5. ALTERNATIVES ANALYSIS

The purpose of the alternatives analysis is to identify and evaluate Airport development alternatives that align with the established MPU goals. The alternatives must adhere to FAA standards, as well as identify the facilities required to accommodate the high growth scenario demand for aviation activity, which may vary from the FAA-approved forecast, either in magnitude or characteristics. The Preferred Airport Development Alternative prioritizes supporting aviation growth in a safe, efficient, and cost-effective manner through an organized and synergistic long-range development plan.

Multiple development alternatives were identified, screened, evaluated, and refined. In the context of the facility requirements, the exploration of alternatives was influenced by the opportunity to right size Airport facilities, while leveraging existing facilities and optimizing infrastructure investments.

Component alternatives were developed based on the facility requirements necessary to meet forecast demand, as well as other recognized operational needs. The alternatives analysis included several workshops convened with Milwaukee County staff to further develop, evaluate, and recommend refinements to the alternatives to ultimately identify the preferred alternative. The alternative analysis included public and stakeholder engagement.

This section of the MPU outlines the alternatives analysis process—the screening, refinement, and ultimate selection of the Preferred Airport Development Alternative.

5.1 GOALS

In coordination with Milwaukee County, eight draft MPU goals were established and shared with the Stakeholder Advisory Group (SAG) and Technical Advisory Group (TAG). These documented goals, which were used to guide the alternatives development process, are summarized on **Exhibit 5-1**.

The goals reflect a vision of incremental development for the long-term evolution of MKE. They leverage the aspects of the Airport that are functioning well and recognize the financial investments and challenges that a more transformative view would encompass. An incremental approach to the Airport's development includes more moderate changes that occur continuously (as needs are triggered) over the planning horizon.

EXHIBIT 5-1 MASTER PLAN UPDATE GOALS

- Affirm a future-focused airport that supports aviation growth in a safe, efficient, and cost-effective manner through an organized and synergistic long-range development plan.
- Recognize opportunities to enhance the sustainability, resiliency, and environmental sensitivity over time with continued growth of MKE.
- Seek opportunities for an enhanced customer and passenger experience.
- Optimize infrastructure and resources in an operationally, financially, and sustainable manner.
- Adopt scalable development plans that flexibly accommodate variations in demand and technology over the planning horizon.
- Protect the long-range utility of the Airport (post-2040).
- Recognize opportunities for enhanced nonaeronautical revenue generation in the utilization of MKE property and amplify the revenue-generating potential of Airport property.
- Define a long-range development plan that reflects MKE's role in the community and recognizes diversity in community stakeholder priorities.

SOURCES: Milwaukee Mitchell International Airport Representatives December 2019; Ricondo & Associates, Inc., October 2019.

5.2 ALTERNATIVES PLANNING PROCESS

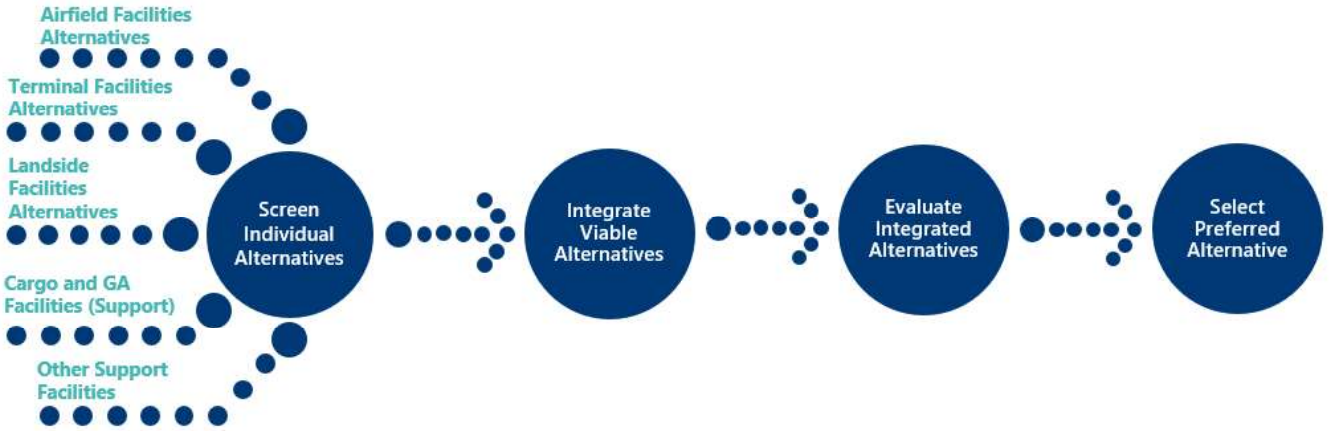
The facility requirements defined in Section 4, Demand/Capacity Analysis and Facility Requirements, provide the quantitative basis for formulating development alternatives to accommodate the forecast demand. The ultimate objective is to define a preferred development plan that provides for incremental development of facilities to meet aeronautical needs, preserves flexibility to respond to changes in demand (magnitude, timing, or characteristics), and protects for future Airport development beyond the 20-year planning horizon. **Exhibit 5-2** illustrates the general process for the alternatives analysis, which entailed the following steps:

- Identify specific challenges and opportunities to be addressed over the planning horizon.
- Recognize the individual facility capacities required to meet demand through 2040.
- Develop discrete (component) alternatives for meeting the identified challenges and requirements in each of the four major facility types in the hierarchy:
  - airfield facilities (runway focus), including deicing facilities
  - terminal facilities
  - landside facilities (curbside, roadway, parking, rental car, and related facilities)
  - support facilities (including aircraft maintenance, Airport maintenance, FAA, cargo, and GA facilities)
- Screen the facility component alternatives to eliminate or modify those that are not feasible.
- Combine facility component alternatives into comprehensive integrated Airport alternatives, adjusting as necessary to accommodate all facility components and considering the following:
  - locational and functional adjacency dependencies and requirements

- operational efficiencies
- effective utilization of existing facilities
- passenger and tenant convenience / Level of Service (LOS)

- Evaluate the integrated alternatives at an increasing level of detail and review.
- Select and refine the Preferred Airport Development Alternative.

EXHIBIT 5-2 ALTERNATIVES ANALYSIS PROCESS



SOURCE: Ricondo & Associates, Inc., October 2019.

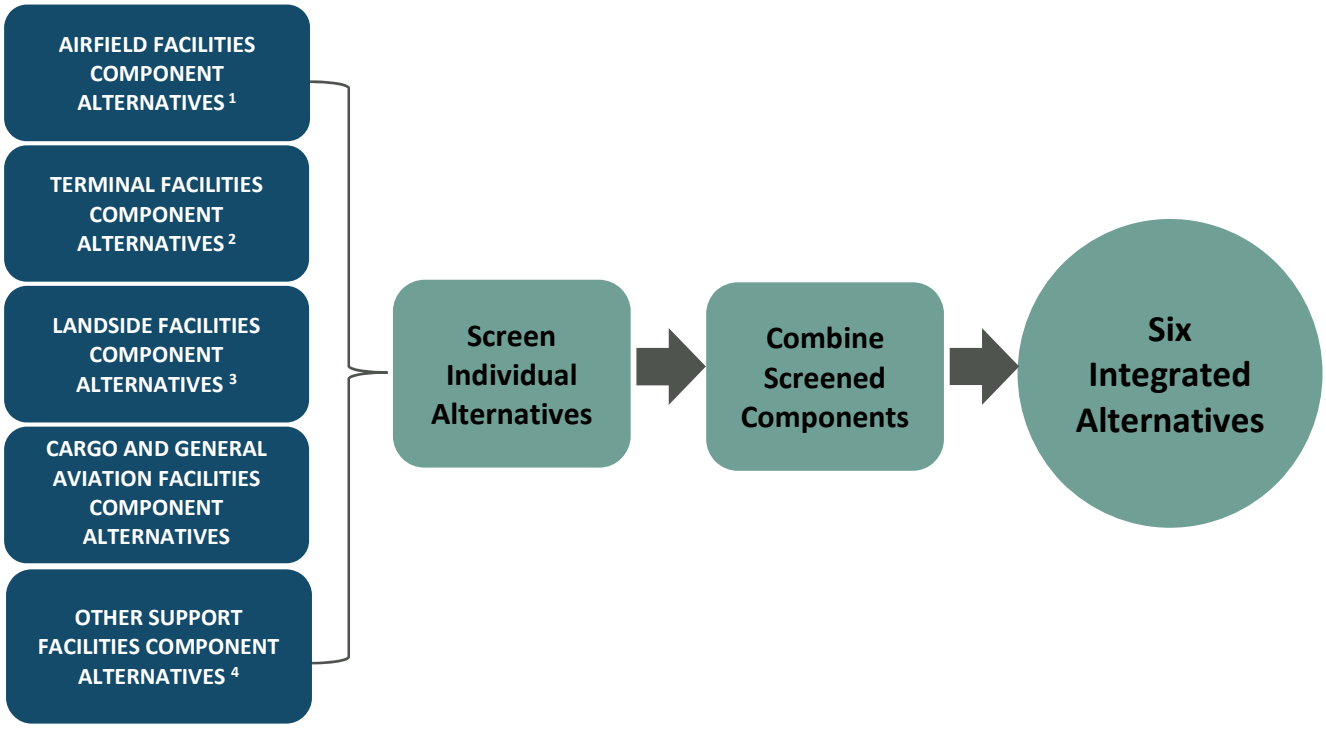
An initial workshop was convened with Aviation Division representatives to review the process and goals and to explore preliminary ideas for meeting the future requirements for each facility component. **Appendix D** includes the presentation that served as the foundation for the initial alternative analysis workshop.

5.3 IDENTIFICATION AND SCREENING OF COMPONENT ALTERNATIVES

Individual alternatives were developed for each of the four facility types. These alternatives were then screened to eliminate those that were deemed to contain significant deficiencies or challenges that limited their viability. The remaining alternatives were combined according to the hierarchy among the aeronautical facilities, and they were adjusted to ensure each was physically and operationally feasible. This process yielded a total of six composite or integrated alternatives. **Exhibit 5-3** illustrates the initial alternatives development and screening process.

Component alternatives were developed based on the facility requirements defined to meet both the 2040 baseline forecast and the 2040 high growth scenario to ensure sufficient flexibility is provided to accommodate growth that may occur differently than forecast (magnitude or characteristics) or that may be triggered or delayed by unplanned events. Considering the high growth scenario in the exploration of alternatives minimizes the potential for future facility conflicts and relocations, incompatible or fragmented development, split operations, and other inefficient development or operational consequences. **Appendix D** includes the presentation that supported the initial discussion of component alternatives during a second workshop with Aviation Division representatives.

EXHIBIT 5-3 INITIAL ALTERNATIVES DEVELOPMENT AND SCREENING PROCESS



NOTES:
1 Airfield facilities alternatives include deicing facility alternatives.
2 Terminal facilities alternatives include security checkpoint consolidation configurations.
3 Landside facilities alternatives include roadway, parking, rental car, and curbside,
4 Other support facilities alternatives include Airport and airline maintenance facilities, Aircraft Rescue and Fire Fighting facilities, fuel storage, utilities, and related functions that support the operation of MKE.
SOURCE: Ricondo & Associates, Inc., November 2020.

5.3.1 AIRFIELD FACILITIES COMPONENT ALTERNATIVES

The identification of airfield alternatives focused on rightsizing the airfield based on capacity, runway length requirements, and alignment with the current design standards prescribed by the FAA.[1] In addition, off-gate deicing locations were identified to satisfy the future deicing requirement at the Airport should deicing in the terminal/gate area be discontinued.

As described in Section 4, Demand/Capacity Analysis and Facility Requirements, additional airfield capacity would not be needed to meet forecast demand over the 2040 planning horizon, under either the baseline forecast or the high growth scenario. However, the FAA recommends that airport operators initiate planning for future runway capacity as the ASV exceeds 60 percent of airfield capacity.[2] This threshold is reached in both the baseline forecast and the high growth scenario. The airfield alternatives analysis focused on addressing the following challenges:

[1] US Department of Transportation, Federal Aviation Administration, Advisory Circular 150/5300-13A – Change 1, *Airport Design*, February 2014.

[2] US Department of Transportation, Federal Aviation Administration, Order 5090.5, *Formulation of the NPIAS and ACIP*, September 2019.

- need for a 10,000-foot runway to meet candidate 128th Air Refueling Wing of the Wisconsin Air National Guard (WI ANG) mission preferences
- compliance with FAA dimensional criteria and standards, including minimization of complex intersections and airfield hot spots
- recognition of FAA funding eligibility
- Runway 1R-19L proximity to WI ANG facilities
- recognition of noise exposure potential given proximity to residential communities
- preservation of adequate wind coverage and crosswind capabilities
- recognition that demand is forecast to pass the 60 percent ASV threshold within the 2040 planning horizon, indicating the initial consideration of additional airfield capacity may be warranted

The following subsections describe the airfield alternatives. Section 2, Inventory of Existing Conditions, describes the existing airfield configuration.

5.3.1.1 AIRFIELD RUNWAY ALTERNATIVES

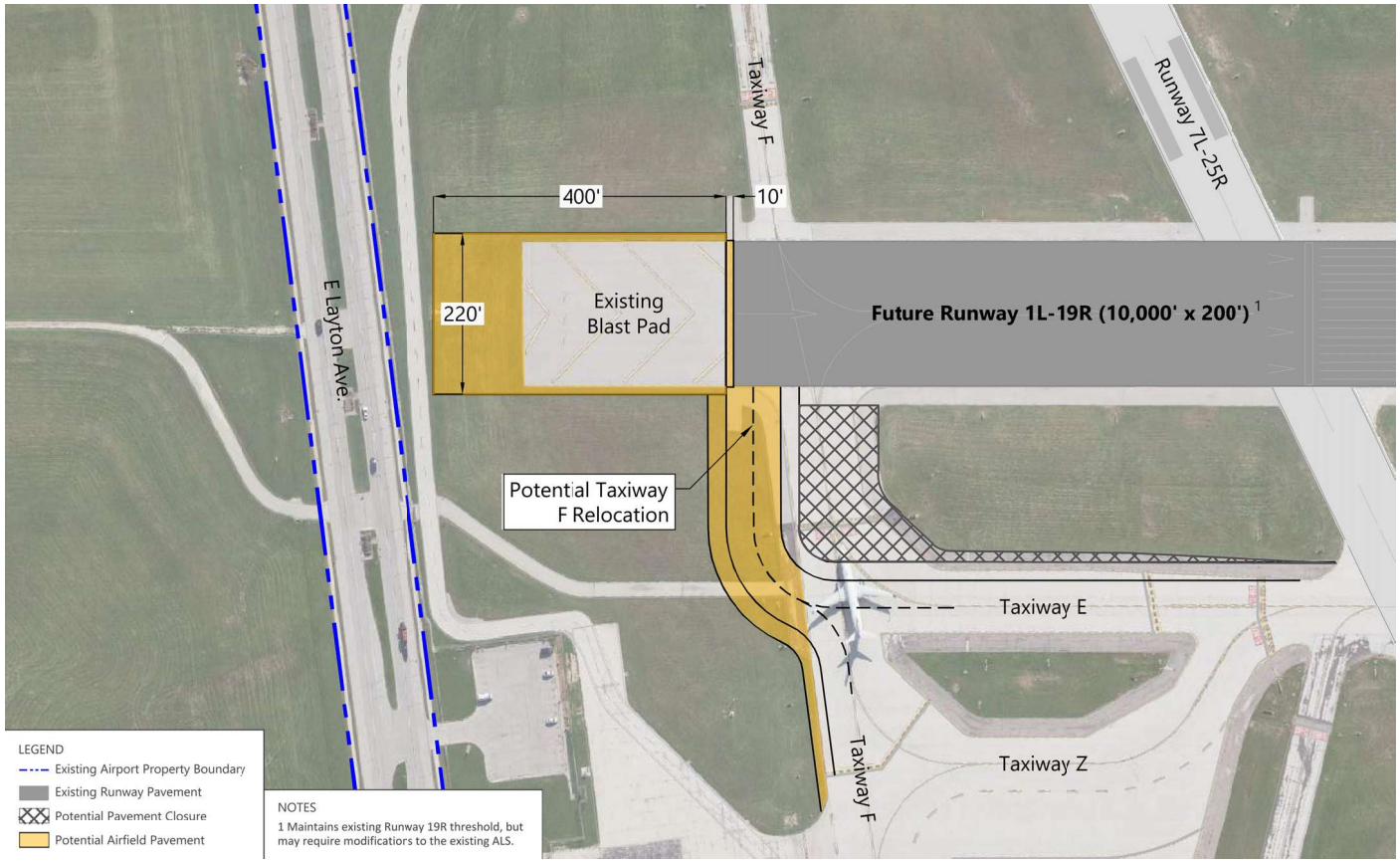
Three alternatives were developed to achieve a 10,000-foot runway to meet future WI ANG mission-specific operational needs. These alternatives include three options: one alternative extends Runway 1L-19R, currently 9,990 feet, by 10 feet to the north, and two alternatives extend the runway to the south. Each alternative moved forward for alternative integration and further evaluation.

Also, 12 additional runway alternatives were developed, which consisted of maintaining the existing five-runway configuration, decommissioning one or more runways, and extending and widening existing runways. **Exhibit 5-4** through **Exhibit 5-7** illustrate the initial runway alternatives and **Table 5-1** describes the primary features of the initial runway alternatives. These alternatives were screened to eliminate those that were not viable, and they were adjusted to ensure each was physically and operationally workable.

5.3.1.2 AIRFIELD OFF-GATE DEICING ALTERNATIVES

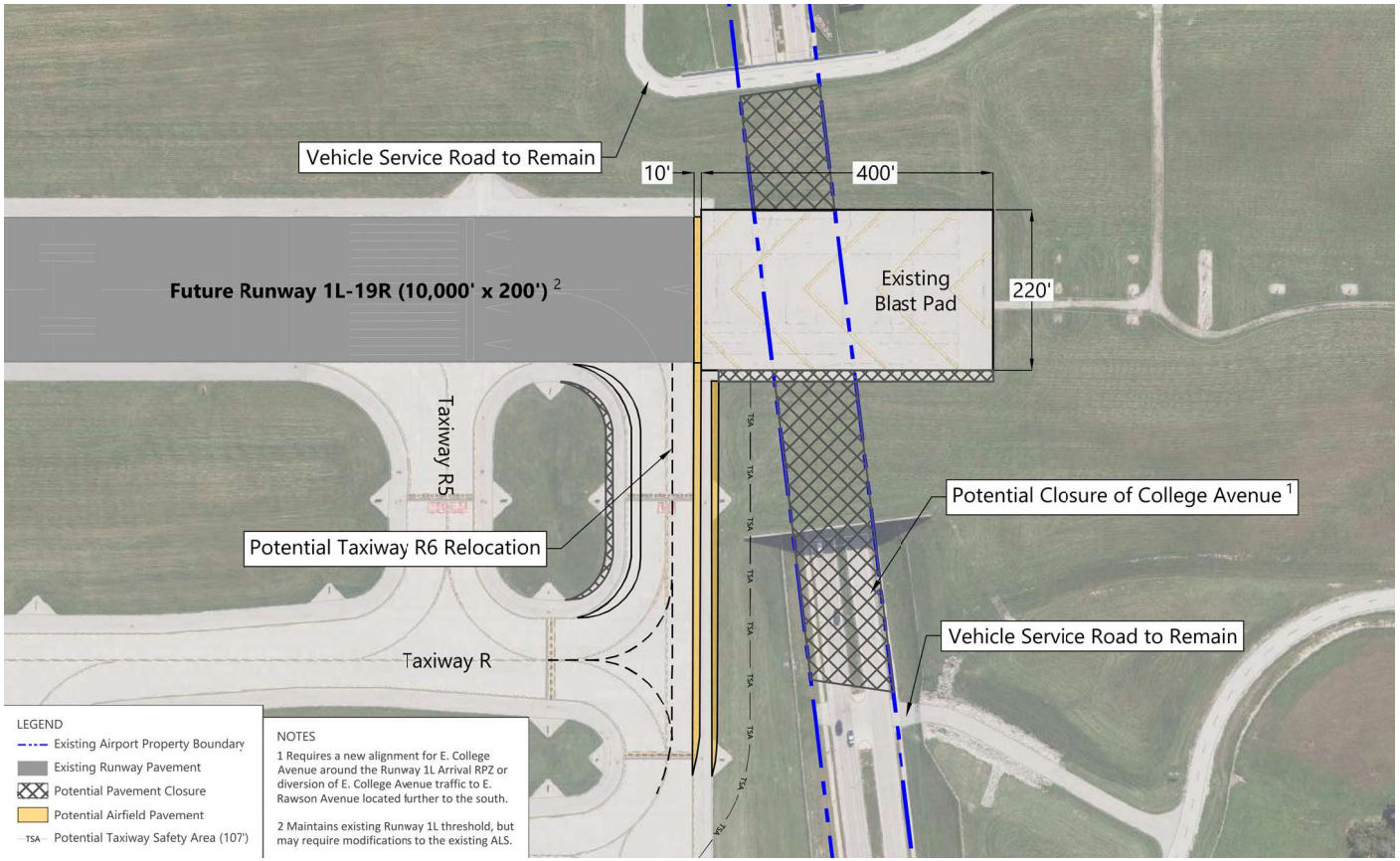
Section 2, Inventory of Existing Conditions, identifies the existing remote deicing locations. Under both the baseline forecast and the high growth scenario, there is a current need for 7 remote ADG III deicing positions, which grows to a need for 10 ADG III positions by 2040, based on the DDFS presented in Section 3, Aviation Activity Forecast. It was determined that opportunities to provide additional deicing pads to support the different IMC airfield operating configurations should be explored in the airfield alternatives, given taxi times and deice fluid holdover time limitations.

EXHIBIT 5-4 RUNWAY 1L-19R EXTENSION OPTION 1



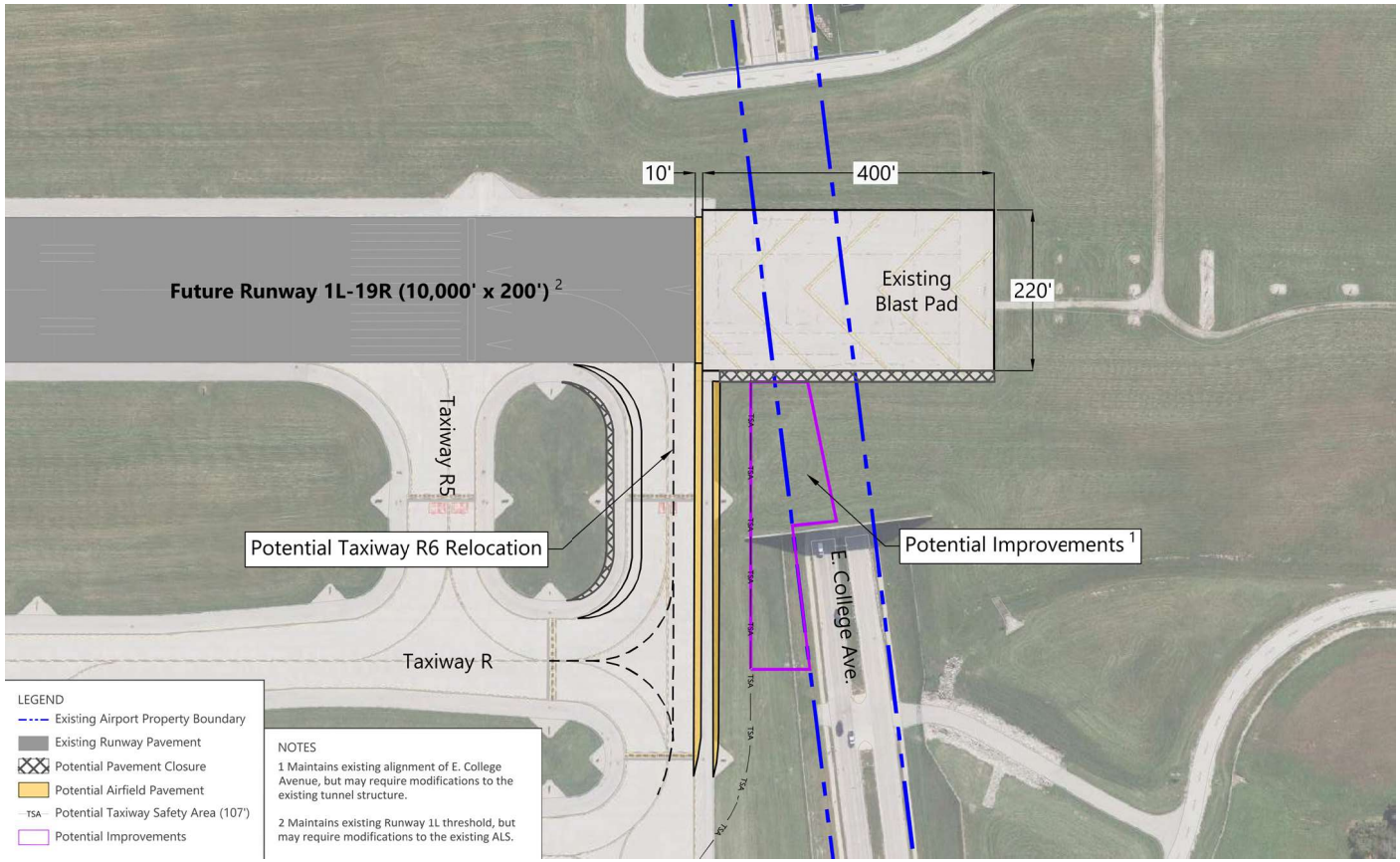
SOURCE: Ricondo & Associates, Inc., January 2020.

EXHIBIT 5-5 RUNWAY 1L-19R EXTENSION OPTION 2



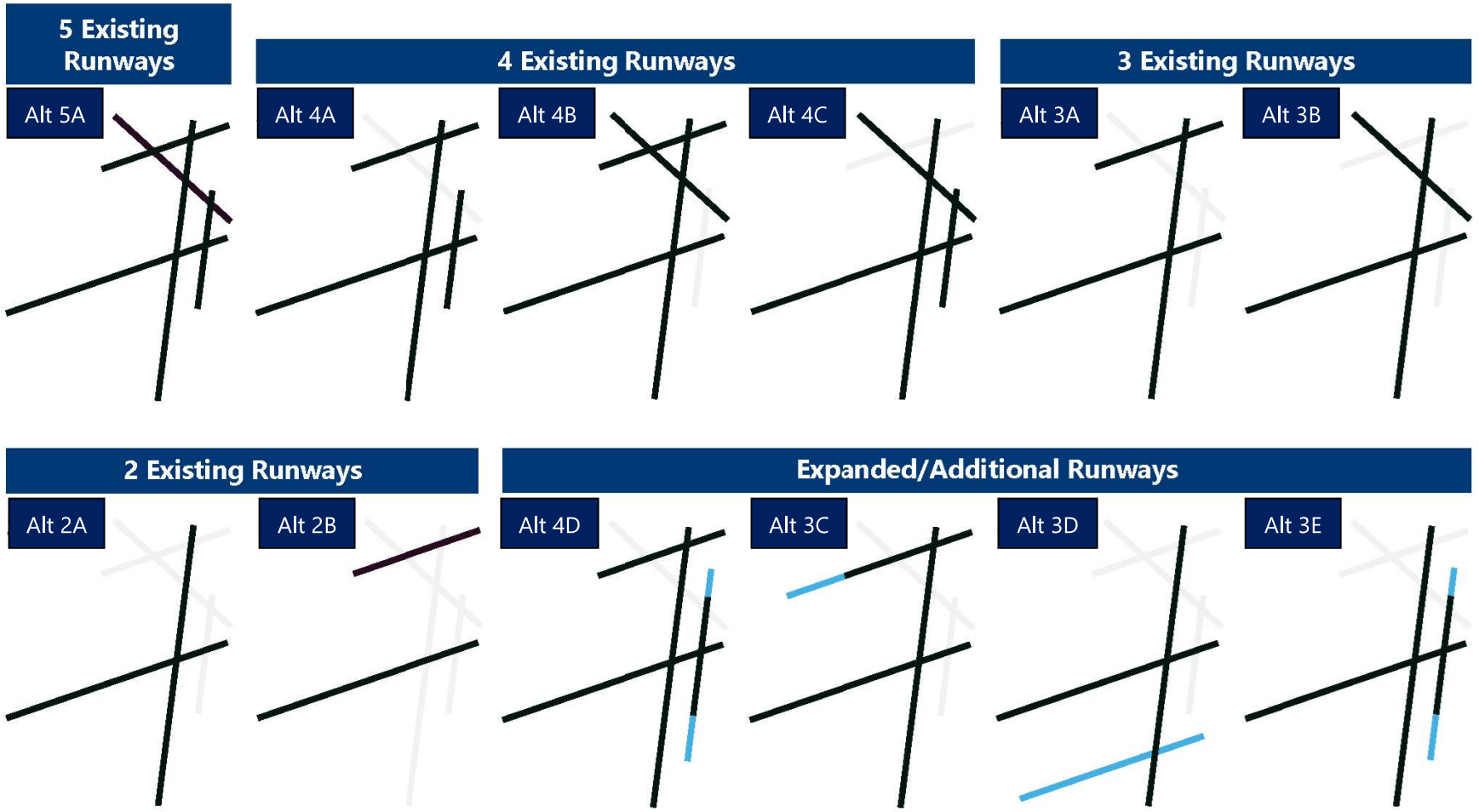
SOURCE: Ricondo & Associates, Inc., January 2020.

EXHIBIT 5-6 RUNWAY 1L-19R EXTENSION OPTION 3



SOURCE: Ricondo & Associates, Inc., January 2020.

EXHIBIT 5-7 AIRFIELD RUNWAY ALTERNATIVES



NOTE:
Black – existing/retained runway; Blue – future or modified runway.
SOURCE: Ricondo & Associates, Inc., August 2019.

TABLE 5-1 (1 OF 2) AIRFIELD FACILITIES COMPONENT ALTERNATIVES – RUNWAY

ALTERNATIVE	DESCRIPTION	FURTHER EVALUATION AND INTEGRATION
Runway 1L South Extension – Option 1	▪ Runway 1L is extended 10 feet to the south to provide a 10,000-foot runway. ▪ Taxiway R6 is shifted 10 feet south to align with the 10-foot extension of runway pavement. ▪ This alternative maintains the existing alignment of East College Avenue, but it may require modifications to the existing tunnel structure. ▪ This alternative maintains the existing Runway 1L threshold.	**Yes**
Runway 1L South Extension – Option 2	▪ Runway 1L is extended 10 feet to the south to provide a 10,000-foot runway. ▪ Taxiway R6 is shifted 10 feet south to align with the 10-foot extension of runway pavement. ▪ This alternative requires new alignment for East College Avenue around the Runway 1L arrival runway protection zone, extension of the East College Avenue tunnel, or diversion of East College Avenue traffic to East Rawson Avenue located further to the south. ▪ This alternative maintains the existing Runway 1L threshold.	**Yes**
Runway 19R North Extension	▪ Runway 19R is extended 10 feet to the north to provide a 10,000-foot runway ▪ Taxiway F is shifted north to align with added runway pavement and create a 90-degree connection with Runway 1L	**Yes**
2A	▪ This is a two-runway alternative. ▪ Runways 13-31, 1R-19L, and 7L-25R are decommissioned. ▪ Existing Runways 7R-25L and 1L-19R remain in operation.	No
2B	▪ This is a two-runway alternative. ▪ Runways 13-31, 1R-19L, and 1L-19R are decommissioned. ▪ Existing Runways 7R-25L and 7L-25R remain in operation.	No
3A	▪ This is a three-runway alternative. ▪ Runways 13-31 and 1R-19L are decommissioned. ▪ Existing Runways 1L-19R, 7R-25L, and 7L-25R remain in operation.	No
3B	▪ This is a three-runway alternative. ▪ Runways 13-31 and 1R-19L are decommissioned. ▪ Existing Runways 1L-19R, 7R-25L, and 7L-25R remain in operation.	**Yes**
3C	▪ This is a three-runway alternative. ▪ Runways 13-31 and 7L-25L are decommissioned. ▪ Existing Runways 1L-19R, 1R-19L, and 7R-25L remain in operation. ▪ Runway 1R-19L is extended to the north or south.	**Yes**

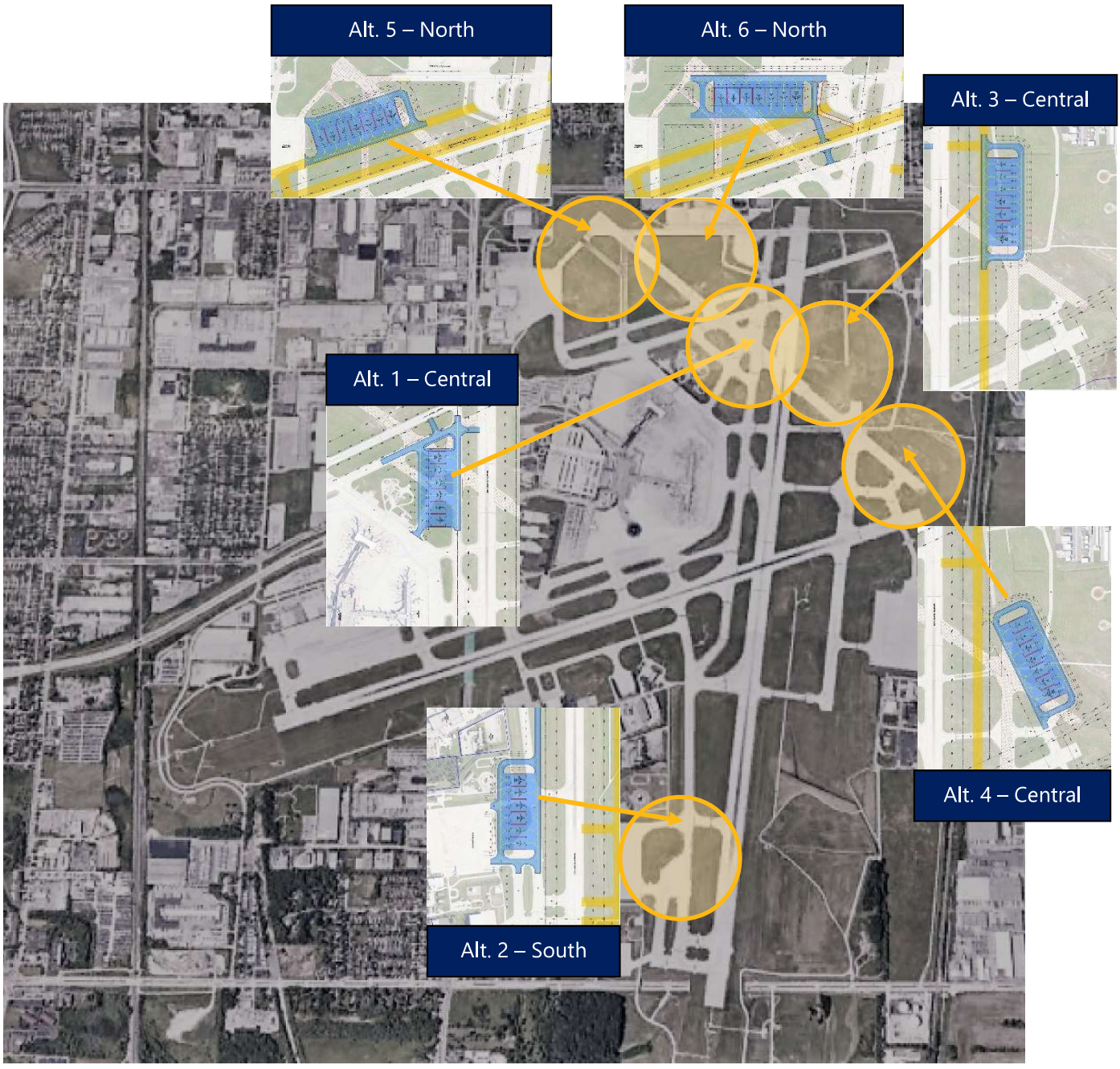
TABLE 5-1 (2 OF 2) AIRFIELD FACILITIES COMPONENT ALTERNATIVES – RUNWAY

ALTERNATIVE	DESCRIPTION	FURTHER EVALUATION AND INTEGRATION
3D	▪ This is a three-runway alternative. ▪ Runways 13-31, 1R-19L, and 7L-25R are decommissioned. ▪ Existing Runways 7R-25L and 1L-19R remain in operation. ▪ A new parallel runway south of Runway 7R-25L is developed.	No
3E	▪ This is a three-runway alternative. ▪ Runways 13-31 and 7L-25R are decommissioned. ▪ Existing Runways 7R-25L, 1R-19L, and 1L-19R remain in operation. ▪ Runway 1R-19L is extended to the north or south.	**Yes**
4A	▪ This is a four-runway alternative. ▪ Runway 13-31 is decommissioned. ▪ Existing Runways 7L-25R, 7R-25L, 1L-19R, and 1R-19L remain in operation.	No
4B	▪ This is a four-runway alternative. ▪ Runway 1R-19L is decommissioned. ▪ Existing Runways 7L-25R, 7R-25L, 1L-19R, and 1R-19L remain in operation.	No
4C	▪ This is a four-runway alternative. ▪ Runway 7L-25R is decommissioned. ▪ Existing Runways 13-31, 7R-25L, 1L-19R, and 1R-19L remain in operation.	No
4D	▪ This is a four-runway alternative. ▪ Runway 13-31 is decommissioned. ▪ Existing Runways 7L-25R, 7R-25L, 1L-19R, and 1R-19L remain in operation. ▪ Runway 1R-19L is extended to the north or south.	No
5A	▪ This is a five-runway alternative. ▪ Existing Runways 13-31, 7L-25R, 7R-25L, 1L-19R, and 1R-19L remain in operation.	No

SOURCE: Ricondo & Associates, Inc., October 2019.

In the context of the airfield runway alternative variations, six deice facility alternatives were developed to accommodate future demand in typical winter/deicing runway operating configurations. **Exhibit 5-8** depicts the deice pad alternatives.

EXHIBIT 5-8 AIRFIELD FACILITIES COMPONENT ALTERNATIVES – DEICING



SOURCES: Martinez Geospatial September 2018 (aerial Image); Mead & Hunt, Inc., October 2019.

5.3.2 TERMINAL FACILITIES COMPONENT ALTERNATIVES

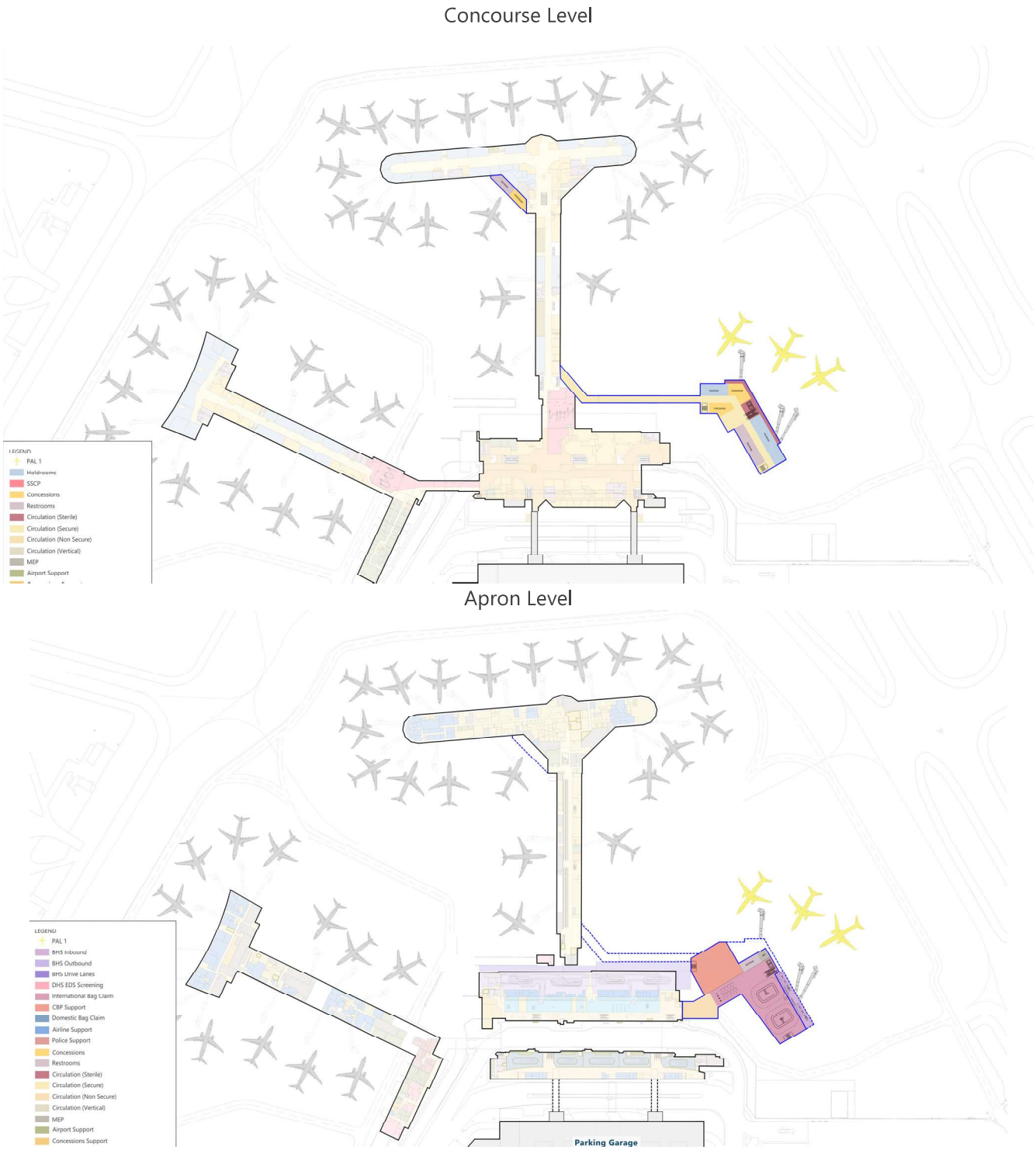
The terminal facilities encompass the facilities that are required to process passengers. The Airport currently has one main terminal processor with check-in, bag screening, bag makeup, and bag claim. The terminal processor supports gates on three concourses: Concourses C, D, and E. In 2017 Concourse E closed, with the passenger boarding bridges and furniture removed. In 2019 a design was initiated to redevelop the concourse with gates to support international arrivals; construction, including demolition of the current concourse, is anticipated in 2022. The existing terminal facilities, which are illustrated in Section 2, Inventory of Existing Conditions, include the redevelopment of Concourse E as a baseline condition.

Section 4, Demand/Capacity Analysis and Facility Requirements, summarizes the terminal improvements and capacity enhancements required to meet forecast demand over the planning horizon. The terminal facilities component alternatives focused on addressing the following challenges:

- potential for SSCP consolidation (Currently, each concourse has a separate SSCP without any connection between concourses post security.)
- integration of near-term gating recommendations (Gate Optimization Study, conducted by others as a separate project)
- maximization of aircraft parking flexibility by standardization of gate sizes (aircraft wingspans and spacing) to ADG III
- enhancement of holdroom and passenger amenities spaces/dimensions to meet current industry guidance
- additional check-in positions required after 2028 under the high growth scenario
- additional SSCP lanes required by 2028 at Concourse C, if there is no SSCP consolidation under the high growth scenario
- additional 10,000 to 15,000 square feet of baggage makeup space required (by 2040) under the high growth scenario
- accommodation of additional gates: +4 to +10 gates, depending on operational assumptions
- potential need for additional MKE administrative space

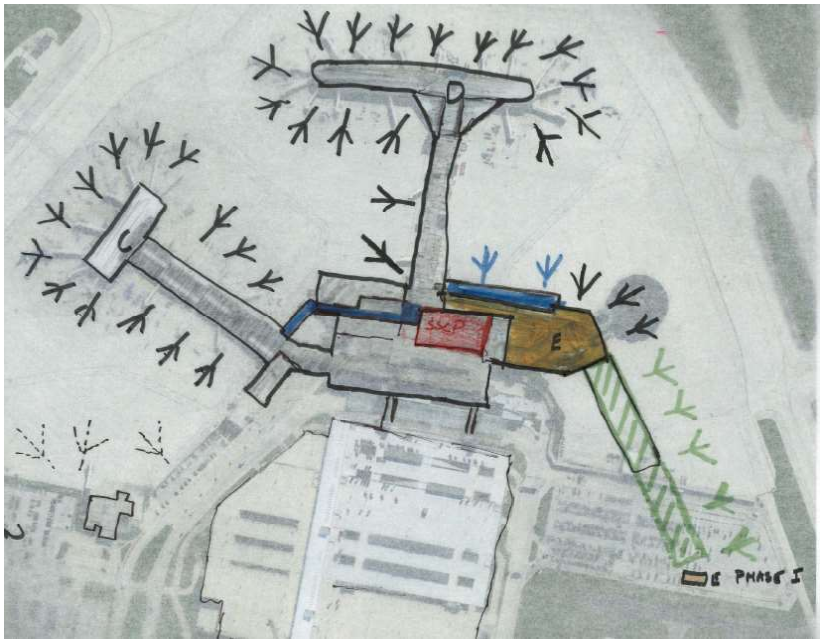
As Concourse E is planned for redevelopment to incorporate international arriving passenger processing, the Concourse E alternative accommodating up to three gates is integrated into each of the terminal alternatives. The current design for the Concourse E redevelopment encompasses two ADG III gates, with the planned expansion to incorporate an additional ADG III gate with international capabilities. This configuration provides the ability to accommodate one ADG V and two ADG III aircraft simultaneously, as depicted on **Exhibit 5-9**. The terminal component alternatives were developed to accommodate the gate requirements for 2040. Therefore, northward expansion alternatives and southward expansion alternatives were developed. **Exhibit 5-10** through **Exhibit 5-14** illustrate these terminal component alternatives. As an outcome of the screening process, Alternatives 3 and 4 were eliminated from further consideration and adjustments were made to the remaining alternatives. **Exhibit 5-15** through **Exhibit 5-17** illustrate the three terminal component alternatives that warranted further consideration.

EXHIBIT 5-9 SOUTH EXPANSION – CONCOURSE E REDEVELOPMENT CONCEPT



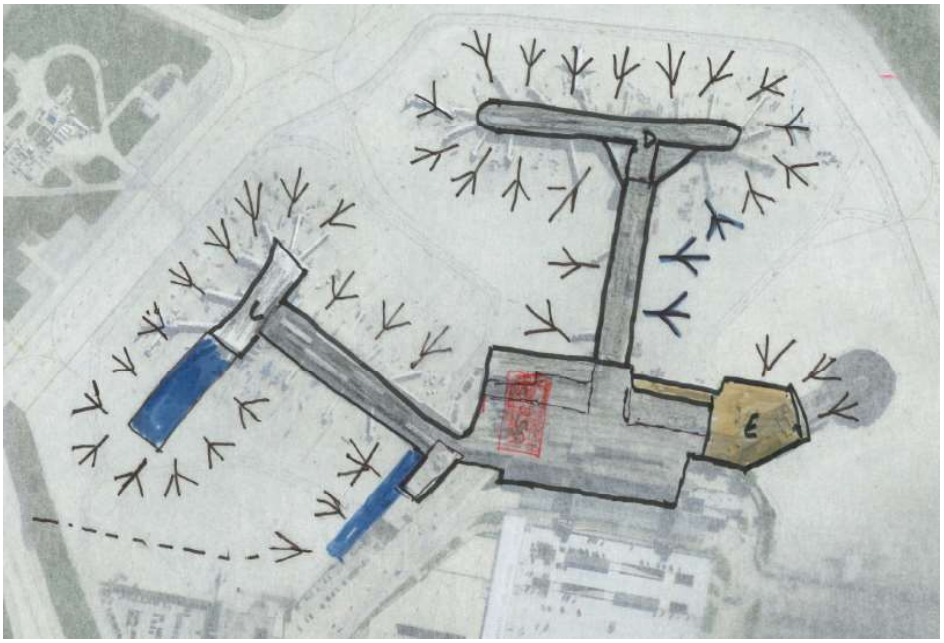
SOURCES: Alliance Architecture, September 2019 (Concourse E Redevelopment); Ricondo & Associates, Inc. September 2019 (Future concourse development and Concourses C and D aircraft parking layout); Milwaukee Mitchell International Airport Representatives (base mapping); Mead & Hunt, October 2018 (existing terminal space allocations).

EXHIBIT 5-10 TERMINAL COMPONENT ALTERNATIVE 1



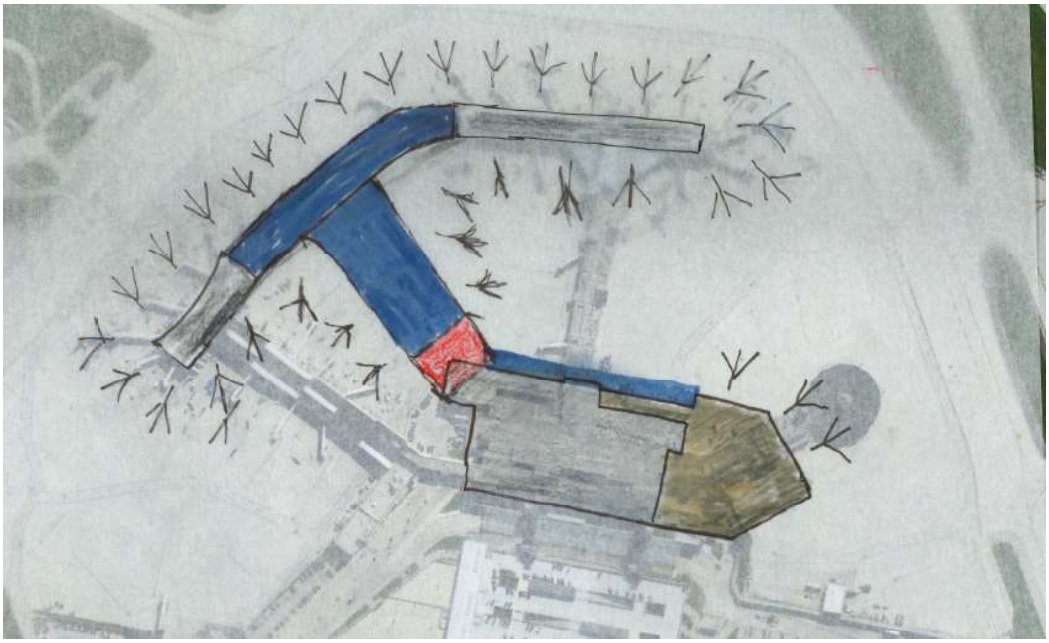
NOTE: Blue – terminal modification; brown – Concourse E redevelopment; green – future concourse and gates; red – security checkpoint modification.
SOURCE: Ricondo & Associates, Inc., August 2019.

EXHIBIT 5-11 TERMINAL COMPONENT ALTERNATIVE 2



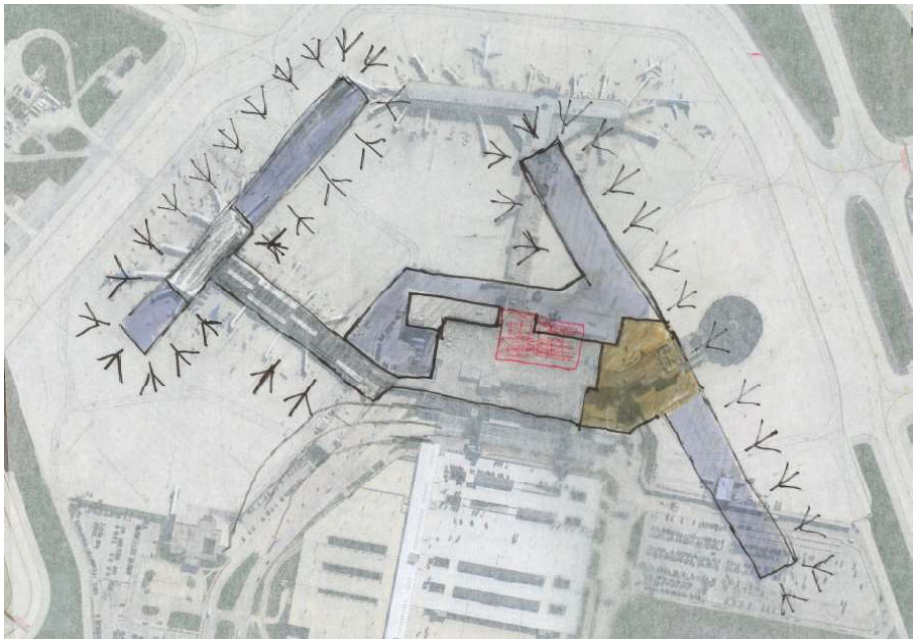
NOTE: Blue – terminal modification; brown – Concourse E redevelopment; green – future concourse and gates; red – security checkpoint modification.
SOURCE: Ricondo & Associates, Inc., August 2019.

EXHIBIT 5-12 TERMINAL COMPONENT ALTERNATIVE 3



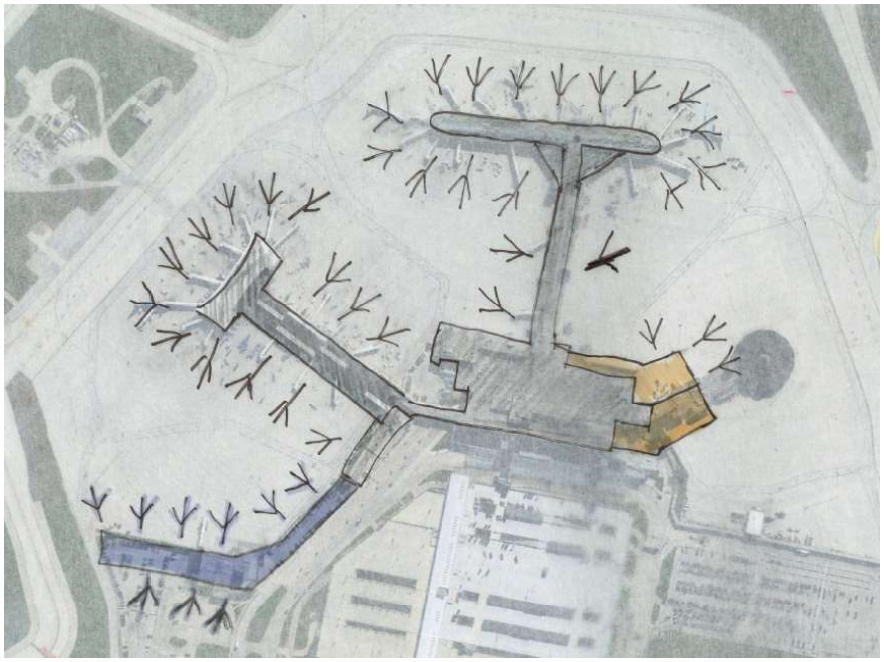
NOTE: Blue – future concourse and gates and terminal modification; brown – Concourse E redevelopment; red – security checkpoint modification.
SOURCE: Ricondo & Associates, Inc., August 2019.

EXHIBIT 5-13 TERMINAL COMPONENT ALTERNATIVE 4



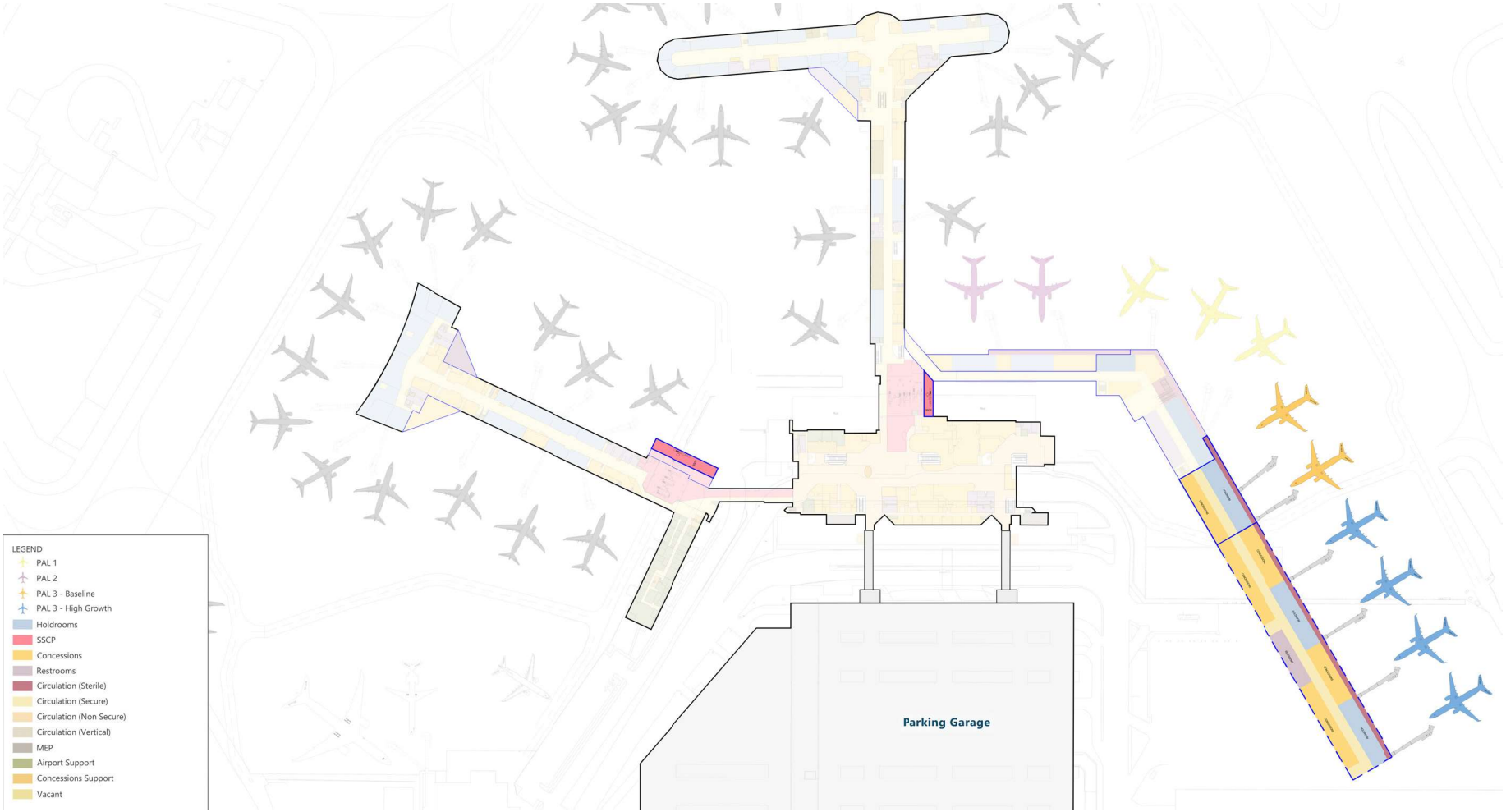
NOTE: Blue – future concourse and gates and terminal modification; brown – Concourse E redevelopment; red – security checkpoint modification.
SOURCE: Ricondo & Associates, Inc., August 2019.

EXHIBIT 5-14 TERMINAL COMPONENT ALTERNATIVE 5



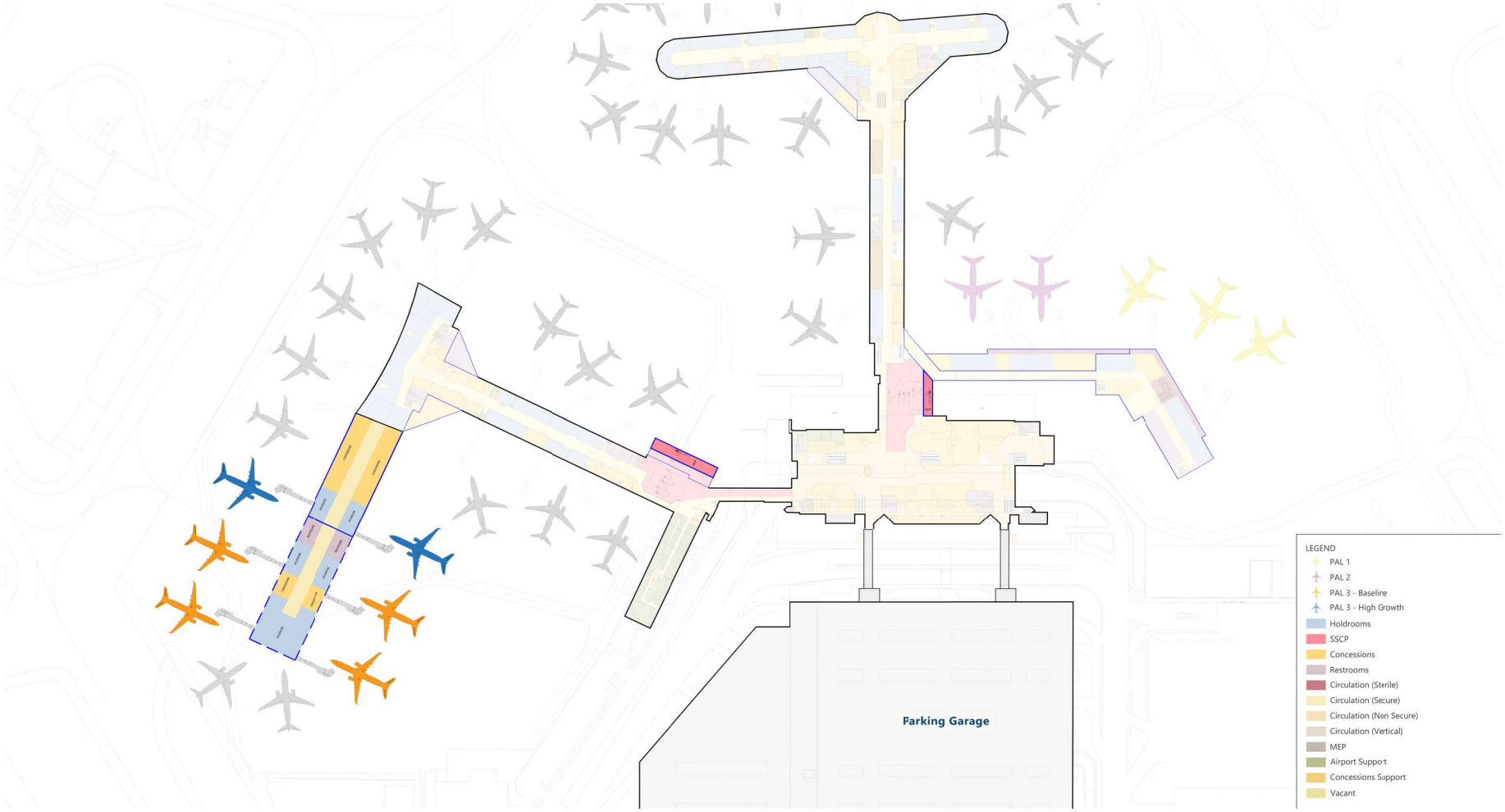
NOTE: Blue – future concourse and gates; brown – Concourse E redevelopment.
SOURCE: Ricondo & Associates, Inc., August 2019.

EXHIBIT 5-15 REFINED TERMINAL COMPONENT ALTERNATIVE 1



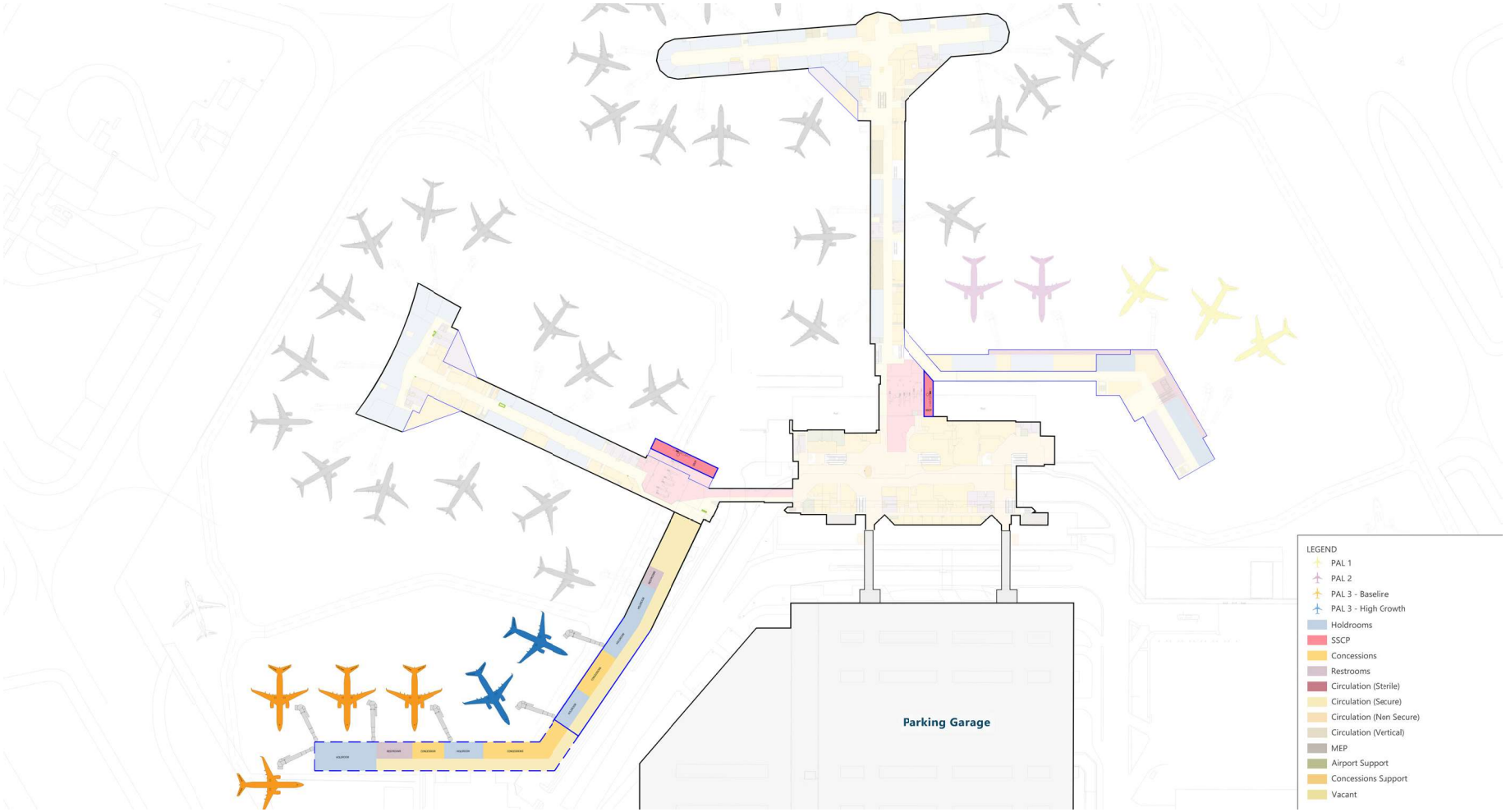
SOURCE: Ricondo & Associates, Inc., August 2019.
NOTE: Blue – future concourse and gates; brown – Concourse E redevelopment.

EXHIBIT 5-16 REFINED TERMINAL COMPONENT ALTERNATIVE 2



SOURCE: Ricondo & Associates, Inc., August 2019.

EXHIBIT 5-17 REFINED TERMINAL COMPONENT ALTERNATIVE 5



SOURCE: Ricondo & Associates, Inc., August 2019.

Table 5-2 summarizes the major terminal component alternative elements that moved forward for refinement and integration into composite alternatives for further evaluation.

In a separate study, alternatives were developed to consider opportunities to consolidate the SSCPs currently located at the base of each concourse, as illustrated on **Exhibit 5-18**. The SSCP alternatives were considered when defining the set of six integrated alternatives for further evaluation.

5.3.3 LANDSIDE FACILITIES COMPONENT ALTERNATIVES

Section 2, Inventory of Existing Conditions, describes the Airport's landside facilities, which include roadway, curbside, parking, and rental car facilities. The identification of landside facilities component alternatives focused on improvements to roadway wayfinding, merge and weave distances, and decision times, as well as resizing landside components to meet the 2040 high growth scenario requirements. In addition to meeting defined requirements, the landside component alternatives focused on addressing the following challenges:

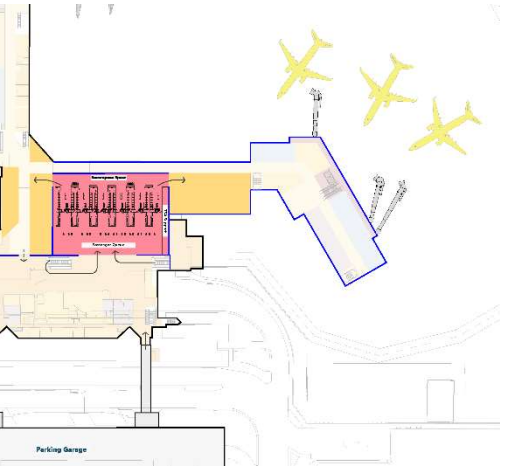
- Expand and reconfigure public parking and rental car operations near the terminal given the LOS and convenience they provide passengers.
- Enhance the driver experience and ease of wayfinding.
- Improve Airport wayfinding, decision-making times, and weave distances to enhance ingress, egress, and recirculation of Airport access roadways.
- Reduce vehicle dwell times at the curbside to support a more efficient curbside environment.
- Improve merge, weave, and sight distances.
- Ease curbside and on-Airport roadway congestion during peak periods to improve the LOS and accommodate growth in activity.
- Reduce or eliminate the need for shuttling rental cars off-site for storage, staging, and light maintenance through consolidation.
- Preserve flexibility to rebalance or repurpose future landside facilities should access mode shares shift.

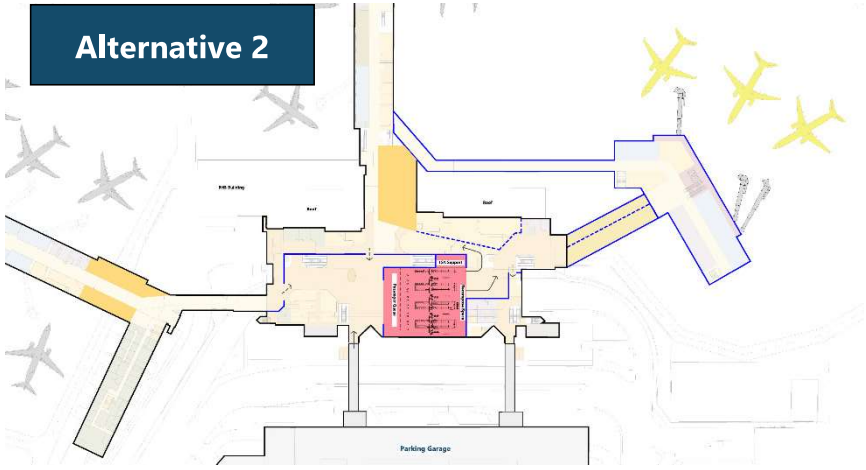
Landside facilities component alternatives were developed for TNC staging, ground transportation modes, curbside, terminal area roadways, public parking, and rental car components, which are described in the following subsections.

TABLE 5-2 TERMINAL FACILITIES COMPONENT ALTERNATIVES

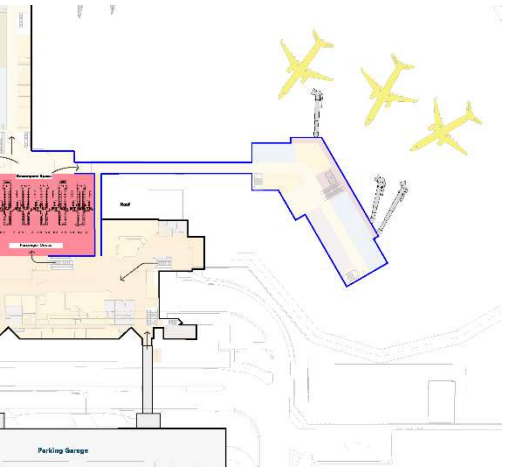
ALTERNATIVE	DESCRIPTION
Alternative 1 – South Expansion: Concourse E Full Build Expansion	▪ The single-loaded Concourse E is expanded to the southwest of the integrated new concourse. ▪ Additional area is provided at Concourse C for a SSCP (assuming no consolidation), as well as concession space near the end of the concourse. ▪ No new gates are added on Concourse C. ▪ Additional area is provided at Concourse D for concession space near the center of the concourse. ▪ No new gates are added on Concourse D. ▪ The alternative accommodates up to an additional 11 ADG III gates on Concourse E.
Alternative 2 – North Expansion: Concourse C Double Loaded Extension	▪ This alternative accommodates two additional ADG III gates between the Concourse D and Concourse E development. ▪ Additional area is provided at Concourse C for a SSCP (assuming no consolidation), as well as concession space near the end of the concourse. ▪ A dual-loaded concourse extension is provided to the northwest of the Concourse C terminus to accommodate six additional ADG III gates. ▪ Additional area is provided at Concourse D for concession space near the center of the concourse. ▪ No new gates are provided on Concourse D. ▪ This alternative accommodates 5 or more gates at Concourse E and 6 or more gates at Concourse C for a total of up to 11 ADG III gates.
Alternative 5 – North Expansion: Concourse B	▪ Additional area is provided at Concourse C for a SSCP (assuming no consolidation), as well as concession space near the end of the concourse. ▪ No new gates are provided on Concourse C. ▪ Additional area is provided at Concourse D for concession space near the center of the concourse. ▪ No new gates are provided on Concourse D. ▪ Concourse B is developed to the west of the Concourse C SSCP to accommodate six additional ADG III gates in a single-loaded concourse. ▪ This alternative accommodates 5 or more gates at Concourse E and 6 or more gates at Concourse B for a total of up to 11 ADG III gates.

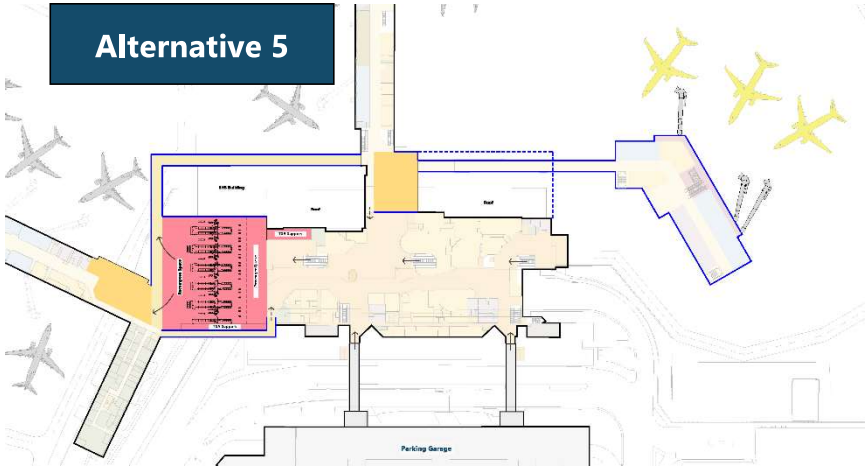
NOTES:
ADG – Airplane Design Group
SSCP – Security Screening Checkpoint
SOURCES: Alliance Architecture, September 2019 (Concourse E Redevelopment); Ricondo & Associates, Inc. September 2019 (Future concourse development and Concourses C and D aircraft parking layout); Milwaukee Mitchell International Airport Representatives (base mapping); Mead & Hunt, October 2018 (existing terminal space allocations).

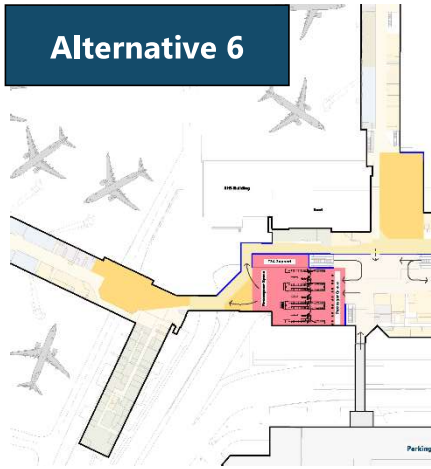


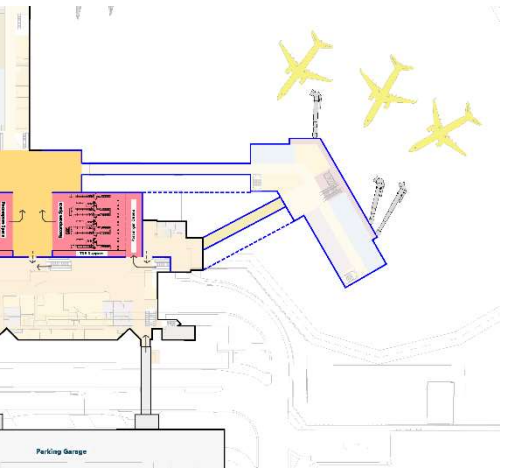

Alternative 2


Alternative 3




Alternative 5


Alternative 6



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5.3.3.1 TRANSPORTATION NETWORK COMPANY STAGING/PICKUP, GROUND TRANSPORTATION, AND CURBSIDE

Three locations were identified for remote Transportation Network Company (TNC) staging areas, as shown on **Exhibit 5-19**. As the size of the alternative sites vary, other uses can be considered for the portion not needed to meet TNC staging requirements. Of the sites identified, the locations at Howell Avenue and Layton Avenue in addition to the site located on the existing taxi staging lot moved forward into refinement and alternative integration.

Section 4, Demand/Capacity and Facility Requirements, identified a need for more efficient curbside utilization (mode reallocations and reassignments, pedestrian crossing modification, etc.) as an alternative to expanded curbsides. Without the revised curbside utilization, additional curb length would ultimately be needed to accommodate curbside modes that utilize the curbside more intensely, such as TNCs and vehicles with extended dwell times. This can be accommodated by physically extending portions of existing curbs or by moving specific curbside ground transportation users. Three additional alternatives were developed to add curbside by reconfiguring the drive aisles along the terminal side of the existing garage to create a "remote curb" in proximity to the terminal. **Exhibit 5-20** through **Exhibit 5-22** illustrate the three curbside alternatives. These alternatives all moved into refinement and integration and are summarized in **Table 5-3**.

TABLE 5-3 LANDSIDE FACILITIES COMPONENT ALTERNATIVES – TNC AND CURBSIDE

ALTERNATIVE	DESCRIPTION
1	▪ The existing TNC pick-up area is relocated to inside the parking garage. ▪ The existing drive lanes are reconfigured within the garage (behind rental car counters) to support remote TNC curbside loading. ▪ The rental car area is potentially relocated from Level 1 of garage. ▪ The existing limo pick-up area is relocated to Level 3 of the garage. ▪ The existing TNC staging lot is relocated. ▪ The existing TNC pick-up area is converted to through lanes for the departures curbside.
2	▪ Additional curbside is added by opening the first 60-foot bay on the ground floor of the garage and utilizing existing drive lanes within the garage. ▪ The rental car area is relocated from Level 1 of the garage. ▪ The TNC staging area is relocated due to the inability to cross the inbound roadway to enter the new curbside. ▪ This alternative does not require modification to existing pedestrian bridges and vertical cores within the garage as part of the parking garage modification. ▪ A new three-lane remote curbside is created for TNC pickups and other ground transportation loading/unloading.
3	▪ The Ground Transportation Center (GTC) customer service area is incorporated within the existing garage. ▪ The rental car customer service area portion of the garage is removed to accommodate additional curbside within the garage. ▪ The rental car counters are relocated to the new CONRAC site. ▪ The existing pedestrian bridges and vertical cores within the parking garage are modified. ▪ The outer arrivals curb and lanes shift to the west by one lane toward the newly defined GTC area. ▪ An additional through lane is added near the existing inner arrivals curbside.

NOTES:
Colors in Alternative 1 denote rental car company space allocations in the rental car customer service area.
TNC – Transportation Network Company CONRAC – Consolidated Rental Car facility
SOURCES: Ricondo & Associates, Inc., October 2019 (future features); Milwaukee Mitchell International Airport Representatives (base mapping); Mead & Hunt, October 2018 (existing rental car and garage space allocations); Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

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Runway 1R-19L
Runway 1L-19R
Runway 13-31
Runway 7L-25R
Runway 7R-25L
E Layton Ave
S Howell Ave
S Howell Ave
S Howell
yton Ave
irport Spur
1
3
4

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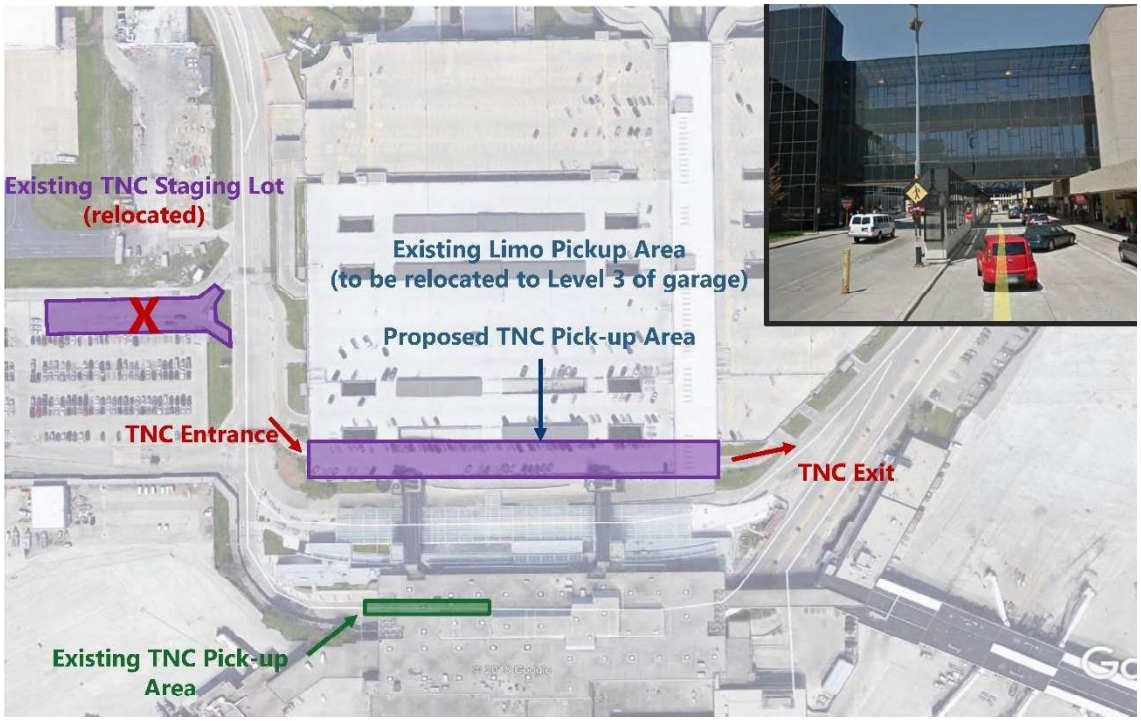
EXHIBIT 5-20 LANDSIDE FACILITIES – CURBSIDE COMPONENT ALTERNATIVE 1



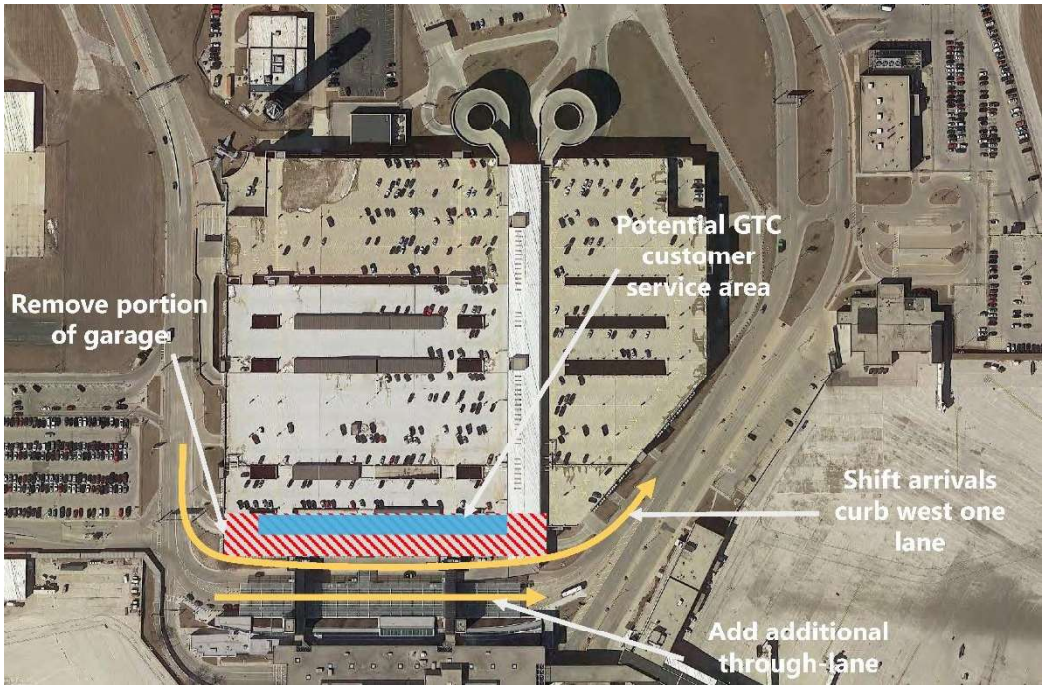
Rental Car Customer Service Center

NOTES
Purple – TNC facility.
Colored spaces in rental car customer service center represent individual rental car company customer and administrative spaces.
SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 5-21 LANDSIDE FACILITIES – CURBSIDE COMPONENT ALTERNATIVE 2

SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 5-22 LANDSIDE FACILITIES – CURBSIDE COMPONENT ALTERNATIVE 3



SOURCE: Ricondo & Associates, Inc. October 2019.

5.3.3.2 LANDSIDE ROADWAYS

The landside roadway component alternatives were created to be complementary to other landside facilities alternatives, such as parking and rental car. Six landside roadway component alternatives were developed to address roadway LOS deficiencies and enhance circulation and wayfinding. An alternative roadway entrance/exit to the existing parking garage was also explored as a candidate to support any of the alternatives that utilize the existing daily parking entrance to the parking/rental car facility. The six landside roadway component alternatives are illustrated in **Exhibit 5-23** through **Exhibit 5-28**. All the initial landside roadway component alternatives, as well as the option to close the hourly parking entrance, moved into refinement and integration and are summarized in **Table 5-4**.

TABLE 5-4 LANDSIDE FACILITIES COMPONENT ALTERNATIVES – ROADWAY

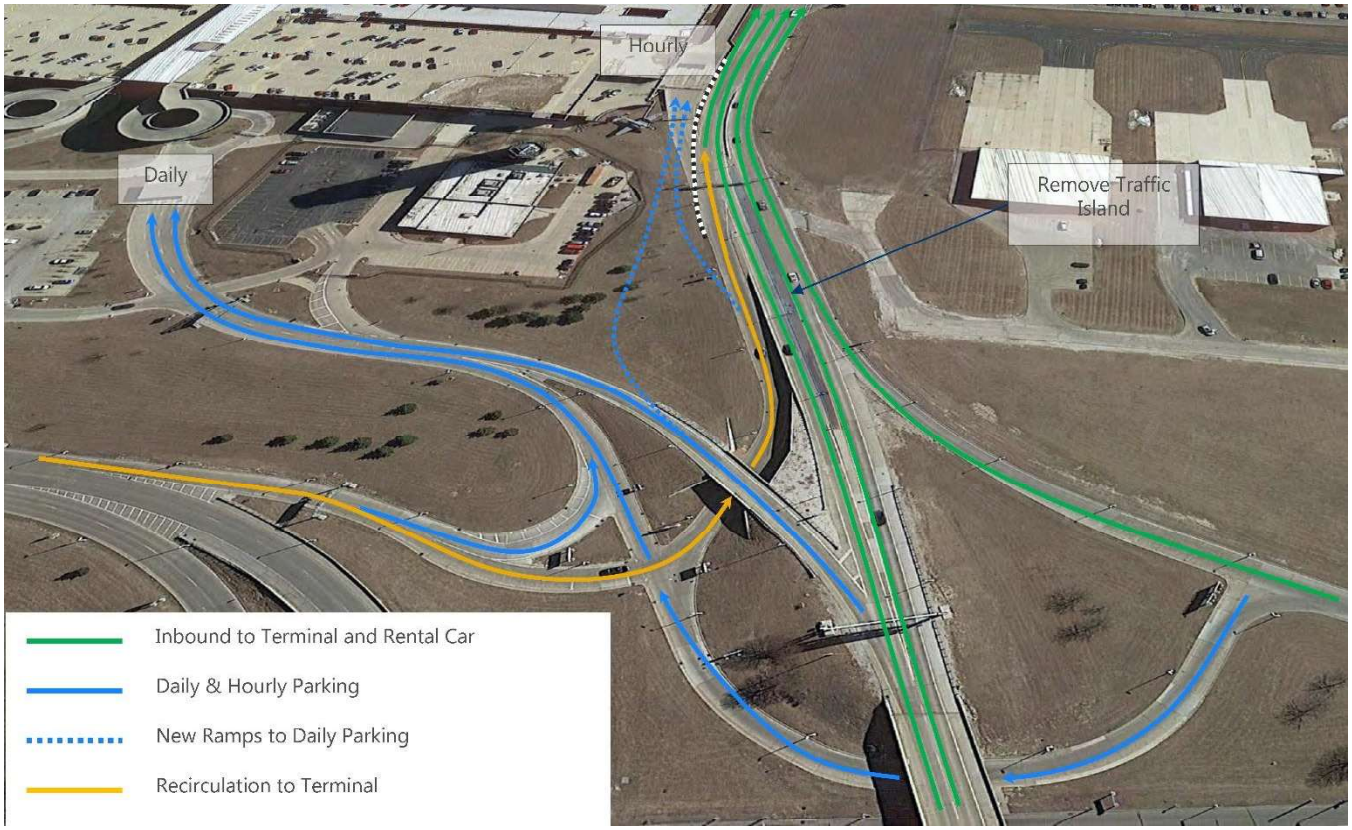
ALTERNATIVE	DESCRIPTION
1	▪ The removal of the island provides two new inbound lanes toward the curbsides and rental car entrances. ▪ One new roadway diverges from the parking ramp into the hourly parking garage. ▪ The other new roadway diverges from the recirculation roadway into the hourly parking garage. ▪ This alternative eliminates the need for challenging weave movements on the entrance road to the parking/rental car structure.
2	▪ The parking exit plaza is reoriented to provide additional space for improved weave and merge distances and decision times. The new exit provides an additional 400 feet for vehicles exiting the parking garage to weave across traffic for Airport exits. ▪ This alternative accommodates the option to expand parking to the west of the existing parking structure, over existing parking plazas.
3	▪ The existing terminal entrance roadway is shifted to the south. ▪ The Airport Spur alignment is reconfigured to allow segregation of vehicles by destination: curbside, parking, rental car, etc. ▪ This alternative relocates the recirculation roadway further away from the terminal and provides additional areas for traffic segregation and additional ramp connectivity. ▪ An additional loop road is created within the terminal loop road for access to all parking options, including an additional 5.4 acres for development. ▪ Space is provided for expanded parking/RAC or collateral development south of the existing entrance road.
4	▪ This alternative segregates the vehicles utilizing the curbside from the vehicles accessing the parking garage/RAC, etc. ▪ The existing terminal entrance roadway is moved to the south. ▪ The recirculation road becomes a flyover for vehicles accessing the terminal. ▪ Space is provided for expanded parking/RAC or collateral development south of the existing entrance road.
5	▪ The terminal entrance roadway is realigned south to accommodate a new parking/RAC footprint. ▪ The existing parking/RAC is torn down and replaced. ▪ The new parking/RAC is expanded to the south, impacting the existing entrance roadway. ▪ An entrance to the new parking/RAC is provided via the existing parking entrance roadway and an alternate entrance from the existing terminal entrance roadway. ▪ Additional public parking or collateral development area is provided to the south of the new terminal entrance road.
6 (Optional Garage Entrance Modification)	▪ The hourly parking entrance from the main Airport inbound roadway is closed. ▪ Signage is changed, so both hourly and daily parking utilize the same exit ramp from the inbound spur, and a new exit from the shared ramp is constructed for daily parking. ▪ The island on the inbound spur roadway is removed as the need to weave to hourly parking has been eliminated. ▪ Daily parking recirculation vehicles exit left to the existing daily parking entrance. ▪ This alternative was considered as a component of several of the landside alternatives and, therefore, is not considered to be a stand-alone alternative.

NOTES:

RAC – Rental Car facility

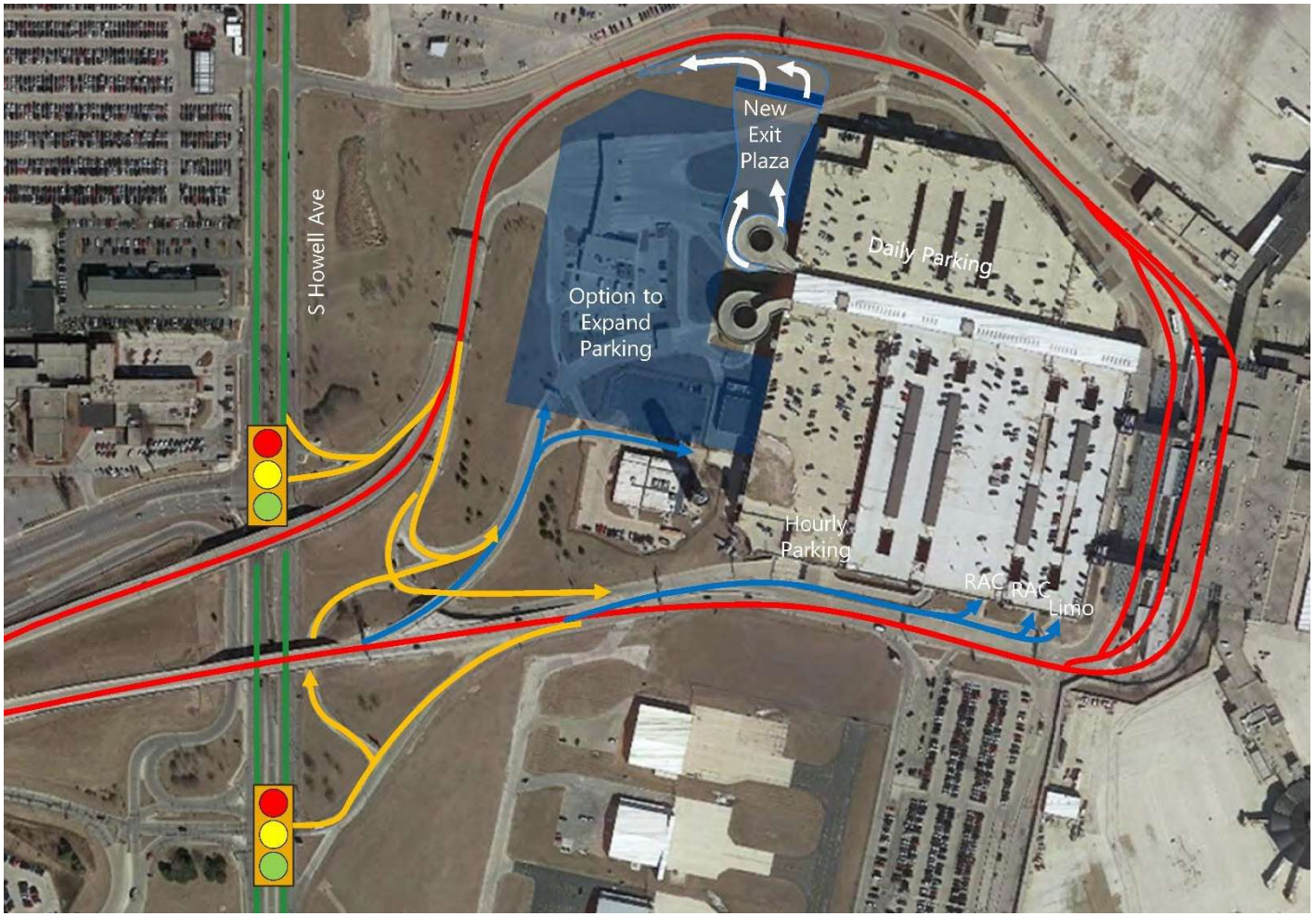
SOURCES: Ricondo & Associates, Inc., September 2019 (future features). Milwaukee Mitchell International Airport Representatives (base mapping); Mead & Hunt, October 2018 (existing garage space allocations); Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

EXHIBIT 5-23 LANDSIDE FACILITIES – ROADWAY COMPONENT ALTERNATIVE 1



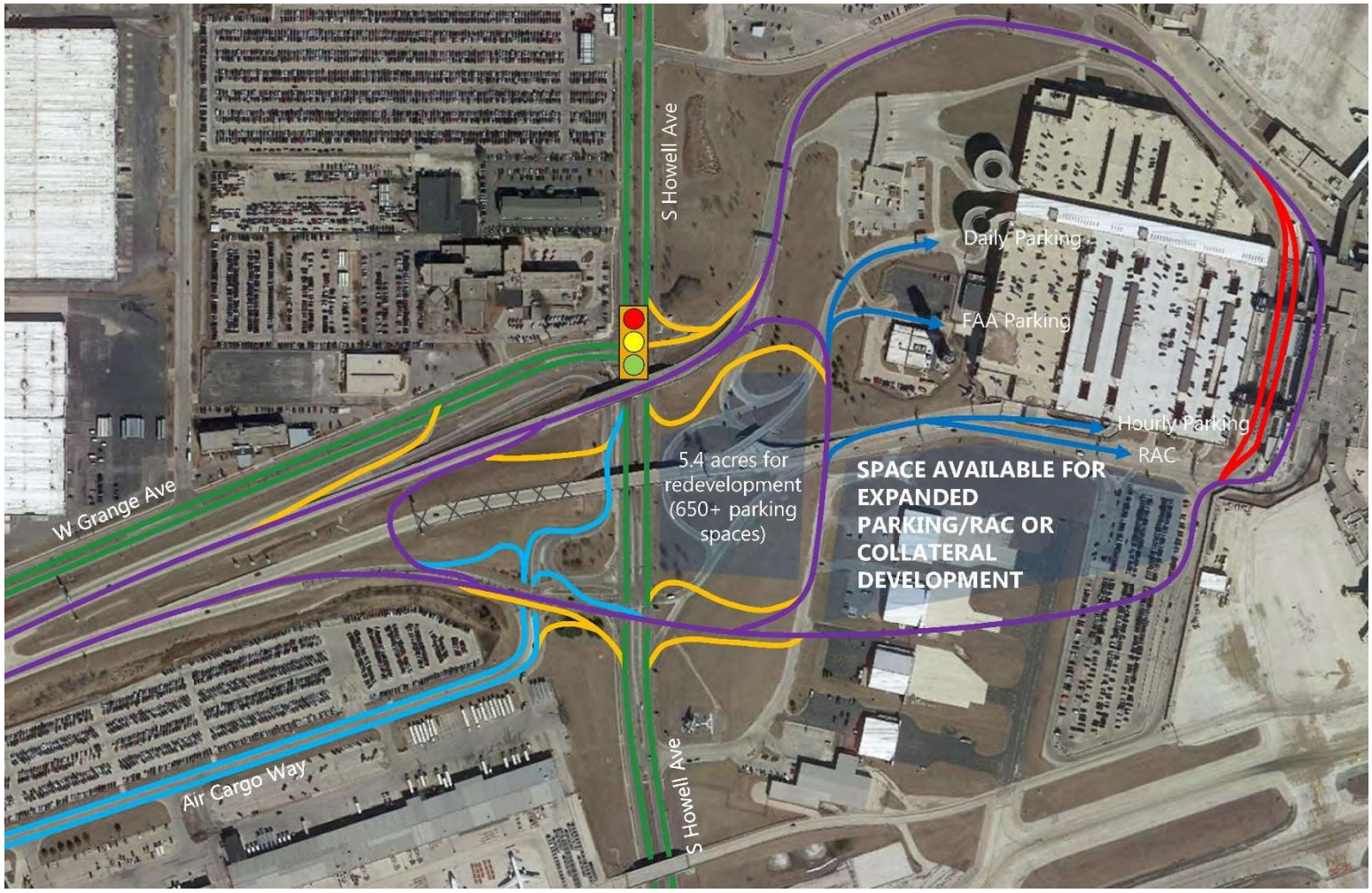
SOURCE: Ricondo & Associates, Inc., October 2019; Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

EXHIBIT 5-24 LANDSIDE FACILITIES – ROADWAY COMPONENT ALTERNATIVE 2



NOTES
Blue lines - parking entrance; Yellow lines - Howell Avenue exit/entrance and recirculation roadway; Green lines - Howell Avenue; Red lines - existing airport entrance/exit roadway.
SOURCE: Ricondo & Associates, Inc., October 2019; Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

EXHIBIT 5-25 LANDSIDE FACILITIES – ROADWAY COMPONENT ALTERNATIVE 3

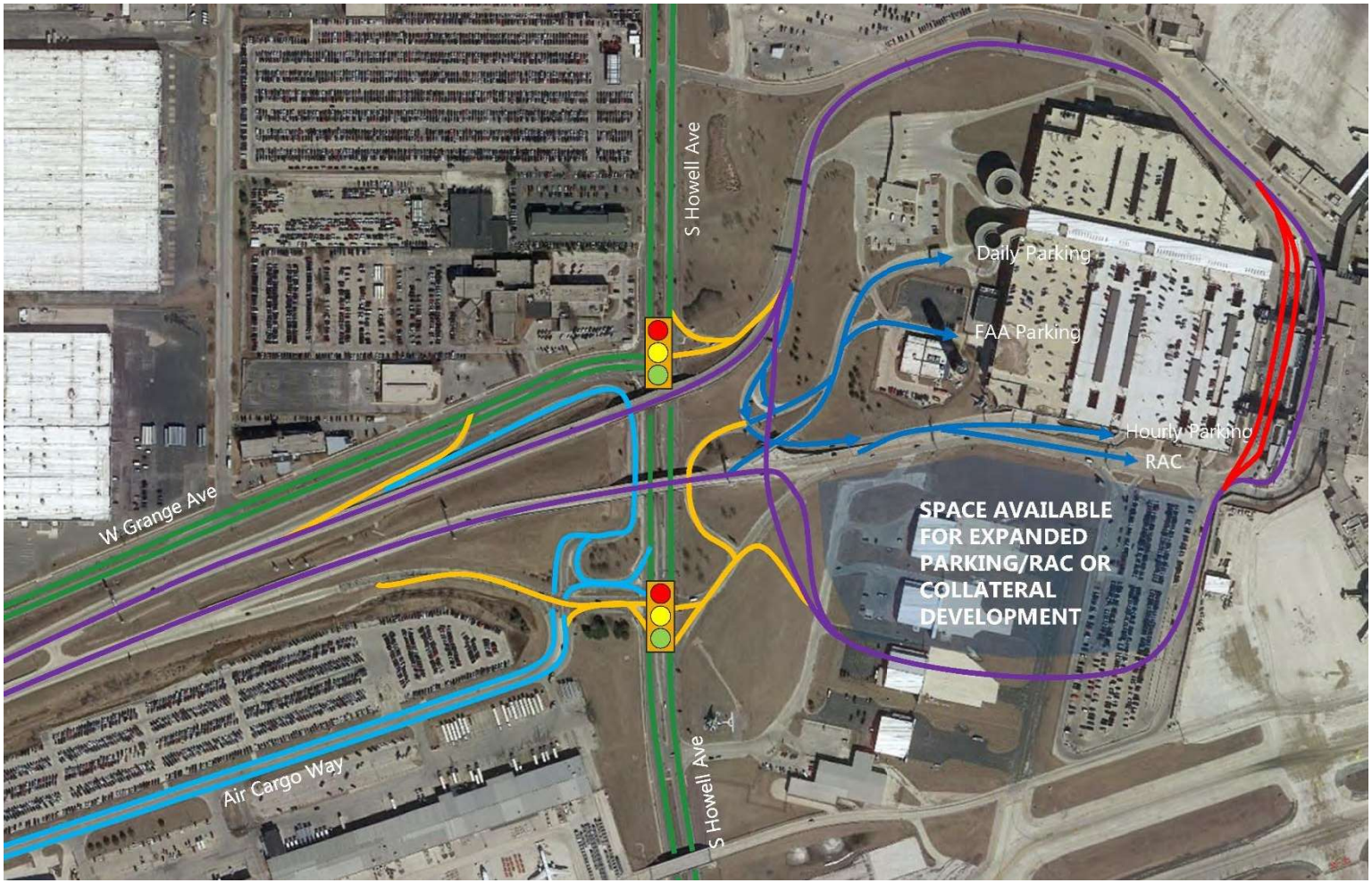


NOTES

Dark blue lines - parking entrance; Yellow lines - Howell Avenue exit/entrance and recirculation roadway; Purple lines - relocated airport entrance roadway; Light blue lines – Air Cargo Way reconfiguration; Green lines – Howell Avenue; Red: lines - existing airport curbside.

SOURCE: Ricondo & Associates, Inc., October 2019; Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

EXHIBIT 5-26 LANDSIDE FACILITIES – ROADWAY COMPONENT ALTERNATIVE 4



NOTES

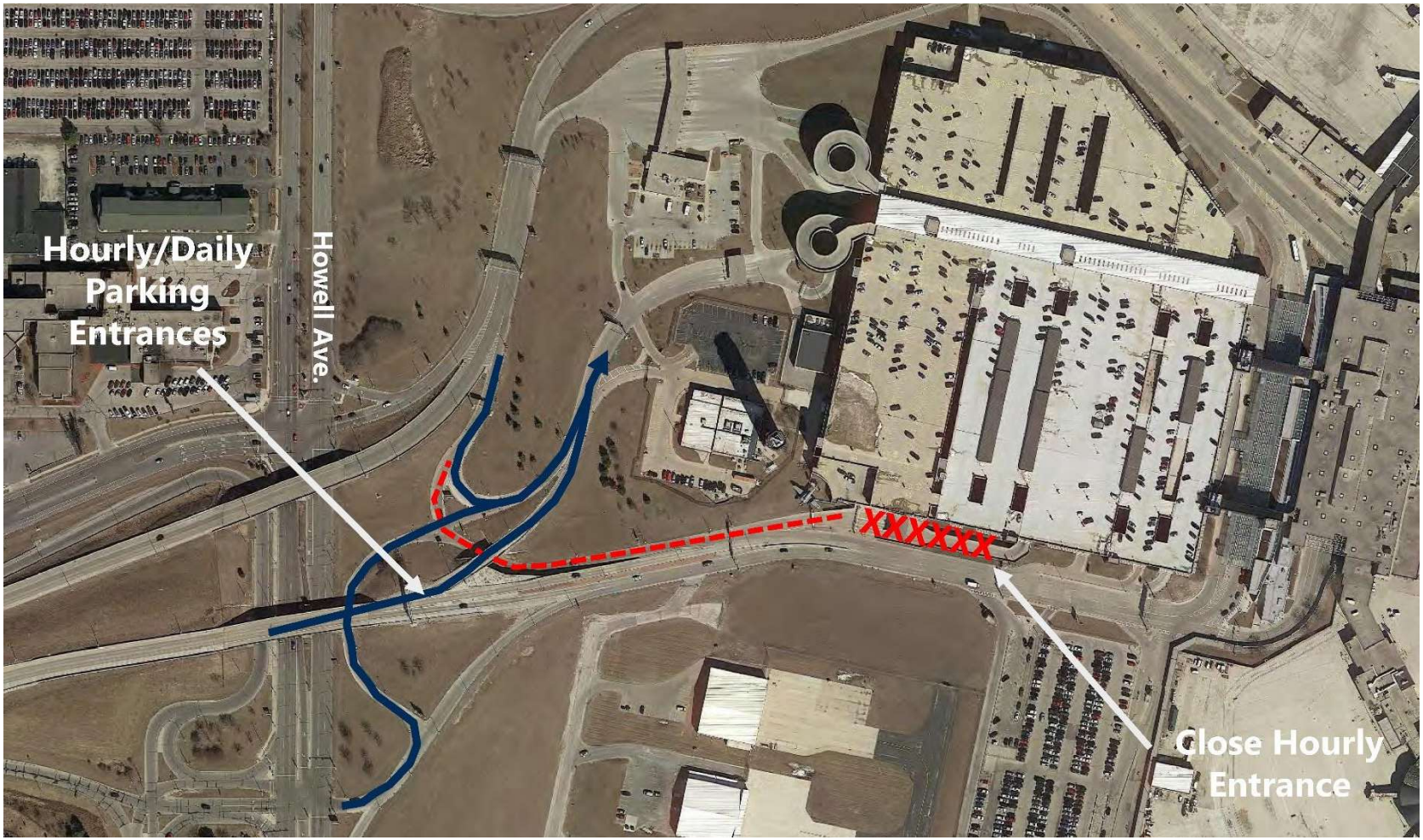
Dark blue lines - parking entrance; Yellow lines - Howell Avenue exit/entrance and recirculation roadway; Purple lines - relocated airport entrance roadway; Light blue lines – Air Cargo Way reconfiguration; Green lines – Howell Avenue; Red: lines - existing airport curbside

SOURCE: Ricondo & Associates, Inc., October 2019; Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

EXHIBIT 5-27 LANDSIDE FACILITIES – ROADWAY COMPONENT ALTERNATIVE 5

NOTES: Blue lines - parking entrance; Green lines – relocated airport entrance roadway.
SOURCE: Ricondo & Associates, Inc., October 2019; Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

EXHIBIT 5-28 LANDSIDE FACILITIES – ROADWAY COMPONENT ALTERNATIVE 6 (OPTIONAL GARAGE ENTRANCE MODIFICATION)



NOTES: Blue lines - parking entrance; Red lines – garage entrance considered for closure.
SOURCE: Ricondo & Associates, Inc., October 2019; Google Earth Professional, Geo Eye, Terrametrics (aerial imagery), October 2019.

5.3.3.3 LANDSIDE PARKING AND RENTAL CAR

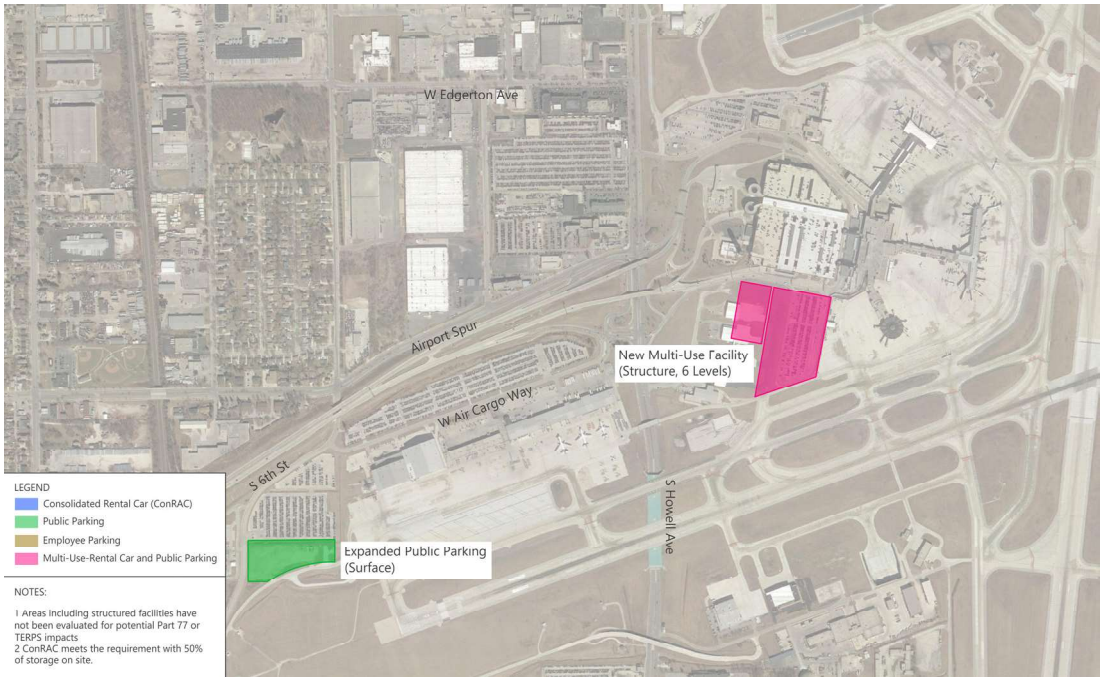
Landside parking alternatives were developed to accommodate the additional parking need (2,600 to 4,600 spaces) through the 2040 planning horizon. As rental car companies currently share the terminal parking garage, parking and rental car alternatives were explored simultaneously. Employee parking was considered as a component of overall parking requirements, though the demand for employee parking is expected to remain below the existing parking capacity through the planning horizon. Alternate employee parking locations were considered if the existing parking lot was displaced for airside or alternative landside uses. Six alternatives were defined in proximity to the terminal core, and two remote alternatives were also identified. The eight landside parking and rental car component alternatives are illustrated in **Exhibit 5-29** through **Exhibit 5-36**. **Table 5-5** summarizes the alternatives.

TABLE 5-5 LANDSIDE FACILITIES COMPONENT ALTERNATIVES – PARKING AND RENTAL CAR

ALTERNATIVE	DESCRIPTION
1	▪ A new multiuse facility (six-level structure) is constructed, including public parking and rental car spaces/operations, south of the existing garage. ▪ The remote public surface parking is expanded near 6th Street.
2	▪ The existing parking structure is rebuilt as a new multiuse facility (five-level structure). ▪ The remote public surface parking is expanded near 6th Street.
3	▪ The existing parking structure is rebuilt as a new multiuse facility (four-level structure). ▪ New public surface parking is constructed south of the new entrance road. ▪ The terminal entrance roadway is realigned to support new parking and rental car facilities. ▪ Remote public surface parking is expanded near 6th Street.
4	▪ A new multiuse facility (seven-level structure) is constructed near Air Cargo Way and Airport Spur.
5	▪ New public surface parking is constructed to the south and north of the existing garage. ▪ Replacement employee parking is constructed south of Airport Spur and east of Howell Avenue. ▪ A new consolidated rental car facility (three-level structure) is constructed near 6th Street.
6	▪ New public surface parking is constructed to the north of the existing garage. ▪ A new consolidated rental car facility (three-level structure) is constructed south of Airport Spur. ▪ Replacement employee parking is constructed near 6th Street.
7	▪ New public surface parking is constructed to the north of Layton Avenue adjacent to the Runway 19L runway protection zone. ▪ A new consolidated rental car facility (two-level structure) is constructed at the northeast corner of the intersection of Layton Avenue and Howell Avenue. ▪ The existing parking facilities in the terminal area remain operational.
8	▪ New public surface parking is constructed at the northeast corner of the intersection of Layton Avenue and Howell Avenue. ▪ A new consolidated rental car facility (two-level structure) is constructed north of Layton Avenue adjacent to the Runway 19L runway protection zone. ▪ The existing parking facilities in the terminal area remain operational.

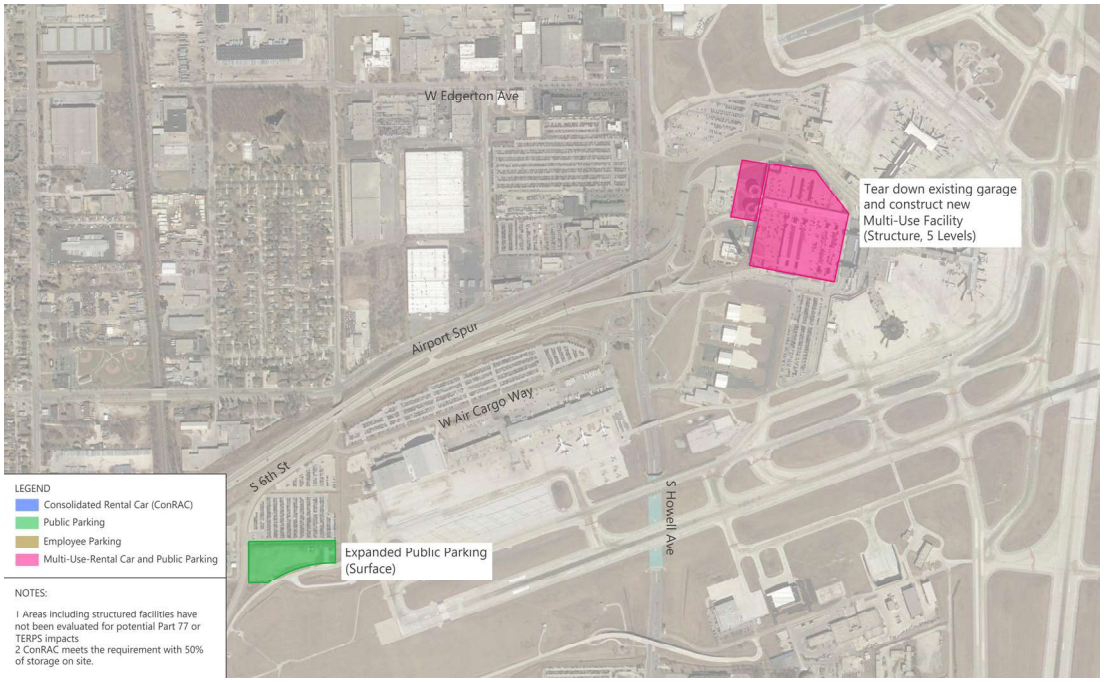
NOTE:
The multiuse facility is a structure or surface parking area that allows for more than one use (i.e., rental car activities and passenger vehicle parking).
SOURCE: Ricondo & Associates, Inc., September 2019.

EXHIBIT 5-29 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 1



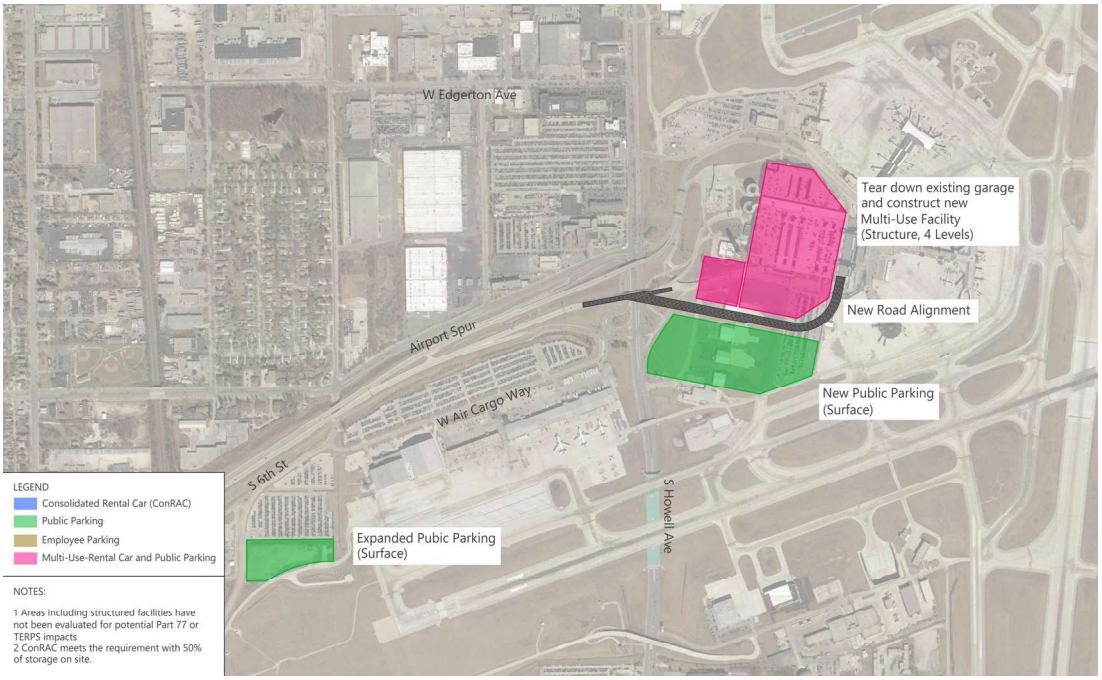
SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 5-30 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 2



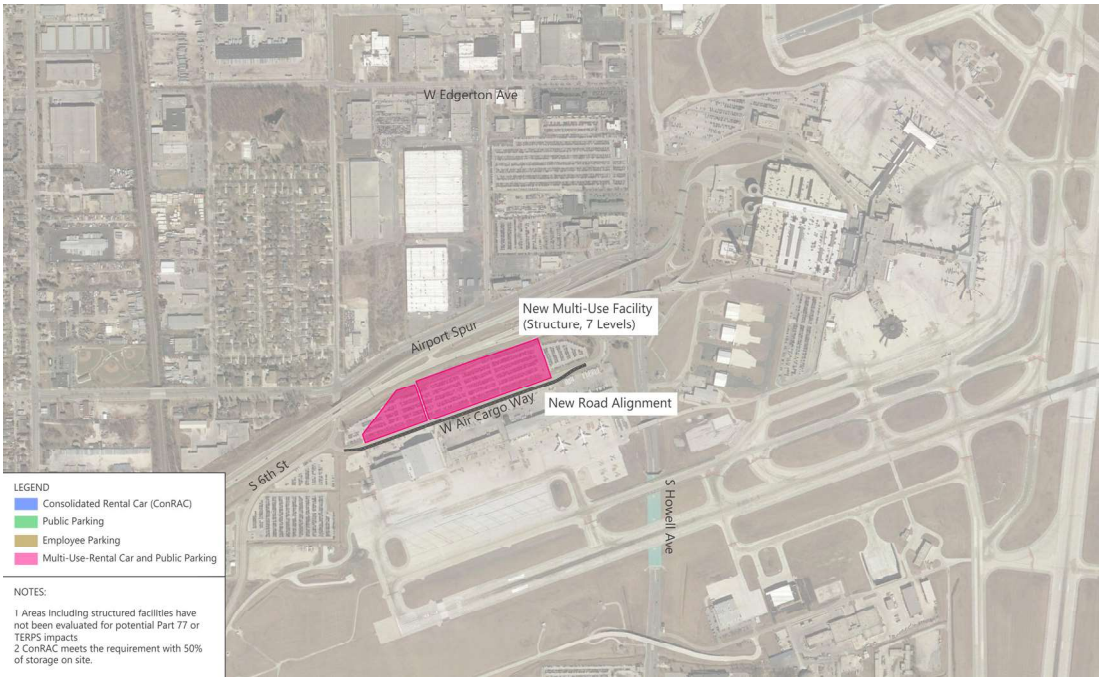
SOURCE: Ricondo & Associates, Inc., October2019.

EXHIBIT 5-31 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 3



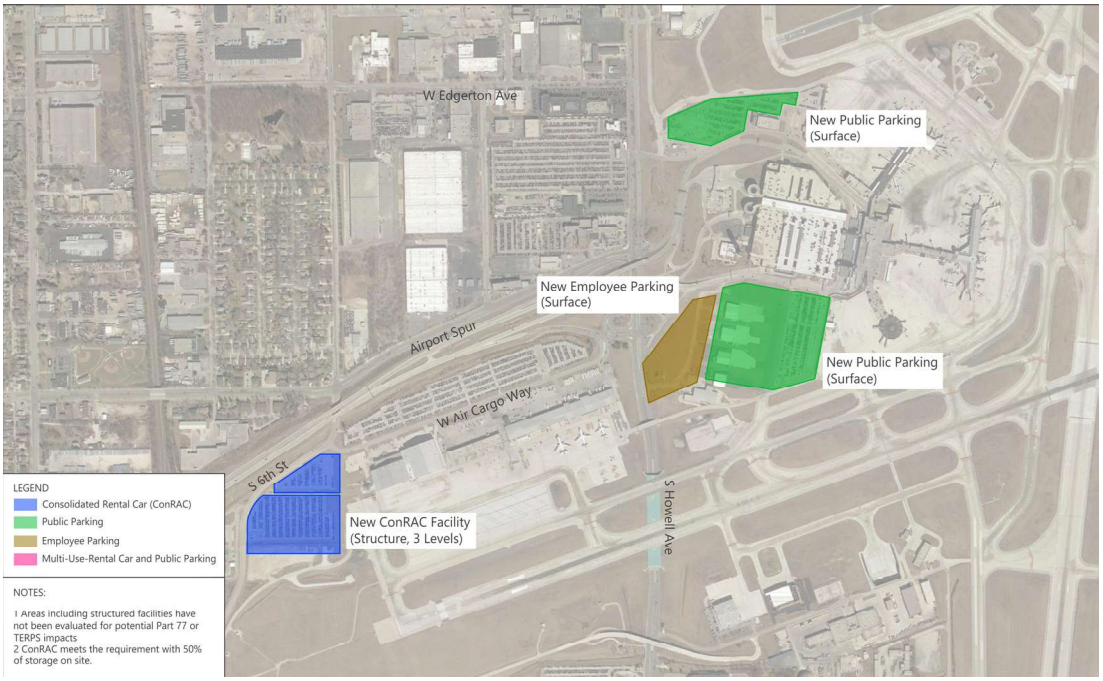
SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 5-32 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 4



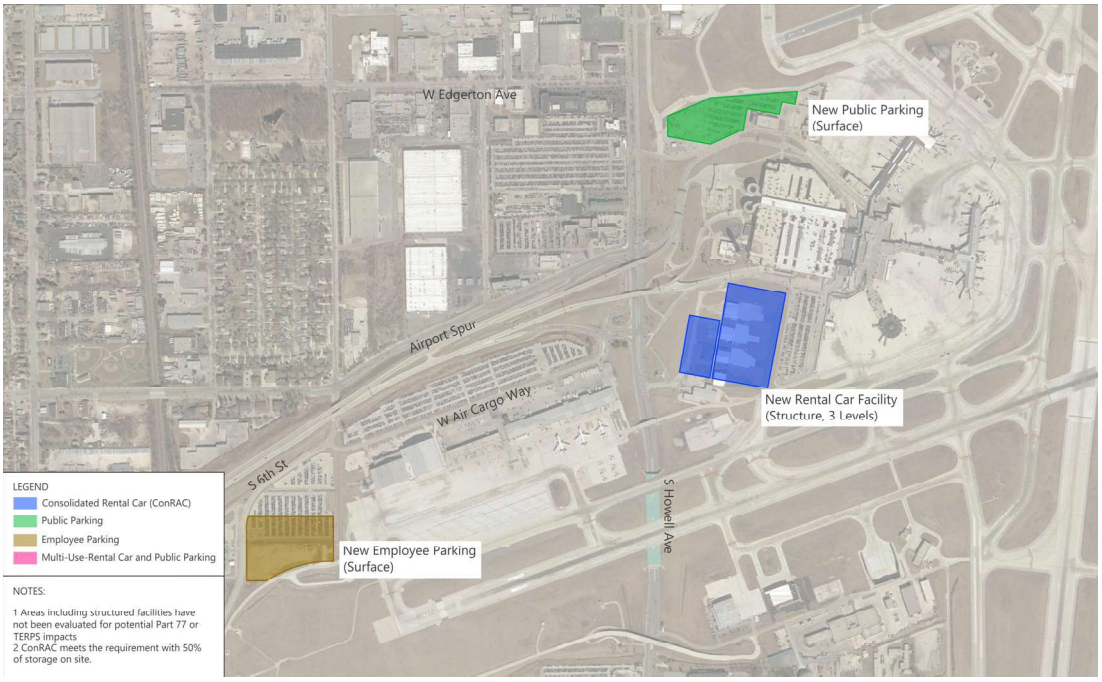
SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 5-33 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 5



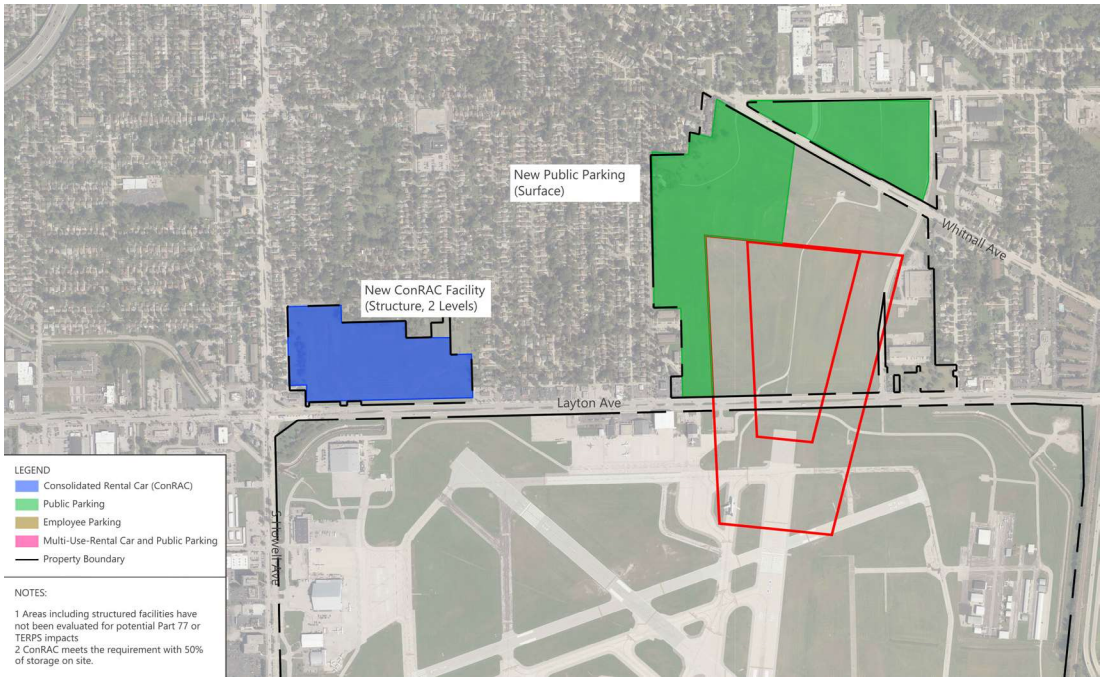
SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 5-34 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 6



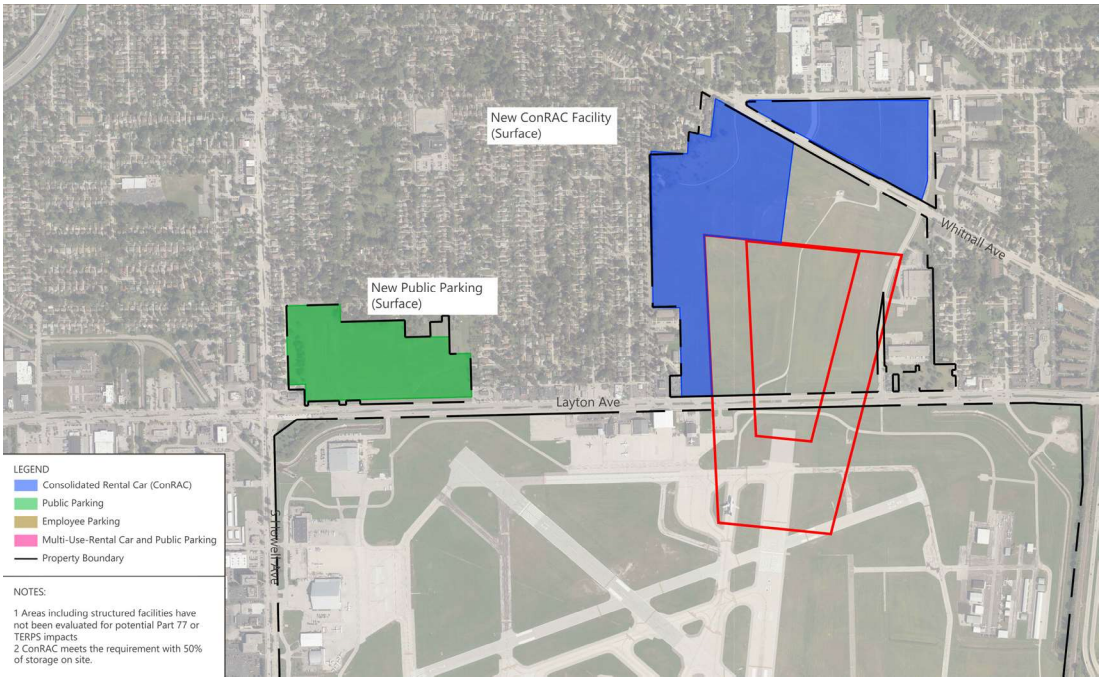
SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 3-35 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 7



SOURCE: Ricondo & Associates, Inc., October 2019.

EXHIBIT 5-36 LANDSIDE FACILITIES – PARKING AND RENTAL CAR COMPONENT ALTERNATIVE 8



SOURCE: Ricondo & Associates, Inc., October 2019.

5.3.4 SUPPORT FACILITIES COMPONENT ALTERNATIVES

The support facilities component alternatives are complementary to the airfield alternatives given the typical need for airfield access. Support facilities encompass cargo, GA, aircraft maintenance, Airport maintenance, and other facilities that support the safe and efficient operation of the Airport and its tenants.

The identification of support facilities component alternatives focused on tenant requirements, forecast GA activity, and forecast cargo operations and volumes. While future support facility needs are quantitatively established in Section 4, Demand/Capacity and Facility Requirements, it is important to note there is a discretionary nature to some support facility elements. Additional cargo, GA, or airline support facilities development may be triggered by tenant (or prospective tenant) interest or airline or FBO business models, as well as increases in activity.

The component alternatives for the support facilities are addressed as individual components in the following subsections.

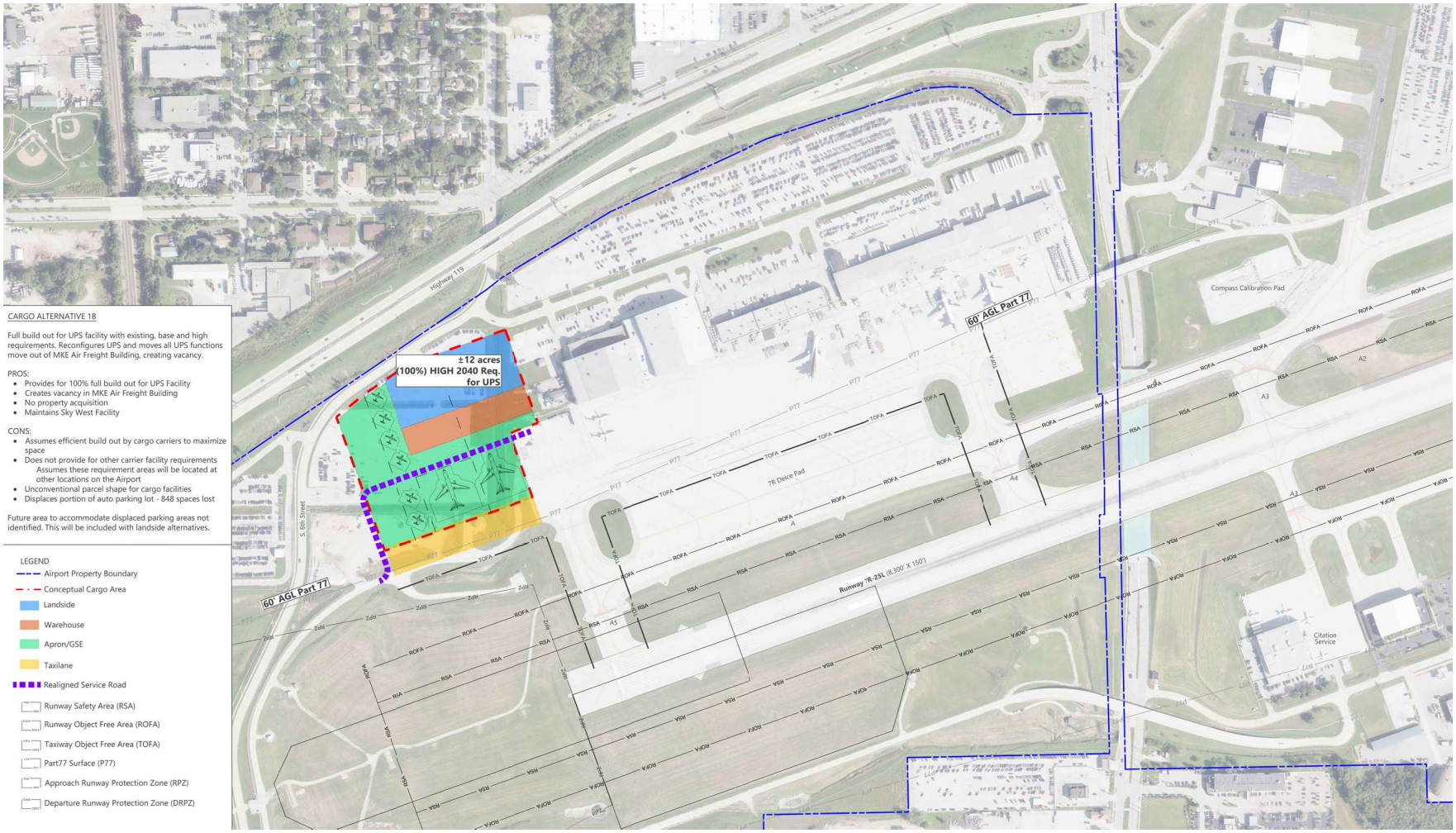
CARGO FACILITIES

Section 2, Inventory of Existing Conditions, describes the existing cargo facilities. The identification of future cargo facilities alternatives focused on addressing the following challenges:

- inefficient facility configuration for some tenants
- dispersed facilities
- long-term growth opportunities/capabilities
- ramp congestion and facility adjacencies
- planned conceptual cargo ramp expansion
- unmet need/demand
- landside adequacy for larger transportation vehicles (truck maneuvering)

Exhibit 5-37 through **Exhibit 5-44** illustrate the eight cargo component alternatives that were identified and **Table 5-6** summarizes these alternatives.

EXHIBIT 5-37 CARGO FACILITIES COMPONENT ALTERNATIVE 1 (WEST 1)



NOTES:
Yellow – taxiway/taxilane access; green – aircraft parking apron; blue – landside facilities; orange – cargo buildings; purple dash – vehicle service road.
Cargo facilities accommodate both narrowbody and widebody aircraft.
SOURCE: Mead & Hunt, October 2019.