# Appendix B:
# Consolidated Terminal Program Phasing

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

## ADVANCED PLANNING TECHNICAL MEMO #2

# CONSOLIDATED TERMINAL PROGRAM PHASING

This technical memo, along with the other technical memos prepared as part of this Advanced Planning task, represents the **Program Criteria Document** for the St. Louis Lambert International Airport **Consolidated Terminal Program**. Each standalone technical memo provides additional information to support the National Environmental Policy Act (NEPA) and design processes.



Purpose of this Memo:

In the Advanced Planning task, the Master Plan projects and connected projects/actions were combined into two programs that are not connected, the Consolidated Terminal Program (CTP) and the West Airfield Program (WAP). This memo provides a description and depiction of high-level construction phasing of the CTP projects, outlining the timeline from 2024 to 2031.

ST. LOUIS LAMBERT INTERNATIONAL AIRPORT

## ADVANCED PLANNING TECHNICAL MEMO #2

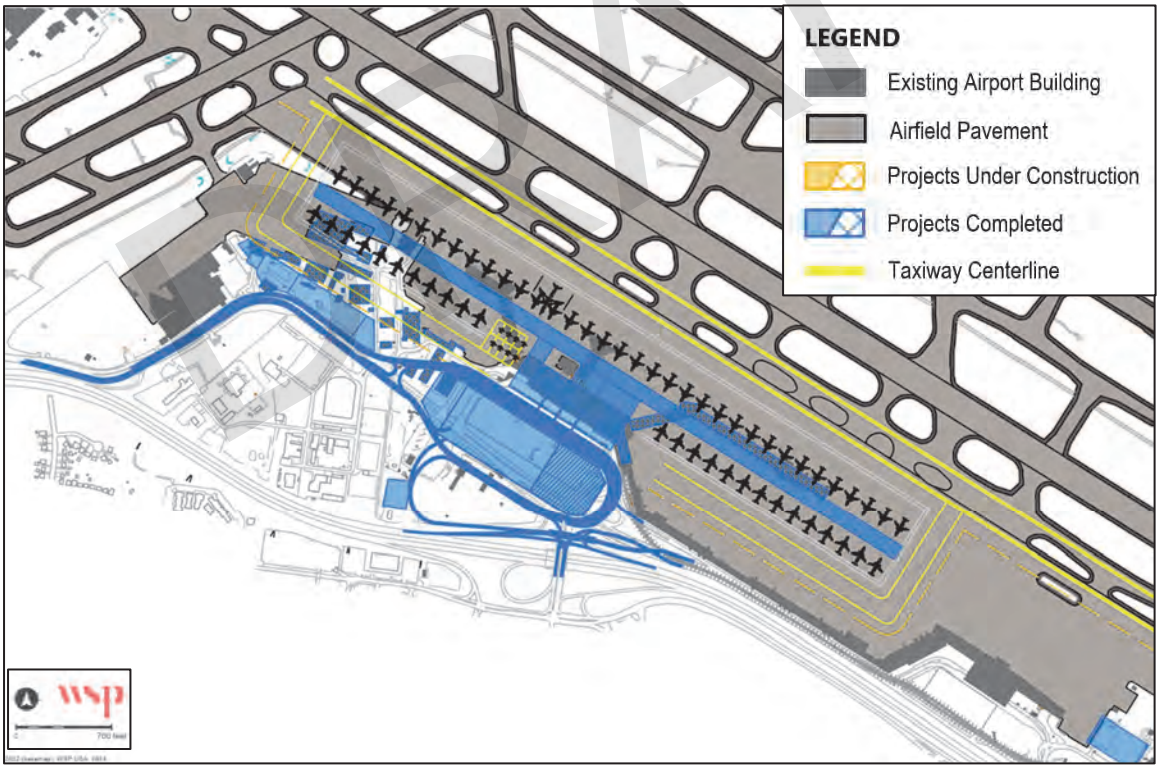
# CONSOLIDATED TERMINAL PROGRAM PHASING

# 1 EXECUTIVE SUMMARY

In the Advanced Planning task, the Master Plan projects and connected projects/actions were combined into two programs, the Consolidated Terminal Program (CTP) and the West Airfield Program (WAP). This memo provides a description and depiction of high-level construction phasing of the CTP projects by year.

**Figure 1-1** depicts the CTP layout after the completion of the program in late 2031. Note that the planned terminal size of 62 gates represents the higher end of the planning need. This conservative approach ensures there is sufficient space for the terminal. The plan will likely change as actual by-airline needs are established in the Airline Use Agreement and architectural design.

**Figure 1-1: Consolidated Terminal Program Projects**

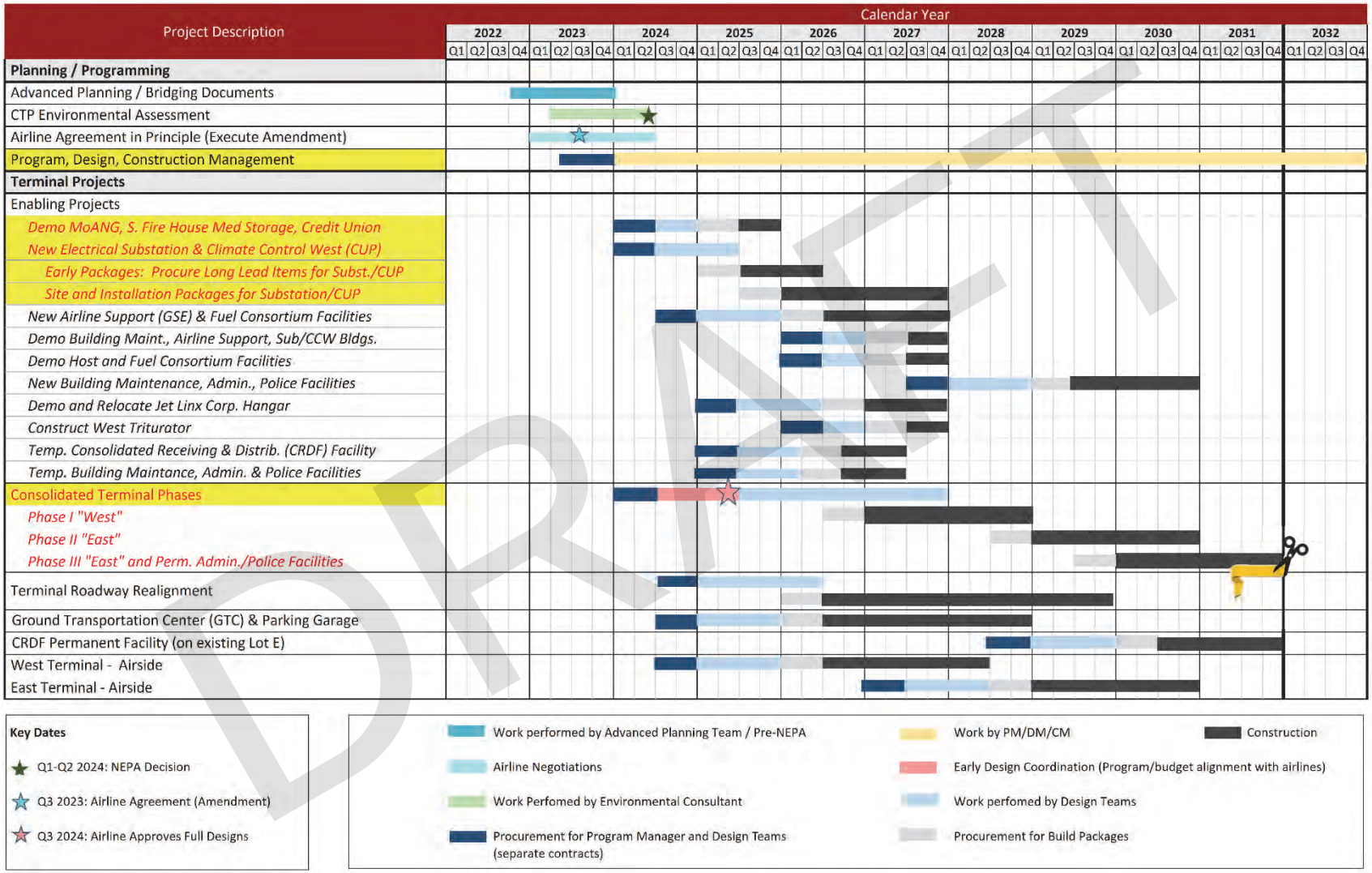



Source: WSP USA, 2023.

# 2 BACKGROUND

The CTP was developed to enhance the passenger experience, increase airport revenue, eliminate duplication of services, eliminate aging and redundant building systems, ensure continued safe, secure, and efficient operations at STL, by providing sufficient space and facilities for current and forecast passenger demand and aircraft operations. Construction of the CTP is planned to span from 2024 to 2031. **Table 2-1** outlines the schedule for the CTP.

## Table 2-1: Consolidated Terminal Program Schedule




Source: WSP USA, 2023.

# 3 PROJECTS BY YEAR

This section provides a list and depiction of CTP projects based on construction years.

## 3.1 2025 PROJECTS

The following are projects scheduled for 2025:

- Demolishing of the MoANG Buildings (2024-2025)
- Demolishing of the South Fire House Medical Storage (2025)
- Demolishing of the credit union building (2025)
- Procurement of long lead items for West (Lambert) Electrical Substation and Central Utility Plan (2025-2026)

**Figure 3-1** depicts the construction projects in 2025.

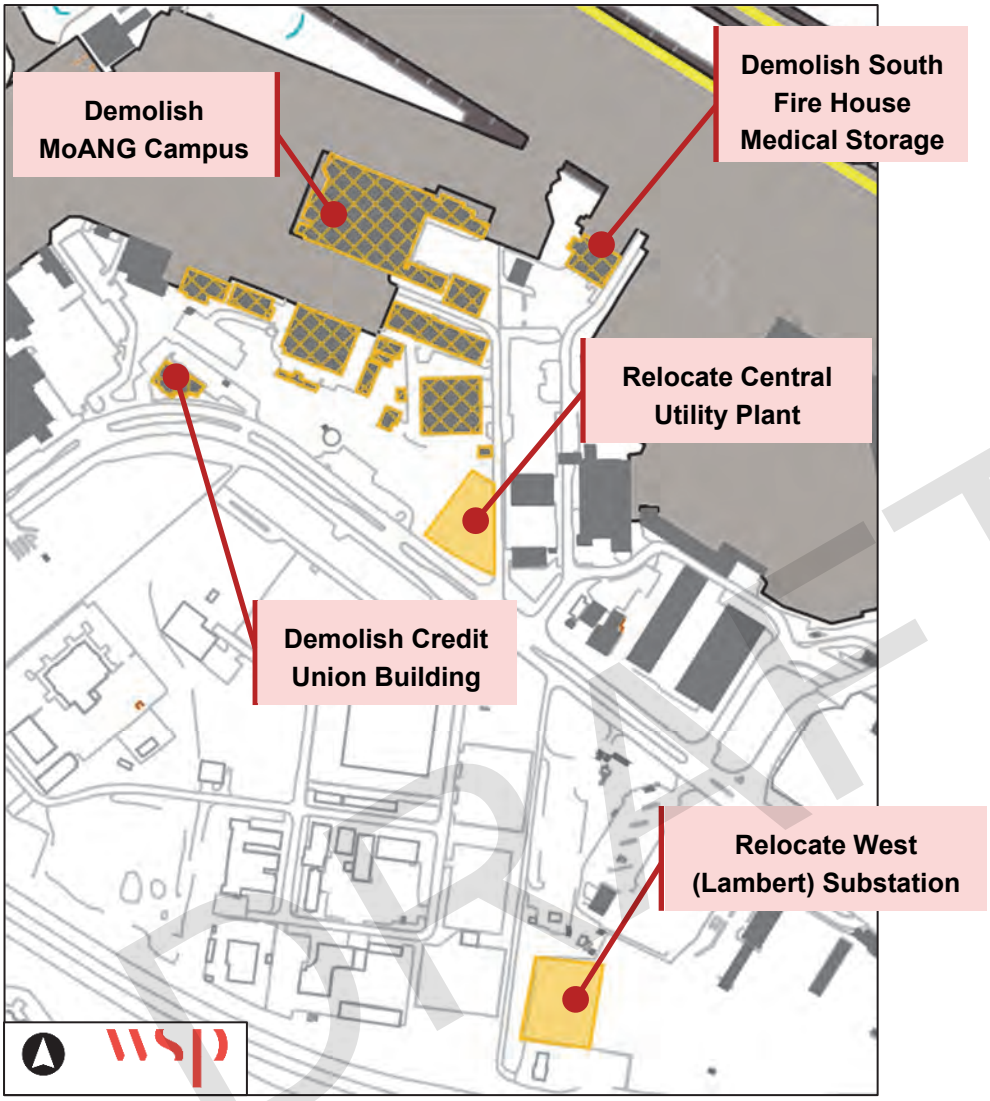
## 3.2 2026 PROJECTS

The following are projects scheduled for 2026:

- Procurement of long lead items for West (Lambert) Electrical Substation and Central Utility Plan (2025-2026)
- Reactivate Concourse D and portion of Concourse C (2026)
- Site and Installation packages for West (Lambert) Electrical Substation and Central Utility Plan (2026-2027)
- Construction of New Airline Support (GSE) facility (2026-2027)
- Construction of Fuel Consortium facility (2026-2027)
- Constructing a temporary Consolidated Receiving & Distribution Facility (CRDF) (2026-2027)
- Constructing a temporary Building Maintenance Facility (2026-2027)
- Constructing a temporary Airport Administration space (2026-2027)
- Constructing a temporary Airport Police space (2026-2027)
- Realign the Terminal roadway (2026-2029)
- Construct the Ground Transportation Center (GTC) and Parking Garage (2026-2028)
- Construct the apron for the West Terminal side (2026-2028)

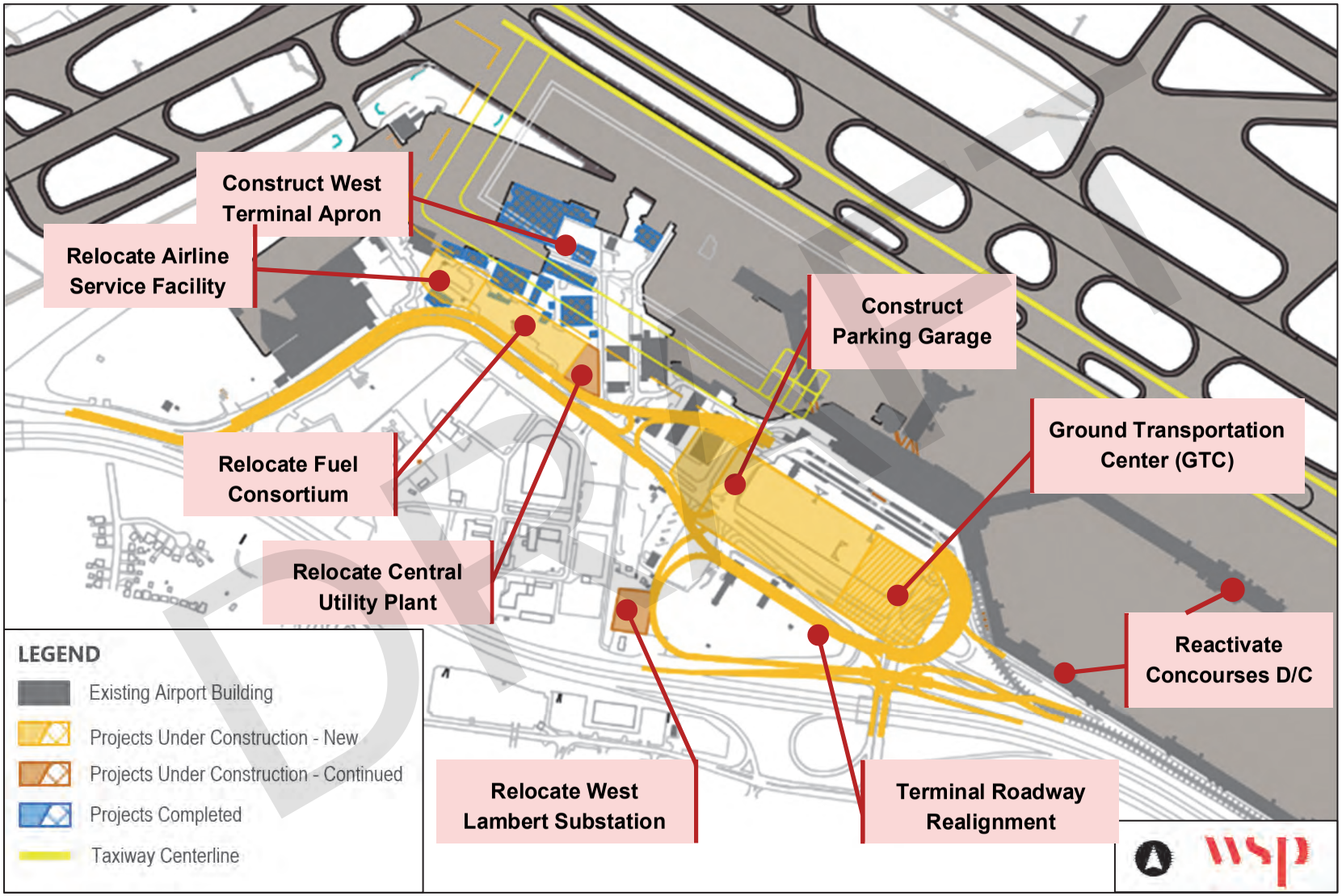
**Figure 3-2** depicts the construction projects in 2026.

**Figure 3-1: 2025 Construction Projects**




Source: WSP USA, 2023.

**Figure 3-2: 2026 Construction Projects**




Source: WSP USA, 2023.

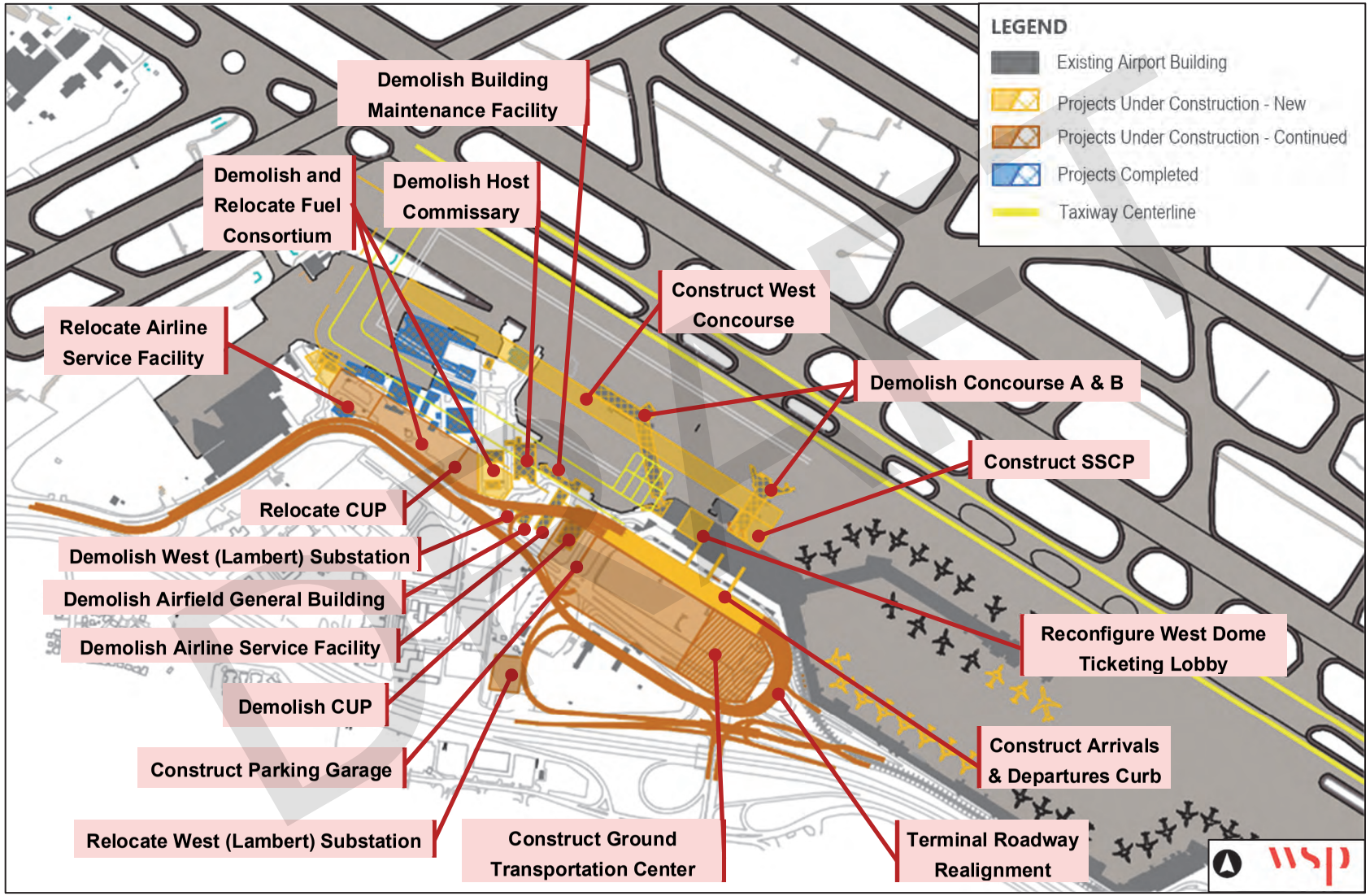
## 3.3 2027 PROJECTS

The following are projects scheduled for 2027:

- Site and Installation packages for West (Lambert) Electrical Substation and Central Utility Plant (2026-2027).
- Construction of New Airline Support (GSE) facility (2026-2027)
- Construction of Fuel Consortium facility (2026-2027)
- Construction of a temporary CRDF (2026-2027)
- Construction of a temporary Building Maintenance Facility (2026-2027)
- Construction of a temporary Airport Administration space (2026-2027)
- Construction of a temporary Airport Police space (2026-2027)
- Construction of the Ground Transportation Center (GTC) and Parking Garage (2026-2028)
- Construction of the apron for the West Terminal side (2026-2028)
- Realigning the Terminal roadway (2026-2029)
- Demolition of existing Building Maintenance facility (2027)
- Demolition of existing Airline Support facility (2027)
- Demolition of existing West (Lambert) Electrical Substation facility (2027)
- Demolition of existing Central Utility Plant (2027)
- Demolition of Host Commissary (2027)
- Demolition of existing Fuel Consortium facility (2027)
- Terminal Phase 1 (2027-2028):
    - Demolition of Concourse A and B (requires relocation of Concourse B Operations Center and staff training stations)
    - Relocation of Building Maintenance Facility
    - Relocation of West Triturator
    - Construction of West Concourse (up to 31 Nominal Gates)
    - Construction of Apron inside West Terminal Area
    - Construction of SSCP/CBIS
    - Reconfiguration of ticketing lobby under the west dome
    - Construction of Stacked Arrivals & Departures Curb Drives

**Figure 3-3** depicts the construction projects in 2027.

## Figure 3-3: 2027 Construction Projects




Source: WSP USA, 2023.

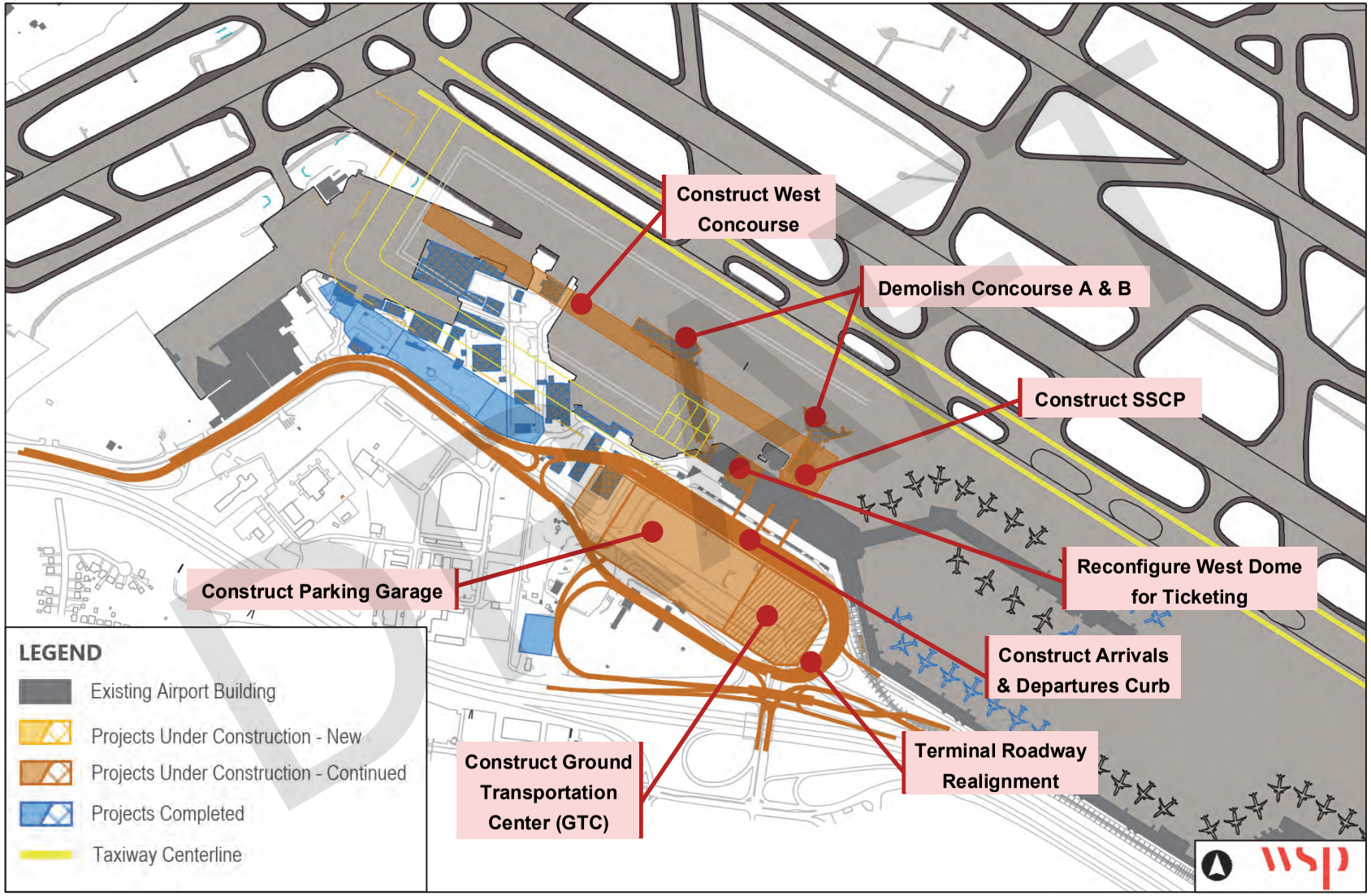
## 3.4 2028 PROJECTS

The following are projects scheduled for 2028:

- Construction of the Ground Transportation Center (GTC) and Parking Garage (2026-2028).
- Construction of the apron for the West Terminal side (2026-2028)
- Realignment of the Terminal roadway (2026-2029)
- Terminal Phase 1 (2027-2028):
  - Demolition of Concourse A and B
  - Relocation of Building Maintenance Facility
  - Relocation of West Triturator
  - Construction of West Concourse (up to 31 Nominal Gates)
  - Construction of Apron inside West Terminal Area
  - Construction of SSCP/CBIS
  - Reconfiguration of the western portion of domes for Ticketing
  - Construction of Stacked Arrivals & Departures Curb Drives

**Figure 3-4** depicts the construction projects in 2028.

## Figure 3-4: 2028 Construction Projects




Source: WSP USA, 2023

## 3.5 2029 PROJECTS

The following are projects scheduled for 2029:

- Realign the Terminal roadway (2026-2029)
- Construction of New Building Maintenance facility (2029-2030)
- Construction of New Airport Administration space (2029-2030)
- Construction of Airport Police space (2029-2030)
- Construct the apron for the East Terminal side (2029-2030)
- Terminal Phase 2 (2029-2030):
  - Demolition of Concourse C
  - Construction of East Concourse (up to 31 Nominal Gates)
  - Construction of western half of Baggage Claim
  - Construction of new Federal Inspection Service (FIS)[1]
  - Reconfiguration of center portion of domes for Ticketing

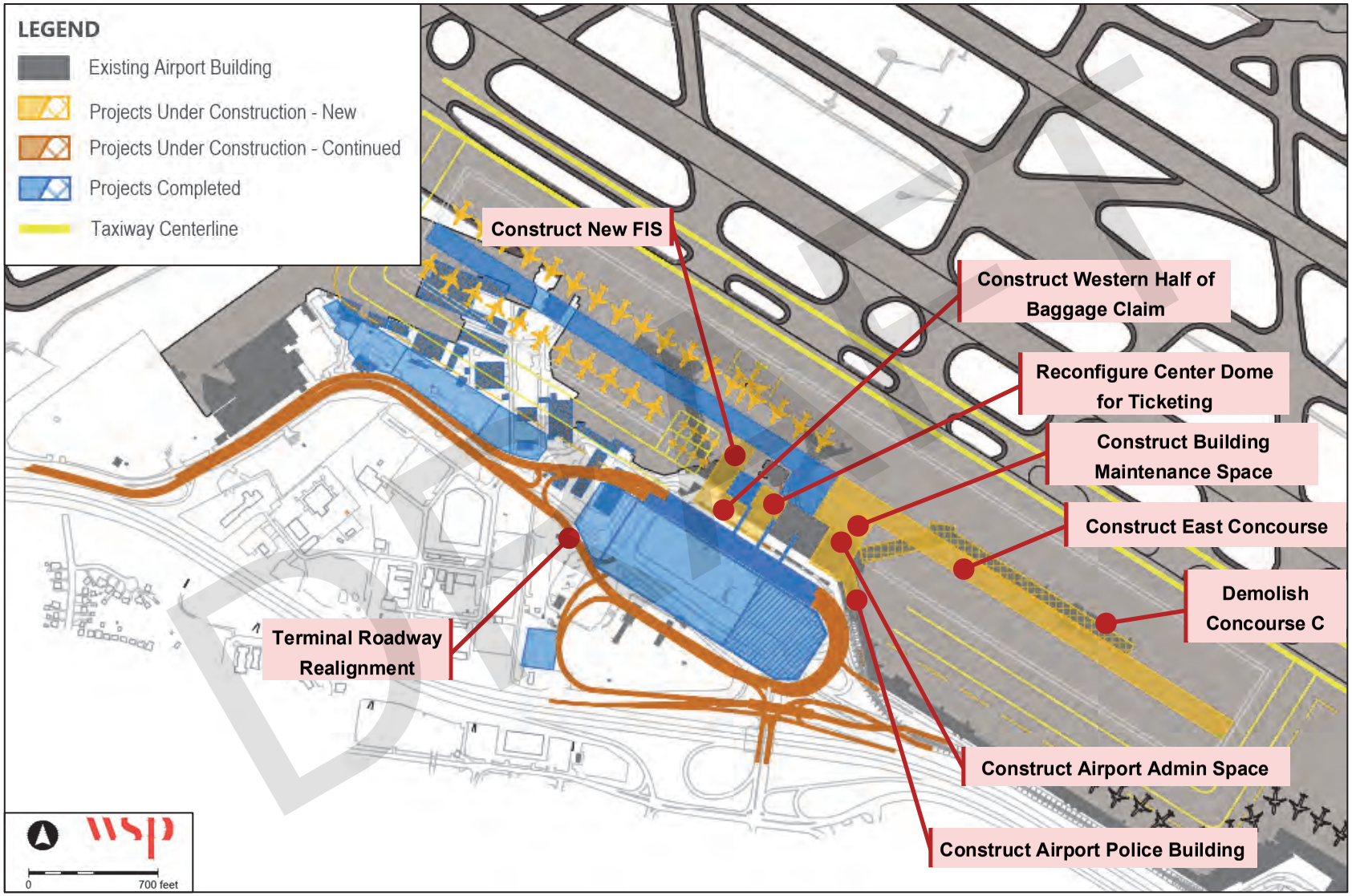
**Figure 3-5** depicts the construction projects in 2029.



[1] The new FIS is planned to be constructed in Terminal Phase 2, for the following reasons:

- In order to build the new FIS and bag claim area, the existing departures roadway has to be demolished, which requires the new terminal curbs to be built and operational (scheduled completion in 2028).
- Additionally, the Meeter/Greeter lobby and bag recheck for the FIS are within the new bag claim area, which can also only be built in 2029, once the new terminal curbs are complete. If the FIS were built before 2029, arriving passengers would have to go through a temporary facility in the existing bag claim area, which has no room. Then, when tearing down and rebuilding the west end of the bag claim area, these arriving passengers would need to be accommodated elsewhere or be worked around. This is undesired for both passenger experience and construction efficiency. The FIS building could be redesigned to include the Meeter/Greeter lobby and recheck functions. However, this would add area and cost, compared to integrating these functions into the domestic bag lobby.

**Figure 3-5: 2029 Construction Projects**




Source: WSP USA, 2023.

## 3.6 2030 PROJECTS

The following are projects scheduled for 2030:

- Construction of New Building Maintenance facility (2029-2030)
- Construction of New Airport Administration space (2029-2030)
- Construction of Airport Police space (2029-2030)
- Construction of the apron for the East Terminal side (2029-2030)
- Terminal Phase 2 (2029-2030):
  - Demolition of Concourse C
  - Construction of East Concourse (up to 31 Nominal Gates)
  - Construction of west half of Baggage Claim
  - Construction of new FIS
  - Reconfiguration of center portion of domes for Ticketing
- Terminal Phase 3 (2030-2031):
  - Construction of eastern half of Baggage Claim
  - Reconfiguration of eastern portion of domes for Ticketing
- Construction of a permanent CRDF on existing Lot E (2030-2031)

**Figure 3-6** depicts the construction projects in 2030.

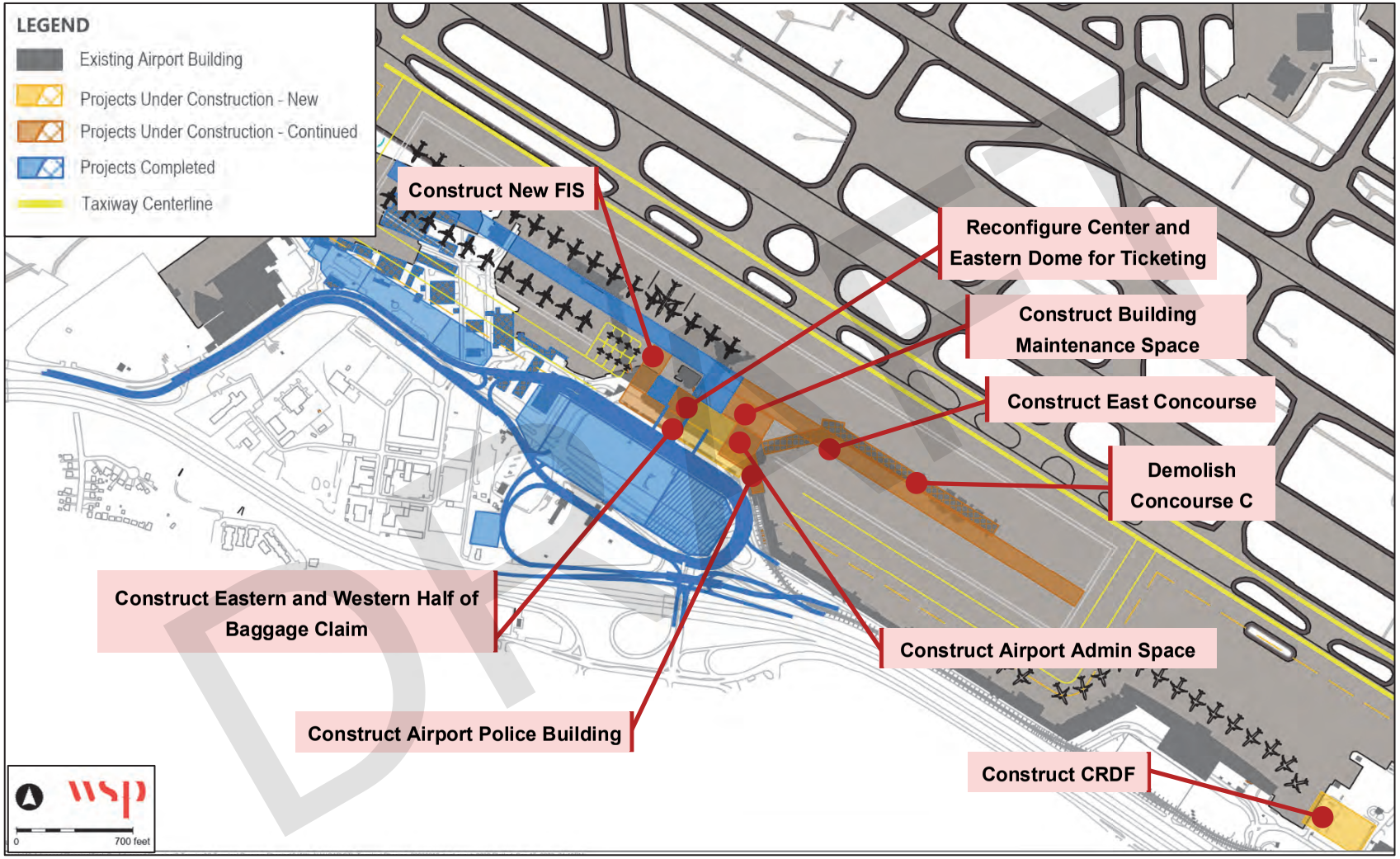
## 3.7 2031 PROJECTS

The following are projects scheduled for 2031:

- Terminal Phase 3 (2030-2031):
  - Construction of eastern half of Baggage Claim
  - Reconfiguration of eastern portion of domes for Ticketing
- Construction of a permanent CRDF on existing Lot E (2030-2031)

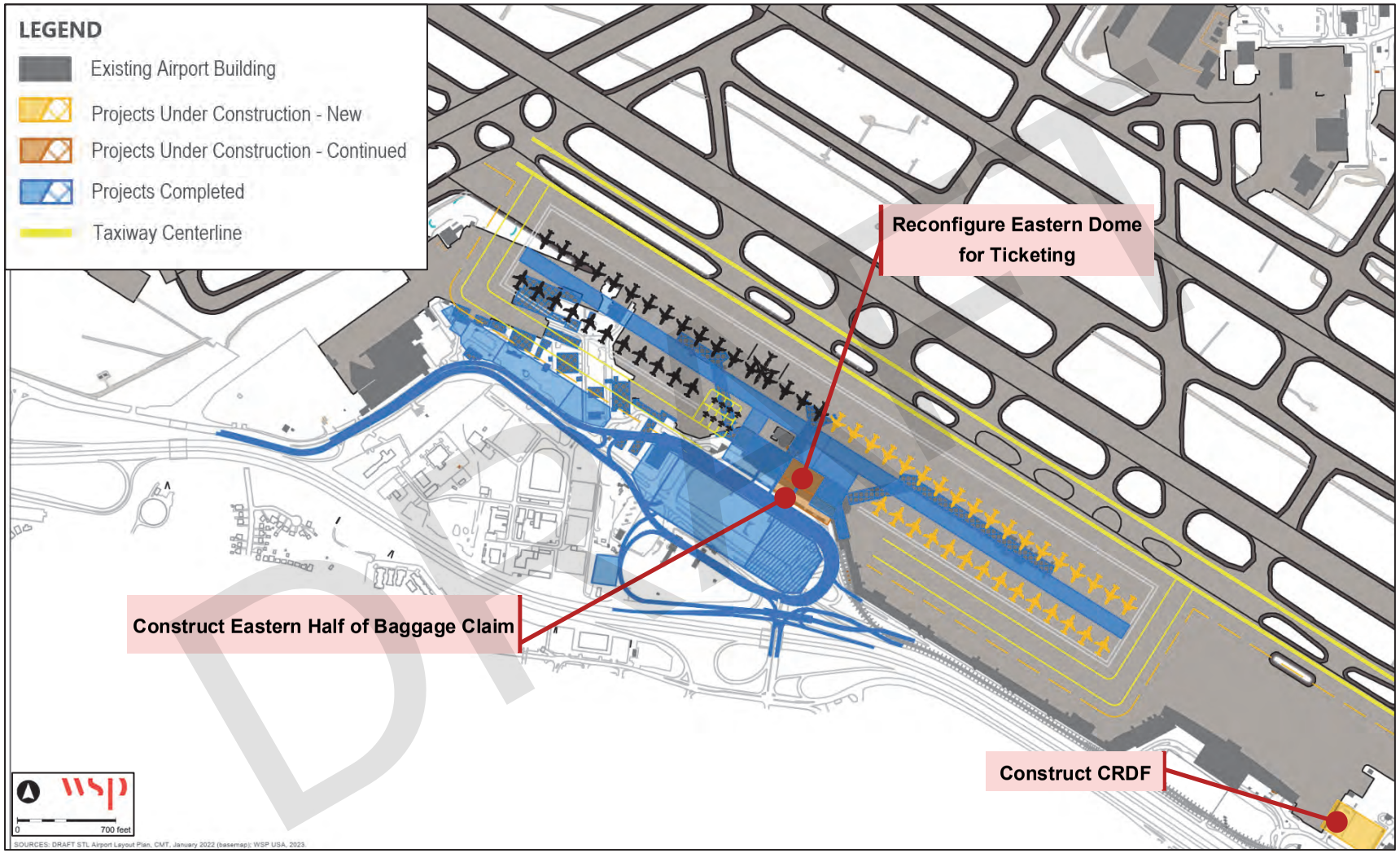
**Figure 3-7** depicts the construction projects in 2031.

## Figure 3-6: 2030 Construction Projects




Source: WSP USA, 2023

## Figure 3-7: 2031 Construction Projects




Source: WSP USA, 2023

# 4 CONSTRUCTION STAGING

This section identifies potential sites for contractor staging areas throughout the construction of the CTP and associated projects. Actual staging and layout down areas will be defined during the Program Management/Construction Management phase.

## 4.1 METHODOLOGY

The Kansas City International Airport (MCI) terminal construction project was used as a benchmark to determine the size of required staging areas. Based on aerial images of the construction areas, MCI had approximately 7.5 acres of staging for a 42-gate terminal project, including landside access and a 7,000-space parking garage. As such, STL's 62-gate terminal project is assumed to require a construction staging area of approximately 11 acres.

## 4.2 ENABLING, WEST CONCOURSE AND LANDSIDE CONSTRUCTION STAGING

To accommodate staging needs for Phase 0 (enabling projects) and Phase 1 (construction of the West Concourse) of the CTP, two site options were explored. These sites allow for efficient utilization of space while minimizing disruption to surrounding areas.

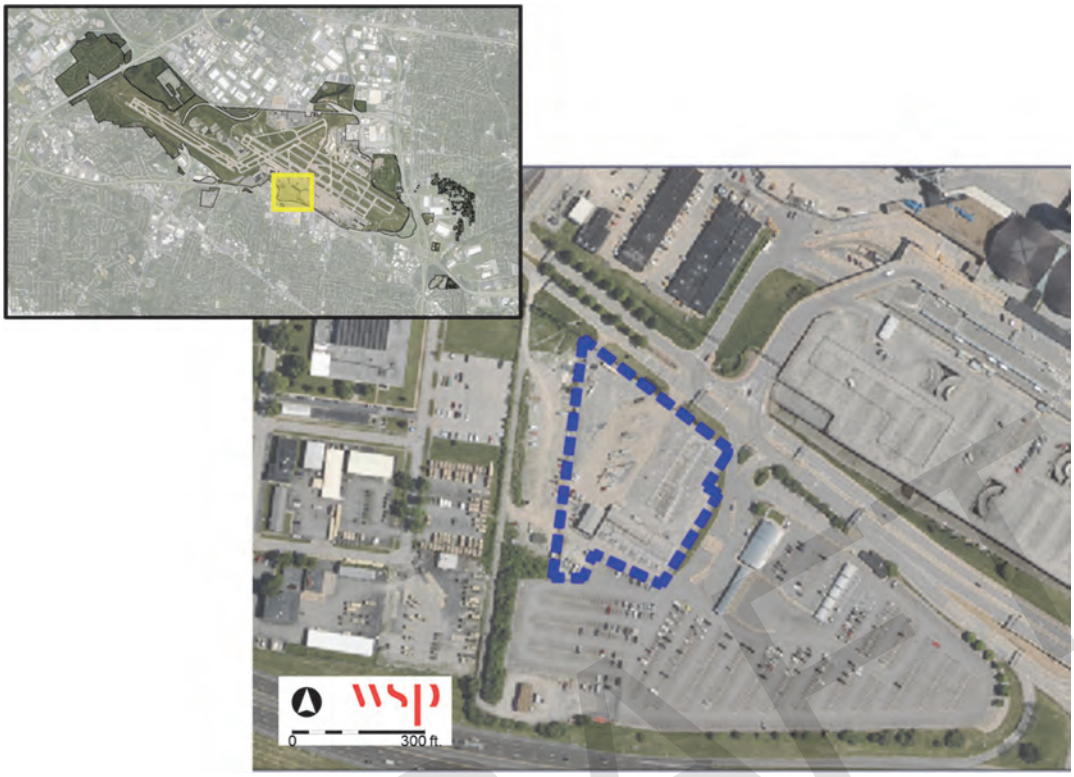
### *4.2.1 OPTION 1*

Option 1 is located in the old fuel farm next to Lot A, which offers approximately 3 acres of space for landside and garage construction staging, as seen in

**Figure 4-1.** The cons associated with this option are:

- Insufficient staging space available.
- Construction vehicles would utilize Lambert International Boulevard, causing heavy traffic.

**Figure 4-1: Option 1 Site - Lot A**

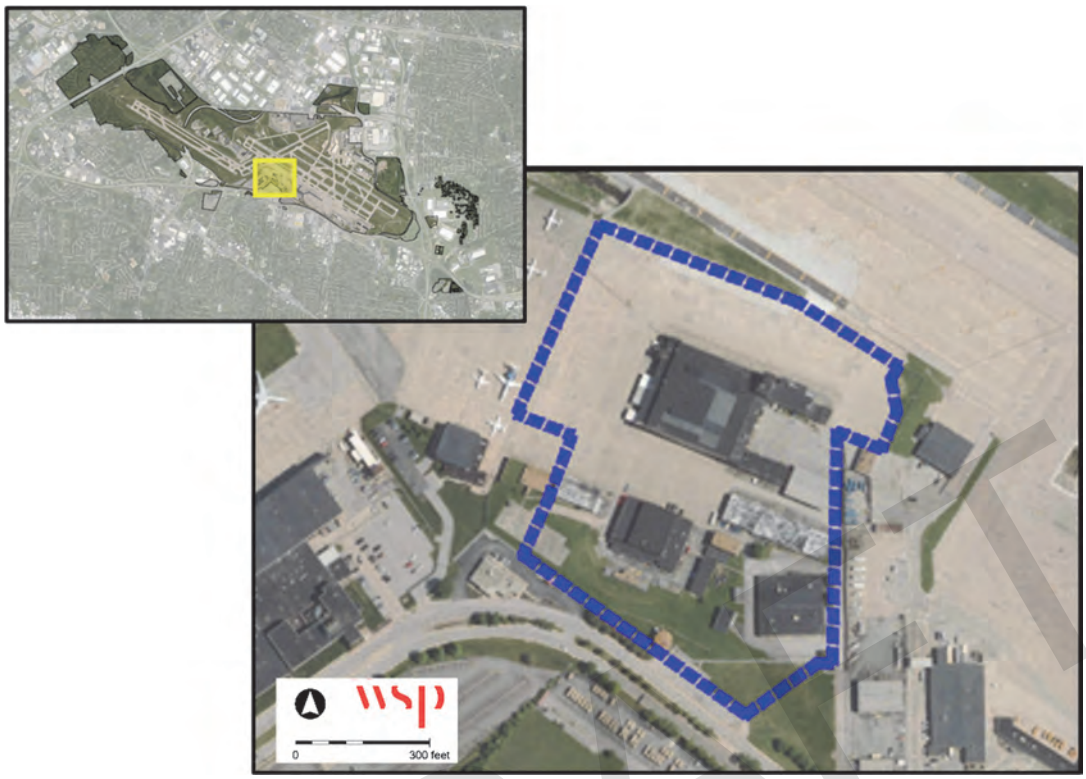



Source: WSP USA, 2023.

### *4.2.2 OPTION 2*

Option 2 consists of using the MoANG area as the construction staging area, with approximately 14 acres of space available after existing buildings are demolished, as depicted in **Figure 4-2**. The staging at the MoANG site will not impact the existing Medical Supplies Building, Fuel Consortium, Host Commissary, credit union, or airport support buildings.

**Figure 4-2. Option 2 Site - MoANG Facility**




Source: WSP USA, 2023.

## 4.3 EAST CONCOURSE CONSTRUCTION STAGING

During Phase 2 (construction of the East Concourse), the staging area on the site of the demolished MoANG facilities will no longer be available, since the West Concourse and airport support buildings along the west LIB corridor will be constructed and in service. Although Lot A is still available, the space will not be sufficient to meet the staging area needs. Accessibility of the lot to/from the East Concourse construction area would also be challenging. To accommodate staging needs for Phase 2 of the CTP, two other site options were explored.

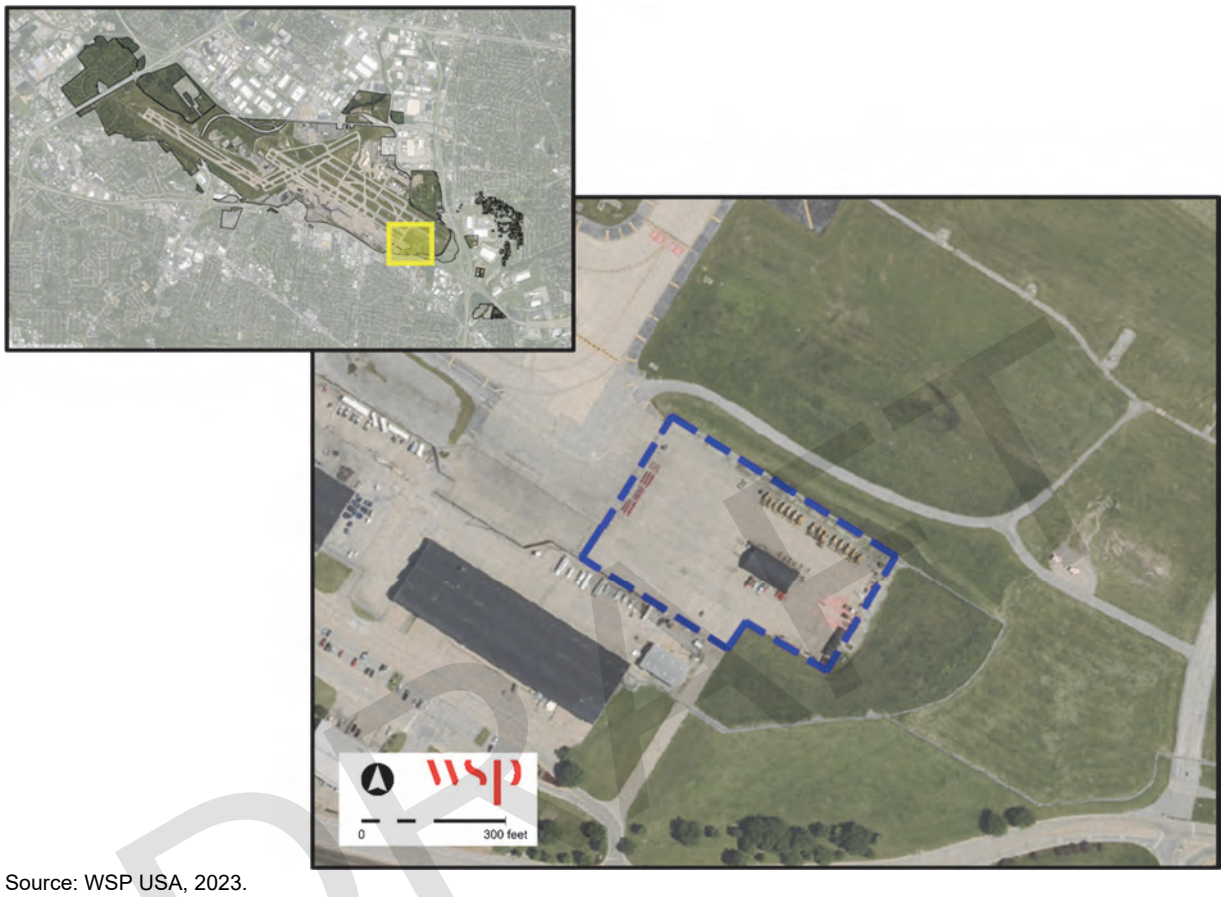
### *4.3.1 OPTION 1*

Option 1 consists of designating the existing 3.5-acre Snow Removal Equipment Area, as shown in **Figure 4-3**, as the construction staging area. There are several cons associated with this option including:

- Hauling construction materials and equipment past Terminal 2 active operations areas, which may pose safety concerns and impede efficient operations
- Long hauling distance from staging site to the construction area
- Requires Security Identification Display Area (SIDA) escorts
- Insufficient staging space available

- Additional costs may be incurred to provide construction traffic access around Terminal 2 to access the East Concourse construction site, as shown in

**Figure 4-3. Option 1 Site – Snow Removal Equipment Area**




Source: WSP USA, 2023.

**Table 4-1: East Concourse Haul Route around Terminal 2**

| ITEMS | COST [1] |
|---|---|
| **Gate Guard (assume 2 at $75/hr for 10 hours per day)** | $600,000 |
| **Escorts (assume 4 vehicles at $125/hr for 10 hours per day)** | $2,000,000 |
| **Sweepers (assume 2 vehicles at $250/hr for 10 hours per day)** | $2,000,000 |
| **Total** | **$5,000,000** [2] |

Note:

1/ Cost estimate assumes construction period of 2 years (or 200 active construction days per year).

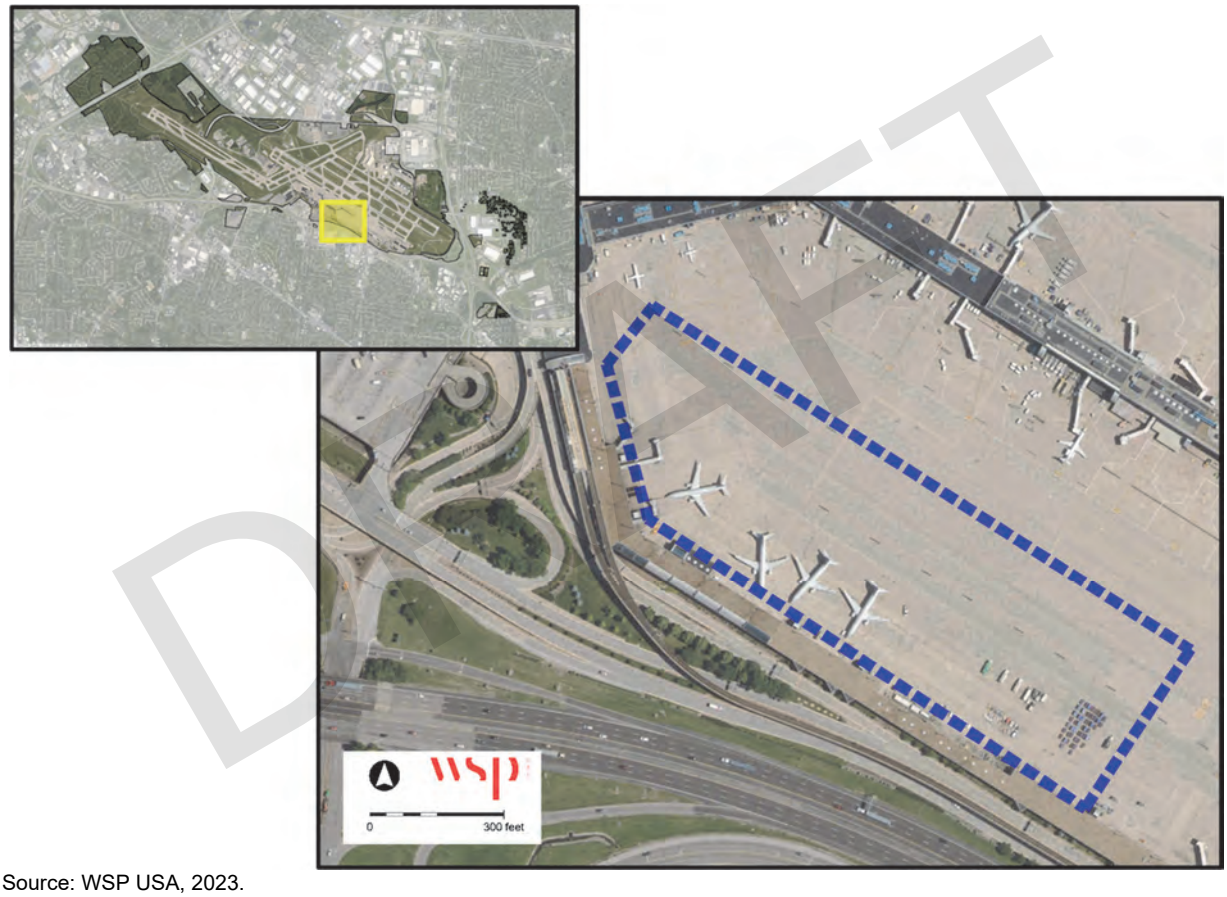
2/ Total cost rounded up to nearest million.

### *4.3.2 OPTION 2*

Option 2 consists of an 11-acre portion of the existing Concourse D apron, as depicted in **Figure 4-4**, for the construction staging area. Part of Concourse D would need to be demolished to provide non-SIDA access to the construction site. The cons associated with this option are:

- Partial demolition of Concourse D may impact the utilidor (utility corridor between Terminals 1 and 2) and result in costly updates to modify utility runs, such as two 14" water lines
- Construction vehicles would utilize Lambert International Boulevard, increasing traffic

**Figure 4-4: Potential Site at Concourse D**




Source: WSP USA, 2023.

# APPENDIX B

*Consolidated Terminal Program*

# Calibration Report

9/11/2023

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# 1.0 INTRODUCTION

Vissim modeling was started in 2020 as part of the St. Louis Lambert International (STL) Airport Layout Plan Update (ALPU), which later became the STL Master Plan. During the STL Master Plan, the intent of the modeling was to determine and analyze existing and future conditions of the airport's roadways that serve the airport, including Terminal 1 and Terminal 2. During the initial effort, only the airport roadways were modeled, and I-70 was excluded, as the analysis focused on the curbside and areas immediately surrounding the terminals. More recently, new airport roadway scenarios were studied that would serve a consolidated terminal at the site of the current Terminal 1, known as the Consolidated Terminal Program (CTP). These new roadway scenarios studied how terminal loop roads could connect to I-70 to improve and lengthen the distance from the interstate to the curbside. To better understand how these scenarios work in conjunction with the interchanges on I-70, existing models were created and calibrated to use as a basis in comparison to future models based on build and no build scenarios. For this project, it was determined that the airport peak hour and roadways peak hour aligned for the AM and PM peak periods. Therefore, for the conceptual phase of the project, there are two modeled periods: PM peak conditions (4:30pm-5:30pm) and AM Peak conditions (8:00am-9:00am). The boundary of modeling contains all of I-70 mainline and ramps within MO 180 and I-170. This technical memo describes the development, evaluation, and calibration of the existing models.

## 1.1 Version of Software Used

PTV Vissim 2022 (SP 12)

## 1.2 Future Applications of Calibrated Model

The calibrated existing models and their results will serve as the basis of comparison for future models' operations and performance changes.

# 2.0 MODEL DEVELOPMENT

## 2.1 Analysis Study Area

The study area includes I-70 from MO 180 to the west side of the I-170 interchange (as shown in Figures 1 & 2 below). The conceptual roadway conditions are expected to impact the interchanges at Cypress Road and Airflight Drive. It is common in traffic modeling to include adjacent interchanges to control traffic volumes entering the network. This study

area was further expanded to the east to include the west of the I-170 interchange per MoDOT's request to study the interaction of traffic to and from Lambert International Boulevard (LIB).

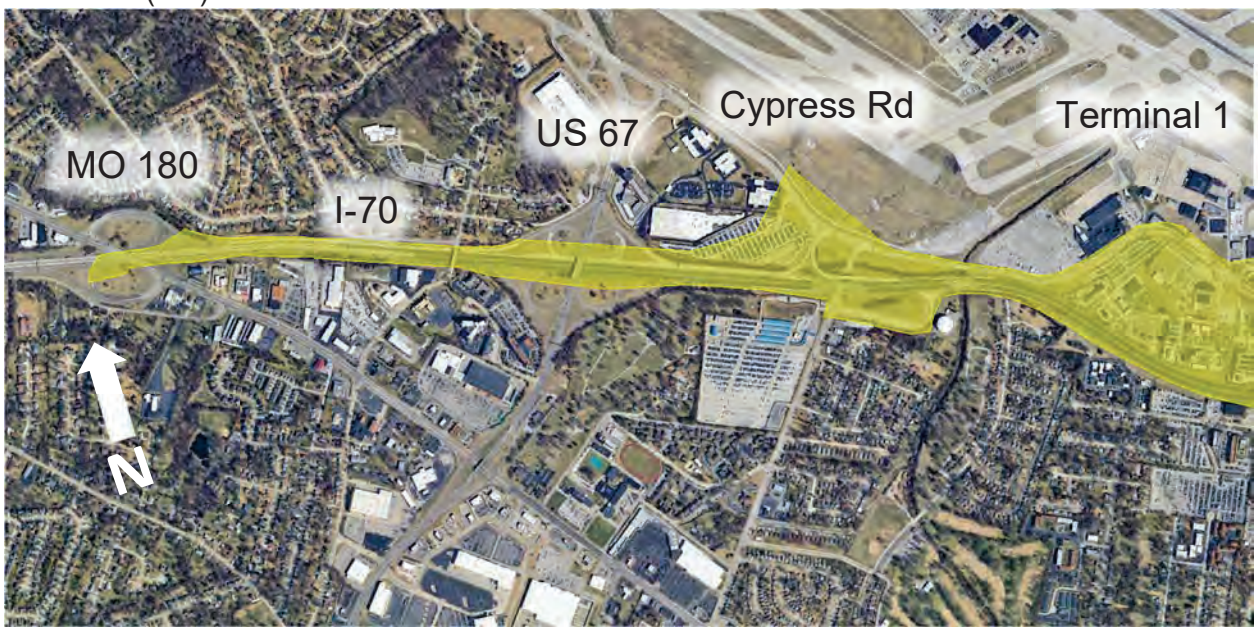


***Figure 1 – West Side of Study Area (aerial image source: Google Earth)***


***Figure 2 – East Side of Study Area (aerial image source: Google Earth)***

## 2.2 Analysis Years

Operational analysis will include AM and PM peak hours for the years listed below.

- Existing Base Year: 2022
- Assumed Interim/Opening Year of the CTP: 2032
- Horizon/Design Year: 2037

## 2.3 Analysis Peak Periods

The AM and PM peak hours were both modeled. The AM peak hour is 8:00am to 9:00am and the PM peak hour is 4:30pm to 5:30pm. Peak hour volumes were determined by evaluating the traffic count data for intersections directly serving the airport terminals and MoDOT's Traffic Volume Map. Therefore, the peak hour volumes used for the existing conditions analysis represent the highest traffic volumes that occur at the airport. Although there is peaking in the PM peak period, there was no sufficient evidence of peaking during the AM peak hour and therefore, the flow rate is constant throughout the 30-minute seeding period and each 15-minute interval following. Peaking for each period can be seen below in **Table 1**.

***Table 1 – Peaking Input Examples***

| AM Peaking Input Example | | | | | |
|---|---|---|---|---|---|
| Input | Time Interval | Hourly Flow | Interval Factor | 15-Min Flow | Average Flow |
| 1 | Seed | -- | 1.00 | 2300 | -- |
| | 0-15 | 2300 | 1.00 | 2300 | 2300 |
| | 15-30 | | 1.00 | 2300 | |
| | 30-45 | | 1.00 | 2300 | |
| | 45-60 | | 1.00 | 2300 | |

| PM Peaking Input Example | | | | | |
|---|---|---|---|---|---|
| Input | Time Interval | Hourly Flow | Interval Factor | 15-Min Flow | Average Flow |
| 1 | Seed | -- | 1.00 | 2395 | -- |
| | 0-15 | 2395 | 0.88 | 2108 | 2395 |
| | 15-30 | | 1.12 | 2682 | |
| | 30-45 | | 0.88 | 2108 | |
| | 45-60 | | 1.12 | 2682 | |

## 2.4 Data Collection and Preparation

### 2.4.1 Traffic and Roadway Data

Geometric data was gathered from field visits and Google Earth. Geometric data includes number of lanes, lane width, posted speeds, signage, storage length, signal locations and striping. Volume data was provided from four sources including: intersection turning movement counts from two associated projects, the MoDOT (Missouri Department of Transportation) Interactive Traffic Volumes map, and Transcore roadside sensor data. The newer of the two provided intersection turning movement counts listed below in **Table 2** were used for arterials in all cases, aside from a few missing intersections and movements which were not provided in these counts. The mainline volumes were primarily from MoDOT's Interactive Traffic Volumes Map, but where mainline segments were severely imbalanced, the volumes were taken from Transcore roadside sensor data. The RITIS (Regional Integrated Transportation Information System) data was normalized and used in tandem with incident data, weather conditions, and roadway sensor data to select each desired day of peak calibration data via k clustering. RITIS data was also used in the bidirectional speed distributions for mainline.

***Table 2 - Data Items Used for Model Development***

| *Data Item* | *Source(s)* | *Model Incorporation* |
|---|---|---|
| *Aerial's* | *Google Earth* | *Roadway geometry, turn restrictions, number of lanes, signage* |
| *Field Visits and Observations* | *WSP* | *Roadway geometry, turn restrictions, number of lanes, driver behavior, signage* |
| *Vehicle Travel Time and Speeds* | *RITIS* (Regional Integrated Transportation Information System) | *Mainline speed distributions, Calibration data selection* |
| *Volume and Speed Data* | *Roadside Sensors, Transcore Transuite ATMS (Advanced Transportation Management System)* | *Verification of RITIS speeds, peak hour verification, analysis of peaking, mainline volumes, Calibration data selection* |
| *Traffic signal timing plans* | *St. Louis Lambert International Airport, MoDOT* | *Detector placement, signal phasing, splits, offsets* |
| *Intersection Turning Movement Count* | *Lambert Traffic Management Enhancement Project (2017), CBB Transportation & Engineers & Planners* | *Intersection movement, vehicle compositions* |
| *Data Item* | *Source(s)* | *Model Incorporation* |
| *Intersection Turning Movement Count* | *MoDOT I-70 Project Team (consultant collected)* | *Intersection movement, vehicle compositions* |
| *MoDOT Interactive Traffic Volumes Map* | *MoDOT* | *Mainline traffic volume estimates and verification of volume and heavy vehicle data collected* |
| *Terminal Curbside Observations* | *WSP* | *Docking times, vehicle and pedestrian behaviors, speeds, and congestion* |
| *Incident Data* | *MoDOT Data Zone* | *Calibration data selection* |
| *Weather Data* | *Weather Underground, wunderground.com* | *Roadway conditions, calibration data selection* |

### 2.4.2 Base Model Development

Link geometries were first developed from provided data. Following the completion of link geometries, intersection control was coded throughout the model based on existing timings. As specified from existing timing, overlaps were coded to allow for permissive movements. Following this, all conflict areas were given the correct designation throughout the model to allow for proper movements. In several cases a priority rule and/or stop sign was coded to allow for the correct order of traffic movement operations, specifically for right turns that oppose a permissive left turn movement. Arterial desired speeds and reduced speed areas throughout were based on posted speed limits. These distributions are linear and were within 5 mph of the posted speed. Mainline speed distributions were based on actual data and represent the cumulative distribution (S-curve) as defined from free flow speeds derived from the RITIS data for each direction.

Vehicle routing is static throughout the model and done on a point-to-point basis. Origin-Destination data was not considered in this analysis and therefore, Origin-Destination vehicle routing was not implemented in the models. What can be seen is the combination of some routes throughout the model. In these instances, traffic operations looked more realistic with combined routes upstream. Following the coding of vehicle routing, interval data was set up.

The first 1800 simulation seconds (30 minutes) represents the seeding period. Following this, each 900 second (15 minute) interval represents the peak period being analyzed. Vehicle input volumes were then coded to equal the sum of the vehicle routing decision downstream of the vehicle input. Lastly, driver behaviors were updated for the freeway within the suggested ranges to represent realistic traffic movements on the mainline for this region. The values used for the altered driver behavior parameters can be seen in **Table 6** in section 3.5, Parameter Refinement.

## 2.5 Model Assumptions

Assumed data found in each model is within MoDOT Engineering Policy Guide (EPG) guidelines and follows recommendations found within FHWA's Traffic Analysis Toolbox. Several of the assumptions act as standardizations derived from tangible data. Assumptions include vehicle routing, speed distributions, vehicle compositions, intervals, peaking, and driver behaviors. The assumptions made during the base model development can be seen below in **Table 3**. These assumptions are to remain constant in future models to assure for the most realistic representation of results.

***Table 3 - Model Assumptions***

| Type | Category | Setting | Assumption | Reason |
|---|---|---|---|---|
| *Base Data* | *Distribution* | *Desired speed* | *Linear distributions* | *Use posted speed limits +/-5 mph as the upper and lower bound of desired speed.* |
| | | *Turn-speed* | *Linear distributions* | *Linear distribution of 7.5 to 15.5 mph and 12.4 to 18.6 mph was defined for each turn according to its turn-type.* |
| *Base Data* | *Distribution* | *Desired Speed* | *Cumulative Distributions* | *Distributions were developed based on available data and assume free flow speeds based on provided data.* |
| *Traffic* | *Vehicle composition* | *Highways/ local streets* | *Vehicles classified by combination trucks, single-unit trucks, and cars* | *Vehicle compositions were developed from available field data* |
| *Vehicle Inputs* | *Intervals & Volumes* | *Seeding Time Duration* | *30 minutes* | *Captures full throughput into model* |
| | | *Recording interval duration* | *60 minutes* | |
| *Routing Decisions* | *Static* | *Relative Flows* | *Proportional traffic distribution* | *In the absence of any data regarding O/D patterns, all patterns were assumed to be proportional* |
| *Vehicle Inputs* | *Volume* | *Volume Per Intervals* | *Peaking was provided from data where applicable* | *Data did not provide sufficient evidence to include peaking during the AM peak period, but peaking was seen in the PM peak period.* |
| *Driver Behavior* | *Link Behavior Types* | *Driver Behavior Parameters* | *Values were assumed differently from the default assumed values* | *The selected values are all within recommended limits and enable vehicles to move more realistically throughout sections of the mainline* |
| *Link Connector Attributes* | *Lane Change* | *Lane Change Distance* | *Nearest exit signage beyond last exit sign* | *Consistency amongst methodologies. Many people begin to position themselves at this point* |

# 3.0 MODEL PARAMETER CALIBRATION

Model calibration follows guidelines closely specified in FHWA's *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software.* One representative day was selected for each peak period from our RITIS data sample. Selecting average travel times or speeds over a longer period would have led to the modeling of a synthetic day, which may not be representative of normal conditions.

## 3.1 Calibration Procedure

Calibration of the model to the specified calibration parameters was done in a trial-and-error manner. The model was close to being calibrated to the accepted calibration parameter targets using the speed distributions calculated from the RITIS data and default driver behaviors. For each subsequent iteration, the driver behaviors were adjusted (see **Table 6**) to enable vehicles to have more realistic interactions along mainline and reach realistic speeds and capacity thresholds.

## 3.2 Selection of Calibration Parameters

As mentioned in the TIA Methods and Assumptions Report, the calibration parameters used during the calibration process include vehicle travel times/vehicle speeds, link flows and GEH statistics[1], and observed arterial operations. An initial data sample for RITIS was considered for speed/travel time calibrations. The RITIS data sample was then narrowed down to one day for each peak period. This process was done through k clustering and follows the suggested guidelines in FHWA's *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software.* Identifying one representative day for each peak period through k clustering helps to validate the data which the model is being calibrated to and ensures that a modeler is not attempting to calibrate a model to fictional conditions.

## 3.3 Measures of Effectiveness (MOEs) for Validation

Measures of Effectiveness (MOEs) to be reported:

- Vehicle Throughput
- Mainline Travel Time
- Mainline Speeds
- Mainline Density, Levels of Service (LOS)
- Intersection Delay, LOS
- Intersection Queueing

[1]The GEH (Geoffrey E. Havers) Statistic is a formula used in traffic engineering, traffic forecasting, and traffic modelling to compare two sets of traffic volumes.

## 3.4 Calibration Criteria and Targets

The accepted Calibration targets can be seen below in **Table 4** and **Table 5**.

***Table 4 – Calibration Targets for Link Flows and GEH Statistics***

| Criteria and Measures | Calibration Acceptance Targets |
|---|---|
| Individual Link Flows | |
| Within 15%, for 700 veh/h < Flow < 2700 veh/h | > 85% of cases |
| Within 100 veh/h, for Flow < 700 veh/h | > 85% of cases |
| Within 400 veh/h, for Flow > 2700 veh/h | > 85% of cases |
| Sum of All Link Flows | Within 5% of sum of all link counts |
| GEH Statistic <5 for Individual Link Flows | > 85% of cases |
| GEH Statistic for Sum of All Link Flows | GEH < 4 for sum of all link counts |
| Source: FHWA Traffic Analysis Toolbox, Volume III, Section 5.6 (Table 4) | |

***(Source: Missouri Department of Transportation EPG)***

***Table 5 – Calibration Targets for Vehicle Travel Times and Speeds***

| Calibration Measures | Calibration Acceptance Target |
|---|---|
| Vehicle Speeds | Model speeds will be within 5 mph of RITIS speeds on at least 85% of all RITIS segments. |
| Vehicle Travel Time | Freeway travel times will be within 15% of real-world travel times (or 1 minute maximum, if higher) for greater than 85% of the cases. |

***(Source: Missouri Department of Transportation EPG)***

## 3.5 Parameter Refinement

During the calibration process, several iterations were performed for both modeled peak periods to achieve realistic car movements and operations. Initially, the model used one behavior for freeway using Wiedemann 99 car following parameters and another for urban arterials using Wiedemann 74 car following parameters. The Urban driver behavior worked well as default for both peak periods. Insufficient lane changing and following behaviors were observed throughout the model in merge, diverge, and weave areas. Therefore, it was decided that a new behavior would be created to properly depict lane changes and following behaviors in these areas.

The “Merge/Diverge/Weave” driver behavior was created to be assigned to all merge, diverge, and weave areas. To create consistency for present and future models, the influence areas of the merge, weave, and diverge were coded as described in the highway capacity manual and is as follows: 1500’ upstream from gore of an exit ramp is defined as diverge segment, 1500’ downstream from the gore of an entrance ramp is defined as a merge segment, and all sections of highway which have an auxiliary lane that are directly connected to both an entry and exit ramp as well as 500’ before and after are defined as a weave segment. All driver behavior parameters are within MoDOT’s suggested parameters and can be seen below in **Table 6**.

***Table 6 - Driver Behavior Parameters***

| Wiedemann 99 Car Following Parameters | | | | | | | |
|---|---|---|---|---|---|---|---|
| Parameter | | Default | Unit | MoDOT Suggested Range | | Existing Calibrated Model | |
| | | | | Basic Segment | Merge/Diverge & Weaving | Freeway | Merge/Diverge |
| CC0 | Standstill Distance | 4.92 | ft | 4.50 - 5.50 | > 4.92 | Default | |
| CC1 | Headway Time | 0.9 | s | 0.70 - 3.00 | 0.90 - 3.00 | Default | |
| CC2 | Following' Oscillation | 13.12 | ft | 6.56 - 22.97 | 13.12 - 39.37 | Default | 39.37 |
| CC3 | Threshold for entering 'following' | -8 | | Use Default | | Default | |
| CC4 | Negative 'following' threshold | -0.35 | | Use Default | | Default | |
| CC5 | Positive 'following' threshold | 0.35 | | Use Default | | Default | |
| CC6 | Speed Dependancy of Oscillation | 11.44 | | Use Default | | Default | |
| CC7 | Oscillatino Acceleration | 0.82 | ft/s² | Use Default | | Default | |
| CC8 | Standstill Acceleration | 11.48 | ft/s² | Use Default | | Default | |
| CC9 | Aceleration at 50 mph | 4.92 | ft/s² | Use Default | | Default | |

| Lane Change Parameters | | | | | |
|---|---|---|---|---|---|
| General Behavior | Free Lane Selection | | | Existing Calibrated Model | |
| Necessary Lane Change (route) | Own | Trailing Vehicle | Unit | Freeway | Merge/Diverge |
| Maximum deceleration: | -15 to -12 | -12 to -8 | ft/s² | Default | |
| -1 ft/s² per distance: | 150 to 250 | 150 to 250 | ft | Default | |
| Accepted deceleration: | -2.5 to -4.0 | -1.5 to 2.5 | ft/s² | Default | |
| Waiting time before diffusion: | | 30 to 60 | s | Default | |
| Min. headway (front/rear): | | 1.5 to 2.0 | ft | Default | |
| To slower if collision time above: | | 0 to 0.5 | s | Default | |
| Safety distance reduction factor: | | 0.25 to 1.00 | | Default | 0.25 |
| Maximum deceleration for cooperative breaking: | | -8 to -15 | ft/s² | Default | -15 |
| Overtake reduced speed areas: | | Leave Unchecked | | Default | |
| Advanced Merging: | | Can Adjust | | Default | |
| Cooperative Lane Change: | | Can Adjust | | Default | Turned On |
| Rear correction of lateral position: | | Leave Unchecked | | Default | |

***(Source: Missouri Department of Transportation EPG)***

# 4.0 MODEL VALIDATION RESULTS

The metrics used for calibration include traffic volumes, vehicle speeds and travel times, and arterial intersection operations. The raw data can be seen organized in the attached excel sheets titled “Existing Conditions Results,” “Existing VISSIM Node Evaluation (AM),” and “Existing VISSIM Node Evaluation (PM).”

## 4.1 Traffic Volumes

Vehicle Throughput was analyzed for arterial and mainline links within the model. Calibration targets described in section 3.4 were achieved in both the AM and PM peak periods as shown below in **Table 7**.

***Table 7 - Traffic Volume Validation Summary***

| *Criteria/Measures* | *Targets* | *AM Peak* | | *PM Peak* | |
|---|---|---|---|---|---|
| | | *Freeway* | *Arterial* | *Freeway* | *Arterial* |
| *Within 100 vph, for flow < 700 vph* | *> 85%* | *100%* | *100%* | *100%* | *100%* |
| *Within 15%, for 700 vph < flow < 2,700 vph* | *> 85%* | *100%* | *100%* | *100%* | *100%* |
| *Within 400 vph, for flow > 2,700 vph* | *> 85%* | *100%* | *100%* | *100%* | *100%* |
| *GEH < 5 for individual link flows* | *> 85%* | *100%* | *100%* | *100%* | *100%* |
| *GEH < 4 for sum of all link counts* | *100%* | *100%* | | *100%* | |

***(Source: Missouri Department of Transportation EPG)***

## 4.2 RITIS Segment Speed Analysis

AM and PM period speeds were analyzed along the mainline (I-70). As described in section 3.4, model speeds must be within 5 miles per hour of RITIS speed. As seen below in **Table 8**, **Table 9**, **Table 10**, and **Table 11**, average speed over the peak hour for each segment is within 5 miles per hour of RITIS’s average peak hour speeds for 100% of the RITIS segments. For a more detailed analysis of the speeds, each 5-minute interval could be compared for the model and the RITIS data speeds. The 5-minute interval accuracy along each RITIS segment in the model for both peak periods was also studied. The AM peak period is within 5 miles per hour for 97% and 100% in the westbound and eastbound directions, respectively. The PM peak period is within 99% and 88% in the westbound and eastbound directions, respectively.

### *Table 8 - Westbound Speeds (AM Peak Period)*

| RITIS I-70 WB | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Segment ID** | **Corridor** | **Section** | **Length** | **8:00 AM** | **8:05 AM** | **8:10 AM** | **8:15 AM** | **8:20 AM** | **8:25 AM** | **8:30 AM** | **8:35 AM** | **8:40 AM** | **8:45 AM** | **8:50 AM** | **8:55 AM** | **AVG** |
| 119+04295 | I-70 Mainline Westbound | I170 - STL Airport | 0.7 | 67 | 66 | 66 | 63 | 66 | 66 | 66 | 64 | 65 | 67 | 64 | 67 | 65.7 |
| 119+04296 | | STL Airport - Airflight Dr | 1.1 | 65 | 65 | 66 | 61 | 65 | 65 | 64 | 64 | 63 | 66 | 65 | 67 | 64.8 |
| 119+04297 | | Airflight Dr - LIB | 0.5 | 63 | 64 | 66 | 63 | 65 | 66 | 65 | 64 | 64 | 63 | 66 | 66 | 64.5 |
| 119+04298 | | LIB - Cyprus Rd | 0.4 | 64 | 65 | 64 | 64 | 63 | 64 | 64 | 64 | 65 | 64 | 66 | 67 | 64.4 |
| 119+04299 | | Cyprus Rd - US 67 | 0.8 | 66 | 67 | 65 | 64 | 62 | 65 | 65 | 67 | 66 | 66 | 67 | 67 | 65.5 |
| 119+04300 | | US 67 - MO 180 | 0.6 | 67 | 70 | 67 | 66 | 65 | 67 | 66 | 67 | 66 | 67 | 67 | 66 | 66.7 |
| VISSIM I-70 WB | | | | | | | | | | | | | | | | |
| **Segment ID** | **Corridor** | **Section** | **Length** | **8:00 AM** | **8:05 AM** | **8:10 AM** | **8:15 AM** | **8:20 AM** | **8:25 AM** | **8:30 AM** | **8:35 AM** | **8:40 AM** | **8:45 AM** | **8:50 AM** | **8:55 AM** | **AVG** |
| 119+04295 | I-70 Mainline Westbound | I170 - STL Airport | 0.7 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 64 | 63 | 63 | 63 | 63.3 |
| 119+04296 | | STL Airport - Airflight Dr | 1.1 | 62 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 62.8 |
| 119+04297 | | Airflight Dr - LIB | 0.5 | 62 | 63 | 63 | 63 | 63 | 63 | 62 | 62 | 62 | 63 | 63 | 62 | 62.5 |
| 119+04298 | | LIB - Cyprus Rd | 0.4 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 60 | 63 | 62 | 62 | 61.9 |
| 119+04299 | | Cyprus Rd - US 67 | 0.8 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63.0 |
| 119+04300 | | US 67 - MO 180 | 0.6 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63.1 |

### *Table 9 - Eastbound Speeds (AM Peak Period)*

| RITIS I-70 EB | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Segment ID** | **Corridor** | **Section** | **Length** | **8:00 AM** | **8:05 AM** | **8:10 AM** | **8:15 AM** | **8:20 AM** | **8:25 AM** | **8:30 AM** | **8:35 AM** | **8:40 AM** | **8:45 AM** | **8:50 AM** | **8:55 AM** | **AVG** |
| 119-04299 | I-70 Mainline Eastbound | MO 180 - Us 67 | 1.2 | 64 | 63 | 63 | 64 | 62 | 61 | 61 | 63 | 62 | 63 | 66 | 66 | 63.2 |
| 119-04298 | | US 67 - Cypress Rd | 0.5 | 65 | 65 | 65 | 66 | 64 | 62 | 62 | 64 | 63 | 63 | 64 | 67 | 64.1 |
| 119-04297[1] | | Cypress Rd - Airflight Dr | 1.0 | 62 | 63 | 61 | 64 | 63 | 62 | 61 | 61 | 59 | 60 | 61 | 63 | 61.6 |
| 119-04295 | | Airflight Dr - MO 115 | 1.2 | 63 | 62 | 59 | 62 | 62 | 63 | 60 | 59 | 60 | 61 | 61 | 64 | 61.3 |
| 119-04294 | | MO 115 - I170 | 0.9 | 66 | 66 | 64 | 65 | 64 | 64 | 63 | 61 | 62 | 63 | 64 | 65 | 63.8 |
| VISSIM I-70 EB | | | | | | | | | | | | | | | | |
| **Segment ID** | **Corridor** | **Section** | **Length** | **8:00 AM** | **8:05 AM** | **8:10 AM** | **8:15 AM** | **8:20 AM** | **8:25 AM** | **8:30 AM** | **8:35 AM** | **8:40 AM** | **8:45 AM** | **8:50 AM** | **8:55 AM** | **AVG** |
| 119-04299 | I-70 Mainline Eastbound | MO 180 - Us 67 | 1.2 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 63 | 63 | 62 | 62.4 |
| 119-04298 | | US 67 - Cypress Rd | 0.5 | 62 | 61 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 61 | 61.8 |
| 119-04297[1] | | Cypress Rd - Airflight Dr | 1.0 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 63 | 62 | 62 | 62.1 |
| 119-04295 | | Airflight Dr - MO 115 | 1.2 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 61.8 |
| 119-04294 | | MO 115 - I170 | 0.9 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63.0 |

## *Table 10 - Westbound Speeds (PM Peak Period)*

| RITIS I-70 WB | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Segment ID** | **Corridor** | **Section** | **Length** | **4:30 PM** | **4:35 PM** | **4:40 PM** | **4:45 PM** | **4:50 PM** | **4:55 PM** | **5:00 PM** | **5:05 PM** | **5:10 PM** | **5:15 PM** | **5:20 PM** | **5:25 PM** | **AVG** |
| 119+04295 | I-70 Mainline Westbound | I170 - STL Airport | 0.7 | 63 | 62 | 65 | 62 | 60 | 62 | 65 | 64 | 63 | 64 | 64 | 62 | 63.0 |
| 119+04296 | | STL Airport - Airflight Dr | 1.1 | 64 | 64 | 64 | 63 | 59 | 61 | 65 | 64 | 63 | 62 | 62 | 56 | 62.1 |
| 119+04297 | | Airflight Dr - LIB | 0.5 | 61 | 63 | 64 | 63 | 61 | 60 | 62 | 63 | 63 | 61 | 62 | 57 | 61.7 |
| 119+04298 | | LIB - Cyprus Rd | 0.4 | 61 | 63 | 65 | 63 | 60 | 59 | 61 | 62 | 60 | 61 | 57 | 61 | 60.9 |
| 119+04299 | | Cyprus Rd - US 67 | 0.8 | 58 | 62 | 65 | 63 | 61 | 63 | 64 | 63 | 62 | 65 | 61 | 64 | 62.5 |
| 119+04300 | | US 67 - MO 180 | 0.6 | 62 | 62 | 65 | 66 | 64 | 64 | 66 | 63 | 62 | 67 | 61 | 65 | 64.0 |
| VISSIM I-70 WB | | | | | | | | | | | | | | | | |
| **Segment ID** | **Corridor** | **Section** | **Length** | **4:30 PM** | **4:35 PM** | **4:40 PM** | **4:45 PM** | **4:50 PM** | **4:55 PM** | **5:00 PM** | **5:05 PM** | **5:10 PM** | **5:15 PM** | **5:20 PM** | **5:25 PM** | **AVG** |
| 119+04295 | I-70 Mainline Westbound | I170 - STL Airport | 0.7 | 63 | 63 | 63 | 63 | 62 | 63 | 63 | 63 | 64 | 63 | 63 | 63 | 63.0 |
| 119+04296 | | STL Airport - Airflight Dr | 1.1 | 62 | 63 | 63 | 62 | 62 | 61 | 62 | 63 | 63 | 62 | 62 | 61 | 62.0 |
| 119+04297 | | Airflight Dr - LIB | 0.5 | 62 | 62 | 62 | 62 | 61 | 61 | 61 | 62 | 62 | 62 | 61 | 61 | 61.7 |
| 119+04298 | | LIB - Cyprus Rd | 0.4 | 61 | 62 | 62 | 61 | 60 | 58 | 59 | 61 | 62 | 61 | 60 | 56 | 60.4 |
| 119+04299 | | Cyprus Rd - US 67 | 0.8 | 62 | 63 | 63 | 62 | 62 | 61 | 62 | 62 | 63 | 63 | 62 | 62 | 62.2 |
| 119+04300 | | US 67 - MO 180 | 0.6 | 62 | 63 | 63 | 63 | 62 | 62 | 61 | 63 | 63 | 63 | 62 | 62 | 62.4 |

## *Table 11 - Eastbound Speeds (PM Peak Period)*

| RITIS I-70 EB | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Segment ID** | **Corridor** | **Section** | **Length** | **4:30 PM** | **4:35 PM** | **4:40 PM** | **4:45 PM** | **4:50 PM** | **4:55 PM** | **5:00 PM** | **5:05 PM** | **5:10 PM** | **5:15 PM** | **5:20 PM** | **5:25 PM** | **AVG** |
| 119-04299 | I-70 Mainline Eastbound | MO 180 - Us 67 | 1.2 | 68 | 66 | 70 | 65 | 67 | 67 | 66 | 69 | 66 | 69 | 66 | 66 | 66.9 |
| 119-04298 | | US 67 - Cypress Rd | 0.5 | 67 | 64 | 68 | 65 | 65 | 65 | 66 | 67 | 66 | 67 | 66 | 67 | 66.1 |
| 119-04297[1] | | Cypress Rd - Airflight Dr | 1.0 | 65 | 61 | 64 | 62 | 61 | 63 | 61 | 63 | 63 | 64 | 61 | 62 | 62.5 |
| 119-04295 | | Airflight Dr - MO 115 | 1.2 | 65 | 62 | 64 | 64 | 61 | 61 | 61 | 64 | 63 | 63 | 63 | 61 | 62.6 |
| 119-04294 | | MO 115 - I170 | 0.9 | 66 | 64 | 62 | 65 | 64 | 62 | 62 | 62 | 66 | 65 | 66 | 64 | 64.1 |
| VISSIM I-70 EB | | | | | | | | | | | | | | | | |
| **Segment ID** | **Corridor** | **Section** | **Length** | **4:30 PM** | **4:35 PM** | **4:40 PM** | **4:45 PM** | **4:50 PM** | **4:55 PM** | **5:00 PM** | **5:05 PM** | **5:10 PM** | **5:15 PM** | **5:20 PM** | **5:25 PM** | **AVG** |
| 119-04299 | I-70 Mainline Eastbound | MO 180 - Us 67 | 1.2 | 63 | 63 | 62 | 62 | 62 | 62 | 62 | 63 | 63 | 62 | 61 | 62 | 62.3 |
| 119-04298 | | US 67 - Cypress Rd | 0.5 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 60 | 61 | 61 | 61.7 |
| 119-04297[1] | | Cypress Rd - Airflight Dr | 1.0 | 63 | 63 | 62 | 62 | 62 | 62 | 62 | 63 | 63 | 62 | 61 | 61 | 62.1 |
| 119-04295 | | Airflight Dr - MO 115 | 1.2 | 62 | 62 | 61 | 61 | 61 | 61 | 62 | 62 | 62 | 62 | 61 | 61 | 61.6 |
| 119-04294 | | MO 115 - I170 | 0.9 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 62.8 |

## 4.3 Travel Times

As specified in section 3.4, freeway travel times will be within 15% of real-world travel times (or 1 minute maximum, if higher) for greater than 85% of the cases in the calibrated model. As seen in **Table 12** and **Table 13**, the vehicle travel times meet the required target calibration parameters. For both peak periods, the modeled vehicle travel times were within 15% of RITIS vehicle travel times for 100% of cases. It is important to note that one of the segments in the eastbound direction was combined with the downstream segment due to its short length of less than 0.2 miles.

***Table 12 - AM Vehicle Travel Times***

| AM Travel Time (I-70) - All Vehicles | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Segment ID | Corridor | Section | RITIS Length (mi) | RITIS AVG Travel Time (min) | Travel Time Percent Difference* | Travel Time Difference (min) | EXISTING VISSIM Travel Time (min) | EXISTING VISSIM Distance* |
| 119+04295 | I-70 Westbound | I170 - STL Airport | 0.7 | 0.6 | -2.5% | 0.0 | 0.7 | 0.7 |
| 119+04296 | | STL Airport - Airflight Dr | 1.1 | 1.0 | -2.6% | 0.0 | 1.1 | 1.1 |
| 119+04297 | | Airflight Dr - LIB | 0.5 | 0.5 | -0.6% | 0.0 | 0.5 | 0.5 |
| 119+04298 | | LIB - Cyprus Rd | 0.4 | 0.4 | -8.3% | 0.0 | 0.4 | 0.4 |
| 119+04299 | | Cyprus Rd - US 67 | 0.8 | 0.8 | -6.3% | 0.0 | 0.8 | 0.8 |
| 119+04300 | | US 67 - MO 180 | 0.6 | 0.5 | -5.1% | 0.0 | 0.6 | 0.6 |
| **Total** | | | **4.2** | **3.9** | **-4.0%** | **-0.2** | **4.0** | **4.2** |
| 119-04299 | I-70 Eastbound | MO 180 - Us 67 | 1.2 | 1.1 | -1.4% | 0.0 | 1.1 | 1.2 |
| 119-04298 | | US 67 - Cypress Rd | 0.5 | 0.5 | -1.3% | 0.0 | 0.5 | 0.5 |
| 119-04297[1] | | Cypress Rd - Airflight Dr | 1.0 | 1.0 | -0.9% | 0.0 | 1.0 | 1.0 |
| 119-04295 | | Airflight Dr - MO 115 | 1.2 | 1.2 | 2.4% | 0.0 | 1.1 | 1.2 |
| 119-04294 | | MO 115 - I170 | 0.9 | 0.9 | -0.4% | 0.0 | 0.9 | 0.9 |
| **Total** | | | **5.9** | **5.7** | **-0.3%** | **0.0** | **5.7** | **5.9** |

* MoDOT Guidance 5.3.2.3.4 - Travel times should be within 15% (or 1 minute maximum) of real-world travel times for greater than 85% of cases

[1]RITIS Segments 119-04297 and 119-04296 were combined due to the short length of 119-04296

***Table 13 - PM Vehicle Travel Times***

| PM Travel Time (I-70) - All Vehicles | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Segment ID | Corridor | Section | RITIS Length (mi) | RITIS AVG Travel Time (min) | Travel Time Percent Difference* | Travel Time Difference (min) | EXISTING VISSIM Travel Time (min) | EXISTING VISSIM Distance (mi) |
| 119+04295 | I-70 Westbound | I170 - STL Airport | 0.7 | 0.6 | -0.9% | 0.0 | 0.7 | 0.7 |
| 119+04296 | | STL Airport - Airflight Dr | 1.1 | 1.0 | -2.8% | 0.0 | 1.1 | 1.1 |
| 119+04297 | | Airflight Dr - LIB | 0.5 | 0.5 | -1.1% | 0.0 | 0.5 | 0.5 |
| 119+04298 | | LIB - Cyprus Rd | 0.4 | 0.4 | -9.2% | 0.0 | 0.4 | 0.4 |
| 119+04299 | | Cyprus Rd - US 67 | 0.8 | 0.8 | -7.1% | -0.1 | 0.8 | 0.8 |
| 119+04300 | | US 67 - MO 180 | 0.6 | 0.5 | -5.0% | 0.0 | 0.6 | 0.6 |
| **Total** | | | **4.2** | **3.9** | **-4.1%** | **-0.2** | **4.1** | **4.2** |
| 119-04299 | I-70 Eastbound | MO 180 - Us 67 | 1.2 | 1.1 | -5.6% | -0.1 | 1.1 | 1.2 |
| 119-04298 | | US 67 - Cypress Rd | 0.5 | 0.5 | -4.6% | 0.0 | 0.5 | 0.5 |
| 119-04297[1] | | Cypress Rd - Airflight Dr | 1.0 | 1.0 | -3.1% | 0.0 | 1.0 | 1.0 |
| 119-04295 | | Airflight Dr - MO 115 | 1.2 | 1.1 | -0.8% | 0.0 | 1.1 | 1.2 |
| 119-04294 | | MO 115 - I170 | 0.9 | 0.9 | -2.0% | 0.0 | 0.9 | 0.9 |
| **Total** | | | **5.9** | **5.5** | **-3.1%** | **-0.2** | **5.7** | **5.9** |

* MoDOT Guidance 5.3.2.3.4 - Travel times should be within 15% (or 1 minute maximum) of real-world travel times for greater than 85% of cases

[1]RITIS Segments 119-04297 and 119-04296 were combined due to the short length of 119-04296

## 4.4 Intersection Operational Measures of Effectiveness

To maintain modeling accuracy, analysis of intersection operations was done through node evaluation. Delay, level-of-service, and queuing were all compared to existing observations to ensure the model was calibrated for the arterial roadways. The results for the AM node evaluation can be seen in **Table 14** and the results for the PM node evaluation can be seen in **Table 15**.

***Table 14 - AM Node Evaluation Results***

| Intersection | Approach | Movement | Volume | Delay (sec) | Delay Stopped (sec) | Queue Length Max (ft) | Queue Length Average (ft) | LOS |
|---|---|---|---|---|---|---|---|---|
| 1: MO 115/LIB @ Parking Lot D | NB | Left | 0 | 0.0 | 0.0 | 0.0 | 0.0 | A |
| 1: MO 115/LIB @ Parking Lot D | NB | Right | 12 | 5.5 | 0.2 | 61 | 1 | A |
| 1: MO 115/LIB @ Parking Lot D | EB | Through | 171 | 0.1 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | EB | Right | 16 | 0.6 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | WB | Left | 0 | 0.0 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | WB | Through | 211 | 0.0 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | Total | Total | 410 | 0.2 | 0.0 | 61 | 0 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | NB | Left | 111 | 14.7 | 7.8 | 128 | 8 | B |
| 2: I-70 WB @ MO 115/Cypress/LIB | NB | Right | 140 | 3.4 | 0.1 | 89 | 1 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | EB | Through | 173 | 9.9 | 3.8 | 103 | 6 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | EB | Right | 11 | 1.1 | 0.0 | 10 | 0 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | WB | Left | 82 | 5.1 | 2.4 | 87 | 2 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | WB | Through | 100 | 5.3 | 1.8 | 66 | 1 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | Total | Total | 617 | 7.8 | 3.1 | 133 | 3 | A |
| 3: Cypress @ MO 115/LIB | NB | Left | 124 | 12.5 | 7.0 | 92 | 7 | B |
| 3: Cypress @ MO 115/LIB | NB | Right | 96 | 1.0 | 0.0 | 0 | 0 | A |
| 3: Cypress @ MO 115/LIB | EB | Through | 82 | 6.5 | 2.5 | 109 | 2 | A |
| 3: Cypress @ MO 115/LIB | EB | Right | 231 | 1.6 | 0.1 | 93 | 1 | A |
| 3: Cypress @ MO 115/LIB | WB | Left | 57 | 5.1 | 1.9 | 61 | 1 | A |
| 3: Cypress @ MO 115/LIB | WB | Through | 58 | 4.3 | 1.3 | 51 | 1 | A |
| 3: Cypress @ MO 115/LIB | Total | Total | 648 | 4.8 | 2.0 | 119 | 2 | A |
| 4: I-70 EB @ Cypress | NB | Left | 10 | 5.9 | 3.4 | 25 | 0 | A |
| 4: I-70 EB @ Cypress | NB | Through | 143 | 7.8 | 4.3 | 107 | 4 | A |
| 4: I-70 EB @ Cypress | NB | Right | 139 | 1.6 | 0.2 | 27 | 0 | A |
| 4: I-70 EB @ Cypress | EB | Left | 18 | 20.3 | 15.1 | 61 | 3 | C |
| 4: I-70 EB @ Cypress | EB | Through | 12 | 20.6 | 14.3 | 61 | 3 | C |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4: I-70 EB @ Cypress | EB | Right | 10 | 0.9 | 0.1 | 11 | 0 | A |
| 4: I-70 EB @ Cypress | SB | Left | 68 | 5.0 | 2.2 | 63 | 1 | A |
| 4: I-70 EB @ Cypress | SB | Through | 181 | 5.2 | 2.5 | 88 | 4 | A |
| 4: I-70 EB @ Cypress | SB | Right | 40 | 0.8 | 0.0 | 0 | 0 | A |
| 4: I-70 EB @ Cypress | WB | Left | 36 | 20.7 | 14.7 | 95 | 6 | C |
| 4: I-70 EB @ Cypress | WB | Through | 15 | 26.3 | 17.5 | 95 | 6 | C |
| 4: I-70 EB @ Cypress | WB | Right | 58 | 1.5 | 0.0 | 58 | 0 | A |
| 4: I-70 EB @ Cypress | Total | Total | 730 | 6.2 | 3.4 | 123 | 1 | A |
| 5: T1 Cell Phone Lot | EB | Left | 30 | 0.8 | 0.0 | 19 | 0 | N/A |
| 5: T1 Cell Phone Lot | EB | Through | 148 | 0.0 | 0.0 | 0 | 0 | N/A |
| 5: T1 Cell Phone Lot | SB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 5: T1 Cell Phone Lot | SB | Right | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 5: T1 Cell Phone Lot | WB | Through | 115 | 0.0 | 0.0 | 0 | 0 | N/A |
| 5: T1 Cell Phone Lot | WB | Right | 0 | 0.0 | 0.0 | 0 | 0 | N/A |
| 5: T1 Cell Phone Lot | Total | Total | 293 | 0.1 | 0.0 | 19 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | EB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | EB | Through | 147 | 2.0 | 0.6 | 49 | 1 | A |
| 6: I-70 WB @ LIB (before Cypress) | EB | Right | 0 | 0 | 0 | 86 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | SB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | SB | Through | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | SB | Right | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | WB | Left | 239 | 2.1 | 0.1 | 78 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | WB | Through | 116 | 0.1 | 0.0 | 0 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | WB | Right | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | Total | Total | 502 | 1.6 | 0.2 | 94 | 0 | A |
| 7: Parking Lot B | NB | Left | 5 | 1.6 | 0.2 | 16 | 0 | A |
| 7: Parking Lot B | NB | Right | 35 | 1.0 | 0.0 | 30 | 0 | A |
| 7: Parking Lot B | EB | Through | 147 | 0.0 | 0.0 | 0 | 0 | N/A |
| 7: Parking Lot B | EB | Right | 0 | 0.0 | 0.0 | 0 | 0 | N/A |
| 7: Parking Lot B | WB | Left | 20 | 1.0 | 0.0 | 17 | 0 | N/A |
| 7: Parking Lot B | WB | Through | 350 | 0.4 | 0.0 | 0 | 0 | N/A |
| 7: Parking Lot B | Total | Total | 557 | 0.3 | 0.0 | 35 | 0 | A |
| 8: Lambert Field St @ LIB | NB | Left | 0 | 0.0 | 0.0 | 30 | 1 | A |
| 8: Lambert Field St @ LIB | NB | Through | 0 | 0.0 | 0.0 | 30 | 1 | A |
| 8: Lambert Field St @ LIB | NB | Right | 4 | 58.7 | 52.9 | 30 | 1 | E |
| 8: Lambert Field St @ LIB | EB | Left 1 | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 8: Lambert Field St @ LIB | EB | Left 2 | 33 | 3.4 | 1.1 | 54 | 1 | A |
| 8: Lambert Field St @ LIB | EB | Through | 129 | 1.5 | 0.6 | 54 | 1 | A |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8: Lambert Field St @ LIB | EB | Right | 21 | 1.9 | 0.9 | 24 | 0 | A |
| 8: Lambert Field St @ LIB | SEB | Left | 12 | 62.3 | 49.2 | 44 | 4 | E |
| 8: Lambert Field St @ LIB | SEB | Right | 0 | 0.0 | 0.0 | 44 | 4 | A |
| 8: Lambert Field St @ LIB | SEB | Through | 0 | 0.0 | 0.0 | 44 | 4 | A |
| 8: Lambert Field St @ LIB | SWB | Left | 8 | 46.8 | 38.8 | 42 | 2 | D |
| 8: Lambert Field St @ LIB | SWB | Right | 0 | 0.0 | 0.0 | 42 | 2 | A |
| 8: Lambert Field St @ LIB | SWB | Through | 0 | 0.0 | 0.0 | 42 | 2 | A |
| 8: Lambert Field St @ LIB | WB | Left | 6 | 2.0 | 0.6 | 59 | 1 | A |
| 8: Lambert Field St @ LIB | WB | Through | 370 | 1.0 | 0.2 | 59 | 1 | A |
| 8: Lambert Field St @ LIB | WB | Right 2 | 0 | 0.0 | 0.0 | 59 | 1 | A |
| 8: Lambert Field St @ LIB | WB | Right 1 | 20 | 1.4 | 0.4 | 59 | 1 | A |
| 8: Lambert Field St @ LIB | Total | Total | 603 | 3.5 | 2.2 | 66 | 1 | A |
| 9: T2 Entrance | NB | Left | 330 | 3.2 | 1.7 | 298 | 38 | A |
| 9: T2 Entrance | NB | Through | 253 | 2.7 | 1.6 | 299 | 40 | A |
| 9: T2 Entrance | NB | Right | 138 | 0.4 | 0.0 | 257 | 35 | A |
| 9: T2 Entrance | WB | Left | 44 | 41.6 | 34.2 | 174 | 21 | D |
| 9: T2 Entrance | WB | Right | 38 | 40.5 | 35.3 | 88 | 9 | D |
| 9: T2 Entrance | Total | Total | 803 | 6.4 | 4.8 | 300 | 29 | A |
| 10: T1 Exit @ LIB | NB 1 | Left | 0 | 0 | 0 | 0 | 0 | A |
| 10: T1 Exit @ LIB | NB 1 | Through | 0 | 0 | 0 | 0 | 0 | A |
| 10: T1 Exit @ LIB | NB 1 | Right | 0 | 0 | 0 | 0 | 0 | A |
| 10: T1 Exit @ LIB | NB 2 | Right | 48 | 7.6 | 1.2 | 44 | 2 | A |
| 10: T1 Exit @ LIB | EB | Through | 146 | 18.0 | 12.4 | 96 | 11 | B |
| 10: T1 Exit @ LIB | EB | Right 2 | 8 | 17.7 | 12.2 | 96 | 11 | B |
| 10: T1 Exit @ LIB | EB | Right 1 | 0 | 0.0 | 0.0 | 96 | 11 | A |
| 10: T1 Exit @ LIB | WB | Left 1 | 94 | 8.8 | 5.2 | 99 | 4 | A |
| 10: T1 Exit @ LIB | WB | Left 2 | 0 | 0.0 | 0.0 | 139 | 18 | A |
| 10: T1 Exit @ LIB | WB | Through | 254 | 19.6 | 13.6 | 139 | 18 | B |
| 10: T1 Exit @ LIB | SB - A | Left | 184 | 47.5 | 39.5 | 179 | 40 | D |
| 10: T1 Exit @ LIB | SB - A | Through | 9 | 51.6 | 43.1 | 179 | 40 | D |
| 10: T1 Exit @ LIB | SB - A | Right | 43 | 39.9 | 33.9 | 179 | 40 | D |
| 10: T1 Exit @ LIB | SB - D | Left | 239 | 38.8 | 31.6 | 209 | 49 | D |
| 10: T1 Exit @ LIB | SB - D | Through | 0 | 0.0 | 0.0 | 209 | 49 | A |
| 10: T1 Exit @ LIB | SB - D | Right | 99 | 40.8 | 33.7 | 209 | 49 | D |
| 10: T1 Exit @ LIB | Total | Total | 1,124 | 29.5 | 23.0 | 216 | 18 | C |
| 11: I-70 WB @ Airflight | NB | Left | 290 | 7.3 | 3.1 | 175 | 9 | A |
| 11: I-70 WB @ Airflight | NB | Through | 415 | 3.3 | 1.4 | 123 | 5 | A |
| 11: I-70 WB @ Airflight | SB | Through | 221 | 10.1 | 6.0 | 115 | 8 | B |
| 11: I-70 WB @ Airflight | WB | Left | 213 | 39.8 | 30.4 | 244 | 45 | D |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 11: I-70 WB @ Airflight | WB | Right | 78 | 27.9 | 18.8 | 9 | 0 | C |
| 11: I-70 WB @ Airflight | Total | Total | 1,217 | 13.4 | 8.8 | 253 | 10 | B |
| 12: I-70 EB @ Pear Tree | NEB | Right | 32 | 7.2 | 0.6 | 71 | 1 | A |
| 12: I-70 EB @ Pear Tree | EB | Through | 126 | 40.0 | 31.5 | 113 | 21 | D |
| 12: I-70 EB @ Pear Tree | EB | Right | 5 | 40.5 | 35.2 | 113 | 21 | D |
| 12: I-70 EB @ Pear Tree | SB | Left | 531 | 7.7 | 3.5 | 259 | 18 | A |
| 12: I-70 EB @ Pear Tree | SB | Through | 25 | 7.6 | 3.7 | 259 | 18 | A |
| 12: I-70 EB @ Pear Tree | SB | Right | 44 | 2.3 | 0.4 | 56 | 0 | A |
| 12: I-70 EB @ Pear Tree | WB | Through | 48 | 34.6 | 29.0 | 98 | 10 | C |
| 12: I-70 EB @ Pear Tree | WB | Right | 85 | 37.9 | 30.2 | 155 | 19 | D |
| 12: I-70 EB @ Pear Tree | Total | Total | 896 | 16.5 | 11.2 | 259 | 11 | B |
| 13: I-70 EB @ Airflight | NB | Left | 5 | 47.5 | 40.3 | 109 | 14 | D |
| 13: I-70 EB @ Airflight | NB | Through | 38 | 47.4 | 39.0 | 109 | 14 | D |
| 13: I-70 EB @ Airflight | NB | Right | 5 | 45.2 | 38.8 | 109 | 14 | D |
| 13: I-70 EB @ Airflight | EB | Left | 430 | 20.8 | 15.5 | 202 | 37 | C |
| 13: I-70 EB @ Airflight | EB | Through | 210 | 16.3 | 10.1 | 252 | 24 | B |
| 13: I-70 EB @ Airflight | EB | Right | 50 | 16.0 | 11.4 | 252 | 24 | B |
| 13: I-70 EB @ Airflight | SB | Left | 192 | 20.7 | 15.1 | 235 | 32 | C |
| 13: I-70 EB @ Airflight | SB | Through | 73 | 21.4 | 14.5 | 235 | 32 | C |
| 13: I-70 EB @ Airflight | SB | Right | 108 | 2.4 | 0.5 | 235 | 32 | A |
| 13: I-70 EB @ Airflight | WB | Left | 11 | 48.5 | 41.8 | 47 | 3 | D |
| 13: I-70 EB @ Airflight | WB | Through | 19 | 47.1 | 37.2 | 62 | 5 | D |
| 13: I-70 EB @ Airflight | WB | Right | 251 | 3.2 | 0.6 | 121 | 2 | A |
| 13: I-70 EB @ Airflight | Total | Total | 1,392 | 16.8 | 11.9 | 264 | 17 | B |
| 14: Pear Tree @ Edmundson | NB | Left | 113 | 31.7 | 25.9 | 166 | 22 | C |
| 14: Pear Tree @ Edmundson | NB | Right | 46 | 5.8 | 0.7 | 64 | 2 | A |
| 14: Pear Tree @ Edmundson | EB | Through | 307 | 7.2 | 3.1 | 228 | 10 | A |
| 14: Pear Tree @ Edmundson | EB | Right | 100 | 1.6 | 0.1 | 74 | 0 | A |
| 14: Pear Tree @ Edmundson | WB | Left | 29 | 9.3 | 4.9 | 41 | 1 | A |
| 14: Pear Tree @ Edmundson | WB | Through | 239 | 7.0 | 3.2 | 129 | 7 | A |
| 14: Pear Tree @ Edmundson | Total | Total | 834 | 9.8 | 5.8 | 232 | 7 | A |
| 15: T2 Exit @ LIB | EB | Through | 409 | 9.8 | 6.1 | 163 | 15 | A |
| 15: T2 Exit @ LIB | SB - A | Left | 128 | 28.2 | 22.4 | 178 | 22 | C |
| 15: T2 Exit @ LIB | SB - A | Right | 160 | 29.1 | 23.1 | 253 | 33 | C |
| 15: T2 Exit @ LIB | SB - D | Left | 172 | 29.1 | 23.1 | 253 | 33 | C |
| 15: T2 Exit @ LIB | SB - D | Right | 191 | 32.7 | 25.1 | 267 | 41 | C |
| 15: T2 Exit @ LIB | WB | Through | 276 | 2.0 | 1.0 | 60 | 2 | A |
| 15: T2 Exit @ LIB | Total | Total | 1,336 | 18.0 | 13.6 | 273 | 24 | B |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 16: T2 Parking Exit @ LIB | EB | Through | 712 | 2.9 | 0.6 | 174 | 3 | N/A |
| 16: T2 Parking Exit @ LIB | SB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 16: T2 Parking Exit @ LIB | SB | Right | 28 | 44.5 | 38.1 | 65 | 7 | E |
| 16: T2 Parking Exit @ LIB | WB | Through | 247 | 0.0 | 0.0 | 0 | 0 | N/A |
| 16: T2 Parking Exit @ LIB | Total | Total | 987 | 3.3 | 1.5 | 174 | 3 | E |
| 17: T1 Entrance @ LIB | EB | Left | 475 | 33.0 | 18.5 | 357 | 44 | C |
| 17: T1 Entrance @ LIB | EB | Through | 235 | 1.6 | 0.2 | 27 | 0 | A |
| 17: T1 Entrance @ LIB | SB | Left | 5 | 76.3 | 70.6 | 39 | 2 | E |
| 17: T1 Entrance @ LIB | SB | Right | 39 | 6.9 | 0.3 | 85 | 2 | A |
| 17: T1 Entrance @ LIB | WB | Through | 209 | 16.2 | 11.2 | 136 | 14 | B |
| 17: T1 Entrance @ LIB | WB | Right | 247 | 20.4 | 13.3 | 146 | 18 | C |
| 17: T1 Entrance @ LIB | Total | Total | 1,210 | 20.8 | 12.3 | 357 | 13 | C |
| 18: Parking Lot E @Air Cargo Rd | EB | Through | 138 | 0.0 | 0.0 | 0 | 0 | N/A |
| 18: Parking Lot E @Air Cargo Rd | SB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 18: Parking Lot E @Air Cargo Rd | SB | Right | 8 | 1.4 | 0.0 | 11 | 0 | A |
| 18: Parking Lot E @Air Cargo Rd | WB | Through | 113 | 0.3 | 0.0 | 0 | 0 | N/A |
| 18: Parking Lot E @Air Cargo Rd | Total | Total | 259 | 0.2 | 0.0 | 11 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | NB | Left | 70 | 0.6 | 0.0 | 0 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | NB | Right | 50 | 0.7 | 0.0 | 0 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | EB | Through | 68 | 10.9 | 0.2 | 2 | 0 | B |
| 19: Air Cargo Rd @ James S McDonnell | EB | Right | 70 | 5.7 | 0.2 | 2 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | WB | Left | 29 | 6.2 | 0.2 | 0 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | WB | Through | 44 | 10.2 | 0.2 | 0 | 0 | B |
| 19: Air Cargo Rd @ James S McDonnell | Total | Total | 331 | 5.6 | 0.1 | 2 | 0 | A |
| 20: MO 115 @ I-70 EB/SOR | NB | Left | 66 | 27.4 | 21.1 | 188 | 18 | C |
| 20: MO 115 @ I-70 EB/SOR | NB | Through | 44 | 28.1 | 21.5 | 188 | 18 | C |
| 20: MO 115 @ I-70 EB/SOR | NB | Right | 110 | 5.7 | 2.3 | 26 | 0 | A |
| 20: MO 115 @ I-70 EB/SOR | EB | Through | 308 | 11.9 | 6.7 | 158 | 17 | B |
| 20: MO 115 @ I-70 EB/SOR | EB | Right | 22 | 12.2 | 7.9 | 158 | 17 | B |
| 20: MO 115 @ I-70 EB/SOR | WB | Left | 126 | 28.1 | 22.2 | 167 | 20 | C |
| 20: MO 115 @ I-70 EB/SOR | WB | Through | 172 | 4.7 | 2.0 | 87 | 3 | A |
| 20: MO 115 @ I-70 EB/SOR | WB | Right | 108 | 5.0 | 2.2 | 74 | 2 | A |
| 20: MO 115 @ I-70 EB/SOR | Total | Total | 956 | 13.1 | 8.6 | 196 | 10 | B |

### *Table 15 - PM Node Evaluation Results*

| Intersection | Approach | Movement | Volume | Delay (sec) | Delay Stopped (sec) | Queue Length Max (ft) | Queue Length Average (ft) | LOS |
|---|---|---|---|---|---|---|---|---|
| 1: MO 115/LIB @ Parking Lot D | NB | Left | 0 | 0.0 | 0.0 | 0.0 | 0.0 | A |
| 1: MO 115/LIB @ Parking Lot D | NB | Right | 14 | 6.0 | 0.3 | 62 | 1 | A |
| 1: MO 115/LIB @ Parking Lot D | EB | Through | 489 | 0.2 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | EB | Right | 14 | 0.5 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | WB | Left | 0 | 0.0 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | WB | Through | 264 | 0.1 | 0.0 | 0 | 0 | N/A |
| 1: MO 115/LIB @ Parking Lot D | Total | Total | 781 | 0.3 | 0.0 | 62 | 0 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | NB | Left | 114 | 16.5 | 9.5 | 149 | 10 | B |
| 2: I-70 WB @ MO 115/Cypress/LIB | NB | Right | 161 | 4.5 | 0.4 | 87 | 1 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | EB | Through | 446 | 11.7 | 4.6 | 157 | 16 | B |
| 2: I-70 WB @ MO 115/Cypress/LIB | EB | Right | 57 | 1.7 | 0.1 | 41 | 0 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | WB | Left | 96 | 4.8 | 2.2 | 90 | 2 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | WB | Through | 150 | 5.0 | 1.8 | 79 | 2 | A |
| 2: I-70 WB @ MO 115/Cypress/LIB | Total | Total | 1,024 | 8.9 | 3.6 | 177 | 5 | A |
| 3: Cypress @ MO 115/LIB | NB | Left | 168 | 12.3 | 6.9 | 110 | 9 | B |
| 3: Cypress @ MO 115/LIB | NB | Right | 154 | 1.4 | 0.0 | 0 | 0 | A |
| 3: Cypress @ MO 115/LIB | EB | Through | 138 | 7.3 | 2.8 | 196 | 10 | A |
| 3: Cypress @ MO 115/LIB | EB | Right | 468 | 4.1 | 0.7 | 195 | 6 | A |
| 3: Cypress @ MO 115/LIB | WB | Left | 73 | 5.4 | 1.8 | 79 | 1 | A |
| 3: Cypress @ MO 115/LIB | WB | Through | 77 | 4.7 | 1.4 | 65 | 1 | A |
| 3: Cypress @ MO 115/LIB | Total | Total | 1,078 | 5.5 | 2.0 | 206 | 5 | A |
| 4: I-70 EB @ Cypress | NB | Left | 10 | 7.4 | 4.4 | 27 | 0 | A |
| 4: I-70 EB @ Cypress | NB | Through | 183 | 14.0 | 8.8 | 185 | 11 | B |
| 4: I-70 EB @ Cypress | NB | Right | 252 | 3.7 | 1.0 | 55 | 0 | A |
| 4: I-70 EB @ Cypress | EB | Left | 54 | 26.7 | 21.5 | 88 | 9 | C |
| 4: I-70 EB @ Cypress | EB | Through | 11 | 24.5 | 18.4 | 88 | 9 | C |
| 4: I-70 EB @ Cypress | EB | Right | 14 | 1.0 | 0.1 | 14 | 0 | A |
| 4: I-70 EB @ Cypress | SB | Left | 153 | 8.2 | 4.2 | 125 | 6 | A |
| 4: I-70 EB @ Cypress | SB | Through | 324 | 7.8 | 4.2 | 129 | 9 | A |
| 4: I-70 EB @ Cypress | SB | Right | 62 | 1.4 | 0.2 | 0 | 0 | A |
| 4: I-70 EB @ Cypress | WB | Left | 63 | 29.2 | 22.9 | 130 | 13 | C |
| 4: I-70 EB @ Cypress | WB | Through | 9 | 26.2 | 18.3 | 130 | 13 | C |
| 4: I-70 EB @ Cypress | WB | Right | 85 | 2.0 | 0.1 | 69 | 0 | A |
| 4: I-70 EB @ Cypress | Total | Total | 1,220 | 9.4 | 5.6 | 359 | 4 | A |
| 5: T1 Cell Phone Lot | EB | Left | 35 | 0.0 | 0.0 | 23 | 0 | N/A |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5: T1 Cell Phone Lot | EB | Through | 257 | 0.1 | 0.0 | 0 | 0 | N/A |
| 5: T1 Cell Phone Lot | SB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 5: T1 Cell Phone Lot | SB | Right | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 5: T1 Cell Phone Lot | WB | Through | 150 | 0.0 | 0.0 | 0 | 0 | N/A |
| 5: T1 Cell Phone Lot | WB | Right | 0 | 0.0 | 0.0 | 0 | 0 | N/A |
| 5: T1 Cell Phone Lot | Total | Total | 442 | 0.0 | 0.0 | 23 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | EB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | EB | Through | 253 | 2.6 | 0.9 | 73 | 2 | A |
| 6: I-70 WB @ LIB (before Cypress) | EB | Right | 4 | 2 | 0 | 110 | 1 | A |
| 6: I-70 WB @ LIB (before Cypress) | SB | Left | 4 | 61.0 | 54.2 | 44 | 2 | E |
| 6: I-70 WB @ LIB (before Cypress) | SB | Through | 0 | 0.0 | 0.0 | 44 | 2 | A |
| 6: I-70 WB @ LIB (before Cypress) | SB | Right | 4 | 6.4 | 0.3 | 34 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | WB | Left | 341 | 3.8 | 0.5 | 175 | 2 | A |
| 6: I-70 WB @ LIB (before Cypress) | WB | Through | 147 | 0.3 | 0.1 | 24 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | WB | Right | 5 | 0.7 | 0.0 | 22 | 0 | A |
| 6: I-70 WB @ LIB (before Cypress) | Total | Total | 758 | 3.0 | 0.8 | 175 | 1 | A |
| 7: Parking Lot B | NB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 7: Parking Lot B | NB | Right | 28 | 1.0 | 0.1 | 23 | 0 | A |
| 7: Parking Lot B | EB | Through | 257 | 0.1 | 0.0 | 0 | 0 | N/A |
| 7: Parking Lot B | EB | Right | 0 | 0.0 | 0.0 | 0 | 0 | N/A |
| 7: Parking Lot B | WB | Left | 0 | 0.0 | 0.0 | 0 | 0 | N/A |
| 7: Parking Lot B | WB | Through | 494 | 0.6 | 0.0 | 0 | 0 | N/A |
| 7: Parking Lot B | Total | Total | 779 | 0.4 | 0.0 | 23 | 0 | A |
| 8: Lambert Field St @ LIB | NB | Left | 0 | 0.0 | 0.0 | 39 | 2 | A |
| 8: Lambert Field St @ LIB | NB | Through | 0 | 0.0 | 0.0 | 39 | 2 | A |
| 8: Lambert Field St @ LIB | NB | Right | 8 | 54.7 | 48.9 | 39 | 2 | D |
| 8: Lambert Field St @ LIB | EB | Left 1 | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 8: Lambert Field St @ LIB | EB | Left 2 | 24 | 4.9 | 2.0 | 93 | 2 | A |
| 8: Lambert Field St @ LIB | EB | Through | 264 | 2.5 | 1.1 | 93 | 2 | A |
| 8: Lambert Field St @ LIB | EB | Right | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 8: Lambert Field St @ LIB | SEB | Left | 8 | 0.0 | 0.0 | 37 | 2 | A |
| 8: Lambert Field St @ LIB | SEB | Right | 0 | 0.0 | 0.0 | 37 | 2 | A |
| 8: Lambert Field St @ LIB | SEB | Through | 0 | 0.0 | 0.0 | 37 | 2 | A |
| 8: Lambert Field St @ LIB | SWB | Left | 22 | 45.2 | 37.3 | 113 | 9 | D |
| 8: Lambert Field St @ LIB | SWB | Right | 10 | 50.4 | 43.5 | 113 | 9 | D |
| 8: Lambert Field St @ LIB | SWB | Through | 0 | 0.0 | 0.0 | 113 | 9 | A |
| 8: Lambert Field St @ LIB | WB | Left | 0 | 0.0 | 0.0 | 110 | 3 | A |
| 8: Lambert Field St @ LIB | WB | Through | 483 | 2.3 | 0.7 | 110 | 3 | A |
| 8: Lambert Field St @ LIB | WB | Right 2 | 0 | 0.0 | 0.0 | 110 | 3 | A |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8: Lambert Field St @ LIB | WB | Right 1 | 18 | 2.5 | 0.9 | 110 | 3 | A |
| 8: Lambert Field St @ LIB | Total | Total | 837 | 4.6 | 2.8 | 125 | 3 | A |
| 9: T2 Entrance | NB | Left | 234 | 3.7 | 2.2 | 288 | 25 | A |
| 9: T2 Entrance | NB | Through | 211 | 3.0 | 1.8 | 287 | 25 | A |
| 9: T2 Entrance | NB | Right | 147 | 0.4 | 0.0 | 247 | 23 | A |
| 9: T2 Entrance | WB | Left | 79 | 42.1 | 34.7 | 181 | 30 | D |
| 9: T2 Entrance | WB | Right | 28 | 41.2 | 36.3 | 75 | 6 | D |
| 9: T2 Entrance | Total | Total | 699 | 8.6 | 6.7 | 289 | 22 | A |
| 10: T1 Exit @ LIB | NB 1 | Left | 0 | 0 | 0 | 0 | 0 | A |
| 10: T1 Exit @ LIB | NB 1 | Through | 0 | 0 | 0 | 0 | 0 | A |
| 10: T1 Exit @ LIB | NB 1 | Right | 0 | 0 | 0 | 0 | 0 | A |
| 10: T1 Exit @ LIB | NB 2 | Right | 128 | 8.7 | 1.9 | 62 | 5 | A |
| 10: T1 Exit @ LIB | EB | Through | 293 | 20.3 | 14.0 | 166 | 22 | C |
| 10: T1 Exit @ LIB | EB | Right 2 | 10 | 23.2 | 16.5 | 166 | 22 | C |
| 10: T1 Exit @ LIB | EB | Right 1 | 0 | 0.0 | 0.0 | 166 | 22 | A |
| 10: T1 Exit @ LIB | WB | Left 1 | 55 | 8.5 | 4.8 | 90 | 2 | A |
| 10: T1 Exit @ LIB | WB | Left 2 | 0 | 0.0 | 0.0 | 160 | 23 | A |
| 10: T1 Exit @ LIB | WB | Through | 305 | 21.0 | 15.0 | 160 | 23 | C |
| 10: T1 Exit @ LIB | SB - A | Left | 380 | 41.8 | 33.4 | 247 | 67 | D |
| 10: T1 Exit @ LIB | SB - A | Through | 9 | 44.4 | 35.9 | 247 | 67 | D |
| 10: T1 Exit @ LIB | SB - A | Right | 118 | 37.0 | 29.8 | 247 | 67 | D |
| 10: T1 Exit @ LIB | SB - D | Left | 207 | 40.6 | 33.3 | 181 | 43 | D |
| 10: T1 Exit @ LIB | SB - D | Through | 0 | 0.0 | 0.0 | 181 | 43 | A |
| 10: T1 Exit @ LIB | SB - D | Right | 78 | 43.0 | 36.4 | 181 | 43 | D |
| 10: T1 Exit @ LIB | Total | Total | 1,583 | 29.4 | 22.5 | 247 | 23 | C |
| 11: I-70 WB @ Airflight | NB | Left | 306 | 8.6 | 2.6 | 227 | 10 | A |
| 11: I-70 WB @ Airflight | NB | Through | 345 | 4.9 | 1.4 | 206 | 6 | A |
| 11: I-70 WB @ Airflight | SB | Through | 297 | 16.7 | 10.5 | 206 | 19 | B |
| 11: I-70 WB @ Airflight | WB | Left | 280 | 39.7 | 29.9 | 275 | 55 | D |
| 11: I-70 WB @ Airflight | WB | Right | 66 | 31.4 | 22.0 | 30 | 0 | C |
| 11: I-70 WB @ Airflight | Total | Total | 1,294 | 17.4 | 11.0 | 286 | 13 | B |
| 12: I-70 EB @ Pear Tree | NEB | Right | 58 | 7.3 | 0.8 | 89 | 2 | A |
| 12: I-70 EB @ Pear Tree | EB | Through | 221 | 41.1 | 31.9 | 181 | 37 | D |
| 12: I-70 EB @ Pear Tree | EB | Right | 10 | 35.8 | 29.9 | 181 | 37 | D |
| 12: I-70 EB @ Pear Tree | SB | Left | 409 | 8.5 | 4.4 | 216 | 15 | A |
| 12: I-70 EB @ Pear Tree | SB | Through | 22 | 7.2 | 3.7 | 216 | 15 | A |
| 12: I-70 EB @ Pear Tree | SB | Right | 64 | 2.4 | 0.5 | 49 | 0 | A |
| 12: I-70 EB @ Pear Tree | WB | Through | 50 | 26.1 | 20.3 | 120 | 7 | C |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 12: I-70 EB @ Pear Tree | WB | Right | 154 | 26.3 | 18.8 | 255 | 25 | C |
| 12: I-70 EB @ Pear Tree | Total | Total | 988 | 19.2 | 13.4 | 267 | 14 | B |
| 13: I-70 EB @ Airflight | NB | Left | 0 | 0.0 | 0.0 | 124 | 20 | A |
| 13: I-70 EB @ Airflight | NB | Through | 58 | 47.8 | 39.5 | 124 | 20 | D |
| 13: I-70 EB @ Airflight | NB | Right | 9 | 49.4 | 42.3 | 124 | 20 | D |
| 13: I-70 EB @ Airflight | EB | Left | 412 | 18.0 | 12.8 | 210 | 30 | B |
| 13: I-70 EB @ Airflight | EB | Through | 255 | 14.9 | 9.1 | 289 | 24 | B |
| 13: I-70 EB @ Airflight | EB | Right | 22 | 12.8 | 8.6 | 289 | 24 | B |
| 13: I-70 EB @ Airflight | SB | Left | 266 | 39.0 | 29.3 | 398 | 77 | D |
| 13: I-70 EB @ Airflight | SB | Through | 34 | 39.1 | 28.1 | 398 | 77 | D |
| 13: I-70 EB @ Airflight | SB | Right | 156 | 4.8 | 1.9 | 398 | 77 | A |
| 13: I-70 EB @ Airflight | WB | Left | 11 | 44.3 | 37.6 | 43 | 3 | D |
| 13: I-70 EB @ Airflight | WB | Through | 49 | 43.4 | 33.0 | 130 | 11 | D |
| 13: I-70 EB @ Airflight | WB | Right | 196 | 4.1 | 1.2 | 132 | 3 | A |
| 13: I-70 EB @ Airflight | Total | Total | 1,468 | 20.8 | 14.8 | 398 | 24 | C |
| 14: Pear Tree @ Edmundson | NB | Left | 47 | 6.9 | 1.2 | 74 | 2 | A |
| 14: Pear Tree @ Edmundson | NB | Right | 129 | 43.5 | 36.9 | 249 | 37 | D |
| 14: Pear Tree @ Edmundson | EB | Through | 406 | 5.1 | 1.0 | 229 | 7 | A |
| 14: Pear Tree @ Edmundson | EB | Right | 126 | 1.6 | 0.0 | 20 | 0 | A |
| 14: Pear Tree @ Edmundson | WB | Left | 277 | 4.6 | 1.6 | 148 | 5 | A |
| 14: Pear Tree @ Edmundson | WB | Through | 29 | 10.3 | 5.2 | 40 | 0 | B |
| 14: Pear Tree @ Edmundson | Total | Total | 1,014 | 9.6 | 5.7 | 270 | 9 | A |
| 15: T2 Exit @ LIB | EB | Through | 523 | 12.0 | 7.1 | 202 | 22 | B |
| 15: T2 Exit @ LIB | SB - A | Left | 88 | 30.8 | 25.1 | 133 | 16 | C |
| 15: T2 Exit @ LIB | SB - A | Right | 147 | 30.8 | 25.2 | 194 | 22 | C |
| 15: T2 Exit @ LIB | SB - D | Left | 112 | 30.8 | 25.2 | 194 | 22 | C |
| 15: T2 Exit @ LIB | SB - D | Right | 151 | 33.6 | 26.4 | 224 | 34 | C |
| 15: T2 Exit @ LIB | WB | Through | 454 | 2.0 | 1.3 | 72 | 3 | A |
| 15: T2 Exit @ LIB | Total | Total | 1,475 | 15.6 | 11.5 | 235 | 21 | B |
| 16: T2 Parking Exit @ LIB | EB | Through | 723 | 3.6 | 1.0 | 155 | 5 | N/A |
| 16: T2 Parking Exit @ LIB | SB | Left | 34 | 38.0 | 30.9 | 77 | 7 | E |
| 16: T2 Parking Exit @ LIB | SB | Right | 29 | 36.9 | 31.0 | 59 | 5 | E |
| 16: T2 Parking Exit @ LIB | WB | Through | 424 | 0.1 | 0.0 | 0 | 0 | N/A |
| 16: T2 Parking Exit @ LIB | Total | Total | 1,210 | 4.1 | 2.2 | 155 | 5 | E |
| 17: T1 Entrance @ LIB | EB | Left | 401 | 30.8 | 17.7 | 307 | 37 | C |
| 17: T1 Entrance @ LIB | EB | Through | 351 | 1.4 | 0.2 | 31 | 0 | A |
| 17: T1 Entrance @ LIB | SB | Left | 5 | 71.9 | 66.2 | 36 | 2 | E |
| 17: T1 Entrance @ LIB | SB | Right | 74 | 8.9 | 0.4 | 116 | 5 | A |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 17: T1 Entrance @ LIB | WB | Through | 351 | 14.8 | 9.6 | 161 | 19 | B |
| 17: T1 Entrance @ LIB | WB | Right | 193 | 16.1 | 10.9 | 123 | 12 | B |
| 17: T1 Entrance @ LIB | Total | Total | 1,375 | 16.1 | 9.5 | 307 | 12 | B |
| 18: Parking Lot E @Air Cargo Rd | EB | Through | 148 | 0.0 | 0.0 | 0 | 0 | N/A |
| 18: Parking Lot E @Air Cargo Rd | SB | Left | 0 | 0.0 | 0.0 | 0 | 0 | A |
| 18: Parking Lot E @Air Cargo Rd | SB | Right | 8 | 1.7 | 0.1 | 17 | 0 | A |
| 18: Parking Lot E @Air Cargo Rd | WB | Through | 133 | 0.3 | 0.0 | 0 | 0 | N/A |
| 18: Parking Lot E @Air Cargo Rd | Total | Total | 289 | 0.2 | 0.0 | 17 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | NB | Left | 84 | 0.7 | 0.0 | 0 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | NB | Right | 60 | 0.8 | 0.0 | 0 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | EB | Through | 75 | 11.3 | 0.2 | 4 | 0 | B |
| 19: Air Cargo Rd @ James S McDonnell | EB | Right | 73 | 5.7 | 0.2 | 4 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | WB | Left | 44 | 6.1 | 0.2 | 0 | 0 | A |
| 19: Air Cargo Rd @ James S McDonnell | WB | Through | 49 | 10.3 | 0.2 | 0 | 0 | B |
| 19: Air Cargo Rd @ James S McDonnell | Total | Total | 385 | 5.5 | 0.1 | 4 | 0 | A |
| 20: MO 115 @ I-70 EB/SOR | NB | Left | 62 | 33.7 | 25.7 | 368 | 44 | C |
| 20: MO 115 @ I-70 EB/SOR | NB | Through | 94 | 35.7 | 27.2 | 368 | 44 | D |
| 20: MO 115 @ I-70 EB/SOR | NB | Right | 177 | 13.9 | 7.6 | 47 | 0 | B |
| 20: MO 115 @ I-70 EB/SOR | EB | Through | 375 | 13.4 | 7.7 | 175 | 22 | B |
| 20: MO 115 @ I-70 EB/SOR | EB | Right | 32 | 13.0 | 8.6 | 175 | 22 | B |
| 20: MO 115 @ I-70 EB/SOR | WB | Left | 177 | 33.5 | 26.9 | 217 | 35 | C |
| 20: MO 115 @ I-70 EB/SOR | WB | Through | 338 | 5.7 | 2.3 | 151 | 7 | A |
| 20: MO 115 @ I-70 EB/SOR | WB | Right | 181 | 5.3 | 2.1 | 107 | 3 | A |
| 20: MO 115 @ I-70 EB/SOR | Total | Total | 1,436 | 15.4 | 10.2 | 368 | 19 | B |

## 5.0 SIMULATION RUNS

To determine the required number of replications, the formulas below were used. These formulas along with our methodology for determining the number of replications follow the suggestions and procedures outlined in FHWA's *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software*. Each of the data clusters and their corresponding key performance measures were considered when the computations were performed for the minimum required runs. The maximum of these computations was used as the required number of simulations or replications. It is important to note that the small amount of variation found from run to run when considering the average of performance measures over the entirety of the simulations rendered a small minimum required number of runs. Because of this, a 5-minute time variant comparison was done for each of the considered measures and the 5-minute interval which had the most variation was considered in selecting the minimum number of runs. Results indicated using 9 simulation runs, which is acceptable under FHWA's guidance as mentioned in *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software,* but it is stated in MoDOT's EPG "905.3.5.3.2.3.1 Initial Simulation Runs" that the minimum is 10, if justified. Therefore, for operational analysis via modeling, 10 simulation runs were used.

$$N_{min} = \left(\frac{t_{n-1,95\%}\, s}{e\bar{x}}\right)^2 \qquad (15)$$

where:

| | | |
|---|---|---|
| $N_{min}$ | : | Required number of model runs |
| $n$ | : | Number of initial model runs (i.e., 4) |
| $\bar{x}, s$ | : | Mean and standard deviation of the initial runs |
| $t_{n-1,95\%}$ | : | $t$ statistic for $n$-1 degrees of freedom and 95% confidence level |
| $e$ | : | Tolerance error |

Tolerance error is computed as follows:

$$e = \frac{t_{n-1,95\%}\left(\frac{s}{\sqrt{n}}\right)}{\bar{x}} \qquad (17)$$

**Figure 3 – *Formula for Minimum Number of Required Model Runs***
***(Source: FHWA (Federal Highway Administration))***

# 6.0 CONCLUSION

During the calibration process, several guidelines were followed including FHWA's Guidelines for Applying Traffic Microsimulation Modeling Software 2019 Update to the 2004 Version. Another guideline used during the calibration process includes MoDOT's EPG 905.3.5.3.2. The main goal of the calibration process was to create Vissim models which depict existing period conditions as accurately as possible by setting calibration thresholds such as speed, throughput, travel times, and operational measures. These calibration thresholds were found within MoDOT's EPG 905.3.5.3.2.3.4 and were agreed on in the previously submitted TIA Methods and Assumptions report. All calibration thresholds are well met in both modeled peak periods. Creating a well calibrated model using assumed and given parameters increases the accuracy of future models using the same inputs such as driver behaviors, speed distributions, and routing methods.