7	-24.5	595.2	-59.0	551.0	-14.7	Fixed by Function
1849	Runway Light	536.3	543.5	-7.3	552.5	-16.2	551.0	-14.7	560.7	-24.5	595.2	-59.0	551.0	-14.7	Fixed by Function
1850	Runway Light	536.3	543.5	-7.3	552.5	-16.2	551.0	-14.7	560.7	-24.5	595.2	-59.0	551.0	-14.7	Fixed by Function
1851	Runway Light	534.7	541.5	-6.8	550.0	-15.3	548.0	-13.3	557.4	-22.7	592.0	-57.3	548.0	-13.3	Fixed by Function
1852	Runway Light	534.7	541.5	-6.8	550.0	-15.3	548.0	-13.3	557.4	-22.7	592.0	-57.3	548.0	-13.3	Fixed by Function
1853	Runway Light	534.7	541.5	-6.8	550.0	-15.3	548.0	-13.3	557.4	-22.7	592.0	-57.3	548.0	-13.3	Fixed by Function
1854	Sign	533.8	540.8	-7.0	651.5	-117.8	-	-	-	-	-	-	-	-	Fixed by Function
1855	Runway Light	534.1	539.7	-5.6	547.7	-13.7	545.4	-11.3	554.4	-20.3	589.2	-55.1	545.4	-11.3	Fixed by Function
1856	Runway Light	534.1	539.7	-5.6	547.7	-13.6	545.4	-11.3	554.4	-20.3	589.1	-55.1	545.4	-11.3	Fixed by Function
1857	Runway Light	534.2	539.7	-5.5	547.7	-13.5	545.4	-11.2	554.4	-20.2	589.1	-54.9	545.4	-11.2	Fixed by Function
1858	Runway Light	532.5	537.9	-5.4	545.5	-13.0	542.7	-10.3	551.4	-18.9	586.3	-53.8	542.7	-10.3	Fixed by Function
1859	Runway Light	532.4	537.9	-5.6	545.5	-13.1	542.7	-10.4	551.4	-19.0	586.3	-53.9	542.7	-10.4	Fixed by Function
1860	Runway Light	532.5	537.9	-5.4	545.5	-13.0	542.7	-10.2	551.4	-18.9	586.3	-53.8	542.7	-10.2	Fixed by Function
1861	Sign	531.1	536.4	-5.3	546.3	-15.2	540.5	-9.4	-	-	583.9	-52.8	540.5	-9.4	Fixed by Function
1862	Runway Light	531.4	536.1	-4.8	543.2	-11.9	540.1	-8.7	548.4	-17.0	583.4	-52.0	540.1	-8.7	Fixed by Function
1863	Runway Light	531.4	536.1	-4.8	543.2	-11.9	540.1	-8.7	548.4	-17.0	583.4	-52.0	540.1	-8.7	Fixed by Function
1864	Runway Light	531.4	536.1	-4.8	543.2	-11.9	540.1	-8.7	548.4	-17.0	583.4	-52.0	540.1	-8.7	Fixed by Function
1865	Runway Light	530.1	534.3	-4.2	541.0	-10.9	537.4	-7.3	545.4	-15.3	580.5	-50.4	537.4	-7.3	Fixed by Function
1866	Runway Light	530.1	534.3	-4.2	541.0	-10.9	537.4	-7.3	545.4	-15.3	580.5	-50.4	537.4	-7.3	Fixed by Function
1867	Runway Light	530.1	534.3	-4.2	541.0	-10.9	537.4	-7.3	545.4	-15.3	580.5	-50.4	537.4	-7.3	Fixed by Function
1868	Runway Light	530.1	534.3	-4.2	541.0	-10.9	537.4	-7.3	545.4	-15.3	580.5	-50.4	537.4	-7.3	Fixed by Function
1869	Runway Light	530.1	534.3	-4.2	541.0	-10.9	537.4	-7.3	545.4	-15.3	580.5	-50.4	537.4	-7.3	Fixed by Function
1870	Sign	532.2	534.1	-1.9	540.7	-8.5	537.1	-4.9	545.0	-12.8	580.2	-47.9	537.1	-4.9	Fixed by Function
1871	Sign	531.4	531.8	-0.4	610.7	-79.3	533.7	-2.3	-	-	-	-	-	-	Fixed by Function
1872	Sign	532.2	529.8	2.4	550.4	-18.3	530.8	1.4	-	-	573.3	-41.1	530.8	1.4	Fixed by Function
1873	Sign	530.5	528.8	1.7	620.8	-90.3	529.3	1.2	-	-	-	-	-	-	Fixed by Function
1876	Sign	529.5	-	-	540.0	-10.5	-	-	531.9	-2.4	567.6	-38.1	-	-	Fixed by Function
1877	Rail	528.5	-	-	550.3	-21.8	-	-	530.0	-1.5	565.8	-37.3	-	-	Fixed by Function
1878	Rail	528.5	-	-	550.3	-21.8	-	-	530.0	-1.5	565.8	-37.3	-	-	Fixed by Function
1882	Sign	529.9	-	-	-	-	-	-	-	-	563.2	-33.3	-	-	Fixed by Function
5323	Guard Rail	567.1	610.3	-43.2	636.1	-69.0	649.2	-82.1	-	-	702.0	-134.8	649.2	-82.1	No Action
5325	Guard Rail	569.8	610.1	-40.3	635.8	-66.0	648.9	-79.1	-	-	701.6	-131.8	648.9	-79.1	No Action
5331	Guard Rail	576.0	607.5	-31.5	632.5	-56.5	645.0	-69.0	-	-	697.4	-121.4	645.0	-69.0	No Action
5339	Fence	556.6	605.5	-48.9	630.0	-73.4	642.1	-85.5	-	-	694.2	-137.6	642.1	-85.5	No Action
5343	Fence	557.2	603.4	-46.2	627.4	-70.2	639.1	-81.9	-	-	690.9	-133.7	639.1	-81.9	No Action
8560	Fence	555.8	598.3	-42.6	621.1	-65.3	631.6	-75.8	-	-	682.8	-127.0	631.6	-75.8	No Action
8562	Guard Rail	575.9	602.1	-26.2	625.8	-49.9	637.2	-61.3	-	-	688.9	-113.0	637.2	-61.3	No Action
8659	Building	574.8	589.9	-15.1	610.5	-35.7	619.2	-44.3	-	-	669.3	-94.5	619.2	-44.3	No Action
8710	Dirt Pile	549.5	580.6	-31.1	598.9	-49.4	605.5	-56.0	-	-	654.4	-104.9	605.5	-56.0	No Action
8711	Dirt Pile	548.8	581.1	-32.3	599.5	-50.7	606.2	-57.5	623.4	-74.6	655.3	-106.5	606.2	-57.5	No Action
8714	Vertical Point	552.6	587.4	-34.9	607.4	-54.9	615.6	-63.0	-	-	665.4	-112.8	615.6	-63.0	No Action
8905	Solar Panels	591.0	623.7	-32.8	652.8	-61.9	668.9	-78.0	694.4	-103.5	723.4	-132.4	668.9	-78.0	No Action
8906	Solar Panels	592.6	620.2	-27.7	648.4	-55.9	663.8	-71.2	688.6	-96.0	717.7	-125.2	663.8	-71.2	No Action
8997	Light Pole	588.8	599.0	-10.2	621.9	-33.1	632.6	-43.8	653.2	-64.4	683.9	-95.1	632.6	-43.8	No Action
10291	Sign	533.8	540.8	-7.0	651.5	-117.8	-	-	-	-	-	-	-	-	Fixed by Function
10302	Sign	533.5	546.3	-12.7	555.9	-22.4	555.0	-21.5	-	-	599.6	-66.1	555.0	-21.5	Fixed by Function
10445	Service Road	541.6	549.0	-7.4	603.3	-61.7	559.0	-17.4	-	-	-	-	-	-	No Action
10446	Service Road	542.5	551.4	-8.9	562.4	-19.9	562.6	-20.1	-	-	607.8	-65.4	-	-	No Action
10447	Service Road	542.8	552.3	-9.5	563.5	-20.7	563.9	-21.1	-	-	609.3	-66.5	563.9	-21.1	No Action
10448	Service Road	543.7	555.3	-11.6	567.3	-23.6	568.4	-24.7	580.5	-36.7	614.1	-70.4	568.4	-24.7	No Action
10449	Service Road	540.0	544.6	-4.6	553.9	-13.9	552.6	-12.6	-	-	597.0	-57.0	552.6	-12.6	No Action
10450	Service Road	540.0	545.6	-5.6	555.1	-15.1	554.0	-14.0	-	-	598.6	-58.6	-	-	No Action
10451	Service Road	551.1	576.5	-25.3	593.7	-42.6	599.4	-48.3	615.7	-64.5	647.9	-96.7	599.4	-48.3	No Action
10452	Service Road	550.8	579.4	-28.6	597.4	-46.6	603.8	-53.0	-	-	652.6	-101.8	603.8	-53.0	No Action
10453	Service Road	550.8	580.4	-29.6	598.6	-47.8	605.1	-54.4	-	-	654.1	-103.3	-	-	No Action
10454	Service Road	550.8	581.1	-30.3	599.5	-48.7	606.3	-55.5	-	-	-	-	-	-	No Action
10455	Service Road	558.2	582.4	-24.2	601.1	-43.0	-	-	-	-	-	-	-	-	No Action
10456	Service Road	560.0	582.7	-22.7	618.1	-58.1	-	-	-	-	-	-	-	-	No Action
10457	Service Road	540.0	542.6	-2.6	551.3	-11.3	549.6	-9.6	559.2	-19.2	593.7	-53.7	549.6	-9.6	No Action
10458	Service Road	559.5	583.3	-23.8	602.2	-42.7	609.5	-49.9	627.0	-67.5	658.8	-99.2	609.5	-49.9	No Action
10459	Service Road	560.0	586.8	-26.8	606.6	-46.6	614.6	-54.6	632.8	-72.8	664.3	-104.3	614.6	-54.6	No Action
10460	Service Road	563.2	590.7	-27.5	611.5	-48.3	620.3	-57.1	639.3	-76.1	670.5	-107.4	620.3	-57.1	No Action

Runway 12L Inner Approach (Existing)

LEGEND

1. Numbers shown in red are a penetration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12L30R - 12L P77 (4)
LAYOUT: 12L Inner (1)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 2/22/2023 8:22 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 12L Obstruction Tables Inner Portion (Existing/Future)

SCALE	AS NOTED	JOB NO. 20042701.00
DATE	2/2023	
SHEET 52 OF 59 SHEETS		

Runway 12L Existing Obstruction Table Inner Portion of the Approach Surface															
Object ID	Description	Object Elevation (MSL)	Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		VASI		TERPS Visual Surface		Disposition
			Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	
10461	Service Road	546.4	566.8	-20.4	581.6	-35.2	585.2	-38.8	599.6	-53.2	632.5	-86.0	585.2	-38.8	No Action
10462	Service Road	551.1	576.1	-25.0	593.3	-42.2	598.9	-47.8	615.1	-64.0	647.3	-96.2	598.9	-47.8	No Action
10463	Service Road	561.5	591.3	-29.9	612.3	-50.8	621.3	-59.8	640.4	-79.0	671.6	-110.1	621.3	-59.8	No Action
10464	Service Road	550.0	587.0	-37.0	606.9	-56.9	614.9	-64.9	-	-	664.6	-114.6	614.9	-64.9	No Action
10465	Service Road	548.3	571.7	-23.4	587.8	-39.4	592.4	-44.1	-	-	640.3	-91.9	592.4	-44.1	No Action
10466	Service Road	547.4	570.6	-23.2	586.4	-39.0	590.8	-43.5	-	-	638.5	-91.1	-	-	No Action
10467	Service Road	550.0	580.7	-30.7	599.0	-49.0	605.6	-55.6	-	-	-	-	-	-	No Action
10468	Service Road	549.0	579.4	-30.4	597.4	-48.4	-	-	-	-	-	-	-	-	No Action
10469	Service Road	548.1	578.3	-30.2	621.8	-73.6	-	-	-	-	-	-	-	-	No Action
10470	Service Road	560.0	557.8	-17.8	638.8	-98.8	-	-	-	-	-	-	-	-	No Action
10471	Service Road	541.5	560.3	-18.8	589.8	-48.3	575.7	-34.2	-	-	-	-	-	-	No Action
10472	Service Road	542.2	561.2	-19.0	574.6	-32.4	576.9	-34.8	-	-	-	-	-	-	No Action
10473	Service Road	544.0	563.9	-19.9	577.9	-34.0	580.9	-36.9	-	-	627.7	-83.7	-	-	No Action
10474	Service Road	545.6	571.8	-26.3	627.1	-81.6	-	-	-	-	-	-	-	-	No Action
10479	Service Road	552.5	608.2	-55.7	633.3	-80.9	646.0	-93.5	-	-	698.5	-146.0	646.0	-93.5	No Action
10482	Service Road	554.5	611.0	-56.5	636.9	-82.4	650.2	-95.7	-	-	703.0	-148.5	-	-	No Action
10483	Service Road	554.6	611.1	-56.5	637.0	-82.4	-	-	-	-	703.1	-148.5	-	-	No Action
10486	Service Road	560.0	613.7	-53.7	640.2	-80.2	-	-	-	-	-	-	-	-	No Action
10488	Service Road	560.0	-	-	642.6	-82.6	-	-	-	-	-	-	-	-	No Action
10502	Service Road	552.3	-	-	-	-	-	-	-	-	-	-	-	-	No Action
10504	Service Road	550.0	579.4	-29.5	597.4	-47.5	603.8	-53.8	-	-	652.6	-102.6	-	-	No Action
10506	Service Road	570.0	618.3	-48.3	646.0	-76.0	-	-	-	-	714.7	-144.7	-	-	No Action
10507	Service Road	570.0	619.0	-49.0	646.9	-76.9	661.9	-91.9	-	-	715.8	-145.8	-	-	No Action
11156	Railroad	598.8	614.6	-15.8	641.4	-42.6	655.5	-56.7	679.2	-80.4	708.8	-109.9	655.5	-56.7	No Action
11157	Railroad	605.1	617.0	-11.8	644.4	-39.2	659.0	-53.8	683.1	-78.0	712.6	-107.4	659.0	-53.8	No Action
11158	Railroad	591.5	602.9	-11.4	626.7	-35.3	638.2	-46.8	-	-	690.0	-98.6	638.2	-46.8	No Action
11159	Railroad	593.0	604.4	-11.4	628.7	-35.7	640.6	-47.6	-	-	692.5	-99.5	640.6	-47.6	No Action
11160	Railroad	593.0	607.4	-14.4	632.4	-39.4	644.9	-51.9	-	-	697.2	-104.2	644.9	-51.9	No Action
11161	Railroad	589.3	600.0	-10.7	623.1	-33.8	634.0	-44.7	-	-	685.4	-96.1	-	-	No Action
11162	Railroad	589.1	599.5	-10.4	622.5	-33.4	633.3	-44.2	-	-	-	-	-	-	No Action
11163	Railroad	591.9	601.6	-9.7	625.2	-33.3	636.4	-44.5	-	-	-	-	-	-	No Action
11164	Railroad	592.1	602.1	-9.9	625.7	-33.6	637.1	-45.0	-	-	688.8	-96.6	-	-	No Action
11165	Railroad	573.0	594.5	-21.5	616.3	-43.3	-	-	-	-	-	-	-	-	No Action
11166	Railroad	573.0	-	-	615.6	-42.6	-	-	-	-	-	-	-	-	No Action
11167	Railroad	593.0	612.6	-19.6	639.0	-46.0	652.6	-59.6	-	-	705.6	-112.6	652.6	-59.6	No Action
11168	Railroad	593.0	611.8	-18.8	637.7	-44.7	651.1	-58.1	-	-	704.0	-111.0	-	-	No Action
11169	Railroad	593.0	611.6	-18.6	637.6	-44.6	-	-	-	-	704.0	-111.0	-	-	No Action
11170	Railroad	595.4	610.8	-15.4	636.7	-41.2	-	-	-	-	-	-	-	-	No Action
11171	Railroad	596.6	-	-	636.3	-39.7	-	-	-	-	-	-	-	-	No Action
11190	Road	565.0	609.7	-44.7	635.2	-70.2	648.3	-83.3	671.0	-106.0	700.9	-135.9	648.3	-83.3	No Action
11191	Road	575.0	600.9	-25.9	624.2	-49.2	635.3	-60.3	656.3	-81.3	686.8	-111.8	635.3	-60.3	No Action
11192	Road	575.0	596.5	-21.5	618.8	-43.8	628.9	-53.9	649.1	-74.1	679.9	-104.9	628.9	-53.9	No Action
11193	Road	572.4	595.0	-22.5	616.9	-44.4	626.7	-54.2	-	-	677.4	-105.0	626.7	-54.2	No Action
11194	Road	568.8	594.8	-25.9	616.6	-47.8	626.4	-57.5	-	-	677.1	-108.3	-	-	No Action
11195	Road	567.9	594.7	-26.8	616.5	-48.6	626.2	-58.3	-	-	-	-	-	-	No Action
11196	Road	571.9	-	-	612.7	-40.7	-	-	-	-	-	-	-	-	No Action
11197	Road	571.8	591.7	-19.9	612.8	-41.0	-	-	-	-	-	-	-	-	No Action
11198	Road	565.1	592.2	-27.1	613.4	-48.2	622.5	-57.4	-	-	-	-	-	-	No Action
11199	Road	567.4	592.2	-24.8	613.3	-46.0	622.5	-55.2	-	-	672.9	-105.6	-	-	No Action
11200	Road	568.9	592.2	-23.4	613.4	-44.6	622.6	-53.8	-	-	673.1	-104.2	622.6	-53.8	No Action
11201	Road	572.5	593.0	-20.5	614.4	-41.9	623.7	-51.3	643.2	-70.7	674.3	-101.8	623.7	-51.2	No Action
11202	Road	575.0	595.1	-20.1	617.0	-42.0	626.8	-51.8	648.7	-73.7	677.6	-102.6	626.8	-51.8	No Action
11203	Road	585.0	600.6	-15.6	623.9	-38.9	634.9	-49.9	655.9	-70.9	686.4	-101.4	634.9	-49.9	No Action
11206	Road	575.0	613.1	-38.1	639.5	-64.5	653.3	-78.3	-	-	706.3	-131.3	653.3	-78.3	No Action
11209	Road	575.0	615.0	-40.0	641.9	-66.9	656.1	-81.1	-	-	709.4	-134.4	-	-	No Action
11210	Road	575.0	615.4	-40.4	642.4	-67.4	-	-	-	-	710.0	-135.0	-	-	No Action
11212	Road	568.1	618.4	-50.4	646.2	-78.1	-	-	-	-	-	-	-	-	No Action
11213	Road	565.0	-	-	648.6	-83.6	-	-	-	-	-	-	-	-	No Action
11214	Road	565.0	-	-	650.4	-85.4	-	-	-	-	-	-	-	-	No Action
11252	Road	571.0	625.1	-54.2	654.6	-83.6	671.0	-100.0	696.8	-125.8	725.6	-154.6	671.0	-100.0	No Action
11253	Road	568.4	614.7	-46.3	641.5	-73.1	655.6	-87.3	679.3	-111.0	708.9	-140.5	655.6	-87.3	No Action

Runway 12L Inner Approach (Existing)

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert2020\Dwg\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12L9R - 12L 77 (4)
LAYOUT: 12L Inner (2)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 2/22/2023 8:22 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

REVISIONS				REVISIONS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 12L Obstruction Tables Inner Portion (Existing/Future)

SCALE	AS NOTED
JOB NO.	20042701.00
DATE	2/2023
SHEET	53 OF 59 SHEETS

Runway 12L Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
1097	Tree	701.5	701.9	-0.4	750.5	-49.0	-	-	-	-	848.1	-146.6	-	-	No Action
1098	Tree	704.1	701.8	2.3	750.4	-46.3	-	-	-	-	848.0	-143.9	-	-	To Be Studied
1099	Tree	702.6	699.6	3.0	747.7	-45.1	-	-	-	-	844.6	-142.0	-	-	To Be Studied
1100	Tree	675.8	684.0	-8.2	728.2	-52.5	757.6	-81.8	794.9	-119.1	819.7	-143.9	757.6	-81.8	No Action
1101	Tree	686.2	683.7	2.4	727.9	-41.7	757.2	-71.0	794.4	-108.3	819.2	-133.0	757.2	-71.0	To Be Studied
1102	Tree	682.5	683.7	-1.2	727.9	-45.4	757.1	-74.7	-	-	819.2	-136.7	757.1	-74.7	No Action
1103	Tree	678.8	683.6	-4.9	727.7	-49.0	757.0	-78.2	794.2	-115.5	819.0	-140.3	757.0	-78.2	No Action
1104	Tree	682.2	683.4	-1.2	727.4	-45.2	756.6	-74.4	793.8	-111.6	818.6	-136.4	756.6	-74.4	No Action
1105	Tree	673.2	683.2	-10.0	727.2	-54.0	756.3	-83.1	793.5	-120.3	818.3	-145.1	756.3	-83.1	No Action
1106	Tree	682.8	683.0	-0.1	726.9	-44.1	756.0	-73.2	793.1	-110.3	818.0	-135.1	756.0	-73.2	No Action
1107	Tree	682.6	682.7	-0.1	726.6	-44.0	755.7	-73.1	792.7	-110.2	817.6	-135.0	755.7	-73.1	No Action
1108	Tree	674.8	682.7	-7.9	726.6	-51.7	755.6	-80.8	792.7	-117.9	817.5	-142.7	755.6	-80.8	No Action
1109	Tree	679.1	682.0	-2.8	725.7	-46.5	754.6	-75.4	791.5	-112.4	816.4	-137.3	754.6	-75.4	No Action
1110	Tree	675.2	681.7	-6.5	725.3	-50.1	754.1	-78.9	791.0	-115.8	815.9	-140.7	754.1	-78.9	No Action
1111	Tree	678.1	681.5	-3.3	725.0	-46.9	753.8	-75.7	790.6	-112.5	815.6	-137.4	753.8	-75.7	No Action
1112	Tree	675.8	681.0	-5.2	724.4	-48.6	753.1	-77.3	789.8	-114.0	814.8	-139.0	753.1	-77.3	No Action
1113	Tree	676.6	680.5	-3.9	723.8	-47.3	752.4	-75.8	789.0	-112.5	814.0	-137.5	752.4	-75.8	No Action
1114	Tree	673.6	679.8	-6.3	723.0	-49.4	751.4	-77.8	787.9	-114.3	813.0	-139.4	751.4	-77.8	No Action
1115	Tree	675.2	677.8	-2.6	720.5	-45.3	748.4	-73.3	784.5	-109.4	809.7	-134.6	748.4	-73.3	No Action
1116	Tree	672.7	677.4	-4.7	719.9	-47.2	747.8	-75.1	783.8	-111.1	809.1	-136.3	747.8	-75.1	No Action
1117	Tree	683.5	677.3	6.2	719.8	-36.3	747.7	-64.2	783.7	-100.2	809.0	-125.4	747.7	-64.2	To Be Studied
1118	Tree	681.9	677.0	4.9	719.4	-37.6	747.2	-65.4	783.2	-101.3	808.4	-126.5	747.2	-65.4	To Be Studied
1119	Utility Pole	666.1	675.5	-9.4	717.6	-51.5	745.1	-78.9	-	-	806.1	-139.9	745.1	-78.9	No Action
1120	Utility Pole	666.6	673.7	-7.1	715.4	-48.8	742.4	-75.8	-	-	803.2	-136.6	742.4	-75.8	No Action
1121	Utility Pole	670.4	670.3	0.1	711.0	-40.7	737.4	-67.0	-	-	797.7	-127.3	737.4	-67.0	To Be Studied
1122	Utility Pole	671.0	669.2	1.8	709.7	-38.7	735.7	-64.8	-	-	795.9	-125.0	735.7	-64.8	To Be Studied
1123	Utility Pole	669.7	664.4	5.3	703.6	-33.9	728.7	-59.0	-	-	788.3	-118.6	728.7	-59.0	To Be Studied
1124	Tree	654.6	662.6	-8.1	701.5	-46.9	726.1	-71.6	759.3	-104.7	785.5	-130.9	726.1	-71.6	No Action
1125	Tree	653.8	662.3	-8.5	701.0	-47.3	725.6	-71.8	-	-	784.9	-131.1	725.6	-71.8	No Action
1126	Utility Pole	666.2	659.1	7.1	697.1	-30.9	721.0	-54.7	-	-	779.9	-113.7	721.0	-54.7	To Be Studied
1127	Tree	658.9	658.1	0.9	695.8	-36.8	719.4	-60.5	751.6	-92.7	778.2	-119.3	719.4	-60.5	To Be Studied
1128	Utility Pole	671.8	656.5	15.3	693.9	-22.0	717.2	-45.3	-	-	775.8	-103.9	717.2	-45.3	To Be Studied
1129	Tree	646.8	656.1	-9.3	693.3	-46.5	716.5	-69.7	-	-	775.0	-128.2	716.5	-69.7	No Action
1131	Building	646.1	656.0	-9.9	693.2	-47.1	716.4	-70.3	748.2	-102.1	774.9	-128.8	716.4	-70.3	No Action
1132	Tree	649.0	656.0	-7.0	693.2	-44.2	716.3	-67.4	748.2	-99.2	774.9	-125.9	716.3	-67.4	No Action
1134	Tree	651.9	655.8	-3.9	692.9	-41.0	716.1	-64.2	747.9	-96.0	774.6	-122.7	716.1	-64.2	No Action
1135	Tree	651.5	655.6	-4.1	692.7	-41.2	715.8	-64.3	747.5	-96.0	774.2	-122.7	715.8	-64.3	No Action
1136	Building	651.9	655.6	-3.6	692.6	-40.7	715.8	-63.8	-	-	774.2	-122.3	715.7	-63.8	No Action
1138	Tree	654.7	655.5	-0.8	692.6	-37.9	715.6	-60.9	747.4	-92.7	774.1	-119.4	715.6	-60.9	No Action
1139	Tree	655.9	655.4	0.4	692.5	-36.6	715.5	-59.7	747.2	-91.4	774.0	-118.1	715.5	-59.7	To Be Studied
1141	Tree	652.8	655.3	-2.5	692.3	-39.5	715.4	-62.6	747.1	-94.3	773.8	-121.0	715.4	-62.6	No Action
1142	Tree	659.5	655.3	4.2	692.3	-32.8	715.3	-55.9	747.0	-87.6	773.8	-114.3	715.3	-55.9	To Be Studied
1143	Tree	654.3	655.3	-0.9	692.3	-37.9	715.3	-61.0	747.0	-92.7	773.8	-119.4	715.3	-61.0	No Action
1144	Tree	658.9	655.2	3.7	692.1	-33.3	715.1	-56.3	746.8	-87.9	773.6	-114.7	715.1	-56.3	To Be Studied
1145	Tree	650.8	655.1	-4.3	692.1	-41.3	715.1	-64.3	746.7	-96.0	773.5	-122.7	715.1	-64.3	No Action
1146	Tree	647.6	655.0	-7.4	691.9	-44.3	714.9	-67.3	746.5	-98.9	773.3	-125.7	714.9	-67.3	No Action
1148	Tree	652.4	654.5	-2.1	691.3	-38.9	714.2	-61.8	745.7	-93.3	772.5	-120.1	714.2	-61.8	No Action
1150	Utility Pole	654.6	654.3	0.3	691.0	-36.5	713.8	-59.3	-	-	772.1	-117.6	713.8	-59.3	To Be Studied
1151	Tree	645.8	654.0	-8.3	690.7	-44.9	713.5	-67.7	744.9	-99.1	771.7	-126.0	713.5	-67.7	No Action
1152	Utility Pole	656.4	654.0	2.5	690.6	-34.2	713.4	-56.9	-	-	771.7	-115.2	713.4	-56.9	To Be Studied
1153	Utility Pole	646.1	653.9	-7.8	690.6	-44.5	713.3	-67.2	744.7	-98.6	771.6	-125.5	713.3	-67.2	No Action
1154	Utility Pole	651.4	653.8	-2.4	690.5	-39.0	713.2	-61.8	744.6	-93.1	771.4	-120.0	713.2	-61.8	No Action
1155	Utility Pole	654.0	653.6	0.4	690.2	-36.2	712.9	-58.9	-	-	771.1	-117.1	712.9	-58.9	To Be Studied
1156	Utility Pole	652.4	653.5	-1.1	690.0	-37.6	712.6	-60.3	-	-	770.8	-118.5	712.6	-60.3	No Action
1157	Utility Pole	652.1	653.4	-1.3	690.0	-37.9	712.6	-60.5	743.9	-91.8	770.8	-118.7	712.6	-60.5	No Action
1158	Utility Pole	652.2	653.2	-1.0	689.7	-37.5	712.3	-60.0	-	-	770.4	-118.2	712.3	-60.0	No Action
1159	Utility Pole	651.5	652.5	-1.0	688.8	-37.3	711.2	-59.7	-	-	769.3	-117.8	711.2	-59.7	No Action
1160	Light Pole	650.3	651.8	-1.5	688.0	-37.7	710.3	-60.0	741.3	-91.0	768.3	-118.0	710.3	-60.0	No Action
1161	Building	642.2	651.8	-9.7	688.0	-45.8	710.2	-68.1	741.2	-99.1	768.2	-126.1	710.2	-68.1	No Action
1162	Utility Pole	654.0	651.7	2.3	687.8	-33.8	710.0	-56.0	-	-	768.0	-114.0	710.0	-56.0	To Be Studied
1163	Utility Pole	653.4	651.7	1.8	687.8	-34.3	-	-	-	-	768.0	-114.6	-	-	To Be Studied
1164	Utility Pole	654.5	651.5	3.0	687.6	-33.1	-	-	-	-	-	-	-	-	To Be Studied
1165	Tree	666.7	651.2	15.5	687.2	-20.5	709.3	-42.6	740.2	-73.5	767.3	-100.5	709.3	-42.6	To Be Studied
1166	Tree	698.9	651.1	47.8	687.1	11.8	709.2	-10.3	740.1	-41.2	767.1	-68.2	709.2	-10.3	To Be Studied
1167	Tree	654.0	651.1	2.9	687.1	-33.0	709.2	-55.1	740.0	-86.0	767.1	-113.0	709.2	-55.1	To Be Studied
1168	Utility Pole	661.4	-	-	687.0	-25.6	-	-	-	-	-	-	-	-	No Action
1169	Tree	663.6	651.0	12.6	687.0	-23.4	709.1	-45.5	739.9	-76.3	767.0	-103.4	709.1	-45.5	To Be Studied
1170	Utility Pole	652.7	650.8	1.9	686.7	-34.0	708.8	-56.1	-	-	766.7	-113.9	708.8	-56.1	To Be Studied
1171	Tree	658.0	650.7	7.3	686.5	-28.5	708.5	-50.5	-	-	766.4	-108.4	708.5	-50.5	To Be Studied
1172	Tree	680.6	650.2	30.3	686.0	-5.4	707.9	-27.3	738.6	-58.0	765.7	-85.1	707.9	-27.3	To Be Studied
1173	Tree	682.2	649.8	32.4	685.5	-3.3	707.3	-25.1	737.9	-55.7	765.1	-82.9	707.3	-25.1	To Be Studied
1174	Tree	670.3	649.6	20.6	685.2	-15.0	707.0	-36.8	737.6	-67.4	764.8	-94.5	707.0	-36.8	To Be Studied
1175	Tree	647.5	649.3	-1.8	684.8	-37.3	706.6	-59.0	737.1	-89.6	764.3	-116.7	706.6	-59.0	No Action
1176	Tree	684.8	649.2	35.7	684.6	0.2	706.3	-21.5	736.8	-52.0	764.0	-79.2	706.3	-21.5	To Be Studied
1177	Utility Pole	663.6	-	-	684.3	-20.8	-	-	-	-	-	-	-	-	No Action
1178	Light Pole	650.8	648.9	1.9	684.3	-33.5	706.0	-55.1	736.4	-85.6	763.6	-112.8	706.0	-55.1	To Be Studied
1179	Tree	682.1	648.8	33.3	684.2	-2.0	705.8	-23.7	736.2	-54.1	763.4	-81.3	705.8	-23.7	To Be Studied
1180	Tree	687.8	648.4	39.4	683.6	4.1	705.1	-17.4	735.5	-47.7	762.7	-74.9	705.1	-17.4	To Be Studied
1181	Tree	651.9	648.3	3.6	683.5	-31.6	705.0	-53.1	735.3	-83.4	762.6	-110.6	705.0	-53.1	To Be Studied
1182	Utility Pole	651.0	647.9	3.1	683.1	-32.1	704.5	-53.5	-	-	762.0	-111.0	704.5	-53.5	To Be Studied
1183	Tree	681.6	647.8	33.7	683.0	-1.4	704.4	-22.8	734.6	-53.0	761.9	-80.3	704.4	-22.8	To Be Studied
1184	Tree	655.3	647.7	7.6	682.8	-27.5	704.2	-48.9	734.4	-79.1	761.6	-106.3	704.2	-48.9	To Be Studied
1185	Tree	643.5	647.7	-4.1	682.7	-39.2	704.1	-60.6	734.3	-90.7	761.6	-118.0	704.1	-60.6	No Action
1186	Tree	648.9	647.6	1.3	682.7	-33.8	704.0	-55.1	734.2	-85.3	761.5	-112.6	704.0	-55.1	To Be Studied
1188	Tree	642.5	647.3	-4.7	682.2	-39.7	703.5	-61.0	733.6	-91.1	760.9	-118.4	703.5	-61.0	No Action
1189	Tree	641.2	647.2	-6.1	682.2	-41.1	703.5	-62.3	733.6	-92.4	760.9	-119.7	703.5	-62.3	No Action
1190	Tree	660.5	647.2	13.3	682.2	-21.7	703.5	-42.9	733.6	-73.0	760.9	-100.3	703.5	-42.9	To Be Studied
1191	Tree	646.2	646.8	-0.6	681.7	-35.5	702.9	-56.7	732.9	-86.7	760.3	-114.0	702.9	-56.7	No Action
1192	Building	640.0	646.4	-6.4	681.2	-41.2	702.3	-62.2	732.2	-92.2	759.6	-119.5	702.3	-62.2	No Action
1193	Tree	653.8	646.3	7.6	681.0	-27.2	702.1	-48.2	732.0	-78.1	759.3	-105.5	702.1	-48.2	To Be Studied
1194	Tree	636.6	646.0	-9.5	680.7	-44.2	701.7	-65.2	731.6	-95.0	759.0	-122.4	701.7	-65.2	No Action
1195	Utility Pole	658.1	-	-	680.1	-22.1	-	-	-	-	-	-	-	-	No Action
1198	Light Pole	641.7	644.1	-2.4	678.4	-36.7	698.9	-57.2	728.4	-86.7	756.0	-114.3	698.9	-57.2	No Action
1199	Utility Pole	644.2	644.1	0.1	678.4	-34.1	698.9	-54.7	-	-	756.0	-111.7	698.9	-54.7	To Be Studied
1200	Tree	642.9	643.9	-1.0	678.0	-35.2	698.6	-55.7	728.0	-85.2	755.6	-112.7	698.6	-55.7	No Action
1201	Tree	649.5	643.8	5.6	678.0	-28.5	698.5	-49.0	727.9	-78.5	755.5	-106.0	698.5	-49.0	To Be Studied
1202	Tree	635.5	643.6	-8.1	677.7	-42.2	698.1	-62.6	727.5	-92.0	755.1	-119.6	698.1	-62.6	No Action
1203	Tree	643.7	643.6	0.1	677.6	-34.0	698.1	-54.4	727.5	-83.8	755.1	-111.4	698.1	-54.4	To Be Studied
1204	Tree	662.4	643.5	18.9	677.5	-15.2	698.0	-35.6	727.3	-65.0	754.9	-92.5	698.0	-35.6	To Be Studied
1206	Tree	656.3	643.3	13.0	677.2	-20.9	697.6	-41.3	-	-	754.5	-98.2	697.6	-41.3	To Be Studied
1207	Tree	674.1	643.2	30.9	677.2	-3.0	697.5	-23.4	726.8	-52.7	754.4	-80.3	697.5	-23.4	To Be Studied
1208	Tree	657.3	643.1	14.1	677.1	-19.8	697.5	-40.2	726.8	-69.5	754.4	-97.1	697.5	-40.2	To Be Studied
1209	Tree	650.7	643.1	7.6	677.1	-26.4	697.5	-46.7	-	-	754.4	-103.6	697.5	-46.7	To Be Studied
1210	Tree	666.9	643.1	23.8	677.0	-10.1	697.4	-30.5	726.7	-59.8	754.3	-87.3	697.4	-30.5	To Be Studied
1211	Tree	665.7	643.1	22.7	677.0	-11.3	697.4	-31.6	726.7	-60.9	754.3	-88.5	697.4	-31.6	To Be Studied
1212	Tree	673.5	643.1	30.4	677.0	-3.6	697.4	-23.9	726.7	-53.2	754.3	-80.8	697.4	-23.9	To Be Studied
1213	Tree	665.2	643.0	22.2	677.0	-11.7	697.3	-32.1	726.6	-61.3	754.2	-88.9	697.3	-32.1	To Be Studied
1214	Tree	670.3	642.9	27.4	676.8	-6.5	697.2	-26.9	726.4	-56.1	754.0	-83.7	697.2	-26.9	To Be Studied
1219	Tree	678.6	642.7	35.9	676.5	2.1	696.8	-18.2	726.0	-47.4	753.6	-75.0	696.8	-18.2	To Be Studied
1227	Utility Pole	659.0	-	-	676.0	-17.0	-	-	-	-	-	-	-	-	No Action
1228	Tree	667.8	642.2	25.6	676.0	-8.2	696.2	-28.4	725.3	-57.5	752.9	-85.1	696.2	-28.4	To Be Studied
1229	Tree	670.5	642.2	28.3	676.0	-5.5	696.1	-25.7	725.3	-54.8	752.9	-82.4	696.1	-25.6	To Be Studied
1231	Building	641.2	642.2	-1.0	675.9	-34.7	696.1	-54.9	-	-	752.8	-111.6	696.1	-54.9	No Action
1232	Tree	632.2	642.2	-10.0	675.9	-43.7	696.0	-63.8	725.1	-93.0	752.8	-120.6	696.0	-63.8	To Be Studied
1236	Building	643.5	642.0	1.5	675.7	-32.2	695.9	-52.3	724.9	-81.4	752.6	-109.1	695.9	-52.3	To Be Studied
1237	Building	645.1	642.0	3.1	675.7	-30.6	695.8	-50.7	724.9	-79.8	752.6	-107.5	695.8	-50.7	To Be Studied
1240	Tree	659.0	641.9	17.2	675.5	-16.5	695.6	-36.6	724.7	-65.6	752.4	-93.3	695.6	-36.6	To Be Studied
1241	Building	637.8	641.8	-4.1	675.4	-37.7	695.5	-57.8	724.6	-86.8	752.3	-114.5	695.5	-57.8	No Action
1243	Tree	667.1	641.6	25.6	675.1	-8.0	695.1	-28.0	724.1	-57.0	751.8	-84.7	695.1	-28.0	To Be Studied
1244	Tree	659.0	641.5	17.5	675.1	-16.1	695.1	-36.1	-	-	751.8	-92.8	695.1	-36.1	To Be Studied
1245	Building	641.0	641.5	-0.5	675.1	-34.1	-	-	-	-	-	-	-	-	No Action
1246	Tree	633.3	641.5	-8.2	675.1	-41.8	695.1	-61.8	724.1	-90.7	751.8	-118.5	695.1	-61.8	No Action
1247	Tree	665.4	641.4	24.0	675.0	-9.6	695.0	-29.6	-	-	751.6	-86.3	695.0	-29.6	To Be Studied
1249	Tree	669.6	641.3	28.3	674.9	-5.2	694.8	-25.2	723.8	-54.2	751.5	-81.9	694.8	-25.2	To Be Studied
1250	Tree	671.6	641.3	30.2	674.8	-3.3	694.8	-23.2	723.8	-52.2	751.5	-79.9	694.8	-23.2	To Be Studied
1251	Tree	669.7	641.2	28.4	674.7	-5.0	694.6	-25.0	723.6	-53.9	751.3	-81.6	694.6	-25.0	To Be Studied
1253	Tree	633.1	641.2	-8.1	674.7	-41.6	694.6	-61.5	723.5	-90.4	751.3	-118.1	694.6	-61.5	No Action
1258	Tree	633.0	640.9	-7.9	674.3	-41.3	694.2	-61.2	723.0	-90.1	750.8	-117.8	694.2	-61.2	No Action
1260	Tree	656.4	640.9	15.5	674.3	-17.8	694.1	-37.7	723.0	-66.6	750.7	-94.3	694.1	-37.7	To Be Studied
1265	Tree	653.7	640.5	13.2	673.8	-20.1	693.6	-39.9	722.4	-68.7	750.2	-96.5	693.6	-39.9	To Be Studied
1274	Utility Pole	638.7	640.2	-1.4	673.4	-34.6	693.1	-54.3	-	-	749.6	-110.9	693.1	-54.3	No Action
1275	Tree	631.7	640.1	-8.4	673.3	-41.6	693.0	-61.3	721.8	-90.0	749.6	-117.8	693.0	-61.3	No Action
1276	Tree	656.4	640.1	16.2	673.3	-17.0	693.0	-36.7	-	-	749.5	-93.2	693.0	-36.7	To Be Studied
1280	Tree	650.5	640.0	10.5	673.2	-22.6	692.8	-42.3	721.5	-71.0	749.3	-98.8	692.8	-42.3	To Be Studied
1287	Tree	629.8	639.5	-9.8	672.6	-42.8	692.2	-62.4	720.8	-91.0	748.6	-118.8	692.2	-62.4	No Action
1288	Utility Pole	631.6	639.4	-7.8	672.5	-40.8	692.0	-60.4	720.6	-88.9	748.4	-116.8	692.0	-60.4	No Action
1289	Utility Pole	637.4	639.1	-1.7	672.0	-34.6	691.5	-54.1	-	-	747.9	-110.5	691.5	-54.1	No Action
1290	Utility Pole	639.0	639.0	0.0	671.9	-32.9	691.4	-52.4	-	-	747.8	-108.8	691.4	-52.4	To Be Studied
1291	Utility Pole	654.0	-	-	671.8	-17.8	-	-	-	-	-	-	-	-	No Action
1292	Tree	629.7	638.4	-8.7	671.2	-41.5	690.5	-60.8	-	-	746.8	-117.1	690.5	-60.8	No Action
1293	Tree	629.2	638.2	-9.0	670.9	-41.7	690.2	-61.0	718.5	-89.3	746.5	-117.2	690.2	-61.0	No Action
1295	Tree	628.2	637.8	-9.6	670.4	-42.3	689.6	-61.5	717.9	-89.7	745.9	-117.7	689.6	-61.5	No Action
1296	Tree	629.0	637.7	-8.6	670.2	-41.2	689.4	-60.4	717.6	-88.6	745.6	-116.6	689.4	-60.4	No Action
1298	Tree	653.4	637.5	15.9	670.1	-16.7	689.2	-35.8	717.4	-64.0	745.4	-92.0	689.2	-35.8	To Be Studied
1309	Utility Pole	630.1	635.8	-5.7	667.9	-37.8	686.6	-56.5	714.5	-84.4	742.6	-112.5	686.6	-56.5	No Action
1310	Utility Pole	637.2	635.7	1.5	667.8	-30.6	686.5	-49.3	714.3	-77.2	742.4	-105.3	686.5	-49.3	To Be Studied
1311	Utility Pole	650.8	-	-	667.6	-16.8	-	-	-	-	-	-	-	-	No Action
1312	Tree	625.9	635.3	-9.4	667.3	-41.4	685.9	-60.0	713.6	-87.8	741.8	-115.9	685.9	-60.0	To Be Studied
1315	Tree	658.5	635.1	23.3	667.1	-8.6	685.7	-27.2	713.4	-55.0	741.6	-83.1	685.7	-27.2	To Be Studied
1316	Tree	655.6	635.1	20.5	667.1	-11.5	685.7	-30.1	713.4	-57.8	741.5	-85.9	685.7	-30.1	To Be Studied
1318	Tree	625.4	635.0	-9.6	667.0	-41.5	685.5	-60.1	713.3	-87.8	741.4	-116.0	685.5	-60.1	No Action
1323	Tree	643.1	634.7	8.4	666.5	-23.4	685.0	-41.9	712.7	-69.6	740.9	-97.7	685.0	-41.9	To Be Studied
1326	Tree	642.6	634.6	8.1	666.4	-23.8	684.9	-42.2	712.5	-69.9	740.7	-98.1	684.9	-42.2	To Be Studied
1330	Tree	664.0	634.4	29.5	666.2	-2.2	684.6	-20.7	712.2	-48.3	740.4	-76.5	684.6	-20.7	To Be Studied
1332	Tree	626.3	634.2	-7.9	665.9	-39.7	684.3	-58.1	711.9	-85.6	740.1	-113.8	684.3	-58.1	No Action
1333	Tree	645.5	634.1	11.4	665.8	-20.3	684.1	-38.7	711.7	-66.2	739.9	-94.4	684.1	-38.7	To Be Studied
1335	Tree	667.1	634.1	33.0	665.8	1.3	684.1	-17.0	711.7	-44.6	739.9	-72.8	684.1	-17.0	To Be Studied
1337	Tree	626.8	634.0	-7.1	665.6	-38.8	684.0	-57.1	711.5	-84.6	739.7	-112.9	684.0	-57.1	No Action
1341	Tree	654.7	633.6	21.1	665.2	-10.5	683.5	-28.8	710.9	-56.2	739.2	-84.5	683.5	-28.8	To Be Studied
1343	Tree	671.0	633.4	37.5	664.9	6.0	683.2	-12.2	710.5	-39.6	738.8	-67.9	683.2	-12.2	To Be Studied
1358	Tree	644.3	632.6	11.7	663.9	-19.6	681.9	-37.6	709.2	-64.9	737.5	-93.2	681.9	-37.6	To Be Studied
1361	Tree	643.9	632.4	11.5	663.7	-19.8	681.7	-37.8	708.9	-65.0	737.2	-93.3	681.7	-37.8	To Be Studied
1366	Tree	656.9	632.0	24.9	663.2	-6.3	681.1	-24.2	708.2	-51.3	736.6	-79.7	681.1	-24.2	To Be Studied
1368	Tree	622.8	632.0	-9.2	663.2	-40.4	681.1	-58.3	708.2	-85.4	736.6	-113.8	681.1	-58.3	No Action
1371	Utility Pole	633.9	631.9	2.0	663.0	-29.2	680.9	-47.1	708.0	-74.2	736.4	-102.5	680.9	-47.1	To Be Studied
1373	Tree	625.3	631.7	-6.5	662.8	-37.6	680.7	-55.4	707.8	-82.5	736.1	-110.9	680.7	-55.4	No Action
1374	Tree	655.7	631.7	24.0	662.8	-7.1	680.6	-25.0	707.7	-52.0	736.1	-80.4	680.6	-25.0	To Be Studied
1376	Tree	656.2	631.7	24.5	662.8	-6.6	680.6	-24.4	707.7	-51.5	736.1	-79.9	680.6	-24.4	To Be Studied
1378	Tree	623.8	631.6	-7.9	662.7	-38.9	680.5	-56.8	707.6	-83.8	736.0	-112.2	680.5	-56.8	No Action
1380	Tree	625.5	631.5	-6.0	662.6	-37.0	680.4	-54.8	707.4	-81.9	735.8	-110.3	680.4	-54.8	No Action
1382	Tree	627.0	631.3	-4.4	662.3	-35.4	680.1	-53.1	707.1	-80.1	735.5	-108.5	680.1	-53.1	No Action
1384	Tree	647.1	631.3	15.8	662.2	-15.1	680.0	-32.9	707.0	-59.9	735.4	-88.3	680.0	-32.9	To Be Studied
1386	Tree	648.0	631.0	16.9	662.0	-14.0	679.7	-31.7	706.6	-58.6	735.0	-87.1	679.7	-31.7	To Be Studied
1387	Tree	659.0	630.9	28.0	661.8	-2.9	679.5	-20.6	706.4	-47.5	734.9	-75.9	679.5	-20.6	To Be Studied
1388	Tree	628.0	630.9	-2.8	661.8	-33.7	679.4	-51.4	706.3	-78.3	734.8	-106.7	679.4	-51.4	No Action
1389	Tree	657.7	630.8	26.8	661.7	-4.0	679.4	-21.7	706.3	-48.6	734.7	-77.0	679.4	-21.7	To Be Studied
1391	Tree	628.7	630.8	-2.1	661.7	-33.0	679.3	-50.7	706.2	-77.6	734.7	-106.0	679.3	-50.7	No Action
1393	Tree	655.0	630.6	24.3	661.4	-6.5	679.1	-24.1	705.9	-50.9	734.4	-79.4	679.1	-24.1	To Be Studied
1394	Utility Pole	650.6	-	-	661.4	-10.8	-	-	-	-	-	-	-	-	No Action
1399	Tree	629.8	630.2	-0.4	661.0	-31.2	678.5	-48.7	705.3	-75.5	733.7	-104.0	678.5	-48.7	To Be Studied

Runway 12L P77 Approach (Existing)

Runway 12L Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
1400	Tree	654.4	630.2	24.2	660.9	-6.5	678.4	-24.1	705.2	-50.8	733.7	-79.3	678.4	-24.1	To Be Studied
1403	Utility Pole	631.9	630.0	1.9	660.6	-28.8	678.1	-46.2	704.8	-72.9	733.3	-101.4	678.1	-46.2	To Be Studied
1413	Tree	656.6	629.4	27.2	659.9	-3.3	677.3	-20.7	703.9	-47.3	732.4	-75.8	677.3	-20.7	To Be Studied
1414	Tree	623.7	629.4	-5.7	659.9	-36.2	677.2	-53.6	703.9	-80.2	732.4	-108.7	677.2	-53.6	No Action
1416	Tree	653.6	629.2	24.4	659.7	-6.1	677.0	-23.4	703.5	-49.9	732.1	-78.5	677.0	-23.4	To Be Studied
1418	Tree	639.4	629.2	10.2	659.6	-20.3	676.9	-37.6	703.5	-64.1	732.0	-92.7	676.9	-37.6	To Be Studied
1419	Tree	641.4	629.1	12.3	659.6	-18.2	676.9	-35.4	703.4	-62.0	732.0	-90.6	676.9	-35.4	To Be Studied
1421	Tree	651.5	629.0	22.5	659.4	-7.9	676.7	-25.2	703.2	-51.7	731.8	-80.3	676.7	-25.2	To Be Studied
1423	Tree	623.9	628.9	-5.1	659.3	-35.5	676.6	-52.7	703.1	-79.2	731.7	-107.8	676.6	-52.7	No Action
1424	Tree	622.2	628.8	-6.6	659.2	-37.0	676.4	-54.2	702.9	-80.7	731.5	-109.2	676.4	-54.2	No Action
1425	Tree	645.0	628.8	16.2	659.1	-14.2	676.4	-31.4	702.8	-57.9	731.4	-86.4	676.4	-31.4	To Be Studied
1426	Tree	662.6	628.7	33.9	659.0	3.6	676.2	-13.6	702.7	-40.1	731.3	-68.6	676.2	-13.6	To Be Studied
1427	Tree	648.2	628.6	19.6	658.9	-10.7	676.1	-27.9	702.5	-54.4	731.1	-83.0	676.1	-27.9	To Be Studied
1428	Tree	650.5	628.5	22.0	658.8	-8.3	676.0	-25.5	702.4	-51.9	731.0	-80.5	676.0	-25.5	To Be Studied
1432	Tree	655.6	628.4	27.2	658.6	-3.0	675.7	-20.1	702.2	-46.5	730.8	-75.2	675.7	-20.1	To Be Studied
1433	Tree	620.2	628.3	-8.0	658.5	-38.3	675.6	-55.4	702.0	-81.8	730.6	-110.4	675.6	-55.4	No Action
1434	Tree	626.7	628.2	-1.4	658.4	-31.6	675.5	-48.7	701.8	-75.1	730.5	-103.7	675.5	-48.7	No Action
1435	Tree	625.9	628.2	-2.3	658.4	-32.5	675.5	-49.6	701.8	-76.0	730.4	-104.6	675.5	-49.6	No Action
1436	Tree	645.4	628.1	17.3	658.3	-12.9	675.4	-30.0	701.8	-56.4	730.4	-85.0	675.4	-30.0	To Be Studied
1437	Tree	620.4	628.1	-7.8	658.3	-38.0	675.4	-55.0	701.7	-81.4	730.4	-110.0	675.4	-55.0	No Action
1438	Tree	626.3	628.1	-1.8	658.3	-32.0	675.4	-49.1	701.7	-75.4	730.4	-104.1	675.4	-49.1	No Action
1439	Tree	645.8	628.0	17.8	658.2	-12.4	675.2	-29.4	701.5	-55.8	730.2	-84.4	675.2	-29.4	To Be Studied
1440	Tree	626.9	628.0	-1.1	658.2	-31.2	675.2	-48.3	701.5	-74.6	730.2	-103.3	675.2	-48.3	No Action
1441	Tree	622.0	628.0	-5.9	658.1	-36.1	675.1	-53.1	701.5	-79.4	730.1	-108.1	675.1	-53.1	No Action
1442	Tree	661.0	628.0	33.0	658.1	2.8	675.1	-14.2	701.5	-40.5	730.1	-69.2	675.1	-14.2	To Be Studied
1443	Utility Pole	628.6	-	-	658.1	-29.5	-	-	-	-	-	-	-	-	No Action
1444	Tree	629.9	628.0	1.9	658.1	-28.2	675.1	-45.3	701.5	-71.6	730.1	-100.2	675.1	-45.3	To Be Studied
1445	Tree	629.0	627.8	1.2	657.9	-29.0	674.9	-46.0	701.2	-72.3	729.9	-100.9	674.9	-46.0	To Be Studied
1446	Tree	632.2	627.7	4.4	657.8	-25.7	674.8	-42.7	701.1	-68.9	729.8	-97.6	674.8	-42.7	To Be Studied
1447	Tree	625.0	627.7	-2.7	657.8	-32.8	674.8	-49.8	701.1	-76.1	729.7	-104.7	674.8	-49.8	No Action
3190	Light Pole	661.9	706.9	-44.9	756.8	-94.9	-	-	-	-	-	-	-	-	No Action
3222	Light Pole	661.3	706.0	-44.6	755.7	-94.3	-	-	-	-	854.7	-193.4	-	-	No Action
3391	Utility Pole	655.9	700.0	-44.2	748.3	-92.4	-	-	-	-	845.2	-189.4	-	-	No Action
3400	Tree	686.6	699.6	-13.0	747.7	-61.1	-	-	-	-	844.6	-158.0	-	-	No Action
3402	Tree	687.3	699.6	-12.3	747.7	-60.4	-	-	-	-	844.5	-157.2	-	-	No Action
3415	Tree	684.6	698.9	-14.4	746.9	-62.3	-	-	-	-	843.5	-158.9	-	-	No Action
3423	Tree	685.8	698.6	-12.8	746.4	-60.6	-	-	-	-	842.9	-157.1	-	-	No Action
3459	Tree	686.1	697.1	-10.9	744.5	-58.4	-	-	-	-	840.5	-154.4	-	-	No Action
3491	Utility Pole	655.9	695.9	-40.0	743.0	-87.2	-	-	-	-	838.6	-182.7	-	-	No Action
3500	Utility Pole	650.6	695.5	-45.0	742.6	-92.1	-	-	-	-	-	-	-	-	No Action
3517	Utility Pole	655.0	694.9	-39.9	741.9	-86.9	-	-	-	-	837.1	-182.1	-	-	No Action
3531	Utility Pole	650.1	694.3	-44.2	741.1	-91.0	-	-	-	-	836.0	-186.0	-	-	No Action
3549	Utility Pole	648.7	693.3	-44.6	739.8	-91.1	771.2	-122.5	-	-	834.5	-185.8	771.2	-122.5	No Action
3572	Utility Pole	649.7	692.3	-42.6	738.6	-88.9	769.8	-120.1	-	-	833.0	-183.2	769.8	-120.1	No Action
3595	Utility Pole	652.5	691.3	-38.8	737.4	-84.9	768.3	-115.8	-	-	831.3	-178.8	768.3	-115.8	No Action
3614	Utility Pole	645.2	690.3	-45.1	736.1	-90.9	766.8	-121.6	-	-	829.7	-184.5	766.8	-121.6	No Action
3625	Utility Pole	645.6	689.8	-44.1	735.4	-89.8	766.0	-120.4	-	-	828.8	-183.2	766.0	-120.4	No Action
3647	Utility Pole	643.5	688.9	-45.4	734.3	-90.9	764.7	-121.3	-	-	827.4	-184.0	764.7	-121.3	No Action
3658	Utility Pole	640.6	688.0	-47.5	733.2	-92.7	763.5	-122.9	-	-	826.1	-185.5	763.5	-122.9	No Action
3670	Utility Pole	652.0	686.9	-34.9	731.9	-79.9	761.9	-109.9	799.7	-147.7	824.3	-172.3	761.9	-109.9	No Action
3709	Utility Pole	652.4	685.5	-33.1	730.1	-77.7	759.8	-107.4	797.4	-145.0	822.1	-169.7	759.8	-107.4	No Action
3760	Utility Pole	665.9	684.2	-18.3	728.4	-62.5	757.8	-91.9	795.1	-129.2	819.9	-154.0	757.8	-91.9	No Action
3773	Tree	669.6	683.6	-14.0	727.8	-58.1	757.0	-87.4	794.3	-124.7	819.1	-149.4	757.0	-87.4	No Action
3786	Utility Pole	663.2	683.1	-19.9	727.1	-63.9	756.2	-93.1	793.4	-130.2	818.2	-155.0	756.2	-93.1	No Action
3830	Utility Pole	632.7	680.6	-47.9	723.9	-91.3	752.5	-119.9	789.2	-156.5	814.2	-181.5	752.5	-119.9	No Action
3831	Tree	666.6	680.5	-13.9	723.8	-57.2	752.4	-85.8	789.0	-122.4	814.0	-147.4	752.4	-85.8	No Action
3851	Tree	665.2	679.5	-14.3	722.6	-57.4	750.9	-85.7	787.4	-122.2	812.4	-147.2	750.9	-85.7	No Action
3864	Tree	668.6	679.0	-10.4	722.0	-53.3	750.2	-81.6	786.5	-117.9	811.6	-143.0	750.2	-81.6	No Action
3894	Utility Pole	649.3	677.8	-28.5	720.4	-71.2	748.4	-99.1	784.5	-135.2	809.7	-160.4	748.4	-99.1	No Action
3900	Building	630.3	677.6	-47.3	720.2	-89.9	748.2	-117.9	784.3	-153.9	809.5	-179.1	748.2	-117.9	No Action
3915	Tree	662.1	677.1	-15.0	719.6	-57.4	747.4	-85.3	783.4	-121.2	808.6	-146.5	747.4	-85.3	No Action
3947	Building	637.1	675.9	-38.8	718.1	-81.0	745.7	-108.5	781.4	-144.3	806.7	-169.6	745.7	-108.5	No Action
3954	Utility Pole	630.9	675.7	-44.8	717.9	-86.9	745.4	-114.5	781.1	-150.2	806.4	-175.5	745.4	-114.5	No Action
3975	Tree	661.1	675.4	-14.3	717.4	-56.4	744.9	-83.8	780.5	-119.5	805.9	-144.8	744.9	-83.8	No Action
4000	Tree	661.3	674.8	-13.6	716.7	-55.5	744.1	-82.8	779.6	-118.3	805.0	-143.7	744.1	-82.8	No Action
4025	Utility Pole	640.7	674.1	-33.4	715.8	-75.1	742.9	-102.3	778.3	-137.6	803.7	-163.1	742.9	-102.3	No Action
4077	Building	625.7	671.6	-46.0	712.7	-87.1	739.4	-113.7	774.3	-148.6	799.9	-174.2	739.4	-113.7	No Action
4079	Utility Pole	641.4	671.5	-30.1	712.6	-71.2	739.2	-97.8	774.1	-132.7	799.7	-158.3	739.2	-97.8	No Action
4104	Utility Pole	640.1	670.6	-30.5	711.5	-71.4	737.9	-97.8	772.6	-132.5	798.3	-158.2	737.9	-97.8	No Action
4110	Utility Pole	640.5	670.5	-30.0	711.3	-70.8	737.7	-97.2	772.3	-131.8	798.0	-157.5	737.7	-97.2	No Action
4201	Utility Pole	632.6	667.2	-34.6	707.1	-74.5	732.8	-100.2	766.8	-134.2	792.7	-160.1	732.8	-100.2	No Action
4266	Utility Pole	628.8	665.4	-36.7	705.0	-76.2	730.2	-101.5	763.9	-135.1	790.0	-161.2	730.2	-101.5	No Action
4315	Utility Pole	623.3	663.7	-40.4	702.8	-79.5	727.7	-104.4	761.0	-137.7	787.2	-163.9	727.7	-104.4	No Action
4351	Tree	649.3	662.4	-13.1	701.2	-51.9	725.8	-76.5	758.9	-109.6	785.2	-135.9	725.8	-76.5	No Action
4354	Tree	650.7	662.3	-11.6	701.0	-50.3	725.6	-74.9	758.7	-108.0	784.9	-134.2	725.6	-74.9	No Action
4360	Tree	651.7	662.1	-10.4	700.8	-49.1	725.3	-73.6	-	-	784.6	-132.9	725.3	-73.6	No Action
4361	Tree	649.6	662.0	-12.4	700.7	-51.1	725.2	-75.6	758.2	-108.7	784.5	-134.9	725.2	-75.6	No Action
4370	Utility Pole	623.9	661.8	-37.8	700.4	-76.5	724.9	-100.9	757.8	-133.9	784.1	-160.2	724.9	-100.9	No Action
4371	Tree	647.7	661.7	-14.1	700.4	-52.7	724.8	-77.2	-	-	784.1	-136.4	724.8	-77.2	No Action
4378	Building	644.7	661.5	-16.9	700.1	-55.4	724.5	-79.9	757.4	-112.8	783.7	-139.1	724.5	-79.9	No Action
4379	Utility Pole	619.0	661.5	-42.5	700.0	-81.1	724.4	-105.5	757.3	-138.4	783.7	-164.7	724.4	-105.5	No Action
4423	Light Pole	613.9	659.6	-45.7	697.7	-83.8	721.7	-107.8	-	-	780.7	-166.8	721.7	-107.8	No Action
4442	Utility Pole	625.8	659.1	-33.3	697.0	-71.2	720.9	-95.1	753.3	-127.5	779.8	-154.0	720.9	-95.1	No Action
4455	Building	644.9	658.8	-13.9	696.7	-51.8	720.5	-75.6	752.8	-107.9	779.4	-134.4	720.5	-75.6	No Action
4536	Utility Pole	629.9	656.8	-26.9	694.2	-64.3	717.5	-87.7	749.5	-119.7	776.2	-146.3	717.5	-87.7	No Action
4566	Tree	645.5	656.1	-10.6	693.3	-47.8	716.5	-71.0	748.4	-102.9	775.1	-129.6	716.5	-71.0	No Action
4582	Utility Pole	631.8	655.8	-24.0	693.0	-61.2	716.1	-84.3	747.9	-116.1	774.6	-142.8	716.1	-84.3	No Action
4589	Utility Pole	626.0	655.7	-29.7	692.8	-66.9	716.0	-90.0	747.7	-121.8	774.4	-148.5	716.0	-90.0	No Action
4597	Traffic Light/Signal	617.0	655.6	-38.6	692.6	-75.6	715.7	-98.7	747.5	-130.5	774.2	-157.2	715.7	-98.7	No Action
4603	Utility Pole	620.5	655.5	-35.0	692.5	-72.1	715.6	-95.1	747.3	-126.9	774.1	-153.6	715.6	-95.1	No Action
4609	Utility Pole	642.0	655.4	-13.4	692.4	-50.5	715.5	-73.5	747.2	-105.2	773.9	-132.0	715.5	-73.5	No Action
4611	Tree	644.2	655.4	-11.2	692.4	-48.2	715.4	-71.2	747.1	-102.9	773.9	-129.7	715.4	-71.2	No Action
4612	Street Sign	605.6	655.3	-49.7	692.4	-86.8	715.4	-109.8	747.1	-141.5	773.8	-168.2	715.4	-109.8	No Action
4637	Tree	642.3	654.8	-12.5	691.7	-49.4	714.6	-72.4	746.2	-103.9	773.0	-130.7	714.6	-72.4	No Action
4638	Tree	643.9	654.8	-10.9	691.7	-47.8	714.6	-70.7	746.2	-102.3	773.0	-129.1	714.6	-70.7	No Action
4641	Traffic Light/Signal	617.1	654.7	-37.7	691.6	-74.5	714.5	-97.4	746.1	-129.0	772.9	-155.8	714.5	-97.4	No Action
4647	Tree	643.1	654.6	-11.5	691.5	-48.4	714.3	-71.3	745.9	-102.8	772.7	-129.6	714.3	-71.3	No Action
4656	Utility Pole	619.4	654.4	-35.0	691.2	-71.7	714.0	-94.6	745.5	-126.1	772.3	-152.9	714.0	-94.6	No Action
4659	Traffic Light/Signal	612.7	654.3	-41.7	691.1	-78.4	713.9	-101.3	745.4	-132.8	772.2	-159.6	713.9	-101.3	No Action
4660	Tree	643.5	654.3	-10.8	691.1	-47.6	713.9	-70.4	745.4	-101.9	772.2	-128.7	713.9	-70.4	No Action
4677	Tree	643.5	654.0	-10.4	690.6	-47.1	713.4	-69.9	744.8	-101.3	771.6	-128.1	713.4	-69.9	No Action
4684	Tree	639.3	653.8	-14.5	690.5	-51.1	713.2	-73.8	744.6	-105.2	771.4	-132.1	713.2	-73.8	No Action
4689	Light Pole	620.4	653.7	-33.3	690.3	-69.9	713.0	-92.6	-	-	771.3	-150.8	713.0	-92.6	No Action
4698	Tree	639.3	653.4	-14.1	690.0	-50.7	712.6	-73.3	-	-	770.8	-131.5	712.6	-73.3	No Action
4719	Street Sign	604.2	652.9	-48.7	689.3	-85.1	711.8	-107.6	743.0	-138.8	769.9	-165.7	711.8	-107.6	No Action
4724	Street Sign	604.9	652.8	-47.8	689.1	-84.2	711.6	-106.7	742.8	-137.9	769.7	-164.8	711.6	-106.7	No Action
4736	Light Pole	627.1	652.4	-25.3	688.7	-61.6	711.1	-84.0	742.2	-115.2	769.2	-142.1	711.1	-84.0	No Action
4748	Billboard	604.2	652.0	-47.8	688.2	-84.0	710.5	-106.3	741.6	-137.4	768.5	-164.3	710.5	-106.3	No Action
4752	Bridge	602.6	651.9	-49.2	688.0	-85.4	710.3	-107.7	741.3	-138.7	768.3	-165.7	710.3	-107.7	No Action
4773	Bridge	604.0	650.8	-46.8	686.7	-82.7	708.8	-104.8	739.6	-135.6	766.7	-162.7	708.8	-104.8	No Action
4777	Tree	637.8	650.8	-12.9	686.6	-48.8	708.7	-70.9	-	-	766.5	-128.7	708.7	-70.9	No Action
4778	Street Sign	604.8	650.6	-45.8	686.5	-81.7	708.5	-103.7	739.3	-134.5	766.3	-161.5	708.5	-103.7	No Action
4779	Tree	637.7	650.6	-12.9	686.4	-48.7	708.4	-70.7	-	-	766.2	-128.5	708.4	-70.7	No Action
4787	Tree	635.8	650.0	-14.3	685.7	-49.9	707.6	-71.8	-	-	765.4	-129.6	707.6	-71.8	No Action
4789	Light Pole	627.9	649.8	-21.9	685.4	-57.5	707.2	-79.3	737.8	-109.9	764.9	-137.1	707.2	-79.3	No Action
4796	Street Sign	601.3	649.2	-47.9	684.7	-83.3	706.4	-105.0	-	-	764.0	-162.7	706.4	-105.0	No Action
4798	Bridge	602.8	648.9	-46.1	684.3	-81.6	706.0	-103.2	736.4	-133.6	763.6	-160.8	706.0	-103.2	No Action
4801	Street Sign	602.0	648.8	-46.9	684.2	-82.2	705.8	-103.8	-	-	763.4	-161.5	705.8	-103.8	No Action
4805	Bridge	601.3	648.4	-47.1	683.6	-82.4	705.2	-103.9	735.5	-134.2	762.7	-161.4	705.2	-103.9	No Action
4810	Miscellaneous Utility	601.0	648.0	-47.0	683.2	-82.2	704.7	-103.6	734.9	-133.9	762.2	-161.2	704.7	-103.6	No Action
4818	Street Sign	602.9	647.3	-44.3	682.3	-79.3	703.5	-100.6	733.6	-130.7	760.9	-158.0	703.5	-100.6	No Action
4820	Light Pole	626.8	647.1	-20.3	682.1	-55.3	703.3	-76.6	733.4	-106.6	760.7	-134.0	703.3	-76.6	No Action
4821	Pole	608.6	647.1	-38.5	682.0	-73.4	703.2	-94.7	733.3	-124.7	760.6	-152.1	703.2	-94.7	No Action
4828	Tree	633.4	646.2	-12.7	680.9	-47.5	701.9	-68.5	731.8	-98.4	759.2	-125.8	701.9	-68.5	No Action
4834	Bridge	597.4	645.7	-48.3	680.3	-82.9	701.3	-103.8	731.1	-133.6	758.5	-161.0	701.3	-103.8	No Action
4836	Traffic Light/Signal	612.9	645.7	-32.8	680.3	-67.4	701.2	-88.3	731.0	-118.1	758.4	-145.5	701.2	-88.3	No Action
4837	Traffic Light/Signal	611.9	645.6	-33.7	680.1	-68.2	701.0	-89.1	-	-	758.2	-146.3	701.0	-89.1	No Action
4842	Street Sign	598.2	645.3	-47.1	679.8	-81.6	700.7	-102.5	730.4	-132.2	757.9	-159.6	700.7	-102.5	No Action
4845	Pole	605.4	645.0	-39.6	679.4	-74.0	700.2	-94.8	729.8	-124.5	757.3	-151.9	700.2	-94.8	No Action
4857	Light Pole	626.8	644.2	-17.4	678.4	-51.6	699.0	-72.2	728.5	-101.7	756.0	-129.2	699.0	-72.2	No Action
4858	Pole	604.1	644.2	-40.1	678.4	-74.3	699.0	-94.9	728.5	-124.4	756.0	-151.9	699.0	-94.9	No Action
4872	Tree	629.7	643.6	-13.9	677.6	-47.9	698.1	-68.4	727.5	-97.8	755.0	-125.4	698.1	-68.4	No Action
4905	Tree	627.5	641.8	-14.4	675.5	-48.0	695.6	-68.1	724.6	-97.1	752.3	-124.8	695.6	-68.1	No Action
4985	Tree	625.0	639.5	-14.5	672.5	-47.5	692.1	-67.1	720.7	-95.7	748.5	-123.5	692.1	-67.1	No Action
5071	Utility Pole	592.7	637.0	-44.2	669.4	-76.7	688.4	-95.7	716.5	-123.8	744.5	-151.8	688.4	-95.7	No Action
5079	Utility Pole	608.7	636.5	-27.8	668.8	-60.1	687.7	-79.0	715.7	-107.0	743.8	-135.0	687.7	-79.0	No Action
5080	Tree	625.0	636.5	-11.5	668.8	-43.8	687.7	-62.7	715.7	-90.7	743.7	-118.8	687.7	-62.7	No Action
5081	Utility Pole	602.9	636.4	-33.5	668.6	-65.8	687.5	-84.6	715.5	-112.6	743.6	-140.7	687.5	-84.6	No Action
5084	Utility Pole	599.6	636.3	-36.7	668.6	-69.0	687.4	-87.8	715.4	-115.8	743.4	-143.9	687.4	-87.8	No Action
5097	Utility Pole	621.6	635.4	-13.8	667.4	-45.8	686.1	-64.5	713.9	-92.2	742.0	-120.4	686.1	-64.5	No Action
5136	Tree	622.6	632.8	-10.2	664.2	-41.5	682.3	-59.6	709.5	-86.9	737.8	-115.2	682.3	-59.6	No Action
5169	Solar Panels	588.6	629.7	-41.1	660.3	-71.7	677.7	-89.1	704.4	-115.8	732.9	-144.3	677.7	-89.1	No Action
5186	Tree	616.9	628.1	-11.2	658.3	-41.4	675.3	-58.4	701.7	-84.8	730.3	-113.4	675.3	-58.4	No Action
8567	Tree	661.1	675.4	-14.3	717.4	-56.4	744.9	-83.8	780.5	-119.5	805.9	-144.8	744.9	-83.8	No Action
8915	Building	647.8	660.7	-13.0	699.1	-51.3	723.3	-75.6	756.1	-108.3	782.5	-134.7	723.3	-75.6	No Action
8916	Building	644.8	657.3	-12.5	694.8	-50.0	718.3	-73.5	750.4	-105.6	777.0	-132.2	718.3	-73.5	No Action
8917	Building	644.8	658.1	-13.3	695.8	-51.0	719.5	-74.7	751.7	-106.9	778.3	-133.5	719.5	-74.7	No Action
8920	Building	646.4	668.0	-21.6	708.1	-61.8	734.0	-87.6	768.1	-121.8	794.0	-147.6	734.0	-87.6	No Action
8921	Building	646.0	668.5	-22.5	708.8	-62.9	734.8	-88.8	769.1	-123.1	794.9	-148.9	734.8	-88.8	No Action
8922	Building	646.4	669.3	-23.0	709.9	-63.5	736.0	-89.6	770.4	-124.1	796.2	-149.8	736.0	-89.6	No Action
8924	Utility Pole	646.5	671.8	-25.3	713.0	-66.5	739.6	-93.2	774.6	-128.1	800.2	-153.7	739.6	-93.2	No Action
8929	Building	641.5	652.2	-10.7	688.5	-47.0	710.8	-69.3	741.9	-100.4	768.9	-127.4	710.8	-69.3	No Action
9004	Utility Pole	628.4	639.5	-11.1	672.5	-44.2	692.1	-63.7	720.7	-92.3	748.5	-120.2	692.1	-63.7	No Action

Runway 12L P77 Approach (Existing)

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12L30R - 12L P77 (4)
LAYOUT: 12L-30R Inner P77 (3)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 2/22/2023 8:22 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 12L Obstruction Tables Part 77 (Existing/Future)

SCALE AS NOTED		JOB NO. 20042701.00
DATE 2/2023		
SHEET 54 OF 59 SHEETS		

Runway 12L Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
1097	Tree	701.5	701.9	-0.4	750.5	-49.0	-	-	-	-	848.1	-146.6	-	-	No Action
1098	Tree	704.1	701.8	2.3	750.4	-46.3	-	-	-	-	848.0	-143.9	-	-	To Be Studied
1099	Tree	702.6	699.6	3.0	747.7	-45.1	-	-	-	-	844.6	-142.0	-	-	To Be Studied
1100	Tree	675.8	684.0	-8.2	728.2	-52.5	757.6	-81.8	794.9	-119.1	819.7	-143.9	757.6	-81.8	No Action
1101	Tree	686.2	683.7	2.4	727.9	-41.7	757.2	-71.0	794.4	-108.3	819.2	-133.0	757.2	-71.0	To Be Studied
1102	Tree	682.5	683.7	-1.2	727.9	-45.4	757.1	-74.7	-	-	819.2	-136.7	757.1	-74.7	No Action
1103	Tree	678.8	683.6	-4.9	727.7	-49.0	757.0	-78.2	794.2	-115.5	819.0	-140.3	757.0	-78.2	No Action
1104	Tree	682.2	683.4	-1.2	727.4	-45.2	756.6	-74.4	793.8	-111.6	818.6	-136.4	756.6	-74.4	No Action
1105	Tree	673.2	683.2	-10.0	727.2	-54.0	756.3	-83.1	793.5	-120.3	818.3	-145.1	756.3	-83.1	No Action
1106	Tree	682.8	683.0	-0.1	726.9	-44.1	756.0	-73.2	793.1	-110.3	818.0	-135.1	756.0	-73.2	No Action
1107	Tree	682.6	682.7	-0.1	726.6	-44.0	755.7	-73.1	792.7	-110.2	817.6	-135.0	755.7	-73.1	No Action
1108	Tree	674.8	682.7	-7.9	726.6	-51.7	755.6	-80.8	792.7	-117.9	817.5	-142.7	755.6	-80.8	No Action
1109	Tree	679.1	682.0	-2.8	725.7	-46.5	754.6	-75.4	791.5	-112.4	816.4	-137.3	754.6	-75.4	No Action
1110	Tree	675.2	681.7	-6.5	725.3	-50.1	754.1	-78.9	791.0	-115.8	815.9	-140.7	754.1	-78.9	No Action
1111	Tree	678.1	681.5	-3.3	725.0	-46.9	753.8	-75.7	790.6	-112.5	815.6	-137.4	753.8	-75.7	No Action
1112	Tree	675.8	681.0	-5.2	724.4	-48.6	753.1	-77.3	789.8	-114.0	814.8	-139.0	753.1	-77.3	No Action
1113	Tree	676.6	680.5	-3.9	723.8	-47.3	752.4	-75.8	789.0	-112.5	814.0	-137.5	752.4	-75.8	No Action
1114	Tree	673.6	679.8	-6.3	723.0	-49.4	751.4	-77.8	787.9	-114.3	813.0	-139.4	751.4	-77.8	No Action
1115	Tree	675.2	677.8	-2.6	720.5	-45.3	748.4	-73.3	784.5	-109.4	809.7	-134.6	748.4	-73.3	No Action
1116	Tree	672.7	677.4	-4.7	719.9	-47.2	747.8	-75.1	783.8	-111.1	809.1	-136.3	747.8	-75.1	No Action
1117	Tree	683.5	677.3	6.2	719.8	-36.3	747.7	-64.2	783.7	-100.2	809.0	-125.4	747.7	-64.2	To Be Studied
1118	Tree	681.9	677.0	4.9	719.4	-37.6	747.2	-65.4	783.2	-101.3	808.4	-126.5	747.2	-65.4	To Be Studied
1119	Utility Pole	666.1	675.5	-9.4	717.6	-51.5	745.1	-78.9	-	-	806.1	-139.9	745.1	-78.9	No Action
1120	Utility Pole	666.6	673.7	-7.1	715.4	-48.8	742.4	-75.8	-	-	803.2	-136.6	742.4	-75.8	No Action
1121	Utility Pole	670.4	670.3	0.1	711.0	-40.7	737.4	-67.0	-	-	797.7	-127.3	737.4	-67.0	To Be Studied
1122	Utility Pole	671.0	669.2	1.8	709.7	-38.7	735.7	-64.8	-	-	795.9	-125.0	735.7	-64.8	To Be Studied
1123	Utility Pole	669.7	664.4	5.3	703.6	-33.9	728.7	-59.0	-	-	788.3	-118.6	728.7	-59.0	To Be Studied
1124	Tree	654.6	662.6	-8.1	701.5	-46.9	726.1	-71.6	759.3	-104.7	785.5	-130.9	726.1	-71.6	No Action
1125	Tree	653.8	662.3	-8.5	701.0	-47.3	725.6	-71.8	-	-	784.9	-131.1	725.6	-71.8	No Action
1126	Utility Pole	666.2	659.1	7.1	697.1	-30.9	721.0	-54.7	-	-	779.9	-113.7	721.0	-54.7	To Be Studied
1127	Tree	658.9	658.1	0.9	695.8	-36.8	719.4	-60.5	751.6	-92.7	778.2	-119.3	719.4	-60.5	To Be Studied
1128	Utility Pole	671.8	656.5	15.3	693.9	-22.0	717.2	-45.3	-	-	775.8	-103.9	717.2	-45.3	To Be Studied
1129	Tree	646.8	656.1	-9.3	693.3	-46.5	716.5	-69.7	-	-	775.0	-128.2	716.5	-69.7	No Action
1131	Building	646.1	656.0	-9.9	693.2	-47.1	716.4	-70.3	748.2	-102.1	774.9	-128.8	716.4	-70.3	No Action
1132	Tree	649.0	656.0	-7.0	693.2	-44.2	716.3	-67.4	748.2	-99.2	774.9	-125.9	716.3	-67.4	No Action
1134	Tree	651.9	655.8	-3.9	692.9	-41.0	716.1	-64.2	747.9	-96.0	774.6	-122.7	716.1	-64.2	No Action
1135	Tree	651.5	655.6	-4.1	692.7	-41.2	715.8	-64.3	747.5	-96.0	774.2	-122.7	715.8	-64.3	No Action
1136	Building	651.9	655.6	-3.6	692.6	-40.7	715.8	-63.8	-	-	774.2	-122.3	715.7	-63.8	No Action
1138	Tree	654.7	655.5	-0.8	692.6	-37.9	715.6	-60.9	747.4	-92.7	774.1	-119.4	715.6	-60.9	No Action
1139	Tree	655.9	655.4	0.4	692.5	-36.6	715.5	-59.7	747.2	-91.4	774.0	-118.1	715.5	-59.7	To Be Studied
1141	Tree	652.8	655.3	-2.5	692.3	-39.5	715.4	-62.6	747.1	-94.3	773.8	-121.0	715.4	-62.6	No Action
1142	Tree	659.5	655.3	4.2	692.3	-32.8	715.3	-55.9	747.0	-87.6	773.8	-114.3	715.3	-55.9	To Be Studied
1143	Tree	654.3	655.3	-0.9	692.3	-37.9	715.3	-61.0	747.0	-92.7	773.8	-119.4	715.3	-61.0	No Action
1144	Tree	658.9	655.2	3.7	692.1	-33.3	715.1	-56.3	746.8	-87.9	773.6	-114.7	715.1	-56.3	To Be Studied
1145	Tree	650.8	655.1	-4.3	692.1	-41.3	715.1	-64.3	746.7	-96.0	773.5	-122.7	715.1	-64.3	No Action
1146	Tree	647.6	655.0	-7.4	691.9	-44.3	714.9	-67.3	746.5	-98.9	773.3	-125.7	714.9	-67.3	No Action
1148	Tree	652.4	654.5	-2.1	691.3	-38.9	714.2	-61.8	745.7	-93.3	772.5	-120.1	714.2	-61.8	No Action
1150	Utility Pole	654.6	654.3	0.3	691.0	-36.5	713.8	-59.3	-	-	772.1	-117.6	713.8	-59.3	To Be Studied
1151	Tree	645.8	654.0	-8.3	690.7	-44.9	713.5	-67.7	744.9	-99.1	771.7	-126.0	713.5	-67.7	No Action
1152	Utility Pole	656.4	654.0	2.5	690.6	-34.2	713.4	-56.9	-	-	771.7	-115.2	713.4	-56.9	To Be Studied
1153	Utility Pole	646.1	653.9	-7.8	690.6	-44.5	713.3	-67.2	744.7	-98.6	771.6	-125.5	713.3	-67.2	No Action
1154	Utility Pole	651.4	653.8	-2.4	690.5	-39.0	713.2	-61.8	744.6	-93.1	771.4	-120.0	713.2	-61.8	No Action
1155	Utility Pole	654.0	653.6	0.4	690.2	-36.2	712.9	-58.9	-	-	771.1	-117.1	712.9	-58.9	To Be Studied
1156	Utility Pole	652.4	653.5	-1.1	690.0	-37.6	712.6	-60.3	-	-	770.8	-118.5	712.6	-60.3	No Action
1157	Utility Pole	652.1	653.4	-1.3	690.0	-37.9	712.6	-60.5	743.9	-91.8	770.8	-118.7	712.6	-60.5	No Action
1158	Utility Pole	652.2	653.2	-1.0	689.7	-37.5	712.3	-60.0	-	-	770.4	-118.2	712.3	-60.0	No Action
1159	Utility Pole	651.5	652.5	-1.0	688.8	-37.3	711.2	-59.7	-	-	769.3	-117.8	711.2	-59.7	No Action
1160	Light Pole	650.3	651.8	-1.5	688.0	-37.7	710.3	-60.0	741.3	-91.0	768.3	-118.0	710.3	-60.0	No Action
1161	Building	642.2	651.8	-9.7	688.0	-45.8	710.2	-68.1	741.2	-99.1	768.2	-126.1	710.2	-68.1	No Action
1162	Utility Pole	654.0	651.7	2.3	687.8	-33.8	710.0	-56.0	-	-	768.0	-114.0	710.0	-56.0	To Be Studied
1163	Utility Pole	653.4	651.7	1.8	687.8	-34.3	-	-	-	-	768.0	-114.6	-	-	To Be Studied
1164	Utility Pole	654.5	651.5	3.0	687.6	-33.1	-	-	-	-	-	-	-	-	To Be Studied
1165	Tree	666.7	651.2	15.5	687.2	-20.5	709.3	-42.6	740.2	-73.5	767.3	-100.5	709.3	-42.6	To Be Studied
1166	Tree	698.9	651.1	47.8	687.1	11.8	709.2	-10.3	740.1	-41.2	767.1	-68.2	709.2	-10.3	To Be Studied
1167	Tree	654.0	651.1	2.9	687.1	-33.0	709.2	-55.1	740.0	-86.0	767.1	-113.0	709.2	-55.1	To Be Studied
1168	Utility Pole	661.4	-	-	687.0	-25.6	-	-	-	-	-	-	-	-	No Action
1169	Tree	663.6	651.0	12.6	687.0	-23.4	709.1	-45.5	739.9	-76.3	767.0	-103.4	709.1	-45.5	To Be Studied
1170	Utility Pole	652.7	650.8	1.9	686.7	-34.0	708.8	-56.1	-	-	766.7	-113.9	708.8	-56.1	To Be Studied
1171	Tree	658.0	650.7	7.3	686.5	-28.5	708.5	-50.5	-	-	766.4	-108.4	708.5	-50.5	To Be Studied
1172	Tree	680.6	650.2	30.3	686.0	-5.4	707.9	-27.3	738.6	-58.0	765.7	-85.1	707.9	-27.3	To Be Studied
1173	Tree	682.2	649.8	32.4	685.5	-3.3	707.3	-25.1	737.9	-55.7	765.1	-82.9	707.3	-25.1	To Be Studied
1174	Tree	670.3	649.6	20.6	685.2	-15.0	707.0	-36.8	737.6	-67.4	764.8	-94.5	707.0	-36.8	To Be Studied
1175	Tree	647.5	649.3	-1.8	684.8	-37.3	706.6	-59.0	737.1	-89.6	764.3	-116.7	706.6	-59.0	No Action
1176	Tree	684.8	649.2	35.7	684.6	0.2	706.3	-21.5	736.8	-52.0	764.0	-79.2	706.3	-21.5	To Be Studied
1177	Utility Pole	663.6	-	-	684.3	-20.8	-	-	-	-	-	-	-	-	No Action
1178	Light Pole	650.8	648.9	1.9	684.3	-33.5	706.0	-55.1	736.4	-85.6	763.6	-112.8	706.0	-55.1	To Be Studied
1179	Tree	682.1	648.8	33.3	684.2	-2.0	705.8	-23.7	736.2	-54.1	763.4	-81.3	705.8	-23.7	To Be Studied
1180	Tree	687.8	648.4	39.4	683.6	4.1	705.1	-17.4	735.5	-47.7	762.7	-74.9	705.1	-17.4	To Be Studied
1181	Tree	651.9	648.3	3.6	683.5	-31.6	705.0	-53.1	735.3	-83.4	762.6	-110.6	705.0	-53.1	To Be Studied
1182	Utility Pole	651.0	647.9	3.1	683.1	-32.1	704.5	-53.5	-	-	762.0	-111.0	704.5	-53.5	To Be Studied
1183	Tree	681.6	647.8	33.7	683.0	-1.4	704.4	-22.8	734.6	-53.0	761.9	-80.3	704.4	-22.8	To Be Studied
1184	Tree	655.3	647.7	7.6	682.8	-27.5	704.2	-48.9	734.4	-79.1	761.6	-106.3	704.2	-48.9	To Be Studied
1185	Tree	643.5	647.7	-4.1	682.7	-39.2	704.1	-60.6	734.3	-90.7	761.6	-118.0	704.1	-60.6	No Action
1186	Tree	648.9	647.6	1.3	682.7	-33.8	704.0	-55.1	734.2	-85.3	761.5	-112.6	704.0	-55.1	To Be Studied
1188	Tree	642.5	647.3	-4.7	682.2	-39.7	703.5	-61.0	733.6	-91.1	760.9	-118.4	703.5	-61.0	No Action
1189	Tree	641.2	647.2	-6.1	682.2	-41.1	703.5	-62.3	733.6	-92.4	760.9	-119.7	703.5	-62.3	No Action
1190	Tree	660.5	647.2	13.3	682.2	-21.7	703.5	-42.9	733.6	-73.0	760.9	-100.3	703.5	-42.9	To Be Studied
1191	Tree	646.2	646.8	-0.6	681.7	-35.5	702.9	-56.7	732.9	-86.7	760.3	-114.0	702.9	-56.7	No Action
1192	Building	640.0	646.4	-6.4	681.2	-41.2	702.3	-62.2	732.2	-92.2	759.6	-119.5	702.3	-62.2	No Action
1193	Tree	653.8	646.3	7.6	681.0	-27.2	702.1	-48.2	732.0	-78.1	759.3	-105.5	702.1	-48.2	To Be Studied
1194	Tree	636.6	646.0	-9.5	680.7	-44.2	701.7	-65.2	731.6	-95.0	759.0	-122.4	701.7	-65.2	No Action
1195	Utility Pole	658.1	-	-	680.1	-22.1	-	-	-	-	-	-	-	-	No Action
1198	Light Pole	641.7	644.1	-2.4	678.4	-36.7	698.9	-57.2	728.4	-86.7	756.0	-114.3	698.9	-57.2	No Action
1199	Utility Pole	644.2	644.1	0.1	678.4	-34.1	698.9	-54.7	-	-	756.0	-111.7	698.9	-54.7	To Be Studied
1200	Tree	642.9	643.9	-1.0	678.0	-35.2	698.6	-55.7	728.0	-85.2	755.6	-112.7	698.6	-55.7	No Action
1201	Tree	649.5	643.8	5.6	678.0	-28.5	698.5	-49.0	727.9	-78.5	755.5	-106.0	698.5	-49.0	To Be Studied
1202	Tree	635.5	643.6	-8.1	677.7	-42.2	698.1	-62.6	727.5	-92.0	755.1	-119.6	698.1	-62.6	No Action
1203	Tree	643.7	643.6	0.1	677.6	-34.0	698.1	-54.4	727.5	-83.8	755.1	-111.4	698.1	-54.4	To Be Studied
1204	Tree	662.4	643.5	18.9	677.5	-15.2	698.0	-35.6	727.3	-65.0	754.9	-92.5	698.0	-35.6	To Be Studied
1206	Tree	656.3	643.3	13.0	677.2	-20.9	697.6	-41.3	-	-	754.5	-98.2	697.6	-41.3	To Be Studied
1207	Tree	674.1	643.2	30.9	677.2	-3.0	697.5	-23.4	726.8	-52.7	754.4	-80.3	697.5	-23.4	To Be Studied
1208	Tree	657.3	643.1	14.1	677.1	-19.8	697.5	-40.2	726.8	-69.5	754.4	-97.1	697.5	-40.2	To Be Studied
1209	Tree	650.7	643.1	7.6	677.1	-26.4	697.5	-46.7	-	-	754.4	-103.6	697.5	-46.7	To Be Studied
1210	Tree	666.9	643.1	23.8	677.0	-10.1	697.4	-30.5	726.7	-59.8	754.3	-87.3	697.4	-30.5	To Be Studied
1211	Tree	665.7	643.1	22.7	677.0	-11.3	697.4	-31.6	726.7	-60.9	754.3	-88.5	697.4	-31.6	To Be Studied
1212	Tree	673.5	643.1	30.4	677.0	-3.6	697.4	-23.9	726.7	-53.2	754.3	-80.8	697.4	-23.9	To Be Studied
1213	Tree	665.2	643.0	22.2	677.0	-11.7	697.3	-32.1	726.6	-61.3	754.2	-88.9	697.3	-32.1	To Be Studied
1214	Tree	670.3	642.9	27.4	676.8	-6.5	697.2	-26.9	726.4	-56.1	754.0	-83.7	697.2	-26.9	To Be Studied
1219	Tree	678.6	642.7	35.9	676.5	2.1	696.8	-18.2	726.0	-47.4	753.6	-75.0	696.8	-18.2	To Be Studied
1227	Utility Pole	659.0	-	-	676.0	-17.0	-	-	-	-	-	-	-	-	No Action
1228	Tree	667.8	642.2	25.6	676.0	-8.2	696.2	-28.4	725.3	-57.5	752.9	-85.1	696.2	-28.4	To Be Studied
1229	Tree	670.5	642.2	28.3	676.0	-5.5	696.1	-25.7	725.3	-54.8	752.9	-82.4	696.1	-25.6	To Be Studied
1231	Building	641.2	642.2	-1.0	675.9	-34.7	696.1	-54.9	-	-	752.8	-111.6	696.1	-54.9	No Action
1232	Tree	632.2	642.2	-10.0	675.9	-43.7	696.0	-63.8	725.1	-93.0	752.8	-120.6	696.0	-63.8	To Be Studied
1236	Building	643.5	642.0	1.5	675.7	-32.2	695.9	-52.3	724.9	-81.4	752.6	-109.1	695.9	-52.3	To Be Studied
1237	Building	645.1	642.0	3.1	675.7	-30.6	695.8	-50.7	724.9	-79.8	752.6	-107.5	695.8	-50.7	To Be Studied
1240	Tree	659.0	641.9	17.2	675.5	-16.5	695.6	-36.6	724.7	-65.6	752.4	-93.3	695.6	-36.6	To Be Studied
1241	Building	637.8	641.8	-4.1	675.4	-37.7	695.5	-57.8	724.6	-86.8	752.3	-114.5	695.5	-57.8	No Action
1243	Tree	667.1	641.6	25.6	675.1	-8.0	695.1	-28.0	724.1	-57.0	751.8	-84.7	695.1	-28.0	To Be Studied
1244	Tree	659.0	641.5	17.5	675.1	-16.1	695.1	-36.1	-	-	751.8	-92.8	695.1	-36.1	To Be Studied
1245	Building	641.0	641.5	-0.5	675.1	-34.1	-	-	-	-	-	-	-	-	No Action
1246	Tree	633.3	641.5	-8.2	675.1	-41.8	695.1	-61.8	724.1	-90.7	751.8	-118.5	695.1	-61.8	No Action
1247	Tree	665.4	641.4	24.0	675.0	-9.6	695.0	-29.6	-	-	751.6	-86.3	695.0	-29.6	To Be Studied
1249	Tree	669.6	641.3	28.3	674.9	-5.2	694.8	-25.2	723.8	-54.2	751.5	-81.9	694.8	-25.2	To Be Studied
1250	Tree	671.6	641.3	30.2	674.8	-3.3	694.8	-23.2	723.8	-52.2	751.5	-79.9	694.8	-23.2	To Be Studied
1251	Tree	669.7	641.2	28.4	674.7	-5.0	694.6	-25.0	723.6	-53.9	751.3	-81.6	694.6	-25.0	To Be Studied
1253	Tree	633.1	641.2	-8.1	674.7	-41.6	694.6	-61.5	723.5	-90.4	751.3	-118.1	694.6	-61.5	No Action
1258	Tree	633.0	640.9	-7.9	674.3	-41.3	694.2	-61.2	723.0	-90.1	750.8	-117.8	694.2	-61.2	No Action
1260	Tree	656.4	640.9	15.5	674.3	-17.8	694.1	-37.7	723.0	-66.6	750.7	-94.3	694.1	-37.7	To Be Studied
1265	Tree	653.7	640.5	13.2	673.8	-20.1	693.6	-39.9	722.4	-68.7	750.2	-96.5	693.6	-39.9	To Be Studied
1274	Utility Pole	638.7	640.2	-1.4	673.4	-34.6	693.1	-54.3	-	-	749.6	-110.9	693.1	-54.3	No Action
1275	Tree	631.7	640.1	-8.4	673.3	-41.6	693.0	-61.3	721.8	-90.0	749.6	-117.8	693.0	-61.3	No Action
1276	Tree	656.4	640.1	16.2	673.3	-17.0	693.0	-36.7	-	-	749.5	-93.2	693.0	-36.7	To Be Studied
1280	Tree	650.5	640.0	10.5	673.2	-22.6	692.8	-42.3	721.5	-71.0	749.3	-98.8	692.8	-42.3	To Be Studied
1287	Tree	629.8	639.5	-9.8	672.6	-42.8	692.2	-62.4	720.8	-91.0	748.6	-118.8	692.2	-62.4	No Action
1288	Utility Pole	631.6	639.4	-7.8	672.5	-40.8	692.0	-60.4	720.6	-88.9	748.4	-116.8	692.0	-60.4	No Action
1289	Utility Pole	637.4	639.1	-1.7	672.0	-34.6	691.5	-54.1	-	-	747.9	-110.5	691.5	-54.1	No Action
1290	Utility Pole	639.0	639.0	0.0	671.9	-32.9	691.4	-52.4	-	-	747.8	-108.8	691.4	-52.4	To Be Studied
1291	Utility Pole	654.0	-	-	671.8	-17.8	-	-	-	-	-	-	-	-	No Action
1292	Tree	629.7	638.4	-8.7	671.2	-41.5	690.5	-60.8	-	-	746.8	-117.1	690.5	-60.8	No Action
1293	Tree	629.2	638.2	-9.0	670.9	-41.7	690.2	-61.0	718.5	-89.3	746.5	-117.2	690.2	-61.0	No Action
1295	Tree	628.2	637.8	-9.6	670.4	-42.3	689.6	-61.5	717.9	-89.7	745.9	-117.7	689.6	-61.5	No Action
1296	Tree	629.0	637.7	-8.6	670.2	-41.2	689.4	-60.4	717.6	-88.6	745.6	-116.6	689.4	-60.4	No Action
1298	Tree	653.4	637.5	15.9	670.1	-16.7	689.2	-35.8	717.4	-64.0	745.4	-92.0	689.2	-35.8	To Be Studied
1309	Utility Pole	630.1	635.8	-5.7	667.9	-37.8	686.6	-56.5	714.5	-84.4	742.6	-112.5	686.6	-56.5	No Action
1310	Utility Pole	637.2	635.7	1.5	667.8	-30.6	686.5	-49.3	714.3	-77.2	742.4	-105.3	686.5	-49.3	To Be Studied
1311	Utility Pole	650.8	-	-	667.6	-16.8	-	-	-	-	-	-	-	-	No Action
1312	Tree	625.9	635.3	-9.4	667.3	-41.4	685.9	-60.0	713.6	-87.8	741.8	-115.9	685.9	-60.0	To Be Studied
1315	Tree	658.5	635.1	23.3	667.1	-8.6	685.7	-27.2	713.4	-55.0	741.6	-83.1	685.7	-27.2	To Be Studied
1316	Tree	655.6	635.1	20.5	667.1	-11.5	685.7	-30.1	713.4	-57.8	741.5	-85.9	685.7	-30.1	To Be Studied
1318	Tree	625.4	635.0	-9.6	667.0	-41.5	685.5	-60.1	713.3	-87.8	741.4	-116.0	685.5	-60.1	No Action
1323	Tree	643.1	634.7	8.4	666.5	-23.4	685.0	-41.9	712.7	-69.6	740.9	-97.7	685.0	-41.9	To Be Studied
1326	Tree	642.6	634.6	8.1	666.4	-23.8	684.9	-42.2	712.5	-69.9	740.7	-98.1	684.9	-42.2	To Be Studied
1330	Tree	664.0	634.4	29.5	666.2	-2.2	684.6	-20.7	712.2	-48.3	740.4	-76.5	684.6	-20.7	To Be Studied
1332	Tree	626.3	634.2	-7.9	665.9	-39.7	684.3	-58.1	711.9	-85.6	740.1	-113.8	684.3	-58.1	No Action
1333	Tree	645.5	634.1	11.4	665.8	-20.3	684.1	-38.7	711.7	-66.2	739.9	-94.4	684.1	-38.7	To Be Studied
1335	Tree	667.1	634.1	33.0	665.8	1.3	684.1	-17.0	711.7	-44.6	739.9	-72.8	684.1	-17.0	To Be Studied
1337	Tree	626.8	634.0	-7.1	665.6	-38.8	684.0	-57.1	711.5	-84.6	739.7	-112.9	684.0	-57.1	No Action
1341	Tree	654.7	633.6	21.1	665.2	-10.5	683.5	-28.8	710.9	-56.2	739.2	-84.5	683.5	-28.8	To Be Studied
1343	Tree	671.0	633.4	37.5	664.9	6.0	683.2	-12.2	710.5	-39.6	738.8	-67.9	683.2	-12.2	To Be Studied
1358	Tree	644.3	632.6	11.7	663.9	-19.6	681.9	-37.6	709.2	-64.9	737.5	-93.2	681.9	-37.6	To Be Studied
1361	Tree	643.9	632.4	11.5	663.7	-19.8	681.7	-37.8	708.9	-65.0	737.2	-93.3	681.7	-37.8	To Be Studied
1366	Tree	656.9	632.0	24.9	663.2	-6.3	681.1	-24.2	708.2	-51.3	736.6	-79.7	681.1	-24.2	To Be Studied
1368	Tree	622.8	632.0	-9.2	663.2	-40.4	681.1	-58.3	708.2	-85.4	736.6	-113.8	681.1	-58.3	No Action
1371	Utility Pole	633.9	631.9	2.0	663.0	-29.2	680.9	-47.1	708.0	-74.2	736.4	-102.5	680.9	-47.1	To Be Studied
1373	Tree	625.3	631.7	-6.5	662.8	-37.6	680.7	-55.4	707.8	-82.5	736.1	-110.9	680.7	-55.4	No Action
1374	Tree	655.7	631.7	24.0	662.8	-7.1	680.6	-25.0	707.7	-52.0	736.1	-80.4	680.6	-25.0	To Be Studied
1376	Tree	656.2	631.7	24.5	662.8	-6.6	680.6	-24.4	707.7	-51.5	736.1	-79.9	680.6	-24.4	To Be Studied
1378	Tree	623.8	631.6	-7.9	662.7	-38.9	680.5	-56.8	707.6	-83.8	736.0	-112.2	680.5	-56.8	No Action
1380	Tree	625.5	631.5	-6.0	662.6	-37.0	680.4	-54.8	707.4	-81.9	735.8	-110.3	680.4	-54.8	No Action
1382	Tree	627.0	631.3	-4.4	662.3	-35.4	680.1	-53.1	707.1	-80.1	735.5	-108.5	680.1	-53.1	No Action
1384	Tree	647.1	631.3	15.8	662.2	-15.1	680.0	-32.9	707.0	-59.9	735.4	-88.3	680.0	-32.9	To Be Studied
1386	Tree	648.0	631.0	16.9	662.0	-14.0	679.7	-31.7	706.6	-58.6	735.0	-87.1	679.7	-31.7	To Be Studied
1387	Tree	659.0	630.9	28.0	661.8	-2.9	679.5	-20.6	706.4	-47.5	734.9	-75.9	679.5	-20.6	To Be Studied
1388	Tree	628.0	630.9	-2.8	661.8	-33.7	679.4	-51.4	706.3	-78.3	734.8	-106.7	679.4	-51.4	No Action
1389	Tree	657.7	630.8	26.8	661.7	-4.0	679.4	-21.7	706.3	-48.6	734.7	-77.0	679.4	-21.7	To Be Studied
1391	Tree	628.7	630.8	-2.1	661.7	-33.0	679.3	-50.7	706.2	-77.6	734.7	-106.0	679.3	-50.7	No Action
1393	Tree	655.0	630.6	24.3	661.4	-6.5	679.1	-24.1	705.9	-50.9	734.4	-79.4	679.1	-24.1	To Be Studied
1394	Utility Pole	650.6	-	-	661.4	-10.8	-	-	-	-	-	-	-	-	No Action
1399	Tree	629.8	630.2	-0.4	661.0	-31.2	678.5	-48.7	705.3	-75.5	733.7	-104.0	678.5	-48.7	To Be Studied

Runway 12L P77 Approach (Existing)

Runway 12L Existing Obstruction Table
Part 77 Approach and Runway Departure Surface

Object ID	Description	Object Elevation (MSL)	Part 77 Approach Surface Elevation (MSL)	Part 77 Approach Penetration/ Clearance (ft)	Departure Surface Surface Elevation (MSL)	Departure Surface Penetration/ Clearance (ft)	Threshold Siting Surface Surface Elevation (MSL)	Threshold Siting Surface Penetration/ Clearance (ft)	VGS Surface Surface Elevation (MSL)	VGS Surface Penetration/ Clearance (ft)	PAPI Surface Elevation (MSL)	PAPI Penetration/ Clearance (ft)	TERPS Visual Surface Surface Elevation (MSL)	TERPS Visual Surface Penetration/ Clearance (ft)	Disposition
1400	Tree	654.4	630.2	24.2	660.9	-6.5	678.4	-24.1	705.2	-50.8	733.7	-79.3	678.4	-24.1	To Be Studied
1403	Utility Pole	631.9	630.0	1.9	660.6	-28.8	678.1	-46.2	704.8	-72.9	733.3	-101.4	678.1	-46.2	To Be Studied
1413	Tree	656.6	629.4	27.2	659.9	-3.3	677.3	-20.7	703.9	-47.3	732.4	-75.8	677.3	-20.7	To Be Studied
1414	Tree	623.7	629.4	-5.7	659.9	-36.2	677.2	-53.6	703.9	-80.2	732.4	-108.7	677.2	-53.6	No Action
1416	Tree	653.6	629.2	24.4	659.7	-6.1	677.0	-23.4	703.5	-49.9	732.1	-78.5	677.0	-23.4	To Be Studied
1418	Tree	639.4	629.2	10.2	659.6	-20.3	676.9	-37.6	703.5	-64.1	732.0	-92.7	676.9	-37.6	To Be Studied
1419	Tree	641.4	629.1	12.3	659.6	-18.2	676.9	-35.4	703.4	-62.0	732.0	-90.6	676.9	-35.4	To Be Studied
1421	Tree	651.5	629.0	22.5	659.4	-7.9	676.7	-25.2	703.2	-51.7	731.8	-80.3	676.7	-25.2	To Be Studied
1423	Tree	623.9	628.9	-5.1	659.3	-35.5	676.6	-52.7	703.1	-79.2	731.7	-107.8	676.6	-52.7	No Action
1424	Tree	622.2	628.8	-6.6	659.2	-37.0	676.4	-54.2	702.9	-80.7	731.5	-109.2	676.4	-54.2	No Action
1425	Tree	645.0	628.8	16.2	659.1	-14.2	676.4	-31.4	702.8	-57.9	731.4	-86.4	676.4	-31.4	To Be Studied
1426	Tree	662.6	628.7	33.9	659.0	3.6	676.2	-13.6	702.7	-40.1	731.3	-68.6	676.2	-13.6	To Be Studied
1427	Tree	648.2	628.6	19.6	658.9	-10.7	676.1	-27.9	702.5	-54.4	731.1	-83.0	676.1	-27.9	To Be Studied
1428	Tree	650.5	628.5	22.0	658.8	-8.3	676.0	-25.5	702.4	-51.9	731.0	-80.5	676.0	-25.5	To Be Studied
1432	Tree	655.6	628.4	27.2	658.6	-3.0	675.7	-20.1	702.2	-46.5	730.8	-75.2	675.7	-20.1	To Be Studied
1433	Tree	620.2	628.3	-8.0	658.5	-38.3	675.6	-55.4	702.0	-81.8	730.6	-110.4	675.6	-55.4	No Action
1434	Tree	626.7	628.2	-1.4	658.4	-31.6	675.5	-48.7	701.8	-75.1	730.5	-103.7	675.5	-48.7	No Action
1435	Tree	625.9	628.2	-2.3	658.4	-32.5	675.5	-49.6	701.8	-76.0	730.4	-104.6	675.5	-49.6	No Action
1436	Tree	645.4	628.1	17.3	658.3	-12.9	675.4	-30.0	701.8	-56.4	730.4	-85.0	675.4	-30.0	To Be Studied
1437	Tree	620.4	628.1	-7.8	658.3	-38.0	675.4	-55.0	701.7	-81.4	730.4	-110.0	675.4	-55.0	No Action
1438	Tree	626.3	628.1	-1.8	658.3	-32.0	675.4	-49.1	701.7	-75.4	730.4	-104.1	675.4	-49.1	No Action
1439	Tree	645.8	628.0	17.8	658.2	-12.4	675.2	-29.4	701.5	-55.8	730.2	-84.4	675.2	-29.4	To Be Studied
1440	Tree	626.9	628.0	-1.1	658.2	-31.2	675.2	-48.3	701.5	-74.6	730.2	-103.3	675.2	-48.3	No Action
1441	Tree	622.0	628.0	-5.9	658.1	-36.1	675.1	-53.1	701.5	-79.4	730.1	-108.1	675.1	-53.1	No Action
1442	Tree	661.0	628.0	33.0	658.1	2.8	675.1	-14.2	701.5	-40.5	730.1	-69.2	675.1	-14.2	To Be Studied
1443	Utility Pole	628.6	-	-	658.1	-29.5	-	-	-	-	-	-	-	-	No Action
1444	Tree	629.9	628.0	1.9	658.1	-28.2	675.1	-45.3	701.5	-71.6	730.1	-100.2	675.1	-45.3	To Be Studied
1445	Tree	629.0	627.8	1.2	657.9	-29.0	674.9	-46.0	701.2	-72.3	729.9	-100.9	674.9	-46.0	To Be Studied
1446	Tree	632.2	627.7	4.4	657.8	-25.7	674.8	-42.7	701.1	-68.9	729.8	-97.6	674.8	-42.7	To Be Studied
1447	Tree	625.0	627.7	-2.7	657.8	-32.8	674.8	-49.8	701.1	-76.1	729.7	-104.7	674.8	-49.8	No Action
3190	Light Pole	661.9	706.9	-44.9	756.8	-94.9	-	-	-	-	-	-	-	-	No Action
3222	Light Pole	661.3	706.0	-44.6	755.7	-94.3	-	-	-	-	854.7	-193.4	-	-	No Action
3391	Utility Pole	655.9	700.0	-44.2	748.3	-92.4	-	-	-	-	845.2	-189.4	-	-	No Action
3400	Tree	686.6	699.6	-13.0	747.7	-61.1	-	-	-	-	844.6	-158.0	-	-	No Action
3402	Tree	687.3	699.6	-12.3	747.7	-60.4	-	-	-	-	844.5	-157.2	-	-	No Action
3415	Tree	684.6	698.9	-14.4	746.9	-62.3	-	-	-	-	843.5	-158.9	-	-	No Action
3423	Tree	685.8	698.6	-12.8	746.4	-60.6	-	-	-	-	842.9	-157.1	-	-	No Action
3459	Tree	686.1	697.1	-10.9	744.5	-58.4	-	-	-	-	840.5	-154.4	-	-	No Action
3491	Utility Pole	655.9	695.9	-40.0	743.0	-87.2	-	-	-	-	838.6	-182.7	-	-	No Action
3500	Utility Pole	650.6	695.5	-45.0	742.6	-92.1	-	-	-	-	-	-	-	-	No Action
3517	Utility Pole	655.0	694.9	-39.9	741.9	-86.9	-	-	-	-	837.1	-182.1	-	-	No Action
3531	Utility Pole	650.1	694.3	-44.2	741.1	-91.0	-	-	-	-	836.0	-186.0	-	-	No Action
3549	Utility Pole	648.7	693.3	-44.6	739.8	-91.1	771.2	-122.5	-	-	834.5	-185.8	771.2	-122.5	No Action
3572	Utility Pole	649.7	692.3	-42.6	738.6	-88.9	769.8	-120.1	-	-	833.0	-183.2	769.8	-120.1	No Action
3595	Utility Pole	652.5	691.3	-38.8	737.4	-84.9	768.3	-115.8	-	-	831.3	-178.8	768.3	-115.8	No Action
3614	Utility Pole	645.2	690.3	-45.1	736.1	-90.9	766.8	-121.6	-	-	829.7	-184.5	766.8	-121.6	No Action
3625	Utility Pole	645.6	689.8	-44.1	735.4	-89.8	766.0	-120.4	-	-	828.8	-183.2	766.0	-120.4	No Action
3647	Utility Pole	643.5	688.9	-45.4	734.3	-90.9	764.7	-121.3	-	-	827.4	-184.0	764.7	-121.3	No Action
3658	Utility Pole	640.6	688.0	-47.5	733.2	-92.7	763.5	-122.9	-	-	826.1	-185.5	763.5	-122.9	No Action
3670	Utility Pole	652.0	686.9	-34.9	731.9	-79.9	761.9	-109.9	799.7	-147.7	824.3	-172.3	761.9	-109.9	No Action
3709	Utility Pole	652.4	685.5	-33.1	730.1	-77.7	759.8	-107.4	797.4	-145.0	822.1	-169.7	759.8	-107.4	No Action
3760	Utility Pole	665.9	684.2	-18.3	728.4	-62.5	757.8	-91.9	795.1	-129.2	819.9	-154.0	757.8	-91.9	No Action
3773	Tree	669.6	683.6	-14.0	727.8	-58.1	757.0	-87.4	794.3	-124.7	819.1	-149.4	757.0	-87.4	No Action
3786	Utility Pole	663.2	683.1	-19.9	727.1	-63.9	756.2	-93.1	793.4	-130.2	818.2	-155.0	756.2	-93.1	No Action
3830	Utility Pole	632.7	680.6	-47.9	723.9	-91.3	752.5	-119.9	789.2	-156.5	814.2	-181.5	752.5	-119.9	No Action
3831	Tree	666.6	680.5	-13.9	723.8	-57.2	752.4	-85.8	789.0	-122.4	814.0	-147.4	752.4	-85.8	No Action
3851	Tree	665.2	679.5	-14.3	722.6	-57.4	750.9	-85.7	787.4	-122.2	812.4	-147.2	750.9	-85.7	No Action
3864	Tree	668.6	679.0	-10.4	722.0	-53.3	750.2	-81.6	786.5	-117.9	811.6	-143.0	750.2	-81.6	No Action
3894	Utility Pole	649.3	677.8	-28.5	720.4	-71.2	748.4	-99.1	784.5	-135.2	809.7	-160.4	748.4	-99.1	No Action
3900	Building	630.3	677.6	-47.3	720.2	-89.9	748.2	-117.9	784.3	-153.9	809.5	-179.1	748.2	-117.9	No Action
3915	Tree	662.1	677.1	-15.0	719.6	-57.4	747.4	-85.3	783.4	-121.2	808.6	-146.5	747.4	-85.3	No Action
3947	Building	637.1	675.9	-38.8	718.1	-81.0	745.7	-108.5	781.4	-144.3	806.7	-169.6	745.7	-108.5	No Action
3954	Utility Pole	630.9	675.7	-44.8	717.9	-86.9	745.4	-114.5	781.1	-150.2	806.4	-175.5	745.4	-114.5	No Action
3975	Tree	661.1	675.4	-14.3	717.4	-56.4	744.9	-83.8	780.5	-119.5	805.9	-144.8	744.9	-83.8	No Action
4000	Tree	661.3	674.8	-13.6	716.7	-55.5	744.1	-82.8	779.6	-118.3	805.0	-143.7	744.1	-82.8	No Action
4025	Utility Pole	640.7	674.1	-33.4	715.8	-75.1	742.9	-102.3	778.3	-137.6	803.7	-163.1	742.9	-102.3	No Action
4077	Building	625.7	671.6	-46.0	712.7	-87.1	739.4	-113.7	774.3	-148.6	799.9	-174.2	739.4	-113.7	No Action
4079	Utility Pole	641.4	671.5	-30.1	712.6	-71.2	739.2	-97.8	774.1	-132.7	799.7	-158.3	739.2	-97.8	No Action
4104	Utility Pole	640.1	670.6	-30.5	711.5	-71.4	737.9	-97.8	772.6	-132.5	798.3	-158.2	737.9	-97.8	No Action
4110	Utility Pole	640.5	670.5	-30.0	711.3	-70.8	737.7	-97.2	772.3	-131.8	798.0	-157.5	737.7	-97.2	No Action
4201	Utility Pole	632.6	667.2	-34.6	707.1	-74.5	732.8	-100.2	766.8	-134.2	792.7	-160.1	732.8	-100.2	No Action
4266	Utility Pole	628.8	665.4	-36.7	705.0	-76.2	730.2	-101.5	763.9	-135.1	790.0	-161.2	730.2	-101.5	No Action
4315	Utility Pole	623.3	663.7	-40.4	702.8	-79.5	727.7	-104.4	761.0	-137.7	787.2	-163.9	727.7	-104.4	No Action
4351	Tree	649.3	662.4	-13.1	701.2	-51.9	725.8	-76.5	758.9	-109.6	785.2	-135.9	725.8	-76.5	No Action
4354	Tree	650.7	662.3	-11.6	701.0	-50.3	725.6	-74.9	758.7	-108.0	784.9	-134.2	725.6	-74.9	No Action
4360	Tree	651.7	662.1	-10.4	700.8	-49.1	725.3	-73.6	-	-	784.6	-132.9	725.3	-73.6	No Action
4361	Tree	649.6	662.0	-12.4	700.7	-51.1	725.2	-75.6	758.2	-108.7	784.5	-134.9	725.2	-75.6	No Action
4370	Utility Pole	623.9	661.8	-37.8	700.4	-76.5	724.9	-100.9	757.8	-133.9	784.1	-160.2	724.9	-100.9	No Action
4371	Tree	647.7	661.7	-14.1	700.4	-52.7	724.8	-77.2	-	-	784.1	-136.4	724.8	-77.2	No Action
4378	Building	644.7	661.5	-16.9	700.1	-55.4	724.5	-79.9	757.4	-112.8	783.7	-139.1	724.5	-79.9	No Action
4379	Utility Pole	619.0	661.5	-42.5	700.0	-81.1	724.4	-105.5	757.3	-138.4	783.7	-164.7	724.4	-105.5	No Action
4423	Light Pole	613.9	659.6	-45.7	697.7	-83.8	721.7	-107.8	-	-	780.7	-166.8	721.7	-107.8	No Action
4442	Utility Pole	625.8	659.1	-33.3	697.0	-71.2	720.9	-95.1	753.3	-127.5	779.8	-154.0	720.9	-95.1	No Action
4455	Building	644.9	658.8	-13.9	696.7	-51.8	720.5	-75.6	752.8	-107.9	779.4	-134.4	720.5	-75.6	No Action
4536	Utility Pole	629.9	656.8	-26.9	694.2	-64.3	717.5	-87.7	749.5	-119.7	776.2	-146.3	717.5	-87.7	No Action
4566	Tree	645.5	656.1	-10.6	693.3	-47.8	716.5	-71.0	748.4	-102.9	775.1	-129.6	716.5	-71.0	No Action
4582	Utility Pole	631.8	655.8	-24.0	693.0	-61.2	716.1	-84.3	747.9	-116.1	774.6	-142.8	716.1	-84.3	No Action
4589	Utility Pole	626.0	655.7	-29.7	692.8	-66.9	716.0	-90.0	747.7	-121.8	774.4	-148.5	716.0	-90.0	No Action
4597	Traffic Light/Signal	617.0	655.6	-38.6	692.6	-75.6	715.7	-98.7	747.5	-130.5	774.2	-157.2	715.7	-98.7	No Action
4603	Utility Pole	620.5	655.5	-35.0	692.5	-72.1	715.6	-95.1	747.3	-126.9	774.1	-153.6	715.6	-95.1	No Action
4609	Utility Pole	642.0	655.4	-13.4	692.4	-50.5	715.5	-73.5	747.2	-105.2	773.9	-132.0	715.5	-73.5	No Action
4611	Tree	644.2	655.4	-11.2	692.4	-48.2	715.4	-71.2	747.1	-102.9	773.9	-129.7	715.4	-71.2	No Action
4612	Street Sign	605.6	655.3	-49.7	692.4	-86.8	715.4	-109.8	747.1	-141.5	773.8	-168.2	715.4	-109.8	No Action
4637	Tree	642.3	654.8	-12.5	691.7	-49.4	714.6	-72.4	746.2	-103.9	773.0	-130.7	714.6	-72.4	No Action
4638	Tree	643.9	654.8	-10.9	691.7	-47.8	714.6	-70.7	746.2	-102.3	773.0	-129.1	714.6	-70.7	No Action
4641	Traffic Light/Signal	617.1	654.7	-37.7	691.6	-74.5	714.5	-97.4	746.1	-129.0	772.9	-155.8	714.5	-97.4	No Action
4647	Tree	643.1	654.6	-11.5	691.5	-48.4	714.3	-71.3	745.9	-102.8	772.7	-129.6	714.3	-71.3	No Action
4656	Utility Pole	619.4	654.4	-35.0	691.2	-71.7	714.0	-94.6	745.5	-126.1	772.3	-152.9	714.0	-94.6	No Action
4659	Traffic Light/Signal	612.7	654.3	-41.7	691.1	-78.4	713.9	-101.3	745.4	-132.8	772.2	-159.6	713.9	-101.3	No Action
4660	Tree	643.5	654.3	-10.8	691.1	-47.6	713.9	-70.4	745.4	-101.9	772.2	-128.7	713.9	-70.4	No Action
4677	Tree	643.5	654.0	-10.4	690.6	-47.1	713.4	-69.9	744.8	-101.3	771.6	-128.1	713.4	-69.9	No Action
4684	Tree	639.3	653.8	-14.5	690.5	-51.1	713.2	-73.8	744.6	-105.2	771.4	-132.1	713.2	-73.8	No Action
4689	Light Pole	620.4	653.7	-33.3	690.3	-69.9	713.0	-92.6	-	-	771.3	-150.8	713.0	-92.6	No Action
4698	Tree	639.3	653.4	-14.1	690.0	-50.7	712.6	-73.3	-	-	770.8	-131.5	712.6	-73.3	No Action
4719	Street Sign	604.2	652.9	-48.7	689.3	-85.1	711.8	-107.6	743.0	-138.8	769.9	-165.7	711.8	-107.6	No Action
4724	Street Sign	604.9	652.8	-47.8	689.1	-84.2	711.6	-106.7	742.8	-137.9	769.7	-164.8	711.6	-106.7	No Action
4736	Light Pole	627.1	652.4	-25.3	688.7	-61.6	711.1	-84.0	742.2	-115.2	769.2	-142.1	711.1	-84.0	No Action
4748	Billboard	604.2	652.0	-47.8	688.2	-84.0	710.5	-106.3	741.6	-137.4	768.5	-164.3	710.5	-106.3	No Action
4752	Bridge	602.6	651.9	-49.2	688.0	-85.4	710.3	-107.7	741.3	-138.7	768.3	-165.7	710.3	-107.7	No Action
4773	Bridge	604.0	650.8	-46.8	686.7	-82.7	708.8	-104.8	739.6	-135.6	766.7	-162.7	708.8	-104.8	No Action
4777	Tree	637.8	650.8	-12.9	686.6	-48.8	708.7	-70.9	-	-	766.5	-128.7	708.7	-70.9	No Action
4778	Street Sign	604.8	650.6	-45.8	686.5	-81.7	708.5	-103.7	739.3	-134.5	766.3	-161.5	708.5	-103.7	No Action
4779	Tree	637.7	650.6	-12.9	686.4	-48.7	708.4	-70.7	-	-	766.2	-128.5	708.4	-70.7	No Action
4787	Tree	635.8	650.0	-14.3	685.7	-49.9	707.6	-71.8	-	-	765.4	-129.6	707.6	-71.8	No Action
4789	Light Pole	627.9	649.8	-21.9	685.4	-57.5	707.2	-79.3	737.8	-109.9	764.9	-137.1	707.2	-79.3	No Action
4796	Street Sign	601.3	649.2	-47.9	684.7	-83.3	706.4	-105.0	-	-	764.0	-162.7	706.4	-105.0	No Action
4798	Bridge	602.8	648.9	-46.1	684.3	-81.6	706.0	-103.2	736.4	-133.6	763.6	-160.8	706.0	-103.2	No Action
4801	Street Sign	602.0	648.8	-46.9	684.2	-82.2	705.8	-103.8	-	-	763.4	-161.5	705.8	-103.8	No Action
4805	Bridge	601.3	648.4	-47.1	683.6	-82.4	705.2	-103.9	735.5	-134.2	762.7	-161.4	705.2	-103.9	No Action
4810	Miscellaneous Utililty	601.0	648.0	-47.0	683.2	-82.2	704.7	-103.6	734.9	-133.9	762.2	-161.2	704.7	-103.6	No Action
4818	Street Sign	602.9	647.3	-44.3	682.3	-79.3	703.5	-100.6	733.6	-130.7	760.9	-158.0	703.5	-100.6	No Action
4820	Light Pole	626.8	647.1	-20.3	682.1	-55.3	703.3	-76.6	733.4	-106.6	760.7	-134.0	703.3	-76.6	No Action
4821	Pole	608.6	647.1	-38.5	682.0	-73.4	703.2	-94.7	733.3	-124.7	760.6	-152.1	703.2	-94.7	No Action
4828	Tree	633.4	646.2	-12.7	680.9	-47.5	701.9	-68.5	731.8	-98.4	759.2	-125.8	701.9	-68.5	No Action
4834	Bridge	597.4	645.7	-48.3	680.3	-82.9	701.3	-103.8	731.1	-133.6	758.5	-161.0	701.3	-103.8	No Action
4836	Traffic Light/Signal	612.9	645.7	-32.8	680.3	-67.4	701.2	-88.3	731.0	-118.1	758.4	-145.5	701.2	-88.3	No Action
4837	Traffic Light/Signal	611.9	645.6	-33.7	680.1	-68.2	701.0	-89.1	-	-	758.2	-146.3	701.0	-89.1	No Action
4842	Street Sign	598.2	645.3	-47.1	679.8	-81.6	700.7	-102.5	730.4	-132.2	757.9	-159.6	700.7	-102.5	No Action
4845	Pole	605.4	645.0	-39.6	679.4	-74.0	700.2	-94.8	729.8	-124.5	757.3	-151.9	700.2	-94.8	No Action
4857	Light Pole	626.8	644.2	-17.4	678.4	-51.6	699.0	-72.2	728.5	-101.7	756.0	-129.2	699.0	-72.2	No Action
4858	Pole	604.1	644.2	-40.1	678.4	-74.3	699.0	-94.9	728.5	-124.4	756.0	-151.9	699.0	-94.9	No Action
4872	Tree	629.7	643.6	-13.9	677.6	-47.9	698.1	-68.4	727.5	-97.8	755.0	-125.4	698.1	-68.4	No Action
4905	Tree	627.5	641.8	-14.4	675.5	-48.0	695.6	-68.1	724.6	-97.1	752.3	-124.8	695.6	-68.1	No Action
4985	Tree	625.0	639.5	-14.5	672.5	-47.5	692.1	-67.1	720.7	-95.7	748.5	-123.5	692.1	-67.1	No Action
5071	Utility Pole	592.7	637.0	-44.2	669.4	-76.7	688.4	-95.7	716.5	-123.8	744.5	-151.8	688.4	-95.7	No Action
5079	Utility Pole	608.7	636.5	-27.8	668.8	-60.1	687.7	-79.0	715.7	-107.0	743.8	-135.0	687.7	-79.0	No Action
5080	Tree	625.0	636.5	-11.5	668.8	-43.8	687.7	-62.7	715.7	-90.7	743.7	-118.8	687.7	-62.7	No Action
5081	Utility Pole	602.9	636.4	-33.5	668.6	-65.8	687.5	-84.6	715.5	-112.6	743.6	-140.7	687.5	-84.6	No Action
5084	Utility Pole	599.6	636.3	-36.7	668.6	-69.0	687.4	-87.8	715.4	-115.8	743.4	-143.9	687.4	-87.8	No Action
5097	Utility Pole	621.6	635.4	-13.8	667.4	-45.8	686.1	-64.5	713.9	-92.2	742.0	-120.4	686.1	-64.5	No Action
5136	Tree	622.6	632.8	-10.2	664.2	-41.5	682.3	-59.6	709.5	-86.9	737.8	-115.2	682.3	-59.6	No Action
5169	Solar Panels	588.6	629.7	-41.1	660.3	-71.7	677.7	-89.1	704.4	-115.8	732.9	-144.3	677.7	-89.1	No Action
5186	Tree	616.9	628.1	-11.2	658.3	-41.4	675.3	-58.4	701.7	-84.8	730.3	-113.4	675.3	-58.4	No Action
8567	Tree	661.1	675.4	-14.3	717.4	-56.4	744.9	-83.8	780.5	-119.5	805.9	-144.8	744.9	-83.8	No Action
8915	Building	647.8	660.7	-13.0	699.1	-51.3	723.3	-75.6	756.1	-108.3	782.5	-134.7	723.3	-75.6	No Action
8916	Building	644.8	657.3	-12.5	694.8	-50.0	718.3	-73.5	750.4	-105.6	777.0	-132.2	718.3	-73.5	No Action
8917	Building	644.8	658.1	-13.3	695.8	-51.0	719.5	-74.7	751.7	-106.9	778.3	-133.5	719.5	-74.7	No Action
8920	Building	646.4	668.0	-21.6	708.1	-61.8	734.0	-87.6	768.1	-121.8	794.0	-147.6	734.0	-87.6	No Action
8921	Building	646.0	668.5	-22.5	708.8	-62.9	734.8	-88.8	769.1	-123.1	794.9	-148.9	734.8	-88.8	No Action
8922	Building	646.4	669.3	-23.0	709.9	-63.5	736.0	-89.6	770.4	-124.1	796.2	-149.8	736.0	-89.6	No Action
8924	Utility Pole	646.5	671.8	-25.3	713.0	-66.5	739.6	-93.2	774.6	-128.1	800.2	-153.7	739.6	-93.2	No Action
8929	Building	641.5	652.2	-10.7	688.5	-47.0	710.8	-69.3	741.9	-100.4	768.9	-127.4	710.8	-69.3	No Action
9004	Utility Pole	628.4	639.5	-11.1	672.5	-44.2	692.1	-63.7	720.7	-92.3	748.5	-120.2	692.1	-63.7	No Action

Runway 12L P77 Approach (Existing)

LEGEND
1. Numbers shown in red are a penetration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12L30R - 12L P77 (4)
LAYOUT: 12L P77 (4)
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 2/22/2023 8:22 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

WSP

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY AJB & CAS
DRAWN BY CMT
CHECKED BY AJB & CAS
APPROVED BY

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 12L Obstruction Tables Part 77 (Existing/Future)

SCALE AS NOTED
JOB NO. 20042701.00
DATE 2/2023
SHEET **55** OF **59** SHEETS

Runway 30R Existing Obstruction Table																
			Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface			
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition	On/Off Airport
2443	Sign	605.2	-	-	-	-	-	-	-	-	631.5	-26.3	-	-	Fixed by Function	On
2477	Runway Light	605.5	604.5	1.1	609.5	-4.0	604.6	1.0	611.3	-5.7	643.7	-38.2	604.6	1.0	Fixed by Function	On
2478	Runway Light	605.4	604.5	0.9	609.5	-4.1	604.6	0.8	611.3	-5.9	643.7	-38.3	604.6	0.8	Fixed by Function	On
2479	Runway Light	605.7	604.5	1.2	609.5	-3.9	604.6	1.1	611.3	-5.6	643.7	-38.0	604.6	1.1	Fixed by Function	On
2483	Runway Light	605.3	606.6	-1.3	612.2	-6.9	607.7	-2.4	614.8	-9.5	647.0	-41.7	607.7	-2.4	Fixed by Function	On
2484	Runway Light	605.3	606.6	-1.3	612.2	-6.9	607.7	-2.4	614.8	-9.5	647.0	-41.8	607.7	-2.4	Fixed by Function	On
2485	Runway Light	605.3	606.6	-1.3	612.2	-6.9	607.7	-2.4	614.8	-9.5	647.1	-41.8	607.7	-2.4	Fixed by Function	On
2491	Runway Light	607.1	608.7	-1.6	614.8	-7.7	610.7	-3.6	618.3	-11.1	650.4	-43.3	610.7	-3.6	Fixed by Function	On
2492	Runway Light	607.1	608.7	-1.6	614.8	-7.7	610.7	-3.6	618.3	-11.2	650.4	-43.3	610.7	-3.6	Fixed by Function	On
2493	Runway Light	607.1	608.7	-1.6	614.8	-7.7	610.7	-3.6	618.3	-11.2	650.4	-43.3	610.7	-3.6	Fixed by Function	On
2494	Fence	599.4	609.2	-9.8	726.7	-127.3	-	-	-	-	-	-	-	-	No Action	On
2498	Runway Light	608.9	610.8	-1.9	617.4	-8.5	613.8	-4.9	621.8	-12.9	653.7	-44.8	613.8	-4.9	Fixed by Function	On
2499	Runway Light	608.8	610.8	-2.0	617.4	-8.6	613.8	-5.0	621.8	-13.0	653.7	-44.9	613.8	-5.0	Fixed by Function	On
2500	Runway Light	608.9	610.8	-1.9	617.4	-8.5	613.8	-4.9	621.8	-12.9	653.7	-44.9	613.8	-4.9	Fixed by Function	On
2501	Runway Light	608.9	610.8	-1.9	617.4	-8.5	613.8	-4.9	621.8	-12.9	653.8	-44.9	613.8	-4.9	Fixed by Function	On
2502	Runway Light	608.7	610.8	-2.0	617.4	-8.7	613.8	-5.1	621.8	-13.0	653.8	-45.0	613.8	-5.1	Fixed by Function	On
2503	Post	600.9	610.9	-10.0	617.6	-16.7	614.0	-13.1	622.0	-21.1	654.0	-53.1	614.0	-13.1	No Action	On
2504	Post	601.2	610.9	-9.7	617.6	-16.4	614.0	-12.9	622.0	-20.8	654.0	-52.8	614.0	-12.9	No Action	On
2505	Post	601.4	610.9	-9.5	617.6	-16.2	614.0	-12.6	622.0	-20.6	654.0	-52.6	614.0	-12.6	No Action	On
2506	Post	601.5	610.9	-9.4	617.6	-16.0	614.0	-12.5	622.0	-20.5	654.0	-52.4	614.0	-12.5	No Action	On
2507	Post	601.5	610.9	-9.4	617.6	-16.0	614.0	-12.5	622.0	-20.5	654.0	-52.4	614.0	-12.5	No Action	On
2510	Runway Light	610.2	612.9	-2.7	620.0	-9.9	616.9	-6.8	625.3	-15.1	657.1	-46.9	616.9	-6.8	Fixed by Function	On
2511	Runway Light	610.0	612.9	-2.9	620.0	-10.1	616.9	-6.9	625.3	-15.3	657.1	-47.1	616.9	-6.9	Fixed by Function	On
2512	Runway Light	610.2	612.9	-2.7	620.0	-9.9	616.9	-6.8	625.3	-15.1	657.1	-46.9	616.9	-6.8	Fixed by Function	On
2513	Runway Light	611.4	615.0	-3.6	622.7	-11.3	620.0	-8.7	628.8	-17.4	660.5	-49.1	620.0	-8.7	Fixed by Function	On
2514	Runway Light	611.3	615.0	-3.7	622.7	-11.4	620.0	-8.8	628.8	-17.5	660.5	-49.2	620.0	-8.8	Fixed by Function	On
2515	Runway Light	611.4	615.0	-3.6	622.7	-11.3	620.0	-8.7	628.8	-17.4	660.5	-49.1	620.0	-8.7	Fixed by Function	On
2516	Runway Light	612.4	617.1	-4.8	625.3	-13.0	623.2	-10.8	632.4	-20.0	663.9	-51.5	623.2	-10.8	Fixed by Function	On
2517	Runway Light	612.4	617.1	-4.8	625.3	-13.0	623.2	-10.8	632.4	-20.0	663.9	-51.5	623.2	-10.8	Fixed by Function	On
2518	Runway Light	612.4	617.1	-4.7	625.3	-13.0	623.2	-10.8	632.4	-20.0	663.9	-51.5	623.2	-10.8	Fixed by Function	On
2519	Runway Light	613.6	619.2	-5.6	628.0	-14.4	626.3	-12.7	635.8	-22.3	667.2	-53.7	626.3	-12.7	Fixed by Function	On
2520	Runway Light	613.6	619.2	-5.6	628.0	-14.4	626.3	-12.7	635.8	-22.3	667.2	-53.7	626.3	-12.7	Fixed by Function	On
2521	Runway Light	613.6	619.2	-5.6	628.0	-14.4	626.3	-12.7	635.9	-22.3	667.2	-53.7	626.3	-12.7	Fixed by Function	On
2523	OI On Localizer	610.9	620.5	-9.6	629.6	-18.7	628.2	-17.3	638.0	-27.1	669.3	-58.4	628.2	-17.3	Fixed by Function	On
2524	OI On Localizer	611.0	620.5	-9.6	629.6	-18.6	628.2	-17.2	638.1	-27.1	669.4	-58.4	628.2	-17.2	Fixed by Function	On
2526	Runway Light	614.5	621.2	-6.8	630.5	-16.0	629.2	-14.7	639.2	-24.7	670.4	-56.0	629.2	-14.7	Fixed by Function	On
2527	Runway Light	614.5	621.2	-6.7	630.5	-15.9	629.2	-14.7	639.2	-24.6	670.4	-55.9	629.2	-14.7	Fixed by Function	On
2528	Runway Light	614.5	621.2	-6.7	630.5	-15.9	629.2	-14.7	639.2	-24.7	670.4	-55.9	629.2	-14.7	Fixed by Function	On
2529	Runway Light	614.5	621.2	-6.7	630.5	-16.0	629.2	-14.7	639.2	-24.7	670.4	-55.9	629.2	-14.7	Fixed by Function	On
2530	Runway Light	614.5	621.2	-6.7	630.5	-16.0	629.2	-14.7	639.2	-24.7	670.4	-56.0	629.2	-14.7	Fixed by Function	On
2531	Tree	620.7	621.3	-0.7	679.5	-58.9	629.3	-8.7	-	-	-	-	-	-	No Action	On
2532	Tree	616.0	621.5	-5.4	671.6	-55.6	629.6	-13.5	-	-	-	-	-	-	No Action	On
2533	Tree	613.7	622.0	-8.3	671.5	-57.9	630.3	-16.7	-	-	-	-	-	-	No Action	On
2535	Runway Light	615.7	623.1	-7.4	632.8	-17.1	631.9	-16.2	642.3	-26.6	673.4	-57.7	631.9	-16.2	Fixed by Function	On
2536	Building	614.9	623.3	-8.4	633.1	-18.2	632.3	-17.3	-	-	673.8	-58.8	632.3	-17.3	No Action	On
2537	Antenna	620.1	623.6	-3.5	633.4	-13.4	632.7	-12.6	-	-	674.2	-54.1	632.7	-12.6	Fixed by Function	On
2539	Tree	617.4	624.3	-6.9	634.3	-17.0	633.7	-16.4	-	-	675.3	-58.0	-	-	No Action	On
2541	Tree	617.3	624.4	-7.1	634.5	-17.2	633.9	-16.6	-	-	675.6	-58.3	-	-	No Action	On
2542	Runway Light	617.3	625.0	-7.7	635.1	-17.8	634.7	-17.4	645.4	-28.1	676.4	-59.1	634.7	-17.4	Fixed by Function	On
2543	Tree	618.7	625.4	-6.7	635.7	-17.0	635.3	-16.6	-	-	677.1	-58.4	-	-	No Action	On
2544	Fence	618.1	626.0	-7.9	718.4	-100.3	-	-	-	-	-	-	-	-	No Action	On
2545	Tree	628.7	626.1	2.6	636.6	-7.9	636.4	-7.7	-	-	678.2	-49.6	-	-	To Be Studied	On
2546	Tree	624.5	626.5	-2.1	662.2	-37.8	637.0	-12.6	-	-	-	-	-	-	No Action	Off
2549	Tree	617.9	626.8	-8.9	637.4	-19.5	637.3	-19.5	-	-	679.3	-61.4	637.3	-19.5	No Action	On
2550	Runway Light	617.9	626.8	-8.9	637.4	-19.5	637.4	-19.5	648.4	-30.5	679.3	-61.4	637.4	-19.5	Fixed by Function	On
2552	Tree	623.2	628.3	-5.1	639.3	-16.1	639.6	-16.4	-	-	681.8	-58.6	-	-	No Action	Off
2553	Tree	623.5	628.3	-4.9	639.4	-15.9	639.7	-16.2	-	-	681.8	-58.3	-	-	No Action	Off
2555	Runway Light	619.1	628.6	-9.5	639.8	-20.6	640.1	-21.0	651.6	-32.4	682.3	-63.2	640.1	-21.0	Fixed by Function	On
2558	Tree	637.0	629.1	7.9	707.1	-70.1	-	-	-	-	-	-	-	-	To Be Studied	On
2564	Tree	635.1	629.4	5.7	699.4	-64.3	-	-	-	-	-	-	-	-	To Be Studied	On
2565	Tree	622.5	629.4	-6.9	640.8	-18.2	641.3	-18.8	-	-	683.6	-61.0	-	-	No Action	Off
2567	Tree	627.6	629.7	-2.1	707.1	-79.6	-	-	-	-	-	-	-	-	No Action	On
2569	Tree	624.2	629.7	-5.5	718.6	-94.4	-	-	-	-	-	-	-	-	No Action	On
2575	Tree	631.4	630.3	1.1	717.4	-86.0	-	-	-	-	-	-	-	-	To Be Studied	On
2576	Tree	625.4	630.4	-5.0	641.9	-16.5	642.7	-17.3	-	-	685.1	-59.7	642.7	-17.3	No Action	Off
2580	Tree	629.8	630.6	-0.8	642.2	-12.4	643.0	-13.2	-	-	685.5	-55.6	643.0	-13.2	No Action	Off
2581	Tree	631.6	630.7	0.9	642.3	-10.7	643.1	-11.5	-	-	685.5	-53.9	643.1	-11.5	To Be Studied	Off
2583	Tree	633.5	630.9	2.6	642.5	-9.1	643.4	-9.9	655.2	-21.8	685.8	-52.4	643.4	-9.9	To Be Studied	Off
2584	Tree	621.7	630.9	-9.2	642.6	-20.9	643.4	-21.8	-	-	685.9	-64.2	643.4	-21.8	No Action	Off
2585	Tree	628.9	631.0	-2.0	711.7	-82.7	-	-	-	-	-	-	-	-	No Action	On
2588	Tree	639.1	631.1	8.0	693.5	-54.4	-	-	-	-	-	-	-	-	To Be Studied	On
2590	Tree	634.7	631.2	3.5	643.0	-8.2	643.9	-9.2	-	-	686.4	-51.7	643.9	-9.2	To Be Studied	Off
2592	Tree	637.9	631.6	6.3	643.5	-5.6	644.5	-6.6	656.5	-18.6	687.0	-49.1	644.5	-6.6	To Be Studied	Off
2594	Tree	626.6	631.7	-5.1	709.4	-82.8	-	-	-	-	-	-	-	-	No Action	On
2595	Tree	631.0	631.8	-0.8	716.5	-85.5	-	-	-	-	-	-	-	-	No Action	On
2597	Tree	631.6	631.8	-0.2	643.7	-12.1	644.8	-13.2	-	-	687.3	-55.8	644.8	-13.2	No Action	Off
2598	Tree	638.5	631.8	6.6	643.8	-5.3	644.8	-6.3	656.9	-18.4	687.4	-48.9	644.8	-6.3	To Be Studied	Off
2599	Tree	631.4	632.2	-0.8	709.6	-78.2	-	-	-	-	-	-	-	-	No Action	On
2603	Tree	629.9	632.3	-2.4	644.3	-14.4	645.4	-15.5	657.6	-27.7	688.1	-58.2	645.4	-15.5	No Action	Off
2605	Tree	664.6	632.5	32.0	708.0	-43.4	-	-	-	-	-	-	-	-	To Be Studied	On
2606	Tree	639.1	633.0	6.2	672.3	-33.2	-	-	-	-	-	-	-	-	To Be Studied	On
2607	Tree	639.7	633.0	6.7	699.5	-59.8	-	-	-	-	-	-	-	-	To Be Studied	On
2608	Tree	641.4	633.1	8.3	645.3	-3.9	646.7	-5.3	659.0	-17.6	689.4	-48.0	646.7	-5.3	To Be Studied	Off
2611	Tree	640.5	633.3	7.2	703.0	-62.5	-	-	-	-	-	-	-	-	To Be Studied	On
2612	Tree	649.2	633.5	15.7	709.6	-60.4	-	-	-	-	-	-	-	-	To Be Studied	On
2614	Tree	628.4	633.7	-5.3	646.1	-17.7	647.6	-19.2	660.0	-31.6	690.4	-62.0	647.6	-19.2	No Action	Off
2616	Tree	632.6	633.8	-1.2	689.2	-56.5	-	-	-	-	-	-	-	-	No Action	On
2617	Tree	628.3	634.0	-5.8	646.5	-18.2	648.0	-19.8	660.5	-32.3	690.9	-62.6	648.0	-19.8	No Action	Off
2618	Tree	628.2	634.1	-5.8	646.5	-18.3	648.1	-19.9	660.6	-32.4	690.9	-62.7	648.1	-19.9	No Action	Off
2619	Tree	673.1	634.1	39.1	695.9	-22.8	-	-	-	-	-	-	-	-	To Be Studied	On
2620	Tree	637.5	634.2	3.4	710.6	-73.1	-	-	-	-	-	-	-	-	To Be Studied	On
2622	Tree	661.3	634.3	27.0	713.4	-52.1	-	-	-	-	-	-	-	-	To Be Studied	On
2625	Tree	631.2	634.5	-3.3	647.1	-15.9	648.7	-17.5	661.3	-30.1	691.6	-60.4	648.7	-17.5	No Action	Off
2626	Tree	656.0	634.6	21.4	666.0	-10.0	648.9	7.1	-	-	-	-	-	-	To Be Studied	On
2627	Tree	659.2	634.6	24.6	684.1	-24.9	-	-	-	-	-	-	-	-	To Be Studied	On
2629	Tree	656.0	634.7	21.3	692.7	-36.7	-	-	-	-	-	-	-	-	To Be Studied	On
2630	Tree	654.3	634.8	19.5	676.0	-21.7	-	-	-	-	-	-	-	-	To Be Studied	On
2633	Tree	653.5	635.0	18.5	665.7	-12.2	649.5	4.1	-	-	-	-	-	-	To Be Studied	On
2634	Tree	627.2	635.0	-7.8	647.8	-20.5	649.5	-22.3	662.2	-35.0	692.5	-65.3	649.5	-22.3	No Action	Off
2635	Tree	628.9	635.2	-6.3	648.0	-19.1	649.8	-20.9	-	-	692.8	-63.9	649.8	-20.9	No Action	On
2637	Tree	674.6	635.4	39.2	673.2	1.4	-	-	-	-	-	-	-	-	To Be Studied	On
2639	Tree	637.0	635.5	1.6	695.5	-58.4	-	-	-	-	-	-	-	-	To Be Studied	On
2641	Tree	656.1	635.6	20.6	663.7	-7.6	650.3	5.9	-	-	-	-	-	-	To Be Studied	On
2642	Tree	639.0	635.6	3.3	648.5	-9.5	650.4	-11.4	-	-	693.4	-54.5	-	-	To Be Studied	On
2645	Tree	653.5	635.9	17.6	648.8	4.7	650.7	2.7	-	-	-	-	-	-	To Be Studied	On
2646	Tree	644.1	636.0	8.1	690.9	-46.7	-	-	-	-	-	-	-	-	To Be Studied	On
2647	Tree	654.9	636.1	18.8	654.3	0.6	651.1	3.8	-	-	-	-	-	-	To Be Studied	On
2648	Tree	628.7	636.2	-7.5	676.5	-47.8	-	-	-	-	-	-	-	-	No Action	On
2652	Tree	646.2	636.2	9.9	706.2	-60.1	-	-	-	-	-	-	-	-	To Be Studied	On
2653	Tree	643.5	636.3	7.3	665.5	-22.0	651.3	-7.8	-	-	-	-	-	-	To Be Studied	On
2654	Tree	639.6	636.4	3.2	649.5	-9.8	651.5	-11.9	-	-	694.7	-55.1	-	-	To Be Studied	On
2656	Tree	640.8	636.5	4.2	683.5	-42.7	-	-	-	-	-	-	-	-	To Be Studied	On
2657	Tree	658.6	636.5	22.1	693.0	-34.4	-	-	-	-	-	-	-	-	To Be Studied	On
2658	Tree	643.4	636.7	6.8	702.9	-59.4	-	-	-	-	-	-	-	-	To Be Studied	On
2661	Tree	649.6	636.8	12.8	650.0	-0.3	652.1	-2.5	-	-	695.3	-45.7	-	-	To Be Studied	On
2663	Tree	656.3	636.8	19.5	667.1	-10.8	-	-	-	-	-	-	-	-	To Be Studied	On
2664	Tree	654.2	636.8	17.4	651.5	2.8	652.2	2.0	-	-	-	-	-	-	To Be Studied	On
2667	Tree	640.3	637.2	3.2	655.1	-14.8	652.6	-12.3	-	-	-	-	-	-	To Be Studied	On
2668	Tree	641.7	637.2	4.5	650.4	-8.7	652.6	-11.0	-	-	695.9	-54.2	-	-	To Be Studied	On
2669	Tree	637.3	637.2	0.1	701.9	-64.7	-	-	-	-	-	-	-	-	To Be Studied	On
2670	Tree	642.0	637.2	4.7	708.7	-66.7	-	-	-	-	-	-	-	-	To Be Studied	On
2672	Power Transmission Pylon	647.0	637.5	9.5	651.1	-4.1	653.1	-6.1	-	-	-	-	-	-	To Be Studied	Off
2674	Tree	656.1	637.6	18.4	651.2	4.9	653.3	2.7	-	-	-	-	-	-	To Be Studied	On
2678	Tree	679.9	638.8	41.1	711.5	-31.7	-	-	-	-	-	-	-	-	To Be Studied	On
2682	Tree	638.8	639.2	-0.4	654.0	-15.2	655.6	-16.8	-	-	-	-	-	-	No Action	On
2687	Tree	635.1	639.8	-4.7	653.8	-18.6	656.6	-21.4	-	-	700.2	-65.0	-	-	No Action	On
2688	Tree	637.1	639.9	-2.8	653.9	-16.7	656.7	-19.5	-	-	700.3	-63.1	-	-	No Action	On
2690	Tree	677.1	640.0	37.1	700.7	-23.6	-	-	-	-	-	-	-	-	To Be Studied	On
2694	Tree	652.0	640.5	11.5	691.5	-39.5	-	-	-	-	-	-	-	-	To Be Studied	On
2703	Power Transmission Line	669.8	670.7	-0.9	692.4	-22.6	702.0	-32.2	-	-	749.5	-79.7	702.0	-32.2	No Action	Off
2704	Power Transmission Pylon	683.1	672.5	10.5	694.6	-11.6	704.6	-21.6	-	-	752.4	-69.3	704.6	-21.6	To Be Studied	Off
2705	Power Transmission Pylon	688.3	677.6	10.6	701.0	-12.8	-	-	-	-	-	-	-	-	To Be Studied	Off
8356	Power Transmission Pylon	683.1	672.5	10.5	694.6	-11.6	704.6	-21.6	-	-	752.4	-69.3	704.6	-21.6	To Be Studied	Off
8950	Power Transmission Pylon	633.2	649.1	-15.9	665.4	-32.1	670.2	-37.0	685.7	-52.4	715.0	-81.8	670.2	-37.0	No Action	Off
9048	Tree	631.6	630.7	0.9	642.3	-10.7	643.1	-11.5	-	-	685.5	-53.9	643.1	-11.5	To Be Studied	Off
9262	Power Transmission Line	624.5	656.4	-31.9	674.5	-50.0	681.0	-56.4	697.9	-73.3	726.7	-102.1	681.0	-56.4	No Action	Off
10673	Service Road	610.0	608.0	2.0	737.3	-127.3	-	-	-	-	-	-	-	-	To Be Studied	Off
10676	Service Road	610.0	614.9	-4.9	692.5	-82.5	619.9	-9.9	-	-	-	-	-	-	No Action	Off
10677	Service Road	610.0	620.9	-10.9	645.0	-35.0	628.7	-18.7	-	-	669.9	-59.9	-	-	No Action	Off
10678	Service Road	610.0	621.5	-11.5	630.8	-20.8	629.6	-19.6	-	-	670.9	-60.9	-	-	No Action	Off
10679	Service Road	610.0	621.9	-11.9	631.3	-21.3	630.2	-20.2	-	-	671.5	-61.5	630.2	-20.2	No Action	Off
10680	Service Road	608.4	622.3	-13.9	631.8	-23.4	630.8	-22.4	641.0	-32.6	672.2	-63.8	630.8	-22.4	No Action	Off
10681	Service Road	610.0	622.3	-12.3	631.9	-21.9	630.8	-20.8	641.0	-31.0	672.2	-62.2	630.8	-20.8	No Action	Off
10682	Service Road	609.4	621.7	-12.3	631.0	-21.7	629.8	-20.5	639.9	-30.5	671.1	-61.8	629.8	-20.5	No Action	Off
10683	Service Road	600.0	620.0	-20.0	629.0	-29.0	627.4	-27.4	-	-	668.5	-68.5	627.4	-27.4	No Action	Off
10684	Service Road	600.0	619.6	-19.6	628.5	-28.5	626.8	-26.8	-	-	667.9	-67.9	-	-	No Action	Off
10685	Service Road	600.0	618.5	-18.5	645.9	-45.9	625.2	-25.2	-	-	666.1	-66.1	-	-	No Action	Off
10686	Service Road	610.0	606.7	3.3	702.2	-92.2	607.9	2.1	-	-	-	-	-	-	To Be Studied	Off
10687	Service Road	610.0	-	-	710.8	-100.8	-	-	-	-	-	-	-	-	No Action	Off
10688	Service Road	610.0	618.4	-8.4	627.0	-17.0	625.1	-15.1	634.5	-24.5	665.9	-55.9	625.1	-15.1	No Action	Off
10689	Service Road	609.4	624.6	-15.3	634.7	-25.4	634.2	-24.9	644.9	-35.5	675.9	-66.5	634.2	-24.9	No Action	Off
10703	Service Road	610.0	612.2	-2.2	733.8	-123.8	-	-	-	-	-	-	-	-	No Action	Off
10706	Service Road	602.0	630.3	-28.3	641.8	-39.8	642.5	-40.5	-	-	684.9	-82.9	-	-	No Action	Off
10707	Service Road	600.0	631.0	-31.0	642.7	-42.7	643.6	-43.6	-	-	686.1	-86.1	-	-	No Action	Off
10708	Service Road	600.0	631.1	-31.1	642.8	-42.8	643.7	-43.7	-	-	-	-	-	-	No Action	Off
10710	Service Road	600.2	630.3	-30.1	641.8	-41.6	642.5	-42.3	-	-	684.9	-84.7	642.5	-42.3	No Action	Off
10712	Service Road	600.0	630.3	-30.3	641.8	-41.8	642.5	-42.5	654.3	-54.3	684.9	-84.9	642.5	-42.5	No Action	Off
10713	Service Road	580.0	637.5	-57.5	650.8	-70.8	653.1	-73.1	666.3	-86.3	696.4	-116.4	653.1	-73.1	No Action	Off
10714	Service Road	600.0	633.3	-33.3	645.5	-45.5	646.9	-46.9	659.2	-59.2	689.7	-89.7	646.9	-46.9	No Action	Off
10715	Service Road	560.0	637.2	-77.2	650.5	-90.5	652.7	-92.7	665.9	-105.9	696.0	-136.0	652.7	-92.7	No Action	Off
10717	Service Road	570.0	640.1	-70.1	654.1	-84.1	656.9	-86.9	670.6	-100.6	700.6	-130.6	656.9	-86.9	No Action	Off
10794	Interstate	567.0	626.4	-59.4	721.9	-154.9	-	-	-	-	-	-	-	-	No Action	Off
10795	Interstate	567.0	629.5	-62.5	719.4	-152.4	-	-	-	-	-	-	-	-	No Action	Off
10796	Interstate	567.0	629.1	-62.1	675.7	-108.7	640.8	-73.8	-	-	-	-	-	-	No Action	Off
10797	Interstate	560.2	632.7	-72.4	671.5	-111.2	646.0	-85.8	-	-	-	-	-	-	No Action	Off
10798	Interstate	562.8	631.0	-68.2	642.8	-80.0	643.6	-80.8	-	-	-	-	-	-	No Action	Off
10799	Interstate	562.6	631.1	-68.5	642.8	-80.2	643.7	-81.1	-	-	686.2	-123.6	-	-	No Action	Off
10800	Interstate	557.0	634.3	-77.3	646.9	-89.9	648.5	-91.5	-	-	-	-	-	-	No Action	Off
10801	Interstate	557.0	634.8	-77.8	647.4	-90.4	649.1	-92.1	-	-	692.1	-135.1	-	-	No Action	Off
10802	Interstate	560.9	637.0	-76.1	650.2	-89.3	652.4	-91.5	-	-	695.6	-134.7	652.4	-91.5	No Action	Off
10803	Interstate	557.0	641.7	-84.7	656.1	-99.1	659.3	-102.3	673.4	-116.4	703.2	-146.2	659.3	-102.3	No Action	Off
10804	Interstate	557.0	632.9	-75.9	645.1	-88.1	646.4	-89.4	-	-	689.2	-132.2	646.4	-89.4	No Action	Off
10805	Interstate	561.9	635.9	-74.0	648.8	-86.9	650.7	-88.9	663.6	-101.7	693.8	-132.0	650.7	-88.9	No Action	Off
10806	Interstate	557.0	640.9	-83.9	655.1	-98.1	658.1	-101.1	671.9	-114.9	701.8	-144.8	658.1	-101.1	No Action	Off
10809	Interstate	557.0	646.1	-89.1	661.6	-104.6	665.8	-108.8	680.6	-123.6	710.2	-153.2	665.8	-108.8	No Action	Off
10814	Interstate	555.4	647.5	-92.1	663.3	-108.0	667.8	-112.4	-	-	712.4	-157.0	667.8	-112.4	No Action	Off
10815	Interstate	557.0	648.1	-91.1	664.2	-107.2	668.8	-111.8	-	-	713.5	-156.5	-	-	No Action	Off
10816	Interstate	562.7	648.4	-85.6	664.4	-101.7	669.1	-106.4	-	-	-	-	-	-	No Action	Off
10817	Interstate	566.0	648.4	-82.4	664.5	-98.5	-	-	-	-	-	-	-	-	No Action	Off
10818	Interstate	572.1	648.5	-76.5	703.6	-131.6	-	-	-	-	-	-	-	-	No Action	Off
10836	Road	596.5	612.7	-16.2	733.4	-136.8	-	-	-	-	-	-	-	-	No Action	Off
10837	Road	605.0	618.4	-13.4	688.3	-83.3	625.1	-20.1	-	-	-	-	-	-	No Action	Off

Runway 30R Inner Approach (Existing)

Runway 30R Existing Obstruction Table Inner Portion of the Approach Surface																
			Part 77 Approach		Departure Surface		Threshold Siting Surface		VGS Surface		PAPI		TERPS Visual Surface			
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition	On/Off Airport
10838	Road	605.0	621.2	-16.2	644.9	-39.9	629.2	-24.2	-	-	670.4	-65.4	-	-	No Action	Off
10839	Road	607.9	621.9	-14.0	631.3	-23.4	630.2	-22.3	-	-	671.5	-63.6	-	-	No Action	Off
10840	Road	615.0	624.0	-9.0	633.9	-18.9	633.2	-18.2	643.8	-28.8	674.8	-59.8	633.2	-18.2	No Action	Off
10841	Road	613.3	625.9	-12.6	636.3	-23.1	636.1	-22.8	647.0	-33.7	677.9	-64.7	636.1	-22.8	No Action	Off
10842	Road	606.9	626.4	-19.5	637.0	-30.1	636.8	-30.0	647.8	-41.0	678.7	-71.9	636.8	-30.0	No Action	Off
10843	Road	612.2	626.5	-14.3	637.1	-24.9	637.0	-24.8	-	-	678.9	-66.7	637.0	-24.8	No Action	Off
10845	Road	615.0	626.7	-11.7	637.3	-22.3	637.2	-22.2	-	-	679.2	-64.2	-	-	No Action	Off
10846	Road	615.0	626.7	-11.7	642.9	-27.9	637.3	-22.3	-	-	679.2	-64.2	-	-	No Action	Off
10848	Road	615.0	626.8	-11.8	678.4	-63.4	637.4	-22.4	-	-	-	-	-	-	No Action	Off
10850	Road	622.1	627.0	-4.8	721.5	-99.4	-	-	-	-	-	-	-	-	No Action	Off
10863	Road	562.8	636.4	-73.6	713.7	-150.9	-	-	-	-	-	-	-	-	No Action	Off
10864	Road	558.6	639.9	-81.3	662.9	-104.3	656.7	-98.0	-	-	-	-	-	-	No Action	Off
10865	Road	558.4	640.4	-82.0	654.4	-96.1	657.4	-99.0	-	-	-	-	-	-	No Action	Off
10866	Road	558.4	641.6	-83.2	655.9	-97.5	659.1	-100.7	-	-	702.9	-144.5	-	-	No Action	Off
11516	Road	566.8	-	-	716.5	-149.7	-	-	-	-	-	-	-	-	No Action	Off
11517	Road	555.9	691.8	-136.0	718.8	-162.9	-	-	-	-	-	-	-	-	No Action	Off
11518	Road	547.6	693.1	-145.5	720.3	-172.8	-	-	-	-	785.2	-237.6	-	-	No Action	Off
11519	Road	545.0	693.4	-148.4	720.7	-175.7	735.3	-190.3	-	-	785.7	-240.7	-	-	No Action	Off
11520	Road	540.5	694.5	-154.0	722.2	-181.6	737.0	-196.5	-	-	787.6	-247.0	737.0	-196.5	No Action	Off
11521	Road	540.3	698.8	-158.6	727.5	-187.3	743.3	-203.0	-	-	794.4	-254.1	-	-	No Action	Off
11522	Road	543.8	698.2	-154.4	726.8	-183.0	-	-	-	-	793.5	-249.7	-	-	No Action	Off
11523	Road	552.8	697.1	-144.3	725.4	-172.6	-	-	-	-	-	-	-	-	No Action	Off
11524	Road	557.3	-	-	723.7	-166.5	-	-	-	-	-	-	-	-	No Action	Off
11526	Road	533.2	698.3	-165.1	726.9	-193.7	742.5	-209.4	767.6	-234.5	793.5	-260.4	742.5	-209.4	No Action	Off
11537	Road	535.0	699.7	-164.7	728.7	-193.7	744.6	-209.6	-	-	795.8	-260.8	744.6	-209.6	No Action	Off
11540	Interstate	557.0	651.1	-94.1	667.8	-110.8	673.1	-116.1	689.0	-132.0	718.1	-161.1	673.1	-116.1	No Action	Off
11548	Interstate	557.0	660.9	-103.9	680.1	-123.1	687.6	-130.6	705.4	-148.4	733.9	-176.9	687.6	-130.6	No Action	Off
11552	Interstate	557.0	650.0	-93.0	666.5	-109.5	671.6	-114.6	-	-	716.5	-159.5	671.6	-114.6	No Action	Off
11553	Interstate	560.1	652.1	-92.0	669.1	-109.0	674.6	-114.5	-	-	719.8	-159.7	-	-	No Action	Off
11554	Interstate	563.2	652.7	-89.5	669.9	-106.7	675.5	-112.3	-	-	-	-	-	-	No Action	Off
11555	Interstate	567.0	654.2	-87.2	671.7	-104.7	-	-	-	-	-	-	-	-	No Action	Off
11556	Interstate	587.0	661.2	-74.2	680.4	-93.4	687.9	-100.9	-	-	734.2	-147.2	687.9	-100.9	No Action	Off
11557	Interstate	557.0	667.0	-110.0	687.7	-130.7	696.5	-139.5	-	-	743.6	-186.6	696.5	-139.5	No Action	Off
11558	Interstate	584.4	663.3	-78.9	683.1	-98.7	691.1	-106.7	-	-	737.7	-153.2	-	-	No Action	Off
11559	Interstate	578.4	663.5	-85.2	683.4	-105.0	691.4	-113.1	-	-	-	-	-	-	No Action	Off
11561	Interstate	584.9	665.9	-81.0	686.3	-101.4	-	-	-	-	-	-	-	-	No Action	Off
11562	Interstate	587.8	666.0	-78.3	689.1	-101.4	-	-	-	-	-	-	-	-	No Action	Off
11563	Interstate	558.2	669.4	-111.1	690.7	-132.5	700.0	-141.8	-	-	747.3	-189.1	-	-	No Action	Off
11565	Interstate	562.6	670.7	-108.1	692.3	-129.8	701.9	-139.3	-	-	749.5	-186.9	-	-	No Action	Off
11568	Interstate	578.0	655.3	-77.3	698.0	-120.0	-	-	-	-	-	-	-	-	No Action	Off
11569	Interstate	580.0	657.8	-77.8	676.2	-96.2	-	-	-	-	-	-	-	-	No Action	Off
11583	Interstate	560.6	-	-	694.4	-133.8	-	-	-	-	-	-	-	-	No Action	Off
11584	Interstate	560.6	671.9	-111.4	693.9	-133.3	-	-	-	-	-	-	-	-	No Action	Off
11585	Interstate	557.0	670.5	-113.5	692.1	-135.1	-	-	-	-	-	-	-	-	No Action	Off
11586	Interstate	557.0	-	-	692.9	-135.9	-	-	-	-	-	-	-	-	No Action	Off
11587	Interstate	570.8	674.4	-103.6	697.0	-126.2	-	-	-	-	-	-	-	-	No Action	Off
11588	Interstate	572.8	-	-	698.1	-125.2	-	-	-	-	-	-	-	-	No Action	Off
11635	Road	560.2	644.3	-84.1	659.3	-99.1	663.1	-102.9	-	-	707.3	-147.1	663.1	-102.9	No Action	Off
11636	Road	553.3	650.2	-97.0	666.8	-113.5	671.9	-118.6	687.5	-134.3	716.8	-163.5	671.9	-118.6	No Action	Off
11650	Road	560.1	-	-	710.7	-150.6	-	-	-	-	-	-	-	-	No Action	Off
11651	Road	575.8	-	-	705.3	-129.6	-	-	-	-	-	-	-	-	No Action	Off
11654	Road	585.0	680.5	-95.5	704.6	-119.6	-	-	-	-	-	-	-	-	No Action	Off
11655	Road	595.0	679.0	-84.0	702.7	-107.7	-	-	-	-	762.7	-167.7	-	-	No Action	Off
11656	Road	595.0	678.8	-83.8	702.5	-107.5	713.8	-118.8	-	-	762.4	-167.4	-	-	No Action	Off
11658	Road	592.9	677.5	-84.6	700.9	-108.0	712.0	-119.1	-	-	760.4	-167.5	712.0	-119.1	No Action	Off
11660	Road	559.4	689.1	-129.6	715.3	-155.9	-	-	-	-	-	-	-	-	No Action	Off
11661	Road	549.9	693.3	-143.4	720.6	-170.7	-	-	-	-	785.5	-235.7	-	-	No Action	Off
11662	Road	545.0	695.1	-150.1	722.9	-177.9	737.8	-192.8	-	-	788.5	-243.5	-	-	No Action	Off
11664	Road	538.7	698.9	-160.2	727.6	-189.0	743.4	-204.7	-	-	794.5	-255.8	743.4	-204.7	No Action	Off
11666	Road	553.4	692.7	-139.4	719.9	-166.6	734.4	-181.0	-	-	784.7	-231.3	-	-	No Action	Off
11667	Road	561.2	691.7	-130.6	718.7	-157.5	732.9	-171.8	-	-	783.1	-221.9	732.9	-171.8	No Action	Off
11669	Road	566.8	687.7	-120.9	713.6	-146.8	726.9	-160.1	750.0	-183.1	776.6	-209.8	726.9	-160.1	No Action	Off
11671	Road	579.0	686.1	-107.1	711.6	-132.6	-	-	-	-	774.1	-195.1	-	-	No Action	Off
11672	Road	582.0	685.7	-103.7	711.1	-129.1	724.0	-142.0	-	-	773.4	-191.4	-	-	No Action	Off
11673	Road	586.3	682.5	-96.2	707.1	-120.8	719.2	-133.0	-	-	768.2	-182.0	719.2	-133.0	No Action	Off
11674	Road	579.9	674.3	-94.3	696.8	-116.9	707.2	-127.2	727.6	-147.6	755.2	-175.2	707.2	-127.2	No Action	Off
11685	Road	538.9	670.3	-131.5	691.9	-153.0	701.4	-162.5	721.0	-182.2	748.9	-210.0	701.4	-162.5	No Action	Off
11686	Road	545.0	661.1	-116.1	680.4	-135.4	687.9	-142.9	705.7	-160.7	734.2	-189.2	687.9	-142.9	No Action	Off
11691	Road	569.1	667.4	-98.3	688.3	-119.2	697.2	-128.1	716.2	-147.1	744.3	-175.2	697.2	-128.1	No Action	Off
11692	Road	585.0	668.6	-83.6	689.7	-104.7	698.8	-113.8	-	-	746.0	-161.0	-	-	No Action	Off
11693	Road	573.1	667.2	-94.2	688.0	-114.9	696.8	-123.8	-	-	743.9	-170.9	696.8	-123.8	No Action	Off
11694	Road	549.6	667.7	-118.1	688.7	-139.0	697.6	-148.0	716.7	-167.1	744.7	-195.1	697.6	-148.0	No Action	Off
11696	Road	545.0	692.1	-147.1	719.2	-174.2	733.5	-188.5	-	-	783.7	-238.7	733.5	-188.5	No Action	Off
11697	Road	540.9	693.2	-152.3	720.6	-179.6	735.1	-194.2	759.2	-218.3	785.5	-244.6	735.1	-194.2	No Action	Off
11700	Road	527.2	702.7	-175.5	732.4	-205.2	749.0	-221.8	775.0	-247.8	800.6	-273.4	749.0	-221.8	No Action	Off
11703	Road	532.2	700.8	-168.6	730.0	-197.8	746.2	-214.0	771.7	-239.5	797.5	-265.3	746.2	-214.0	No Action	Off

Runway 30R Inner Approach (Existing)

Runway 30R Existing Obstruction Table Part 77 Approach and Runway Departure Surface															
			Part 77 Approach		Departure Surface		Threshold Siting Surface		GQS Surface		PAPI		TERPS Visual Surface		
Object ID	Description	Object Elevation (MSL)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Surface Elevation (MSL)	Penetration/ Clearance (ft)	Disposition
8411	Pole	723.7	763.6	-39.9	808.6	-84.9	838.6	-114.9	-	-	897.9	-174.2	838.6	-114.9	To Be Studied

Runway 30R P77 Approach (Existing)

LEGEND

1. Numbers shown in red are a penatration to the respective surface.
2. Negative numbers shown are below the respective surface.

K:\ALP\Lambert\2020\Draw\Sheets
FILE: STL 20217 ALP Obs Tables Ex-12L30R - 12L P77 (4)
LAYOUT: 30R Inner & Outer
UPDATE BY: Mike Wilson
SURVEY BOOK #
DATE: 2/22/2023 8:22 AM
XREF DWG:

0 1 2
THIS BAR IS EQUAL TO 2" AT FULL SCALE (36x48).

STL ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

wsp

CMT

REVISIONS			
NO.	BY	DATE	DESCRIPTION

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DESIGN BY	AJB & CAS
DRAWN BY	CMT
CHECKED BY	AJB & CAS
APPROVED BY	

St. Louis Lambert International Airport
St. Louis, Missouri

Runway 30R Obstruction Tables Inner Portion & Part 77 (Existing/Future)

SCALE AS NOTED
JOB NO. 20042701.00
DATE 2/2023
SHEET 56 OF 59 SHEETS

APPENDIX 5E – AIRFIELD MAINTENANCE CAMPUS RELOCATION

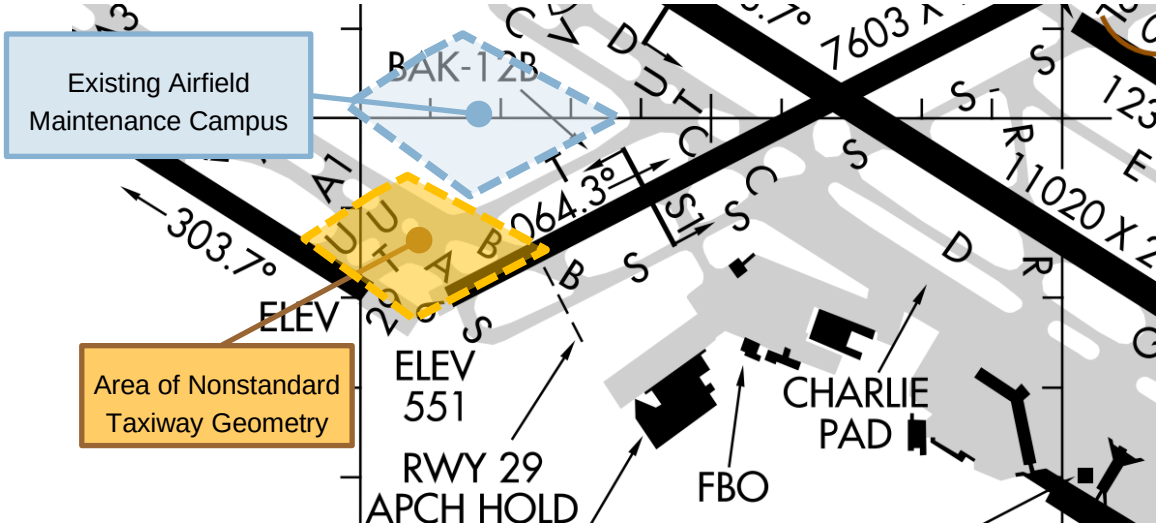
This memo provides the background information, project descriptions and program sizing analysis for the relocation of the Airfield Maintenance campus/Snow Removal Equipment facilities (AFM/SRE) at St. Louis Lambert International Airport (STL). Two other projects are also discussed in this memo, because they are planned in the same area: the Westside Taxiway Improvements and the West Deicing Pad.

5E.1 BACKGROUND

During the STL master planning effort, the deicing needs of the Airport were determined through coordination with STLAA personnel, STL ATCT personnel, and a review of the *Deicing Upgrade and Improvements Report* dated July 2020, prepared by Gresham Smith. The findings of the study identified an East/West Deicing Pad as a long-term improvement recommendation. The selection of either an East or West Deicing Pad is dependent on the future terminal development configuration. The STL Master Plan's preferred terminal alternative is to consolidate both Terminals 1 and 2 into a new linear terminal on the general site of existing Terminal 1. The proposed concourse footprint would overlap with two of the existing three deicing pads (Charlie Pad and Lima Pad) that serve the terminal area. The preferred site of the future replacement deicing pad ("West Deicing Pad") would be located on top of the existing AFM campus/SRE facilities, thus requiring their relocation.

Additionally, several nonstandard airfield geometry issues were identified as part of the STL master planning effort, including areas of expansive pavement at Taxiways A and B intersections with Taxiway T, the nonperpendicular angles of Taxiways A and B at Runway 6-24, as well as the Taxiways U and T intersection with the Runway 29 end. **Figure 5E-1** depicts the existing taxiway network at STL in the vicinity of the AFM/SRE facilities. Per FAA Advisory Circular (AC) 150/5300-13B, runway/taxiway intersections must be designed as "right-angle intersections, except where there is a need for acute angled exit taxiways, such as a high-speed exit." The current configuration of Taxiways A, B, T and U do not follow these design standards. As a result, they need to be reconfigured to achieve right-angle intersections with the respective runways. The taxiway nomenclature in Figure 5E-1 is the current naming convention; planned taxiway naming changes will be implemented later.

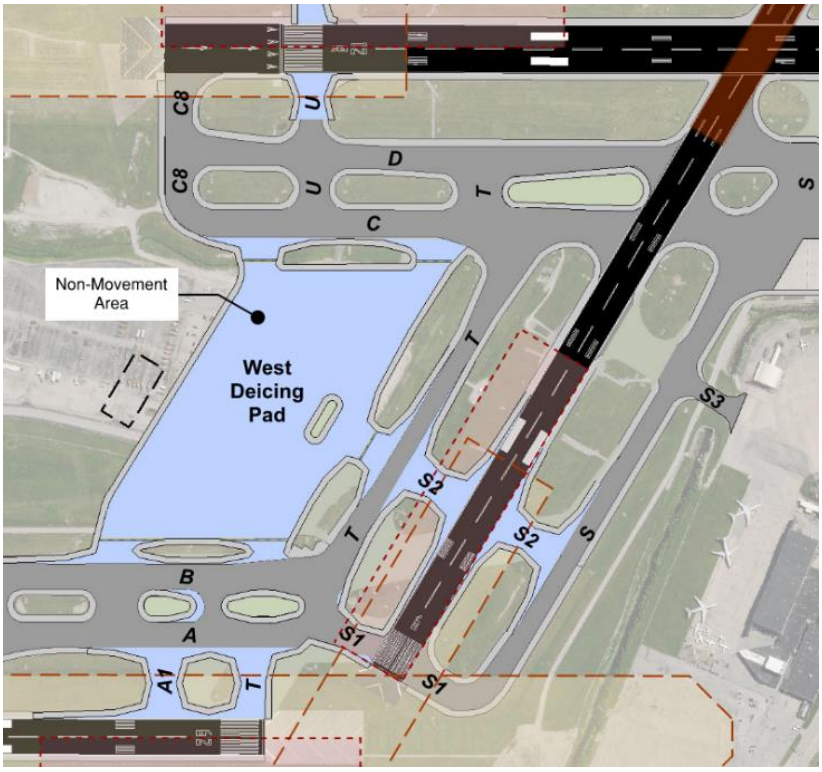
Figure 5E-1: Existing and Proposed Taxiway Network in Vicinity of Airfield Maintenance Campus



Sources: FAA STL *Airport Diagram*, May 2022; WSP USA, 2022.

These nonstandard taxiway geometries will be addressed as part of the master plan's proposed near-term taxiway improvements. Taxiways U and T (connectors to Runway 11-29) and Taxiways A and B will be reconstructed at right angles to Runway 11-29, Runway 6-24, as depicted on **Figure 5E-2**.

Figure 5E-2: Preferred Location of West Deicing Pad and Taxiways A, B, T, U Realignments

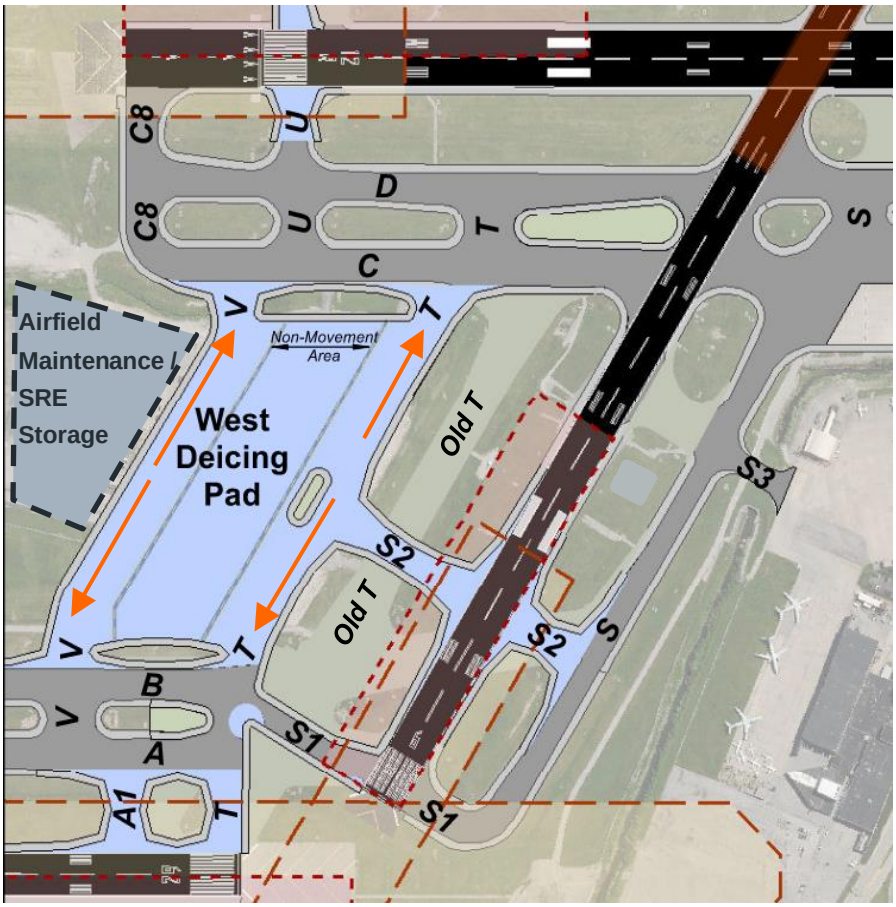


Source: WSP USA, 2022.

These taxiway geometry improvements will need to occur regardless of the terminal consolidation and the West Deicing Pad construction.

Upon Taxiway T reaching the end of its useful life, the existing Taxiway T between Taxiways C and B will be closed, at which time, crossfield airfield movements will be shifted to the easternmost taxiway along the new deicing pad, as depicted in **Figure 5E-3,** which will be named "Taxiway T" as well.

Figure 5E-3: Proposed Ultimate Taxiway Configuration



Source: WSP USA, 2022.

5E.2 AFM FACILITY REQUIREMENTS

METHODOLOGY

The size of the AFM/SRE facilities is based on the amount of airfield areas at STL that need maintaining (pavements, grass, …) or clearing of snow and ice. Since there is no significant increase in airfield pavement (runway, taxiway, apron) and no airport property increase anticipated through 2040, it is assumed that existing space needs will apply through the planning horizon. As such, this analysis will determine the existing space needs for the AFM/SRE facilities and use them through 2040. It should be noted that there is room for expansion of the proposed site to the northwest, should the need arise in the future (new technologies, larger equipment, …).

Space needs of the AFM/SRE facilities were determined using industry planning standards and the following FAA guidance:

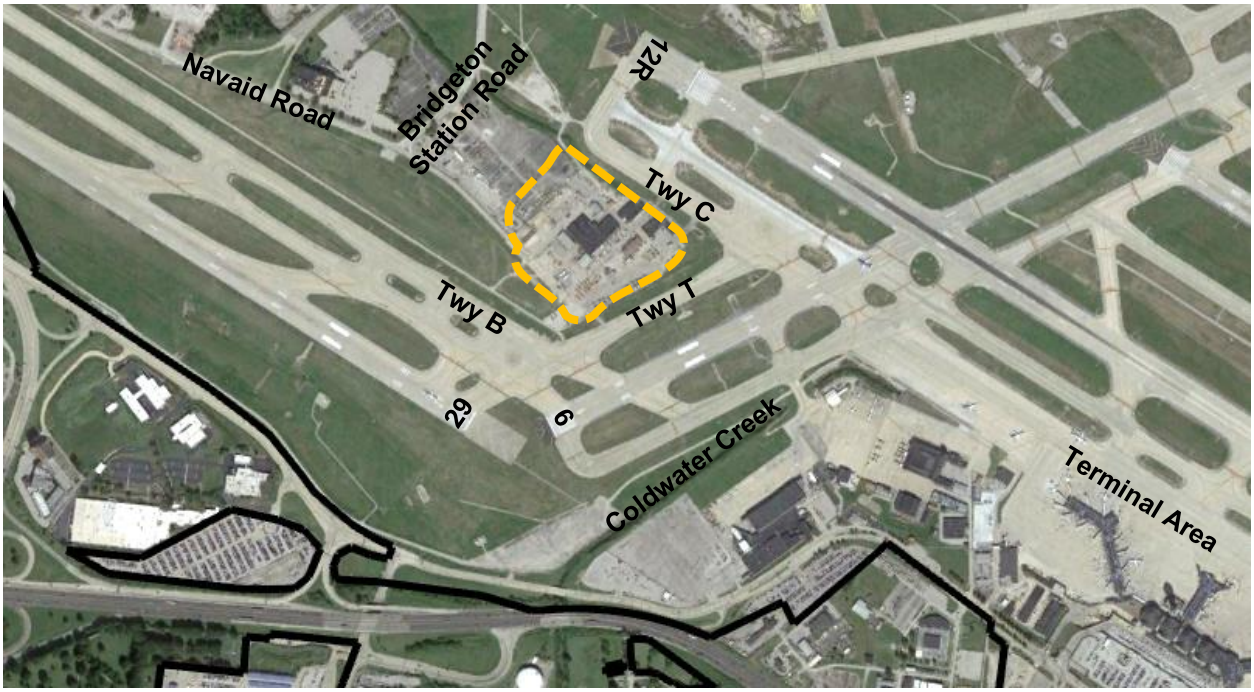
- FAA Advisory Circular (AC) 5220-18, *Buildings for Storage and Maintenance of Airport Snow and Ice Control Equipment and Materials*
- FAA AC 5220-20, *Airport Snow and Ice Control Equipment*
- FAA Order 5100.38D, *AIP Handbook*

A spreadsheet model was developed to identify space programming of the AFM/SRE facilities.

EXISTING CONDITIONS / INVENTORY

The existing AFM campus/SRE facilities are located west of Runway 6-24 and between runway ends 12R and 29, as depicted on **Figure 5E-4**.

Figure 5E-4: Location of Airfield Maintenance Campus



Sources: Google Earth, September 2021; WSP USA, 2022.

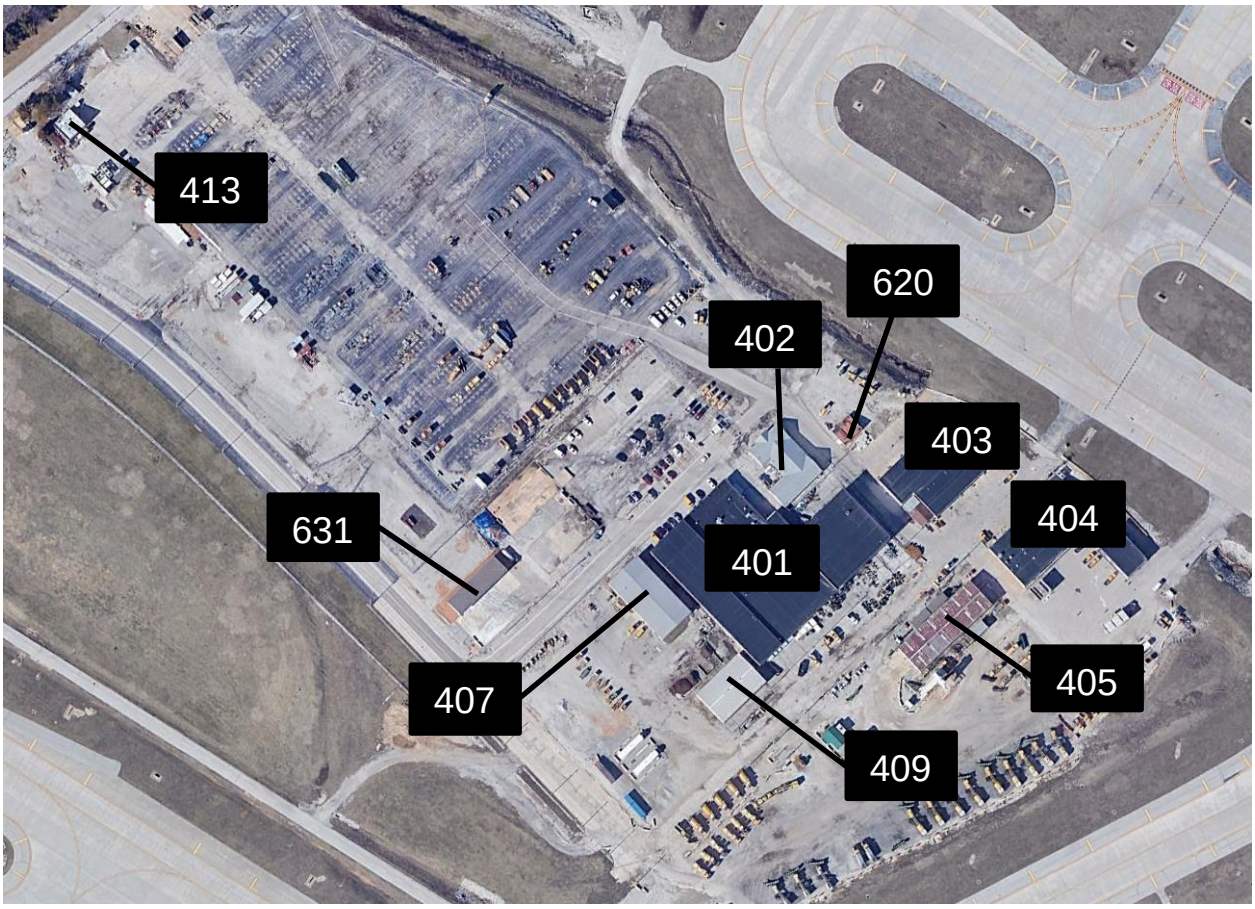
The AFM campus/SRE facilities are constrained by Taxiway C to the north, Taxiway T to the east and Taxiway B to the south. The site is approximately 18 acres, which includes about 2 acres of vehicle and material storage in the northwest corner of the AFM campus, near the corner of Bridgeton Station and Navaid Roads. The core 16 acres of the campus is low-lying, adjacent to the tributary of Coldwater Creek, and is prone to flooding during large rain events. More recently, the AFM campus flooded on July 26, 2022 from a recorded 8.06 inches of overnight rainfall, as depicted on **Figure 5E-5.** The prior rainfall record was 6.85 inches on August 20, 1915. In fact, the ground floor of Maintenance Buildings #403 and #404 (commonly referred to as Buildings A and B) floods more than once a year on average.

Figure 5E-5: Maintenance Building B/#404 (north and south elevations)

AIRFIELD MAINTENANCE CAMPUS FACILITIES

Figure 5E-6 provides an overview of AFM campus buildings and their assigned number.

Figure 5E-6: Airfield Maintenance Campus Overview



Source: WSP USA, 2022.

The AFM campus/SRE facilities are comprised of the following buildings, totaling nearly 134,000 sq. ft.:

- 401: Materials Management / Central Stores
- 402: Office
- 403: Auto Shop
- 404: Auto Shop
- 405: Sand Storage
- 407: Landscaping
- 409: Storage
- 413: Fabrication Shop
- 620: AFM paint locker
- 631: Salt Storage

The campus buildings were built in the late 1970s and early 1980s. All are reaching the end of their service life, requiring significant maintenance and replacement projects. Furthermore, the buildings were also sized for maintenance and storage building standards that no longer meet the FAA AC 5220-18 Equipment Safety Zone (ESZ) standards for clearance around equipment during its storage and/or maintenance (Table 3-1). In many cases, there is not adequate, safe working room or maneuvering room inside the buildings around equipment.

All the SRE is stored outside, due to lack of indoor storage space, deteriorating the fleet at a faster rate, due to exposure to elements and weather. Many of the buildings were also sized for equipment and machinery that no longer are in use, and that were much smaller in size than today's modern equipment. Due to the inadequate size (width and height clearances) of existing building doors, much of the airport's current maintenance and SRE fleet is maintained outdoors.

Storage of the SRE outside means that the equipment is often iced over when it is time for activation to clear snow or ice. This historically has resulted in one to two staff injuries annually. Not only does storage of the SRE outside pose a risk to crew (slippage injuries), it also places the Airport in jeopardy of operational readiness as the injuries often mean staffing impacts that

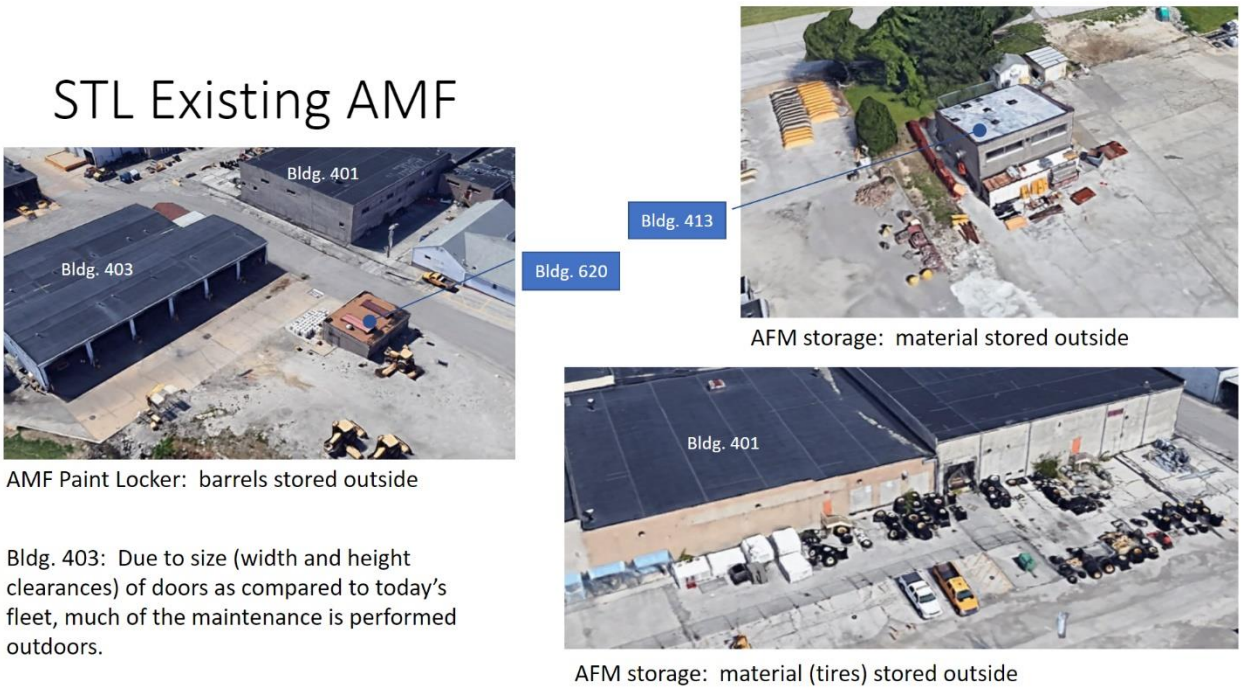
The site is not well configured either for movement between buildings and maneuvering of modern airport equipment, such as large snow and ice removal equipment. It is generally difficult to maneuver the larger SRE around the existing campus for refueling activities, driver breaks, and positioning for necessary maintenance activities.

Figures 5E-7 through **5E-10** depict various facilities on the AFM campus that serve functions such as SRE (equipment and material) storage and maintenance, AFM storage, vehicle maintenance, and general airport facility storage (central stores/warehousing).

Figure 5E-7: Existing Airfield Maintenance Campus - Looking Northeast

Source: Google Earth, 2021.

Figure 5E-8: Existing Airfield Maintenance Campus Buildings

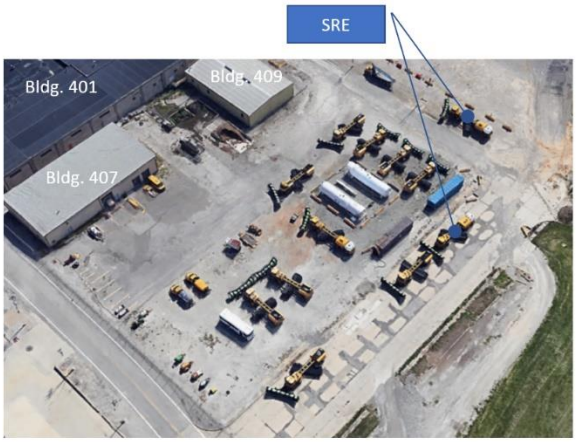


Bldg. 403: Due to size (width and height clearances) of doors as compared to today's fleet, much of the maintenance is performed outdoors.

Source: Google Earth, 2021.

Figure 5E-9: Existing Snow Removal Equipment Storage (outside)

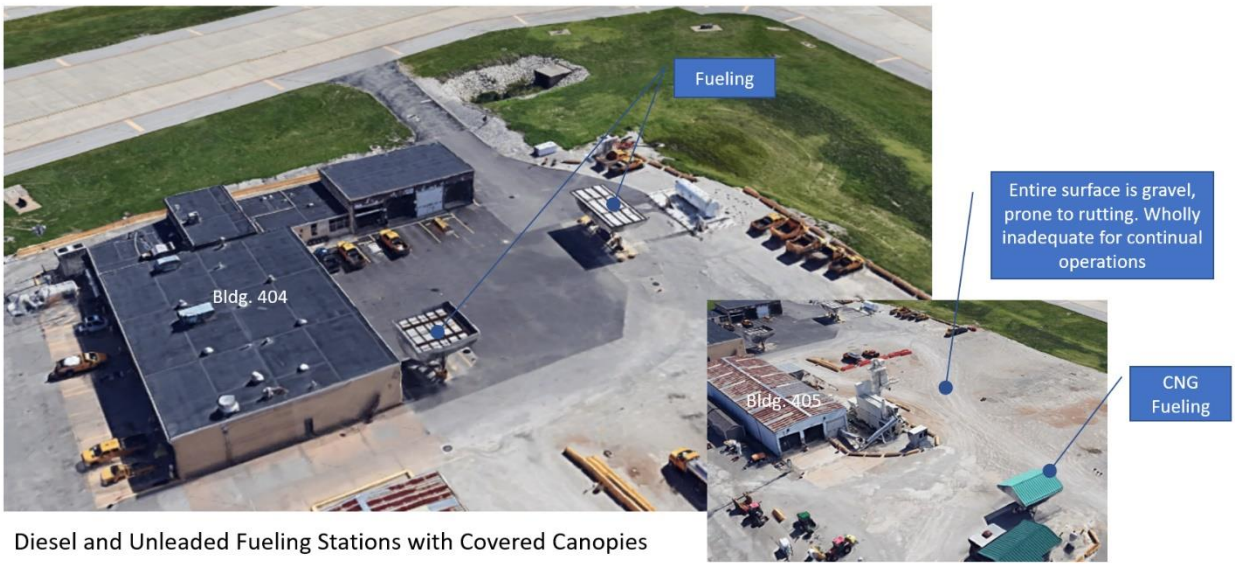
SRE Storage – all stored outside, none undercover



SRE Storage – all stored outside, none undercover

Source: Google Earth, 2021.

Figure 5E-10: Existing Fueling Stations



Diesel and Unleaded Fueling Stations with Covered Canopies

Source: Google Earth, 2021.

AIRFIELD SNOW REMOVAL EQUIPMENT FLEET

Based on a revised equipment list received from STL in June 2022, 75 pieces of Snow and Ice Control equipment are in use at STL:

- 27 combos (plows with a broom at midsection)
- 1 XRS (blower in front) & 5 blowers
- 6 Lg. and 5 Sm. dump trucks (with spreaders and plows, applies NAAC, also known as Sodium Acetate, around aprons)
- 8 tandem trucks (with spreaders and plows)

- 8 deicer trucks (applies deicing chemicals on runway)
- 2 water trucks (applies deicing chemicals on ramp areas)
- 2 multi-hogs (snow removal for runways, taxiways, and aprons; also used to blow snow off signs)
- 2 forklifts and 3 front-end loaders (for loading NAAC)
- 6 sweepers

In total, the AFM/SRE campus houses 207 pieces of equipment.[2]

A full listing of SRE and AFM vehicles and equipment is provided in **Table 5E-1**.

[2] STL Operations Department, Airport Equipment List, June, 2022.

Table 5E-1: Airfield Maintenance and Snow Removal Equipment List

Equipement	Length	Width	Quantity	SRE*	SRE Count	* reviewed with DRK June 14, 2022
Combos (plow w/ broom at midsection)	54	24	27	Y	27	see photos 6043 and 6047
XRS (with blower in front)	79	19	1	Y	1	
Blowers	14	8	5	Y	5	
Dump Truck (spreaders + plows)	26	8	6	Y	6	
Tandem Truck (spreaders + plows)	26	8	8	Y	8	
Deicer Trucks (Airfield SRE)	39	9	8	Y	8	applies deicing chems on runway
Water Trucks (Airfield SRE)	24	9	2	Y	2	applies deicing chems on gates/ramps
Large Mower Tow Behind	30	25	8			
Large Mower Flail	19	9	6			
Ride on Mowers	10	6	9			
Landside Mowers (Stand On)	7	5	5			
Rubber Removal Truck	36	8	2			
Paint Truck	36	8	2			
Graco paint machines	7	5	6			
Small Dump Truck (spreaders + plows)	22	8	5	Y	5	applies NAAC on services roads and gates
Emergency Bus	44	8	3			
Mobile Command Bus	50	10	1			
Light Trailer	9	5	4			
Lighted X	11	6	8			
Gradall	32	8	1			
Ashpalt Mixer	22	8	2			
Multi Hog (SRE for Rwy, Twy, & aprons)	14	7	2	Y	2	used to blow snow off signs, etc.
Takechuii	13	7	5			
Genie Forklift (loads NAAC sacks)	25	8	2	Y	2	
Tow Bewhind Compressor	12	5	3			
Vibrater Roller	17	8	2			
Front Loader (load chems)	24	8	3	Y	3	used to load chems to spreaders for SRE
Backhoe	24	8	2			
Asphalt Trailer	16	8	1			
Sweeper	20	6	6	Y	6	
					75	
Forklift	25	8	I to line 26 for 3 total			
Track Type Crawler	21	8	1			
Also Need designated Outside parking with containment for 2 fuel trucks						
Fuel Trucks	9	24	2			
Landscaping Building	8000 Sq Ft.					
Air compressors Pull behind	5	13	4			
Landscaping Equipment:						
Small/ Mids size tractors w attachments	8	15	8			
Paletized acessories	5	9	6			
Puch mowers / misc push equpment	3	5	30			
Leaf Vac Trailer	6	14	1			
Misc equipment attachments	8	8	10			
			207			

Source: STL Operations Department, Airport Equipment List, June, 2022.

SPACE NEEDS

Table 5E-2 provides the detailed AFM/SRE campus planning-level space program. The space program will be further vetted in the design stage, after interviews with airport staff on their operational procedures and practices.

SRE needs are defined by how much equipment is needed to clear "Priority 1 Snow Clearance Areas". Priority 1 Snow Clearance Areas at STL are depicted on **Figure 5E-11**.

The FAA SRE Calculator was used to determine how many pieces of SRE equipment is needed to clear STL's Priority 1 areas. Inputs to the calculator and results are shown on **Figure 5E-12**.

INDOOR SPACE NEEDS

The following inputs and assumptions were used for developing indoor space needs:

- Assigned space standards (width and length) to common groups of areas (indoor vehicle storage, material management/parts, maintenance storage areas, support areas, admin/office space, and crew spaces).
- Grouped actual SRE and AFM equipment further, into general size categories (X-long, X-wide, Large, Medium, Small) to make accounting for each piece easier.
- Applied circulation space (maneuverability, as well as walk-around space, falling under the ESZ spacing guidelines of the FAA AC 5220-18, Table 3-1) to common groups of areas subtotals to produce a total square footage for each common group. Circulation factors between 20% and 40% were applied, depending on the activity within the common area (higher circulation needed for maintenance areas, lower needed for storage).

Total existing indoor (building) space needs for the AFM/SRE campus are approximately 258,000 sq. ft.

OUTDOOR SPACE NEEDS

Outdoor space needs include:

- Employee and visitor parking
- Downline parking (vehicles that are inoperable and "next in line" for maintenance repairs)
- Bunker storage (compartment for storage)
- Other outdoor items (deicing tanks, generators, dumpsters, etc.)
- A fueling center (fueling positions and tank storage)

Circulation factors between 25% and 100% were assumed.

Total outdoor space needs for the AFM/SRE campus are approximately 128,000 sq. ft.

COMBINED SPACE NEEDS

The space needs for the AFM/SRE facilities (indoor and outdoor spaces combined) add up to approximately 386,000 sq. ft. A site circulation factor of 100% is applied, resulting in approximately 773,000 sq. ft., or **18 acres, in overall footprint** needs for the AFM/SRE facilities. The proposed site size is approximately the same size as the existing campus.

Table 5E-2: Planning-Level AFM/SRE Campus Space Program

The June 2022 Equipment List update was also reviewed. The total area shown in the program remains adqueate for the updated list.

PRELIMINARY SPACE NEEDS PROGRAM
April 11, 2022

Legend:
A-Alcove, O- Open Space, E- Enclosed, C- Canopy Covered

Space Name		Space Standard		Qty.	Proposed Area (SF)	Remarks	Eligible SF		SRE Eligibility Remarks
STORAGE AREAS									
Indoor Vehicle Storage									
X-Long Space	[O]	30 x 85	2,550	1	2,550	The Updated Equipment List provided by David Kulinsky (STL) on January 18, 2022 has been reviewed against this program. Total area shown in the program is adequate to support the updated list.	2550		Assumes large rotary (tandem)
X-Wide Space	[O]	30 x 60	1,800	25	45,000	According to FAA SRE Calculator 46 pieces of SRE	32400		assumes 18 of 25 are for SRE
Large Space	[O]	15 x 30	450	45	20,250	Equipment are eligible for AIP funding	12150		assumes 27 of 45 are for SRE
Medium Space	[O]	10 x 20	200	25	5,000		0		
Small Space	[O]	10 x 10	100	35	3,500		0		
Subtotal					76,300		47100		
Circulation			35%		26,705		16485		
Total					**103,005**		**63,585**		
Materials Management/ Parts									
Storeroom	[O]	40 x 70	48,000	1	48,000	Need separate securable area, 200 sf	4,800		assumes 10% is SRE related storage
Consumable Autoparts	[E]	100 x 100	10,000	1	10,000	Separate controlled area for Auto Shop			
Parts Counter						Secured window to repair bays, included in storeroom SF.			
Tool Crib	[E]	20 x 20	400	1	400	Securable area for specialty tools			
Truck Dock	[C]	30 x 60	1,800	4					
Shipping and Receiving	[O]	30 x 20	600	1	600		300		assume used for vehicle maintenance, 50% for SRE
Subtotal					59,000		5,100		
Circulation			20%		11,800		1,020		
Total					**70,800**		**6,120**		

Space Name		Space Standard		Qty.	Proposed Area (SF)	Remarks	Eligible SF		SRE Eligibility Remarks
Maintenance Storage Areas									
Salt Storage	[E]	75 x 100	7,500	1	7,500	heated space, overhead door for loading and unloading with front end loader			
Paint Storage	[E]	45 x 100	4,500	1	4,500	includes vehicle storage, paint, glass beads and sand storage, ***can be remotely located***			
Sand Storage	[E]	100 x 100	10,000	1	10,000	heated space, overhead door for loading and unloading with front end loader	10,000		assume for SRE
Landscaping	[E]	80 x 100	8,000	1	8,000	Storage for field maintenance tools and supplies to include separate securable area for chainsaws			
Subtotal					30,000		10,000		
Circulation			20%		6,000		2,000		
Total					**36,000**		**12,000**		

SUPPORT AREAS

Maintenance Areas									
Tire Shop	[O]	15 x 20	300	1	300	Tire machine and wheel balancer, ***next to repair bays***	150		assume 50% for SRE use
Tire Storage	[O]		600	1	600	***Easy access for deliveries, next to tire shop***	300		assume 50% for SRE use
Welding/Machine Shop	[E]	50 x 85	4,250	1	4,250	***Near to repair bays,*** to have fume extraction, overhead crane	2,125		assume 50% for SRE use
Parts Cleaning	[O]	20 x 10	200	1	200	Abrasive blast unit, parts cleaning tank, ***near to repair bays***			
Paint Shop	[E]	30 x 20	600	1	600	Paint mixers, open faced paint booth, ***near to repair bays***			
Tool Box Storage	[O]	20 x 50	1,000	1	1,000	***dedicated area close to repair bays***	500		assume 50% for SRE use
Portable Equipment Storage	[O]	30 x 60	1,800	1	1,800				
Used Fluids Area	[O]	10 x 20	200	1	200	Space for filter crusher and drain pans, wall mtd. Pumps for coolant and oil to be transferred to remote used tanks, ***adjacent to repair bays***	100		assume 50% for SRE use
Wash/Steam Clean Large	[E]	36 x 85	3,060	1	3,060	catwalk, high pressure and high volume hoses each side	3,060		sized for SRE largest vehicle
Light Duty Vehicles	[O]	20 x 30	600	4	2,400	12 ton vehicle lift, lubrication reel (may be shared), vehicle exhaust reel, based on providing clear and work space around an 8'x20' vehicle			
Heavy Duty Repair	[O]	30 x 60	1,800	4	7,200	flat bay with portable lifts, lubrication reel (may be shared), vehicle exhaust, overhead crane, based on providing clear and work space around an 24' x 54' vehicle	1,500		per AIP handbook one bay allowable (1500 SF max)
Subtotal					21,610		7,735		
Circulation			40%		8,644		3,094		
Total					**30,254**		**10,829**		

Space Name		Space Standard		Qty.	Proposed Area (SF)	Remarks	Eligible SF		SRE Eligibility Remarks
Administration/Offices									
Lobby	[E]	15 x 12	180	1	180	control point for visitors to secure work areas and promote safety and efficiency, ***close to visitor parking***	90		assume 50% use for SRE
Conference Room	[E]	20 x 30	600	1	600	meeting place for vendors, etc. room sized for 4 people			
Rest Room	[E]	12 x 14	168	2	336	Shared by visitors and office spaces	168		assume 50% use for SRE
Copy/Mail Room	[E]	10 x 10	100	1	100				
Fuel Control Room	[E]	10 x 10	100	1	100				
Auto Shop- Maintenance Manager	[E]	12 x 15	180	1	180				
Auto Shop- Foremen	[E]	12 x 14	168	1	168	2 Computer work stations, ***convenient to Auto Shop***			
Field Maintenance- Maintenance Supervisor	[E]	12 x 15	180	1	180				
Field Maintenance- Foremen	[E]	25 x 25	625	1	625	6 computer work stations with reference library			
Landscaping- Gardener Supervisor	[E]	12 x 15	180	1	180				
Materials Management- Manager	[E]	12 x 15	180	1	180				
Subtotal					2,829		258		
Circulation			25%		707		65		
Total					**3,536**		**323**		

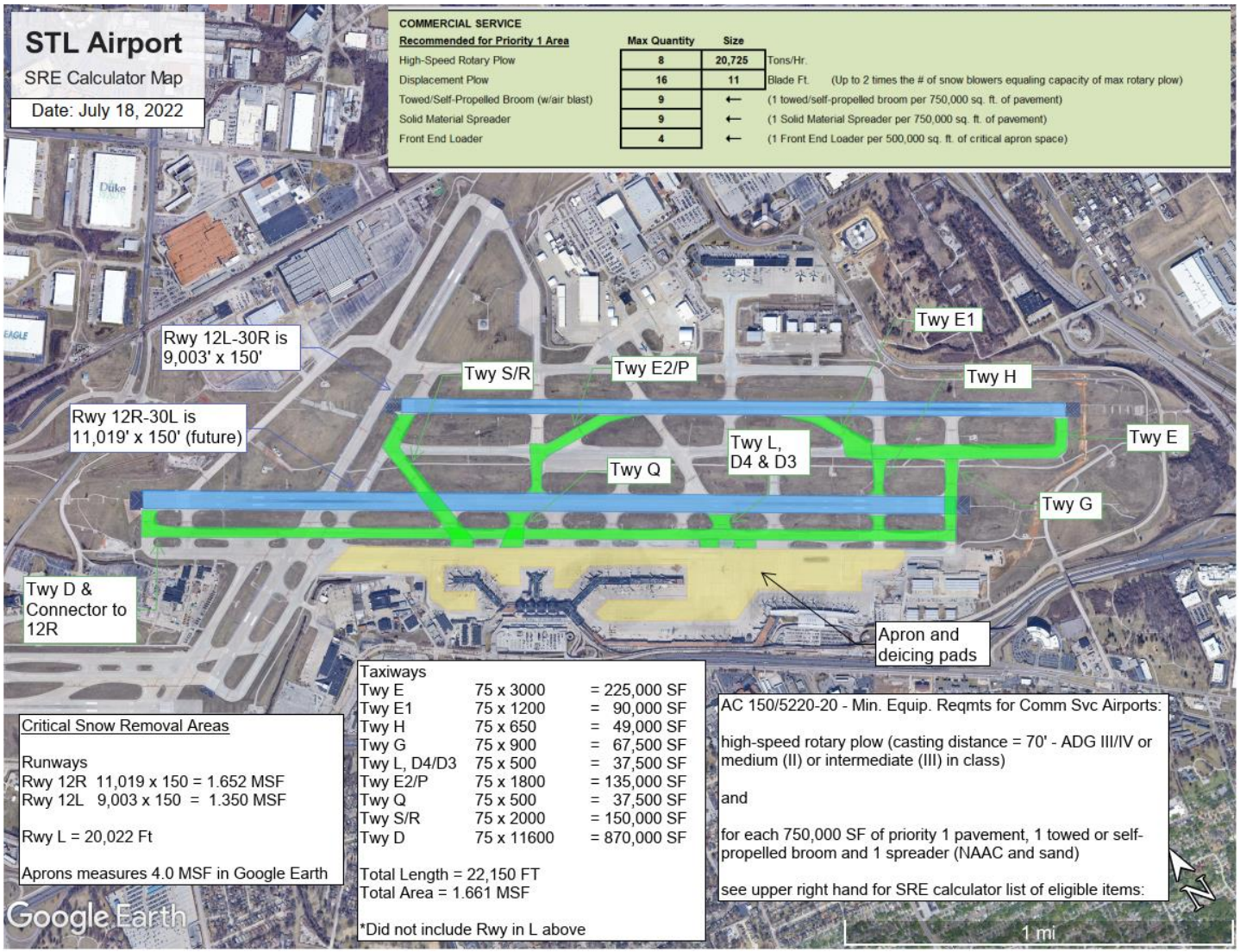
Crew Spaces						
Break/Training Room	[E]	50 x 80	4,000	1	4,000	Large screen monitor, white board, wall maps, 1 computer work station, tables and chairs for 60 people
Training Room Storage	[E]	10 x 25	250	1	250	Supplies for tables and chairs, training equipment and other breakroom supplies
Kitchen	[E]	12 x 25	300	1	300	Commercial kitchen appliances: Multi-burner stove top with exhaust hood, 2 ovens, 2 microwaves, refrigerator, dishwasher, icemaker, ***Adjacent to Break/training Room***
Vending Area	[A]					Locate within break room space
Bunk Rooms	[E]	12 x 12	144	5	720	Sized for 4 people, 2 bunk beds
Bunk Room Storage	[E]	10 x 25	250	1	250	Supplies for Bedding, etc., ***adjacent to Bunk Room***
Laundry	[E]	12 x 10	120	1	120	Commercial washer and dryer with folding table, ***near to mud room***
Mud Room	[E]	12 x 10	120	1	120	Hooks for 20 storm covers, hand sink, janitor sink, benches
Men's Lockers and Rest Room	[E]	40 x 40	1,600	1	1,600	50 double lockers with benches, 4 showers, 4 urinals, 4 toilets
Women's Locker's and Rest Room	[E]	20 x 40	800	1	800	25 double lockers with benches, 2 showers, 4 toilets
Uniform Locker Area	[A]	12 x 15	180	1	180	
Subtotal					8,340	
Circulation			25%		2,085	
Total					**10,425**	

Space Name		Space Standard		Qty.	Proposed Area (SF)	Remarks	Eligible SF		SRE Eligibility Remarks
SPECIAL EQUIPMENT AREAS									
Special Equipment Areas									
Lubrication/Compressor Room	[E]	40 x 30	1,200	1	1,200	centralized area for fluids and tanks, with overhead door to exterior	600		assume 50% use for SRE
Wash Bay Equipment Room	[A]	10 x 15	150	1	150	***Alcove off wash bay***	75		assume 50% use for SRE
Rest Room	[E]	8 x 8	64	1	64	***Convenient to equipment maintenance areas***			
Crew Ice Area	[A]					***Area for ice machine, with foot pedal dispensing, and 2 coolers, convenient to exterior, fit into circulation space***			
Telecom Room	[E]	12 x 12	144	1	144	size to be verified in schematic design, fit into mezzanine space			
Mechanical Room	[E]	20 x 40	800	1	800	size to be verified in schematic design, fit into mezzanine space	400		assume 50% use for SRE
Electrical Room	[E]	20 x 30	600	1	600	size to be verified in schematic design, fit into mezzanine space	300		assume 50% use for SRE
Custodial Room	[E]	10 x 12	120	1	120		60		assume 50% use for SRE
Subtotal					3,078		1,435		
Circulation			20%		616		287		
Total					**3,694**		**1,722**		
Total Interior Spaces					**257,714**		**94,579**		**total SRE eligible indoor space**
							36.70%		
EXTERIOR AREAS									
Bunker Storage and Outdoor Items									
De-icing Tanks	[O]	30 x 60	1,800	5	9,000	5 above ground steel tanks			
Emergency Generator	[O]	12 X 40	480	1	480	Size and systems to be included to be determined in schematic design			
Dumpsters	[O]	8 X 25	200	7	1,400	Provide easy access for crews dropping trash at shift end			
Hazardous Material Storage	[E]	8 X 25	200	4	800				
Secure Storage TSA/Police	[O]	20 x 20	400	1	400				
Misc. Yard Storage	[O]	150 x 200	30,000	1	30,000				
Subtotal					42,080	Misc. Yard Storage has been increased on the concept drawings and do not reflect the sq. footage shown to the left.			
Circulation			25%		10,520				
Total					**52,600**				

Space Name		Space Standard		Qty.	Proposed Area (SF)	Remarks	Eligible SF		SRE Eligibility Remarks
Fueling									
Diesel Fuel Position	[C]	60 x 30	1,800	2	3,600	diesel pumps at both sides to fill saddle tanks simultaneously	3,600		assume both for SRE
Unleaded Fuel Position	[C]	30 x 15	450	1	450				
CNG Fuel Position	[C]	30 x 15	450	1	450				
Fuel Tank Farm	[O]	60 x 80	4,800	1	4,800				
Subtotal					9,300	Program does not have outdoor space allocated for 2 fuel trucks (9' x 24') and will need to be added in concepts	3,600		
Circulation			100%		9,300		3,600		
Total					**18,600**		**7,200**		
Downline Parking									
X-Wide Space	[O]	60 x 30	1,800	4	7,200		3,600		assume 50% use for SRE
X-Long Space	[O]	85 x 30	2,550	1	2,550		2,550		assume all for SRE use
Large Space	[O]	30 x 15	450	7	3,150		900		assume 2 of 7 are for SRE
Medium Space	[O]	20 x 10	200	4	800				
Subtotal					13,700		7,050		
Circulation			25%		3,425		1,763		
Total					**17,125**		**8,813**		
Employee and Visitor Parking									
Employee Spaces	[O]	20 x 10	200	110	22,000	108 Staff are listed in the Org Chart for Auto Shop, Field Mx, Landscaping, and Mtl Mngmt	10,400		assume 52 are for SRE use
Visitor Spaces	[O]	20 x 10	200	25	5,000				
Subtotal					27,000		10,400		
Circulation			50%		13,500		5,200		
Total					**40,500**		**15,600**		
Total Outdoor Spaces					**128,825**		**31,613**		**total SRE eligible outdoor space**
							24.54%		
Subtotal					386,539				
Site Circulation			100%		386,539				
Site Total					**773,078**				

17.75 acres

Figure 5E-11: Priority 1 Snow Clearance Areas



Source: WSP USA, 2022.

Figure 5E-12: FAA Snow Removal Equipment Calculator (2016 revision)

Snow Removal Equipment Calculations

Enter Data in Highlighted Fields

Users requiring assistance or reasonable accommodation may contact the FAA Central Region Airports Division at 816-329-2600.

When using this calculation aid, you must still refer to the current version of AC 150/5220-20, Airport Snow and Ice Control Equipment, and AC 150/5200-30, Airport Winter Safety and Operations for specific guidance.

Airport Name:	St. Louis Lamber Int'l (STL)
Location:	St. Louis, MO
Average Annual Snow Fall:	18
Select Type of Airport:	Commercial Service
Select Annual Operations:	>40,000
Clearance Time	0.5 hours

Critical Priority 1 Snow Removal Areas[1] *(Submit map/drawing that illustrates Priority 1 area):*

	Length (ft)		Width (ft)		Sq. Ft.
Primary Runway	22,022	X	150	=	3,303,300
Primary Taxiway	22,150	X	75	=	1,661,250
High Speed Turnoffs		X		=	0
Connecting Taxiway(s)		X		=	0
Terminal/GA Apron[2] (enter 50% of apron or less)	2,000	X	1,000	=	2,000,000
Cargo Apron[2] (enter 50% of apron or less)		X		=	0
ARFF Access/Emergency Roads		X		=	0
NAVAID (Instrument Rwy)		X		=	0
Other	0	X	0	=	0
				Total	6,964,550

Snow Depth[3] (in) 1 — Snow Density[3] (lbs/cu ft) 25 — 7,254 tons

AIP ELIGIBILITY (Refer to the current version of FAA Order 5100.38)

AIRPORTS NOT CERTIFICATED UNDER 14 CFR PART 139:

Only one snow removal carrier vehicle is AIP eligible unless the ADO concurs that the airport is large enough, busy enough, and/or has significant snowfall to warrant an additional vehicle.

AIRPORTS CERTIFICATED UNDER 14 CFR PART 139:

Must meet the requirements in Table M-1(d) in Appendix M.

HIGH-SPEED ROTARY PLOW

Rotary Plow Efficiency Percent	70	← 70% is standard.
Minimum Rotary Plow Snow Removal Rate (tons/hr)	20,725	
Select Plow Class	Class 3 (up to 2500 tons/hr, 100' casting distance)	← Selection should approximately match the minimum tons/hr removal rate. A selection that is excessive is not jusitified. Refer to Section 2-4 in AC 150/5220-20.

DISPLACEMENT PLOW

Operating Speed (mph)	25	← 25mph is typical operating speed. Smaller airports will typically use lower speed.
Plow Efficiency Percent	70	← 70% is standard.
Plow Cutting Angle	35	← 35 degrees is typical for removal operations.
Total Effective Blade Length (ft) Required	151	
Total Actual Blade Length (ft) Required	184	← Blade length per unit is calculated below

COMMERCIAL SERVICE

Recommended for Priority 1 Area	Max Quantity	Size	
High-Speed Rotary Plow	8	20,725	Tons/Hr.
Displacement Plow	16	11	Blade Ft. (Up to 2 times the # of snow blowers equaling capacity of max rotary plow)
Towed/Self-Propelled Broom (w/air blast)	9	←	(1 towed/self-propelled broom per 750,000 sq. ft. of pavement)
Solid Material Spreader	9	←	(1 Solid Material Spreader per 750,000 sq. ft. of pavement)
Front End Loader	4	←	(1 Front End Loader per 500,000 sq. ft. of critical apron space)

NON-COMMERCIAL SERVICE

Minimum Recommended Items

	>10,000 ops	≤10,000 ops	Size	
High-Speed Rotary Plow	[redacted]			Tons/Hr.
Displacement Plow				Blade Ft.

NOTES:

[1] For commercial service airports, the Priority 1 areas should be identified in the airport's Snow and Ice Control Plan.

[2] Critical apron areas are assumed as 50%.

[3] Airports should have sufficient equipment to clear Priority 1 areas with 1 inch of snow weighing 25 lbs/cu ft within the recommended clearance time.

Rev Date: 02-24-16

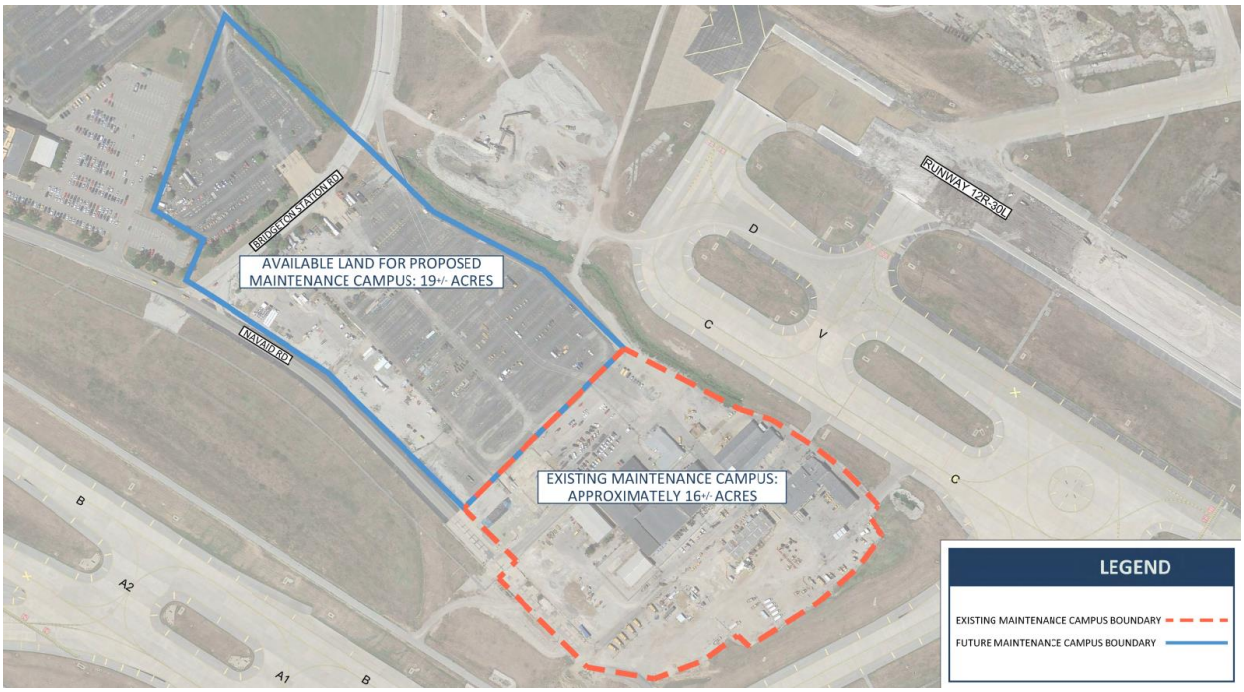
ALTERNATIVES DEVELOPMENT

This section reviews previous study findings and refines the preferred site layout based on the latest fleet information.

PREFERRED RELOCATION SITE

Figure 5E-13 depicts the existing AFM/SRE facilities and the 19-acre site to the northwest that is the preferred relocation site. Discussions with STLAA staff confirmed that this site is still the preferred relocation site.

Figure 5E-13: Existing Airfield Maintenance Campus and Available Site for Relocation



Source: Jacobsen Daniels, STL Planning On-Call Contract Task Order #6, 2016.

The preferred site offers the space needed to house modern airport maintenance equipment as well as modern SRE. Further, the preferred location is outside the planned relocation area for the Taxiway T project to address FAA Design standards, is outside of the planned location for a future consolidated West Deicing pad, and is at a higher elevation, eliminating existing flooding issues.

PROPOSED SITE LAYOUT OPTIONS

Option 1: Keep existing AFM Facilities, Build New SRE Areas

A 2013 JDA study, conducted as part of Planning Task Order 2 (TO2), focused specifically on constructing four new SRE buildings northwest of the existing AFM campus, while continuing to use the existing AFM buildings (offices, shops, storage, and crew support). In this study, JDA programmed the need for an additional 94,250 sq. ft. of buildings to house the airfield SRE alone. Combined with the existing AFM campus building space (134,000 sq. ft.), this yields a total building space needs of 228,250 sq. ft.

It should be noted that since 2013, when this study was conducted, the Airport has acquired nine additional multi-task vehicles, which would require approximately 30,000 sq. ft. of building space for storage (or a total building space for Option 1 of approximately 258,250 sq. ft.).

Option 2: Build New SRE and AFM Facilities to the Northwest (2016 fleet)

A subsequent study conducted by JDA in 2016 assessed three potential alternatives for relocating the entire AFM campus to accommodate all required buildings, while providing a well-configured space for large equipment cover and staging. These alternatives are depicted in **Figures 5E-14 through 5E-16**. Although each alternative proposed a different site configuration, all three alternatives proposed relocating the AFM/SRE facilities northwest of the existing site. The total building space needed in this alternative is 234,000 sq. ft.

It is not clear if, in this 2016 study, the nine additional multitask vehicles obtained by the Airport were accounted for. Most likely not since the required area was comparable to the 2013 study. If this study did not include these nine multi-task vehicles, an increase to the proposed building size of about 30,000 sq. ft. would be required (or a total building space of approximately 264,000 sq. ft.). This total building space requirement is similar to WSP's building space assessment of 258,000 sq. ft.

Option 3: Build New SRE Areas and AFM Facilities to the Northwest (2021 fleet)

WSP's calculated requirements for the AFM campus/SRE facilities are summarized:

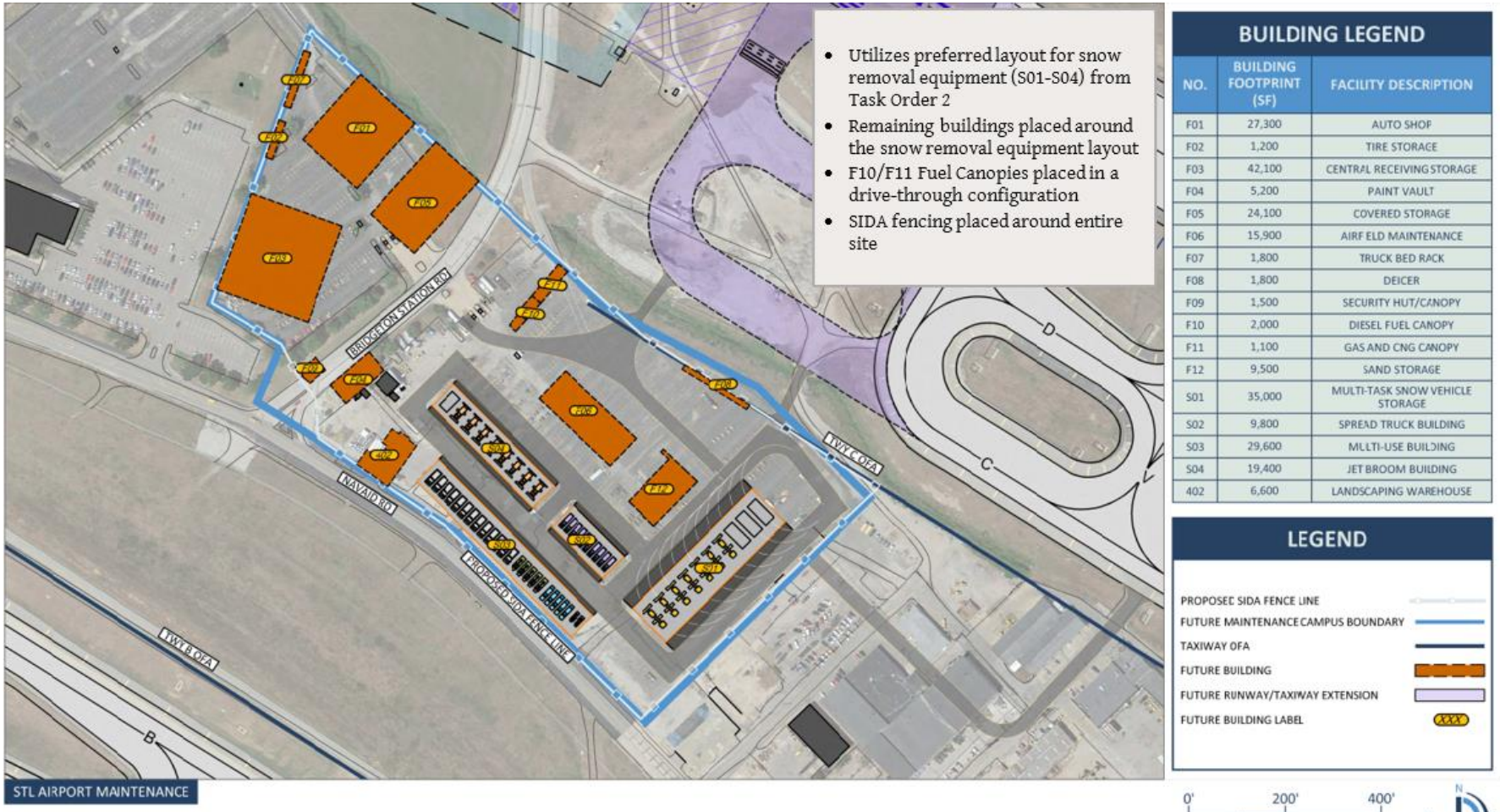
- 18-acre site
- building space needs of approximately 258,000 sq. ft., consisting of:
  - AFM building space of approximately 156,000 sq. ft.
  - SRE building space of approximately 102,000 sq. ft.

As part of the 2022 master planning effort, WSP refined the previous JDA studies and incorporated the latest SRE fleet data and building space requirements.

The previously identified site northwest of the existing AFM campus/SRE facilities, at 19 acres, meets the 18-acre size requirement calculated as part of this assessment. This site provides optimal airfield access and increases operational efficiency (equipment maneuverability and storage).

WSP developed two layout alternatives for the various AFM and SRE functions required through the planning horizon. The layouts are depicted on **Figures 5E-17** and **5E-18**.

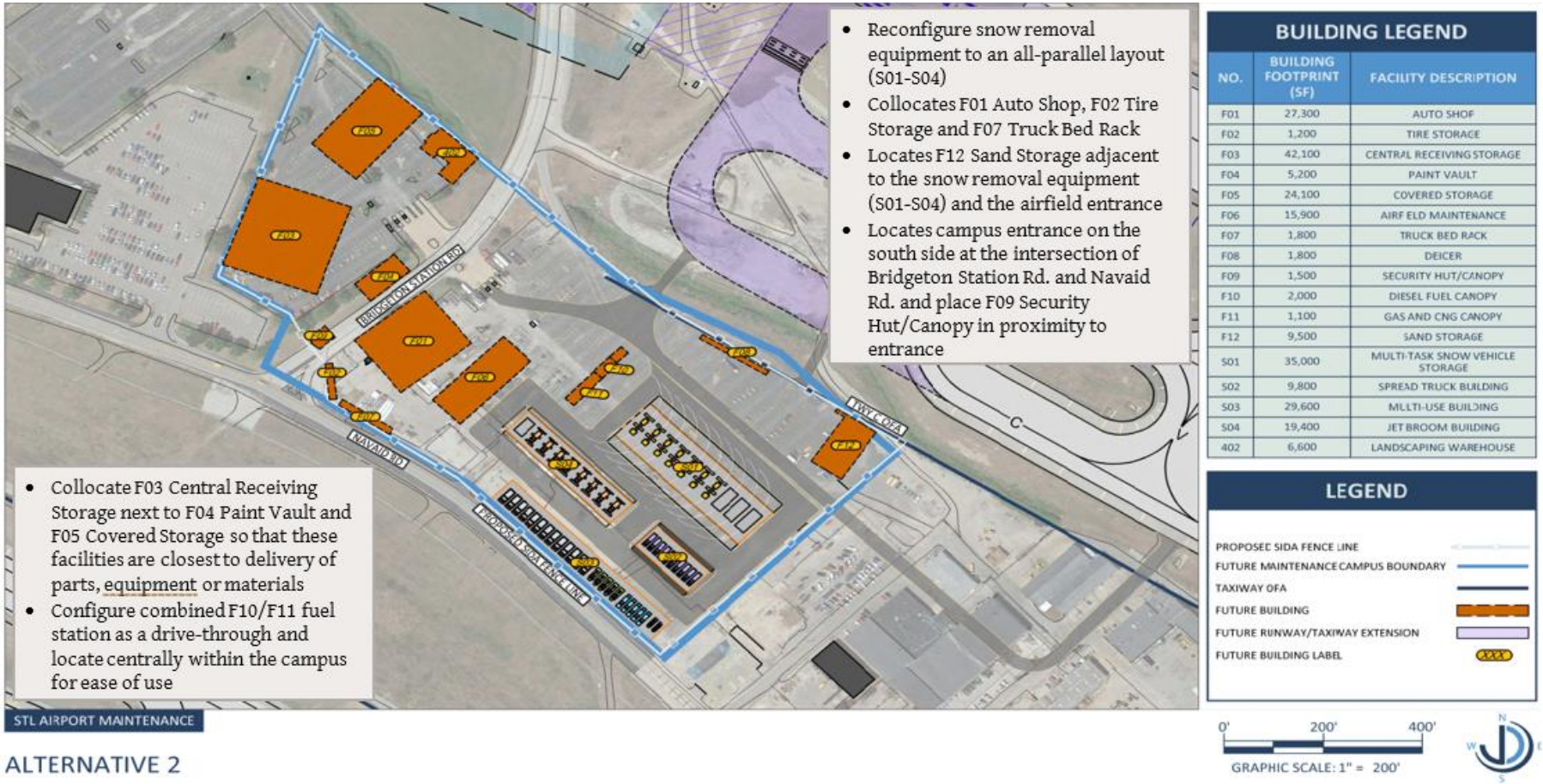
Figure 5E-14: Airfield Maintenance Campus Relocation – Site Layout Alternative 1 (JDA, 2016)



ALTERNATIVE 1

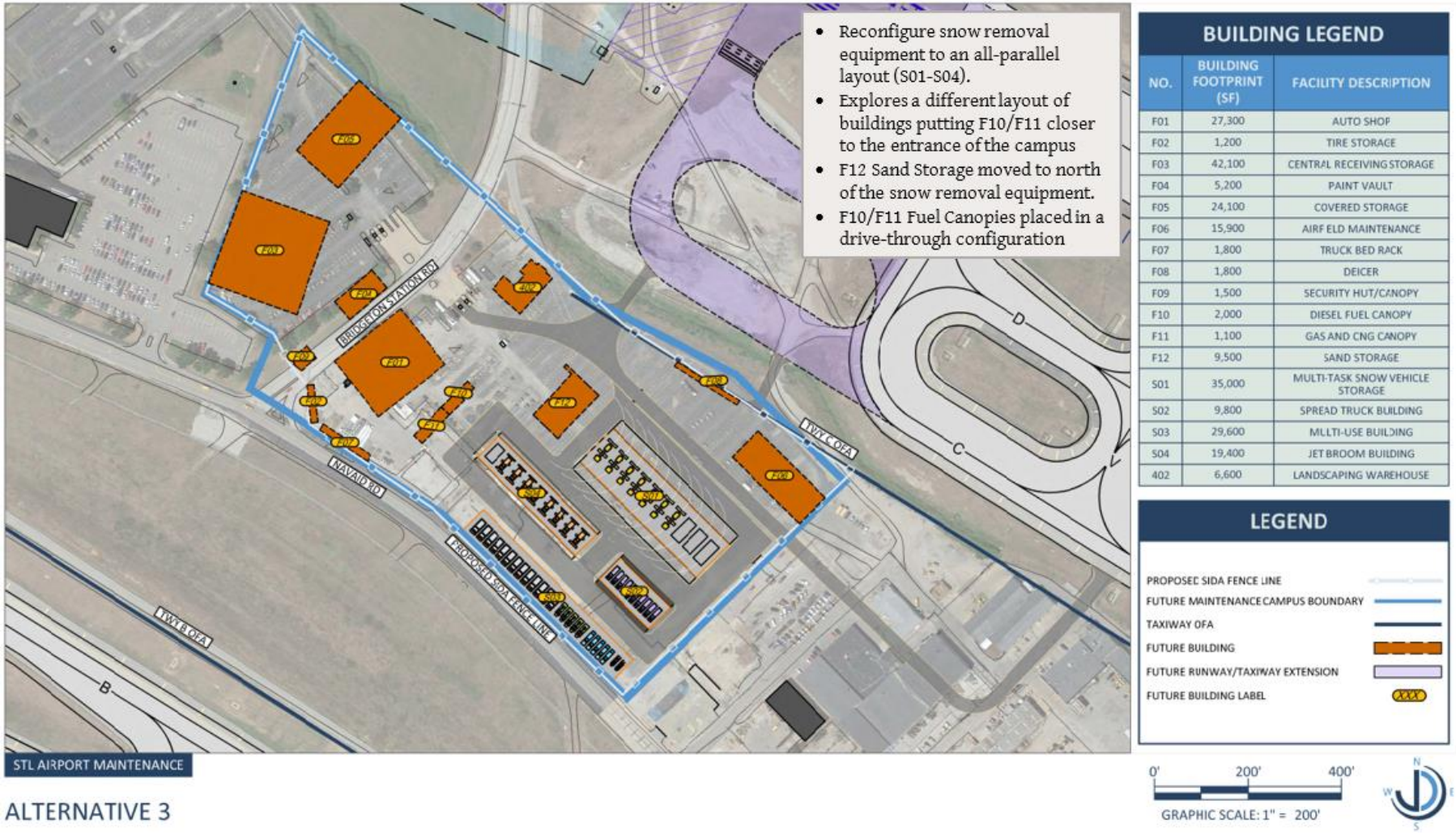
Source: Jacobsen Daniels, STL Planning On-Call Contract Task Order #6, 2016.

Figure 5E-15: Airfield Maintenance Campus Relocation – Site Layout Alternative 2 (JDA, 2016)



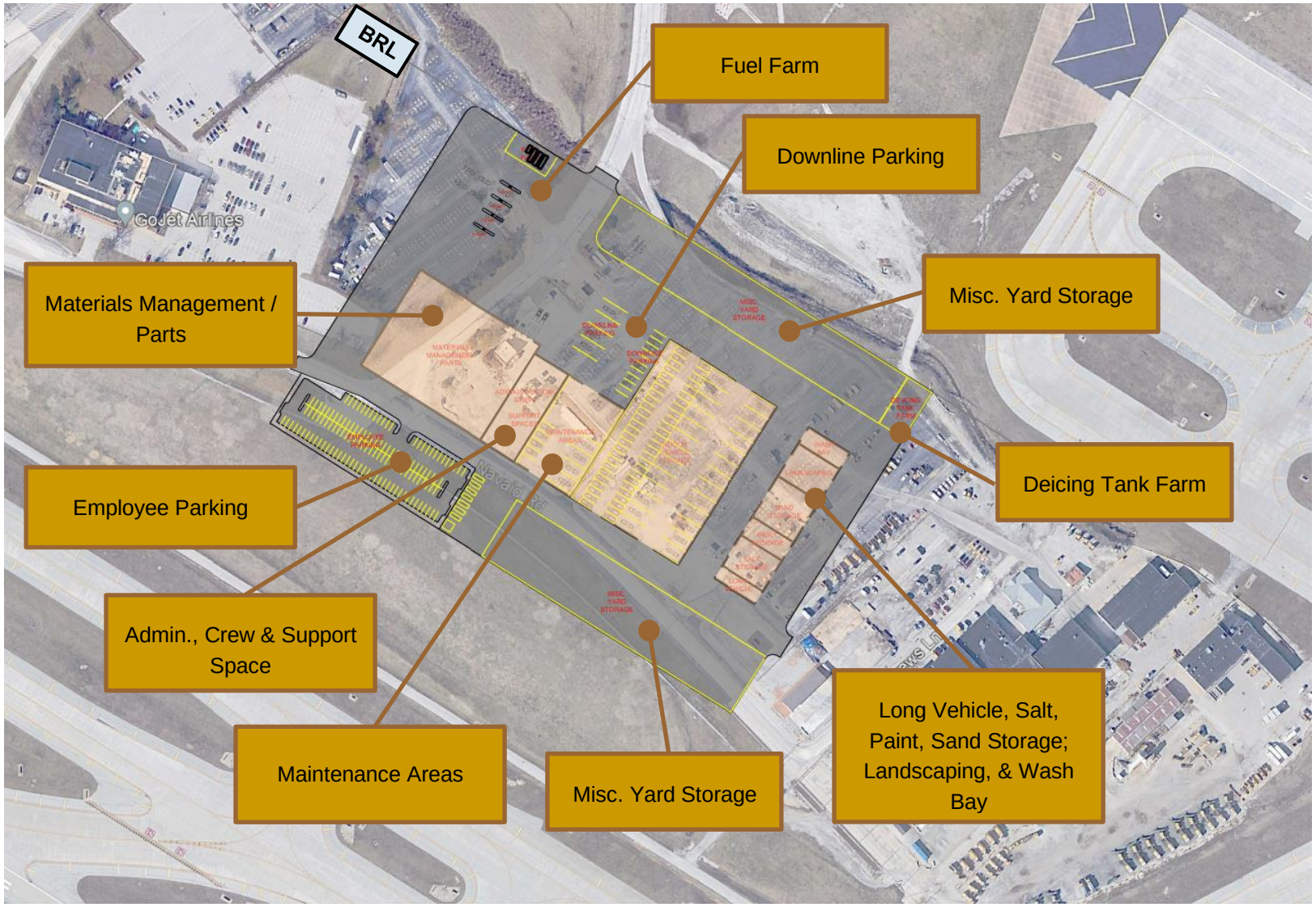
Source: Jacobsen Daniels, STL Planning On-Call Contract Task Order #6, 2016.

Figure 5E-16: Airfield Maintenance Relocation – Site Layout Alternative 3 (JDA, 2016)



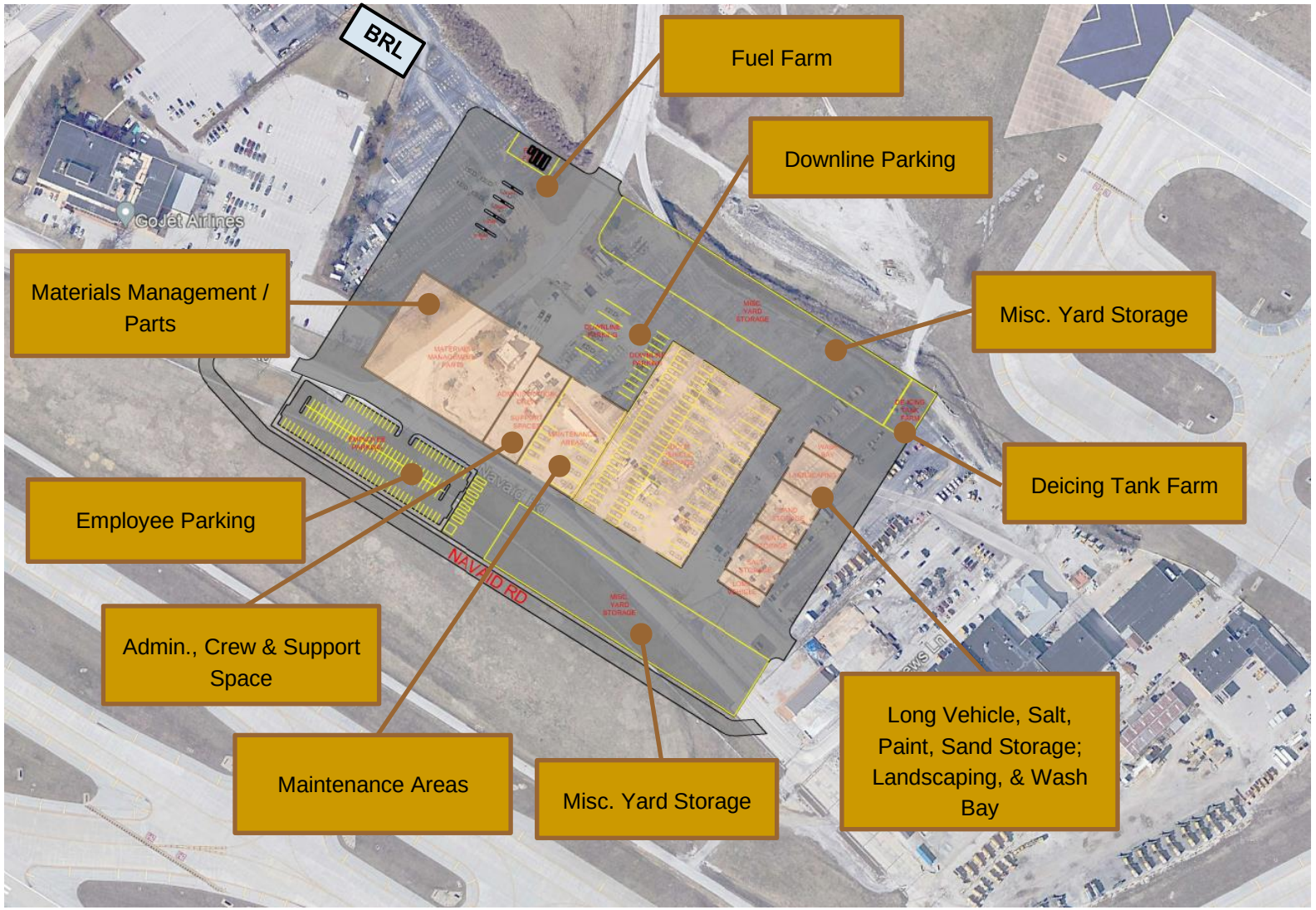
Source: Jacobsen Daniels, STL Planning On-Call Contract Task Order #6, 2016.

Figure 5E-17: Airfield Maintenance / Snow Removal Equipment Facilities Relocation - Site Layout Alternative 1 (WSP, 2022)



Source: WSP, USA, May 2022.

Figure 5E-18: Airfield Maintenance / Snow Removal Equipment Facilities Relocation - Site Layout Alternative 2 (WSP, 2022)



Source: WSP USA, May 2022.

Recommended Alternative

Of the three layout alternatives developed by JDA and the two layout alternatives developed by WSP, WSP's Alternative 1 (Figure 5E-17) is the recommended alternative, for the following reasons:

- It is most operationally efficient
- It is the smallest
- It will have a slightly lower overall cost
- It remains clear of the Runway 12R Approach Runway Protection Zone.
- It remains clear of future Taxiway T relocation and West Deicing Pad.

WSP's Alternative 1 takes the Navaid Rd. alignment through the relocated AFM/SRE facilities, rather than realigning it to the south (which would go through the existing berm), as in the case for WSP's Alternative 2. Realigning Navaid Rd does not provide additional benefits to justify the additional cost. Access to the east, through the AFM/SRE facilities is necessary for the future West Deicing Pad and its support functions, such as bulk material delivery, crew accessibility, etc.

5E.3 PROJECT DESCRIPTIONS AND NEEDS

Projects would be implemented in the following general order:

- Construct new AFM/SRE campus ($85M)
- Construct West Deicing Pad ($52M)
- Near-term taxiway improvements ($14M)
- Long-term taxiway improvements ($2M)
- Storm basins ($9M)

NEAR-TERM AIRFIELD MAINTENANCE CAMPUS RELOCATION

Description: Relocate the AFM/SRE campus to the northwest, adjacent to the future new consolidated deicing pad. This location was identified in past studies and was confirmed in the master plan.

Need: The relocation is required to address periodic flooding, as well as obsolete and undersized facilities. The preferred site in the master plan was also recommended previously and is consistent with the preferred new consolidated deicing pad location.

Cost: $85 Million

NEAR-TERM WEST DEICING PAD CONSTRUCTION

Description: Provide a new, larger, consolidated deicing pad west of existing Taxiway T, close to the runway ends Runways 12R and 29 departures. The master plan found this location to be ideal. Deicing pad ingress/egress will be provided by two north-south taxiways/taxilanes along the east and west sides of the pad. This configuration allows for the future closure of existing Taxiway T (at the end of its useful life), at

which time, crossfield airfield movements will be shifted to the easternmost taxiway along the new deicing pad (Future Taxiway T, see Figure 5E-3).

This site requires the relocation of the current AFM/SRE campus, but this facility is already being planned for relocation.

Need: The West Deicing Pad project is required for three reasons:

- Need for increased deicing capacity, which is required with or without terminal reconstruction
- Need to address the exceeded useful life of existing deicing pads' supporting infrastructure (glycol collection system)
- Need to improve operational inefficiency of the current multiple deicing pad locations, which are not convenient to the runway ends during southeast flow

Cost: $52 Million

NEAR-TERM TAXIWAY IMPROVEMENT PROJECTS

Description: Realign existing Taxiways U, T entrances to Runway 29 end, and Taxiways A and B entrances to the Runway 6 end.

Need: These projects are required to meet FAA airfield geometry standards (incursion prevention) and address non-standard intersection angles, complex geometry, and areas of expansive pavement (Runways 6/29 ends and Taxiways U/T/A/B).

Cost: $14 Million (Taxiway S1 costs are included in Taxiways T and S2 Realignment projects, as these would best be constructed as one package due to the phasing and safety area closures to implement them).

LONG-TERM TAXIWAY IMPROVEMENT PROJECT

Description: Close existing Taxiway T between Taxiways B and C, shorten east end of Taxiways A and B and extend north end of Taxiway S1. Even though these projects are on a longer timeline than the AFM/SRE and Deicing Pad projects, they are included here to show that planning for the near-term projects does not preclude the longer-term taxiway improvement projects.

Need: These projects will be implemented once the pavement's useful life is reached.

Cost: $2 Million.

STORM BASIN

Description: Construct a storm detention basin north of proposed Taxiway S2 and west of Runway 6-24

Need: Additional storm detention capacity is needed on the airfield

Cost: $4.8 Million

5E.4 IMPLEMENTATION SEQUENCE

Projects would be implemented in the following order:

- Construct new AFM/SRE (following NEPA evaluation and design)
- Construct West Deicing Pad (including taxiways along the eastern and western side of the deicing pad, (following NEPA evaluation and design, demolish AFM campus, route stormwater to the existing North Detention Basin, install new Glycol Collection System infrastructure)
- Long-term, once the pavements' useful lives will be reached, and reconstruction is required, remove existing Taxiways T, and U, A and B entrances to Runways 29 and 6 ends, and construct new 90-degree entrances to Runways 6 and 29 ends.

APPENDIX 8A – FAA SOP CHECKLIST

APPENDIX A. ALP REVIEW CHECKLIST

The following checklist shall be used in lieu of FAA AC 150/5070-6B, Appendix F, Airport Layout Plan Drawing set. This checklist is intended for use when submitting a new or updated ALP to the FAA for review and approval. Consultants and/or sponsors should indicate "Yes," "No" or "N/A" (not applicable) for every item on the checklist. The same checklist shall be provided to FAA for review and verification. For all reviewers: It is important that each item listed be shown on the respective plan.

Airport Identification (to be completed by Sponsor or Consultant)			
Airport	**St. Louis Lambert International Airport**		
City and State	**St. Louis, Missouri**	Location Identifier	**STL**
Airport Owner	**City of St. Louis, Missouri**		

ALP Submission Information (to be completed by Sponsor or Consultant)		
ALP Prepared by:	Crawford, Murphy & Tilly (CMT); WSP	
Name of Consulting Firm:	CMT; WSP	
Name of Individual:	Douglas Gregory (CMT); Jennifer Kuchinski (WSP)	3/31/2023
		Date
Telephone:	217-572-1119; 314-698-0974	
Email address:	dgregory@cmtengr.com; Jennifer.Kuchinski@wsp.com	
Consulting QA/QC Review	Craig Stankiewicz, Project Manager (CMT)	3/31/2023
	Name and Title of Individual	Date
Sponsor Review:	Gerald A. Beckmann, Airport Deputy Director	3/31/2023
	Name and Title of Individual	Date

FAA Review (to be completed by FAA)		
	Name and Title of Individual	Date

Critical Design Aircraft or Family of Aircraft:

	Make	Model	Annual Itinerant Operations
Existing	Boeing	767-300F/ER and 757-300	890
Future	Boeing	767-300F/ER and 757-300	1,404

Forecasted Year: 2040

Airport Reference Code (ARC): D-IV

Runway Design Code (RDC) & Runway Reference (RRC):

Runway	RDC	RRC
12L/30R	D-IV	D/VI/2400 D/V/1600
12R/30L	D-IV	D/IV/2400 D/V/2400
11	D-III	D/V/2400 D/IV/1600
29	D-III	D/V/2400 D/IV/2400
6	C-III	D/IV/2400 D/V/2400
24	C-III	D/IV/4000 D/V/4000

Approach Minimums:

Rwy End	Minimum	Rwy End	Minimum
12L	600	11	600
30R	600	29	2400
12R	2400	6	2400
30L	2400	24	4000

Runways (Existing and Future):

Runway	Existing		Future		Departure Surface (Y or N/A)
	Length (ft)	Width (ft)	Length (ft)	Width (ft)	
12L/30R	9013’	150’	Same	Same	Y
12R/30L	11,020’	200’	Same	150’	Y
11/29	9,000’	150’	Same	Same	Y
6/24	7,603’	150’	Same	Same	Y

Runway	Existing		Future		Departure Surface (Y or N/A)
	Length (ft)	Width (ft)	Length (ft)	Width (ft)	

For the balance of the checklist, enter a mark (✔ or X) to confirm inclusion.

A.1. Narrative Report

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Executive Summary – A concise summary of the findings/ recommendations of the master planning effort or changes to the ALP. This should include a description of planned projects, an implementation plan/timeline, and identification of benchmarks or actions that will be conducted to either verify the original planning assumptions or proceed with project implementation.	From AC 150/5070-6, Section 202: An accompanying ALP Narrative Report should explain and document those changes and contain at least the following elements: – Basic aeronautical forecasts. – Basis for the proposed items of development. – Rationale for unusual design features and/or modifications to FAA Airport Design Standards. – Summary of the various stages of airport development and layout sketches of the major items of development in each stage. – An environmental overview to document environmental conditions that should be considered in the identification and analysis of airport development alternatives and proposed projects.	✔ Reduced ALP Narrative Report serves this purpose			
1. Identify Projects along with description			✔		
2. Create a Timeline for each Project			✔		
3. Identify and List:					
a. Proposed Projects (e.g., Hangar development)			✔		
b. Milestones/ Triggering Events (e.g., 1. All hangars are full, 2. There is a waiting list long enough to fill a new development, 3. Hangars have reached their useful life, etc.)			✔		
c. Action items/Next Steps (e.g., 1. Maintain log and gather data, 2. Discuss plan with ADO, 3. Coordinate with ADO regarding potential for inclusion in FAA ACIP (Airports Capital Improvement Program), 4. Identify funding sources.)			✔		
d. Funding Plan	Capital Improvement Plan for the forecast horizons. See AC 150/5070-6, Chapter 11. Only a rough, order-of-magnitude report is needed in the executive summary.		✔		

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
B. Basic aeronautical forecasts (0-5, 6-10, 11-20 years): Basic aeronautical forecasts (0-5, 6-10, 11-20 years):	Forecasts of future levels of aviation activity as approved by the FAA. These projections are used to determine the need for new or expanded facilities. See AC 150/5070-6, Chapter 7.	✔			
1. Total annual operations	Total local and itinerant aircraft operations at the airport.	✔			
2. Annual itinerant operations by all aircraft	Itinerant operations by aircraft that leaves the local airspace, generally 25 miles or more from the airport. See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.	✔			
3. Annual itinerant operations by current critical aircraft		✔			
4. Annual itinerant operations by future critical aircraft		✔			
5. Number of based aircraft	Aircraft that use the subject airport as a home base, i.e., have hangar or tie-down space agreements. See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.	✔			
6. Annual instrument approaches	Number of instrument approaches expected to be executed during a 12-month period. See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.	✔			
7. Number of enplanements	See AC 150/5070-6, Chapter 7, Section 702.a. and Figure 7-2.	✔			

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
8. Critical Aircraft (also referred as "design aircraft" or "critical design aircraft)	The critical aircraft is the most demanding aircraft identified in the forecast that will use the airport. Federally funded projects require that the critical aircraft will make substantial use of the airport in the planning period. Substantial use means either 500 or more annual itinerant operations or scheduled service. The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. Provide the aircraft, AAC, and ADG. (e.g. Boeing 737-400, C-III) See AC 150/5300-13A, Paragraph 105(b) and FAA Order 5090.3C, 3-4.	✔			
9. Runway Design Code (RDC)	Describe the RDC for each runway. For the purpose of airport geometric design, each runway will contain a RDC which signifies the design standards to which the runway is to be built. The RDC consists of three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG) and the approach visibility minimums. These parameters represent the aircraft that are intended to be accommodated by the airport, regardless of substantial use. See AC 150/5300-13A, Paragraph 105(c).	✔			
10. Runway Reference Code (RRC)	Describe the RRC for each runway. The RRC describes the current operational capabilities of a runway where no special operating procedures are necessary. The RRC consists of the same three components as the RDC, but is based on planned development and has no operational application. See AC 150/5300-13A, Paragraph 318.	✔			
C. Alternatives/Proposed Development					

Narrative Report					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
11. Explanation of proposed development items	Specific projects can be described as project listings on a master table, on individual project data sheets, or in projects booklets.	✔			
12. Discuss near-term and future Approach Procedure Requirements or effects (e.g., LPV, Circling, etc.)	Based on existing or forecast usage. See FAA Order 7400.2, Figures 6-6-3 and 6-3-9.	✔			
13. Navigational Aids or Other Equipment Needs (e.g., Approach Lights, Wind Cones, AWOS, etc.)	The need for new or additional navigational aids is a function of the fleet mix, the percentage of time that poor weather conditions are present, and the cost to the users of not being able to use the airport while it is not accessible.	✔			
14. Wind coverage. Is it adequate for existing and future runway layouts? Has wind data been updated?	This analysis determines if additional runways are needed to provide the necessary wind coverage. Reference AC 150/5300-13A, Appendix 2 for guidance on wind coverage analysis techniques.		✔		
D. Modification to Standards.	Any approved nonconformance to FAA standards, other than dimensional standards for RSAs and OFZs, require FAA approval. A description of all approved modification to standards shall be provided. See AC 150/5300-13A, Paragraph 106(b) and FAA Order 5300.1.		✔		
E. Obstruction Surfaces (14 CFR Part 77 and Threshold Siting Surface)	Reference 14 CFR Part 77 and AC 150/5300-13A, Paragraph 303.	✔			
F. Runway Protection Zone	A description of any incompatible land uses inside the RPZ shall be provided. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310 and FAA memorandum dated September 27, 2012.	✔			

Narrative Report					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
G. Development summary (including sketches, schedules, and cost estimates) for stages of construction for: Development summary (including sketches, schedules, and cost estimates) for stages of construction for:	Documentation provided should include any electronic spreadsheets and files to facilitate in modifying the financial plan on an as-needed basis.		✔		
15. Development Projects Completed Since Last ALP			✔		
16. 0-5 years			✔		
17. 6-10 years			✔		
18. 11-20 years			✔		
H. Shadow or line-of-sight study for towered airports (negative or positive statements are required).	Reference FAA Order 6480.4. This can be from the Airway Facilities Tower Integration Laboratory (AFTIL) or simpler GIS-generated studies.		✔		
I. Letters of coordination with all levels of government, as needed.	Affected private and/or governmental groups, agencies, commissions, etc., that may have input on the plans. See AC 150/5070-6, Chapter 3.		✔		
J. Wildlife Hazard Management Issues Review (in narrative).	Reference AC 150/5200-33.		✔		
K. Preliminary Identification of Environmental Features	Potential or known features only. Further environmental analysis will be necessary. Reference FAA Order 5050.4B. Begin framework for NEPA analysis.		✔		
19. Major airport drainage ditches					
20. Wetlands					
21. Flood Zones					
22. Historic or Cultural features					
23. Section 4(f) features					

Narrative Report					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
24. Flora/Fauna					
25. Natural Resources					
26. Etc. (other features identified in Order 5050.4B)					
L. Note Action Items from Runway Safety Program Office	List and note status of items from Runway Safety Program Office or Runway Safety Action Plan.			✔	
M. Declared Distance (DD)	The narrative on declared distances is used to aid in understanding the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distances performance requirements for turbine powered aircraft. The narrative shall also provide clarification on why declared distances have been implemented. Declared distances data must be listed for all runway ends. The TORA, TODA, ASDA, and LDA will be equal to the runway length in cases where a runway does not have displaced thresholds, stopways, or clearway, and have standard RSAs, ROFAs, RPZs, and TSS. Reference AC 150/5300-13A, Paragraph 323.	✔			

Remarks

Timeline for projects depicted on the ALP will be provided as part of the Master Plan materials.

Funding plan will be presented in the Master Plan report materials.

Forecast information presented in summary within this ALP Narrative document. The FAA approved Forecast Working Paper is included in the Master Plan materials.

Facility requirements & development needs/implementation timeline are identified in the Master Plan materials.

Wind coverage and Modification to Standards (MOS) details can be found in the Master Plan materials.

Letters of Coordination, environmental features and impacts, and wildlife hazards can be found in the master plan materials.

Line-of-sight impacts are being studied under the advanced planning contract.

A.2. Title Sheet

- The scale of the Title Sheet should be developed to include the items listed below.
- The minimum size for the final drawing set is 22" X 34" (ANSI D) and 24" X 36" (ARCH D). Coordinate use of 34" x 44" (ANSI E) and 26" X 48" (ARCH E) with FAA. Color drawings may be acceptable if they are still usable if reproduced in grey scale.

Title Sheet					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
A. Title and revision blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Airport sponsor approval block	Provide an approval block for the sponsoring authority's representative to sign. Include space for name, title, and date.	✔			
C. Date of ALP (date the airport sponsor signs the ALP)	The month and year of signature prominently shown near the title.	✔			
D. Index of sheets (including revision date column)	Airport Layout Drawing, Airport Airspace Drawing, Inner Portion of the Approach Surface Drawing, Terminal Area Drawing, Land Use Drawing, Airport Property Map, Airport Departure Surface, etc.	✔			
E. State Aeronautics Agency Approval Block (as needed)	Provide an approval block for the sponsoring authority's representative to sign. Include space for name, title, and date.			✔	
F. State outline with county boundaries. County in which airport is located should be highlighted.	Provide as needed.	✔			
G. Location map (general area)		✔			
H. Vicinity map (specific airport area)		✔			
Remarks					

A.3. Airport Data Sheet

- For smaller airports, some of the ALP sheets may be combined if practical and approved FAA.

Airport Data Sheet						
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Wind Rose (all weather and IFR) with appropriate airport reference code and runway orientation depicted, crosswind coverage, and combined coverage, source of wind information and time period covered (for IFR runways applicable minimums should be included):	Assembly and analysis of wind data to determine ultimate runway orientation and also provides the operational impact of winds on existing runways. If instrument procedures are present or will be requested then both all-weather and instrument meteorological condition wind roses are required. See AC 150/5300-13A, Appendix 2.	✔			
1. 10.5, 13, 16, 20 knots wind rose (based on appropriate airport reference code)	When a runway orientation provides less than 95 percent wind coverage for any aircraft forecasted to use the airport on a regular basis, a crosswind runway is recommended. The 95 percent wind coverage is computed on the basis of the crosswind not exceeding 10.5 knots for Airport Reference Codes A-I and B-I, 13 knots for Airport Reference Codes A-II and B-II, 16 knots for Airport Reference Codes A-III, B-III, and C-I through D-III, and 20 knots for Airport Reference Codes A-IV through D-VI. See also AC 150/5300-13A, Paragraph 302(c)(3) and AC 150/5300-13A, Appendix 2.	✔			
2. Percentage of wind coverage/crosswind		✔			
3. Source of data	Wind data may be obtained from NOAA at http://www.ncdc.noaa.gov/ Reference AC 150/5300-13A, Appendix 2, Paragraph A2-5 and A2-6.	✔			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
4. Age of data (last 10 consecutive years of data with most current data no older than 10 years)	Data must be from the latest 10-year period from the reporting station closest to the airport. Reference AC 150/5300-13A, Appendix 2, Paragraph A2-5.	✔			
C. Airport Data Table					
1. ARC for Airport	List the Airport Reference Code (ARC) for airport. 5300-13AARC is an airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. Reference AC 150/5300-13A.	✔			
2. Mean maximum temperature of hottest month	List the mean maximum temperature and the hottest month for the airport location as listed in "Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree-Days" (Climatography of the United States No. 81). See AC 150/5325-4, 506.b.	✔			
3. Airport elevation (highest point of the landing areas, nearest 0.1 foot) – using North American Vertical Datum of 1988 (NAVD88)	List the Airport Elevation, the highest point on an airport's usable runway expressed in feet above mean sea level (MSL). Use NAVD88. Reference AC 150/5300-13A, Paragraph 102(g) All elevations shall be in NAVD88. A note shall be put on the Airport Layout Drawing that denotes that the NAVD88 vertical control datum was used.	✔			
4. Airport Navigational Aids, including ownership (NDB, TVOR, ASR, Beacon, etc.)	List the electronic aids available at the airport.	✔			

Airport Data Sheet					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
5. Airport reference point coordinates, nearest second (existing, future if appropriate, and ultimate) - NAD83	List the Airport Reference Point, the latitude and longitude of the approximate center of the airport. Use the North American Datum of 1983 (NAD83) coordinate system. See AC 150/5300-13A, Paragraph 207. All latitude/longitude coordinates shall be in NAD83. A note shall be put on the Airport Layout Drawing that denotes that the NAD83 coordinate system was used.	✔			
6. Miscellaneous facilities (taxiway lighting, lighted wind cone(s), AWOS, etc.) [Including type/model and any facility critical areas]	List any other facilities available at the airport.	✔			
7. Airport Reference Code and Critical Aircraft (existing & future)	List the existing and ultimate Airport Reference Code and Critical Aircraft, the most demanding aircraft identified in the forecast that will use the airport. Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes. See AC 150/5325-4, 102.a.(8) and AC 150/5070-6, 702.a. Indicated dimensions for wingspan and undercarriage, along with approach speed.	✔			
8. Airport magnetic variation, date and source	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	✔			
9. NPIAS service level (GA, RL, P, CS, etc.)	See FAA Order 5090.3C.	✔			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
10. State equivalent service role	As applicable pursuant to State Aviation Department System Plan.			✔	
D. Runway Data Table	The Runway Data Table should show information for both existing and ultimate runways.				
1. Runway identification (Include identifying runways that are “utility”)	A column for each runway end should be present. List the runway end number and if pavement strength is less than 12,500 pounds (single-wheel), then note as utility.	✔			
2. Runway Design Code (RDC)	5300-13AThe first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics); whichever is more restrictive. The third component relates to the visibility minimums expressed by RVR values in feet of 1200, 1600, 2400, and 4000. List the RDC for each runway. See AC 150/5300-13A, Paragraph 105(c).	✔			
3. Runway Reference Code (RRC)	The RRC describes the current operational capabilities of a runway where no special operating procedures are necessary. Like the RDC, it is composed of three components: AAC, ADG, and visibility minimums. List the RRC for each Runway. See AC 150/5300-13A, Paragraph 318.			✔ Replaced with APRC and DPRC	
4. Pavement Strength & Material Type	Indicate the runway surface material type, e.g., turf, asphalt, concrete, water, etc.	✔			
a. Strength by wheel loading	List the existing and ultimate design strength of the landing surface. See AC 150/5320-6, Chapter 3.	✔			
b. Strength by PCN	See AC 150/5335-5.	✔			

Airport Data Sheet					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
c. Surface treatment	Note any surface treatment: grooved, PFC, etc.	✔			
5. Effective Runway Gradient (%) Author to note maximum grade within runway length. Note to included statement that the runway meets line of sight requirements	List the maximum longitudinal grade of each runway centerline. See AC 150/5300-13A, Paragraph 313.	✔			
6. Percent (%) Wind Coverage (each runway)	List the percent wind coverage for each runway for each Aircraft Approach Category. See AC 150/5300-13A, Appendix 2.	✔			
7. Runway dimensions (length and width)	Dimensions determined for the Critical Design Aircraft by using graphical information in AC 150/5325-4.	✔			
8. Displaced Threshold	Provide the pavement elevation of the runway pavement at any displaced threshold. See AC 150/5300-13A, Paragraph 303(2).	✔			
9. Runway safety area dimensions (actual existing and design standard)	List the existing and ultimate dimensions of the Runway Safety Area (RSA). See AC 150/5300-13A, Paragraph 307.	✔			
10. Runway end coordinates (NAD83) (include displaced threshold coordinates, if applicable) to the nearest 0.01 second and 0.1 foot of elevation.	Show the latitude and longitude of the threshold center and end of pavement (if different) to the nearest .01 of a second and 0.1 foot of elevation.	✔			
11. Runway lighting type (LIRL, MIRL, HIRL)	List the existing and ultimate type of runway lighting system for each runway, e.g., Reflectors, Low Intensity Runway Lighting (LIRL), Medium Intensity Runway Lighting (MIRL), or High Intensity Runway Lighting (HIRL). LIRLs will typically not be shown for new systems. See AC 150/5340-30, Ch. 2.	✔			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
12. Runway Protection Zone (RPZ) Dimensions	List the existing and ultimate Runway Protection Zone (RPZ) dimensions. See AC 150/5300-13A, Paragraph 310. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310 and FAA memorandum dated September 27, 2012.	✔ Includes ARPZ and DRPZ			
13. Runway marking type (visual or basic, non-precision, precision)	Indicate the existing and ultimate pavement markings for each runway. See AC 150/5340-1, Section 2.	✔			
14. 14 CFR Part 77 approach category (50:1; 34:1; 20:1) Existing and Future	List the existing and ultimate approach surface slope. See FAA Order 7400.2, Figures 6-6-3 and 6-3-9.	✔			
15. Approach Type (precision, non-precision, visual)	List the existing and ultimate Part 77 Approach Use Types. See FAA Order 7400.2, Figures 6-6-3 and 6-3-9.	✔			
16. Visibility minimums (existing and future)	List the existing and ultimate visibility minimums for each runway. See AC 150/5300-13A, Table 1-3.	✔			
17. Type of Aeronautical Survey Required for Approach (Vertically Guided, not Vert. Guided)	List the type of aeronautical survey required for the visibility minimums given. See AC 150/5300-18, Section 2.7 and AC 150/5300-13A, Table 3-4 and Table 3-5.	✔			
18. Runway Departure Surface (Yes or N/A)"	Determine applicability of 40:1 Departure Obstacle Clearance Surface (OCS) as defined in Paragraph 303(c) of AC 150/5300-13A.	✔			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
19. Runway Object Free Area	List the existing and ultimate dimensions of the Runway Object Free Area (OFA). See AC 150/5300-13A, Paragraph 309. Objects non-essential for air navigation or aircraft ground maneuvering purposes must not be placed in the ROFA, unless a modification to standard has been approved.	✔			
20. Obstacle Free Zone	The OFZ clearing standard precludes aircraft and other object penetrations, except for frangible NAVAIDs that need to be located in the OFZ because of their function. Modification to standards does not apply to the OFZ. List the Runway OFZ, Inner-approach OFZ, Inner-transitional OFZ, and Precision OFZ if applicable.	✔			
21. Threshold siting surface (TSS)	List the existing and ultimate threshold siting surface (i.e. approach and departure surfaces). Identify any objects penetrating the surface. If none, state “No TSS Penetrations”. Reference AC 150/5300-13A, Paragraph 303.	✔			
22. Visual and instrument NAVAIDs (Localizer, GS, PAPI, etc.)	List the existing and ultimate visual navigational aids serving each runway.	✔			
23. Touchdown Zone Elevation	List the highest runway centerline elevation in the existing and ultimate first 3000 feet from landing threshold. See FAA Order 8260.3, Appendix 1.	✔			
23. Taxiway and Taxilane width	List the existing and ultimate width of the taxiways and taxilane. Reference AC 150/5300-13A, Paragraph 403 and Table 4-2.	✔			
24. Taxiway and Taxilane Safety Area dimensions	List the existing and ultimate taxiway and taxilane safety area dimensions. Reference AC 150/5300-13A, Paragraph 404(c) and Table 4-1.	✔			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
25. Taxiway and Taxilane Object Free Area	List the existing and ultimate taxiway and taxilane object free area dimensions. Reference AC 150/5300-13A, Paragraph 404(b) and Table 4-1.	✔			
26. Taxiway and Taxilane Separation	List any objects located inside the Taxiway/Taxilane Safety Area and Taxiway/Taxilane Object Free Area. Also provide the distance from the taxiway/taxilane centerline to the fixed or movable object. Reference Paragraph 404(a) and Table 4-1.	✔			
27. Taxiway/Taxilane lighting	List the existing and ultimate type of taxiway lighting system, e.g., Reflectors, Low Intensity Taxiway Lighting (LITL), Medium Intensity Taxiway Lighting (MITL), or High Intensity Taxiway Lighting (HITL). LITLs will typically not be shown for new systems. See AC 150/5340-30, Chapter 4.	✔			
28. Identify the vertical and horizontal datum	All latitude/longitude coordinates shall be in North American Datum of 1983 (NAD 83). A note shall be put on the Airport Layout Drawing that denotes that the NAD 83 coordinate system was used. All elevations shall be NAVD88. A note shall be put on the Airport Layout Drawing that denotes that the NAVD88 vertical control datum was used.	✔			
E. Modification to Standards Approval Table (if applicable, a separate written request, including justification, should accompany the modification to standards). Show: Approval Date/ Airspace Case No. / Standard to be Modified / Description	Provide a table to list all FAA approved Modifications to Standards. See AC 150/5300-13A, Paragraph 106(b), and FAA Order 5300.1. List “None Required” on the table if no Modifications have yet been proposed or approved.	✔			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
F. Declared Distances Table	Required even if Declared Distances are not in effect. Declared distances are only to be used for runways with turbine-powered aircraft. The TORA, TODA, ASDA, and LDA will be equal to the runway length in cases where a runway does not have displaced thresholds, stopways, or clearways, and have standard RSAs, ROFAs, RPZs, and TSS. Reference AC 150/5300-13A, Paragraph 323.	✔			
1. Take Off Run Available (TORA)	List the runway length declared available and suitable for the ground run of an airplane taking off, i.e., Take Off Run Available (TORA). The TORA may be reduced such that it ends prior to the runway to resolve incompatible land uses in the departure RPZ, and/or to mitigate environmental effects. Reference AC 150/5300-13A, Paragraph 323(d)(1).	✔			
2. Take Off Distance Available (TODA)	List the length of remaining runway or clearway (CWY) beyond the far end of the TORA ADDED TO the TORA. The resulting sum is the Take Off Distance Available (TODA) for the runway. The TODA may be reduced to mitigate penetrations to the 40:1 instrument departure surface, if applicable. The TODA may also extend beyond the runway end through the use of a clearway Reference AC 150/5300-13A, Paragraph 323(d)(2).	✔			
3. Accelerate Stop Distance Available (ASDA)	5300-13A List the length the length of runway plus stopway (if any) declared available and suitable for satisfying accelerate-stop distance requirements for a rejected takeoff. Additional RSA and ROFA can be obtained by reducing the ASDA. Reference AC 150/5300-13A, Paragraph 323(d)(3).	✔			

Airport Data Sheet					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
4. Landing Distance Available (LDA)	5300-13A List the length of runway declared available and suitable for satisfying landing distance requirements. The LDA may be reduced to satisfy the approach RPZ, RSA, and ROFA requirements. Reference AC 150/5300-13A, Paragraph 323(e).	✔			
G. Legend	Provide a Legend that identifies all symbols and line types used on the drawing. Lines must be clear and readable with sufficient scale and quality to discern details.	✔			
Remarks					

A.4. Airport Layout Plan Drawing

- For smaller airports, some of the ALP sheets may be combined if practical and approved by FAA.
- Two, or more, sheets may be necessary for clarity, existing and proposed. The reviewer should be able to differentiate between existing, future, and ultimate development. If clarity is an issue, some features of this drawing may be placed in tabular format. North should be pointed towards the top of the page or to the left. (scale 1"=200' to 1"=600')

Airport Layout Plan Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Space for the FAA approval stamp	Leave a blank four-inch by four-inch area for the FAA approval stamp.	✔			
C. Layout of existing and proposed facilities and features:	To assure full consideration of future airport development in 14 CFR Part 77 studies, airport owners must have their plans on file with the FAA. The necessary plan data includes, as a minimum, planned runway end coordinates, elevation, and type of approach for any new runway or runway extension. See AC 150/5300-13A, Paragraph 106.	✔			
1. True and magnetic North arrow with year of magnetic declination	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	✔			
2. Airport reference point – locate by symbol a Lat./Long. To nearest second (existing, future, and ultimate) NAD 83	List the Airport Reference Point, the latitude and longitude of the approximate center of the airport. Use the NAD 83 coordinate system. See AC 150/5300-13A, Paragraph 207.	✔			
3. Wind cones, segmented circle, beacon, AWOS, etc.	Show as applicable pursuant to AC 150/5300-13A, Chapter 6.	✔			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
4. Contours (showing only significant terrain differences)	Topography, budget, and future uses of the base mapping, will dictate what intervals of topographical contours to use on the maps. Topographic issues may be important in the alternatives analysis, which may require that reduced contour intervals be used. See AC 150/5070-6, 1005.	✔			
5. Elevations: All NAVD88	All latitude/longitude coordinates shall be in NAD83/NAVD88.	✔			
a. Runway – existing, future, and ultimate ends (nearest 0.1 ft.)	Show the latitude and longitude of the threshold center and end of pavement.	✔			
b. Touchdown Zone Elevation (highest point in first 3,000 ft. of runway)	List the highest runway centerline elevation in the existing and ultimate first 3000 feet from landing threshold. See FAA Order 8260.3, Appendix 1.	✔			
c. Runway high/low points (existing and future)	For all runways identify high and low points (centerline) and provide elevation information.	✔			
d. Label runway/runway intersection elevations	Label the pavement elevation of runway intersections where the centerlines cross.	✔			
e. Displaced Thresholds (if any)	Label the pavement elevation and coordinates of the runway pavement at any displaced threshold. See AC 150/5300-13A, Paragraph 303(a)(2).	✔			
f. Roadways & Railroads (where they intersect Approach surfaces, the extended runway centerline, and at the most critical points)	Provide elevation information for the traverse ways' centerline elevation where they intersect the Part 77 Approach surfaces (existing and ultimate). Note whether this elevation is the actual elevation or the traverseway elevation plus the traverseway adjustment (23' for railways, 17' for interstate highways, 15' for other public roads, or 10' for private roads). See also 14 CFR Part 77.		✔ *Identified by runway on individual approach sheets*		

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
g. Structures, Buildings, and Facilities	All buildings on the Airport Layout Drawing should be identified by an alphanumeric character. List these identifiers in a table and give a description of the building. If no Terminal Area drawing is done, also include the top of structure elevation in MSL. If any of the structures violate any airport or approach surfaces give an ultimate disposition to remedy the violation. Don't forget navigation aid shelters, AWOS/ASOS, RVRs, PAPIs, Fueling systems, REILs, etc. Also identify the structure use (hangar, FBO, crew quarters, etc.), as needed. Some lesser objects may be identified by symbols in the legend.	✔			
h. Define features to include: trees streams, water bodies, etc.	Provide information and delineate trees, streams, water bodies, etc., on or near airport property and approach surfaces.	✔			
6. Runway Details					
a. Runway Design – runway length, runway width, shoulder width, blast pad width, blast pad length, and cross wind component. (existing, future, and ultimate)	AC 150/5325-4 describes procedures for establishing the appropriate runway length. AC 150/5300-13A, Table 3-4 and Table 3-5 provides the minimum runway length. AC 150/5300-13A, Table 3-8 provides the standard dimensions of the runway width, shoulder width, blast pad width, blast pad length, and crosswind component based on RDC. Clearly denote the runway numbers at the thresholds. Show location of existing and future threshold lights.	✔ *Dimension included on Data Table Sheet for readability on ALD*			
b. Orientation – true bearing to nearest 0.01 second (and runway numbers)	Show the true bearing to the nearest .01 of a degree of the runway centerline.	✔			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
c. End Coordinates – existing, future, and ultimate degrees, minutes, seconds (to the nearest 0.01 second)	Show the latitude and longitude of the threshold center and end of pavement (if different) to the nearest .01 of a second.	✔			
d. Runway Safety Areas (RSA) – actual, existing, future, and ultimate (including dimensions)	Show the extents of the existing and ultimate RSA 5300-13A. Reference AC 150/5300-13A, Paragraph 307.	✔			
e. Runway Object Free Areas (ROFA)	Show the extents of the existing and ultimate ROFA. Reference AC 150/5300-13A, Paragraph 309.	✔			
f. Precision Obstacle Free Zone (POFZ)	Show the extents of the existing and ultimate POFZ. Reference AC 150/5300-13A, Paragraph 308(d).	✔			
g. Obstacle Free Zone (OFZ)	Show the extents of the existing and ultimate OFZ. Reference AC 150/5300-13A, Paragraph 308.	✔			
h. Clearways and Stopways	Show any/all clearways and stopways/overruns and the markings used to denote these areas. See AC 150/5300-13A, Paragraph 311 and 312; and AC 150/5340-1, Section 2, Paragraph 14.			✔	
i. Runway Protection Zone (RPZ) - Dimensions (existing, future, and ultimate)	Show existing and ultimate RPZ. See AC 150/5300-13A, Paragraph 310. Show the existing and ultimate protective area/zone type of ownership. Identify any incompatible objects and activities inside the RPZ. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310 and FAA memorandum dated September 27, 2012.	✔			

Airport Layout Plan Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
j. 14 CFR Part 77 Approach Surfaces	Show the portion of the existing and ultimate approach surfaces that are over airport and adjacent property and identify the approach surface dimensions and slope. See FAA Order 7400.2, Figure 6-3-9.	✔			
k. Threshold Siting Criteria: Approach/Departure Surface (existing, future, and ultimate) 5300-13A	Determine and identify pursuant to AC 150/5300-13A, Paragraph 303(b) and 303(c).	✔			
l. Terminal Instrument Procedures (TERPS)surface and TERPS GQS, if applicable.	Determine and identify pursuant to AC 150/5300-13A, Paragraph 303(a)(4)(a), Table 3-4, and Table 3-5. Reference FAA Order 8260.3.	✔			
m. Navigation Aids (NAVAIDS) – PAPI, ILS, GS, LOC, ALS, MALSR, REIL, etc., (plus facility critical area's)	Show all NAVAIDS and provide clearance distances from runways, taxiways, etc. Reference AC 150/5300-13A, Chapter 6.	✔			
n. Marking – thresholds, hold lines, etc.	Show on the runway the type and location of markings, existing and ultimate. See AC 150/5340-1, Section 2.	✔			
o. Displaced threshold coordinates and elevation	Show the latitude, longitude, and the pavement elevation of the runway pavement at any displaced threshold. See AC 150/5300-13A, Paragraph 303(a)(2).5300-13A.	✔			
p. Runway centerline separation distances	Show the runway centerline separation distances to parallel runway centerline, holding position, parallel taxiway/taxilane centerline, aircraft parking area, and helicopter touchdown pad, if applicable. Reference AC 150/5300-13A, Paragraph 321 and Table 3-8.	✔			
7. Taxiway Details	Show the taxiway centerline separation distances to parallel taxiway/taxilane centerlines, fixed or movable objects.	✔			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
a. Dimensions – width (existing & ultimate)	Taxiway width based on Taxiway Design Group (TDG). See AC 150/5300-13A, Table 4-2.	✔ *Dimensions included on Data Table Sheet*			
b. Taxiway Edge Safety Margin (TESM)	TESM dimension based on TDG. See AC 150/5300-13A, Table 4-2.	✔ *Dimensions included on Data Table Sheet*			
c. Taxiway Shoulder Width	Taxiway shoulder width based on TDG. See AC 150/5300-13A, Table 4-2.	✔ *Dimensions included on Data Table Sheet*			
b. Taxiway/Taxilane Object Free Area (TOFA)	TOFA width based on Taxiway Design Group (TDG). TOFA extend the entire length of taxiway. See AC 150/5300-13A, Table 4-1.	✔ *Dimensions included on Data Table Sheet*			
c. Taxiway/Taxilane Safety Area (TSA)	TSA width based on TDG. TSA extend the entire length of taxiway. See AC 150/5300-13A, Table 4-1.	✔ *Dimensions included on Data Table Sheet*			
d. Taxiway/Taxilane Centerline Separation from:					
i. Runway centerline	Show the distance from centerline of runway to centerline of taxiway. See AC 150/5300-13A, Table 4-1.	✔			
ii. Parallel taxiway	Show the distance from centerline of taxiway to centerline of parallel taxiway. See AC 150/5300-13A, Table 4-1.	✔			
iii. Aircraft parking	Show the distance from centerline of taxiway to marked aircraft parking/tie downs. See AC 150/5300-13A, Table 4-1.	✔			
iv. Fixed or Movable Objects	Show the distance from centerline of taxiway to airport objects such as buildings, facilities, poles, etc. See AC 150/5300-13A, Table 4-1.	✔			
8. Fences (identify height)	Show the location of existing and ultimate fences and identify height.	✔			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
9. Aprons					
a. Dimensions (square footage, dimension, or length and width)	Include dimensions of apron and distance from runway and taxiway centerlines. Apron should be sized using activity forecast and the apron design spreadsheet. See AC 150/5300-13A, Chapter 5 and FAA Engineering Brief No. 75.	✔ *Dimensions included on Terminal Area Drawings for readability*			
b. Identify aircraft tie-down layout	Show proposed tie-down layout on the apron area. See AC 150/5300-13A, Figure A5-1, AC 20-35, and AC 150/5340-1.	✔ *Dimensions included on Terminal Area Drawings for readability*			
c. Identify Special Use Areas (e.g., deicing or aerial application areas on or near apron)	Show as applicable and pursuant to representative ACs.	✔			
10. Roads	Label all roads.	✔			
11. Legend	Provide a Legend that identifies all symbols and line types used on the drawing. Lines must be clear and readable with sufficient scale and quality to discern details.	✔			
12. Items to be identified with distinct line types	Use distinct line types to identify different items and differentiate between existing and ultimate.	✔			
a. NAVAID Critical Areas (Glide Slope, Localizer, AWOS, ASOS, VOR, RVR, etc.)	Show the critical area outline for all Instrument Landing System and other electronic Navigational Aids located on the airport. See AC 150/5300-13A, Chapter 6 for general guidance and FAA Order 5750.16 for critical area dimensions.	✔			
b. Building Restriction Lines 5300-13A(BRL)	The BRL is the line indicating where airport buildings must not be located, limiting building proximity to aircraft movement areas. See AC 150/5300-13A, Paragraph 213(a).	✔			

c. Runway Visibility Zone (RVZ)	Show the RVZ for the existing and ultimate airport configurations. See AC 150/5300-13A, 305(c).	✔			

Airport Layout Plan Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
d. Airport Property Lines and Easements (existing, future, and ultimate)	Show the airport property boundaries, including easements, for the existing and ultimate airport configurations.	✔			
13. Survey Documentation					
a. Survey Monuments (PACS/SACS, see AC 150/5300-16)	Show the location of all established survey monuments located on or near the airport property. Identify Primary and Secondary Airport Control Stations (PACS/SACS) if they exist. See AC 150/5300-16. Show the location of all section corners on or near the airport property.	✔			
b. Offsets, stations, etc.	Show as applicable.	✔			
14. Any Air Traffic Control Tower (ATCT) line of sight/shadow study areas (use separate sheet if necessary)	Reference FAA Order 6480.4.		✔		
15. General Aviation development area (e.g., fuel facilities, FBO, hangars, etc.) – greater detail can be shown on the terminal area drawing	Show as applicable.	✔			
16. Facilities and movement areas that are to be phased out, if any, are described	Show as applicable.	✔			
Remarks Line-of-sight studies are being prepared under the advanced planning contract.					

A.5. Airport Airspace Drawing

- A required drawing.
- Scale 1" = 2000' plan view, 1" = 1000' approach profiles, 1"=100' (vertical) for approach profiles.
- 14 CFR Part 77, Objects Affecting Navigable Airspace, defines this as a drawing depicting obstacle identification surfaces for the full extent of all airport development. It should also depict airspace obstructions for the portions of the surfaces excluded from the Inner Portion of the Approach Surface Drawing.

Airport Airspace Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Block	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Plan view (based on ultimate runway lengths) Include location of water or sewage facilities if inside horizontal surface.					
1. U.S. Geological Survey (USGS) Quad Sheet for base map	Use the most current USGS Quadrangle(s) as a base map for the airspace drawing.	✔			
2. Runway end numbers	Show the ultimate runways and runway numbers. Contact the FAA before renumbering existing runways.	✔			
3. Part 77 Surfaces (Horizontal, Conical, Transition, based on ultimate). Including elevations at the point where surfaces change.	Show the extents of the Part 77 imaginary surfaces. For airports that have precision approach runways show balance of the 40,000' approach on a second sheet, if necessary. See 14 CFR Part 77.19.	✔			
4. 50' elevation contours on sloping surfaces (NAVD88)	Show contour lines on all sloping Part 77 imaginary surfaces. See 14 CFR Part 77.19.		✔		
5. Top elevations of penetrating objects for the inner portion of the approach surface drawing	Identify by unique alphanumeric symbol all objects beyond the Runway Protection Zones that penetrate any of the Part 77 surfaces. See 14 CFR Part 77.	✔			
6. Note specifying height restriction (ordinances/statutes)	List any local zoning restrictions that are in place to protect the airport and surrounding airspace. See AC 150/5190-4.			✔	

Airport Airspace Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
7. North Arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	✔			
C. Profile view					
1. Airport Elevation	List the Airport Elevation, the highest point on an airport's usable runway expressed in feet above mean sea level (MSL). Use NAVD88 datum. See AC 150/5300-13A, Chapter 1, Paragraph 102(g).	✔			
2. Composite Ground Profile along extended Runway Centerline (Representing the composite profile, based on the highest terrain across the width and along the length of the approach surface)	Depict the ground profile along the extended runway centerline representing the composite profile, based on the highest terrain across the width and along the length of the approach surface.	✔ See applicable Inner & Approach/ Departure Airspace Drawings			
3. Significant objects (bluffs, rivers, roads, schools, towers, etc.) and elevations	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions. Use the objects' same alphanumeric identifier that was used on the plan view. Identify the top elevations of all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions.	✔ See applicable Inner & Approach/ Departure Airspace Drawings			
4. Existing, future, and ultimate runway ends and approach slopes	Show existing and ultimate runway ends and FAR Part 77 approach surface slopes. See 14 CFR Part 77.19.	✔			
D. Obstruction Data Tables (identify obstacles not depicted on the Inner Portion of the Approach Surface Drawing)					
1. Object identification number	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach	✔			

Airport Airspace Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
	surfaces, regardless of whether or not they are obstructions. Use the objects alphanumeric identifier that was used on the plan view. Identify the top elevations of all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions.	See ALP Sheets 39-56.			
2. Description	Provide a brief description of the object, e.g., Power Pole, Cell Tower, Natural Gas Flare, etc.	✔ See Sheet Numbers 39-56.			
3. Date of Obstruction Survey	Provide the date of latest obstruction survey.	✔			
4. Ground Surface Elevation	Provide the ground surface elevation (MSL) at the base of each object.		✔		
5. Object Elevation	List the above ground level (AGL) height and the top of object elevation (above mean sea level / AMSL / MSL) for each object.	✔ See Sheet Numbers 39-56.			
6. Amount of surface penetration	List the surface that is penetrated and the amount the object protrudes above the surface. See 14 CFR Part 77.	✔ See Sheet Numbers 39-56.			
7. Proposed or existing disposition of the obstruction	Provide a proposed or existing disposition of the object to remedy the penetration. See AC 70/7460-1.				
a. Proposed Disposition (existing)		✔ See Sheet Numbers 39-56.			
b. Proposed Disposition (future)		✔ See Sheet Numbers 39-56.			
Remarks Obstructions analyzed are identified on individual obstruction table sheets to improve readability of airspace sheets.					

A.6. Inner Portion of the Approach Surface Drawing

- A required drawing.
- Scale 1"=200' Horizontal, 1"=20' Vertical, two sheets may be necessary for clarity. Typically, the plan view is on the top half of the drawing and the profile view is on the bottom half. Views should be drawn from the runway threshold to a point on the approach slope 100 feet above the runway threshold elevation, at a minimum, or the limits of the RPZ, whichever is further.
- Drawings containing the plan and profile view of the inner portion of the approach surface to the runway and a tabular listing of all surface penetrations. The drawing will depict the obstacle identification approach surfaces contained in 14 CFR Part 77, Objects Affecting Navigable Airspace. The drawing may also depict other surfaces, including the threshold-siting surface, Glideslope Qualification Surface (GQS), those surfaces associated with United States Standards for Instrument Procedures (TERPS), or those required by the local FAA office or state agency. The extent of the approach surface and the number of airspace obstructions shown may restrict each sheet to only one runway end or approach.

Inner Portion of the Approach Surface Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
A. Title and Revision Block	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Plan View (existing, future, and ultimate)					
1. Inner portion of approach surface	Show the area from the runway threshold out to where the ultimate approach surface slope is 100 feet above the threshold elevation.	✔			
2. Aerial photo for base map	Use an aerial photograph for the base map.	✔			
3. Objects (identified by numbers)	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions using an alphanumeric character.	✔			
4. Property line within approaches	Show the property lines that are within the area/portion of airport shown.	✔			

Inner Portion of the Approach Surface Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
5. Road & railroad elevations, plus movable object heights	Provide elevation information for the traverse ways' centerline elevation where they intersect the Part 77 Approach surfaces (existing and ultimate). Note whether this elevation is the actual elevation or the traverse way elevation plus the traverse way adjustment (23' for railways, 17' for interstate highways, 15' for other public roads, or 10' for private roads). See also 14 CFR Part 77.	✔			
6. Part 77 Approach Surface clearance over Roads and Railroads at the most critical points, the Centerline and Edge of the surface.	Provide elevation information for the traverse ways where they intersect the edges and centerline of the Part 77 Approach surfaces (existing and ultimate). Note whether this elevation is the actual elevation or the traverseway elevation plus the traverseway adjustment (23' for railways, 17' for interstate highways, 15' for other public roads, or 10' for private roads). See also 14 CFR Part 77.	✔			
7. Physical end of runway, end number, elevation (NAVD88) Nearest 0.1 foot	Show the existing and ultimate runway end, runway number, and the elevation of the threshold center.	✔			
8. Airport Design Surfaces					
a. Runway Safety Area	Show the extents of the existing and ultimate Runway Safety Area (RSA). See AC 150/5300-13A, Paragraph 307 and Table 3-8.	✔			
b. Runway Object Free Area	Show the extents of the existing and ultimate Object Free Area (OFA). See AC 150/5300-13A, Paragraph 309 and Table 3-8.	✔			
c. Runway Obstacle Free Zone (OFZ)	Show the extents of the existing and ultimate OFZ which includes the inner-approach OFZ, inner-transitional OFZ, and the Precision OFZ (POFZ), if applicable. See AC 150/5300-13A, Paragraph 308.	✔			

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
d. Runway Protection Zone (RPZ)	Show the extents of the existing and ultimate RPZ. Prior to including new or modified land use in the RPZ, the Regional and ADO staff must consult with the National Airport Planning and Environmental Division, APP-400. This policy is exempt from existing land uses in the RPZ. See AC 150/5300-13A, Paragraph 310, Table 3-5 and FAA memorandum dated September 27, 2012.	✔ Approach and Departure RPZ's are depicted.			
e. NAVAID critical area	Show the critical area outline for all Instrument Landing System and other electronic Navigational Aids located on the airport. See AC 150/5300-13A, Chapter 6 for general guidance and FAA Order 5750.16 for critical area dimensions.	✔			
9. Ground contours	Show ground contour lines in 2', 5', or 10' intervals. Topographic issues may be important in the alternatives analysis, which may require that reduced contour intervals be used. See AC 150/5070-6, Paragraph 1005.	✔			
10. North arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, Chapter 2, Section 5, for further information.	✔			
C. Profile view					
1. Existing and proposed runway centerline ground profile (list elevations at runway ends & at all points of grade changes) (representing the composite profile based on the highest terrain across the width and along the length of the approach surface)	Depict the ground profile along the extended runway centerline representing the composite profile, based on the highest terrain across the width and along the length of the approach surface to where the ultimate approach surface slope is 100 feet above the threshold elevation. A more effective presentation may be a rendering of a composite critical profile.	✔			

Inner Portion of the Approach Surface Drawing					
Item	Instructions	Sponsor/Consultant			FAA
		Yes	No	N/A	
2. Future development from plan view	Identify future development using same alphanumeric identifier that was used on the plan view.	✔			
3. Part 77 Approach/transition surface; existing and future VASI/PAPI siting surface	Show the boundaries of the existing and ultimate Part 77 Approach Surface. See FAA Order 7400.2, Figure 6-3-9, See also 14 CFR Part 77.	✔			
4. Threshold Siting Surface	Depict any applicable siting requirements pursuant to Table 3-2 of FAA AC 150/5300-13A.	✔			
5. Terrain in approach area (fences, streams, etc.)	Show all significant terrain (fences, streams, mountains, etc.) within the approach surfaces, regardless ofwhether or not they are obstructions	✔			
6. Objects – identify the controlling object (same numbers as plan view)	Show all significant objects (roads, rivers, railroads, towers, sign and power poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions. Identify the objects using same alphanumeric identifier that was used on the plan view.	✔			
7. Cross section of road & railroad	Show the cross-section of any roads and/or railroads that cross the area shown. Indicate cross section elevations of roads and railroads at edges and extended centerlines that cross the area shown.	✔			
8. Existing and proposed property and easement lines	Show the airport property boundaries, including easements, for the existing and ultimate airport configurations. AC 5300-13A Note easements for pipelines and residential through the fence gateways.	✔			
D. Obstruction tables for each approach surface (surface should be identified)	A separate table for each runway end must be used to enhance information clarity.	✔			
1. Object identification number	List each object by the same alphanumeric symbol used in the plan view.	✔			

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
2. Description	Provide a brief description of the object, e.g., Power Pole, Cell Tower, Natural Gas Flare, etc.	✔			
3. Date of Obstruction Survey and Survey Accuracy	Provide the date of latest obstruction survey.	✔			
4. Surface Penetrations	5300-13A For any object that penetrates the Part 77 surface, the approach surface, or the obstacle free zone, describe the vertical length the object protrudes.	✔			
5. Proposed disposition of surface penetrations	Provide a proposed disposition of the object to remedy the penetration as described in item 4 above. See AC 70/7460-1 for Part 77 violations. “Removal” and/or “Lower” should be listed for any Airports safety area/zone violations. See AC 150/5300-13A, Paragraph 303 and 308.	✔			
6. Object elevation	List the Above Ground Level (AGL) height and the top of object elevation in MSL for each object.	✔			
7. Triggering Event (e.g., a runway extension) – Timeframe/expected date for removal	List the surface that is penetrated and the amount the object protrudes above the surface. See 14 CFR Part 77 and AC 150/5300-13A, Paragraphs 303 and 308.			✔	
8. Allowable approach surface elevation (if applicable)		✔			
9. Amount of approach surface penetration (if applicable)		✔			
10. Proposed disposition of approach surface obstruction (if applicable)	Provide a proposed disposition of the object to remedy the penetration. See AC 70/7460-1 for Part 77 violations. “Removal” and/or “Lower” should be listed for any Airports safety area/zone violations. See AC 150/5300-13A, Paragraph 303.	✔			

Inner Portion of the Approach Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
11. Obstacle Free Zone (OFZ)	Determine and depict the applicable OFZ surfaces, see AC 150/5300-13A, Paragraph 308. Provide a proposed disposition of the object to remedy the penetration. Note: Modification to the OFZ standard is not permitted.	✔			
E. Runway Centerline Profile	This may be shown on the Inner Portion of the Approach Surface drawing if there is space to show the runway and Runway Safety Area in sufficient detail otherwise a separate sheet may be necessary. At a minimum this drawing is to show the full length of the runway and Runway Safety Area including: runway elevations, runway and Runway Safety Area gradients, all vertical curves, and a line representing the 5' line-of-sight. See AC 150/5300-13A, Paragraph 305.	✔			
1. Scale	The vertical scale of this drawing must be able to show the separation of the runway surface and the 5' Line-of-Sight line. See AC 150/5300-13A, Paragraph 305.	✔			
2. Elevation	Show runway elevations, runway and Runway Safety Area gradients, and all vertical curve data. See AC 150/5300-13A, Paragraph 318.	✔			
3. Line of Sight	The vertical scale of this drawing must be able to show the separation of the runway surface and the 5' Line-of-Sight line. See AC 150/5300-13A, Section 305.	✔			
Remarks Detailed obstruction information is contained within separate Obstruction Tables to aid in readability of airspace drawings.					

A.7. Runway Departure Surface Drawing

- Required where applicable. For each runway that is designated for instrument departures.
- This drawing depicts the applicable departure surfaces as defined in Paragraph 303 of FAA AC 150/5300-13A. The surfaces are shown for runway end(s) designated for instrument departures.
- 40:1 for Instrument Procedure Runways (Scale, 1" = 1000' Horizontal, 1" = 100' Vertical, Out to 10,200' beyond Runway threshold) 62.5:1 for Commercial Service Runways (Scale, 1" = 2000' Horizontal, 1" = 100' Vertical, Out to 50,000' beyond Runway threshold).
- Contact the FAA if the scale does not allow the entire area to fit on a single sheet. The depiction of the One Engine Inoperative (OEI) surface is optional; it is not currently required.

Runway Departure Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Plan view (existing & future)	See AC 150/5300-13A, Paragraph 303(c).	✔			
1. Aerial Photo for base map	Use an aerial photograph for the base map. A USGS 7.5-minute series map is also acceptable.	✔			
2. Runway end numbers and elevations (nearest 1/10 of a foot)	Show the existing and ultimate runway end, runway number, and the elevation of the threshold center. For runways that have a clearway, depict this surface and the relocated departure surface. Reference AC 150/5300-13A, Paragraph 303(c)(1).	✔			
3. 50' elevation contours on sloping surfaces (NAVD88)	Show contour lines on the Part 77 imaginary surfaces. See 14 CFR Part 77.19.		✔		
4. Depict property line, including easements	Show the property line(s) that are within the area/portion of airport shown.	✔			
5. Identify, by numbers, all traverse ways with elevations and computed vertical clearance in the departure surface	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the departure surfaces, regardless of whether or not they are obstructions using unique alphanumeric characters.	✔			

Runway Departure Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
6. Ground contours	Show ground contour lines in 2', 5', or 10' intervals. Topographic issues may be important in the alternatives analysis, which may require that reduced contour intervals be used.	✔			
C. Profile view (existing & future)					
1. Ground profile	Depict the ground profile along the extended runway centerline representing the composite profile, based on the highest terrain across the width and along the length of the departure surface to extents of the surface dimensions.	✔			
2. Significant objects (bluffs, rivers, roads, buildings, fences, structures, etc.)	Show all significant objects (roads, rivers, railroads, towers, poles, etc.) within the approach surfaces, regardless of whether or not they are obstructions using an alphanumeric character.	✔			
3. Identify obstructions with numbers on the plan view	Identify the objects using same alphanumeric identifier that was used on the plan view.	✔			
4. Show roads and railroads with dashed lines at edge of the departure surface	Show the cross-section of any roads and/or railroads that cross the area shown.	✔			
D. Obstruction Data Tables					
1. Object identification number	Identify all significant objects (roads, rivers, railroads, towers, poles, etc.) within the departure surfaces, regardless of whether or not they are obstructions using unique alphanumeric characters. List each object by the same alphanumeric symbol used in the plan view.	✔			
2. Description	Provide a brief description of the object, e.g., Power Pole, Cell Tower, Tree, Natural Gas Flare, etc.	✔			
3. Object Elevation	List the Above Ground Level (AGL) height and the top of object elevation in MSL for each object.	✔			

Runway Departure Surface Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
4. Amount of surface penetration	List the object protrudes above the departure surface. See AC 150/5300-13A, Paragraph 303(c).	✔			
5. Proposed or existing disposition of the obstruction	Provide a proposed disposition of the object to remedy the penetration. See AC 150/5300-13A, Paragraph 303(c).	✔			
6. Separate table for each departure surface	A separate table for each runway end must be used to enhance information clarity.	✔			
Remarks					

A.8. Terminal Area Drawing

- Scale 1”=50’ or 1”=100’. Plan view of aprons, buildings, hangars, parking lots, roads.
- This plan consists of one or more drawings that present a large-scale depiction of areas with significant terminal facility development. Such a drawing is typically an enlargement of a portion of the ALP. At a commercial service airport, the drawing would include the passenger terminal area, but might also include general aviation facilities and cargo facilities. See AC 150/5300-13A, Appendix 5.
- Use scale that allows the extent of the terminal/FBO apron area to best fit the chosen sheet size, e.g., typical GA airports may be able to use 1”=50’ scale on a 22” X 34” sheet, but a complex hub airport with multiple terminal areas may require a 1”=100’ scale on a 36” X 48” sheet. Contact FAA if an airport layout requires scaling or sheet sizing other than what is listed.
- This drawing is not needed at every airport type and is therefore optional.

Terminal Area Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Building data table	All buildings on the Airport Layout Drawing should be identified by an alphanumeric character. List these identifiers in a table and give a description of the building. If no Terminal Area drawing is done, also include the top of structure elevation in MSL.				
1. Structure identification number		✔			
2. Top elevation of structures (AMSL)		✔			
3. Obstruction marking/lighting (existing/future)	Show the location of existing and ultimate hangars. Include dimensions of apron and distance from runway and taxiway centerlines. See AC 150/5300-13A, Appendix 5. Show the elevation of the highest point of each structure.		✔		
C. Buildings to be removed or relocated noted	If any of the structures violate any airport or approach surfaces give an ultimate disposition to remedy the violation.	✔			
D. Fueling facilities, existing and future	Show the location of existing and ultimate fueling facilities. Include dimensions of apron and distance from runway and taxiway centerlines.	✔			

Terminal Area Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
E. Air carrier gates positions shown (existing/future)	Show the existing and ultimate air carrier gate positions. See AC 150/5300-13A, Chapter 5.	✔			
F. Existing and future security fencing with gates	Show the existing and ultimate security fencing and gates. See AC 150/5300-13A, Paragraph 606.	✔			
G. Building restriction line (BRL)	Show the Building Restriction Line (BRL) that is within the area/portion of airport shown. The BRL identifies suitable building area locations on airports. This should be located where the Part 77 surfaces are at 35' above the airport elevation unless a different height is coordinated with the FAA. See AC 150/5300-13A, Paragraph 213(a).	✔			
H. Taxiway or Taxilane centerlines designated	Show centerlines of all taxiway and taxilanes within the area/portion of airport shown.	✔			
I. Dimensions					
1. Clearance Dimensions between runway, taxiway, and taxilane centerlines and hangars, buildings, aircraft parking, and other objects.	Show the location of existing and ultimate apron. Include dimensions of apron and distance from runway and taxiway centerlines. Apron should be sized using activity forecast and the apron design spreadsheet. See AC 150/5300-13A, Chapter 5 and FAA Engineering Brief No. 75. Show the dimensions between existing and ultimate runway, taxiway, and taxilane centerlines and existing and ultimate hangars, buildings, aircraft parking, and other fixed or movable objects. See AC 150/5300-13A, Chapter 3 and Chapter 4. Show proposed tie-down layout on the apron area as well as taxilane marking plan. See AC 150/5300-13A, Appendix 5, AC 20-35, and AC 150/5340-1.	✔			
2. Dimensions of aprons, taxiways, etc. Apron/Hangar areas that do not meet dimensional standards of the critical aircraft should be identified and the wingspan/design group of the aircraft that can use that area depicted. Include tie down location with clearances		✔			

Terminal Area Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
J. Property Line	Show the property line(s) that are within the area/portion of airport shown.	✔			
K. Auto parking (existing & ultimate)	Show the existing and ultimate auto parking areas. See AC 150/5300-13A, Appendix 5.	✔			
L. Major airport drainage ditches or storm sewers	Show any significant airport drainage ditches or storm sewers within the area/portion of airport shown.	✔			
M. Special Use Area (e.g., Agricultural spraying support, Deicing, or Containment)	Show any special use areas within the area/portion of airport shown.	✔			
N. North Arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	✔			
O. Fence	Show the existing and ultimate perimeter fencing or general area fencing.	✔			
P. Entrance Road	Show the existing and ultimate entrance road. See 5300-13AFAA Order 5100.38, Chapter 6, Section 2.	✔			
Remarks Building data tables included on Sheets 2 and 3 indicate building heights.					

A.9. Land Use Drawing

- Scale 1”=200’ to 1”=600’.
- A drawing depicting on- and off-airport land uses and zoning in the area around the airport. At a minimum, the drawing must contain land within the 65 DNL noise contour. For medium or high activity commercial service airports, on-airport land use and off-airport land use may be on separate drawings. The Airport Layout Drawing should be used as a base map.
- Drawing optional. Need based on scope of work.

Land Use Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Title and Revision Blocks	Each drawing in the Airport Layout Plan drawing set shall have a Title and Revision Block. For drawings that have been updated, e.g., as-builts, the revision block should show the current revision number and date of revision.	✔			
B. Airport boundaries/property, existing & future (fee and easement)	Show the existing and ultimate property lines. If known, show property lines for parcels surrounding the airport.	✔			
C. Plan view of land uses by category (Agricultural, Aeronautical, Commercial, Residential, etc.). Use local land use categories.		✔			
1. On-Airport (existing & future)	Label existing and ultimate on-airport property by usage, e.g., Terminal Area, Air Cargo, Public Ramp, Airfield - Movement, Airfield - Non-movement, etc. Include existing and future airport features (e.g., runways, taxiways, aprons, safety areas/zones, terminal buildings and navigational aids).		✔		
2. Off-Airport (existing & future) [to the 65 DNL Contour at a minimum, if contour known]	Label existing and ultimate off-airport property by usage and zoning, e.g., Agricultural, Industrial, Residential, Commercial, etc.	✔			
D. Boundaries of local government	List any local zoning restrictions that are in place to protect the airport and surrounding airspace. See AC 150/5190-4.	✔			
E. Land use legend	Provide a legend that identifies all symbols and line types used on the drawing. Lines must be clear and readable with sufficient scale and quality to discern details.	✔			

Land Use Drawing					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
F. Public facilities (schools, hospitals, parks, churches etc.)	Identify public facilities, e.g., schools, parks, etc.	✔			
G. Runway visibility zone for intersecting runways	Show the Runway Visibility Zone(s) for the existing and ultimate airport configurations. See AC 150/5300-13A, Section 305.	✔			
H. Show off-airport property out to 65 DNL if available	Label existing and ultimate off-airport property by usage and zoning, e.g., Agricultural, Industrial, Residential, Commercial, etc.			✔	
I. Airport Overlay Zoning or Zoning Restrictions	List any local zoning restrictions that are in place to protect the airport and surrounding airspace. See AC 150/5190-4.			✔	
J. North arrow with magnetic declination and year	Magnetic declination may be calculated at http://www.ngdc.noaa.gov/geomag-web/#declination. This model is using the latest World Magnetic Model which has an Epoch Year of 2010. See FAA Order 8260.19, "Flight Procedures and Airspace." Chapter 2, Section 5, for further information.	✔			
K. Drawing details to include runways, taxiways, aprons, RPZ, terminal buildings and NAVAIDS	Show existing and future airport features (e.g., runways, taxiways, aprons, safety areas/zones, terminal buildings and navigational aids, etc.). See AC 150/5300-13A.	✔			
L. Crop Restrictions	Show the Crop Restriction Line (CRL). See AC 150/5300-13A, Paragraph 322 and AC 150/5200-33.			✔	
Remarks On-airport land use types are listed with clarifying text on Terminal Area sheets (e.g., Cargo areas labeled accordingly)					

A.10. Airport Property Map / Exhibit A

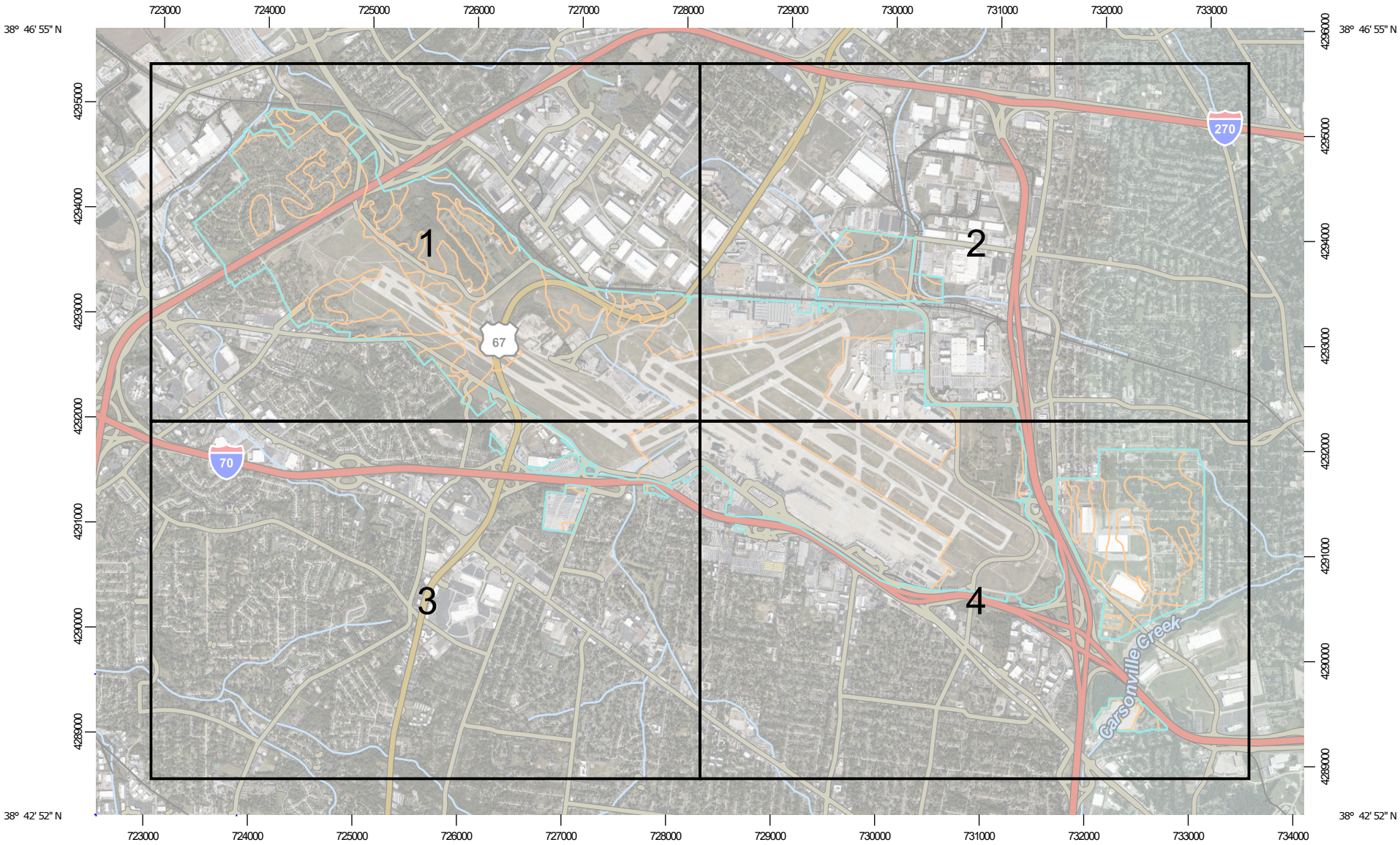
- Scale 1”=200’ to 1”=600’.

Airport Property Map / Exhibit A					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
A. Will Property Map serve as Exhibit A? – **If YES,** follow the directions to the right. – **If NO,** go to item B below.	If prepared in accordance with AC 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects, use ARP SOP no. 3.00 Exhibit A guidance instead of below checklist.		✔		
If Property Map *will not* serve as Exhibit A: B. Title and Revision Blocks					
C. Plan view showing parcels of land (existing, future, and ultimate)					
1. Fee land interests (existing and future)					
2. Easement interests (existing and future)					
a. Part 77 protection					
b. Compatible Land Use					
c. RPZ protection					
3. Airport Property Line					
D. Legend – shading/cross hatching, survey monuments, etc.					
E. Data Table					
1. Depiction of various tracts of land acquired to develop airport	If any obligations were incurred as a result of obtaining property, or an interest therein, they should be noted. Obligations that stem from Federal grant or an FAA-administered land transfer program, such as surplus property programs, should also be noted. The drawing should also depict easements beyond the airport boundary.				

Airport Property Map / Exhibit A					
Item	**Instructions**	**Sponsor/Consultant**			**FAA**
		Yes	**No**	**N/A**	
2. Method of acquisition or property status (fee simple, easement, etc.)					
3. Type of Acquisition Indicated	(e.g., AIP-noise, AIP-entitlement, PFC, surplus property, local purchase, local donation, condemnation, other)				
4. Acreage					
F. Access point(s) for through-the-fence arrangements including residential					
Remarks Property map being developed in coordination with STLAA. Property information presented in ALP is intended for informational purposes only. STLAA maintains separate Exhibit A information.					

APPENDIX 9A – NRCS SOIL REPORT

Soil Map—St. Louis County and St. Louis City, Missouri
(Lambert International Airport)
Index Sheet



Map Scale: 1:52,800 if printed on A landscape (11" x 8.5") sheet.

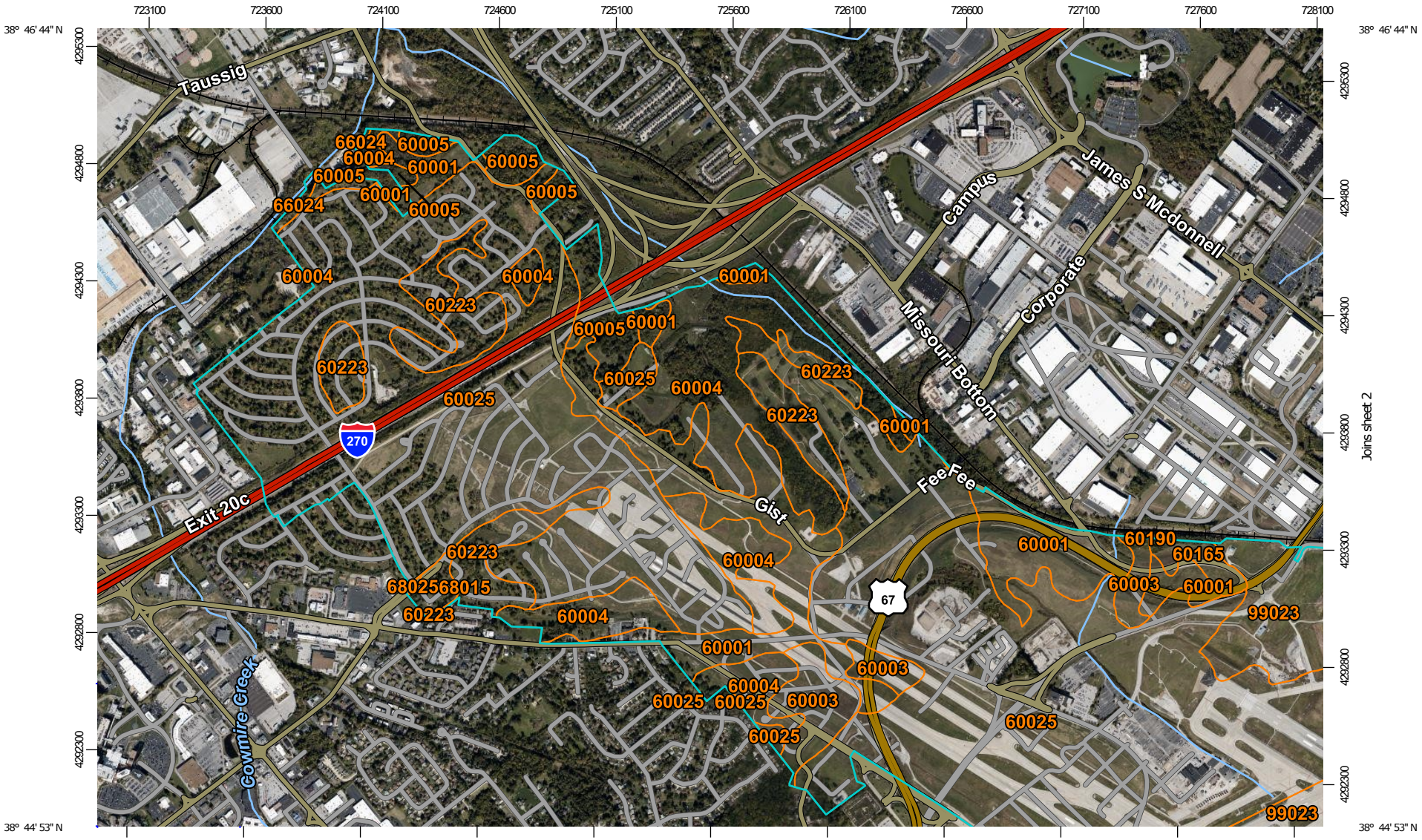
N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

Soil Map—St. Louis County and St. Louis City, Missouri
(Lambert International Airport)
Map sheet 1 of 4



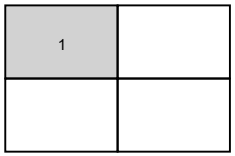
Map Scale: 1:24,000 if printed on A landscape (11" x 8.5") sheet.

N

0 350 700 1400 2100 Meters

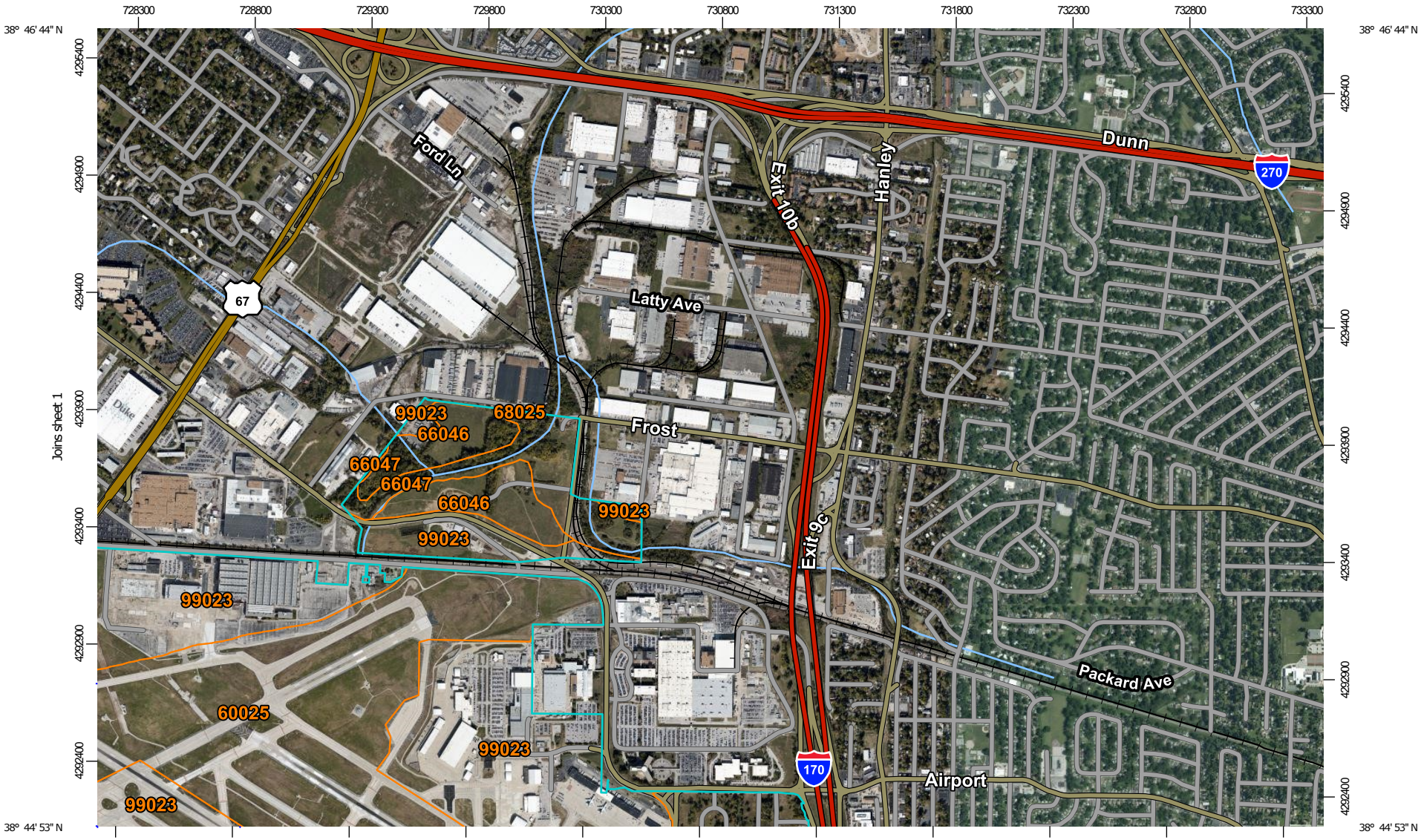
0 1000 2000 4000 6000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



Map Sheet Location

Soil Map—St. Louis County and St. Louis City, Missouri
(Lambert International Airport)
Map sheet 2 of 4



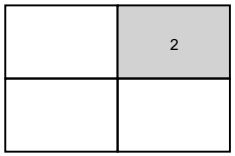
Map Scale: 1:24,000 if printed on A landscape (11" x 8.5") sheet.

N

0 350 700 1400 2100 Meters

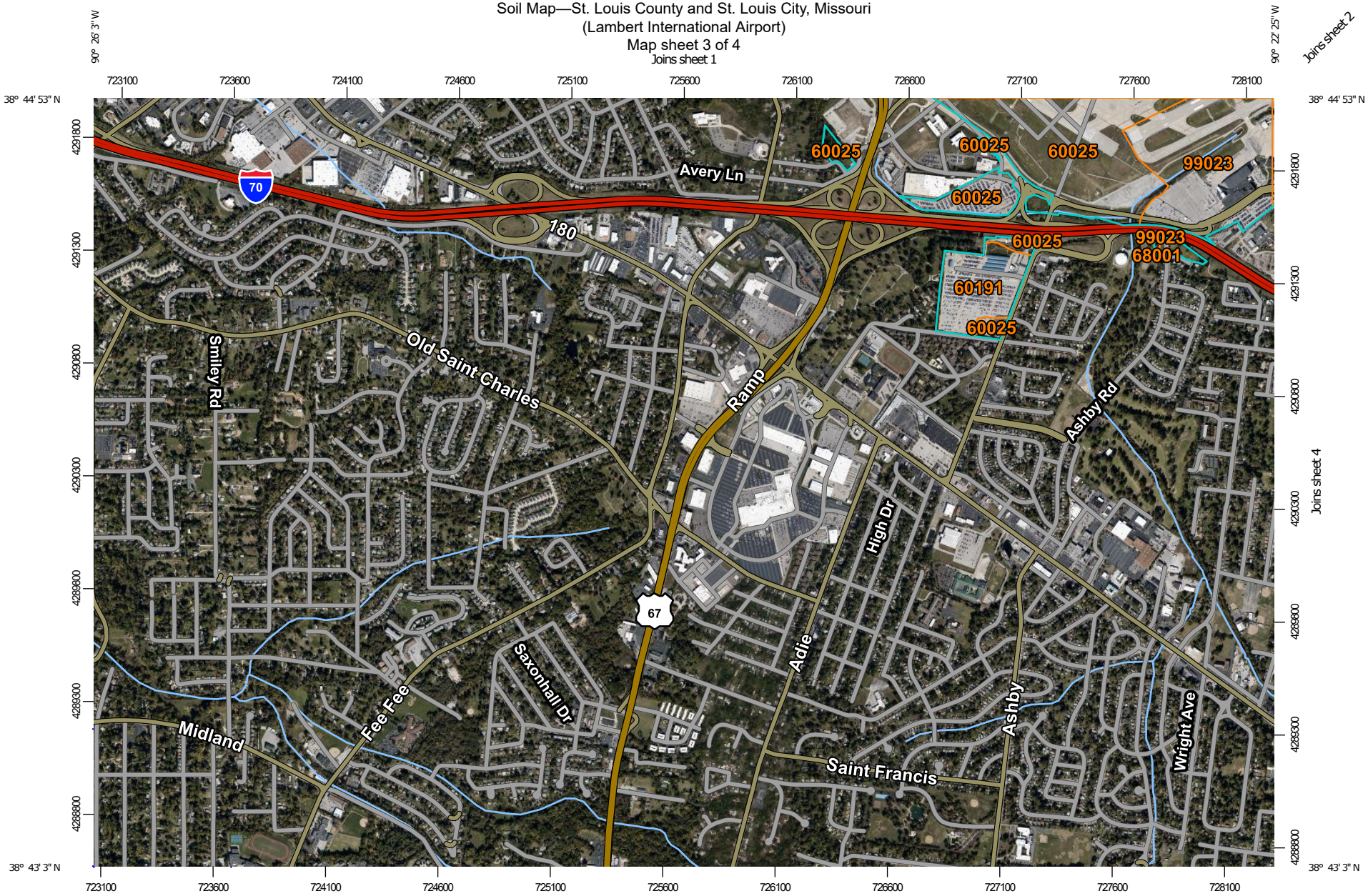
0 1000 2000 4000 6000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



Map Sheet Location

Soil Map—St. Louis County and St. Louis City, Missouri
(Lambert International Airport)
Map sheet 3 of 4



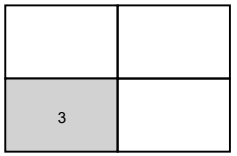
Map Scale: 1:24,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 350 700 1400 2100

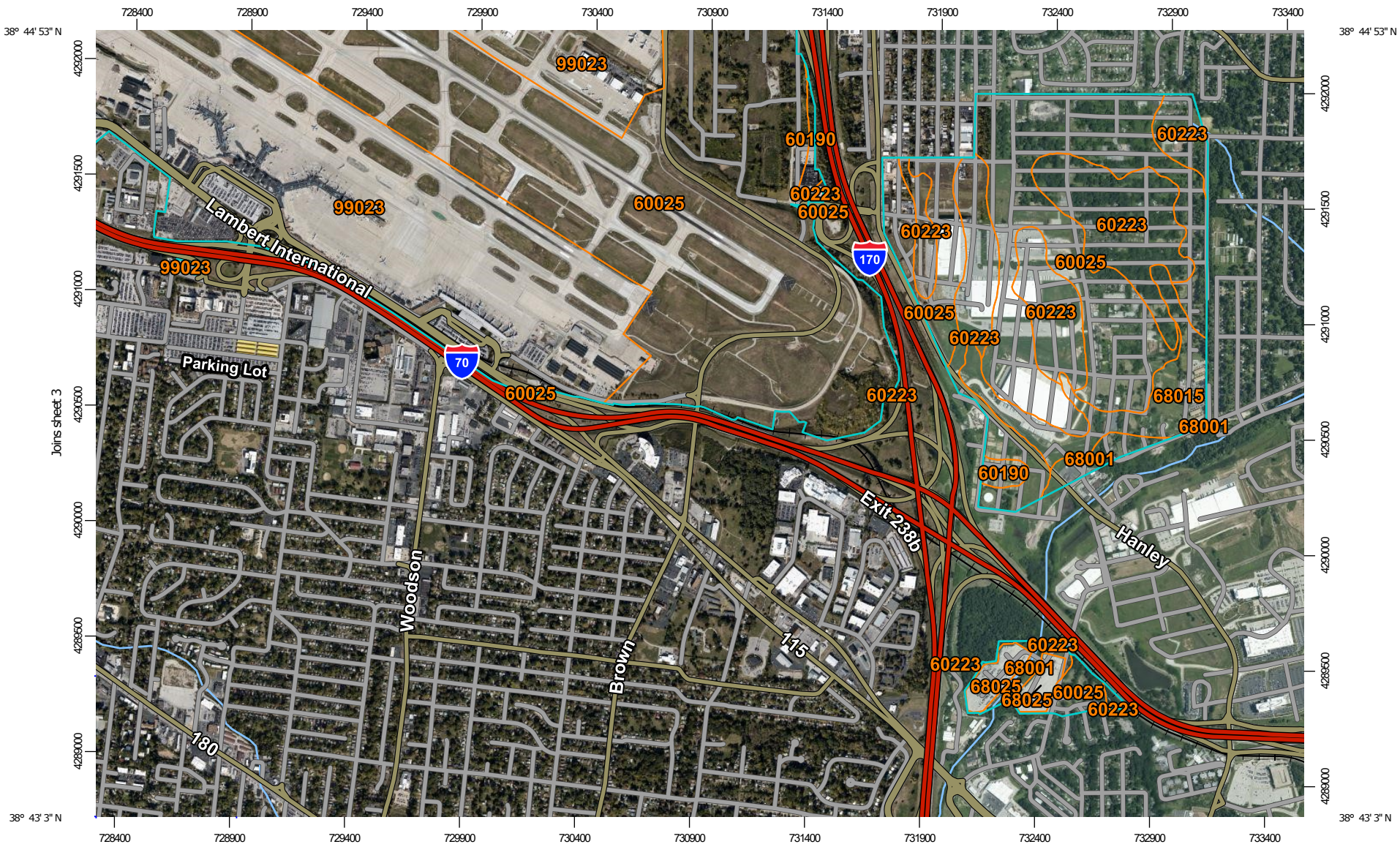
Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



Map Sheet Location

Soil Map—St. Louis County and St. Louis City, Missouri
(Lambert International Airport)
Map sheet 4 of 4



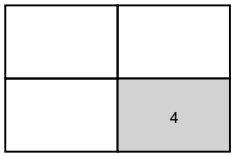
Map Scale: 1:24,000 if printed on A landscape (11" x 8.5") sheet.

N

0 350 700 1400 2100 Meters

0 1000 2000 4000 6000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



Map Sheet Location

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: St. Louis County and St. Louis City, Missouri
Survey Area Data: Version 22, Sep 7, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2018—Dec 4, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
60001	Menfro silt loam, 5 to 9 percent slopes, eroded	187.4	4.4%
60003	Menfro silt loam, 9 to 14 percent slopes, eroded	48.5	1.1%
60004	Menfro silt loam, 14 to 20 percent slopes, eroded	201.4	4.7%
60005	Menfro silt loam, 20 to 45 percent slopes	48.8	1.1%
60025	Urban land-Harvester complex, 2 to 9 percent slopes	2,301.1	53.5%
60165	Menfro silt loam, 2 to 5 percent slopes	11.7	0.3%
60190	Menfro-Urban land complex, 5 to 9 percent slopes	10.2	0.2%
60191	Menfro-Urban land complex, 9 to 20 percent slopes	29.9	0.7%
60223	Urban land-Harvester complex, 9 to 20 percent slopes	288.4	6.7%
66024	Wilbur silt loam, 0 to 2 percent slopes, frequently flooded	3.5	0.1%
66046	Nevin silt loam, 0 to 2 percent slopes	61.8	1.4%
66047	Nevin-Urban land complex, 0 to 2 percent slopes	51.3	1.2%
68001	Fishpot-Urban land-Freeburg complex, 0 to 2 percent slopes, frequently flooded	19.4	0.5%
68015	Fishpot-Urban land-Freeburg complex, 0 to 3 percent slopes	61.7	1.4%
68025	Urban land-Fishpot complex, 0 to 3 percent slopes	18.7	0.4%
99023	Urban land, upland, 0 to 5 percent slopes	957.5	22.3%
Totals for Area of Interest		**4,301.2**	**100.0%**

APPENDIX 9B – ALTERNATIVE ROM COST ESTIMATE

APPENDIX B – ALTERNATIVE ROM COST ESTIMATES

STL AIRPORT LAYOUT PLAN - COST ESTIMATES

User to complete non-shaded fields and define yellow-shaded input cells (Refer to Resources Tab)

Storage Basins 1 & 2 Estimate

M3 Engineering Group

Input Cell

ESTIMATE NUMBER	PROJECT NAME
DATE OF ESTIMATE	DATES OF PROJECT
ESTIMATE PREPARED BY	CLIENT NAME

Project Start Year	2,027
Project End Year	2,027
Escalation	3.00 %
TOTAL GSF	

CONSTRUCTION ITEM	NOTES	UNIT	UNIT COST	TOTAL COST	QUANTITY	
DETENTION BASIN	INCLUDING EXCAVATION, GRADING, SEEDING, AND HAULING EXCESS MATERIAL	CY	$ 30.00	$ 16,038,300.00	534,610	
CONCRETE WEIR	5' High with 1.5' x 3' W Footing	LF	$ 476.00	$ 27,619.75	58	
			$ -	$ -		
			$ -	$ -		
			$ -	$ -		
TOTAL CONSTRUCTION COSTS				**$ 16,065,919.75**		

SUB-TOTAL CONSTRUCTION				**$ 17,000,000.00**	**0.00**	

SOFT COSTS, MARKUPS, CONTINGENCY

CATEGORY	NOTES	PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
DESIGN CONTINGENCY		25.00 %	$ 17,000,000.00	$ 4,250,000.00	0.00	
SUB-TOTAL COST OF WORK				$ 21,250,000.00	0.00	
General Contractor Mark-ups		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
PROJECT LOGISTICS AND LABOR FACTOR			$ 21,250,000.00	$ -	0.00	
GENERAL REQ'S, PHASING, AND TEMP CONSTRUCTION			$ 21,250,000.00	$ -	0.00	
GENERAL CONDITIONS			$ 21,250,000.00	$ -	0.00	
GENERAL CONTRACTOR OVERHEAD & PROFIT		5.00 %	$ 21,250,000.00	$ 1,062,500.00	0.00	
INSURANCE		2.00 %	$ 22,312,500.00	$ 446,250.00	0.00	
PERFORMANCE AND PAYMENT BOND		1.00 %	$ 1,508,750.00	$ 15,087.50	0.00	
OPINION OF PROBABLE COST OF WORK				$ 22,773,837.50	0.00	
Owner's Soft Costs		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
MANAGEMENT		3.00 %	$ 22,773,837.50	$ 683,215.13	0.00	
CONSTRUCTION MANAGER		-	$ 22,773,837.50	$ -	0.00	
PLANNING & PRECONSTRUCTION		0.20 %	$ 22,773,837.50	$ 45,547.68	0.00	
ARCHITECTURAL/ENGINEERING DESIGN		8.00 %	$ 22,773,837.50	$ 1,821,907.00	0.00	
ARCHITECTURAL/ENGINEERING CONSTRUCTION ADMIN.		2.00 %	$ 22,773,837.50	$ 455,476.75	0.00	
SURVEYING		0.50 %	$ 22,773,837.50	$ 113,869.19	0.00	
TESTING		0.50 %	$ 22,773,837.50	$ 113,869.19	0.00	
INSPECTIONS		1.10 %	$ 22,773,837.50	$ 250,512.21	0.00	
HAZARDOUS ABATEMENT		-	$ 22,773,837.50	$ -	0.00	
LAND & RIGHT OF WAY		-	$ 22,773,837.50	$ -	0.00	
MISCELLANEOUS FEES (PERMITS)		0.60 %	$ 22,773,837.50	$ 136,643.03	0.00	
OWNER'S CONSTRUCTION CONTINGENCY		-	$ 22,773,837.50	$ -	0.00	
PROJECT CONTINGENCY		1.50 %	$ 22,773,837.50	$ 341,607.56	0.00	
SUBTOTAL INCL. SOFT COSTS			$ -	$ 26,736,485.23	0.00	
ENVIRONMENTAL ASSESSMENT		4.00 %	$ 26,736,485.23	$ 1,069,459.41	0.00	
ROM TOTAL COST ESTIMATE				$ 28,000,000.00	0.00	

STL AIRPORT LAYOUT PLAN - COST ESTIMATES

User to complete non-shaded fields and define yellow-shaded input cells (Refer to Resources Tab)

Detention Basin 3 Estimate

M3 Engineering Group

Input Cell

ESTIMATE NUMBER	PROJECT NAME
DATE OF ESTIMATE	DATES OF PROJECT
ESTIMATE PREPARED BY	CLIENT NAME

Project Start Year	2,027
Project End Year	2,027
Escalation	3.00 %
TOTAL GSF	

CONSTRUCTION ITEM	NOTES	UNIT	UNIT COST	TOTAL COST	QUANTITY	
DETENTION BASIN	INCLUDING EXCAVATION, GRADING, SEEDING, AND HAULING EXCESS MATERIAL	CY	$ 30.00	$ 1,620,420.00	54,014	
BASIN OUTLET RISER		LS	$ 20,000.00	$ 20,000.00	1	
PIPE SEWER 60 INCH (STORM)		LF	$ 300.00	$ 15,000.00	50	
			$ -	$ -		
			$ -	$ -		
TOTAL CONSTRUCTION COSTS				**$ 1,655,420.00**		

SUB-TOTAL CONSTRUCTION				**$ 2,000,000.00**	**0.00**	
		SOFT COSTS, MARKUPS, CONTINGENCY				
CATEGORY	**NOTES**	**PERCENTAGE**	**ALLOCATED TO SUBTOTAL**	**ESTIMATE**	**GSF**	
DESIGN CONTINGENCY		25.00 %	$ 2,000,000.00	$ 500,000.00	0.00	
SUB-TOTAL COST OF WORK				$ 2,500,000.00	0.00	
General Contractor Mark-ups		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
PROJECT LOGISTICS AND LABOR FACTOR			$ 2,500,000.00	$ -	0.00	
GENERAL REQ'S, PHASING, AND TEMP CONSTRUCTION			$ 2,500,000.00	$ -	0.00	
GENERAL CONDITIONS			$ 2,500,000.00	$ -	0.00	
GENERAL CONTRACTOR OVERHEAD & PROFIT		5.00 %	$ 2,500,000.00	$ 125,000.00	0.00	
INSURANCE		2.00 %	$ 2,625,000.00	$ 52,500.00	0.00	
PERFORMANCE AND PAYMENT BOND		1.00 %	$ 177,500.00	$ 1,775.00	0.00	
OPINION OF PROBABLE COST OF WORK				$ 2,679,275.00	0.00	
Owner's Soft Costs		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
MANAGEMENT		3.00 %	$ 2,679,275.00	$ 80,378.25	0.00	
CONSTRUCTION MANAGER		-	$ 2,679,275.00	$ -	0.00	
PLANNING & PRECONSTRUCTION		0.20 %	$ 2,679,275.00	$ 5,358.55	0.00	
ARCHITECTURAL/ENGINEERING DESIGN		8.00 %	$ 2,679,275.00	$ 214,342.00	0.00	
ARCHITECTURAL/ENGINEERING CONSTRUCTION ADMIN.		2.00 %	$ 2,679,275.00	$ 53,585.50	0.00	
SURVEYING		0.50 %	$ 2,679,275.00	$ 13,396.38	0.00	
TESTING		0.50 %	$ 2,679,275.00	$ 13,396.38	0.00	
INSPECTIONS		1.10 %	$ 2,679,275.00	$ 29,472.03	0.00	
HAZARDOUS ABATEMENT		-	$ 2,679,275.00	$ -	0.00	
LAND & RIGHT OF WAY		-	$ 2,679,275.00	$ -	0.00	
MISCELLANEOUS FEES (PERMITS)		0.60 %	$ 2,679,275.00	$ 16,075.65	0.00	
OWNER'S CONSTRUCTION CONTINGENCY		-	$ 2,679,275.00	$ -	0.00	
PROJECT CONTINGENCY		1.50 %	$ 2,679,275.00	$ 40,189.13	0.00	
SUBTOTAL INCL. SOFT COSTS			$ -	$ 3,145,468.85	0.00	
ENVIRONMENTAL ASSESSMENT		4.00 %	$ 3,145,468.85	$ 125,818.75	0.00	
ROM TOTAL COST ESTIMATE				$ 4,000,000.00	0.00	

STL AIRPORT LAYOUT PLAN - COST ESTIMATES

User to complete non-shaded fields and define yellow-shaded input cells (Refer to Resources Tab)

Detention Basin 4 Estimate

M3 Engineering Group

Input Cell

ESTIMATE NUMBER	PROJECT NAME
DATE OF ESTIMATE	DATES OF PROJECT
ESTIMATE PREPARED BY	CLIENT NAME

Project Start Year	2,027
Project End Year	2,027
Escalation	3.00 %
TOTAL GSF	

CONSTRUCTION ITEM	NOTES	UNIT	UNIT COST	TOTAL COST	QUANTITY	
DETENTION BASIN	INCLUDING EXCAVATION, GRADING, SEEDING, AND HAULING EXCESS MATERIAL	CY	$ 30.00	$ 2,222,310.00	74,077	
BASIN OUTLET STRUCTURE		LS	$ 20,000.00	$ 20,000.00	1	
PIPE SEWER 60 INCH (STORM)		LF	$ 300.00	$ 15,000.00	50	
			$ -	$ -		
			$ -	$ -		
TOTAL CONSTRUCTION COSTS				**$ 2,257,310.00**		
SUB-TOTAL CONSTRUCTION				**$ 3,000,000.00**	**0.00**	

SOFT COSTS, MARKUPS, CONTINGENCY

CATEGORY	NOTES	PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
DESIGN CONTINGENCY		25.00 %	$ 3,000,000.00	$ 750,000.00	0.00	
SUB-TOTAL COST OF WORK				**$ 3,750,000.00**	**0.00**	
General Contractor Mark-ups		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
PROJECT LOGISTICS AND LABOR FACTOR			$ 3,750,000.00	$ -	0.00	
GENERAL REQ'S, PHASING, AND TEMP CONSTRUCTION			$ 3,750,000.00	$ -	0.00	
GENERAL CONDITIONS			$ 3,750,000.00	$ -	0.00	
GENERAL CONTRACTOR OVERHEAD & PROFIT		5.00 %	$ 3,750,000.00	$ 187,500.00	0.00	
INSURANCE		2.00 %	$ 3,937,500.00	$ 78,750.00	0.00	
PERFORMANCE AND PAYMENT BOND		1.00 %	$ 266,250.00	$ 2,662.50	0.00	
OPINION OF PROBABLE COST OF WORK				**$ 4,018,912.50**	**0.00**	
Owner's Soft Costs		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
MANAGEMENT		3.00 %	$ 4,018,912.50	$ 120,567.38	0.00	
CONSTRUCTION MANAGER		-	$ 4,018,912.50	$ -	0.00	
PLANNING & PRECONSTRUCTION		0.20 %	$ 4,018,912.50	$ 8,037.83	0.00	
ARCHITECTURAL/ENGINEERING DESIGN		8.00 %	$ 4,018,912.50	$ 321,513.00	0.00	
ARCHITECTURAL/ENGINEERING CONSTRUCTION ADMIN.		2.00 %	$ 4,018,912.50	$ 80,378.25	0.00	
SURVEYING		0.50 %	$ 4,018,912.50	$ 20,094.56	0.00	
TESTING		0.50 %	$ 4,018,912.50	$ 20,094.56	0.00	
INSPECTIONS		1.10 %	$ 4,018,912.50	$ 44,208.04	0.00	
HAZARDOUS ABATEMENT		-	$ 4,018,912.50	$ -	0.00	
LAND & RIGHT OF WAY		-	$ 4,018,912.50	$ -	0.00	
MISCELLANEOUS FEES (PERMITS)		0.60 %	$ 4,018,912.50	$ 24,113.48	0.00	
OWNER'S CONSTRUCTION CONTINGENCY		-	$ 4,018,912.50	$ -	0.00	
PROJECT CONTINGENCY		1.50 %	$ 4,018,912.50	$ 60,283.69	0.00	
SUBTOTAL INCL. SOFT COSTS			$ -	$ 4,718,203.28	0.00	
ENVIRONMENTAL ASSESSMENT		4.00 %	$ 4,718,203.28	$ 188,728.13	0.00	
ROM TOTAL COST ESTIMATE				**$ 5,000,000.00**	**0.00**	

STL AIRPORT LAYOUT PLAN - COST ESTIMATES

User to complete non-shaded fields and define yellow-shaded input cells (Refer to Resources Tab)

Detention Basin 5 Estimate

M3 Engineering Group

Input Cell

ESTIMATE NUMBER	PROJECT NAME
DATE OF ESTIMATE	DATES OF PROJECT
ESTIMATE PREPARED BY	CLIENT NAME

Project Start Year	2,027
Project End Year	2,027
Escalation	3.00 %
TOTAL GSF	

CONSTRUCTION ITEM	NOTES	UNIT	UNIT COST	TOTAL COST	QUANTITY	
DETENTION BASIN	INCLUDING EXCAVATION, GRADING, SEEDING, HAULING EXCESS MATERIAL, AND GRADED OUTLET	CY	$ 30.00	$ 1,446,750.00	48,225	
			$ -	$ -		
			$ -	$ -		
TOTAL CONSTRUCTION COSTS				**$ 1,446,750.00**		

SUB-TOTAL CONSTRUCTION				**$ 2,000,000.00**	**0.00**	

SOFT COSTS, MARKUPS, CONTINGENCY

CATEGORY	NOTES	PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
DESIGN CONTINGENCY		25.00 %	$ 2,000,000.00	$ 500,000.00	0.00	
SUB-TOTAL COST OF WORK				**$ 2,500,000.00**	**0.00**	
General Contractor Mark-ups		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
PROJECT LOGISTICS AND LABOR FACTOR			$ 2,500,000.00	$ -	0.00	
GENERAL REQ'S, PHASING, AND TEMP CONSTRUCTION			$ 2,500,000.00	$ -	0.00	
GENERAL CONDITIONS			$ 2,500,000.00	$ -	0.00	
GENERAL CONTRACTOR OVERHEAD & PROFIT		5.00 %	$ 2,500,000.00	$ 125,000.00	0.00	
INSURANCE		2.00 %	$ 2,625,000.00	$ 52,500.00	0.00	
PERFORMANCE AND PAYMENT BOND		1.00 %	$ 177,500.00	$ 1,775.00	0.00	
OPINION OF PROBABLE COST OF WORK				**$ 2,679,275.00**	**0.00**	
Owner's Soft Costs		PERCENTAGE	ALLOCATED TO SUBTOTAL	ESTIMATE	GSF	
MANAGEMENT		3.00 %	$ 2,679,275.00	$ 80,378.25	0.00	
CONSTRUCTION MANAGER		-	$ 2,679,275.00	$ -	0.00	
PLANNING & PRECONSTRUCTION		0.20 %	$ 2,679,275.00	$ 5,358.55	0.00	
ARCHITECTURAL/ENGINEERING DESIGN		8.00 %	$ 2,679,275.00	$ 214,342.00	0.00	
ARCHITECTURAL/ENGINEERING CONSTRUCTION ADMIN.		2.00 %	$ 2,679,275.00	$ 53,585.50	0.00	
SURVEYING		0.50 %	$ 2,679,275.00	$ 13,396.38	0.00	
TESTING		0.50 %	$ 2,679,275.00	$ 13,396.38	0.00	
INSPECTIONS		1.10 %	$ 2,679,275.00	$ 29,472.03	0.00	
HAZARDOUS ABATEMENT		-	$ 2,679,275.00	$ -	0.00	
LAND & RIGHT OF WAY		-	$ 2,679,275.00	$ -	0.00	
MISCELLANEOUS FEES (PERMITS)		0.60 %	$ 2,679,275.00	$ 16,075.65	0.00	
OWNER'S CONSTRUCTION CONTINGENCY		-	$ 2,679,275.00	$ -	0.00	
PROJECT CONTINGENCY		1.50 %	$ 2,679,275.00	$ 40,189.13	0.00	
SUBTOTAL INCL. SOFT COSTS			**$ -**	**$ 3,145,468.85**	**0.00**	
ENVIRONMENTAL ASSESSMENT		4.00 %	$ 3,145,468.85	$ 125,818.75	0.00	
ROM TOTAL COST ESTIMATE				**$ 4,000,000.00**	**0.00**	

APPENDIX 10A – OPEN HOUSE COMMENTS SUMMARY

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT®

AIRPORT LAYOUT PLAN UPDATE/ MASTER PLAN

OPEN HOUSE COMMENT SUMMARY

MAY 2022

Prepared by

VECTOR COMMUNICATIONS

WSP

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

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Overview

St. Louis Lambert International Airport (STL) hosted a public Open House to share information and gather feedback about the ongoing Airport Layout Plan Update/Master Plan (ALPU/MP). The Open House took place on Thursday, May 5, 2022 from 4:00 p.m. to 7:00 p.m. at STL Terminal 1, Concourse B.

The Open House was promoted on STL's social media platforms and FlySTL website. Email invitations were sent to key project stakeholders. Editorial briefings with four major regional news outlets were held to discuss the ALPU/MP project and Open House. A press advisory was also distributed to regional new outlets. These tasks resulted in several promotional stories about the Open House and comment process. Furthermore, postcards with Open House details were sent to 14,110 residents and businesses within a one-mile radius of the airport. *The postcard and one-mile radius delivery map can be found in* ***Appendices A and B****, respectively.*

The purpose of the Open House was to inform the public of the ALPU/MP project status – including sharing the preliminary plan to create a single consolidated terminal – and solicit public input. Meeting attendees had the opportunity to complete paper or online comment forms, ask questions, and share their thoughts about the preliminary plan. One hundred five people attended the Open House.

Attendees viewed twenty four display boards highlighting aspects of the ALPU/MP project and preliminary plan. STL and WSP staff were stationed around the room to respond to questions and explain the display boards. At the final station, the public had the opportunity to submit comments. Comments could be submitted online using their personal smart phone or a provided iPad, in writing, or verbally.

Additionally, attendees heard a formal presentation with remarks from Rhonda Hamm-Niebruegge, Director of Airports, a project overview from John van Woensel, Vice President, WSP USA, and participated in a Question & Answer session facilitated by Laurna Godwin, President of Vector Communications. The formal presentation was held at 4:45 p.m. and repeated at 5:45 p.m.

The Open House station guide, display boards and presentation slides can be found in ***Appendices C, D, and E****, respectively. To watch a recording of the Open House presentation, which is available publicly on the FlySTL website click here.*

Comment Summary

Open House attendees were encouraged to provide their feedback during the event by submitting an online comment form on their smartphone or tablet, verbally sharing, or submitting a paper comment form. The online comment form was also available on the Open House website. The public was given an additional fifteen days – until May 20, 2022 – to complete the online comment form or email their comments to STL Project Manager Dana Ryan (Dana's contact information has been listed on the FlySTL website since the beginning of the ALPU/MP, and appropriate STL contact info will continue to be shown until the project is complete).

A total of fifty-six comments were received via:

- Online comment forms (39),
- Comments directly shared with Dana Ryan via phone or email (15), and
- Paper comment forms (2).

Online & Paper Comment Form Results

Two individuals submitted paper comment forms and thirty-nine submitted feedback through the online comment form. Both forms included the same six questions and write-in areas. *The online and paper comment forms can be found in **Appendices F and G**, respectively.*

Results from the forty-one comment forms are summarized in this section.

Question 1: Please provide your comments about the Airport Layout Plan Update/Master Plan below.

The forty-one comments were coded with themes. There was no limit to the number of themes per comment. The coded comment breakdown is as follows:

Theme	Count
Positive sentiment	13
Landside amenities	10
Positive sentiment for single consolidated terminal	7
Negative sentiment	6
Terminal design	6
Concessions	4
Negative sentiment for consolidated single terminal	4
Parking facilities	4
Preference for Terminal 2	4
Regional impact	4
Roadway access	4
Timeline	4
Perception	3
Rental car facility	3
Terminal 2 future use	3
Terminal layout	3
Ambivalent sentiment	2
Modernization need	2
Neighboring municipalities	2
Public engagement	2
Accessibility	1
Aesthetics	1
Alternative options	1
Congestion	1
Construction impact	1
Convenience	1

Theme (continued)	Count
Cultural education	1
Domes	1
High-speed rail	1
Light rail	1
MetroLink	1
N/A	1
Noise mitigation	1
Relationship to airlines	1
Terminal shuttles	1
Transportation hub	1
TSA checkpoints	1
USO	1

*Verbatim comments are listed by theme in **Appendix H**.*

Question 2: In what zip code do you live?

The forty-one survey respondents represent thirty-three distinct zip codes. Most distant is Philadelphia, Pennsylvania. Three responses were received from Illinois, and the remaining responses from the City of St. Louis, St. Louis County and St. Charles County.

Zip code	Count
63303 (St. Charles)	3
63017 (Chesterfield)	2
63042 (Hazelwood)	2
63101 (Downtown St. Louis City)	2
63109 (St. Louis Hills)	2
63143 (Maplewood)	2
63301 (St. Charles)	2
63376 (St. Peters)	2
19106 (Philadelphia, PA)	1
62010 (Bethalto, IL)	1
62221 (Belleville, IL)	1
62271 (Okawville, IL)	1
63043	1
63044	1
63103	1
63110	1
63112	1
63114	1
63123	1
63124	1
63126	1
63128	1
63129	1
63130	1
63131	1
63134	1
63136	1
63139	1
63144	1
63146	1
63368	1

Question 3: What is your relationship to Lambert Airport and this project? Please check all that apply.

The most frequently reported relationship to the project was respondents traveling via STL monthly or less (22, 36%) followed by frequently traveling via STL more than twice per month (14, 23%) and living near STL (12, 20%).

Relationship to Project	Count
I sometimes travel via Lambert Airport (monthly or less).	22
I frequently travel via Lambert Airport (more than twice per month).	14
I live near Lambert Airport.	12
I work in/near Lambert Airport.	7
I am an elected official in St. Louis County.	2
I rarely travel via Lambert Airport (once per year or less).	1
I am an elected official in St. Louis City.	0
Other	3

"Other" responses included the following:

- Fly 3 to 4 times yearly
- Former employee/city resident
- I live in St. Louis and use Lambert whenever I fly. It's the gateway to our city and I would like our city to leave a fantastic first and last impression for people visiting or even [for] those just passing through.

Question 4: How did you find out about this Open House? Please check all that apply.

The most frequently reported method of learning about the open house was local media coverage (25, 40%), followed by the STL website and social media (17, 27%) and email (7, 11%).

Method	Count
Local media coverage	25
Airport website/social media coverage	17
Email	7
Word of mouth	5
Mailed postcard	2
Sign in Lambert Airport	1
Other	6

"Other" responses include:

- Google News alert (2)
- Aviation STL on Twitter
- Greater STL email
- Twitter user
- UrbanSTL, Airliners.net, NextSTL

Question 5: Please evaluate this event according to the following criteria.

Nearly all respondents agreed that the public meeting was informative and well planned.

The Open House was informative.

Sentiment	Count
Agree	17
Strongly agree	11
Neutral	8
Disagree	2
Strongly disagree	0

The Open House was well planned.

Sentiment	Count
Agree	17
Strongly agree	10
Neutral	7
Disagree	2
Strongly disagree	0

Question 6: Please provide your email address below if you would like future updates about this project.

Twenty-three respondents shared contact information to subscribe to project updates. The contact list will be provided to STL in the Project Database.

Summary of Comments Directly Submitted to STL

Fifteen people submitted comments directly to STL Project Manager Dana Ryan via phone or email. These comments were coded with themes. There was no limit to the number of themes per comment. The categorized comment breakdown is as follows:

Theme	Count
Public engagement	4
Community impact	2
Open House	2
Preference for Terminal 2	2
Safety	2
Accessibility	1
Comment form	1
Environmental impact	1
Evacuation sites	1
Landside amenities	1
MetroLink	1
Modernization need	1
Negative sentiment	1
Perception	1
Positive sentiment for single consolidated terminal	1
Public transportation	1
Regional impact	1
Rental car facilities	1
Security protocols	1
Terminal 2 future use	1
Transportation hub	1

Verbatim comments directly submitted to STL Project Manager Dana Ryan can be found in ***Appendix I****.*

Compiled Comment Topics

When combining the themes of all fifty-six submitted comments, the following themes were most frequently referenced:

Theme	Count	Comment percentage*
Positive sentiment	13	23%
Landside amenities	11	20%
Positive sentiment for single consolidated terminal	8	14%
Negative sentiment	7	13%
Preference for Terminal 2	6	11%
Public engagement	6	11%
Terminal design	6	11%
Regional impact	5	9%
Concessions	4	7%
Negative sentiment for consolidated single terminal	4	7%
Parking facilities	4	7%
Perception	4	7%
Rental car facility	4	7%
Roadway access	4	7%
Terminal 2 future use	4	7%
Timeline	4	7%

**Percentage of the fifty-six comments that included this theme. Most comments had more than one theme.*

*A complete list of compiled comment topics can be found in **Appendix J**.*

Conclusion

While the Open House materials evoked mostly positive and some negative reactions from the public, there was a clear consensus that the airport is a critical aspect of the St. Louis region, serving as the region's front door to many travelers, and that there is a need for major improvement. Most respondents are either neutral or in favor of the preliminary plan, no major omissions or errors were identified. The public's input will help STL and the consultant team refine and complete the ALPU/MP.

Appendix

Appendix A: Open House postcard ____ 13
Appendix B: Open House postcard delivery map ____ 14
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Appendix I: Verbatim email comments with thematic codes ____ 50
Appendix J: List of compiled comment themes ____ 59

Appendix A: Open House postcard

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.
P.O. Box 10212, St. Louis, MO 63145-00212

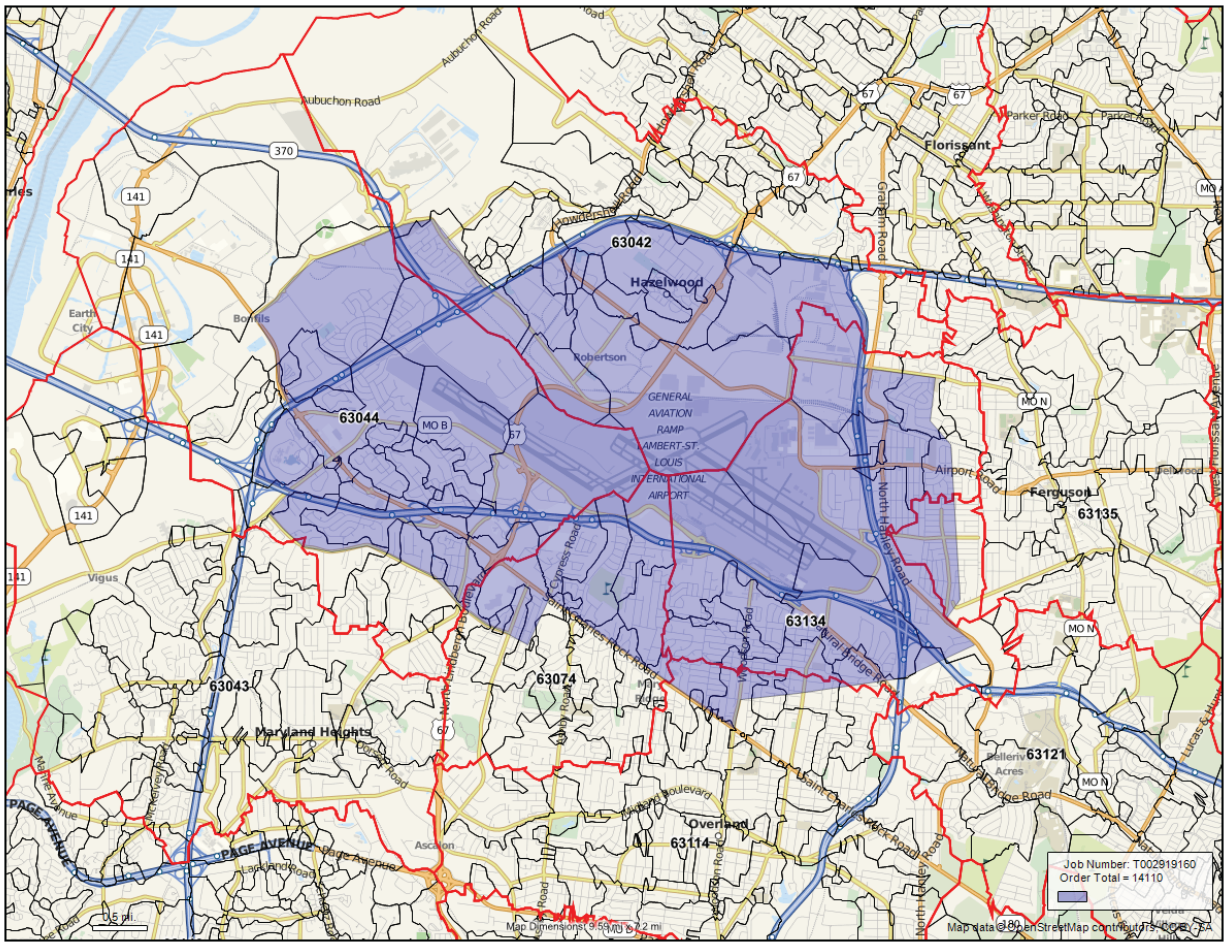
STL Airport Open House!

Thursday, May 5, 2022
4 p.m.-7 p.m.
Stop by anytime.
Presentations at 4:45 p.m. and 5:45 p.m.

STL Lambert International Airport, Terminal 1, Concourse B
10701 Lambert International Blvd.
St. Louis, MO 63145-0212

Visit **flystl.com/about-us/stl-airport-layout-plan** for parking and transportation info.

Appendix B: Open House postcard delivery map



ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Airport Open House
May 5, 2022
Station Guide

Welcome!

Thank you for attending today's Airport Open House. This guide provides an overview of the information presented at each station. Subject matter experts from the airport and consultant team members are at each station to answer your questions.

Presentation - A formal presentation will take place at 4:45 p.m. and repeated at 5:45 p.m. Hear an overview of this project and participate in a Q&A with project team members. *ASL interpretation will be provided at both presentations. A recording of this presentation will be available on the project website, listed below.*

Station #1 - What is a Master Plan? Learn about the master plan process and what stakeholders are involved.

Station #2 - Forecast – Why are we planning for improvements? At this station, you can learn about the challenges that STL's terminals face and view the forecast of passenger activity through 2040.

Station #3 - Preliminary Plan – Terminal This station informs on the terminal needs, the alternatives development and evaluation process, and the preliminary preferred terminal alternative.

Station #4 - Preliminary Plan – Landside This station informs on the key ground access issues at STL, the roadway alternatives development and evaluation process, and the preliminary preferred airport access roadway alternative. The proposed parking garage is also depicted.

Station #5 - Preliminary Plan – Airside & Support Functions Learn about the preliminary preferred airfield improvements and support functions sites.

Station #6 - Cost & Funding Learn about funding sources and preliminary terminal cost estimates.

Station #7 - Environmental Considerations Learn about what environmental resources were identified and how the preliminary plan mitigates any impact. Additionally, airport noise information is available for review.

Station #8 - What's Next? Learn about the next steps in the Airport Layout Plan Update/Master Plan process.

Station #9 - Public Comments Submit an online, paper, or verbal comment.

Pick up a parking validation ticket at the check-in table. Parking validation is available for the Terminal 1 Garage, Lots A, B, C, and D. Shuttles to & from Lots A-D are available every 10 minutes from the SuperPark shuttle pick-up.

www.flySTL.com/About-Us/STL-Airport-Layout-Plan

Appendix D: Open House display boards

What is an Airport Master Plan?

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

Planning Process

"An airport master plan is a comprehensive study of an airport and usually describes the short-, medium- and long-term development plans to meet future aviation demand"

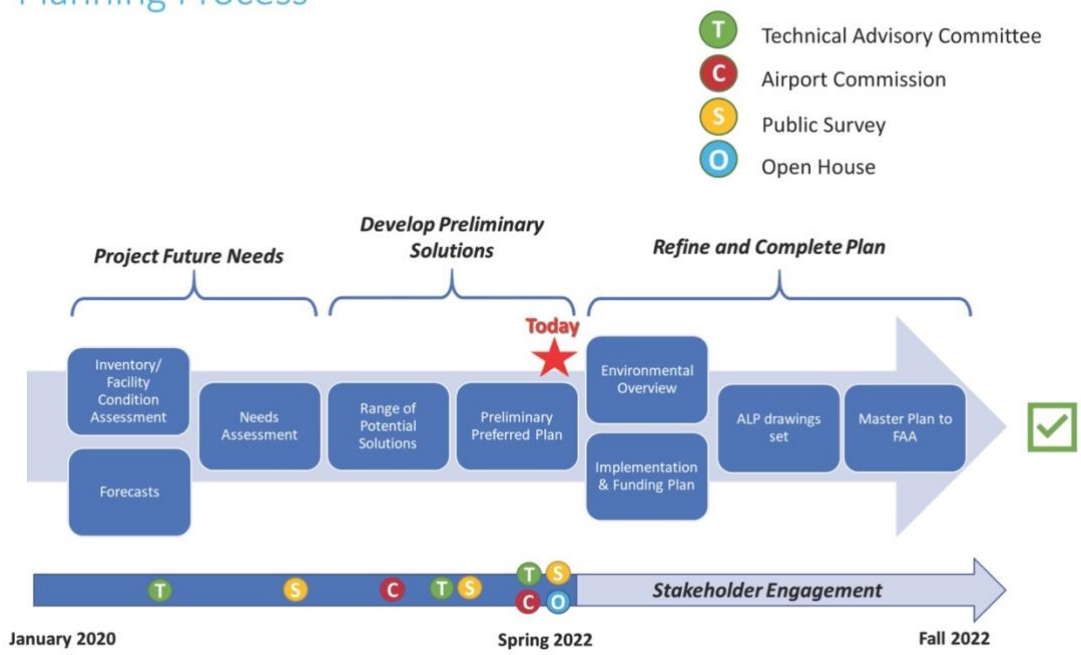
- FAA Advisory circular 150/5070-6B, Airport Master Plans

- Provides a blueprint for expected airport development
- Completed every 8-10 years, last plan in 2012
- Needed to continue receiving FAA funding
- Plans for 20-year period
- Requires public input
- Followed by multiple steps before construction

Planned projects can only move forward if they are:
- **Justified by actual demand**
- **Environmentally approved**
- **Financially feasible**

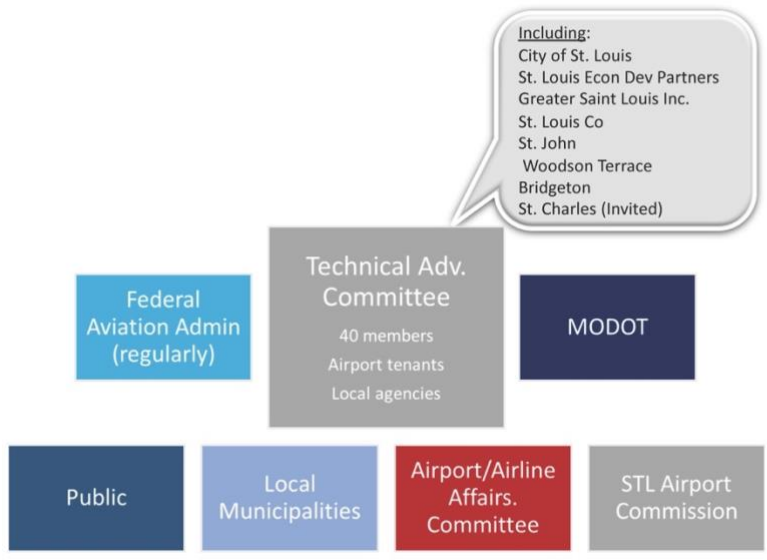
What is an Airport Master Plan?

Planning Process



Input into the Airport Master

Stakeholder Engagement to Date



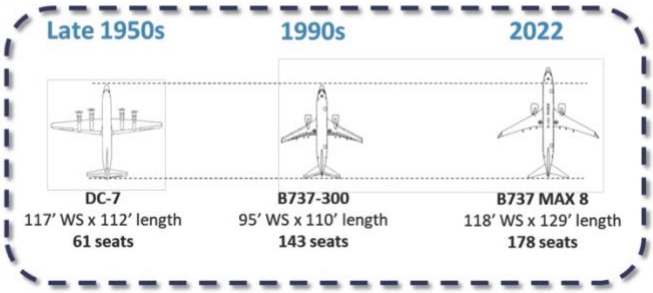
Engagement to Date:

- Three Public surveys:
  - 2,948 total responses
- 25 meetings with over 400 total attendees:
  - TAC: 3 meetings
  - Airport Commission: 2 meetings
  - Airlines committee: 3 meetings
  - MODOT: 3 meetings
  - St. Louis County: 1 meeting
  - EWGCC: 1 meeting
  - Metro: 2 meetings
  - Greater STL Inc: 2 meetings
  - Regional Business Council: 1 meeting
  - YPO: 1 meeting
  - Southern municipalities: 3 meetings
  - American Society for Industrial Security : 1 meeting
- Ongoing Website Updates
- Upcoming Public Engagement:
  - Open house
  - Airport Commission

Why Plan for Improvements?

Changed Industry Conditions

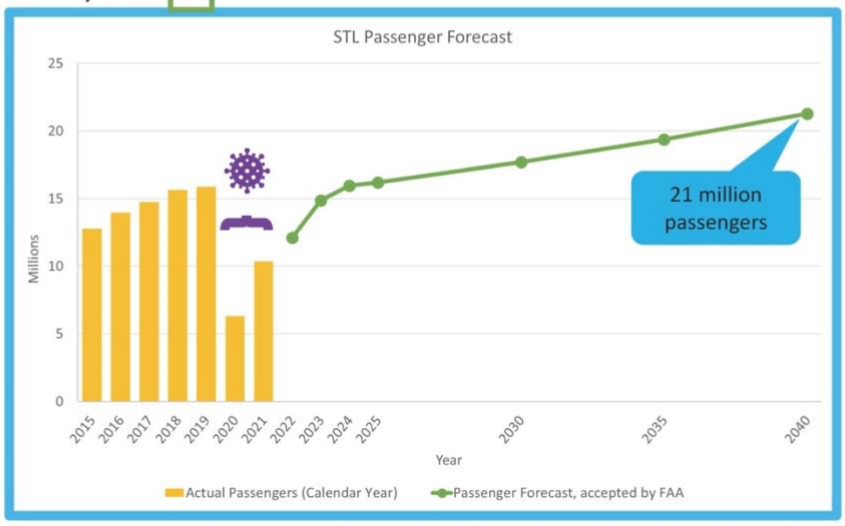
- Current conditions:
  - Lack functionality of facilities
- Age of facilities:
  - Terminal 1 built in 1956
  - Terminal 2 built in 1998
  - Maintenance vs. Reliability
- Industry changes:
  - Aircraft getting larger (size and number of seats)
  - Air travel is growing
  - 9/11 security requirements
  - Connecting hub



Why Plan for Improvements?

Passenger Forecast

- Strong recovery from COVID
- Growth to 21M passengers by 2040
- Approved by FAA ☑

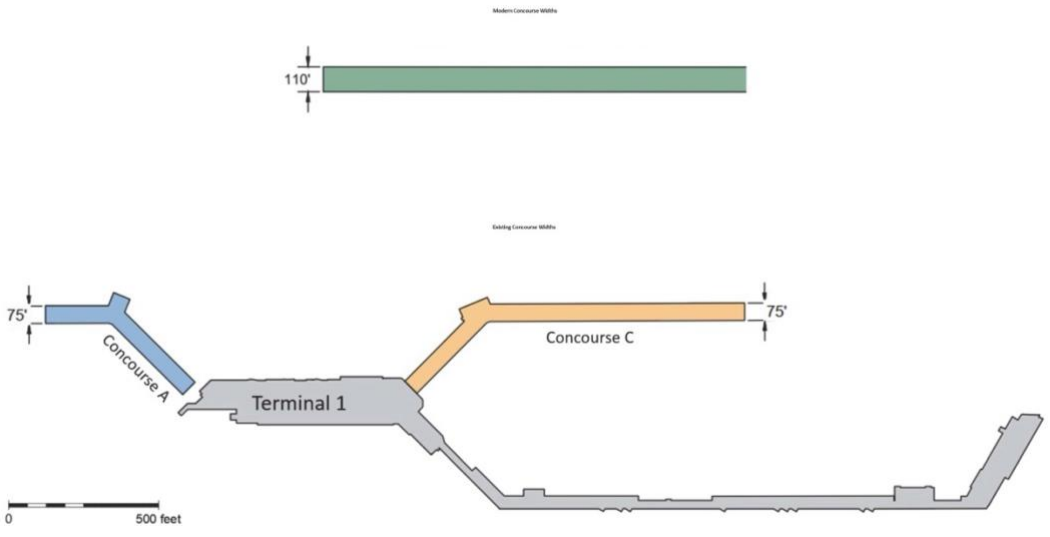


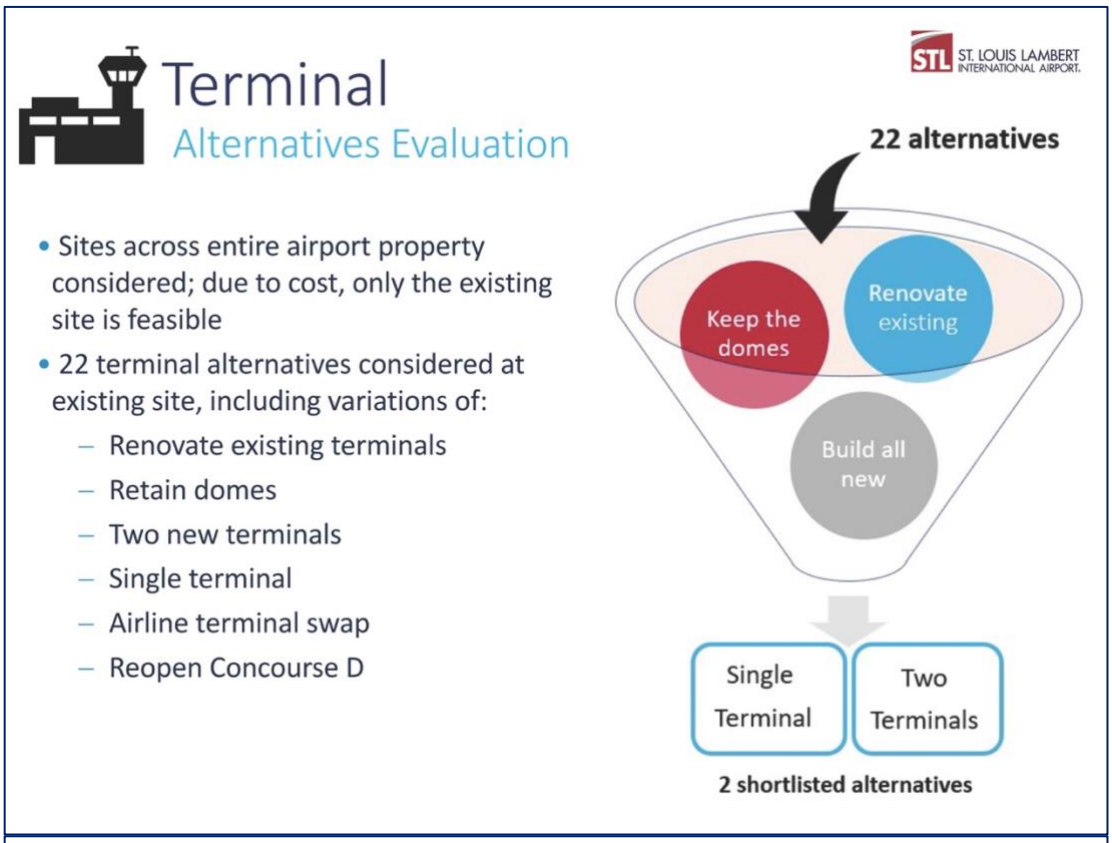
Terminal Needs and Solutions

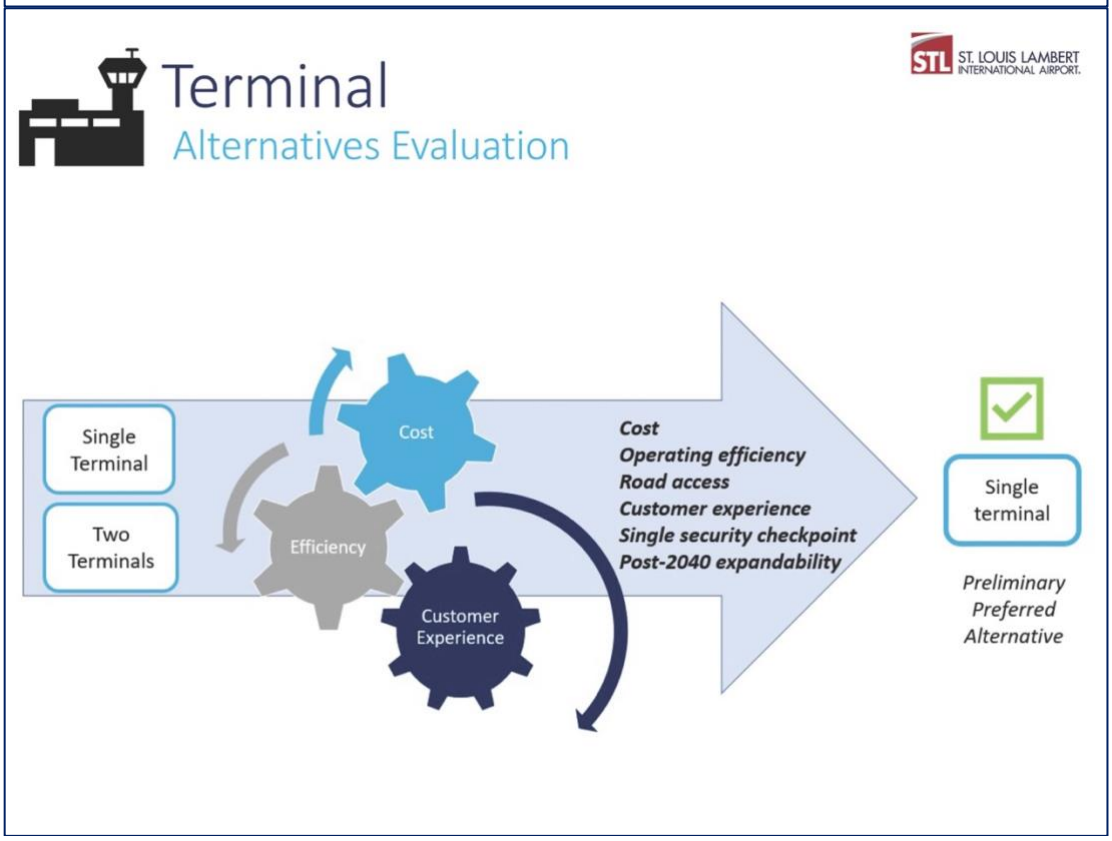
Need	Solution
Growth in Passengers	Increase number of aircraft gates (up to 62) Increase terminal and concourse space Accommodate modern aircraft
Old/Aging Facilities	Upgrade customer experience Reduce Operating & Maintenance costs Improve resilience
Inadequate Concessions	Increase customer choices Provide additional revenues
Insufficient Revenue Opportunities	Provide additional garage parking & revenues

Terminal

Concourse Width Comparison

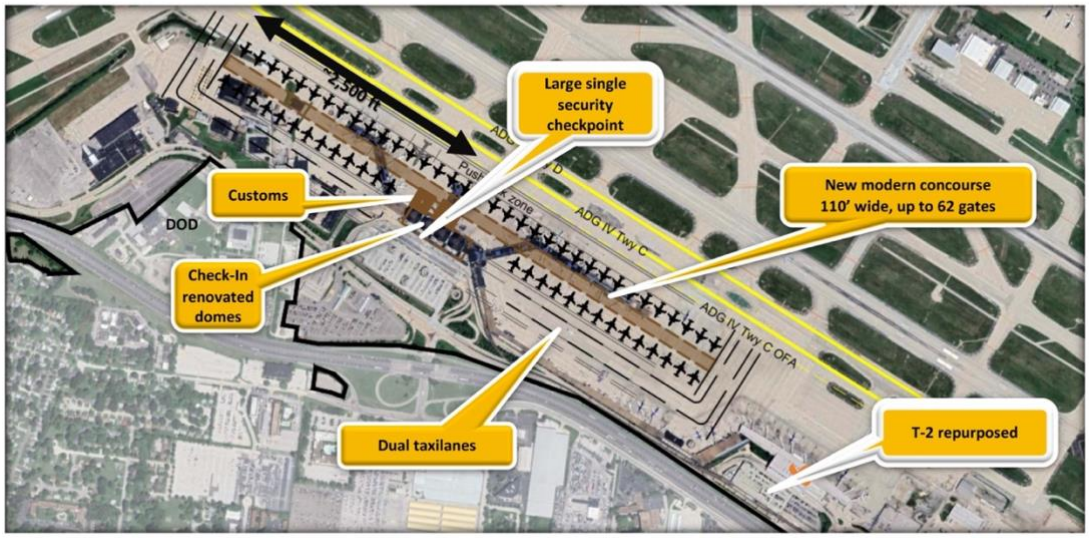



Terminal
Alternatives Evaluation
ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.
• Sites across entire airport property considered; due to cost, only the existing site is feasible
• 22 terminal alternatives considered at existing site, including variations of:
– Renovate existing terminals
– Retain domes
– Two new terminals
– Single terminal
– Airline terminal swap
– Reopen Concourse D
22 alternatives
Keep the domes
Renovate existing
Build all new
Single Terminal
Two Terminals
2 shortlisted alternatives


Terminal
Alternatives Evaluation
ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.
Single Terminal
Two Terminals
Cost
Efficiency
Customer Experience
Cost
Operating efficiency
Road access
Customer experience
Single security checkpoint
Post-2040 expandability
Single terminal
Preliminary Preferred Alternative

Terminal

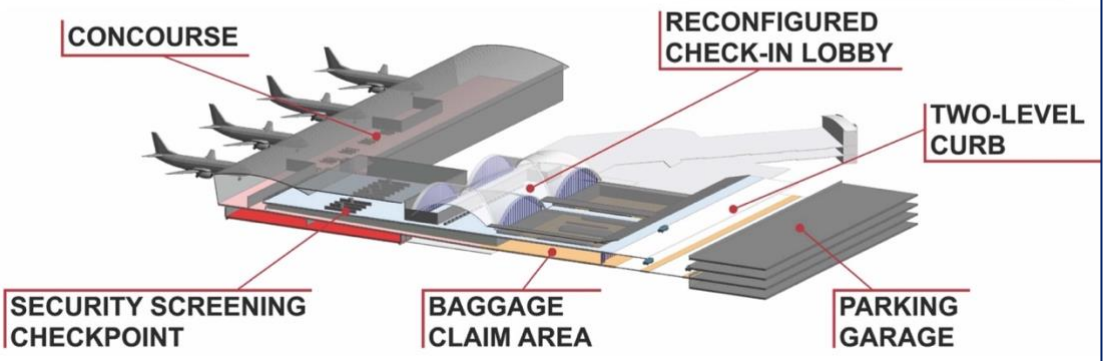
Preliminary Preferred Terminal Plan



Terminal

Preliminary Preferred Terminal Plan

- ✓ Passenger convenience
- ✓ FIS accessible to all carriers
- ✓ Single security checkpoint
- ✓ Gates on both sides
- ✓ New roadways & entrance
- ✓ Concourse can expand further
- ✓ Right-sized space

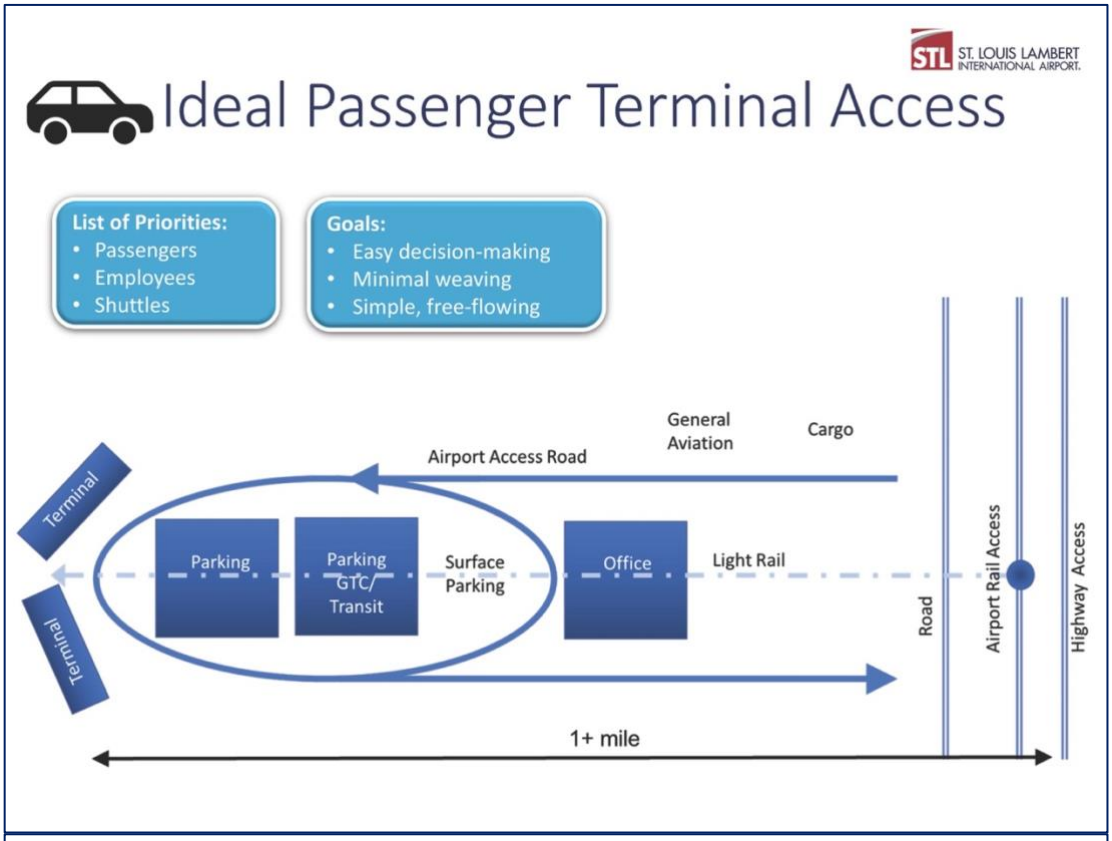


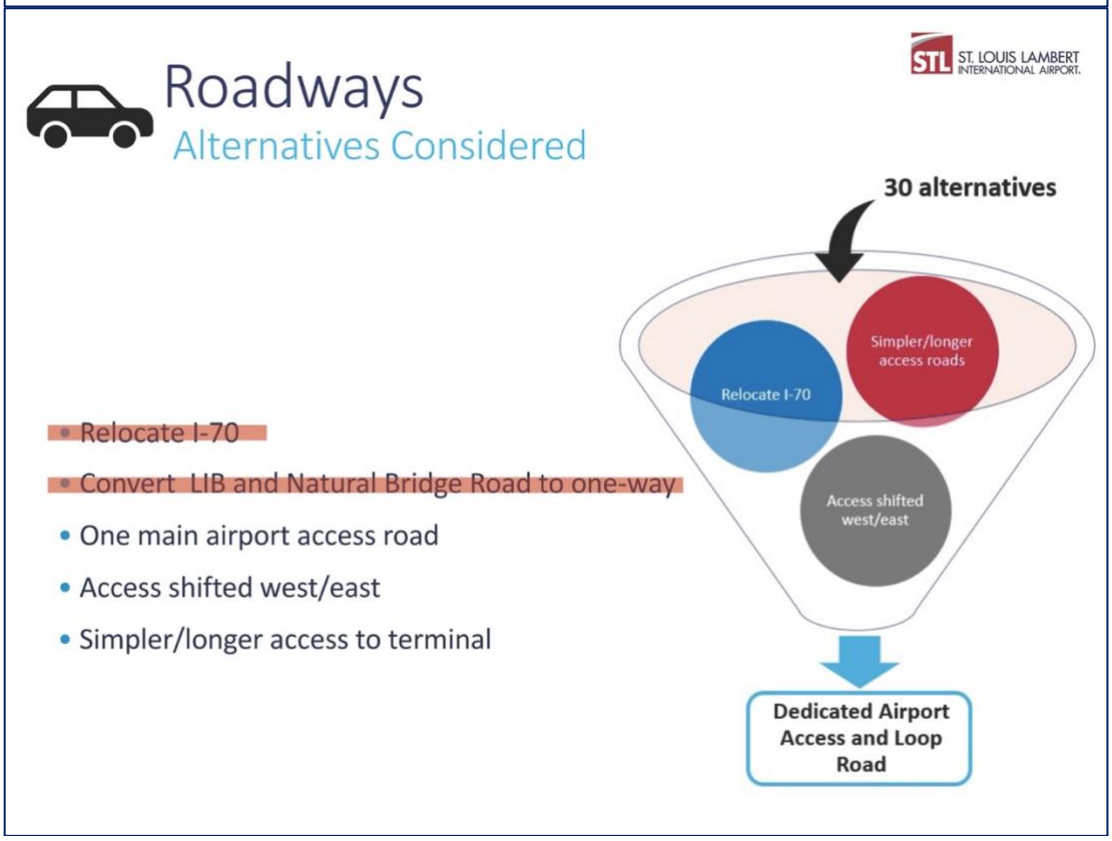
Roadways
Key Issues – Terminal 1

- Insufficient decision distance from highway
- Signage overload
- Tight parking envelope

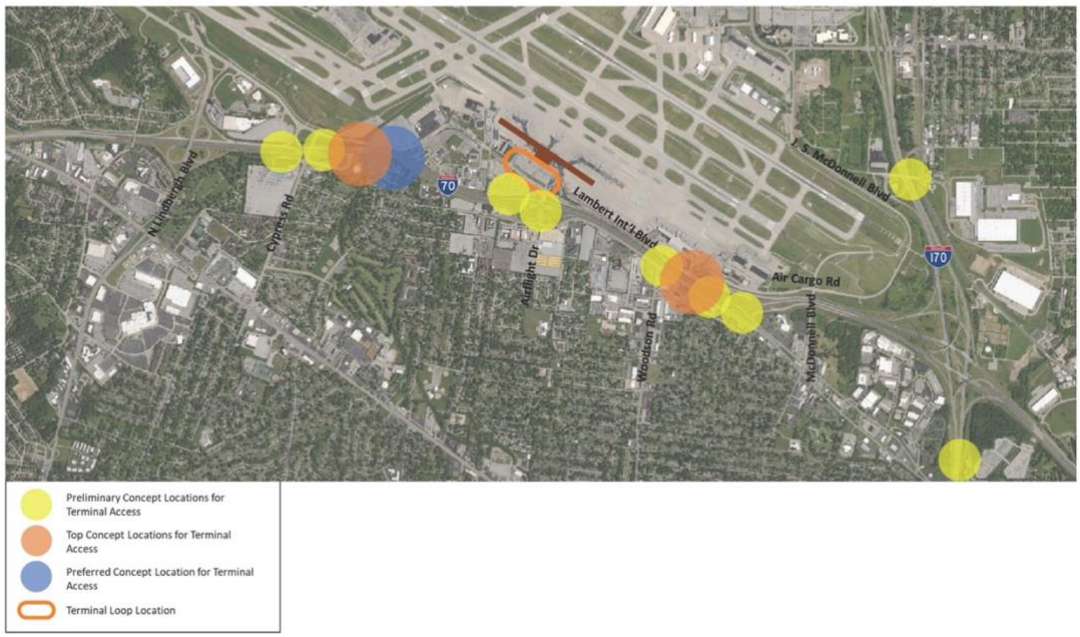
Roadways
Key Issues – Terminal 2

- Tight turn/short decision time
- Inadequate number of arrival curb lanes
- Short sightlines
- Elevated MetroLink tracks limit options


ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.
Ideal Passenger Terminal Access
List of Priorities:
• Passengers
• Employees
• Shuttles
Goals:
• Easy decision-making
• Minimal weaving
• Simple, free-flowing
General Aviation
Cargo
Airport Access Road
Terminal
Parking
Parking
GTC/ Transit
Surface Parking
Office
Light Rail
Road
Airport Rail Access
Highway Access
Terminal
1+ mile


ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.
Roadways
Alternatives Considered
30 alternatives
Simpler/longer access roads
Relocate I-70
Access shifted west/east
Dedicated Airport Access and Loop Road
• Relocate I-70
• Convert LIB and Natural Bridge Road to one-way
• One main airport access road
• Access shifted west/east
• Simpler/longer access to terminal

Terminal Access Concepts

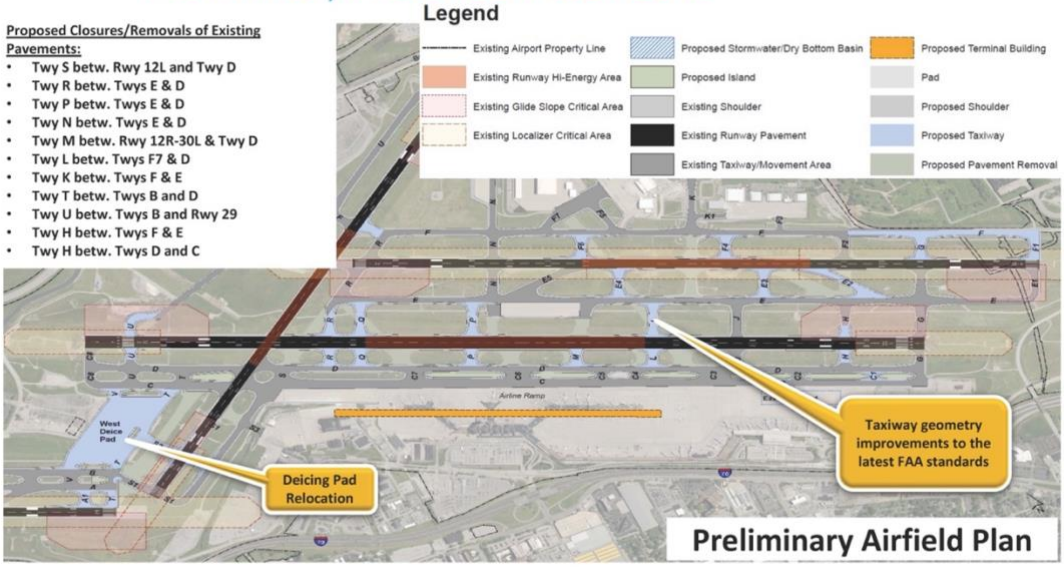


Airfield

Preliminary Preferred Alternative

Proposed Closures/Removals of Existing Pavements:

- Twy S betw. Rwy 12L and Twy D
- Twy R betw. Twys E & D
- Twy P betw. Twys E & D
- Twy N betw. Twys E & D
- Twy M betw. Rwy 12R-30L & Twy D
- Twy L betw. Twys F7 & D
- Twy K betw. Twys F & E
- Twy T betw. Twys B and D
- Twy U betw. Twys B and Rwy 29
- Twy H betw. Twys F & E
- Twy H betw. Twys D and C



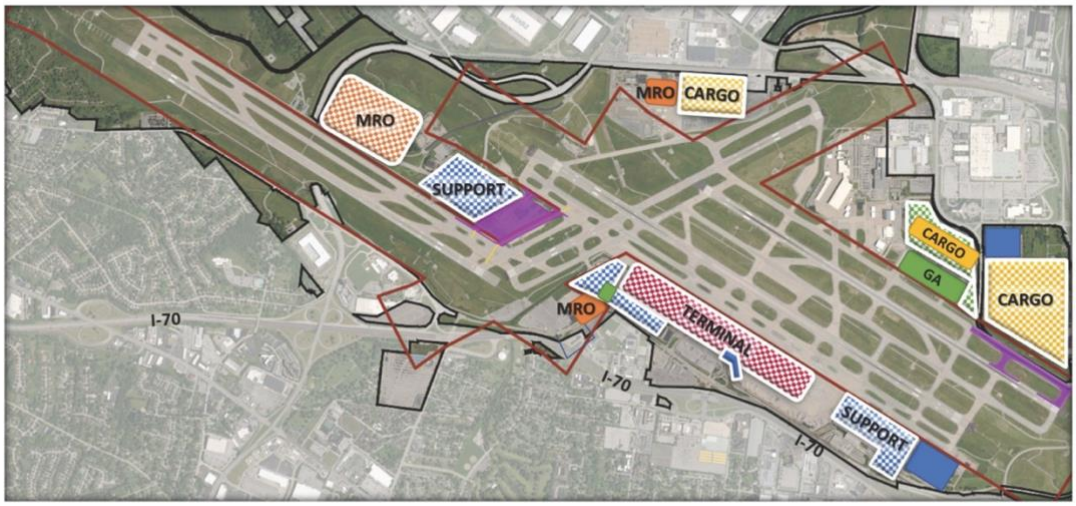
- Sufficient runway length
- Sufficient runway capacity

Cargo and Support Facilities

Preliminary Preferred Alternative

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

Legend:
- Existing
- Proposed
- Airport Property Line
- Development Boundary



Funding

Typical / Likely Funding Sources

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

- **No City or local tax dollars required**
- FAA grants
- Airport bonds
- Existing user fees (PFCs) USER FEE
- Rent & charges from airport tenants

➢ Preliminary Terminal Program cost-per-gate estimate is within the industry ballpark :

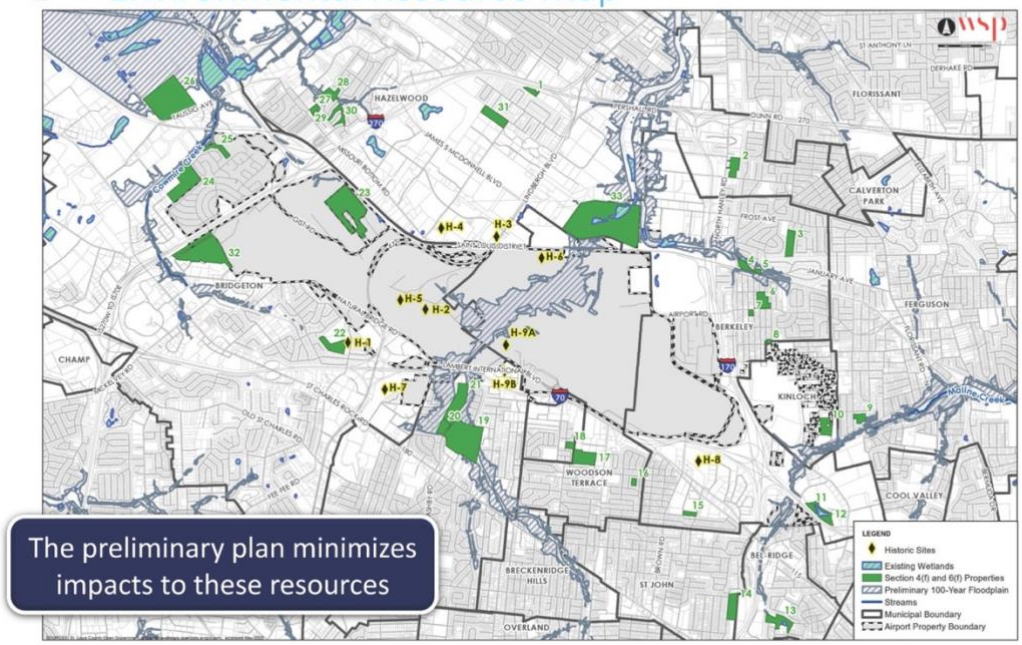
  ➢ Terminal building only: $31 million per gate

  ➢ Entire Terminal Program: $40-44 million per gate (includes terminal building and roads, west deicing pad, taxiway connectors, terminal support facilities, parking garage, etc.)

  ➢ Refinement and feasibility analysis underway

Environmental Considerations

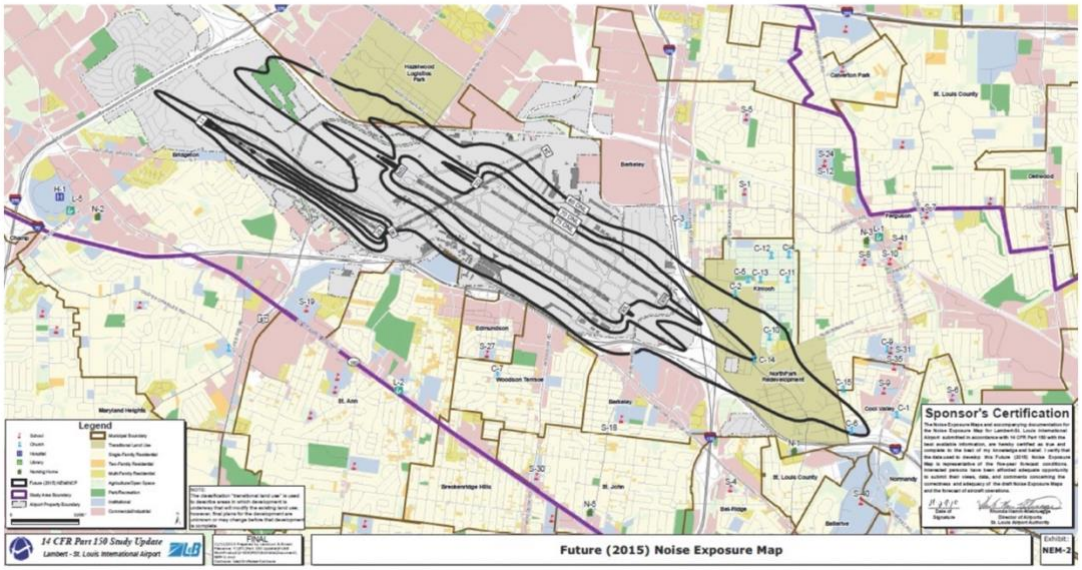
Environmental Resource Map



The preliminary plan minimizes impacts to these resources

Environmental Considerations

Existing Airport Noise



Source: 2015 Noise Exposure Map, 14 CFR STL Noise Exposure Map Update and Noise Compatibility Program Update, November 2010.

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

Next Steps

Implementing the Program

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

Tell Us What You Think!

Public Input Opportunities

Share your feedback about the preliminary Airport Layout Plan Update/Master Plan by:

- Completing an online comment form using an iPad or your phone
- Submitting a paper form
- Recording a verbal comment

Need more time to compile your feedback?

- The comment form is available at **www.flySTL.com/About-Us/STL-Airport-Layout-Plan**
- Comment forms can also be mailed to:
  Dana Ryan, Airport Layout Plan Update/Master Plan Project Manager
  P.O. Box 10212
  St. Louis, MO 63145-00212

All comments must be submitted by May 20, 2022.

Scan here to complete an online comment form

Appendix E: Open House presentation slides

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

Open House

St. Louis Lambert International Airport Layout Plan Update & Master Plan

May 5, 2022

What is an Airport Master Plan?

Planning Process

"An airport master plan is a comprehensive study of an airport and usually describes the short-, medium- and long-term development plans to meet future aviation demand"

- FAA Advisory circular 150/5070-6B, Airport Master Plans

- Provides a blueprint for expected airport development
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- Followed by multiple steps before construction

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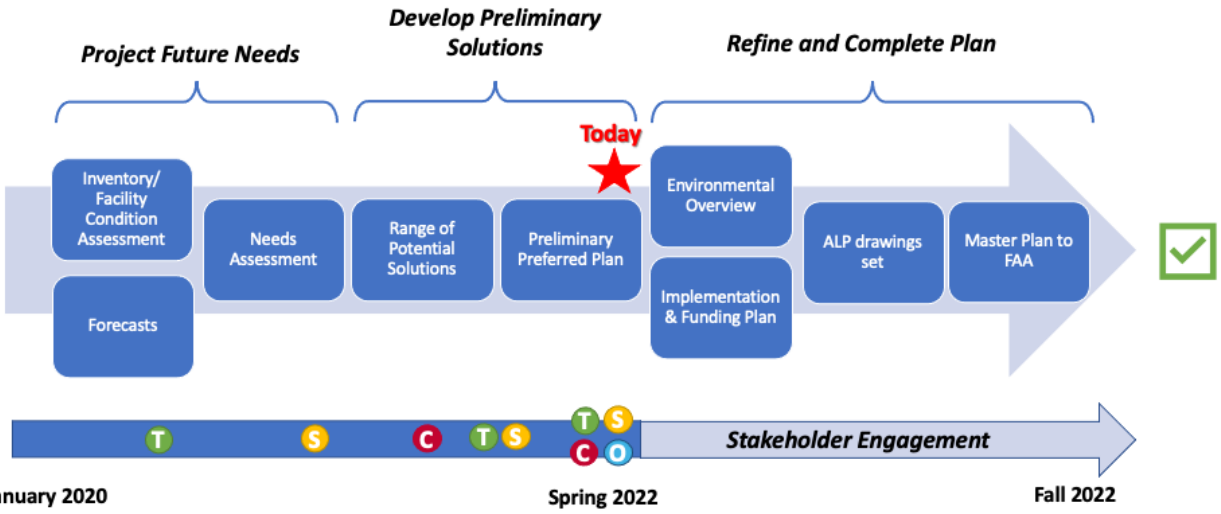
- **Financially feasible**

What is an Airport Master Plan?

Planning Process

T Technical Advisory Committee
C Airport Commission
S Public Survey
O Open House



Input into the Airport Master Plan

Stakeholder Engagement to Date

Including:
City of St. Louis
St. Louis Econ Dev Partners
Greater Saint Louis Inc.
St. Louis Co
St. John
Woodson Terrace
Bridgeton
St. Charles (Invited)

Federal Aviation Admin (regularly)

Technical Adv. Committee
40 members
Airport tenants
Local agencies

MODOT

Public

Local Municipalities

Airport/Airline Affairs. Committee

STL Airport Commission

Engagement to Date:

- Three Public surveys:
  - 2,948 total responses
- 25 meetings with over 400 total attendees:
  - TAC: 3 meetings
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  - Airlines committee: 3 meetings
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- Ongoing Website Updates
- Upcoming Public Engagement:
  - Open house
  - Airport Commission

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

Why Plan for Improvements?

Changed Industry Conditions

- Current conditions:
  - Lack functionality of facilities
- Age of facilities:
  - Terminal 1 built in 1956
  - Terminal 2 built in 1998
  - Maintenance vs. Reliability
- Industry changes:
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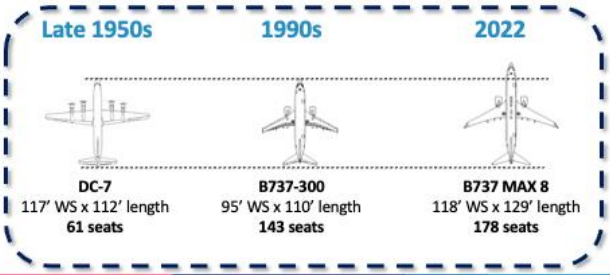
  - Air travel demand is growing
  - 9/11 security requirements
  - Connecting hub



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Passenger Forecast

- Strong recovery from COVID
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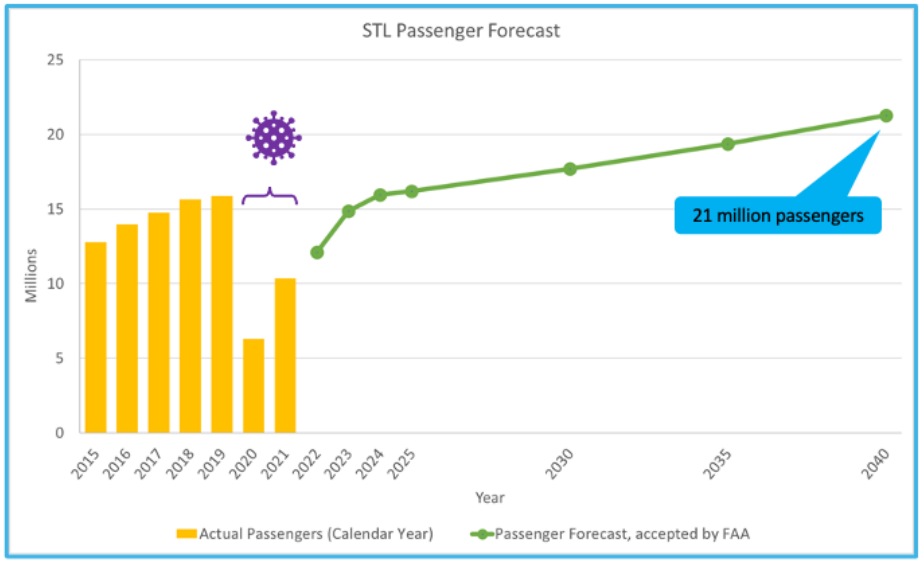
- Approved by FAA

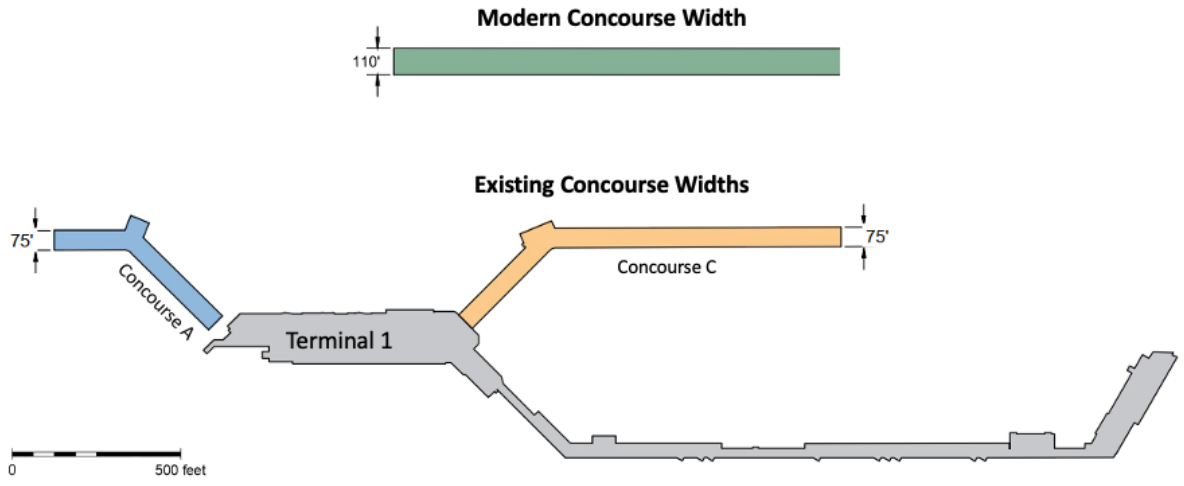


Terminal Needs and Solutions

Need	Solution
Growth in Passengers	Increase number of aircraft gates (up to 62) Expand terminal and concourse space Accommodate modern aircraft
Old/Aging Facilities	Upgrade customer experience Reduce Operating & Maintenance costs Improve resilience
Inadequate Concessions	Increase customer choices Provide additional revenues
Insufficient Revenue Opportunities	Provide more garage parking & revenues

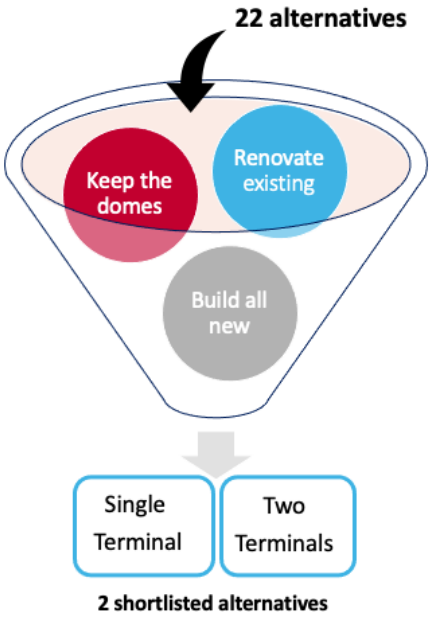
Terminal

Concourse Width Comparison

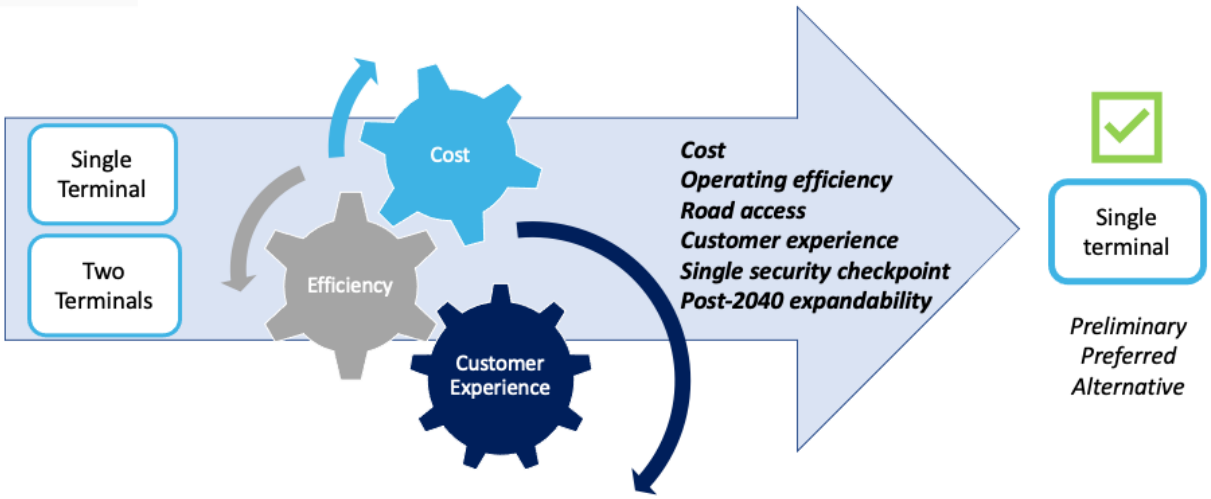


Terminal
Alternatives Evaluation

- Sites across entire airport property considered; due to cost, only the existing site is feasible
- 22 terminal alternatives considered at existing site, including variations of:
  - Renovate existing terminals
  - Retain domes
  - Two new terminals
  - Single terminal
  - Airline terminal swap
  - Reopen Concourse D

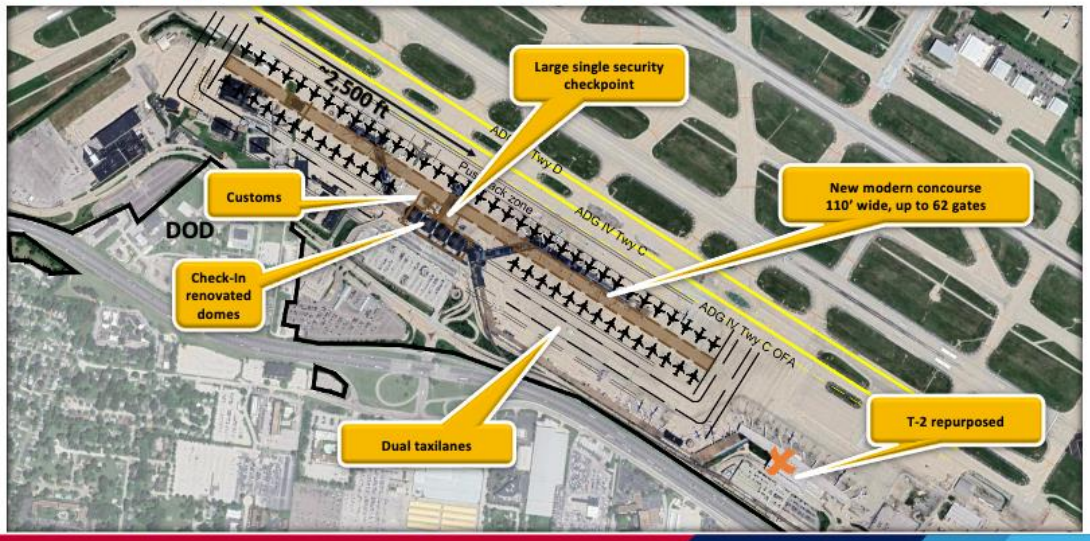


Terminal
Alternatives Evaluation



Terminal

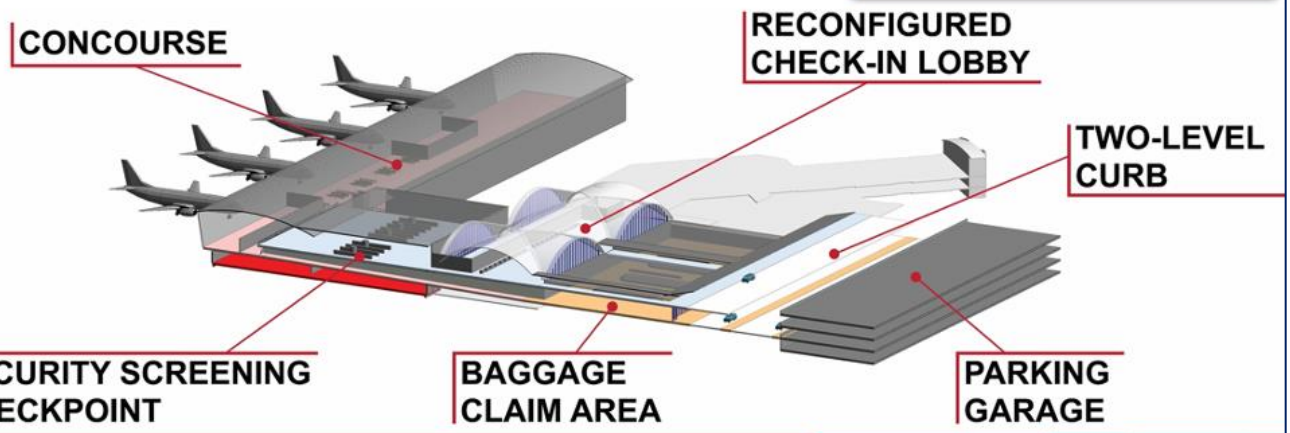
Preliminary Preferred Terminal Plan



Terminal

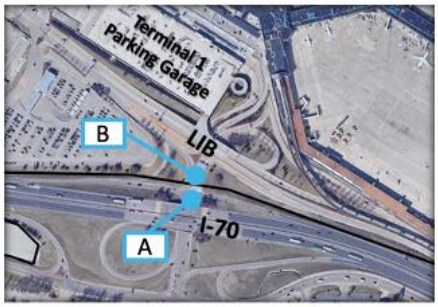
Preliminary Preferred Terminal Plan

- ✓ Passenger convenience
- ✓ FIS accessible to all carriers
- ✓ Single security checkpoint
- ✓ Gates on both sides
- ✓ New roadways & entrance
- ✓ Concourse can expand further
- ✓ Right-sized space



Roadways

Key Issues - Terminal 1



- Insufficient decision distance from highway
- Signage overload
- Tight parking envelope

Roadways

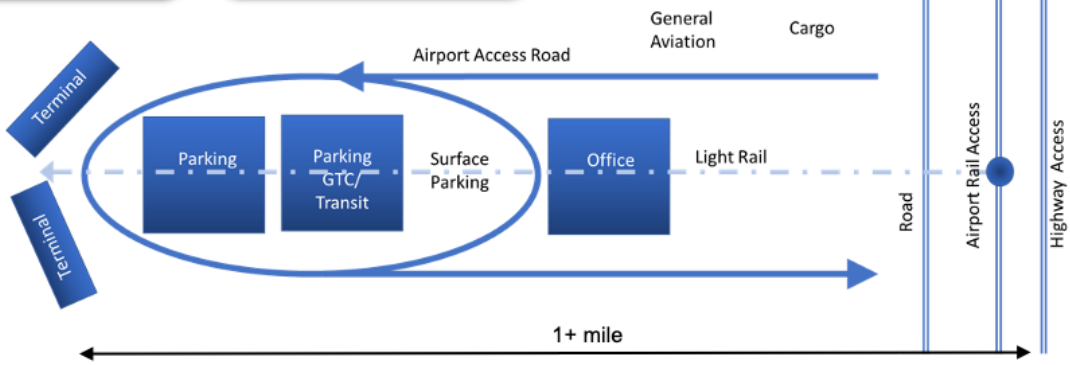
Key Issues - Terminal 2

- Tight turn/short decision time
- Inadequate number of arrival curb lanes
- Short sightlines
- Elevated MetroLink tracks limit options

Ideal Passenger Terminal Access

List of Priorities:
- Passengers
- Employees
- Shuttles

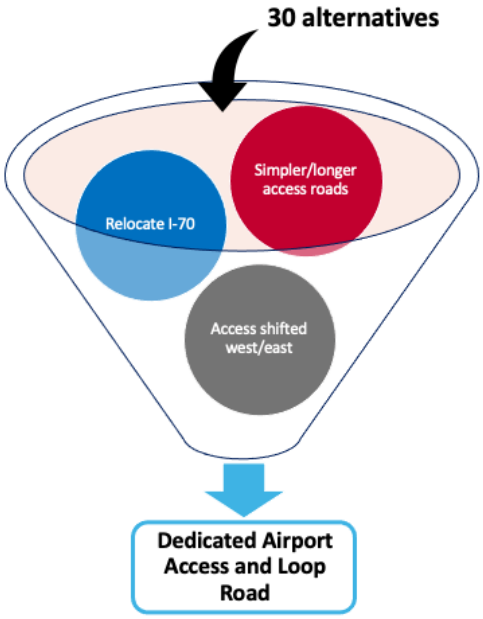
Goals:
Easy decision-making
Minimal weaving
Simple, free-flowing



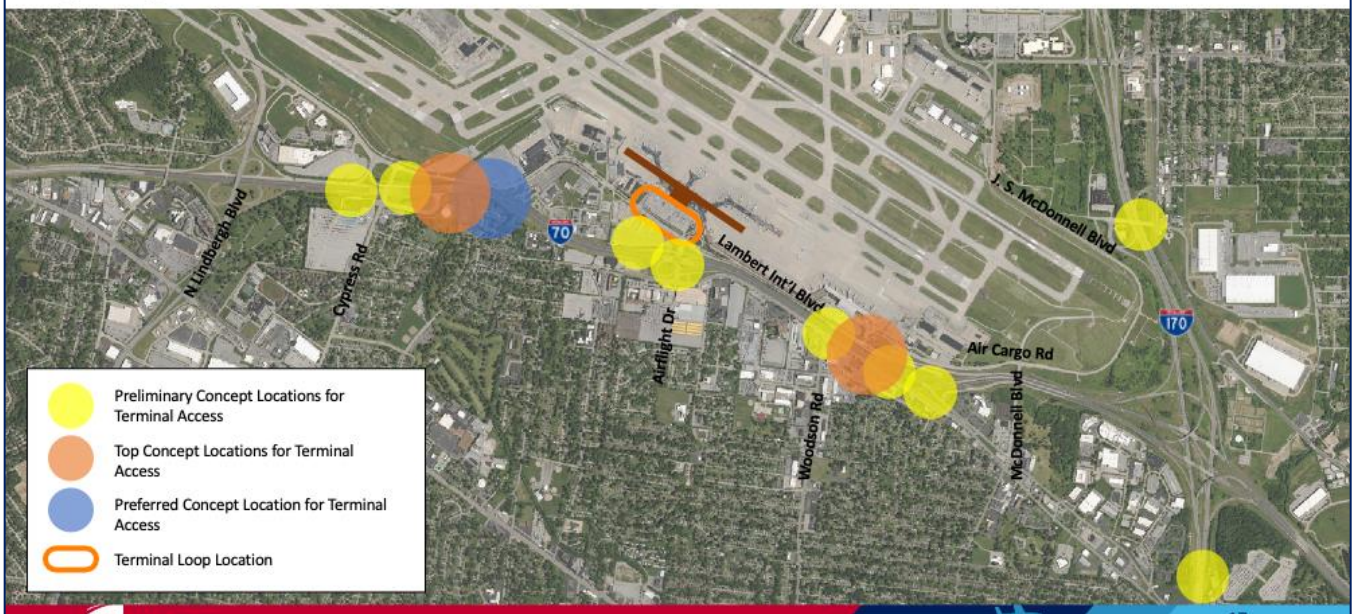
Roadways

Alternatives Considered

- ~~Relocate I-70~~
- ~~Convert LIB and Natural Bridge Road to one-way~~
- One main airport access road
- Access shifted west/east
- Simpler/longer access to terminal



Terminal Access Concepts

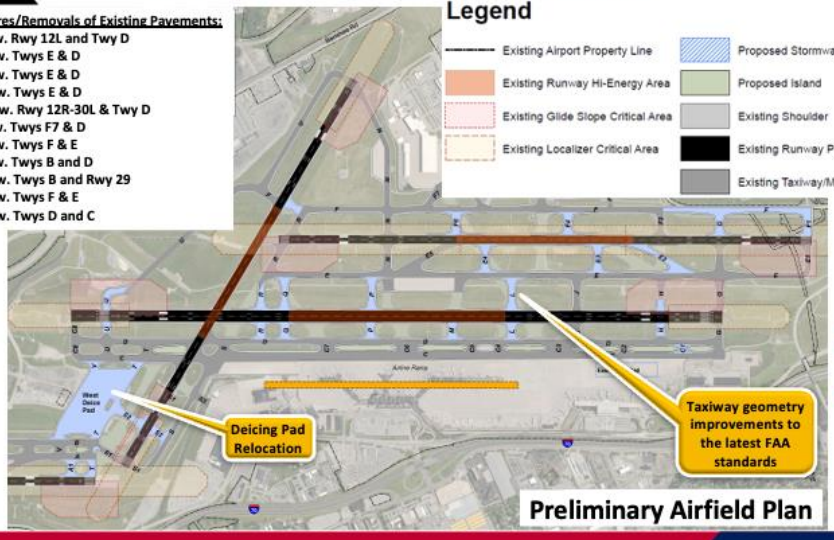


Airfield

Preliminary Preferred Alternative

Proposed Closures/Removals of Existing Pavements:

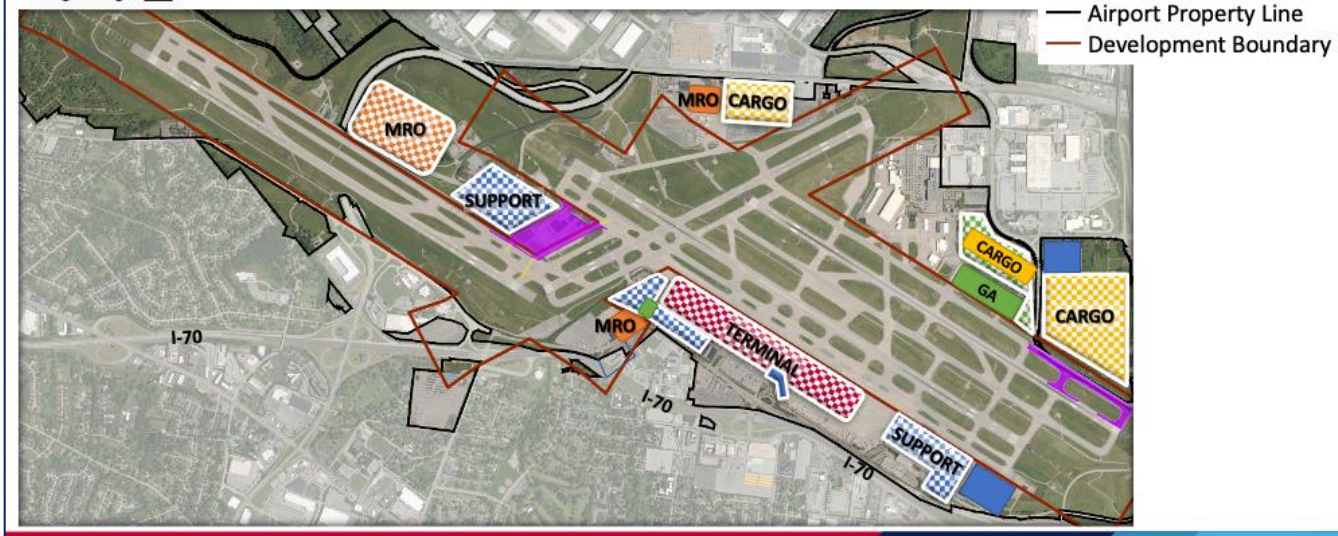
- Twy S betw. Rwy 12L and Twy D
- Twy R betw. Twys E & D
- Twy P betw. Twys E & D
- Twy N betw. Twys E & D
- Twy M betw. Rwy 12R-30L & Twy D
- Twy L betw. Twys F7 & D
- Twy K betw. Twys F & E
- Twy T betw. Twys B and D
- Twy U betw. Twys B and Rwy 29
- Twy H betw. Twys F & E
- Twy H betw. Twys D and C



- Sufficient runway length
- Sufficient runway capacity

Cargo and Support Facilities

Preliminary Preferred Alternative



Funding

Typical/Likely Funding Sources

- **No City or local tax dollars required**
- FAA grants
- Airport bonds
- Existing user fees (PFCs)
- Rent & charges from airport tenants

➢ Preliminary Terminal Program cost-per-gate estimate is within the industry ballpark :

  ➢ Terminal building only: $31 million per gate

  ➢ Entire Terminal Program: $40-44 million per gate (includes terminal building and roads, west deicing pad, taxiway connectors, terminal support facilities, parking garage, etc.)

  ➢ Refinement and feasibility analysis underway

Next Steps

Implementing the Program

flystl.com

Contact:
Dana Ryan
dlryan@flystl.com
314-551-5027

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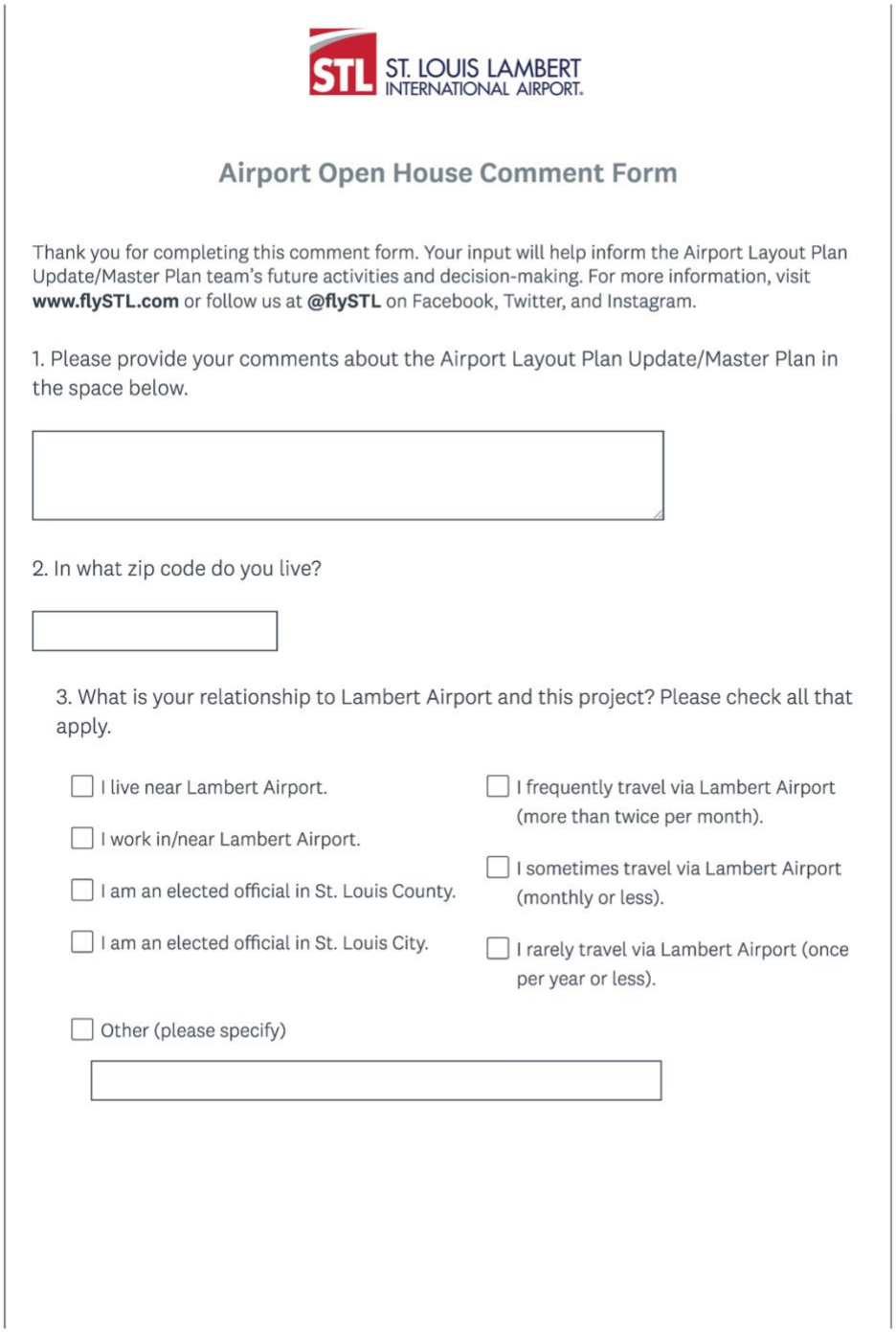
Appendix F: Online comment form



ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

Airport Open House Comment Form

Thank you for completing this comment form. Your input will help inform the Airport Layout Plan Update/Master Plan team's future activities and decision-making. For more information, visit **www.flySTL.com** or follow us at **@flySTL** on Facebook, Twitter, and Instagram.

1. Please provide your comments about the Airport Layout Plan Update/Master Plan in the space below.

2. In what zip code do you live?

3. What is your relationship to Lambert Airport and this project? Please check all that apply.

- ☐ I live near Lambert Airport.
- ☐ I work in/near Lambert Airport.
- ☐ I am an elected official in St. Louis County.
- ☐ I am an elected official in St. Louis City.
- ☐ I frequently travel via Lambert Airport (more than twice per month).
- ☐ I sometimes travel via Lambert Airport (monthly or less).
- ☐ I rarely travel via Lambert Airport (once per year or less).
- ☐ Other (please specify)

4. How did you find out about this Public Meeting? Please check all that apply.

- ☐ Email
- ☐ Local media coverage
- ☐ Airport website/social media
- ☐ Mailed postcard
- ☐ Word of mouth
- ☐ Sign in Lambert Airport
- ☐ Other (please specify)

5. Please evaluate this event according to the following criteria.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The Public Meeting was informative.	☐	☐	☐	☐	☐
The Public Meeting was well planned.	☐	☐	☐	☐	☐

6. Please provide your email address for future updates about this project. (Optional)

Name

Email Address

Appendix G: Paper comment form

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT.

Airport Layout Plan Update/Master Plan Open House – May 5, 2022

Comment Form

Thank you for completing this comment form. Your input will help inform the Airport Layout Plan Update/Master Plan team's future activities and decision-making. For more information, visit **www.flySTL.com** or follow us at **@flySTL** on Facebook, Twitter, and Instagram.

1. Please provide your comments about the Airport Layout Plan Update/Master Plan below. *More space is available on the back side of this comment form.*

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. In what zip code do you live?

_____

3. What is your relationship to Lambert Airport and this project? *Please check all that apply.*

___ I live near Lambert Airport.
___ I work in/near Lambert Airport.
___ I am an elected official in St. Louis County.
___ I am an elected official in St. Louis City.
___ I frequently travel via Lambert Airport (more than twice a month).
___ I sometimes travel via Lambert Airport (monthly or less).
___ I rarely travel via Lambert Airport (once per year or less)
Other: _____

4. How did you find out about this Open House? *Please check all that apply.*

___ Email
___ Mailed postcard
___ Local media coverage
___ Word of mouth
___ Airport website/social media
___ Sign in Lambert Airport

Other: _____

FLIP OVER

5. Please evaluate this event according to the following criteria.

A. The Open House was informative.

Strongly disagree Disagree Neutral Agree Strongly agree

B. The Open House was well planned.

Strongly disagree Disagree Neutral Agree Strongly agree

6. Please provide your email address below if you would like future updates about this project.

Name: _____ Email: _____

Additional space for comments:

Appendix H: Verbatim comments with thematic codes

Verbatim Comment	Theme(s)
One, the fundamental goals are good. Two, maintaining the domes appears to be negatively driving too many decisions. Three, while I understand the site constraints, the linear proposal, for both gates and parking, being a mile long, will be unwalkable for many passengers. Four, it would be both more functional and less disruptive to construct a new, better terminal complex either in the northeast corner, off of I-170 ("cargo", "GA"), or between Rwy 6-24 & Lindbergh ("support", "MRO"). Five, how do you plan to "repurpose" T-2?	Accessibility Alternative options Domes Landside amenities Positive sentiment Roadway access Terminal 2 future use Terminal design
The STL airport is bad, but the same poor leadership promoting this upgrade is the same poor leadership that spent millions on the last poorly executed “upgrade” and rebranding of Terminal B to a terminal 2. The congestion of traffic, drop off and pick up of passengers and slow baggage claim…these are the ongoing challenges. The new concept doesn’t seem to improve these issues and could make them worse. Whomever picks the finishes in the airport has bad taste. So many other cities have nicer airports with upscale finishes…stone, tile, artistic glass and steel.the STL airport interior looks like a prison with drab colors. The area around the airport is depressed. You need to think about enhancing the surrounding area and economic development in Edmundson, St. Ann, etc. It is an ugly area that is the first impression of visitors. There should be lush landscaping all around. Why not engage the Missouri Botanical Garden and do a strategic partnership to beautify the front door entrance to St. Louis. There should be trees and greenery instead of decay and a concrete jungle.	Aesthetics Negative sentiment Neighboring municipalities Perception Roadway access Terminal design
1) language on website is vague and doesn't communicate the purpose of your plan clearly and is poorly communicated if you are planning to modernize your passenger cargo facilities in the existing airport footprint - then make that clear. Everyone knows this airport is terrible and needs work, but it could be a disruption. So, say what you plan to do. 3) the Bridgeton area is very sensitive to construction in the airport area. Carrollton left a major scar on community culture. You need to specify if there are no plans to purchase homes and property in the bridgeton or surrounding area to ease resident fears. The buy outs of early 80s are still in people's memory and it scares everyone. Be sensitive to that. 4) all materials printed and web didn't provide specifics on parking structures and airport ingress or egress. Will exists and entrances change? 5) someone mentioned a car rental space on airport property. The car rental areas on the other side of 70 are very terrible. Slick new car rental space would add great appeal to any airport plan. 6)	Ambivalent sentiment Concessions Construction impact Neighboring municipalities Public engagement Rental car facility

hopefully you will add better shopping and restaurants outside of the *[continued]* security areas. Like Reagan in D.C.	
If anything do away with terminal 1 and expand terminal 2. Terminal 1 is way less nice.	Ambivalent sentiment Preference for Terminal 2
More attention should be paid to integrating Metrolink. A single terminal is great with a grand food court / shopping area. Bring in local brands: Panera, Lions Choice, Normal Brand, Caleres, etc. The terminal should have lots of light. There needs to be a museum to show the history of flight in St. Louis, bring in the Historical Society; Lindbergh, TWA, Yamasaki, McDonnell Douglas, it should all be showcased. How will you highlight St. Louis? There MUST be partnerships with the Magic House, City Museum. There MUST be partnerships with Anheuser Busch, Cortex, WashU. Partner with Cortex, TREX, Arch Grants, etc and create a aerospace incubator. The Airport must be the best sales pitch for the region. Make us proud.	Concessions Cultural education Landside amenities MetroLink Regional impact Terminal design
I do not see the benefit of the single terminal. I see Southwest as the only airline where connections are made. For those that are transferring I believe staying in a single terminal not shared by others is the most logical. The Southwest terminal is well designed for those traveling to/from St Louis as well with the access points being in the middle versus the end points as with Terminal 1. People flow patterns go both directions versus one depending on if the plane is arriving or departing. I would leave Southwest as is and focus on the others. United and Delta need 3 gates each, Frontier and Spirit maybe 1 each and American 5. Eliminating the B concourse to build a smaller version of the 62 gate facility with maybe just 20 gates would more than suffice. When completed the A and C can be demolished for future growth if gates become necessary. Lastly, a merger of the terminals would lead to bottlenecks at TSA, baggage claim and increased traffic on the roads in front of the terminals. I believe in the development of high speed rail similar to Europe and Asia. If such a rail is created through St Louis then I believe that air traffic would decrease for trips less than 400 miles (Chicago). This would result in fewer gates needed as well. Optimistic investing in the airport seems like a waste of taxpayer money, especially in a community where it can be used elsewhere for better causes. I would like to see a focus on the use of monorails to transport people in/out of the airport area. A loop between each terminal then across I-70 to a single station that has designated shuttle islands for car rental, hotel and parking can greatly reduce the congestion in front of each terminal and along the access road north of I-70. It would also reduce the confusion many have at baggage claim about which doors to exit and where exactly to stand. One final, personal, note. I travel through many airports and see newsstands sponsored by various news organizations (CNN, MSNBC, etc) and magazines.	Concessions High-speed rail Negative sentiment for consolidated single terminal Terminal layout

However, the fact that St Louis has chosen to select Ebony magazine *[continued]* as a sponsor is unacceptable. While I do not nor ever will read that magazine, it is implied by the name, story samples and cover photos that this is a racially inspired magazine. The fact that this is present in the airport, the gateway to this community, is offensive and should be revisited immediately. There is no reason why it cannot be Hudson News like the others.	
I am very excited about the plan for a single concourse. I really like the plan to have security at the same elevation as the main floor of the domes. I'd like that to be a large open space with a view, if possible. I'd like to see space for food and retail very prioritized. As you know, lines for food in T2 can get very long and cause crowding. A food court area would allow people to see many options rather than settling on the first vendor they come across. I'd like to see a mix of local and chain options. While promoting local restaurants is good, many people on layovers will judge an airport based on their chain fast food / fast casual options. I'd prefer chains for fast food, local restaurants for sit down. I think the airport is a good opportunity to attract some retailers to St. Louis that other malls or shopping districts can't support. Something like Zara or Uniqlo, preferably at their typical low price points. Some airport retail can be excessively high end for what would usually be an affordable brand, such Penguin stores in some airports. I'd also like to see the architecture of the concourse draw inspiration from the airport's mid-century history. I think some mid-century elements could be bright and airy while standing apart from the completely ambiguous designs of most airports.	Concessions Landside amenities Positive sentiment for single consolidated terminal Terminal layout
The new plan will cause more congestion plus arrival and departure will be bad for travelers. I don't like the new plan	Congestion Negative sentiment
It is important to keep Terminal 2. It is so much easier when traveling.	Convenience Preference for Terminal 2
The overall layout looks good. I like the wider concourses and hope that the new airport is built with plenty of natural light and many more dining and shopping options. I like that the domes will be saved. There will be a need for people movers, moving sidewalks, etc. I love the idea of a light rail extension from the new parking garages to the terminal. Terminal 2 should become a consolidated rent a car facility.	Landside amenities Light rail Positive sentiment Terminal 2 future use Terminal design
I can't think of a better example of short-term thinking at the expense of an entire city. TWA turned St. Louis into an international hub, the volume of people who passed through Lambert on a given day has not been seen since. But to tear down the main terminal is to invite not just the airlines that still fly in and out of St. Louis, but also the existing international corporations and other revenue streams to leave - at the expense of tens of thousands of jobs. The main terminal at Lambert was just rebuilt after being struck by a	Landside amenities Negative sentiment for consolidated single terminal Regional impact Relationship to airlines

[continued] tornado, only to now be destroyed again? Lufthansa - a major international airline has just publicized its plans to offer direct flights from St. Louis to Europe - now is not the time to chase them away, it's the time to draw others in. First it's important to remember that even though St. Louis no longer has the breadth of big business that it once did, it is still one of the homes for what used to be Ralsten-Purina (remember Checkerboard Square?) the one of the US bases for ImBev (formerly Anheusar-Busch): Monsanto, a giant it's own right is now a major research campus for Beyer: not to mention that Citibank still has a call center based in St. Louis. Energizer has a campus of offices and PepsiCo has a distribution center here as well. St. Louis has multiple convention centers that regularly attract conventions because of the competitive pricing. BJC is one of the foremost hospitals and medical research companies in the world people travel from countries all over the world to be treated here. And our solution is to repurpose the main airport and stuff everyone into a tiny terminal that is already at maximum capacity? A terminal that was intended for overflow? Here is an idea - do a little bit of updating to an airport that was just rebuilt after being struck by a tornado, and repurpose terminal one - turn it into a fancy restaurant or two, perhaps a large duty free shopping area and exclusive lounge areas for airline VIPs. Have have vans or mini-buses that shuttle people back and forth; and If people are troubled by having to go through security - then offer a security checkpoint for people coming from that terminal. This city never got over the loss of TWA and the broken promise by American Airlines to keep St. Louis as one of its hubs. This city is home to 2 national monuments. It's time for this city to stop feeling sorry for itself, for trying to salvage make a short-term financial gain at the expense of a long term rebuilding of a great city. The absurdity of taking a few extra gates onto an overflow terminal, that has become the Southwest airline hub - sink an obscene amount of money into it (whether it costs the local taxpayers or not - but will cost someone.). So a fortune and money to repurpose a the bulk of Lambert International airport only to spend another fortune trying to piecemeal the other terminal by adding on pieces where it can find the space. For smart people, the planners behind this deal (or potential deal,) seem to be making some pretty illogical and shortsighted. It's embarrassing and I can't think of a faster way to truly turn a historically rich state into what is now commonly known as a "flyover state.)	
Would love to see new parking garages like those at MSP Humphrey terminal. Public parking and rental cars right across the street from the terminal, with sky walks. There are too many shuttles in too small a space. Hope the approach taken in the layout of the facility is to keep things simple. The average traveler is not a frequent flier.	Landside amenities Parking facilities

Going to one terminal is great. And I like the idea of saving the domes. I would suggest terminal two becomes a consolidated rental car facility. I think that is the major lacking force at STL is the fact that all rental cars are a shuttle away and not and a consolidated location. Could use a portion of the metro line there in order to train people from terminal one to terminal two for consolidated rental car. Make a larger parking facility there to house all rental cars? As for the singular terminal. I would hope for a few airline lounges. Definitely keep the admirals club may be a common use lounge.	Landside amenities Parking facilities Positive sentiment Rental car facility Terminal 2 future use
I would like to see the uso within the security area. It makes it easier timing wise to plan when you need to leave the uso to get to your gate on time. I like the old parking arrangement when letting off passengers by departures where cars were diagonal in front off the terminal. It seems more orderly that way	Landside amenities Parking facilities USO
I really like having a single terminal for everyone where changing airlines is easy. From this, I hope there are many food options like a food court like other airports have. I usually go through T2 and the fast food options are pretty non-existent and the ones that are open usually have very long lines. I am thinking like Dallas-Love airport (but we will have more gates) would be a great model for our single terminal airport. Easy in and out, great food options, and then easy to get to any gate. I cannot wait to get this moving. Thanks!	Landside amenities Positive sentiment
I feel like we need to keep the domes and make it one whole terminal with many food options and shops (fast food, sit down, ice cream etc)	Landside amenities Positive sentiment for single consolidated terminal
Of all the plans, the worst is keeping the old 1950s terminal building. Please remove it! Build a NEW MODERN terminal building! As in, NEW EVERYTHING! It's time to move on from the past. The building terminal was cool and "chic" in the 1950s and 1960s. It's old and a dinosaur TODAY. TODAY is what matters, not 70 years ago! Gut the whole thing and quit living in the past. Build a NEW Iconic terminal building. Move St. Louis FORWARD.	Modernization need Perception
It's great to see that we are updating to keep up with modern necessities in airports.	Modernization need Positive sentiment
I have several a	N/A
Please do not combine the terminals. Do not ruin what is already a poor airport experience.	Negative sentiment
I live in St. Charles and when the new runway was being considered there was a townhall meeting with Lambert officials. We were told the planes would fly lower but the new quiet engines would not be a problem. This past month the airport has been using the new runway as the other is under construction. I have a hard time sleeping and if I'm outside trying to have a conversation I have to stop due to the noise. So basically we were just told anything to get this project completed. Now your talking about a new concourse and if this runway is used more will cause more issues for us. We lived here	Negative sentiment Noise mitigation

[continued] long before this runway so with your new environmental impact study please consider what it is doing to the St. Charles folks. I would be glad for them to use my residents in the study.	
Confusing, overall information has ignored the neighboring cities problems. Your Community engagement leaves a lot to be desired.	Negative sentiment Public engagement
I find it boring and unnecessary. It looks like DTW in many ways. Lambert is unique. Also Lambert will never see the traffic and passengers in volume as it did in the years 1999 & 2000. Lambert is no longer a hub for a major legacy carrier. Renovations to the current concourses and reengaging with UA, AA and DL would be beneficial. Luring Jet Blue would benefit Lambert as well versus catering to dollar store airlines like Spirit and Frontier.	Negative sentiment Transportation hub
Leave it as is. Works well as we always fly Southwest and it works well as is. I know how this allowance for public input normally works. You ask what we think so you can say you dud. Then you do what you planned to do all along. It us wirking well, please do not screw it up.	Negative sentiment for consolidated single terminal Preference for Terminal 2
This is a terrible idea. Go ahead and replace terminal 1. But leave the east terminal as it is. The main reason I fly southwest is because it's so easy to use the east terminal. It works. Run a shuttle behind security if people need to move between the two.	Negative sentiment for consolidated single terminal Preference for Terminal 2
Consolidated rental car facility, improved parking options near terminal, reduced # of shuttles around terminal to improve traffic flow, wider terminal, improved TSA security checkpoints.	Parking facilities Rental car facility Roadway access Terminal design Terminal shuttles TSA checkpoints
We need a major renovation sooner than…When friends visit from out of town the airport is their first impression and my friends have all commented that our airport leaves a bad first impression…also is does offer pride of living in St Louis for the residents of St Louis.	Perception Timeline
Let's do this.	Positive sentiment
Sounds great, I hope to see it when done.	Positive sentiment
Very good ideas. This airport has so much potential, and it's very exciting to see how this project will progress.	Positive sentiment
I think reimagining our airport is critical to the health and development of the region.	Positive sentiment Regional impact
This idea should happen. I think it would benefit the city.	Positive sentiment Regional impact
Need work completed much sooner.....!!! Great ideas...let's get to work now!!	Positive sentiment Timeline

STL very much needs to begin this like yesterday!	Positive sentiment Timeline
This needs to happen yesterday…or ASAP. Will bring more business, airlines, flights, and revenue to our city so we can expand and obtain the glory that was once had when TWA existed and when they filmed "Planes, Trains, Automobiles" at the airport	Positive sentiment Timeline
I think it's good. A good way to get more centralized	Positive sentiment for single consolidated terminal
Single terminal is a great idea, it makes the airport a great place to travel/from	Positive sentiment for single consolidated terminal
The selected layout is the best, given the constraints of the airport location. It addresses all major needs of the current airport.	Positive sentiment for single consolidated terminal
I agree that a single terminal would be ideal. I've been a fan of the Phoenix Airport layout. My only concern is departures drop off. At T2 traffic has consistently been backed up past the stop light. This interrupts traffic for Terminal 1. Most recently I was surprised to find a barely busy terminal after waiting in traffic several minutes. My concern is when combining terminals, will this continue to be an issue.	Positive sentiment for single consolidated terminal Roadway access
Overall the plans sound great! When the time comes for final design I would love to see a slight curve to the new concourse instead of the completely straight design currently proposed. Not only would this be an interesting aesthetic improvement but it should allow for larger aircraft to use the airport at the ends of the concourse as there would be more space between the taxiway and terminal for them to fit. Hopefully this will also help bring more international flights to St. Louis. Additionally it would be great to see a short tunnel built to connect terminal 1 and 2. This way if terminal 2 is ever used for passenger service again convenient transfers could be made without the need to go through security again. This might also help to encourage new airlines to bring operations to Lambert due to the improved connections and passenger experience.	Positive sentiment for single consolidated terminal Terminal design

Appendix I: Verbatim email comments with thematic codes

Verbatim Comment	Theme(s)
What is so wrong with Southwest at terminal 2? As a handicap person Southwest is so easy to get to the plane. I won't be able to be at the open house today but would like to know what the layout for the new terminal will look like.What is so wrong with Southwest at terminal 2? As a handicap person Southwest is so easy to get to the plane. I won't be able to be at the open house today but would like to know what the layout for the new terminal will look like.	Accessibility Preference for Terminal 2
Your website states comment forms would be available, but I do not see a link, etc. Could you please forward to me?	Comment form
I attended the Open House this evening and left a lengthy written comment. I'm not sure that your development company is local to the St. Louis area. I didn't get the feeling that the presenters were familiar with the history of Lambert Airport and how it has affected the Bridgeton area in the past. This is a link to a YouTube video that describes the Carrollton Subdivision and the airport expansion in the 80s and 90s. It might help you to understand the scars that were left with area residents…and many still live here. https://youtu.be/d_AwsOOFujE [youtu.be] It is a public relations consideration. Your website needs to be written in plain language without technical jargon. All streets, highways, landmarks, and buildings should be clearly labeled and add the north arrows on maps. The airport sits inside a metropolitan area and people's lives will be effected. Yes, a new terminal will be beneficial in the long term but residents in the area need straight-talk to build trust. You're website left me saying, "huh?" and tonight's meet was only marginally better. Sorry, I had more comments.	Community impact Public engagement

Airports are not immune to social trauma, including in St. Louis. On March 23, 1994, Bob Richards, a television weatherman on Channel 5 KSDK, nosedived his Piper Cherokee 180 into the runway from 400 feet up at Spirit of St. Louis Airport in Chesterfield apparently committing suicide. He was also apparently seeing a psychiatric counselor prior to his death and had been thinking suicidal thoughts. While we cannot know the details of this case, we do know of hundreds of cases where persons under psychiatric care or taking psychiatric drugs have committed suicide or senseless violence. CITIZENS COMMISSION ON HUMAN RIGHTS® OF ST. LOUIS, INC. Established in 1969 by the Church of Scientology to investigate and expose psychiatric violations of human rights UNRAVELING MOTIVELESS AND UNPREDICTABLE VIOLENCE & SUICIDE A Guide for Law Enforcement Investigators and anyone concerned about violence in society -- in school, in the workplace, at home Click here to download and read the CCHR Report on Psychiatric Drugs, Violence & Suicide [cchrstl.org] The Citizens Commission on Human Rights of St. Louis would like to provide you with the above referenced report that is part of our Seminar, Recognizing psychiatric Fraud and Abuse. Acts of criminal violence have been with us since time immemorial but what we have been witnessing over the last couple of decades staggers the mind and assaults the senses. The fact missed by most is that psychiatric, mind-altering drugs have been found to be the common factor in an overwhelming number of these acts of random senseless violence. The scientific research documenting the connection between violence, suicide and psychiatric drugs is overwhelming. The FDA has issued several warnings on psychotropic drugs, cautioning that persons prescribed the drugs must be monitored for increased suicidal ideation and worsening depression. The FDA takes the adverse side effect of suicide seriously by placing a Black Box Warning on certain psychiatric drugs. Here is one relevant FDA reference [fda.gov]: Antidepressants increase the risk of suicidal thinking and behavior (suicidality) in children and adolescents with MDD [Major Depressive Disorder] and other psychiatric disorders. According to information from the U.S. Agency for Healthcare Research and Quality, 106,000 Americans were hospitalized in 2002 for overdosing on	Community impact Safety

[continued] their psychiatric drugs. 63 percent of these people were suicides or attempted suicides. The trend is apparently continuing into the present. Between 1965 and 2001 in the U.S., drug abuse for children and adolescents soared more than 2,900%, in part fueled by the general availability of psychiatric drugs. Very few people recognize that illegal drugs represent only part of today's drug problem. During the last 40 to 50 years there have been major world-wide changes in our reliance on addictive, prescription psychiatric drugs. Addiction to psychiatric drugs now rivals illegal drug addiction as the number one drug problem in many parts of the world. As more and more prescriptions are being written for psychiatric drugs, more and more children are abusing these drugs. For example, the rate of ADHD medication abuse for 13-19 year olds was up 76 percent from 1998 to 2005. Illegally buying and using prescription medications to help them study, college students prefer drugs-of-choice Adderall and Ritalin to help them stay awake longer. Methylphenidate (Ritalin) is a psychomotor stimulant structurally and pharmacologically related to the amphetamines. Studies and case reports indicate that methylphenidate has the same dependence profile as other Schedule II stimulants. Like other Schedule II stimulants, abuse of methylphenidate can lead to tolerance and severe psychological dependence. Psychotic episodes, violent behavior and bizarre mannerisms have been reported. Intravenous and intranasal abuse can result in serious medical complications. In the U.S. today, more than 8 million children have been put on mind-altering psychiatric drugs. These drugs can only chemically mask problems and symptoms; they cannot and never will be able to solve problems. Psychiatric drugs and treatments do create violence and the sooner we recognize this and do something about it, the sooner these kinds of killings will stop. Drugging millions of Americans with psychiatry's mind-altering drugs has become one of the most dangerous and insidious situations facing American life — the corresponding increase in acts of violence are terrorizing our society. Note also that a major part of the treatment for prison inmates (used less for rehabilitation than for managing and disciplining inmates) is a regimen of powerful psychiatric drugs, despite numerous studies showing that aggression and violence are tied to their use.	

[continued] The bottom line: Check for psychiatric treatment and psychiatric drugs (prior or current use, or withdrawal from) in all cases of senseless violence and suicide. Watch the CCHR documentary video Psychiatry's Prescription for Violence at http://www.cchr.org/videos/psychiatrys-prescription-for-violence.html [cchr.org]. Please download and review the above referenced report and let us know how we can help you further.	
Thank you for responding to my email. I hate to be a continual source of bad news about the Bridgeton Area, but here is the other thing as far as Environment around Bridgeton. The video link below exposes the dirty laundry about airport expansion in Bridgeton, but as residents, we have another major problem too. I got an email today that gives access to the EPA dashboard for the Superfund cleanup tracking site. I send this so you can see the full scope of Bridgeton's issues (and the betrayals that many of the residents feel). All the nuclear waste at the superfund site was stored out in the open - for years - on the airport runways. And, the old time residents say that it was trucked to the landfill and the trucks were buried there. EPA Superfund site – Westlake Landfill: https://www.epa.gov/mo/west-lake-landfill-dashboard [epa.gov] There is also a documentary on HBO+ about Westlake. Please be kind to the Bridgeton residents. Could you just invite them to a meeting at the Bridgeton Rec Center or something to make sure the community is OK with the expansion? They've been through a lot. It would be a way of showing people that you care about their thoughts. They've been ignored in the past. One open house is not enough. I live within a mile of the airport. My address is 42XX Tideland Dr., Bridgeton MO 63044 (Google it). I have a lot of neighbors that would appreciate some outreach on their turf - not yours. Talk to them.	Environmental impact Public engagement

Mr. Cusmano announced he would be attending our Open House next week and asked if representatives from FEMA would be present. I informed him the agency had no part in event. He relayed that during the expansion program (RW 11/29) he attended another open house. FEMA was present and revealed to him the former McDonnell Douglas buildings at Lambert Airport would be a processing center to receive mass evacuations resulting from a catastrophic disaster. Since those buildings are no longer suitable for occupation, he was hoping to speak with FEMA and see if St. Louis was still an evacuation point and where the people would be housed.	Evacuation sites
It was a pleasure to meet you yesterday during the open house. My comment is to locate the CONRAC in either Concourse D or Terminal 2 when SWA relocates to Terminal 1.	Landside amenities Rental car facilities
A previous commitment will keep me from attending the meeting, so I'd like to address my primary concern: Direct access to the terminal from Metrolink. Hartsfield-Jackson in Atlanta has entry from inside the terminal directly to MARTA trains via escalator. Access is via a short walk, indoors, in a pleasantly decorated environment. It is well-lit and safe. Lindbergh, by contrast, requires a long walk across a dingy, poorly-lit parking garage that's open to the weather. No woman and few men would feel safe doing this at night. It then requires a trudge up a stairway while hauling luggage. Any plan for modernization should make it easy and safe to access public transportation.	MetroLink Public transportation Safety

We cannot be at the open house but we are incredibly supportive of the new remodel. STL is an embarrassing airport in comparison to nearly every other airport. I travel quite a bit and other airports actually make you feel like staying and shopping and dining. Sometimes I joke that I wish I had more time to enjoy them. Houston, Denver, even San Diego airport have awesome themes relatable to their specific city. Denver smells like Pine! San Diego has electronic swimming sealift that runs the length of the airport. Most of them even have upstairs with restaurants and shops to people watch. STL airport makes me feel disappointed when I come off the plane bc it's so sparse and outdated and not even remotely progressive. I was excited when we got a filtered water bottle dispensary. Our family fully supports to remodel! Welcome to the next century! Thank you for asking for feedback!	Modernization need Perception Positive sentiment for single consolidated terminal
Our airport is in need of updates/improvements, but please, please don't eliminate Terminal 2 and cram it in with all the other airlines in the main terminal. I flew home to St Louis on Sunday from LAX in Los Angeles where they have nine terminals. What's wrong with having two terminals? Neither I nor any of my friends think it's a good idea to get rid of Terminal 2. Thank you for your consideration.	Negative sentiment Preference for Terminal 2
Thank you so much for the invitation! Sadly, we also have our student art show during the same time that evening, and our awards ceremony prior to. May is a busy time! Congratulations on the increased participation and thank you for asking. Reach out anytime!	Open House
I really felt the Open House tonight at the airport covered all the bases. I appreciated the openness and professionalism even as we brought criticism and concern. I would love an opportunity to follow up to talk about how to shape a future dialogue with communities adjacent to the airport that will assure regional growth is not at the expense of these marginalized areas. Also love the framework you have created at Vector Communications. I hope we cross paths many times in the future.	Open House Public engagement

We'd like to request a paper packet and access to watch the formal presentation recording.	Public engagement
As I sit upstairs at Gate 31waiting for yet another delayed flight I have time to contemplate the fate of St. Louis as a business center. St. Louis, as I hope you are aware, was founded on the basis of the ease of transportation. On the banks of the Mississippi River near the confluence of the Missouri, Mississippi, Illinois, and Meramec Rivers, the river system was an excellent method of transportation that led to the growth of St. Louis and as a dominant gateway to the west. With the coming of railroads our forefathers had the wisdom to bridge the Mississippi River, solidly cementing St. Louis as a leading business and industrial hub. St. Louis was again at the forefront of transportation with the advent of airflight, being not only a major hub but a center for the corporate headquarters of a major carrier and of a major manufacturer. Once we had direct flights not only to all major cities in the United States, but served as a hub for international travel. Once I could catch an early morning direct flight to any number of markets and know I would be back home that evening. Today, we are regulated to being at best a third tier community and I sit hear in the middle of the day waiting for a flight that is three hours delayed, and most likely be canceled so the plane can be "repositioned" elsewhere. We have one of the longest runways in the country, now mostly unused. The runway came at a high price - not only in dollars - but in the emotional impact upon residents, as it tore through the very fabric of the community as whole neighborhoods were demolished to make way for the runway. Do we now need what may be one of the longest terminals in the country? Is it your intent to see we stay a third tear community? Linear terminals don't work well for hubs, particularly busy hubs - the plan mentions considering moving walkways, but even with such the time to travel from one end to the other for connecting flights would be long, and the trip most difficult for the elderly, the very young, and those with disabilities. The plan calls for one central security point, i.e. bottleneck - have you bothered to recently look at the chaos at the security check in the west terminal concourse A early in the morning?? One only has to try to navigate through security in the east terminal at busy times to know that a singe check point is a recipe for long lines and missed flights. Instead of trying to reconfigure the airport to serve as a third tier community, why not - as those before you have done - look to the future? What we need is for you and for the Airport Commission to negotiate with the airlines to return flights to St. Louis, to find an airline that will return St. Louis to hub status. We don't need a terminal configured for more uncomfortable little commuter planes, for schedules that require flying to	Regional impact Transportation hub

[continued] Atlanta to change planes to get to Houston, or fly to Detroit to get to Naples, Florida. Without improved direct service from St. Louis you won't have to worry about building a new terminal - the businesses who rely upon air travel will continue to leave and you won't need it.	

I somehow missed the boat on the makeover of the airport. I did see on the news a woman that was just about more like my age or older that would love to see the return of the glory days. Sadly, we can't do that with the airplanes because many of the airplanes has been switched over from the propeller types to jet propulsion. And is one reason why I love Cape Air. It is one of the very few airlines that flies using prop planes. However, banning good law abiding citizens (those who have never been convicted of a violent crime) from going through the concourses is pretty stupid. I too believe in the safety of this country, but if a visitor that doesn't have a ticket walks on the concourse level has a clean police record should be able to walk the concourses. I think ever since 9/11, I wonder if we had some people working Homeland Security were behaving like psychics or something accusing, those without a ticket to be nothing but trouble. Before we start with more tearing things down, etc., let's rewrite the security rules for non ticketed visitors. If the person visiting the airport has a clean police record, that person should be given a gate pass. I do like the idea of going back to when it was just one terminal. But to me, instead of tearing down Terminal 2, how about using it as another restaurant. There was the employee lounge in the basement of T1, but what we really ought to have is a low-priced restaurant with maybe a salad bar, with a 1950s approach. Maybe have it be a senior citizen friendly with a 90% senior citizen roster running the restaurant. A low-price senior citizen friendly restaurant that represents the 1950s in T2 would be great as airplane enthusiasts could look out of the windows and get a good view of the airplanes, and for the link between T1 and T2, save the old D concourse and use that as an indoor link and the travelators could continue to operate. The reason why I say that is if Southwest is going to move to T1, and T1 is going to be enlarged, then give the viewing public that are not holding any tickets a chance to view the airplanes and maybe with a restaurant that would be open to everybody could do the trick. Also on the MetroLink, it would help Metro dodge a closure as that T2 MetroLink station could serve as a shortcut for employees to get to work.	Security protocols Terminal 2 future use

Appendix J: List of compiled comment themes

Theme	Count
Positive sentiment	13
Landside amenities	11
Positive sentiment for single consolidated terminal	8
Negative sentiment	7
Preference for Terminal 2	6
Public engagement	6
Terminal design	6
Regional impact	5
Concessions	4
Negative sentiment for consolidated single terminal	4
Parking facilities	4
Perception	4
Rental car facility	4
Roadway access	4
Terminal 2 future use	4
Timeline	4
Modernization need	3
Terminal layout	3
Accessibility	2
Ambivalent sentiment	2
Community impact	2
MetroLink	2
Neighboring municipalities	2
Open House	2
Safety	2
Transportation hub	2
Aesthetics	1
Alternative options	1
Comment form	1
Congestion	1
Construction impact	1
Convenience	1
Cultural education	1
Domes	1
Environmental impact	1
Evacuation sites	1

Theme (continued)	Count
High-speed rail	1
Light rail	1
N/A	1
Noise mitigation	1
Public transportation	1
Relationship to airlines	1
Security protocols	1
Terminal shuttles	1
TSA checkpoints	1
USO	1

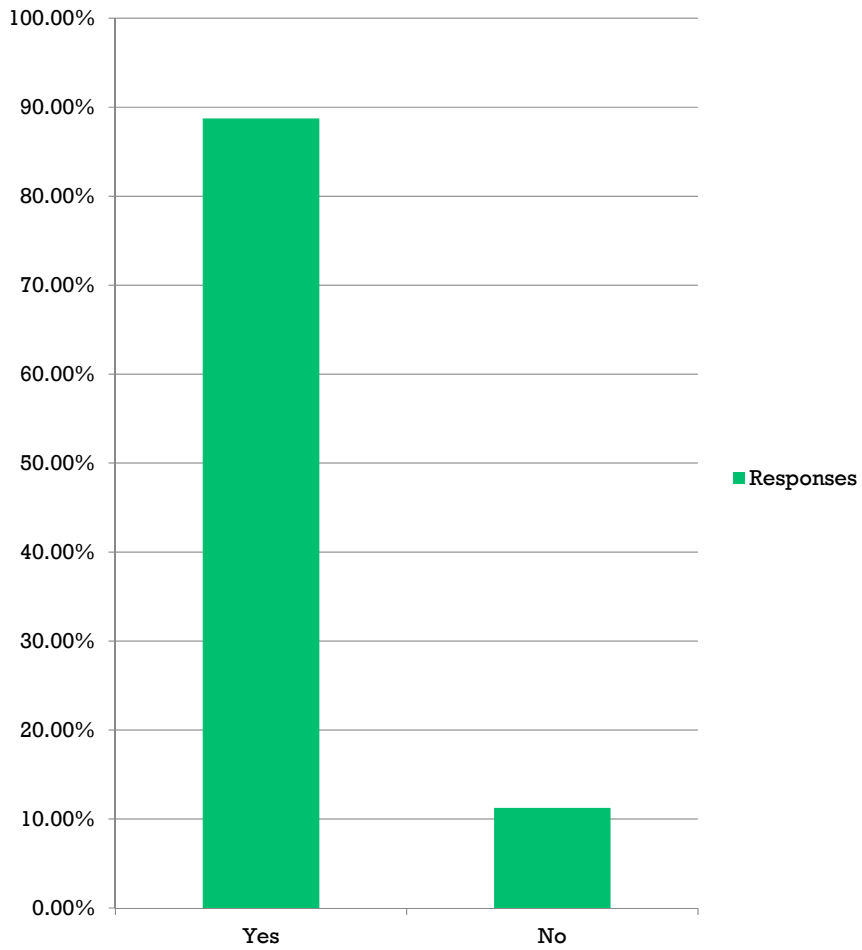
APPENDIX 10B – PUBLIC SURVEY RESULTS

STL ALP UPDATE PUBLIC SURVEY #1 RESPONSES

October 8, 2020

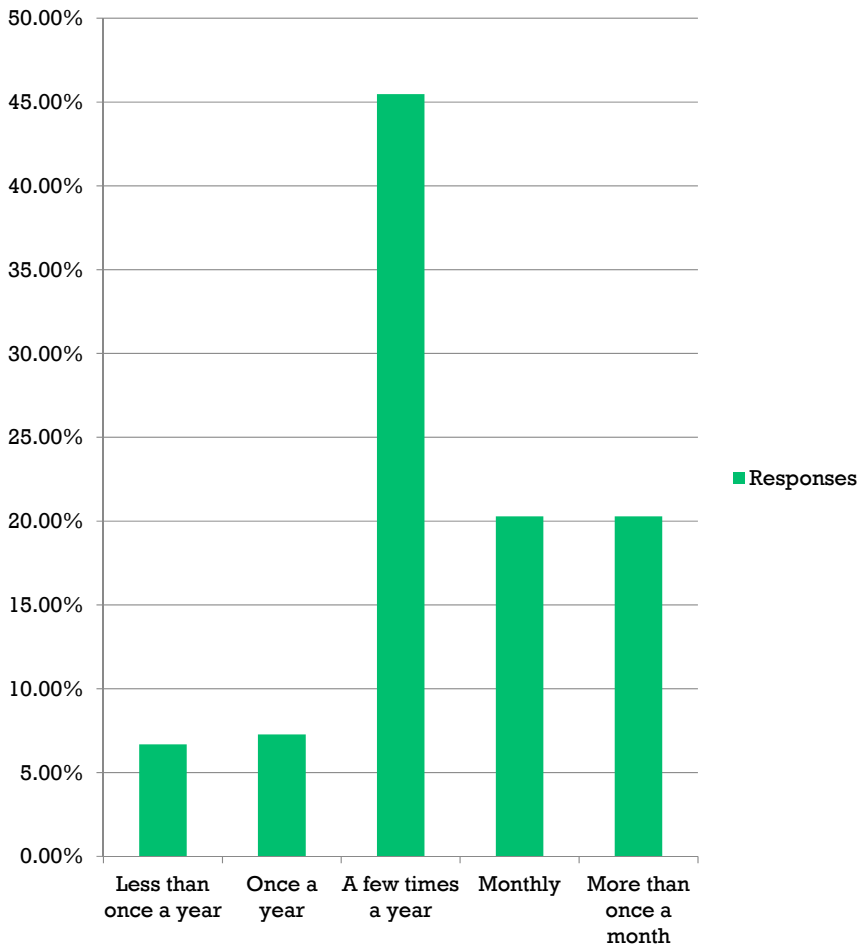
SURVEY #1 OVERVIEW

- The survey was open from Sep 4- Oct 5th, 2020
- The survey link was shared on STL social media platforms and the flystl.com website
- The survey link was shared by industry partners on social media
- A total of 511 people took the survey



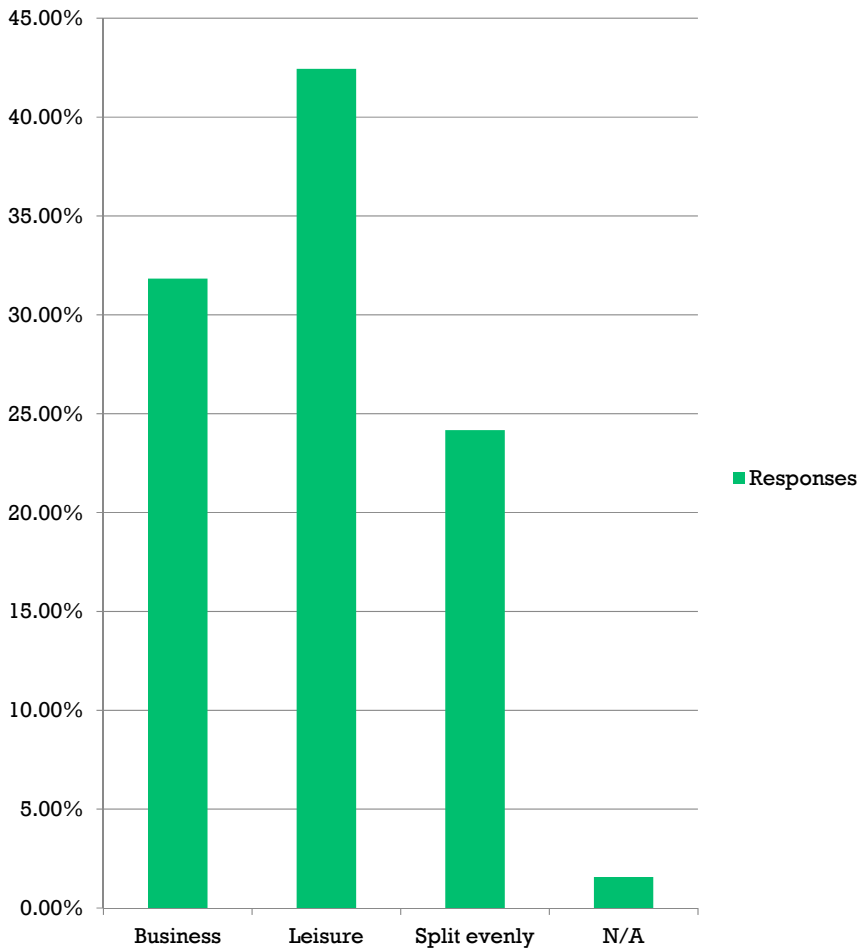
IS STL YOUR HOME/PRIMARY AIRPORT?

- 5 skipped
- 89% of respondents said STL is their primary airport



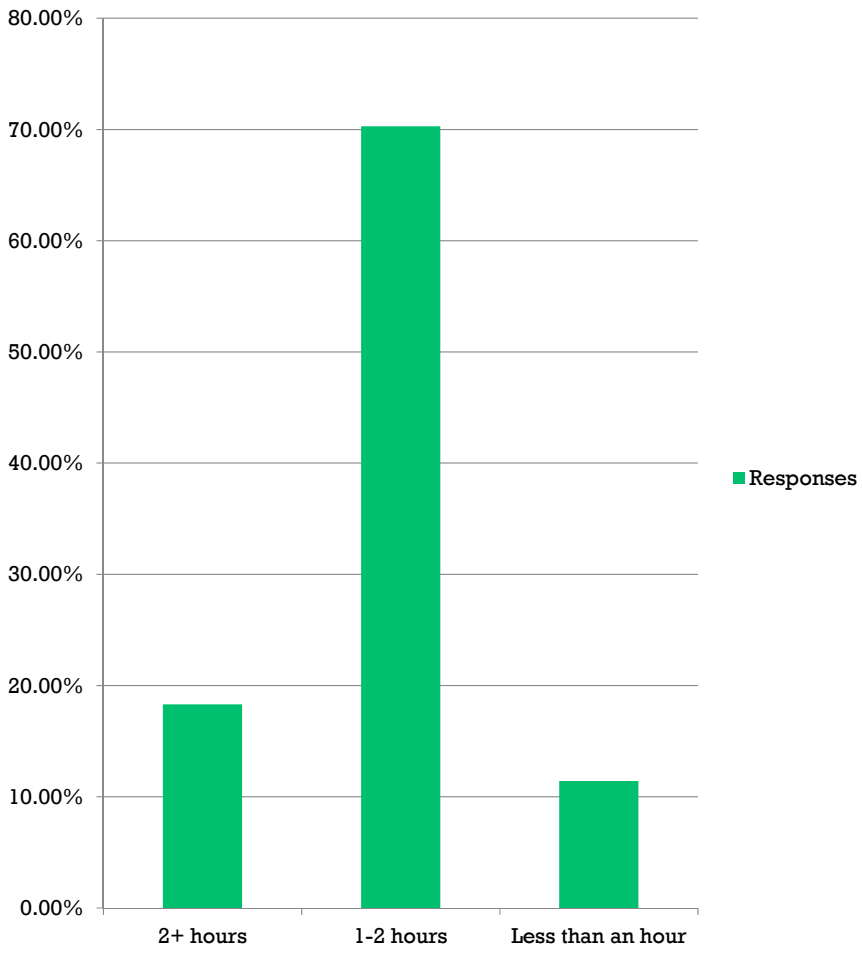
HOW OFTEN DO YOU FLY?

- 3 skipped
- Over 45% of respondents fly a few times a year



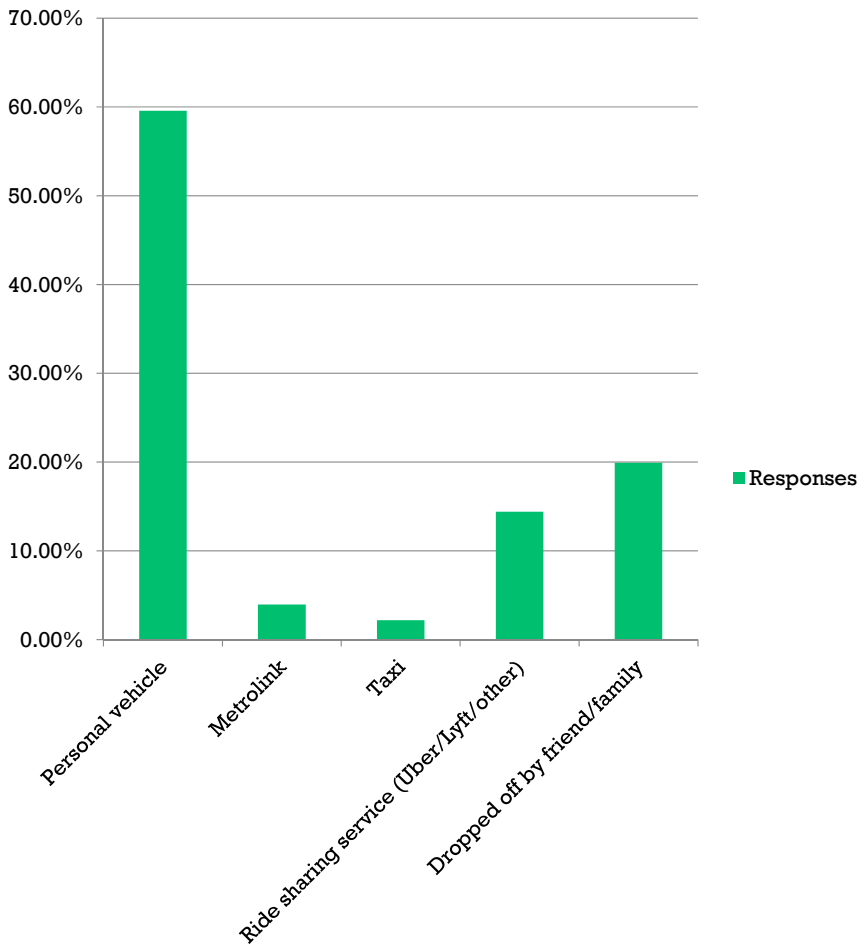
WHAT IS THE MAJORITY OF YOUR TRAVEL FOR?

- 2 skipped
- Over 40% of respondents travel for leisure
- Over 30% of respondents travel for business



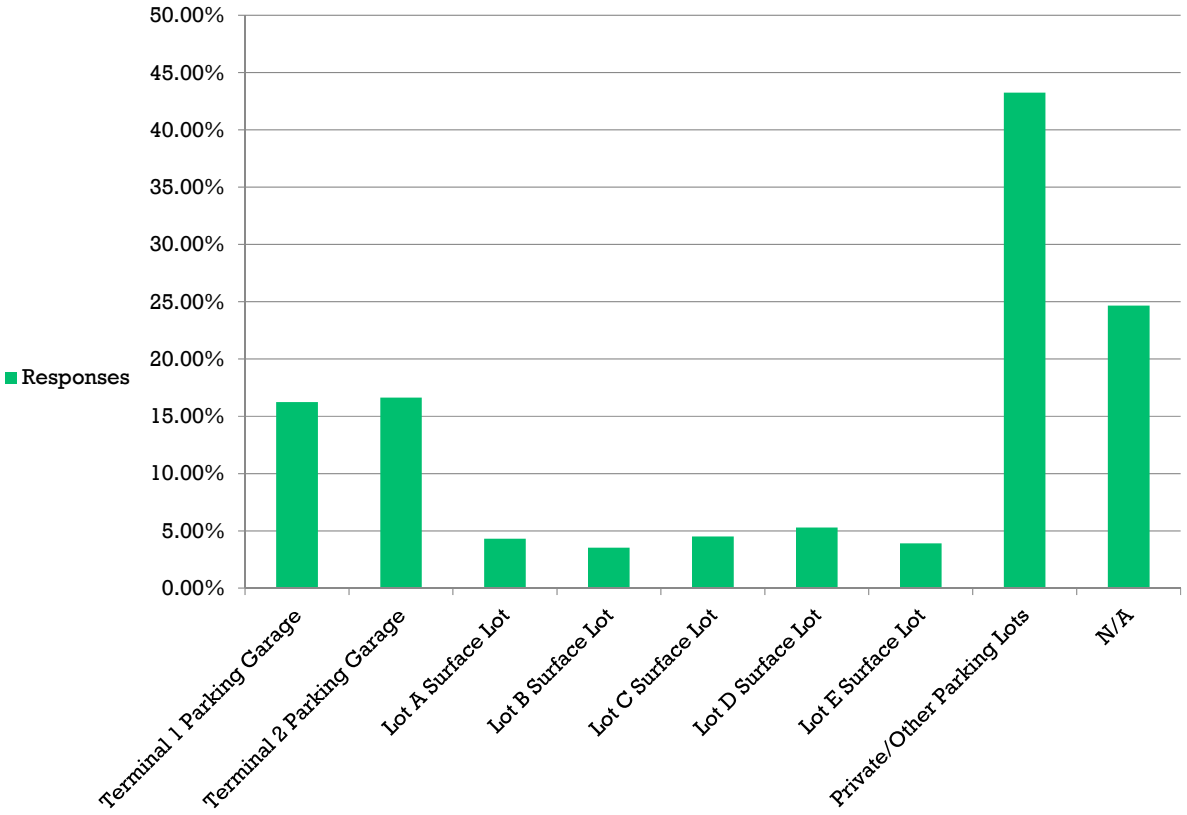
HOW FAR IN ADVANCE DO YOU USUALLY ARRIVE BEFORE YOUR SCHEDULED DEPARTURE?

- 3 skipped
- 70% of respondents arrive between 1-2 hours before departure



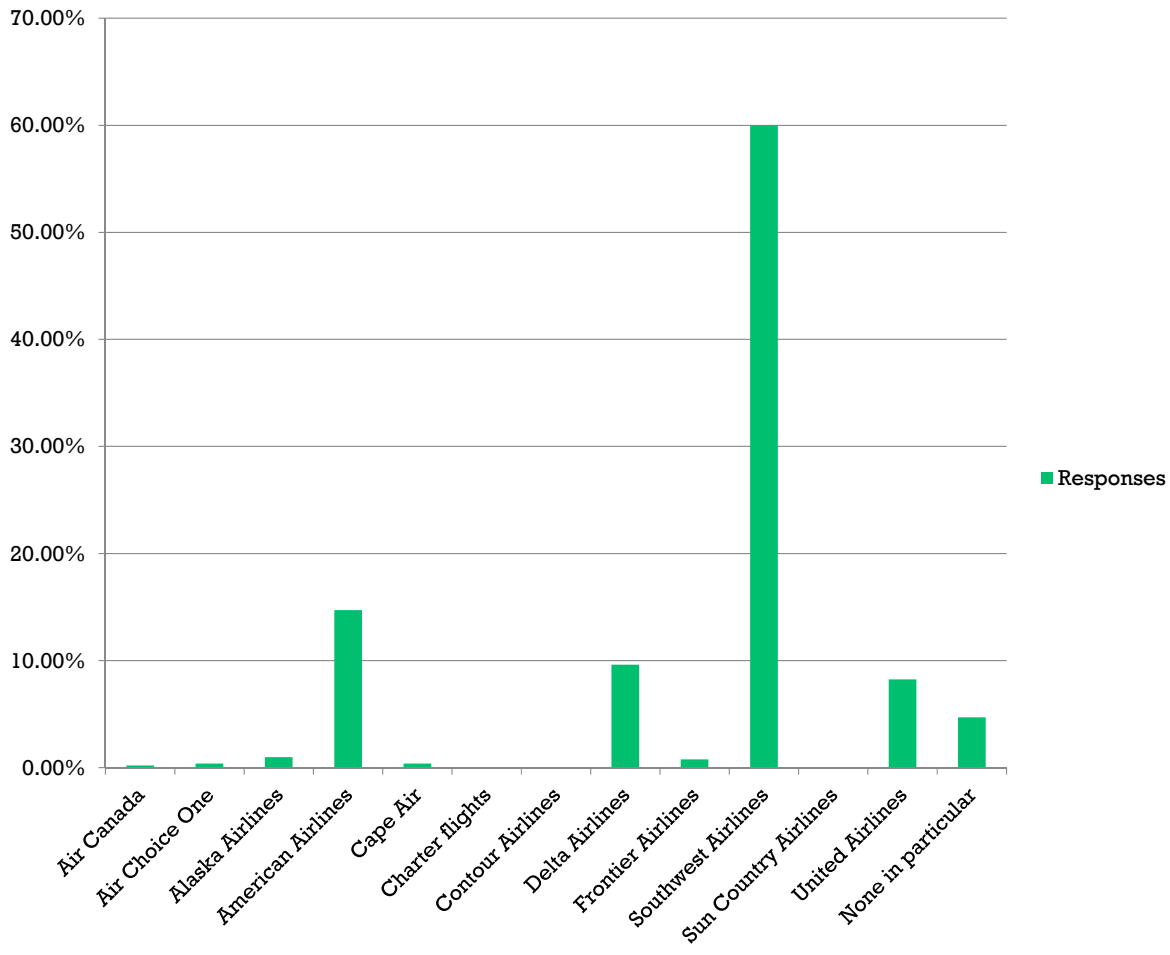
HOW DO YOU USUALLY GET TO THE AIRPORT?

- 4 skipped
- 60% of respondents arrive by personal vehicle



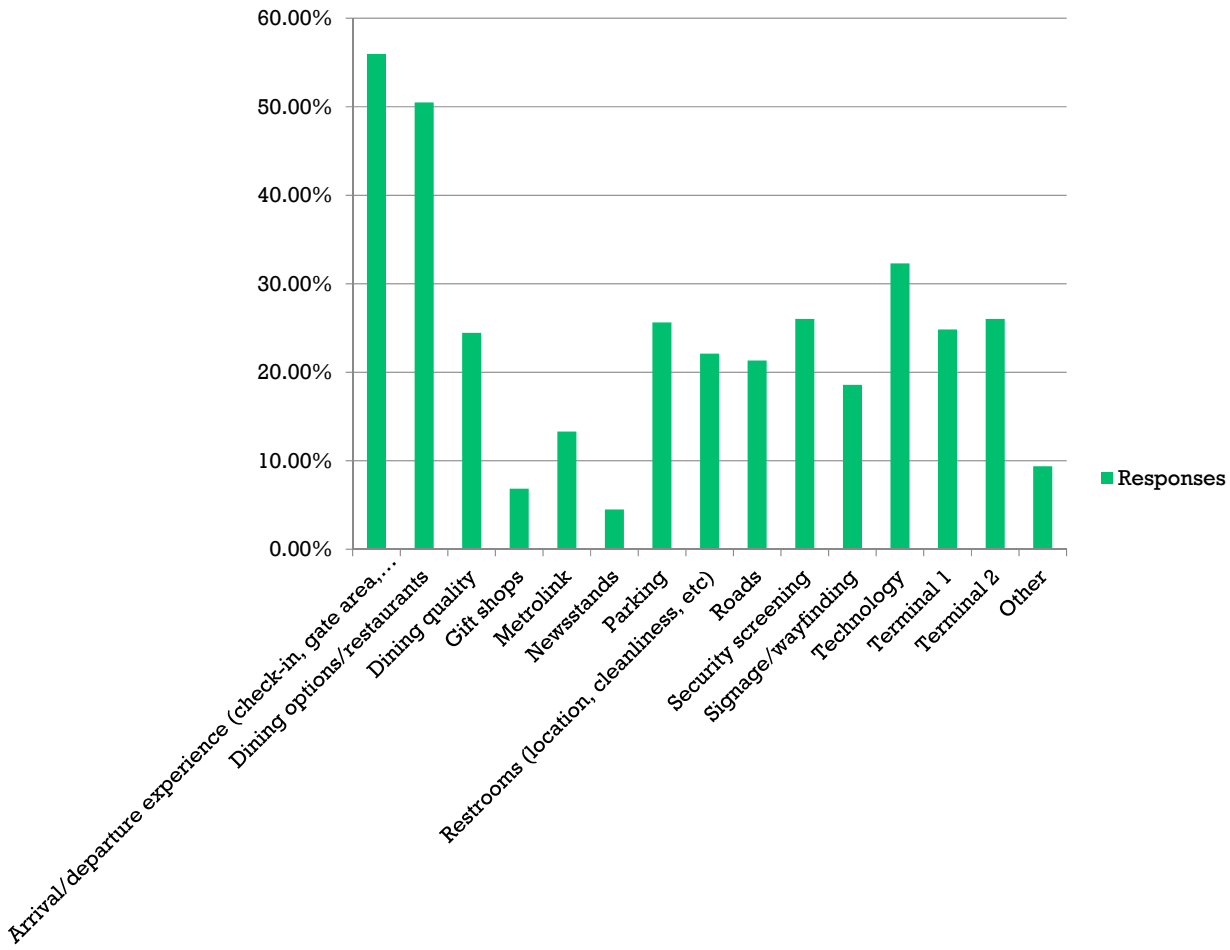
IF YOU DRIVE TO THE AIRPORT, WHERE DO YOU PARK MOST FREQUENTLY? SELECT THE TOP THREE THAT APPLY.

- 511 responded to this question
- 43% of respondents park in private lots



WHAT AIRLINE DO YOU MOST FREQUENTLY FLY?

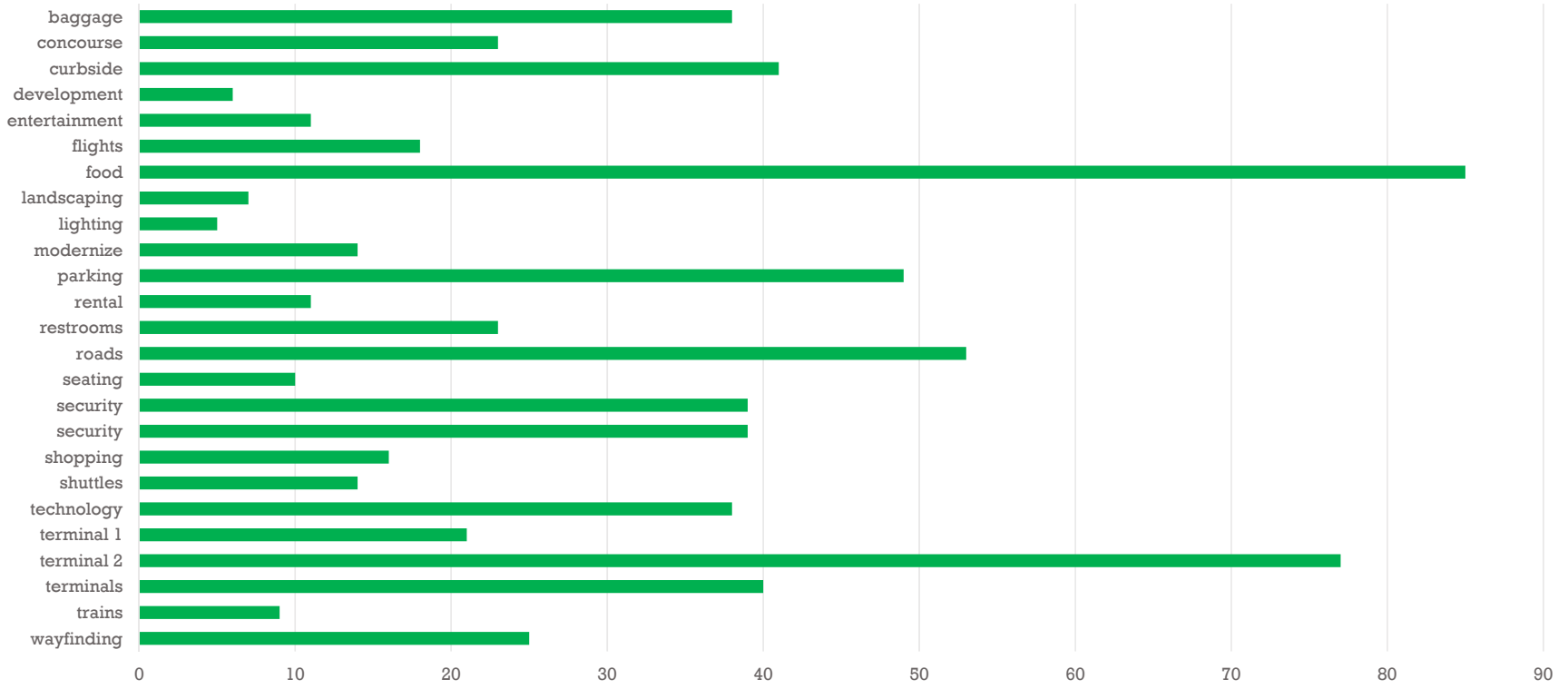
- 1 skipped
- 60% of respondents fly Southwest most frequently
- 15% of respondents fly American Airlines

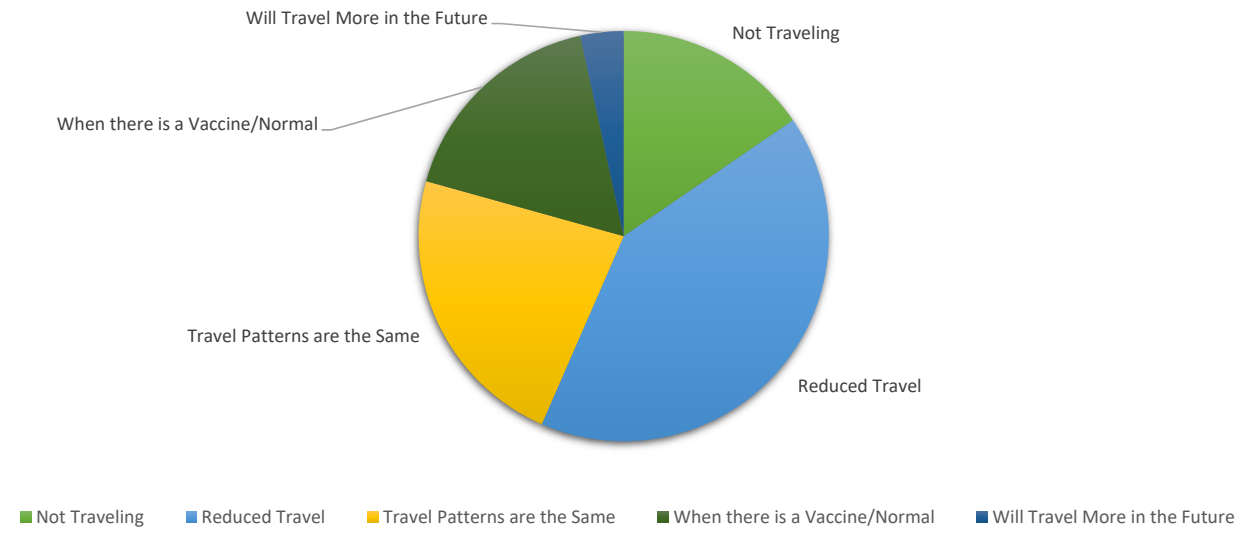


SELECT THE AREAS WHERE YOU WOULD LIKE TO SEE IMPROVEMENTS THAT WOULD MAKE YOUR AIRPORT EXPERIENCE BETTER. PLEASE CHOOSE YOUR TOP FIVE OPTIONS.

- 55% of respondents would like an improved arrival/departure experience
- 50% of respondents would like improved dining option/restaurants
- 32% of respondents would like enhanced technology

SHARE AN IDEA OR THOUGHT ON AN IMPROVEMENT YOU WOULD LIKE TO SEE AT STL?





HOW DO YOU FORESEE THE GLOBAL PANDEMIC CHANGING YOUR TRAVEL HABITS IN THE NEXT FEW YEARS?

41% of respondents have reduced travel

OTHER INPUT FOR THE STUDY TEAM…

- Improve terminals
- Improve concourses
- Enhance experience – physical improvements in buildings to interactions with people to options in the terminals
- Improve parking options and RAC
- Increase flight options – internationally and direct options
- Do not privatize

St. Louis Airport Survey #2

Final Findings

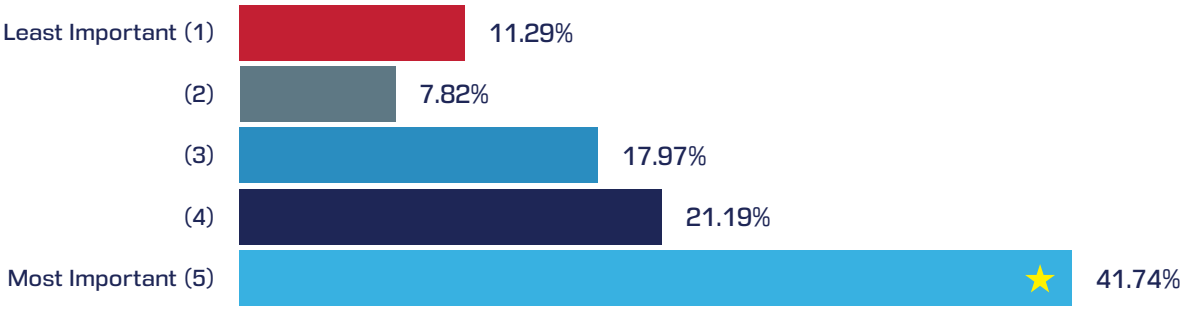
April, 2022

Question 1

RATING

Answered: 1586 Skipped: 41

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a single terminal that connects to one large security screening checkpoint that opens into a wider concourse?

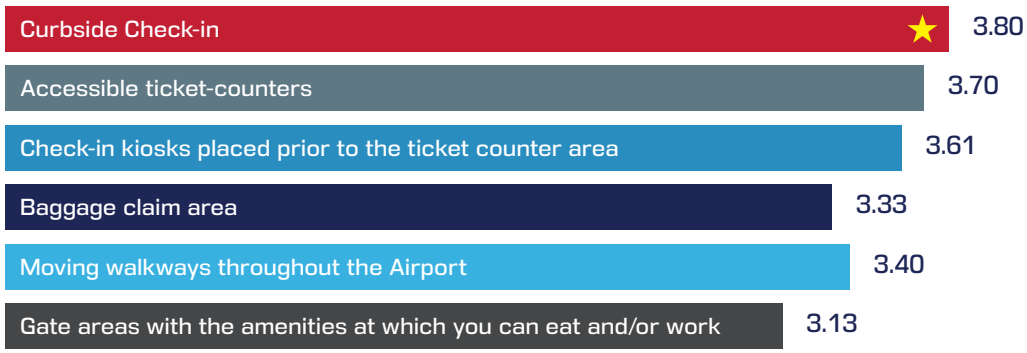


Question 2

RANKING

Answered: 1612 Skipped: 15

Rank by importance from 1 to 6, with 1 being the least and 6 the most, an airport terminal's most critical airline-based feature for your convenience:



Ranking Breakdown:

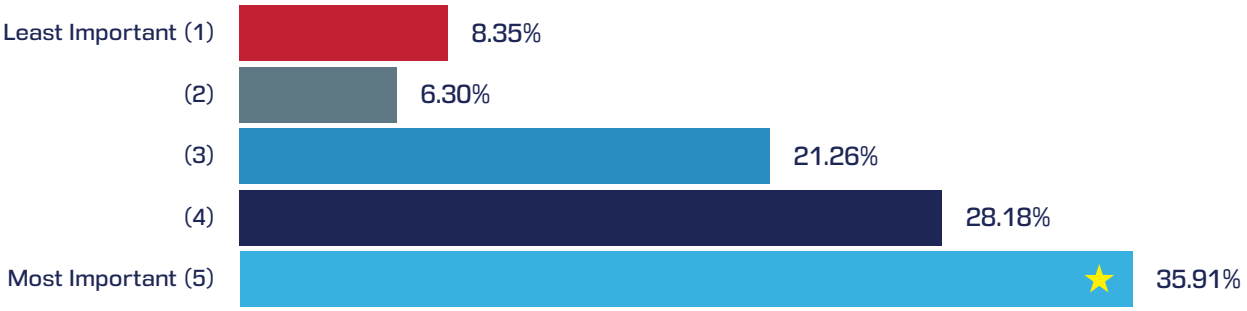
	1	2	3	4	5	6	TOTAL	SCORE
Curbside Check-in	**35.68%** 563	**12.55%** 198	**8.17%** 129	**8.11%** 128	**11.09%** 175	**24.40%** 385	1578	3.80
Accessible ticket-counters	**13.66%** 214	**23.29%** 365	**19.91%** 312	**16.21%** 254	**16.21%** 254	**10.72%** 168	1567	3.70
Check-in kiosks placed prior to the ticket counter area	**13.58%** 213	**19.44%** 305	**20.27%** 318	**19.12%** 300	**16.51%** 259	**11.09%** 174	1569	3.61
Baggage claim area	**5.95%** 94	**17.15%** 271	**21.27%** 336	**25.06%** 396	**20.44%** 323	**10.13%** 160	1580	3.33
Moving walkways throughout the Airport	**12.18%** 193	**16.16%** 256	**19.07%** 302	**18.24%** 289	**21.15%** 335	**13.19%** 209	1584	3.40
Gate areas with the amenities at which you can eat and/or work	**19.15%** 307	**10.73%** 172	**11.04%** 177	**13.10%** 210	**14.60%** 234	**31.38%** 503	1603	3.13

Question 3

RATING

Answered: 1604 Skipped: 23

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a single terminal that directs arriving passengers through the central portion of baggage claim and to the curbside, for surface transportation options?

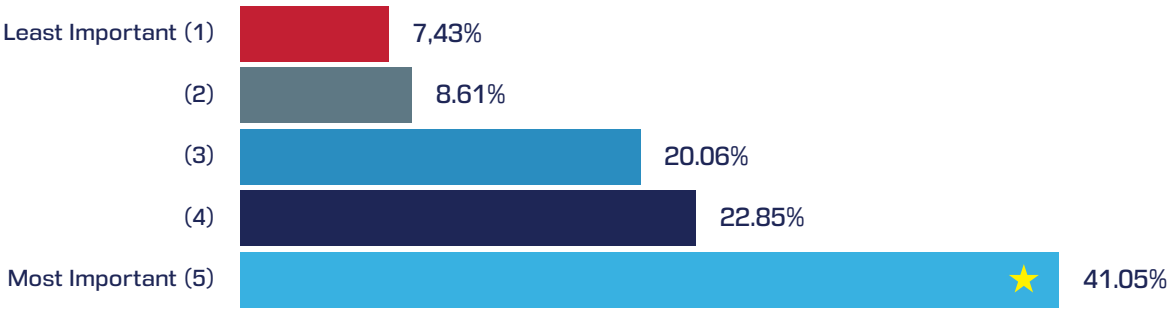


Question 4

RATING

Answered: 1615 Skipped: 12

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a proposed larger multi-level parking garage in front of the single terminal at STL?

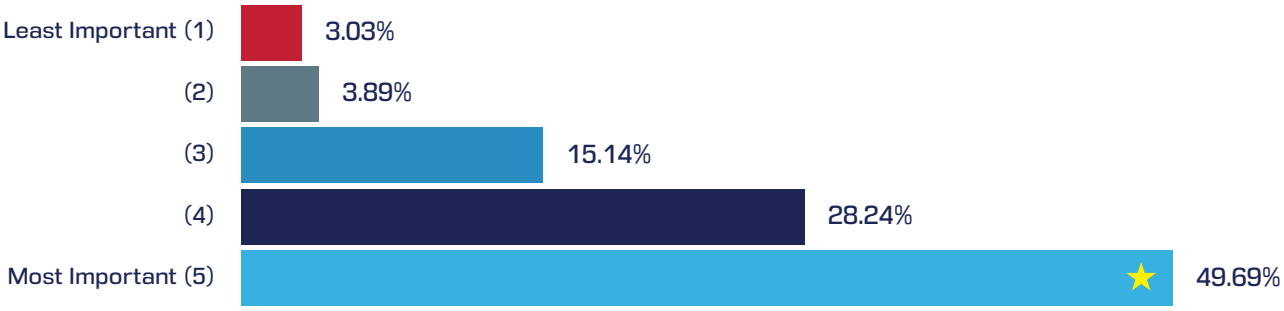


Question 5

RATING

Answered: 1618 Skipped: 9

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a proposed ground transportation center (Ubers, Lyfts, taxis, shuttles, and buses)?

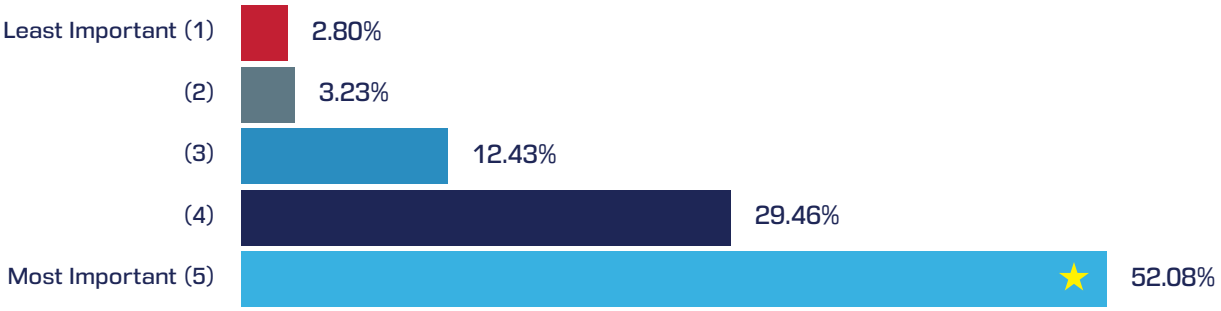


Question 6

RATING

Answered: 1609 Skipped: 18

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate the importance of the ground transportation center being covered space?

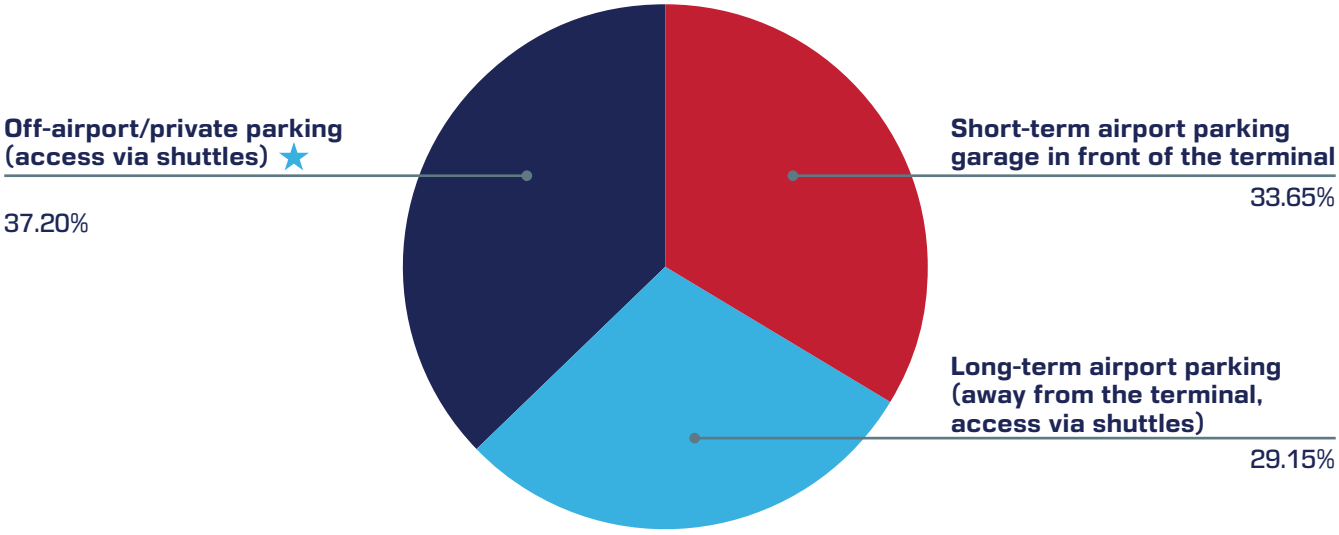


Question 7

SELECTION

Answered: 1602 Skipped: 25

If all airlines serving STL are located in a single terminal, where would you most likely park? (Select One)



Question 8

RANKING

Answered: 1598 Skipped: 29

With 1 being the least and 5 being the most important, rank the most important features regarding STL's parking options (Terminal Garage, Lots A, B, C, D or E).

Ranking Breakdown:

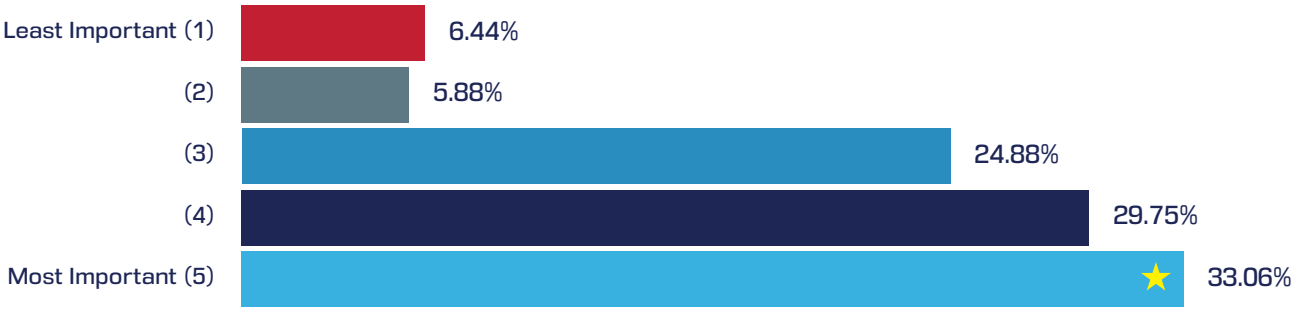
	1	2	3	4	5	TOTAL	SCORE
Covered parking	**14.90%** 232	**25.37%** 395	**23.44%** 365	**24.28%** 378	**12.01%** 187	1557	3.07
Cost of parking	**22.05%** 344	**16.41%** 256	**17.50%** 273	**18.27%** 285	**25.77%** 402	1560	2.91
Walking distance to terminal	**14.97%** 233	**22.17%** 345	**28.98%** 451	**19.92%** 310	**13.95%** 217	1556	3.04
Amount of time needed for shuttle ride to terminal	**10.47%** 164	**23.87%** 374	**21.76%** 341	**29.10%** 456	**14.81%** 232	1567	2.86
Parking Rewards Programs	**37.40%** 589	**11.56%** 182	**8.19%** 129	**8.32%** 131	**35.54%** 544	1575	3.09

Question 9

RATING

Answered: 1600 Skipped: 27

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate this preliminary proposed Airport entrance road (see image above)? Once on Airport, it features a long approach roadway with plenty of time to get oriented and get into the desired lanes (parking, terminal etc.).



Question 10

OPEN

Answered: 822 Skipped: 805

Are there any other comments/suggestions you would like us to consider regarding the preliminary preferred plan for STL?

Question 11

DEMOGRAPHICS

Answered: 1503 Skipped: 124

Please enter your home zip code so we can make sure we are reaching the entire region.

63132 63049 63025 62035 63040 62062 63134 62298 63044 62208 63043 62010
63141 62206 63117 63701 63033 62040 63128 63102 63005 63111
63385 63012 63366 62220 63011 63125 63129 62002
63146 62258 63108 62221 63105 65203 63104 63135
63301 63042 63116 63143 63376 63121
63303 63103 63119 63101 63122 62234
63109 63031 63017 62226 63021 63126 63304
62236 63110 63010 63118 62294 63130 62025 63368
63088 63139 62034 63114 63028 63124 63052 63123 63137
63131 65109 63026 63127 63144 63090 63112 63357 62269 63107 63074
62260 63367 63332 63136 63138 63034

Zip Code Breakdown:

ZIP CODE	COUNT
63119	50
63303	48
63122	42
63376	42
63109	40
63116	40
63017	37
63021	36
63301	36
63104	33
63105	31
63110	31

ZIP CODE	COUNT
63108	30
63118	30
63304	30
63129	27
63130	27
63146	27
63011	26
63368	26
63139	24
63366	24
63114	23
63124	21

ZIP CODE	COUNT
63385	21
63005	20
63123	19
63128	19
63131	19
63033	18
63026	17
63117	16
63141	15
63144	15
62269	13
63043	13

ZIP CODE	COUNT
63044	13
63112	13
63025	12
63040	12
63074	12
63134	12
63136	12
63367	12
63034	11
63103	11
63121	11
63132	11

Not included in breakdown: 174 answers with 10 responses or less

St. Louis Lambert International Airport

Airport Layout Plan (ALP) Update & Master Plan

SURVEY #3
SUMMARY FINDINGS

April 28, 2022

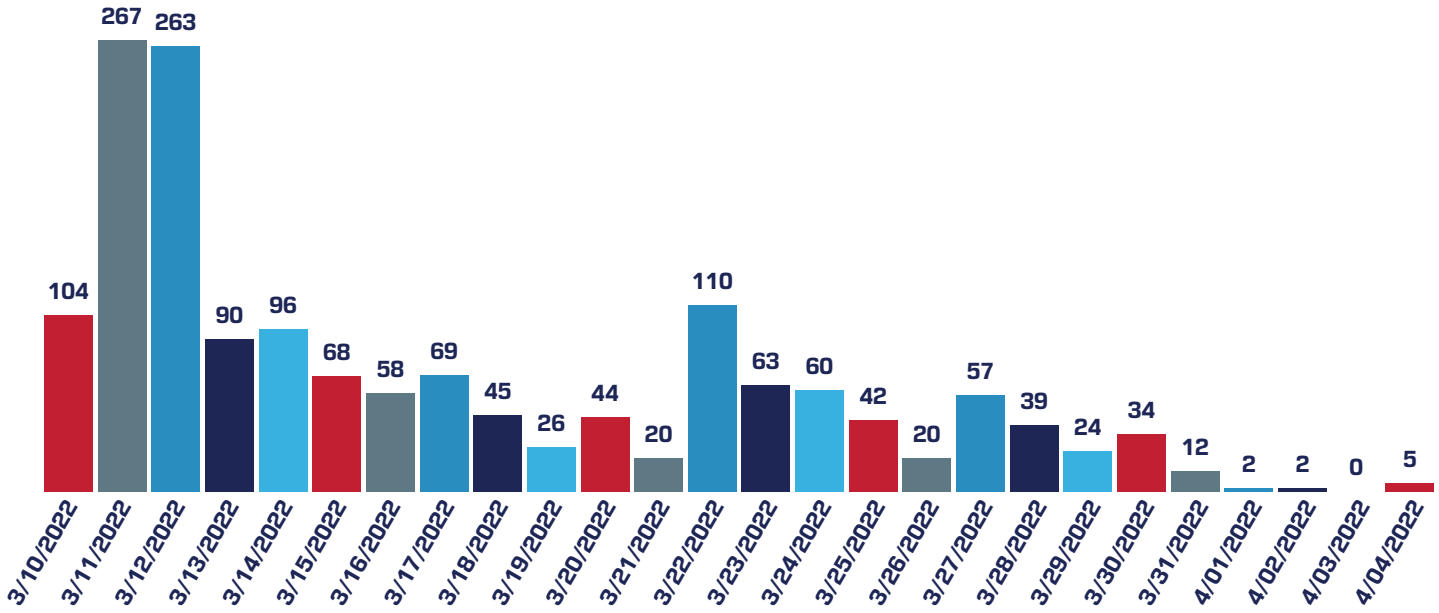
Survey Breakdown

Questions

1. On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a single terminal that connects to one large security screening checkpoint that opens into a wider concourse?	RATING
2. Rank by importance from 1 to 6, with 1 being the least and 6 the most, an airport terminal's most critical airline-based feature for your convenience.	RANKING
3. On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a single terminal that directs arriving passengers through the central portion of baggage claim and to the curbside, for surface transportation options?	RATING
4. On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a proposed larger multi-level parking garage in front of the single terminal at STL?	RATING
5. On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a proposed ground transportation center (Ubers, Lyfts, taxis, shuttles, and buses)?	RATING
6. On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate the importance of the ground transportation center being covered space?	RATING
7. If all airlines serving STL are located in a single terminal, where would you most likely park? (Select One)	SELECTION
8. With 1 being the least and 5 being the most important, rank the most important features regarding STL's parking options (Terminal Garage, Lots A, B, C, D or E).	RANKING
9. On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate this preliminary proposed Airport entrance road (see image above)? Once on Airport, it features a long approach roadway with plenty of time to get oriented and get into the desired lanes (parking, terminal etc.).	RATING
10. Are there any other comments/suggestions you would like us to consider regarding the preliminary preferred plan for STL?	OPEN
11. Please enter your home zip code so we can make sure we are reaching the entire region.	DEMOGRAPHICS
12. If you'd like to be added to our email list, please provide your email address.	EMAIL

Survey Window

Survey created with Survey Monkey and open for data collection from March 1 - April 4, 2022.

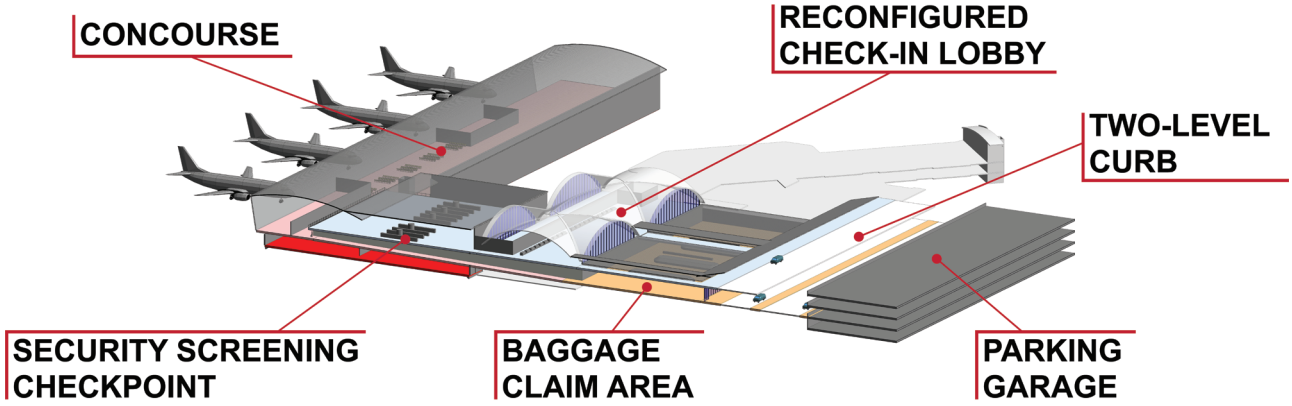


Total responses collected: 1627

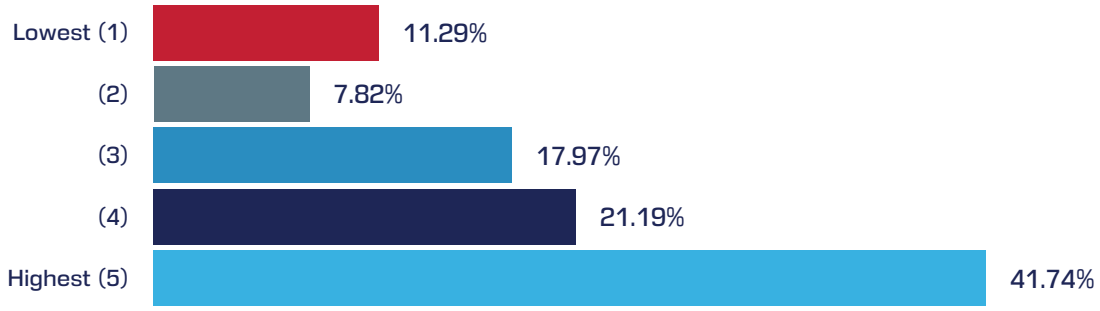
Response Breakdown

Question 1

TERMINAL
RATING



On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a single terminal that connects to one large security screening checkpoint that opens into a wider concourse?

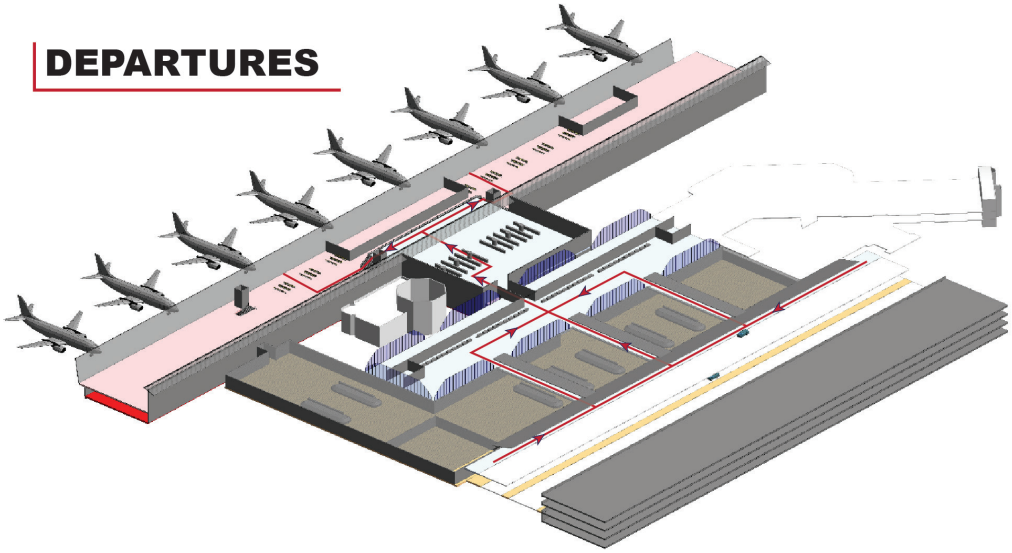


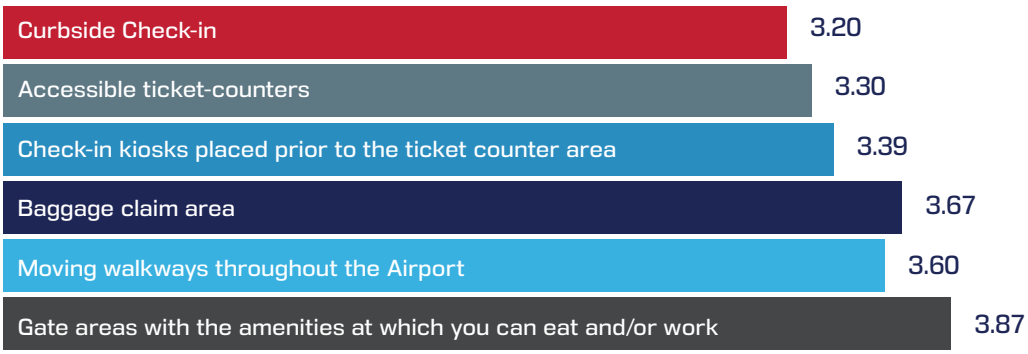
Answered: 1586 Skipped: 41

Question 2

TERMINAL
RANKING

Rank by importance from 1 to 6, with 1 being the least and 6 the most, an airport terminal's most critical airline-based feature for your convenience:



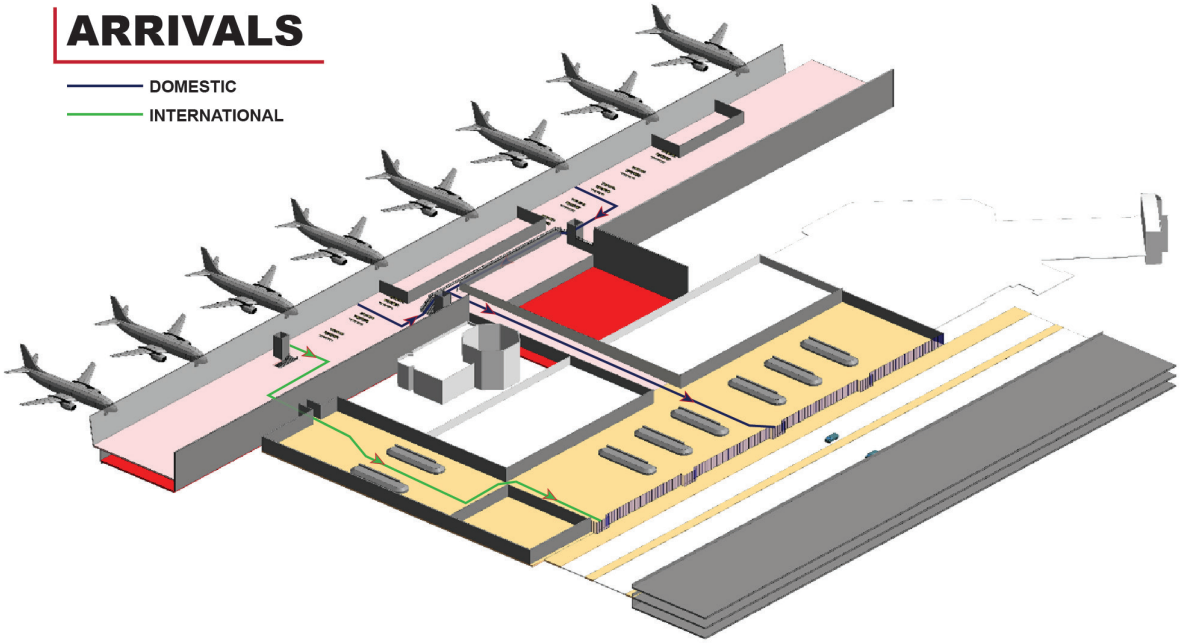


Ranking Breakdown	1	2	3	4	5	6	TOTAL VOTES	AVERAGE SCORE
Curbside Check-in	35.68% 563	12.55% 198	8.17% 129	8.11% 128	11.09% 175	24.40% 385	1578	3.20
Accessible ticket-counters	13.66% 214	23.29% 365	19.91% 312	16.21% 254	16.21% 254	10.72% 168	1567	3.30
Check-in kiosks placed prior to the ticket counter area	13.58% 213	19.44% 305	20.27% 318	19.12% 300	16.51% 259	11.09% 174	1569	3.39
Baggage claim area	5.95% 94	17.15% 271	21.27% 336	25.06% 396	20.44% 323	10.13% 160	1580	3.67
Moving walkways throughout the Airport	12.18% 193	16.16% 256	19.07% 302	18.24% 289	21.15% 335	13.19% 209	1584	3.60
Gate areas with the amenities at which you can eat and/or work	19.15% 307	10.73% 172	11.04% 177	13.10% 210	14.60% 234	31.38% 503	1603	3.87

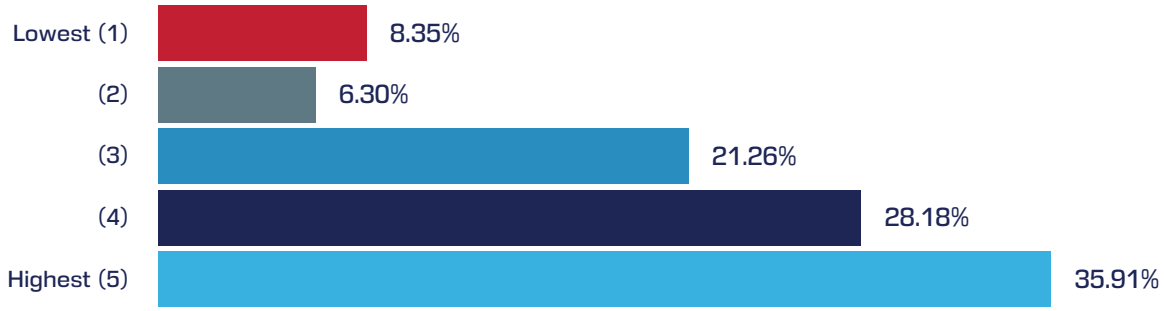
Answered: 1612 Skipped: 15

Question 3

TERMINAL
RATING



On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a single terminal that directs arriving passengers through the central portion of baggage claim and to the curbside, for surface transportation options?



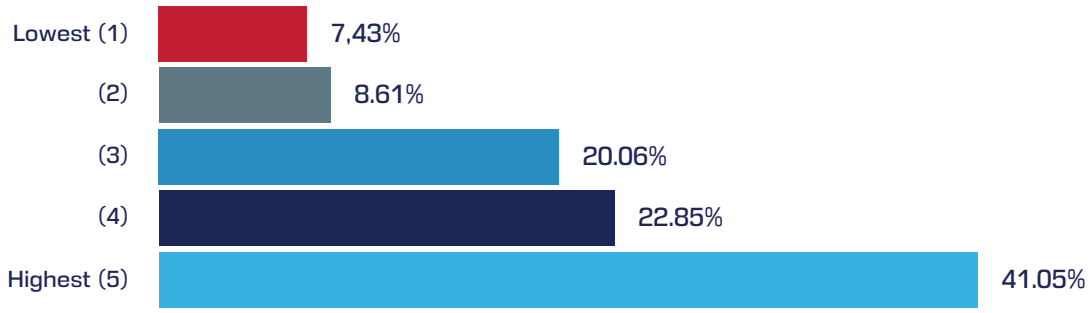
Answered: 1604 Skipped: 23

Question 4

TERMINAL PARKING
RATING

Answered: 1615 Skipped: 12

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a proposed larger multi-level parking garage in front of the single terminal at STL?

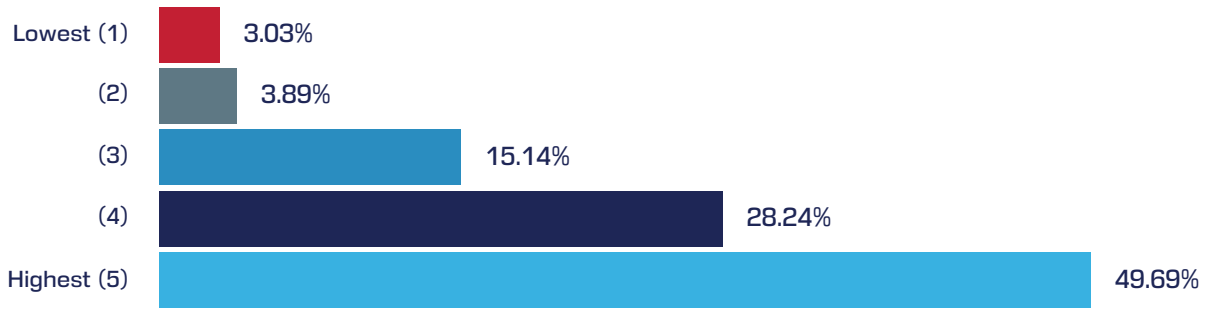


Answered: 1615 Skipped: 12

Question 5

GROUND TRANSPORTATION CENTER
RATING

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate a proposed ground transportation center (Ubers, Lyfts, taxis, shuttles, and buses)?

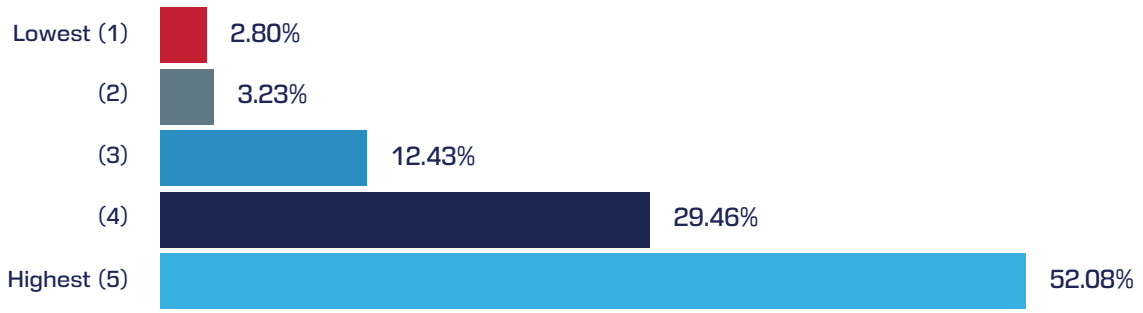


Answered: 1618 Skipped: 9

Question 6

GROUND TRANSPORTATION CENTER
RATING

On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate the importance of the ground transportation center being covered space?

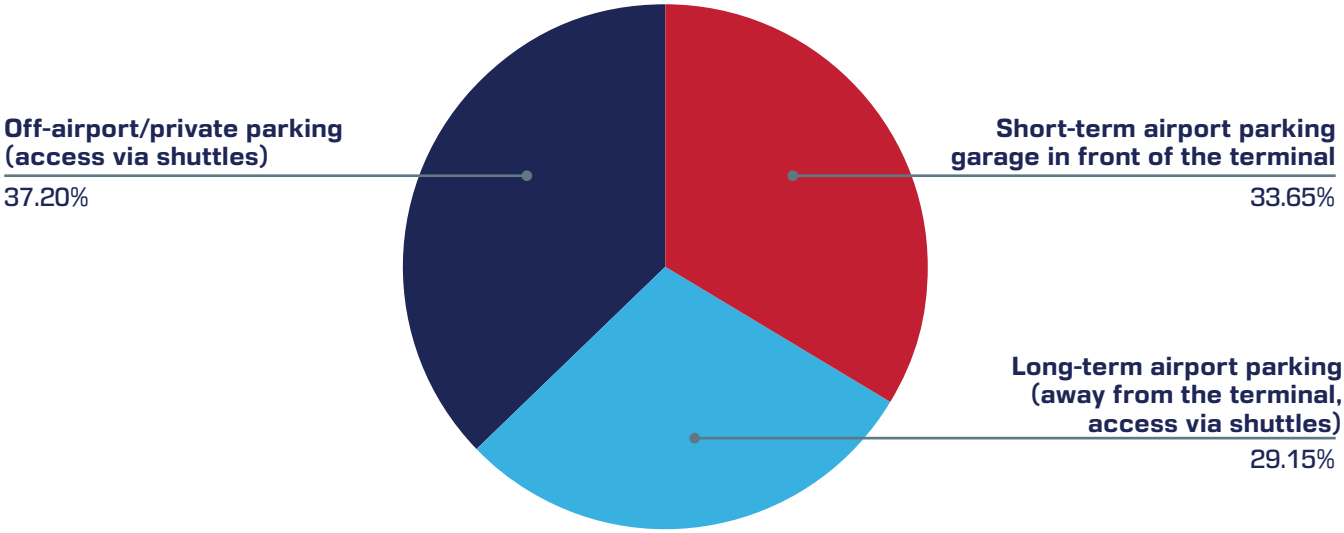


Answered: 1609 Skipped: 18

Question 7

TERMINAL PARKING
SELECTION

If all airlines serving STL are located in a single terminal, where would you most likely park? (Select One)



Answered: 1602 Skipped: 25

Question 8

TERMINAL PARKING
RANKING

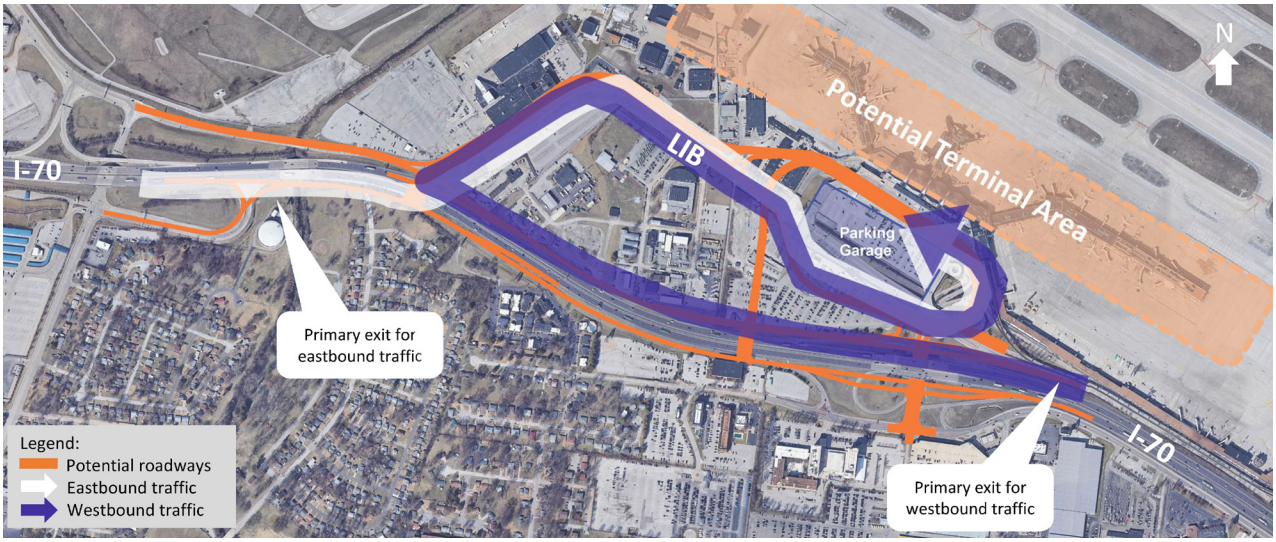
With 1 being the least and 5 being the most important, rank the most important features regarding STL's parking options (Terminal Garage, Lots A, B, C, D or E).

Ranking Breakdown	1	2	3	4	5	TOTAL VOTES	AVERAGE SCORE
Covered parking	**14.90%** 232	**25.37%** 395	**23.44%** 365	**24.28%** 378	**12.01%** 187	1557	2.93
Cost of parking	**22.05%** 344	**16.41%** 256	**17.50%** 273	**18.27%** 285	**25.77%** 402	1560	3.09
Walking distance to terminal	**14.97%** 233	**22.17%** 345	**28.98%** 451	**19.92%** 310	**13.95%** 217	1556	2.95
Amount of time needed for shuttle ride to terminal	**10.47%** 164	**23.87%** 374	**21.76%** 341	**29.10%** 456	**14.81%** 232	1567	3.13
Parking Rewards Programs	**37.40%** 589	**11.56%** 182	**8.19%** 129	**8.32%** 131	**35.54%** 544	1575	2.91

Answered: 1598 Skipped: 29

Question 9

AIRPORT ENTRANCE ROAD
RATING



On a scale of 1 to 5, with 1 being the lowest and 5 the highest, how do you rate this preliminary proposed Airport entrance road (see image above)? Once on Airport, it features a long approach roadway with plenty of time to get oriented and get into the desired lanes (parking, terminal etc.).

Answered: 1600 Skipped: 27

Question 10

WRITTEN COMMENTS
OPEN

Are there any other comments/suggestions you would like us to consider regarding the preliminary preferred plan for STL?

- More shopping and dining options
- Improved wayfinding signage inside and outside
- MetroLink and pedestrian accessibility including sidewalks and ADA accessibility
- Larger area for passenger pick up and drop off
- More affordable parking options for travelers and employees

> "Would appreciate more local STL food options we have so many great culinary choices that would showcase the city to visitors..."

> "Accessibility is a major key factor that needs to be taken seriously regarding the airport."

> "A single terminal while great right now seems to have limited growth potential. I would worry that it would hinder opportunities in the future."

> "Ample drop off and pick up zones for private (non-Uber) vehicles are top priority. At this airport many locals are dropped off and picked up."

Answered: 822 Skipped: 805

Question 11

PARTICIPANT ZIP CODES
DEMOGRAPHICS

Please enter your home zip code so we can make sure we are reaching the entire region.

Zip Code Breakdown:

ZIP CODE	COUNT
63119	50
63303	48
63122	42
63376	42
63109	40
63116	40
63017	37
63021	36
63301	36
63104	33
63105	31
63110	31

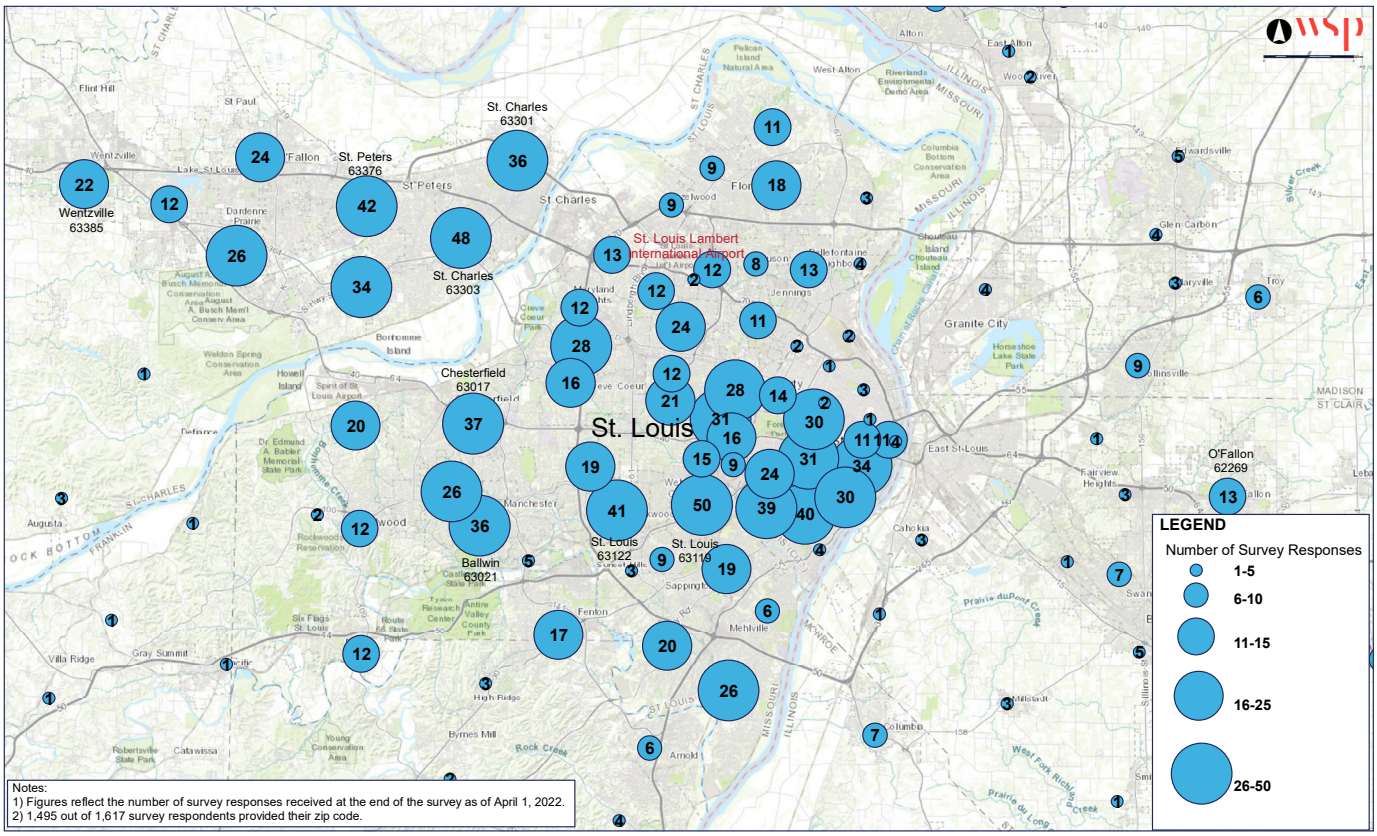
ZIP CODE	COUNT
63108	30
63118	30
63304	30
63129	27
63130	27
63146	27
63011	26
63368	26
63139	24
63366	24
63114	23
63124	21

ZIP CODE	COUNT
63385	21
63005	20
63123	19
63128	19
63131	19
63033	18
63026	17
63117	16
63141	15
63144	15
62269	13
63043	13

ZIP CODE	COUNT
63044	13
63112	13
63025	12
63040	12
63074	12
63134	12
63136	12
63367	12
63034	11
63103	11
63121	11
63132	11

Not included in breakdown: 174 zip codes with 10 responses or fewer

Answered: 1503 Skipped: 124



Question 12

PARTICIPANT EMAILS
DATA COLLECTION

Answered: 169 Skipped: 1458

If you'd like to be added to our email list, please provide your email address.

APPENDIX 11A – COMPONENT CLASSIFICATION SYSTEM

Table 11A-1 Component Classification Abbreviation

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	SUB-SYSTEM ABBREVIATION	ELEMENT (ITEM)
(ex. Terminal 1)	**Substructure**	Foundations	SF	
		Subgrade Enclosures	SE	CMU and CIP Walls
		Slabs on Grade	SG	Floor Slabs
	Shell	Superstructure	SS	Columns
				Floor Construction (Floor above)
		Exterior Vertical Enclosures	VE	CMU and CIP Walls
				Exterior Walls
				Exterior Windows
				Exterior Doors and Grilles
				Exterior Louvers and Vents
				Exterior Wall Appurtenances
		Exterior Horizontal Enclosures	HE	Roof Structure (Roof above)
				Roofing
				Roof Appurtenances
				Traffic Bearing Horizontal Enclosures
				Horizontal Openings
				Overhead Exterior Enclosures
	Interiors	Interior Construction	IC	Miscellaneous Structures
				Interior Partitions
				Interior Windows
				Interior Doors
				Interior Grilles and Gates
				Suspended Ceiling Construction
				Interior Specialties
				Wall Finishes
				Interior Fabrications
				Flooring Finishes
				Ceiling Finishes
	Services	Conveying	CV	Vertical Transportation (Elev. / Esc.)
				Horizontal Transportation (speed walk)
				Material Handling Systems (BHS)

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	SUB-SYSTEM ABBREVIATION	ELEMENT (ITEM)
		HVAC	HV	HVAC BAS/Controls
				HVAC - Air Dist. and Exhaust
				HVAC Terminal Equipment
				HVAC Unitary Equipment
				HVAC Major equipment
				HVAC Htg and Clg Water Dist.
				Facility Fuel Systems
				HVAC Other
		Plumbing	PL	Plbg Piping
				Plbg Water Heating Eqpt.
				Plbg EWC & Drinking Fountains
				Plbg Fixtures
				Plbg Appurtenances
				Plbg Other
		Fire Protection	FP	FP Sprinklers
				FP Risers/Control Valves
				FP Pumps
				FP Standpipes
				FP Alternative Fire Suppression
		Electrical	EL	Branch Distribution Panels
				Service Disconnects
				Raceways and wiring
				Receptacles and Devices
				General Lighting
				Accent Lighting
				Egress Lighting
				Lighting Control
		Communications	LV / IT	Telecom Ground Bars
				Pathways for Communication Systems
				Racks and Cabinets
				Backbone Copper Cabling
				Backbone Fiber Optic Cabling
				Communications Copper Cabling -CAT6/6A
				Communications Fiber Cabling
				Multi-User Flight Information Disp. Syst. (MUFIDS)
				Public Address System (PAS)
				Radio System
				Distributed Antenna System

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	SUB-SYSTEM ABBREVIATION	ELEMENT (ITEM)
				Local Area Network (LAN)
		Security/Access Control	SC	Access Control System
				Video Surveillance System
	Equipment and Furnishings	Equipment	BH	Baggage Handling Equipment
			EQ	Trash Compacting Equipment
	Sitework	Roads & Bridges		Roads & Bridges
		Stormwater		Stormwater Pumps

APPENDIX 11B – TABULAR ASSESSMENT

Table 11B-2 Facility Condition summarized by Component Sub-System

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
Terminal 1 - Tunnels (T1 - Tunnel)			***3***	***>10***
T1 - Tunnel	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
T1 - Tunnel	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	3	>10
T1 - Tunnel	**Services**		***3***	***5-10***
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	3	5-10
		Electrical	2	5-10
Terminal 1 - Apron (T1 - Apron)			*3*	*5-10*
T1 - Apron	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
T1 - Apron	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	3	>10
T1 - Apron	**Interiors**		***4***	***>10***
		Interior Construction	4	>10
T1 - Apron	**Services**		***2***	***5-10***
		Conveying	-	-
		HVAC	2	1-5
		Plumbing	3	5-10
		Fire Protection	2	5-10
		Electrical	2	5-10
T1 - Apron	**Equipment**		***4***	***>10***
		Baggage Handling Systems	4	>10
Terminal 1 - Concourse and Ticketing Levels (T1 - Conc/Ticketing Lvl)			***3***	***5-10***

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
T1 - Conc/Ticketing Lvl	**Substructure**		***3***	***>10***
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
T1 - Conc/Ticketing Lvl	**Shell**		***3***	***5-10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	3	5-10
T1 - Conc/Ticketing Lvl	**Interiors**		***4***	***>10***
		Interior Construction	4	>10
T1 - Conc/Ticketing Lvl	**Services**		***3***	***5-10***
		Conveying	2	5-10
		HVAC	4	5-10
		Plumbing	4	5-10
		Fire Protection	2	5-10
		Electrical	3	5-10
Concourse A - Tunnels (A - Tunnel)			***3***	***>10***
A - Tunnel	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
A - Tunnel	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	-	-
A - Tunnel	**Services**		***3***	***5-10***
		HVAC	3	5-10
		Plumbing	3	>10
		Fire Protection	3	5-10
		Electrical	2	1-5
Concourse A - Apron (A - Apron)			***4***	***5-10***
A - Apron	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
A - Apron	**Shell**		***3***	***5-10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	-	-

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
A - Apron	**Interiors**		***3***	***5-10***
		Interior Construction	3	5-10
A - Apron	**Services**		***3***	***5-10***
		Conveying	-	-
		HVAC	3	5-10
		Plumbing	4	>10
		Fire Protection	3	5-10
		Electrical	2	5-10
Concourse A - Concourse (A - Conc Lvl)			***3***	***5-10***
A - Conc Lvl	**Substructure**		***3***	***>10***
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
A - Conc Lvl	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	4	5-10
		Ext. Horizontal Enclosures	3	>10
A - Conc Lvl	**Interiors**		***4***	***>10***
		Interior Construction	4	>10
A - Conc Lvl	**Services**		***4***	***5-10***
		Conveying	4	5-10
		HVAC	4	5-10
		Plumbing	4	>10
		Fire Protection	2	5-10
		Electrical	3	5-10
Concourse B - Tunnels (B - Tunnel)			***2***	***5-10***
B - Tunnel	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
B - Tunnel	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	-	-
B - Tunnel	**Services**		***2***	***1-5***
		HVAC	2	1-5
		Plumbing	2	1-5
		Fire Protection	3	1-5
		Electrical	2	1-5

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
Concourse B - Apron (B - Apron)			***3***	***5-10***
B - Apron	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
B - Apron	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	-	-
B - Apron	**Interiors**		***3***	***5-10***
		Interior Construction	3	5-10
B - Apron	**Services**		***2***	***5-10***
		Conveying	-	-
		HVAC	4	5-10
		Plumbing	2	1-5
		Fire Protection	2	5-10
		Electrical	2	5-10
Concourse B - Concourse (B - Conc Lvl)			***3***	***5-10***
B - Conc Lvl	**Substructure**		***3***	***>10***
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
B - Conc Lvl	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	3	>10
B - Conc Lvl	**Interiors**		***4***	***5-10***
		Interior Construction	4	5-10
B - Conc Lvl	**Services**		***3***	***5-10***
		Conveying	2	1-5
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	2	5-10
		Electrical	3	5-10
Concourse C - Tunnels (C - Tunnel)			***3***	***5-10***
C - Tunnel	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
C - Tunnel	**Shell**		***3***	***>10***
		Superstructure	3	5-10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	-	-
C - Tunnel	**Services**		***3***	***5-10***
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	3	5-10
		Electrical	2	5-10
Concourse C Extension - Tunnels (CX - Tunnel)			***3***	***>10***
CX - Tunnel	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
CX - Tunnel	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	-	-
CX - Tunnel	**Services**		***3***	***5-10***
		HVAC	3	5-10
		Plumbing	3	>10
		Fire Protection	3	5-10
		Electrical	2	1-5
Concourse C - Apron Level (C - Apron)			***3***	***5-10***
C - Apron	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
C - Apron	**Shell**		***3***	***5-10***
		Superstructure	3	5-10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	-	-
C - Apron	**Interiors**		***3***	***5-10***
		Interior Construction	3	5-10
C - Apron	**Services**		***2***	***5-10***
		Conveying	-	-
		HVAC	3	5-10
		Plumbing	2	5-10

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
		Fire Protection	2	5-10
		Electrical	2	5-10
Concourse C Extension - Apron Level (CX - Apron)			***2***	***5-10***
CX - Apron	**Substructure**		***2***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	2	>10
CX - Apron	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	-	-
CX - Apron	**Interiors**		***2***	***1-5***
		Interior Construction	2	1-5
CX - Apron	**Services**		***2***	***5-10***
		Conveying	-	-
		HVAC	2	1-5
		Plumbing	2	1-5
		Fire Protection	2	5-10
		Electrical	2	5-10
Concourse C - Concourse Level (C - Conc Lvl)			***3***	***>10***
C - Conc Lvl	**Substructure**		***3***	***>10***
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
C - Conc Lvl	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	3	>10
C - Conc Lvl	**Interiors**		***4***	***>10***
		Interior Construction	4	>10
C - Conc Lvl	**Services**		***3***	***5-10***
		Conveying	2	1-5
		HVAC	4	>10
		Plumbing	4	>10
		Fire Protection	2	5-10
		Electrical	3	5-10
Concourse C Extension - Concourse Level (CX - Conc Lvl)			***3***	***5-10***
CX - Conc Lvl	**Substructure**		***3***	***>10***

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
CX - Conc Lvl	Shell		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	3	5-10
CX - Conc Lvl	Interiors		***3***	***5-10***
		Interior Construction	3	5-10
CX - Conc Lvl	Services		***2***	***5-10***
		Conveying	2	1-5
		HVAC	2	1-5
		Plumbing	3	5-10
		Fire Protection	2	5-10
		Electrical	3	5-10
Concourse D - Tunnels (Combined w/ Apron Level)			-	-
Concourse D - Apron Level (D-Apron)			***3***	***5-10***
D - Apron	Substructure		***2***	***>10***
		Foundations	2	>10
		Subgrade Enclosures	2	>10
		Slabs on Grade	3	>10
D - Apron	Shell		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	5-10
		Ext. Horizontal Enclosures	-	-
D - Apron	Interiors		***3***	***5-10***
		Interior Construction	3	5-10
D - Apron	Services		***3***	***5-10***
		Conveying	-	-
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	2	5-10
		Electrical	2	5-10
Concourse D - Concourse Level (D - Conc Lvl)			***3***	***5-10***
D - Conc Lvl	Substructure		***3***	***>10***
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
D - Conc Lvl	**Shell**		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	3	5-10
D - Conc Lvl	**Interiors**		***3***	***5-10***
		Interior Construction	3	5-10
D - Conc Lvl	**Services**		***2***	***5-10***
		Conveying	2	1-5
		HVAC	3	5-10
		Plumbing	2	5-10
		Fire Protection	2	5-10
		Electrical	3	5-10
Terminal 2 - Tunnels (T2 - Tunnel)			***4***	***>10***
T2 - Tunnel	**Substructure**		***4***	***>10***
		Foundations	4	>10
		Subgrade Enclosures	4	>10
		Slabs on Grade	3	>10
T2 - Tunnel	**Shell**		***4***	***>10***
		Superstructure	4	>10
		Exterior Vertical Enclosures	4	>10
		Ext. Horizontal Enclosures	-	-
T2 - Tunnel	**Services**		**-**	**-**
		HVAC	-	-
		Plumbing	-	-
		Fire Protection	-	-
		Electrical	-	-
Terminal 2 - Apron Level (T2 - Apron)			***4***	***>10***
T2 - Apron	**Substructure**		***4***	***>10***
		Foundations	4	>10
		Subgrade Enclosures	4	>10
		Slabs on Grade	3	>10
T2 - Apron	**Shell**		***4***	***>10***
		Superstructure	4	>10
		Exterior Vertical Enclosures	4	>10
		Ext. Horizontal Enclosures	-	-
T2 - Apron	**Interiors**		***4***	***>10***
		Interior Construction	4	>10
T2 - Apron	**Services**		***3***	***5-10***

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
		Conveying	-	-
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	4	>10
		Electrical	3	>10
T2 - Apron	Equipment		***4***	***5-10***
		Baggage Handling Systems	4	5-10
Terminal 2 - Ticketing Level, Pre-Security (T2 Ticketing Lvl)			***4***	***>10***
T2 - Ticketing Lvl	Substructure		***3***	***>10***
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
T2 - Ticketing Lvl	Shell		***4***	***>10***
		Superstructure	4	>10
		Exterior Vertical Enclosures	4	5-10
		Ext. Horizontal Enclosures	4	>10
T2 - Ticketing Lvl	Interiors		***4***	***>10***
		Interior Construction	4	>10
T2 - Ticketing Lvl	Services		***3***	***5-10***
		Conveying	3	5-10
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	4	>10
		Electrical	3	>10
Concourse E - Tunnels (E - Tunnel)			***4***	***>10***
E - Tunnel	Substructure		***4***	***>10***
		Foundations	4	>10
		Subgrade Enclosures	4	>10
		Slabs on Grade	3	>10
E - Tunnel	Shell		***4***	***>10***
		Superstructure	4	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	-	-
E - Tunnel	Services		***3***	***>10***
		HVAC	3	>10
		Plumbing	3	>10
		Fire Protection	4	>10
		Electrical	3	>10

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
Concourse E - Apron Level (E - Apron)			***3***	***>10***
E - Apron	**Substructure**		***4***	***>10***
		Foundations	4	>10
		Subgrade Enclosures	4	>10
		Slabs on Grade	3	>10
E - Apron	**Shell**		***4***	***>10***
		Superstructure	4	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	-	-
E - Apron	**Interiors**		***3***	***5-10***
		Interior Construction	3	5-10
E - Apron	**Services**		***3***	***5-10***
		Conveying	-	-
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	4	>10
		Electrical	3	5-10
Concourse E - Customs and Border Protection / Federal Inspection Service (CBP/FIS)			***4***	***>10***
CBP/FIS	**Substructure**		***4***	***>10***
		Foundations	4	>10
		Subgrade Enclosures	4	>10
		Slabs on Grade	3	>10
CBP/FIS	**Shell**		***4***	***>10***
		Superstructure	4	>10
		Exterior Vertical Enclosures	3	>10
		Ext. Horizontal Enclosures	-	-
CBP/FIS	**Interiors**		***3***	***>10***
		Interior Construction	3	>10
CBP/FIS	**Services**		***3***	***5-10***
		Conveying	-	-
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	3	5-10
		Electrical	3	5-10
CBP/FIS	**Equipment**		***4***	***>10***
		Baggage Handling Systems	4	>10
Concourse E - Concourse Level, Post-Security (E - Conc Lvl)			***4***	***5-10***
E - Conc Lvl	**Substructure**		***3***	***>10***

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
E - Conc Lvl	Shell		***4***	***>10***
		Superstructure	4	>10
		Exterior Vertical Enclosures	4	>10
		Ext. Horizontal Enclosures	3	>10
E - Conc Lvl	Interiors		***4***	***5-10***
		Interior Construction	4	5-10
E - Conc Lvl	Services		***3***	***5-10***
		Conveying	3	5-10
		HVAC	3	5-10
		Plumbing	3	5-10
		Fire Protection	4	>10
		Electrical	3	5-10
Climate Control West			***3***	***5-10***
CCW	Substructure		***3***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	3	>10
		Slabs on Grade	2	>10
CCW	Shell		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	2	5-10
		Ext. Horizontal Enclosures	3	>10
CCW	Interiors		***3***	***5-10***
		Interior Construction	3	5-10
CCW	Services		***3***	***5-10***
		Conveying	-	-
		HVAC	3	5-10
		Plumbing	2	5-10
		Electrical	3	>10
Climate Control East			***3***	***5-10***
CCE	Substructure		***-***	***-***
		Foundations	-	-
		Subgrade Enclosures	-	-
		Slabs on Grade	-	-
CCE	Shell		***2***	***5-10***
		Superstructure	-	-
		Exterior Vertical Enclosures	2	5-10

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
		Ext. Horizontal Enclosures	-	-
CCE	Interiors		***3***	***5-10***
		Interior Construction	3	5-10
CCE	Services		***3***	***5-10***
		Conveying	-	-
		HVAC	4	5-10
		Plumbing	3	5-10
		Electrical	3	5-10
T1 Garage			***3***	***5-10***
T1G	Substructure		***3***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
T1G	Shell		***2***	***>10***
		Superstructure	2	>10
		Exterior Vertical Enclosures	-	-
		Ext. Horizontal Enclosures	-	-
T1G	Services		***3***	***5-10***
		Conveying	4	>10
		Plumbing	2	1-5
		Fire Protection	2	1-5
		Electrical	-	-
T2 Garage			***3***	***5-10***
T2G	Substructure		***3***	***>10***
		Foundations	3	>10
		Subgrade Enclosures	-	-
		Slabs on Grade	3	>10
T2G	Shell		***3***	***>10***
		Superstructure	3	>10
		Exterior Vertical Enclosures	-	-
		Ext. Horizontal Enclosures	-	-
T2G	Services		***3***	***5-10***
		Conveying	3	5-10
		Plumbing	3	5-10
		Fire Protection	3	5-10
		Electrical	3	>10
Roads and Bridges			***3***	***5-10***
T1			***2***	***<5***
		Roads	2	6

FACILITY	COMPONENT SYSTEM	COMPONENT SUB-SYSTEM	CONDITION ASSESSMENT	EST. RUL
		Bridges	2	<5
T2			***3***	***12***
		Roads	3	12
		Bridge	4	>20
LIB			***3***	***>5***
		Roads	3	10
		Bridges	3	>5
Stormwater Pump Station			***3***	***>10***

Note:
[1] Condition Assessment Ratings:
(5) Excellent - New or like new condition with no observable defects
(4) Good - Element performs intended function with high degree of reliability and/or effectiveness
(3) Fair - Element performs intended function with small reduction in reliability and/or effectiveness
(2) Poor - Element performs intended function with significant reduction in reliability and/or effectiveness. Repair or replacement may be required
(1) Unsatisfactory: Element does not perform intended function at an acceptable level of reliability and/or effectiveness. Repair or replacement is required
[2] C Extension is the portion of the C Concourse east of gate C24 and column line 105.

Table 11B-2: Facility Condition summarized by Facility

FACILITY	CONDITION ASSESSMENT	EST. RUL
Terminal 1 - Tunnels (T1 - Tunnel)	3	>10
Terminal 1 - Apron (T1 - Apron)	3	5-10
Terminal 1 - Concourse and Ticketing Levels (T1 - Conc/Ticketing Lvl)	3	5-10
Concourse A - Tunnels (A - Tunnel)	3	>10
Concourse A - Apron (A - Apron)	4	5-10
Concourse A - Concourse (A - Conc Lvl)	3	5-10
Concourse B - Tunnels (B - Tunnel)	2	5-10
Concourse B - Apron (B - Apron)	3	5-10
Concourse B - Concourse (B - Conc Lvl)	3	5-10
Concourse C - Tunnels (C - Tunnel)	3	5-10
Concourse C Extension - Tunnels (CX - Tunnel)	3	>10
Concourse C - Apron Level (C - Apron)	3	5-10
Concourse C Extension - Apron Level (CX - Apron)	2	5-10
Concourse C - Concourse Level (C - Conc Lvl)	3	>10
Concourse C Extension - Concourse Level (CX - Conc Lvl)	3	5-10
Concourse D - Tunnels (D - Tunnel)	-	-
Concourse D - Apron Level (D-Apron)	3	5-10
Concourse D - Concourse Level (D - Conc Lvl)	3	5-10
Terminal 2 - Tunnels (T2 - Tunnel)	4	>10
Terminal 2 - Apron Level (T2 - Apron)	4	>10
Terminal 2 - Ticketing Level, Pre-Security (T2 Ticketing Lvl)	4	>10
Concourse E - Tunnels (E - Tunnel)	4	>10
Concourse E - Apron Level (E - Apron)	3	>10
Concourse E - Customs and Border Protection / Federal Inspection Service (CBP/FIS)	4	>10
Concourse E - Concourse Level, Post-Security (E - Conc Lvl)	4	5-10
Climate Control West	3	5-10
Climate Control East	3	5-10
T1 Garage	3	5-10

FACILITY	CONDITION ASSESSMENT	EST. RUL
T2 Garage	*3*	*5-10*
Roads and Bridges	*3*	*5-10*
Stormwater Pump Station	3	>10

Note:
[1] Condition Assessment Ratings:
(5) Excellent - New or like new condition with no observable defects
(4) Good - Element performs intended function with high degree of reliability and/or effectiveness
(3) Fair - Element performs intended function with small reduction in reliability and/or effectiveness
(2) Poor - Element performs intended function with significant reduction in reliability and/or effectiveness. Repair or replacement may be required
(1) Unsatisfactory: Element does not perform intended function at an acceptable level of reliability and/or effectiveness. Repair or replacement is required
[2] C Extension is the portion of the C Concourse east of gate C24 and column line 105.

APPENDIX 11C.1 – COMPILED FACILITY CONDITION ASSESSMENT CAPEX

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	BH01 -	G	Replace upper level BHS hardware (operating systems, User interface software, HMIs, servers, workstations, monitors, computer peripherals)	-	Baggage Control Room	2	$ 1,500,000	$ 2,610,000		$ -	$ 2,980,000	$ -	$ -	9		Baggage Handling
FCA -	BH02 -	T1	Address loose wires that are not properly terminated in motor control/distribution panels (MCP's). Replace panduit covers in MCP's (maintenance)	-	T1	2	$ 750	$ -		$ 1,300	$ -	$ -	$ -	9		Baggage Handling
FCA -	BH03 -	T1	Replace startup alarm for make-up unit, MU1, on BHS (maintenance)	-	T1	1	$ 3,000	$ 10,000		$ 5,000	$ -	$ -	$ -			Baggage Handling
FCA -	BH04 -	T1	Conduct a deliberate test of the BHS PLC’s warm/hot back up switchover during non-operational hours.	-	T1	3	$ -	$ -		$ -	$ -	$ -	$ -	-	-	Baggage Handling - No cost associated with this item

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	BH05 -	T1	The latest BHS PLC programs should be stored in a central location such as a NAS (network-attached storage) where latest revisions can be managed and properly access in the event of a hardware failure	-	T1	2	$ -	$ -		$ -	$ -	$ -	$ -	-	-	Baggage Handling - No cost associated with this item
FCA -	CV01 -	G	Modernize all elevators over 30 years old (qty. 27).	STL-ES7.1	T1, T2, A, B, C, CX, E, T2G	1	$ 3,900,000	$ 6,780,000		$ -	$ -	$ -	$ -	38-45	25	Update control systems, door operation, signal fixtures, cab interiors. Andy from Midwest Elevator said typically modernization of an elevator is around $150,000, at least $100,000 per elevator.
FCA -	CV01 -	T1			T1	1			$ 1,560,000	$ 550,000	$ 600,000	$ 340,000	$ 390,000			2022: T1-1, T1-3. 2022-26: T1-6, T1-4. 2027-31: T1-5. 2031: T1-2
FCA -	CV01 -	T2			T2	1			$ 520,000	$ -	$ 600,000	$ -	$ -			2022-26: T2-1, T2-2

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	CV01 -	A			A	1			$ 520,000	$ -	$ -	$ -	$ 790,000			2031: A-8, A-17
FCA -	CV01 -	B			B	1			$ 520,000	$ -	$ 300,000	$ 340,000	$ -			2022-26: B-14. 2027-2031: B-4
FCA -	CV01 -	C			C	1			$ 520,000	$ 550,000	$ -	$ -	$ -			2022: C-18, C-12. C-12 is currently out of service and the upgrades can be made at such time as the building is back in service.
FCA -	CV01 -	C X			CX	1			$ 260,000	$ 280,000	$ -	$ -	$ -			2022: C-28
FCA -	CV01 -	D			D	1			$ 260,000	$ 280,000	$ -	$ -	$ -			2022: D-13
FCA -	CV01 -	E			E	1			$ 1,560,000	$ 550,000	$ 600,000	$ -	$ 790,000			2022: E-1, E3. 2022-26: E-5, E-6. 2031: E-2, E-4.
FCA -	CV01 -	T2 G			T2G	1			$ 1,040,000	$ -	$ 890,000	$ 340,000	$ -			2022-26: T2G-3, T2G-2, T2G-1. 2027-31: T2G-4
FCA -	CV02 -	G	Overhaul all elevators over 15 years old (qty. 28).		T1, T2, A, B, C, CX, D, E, T1G, T2G	1	$ 1,960,000	$ 3,410,000		$ -	$ -	$ -	$ -	16-45	25	Examine all parts of the elevator, excluding parts included in modernization (FCA-CV01-G), and repair/replace items as needed. RSMeans:

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
																D10101301000
FCA-	CV02-	T1			T1	1			$ 730,000	$ 260,000	$ 280,000	$ 160,000	$ 180,000			2022: T1-1, T1-3. 2022-26: T1-6, T1-4. 2027-31: T1-5. 2031: T1-2
FCA-	CV02-	T2			T2	1			$ 240,000	$ -	$ 280,000	$ -	$ -			2022-26: T2-1, T2-2
FCA-	CV02-	A			A	1			$ 240,000	$ -	$ -	$ -	$ 370,000			2031: A-8, A-17
FCA-	CV02-	B			B	1			$ 240,000	$ 130,000	$ 140,000	$ -	$ -			2022: B-4. 2022-26: B-14.
FCA-	CV02-	C			C	1			$ 240,000	$ 260,000	$ -	$ -	$ -			2022: C-18, and C-12. C-12 is currently out of service and the upgrades can be made at such time as the building is back in service.
FCA-	CV02-	CX			CX	1			$ 120,000	$ -	$ 140,000	$ -	$ -			2022-26: C28
FCA-	CV02-	D			D	1			$ 120,000	$ 130,000	$ -	$ -	$ -			2022: D-13
FCA-	CV02-	E			E	1			$ 730,000	$ 260,000	$ 280,000	$ -	$ 370,000			2022: E-1, E3. 2022-26: E-5, E-6. 2031: E-2, E-4.
FCA-	CV02-	T1G			T1G	1			$ 240,000	$ -	$ -	$ -	$ 370,000			2031: T1G-3, T1G-4
FCA-	CV02-	T2G			T2G	1			$ 490,000	$ 130,000	$ 420,000	$ -	$ -			2022: T2G-4. 2022-26: T2G-

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
																3, T2G-2, T2G-1.
FCA -	CV03 -	G	Overhaul all escalators over 15 years old (qty. 9).		T1, T2	1	$ 900,000	$ 1,560,000		$ -	$ -	$ -	$ -	25 -30	25	Examine all parts of the escalator, and repair/replace items as needed. RSMeans: D1020110009 0
FCA -	CV03 -	T1			T1	1			$ 1,220,000	$ 550,000	$ 600,000	$ 230,000	$ -			2022: T1-8, T1-11, T1-12. 2022-26: T1-15, T1-16, T1-7. 2027-2031: T1-10
FCA -	CV03 -	T2			T2	1			$ 350,000	$ 370,000	$ -	$ -	$ -			2022: T2-3, T2-4
FCA -	CV04 -	G	Overhaul all moving walkways over 15 years old (qty. 18).		CX, E	1	$ 9,000,000	$ 15,650,000		$ -	$ -	$ -	$ -	38	25	Examine all parts of the moving walkway, and repair/replace items as needed. RSMeans: 143210100400 .
FCA -	CV04 -	C X			CX	1			$ 5,220,000	$ -	$ -	$ 6,810,000	$ -			2027-31: C-1, C-2, C-3, C-4, C-5, C-6. C-1 trhu C-6 are currently out of service and the upgrades can be made at such time as the building is back in service.

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	CV04 -	D			D	1			$ 8,690,000	$ -	$ -	$ 11,340,000	$ -			2027-31: D-1, D-2, D-3, D-4, D-5, D-6, D-7, D-8, D-9, D-10. D-1 thru D-10 are currently out of service and the upgrades can be made at such time as the building is back in service.
FCA -	CV04 -	E			E	1			$ 1,740,000	$1,840,000	$ -	$ -	$ -			2022: D-11, D-12.
FCA -	EL01-	T1	Install additional indirect uplighting in the T1 ticketing area		T1	2	$ 20,000	$ 30,000		$ -	$ 40,000	$ -	$ -			Electrical
FCA -	EL02-	G	Replace substations over 30 years old in 5-10 years	STL-ES12	A, B, C, CX, D	2	$ 4,600,000	$ 8,130,000		$ -	$ -	$ -	$ -		30	Electrical-Power
FCA -	EL02-	A			Conc. A	2			$ 1,070,000	$ -	$ 1,220,000	$ -	$ -		30	
FCA -	EL02-	B			Conc. B	2			$ 570,000	$ -	$ 650,000	$ -	$ -		30	
FCA -	EL02-	C			Conc. C	2			$ 730,000	$ -	$ 840,000	$ -	$ -		30	
FCA -	EL02-	CX			Conc. CX	2			$ 1,150,000	$ -	$ 1,310,000	$ -	$ -		30	
FCA -	EL02-	D			Conc. D	2			$ 1,430,000	$ -	$ 1,640,000	$ -	$ -		30	
FCA -	EL02-	T1			T1	2			$ 3,180,000	$ -	$ 3,640,000	$ -	$ -		30	
FCA -	EL03-	G	Replace fusible switch		A, B, C, CX, T1	2	$ 1,260,000	$ 2,190,000		$ -	$ -	$ -	$ -		30	Electrical-Power

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
			distribution panels over 30 years old in 5-10 years													
FCA-	EL03-	A			Conc. A	2			$ 230,000	$ -	$ -	$ 290,000	$ -		30	
FCA-	EL03-	B			Conc. B	2			$ 190,000	$ -	$ -	$ 250,000	$ -		30	
FCA-	EL03-	C			Conc. C	2			$ 280,000	$ -	$ -	$ 360,000	$ -		30	
FCA-	EL03-	CX			Conc. CX	2			$ 560,000	$ -	$ -	$ 730,000	$ -		30	
FCA-	EL03-	T1			T1	2			$ 940,000	$ -	$ -	$ 1,230,000	$ -		30	
FCA-	EL04-	G	Replace branch circuit breaker panels over 30 years old in 1-5 years		A, B, C, CX, D, T1	2	$ 1,500,000	$ 2,610,000		$ -	$ -	$ -	$ -		30	Electrical-Power
FCA-	EL04-	A			Conc. A	2			$ 240,000	$ -	$ 280,000	$ -	$ -		30	
FCA-	EL04-	B			Conc. B	2			$ 160,000	$ -	$ 180,000	$ -	$ -		30	
FCA-	EL04-	C			Conc. C	2			$ 190,000	$ -	$ 220,000	$ -	$ -		30	
FCA-	EL04-	CX			Conc. CX	2			$ 260,000	$ -	$ 300,000	$ -	$ -		30	
FCA-	EL04-	D			Conc. D	2			$ 540,000	$ -	$ 620,000	$ -	$ -		30	
FCA-	EL04-	T1			T1	2			$ 1,220,000	$ -	$ 1,390,000	$ -	$ -		30	
FCA-	EL05-	G	Replace existing interior lighting on the apron level. (Tenant)		A, B	2	$ 840,000	$ 1,440,000		$ -	$ -	$ -	$ -		20	Electrical-Lighting
FCA-	EL05-	A			Conc. A	2			$ 410,000	$ -	$ 470,000	$ -	$ -		20	

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA-	EL05-	B			Conc. B	2			$ 190,000	$ -	$ 210,000	$ -	$ -		20	
FCA-	EL05-	CX			Conc. CX	2			$ 410,000	$ -	$ 470,000	$ -	$ -		20	
FCA-	EL05-	T1			T1	2			$ 430,000	$ -	$ 490,000	$ -	$ -		20	
FCA-	EL06-	A	Replace waiting area lighting on the concourse level (Tenant)		A		$ 135,000	$ 230,000		$ -	$ 260,000	$ -	$ -		20	Electrical-Lighting
FCA-	EL07-	B	Replace emergency generator #50 (CIP in progress)	STL-ES1	B	1	$ 60,000	$ 100,000		$ 110,000	$ -	$ -	$ -		25	Electrical-Power
FCA-	EL08-	B	Replace general lighting on the concourse level except the area with recessed volumetric 2’ x 2’ fixtures in grid ceiling		B	3	$ 130,000	$ 220,000		$ -	$ 250,000	$ -	$ -		20	Electrical-Lighting
FCA-	EL09-	CX	Replace emergency generator #80 (CIP in progress)	STL-ES1	CX	1	$ 105,000	$ 180,000		$ 190,000	$ -	$ -	$ -		25	Electrical-Power
FCA-	EL10-	G	Replace existing interior and egress lighting on the apron level		C, D	2	$ 650,000	$ 1,130,000		$ -	$ -	$ -	$ -		20	Electrical-Lighting
FCA-	EL10-	C			Conc. C	2			$ 560,000	$ -	$ 640,000	$ -	$ -		20	
FCA-	EL10-	D			Conc. D	2			$ 570,000	$ -	$ 660,000	$ -	$ -		20	

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA-	EL11-	CX	Replace general lighting on the concourse extension section		CX	2	$ 320,000	$ 550,000		$ -	$ 630,000	$ -	$ -		20	Electrical-Lighting
FCA-	EL12-	D	Replace all lighting on the concourse level of Concourse D		D	2	$ 530,000	$ 910,000		$ -	$ 1,040,000	$ -	$ -		20	Electrical-Lighting (See STLAA Comment) Cost to replace whole fixtures
FCA-	EL13-	G	Replace fluorescent fixtures on apron level with LED Fixtures		T2, E	2	$ 575,000	$ 980,000		$ -	$ -	$ -	$ -		20	Electrical-Lighting (See STLAA Comment) Cost to replace whole fixtures
FCA-	EL13-	T2			T2	2			$ 300,000	$ -	$ -	$ 390,000	$ -		20	
FCA-	EL13-	E			E	2			$ 680,000	$ -	$ -	$ 890,000	$ -		20	
FCA-	EL14-	CBP	Replace all cove lighting in Terminal 2 CBP/FIS area		CBP/FIS	2	$ 40,000	$ 70,000		$ -	$ 80,000	$ -	$ -		20	Electrical-Lighting
FCA-	EL15-	T2G	Replace exit lights		T2G	2	$ 30,000	$ 50,000		$ -	$ 60,000	$ -	$ -		20	Electrical-Lighting
FCA-	EL16-	CCW	Replace low voltage panelboards within 5-10 years		CCW	2	$ 100,000	$ 170,000		$ -	$ -	$ 150,000	$ 90,000		30	Electrical-Power
FCA-	EL17-	CCW	Replace Motor control centers		CCW	2	$ 80,000	$ 140,000		$ -	$ -	$ 180,000	$ -	43	30	Electrical-Power
FCA-	EL18-	CCW	Replace fluorescent fixtures with LED Fixtures		CCW	2	$ 70,000	$ 120,000		$ -	$ 130,000	$ -	$ -		30	Electrical-Lighting

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
			in CC admin offices													
FCA -	EL19-	C CE	Replace panelboards over 25 years old		CCE	2	$ 160,000	$ 270,000		$ -	$ -	$ 160,000	$ 230,000		30	Electrical-Power
FCA -	EL20-	C CE	Upgrade four individual low voltage MCC's or outright replace them		CCE	2	$ 230,000	$ 390,000		$ -	$ -	$ 340,000	$ 200,000	38	20	Electrical
FCA -	EL21-		Replace End of Life Emergency Generators	STL-ES1		2	$ 5,000,000	$ 8,690,000		$ -	$ 4,970,000	$ 5,670,000	$ -		25	If EB17 is approved, can scope be reduced?
FCA -	E22-		East (International) Substation Upgrades	STL-ES2		2	$ 1,500,000	$ 2,650,000		$ -	$ -	$ 3,460,000	$ -		30	
FCA -	EL23-		West (Lambert) Substation Upgrades	STL-ES3		2	$ 3,000,000	$ 5,300,000		$ -	$ -	$ 6,920,000	$ -		30	
FCA -	EL24-		Split 4KV Ductbanks from 480V at T1	STL-ES4		2	$ 4,000,000	$ 6,950,000		$ 7,380,000	$ -	$ -	$ -			STL Est: $5,000,000
FCA -	EL25-		Update Electrical One-Lines and Backgrounds Every 5 years	STL-ES11		3	$ 600,000	$ 660,000		$ 350,000	$ -	$ 430,000	$ -			
FCA -	EL26-		Replace End of Life UPS Systems	STL-ES13		2	$ 1,000,000	$ 1,460,000		$ -	$ 830,000	$ 950,000	$ -		15	
FCA -	EQ01 -	G	Replace T2 Trash Compactors Renovate T1 & Concourse Compactors	STL-BM1	T1, T2, A, C, E	2	$ 200,000	$ 340,000		$ -	$ -	$ -	$ -		20	$25K/Compactor + $20K inst _ New (2) $15K/ Compactor + 8K_ Reno. (7)

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA-	EQ01-	T1			T1	2			$ 150,000	$ 80,000	$ 90,000	$ -	$ -		20	
FCA-	EQ01-	T2			T2	2			$ 50,000	$ 50,000	$ -	$ -	$ -		20	
FCA-	EQ01-	A			A	2			$ 26,000	$ -	$ 29,000	$ -	$ -		20	
FCA-	EQ01-	C			C	2			$ 34,000	$ -	$ 40,000	$ -	$ -		20	
FCA-	EQ01-	E			E	2			$ 80,000	$ 80,000	$ -	$ -	$ -		20	
FCA-	FP01-	G	Continue replacement of fire suppression piping as pipe failures occur, and budget for a large-scale replacement of fire suppression piping at a future date		T1, Conc. A-D	2	$ 4,545,000	$ 8,030,000		$ -	$ -	$ -	$ -			Fire Protection - Known interior corrosion and intermittent pipe leakage
FCA-	FP01-	T1			T1	2			$ 1,150,000	$ -	$ 130,000	$ 680,000	$ 780,000			
FCA-	FP01-	A			Conc. A	2			$ 730,000	$ -	$ 80,000	$ 430,000	$ 500,000			
FCA-	FP01-	B			Conc. B	2			$ 420,000	$ -	$ 50,000	$ 250,000	$ 290,000			
FCA-	FP01-	C			Conc. C	2			$ 850,000	$ -	$ 100,000	$ 500,000	$ 580,000			
FCA-	FP01-	CX			Conc. CX	2			$ 720,000	$ -	$ -	$ 470,000	$ 550,000			
FCA-	FP01-	D			Conc. D	2			$ 2,420,000	$ -	$ 280,000	$ 1,420,000	$ 1,650,000			
FCA-	FP01-	E			Conc. E	2			$ 1,190,000	$ -	$ -	$ 780,000	$ 900,000			
FCA-	FP01-	T2			T1	2			$ 360,000	$ -	$ -	$ 240,000	$ 270,000			
FCA-	FP01-	CBP			CBP	2			$ 180,000	$ -	$ 20,000	$ 100,000	$ 120,000			

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	HE01 -	G	Replace membrane roof (total tear off) and install overflow system on the roof		A, B, C, CX	2	$ 942,000	$ 1,610,000		$ -	$ -	$ -	$ -			Super Structure and Exterior Enclosures
FCA -	HE01 -	A			Conc. A	2			$ 550,000	$ -	$ -	$ 720,000	$ -			
FCA -	HE01 -	B			Conc. B	2			$ 450,000	$ -	$ -	$ 580,000	$ -			
FCA -	HE01 -	C			Conc. C	2			$ 470,000	$ -	$ -	$ -	$ 710,000			
FCA -	HE01 -	CX			Conc. CX	2			$ 150,000	$ -	$ -	$ -	$ 220,000			
FCA -	HE02 -	G	Investigate the leaking on concourse, perform a roof core test to examine the extent of water transmission into the roof system		B, C	1	$ 10,000	$ 20,000		$ -	$ -	$ -	$ -			Super Structure and Exterior Enclosures
FCA -	HE02 -	B			B	1			$ 8,000	$ 9,000	$ -	$ -	$ -			
FCA -	HE02 -	C			C	1			$ 8,000	$ 9,000	$ -	$ -	$ -			
FCA -	HE03 -	D	Replace roof walkway pads with roof membrane adhered pads/repair roof in specific area/test roof at area west of D and E concourse (at		D	1	$ 75,000	$ 130,000		$ 140,000	$ -	$ -	$ -			Exterior Enclosures

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
			the MetroLink station)													
FCA-	HE04-	G	Repair/Replace Skylight		D, E	1	$ 90,000	$150,000		$ -	$ -	$ -	$ -			Exterior Enclosures
FCA-	HE04-	D			Conc. D	1			$ 70,000	$ 27,000	$ -	$ 22,000	$ 40,000			
FCA-	HE04-	E			Conc. E	1			$ 80,000	$ 18,000	$ -	$ 33,000	$ 60,000			
FCA-	HE05-	G	Replace curtainwall window system replacement at end of life		T1, T2, A, B, C, CX, D	2	$38,525,000	$ 65,860,000		$ -	$ -	$ -	$ -			Super Structure and Exterior Enclosures
FCA-	HE05-	A			Conc. A	2			$ 6,030,000	$ -	$ -	$ -	$ 9,120,000			
FCA-	HE05-	B			Conc. B	2			$ 4,700,000	$ -	$ -	$ -	$ 7,110,000			
FCA-	HE05-	C			Conc. C	2			$11,110,000	$ -	$ -	$ -	$ 16,810,000			
FCA-	HE05-	CX			Conc. CX	2			$ 4,700,000	$ -	$ -	$ -	$ 7,110,000			
FCA-	HE05-	D			Conc. D	2			$13,680,000	$ -	$ -	$ -	$ 20,690,000			
FCA-	HE05-	T1			Conc. T1	2			$25,640,000	$ -	$ -	$ -	$ 38,800,000			
FCA-	HV01-	G	Institute a formal Asset Management System (Also see IT07)		General	2	$ 290,000	$ 460,000		$ -	$ 530,000	$ -	$ -		-	HVAC & Plumbing
FCA-	HV02-	G	Institute a formal Maintenance Management System		General	2	$ 120,000	$ 170,000		$ -	$ 200,000	$ -	$ -		-	HVAC

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	HV03 -	G	Perform zone pressure testing to identify air balancing and building pressurization problems			2	$ 36,000	$ 60,000		$ -	$ -	$ -	$ -		-	
FCA -	HV03 -	T1			T1	2			$ 20,000	$ -	$ 23,000	$ -	$ -			HVAC
FCA -	HV03 -	T2			T2	2			$ 7,000	$ -	$ 8,000	$ -	$ -			HVAC
FCA -	HV03 -	A			Conc. A	2			$ 4,000	$ -	$ 5,000	$ -	$ -			HVAC
FCA -	HV03 -	B			Conc. B	2			$ 3,000	$ -	$ 3,000	$ -	$ -			HVAC
FCA -	HV03 -	C			Conc. C	2			$ 6,000	$ -	$ 7,000	$ -	$ -			HVAC
FCA -	HV03 -	C X			Conc. CX	2			$ 4,000	$ -	$ 5,000	$ -	$ -			HVAC
FCA -	HV03 -	D			Conc. D	2			$ 6,000	$ -	$ 7,000	$ -	$ -			HVAC
FCA -	HV03 -	E			Conc. E	2			$ 4,000	$ -	$ 5,000	$ -	$ -			HVAC
FCA -	HV03 -	C BP			CBP/FIS	2			$ 3,000	$ -	$ 3,000	$ -	$ -			
FCA -	HV04 -	G	Repair piping and replace insulation at the connections to heating and cooling coils on indoor air handlers and heating and ventilating units throughout the airport		Total	2	$ 330,000	$ 540,000		$ -	$ -	$ -	$ -		25	HVAC

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA-	HV04-	T1			T1	2			$ 200,000	$ 70,000	$ 150,000	$ -	$ -	12-14	25	HVAC
FCA-	HV04-	T2			T2	2			$ -	$ -	$ -	$ -	$ -	20	25	HVAC
FCA-	HV04-	A			Conc. A	2			$ 40,000	$ 9,000	$ 40,000	$ -	$ -	12	25	HVAC
FCA-	HV04-	B			Conc. B	2			$ 15,000	$ -	$ 17,000	$ -	$ -		25	HVAC
FCA-	HV04-	C			Conc. C	2			$ 35,000	$ 17,000	$ 21,000	$ -	$ -	38	25	HVAC
FCA-	HV04-	CX			Conc. CX	2			$ 50,000	$ -	$ 57,000	$ -	$ -	36	25	HVAC
FCA-	HV04-	D			Conc. D	2			$ 150,000	$ 17,000	$ 147,000	$ -	$ -	22	25	HVAC
FCA-	HV04-	E			Conc. E	2			$ 50,000	$ -	$ 55,000	$ -	$ -		25	HVAC
FCA-	HV04-	CCW			CCW	2			$ 5,000	$ -	$ 6,000	$ -	$ -		25	HVAC
FCA-	HV04-	CCE			CCE	2			$ 7,000	$ -	$ 8,000	$ -	$ -	36	25	HVAC
FCA-	HV05-	G	Install redundant cooling systems in IT and communication rooms		T1, C, D Total	1	$ 496,300	$ 850,000		$ -	$ -	$ -	$ -		20	HVAC
FCA-	HV05-	T1			T1	1			$ 310,000	$ -	$ 350,000	$ -	$ -			HVAC
FCA-	HV05-	C			Conc. C	1			$ 80,000	$ -	$ 90,000	$ -	$ -			HVAC
FCA-	HV05-	D			Conc. D	1			$ 310,000	$ -	$ 350,000	$ -	$ -			HVAC
FCA-	HV05-	T2			T2	1			$ 150,000	$ -	$ 180,000	$ -	$ -			HVAC
FCA-	HV06-	G	Institute a program for routine replacement of door air		T1, T2, CX, D, E Total	2	$ 410,000	$ 700,000		$ -	$ -	$ -	$ -	0-22	20	HVAC

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							Excluding escalation			**Distributed forecast values include escalation**						
			curtains, particularly at public entrances - 25% every 5 years													
FCA -	HV06 -	T1			T1	2			$ 310,000	$ 80,000	$ 90,000	$ 100,000	$ 120,000		20	HVAC
FCA -	HV06 -	T2			T2	2			$ 170,000	$ 50,000	$ 50,000	$ 60,000	$ 60,000		20	HVAC
FCA -	HV06 -	CX			Conc. CX	2			$ 50,000	$ 13,000	$ 16,000	$ 16,000	$ 21,000		20	HVAC
FCA -	HV06 -	D			Conc. D	2			$ 50,000	$ 13,000	$ 16,000	$ 16,000	$ 21,000		20	HVAC
FCA -	HV06 -	E			Conc. E	2			$ 120,000	$ 30,000	$ 40,000	$ 40,000	$ 50,000		20	HVAC
FCA -	HV07 -	G	Institute a program to clean bird screens on air intake and exhaust openings on the apron level		All Areas Total	1	$ 18,000	$ 21,000		$ -	$ -	$ -	$ -		-	HVAC
FCA -	HV07 -	T1			T1	1			$ 8,000	$ -	$ 9,000	$ -	$ -		-	HVAC
FCA -	HV07 -	T2			T2	1			$ 3,000	$ -	$ 3,000	$ -	$ -		-	HVAC
FCA -	HV07 -	A			Conc. A	1			$ 2,000	$ -	$ 2,000	$ -	$ -		-	HVAC
FCA -	HV07 -	B			Conc. B	1			$ 1,000	$ -	$ 1,000	$ -	$ -		-	HVAC
FCA -	HV07 -	C			Conc. C	1			$ 2,000	$ -	$ 2,000	$ -	$ -		-	HVAC
FCA -	HV07 -	CX			Conc. CX	1			$ 2,000	$ -	$ 2,000	$ -	$ -		-	HVAC
FCA -	HV07 -	D			Conc. D	1			$ 2,000	$ -	$ 3,000	$ -	$ -		-	HVAC
FCA -	HV07 -	E			Conc. E	1			$ 2,000	$ -	$ 2,000	$ -	$ -		-	HVAC

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	HV07 -	CBP			CBP/FIS	1			$ 1,000	$ -	$ 1,000	$ -	$ -		-	HVAC
FCA -	HV08 -	G	Replace RTU as they reach end of life including RTU148 serving the Properties Department, and all RTU on C Extension		T1, A, B, C, CX,	1/2	$ 8,390,000	$ 14,590,000		$ -	$ -	$ -	$ -	12	20	HVAC
FCA -	HV08 -	T1			T1	1			$ 430,000	$ 460,000	$ -	$ -	$ -	24	20	
FCA -	HV08 -	A			A	2			$3,130,000	$ -	$ -	$ 4,080,000	$ -	12	20	
FCA -	HV08 -	B			B	2			$2,190,000	$ -	$ 320,000	$ 2,500,000	$ -	12	20	
FCA -	HV08 -	C			C	2			$3,130,000	$ -	$ -	$ 4,080,000	$ -	12	20	
FCA -	HV08 -	CX			CX	2			$5,390,000	$ -	$ 6,160,000	$ -	$ -	38	20	
FCA -	HV08 -	D			D	2			$ 310,000	$ -	$ -	$ 410,000	$ -	36	20	
FCA -	HV09 -	E	Evaluate the actual discharge static pressure and the rated operating pressure of AHU116		E	1	$ 20,000	$ 20,000		$ 20,000	$ -	$ -	$ -		-	HVAC
FCA -	HV10 -	T1	Install a dedicated rooftop air conditioner to condition only the Lindbergh Conference Room		T1	2	$ 110,000	$ 190,000		$ -	$ 220,000	$ -	$ -		15	HVAC

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA-	HV12-	G	Replace AHU as they reach end of life. Replace AHU on CX and D when concourse is reopened.		T1, T2, A, C, CX, E, CBP	1/2	$10,920,000	$ 18,650,000		$ -	$ -	$ -	$ -		25	HVAC
FCA-	HV12-	T1			T1	2			$ 1,910,000	$ -	$ 990,000	$ 1,360,000	$ -	12-14	25	
FCA-	HV12-	A			A	2			$3,650,000	$ -	$ -	$ 4,760,000	$ -	20	25	
FCA-	HV12-	C			C	2			$ 900,000	$ -	$ 390,000	$ -	$ 850,000	12	25	
FCA-	HV12-	CX			CX	3			$4,430,000	$ -	$ 3,670,000	$ -	$ 1,840,000	38	25	
FCA-	HV12-	D			D	3			$2,780,000	$ -	$ 3,180,000	$ -	$ -	36	25	
FCA-	HV12-	E			E	2			$4,090,000	$ -	$ 3,670,000	$ -	$ 1,320,000	22	25	
FCA-	HV12-	CBP			CBP	3			$1,220,000	$ -	$ 1,390,000	$ -	$ -	36	25	
FCA-	HV13-	CCW	Replace Domestic hot water heat exchangers and circulating pumps		CCW	1	$ 110,000	$ 190,000		$ -	$ 210,000	$ -	$ -	30	25	Plumbing
FCA-	HV14-	CCW	Replace the water softener system		CCW	1	$ 80,000	$ 140,000		$ -	$ 160,000	$ -	$ -	43	30	Plumbing
FCA-	HV15-	CCW	Replace condenser water pumps		CCW	1	$ 280,000	$ 480,000		$ -	$ 550,000	$ -	$ -	36	20	Plumbing
FCA-	HV17-	CCW	Assess the capacity of cooling towers		CCW	2	$ 24,000	$ 40,000		$ -	$ 50,000	$ -	$ -		35	HVAC
FCA-	HV18-	CCW	Perform a pressure drop study of the		CCW	2	$ 42,000	$ 50,000		$ -	$ 60,000	$ -	$ -		-	Engineering analysis only

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							Excluding escalation			**Distributed forecast values include escalation**						
			chilled water system.													
FCA -	HV20 -	C C W	Replace one water tube boiler and controls, in CCW		CCW	2	$ 1,300,000	$ 2,300,000		$ -	$ 2,630,000	$ -	$ -	30	30	
FCA -	HV21 -	C C W	Replace 1500T Chillers #1 & #3 at CCW	STL-CC2	CCW	2	$ 2,680,000	$ 4,740,000		$ -	$ 2,710,000	$ 3,090,000	$ -	18	23	
FCA -	HV24 -	C CE	Replace three water tube boilers, analog boiler controls, and condensate return tanks in CCE	STL-CC1	CCE	1	$ 4,200,000	$ 7,420,000		$ -	$ 8,480,000	$ -	$ -	36	30	HVAC
FCA -	HV25 -	C CE	Replace 1300T Chillers #1 in CCE	STL-CC2	CCE	1	$ 1,050,000	$ 1,860,000		$ -	$ 2,120,000	$ -	$ -	22 & 35	23	
FCA -	HV26 -	C CE	Replace Fuel Oil Tanks at CCW and CCE	STL-CC5	CCW, CCE	1	$ 1,540,000	$ 2,720,000		$ -	$ -	$ -	$ -		30	
FCA -	HV26 -	C C W			CCW	1			$1,100,000	$ -	$ -	$ 1,440,000	$ -	43	30	(2) 20,000 gallon UST, Cost conf. by Neumeyer
FCA -	HV26 -	C CE			CCE	1			$1,620,000	$ -	$ -	$ 2,110,000	$ -	36	30	(2) 30,000 gallon UST, Cost conf. by Neumeyer
FCA -	IC01-	B	Ceiling replacement-B concourse office spaces/apron level		B	2	$ 85,260	$ 150,000		$ -	$ 170,000	$ -	$ -			Architecture
FCA -	IC02-	G	Water damaged		C, CX, D, E	2	$ 33,000	$ 60,000		$ -	$ -	$ -	$ -			Architecture

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							Excluding escalation			**Distributed forecast values include escalation**						
			area/ceiling damage/carpet repair/partition refinishing													
FCA -	IC02-	C	Ceiling repair & cleaning		C	2			$ 13,000	$ 14,000	$ -	$ -	$ -			
FCA -	IC02-	CX	Floor/carpet stains and the falling ceiling		CX	1			$ 18,000	$ 20,000	$ -	$ -	$ -			Architecture
FCA -	IC02-	D	Carpet replacement		D	2			$ 21,000	$ 20,000	$ -	$ -	$ -			
FCA -	IC02-	E	Partition repair and repaint		E	2			$ 6,000	$ 7,000	$ -	$ -	$ -			
FCA -	IC03-	G	Wall and floor repairs on apron level		C, D, E	2	$ 75,000	$ 130,000		$ -	$ -	$ -	$ -			Architecture
FCA -	IC03-	C	Initial cost then ongoing repairs		Conc. C	2			$ 40,000	$ 19,000	$ 10,000	$ 11,000	$ 13,000			
FCA -	IC03-	D	Initial cost then ongoing repairs		Conc. D	2			$ 40,000	$ 19,000	$ 10,000	$ 11,000	$ 13,000			
FCA -	IC03-	E	Initial cost then ongoing repairs		Conc. E	2			$ 40,000	$ 19,000	$ 10,000	$ 11,000	$ 13,000			
FCA -	IC04-	CX	Gut demo apron level unused areas		CX	1	$ 25,000	$ 40,000		$ 50,000	$ -	$ -	$ -			Architecture
FCA -	IC05-	CX	Rehab apron level abandoned offices/new acoustical ceilings/ drywall partitions/carpet/electrical/hvac		CX	1	$ 292,500	$ 500,000		$ -	$ 570,000	$ -	$ -			Architecture
FCA -	IC06-	G	Concourse ceiling		C, D, E	2	$ 200,000	$ 350,000		$ -	$ -	$ -	$ -			Architecture

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							Excluding escalation			**Distributed forecast values include escalation**						
			repair/replace ment													
FCA -	IC06-	A			Conc. C	2			$ 90,000	$ 50,000	$ -	$ -	$ 70,000			
FCA -	IC06-	C			Conc. D	2			$ 110,000	$ 60,000	$ -	$ -	$ 80,000			
FCA -	IC06-	D			Conc. E	2			$ 160,000	$ 80,000	$ -	$ -	$ 120,000			
FCA -	PL01-	G	Identify locations where sewer back-ups have occurred in underground piping and perform video inspection of those pipe segments.		All Areas	1	$ 15,000	$ 20,000		$ 25,000	$ -	$ -	$ -			4000 LF @ $2.75/Ft + 20% AF +10% Cont.
FCA -	PL02-	A	Install a redundant domestic water supply to Conc. A		A	2	$ 500,000	$ 880,000		$ -	$ 1,010,000	$ -	$ -			Plumbing
FCA -	PL03-	G	Replace plumbing fixtures and piping in any occupied areas on the apron level of C and C Extension. Remove abandoned fixtures and piping in unused areas on the apron level of C and C Extension.		C, CX	2	$ 570,000	$ 990,000		$ -	$ -	$ -	$ -		30	Plumbing

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	PL03-	C			Conc. C	2			$ 780,000	$ -	$ 500,000	$ 450,000	$ -		30	
FCA -	PL03-	CX			Conc. CX	3			$ 210,000	$ -	$ -	$ 270,000	$ -		30	
FCA -	PL04-	G	Upgrade piping to restroom groups in use on the concourse level of C and C Extension. Shut off and drain piping to unused toilet groups in C Extension.		C, CX	2	$ 500,000	$ 850,000		$ -	$ -	$ -	$ -			Plumbing
FCA -	PL04-	C			C	2			$ 510,000	$ -	$ -	$ -	$ 780,000			
FCA -	PL04-	CX			CX	3			$ 340,000	$ -	$ -	$ 450,000	$ -			
FCA -	PL05-	G	Upgrade piping and fixtures in restroom groups to be put into service on the concourse level of Concourses D and CX.		CX, D		$ 870,000	$ 1,510,000		$ -	$ -	$ -	$ -			Plumbing
FCA -	PL05-	CX			CX	3			$ 920,000	$ -	$ -	$ 1,200,000	$ -			
FCA -	PL05-	D			D	3			$ 590,000	$ -	$ -	$ 770,000	$ -			
FCA -	PL06-	G	Upgrade piping and fixtures in restroom groups as		T1, T2, A, B, C, D, E, CBP	2	$ 4,650,000	$ 8,080,000		$ -	$ -	$ -	$ -		30	Estimated based on Public restrooms.

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							Excluding escalation			**Distributed forecast values include escalation**						
			fixtures reach the end of their service life.													
FCA -	PL06-	T1			T1	2			$2,350,000	$ -	$ -	$ -	$ 3,550,000		30	
FCA -	PL06-	T2			T2	2			$ 520,000	$ -	$ -	$ 680,000	$ -		30	
FCA -	PL06-	A			A	2			$ 870,000	$ -	$ -	$ -	$ 1,320,000		30	
FCA -	PL06-	B			B	2			$ 520,000	$ -	$ -	$ 680,000	$ -		30	
FCA -	PL06-	C			C	2			$1,220,000	$ -	$ -	$ -	$ 1,840,000		30	
FCA -	PL06-	E			E	2			$2,170,000	$ -	$ -	$ 2,840,000	$ -		30	
FCA -	PL06-	C BP			CBP	3			$ 430,000	$ -	$ -	$ 570,000	$ -		30	
FCA -	PL07-	T1G	Replace failed and damaged storm drain piping and install new bollards to protect piping adjacent to drive lanes. Clean and paint all exposed piping to inhibit future corrosion		T1G	2	$ 550,000	$ 780,000		$ -	$ 890,000	$ -	$ -		-	Plumbing
FCA -	PL08-	T1G	Excavate debris in open drainage channels on the south side of the garage. Repair broken slabs and piping, and		T1G	2	$ 350,000	$ 600,000		$ -	$ 680,000	$ -	$ -		-	

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							Excluding escalation			**Distributed forecast values include escalation**						
			install fluid applied liner to seal the channels													
FCA -	PL09-	T2 G	Install physical barriers to vehicle traffic to protect vertical piping and piping hung too low to allow vehicle clearance		T2G	3	$ 20,000	$ 30,000		$ -	$ 34,000	$ -	$ -		-	
FCA -	RB01 -	T1	Reconstruct Terminal 1 Arrivals Drive and Departures Drive Roads		T1 - Roads & Bridges	2	$ 3,800,000	$ 6,500,000		$ -	$ 7,420,000	$ -	$ -	35	25	Terminal 1 Roads and Bridges - Reconstruction (Replacement) for the entire component is assumed to take place at the same time. Replacement costs are shown in FY 2022 to 2026 Column since estimated remaining useful life for this component is less than 5 years. Estimated Asset Age is for the oldest portion of the asset.

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)		**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**							
FCA -	RB02 -	T1	Replace Terminal 1 Arrivals Drive and Departures Drive Bridges		T1 - Roads & Bridges	1	$48,200,000	$ 82,400,000		$ -	$94,150,000	$ -	$ -	50	50		
FCA -	RB03 -	T2	Reconstruct Terminal 2 Arrivals Drive and Departures Drive Roads		T2 - Roads & Bridge	2	$1,800,000	$ 3,080,000		$ -	$ 780,000	$ -	$ 3,620,000	22	25		Terminal 2 Roads and Bridge - Reconstruction (Replacement) for the entire component is assumed to take place at the same time. Replacement costs are shown in Beyond FY2031 Column since estimated remaining useful life for this component is greater than 10 years. Includes cost allowance for rehabilitation in FY2022-FY2026 with the thought that there may be slightly more than routine maintenance within the intervening years prior to

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							Excluding escalation			**Distributed forecast values include escalation**						
																full replacement.
FCA -	RB04 -	T2	Replace Terminal 2 Departures Drive Bridge		T2 - Roads & Bridge	3	$11,200,000	$ 19,150,000		$ -	$ 980,000	$ -	$ 27,680,000	22	50	
FCA -	RB05 -	LIB	LIB Reconstruction		LIB and LIB Bridges	2	$26,000,000	$44,450,000		$ -	$ -	$58,010,000	$ -	35	25	LIB and LIB Bridges - Reconstruction (Replacement) for the entire component is assumed to take place at the same time. Replacement costs are shown in FY 2027 to 2031 Column since estimated remaining useful life for this component is greater than 5 years. Estimated Asset Age is for the oldest portion ot the asset.
FCA -	RB06 -	LIB	Replace LIB Bridges		LIB and LIB Bridges	2	$ 5,200,000	$ 8,890,000		$ -	$ -	$11,600,000	$ -	50	50	
FCA -	SE01	G	Remove spalled concrete and corroded rebar from terminal		T1, T2, A, B, C, CX, E	2	$ 2,376,000	$ 3,990,000		$ -	$ -	$ -	$ -		50	Structural-Subgrade Enclosures and Slabs on Grade at

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							Excluding escalation			**Distributed forecast values include escalation**						
			utility tunnel. Patch in new steel reinforcement and concrete.													Tunnels Piping relocation is NOT included in price.
FCA-	SE01-	T1			T1	2			$ 1,060,000	$ 640,000	$ 120,000	$ 200,000	$ 300,000	64 / 55	50	Approximately 6000 sqft
FCA-	SE01-	A			A	2			$ 650,000	$ 210,000	$ 120,000	$ 200,000	$ 300,000	60	50	Approximately 2000 sqft
FCA-	SE01-	B			B	2			$ 550,000	$ 110,000	$ 120,000	$ 200,000	$ 300,000	60	50	Approximately 1000 sqft
FCA-	SE01-	C			C	2			$ 710,000	$ 270,000	$ 120,000	$ 200,000	$ 300,000	60	50	Approximately 2500 sqft
FCA-	SE01-	D			CX	2			$ 550,000	$ 110,000	$ 120,000	$ 200,000	$ 300,000	35	50	Approximately 1000 sqft
FCA-	SE01-	T2/E			T2/E	2			$ 460,000	$ 11,000	$ 120,000	$ 200,000	$ 300,000	22	50	Approximately 100 sqft
FCA-	SE02-	T1	Perform an in-depth evaluation and analysis into the cause and source of moisture into the T1 Tunnel.		T1	1	$ 20,000	$ 20,000		$ 20,000	$ -	$ -	$ -	64 / 55	50	Structural-Subgrade Enclosures and Slabs on Grade
FCA-	SE03-	D	Brace the leaning foundation walls at the three subgrade mechanical room locations		D	1	$ 60,000	$ 100,000		$ 110,000	$ -	$ -	$ -	38	50	Structural-Foundations
FCA-	SG01-	G	Perform epoxy grout injection into cracked slabs on grade. Remove spalled/deteriorated concrete and resurface.		T1, A, B, C, CX, D, E, T2, CCW	2	$ 1,193,000	$ 1,970,000		$ -	$ -	$ -	$ -		50	Structural-Slabs on Grade

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA-	SG01-	T1			T1	2			$ 560,000	$ 390,000	$ 80,000	$ 90,000	$ 100,000	64 / 55	50	
FCA-	SG01-	A			A	2			$ 370,000	$ 260,000	$ 50,000	$ 50,000	$ 60,000	60	50	
FCA-	SG01-	B			B	2			$ 120,000	$ 90,000	$ 15,000	$ 17,000	$ 20,000	60	50	
FCA-	SG01-	C			C	2			$ 260,000	$ 190,000	$ 30,000	$ 30,000	$ 40,000	60	50	
FCA-	SG01-	CX			CX	2			$ 120,000	$ 90,000	$ 15,000	$ 17,000	$ 20,000	38	50	
FCA-	SG01-	D			D	2			$ 410,000	$ 310,000	$ 50,000	$ 50,000	$ 60,000	35	50	
FCA-	SG01-	E			E	2			$ 120,000	$ 80,000	$ 19,000	$ 22,000	$ 25,000	22	50	
FCA-	SS01-	T1	Repair three columns in T1: Shore adjacent concrete framing, remove damaged concrete and replace with fast setting concrete mortar or epoxy injection.	1	T1		$ 75,000	$ 130,000		$ 140,000	$ -	$ -	$ -	64 / 55	50	Structural-Super Structure
FCA-	SS02-	T1	Provide steel protective sleeves or bollards at abraded columns in T1.	3	T1		$ 60,000	$ 100,000		$ 30,000	$ 30,000	$ 30,000	$ 40,000	64 / 55	50	Structural-Super Structure
FCA-	SS03-	G	Grind away corrosion and paint steel members that exhibit corrosion with	3	T1, A, B, C, CX, D, E, T2, CCW		$ 360,000	$ 590,000		$ -	$ -	$ -	$ -		50	Structural-Super Structure and Exterior Enclosures

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							Excluding escalation			**Distributed forecast values include escalation**						
			weather proofing paint.													
FCA-	SS03-	T1			T1				$ 70,000	$ 17,000	$ 19,000	$ 21,000	$ 25,000	64 / 55	50	
FCA-	SS03-	A			A				$ 100,000	$ 30,000	$ 30,000	$ 30,000	$ 40,000	43	50	
FCA-	SS03-	B			B				$ 33,000	$ 9,000	$ 9,000	$ 11,000	$ 12,000	43	50	
FCA-	SS03-	C			C				$ 100,000	$ 30,000	$ 30,000	$ 30,000	$ 40,000	43	50	
FCA-	SS03-	CX			CX				$ 70,000	$ 17,000	$ 19,000	$ 21,000	$ 25,000	38	50	
FCA-	SS03-	D			D				$ 33,000	$ 9,000	$ 9,000	$ 11,000	$ 12,000	35	50	
FCA-	SS03-	T2			T2				$ 160,000	$ 40,000	$ 50,000	$ 50,000	$ 60,000	22	50	
FCA-	SS03-	E			E				$ 33,000	$ 9,000	$ 9,000	$ 11,000	$ 12,000	22	50	
FCA-	SS04-	T1G	Terminal 1 Garage Structural Repairs as outlined in the EDM report		T1G	1	$18,025,000	$ 30,820,000		$18,680,000	$5,030,000	$11,490,000	$ -			Structural
FCA-	SS05-	T2G	Low priority structural fixes laid out by EDM Report		T2G	2	$ 675,000	$ 1,150,000		$ 410,000	$ 440,000	$ 500,000	$ 580,000			Structural
FCA-	SW01		Sandblast and recoat above grade pump housings and piping		T2	3	$ 19,000	$ 30,000		$ -	$ 40,000	$ -	$ -	22	30	Civil
FCA-	SW02		Replace pump housing gaskets		T2	3	$ 500	$ -		$ 1,000	$ -	$ -	$ -	22	30	Civil
FCA-	SW03		Replace Dewatering Pump		T2	3	$ 20,000	$ 30,000		$ -	$ 38,000	$ -	$ -	22	30	Civil

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	SW04		Replace SW Pump Impellers		T2	3	$ 6,000	$ 10,000		$ -	$ -	$ -	$ 15,000	22	30	Civil
FCA -	SW05		Replace Hatches and Vault Covers		T2	3	$ 5,000	$ 10,000		$ -	$ 10,000	$ -	$ -	22	30	Civil
FCA -	SW06		Rehabilitate Wet Well and Vaults		T2	3	$ 120,000	$ 210,000		$ -	$ -	$ -	$ 310,000	22	30	Civil
FCA -	LV01 -	T 1	Upgrade cabling pathways infrastructure including the following: Remove abandoned low voltage cable, provide additional conduit and cable tray pathways, provide fire stopping.		T1	2	$ 408,240	$ 700,000		$ -	$ 400,000	$ 460,000	$ -			Removal of Abandoned Cable Provide additional Cable/Conduit Pathways (as needed) Provide Fire Stopping
FCA -	LV01 -	T 2	Upgrade cabling pathways infrastructure including the following: Remove abandoned low voltage cable, provide additional conduit and cable tray pathways, provide fire stopping.		T2	2	$ 136,080	$ 230,000		$ -	$ 130,000	$ 150,000	$ -			Removal of Abandoned Cable Provide additional Cable/Conduit Pathways (as needed) Provide Fire Stopping

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	LV02 -	T 1	Renovate Telecom Rooms including the following: Remove old un-used equipment in racks, improve lighting, add wire management in racks, clean rooms, provide equipment identification, provide cable management system software, replace UPS rack mounted units. Price is for 8 Telecom Room.		T1	2	$ 332,640	$ 570,000		$ -	$ 650,000	$ -	$ -			Price includes 8 rooms
FCA -	LV02 -	T 2	Renovate Telecom Rooms including the following: Remove old un-used equipment in racks, improve lighting, add wire management in racks, clean rooms, provide equipment identification, provide cable		T2	2	$ 83,160	$ 140,000		$ -	$ 160,000	$ -	$ -			Price includes 2 rooms

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							Excluding escalation			**Distributed forecast values include escalation**						
			management system software, replace UPS rack mounted units. Price is for 2 Telecom Room.													
FCA -	LV03 -	T 1	Public Address System Upgrades including the following: Additional of hearing loops in Ticketing and Hold Rooms for compliance with the ADA and upgrade of paging microphones.		T1	2	$ 835,380	$ 980,000		$ -	$ 560,000	$ 640,000	$ -			Paging Microphone Stations (Unsecure Public Areas) Hearing Loop Systems (Entire Airport) Coordination with MUFIDS vendor
FCA -	LV03 -	T2	Public Address System Upgrades including the following: Additional of hearing loops in Ticketing and Hold Rooms for compliance with the ADA and upgrade of paging microphones.		T2	2	$ 449,820	$ 530,000		$ -	$ 300,000	$ 350,000	$ -			Paging Microphone Stations (Unsecure Public Areas) Hearing Loop Systems (Entire Airport) Coordination with MUFIDS vendor

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	LV04 -	T 1	Multi User Flight Information Display System Upgrades including the following: New MUFIDS hardware, virtualized servers, and computer workstations, MUFIDS database and client workstation software		T1	1	$ 374,220	$ 640,000		$ -	$ 730,000	$ -	$ -			MUFIDS Software MUFIDS Servers and VMware Misc. equipment/cabling
FCA -	LV04 -	T 2	Multi User Flight Information Display System Upgrades including the following: New MUFIDS hardware, virtualized servers, and computer workstations, MUFIDS database and client workstation software		T2	1	$ 41,580	$ 70,000		$ -	$ 80,000	$ -	$ -			MUFIDS Software MUFIDS Servers and VMware Misc. equipment/cabling

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	LV05		Fire Alarm System Upgrades including the following: Update the Notifier FAS Panels to current Notifier version		T1	1	$ -	$ -		$ -	$ -	$ -	$ -			Under Current Maintenance Contract with Tech Electronics Phase 1 - FACP & Workstations / Programming (Refer to Airport RFP for info) ($5400 = per FACP)
FCA -	LV06 -	T 1	Fire Alarm System Upgrades including the following: Update of field devices, visual and annunciating devices and ADA compliance		T2	2	$ 436,440	$ 560,000		$ -	$ 320,000	$ 370,000	$ -			Phase 2 - Initiating Devices / Notification Applicances (Concourse Levels only) / Programming Acceptance Testing
FCA -	LV06 -	T 2	Fire Alarm System Upgrades including the following: Update of field devices, visual and annunciating devices and ADA compliance		T1/T2	2	$ 1,309,316	$ 1,690,000		$ -	$ 970,000	$ 1,110,000	$ -			Phase 2 - Initiating Devices / Notification Applicances (Concourse Levels only) / Programming Acceptance Testing

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	LV07		Tower Crash Phone System Replacement		T1/Concourse B Ops Center / ARFFs and Tower	1	$ 166,320	$ 220,000		$ 230,000	$ -	$ -	$ -			Crash Phone System Equipment Crash Phone System labor Demolition of old system Testing and Commissioning
FCA -	LV08 -	T 1	Expand PA to Ramp and Parking Garages		T1	1	$ 1,242,864	$ 2,120,000		$ 2,250,000	$ -	$ -	$ -			Expand PAS to T1 and T2 Ramp and Parking Garages
FCA -	LV08 -	T 2	Expand PA to Ramp and Parking Garages		T2	1	$ 828,576	$ 1,420,000		$ 1,500,000	$ -	$ -	$ -			Expand PAS to T1 and T2 Ramp and Parking Garages
FCA -	LV09		CCTV Expansion, Replace SANS	STL-OP1		1	$ 4,000,000	$ 4,200,000		$ -	$ 4,800,000	$ -	$ -			**Required if LV10 is approved If approved SC06 should also be approved**
FCA -	LV10		Expand and Upgrade CCTV	STL-ES10		1	$ 3,000,000	$ 3,530,000		$ 3,740,000	$ -	$ -	$ -			**If approved, LV09 must be approved If approved, SC06 should be approved**
FCA -	LV11 -	T 1	MUFIDS - T1 structures, T1 large display		T1	1	$ 756,000	$ 1,290,000		$ -	$1,480,000	$ -	$ -			Relace Terminal 1 MUFIDS displays/structures Add Large display wall in

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							Excluding escalation			**Distributed forecast values include escalation**						
																Terminal 1/software
FCA -	LV11 -	T2	MUFIDS - T2 structures		T2	1	$ 2,268,000	$ 3,880,000		$ -	$4,430,000	$ -	$ -			Relace Terminal 2 MUFIDS displays/structures/software
FCA -	IT01		Dell End of Life Servers Every 5 Years	STL-IT1		1	$ 1,000,000	$ 1,050,000		$ -	$ 600,000	$ 690,000	$ -			
FCA -	IT02		Upgrade Fiber Backbone, Capacity and Redundancy Every 10 Years	STL-IT2		1	$ 2,500,000	$ 4,270,000		$ -	$4,880,000	$ -	$ -			
FCA -	IT03		Replace Firewall Infrastructure Every 7 Years	STL-IT3		1	$ 1,000,000	$ 1,180,000		$ -	$ 670,000	$ 770,000	$ -			
FCA -	IT04		Disaster Recovery Site Equipment Replacement Every 7 Years	STL-IT4		1	$ 900,000	$ 1,060,000		$ -	$ 600,000	$ 690,000	$ -			
FCA -	IT05		UPS Replacements Every 7 Years	STL-IT5		1	$ 250,000	$ 320,000		$ -	$ 370,000	$ -	$ -			
FCA -	IT06		Infrastructure Routers and Switches			1	$ 2,450,895	$ 2,880,000		$ 2,250,000	$ 870,000	$ -	$ -			initial is 48% of infra, subsequent is for remander over lifecycle Procurement and Implementation CA & CM

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	IT07		Formal Asset Management Program (Also see HV01)			2	$ 950,000	$ 1,120,000		$ 650,000	$ 580,000	$ -	$ -			See FCA-HV01 Procurement & Implementation CA & CM
FCA -	IT08		Non-Infrastructure Asset Control and Management			1	$ 206,194	$ 240,000		$ 260,000	$ -	$ -	$ -			Part of this fits within IT1 but expands to include more than just Dell servers Implementation & Support CA & CM
FCA -	IT09		IT Application Operations			2	$ 379,966	$ 450,000		$ 300,000	$ 190,000	$ -	$ -			Procurement & Implemenation Testing and QA CA & CM
FCA -	IT10		IT Operating Systems			1	$ 249,153	$ 260,000		$ 260,000	$ 20,000	$ -	$ -			software upgrades to the systems Procurement & Implemenation Testing and QA CA & CM
FCA -	IT11		IT Security Enhancement Initiative			1	$ 752,371	$ 880,000		$ 940,000	$ -	$ -	$ -			Implementation and SupportSecurity Assessment & Consulting ServicesProcurement & Support

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							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	IT12		Airport IT Hardware Upgrade			1	$ 465,339	$ 490,000		$ 520,000	$ -	$ -	$ -			Procurement & Implemenation
FCA -	SC01		Upgrade Access Control and Video Management System software to most current supported version			1	$ 402,192	$ 420,000		$ 450,000	$ -	$ -	$ -			ACS IDMS
FCA -	SC02		Update IDMS software to provide automated DAC processing and paperless badge applications			1	$ 264,600	$ 310,000		$ 330,000	$ -	$ -	$ -			Add automation feature Required FP Scanner Change Authorized Signatory Portal
FCA -	SC03-	T 1	Extend ACS to passenger boarding bridges		T1	1	$ 440,900	$ 750,000		$ 400,000	$ 430,000	$ -	$ -			Install ACS on 15 Doors - Concourse A Install ACS on 20 Doors - Concourse C
FCA -	SC03-	T 2	Extend ACS to passenger boarding bridges		T2	1	$ 239,426	$ 410,000		$ 220,000	$ 230,000	$ -	$ -			Install ACS on 19 Doors - Concourse E
FCA -	SC04		Supplement airfield surveillance with thermal cameras			2	$ 1,360,800	$ 2,330,000		$ -	$2,660,000	$ -	$ -			PTZ Thermal Cameras (6) Infrastructure

FCA Identification No.			Description	STLAA CapEx Reference No. (If applicable)	Terminal/ Concourse	Priority	Estimated Total Contractor Price 2020 Dollars	Estimated Project Cost 2020 Dollars	Estimated 2020 Proj. Cost Breakdown by Bldg.	Est. Proj. Cost FY2022 (1 Yr)	Est. Proj. Cost FY2022 to 2026 (2 - 5 Yrs)	Est. Proj. Cost FY2026 to FY2031 (5 - 10 Yrs)	Est. Proj. Cost FY2031 to FY2036 (10 - 15 Yrs)	Estimated Asset Age (Yrs)	Asset Useful Life Expectancy (Yrs)	**Additional Comments**
							Excluding escalation			**Distributed forecast values include escalation**						
FCA -	SC05		Implement perimeter intrusion detection system			3	$ 2,154,600	$ 3,680,000		$ 2,340,000	$1,680,000	$ -	$ -			Following perimeter assessment under Security Master Plan - May move up in priority Detection System Infrastructure
FCA -	SC06		Security Master Plan - IT security assessment, perimeter assessment	STL-OP7		2	$ 750,000	$790,000		$ 840,000	$ -	$ -	$ -			Should be a priority 1 STL Est: $1,500,000 **If LV9, LV10 & LV11 are approved, so should OP1**
FCA -	SC07		Upgrade VMS Software			1	$ 12,096	$ 10,000		$ 10,000	$ -	$ -	$ -			Software
FCA -	SC09		Expand and Upgrade Access Control: fire doors, hardware, boarding bridge doors, finger print		A, B, C, D, E	1	$ 5,200,000	$ 8,890,000		$ 9,430,000	$ -	$ -	$ -			175 Doors **If approved, SC06 should be approved**
			Total Costs				**$287,179,478**	**$481,131,000**		**$64,984,300**	**$214,659,000**	**$168,711,000**	**$156,767,000**			

Notes:
[1] Uniformat Classification Abbreviations:

SE	Subgrade Enclosures
SG	Slabs on Grade
SS	Superstructure
CV	Conveying
HV	HVAC
PL	Plumbing
FP	Fire Protection
EL	Electrical
EQ	Equipment
BH	Baggage Handling Systems
RB	Roads & Bridges

SW	Storm Water
LV	Low Voltage Systems
IT	Information Technology
SC	Security

[2] Priority Ratings:
(1) High Priority: Safety and operational requirements,
(2) Strongly Recommended: Non-critical facility maintenance
(3) Prudent: Low priority improvements and preventive maintenance

APPENDIX 11C.2 – BASIS OF ESTIMATE AND MARKUPS

BASIS OF ESTIMATE

This Basis of Estimate accompanies the FCA recommendation cost summary spreadsheet "WSP FCA CapEx" and provides a summary of the considerations and scope of the costs included for each line item recommendation. A summary of the included in the mark-ups, applied to the Estimated Contractor Pricing to obtain the Estimated Project Costs, is provided at the end of this Basis of Estimate.

- **FCA-BH01-G, Replace upper level BHS hardware (operating systems, User interface software, HMIs, servers, workstations, monitors, computer peripherals):** Cost estimate is based on the age and size of the system. Typical life expectancy between 10-15 years. Estimate includes replacement of operating systems, user interface software, HMIs, servers, workstations, monitors, computer peripherals. Estimate includes both T1 and T2 systems. Projected replacement in 2-3 years.
- **FCA-BH02-T1, Address loose wires that are not properly terminated in motor control/distribution panels (MCP's). Replace panduit covers in MCP's (maintenance):** Estimate is based on 3rd party contracted hourly labor. Item should be addressed under BHS maintenance contract provider.
- **FCA-BH03-T1**, **Replace startup alarm for make-up unit, MU1, on BHS (maintenance):** Estimate is based on 3rd party contracted hourly labor. Item should be addressed under BHS maintenance contract provider.
- **FCA-CV01-G, Modernize all elevators over 30 years old:** Modernization includes updating control systems, door operation, signal fixtures, and cab interiors. It is assumed that 27 total elevators need modernization based on the equipment ages from the CityWorks asset list. Costs are based on industry contractor estimates of $100,000 - $150,000 to modernize each elevator.
- **FCA-CV02-G, Overhaul all elevators over 15 years old**: Overhauling includes thorough examination of all components of an elevator, and repairing/replacing select components as needed without modernizing the cab interior. It is assumed that 28 total elevators need to be overhauled based on the equipment ages from the CityWorks asset list. Costs are based on industry contractor estimates of $30,000 to overhaul each elevator.
- **FCA-CV03-G, Overhaul all escalators over 15 years old**: Overhauling includes thorough examination of all components of an escalator and repairing/replacing components as needed. It is assumed that 9 total escalators in Terminal 1 and 2 need to be overhauled based on the equipment ages from the CityWorks asset list. Overhaul and upgrade of key components are estimated at $300,000 per pair of escalators.
- **FCA-CV04-G, Overhaul all moving walkways over 15 years old**: Overhauling includes thorough examination, of all components of a moving walkway and repairing/replacing components as needed. It is assumed that 18 total moving walks need to be overhauled based on the equipment ages from the CityWorks asset list. Equipment is not currently in use, so mechanical overhaul is recommended to put equipment back in service. Terminal One Walkways are currently out of service. Its logical to assume that these systems will not require maintenance for another 5-10 years. The plan for the replacement of these items would extend to 2027 for concourse C and D walkways (C-1 through C-6; D-1 through D-10; D-11 & D-12) at an anticipated cost of $870,000 each.
- **FCA-CV05-G, Deep clean all escalators and moving walkways**: A deep cleaning includes

taking a unit apart and thoroughly cleaning its components. It is assumed that 9 total escalators and 18 total moving walkways need to be deep cleaned based on the equipment ages from the CityWorks asset list.

- **FCA-EL01-T1, Install additional indirect uplighting in the T1 ticketing area:** Existing night-time lighting levels are uneven through the general circulation areas. Estimate includes installation of twelve additional LED indirect uplights in darker areas to produce more uniform lighting levels.
- **FCA-EL02, Replace older substations 5-10 year timeframe:** Many of the existing concourse substations have been in service longer than the standard 30 year life expectancy of electrical equipment. Estimates includes replacement of five substations in Concourse A, three substations in Concourse B, three substations in Concourse C, three substations in Concourse C extension, six substations in Concourse D and eight substations in Terminal 1.
- **FCA-EL03, Replace older fusible switch distribution panels 5-10 year timeframe:** Many existing distribution panels have been in service longer than the standard 30 year life expectancy of electrical equipment. Estimate includes replacement of seven fusible switch distribution panels in Concourse A, five panels in Concourse B, eight panels in Concourse C, fourteen panels in Concourse C extension and 24 panels in Terminal 1.
- **FCA-EL04, Replace older branch circuit breaker panels 1-5 year timeframe:** Many existing branch circuit breaker panels have been in service longer than the standard 30 year life expectancy of electrical equipment. Trip characteristics of molded case breakers degrade with age. Estimate includes replacement of 21 branch circuit breaker panels in Concourse A, twelve branch panels in Concourse B, eleven branch panels in Concourse C, 22 branch panels in Concourse C extension, 46 branch panels in Concourse D and 92 branch panels in Terminal 1.
- **FCA-EL05, Replace existing interior lighting on the apron level:** Existing lighting source is predominantly fluorescent and in poor shape. Estimate assumes new LED fixtures will be installed, with Industrial strip style LED fixtures in unfinished utility spaces and recessed ceiling mounted LED fixtures in finished spaces. Estimate includes replacement of general and emergency lighting fixtures throughout the apron level and tunnel of concourses A, B, and throughout the apron level of concourse C extension and Terminal 1.
- **FCA-EL06-A, Replace waiting area lighting on the concourse level:** Existing lighting source is 4’ x 4’ pendant square in poor shape due to age. Estimate assumes new LED fixtures will be installed. Estimate includes replacement of general lighting fixtures throughout the waiting areas of concourse A.
- **FCA-EL07-B, Replace emergency generator #50 (CIP in progress):** Generator is over 50 years old and in poor shape due to age. Estimate assumes replacement of existing generator with new 75kw generator.
- **FCA-EL08-B, Replace lighting on the concourse level of Concourse B**: Most of the light fixtures in Concourse level of B are older, the area was not included in the Airport Experience renovation project of 2013. Estimate assumes replacement of all general and emergency egress lighting on the concourse level of Concourse B except for the open area at the north end of Concourse B which has newer recessed volumetric 2’ x 2’ fixtures in grid ceiling.
- **FCA-EL09-Cx, Replace emergency generator #50 located on the apron level of concourse C extension (CIP in progress):** Generator is 42 years old and in poor shape due to age. Engine generators have a life expectancy of 20 to 25 years. Estimate assumes replacement of existing generator with new 215kw generator.
- **FCA-EL10-C, Replace existing interior lighting on the apron level of concourse C:** Existing lighting source is predominantly fluorescent and in poor shape. Estimate assumes new LED fixtures will be installed, with industrial strip style LED fixtures in unfinished utility spaces and

recessed ceiling mounted LED fixtures in finished spaces. Estimate includes replacement of general and emergency lighting fixtures throughout the apron level of concourse C.

- **FCA-EL10-D, Replace existing interior lighting on the apron level of concourse D:** Existing lighting source is predominantly fluorescent and in poor shape. Estimate assumes new LED fixtures will be installed, with industrial strip style LED fixtures in unfinished utility spaces and recessed ceiling mounted LED fixtures in finished spaces. Estimate includes replacement of general and emergency lighting fixtures throughout the apron level of concourse D.
- **FCA-EL11-Cx, Replace lighting on the concourse level of Concourse C extension:** Most of the light fixtures in Concourse level of the C extension are older, the area was not included in the Airport Experience renovation project of 2013. Estimate assumes replacement of all general and emergency egress lighting concourse level of the C extension with contemporary LED light fixtures.
- **FCA-EL12-D, Replace lighting on the concourse level of D**: Most of the light fixtures in Concourse level of D are older, appear to be original to the construction of D concourse and appear dated. Estimate assumes replacement of all general and emergency egress lighting concourse level of the D with contemporary LED light fixtures.
- **FCA-EL13-T2, Replace existing interior lighting on the apron level of Terminal 2:** Existing lighting source is predominantly fluorescent. Estimate assumes new LED fixtures will be installed, with industrial strip style LED fixtures in unfinished utility spaces and recessed ceiling mounted LED fixtures in finished spaces. Estimate includes replacement of general and emergency lighting fixtures throughout the apron level of Terminal 2.
- **FCA-EL13-E, Replace existing interior lighting on the apron level of concourse E:** Existing lighting source is predominantly fluorescent. Estimate assumes new LED fixtures will be installed, with industrial strip style LED fixtures in unfinished utility spaces and recessed ceiling mounted LED fixtures in finished spaces. Estimate includes replacement of general and emergency lighting fixtures throughout the apron level of Concourse E.
- **FCA-EL14-CBP, Replace all cove lighting in Terminal 2 CBP/FIS area:** Existing central open areas are outlined with fluorescent cove lights in poor shape. Estimate assumes new LED cove fixtures will be installed to replace existing fluorescent cove lights throughout the CBP/FIS area.
- **FCA-EL15-T2G, Replace exit lights in Terminal 2 parking garage:** Existing exit lights throughout garage are in poor shape. Estimate assumes new LED exit lights will be installed to replace existing exit lights throughout the garage.
- **FCA-EL16-CCW, Replace Low-Voltage Panelboards:** Performance of molded case circuit breakers degrade over time such that its trip characteristic begins to deviate from spec. Seven of the 208V panelboards were observed to be of older vintage such that breakers may be difficult to replace within a few years. Remaining panelboards that include 208V/480V pairs that include matching dedicated dry transformer are relatively recent vintage and replacement breakers should be available if needed.
- **FCA-EL17-CCW, Replace Motor Control Centers:** Two low voltage motor control centers in the climate control complex appear to be older than 20 years. Motor controls that involve full-voltage starters can operate reliably for 25 years. These MCC cabinets operate a high temperature environment and are exposed to heavy equipment traffic. Depending on the technology, motor control components of this vintage may become more difficult to replace. Consider replacing with newer technology within 5 years.
- **FCA-EL18-CCW, Replace Fluorescent Fixtures with LED Fixtures in CC Admin. Offices:** While the fluorescent troffer fixtures in the admin spaces and fluorescent strip lighting in the Electrical shop range from fair to good condition, availability of replacement fluorescent lamps declining. Not only do fluorescent fixtures operate at efficiencies far below the lumens per watt

available with equivalent LED fixtures, LED technology continues to evolve with higher lumens-per-watt and longer emitter life. Consider a replacement program that upgrades all fluorescent luminaires in the CCW spaces to LED technology.

- **FCA-EL19-CCE, Replace Panelboards over 25 Years Old:** Two multi-panelboard assemblies that each include a 480-volt panel, a dry transformer, and a 208-volt panelboard appear to be older than 25 years. Operation of molded case breakers in panelboards of older vintage can be unreliable and new breakers may no longer be compatible. Estimates include replacing both high- and low-voltage panelboards and matching dry transformer.
- **FCA-EL20-CCE, Upgrade Four Individual Low-Voltage MCC's or replace them in 5 years:** Four low voltage motor control centers in the climate control spaces appear to be older than 20 years. Motor controls that involve full-voltage starters can operate reliably for 25 years. These MCC cabinets operate at high temperatures and are located in a dirty environment. Depending on the technology, motor control components of this vintage may become more difficult to replace. Consider replacing with newer technology within 5 years.
- **FCA-EL21, Replace End of Life Emergency Generators:** This item is taken from the STLAA Airline Recommended Baseline CapEx. Costs and descriptions are as included in the STLAA CapEx.
- **FCA-EL22, East Substation Upgrades:** This item is taken from the STLAA Airline Recommended Baseline CapEx. Costs and descriptions are as included in the STLAA CapEx.
- **FCA-EL23, West Substation Upgrades:** This item is taken from the STLAA Airline Recommended Baseline CapEx. Costs and descriptions are as included in the STLAA CapEx.
- **FCA-EL24, Split 4KV Ductbanks from 480V at T1:** This item is taken from the STLAA Airline Recommended Baseline CapEx. Costs and descriptions are as included in the STLAA CapEx.
- **FCA-EL25, Update Electrical One-Lines and Backgrounds:** This item is taken from the STLAA Airline Recommended Baseline CapEx. Costs and descriptions are as included in the STLAA CapEx.
- **FCA-EL26, Replace End of Life UPS Systems:** This item is taken from the STLAA Airline Recommended Baseline CapEx. Costs and descriptions are as included in the STLAA CapEx.
- **FCA-EQ01-G, Replace T2 Trash Compactors, and Renovate T1 & Concourse Compactors**: Estimate includes total replacement of two trash compactors in Terminal 2, and renovation of seven compactors in Terminal 1 and Concourses A & C.
- **FCA-FP01-G, Continue replacement of fire suppression piping as pipe failures occur, and budget for a large-scale replacement of fire suppression piping at a future date:** Estimate includes replacement of sprinkler distribution mains in tunnels and main risers in terminals and concourses. The estimate is based on replacement of approximately 14,000 feet of piping between 4- and 8-inches diameter. Cost distribution is by the estimated pipe length in each building.
- **FCA-HE01, Replace membrane roof (total tear off) and install overflow system on the roof:** For the membrane roofs on the A and B concourses, it was logical to assume that a complete replacement would be due in the next 5 to 10 years given the existing life. Concourse A is calculated at 422 Squares at $1300/Sq. Concourse B is calculated at 358 Squares at $1300/Sq. C and CX concourses could hold off until 2031. The escalated cost per square is Concourse C is calculated at 276 Squares at $1700/Sq. And Concourse CX is calculated at 85 Squares at $1700/Sq.
- **FCA-HE02, Investigate the leaking on concourse, perform a roof core test to examine the extent of water transmission into the roof system:** For concourses B and C, there are ongoing leaking through equipment openings in the roof. This may have long term effects if not identified immediately therefore this work is anticipated in year 1. Roof testing/investigation is calculated

for each Concourse B and Concourse C at $8000 totaling $16,000.

- **FCA-HE03, Replace roof walkway pads with roof membrane adhered pads/repair roof in specific area/test roof at area west of D and E concourse (at the MetroLink station):** A portion of the roof in Concourse D has a chronic ponding issue cause by a raised walkway system presently installed. The ponding has already caused a leaking condition above the area near the Metrolink escalators. Part of this repair should have roof testing to determine system wide damage. This condition deserves immediate attention in year one. Walkway demolition and roof repair is calculated at 10,000 SF at $13/SF for an estimated immediate cost of $131,000.
- **FCA-HE04, Repair/Replace skylight:** This is in reference to the skylights that are leaking caused by the ponding described above in FCA-HE03.
- **FCA-HE05, Replace curtainwall window system replacement at end of life:** This line item is in anticipation of the curtainwall system coming to its effective end of life and being replaced. While the airport maintains a rigorous replacement program for the glazing, the actual support system can deteriorate over a time. It is anticipated that when that time comes, an estimated cost be established to assist in prioritizing facility budgets.
- **FCA-HV01-G, Institute a formal Asset Management System:** Estimate includes an allowance to expand approximately 7000 existing CityWorks data entries and expand the CityWorks data with 1200 additional items. The estimate also includes an allowance for software, programming and management for implementation of the Asset Management System, and ongoing licensing fees and management to maintain the system.
- **FCA-HV02-G, Institute a formal Maintenance Management System:** Estimate includes an allowance to utilize existing and new CityWorks data entries to schedule preventive maintenance and predict capital repairs and replacements of approximately 1200 items using software tools. The estimate includes an allowance for software, programming and management for implementation of the Maintenance Management System, and ongoing licensing fees and management to maintain the system.
- **FCA-HV03-G, Perform zone pressure testing to identify air balancing and building pressurization problems:** Estimate includes collecting pressure readings in 30 locations distributed around the airport with an allowance for project planning and evaluation of results to make an initial assessment of the air balance within major areas of the airport terminal and concourses. Testing would be performed at night with outside exits and passenger boarding bridges closed, and HVAC systems in the zone being tested and adjacent zones operating in the normal occupied mode. Test results would provide guidance for further testing or system modifications.
- **FCA-HV04-G, Repair piping and replace insulation at the connections to heating and cooling coils on indoor air handlers and heating and ventilating units throughout the airport:** Estimate includes localized piping repairs to corroded pipe and fittings and replacement of damaged or missing insulation on the piping manifolds immediately adjacent to steam and water coils, and heat exchangers, on approximately 100 air handling and heating and ventilating units, and 20 pressure reducing stations throughout the terminals and concourses. The distribution is based on an estimated number of units with damaged piping and insulation in each building. Costs were allocated in 2021, but could be prioritized and distributed over 5 years.
- **FCA-HV05-G, Install redundant cooling systems in IT and communication rooms:** Estimate is based on installation of a supplemental 5-ton chilled water computer room air conditioning unit in eleven server rooms around the airport with an allowance for piping, ductwork and electric.
- **FCA-HV06-G, Institute a program for routine replacement of door air curtains, particularly at public entrances - 25% every 5 years:** The estimate is based on published costs for installation of 8-foot long door heaters mounted with an allowance for demolition, electrical work

and repairs to architectural finishes. The total cost included 44 units based on the Climate Control equipment inventory. The suggested replacement schedule is based on an equipment life expectancy of 20 years.

- **FCA-HV07-G, Institute a program to clean bird screens on air intake and exhaust openings on the apron level:** Total cost is based on an estimated 100 intake and exhaust openings throughout the facility that may be remote or overlooked in routine maintenance of air handing equipment. Costs are allocated to years 2-5 due to the condition of existing openings that in some cases severely restricts airflow, but openings included in this task should be cataloged and scheduled for routing maintenance.
- **FCA-HV08, Replace RTU as they reach end of life including RTU148 serving the Properties Department, and all RTU on C Extension:** Cost estimate is based on replacement of existing rooftop air conditioners when they reach 20 years of age. Rooftop air conditioners have an industry average life expectancy of 15 years. Estimate includes an allowance for ductwork, insulation, electrical power, and digital controls on each unit. The Properties unit is projected to be replaced in one year. Seventeen units were projected to be replaced in within 5 years, and 23 units were projected to be replaced in 5-10 years based on the age of existing equipment.
- **FCA-HV09-E, Evaluate the actual discharge static pressure and rated operating pressure of AHU116:** The estimate includes engineering and limited pressure testing on one air handling unit (AHU) observed with a visibly distended casing. Evaluation should include preliminary assessment of airflow through ductwork in the areas served by the AHU.
- **FCA-HV10-T1, Install a dedicated rooftop air conditioner to condition only the Lindbergh Conference Room:** This item is based in STLAA reports of insufficient cooling capacity for large meetings in the conference room. The estimated cost is based on disconnecting ductwork serving the conference room from the existing central air handler and installing a dedicated rooftop air conditioner estimated at 8 tons. Limited ductwork and ceiling replacement are included assuming reuse of significant portions of existing ductwork. An allowance is included for demolition, electrical, roofing and start-up testing and balancing.
- **FCA-HV12, Replace AHU as they reach end of life. Replace AHU on CX and D when concourse is reopened:** Cost estimate is based on replacement of existing air handlers (AHU) and heating and ventilating units (HVU) when they reach 30 years of age. Air handlers have an industry average life expectancy of 25 years. Estimate includes an allowance for ductwork, insulation, electrical power, and digital controls on each unit. Forty units were projected to be replaced in within 5 years, twelve units to be replaced in 5-10 years, and ten units to be replaced in 10-15 years based on the age of existing equipment.
- **FCA-HV13-CCW, Replace Domestic hot water heat exchangers and circulating pumps:** Estimate includes total replacement of central steam to domestic hot water heat exchanger, pumps and controls in Climate Control West.
- **FCA-HV14-CCW, Replace the water softener system:** Estimate includes complete replacement of the water softener brine tank, resin tank, valves and controls in Climate Control West and is based on a 200 GPM duplex system.
- **FCA-HV15-CCW, Replace condenser water pumps:** Estimate includes replacement of three, 36 year old, vertical turbine pumps serving the cooling towers. The life expectancy of vertical turbine pumps is 15-25 years. The estimate includes an allowance for replacement of adjacent piping and valves and the associated electrical work.
- **FCA-HV17-CCW, Assess the capacity of cooling towers:** Estimate represents and engineering evaluation to assess the capacity of cooling towers relative to the capacity and flow rates of the existing chillers and condenser pumps as the cooling towers were represented to be the component limiting the total capacity of the cooling system.

- **FCA-HV18-CCW, Perform a pressure drop study of the chilled water system. Revise select piping segments to improve flow:** Estimate includes engineering and testing labor to assess, and develop concepts to reduce, the total pressure-drop of the chilled water distribution from Climate Control West.
- **FCA-HV20-CCW, Replace one water tube boiler and controls, in CCW:** Estimate includes the cost to replace the one remaining water tube boiler in Climate Control West along with all boiler controls and an allowance for piping, insulation, electrical and start-up and testing within the next five years. The existing boiler is 30 years old. Water tube steam boilers have a life expectancy of 25 – 30 years. The estimate is based on a proportional value of item HV24.
- **FCA-HV21-CCW, Replace Chillers #1 & #3 at CCW:** Estimate includes total replacement of two 1500-ton centrifugal chillers with new valves air separators and digital controls, with an allowance for associated structural and electrical work.
- **FCA-HV22-CCW, Rebuild or replace Cooling Towers at CCW (In progress):** Estimate includes complete overhaul of three cooling towers at Climate Control West with structural reinforcement, new high efficiency fill, new discharge nozzles, new fan motors and overhaul of the gear boxes. Cost is based on vendor estimate of the cost to overhaul similar cooling towers.
- **FCA-HV23-CCE, Repair one cell of the cooling tower that is currently out of service, and critically assess the condition of the remaining 3 operational cells:** Estimate is based on limited repairs to baffles and fill, and motor overhaul, on one of four cells in the cooling tower at Climate Control East. Actual scope of repairs required is not known.
- **FCA-HV24-CCE, Replace three water tube boilers, analog boiler controls, and condensate return tanks in CCE:** Estimate includes the cost to replace two 40,000 Lb/Hr, and one 20,000 Lb/Hr, water tube boilers in Climate Control West along with all boiler controls and an allowance for flues, safeties, piping, valves, insulation, electrical and start-up and testing. All three boilers are 36 years old. Water tube steam boilers have a life expectancy of 25 – 30 years.
- **FCA-HV25-CCE, Replace Chiller #1 at CCE**: Estimate includes total replacement of one 1300-ton centrifugal chiller~~s~~ with new valves air separators and digital controls, with an allowance for associated structural and electrical work.
- **FCA-HV26, Replace Fuel Oil Tanks at CCW and CCE:** Fuel oil tanks at CCW are believed to be 25-30 years old and tanks at CCE are believed to be 35 years old based on the age of the associated fuel oil pumps. Estimate includes replacement of two 20,000 gallon underground tanks and the associated pumps at CCW, and replacement of two 30,000 gallon underground tanks and the associated pumps at CCE. Fuel oil is reportedly seldom used and consideration should be given to the back-up fuel supply required.
- **FCA-IC01, Ceiling replacement-B concourse office spaces/apron level:** Estimate includes an allowance to demolish and replace approximately 20,000 SF of ceiling at the concourse level of the B concourse. While the B concourse offices are in fair condition, the ceiling has deteriorated and is need of replacement.
- **FCA-IC02, Water damaged area/ceiling damage/carpet repair/partition refinishing:** Estimate includes an allowance to demolish and replacement/repair of specific areas that have been affected by extraneous wear and tear, roof leaks, etc. These areas exist in Concourses C, CX, D and E. Areas range from 200 to 1000 SF of affected area.
- **FCA-IC03, Wall and floor repairs on apron level:** Estimate includes an allowance to repair of specific areas that have been affected by wear and tear over time. These areas exist in Concourses C, D and E. It is anticipating interior finish repair of approximately 60,000 SF.
- **FCA-IC04, Gut demo apron level unused areas:** Estimate includes the gut rehab of unused spaces, mainly in concourse CX, but including square footage for other on courses deemed suitable for future use. It is an allowance to demolish the interior office finishes of approximately

60,000 SF.

- **FCA-IC05, Rehab apron level abandoned offices / new acoustical ceilings / drywall / partitions / carpet / electrical / HVAC:** Estimate includes the renovation and restoration of the CX concourse offices. It is an allowance to demolish the interior office finishes of approximately 16,000 SF.
- **FCA-IC06, Concourse ceiling repair/replacement:** Estimate includes an allowance to replace extensive ceiling areas in Concourses C, D and E as a long-term repair project in 10 – 15 years. Allocations are approximately 50,000 SF of affected area for each concourse.
- **FCA-PL01-G, Identify locations where sewer back-ups have occurred in underground piping and perform video inspection of those pipe segments:** Estimate includes an allowance to video survey 4,000 feet of underground piping where possible blockage is suspected, but includes no allowance for repair. Estimated inspection cost may be proportionally adjusted based on the length of pipe to be inspected.
- **FCA-PL02-A, Install a redundant domestic water supply to Concourse A:** Estimate includes installation of a new independent water service to Concourse A as a redundant back-up to the existing service. Estimate assumes a new underground connection to a hypothetical water main in the vicinity of Airfield Service Road west of Concourse A.
- **FCA-PL03, Replace plumbing fixtures and piping in any occupied areas on the apron level of C and C Extension. Remove abandoned fixtures and piping in unused areas on the apron level of C and C Extension:** Estimate includes replacing outdated and out of service fixtures on the apron level of concourse C and C Extension based on the condition of existing fixtures in vacant and un-renovated tenant areas. Estimate includes approximately 60 fixtures (water closets, urinals and lavatories) in Concourse C and 20 fixtures in Concourse CX. Estimates include an allowance for adjacent piping, but do not include new room finishes. The costs for plumbing fixtures and finishes could be part of tenant improvements.
- **FCA-PL04, Upgrade piping to restroom groups in use on the concourse level of C and C Extension. Shut off and drain piping to unused toilet groups in C Extension:** Estimate includes renovations to domestic hot and cold water and sanitary waste and vent piping serving restroom groups but excludes replacement of fixtures. Repairs are forecast to be implemented in years 5 - 15.
- **FCA-PL05, Upgrade piping and fixtures in restroom groups to be put into service on the concourse level of Concourses D and CX:** Estimate includes replacement of 75 fixtures (water closets, urinals and lavatories) on the concourse level of concourse CX, and 45 fixtures in Concourse D, and includes an allowance for replacement of adjacent piping and repairs to adjacent room finishes. The estimate does not include replacement of plumbing mains or room finishes. Costs were forecast for years 5-10 or when concourse CX or D are reactivated.
- **FCA-PL06, Upgrade piping and fixtures in restroom groups as fixtures reach the end of their service life:** Estimate includes forecast costs for replacement or major repairs to fixtures (water closets, urinals and lavatories) and piping in the terminals and concourses currently in use for years 5 through 15 based on an average fixture life expectancy of 30 years including an allowance for replacement of adjacent piping and repairs to adjacent room finishes. The estimate assumes 65 fixtures in Concourse A, 42 fixtures in Concourse B, 90 fixtures in Concourse C, 165 fixtures in Concourse E, 180 fixtures in Terminal 1, 42 fixtures in Terminal 2, and 31 fixtures in Customs and Border Protection.
- **FCA-PL07-T1G, Replace failed and damaged storm drain piping and install new bollards to protect piping adjacent to drive lanes. Clean and paint all exposed piping to inhibit future corrosion:** Estimate includes major repair or replacement of 30 cast iron storm drain risers and leaders on three levels, and installation of bollards or protective framing at risers exposed to

traffic.

- **FCA-PL08-T1G, Excavate debris in open drainage channels on the south side of the garage. Repair broken slabs and piping and install fluid applied liner to seal the channels:** Estimate includes cleaning, concrete repair, and installation of lining on approximately 900 feet of drainage trench along the south edge of the T1 garage to improve stormwater flow and reduce further deterioration or undermining of foundations.
- **FCA-PL09-T2G, Install physical barriers to vehicle traffic to protect vertical piping and piping hung too low to allow vehicle clearance:** Estimate includes installation of concrete or sand-filled plastic barriers where overhead storm leaders are susceptible to vehicle damage at open crosswalks. The estimate is based on 4 locations on each of two levels.
- **FCA-RB01-T1, Terminal 1 Arrivals Drive and Departures Drive Roads**: Programming level estimate based on square foot costs for replacement of T1 Arrivals Drive and Departures Drive at-grade roadways. The limits encompass entrance ramps and roadways from LIB and Airflight Drive at LIB to the exit roadway intersections at LIB, excluding bridges (see RB02). The pavement area is approximately 119,000 square feet. The reconstruction includes associated roadway features, such as pavement markings, signing, lighting, and drainage and an allowance for complexity due to construction phasing and overlapping elements including the Terminal 1 parking garage and interior finish areas. Reconstruction (Replacement) of Terminal 1 Roads and Bridges is assumed to take place at the same time. Replacement costs are forecast for FY 2022 to 2026 since estimated remaining useful life for this component is less than 5 years.
- **FCA-RB02-T1, Terminal 1 Arrivals Drive and Departures Drive Bridges:** Programming level estimate based on square foot costs for T1 Bridge replacements including the Arrivals Drive Bridge, Departures Drive Bridge, Ramps A and D Bridges, and Departures Drive over Arrivals Drive Bridge, and including an allowance for complexity due to construction phasing and overlapping elements including the Terminal 1 parking garage and interior finish areas. Terminal 1 parking garage and concourse level reconstruction costs that will be required if the Terminal 1 roadways and bridges are replaced are included in the FCA-
  WSP CapEx estimate. Reconstruction (Replacement) of Terminal 1 Roads and Bridges is assumed to take place at the same time. Replacement costs are forecast for FY 2022 to 2026 since estimated remaining useful life for this component is less than 5 years.
- **FCA-RB03-T2, Terminal 2 Arrivals Drive and Departures Drive Roads:** Programming level estimate based on square foot costs for replacement of T2 Arrivals Drive and Departures Drive at-grade roadways. The limits extend from LIB, including portions of Air Cargo Road at T2, to exit roadway intersections at LIB, excluding the T2 Departures Drive Bridge (see RB04). The pavement area is approximately 48,000 square feet. The reconstruction includes associated roadway features, such as pavement markings, signing, lighting, and drainage and an allowance for complexity due to construction phasing and overlapping elements including the parking garage. Reconstruction (Replacement) of Terminal 2 Roads and Bridges is assumed to take place at the same time. Replacement costs are forecast beyond FY2031 since estimated remaining useful life for this component is greater than 10 years.
- **FCA-RB04-T2, Terminal 2 Departures Drive Bridge:** Programming level estimate based on square foot costs for replacement of the Departures Drive Bridge including an allowance for complexity due to construction phasing and overlapping elements including the parking garage. Reconstruction (Replacement) of Terminal 2 Roads and Bridges is assumed to take place at the same time. Replacement costs are forecast beyond FY2031 since estimated remaining useful life for this component is greater than 10 years.
- **FCA-RB05-LIB, LIB Reconstruction:** Programming level estimate based on square foot costs for reconstruction includes at-grade roadway sections of LIB from the Cypress Road intersection

west of T1 to approximately 750 feet east of the T2 intersection of Air Cargo Road and LIB. The reconstruction does not include bridges (see RB06). The pavement area is approximately 844,000 square feet. The reconstruction includes associated roadway and intersection features, such as pavement markings, signing, lighting, signals, and drainage and an allowance for complexity due to construction phasing. Reconstruction (Replacement) of LIB and LIB Bridges is assumed to take place at the same time. Costs are forecast for FY 2027 to 2031 since estimated remaining useful life for this component is greater than 5 years.

- **FCA-RB06-LIB, Replace LIB Bridges**: Programming level estimate based on square foot costs for replacement of the LIB Bridge over Airflight Drive and the Garage Entrance Bridge with an allowance for complexity due to construction phasing. Reconstruction (Replacement) of LIB and LIB Bridges is assumed to take place at the same time. The LIB over Coldwater Creek Bridge is not included Costs are forecast for FY 2027 to 2031 since estimated remaining useful life for this component is greater than 5 years.
- **FCA-SE01-G**, **Remove spalled concrete and corroded rebar from terminal utility tunnel. Patch in new steel reinforcement and concrete:** This item is for recommended repairs to areas within the tunnels where the concrete structure exhibits spalling, delamination, and/or exposed and corroded steel reinforcement. This condition is more prevalent in the older structures such at Terminal 1 and Concourse A. A typical repair to this type of distress involves removing the loose/spalled concrete, removing any corroded or damaged steel reinforcement. The area is then repaired with a fast setting grout mixture with steel dowels where needed. Based on a visual evaluation of the tunnels the following areas where estimated to need repairs at each building:
    - Terminal 1: 6000 SF
    - Concourse A: 2000 SF
    - Concourse B: 1000 SF
    - Concourse C: 2500 SF
    - Concourse CX: 1000 SF
    - Concourse E/T2: 100 SF
- **FCA-SE02-T1, Perform an in-depth evaluation and analysis into the cause and source of moisture into the T1 Tunnel:** This item is for recommended further evaluation of the tunnel beneath Terminal 1. It was reported by representatives from the climate control department that significant moisture intrusion occurs during or after rainstorms in the tunnel. The recommended evaluation would be to determine the cause of the moisture intrusion and provide recommendation from remediation and repair.
- **FCA-SE03-D, Brace the leaning foundation walls at the three subgrade mechanical room locations:** This item is for recommended repairs to the foundation walls in three subgrade mechanical rooms along the apron level of concourse D. During the supplemental structural evaluation of concourse D it was noted that three mechanical room exhibit inward leaning foundation walls. The three locations are from column lines 113 – 114, 136 – 138, and 180 – 182 for an approximate of 100 lineal feet of wall. The repair should consist of installing steel supports vertically at 4’ on center to brace the wall from further movement. Additionally, the flatwork directly at the exterior of the concourse adjacent to these locations should be replaced as many locations are settled and negatively sloped.
- **FCA-SG01-G, Perform epoxy grout injection into cracked slabs on grade. Remove spalled/deteriorated concrete and resurface:** This item is for recommended repairs to the concrete slabs-on-grade at the apron levels and at the exterior of the buildings where the concrete is cracked/fractured, spalled, and/or deteriorated and serviceability has been diminished. Repairs would include resurfacing spalled concrete, epoxy injecting fractures, and in some instanced removing and replacing potions of a slab. Based on a visual evaluation of the

tunnels the following areas where estimated to need repairs at each building:

- Terminal 1: 1000 LF cracked, 4000 SF resurface, 1500 SF replace
- Concourse A: 1200 LF cracked, 3000 SF resurface, 1500 SF replace
- Concourse B: 500 LF cracked, 100 SF resurface, 300 SF replace
- Concourse C: 800 LF cracked, 2000 SF resurface, 700 SF replace
- Concourse CX: 600 LF cracked, 1000 SF resurface, 300 SF replace
- Concourse D: 1000 LF cracked, 4000 SF resurface, 1200 SF replace
- Concourse E/T2: 200 LF cracked, 1000 SF resurface, 300 SF replace

- **FCA-SS01-T1, Repair three columns in T1: Shore adjacent concrete framing, remove damaged concrete and replace with fast setting concrete mortar or epoxy injection:** This item is for recommended repairs to three observed columns that have significant fracturing of the concrete. The repair includes shoring the surrounding structure, removing the damaged concrete until sound concrete is reached, replacing any corroded or damaged steel reinforcement, and patching the column with fast setting grout. It should be noted that each column will need to be thoroughly evaluated prior to the final repair recommendation.
- **FCA-SS02-T1, Provide steel protective sleeves or bollards at abraded columns in T1:** This item is for recommended steel protective sleeves to be installed around concrete columns that are near or adjacent to vehicle traffic. During the site visits it was note that many concrete columns exhibited abrasions from what appeared to be vehicle impact and in isolated locations larger chunks of concrete had been dislocated from the column. The steel sleeve would serve a protective measure to avoid an major damage to the columns from the services vehicles. Based on visual observations, it is estimated that approximately 50 columns need a protective sleeve.
- **FCA-SSO3-G, Grind away corrosion and paint steel members that exhibit corrosion with weather proofing paint:** This item is for recommended repairs to areas of steel structural frame that is exposed to the elements and exhibits corrosion. Repairs to this distress include grinding away the corroded steel and sealing/painting the steel to protect and prevent further corrosion. In some cases, bolted connections or weld may need to be replaced. Based on a visual evaluation of the tunnels the following areas where estimated to need repairs at each building:
  - Terminal 1: 250 LF, 2 connections
  - Concourse A: 400 LF, 5 connections
  - Concourse B: 150 LF, 2 connections
  - Concourse C: 400 LF, 5 connections
  - Concourse CX: 250 LF, 2 connections
  - Concourse D: 150 LF, 2 connections
  - Concourse E: 150 LF, 2 connections
  - Terminal 2: 600 LF, 8 connections
- **FCA-SS04-T1G, Terminal 1 Garage Structural Repairs as outlined in the EDM report:** This item is for the recommended repairs to the Terminal 1 parking garage as outlined in the EDM report dated November 25, 2018. During the site visits, the distress outlined in the report was generally confirmed. There was no issues or disagreements with the outlined recommendations upon reviewing the report. Additional cost was added to account for current 2020 costs and for the potential of some of the distress to have advanced since the EDM evaluation.
- **FCA-SS05-T2G, Low priority structural fixes laid out by EDM Report:** This item is for the recommended repairs to the Terminal 2 parking garage as outlined in the EDM report dated November 25, 2018. During the site visits, the distress outlined in the report was generally confirmed. There was no issues or disagreements with the outlined recommendations upon reviewing the report. Additional cost was added to account for current 2020 costs and for the potential of some of the distress to have advanced since the EDM evaluation.

- **FCA-SW1, Stormwater Pump Station Housing and Piping Repairs:** The pump housing for the three stormwater pumps and all above grade piping for the pump station are corroded based on visual inspection on June 22, 2020. This estimate includes sandblasting and recoating of the three stormwater pump housings and all above grade piping in the next two to five years.
- **FCA-SW2, Stormwater Pump Station Housing Gasket Replacement:** The gasket for each of the pump housings for the three stormwater pumps is failing based on visual inspection on June 22, 2020. This estimate includes replacement of the gasket for the three stormwater pump housings in the next year.
- **FCA-SW3, Stormwater Pump Station Dewatering Pump Replacement:** Replacement of the dewatering pump for the stormwater pump station is based on the pump age of 22 years and the need to be rebuilt in 2010 as provided by the Airport maintenance service provider. This estimate includes complete replacement of the pump and impeller in the next two to five years.
- **FCA-SW4, Stormwater Pump Station Pump Impeller Replacement:** Replacement of the stormwater pump impeller for all three (3) primary stormwater pumps is based on the 22-year age of the impellers. The projected replacement timeframe is 10 to 15 years based on a limited amount of wear shown in photos and the limited usage of the pumps as provided by the Airport maintenance service provider for the pump station.
- **FCA-SW5, Stormwater Pump Station Hatch Replacement:** The hatch for the dewatering pump wet well is not operational based on visual inspection on June 22, 2020. This estimate is for replacement of the hatch in the next two to five years.
- **FCA-SW6, Stormwater Pump Station Wet Well and Valve Vault Rehabilitation:** The pump station wet well, dewatering pump wet well, and valve vault are in excellent condition as rated by the Airport maintenance service provider. Rehabilitation of these concrete vault structures by applying a structural epoxy coating in the next 10 to 15 years will extend the life of the existing pump station.
- **FCA-LV01, Pathway Infrastructure Improvements:** Upgrade cabling pathways infrastructure including the following: Remove abandoned low voltage cable, provide additional conduit, and cable tray pathways, provide fire stopping. Budget numbers are based upon historical knowledge from past renovation projects. Also considered is the potential reuse of existing pathways and use of cabling and conduit from the 2005 Infrastructure Upgrade Project. Price reflects additional pathway infrastructure for areas of improvement, code compliance, and future needs. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-LV02, Telecom Room Upgrade (10 rooms):** Renovate Telecom Rooms including the following: Remove old un-used equipment in racks, improve lighting, add wire management in racks, clean rooms, provide equipment identification, provide cable management system software, replace UPS rack mounted units. Price is for 10 Telecom Room. Budget numbers based upon Historical knowledge from past projects that included Telecom Room Renovations. Price reflects 10 TR rooms of similar size and scope of work. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-LV03, Public Address System Upgrades and Expansion:** Public Address System Upgrades including the following: Additional of hearing loops in Ticketing and Hold Rooms for compliance with the ADA and upgrade of paging microphones. Based upon related airport past project costs and updated for alternative MUFIDS visual paging interfacing. Paging mics based on minimal equipment and estimated labor for equipment. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-LV04, MUFIDS So0ftware and Servers:** Multi-User Flight Information Display System Upgrades including the following: New MUFIDS hardware, virtualized servers, and computer

workstations, MUFIDS database and client workstation software. Based upon related airport past project cost and updated for the Facility MUFIDS servers and software, and associated cabling. WSP CapEx breaks pricing out for T1 and T2.

- **FCA-LV05, Fire Alarm System Upgrades, Phase 1:** Fire Alarm System Upgrades including the following: Update the Notifier FAS Panels to current Notifier version. Based upon carry over from previous STL RFP.
- **FCA-LV06, Fire Alarm System Upgrades, Phase 2:** Fire Alarm System Upgrades including the following: Update of field devices, visual and annunciating devices, and ADA compliance. Based upon industry experience, as well as information provided by the hardware/software vendor. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-LV07, Replace Crash Phone:** Tower Crash Phone System Replacement. Based upon minimal equipment replacement and estimated labor for equipment and cabling. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-LV08, Public Address System Upgrades and Expansion:** Expand PA to Ramp and Parking Garages. Based upon carry over from previous STL Recommendation. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-LV09, SAN Replacement:** CCTV Expansion, Replace SANS. Based on previous numbers included in STLAA CapEx.
- **FCA-LV10, Expand and Upgrade CCTV:** Based on previous numbers included in STLAA CapEx program. No relevant data on camera expansion was provided.
- **FCA-LV11, MUFIDS Software and Servers:** MUFIDS - T2 structures, T1 large display. Based upon carry over from previous STL Recommendation. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-IT01, Dell End of Life Servers:** This STLAA CapEx recommendation was part of a previous initiative.
- **FCA-IT02, Upgrade Fiber Backbone, Capacity and Redundancy:** This STLAA CapEx recommendation was part of a previous initiative.
- **FCA-IT03, Replace Firewall Infrastructure:** This STLAA CapEx recommendation was part of a previous initiative.
- **FCA-IT04, Disaster Recovery Site Equipment Replacement:** This STLAA CapEx recommendation was part of a previous initiative: Reed may need to validate these numbers.
- **FCA-IT05, UPS Replacements:** This STLAA CapEx recommendation was part of a previous initiative.
- **FCA-IT06, Infrastructure Upgrade:** Infrastructure Routers and Switches. The budget numbers were developed from the total cost of devices, with the internal cost for labor/setup/configuration necessary to implement. This is a direct replace, so no design or special treatment was included.
- **FCA-IT07, Asset Management Program:** "Formal Asset Management Program (Also see HV01)". This cost is derived by considering the time, software, and efforts needed to design, build, discover, train, assess, and deploy a newly developed program from the ground up.
- **FCA-IT08, Non-Infrastructure Asset Control and Management:** Non-Infrastructure Asset Control and Management. Budget numbers created from direct cost replacements with licensing as applicable.
- **FCA-IT09, Application Operations Upgrade:** IT Application Operations. Based on experience and knowledge of software development and costs associated with previous projects with the scope of work necessary to increase the CityWorks/DTN/Financial application capabilities, etc. This reflects the anticipated cost of adding capabilities to CityWorks as described in the report.
- **FCA-IT10, Lifecycle Management:** IT Operating Systems. Budgets based on direct cost

replacements with licensing as applicable.

- **FCA-IT11, IT Security Enhancement Initiative:** IT Security Enhancement Initiative. Budget costs were derived by considering the time, software, and efforts needed to design, build, discover, train, assess, and deploy a newly developed IT security program from the ground up.
- **FCA-IT12, Airport Hardware Upgrade:** Airport IT Hardware Upgrade. Budget costs reflect equipment pricing and design/bid/build for replacement and upgrade of the existing wireless infrastructure.
- **FCA-SC01, Upgrade Security System Software:** Upgrade Access Control and Video Management System software to most current supported version. Contacted software vendor. Included software and installation only. Server/storage upgrades carried in IT estimates.
- **FCA-SC02, Enhance Intellisoft Functionality:** Update IDMS software to provide automated DAC processing and paperless badge applications. Contacted software vendor for estimated budget numbers.
- **FCA-SC03, Add ACS Functionality to Passenger Bridges:** Extend ACS to passenger boarding bridges. Based on industry experience at other airports, reflecting their costs/gate for adding passenger bridges. WSP CapEx breaks pricing out for T1 and T2.
- **FCA-SC04, Add Thermal Imaging Cameras to Airfield:** Supplement airfield surveillance with thermal cameras. Based on industry experience. Some cost synergy with PIDS.
- **FCA-SC05, Perimeter Intrusion Detection System:** Implement perimeter intrusion detection system. Industry experience (San Jose) Security master plan to guide first deployment areas based on highest risk. Some cost synergy with fiber optic distribution to ACS beam sensors.
- **FCA-SC06, Security Master Plan** - IT security assessment, perimeter assessment. Industry experience with the security master planning process for many other airports.
- **FCA-SC07, Update VMS Software:** Upgrade VMS Software. See SC01 above.
- **FCA-SC09, Expand and Upgrade Access Control**: fire doors, hardware, boarding bridge doors, finger print. This STLAA CapEx recommendation was part of a previous initiative.

MARKUPS APPLIED TO ESTIMATED CONTRACTOR PRICE TO OBTAIN ESTIMATED PROJECT COST

- **Hard Construction Costs** – Costs that are included in the Contractor's Construction Contract Award Price:
  - Estimated Contractor (Subcontract) Pricing – These are the costs of labor, materials, equipment, overhead and profit that a subcontractor will "Bid" to the General Contractor. From an RS Means Cost Estimating Perspective, these are the totals per bid line item (which includes all these markups).
  - Escalation – to the mid-point of construction. (subcontract pricing x calculated escalation rate).
  - Special Conditions – Is a markup to cover unusual items such as: the added cost of having labor, materials and equipment to go through a security checkpoint; the requirement to work off-hours that impacts labor cost; the inefficiency cost of having to work out in the open with the general public. ((subcontractor pricing + escalation) x Special Conditions % (use 0 to 10%))
  - Contractor Overhead (General Conditions) – This is the cost of doing business and includes Office Overhead and Site Overhead. The Office Overhead pays for the GC's home office expenses (rent, equipment, overhead labor & benefits, etc.). The Site Overhead includes the cost of the contractor's temporary facilities: trailer, storage trailers, portable toilets; site construction staff: project manager, project engineer, office engineers, superintendent,

laborers; equipment: trucks, dumpsters, small tools, material hoist, skid steer, temporary water, temporary electric, temporary waste collection, etc. (subcontractor pricing + escalation + special conditions) x Contractor Overhead (assume 15 to 30%).
There is no one size fits all approach for Overhead (or General Conditions); it may be safe to assume 20% of Subcontractor Pricing for a reasonably big job. For smaller
jobs one might calculate a monthly amount for the project and then back-in the %value.

- Contractor Bond and Insurance – bond is typically 1% +/-, insurance 1.5% +/-
- Contractor Profit – will range from 3 to 20% depending on risk, complexity of work and market forces. ((subcontractor pricing + escalation + special conditions + overhead) x profit %).
- Construction Contingency – assume 10% for renovation, 3% for new construction. ((subcontractor pricing + escalation + special conditions + overhead + profit) x construction contingency %).

➢ **Soft Costs** – Other costs associated with completing the project and are broken down into Professional Services and Other Costs. The Professional Services costs are frequently defined as a percentage of the Hard Construction Cost

- Professional Services
  - Legal & Financial Advisor Fees
  - Site Investigation – Land Survey, Geotechnical Investigation, ACM Survey, As-Built Documents
  - Architectural / Engineering Fees
  - Construction Manager Fee
  - Peer Review Fee
  - Testing & Inspection
  - Commissioning
- Other Costs
  - A/E Expenses
  - Bid Documents Print & Distribute
  - Furniture & Equipment
  - Information Technology
  - Owner's Contingency

APPENDIX 11D – REPORTS AND DOCUMENTS REVIEWED

GENERAL

- ASTM E-2018 Standard Guide for Property Condition Assessments
- CityWorks Asset Data, June 2020 – (30) CityWorks spreadsheets for various assets
- Airline-Recommended Baseline CapEx 4-3-19
- 2020 STL CBP Study
- 2006 Airport Experience Project, Facilities Condition Assessment, David Mason & Associates
- 2008 Space by Level from STL MP Technical Document 2012
- Select Record Drawings

BAGGAGE HANDLING SYSTEMS

- STL Lambert [BHS] Assets by Terminal Systems

STRUCTURAL

- Visual Inspection and Load Rating Analysis of Ticketing Drive, April 2008, by URS Corporation and David Mason and Associates
- Visual Inspection and Load Rating Analysis of Baggage Claim Drive, March 2008, by URS Corporation and David Mason and Associates
- Brown Level Shuttle Bus Drive Structural Analysis Report, September 16, 2016, by EDM Incorporated
- Garage Assessment at Terminals 1 and 2, November 15, 2018, by EDM Incorporated
- Garage Assessment at Terminals 1 and 2, Field Survey Drawings, November 15, 2018, by EDM Incorporated

FIRE PROTECTION

- Failure Analysis of Lambert Sprinkler Pipe, Briem, 0714-401 (2014), 0714-401B (2015),
- Ultrasonic Examination of Welds, Briem Procedure BE-403 UT
- STL Climate Control spreadsheet, Equipment on BAS, Oct. 2020

MECHANICAL/ELECTRICAL/PLUMBING

- Climate Control Condition Assessment spreadsheets
- Elevator Escalator & Moving Walk Service Agreement 18-21
- New Terminal 2 Pump Station Plan Drawings, sheets dated 1996
- Maintenance Documentation and Pump Curve provided by Mechanical Maintenance Contractor (Professional Business Providers (PBP)), June 2020.
- West Main Composite Set - Electrical One-line Update and Arc Flash Study Services
- East Main Composite Set - Electrical One-line Update and Arc Flash Study Services
- PSA1064 Record Drawings T1 2014 renovation – combined
- STL Generator Maintenance Annual Report 2019
- ANSI-NETA-ATS-2009 Testing standards for electrical equipment

SECURITY, IT, AND LOW VOLTAGE/PATHWAYS/MUFIDS

- Map of gate locations
- Badge types
- ACS project drawings Vol 1 and Vol 2 (2006 R&B)
- Inventory of active network components
- 2008 Radio Equipment Upgrade project drawings
- MUFIDS 2004-FA-PA 2018 project drawings
- 005 Communications infrastructure upgrade drawings (R&B)

ROADS & BRIDGES

- 2006 Airport Experience
- 2008 T1 Baggage Claim Dr Inspection and Load Rating
- 2012 STL ALP
- 2008 T1 Ticketing Dr Inspection and Load Rating
- 2013 T1 Baggage Claim Dr Column Reinforcing
- 1984 T1 Enplaning Roads
- 1985 T1 Exit Roads
- 2010 T1 Ticketing Drive Joint and Column Repair
- 1983 Access Roadways Ph 1
- 1987 Access Roadways Ph 2
- 1991 Access Roadways Ph 3
- 1996 T2 Construction
- 2010 T1 Structural Calculations for Baggage Claim Dr Load Rating
- 2015 LIB over Airflight
- 2020 Draft MoDOT Bridge Inventory

APPENDIX 11E – MEETING MINUTES

BUILDING MAINTENANCE

Minutes – Meeting: Subject Matter Expert Interviews

Building Maintenance

June 30, 2020 (8:40am-10:00am)

Lindbergh Conference Room / Zoom Webinar

INTRODUCTIONS/ATTENDANCE

- STLAA: Ron Stella (Z), Angel Ramos (Z), Neil Stender (Z), Trevor Gaffery (Z), Jan Titus (Z), Joe Ebert (Z), Ryan Barry (Z), Liz Smart, Larrone Rodgers
- WSP: Jennifer Kuchinski, David Hetlage, Nate Parker, Boen Yin, Gregg Christian, Stephanie Atallah, Catelyn Rees (Z)

(Z) indicates Zoom webinar attendee

MEETING DISCUSSION

1) New roof on A Concourse about 6 years ago
2) Tornado damage in 2011, damaged T2 and Concourse C and A roofs as well as T1
    a. Structurally evaluated – found no damage
    b. Most damage was to windows being blown out, replaced panes and seals
    c. FOLLOW-UP WITH ENGINEERING: was roof insulation replaced?
    d. Windows broke out at Concourse B, C's connection
3) On-going maintenance items include window seal replacement – performed by Building Maintenance personnel – oxidation of panels
    a. Have changed some metal panels on B and D concourse due to age
4) Replacement of some sewer and water lines on A tunnel and apron level and near concourse as part of concourse renovation.
5) Concourse A –Airport/Climate Control supplies hot water to all areas except for Host restaurants. One exception – the Airport supplies hot water to Mike Shannons (Host Restaurant) in Concourse A. Other restaurants control their own hot water – all restaurants get cold water
6) Hot water heating is by Climate Control. HX new 1 yr ago. Building maintenance services plumbing
7) Fire department won't use cabinets with hoses – left there in case occupant can use. 2 ½" hose connection is wet and for FD.
8) FAA tower has a fire pump system. The West Fire House has a fire pump system. It pumps the foam/water mixture into the fire trucks.
9) A concourse does not have secondary feed if it lost primary.
10) Concourse B – not used for aircraft operations (was used for 12 months in 2011 after tornado), now used for events and training space
    a. Roof age: replaced about 5 years ago
    b. Still some leaking – typical when someone goes to roof to work on units and punch a hole in roof, or in some cases leakages from AHU

c. AHU – some look well maintained, some not so – drain stops up and overflows
d. One AHU needs significant overhaul – Climate Control deals with AHU
e. Exterior windows – when fogging, they are replaced
f. West of op center around B10-12, exterior panels need replacement (airline vehicle backed into and damage – no structural damage)
g. Concourse B & D's restroom have not been remodeled

11) Concourse B – required to maintain, organization requirement to maintain all facilities on terminal to same standard
12) Concourse B – plumbing – piping looks to be in good shape, known problems?
    a. Exterior plumbing was changed out near a restroom just recently
    b. Plumbing from concourse to apron level also replaced due to age, restrooms were not remodeled in a while
    c. Fire protection feed being repaired now.
13) Concourse B – temperature required to be maintained in all concourses, HVAC units are "difficult" to maintain
14) Concourse C – new roof in 2011 after tornado at knuckle, then extension roof was replaced a few years later
    a. Extension was built in 1972
    b. AHUs were tossed around during tornado – steal deck/framing repairs – ask Engineering (there was a gaping hole at C16)
    c. Skylights are maintained by Building Maintenance – inspected regularly and maintained, C extension's side skylights haven't been replaced
    d. Fiberglass dome panels/skylights
    e. A portion of the roof of the C extension is a gravel ballast/rubber roof
    f. mast lights – changing out, attached to main structural column of building – will check with Electric Shop if any structural impacts
    g. Plumbing from concourse to tunnel level recently replaced at end of C, remodel last restroom near C30, brought in new water and fire service from D to C as part of this project.
    h. Fire suppression deluge system – water curtain fire protection system in lieu of fire wall – inside and exterior at C extension (only two restaurants were sprinkled, rest was deluge system – went off a couple of months ago – caused by power shutdown. Backup air compressor on emergency power – UPS on emergency systems to keep system operational) – The system is on an emergency generator and is not on the UPS back-up – The system will be placed on the UPS in the future.
        i. exterior system: activated by flame detector, some by heat detector above deluge heads – problem with system when lose compressed air, reliable? considered reliable except for loss of compressed air.
15) Concourse D – new roof 2015 from MT to ET
    a. Standard maintenance on panels, windows, skylights – keep stock of skylights for replacements
    b. 18" square vents covered over on roof? Speculate that when replaced roof, made tenants take units off and keep off? Ask Engineering.
    c. Vehicle strike and weather have damaged some exterior panels, which have been replaced
    d. D1126M foundation wall leaning inwards, concrete is cracking adjacent to the columns and the CMU wall is separating at the bearing joint. Concrete pavement/flatwork at the exterior

is settling and separating from the exterior wall – Engineering is aware of this. Same thing happening at other locations on D and West end of Terminal 2

e. Couldn't identify leaking by Metrolink on south wall in a mechanical room – right under ML platform? Roof is above the old Ozark bag area. Roof was replaced approximately 10 years ago
f. Overhang on Lambert Blvd side, irrigation system damaged wall, had to replace with concrete board, mesh – security breach point?
g. Plumbing is in poor condition from gates D8/D10 to D26, east of D26 the plumbing is in good shape
h. Along D, old TWA PC Air system abandoned (compressor and pipe system appear to be abandoned/disassembled)

16) T2 roof has been put on 6 years ago
17) Trusses at T2 Dome – Isolated corrosion at some connections as seen from the roof. Painted in 2004 and again shortly after. Routinely inspected by Engineering and BM
18) Keep stock of T1 backside windows (not front side, they are all special order) and concourse windows in storeroom
19) T1 roof, baggage level: drips by Entry 16 (not a roof leak, expansion joint over arrivals drive) – keeping watertight is difficult
20) T1: West end behind restaurant, looks like exterior coating/film – placed for sun to reduce heat, tenants' carts scratch up when bump into it.
21) T1 roof drains at valleys, all replaced when roof replaced. Taken off only just recently due to work on roof – leaking when snow accumulates, not when rains.
22) T1 baggage level – moved fire line to above ground because underground kept breaking. Only major work in that area in a while. No issues with domestic water, no structural damage to columns
23) T2 east end windows have bad seals
24) Sewage lift stations – Typical maintenance. No indication of downstream problems.
25) Larrone's biggest fear of failure: building moving at D concourse is biggest. Bones are not bad
26) Zoom attendees caught obvious stuff, nothing comes to mind that wasn't covered
27) Ron Stella: check work orders and engineering documents. WSP response: wilco, this will still be done but using SME workshop interviews to place attention on specifics rather than looking at everything, monumental effort otherwise

CLIMATE CONTROL

Minutes – Meeting: Subject Matter Expert Interviews

Climate Control

July 1, 2020 (8:30am-11:30am)

Joanne Wayne Conference Room / Zoom Webinar

INTRODUCTIONS/ATTENDANCE

- STLAA: Ron Stella (Z), Neil Stender, Trevor Gaffery, Jan Titus (Z), Joe Ebert (Z), Rick Hess, Liz Smart, Steve Gregali (Climate Control), Joe Difani (Climate Control), Angel Ramos
    - Several other phone call-ins occurred by it is not visible who these individuals are
- WSP: Jennifer Kuchinski, David Hetlage, Stephanie Atallah, Catelyn Rees (Z), Keith Wallace, Dave Loduca, Jim Hemphill

(Z) indicates Zoom webinar attendee

MEETING DISCUSSION

General

1) The Climate Control (CC) department is currently working on a spreadsheet for location and ID tags of major equipment.
2) There hasn't been any major retro-commissioning or comprehensive rebalancing work done. New projects have testing, adjusting, & balancing (TAB) done specific for the project's equipment and systems. Concourse B balancing was looked at in 2019 and was good. In 1996 an attempt for balancing Terminal 1 concourses A, B and C was done but difficult due to pressure issues with passenger boarding bridges doors open.

Climate Control

1) WSP will go to the tunnels with Stephen for detailed inspection in late July
2) Steam boiler #1 in CC East is 36 years old – Nebraska water tube boiler. Occasional leaks that are repaired; #1 on capital improvement plan (CIP) to get replaced but no date set for replacement. Water Columns on CCE boilers need repair or replacement. No issues with firebox or safety controls. Steam boiler #2 in CCE is smaller and used more.
3) Water treatment has been doing well. A steam pipe repair recently done in tunnel by CCW showed piping in good condition.
4) Controls such as monitorization on CCE watertube boilers are an issue due to age, need repair/replacement.
5) Deaerators replaced in 2018 and 2019.
6) The boiler #3 in CCW is 30 years old; CCW has 3 fire tube boilers.
7) During summer months preventative maintenance (PM) is performed on boilers – brush fire tubes, check safety valves etc.
8) Boilers: in CCE, run smaller and one larger, run about 60-70% also. Sometimes can get away with only 1 boiler. CCW plant, can run larger/water tube boiler, up over 80%, then one of the other boilers will kick on. Water tube responds faster, makes steam quicker than the fire tube.
9) The condensate tanks are in good condition. They're coated with an epoxy paint on inside.

10) Chillers in CCW are in good working condition. Chiller #3 is oldest of the 3, installed ~2001. Pumping of chilled water has been an issue potentially due to piping design. Improper pressure differential especially with chiller #3, mostly running in Hand (manual) mode and not getting a good heat transfer.
11) One chiller in CCW and CCE plants have changed to variable speed. In process of removing 3-way valves, modifying controls and balancing to get flow to extents of system. There have been problems in past with getting water to ends of concourses. Controls have been an issue, mechanically they are running well, routine repairs. Johnson Controls is the current AC Chiller repair contractor.
12) CCE chillers similar to CCW as far as working condition. Replaced thrust bearing in chiller #1 in CCE.
13) Water treatment in chillers is good – cut into chilled water lines, very well maintained – both east and west piping as aged as they are, the lines being installed in 1953, are in very good shape.
14) The CCW cooling towers are in rough condition mostly due to age. The nozzles have clogging issues with corrosion. Cottonwood has been clogging up the strainers and nozzles was an issue this spring.
15) CCW cooling towers concrete basin in poor condition. Concrete basin has a sprayed-on epoxy/rubber coating – starting to pop up. A project is in design to renovate all three towers – new coating, new fans, variable speed pumps. Outer fiberglass structure is fine, just needs paint job.
16) CCW condenser water pumps installed in 1986, rebuilt a few times. Strainer baskets rusted away.
17) The CCE condenser water pumps are new with 1 redundant.
18) CCE cooling towers overall in good condition, plans to replace a baffle. Concrete structure is good, no excessive vibration. One fan not working.
19) Cooling towers capacity: west plant has problems, tower capacity low during hot days, especially when humid. East is less temperamental but close to capacity on hot days.
20) Keep logs at how heavily loaded chillers are running?
    a. CCE: Hottest days all three at east are operating, 60-70% loaded up. Sometimes exceed that. Chilled water pumps are new.
    b. CCW: about the same. Tend to only have to run two chillers, running closer to 70% each
21) The plate heat exchangers are both working well, no leaks. Johnson Controls (JCI) maintains them under their contract. Johnson Controls (JCI) is the current AC Chiller repair contractor.
22) Control reciprocating air compressors are in good condition for their older age and have been rebuilt. Dryers and blowdown are good.
23) No other noteworthy control issues with CCE or CCW.
24) Condenser water piping for CCE – parts of system have fiberglass pipe, partially buried and partial in tunnel (there is a chase); not under a lot of pressure, but more concern if it is under pressure and not buried – leak in #1, pressure drop – discovered it was coupling at fiberglass pipe. WSP will look more into this.
25) Condenser piping at CCW – not much a concern, some rust blocking up spray heads in tower, can't find source, have a corrosion inhibitor
26) Chilled water piping – during chiller replacement projects piping looked good. CCE plant: in tunnel, line break (fiberglass line, coupling, saddle leakage – age related).
    a. A concourse larger lines are okay. Some rust from condensation at stepdowns and joints.
    b. Take off from roof tops – insulated, sometimes valves do not shut perfectly. C concourse – main runs are fine. Never noticed chilled water leaks.

c. B seems to be fine too – hard to get in this tunnel, no pipes leaking or sweating
d. D – run is on backside of mech rooms, alongside wall by LIB: a location WSP could not identify, under the Metrolink platform, in corner where tunnel comes into mechanical room, near fence, you could hear water running but couldn't tell if that is coming from roof leak, chilled water – Joe said need to replace all of that – steam line, condensate – whole pipe is a mess. Steam trap and strainer leaking. All needs to be replaced.

27) Steam and condensate:
    a. Steam lines are in good shape from recent inspections by Steve, but concern is expansion joints (just replaced several), older ball and joint type expansion joints – generally used on gas and oil pipeline. One was leaking bad (on a short run), others are in ok shape. Installed in 1953. One at a time will be replaced
    b. Reducing stations is where most of problems are, main trunk is ok.
    c. A recently fixed, condensate/steam link in C. Condensate pipe leak is biggest concern. Is located right up against a wall, difficult to get to, will have to break out a wall. Near AA breakroom. Pipe goes steel/fiberglass, and back to steel underground.
    d. East terminal – history of steam leaks on flanges, slowed down a bit when added expansion joints. Pipe was welded/flanged together. Almost a yearly thing to replace expansion joints. Not enough expansion joints when originally constructed. Now have added more over time – this year was first winter didn't have to replace a gasket. Usually had to repair 6-8 gaskets a year. Process is when one gasket blows, replace both pipe ends. If have to shut it down, get both.
28) Projects that CC wish could get done:
    a. Replace RTU's on C extension. In poor shape. WSP will look at again.
    b. Domestic Hot Water distribution system throughout – 4 heat exchangers are rather old in CCW.
    c. Water softening system in west plant – Culligan, takes month to get parts, becoming obsolete and harder for suppliers to find parts. Manufacturer does not make these parts any more
    d. CIP - Air handlers in D concourse
    e. Older Trane units under C extension (former C Concourse Customs location under Gate C28) that use R-22.
29) CIP under the next Airline Use Agreement – WSP has the "CIP Next" file, will need to request from Planning & Engineering the funded CIP file (existing CIP that is presently being worked through, only the cooler tower project remains).

<u>Terminal HVAC</u>

1) Major Equipment
    a. Large RTUs
        i. Skipping over small and medium size – assumption they are tenants' units
        ii. Concourse A:
            1. Properties unit (Terminal 1 just west of Gate 15S) needs most care, leak issues for several years. Humidification shut off. All piping needs to be replaced and insulated properly. Condensate line freezes up, cabinet has deteriorated.
            2. California Pizza Kitchen RTU was removed by Climate Control this year (2020).This RTU was abandoned in place by HMSHost. Became Airport's

responsibility. HMSHost installed their own unit on the apron level. ON design standards, now make concessions install their own units, with proper curbing to avoid leaking into roof.

3. Gets complaints from United – either hot or cold, Concourse level by Gate A10/A12 where their offices are located and in their gate areas (A18, A19 & A21). Airport has recommended to United that they install their own system for their office suite. Temperature sensors is on concourse so not picking up temperature in their offices (Tenant unit – Not STl)
4. Police unit in good condition.
5. Concourse A units installed generally in 2008. Return ducts need to be cleaned. One unit is waiting on a steam coil part.

iii. Concourse B
1. Overall units are in good condition.
2. RTU units #7 and 8 replaced just last month. RTU on ops center on CIP to be replaced.

iv. Concourse C
1. Extension – units in poor condition, large units need to be replaced (#14, 15, 16, 17 etc. 8 or 9 units total). RTU-10 shut off currently. But if we start pushing pax here, will have a hard time to get these areas comfortable
2. RTUs in older section are in good condition – installed ~2008. Clearly being maintained regularly, painted, hail damage replacements to condensers.
3. Not able to cool Lindbergh Conference adequately – combination of outside temp, sun, all the glass. May be an air flow issues, not enough capacity for size of room?
4. T1 Ambassador Club unit replaced after tornado.
5. Problematic tenant unit at C8 (AA) – fans rusted out, curbing is below roof, leaks.
6. Ramp level units – American Airlines put in own units. They installed a ductless system to serve their C Concourse Ramp Level offices and break rooms.

v. Concourse D
1. No problems on RTU's. Not many units on roof.
2. The black top roof – used to be for temporary hold room when T2 was being built but now not used, structural issue, plywood floor – not sufficient load carrying capacity – upgrade is possible with light weight concrete flooring for office space. TSA is underneath – floor of temp hold room is roof for TSA.

vi. East Terminal
1. Two units just demo'd recently
2. 18" stub ups that are capped – are column caps for future Metrolink extension. One cap is missing. Mark from STLAA called it in.

b. AHU's
i. Concourse A Apron level – modular AHUs installed ~2008.

ii. Concourse D Apron level – Central Station AHUs and HVUs are in poor condition, ~1984 installed. Maintenance costs are increasing, and units need to be replaced, end of useful life. Some are heat only, not cooling. Assessed recently with Engineering. Postponed replacement since D is closed down.
iii. East Terminal – large AHU on apron level – big one on either end, look newer. One looks like over-pressured, casing reinforced but door bowing out. Dust marks around door – can feel air flow out of door. Otherwise very reliable 5 units – piping connections some issues but units are in good shape. CC have just replaced belts and filters largely.

c. Built-up AHU
i. MT – big built up units at sub-basement, very good condition, installed 2012+/-
ii. There is one #18, 19 were installed in 1964 – also in good shape; major overhaul in 2008 (sub-basement level east end of T1). WSP to look at this again for second wave of site visits.
iii. Heating & Ventilating units 1 & 2 in baggage area: 2008 - Not maintenance or repair friendly, practically have to take units apart to repair. Coils leaking.
1. Units 3&4 less problematic but similar.

d. Steam-hot water heat exchangers are temperamental – have to replace coils or control. Sometimes steam trap needs to be replaced.
e. Domestic HW HX in CCW a bigger problem
f. Condensate return pumps mostly functional, scattered around. General maintenance (seal replacement, occasionally motor replacement) – except for one in B tunnel where sump pump failed and flooded tunnel when fire system went off.
g. Chilled water circulator pumps – On average most are in good condition. pulling out of distribution line: some look like brand new, some look to be 20 years; most are in good shape, replacing/rebuilding a fair number last few months. A Tunnel is not good, gunk all over it.

2) Controls
a. Steve to give WSP a tour of computer lab on second site visit.
b. Prior to 30 years ago Honeywell controls were on all systems. Starting 30 years ago airport moved to a LON based ESUSA multi-platform system. Moved to a BACnet system, Wonderwear. Mostly spec Schneider, American Automatrix and JCI controls. All Honeywell controls gone currently and trying to remove existing LON based (~30%) since won't work on Wonderware.
c. Pneumatic controls remain for about 10% which are working and reliable. Removing pneumatics when possible.

3) Other
a. ADF control – WSP to review more information to be provided by STLAA (Jan Titus), climate in charge of this; WSP to receive draft report from other consultants in late July. Application is airline activity, but collection is airport responsibility
b. Other glycol abandoned units or systems by tenants that may eventually become Airport's issue to remove
c. Propose a separate call with Jan Titus, Climate Control to identify demarcation of airport vs. airlines. Set up meeting after receive glycol report and conduct site visit before setting

up meeting so we can itemize that which has been abandoned. Tentatively set meeting for August.

d. Air curtains – many in bad shape. Some motors are proprietary.
e. Fuel oil system: used to control gas demand peak. Haven't bought oil since 2017 and haven't used oil in over a year. 3 underground storage tanks (UST) at CCE, total 90,000 gallons. 3 USTs at CCW, total 60,000 gallons.

4) Future wish list – informative list by maintenance? What needs to be worked on? Big wish list items: boilers in east plant. We'll compare to CIP against what is already in the works. Steve can share.
   a. Outlying buildings – boilers are shot/failed at snow melt pad (4 boilers here).
   b. Boilers at CCE plant replacement will be an issue with physical constraints.
   c. Tunnels – long range plan for piping assessment testing and replacement, concern about Unistrut not strong enough to support overhead pipes (20" diameter pipe looks like it is sagging).
   d. The Airport uses CityWorks as their maintenance management system.

ELECTRIC

Minutes – Meeting: Subject Matter Expert Interviews

Electrical

July 1, 2020 (01:00pm-03:30pm)

Joanne Wayne Conference Room / Zoom Webinar

INTRODUCTIONS/ATTENDANCE

- STLAA: Ron Stella (Z), Neil Stender, Trevor Gaffery, Jan Titus (Z), Joe Ebert (Z), Rick Hess, Liz Smart, Matt Laury (Electric Shop), Chris Hanson (Electric Shop), Angel Ramos
    - Several other phone call-ins occurred by it is not visible who these individuals are
- WSP: Jennifer Kuchinski, David Hetlage, Stephanie Atallah, Catelyn Rees (Z), Dave Loduca, Jim Hemphill

(Z) indicates Zoom webinar attendee

MEETING DISCUSSION

Lighting Systems

1) Apron lighting, the pole mounted Apron lighting was converted to LED light source approximately 5 years ago. Guarantee Electric was the contractor. Most of the building mounted exterior lighting has been converted to LED light source, done over time by the Electric shop.
   Main terminal Dome lighting was converted to LED light source in 2018, done by the Electric shop. Comment was made that the lighting level was a little dim.

2) Interior Lighting, moving towards LED light sources.
    a. Lighting in the public spaces in the terminals and concourses has been converted to LED light sources using replacement LED lamps in existing fluorescent and HID light fixtures.
    b. Some of the non-public areas in the terminals and concourses have been converted to LED sources. Conversion is an ongoing process. When a fluorescent light fails it is replaced with LED.
    c. Apron Level lighting is predominately fluorescent. When a fluorescent light fails it is replaced with LED. Terminal 1 Baggage handling area is scheduled to be converted to LED
    d. Garage lighting has been converted to LED, the lower drive at Terminal 2 has been upgraded, but the upper drive has not.
3) Lighting controls. There is no central lighting control system. A system was installed in Terminal 2 but abandoned due to poor performance. Public spaces in the terminals and concourses are generally always on switched at panels. Approximately 100 occupancy sensors have been installed for individual room control but the majority of spaces have manual light switch control.

Power Distribution

1) WSP inquired whether a comprehensive one-line diagram of the medium voltage distribution system was available. The airport indicated that there is a diagram in CityWorks but It may not be

completely up to date.

2) Arc flash studies were discussed. The Airport has commissioned two studies. The 1st study focused on the Airport terminals and concourses and was completed several years ago. There is an ongoing implementation project to correct deficiencies identified in the study. The 2nd arc flash study is scheduled to be completed by mid-July and focuses on the Air Cargo area and other buildings on the north side of the airfield. WSP requested a copy of the 1st Arc flash study.
3) Airport is unaware of any equipment with "NO PPE" arc flash labels.
4) Medium and low voltage substations are serviced every other year.
5) The older Westinghouse substations have been refurbished. The cabinets are original but internal components have been replaced.
6) Enclosures for Transformers T1 thru T6 on the Red Level parking are walk-in.
7) During the survey several of the older model Motor control centers were observed to have numerous buckets turned off and tagged. The electric shop personnel said the MCC's are in good working order and the tags were "not in use" tags.

Generators

1) Generators at Lambert are all maintained under a maintenance contract. WSP was provided a copy of the generator maintenance annual report for 2018 and 2019 produced by the Airport's generator contractor (Handed out at the meeting).
2) Generator #50 and #80 are scheduled to be replaced in the near future.
3) There is one medium voltage generator located on the Red Level of the Terminal 1 Parking Garage, all the rest of the generators are low voltage. Most of the generators utilize diesel as their fuel supply.

Open discussion

1) WSP asked if there were problem areas or "wish list" items that the Electric Shop was aware of that might not be apparent during the field survey.
   A. Utility service from Ameren is unacceptably unreliable. A recent power outage occurred in the East terminal when the tie breaker in Ameren's gear failed and the tie Breaker in the airport's gear failed. The airport repaired the tie breaker and purchased a spare.
   B. The West Substation is the second oldest substation at the airport and should be modernized. Substation 47 is the oldest.
   C. A desire was expressed to have more equipment on generator backup.

APPENDIX 11F – SUPPLEMENTAL STRUCTURAL ASSESSMENT REPORT

Appendix F – Supplemental Structural Assessment Report

CONCOURSE D FOUNDATION EVALUATION

DRAFT

October 12, 2020

Jerry Beckmann
Deputy Director – Planning & Development
Saint Louis Lambert International Airport
10701 Lambert International Boulevard
Saint Louis, Missouri 63145

Re: Concourse D - Foundation Evaluation

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AUTHORIZATION AND PURPOSE

WSP was authorized by Mr. Jerry Beckmann, Deputy Director - Planning & Development with the Saint Louis Lambert International Airport (Airport), to evaluate the foundations at the concourse D and a portion of concourse E. Specifically, WSP evaluated the foundations between column lines 102 to 214. During the initial site visits for the Facility Condition Assessment (FCA), WSP observed signs of foundation movement at the apron level of concourse D. During the SME interviews following the FCA site visits it was noted that there was concern for further building movement at concourse D. WSP was asked to perform a more detailed evaluation the foundations in order to determine the extent of the distress, determine the possible cause of the distress, and to recommend possible methods for remediation, if necessary.

DESCIPTION OF STRUCTURE

The concourse D structure is framed with steel beams and columns with lateral support provided by moment frames. The roof is supported by a steel truss system with a steel roof deck. The floor at the apron levels are a concrete slabs-on-grade and the concourse floor is a composite concrete and steel floor system. The structure is founded on spread footings of varying sizes and varying depths. The apron level features various mechanical rooms which have floors below grade/apron level. There are shallow bearing foundation walls between the columns that support the exterior CMU masonry walls. The structural as-built plans were not available for review at the time of this writing.

SCOPE OF INVESTIGATION

During the additional site visits to further evaluate the foundations of concourse D and a portion of concourse E between column number 102 and 214, WSP visually evaluated the exposed portions of the foundations, the superstructure columns and all other structural components that were visible at the apron level. WSP conducted a plumbness survey of the columns and the exposed shallow bearing foundations at the mechanical rooms. Additionally, WSP used floor plans of concourse D provided by the Airport to perform a field sketch to map the observed distress. It should be noted that only the north exterior wall at the apron level (facing the apron) was observed during the site visit. The south exterior is adjacent to Lambert International Boulevard, so it was not accessed. There concourse level was not assessed because this survey was primary focused on the foundations and columns. Accessing the concourse level would've provided little value to the survey.

OBSERVATIONS

Photographic documentation and other field-obtained data of the structure are being maintained in WSP's file. Select photographs are included within the body of this report and provided for information only or for a general representation of the condition of the structure. During the site visit on September 9, 2020, WSP observed the following:

- Corrosion of the light-gauge steel wall framing at the storage room beneath the Metrolink platform at the west end of concourse D. The corrosion was at the south exterior wall between column lines 107 and 109;
- Inward deflection of the shallow bearing foundation wall in the mechanical room between column lines 113 and 114. The foundation wall was fractured at both sides adjacent to the column footings. The CMU wall which was supported by the concrete foundation wall was separating at the base and leaning in the opposite direction;
- Settlement of the exterior flatwork adjacent to the north side of the building between column lines 113 and 114. In several areas the payment was sloped back toward the structure;
- An exterior fire-escape stairwell structure directly adjacent to the settled flatwork and leaning foundation wall;
- Similar inward deflection of the shallow bearing foundation wall at the mechanical room between column lines 136 and 138. The adjacent exterior pavement was not settled at this location, however, there was an exterior fire-escape stairwell structure directly adjacent to the leaning foundation wall;
- Similar inward deflection of the shallow bearing foundation wall at the mechanical room between column lines 180 and 182. The adjacent exterior pavement was slightly settled at this location with one spot sloping back toward the structure. There was also an exterior fire-escape stairwell structure directly adjacent to the settled flatwork and leaning foundation wall;
- Various locations of settled concrete flatwork adjacent to the structure between column lines 204 and 210. Slope measurements of the flatwork indicated that flatwork was sloping towards the structure.

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PLUMBNESS SURVEY

WSP obtained plumbness measurements of the exterior walls with a MD Building Products® SmartTool™ level instrument. Plumbness measurements are indicated on sheets provided in the **Illustrations** section. A reading of 90.0° indicates that the element is true and plumb with the vertical, whereas each 0.1° difference from 90.0° is equivalent to slightly more than 1/12 inch change over four feet (i.e. 89.7° is approximately 1/4- inch out-of-plumb over four feet). The plumbness measurements obtained by WSP ranged from 87.3° to 90.0°.

At the beginning of the survey starting near column line 102, plumbness measurements were taken at every column. Due to the consistency of the measurements, WSP transitioned to taking measurements at every other column line towards the middle of the survey. At each column two measurement were taken perpendicular to each other in order to determine if the column was leaning in any direction. Most measurement were taken on the surface of concrete protective enclosures and not directly on the steel column itself. Where possible, WSP did take measurement directly on the steel columns. WSP's plumbness measurements on the columns typically ranged from 89.7° to 90.0° which indicated plumb conditions. There were a few instances where isolated measurements were lower such as 89.5° which are considered outliers. The survey of the columns indicates no movement of the superstructure at concourse D.

The plumbness measurements at the leaning shallow bearing foundation walls in the mechanical rooms ranged from 87.3° to 90.0°. The worst measurement was between column line 113 and 114 at 87.3° which is approximately 2-1/4" out-of-plumb. The plumbness readings verified the visual observations of the leaning walls between column lines, 113 – 114, 136 – 138, and 180 – 182.

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ANALYSIS AND CONCLUSIONS

Based on a visual evaluation of the structure, the mapping of distress and the plumbness survey, WSP is of the opinion that there is no movement of the superstructure at concourse D. The plumbness survey indicated that all the measured columns were plumb and/or within normal construction tolerances. If there was any movement of the superstructure, WSP would have expected to see plumbness low readings at multiple columns showing a similar pattern of direction movement. Those patterns were not present at the columns at concourse D.

WSP observed local movement of shallow bearing foundation walls which support exterior CMU partition walls at three mechanical rooms. The evidence of movement includes visual leaning of the walls, cracking/fracturing of the concrete walls, and plumbness reading indicating inward leaning of the walls. This condition was isolated to three mechanical rooms located at the flowing column lines: 113 – 114, 136 – 138, and 180 – 182. The leaning wall between columns 113-114 was the most severe. All the locations should be braced in order to minimize future movement and distress. Additionally, all locations should be routinely monitored to make sure the movement doesn't persist. No bracing or other action such as drilling helical anchors to restore original wall positions at these locations is necessary at this time. However, such measures might be employed if Concourse D is to return to full use.

WSP is of the opinion that the movement is likely the result of induced lateral pressure and/or surcharge loads on these walls. These loads can come from:

1. Bearing pressures under stairwell footings creating large surcharge pressures on wall.
2. Settlement of apron paving from inadequate subgrade compaction resulting in ponding water at the wall.
3. Low areas created by excavation and inadequate backfill compaction and paving repair around stairway foundations, again allowing ponding water.
4. Some combination of these items.

The negative slope or settled pavement patch can allow for excess moisture from rain and/or snow to infiltrate the soils directly adjacent to the structures. Increased moisture in the soil can increase the active pressure or pressure buildup if frozen and cause the foundation walls to lean inward. WSP noted that the leaning condition is always adjacent to a stairwell structure. Structural plans of the stairwells were not available to WSP at the time of this study, and as such have not been reviewed. A review of these plans will determine whether these structures are on shallow foundations. If that is the case, this could be a cause of high surcharge pressures noted above.

REPAIR RECOMMENDATIONS

WSP recommends the following to stop the furthering of movement at all three locations where the shallow bearing foundation walls are leaning:

- Install vertical C channel steel braces from 1' from the bottom of the foundation wall to approximately 8' up on the CMU wall at 4' on center;
  - The C channel should be attached with concrete expansion anchors at the top and bottom;
  - At the top connection, the CMU cells should be fully grouted prior to the installation of the expansion anchors;
- Remove and replace the settled and negatively sloped flatwork adjacent to the leaning foundation walls and between column lines 204 and 210.

Should the above recommendations be performed, WSP recommends a licensed engineer design the exact sizing and configuration of the repairs.

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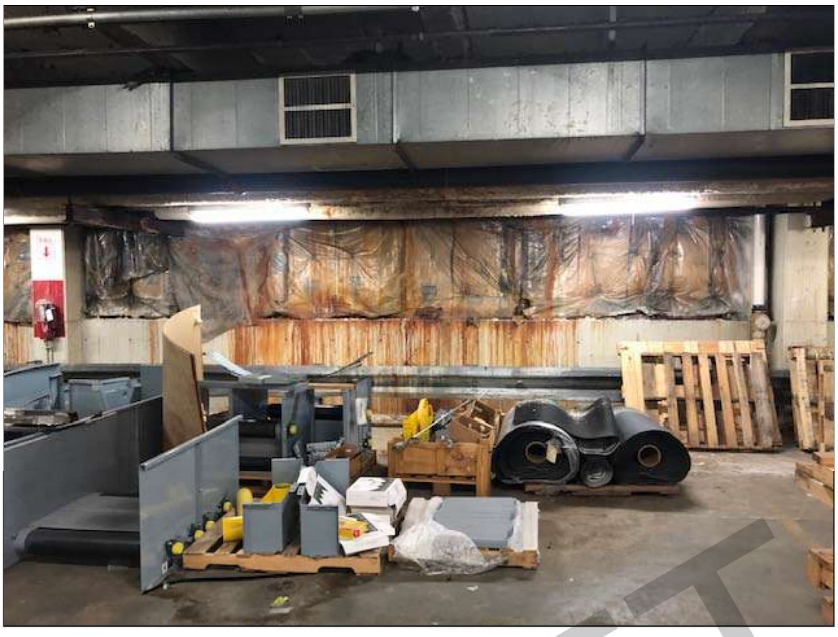

And Photo 1: Corrosion at light-gauge steel framing between column lines 107 and 109

Photo 2: Overall view of typical shallow bearing foundation wall in mechanical room between column line 160 and 162

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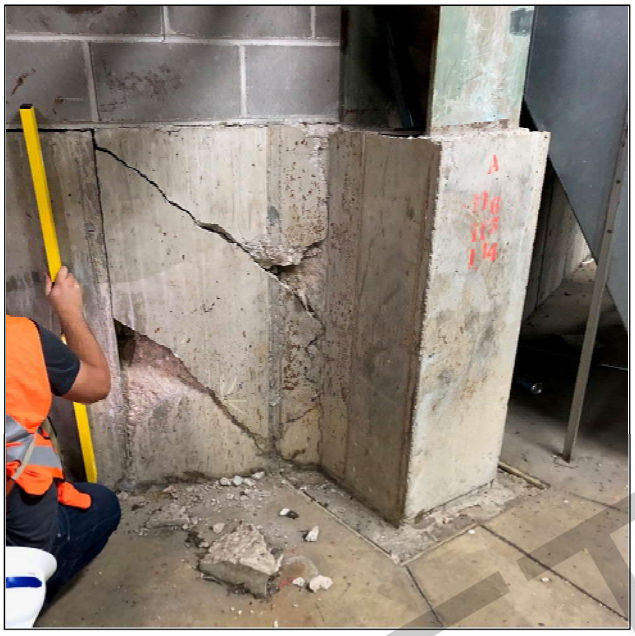

Photo 3: Fractures in leaning foundation wall adjacent to column footing at column line 114

Photo 4: Settled, fractured and negatively sloped concrete flatwork at the exterior adjacent to leaning foundation wall in **Photo 3** between column lines 113 and 114

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Photo 5: View of typical exterior stairwell structure at column line 136

Photo 6: Fractured concrete flatwork between column line 204 and 210

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APPENDIX 11G – FIRE SPRINKLER TESTING REPORT

Appendix G – Fire Sprinkler Testing Report

FIRE SPRINKLER TESTING

DRAFT

PSA 1241 – St. Louis Lambert Airport Fire Protection Sprinkler Piping Testing
Report of Findings
January 15th, 2021

FIRE PROTECTION SPRINKLER PIPING

Summary

Ultrasonic testing was performed on fire protection sprinkler piping Briem Engineering to evaluate the condition of fire protection piping since testing was last performed in December 2015. Ultrasonic inspections were performed on piping that did not have ultrasonic indications of corrosion in the 2015 inspection. Visual inspections were performed on piping that did have ultrasonic indications for corrosion in the 2015 inspection.

The ultrasonic test results indicate that new piping corrosion has occurred where corrosion had not previously occurred in the same locations that were tested 5 years ago.

- No expansion of corrosion was demonstrated by testing in Concourse A, B or C, but pipe leakage observed in Concourse A indicates further deterioration of piping that had corrosion in 2015.
- Some expansion of corrosion was demonstrated by testing in Terminal 1, and pipe leakage observed in Terminal 1 indicates further deterioration of piping that had corrosion in 2015.
- Expansion of corrosion was demonstrated by testing in the east end of Concourse D.
- Expansion of corrosion was demonstrated by testing throughout Concourse E which did not exhibit corrosion in 2015. Pipe leakage was also observed in Concourse E.

The water sample lab analysis identified the presence of magnetic deposit material in all the samples indicating that corrosion is actively occurring and identified conditions that permit scaling where deposits can form on the inside of the pipes. The report identifies under deposit corrosion as the leading cause of pinhole leaks within fire protection systems.

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Introduction

Non-destructive ultrasonic shearwave longitudinal weld testing was performed on fire protection (FP) sprinkler piping at St. Louis Lambert Airport by Briem Engineering (Briem) on 11/30/2020, 12/1/2020 and 12/2/2020. The purpose of this weld testing is to provide an updated report of the condition of FP piping since testing was last done by Briem Engineering in December 2015 (Briem report 0714-401b). The longitudinal welds are evaluated due to a study of the FP piping by Burns & McDonnell in October 2014 that determined the method of failure of FP piping that had failed was corrosion accelerated in the longitudinal welds of electric resistance welded FP pipe. More than 10,000 feet of similar sprinkler pipe is in service in the utility tunnels.

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Fire protection sprinkler piping water samples were taken by Engineered Fire Protection (EFP) on 12/23/2020 at 8 locations and were sent to a testing lab. The purpose of the water analysis is to determine whether water conditions inside the sprinkler piping accelerate piping corrosion. Testing is as recommended in NFPA 13 – Standard for the Installation of Sprinkler Systems, 2019 edition.

Historical Background

The December 2015 Briem report 0714-401b covered 79 sprinkler pipe test locations throughout the terminal and concourse tunnels, and identified 37 locations with ultrasonic indications of weld corrosion and 42 locations with no indication of weld corrosion as shown in the following data from the Briem report:

BRIEM 2015 ULTRASONIC INSPECTION RESULTS

INSPECTION LOCATION	NO. OF LOCATIONS W/ NO CORROSION INDICATION	NO. OF LOCATIONS W/ CORROSION INDICATION	TOTAL NO. OF LOCATIONS TESTED
Concourse A Tunnel	6	5	11
Concourse B Tunnel	5	4	9
Concourse C Tunnel – East	6	4	10
Concourse C Tunnel - West	2	3	5
Concourse D Tunnel	10	9	19
Concourse E (East Terminal) Tunnel	5	0	5
Main Terminal Apron Level	3	0	3
Main Terminal Tunnel East	1	4	5
Main Terminal Tunnel West	4	8	12
Total tests	**42**	**37**	**79**

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The shearwave testing performed by Briem evaluates corrosion in the longitudinal electric weld in the pipe. This shearwave test was performed on pipe 6" and larger in the tunnel areas of each building and 2 locations on the Apron level. Smaller diameter pipe was not tested as the shear wave method requires 3" or larger diameter pipe. Additionally, the method of corrosion was found to be caused by the weld acting as a sacrificial anode. The larger pipes have a proportionately larger cathode in the remaining wall of the pipe, so the weld corrosion is expected to progress faster in larger pipes. The type of corrosion along the electric resistance weld (ERW) is known as grooving or selective corrosion where accelerated metal loss occurs compared to the rest of the pipe material.

2020 Fire Protection Sprinkler Piping Testing

The FP piping tested in December 2020 was performed by Briem at the same 42 locations where corrosion was not found in the 2015 tests. Visual inspections were done at the same 37 locations where corrosion was found in the 2015 tests. In addition to retesting the previously tested locations with no indication of corrosion, 10 additional localized tests on pipes 3" and larger were performed. Two (2) additional continuous weld tests on pipe segments 10 feet long were done. These continuous tests were performed on select pipe segments not included in the 2015 testing and allows for more thorough evaluation of corrosion than localized tests. The Briem report is in Exhibit A.

The tests and inspections were performed by an American Society for Nondestructive Testing (ASNT) Level II certified technician. The indication of weld corrosion in previously uncorroded pipe will be an indicator of further corrosion and the effectiveness of

any treatment over the past 6 years since the previous tests. Shearwave testing is not able to determine whether previously detected corrosion has progressed since 2015, so the 37 locations where grooving corrosion was indicated in the pipe welds in 2015 were only visually inspected for any visible signs of corrosion and leaks.

The 2020 ultrasonic tests identified 15 locations with indications of weld corrosion. Of those, 10 were in locations where no corrosion was indicated in 2015, and 5 were in locations not previously tested. The 2020 tests identified 37 locations with no indication of weld corrosion. Summary results are shown in the table below, and indicated on the tunnel test location plans in Exhibit C.

BRIEM 2020 ULTRASONIC INSPECTION RESULTS

INSPECTION LOCATION	NO. OF LOCATIONS W/ NO CORROSION INDICATION	NO. OF LOCATIONS W/ CORROSION INDICATION	TOTAL NO. OF LOCATIONS TESTED
Concourse A Apron	1	0	1
Concourse A Tunnel	6	0	6
Concourse B Tunnel	5	0	5
Concourse C Apron	1	0	1
Concourse C Tunnel West	3	1	4
Concourse C Tunnel Extension	6	0	6
Concourse D Apron	0	1	1
Concourse D Tunnel	7	4	11
Concourse E (East Terminal) Tunnel	3	6	9
Main Terminal Apron Level	2	1	3
Main Terminal Tunnel East	1	0	1
Main Terminal Tunnel West	2	2	4
Totals of localized tests	**37**	**15**	**52**
Main Terminal Tunnel West 10'-0" Continuous Weld Test	0	100% of section indicated corrosion	1
Concourse E (East Terminal) Tunnel 10'-0" Continuous Weld Test	0	100% of section indicated corrosion	1

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While conducting the visual inspections of the 37 locations where grooving corrosion was indicated in the pipe welds in 2015, piping was found to be leaking in the following locations:

1. Concourse A Tunnel: pipe leak corrosion near valve at column #67
2. Concourse A Tunnel: pipe leak corrosion between columns #68-69 and #71-72.
3. Main Terminal Tunnel (West): pipe leak corrosion near columns #P5, #2 and #8.
4. Concourse E Tunnel: pipe leak corrosion between columns #207-208.

One pipe located in the Concourse B Tunnel was found with an elbow fitting removed and the piping drained. This was planned work and was being addressed by maintenance staff.

To help identify conditions leading to the piping corrosion, one water sample was collected from sprinkler piping in each terminal and concourse building for chemical analysis. NFPA 13 – Standard for the Installation of Sprinkler Systems, 2019 edition, paragraph 5.1.5.2 requires that water supplies be evaluated for conditions that contribute to unusual corrosive properties. Paragraph 5.1.5 Water Supply Treatment, also requires that the water supply be evaluated for the existence of microbes and conditions that contribute to microbiologically influenced corrosion (MIC). Although MIC is uncommon in this area, and testing is therefore not required per NFPA 13, Appendix A, paragraph A.5.1.5, the MIC test was performed along with the mineral analysis.

The sprinkler piping water samples were taken by EFP at the locations listed below and indicated on the sample location plans in Exhibit C. The mineral and MIC analysis was completed by Huguenot Laboratories. The Huguenot lab report is Exhibit B.

HUGUENOT LABORATORIES 2020 WATER SAMPLING LOCATIONS
City water supply before backflow preventer – Water sample #1
Inspectors test drain Terminal 2 (East Terminal) – Water sample #2
Inspectors test drain Concourse D – Water sample #3
Inspectors test drain Concourse C – Water sample #4
Inspectors test drain Terminal 1 (Main Terminal) – Water sample #5
Tunnel drain from distribution Terminal 1 mid-tunnel – Water sample #6
Inspectors test drain Concourse B – Water sample #7
Inspectors test drain Concourse A – Water sample #8

Testing Conclusions & Recommendations

The recent ultrasonic test results indicate that new piping corrosion has occurred where corrosion had not previously occurred in the same locations that were tested 5 years ago. In addition, pipe water leaking corrosion has occurred near some of the locations where the 2015 tests indicated longitudinal weld seam corrosion.

More specifically

- No expansion of corrosion was demonstrated by testing in Concourse A, B or C, but pipe leakage observed in Concourse A indicates further deterioration of piping that had corrosion in 2015.
- Some expansion of corrosion was demonstrated by testing in Terminal 1, and pipe leakage observed in Terminal 1 indicates further deterioration of piping that had corrosion in 2015.
- Expansion of corrosion was demonstrated by testing in the east end of Concourse D.
- Expansion of corrosion was demonstrated by testing throughout Concourse E which did not exhibit corrosion in 2015. Pipe leakage was also observed in Concourse E.

The Concourses D & E tunnel piping appears to be getting worse than other areas although the pipe leaks in the Concourse A tunnel and Terminal 1 indicate that previously detected corrosion is progressing.

The water samples lab analysis results identified the presence of magnetic deposit material in all the samples indicating that corrosion is actively occurring. Causes for pipe corrosion include scaling conditions within the piping where deposits can form on the inside of the pipes. Under deposit corrosion is the leading cause of pinhole leaks within fire protection systems. Factors contributing to the scaling conditions are high pH levels and bacterium known to cause microbiological induced corrosion (MIC). The Huguenot lab report includes specific recommendations for UL listed water treatment for use in fire protection sprinkler systems.

Briem Engineering recommends performing NFPA recommended inspections, and possible water treatment, but cautions that water treatment may dislodge corrosion deposits and clog sprinkler heads. See the Briem Engineering report 1120-688 in Exhibit A for recommendations to address the current state of pipe corrosion and inhibit future corrosion.

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EXHIBIT A

Briem Engineering
MATERIAL TESTING & ENGINEERING
4134 Rider Trail North • Saint Louis, Missouri 63045 • (314) 298-3773 • Fax (314) 298-7097

INSPECTION OF LAMBERT SPRINKLER PIPE
FOR
WSP

DRAFT

Report Number: 1120-688 Rev. 2

Report Date: December 31, 2020

Report By: Patrick Lombard, P.E.
Principal Engineer

Briem Engineering
MATERIAL TESTING & ENGINEERING
4134 Rider Trail North • Saint Louis, Missouri 63045 • (314) 298-3773 • Fax (314) 298-7097

Report Number: 1120-688 Rev. 2
Report Date: December 31, 2020

INSPECTION OF LAMBERT FIRE SPRINKLER PIPE
FOR
WSP

OBJECTIVE

This inspection is a follow up to a 2015 inspection also performed by Briem Engineering (Briem Engineering report 0714-401b, dated December 11, 2015). The objective was to evaluate the progression of the corrosive deterioration in the sprinkler system at Lambert Airport using ultrasonic shearwave inspection of the longitudinal seam welds.

INSPECTION FINDINGS

1. The corrosion in the piping has worsened since the 2015 inspection. Ultrasonic indications of corrosion were found on piping which did **not** show corrosion indications by ultrasound in the 2015 inspection (Table 1). Table 1 includes the forty-two (42) locations which did not show corrosion indications in 2015 with an additional ten (10) locations.

2. Most of the corrosion indications are in the D and E gate area. Approximately 50% of the piping in the D and E gate areas had indications of longitudinal weld corrosion.

3. Leaks were discovered in the following locations:

   a. **A Gates:** Valve leak at column 67, pipe leak at columns 68 and 69, and column 71 and 72.
   b. **E Gates:** Pipe leak near column 207 and 208.
   c. **Main Terminal**: Pipe leak near inspection point #4 at column P5. Pipe leak near inspection point #5 at column 2. Two pipe leaks on overhead piping running North and South between column 8 and 9.

4. Two (2) sections of pipe, ten feet long each were subjected to a continuous ultrasonic shearwave inspection. One section is located at inspection point #75. The other section is located at inspection point #4. Both ten-foot sections were found to contain indications of weld deterioration through 100% of the scanned area.

RECOMMENDATIONS

1. Perform NFPA recommended inspections and tests that may include flushing the system, inspecting sprinkler heads for deposits and obstructions, and a camera inspection of sections of the piping.

2. Recommendations concerning water treatment should be investigated after the above inspections are completed. Attempts to reduce or stop the corrosion using water treatment or other methods may dislodge the corrosion deposits and possibly cause obstructions to the sprinkler heads.

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3. After the above recommended inspections and testing is complete a corrosion control and prevention system should be put in place to prolong the life of the existing system. Water treatment may include increasing the pH, treatment with oxygen scavengers/corrosion inhibitors, regular testing, and annual flushing, which will mitigate future corrosive attack.

BACKGROUND

This inspection is a follow up to a 2014 inspection also performed by Briem Engineering. The failures are in electric resistance welded (ERW) carbon steel pipe that has been in service for as long as three decades. The pipes are part of a wet sprinkler system that had begun leaking. More than 10,000 feet of sprinkler pipe are in service, subjected to 110-120 psi (city water pressure). The submitted failed pipe sections were 8.5 inches O.D. with an apparent original wall thickness of 0.2 inches.

WORK PERFORMED

1. Visual inspections for leaks were performed on the piping which **did** have ultrasonic indications for corrosion in the 2015 inspection.

2. Ultrasonic inspections were performed on piping which did **not** have ultrasonic indications for corrosion in the 2015 inspection.

3. Areas on each inspected pipe were prepared for inspection.

4. The cleaned areas were inspected using ultrasonic shearwave techniques to examine for wall loss at the longitudinal seam welds.

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Patrick Lombard, P.E.
Principal Engineer

RESULTS and DISCUSSION

Table 1: Ultrasonic Inspection Results

	No Corrosion	%	Corrosion	%	Total
"A" Gates	6	100.0%	0	0.0%	6
"B" Gates	5	100.0%	0	0.0%	5
"C" Gates - East	6	100.0%	0	0.0%	6
"C" Gates - West	3	75.0%	1	25.0%	4
"D" Gates	7	63.6%	4	36.4%	11
"E" Gates and East Terminal - Center	2	50.0%	2	50.0%	4
"E" Gates and East Terminal - East	1	25.0%	3	75.0%	4
"E" Gates and East Terminal - West	0	0.0%	1	100.0%	1
Apron Level Fire Protection Valve Shut Off Plan	4	100.0%	0	0.0%	4
Main Terminal - East	1	100.0%	0	0.0%	1
Main Terminal Tunnel West	2	50.0%	2	50.0%	4
Room MT2174B	0	0.0%	1	100.0%	1
Room D1264	0	0.0%	1	100.0%	1
Total	**37**		**15**		**52**

*One of the inspected areas (#1) in Main Terminal Tunnel West was found to contain pitting. (no linear indications)

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NOTES:

1) One (1) new area of inspection designated #85 is located in the main terminal (Concourse Level) inside room MT 2174 B. The inspected weld showed indications of weld deterioration.
2) One new area of inspection designated #86, is located inside room C-1024-FS. The inspected weld shows no indication of weld deterioration.
3) Eight (8) new inspection areas were added in addition to the two (2) notated above and are included in the table.
4) Two (2) sections of pipe, ten feet long each were subjected to a continuous ultrasonic shearwave inspection. One section is located at inspection point #75 and scanned to the West. The other section is located at inspection point #4. Both ten-foot sections were found to contain indications of weld deterioration through 100% of the scanned area.
5) Several sections of fire suppression piping, other than the predetermined sections to be inspected, are showing evidence of leaking. The observed locations are listed below.
    - **A Gates:** Valve leak at column 67, pipe leak at columns 68 and 69, and column 71 and 72.
    - **E Gates:** Pipe leak near column 207 and 208.
    - **Main Terminal**: Pipe leak near inspection point #4 at column P5. Pipe leak near inspection point #5 at column 2. Two pipe leaks on overhead piping running North and South between column 8 and 9.

Tunnel Areas	
Location ID	**Pass/Fail**
A16	Pass
A21	Pass
A22	Pass
A23	Pass
A24	Pass
A26	Pass
B27	Pass
B31	Pass
B33	Pass
B34	Pass
B35	Pass
C56	Pass
C58	Pass
C59	Pass
C60	Pass
C61	Pass
C63	Pass
C67	Pass
C69	Pass
C87	Pass
C88	Fail
D36	Pass
D39	Pass
D40	Fail
D43	Fail
D44	Fail
D45	Fail
D48	Pass
D50	Pass
D51	Pass
D54	Pass
D78	Pass
E71	Fail
E72	Fail
E73	Pass
E74	Fail
E75	Fail
E81	Fail
E82	Pass
E83	Pass
E84	Fail
MT1	Pass (no linear)
MT3	Fail
MT11	Pass
MT14	Fail
MT15	Pass

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Areas outside tunnels	
Location	Pass or Fail
76 Room MT 1476	Pass
77 Bag Claim	Pass
85 Room MT 2174B	Fail
86 Room C 1028	Pass
89 Room D 1264	Fail
90 Room A 1210M	Pass
10’ Sections	
Location	Pass or Fail
MT4 10’ section	Fail
75 plus 10’ west	Fail

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Photo 1
Photo of an open-end pipe discovered during the inspection revealed a linear corrosion indication at the 11:00 position (arrow). This linear corrosion is indicative of the failure mechanism on this piping system – preferential corrosion of the longitudinal weld. Attempts to remove these deposits chemically may cause obstructions of the sprinkler heads.

Photo 2
A ten-foot section of pipe near column P5, inspection point #4, in the main terminal area was inspected along the entire length. Ultrasonic indications of corrosion thinning were observed along the entire length. This pipe had a leak indication located at the inspected area (arrow). Please note the area that appears to be wet along the length of the pipe is actually ultrasonic couplant gel.

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Photo 3
Close up photo of the leak shown in Photo 2 above.

Photo 4
Photo of test location #22 for reference.

Photo 5
Photo of test location #1 for reference.

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EXHIBIT B

HUGUENOT LABORATORIES

Fire Sprinkler System

Microbiological Influenced Corrosion

Water Analysis

St Louis International Airport

St Louis, MO

DRAFT

Requested By:
Mr. Ken Tella
WSP USA
211 North Broadway
St Louis, MO 63102

Huguenot Laboratories
101 Riverdale Rd.
Port Jervis, NY 12771

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www.huguenotlabs.com

HUGUENOT LABORATORIES

www.huguenotlabs.com

January 11th , 2021

WSP USA
Attn: Mr. Ken Tella
211 North Broadway
St Louis, MO 63102

Re: St Louis International Airport, Fire Protection Sprinkler System Water Analyses

Mr. Tella,

We received your documentation and the eight-bottle set of water samples that was sampled from the St. Louis International Airport, Concourse A, B, C, D, Terminal 1 and 2 located at 10701 Lambert International Blvd. in St Louis, MO. The samples as received were labeled as "City Water", "Terminal 2", "D Concourse", "C Concourse", "Main Terminal", "Tunnel Main Term", "B Concourse" and "A Concourse". The samples were analyzed for 22 mineral contents, physical properties, and microbiological contamination.

The recommendations in this report are consistent with "Standard EPA Water Testing", "A.S.T.M. G-4-84 Corrosion Testing Standards" and "Standard methods for the Examination of Water and Wastewater" 20th edition for Microbiological evaluations.

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General Observations and Overview:

The attached water analysis sheet has been color coded to assist with those items requiring your attention. Test items in **red** require action and are better described in the paragraphs below.

- The individual biological analysis tests confirm that the sample labeled as City Water tested positive for Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as Terminal 2 tested positive for Total Aerobic, Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as D Concourse tested positive for Total Aerobic, Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as C Concourse tested positive for Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as Main Terminal tested positive for Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as Tunnel Main Term tested positive for Slime Producing bacterial contamination

- The individual biological analysis tests confirm that the sample labeled as B Concourse tested positive for Total Aerobic, Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as A Concourse tested positive for Slime Producing bacterial contamination.

PHYSICAL TESTS

- The physical tests from the sample labeled as City Water showed no discoloration or odors.
- The physical tests from the sample labeled as Terminal 2 water showed no discoloration with an earthy odor. The sample did have a black magnetic deposit material.

- The physical tests from the sample labeled as D Concourse water showed no discoloration with an earthy odor. The sample did have a black magnetic deposit material.

- The physical tests from the sample labeled as C Concourse showed a brown tinted discoloration with an earthy odor. The sample did have an orange/brown magnetic deposit material.

- The physical tests from the sample labeled as Main Terminal showed a brown discoloration with an earthy odor. The sample did have a brown magnetic deposit material.

- The physical tests from the sample labeled as Tunnel Main Term showed a brown discoloration, with a chlorine odor. The sample did have a brown non-magnetic deposit material.

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- The physical tests from the sample labeled as B Concourse showed a brown discoloration with an earthy odor. The sample did have an orange/brown non-magnetic deposit material.

- The physical tests from the sample labeled as A Concourse showed a brown discoloration with an earthy odor. The sample did have a dark brown magnetic deposit material.

The presence of magnetic and non-magnetic deposit material discovered in all the samples confirms that corrosion is actively occurring. Under deposit corrosion is the leading cause of pinhole leaks within fire protection systems.

CHEMICAL CONDITIONS – Background information.

We consider all the water samples as being moderate in mineral content. That is the "Total Dissolved Solids" within the water samples would fall into an average range when compared to other city waters. When rainwater comes in contact with the ground and or surface it dissolves minerals that are in the rocks and soils. These minerals comprise the quality of the water and can affect all metals in a fire sprinkler system.

City waters are different throughout the country because of their mineral content. Water also contains various gases, some man made, others natural from the atmosphere. Oxygen is one gas that must be monitored within fire sprinkler systems. Attached to this report is our laboratory report showing the types and amounts of key minerals that effect fire sprinkler systems.

It is important to realize that all minerals entering a fire sprinkler system should exit that system. That is all minerals in the city water should appear in the inspector's port. Any lost minerals will show up as deposits inside pipes. Different type minerals affect fire sprinkler metallurgy differently, and for this reason we test all troubling minerals coming into and exiting a fire sprinkler system.

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STL INTL AIRPORT CHEMICAL CONDITIONS

The "Langlier Index" is a chemical calculation that determines if water is corrosive or scaling in nature. This index if + (positive) indicates that the water is dropping minerals out of solution. If the index is – (negative) then it is absorbing minerals into the water.

- STL INTL AIRPORT City Water sample has a Langelier index of 1.7 is a scaling condition.

- STL INTL AIRPORT Terminal 2 sample has a Langelier index of 1.2 is a scaling condition.

- STL INTL AIRPORT D Concourse sample has a Langelier index of 1.1 which is a scaling condition.

- STL INTL AIRPORT C Concourse sample has a Langelier index of 1.6 which is a scaling condition.
- STL INTL AIRPORT Main Terminal sample has a Langelier index of 1.9 which is a scaling condition.
- STL INTL AIRPORT Tunnel Main Term sample has a Langelier index of 2.0 which is scaling condition.
- STL INTL AIRPORT B Concourse sample has a Langelier index of 1.7 which is considered scaling condition.
- STL INTL AIRPORT A Concourse sample has a Langelier index of 1.6 which is considered scaling condition.

The positive index value witnessed indicates that a deposit forming condition exists where deposits can form on the inside of the pipes. Under-deposit corrosion is the leading cause of pinhole leaks.

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pH test

The "pH" test is an electrical/chemical measurement that determines if water is acid (attacking) or alkaline (caustic / depositing). The pH test has a range of 1.0 pH to 14.0 pH. A pH below 7 is considered acidic and a pH above 7.0 is considered alkaline. The middle of the range is 7.0 pH and this is considered neutral that is neither acid nor alkaline. It is important to know that water in the pH acid range will attack almost all metals; therefore it is generally desirable to have a neutral pH. A high pH has two effects that are detrimental to a fire sprinkler system. High pH's cause most minerals to drop out of solution causing deposits. A very high pH attacks soft metals like brass and bronze. Galvanized metal (Zinc coated) is attacked at both ends of the pH range.

- The City Water sample had a measured pH value of 9.3 which is considered elevated.
- The Terminal 2 sample had a measured pH of 9.6 which is considered elevated.
- The D Concourse sample had a measured pH of 9.6 which is considered elevated.
- The C Concourse sample had a measured pH of 9.4 which is considered elevated.
- The Main Terminal sample had a measured pH of 9.5 which is considered elevated.
- The Tunnel Main Term sample had a measured pH of 9.5 which is considered elevated.

- The B Concourse sample had a measured pH of 9.3 which is considered elevated.

- The A Concourse sample had a measured pH of 9.3 which is considered elevated.

An elevated pH will cause soluble minerals to actively precipitate out of solution in the form of deposits.

HARDNESS SALTS

"Hardness salts" are minerals such as Calcium and Magnesium that buffer the water to keep the water balanced or neutral. These mineral salts are the primary minerals in all waters that will protect metal from an acid attack. These minerals are different from other water minerals because they are affected by temperature. A higher temperature causes them to drop out of solution and deposit on pipe surfaces. These deposits may cause a problem known as Under Deposit Corrosion. This corrosion will be discussed later.

- The City Water sample has a Calcium value of 75 parts per million (ppm). The Magnesium was 41 ppm and they add up to a Total Hardness of 116 ppm.

- The Terminal 2 sample has a Calcium value of 10 parts per million (ppm). The Magnesium was 10 ppm and they add up to a Total Hardness of 20 ppm.

- The D Concourse sample had a Calcium value of 5 ppm. The Magnesium test was 5 ppm, and they add up to a Total Hardness of 10 ppm.

- The C Concourse sample had a Calcium value of 70 ppm. The Magnesium test was 22 ppm, and they add up to a Total Hardness of 92 ppm.

- The Main Terminal sample had a Calcium value of 65 ppm. The Magnesium test was 47 ppm, and they add up to a Total Hardness of 112 ppm.

- The Tunnel Main Term sample had a Calcium value of 70 ppm. The Magnesium test was 46 ppm, and they add up to a Total Hardness of 116 ppm.

- The B Concourse sample had a Calcium value of 55 ppm. The Magnesium test was 54 ppm, and they add up to a Total Hardness of 109 ppm.

- The A Concourse sample had a Calcium value of 65 ppm. The Magnesium test was 37 ppm, and they add up to a Total Hardness of 102 ppm.

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IRON

There are two types of iron that can be present in water. Magnetic iron or non-magnetic iron. Magnetic iron comes from processed metal i.e. Steel pipe. Non–magnetic iron comes from the ground and usually enters the ground water by bacterial activity.

Our "Iron" test is a chemical test that determines if iron has been dissolved into the water. An acid condition, or low pH, will dissolve iron from the pipes into the water. Iron can also enter the water by biological attack (MIC). Bacteria such as "Iron Related, Sulfate Reducing or Acid Slime" bacteria can cause an acid condition that attacks the metal pipes causing "Iron" to be dissolved into the water. If non-magnetic iron enters in the city water, this Iron (ferrous hydroxide) can drop out of solution as Ferric Hydroxide, a red brown colored deposit after entering the fire sprinkler system. This Iron is non-magnetic and therefore is in a different state or level than the fire sprinkler iron pipe. This mineral can cause "Galvanic Corrosion" or "Differential Metal Corrosion".

- The City Water sample had an iron content of 0.0 ppm.
- The Terminal 2 sample had an iron content of 1.0 ppm.
- The D Concourse sample had iron content of 1.0 ppm.
- The C Concourse sample had an iron content of 1.0 ppm.
- The Main Terminal sample has an iron content of 1.0 ppm.
- The Tunnel Main Term sample has an iron content of 1.0 ppm.
- The B Concourse sample has an iron content of 1.0 ppm.
- The A Concourse sample has an iron content of 1.0 ppm.

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TOTAL DISSOLVED SOLIDS

The "Total Dissolved Solids" (TDS) test is an Electrical /Chemical Test and calculation that determine the solids that have been dissolved by the water as it moved through the ground. The higher the TDS number is, the greater the chance for scaling or deposits. If this TDS test changes between water samples it indicates that the water is dropping minerals out of solution and producing an unhealthy environment for sprinkler system metallurgy.

- The City Water sample had a TDS of 279.7 ppm.
- The Terminal 2 sample had a TDS of 135.5 ppm.
- The D Concourse sample had a TDS of 114.7 ppm.
- The C Concourse sample had a TDS of 214.5 ppm.

- The Main Terminal sample had a TDS of 255.1 ppm.
- The Tunnel Main Term sample had a TDS of 257.8 ppm.
- The B Concourse sample had a TDS of 255.1 ppm.
- The A Concourse sample had a TDS of 273.1 ppm.

DISSOLVED OXYGEN

Water can absorb oxygen up to about 10 ppm. The actual amount is governed by temperature, pressure and dissolved solids. Air (Oxygen) gives good taste to water and reacts with some gases to purify water. Other gases also can be absorbed but normally affect each other.

- The sample labeled as City Water had a dissolved oxygen level of 8.0 ppm.
- The sample labeled as Terminal 2 had a dissolved oxygen level of 5.2 ppm.
- The sample labeled as D Concourse had a dissolved oxygen level of 4.2 ppm.
- The sample labeled as C Concourse had a dissolved oxygen level of 3.7 ppm.
- The sample labeled as Main Terminal had a dissolved oxygen level of 7.0 ppm.
- The sample labeled as Tunnel Main Term had a dissolved oxygen level of 8.4 ppm.
- The sample labeled as B Concourse had a dissolved oxygen level of 7.1 ppm.
- The sample labeled as A Concourse had a dissolved oxygen level of 4.4 ppm.

The decrease in dissolved oxygen injunction with the increase in iron confirms active corrosion with in the tested fire sprinkler systems.

SILICA

The “Silica” test is a good indicator of electro-chemical reactions. This test indicates that the water is reacting and producing deposit that builds tubercles and drop minerals out of solution. It is a key indicator, in conjunction with others that under deposit differential oxygen cell corrosion” is occurring.

- The sample labeled as City Water had a silica level of 9.0 ppm.

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- The sample labeled as Terminal 2 had a silica level of 2.0 ppm.
- The sample labeled as D Concourse had a silica level of 2.0 ppm.
- The sample labeled as C Concourse had a silica level of 2.0 ppm.
- The sample labeled as Main Terminal had a silica level of 9.0 ppm.
- The sample labeled as Tunnel Main Term had a silica level of 11 ppm.
- The sample labeled as B Concourse had a silica level of 8 ppm.
- The sample labeled as A Concourse had a silica level of 4 ppm.

STL INTL AIRPORT BIOLOGICAL CONDITIONS

Bacteria thrive in fire sprinkler systems. The water is stagnant, normally contains oil (a food for most bacteria), and is normally at a perfect temperature for growth. The water is rarely dumped, and seldom disturbed.

There are two main bacteria groups: Aerobic and Anaerobic. The aerobic bacteria live in an oxygen environment, while the anaerobic live in no oxygen. Both conditions can occur in a fire sprinkler system at the same time. Air will be in the water and no air under a deposit. Bacteria culture tests studies were completed and the results are as follows:

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AGGRESSIVITY INDEX

The aggressively index is a numeric index value that is used to quantify the level of bacteria discovered in a sample. This index is also used as a reference to determine the aggressive nature of the bacteria and its effect it can have in advancing the process of corrosion in a fire sprinkler system.

High Aggressivity = Aggressive damage to sprinkler piping is probable
Medium Aggressivity = Moderate damage to sprinkler piping is probable
Low Aggressivity = Low possibility that bacteria will cause sprinkler pipe damage

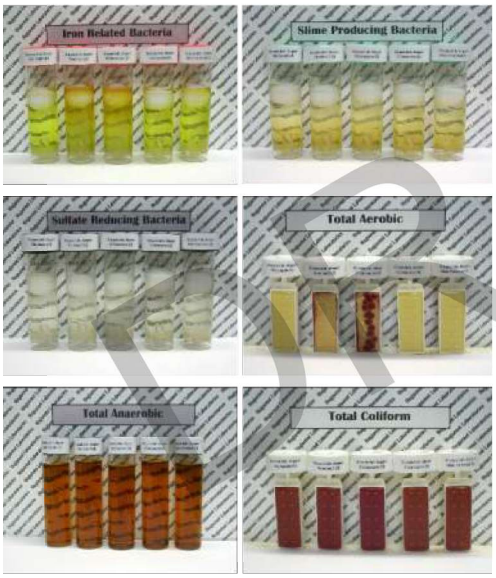
Aerobic	**(100,000-1,000 =)**	**(999-100 =)**
Anaerobic	**(Positive Result =)**	**(Negative Result =)**
Coliform	**(Positive Result =)**	**(Negative Result =)**
Sulfate Reducing	**(6.8MM-1,200 CFU =)**	**(1,199-200 CFU =)**
Iron Related	**(540,000-500 CFU =)**	**(499-25 CFU =)**
Slime Forming	**(1.8MM-12,500 CFU =)**	**(12,499-500 CFU=)**

Bacteria Type	City Water	Terminal 2	D Concourse	C Concourse
Total Aerobic	Negative	10,000 CFU	100,000 CFU	Negative
Coliform	Negative	Negative	Negative	Negative
Total Anaerobic	Negative	Negative	Negative	Negative
Iron Related	35,000 CFU	140,000 CFU	140,000 CFU	Negative
Sulfate Reducing	Negative	Negative	Negative	Negative
Slime Producing	350,000 CFU	350,000 CFU	350,000 CFU	66,500 CFU

Bacteria Type	Main Terminal	Tunnel Main Term	B Concourse	A Concourse
Total Aerobic	Negative	Negative	100,000 CFU	Negative
Coliform	Negative	Negative	Negative	Negative
Total Anaerobic	Negative	Negative	Negative	Negative
Iron Related	35,000 CFU	Negative	140,000 CFU	Negative
Sulfate Reducing	Negative	Negative	Negative	Negative
Slime Producing	12,500 CFU	66,500 CFU	1.8 Million	66,500 CFU

The pictures of your microbiological tests are also attached to the back of this report.

St. Louis International Airport
Microbiological Influenced
Corrosion Analysis



St. Louis International Airport
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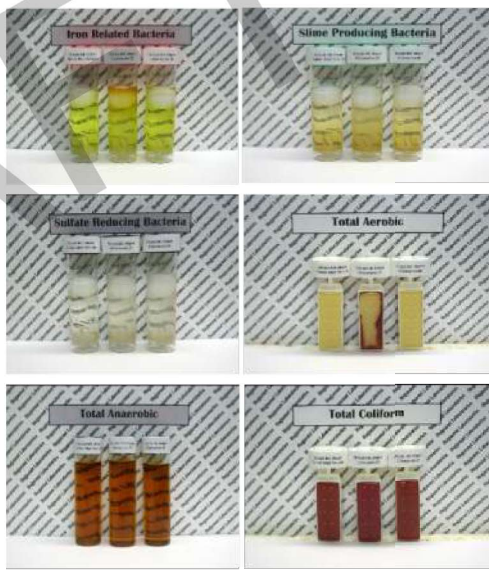
Corrosion Analysis



DRAFT

- The individual biological analysis tests confirm that the sample labeled as City Water tested positive for Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as Terminal 2 tested positive for Total Aerobic, Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as D Concourse tested positive for Total Aerobic, Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as C Concourse tested positive for Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as Main Terminal tested positive for Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as Tunnel Main Term tested positive for Slime Producing bacterial contamination

- The individual biological analysis tests confirm that the sample labeled as B Concourse tested positive for Total Aerobic, Iron Related and Slime Producing bacterial contamination.

- The individual biological analysis tests confirm that the sample labeled as A Concourse tested positive for Slime Producing bacterial contamination.

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CONCLUSION

The analysis of STL INTL AIRPORT water using the "Langlier Index" as an indicator has determined that the water sample are scaling in nature. High pH will cause minerals to deposit and form tubercle formation. Bacterium known to cause Microbiological Induced Corrosion was also detected in all of the samples. It is our opinion that you have the following problems:

The very high counts of Total Aerobic, Iron Related and Slime Producing bacteria are troubling as the consequences of these organisms metabolizing at this density will cause impairment and potentially leaks due to corrosion in as little as 6 months. The manifestations of such infections and corrosive scale conditions will cause oxygen cell and under deposit pinhole leaks.

- Treatment of the supply water is necessary to mitigate the discovered issues.
- Implement a corrosion monitoring program once treatment of the supply water is completed.
- The following corrective action items are the required guidance from the 2019 edition of NFPA 13. The corrective action items are highlighted in YELLOW below.
    - **5.1.5* Water Supply Treatment**

- **5.1.5.1** Water supplies and environmental conditions shall be evaluated for the existence of microbes and conditions that contribute to microbiological influenced corrosion (MIC). Where conditions are found that contribute to MIC, the owner(s) shall notify the sprinkler system installer and a plan shall be developed to treat the system using one of the following methods:
    (1) Install a water pipe that will not be affected by the MIC microbe.
    (2) Treat all water that enters the system using an approved bacterial inhibitor.
    (3) Implement an approved plan for monitoring the interior conditions of the pipe at established intervals and locations.
    (4) Install corrosion monitoring station and monitor at established intervals
- **5.1.5.2** Water supplies and environmental conditions shall be evaluated for conditions that contribute to unusual corrosive properties. Where conditions are found that contribute to unusual corrosive properties, the owner(s) shall notify the sprinkler installer and a plan shall be developed to treat the system using one of the following methods:
    (1) Install a water pipe that is corrosion resistant
    (2) Treat all water that enters the system using a listed corrosion inhibitor
    (3) Implement an approved plan for monitoring the interior conditions of the pipe at established intervals.
    (4) Install corrosion monitoring station and monitor at established intervals.
    (5) Fill dry-pipe or preaction systems with nitrogen as a supervisory gas to mitigate against corrosion.
    (6) When using a generator, use an approved nitrogen generator.

- **7.8 Additives and Coatings:**
    - **7.8.1** Additives to the supply water supply intended for control of microbiological or other corrosion shall be listed for use in fire sprinkler systems.
    - **7.8.2** Internal pipe coatings, excluding galvanizing, intended for control of microbiological or other corrosion shall be listed for use within fire sprinkler systems.

CORROSION ELIMINATION EFFECTIVENESS STUDY: We completed a corrosion effectiveness study to determine the actual corrosion rate of the supply water which is listed on the following page. A secondary study was completed to identify the most effective corrosion inhibitor product and feed rate to reduce or eliminate corrosion in your fire sprinkler system. The water was treated with five (5) known chemical products used today. The object of this study was to determine the most cost-effective product and feed rate to obtain a desirable result.

To obtain this data we needed to determine a base line corrosion rate for the sample water sent to us. Then we put known amounts of treatment into the water and ran a 7-day corrosion study. We then compared it to the base line result. This study is an indication of expected results and does not replace a 30-day in line corrosion test as outline in this report.

Product **Concentration** **Contact Time Corrosion Rate**

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City Water	None	7 days	11.19 mpy
C-205	1 gal / 1500 gal	7 days	4.0 mpy
(Molybdate- Phosphonate)	2 gal / 1500 gal	7 days	3.0 mpy
FSS-ProGuard 295UL	1.0 gal / 1000 gal	7 days	3.8 mpy
(UL Listed Chemistry)	4.0 gal / 1000 gal	7 days	0.14 mpy
C-DWA	¼ gal / 1000 gal	7 days	6.0 mpy
(Drinking Water Inhibitor)	½ gal / 1000 gal	7 days	5.0 mpy
C-FSP-VCI	30 gal / 1000 gal	7 days	1 mpy
(VaporPhase)	50 gal / 1000 gal	7 days	0.5 mpy
C-111 (THPS)	¼ gal / 1000 gal	7 days	16 mpy
(Phosphonium-	2 gal / 1000 gal	7 days	14 mpy
sulfates)	3.0 gal / 1000 gal	7 days	8 mpy

Indicates product of choice and optimum usage rate in water.

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CORROSION ANALYSIS RESULTS:

Number of years of life for various schedule of pipe

Water without and with Treatment	Mils Per Year	Days Tested	Sch 40 4 Inch	Sch 10 4 Inch	Sch 5 4 Inch
City Water	11.2	7	21.2	10.7	7.4
ProGuard 295UL	0.14	7	1754.3	888.2	614.4

The corrosion effectiveness study was completed on the water sample you supplied us. The results of this corrosion study determined that the water had a tested corrosion rate of 11.19 MPY (Mils Per Year) or one-thousandth of an inch with no treatment applied. A secondary test was then conducted with your water where a UL listed corrosion and bacterial inhibitor (FFS ProGuard 295UL) was added at a concentration of 0.4% product to 99.6% parts of water. This treatment concentration on a volume basis equals 4 gallons of treatment protection per 1000 gallons of system volume or 0.4% of treatment. The actual measured corrosion protection results were a measured corrosion rate of only **0.14** mils per year. As you can see from the data above, treatment of this fire protection system will significantly increase the usable life of the system. The expected corrosion analysis results were used to determine the pipe schedule life expectancy. The actual tested results for corrosion protection were significantly improved over the expected results.

MICROBIOLOGICAL ELIMINATION EFFECTIVNESS:

We completed a toxicity study to determine the best effective product and concentration to eliminate bacterial growth in your water system. The water was treated with four (4) known chemical products used today to treat bacterial contamination in fire sprinkler systems. The object was to determine the most cost effective product to obtain an effective bacterial kill rate.

Product	Concentration	Contact Time	Kill Rate
FSS BioGuard Plus (Bromochloro-dimethylhydantoin)	1 gal / 1000 gal	1 hr	85%
	1.5 gal/1000 gal	1 hr	92%
	2 gal / 1000 gal	1 hr	96%
FSS ProGuard 295UL (Proprietary)	1.0 gal / 1000 gal	1 hr	82%
	1.5 gal / 1000 gal	1 hr	92%
	4.0 gal / 1000 gal	1 hr	99%
C-105 (Glutaraldehyde)	¼ gal / 1000 gal	1 hr	84%
	½ gal / 1000 gal	1 hr	88%
	¾ gal / 1000 gal	1 hr	92%
	1 gal / 1000 gal	1 hr	96%
C-110 (Isothiazolinones-and polyionene)	¼ gal / 1000 gal	1 hr	67%
	½ gal / 1000 gal	1 hr	85%
	¾ gal / 1000 gal	1 hr	91%
	1 gal / 1000 gal	1 hr	96%

Indicates product of choice and optimum usage rate in water:

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THE SOLUTION:

The answer to reducing or eliminating the expensive effects of the corrosion witnessed in this system requires a two-step treatment methodology. First drain the system and fill with an approved biocide and oil absorber such as FSS-ProClean B to penetrate the bio-slime mass. Allow the system to soak for 2 to 4 hours to sterilize and clean the fire sprinkler systems. Drain the system again to remove dirt and biological wastes then refill with our UL listed and NFPA approved FSS ProGuard 295UL corrosion and bacterial inhibitor. The FSS ProGuard 295UL product is an environmentally friendly inhibitor specifically designed, approved, and UL listed for the exclusive use in fire sprinkler systems.

VERIFY EFFECTIVNESS:

One of the most proven methods of testing corrosion potential is with corrosion coupons. The American Society of Corrosion Engineers has developed test method ASTM-G4-84 specifically testing iron pipes in plants and building. This test reports the corrosion rates and types of corrosion. It is very cost effective and proves the effectiveness of treating. Huguenot Laboratories Inc. believes it is in the best interest of owners to test before and after treatment in order to appreciate the cost effectiveness of protecting their capital investment. This simple insertion probe is one of the many methods available which evaluate the potential of corrosion.

We thank you for the opportunity to be of service. If there are any questions regarding this report please call us at 800-228-3793.

Mike O'Leary

Mike O'Leary

HUGUENOT LABORATORIES

www.huguenotlabs.com

The foregoing laboratory report by Huguenot Labs, Inc. ("Huguenot Laboratories.") is intended solely as a report of the results of the analytical laboratory procedures undertaken by Huguenot :abs pursuant to the request for laboratory work received by it. Huguenot Labs. warrants only that this report accurately reflects the procedures followed and the results obtained as set forth herein. Huguenot Labs. makes no other warranty or representation of any kind, express or implied. The exclusive remedy against Huguenot Labs. for any cause or action relating to this report is a claim for damages not to exceed any price paid for the report, without regard to whether any such claim is based upon breach of warranty, tort, or any other basis.

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Location: St Louis International Airport
Bldg: Concourse A, B, C, D, Terminal 1 & 2
10701 Lambert International Blvd.
St. Louis, MO 63145

Contractor: WSP USA
211 North Broadway
St. Louis, MO 63102
Attn: Ken Tella

Color codes	Normal = No Action
Color codes	Trouble = Action req'd

Date: 1/4/2021

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Analysis	City Supply (1)	Terminal 2 (2)	D Concourse (3)	C Concourse (4)	Main Terminal (5)
	Sample Points				
Total Hardness as $CaCO_3$, ppm	115.6	20.4	10.2	91.8	112.2
Calcium as $CaCO_3$, ppm	75	10	5	70	65
Magnesium as $CaCO_3$, ppm	41	10	5	22	47
P-Alkalinity as $CaCO_3$, ppm	5	10	15	5	15
M-Alkalinity as $CaCO_3$, ppm	75	60	90	60	85
Silica as SiO_2, ppm	9	2	2	2	9
Nitrite as NO_2, ppm	0	0	0	0	0
Ammonia as NH_3/NH_4, ppm	0	2	2	2	0
Total Phosphate as PO_4, ppm					
Ortho Phosphate as PO_4, ppm	0.42	0.24	0.24	0.3	0.4
pH	9.3	9.6	9.6	9.4	9.5
Specific Cond. micromhos 25° C	604.3	284.0	241.4	499.3	564.7
pHs	7.6	8.4	8.5	7.8	7.6
Langelier Index	1.7	1.2	1.1	1.6	1.9
Ryznar Stability index @ 80° F	5.9	7.2	7.4	6.2	5.6

Analysis	City Supply (1)	Terminal 2 (2)	D Concourse (3)	C Concourse (4)	Main Terminal (5)
	Sample Points				
Total Diss. Solids as, ppm	279.7	135.5	114.7	214.5	255.1
Sulfate as SO_4, ppm	200	55	0	150	200
Hydrogen Sulfide as H_2S, ppm	0	0	0.032	0	0
Manganese as, Mn ppm	0	0	0	0	0
Diss. Oxygen* as, O_2 ppm	8.0	5.2	4.2	3.7	7.0
Total Iron as Fe, ppm	0	<1	<1	<1	1
Chloride as Cl, ppm	36	30	10	32	37
Total Chlorine as, ppm	0	0	0	0	0
Free Chlorine as, ppm	0	0	0	0	0

* Residual Chlorine can create a positive DO interference

Initial Weight (g)	12.0101
Final Weight (g)	11.9956
Days Tested	7
Corrosion Rate (Mil/yr)	11.19

Years of life for various scheduled pipe sizes at corrosion rate above

Schedule 40	Schedule 10	Schedule 5
21.2	10.7	7.4

Special Biological Testing cfu/mL

	NEG	POS	POS	NEG	NEG
Total Aerobic Bacteria		10000	100000		
Total Coliform Bacteria	NEG	NEG	NEG	NEG	NEG
Total Anaerobic Bacteria	NEG	NEG	NEG	NEG	NEG
Iron Related	POS	POS	POS	NEG	POS
Sulfate Reducing	NEG	NEG	NEG	NEG	NEG
SRB 14 day results					
Slime producing	POS	POS	POS	POS	POS

Physical Tests	City Supply (1)	Terminal 2 (2)	D Concourse (3)	C Concourse (4)	Main Terminal (5)
Color	clear	clear	clear	slight brown tint	brown tint
Deposit	none	black	black	orange-brown	brown
Odor	no	slight earthy	earthy	slight earthy	slight earthy
Other		magnetic	magnetic	magnetic	magnetic

Comments:

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Contractor: WSP USA
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St. Louis, MO 63102
Attn: Ken Tella

Color codes	Normal = No Action
Color codes	Trouble = Action req'd

Date: 1/4/2021

Analysis	Tunnel- Main Term. (6)	B Concourse (7)	A Concourse (8)		
	Sample Points				
Total Hardness as $CaCO_3$, ppm	115.6	108.8	102		
Calcium as $CaCO_3$, ppm	70	55	65		
Magnesium as $CaCO_3$, ppm	46	54	37		
P-Alkalinity as $CaCO_3$, ppm	20	10	10		
M-Alkalinity as $CaCO_3$, ppm	90	75	65		
Silica as SiO_2, ppm	11	8	4		
Nitrite as NO_2, ppm	0.25	0.25	0		
Ammonia as NH_3/NH_4, ppm	1	0.5	0.5		
Total Phosphate as PO_4, ppm					
Ortho Phosphate as PO_4, ppm	0.34	0.1	0.24		
pH	9.5	9.3	9.3		
Specific Cond. micromhos 25° C	569.1	564.8	593.5		
pHs	7.5	7.6	7.7		
Langelier Index	2.0	1.7	1.6		
Ryznar Stability index @ 80° F	5.6	6.0	6.2		

Analysis	Tunnel- Main Term. (6)	B Concourse (7)	A Concourse (8)		
	Sample Points				
Total Diss. Solids as, ppm	257.8	255.1	273.1		
Sulfate as SO_4, ppm	200	200	200		
Hydrogen Sulfide as H_2S, ppm	0	0	0		
Manganese as, Mn ppm	0	0	0		
Diss. Oxygen* as, O_2 ppm	8.4	7.1	4.4		
Total Iron as Fe, ppm	<1	<1	<1		
Chloride as Cl, ppm	33	34	35		
Total Chlorine as, ppm	1	0	0		
Free Chlorine as, ppm	0	0	0		

* Residual Chlorine can create a positive DO interference

Initial Weight (g)	12.0101
Final Weight (g)	11.9956
Days Tested	7
Corrosion Rate (Mil/y	11.19

Years of life for various scheduled pipe sizes at corrosion rate above

Schedule 40	Schedule 10	Schedule 5
21.2	10.7	7.4

Special Biological Testing cfu/mL					
Total Aerobic Bacteria	NEG	POS	NEG		
		100,000			
Total Coliform Bacteria	NEG	NEG	NEG		
Total Anaerobic Bacteria	NEG	NEG	NEG		
Iron Related	NEG	POS	NEG		
Sulfate Reducing	NEG	NEG	NEG		
SRB 14 day results					
Slime producing	POS	POS	POS		

Physical Tests	Tunnel- Main Term. (6)	B Concourse (7)	A Concourse (8)		
Color	slight brown tint	slight brown tint	slight brown tint		
Deposit	brown	orange-brown	dark brown		
Odor	chlorine	earthy	earthy		
Other	non-magnetic	non-magnetic	magnetic		

Comments:

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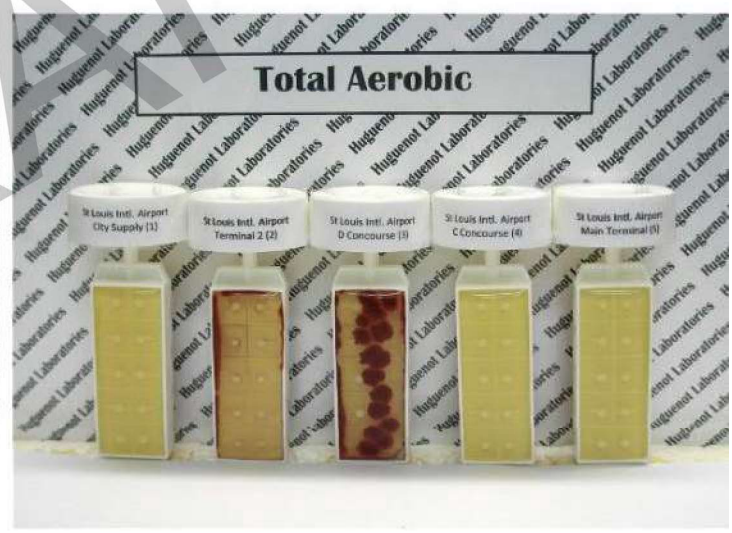
St. Louis International Airport Microbiological Influenced Corrosion Analysis



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St. Louis International Airport Microbiological Influenced Corrosion Analysis

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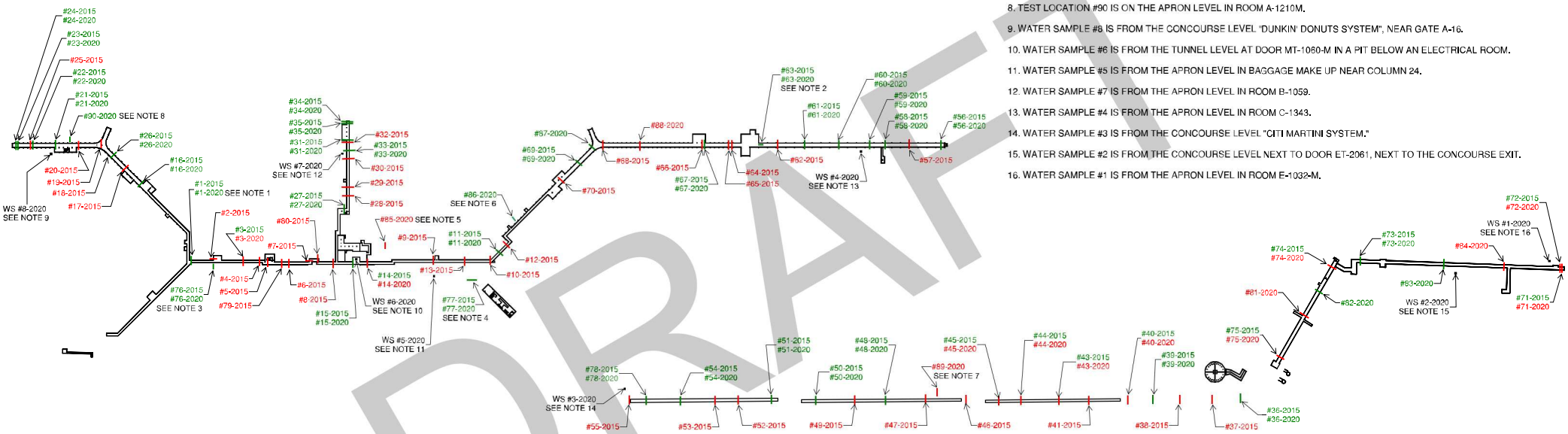
EXHIBIT C

FIRE PROTECTION SPRINKLER PIPING:
ULTRASONIC TEST AND WATER SAMPLE LOCATIONS
STL LAMBERT AIRPORT, TUNNEL LEVEL



NOTES:
GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. TEST LOCATION #1-2020 HAS INDICATIONS OF PITTING CORROSION.
2. A NEW PIPE WAS SELECTED FOR TEST LOCATION #63-2020 BECAUSE THE ORIGINAL TEST WAS TAKEN ON A PIPE THAT WAS REPLACED AFTER 2015.
3. TEST LOCATION #76 IS ON THE APRON LEVEL IN ROOM MT-1476-M.
4. TEST LOCATION #77 IS ON THE APRON LEVEL IN BAGGAGE CLAIM.
5. TEST LOCATION #85 IS ON THE BAGGAGE LEVEL IN ROOM MT-2174-B.
6. TEST LOCATION #86 IS ON THE APRON LEVEL IN ROOM C-1004.
7. TEST LOCATION #89 IS ON THE APRON LEVEL IN ROOM D-1264.
8. TEST LOCATION #90 IS ON THE APRON LEVEL IN ROOM A-1210M.
9. WATER SAMPLE #8 IS FROM THE CONCOURSE LEVEL "DUNKIN' DONUTS SYSTEM", NEAR GATE A-16.
10. WATER SAMPLE #6 IS FROM THE TUNNEL LEVEL AT DOOR MT-1060-M IN A PIT BELOW AN ELECTRICAL ROOM.
11. WATER SAMPLE #5 IS FROM THE APRON LEVEL IN BAGGAGE MAKE UP NEAR COLUMN 24.
12. WATER SAMPLE #7 IS FROM THE APRON LEVEL IN ROOM B-1059.
13. WATER SAMPLE #4 IS FROM THE APRON LEVEL IN ROOM C-1343.
14. WATER SAMPLE #3 IS FROM THE CONCOURSE LEVEL "CITI MARTINI SYSTEM."
15. WATER SAMPLE #2 IS FROM THE CONCOURSE LEVEL NEXT TO DOOR ET-2061, NEXT TO THE CONCOURSE EXIT.
16. WATER SAMPLE #1 IS FROM THE APRON LEVEL IN ROOM E-1032-M.

LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION
- ##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST
- WS ##-20XX WATER SAMPLE LOCATION WITH YEAR OF SAMPLING

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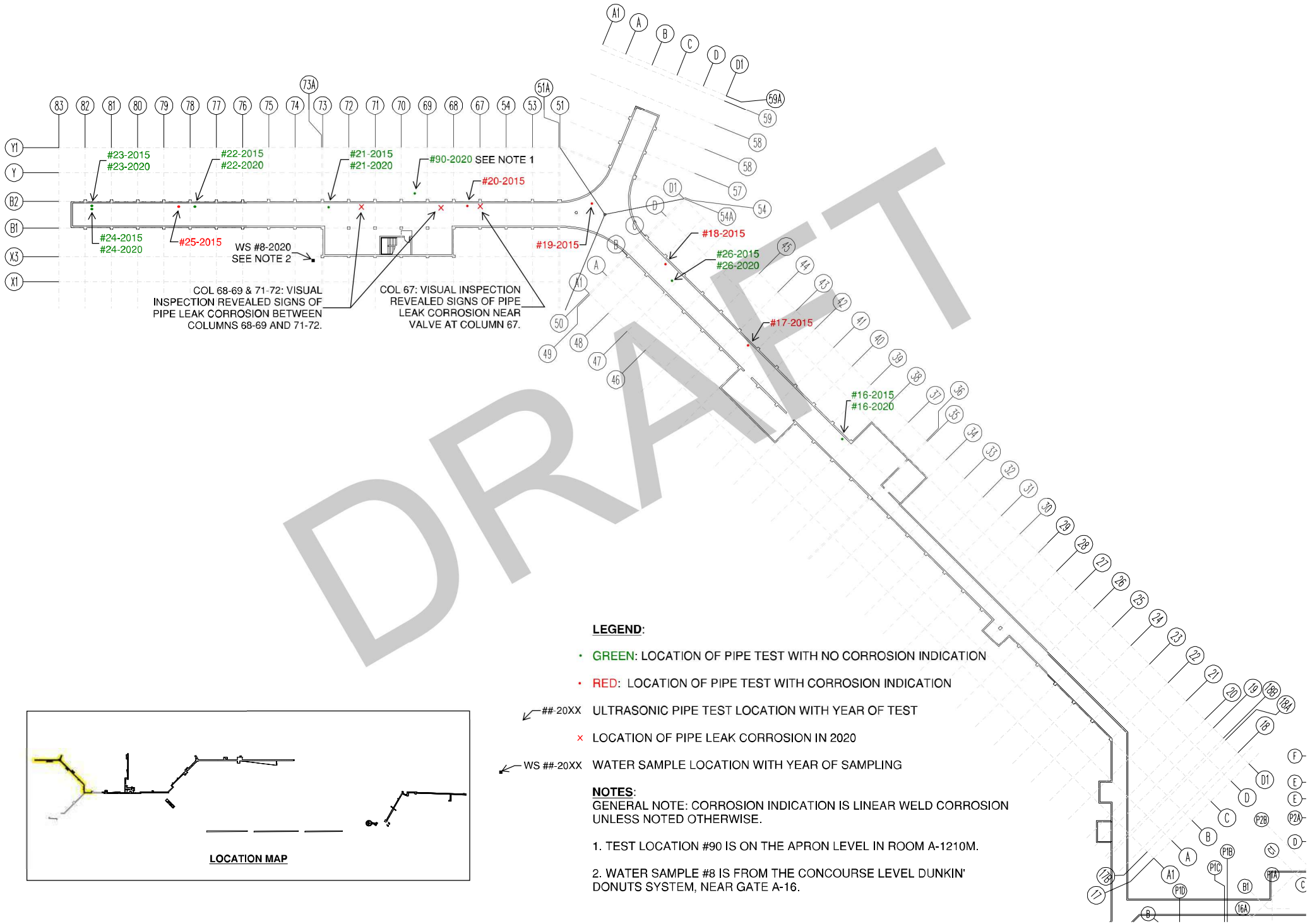
CONCOURSE A TUNNEL



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LOCATION MAP

LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

× LOCATION OF PIPE LEAK CORROSION IN 2020

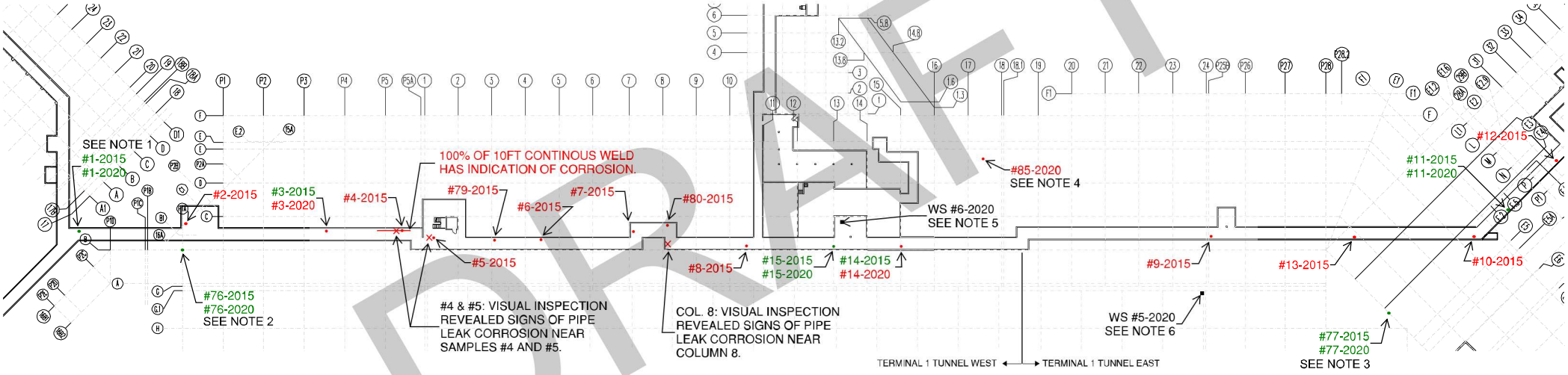
WS ##-20XX WATER SAMPLE LOCATION WITH YEAR OF SAMPLING

NOTES:
GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. TEST LOCATION #90 IS ON THE APRON LEVEL IN ROOM A-1210M.

2. WATER SAMPLE #8 IS FROM THE CONCOURSE LEVEL DUNKIN' DONUTS SYSTEM, NEAR GATE A-16.

TERMINAL 1 TUNNEL
EAST AND WEST



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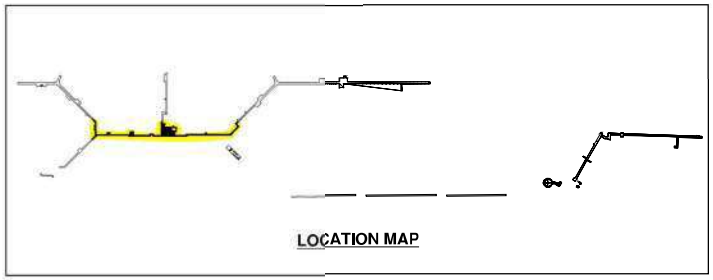


LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

× LOCATION OF PIPE LEAK CORROSION IN 2020

WS ##-20XX WATER SAMPLE LOCATION WITH YEAR OF SAMPLING

NOTES:

GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. TEST LOCATION #1-2020 HAS INDICATIONS OF PITTING CORROSION.

2. TEST LOCATION #76 IS ON THE APRON LEVEL IN ROOM MT-1476-M.

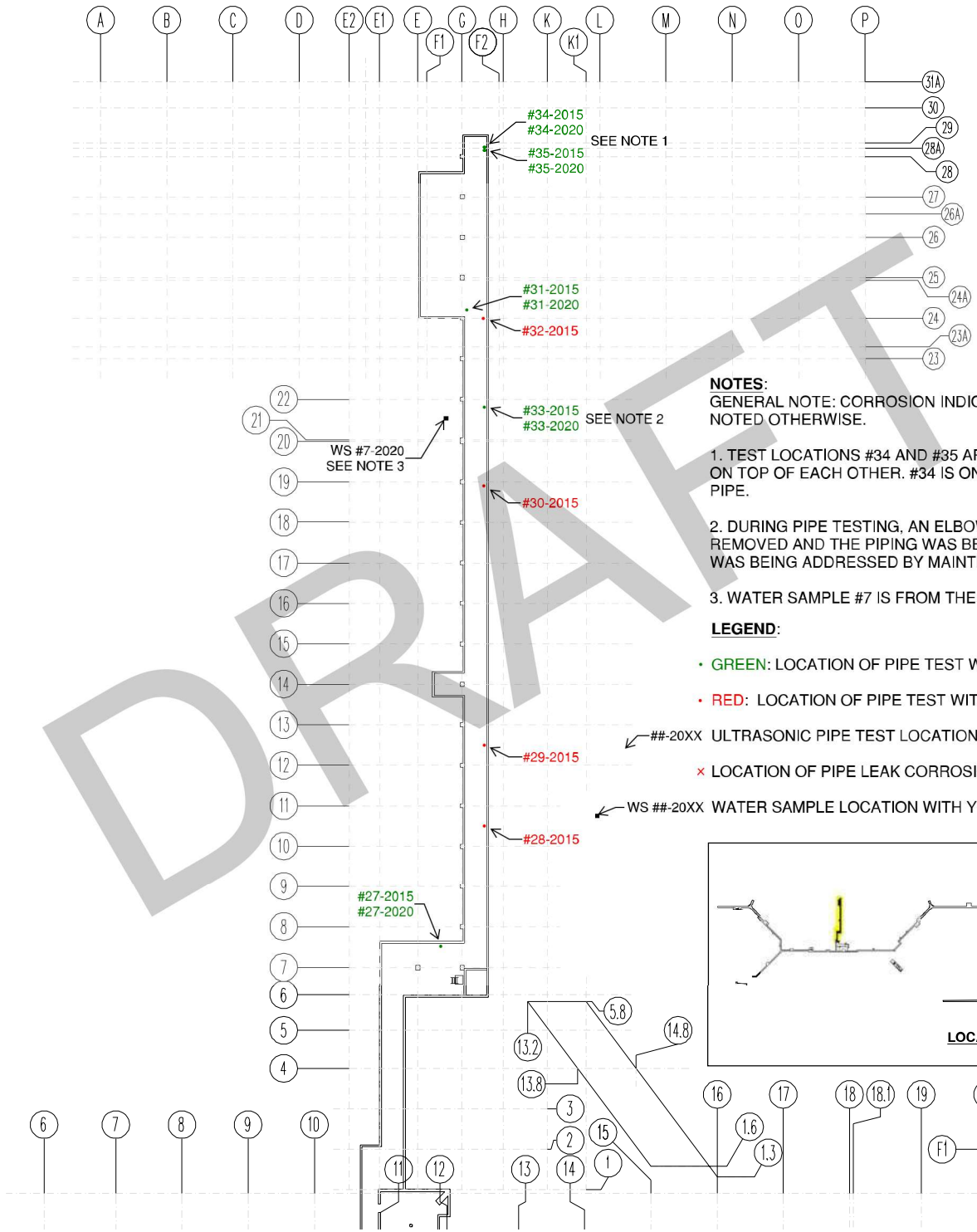
3. TEST LOCATION #77 IS ON THE APRON LEVEL IN BAGGAGE CLAIM.

4. TEST LOCATION #85 IS ON THE BAGGAGE LEVEL IN ROOM MT-2174-B.

5. WATER SAMPLE #6 IS FROM THE TUNNEL LEVEL AT DOOR MT-1060-M IN A PIT BELOW AN ELECTRICAL ROOM.

6. WATER SAMPLE #5 IS FROM THE APRON LEVEL IN BAGGAGE MAKE UP NEAR COLUMN 24.

CONCOURSE B TUNNEL



NOTES:
GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. TEST LOCATIONS #34 AND #35 ARE ON TWO SEPARATE PIPES THAT ARE STACKED ON TOP OF EACH OTHER. #34 IS ON THE TOP PIPE, AND #35 IS ON THE BOTTOM PIPE.

2. DURING PIPE TESTING, AN ELBOW FITTING NEAR TEST LOCATION #33 WAS REMOVED AND THE PIPING WAS BEING DRAINED. THIS WAS PLANNED WORK AND WAS BEING ADDRESSED BY MAINTENANCE STAFF.

3. WATER SAMPLE #7 IS FROM THE APRON LEVEL IN ROOM B-1059.

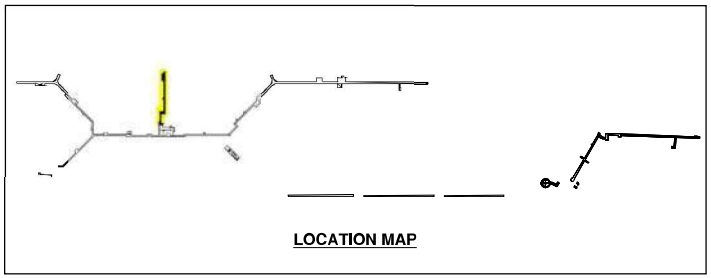
LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

× LOCATION OF PIPE LEAK CORROSION IN 2020

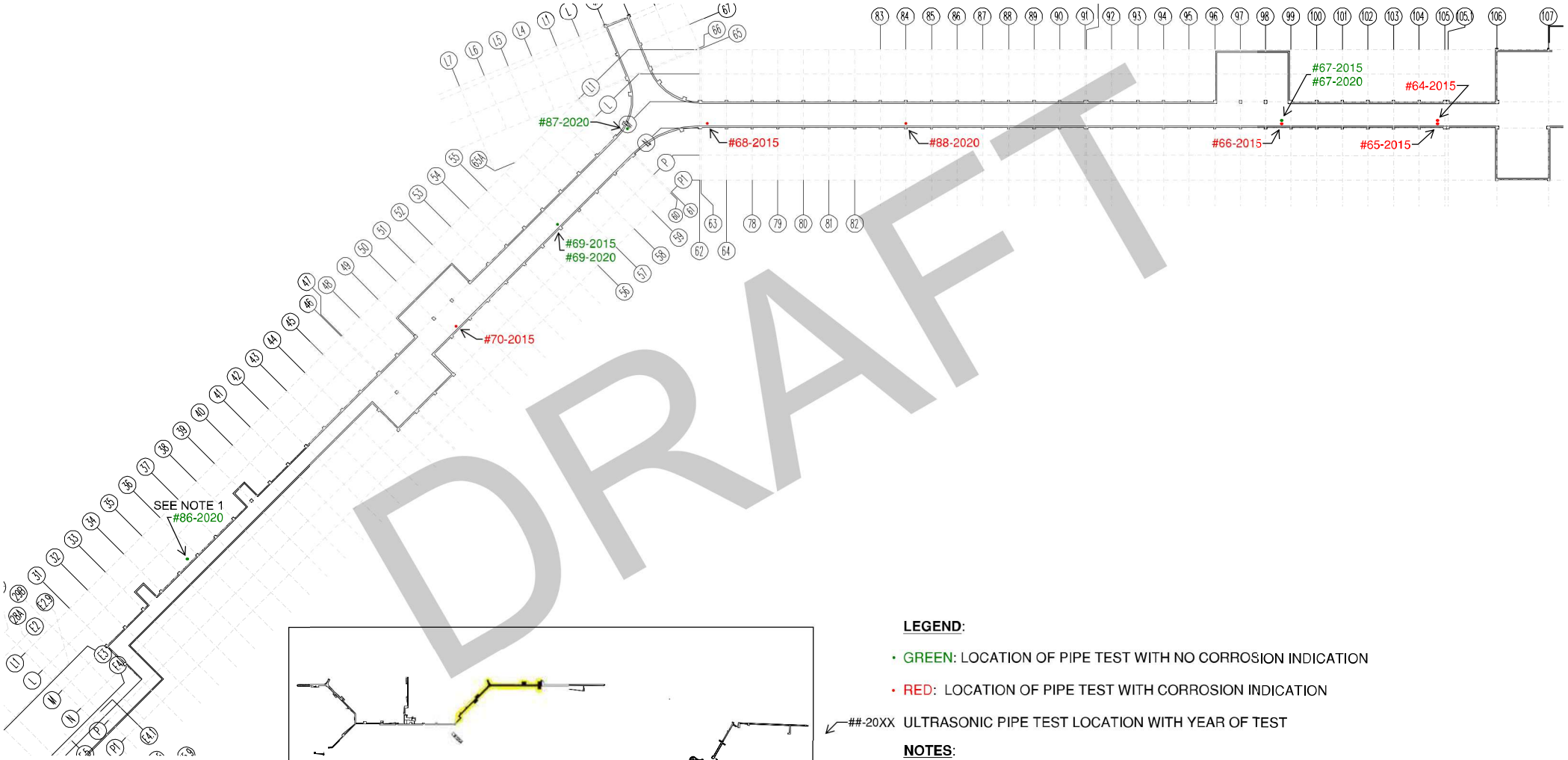
WS ##-20XX WATER SAMPLE LOCATION WITH YEAR OF SAMPLING



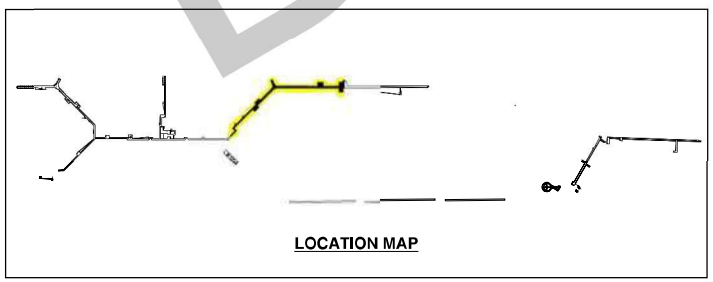
LOCATION MAP

DRAFT

CONCOURSE C TUNNEL



DRAFT



LOCATION MAP

LEGEND:

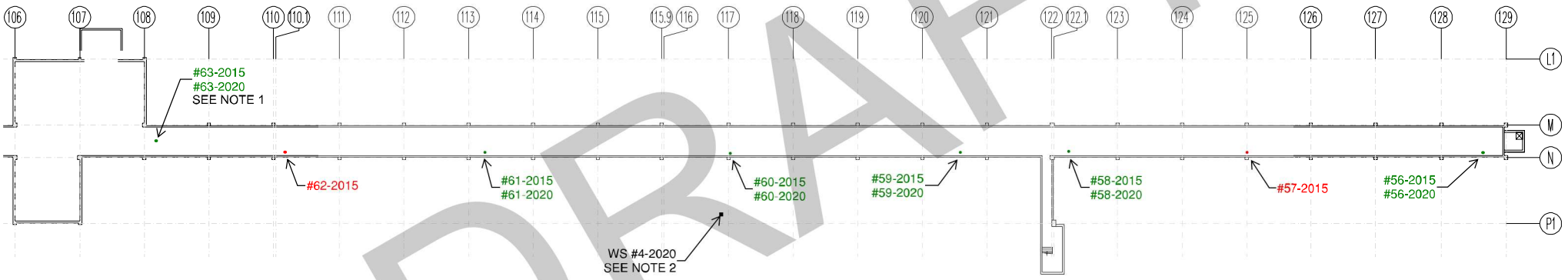
- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

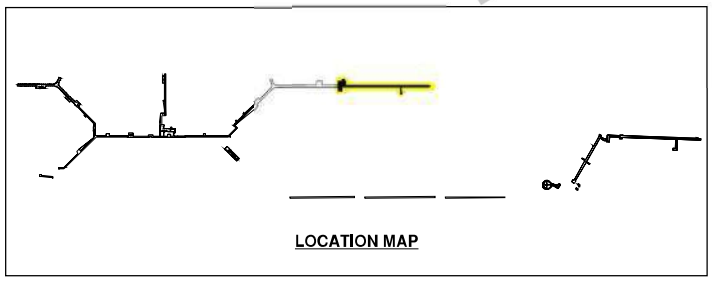
NOTES:
GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. TEST LOCATION #86 IS ON THE APRON LEVEL IN ROOM C-1004.

CONCOURSE C-EXTENSION TUNNEL



DRAFT



LOCATION MAP

LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

WS ##-20XX WATER SAMPLE LOCATION WITH YEAR OF SAMPLING

NOTES:
GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. A NEW TEST LOCATION WAS SELECTED FOR #63 BECAUSE THE ORIGINAL SAMPLE WAS TAKEN ON A PIPE THAT WAS REPLACED AFTER 2015.

2. WATER SAMPLE #4 IS FROM THE APRON LEVEL IN ROOM C-1343.

CONCOURSE D TUNNEL - WEST

LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

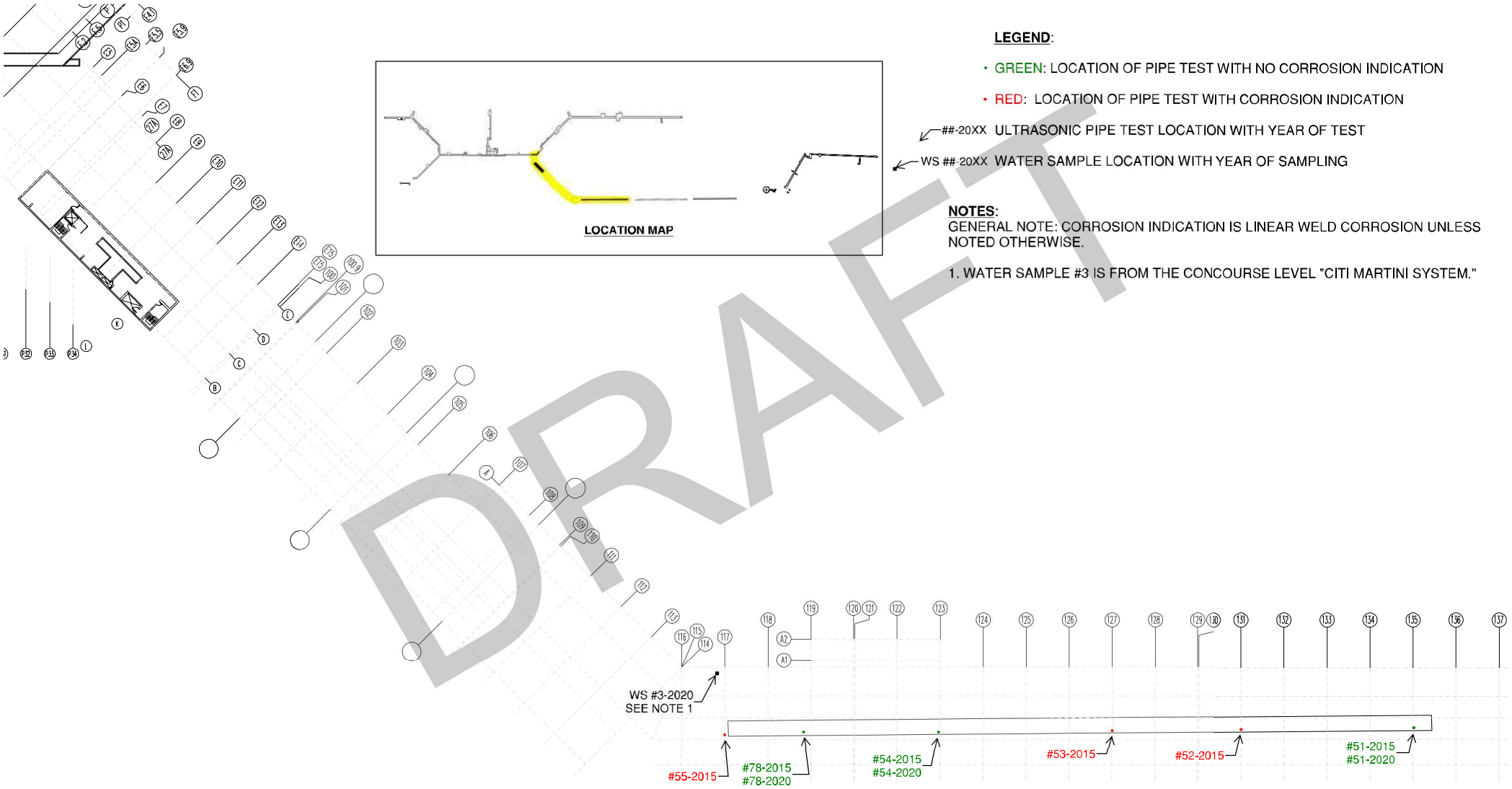
##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

WS ##-20XX WATER SAMPLE LOCATION WITH YEAR OF SAMPLING

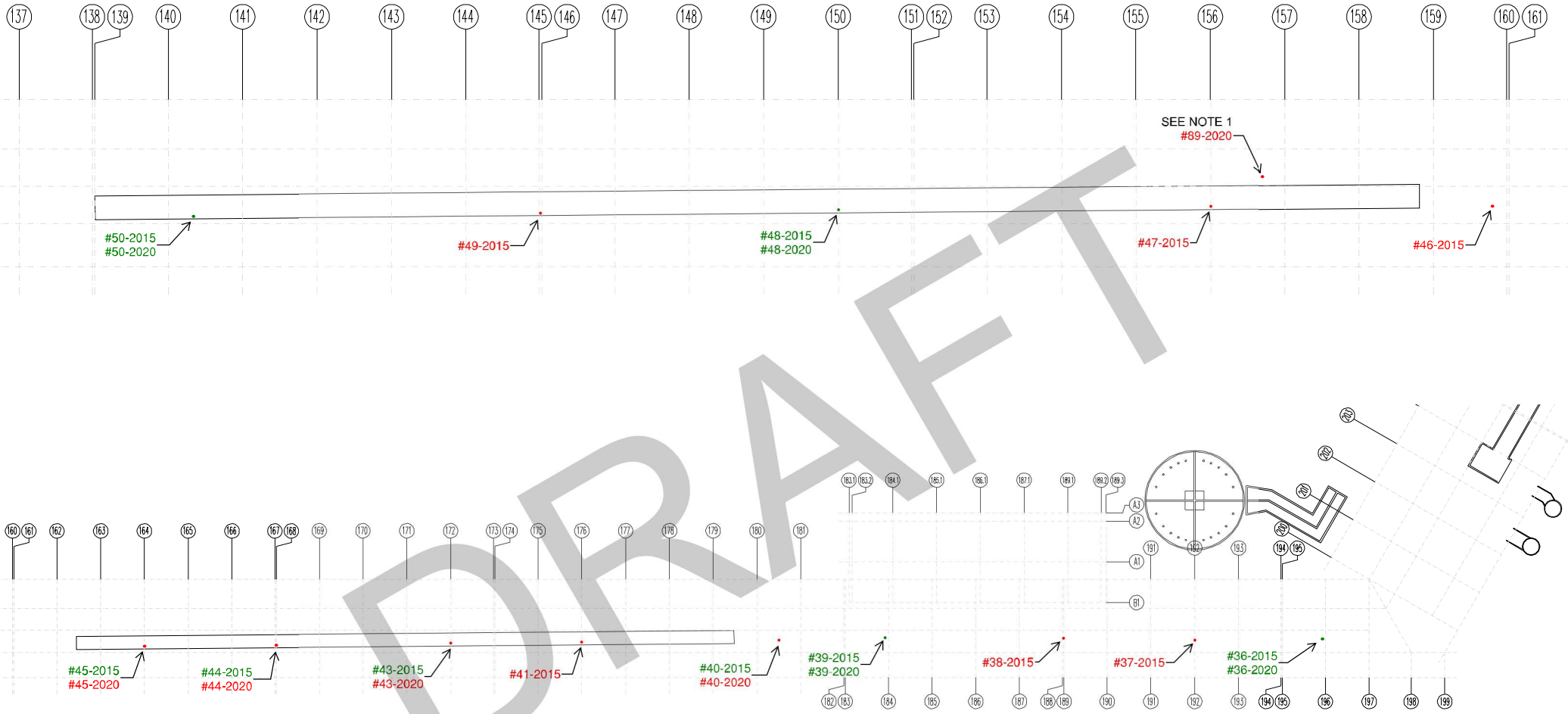
NOTES:
GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. WATER SAMPLE #3 IS FROM THE CONCOURSE LEVEL "CITI MARTINI SYSTEM."

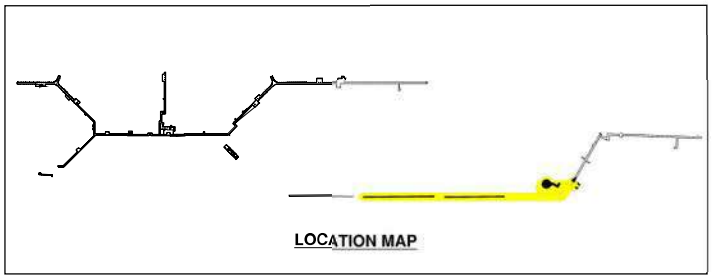
DRAFT



CONCOURSE D TUNNEL - CENTRAL & EAST



DRAFT



LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

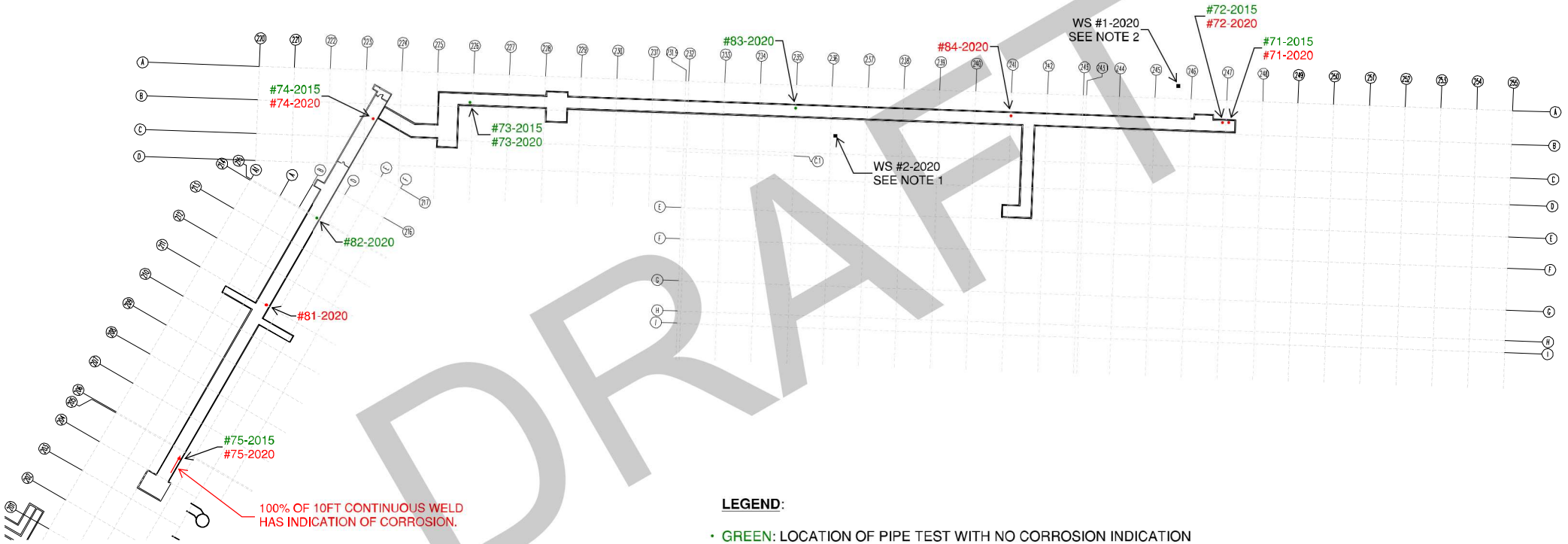
##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

NOTES:

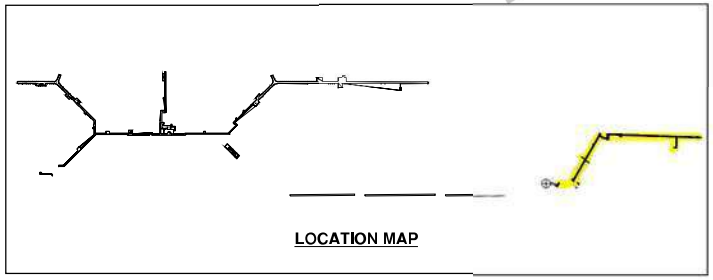
GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1.TEST LOCATION #89 IS ON THE APRON LEVEL IN ROOM D-1264.

CONCOURSE E TUNNEL



DRAFT



LOCATION MAP

LEGEND:

- GREEN: LOCATION OF PIPE TEST WITH NO CORROSION INDICATION
- RED: LOCATION OF PIPE TEST WITH CORROSION INDICATION

##-20XX ULTRASONIC PIPE TEST LOCATION WITH YEAR OF TEST

WS #1-20XX WATER SAMPLE LOCATION WITH YEAR OF SAMPLING

NOTES:

GENERAL NOTE: CORROSION INDICATION IS LINEAR WELD CORROSION UNLESS NOTED OTHERWISE.

1. WATER SAMPLE #2 IS FROM THE CONCOURSE LEVEL NEXT TO DOOR ET-2061, NEXT TO THE CONCOURSE EXIT.

2. WATER SAMPLE #1 IS FROM THE APRON LEVEL IN ROOM E-1032-M.

APPENDIX 11H – TRANSFORMER TESTING REPORT

Appendix H – Transformer Testing Report

TRANSFORMER TESTING

DRAFT

PSA 1241 – St. Louis Lambert Airport Transformer Testing
Report of Findings
January 29th, 2021

TRANSFORMER TESTING

Many of the existing transformers at Lambert Airport are older than the industry standard life expectancy of 30 years. During our interviews with electrical maintenance personnel it was indicated that transformers were not routinely maintained and tested at the airport.

Maintenance and testing procedures aid in providing critical information as to the functionality, safety and reliability of electrical equipment and systems as a whole, as well as providing baselines for continued monitoring of the life expectancy of the electrical equipment. This will aid in planning for future replacement or upgrading.

With the assistance of the Airport Electric Shop, WSP identified eleven transformers 30 years or older as a representative sampling of the older transformers throughout the airport. WSP engaged Aschinger Electric to perform testing and routine maintenance on the transformers to assess their current condition. Insulation-resistance tests were performed in accordance with ANSI/NETA 57.12 and resistance values compared to minimum recommended values in ANSI/NETA 57.12 Table 100.5. This test verifies the integrity of the transformers insulation or identifies degradation in the insulation. Windings ratio tests were also conducted on the transformers and the values compared to the calculated windings ratio for the transformer. Deviation from calculated results can indicate shorting in the windings.

Nine transformers were tested. Transformer insulation values were found to be well above the recommended values in Table 100.5 and windings ratios tested to within 0.1 % of calculated values for all transformers tested. Two of the eleven transformers initially identified as representative were not tested due to schedule availability and with recognition that the nine transformers tested were all within acceptable industry standards.

Routine maintenance and cleaning were performed while the transformers were de-energized for testing.

Electric Power Systems performed the physical testing on behalf of Aschinger Electric. The report from Electric Power Systems with the results of the transformer testing is attached.

DRAFT

TRANSFORMER TESTING

JOB #: 54-0479

DRAFT

877 Horan Dr.
PO Box 26322
Fenton, MO 63026
Phone: 636-343-1211
Fax: 636-343-9658

RECOGNIZE ASCHINGER
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ASCHINGER ELECTRIC

STL20418-240

ELECTRICAL EQUIPMENT TEST REPORT

PEARL
Professional Electrical Apparatus Reconditioning League

NETA™

ST. LOUIS OFFICE

Aaron Lamper - Operations Manager
21 Millpark Ct. Maryland Heights, MO.
P: (314) 890-0999
www.epsii.com

ELECTRIC POWER SYSTEMS

ELECTRICAL TESTING & ENGINEERING

Electric Power Systems
21 Millpark Ct.
Maryland Heights, Missouri 63043
(314) 890-0999

Lance Crayton
Aschinger Electric
(314) 393-5610

SUBJECT: Electrical Equipment Test Report.
EPS JOB: STL20418-240

DRAFT

Mr. Crayton

This report summarizes electrical testing of Lambert Airport located in St. Louis, MO. It has been Electric Power Systems pleasure in providing testing services to Aschinger Electric. If there are any questions, comments or concerns please do not hesitate to contact us directly at our St. Louis Area Office.

Report Prepared by:
Charles Moses
Field Technician
Electrical Power Systems
St. Louis, MO
(314) 890-0999

Report Approved by:
Aaron Lamper
St. Louis Area Operational Manager
Electrical Power Systems
St. Louis, MO
(314) 890-0999

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Equipment Tested	Page 3
Procedures	Page 4 - 12
Summary	Page 13 - 14
Test Data Sheets	See Attached

DRAFT

Purpose:

Electrical systems begin to degrade at the onset of installation and operation. There are many factors, such as design intent, environmental conditions, shipping / handling and installation practices to consider regarding electrical equipment related to power system safety and reliability. Maintenance testing of electrical equipment and apparatus is a useful tool in determining the continued condition of electrical equipment and systems. Maintenance testing procedures aid in providing critical information as to the functionality, safety and reliability of electrical equipment and systems as a whole, as well as providing baselines for continued monitoring of the lifetime of the electrical equipment. This will aid in planning for future replacement or upgrading.

The equipment and components listed in this report have been inspected and tested to help assure their proper and safe operation. Defective or marginal equipment can be identified, repaired, replaced or scheduled for future repairs without costly or unexpected interruptions during normal operating periods

Equipment Tested:

(09) Small Dry Type Transformers

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Procedures:

Transformers, Dry Type, Air-Cooled, Low-Voltage, Small

1. Visual and Mechanical Inspection

1. Compare equipment nameplate data with drawings and specifications.
2. Inspect physical and mechanical condition.
3. Inspect anchorage, alignment, and grounding.
4. Verify that resilient mounts are free and that any shipping brackets have been removed.
5. Verify the unit is clean.
6. Inspect bolted electrical connections for high resistance using one of the following methods:
    1. Use of a low-resistance ohmmeter in accordance with Section 7.2.1.1.2.
7. Verify that as-left tap connections are as specified.
8. Verify that control and alarm settings on temperature indicators are as specified.
9. Verify that cooling fans operate and that fan motors have correct overcurrent protection.

2. Electrical Tests

1. Perform resistance measurements through bolted connections with a low-resistance ohmmeter, if applicable, in accordance with Section 7.2.1.1.1.
2. Perform insulation-resistance tests winding-to-winding and each winding-to-ground. Apply voltage in accordance with manufacturer's published data or in the absence of manufacturer's published data, use Table 100.5.
3. Calculate the dielectric absorption ratio and polarization index in accordance with manufacturer's published data.

*4. Perform turns-ratio tests.

5. Verify correct secondary voltage phase-to-phase and phase-to-neutral after energization and prior to loading

DRAFT

Summary:

The following is a summary of results, notes and deficiencies for the tested equipment. The test data can be found in the data sheets included in this report.

Transformers

All testing results were found to be within acceptable standards.

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric | PAGE

Address 877 Horan Dr.; Fenton MO | JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton | TELEPHONE 314-393-5610

DATE 12/29/2020 | AMBIENT TEMPERATURE 74 °F | HUMIDITY 66 % | EQPT. LOCATION ELECTRIC SHOP

SUBSTATION BSSB2 | POSITION STT#1

NAMEPLATE DATA

MANUFACTURER GENERAL ELECTRIC | YR MFR | SERIAL NO. 9T23A3875

IMPEDANCE % | CAPACITY NA GALLONS | TYPE DRY | CLASS AA / /

KVA 112 / / | WINDING MATERIAL COPPER | TEMPERATURE RISE 150 °C | B.I.L. RATING NA

PRIMARY KV 480 (◉ Δ ○ Y ○ Y) DELTA

SECONDARY KV 208 / 120 (○ Δ ◉ Y ○ Y) WYE

TAP VOLTAGES 502 | 491 | 480 | 469 | 458 | 441 | 431 | INSULATING MEDIUM Air

TAP POSITION 1 | 2 | 3 | 4 | 5 | 6 | 7 | TANK TYPE Free Breathing

TAP SETTING 3 480 Volts | DRY TYPE ☑ | CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN MEGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	1	1	1
0.50			
1.00	4850	880	4060
10.00			5250
P. I.			1.2931

P.I. = 10 min/1 min

WORKING TAP AF 3 AL 3

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
3	4	4.003	4.003	4.003

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER | TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 1/11/2021 AMBIENT TEMPERATURE 78 °F HUMIDITY 55 % EQPT. LOCATION D-14085-E

SUBSTATION DSB-4 POSITION DSB-4 XFMR

NAMEPLATE DATA

MANUFACTURER Westinghouse YR MFR 1984 SERIAL NO. DCV 3163-0102

IMPEDANCE 6.8 % CAPACITY NA GALLONS TYPE DRY CLASS AA / FA /

KVA 750 / 1,000 / WINDING MATERIAL ALUMINUM TEMPERATURE RISE 150 °C B.I.L. RATING NA

PRIMARY KV 4.16 (●) DELTA

SECONDARY KV 480 / 277 (●) WYE

TAP VOLTAGES 4,360 | 4,280 | 4,160 | 4,055 | 3,950 | | | INSULATING MEDIUM Air

TAP POSITION 1-2&5-6 | 1-3&5-6 | 1-3&5-7 | 1-4&5-7 | 1-4&5-8 | | | TANK TYPE Free Breathing

TAP SETTING 1-3&5-7 4,160 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN GIGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	2.5	1	2.5
0.50			
1.00	949	336	769
10.00			1870
P. I.			2.43173

P.I. = 10 min/1 min

WORKING TAP AF 1-3&5-7 AL 1-3&5-7

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
1-3,5-7	15.018	15.017	15.014	15.018

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 1/03/2021 AMBIENT TEMPERATURE 78 °F HUMIDITY 50 % EQPT. LOCATION C-1109-E

SUBSTATION EJWP-1 POSITION E. JETWAY 1 TRANSX

NAMEPLATE DATA

MANUFACTURER FEDERAL PACIFIC YR MFR SERIAL NO. 27905-001

IMPEDANCE 5.34 % CAPACITY NA GALLONS TYPE DRY CLASS AA / / /

KVA 225 / / WINDING MATERIAL COPPER TEMPERATURE RISE 150 °C B.I.L. RATING NA

PRIMARY KV 4.16 ◉ △ ○ ⊣ ○ ⊢ DELTA

SECONDARY KV 480 / 277 ○ △ ◉ ⊣ ○ ⊢ WYE

TAP VOLTAGES 4,368 | 4,264 | 4,160 | 4,056 | 3,952 | | | INSULATING MEDIUM Air

TAP POSITION 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | | | TANK TYPE Free Breathing

TAP SETTING 4-5 4,160 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN TERAOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	2.5	1	2.5
0.50			
1.00	2.240	3	1.354
10.00			5.250
P. I.			3.8774

P.I. = 10 min/1 min

WORKING TAP AF 4-5 AL 4-5

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
4-5	15.018	15.028	15.028	15.029

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 1/03/2021 AMBIENT TEMPERATURE 78 °F HUMIDITY 50 % EQPT. LOCATION C-1109-E

SUBSTATION ESB-2 POSITION TRANSX ESB-2

NAMEPLATE DATA

MANUFACTURER FEDERAL PACIFIC YR MFR SERIAL NO. 27903-001

IMPEDANCE 6.73 % CAPACITY NA GALLONS TYPE DRY CLASS AA / /

KVA 1,000 / / WINDING MATERIAL COPPER TEMPERATURE RISE 150 °C B.I.L. RATING NA

PRIMARY KV 4.16 ◉ Δ ○ Y ○ Z DELTA

SECONDARY KV 208 / 120 ○ Δ ◉ Y ○ Z WYE

TAP VOLTAGES 4,370 | 4,265 | 4,160 | 4,055 | 3,950 | | | INSULATING MEDIUM Air

TAP POSITION 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | | | TANK TYPE Free Breathing

TAP SETTING 4-5 4,160 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN GIGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	2.5	1	2.5
0.50			
1.00	533	59.3	465
10.00			1665
P. I.			3.58065

P.I. = 10 min/1 min

WORKING TAP AF 4-5 AL 4-5

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
4-5	34.67	34.693	34.693	34.693

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 1/12/2021 AMBIENT TEMPERATURE 72 °F HUMIDITY 63 % EQPT. LOCATION C-1263-E

SUBSTATION ESB-3 POSITION TRANSX ESB-3

NAMEPLATE DATA

MANUFACTURER Federal Pacific YR MFR SERIAL NO. 33348-001

IMPEDANCE 6.3 % CAPACITY NA GALLONS TYPE DRY CLASS AA / /

KVA 2,000 / / WINDING MATERIAL ALUMINUM TEMPERATURE RISE 115 °C B.I.L. RATING 30

PRIMARY KV 4.16 (●) DELTA

SECONDARY KV 480 / 277 (●) WYE

TAP VOLTAGES 4,368 | 4,264 | 4,160 | 4,056 | 3,952 INSULATING MEDIUM Air

TAP POSITION 2-3 | 3-4 | 4-5 | 5-6 | 6-7 TANK TYPE Free Breathing

TAP SETTING 4-5 4,160 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN GIGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	2.5	1	2.5
0.50			
1.00	784	24.6	2090
10.00			7500
P. I.			3.58852

P.I. = 10 min/1 min

WORKING TAP AF 4-5 AL 4-5

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
4-5	15.018	15.005	15.005	15.007

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 12/29/2020 AMBIENT TEMPERATURE 74 °F HUMIDITY 66 % EQPT. LOCATION B-1041-M

SUBSTATION FEEDER 3A 3B POSITION CENTER JETWAY POWER TRANSX

NAMEPLATE DATA

MANUFACTURER FEDERAL PACIFIC YR MFR SERIAL NO. 27906-001

IMPEDANCE 4.38 % CAPACITY NA GALLONS TYPE DRY CLASS AA / /

KVA 150 / / WINDING MATERIAL COPPER TEMPERATURE RISE 150 °C B.I.L. RATING NA

PRIMARY KV 4.16 DELTA

SECONDARY KV 480 / 277 WYE

TAP VOLTAGES 4,370 | 4,265 | 4,160 | 4,055 | 3,950 | | | INSULATING MEDIUM Air

TAP POSITION 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | | | TANK TYPE Free Breathing

TAP SETTING 4-5 4,160 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN GIGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	2.5	1	2.5
0.50			
1.00	1973	1040	558
10.00			2220
P. I.			3.97849

P.I. = 10 min/1 min

WORKING TAP AF 4-5 AL 4-5

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
4-5	15.018	15.013	15.013	15.015

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 1/11/2021 AMBIENT TEMPERATURE 78 °F HUMIDITY 55 % EQPT. LOCATION D-14085-E

SUBSTATION PPC9.1 POSITION PPC9.1 XFMR

NAMEPLATE DATA

MANUFACTURER Westinghouse YR MFR NA SERIAL NO. 84F34002

IMPEDANCE 4.3 % CAPACITY NA GALLONS TYPE DRY CLASS AA / / /

KVA 75 / / WINDING MATERIAL COPPER TEMPERATURE RISE 115 °C B.I.L. RATING NA

PRIMARY KV 480 DELTA

SECONDARY KV 208 / 120 WYE

TAP VOLTAGES 504 | 492 | 480 | 468 | 456 | 444 | 432 INSULATING MEDIUM Air

TAP POSITION 1 | 2 | 3 | 4 | 5 | 6 | 7 TANK TYPE Free Breathing

TAP SETTING 3 480 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN GIGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	1	1	1
0.50			
1.00	17.8	14.6	18.5
10.00			46.3
P. I.			2.5027

P.I. = 10 min/1 min

WORKING TAP AF 3 AL 3

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
3	4	4.0014	4.0018	4.002

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 12/29/2020 AMBIENT TEMPERATURE 74 °F HUMIDITY 66 % EQPT. LOCATION B-1041-M

SUBSTATION ROOF TOP AHU'S CSB-1 POSITION ROOF TOP AHU'S XFMR

NAMEPLATE DATA

MANUFACTURER WESTINGHOUSE YR MFR SERIAL NO. G81L20762

IMPEDANCE 5.7 % CAPACITY NA GALLONS TYPE DRY CLASS AA / / /

KVA 150 / / WINDING MATERIAL COPPER TEMPERATURE RISE 150 °C B.I.L. RATING NA

PRIMARY KV 480 DELTA

SECONDARY KV 208 / 120 WYE

TAP VOLTAGES 504 | 492 | 480 | 468 | 456 | 444 | 432 INSULATING MEDIUM Air

TAP POSITION 4-5 | 4-6 | 4-7 | 3-6 | 3-7 | 2-6 | 2-7 TANK TYPE Free Breathing

TAP SETTING 3-7 95 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN GIGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	1	1	1
0.50			
1.00	3000	667	28.2
10.00			136.8
P. I.			4.85106

P.I. = 10 min/1 min

WORKING TAP AF 3-7 AL 3-7

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
3-7	3.8	3.818	3.8175	3.8175

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT

TRANSFORMER TESTS

CUSTOMER Aschinger Electric PAGE

Address 877 Horan Dr.; Fenton MO JOB # STL20418-240

USER Lambert - St. Louis International Airport

OWNER REPRESENTATIVE Lance Crayton TELEPHONE 314-393-5610

DATE 1/13/2021 AMBIENT TEMPERATURE 74 °F HUMIDITY 63 % EQPT. LOCATION ELECTRICAL TRANSX ROOM

SUBSTATION WSB2 POSITION TRANSX WSB2

NAMEPLATE DATA

MANUFACTURER Federal Pacific YR MFR SERIAL NO. 27904-001

IMPEDANCE 6.2 % CAPACITY NA GALLONS TYPE DRY CLASS AA / /

KVA 750 / / WINDING MATERIAL COPPER TEMPERATURE RISE 150 °C B.I.L. RATING NA

PRIMARY KV 4.16 DELTA

SECONDARY KV 208 / 120 WYE

TAP VOLTAGES 4,370 | 4,265 | 4,160 | 4,055 | 3,950 | | | INSULATING MEDIUM Air

TAP POSITION 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | | | TANK TYPE Free Breathing

TAP SETTING 4-5 4,160 Volts DRY TYPE ☑ CONSERVATOR ☐

VISUAL AND MECHANICAL INSPECTION

INSPECTION REPORT		INSPECTION REMARKS
INSPECT PHYSICAL AND MECHANICAL CONDITION	☑ PASS ☐ FAIL	
VERIFY FANS OPERATE	☐ PASS ☐ FAIL	
INSPECT ANCHORAGE, ALIGNMENT AND GROUNDING	☑ PASS ☐ FAIL	

ELECTRICAL TESTS (OPTIONAL FOR L.V. TRANSFORMERS OR BELOW 500 kVA)

INSULATION RESISTANCE IN GIGOHMS			
MINUTES	PRIMARY TO GROUND	SECONDARY TO GROUND	PRIMARY TO SECONDARY
Test kV	2.5	1	2.5
0.50			
1.00	425	64.1	495
10.00			2050
P. I.			4.14141

P.I. = 10 min/1 min

WORKING TAP AF 4-5 AL 4-5

TRANSFORMER TURN RATIO TEST				
TAP	CALC	PHASE A	PHASE B	PHASE C
4-5	34.66	34.621	34.622	34.623

ASSESSMENT OF TRANSFORMER: **PASSED ALL NETA ATS SPECIFICATIONS**

COMMENTS:

DEFICIENCIES:

TEST EQUIPMENT USED: TTR, MEGGER TESTED BY: ME

DRAFT