2. Alternatives Analysis

2.1 Alternative Screening Process

The best operational and engineering solutions were evaluated based on the following criteria:

- Consistency with future land uses and the airport's Master Plan
- Consistency with state, regional, and local plans
- Consistency with FAA policies, guidance, and directives
- Functional compatibility with adjacent facilities
- Co-location of like services
- Economic feasibility
- Availability of sites and adequacy of space
- Environmental constraints

Alternatives were screened to identify a range of reasonable alternatives that meet the purpose and need. The first step in this screening process was to determine if an alternative can address the purpose and need by providing necessary facilities for national defense aircraft production and testing. The second step considered whether the alternative was practical or feasible to implement from an economic and constructability standpoint. An alternative that would result in substantial site development costs, but provide the same operational benefits, would not be retained for detailed evaluation. Constructability considers functionality, compatibility with existing and future land use, compatibility with adjacent facilities, infrastructure availability, and other environmental factors. These physical characteristics can affect engineering costs, project schedules, operational efficiency, and construction sequencing or phasing. An alternative that would result in substantial constructability or technical issues would not be retained for detailed evaluation. Additionally, a test fit assessment was performed to determine whether each alternative's site size and shape were sufficient to accommodate the proposed facilities.

2.2 Initial Alternatives and Alternatives Evaluation

The following five alternatives were subject to the alternatives screening process. The initial range of alternatives to be evaluated include the No Action Alternative, three alternatives that look at implementation of the Proposed Action on different parcels (Figure 2-1), and one alternative that looks at the same locations but with different phasing.

- No Action Alternative
- Proposed Action Alternative: Brownleigh and Northern Tract Parcels (Concurrent Development)
- Action Alternative 1: Berry Hill/Golf Course Parcels
- Action Alternative 2: Brownleigh and Northern Tract Parcels (Sequential Development – Northern Tract Parcel Only for Phase 2)
- Action Alternative 3: Brownleigh and Existing Northern Air Cargo Facility Parcel

These subsections evaluate whether an alternative meets the purpose and need, as well as whether the alternative is practical or feasible to implement from an economic and constructability standpoint, as outlined in Section 2.1.

2.2.1 No Action Alternative

Under the No Action Alternative, the construction and demolition activities would not occur. The current configuration at the airport would be deficient for Boeing's proposed national defense-related aircraft production and testing needs. Boeing would locate their new facilities in another market that is able to meet their national defense aircraft assembly and testing needs. If the facilities have to be relocated to a new market, then Boeing could not provide co-located facilities, resulting in loss of operational and

economic efficiencies. This would result in substantial loss of economic activity in the St. Louis region and prevent the airport from receiving the development activity and ground rent income associated with the Proposed Action.

Although the No Action Alternative does not meet the Proposed Action's Purpose and Need, it is carried forward in the assessment of environmental impacts to establish a baseline condition.

2.2.2 Proposed Action Alternative: Brownleigh and Northern Tract Parcels (Concurrent Development)

Under the Proposed Action Alternative, the airport's partner, Boeing, would lease two parcels, the 76-acre Northern Tract and 109-acre Brownleigh, from the airport to support construction and operation of Boeing's Assembly and Testing Campus (Figure 2-1).

Phases 1 and 2, as designed on Brownleigh and Northern Tract, include a total of 2,612,000 ft^2 of building construction, would have approximately 2,096 occupants, and would result in approximately 185 acres of land development. The target occupancy is January 2026 for Phase 1 on Brownleigh parcel, January 2027 for Phase 1 on Northern Tract parcel, and January 2029 for Phase 2.

The Phase 1 planned construction on Brownleigh is as follows:

- Approximately 979,000-ft^2 Assembly Building
- Approximately 82,000-ft^2 CUP
- Taxiway to connect Taxiway Foxtrot into the parcel

The Phase 1 planned construction on Northern Tract is as follows:

- Approximately 191,500-ft^2 Hangar
- Approximately 94,550-ft^2 RCS Range Building
- Approximately 58,000- ft^2 CUP
- Approximately 25,000-ft^2, Open-air Aircraft Shelters (Launch and Recovery Structures)
- Approximately 14,500-ft^2 Hush House
- Approximately 15,600-ft^2 Maintenance Building
- Approximately 15,200-ft^2 Fuel Calibration Building
- Approximately 11,800-ft^2 Fire Department Satellite Building
- Several small support or storage structures (each under 10,000 ft^2)
- Taxiways to connect Taxiway Victor to the parcel

The Phase 2 planned construction on Brownleigh is as follows:

- Approximately 720,000-ft^2 Assembly Building

The Phase 2 planned construction on Northern Tract is as follows:

- Approximately 75,700-ft^2 Hangar addition
- Approximately 205,000-ft^2 Paint Building
- Approximately 12,500-ft^2 additional Open-air Aircraft Shelters (Launch and Recovery Structures)
- Approximately 13,300-ft^2 additional Hush House
- Approximately 12,000-ft^2 additional Fuel Calibration Building

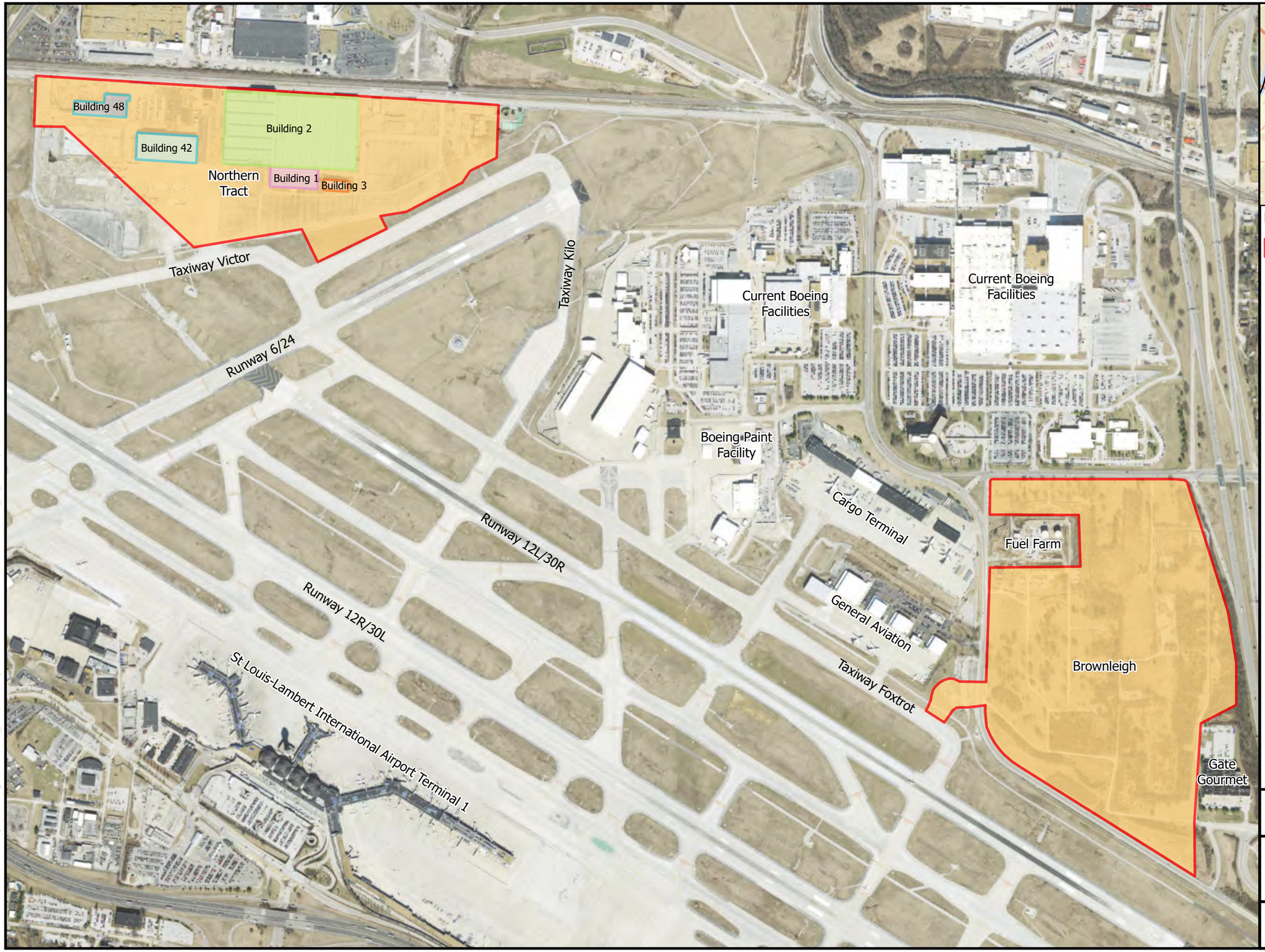
The Proposed Action Alternative would use two parcels, the Northern Tract and Brownleigh. These two parcels would support construction and operation of Boeing's Assembly and Testing Campus with construction occurring on both Brownleigh and the Northern Tract during Phase 1 and Phase 2.

A test fit assessment evaluated a layout based on initial design requirements. That potential layout passed the test fit and would have sufficient functionality, would strengthen compatibility with adjacent facilities, would increase operations efficiency, and would increase future flexibility. Additional capabilities and design requirements were added after charettes and design reviews resulting in a larger Assembly Building

and RCS as well as adding a Fire Department Satellite Building and CUP. This concurrent approach on these parcels meets the current design requirements and would still have sufficient functionality, would strengthen compatibility with adjacent facilities, would increase operations efficiency, and would increase future flexibility.

The Proposed Action Alternative meets the screening criteria outlined in Section 2.1. This Alternative meets the Proposed Action's Purpose and Need, was considered a practicable alternative, and is generally described in the following text.

Both parcels would be connected to the airfield taxiways via taxiway connectors. One taxiway connector would link the Brownleigh parcel to Taxiway Foxtrot. Another two taxiway connectors would link the Northern Tract parcel to Taxiway Victor. The western and southern edges of the Northern Tract lie within the Runway 12L runway protection zone and underneath the Runway 12L approach and departure surfaces. Runway 6-24 is located southeast of the Northern Tract parcel. The proposed towpath avoids the Runway 6-24 high-energy zones.



LEGEND:

Detailed Study Area

N

BASE MAP SOURCE:
USGS USA Topo Map

0 1,000
FEET

Site Map
Boeing STL Expansion

Figure 2-1
Proposed Action Alternative

DATE: 8/23/2023

Jacobs

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To construct the Phase 1 facilities, Boeing would demolish functionally obsolete structures on the parcels, clear vegetation, and level the ground as needed to create a pad-ready environment for the campus. Northern Tract facilities that would need to be demolished include the McDonnell Douglas complex (Building 1, Building 2, Building 3, Building 48, and associated structures) and asphalt surface parking. The McDonnell Douglas complex buildings have been unoccupied and disconnected from utilities for more than 20 years and have been damaged by storms in recent years. Additionally, the security level of the Boeing programs requires a structure to meet Intelligence Community Directive Number 705 standards, and the existing structures do not meet that standard. The buildings were purpose built for hands-on assembly line construction methods for the small planes that the Curtiss-Wright Aeroplane Factory produced during World War II. The buildings do not meet the needs of a modern aeronautical manufacturing tenant for internal configuration because of numerous internal columns, 20-foot-tall ceiling trusses, and a limited floor load (basements under majority of footprints).

Boeing would demolish Building 42 and asphalt surface parking as part of the implementation of Phase 2. Existing tenants of Building 42 (Airport Terminal Services [ATS] Jet Center and GoJet Airlines) would need to be relocated to new or existing facilities on airport property. The airport, in coordination with FAA, would evaluate available sites to determine compatibility with other airport uses. These sites would be evaluated for potential environmental impacts in a supplemental NEPA evaluation once a decision has been made to implement this portion of the Phase 2 development and suitable sites have been identified.

The Brownleigh parcel is currently vacant with the exception of a bulk fuel storage facility and Gate Gourmet facility, which would both remain in the Brownleigh area for future use.

Roads, parking areas, and other infrastructure would be created during both phases within the parcels. Parcels would be secured with new perimeter fencing, guardhouses, and badge access, similar to other Boeing facilities in the area.

Aircraft would be assembled on Brownleigh and then be towed across James S. McDonnell Boulevard into a secure holding area ("sally-port") with gated access to the Air Operations Area. Security measures would be put into place to control vehicular traffic during the towing operations; once the tow operations are complete, the road would remain open to vehicular traffic. From there, the Airport Traffic Control Tower would approve access to Air Operations Area, and the towed aircraft would proceed to the Northern Tract. The proposed towpath avoids the Runway 6-24 high-energy zones. Under Phase 1, these towing operations are anticipated to occur between two and four times per month. Under Phase 2, these towing operations would increase to four to six times per month. An effort would be made to avoid towing operations during high traffic periods.

The Northern Tract parcel would contain the flight ramp structures, and the aircraft would move between the Hangar, Fuel Calibration Building, RCS, Hush House, and open-air shelters, as needed. Modifications to or relocation of FAA infrastructure, cables, and equipment would be coordinated with FAA Air Traffic Organization Technical Operations.

Aircraft operations are primarily the production acceptance of new-build aircraft and the U.S. Government acceptance of those aircraft at the factory. Flights will occur via the taxiway connector to Taxiway Victor. Boeing operates the aircraft built here in accordance with contractual requirements levied by our government customers to verify they meet the specifications and requirements set by our government customer. For these contracts, the aircraft would be operated under public use rules with military airworthiness oversight. These activities, which would be supported by this expansion, continue the long-established, industry-standard processes for the acceptance of aircraft delivered to government customers. Flight testing would generally occur at a rate at which and in the locations where current Boeing test flights are occurring today. There are currently 44 Boeing test flights per month (2 per day for 22 days a month) for all programs from the airport.

If Phase 2 is implemented, the parcels would generally have the same function and operations. Frequency of the movement from Brownleigh would increase as a result of the second Assembly Building coming online. Boeing anticipates towing operations between four and six times a month.

The precise design, footprint, and location of all projects are in the early planning stages. Figures 2-2 and 2-3 provide a conceptual layout for each parcel; however, this may change during the design process. Should locations and final layouts differ substantially from those anticipated in terms of the land use category involved or the compatibility with the land use category at the final designated location, or should the change in location result in additional potential impacts to the previously defined sensitive resources, then separate environmental documentation for those projects would be required.

2.2.3 Action Alternative 1: Berry Hill/Golf Course Parcels

Action Alternative 1 would involve constructing Boeing's Assembly and Testing Campus on the Berry Hill/Golf Course parcels during Phase 1 and Phase 2. Action Alternative 1 would meet the Proposed Action's Purpose and Need but did not meet the screening criteria outlined in Section 2.1. Action Alternative 1 was determined not practical or feasible to implement from an economic and constructability standpoint and was not retained for detailed analysis for the following reasons:

- The parcel is at the western end of the airport with limited vehicular access. It is also furthest from existing Boeing facilities, requiring long tow operations to reach these existing facilities.
- The parcel slopes into a large stormwater runoff pit, which creates challenges in grading the site and would result in substantial earthwork. Additionally, the airfield runoff would have to be diverted to a new location if the site was developed, and there is no known suitable location. These challenges would add scope, engineering challenges, and cost to the Proposed Action.
- Large areas of the parcel closest to the runway are unusable due to mandatory height restrictions in areas with navigable airspace (CFR Title 14 Part 77). The test fit assessment evaluated a layout using initial design requirements. During this initial review, the taller assembly, radar testing, and Hangar structures would create substantial layout challenges and result in additional site development costs as more of the parcel would need to be developed.
- The center of the parcel contains a municipal golf course, which would have to be relocated at an additional cost. Suitable replacement sites within the City of Bridgeton (the course's owner) would be challenging to find, and delays could cause problems with the Proposed Action schedules and construction sequencing.

CONCEPTUAL - SUBJECT TO CHANGE

Lindbergh Boulevard

Norfolk Southern Railroad Tracks

Banshee Road

Building Restriction Line

Runway Protection Zone (Arrival)

Taxiway Victor

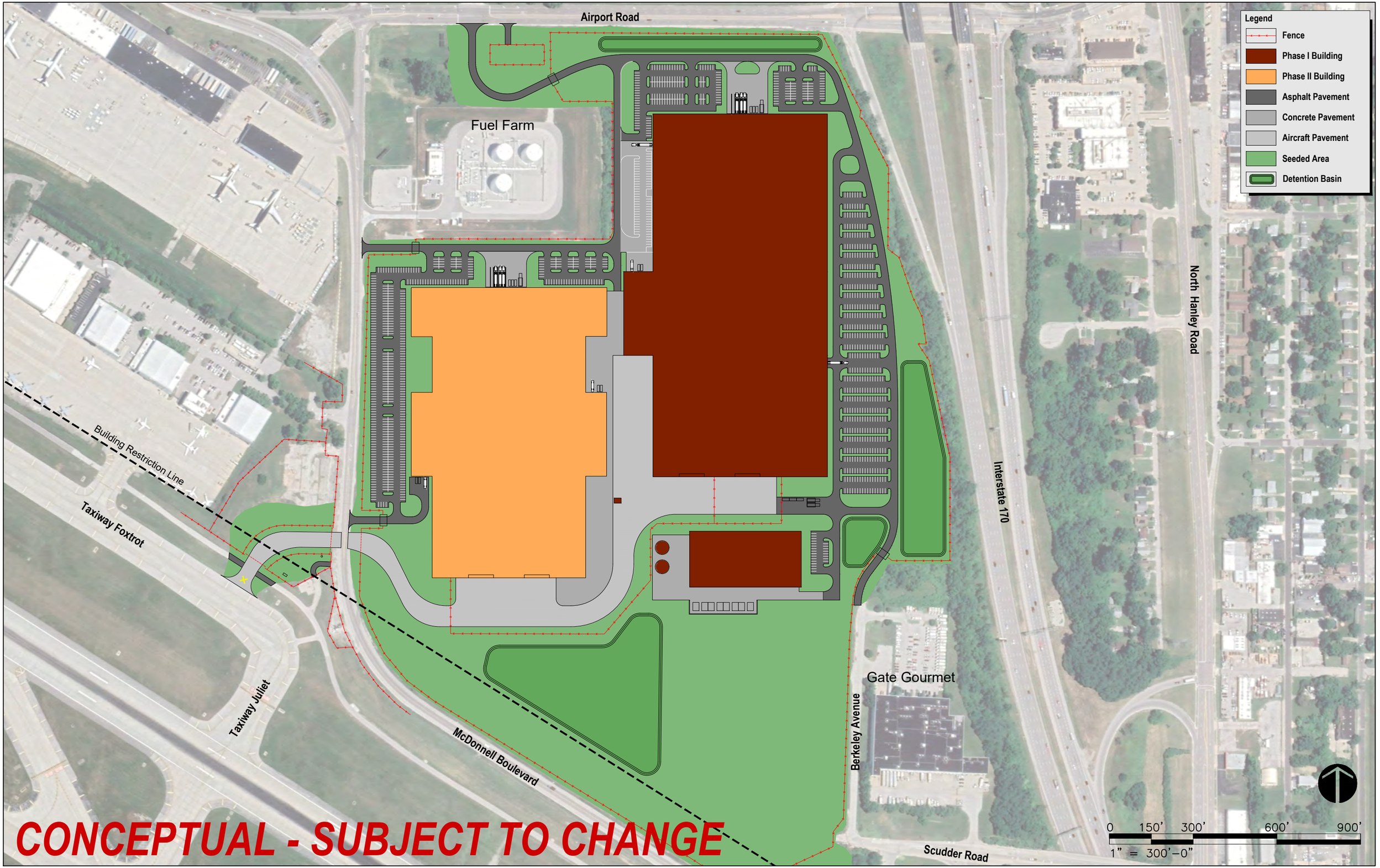
Runway 6/24

0 150’ 300’ 600’ 900’

1” = 300’–0”

Legend

- Fence
- Phase I Building
- Phase II Building
- Asphalt Pavement
- Concrete Pavement
- Aircraft Pavement
- Seeded Area


Airport Road
Fuel Farm
Building Restriction Line
Taxiway Foxtrot
Taxiway Juliet
McDonnell Boulevard
Scudder Road
Berkeley Avenue
Gate Gourmet
Interstate 170
North Hanley Road
Legend
Fence
Phase I Building
Phase II Building
Asphalt Pavement
Concrete Pavement
Aircraft Pavement
Seeded Area
Detention Basin
0 150’ 300’ 600’ 900’
1” = 300’–0”
CONCEPTUAL - SUBJECT TO CHANGE

2.2.4 Action Alternative 2: Brownleigh and Northern Tract Parcels (Sequential Development – Brownleigh Parcel Only for Phase 1)

Throughout the planning process, different approaches using the Brownleigh and Northern Tract parcels were studied. Action Alternative 2, similar to the Proposed Action Alternative, uses the Northern Tract and Brownleigh to support construction and operation of Boeing's Assembly and Testing Campus, but Phase 1 construction would only occur on Brownleigh and Phase 2 construction would occur on Brownleigh and the Northern Tract. Flight ramp operations at Brownleigh would result in flight ramp noise in a new location because flight ramp operations have not occurred here previously. Although this could result in a possible noise risk, it was not examined in enough detail to know whether that risk would affect constructability. Action Alternative 2 would meet the Proposed Action's Purpose and Need but did not meet the screening criteria outlined in Section 2.1. Action Alternative 2 was determined not practical to implement from a constructability standpoint and was not retained for detailed analysis for the following reasons:

- James S. McDonnell Boulevard would need to be permanently closed to accommodate the flight ramp from the Brownleigh parcel and to create the necessary access to the airfield.
- The test fit assessment evaluated a layout using initial design requirements. This potential layout passed the test fit but would create a very crowded flight ramp on Brownleigh and would decrease functionality, would weaken compatibility with adjacent facilities, would reduce operations efficiency, and would limit future flexibility. However, additional capabilities and design requirements were added after charettes and design reviews resulting in a larger Assembly Building and RCS, as well as adding a Firehouse and CUP. As a result, this sequential approach would not meet the current design requirements.
- Concerns arose that if the full buildout does not occur as planned, the Northern Tract parcel would not be developed and the currently underused airport property would not be redeveloped.

2.2.5 Action Alternative 3: Brownleigh Parcel and Existing Northern Air Cargo Facility Parcel

Action Alternative 3 involves building Boeing's Assembly and Testing Campus with construction occurring on the Brownleigh parcel and existing Northern Air Cargo Facility parcel during Phase 1 and Phase 2. Action Alternative 3 would meet the Proposed Action's Purpose and Need but did not meet the screening criteria outlined in Section 2.1. Action Alternative 3 was determined not practical to implement from a constructability standpoint and was not retained for detailed analysis for the following reasons:

- The Northern Air Cargo Facility would have to be relocated and the primary tenants, FedEx, UPS, and Amazon Air (Prime) would need to be relocated into a new air cargo facility before implementing the Proposed Action. The time required to relocate the Northern Air Cargo Facility to another place on the airfield, including design and construction of a new air cargo facility, would exceed the required schedule for implementation of Phase 1 of the Proposed Action.
- Air cargo parcel facilities that would need to be demolished include the existing FedEx and UPS air cargo buildings, apron, taxiway, and asphalt surface parking, all of which are considered functional structures. As previously noted, the existing tenants (FedEx and UPS) would need to be relocated but potentially farther from key highway and roadway connections.
- The combined parcel acreage was also less than the required acreage, creating layout issues for the overall proposed campus during the initial test fit assessment. With the additional capabilities and design requirements added after charettes and design reviews, the layout issues for the overall proposed campus identified during the test fit would likely result in this parcel not meeting the current design requirements.

2.3 Alternatives Carried Forward for Detailed Evaluation

After these initial assessments, three alternatives (Action Alternatives 1, 2, and 3) were eliminated because they failed to meet one or more of the screening criteria outlined in Section 2.1. The No Action Alternative and Proposed Action Alternative: Brownleigh and Northern Tract Parcels (Concurrent Development) have been retained for a more detailed environmental evaluation.