KANSAS CITY
Aviation

Airport Master Plan

KANSAS CITY DOWNTOWN AIRPORT – WHEELER FIELD

Chapter 5

Preferred Development Plan

The airport master planning process for Kansas City Downtown Airport – Wheeler Field (MKC) has evolved through the development of forecasts of future demand, an assessment of future facility needs, and an evaluation of airport development alternatives to meet those future facility needs. The planning process has included three sets of draft working papers, which were presented to the planning advisory committee (PAC) and discussed at several coordination meetings. The draft materials have also been presented at two public information workshops and have been made available on a dedicated project website throughout the process.

In the previous chapter, several alternatives were analyzed to explore options that can accommodate growth and development of the airport. The development alternatives have been refined into a single preferred development plan. This chapter describes the recommended direction for the future use and development of the airport. Where appropriate, the alternative is summarized and a rationale for the selected alternative is presented.

AIRSIDE CONCEPT

The airside concept generally relates to planned improvements to the runway and taxiway system. **Exhibit 5A** presents the long-term master plan development concept for MKC. The following sections will discuss the preferred development plan in more detail.

AIRFIELD CAPACITY REVIEW

The capacity of an airport is a measure of the airport's ability to accommodate actual and forecast operational activity, given the existing runway and taxiway layout. The most common capacity measure is the annual service volume (ASV), which is the estimated number of operations an airport can facilitate before delay becomes a significant factor. Delay can manifest in numerous ways, including extended aircraft hold time prior to departure, extended circling maneuvers instructed by air traffic control personnel, and longer intervals between departure or arrival clearance.

According to Federal Aviation Administration (FAA) Advisory Circular (AC) 160/5060-5, *Airport Capacity and Delay*, an airport should plan capacity improvement projects when its annual operations reach 60 percent of the ASV. Capacity improvement projects may include an additional runway, additional strategically located taxiways, and instrument approach improvements.

This analysis was documented in Chapter Three – Facility Requirements. Annual operations currently represent 60 percent of the ASV. The operations forecast indicates that the airport would be at 85 percent of the ASV in 20 years; therefore, capacity improvement projects are justified for MKC and should be considered as a 20-year capital improvement program is developed for this master plan.

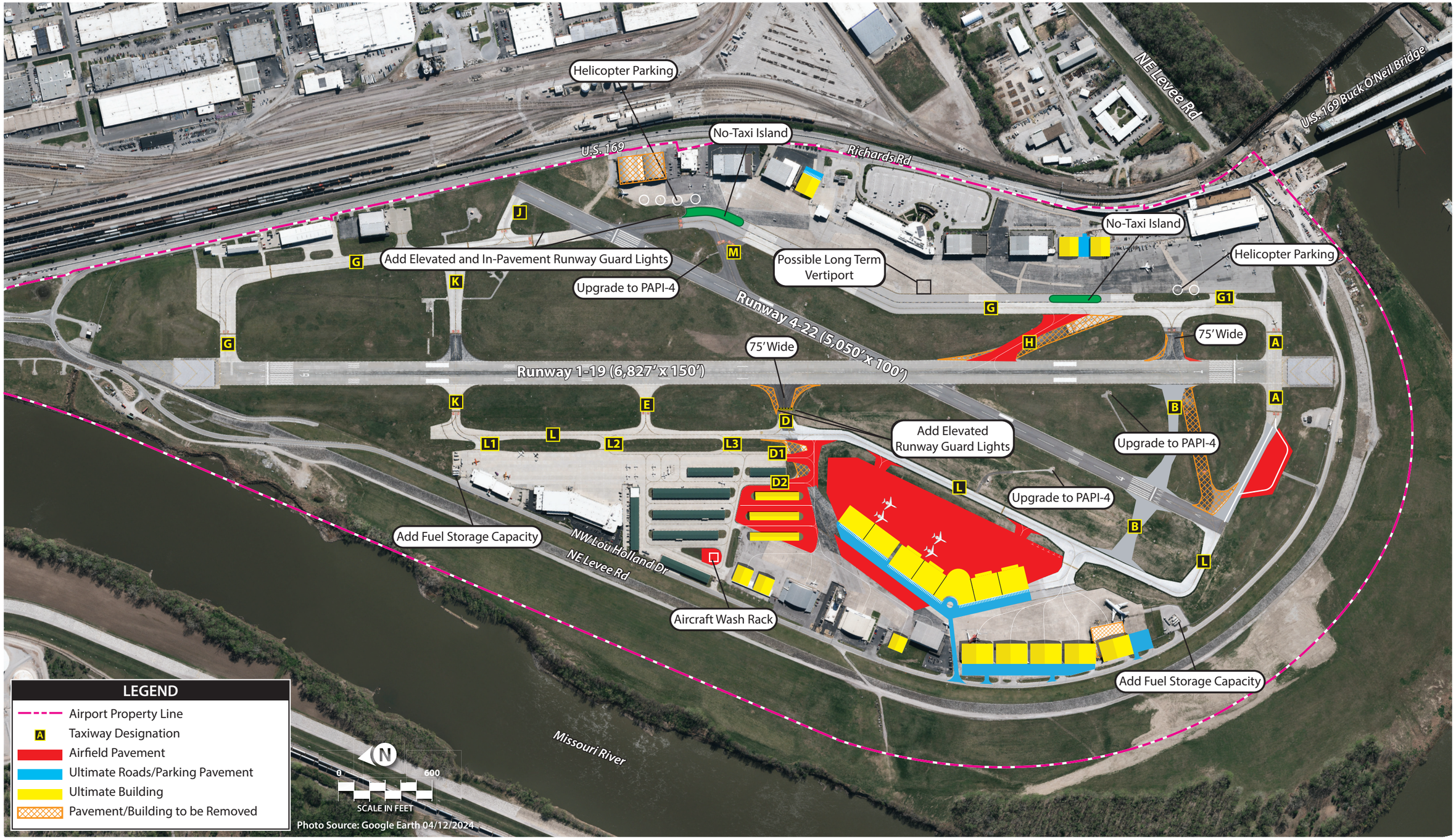
RUNWAY DIMENSIONS

Runway 1-19 is 6,827 feet long and 150 feet wide. This runway is planned to remain at these dimensions. Previous analysis indicated that the airport would be justified for a total runway length of 8,700 feet if an extension were feasible. Due to the constrained airport environment, including the location of the Missouri River levee, a runway extension is not feasible; this runway already provides for the longest length possible for users. The presence of engineer materials arresting systems (EMAS) beyond each end of the runway is important for maximizing runway length, as it provides an acceptable level of safety within a shorter distance than the traditional 1,000-foot-long runway safety area (RSA).

Runway 4-22 is 5,050 feet long and 100 feet wide. This runway is planned to remain at these dimensions for the following reasons:

1) Runway 4-22 provides important crosswind coverage, especially for smaller piston aircraft.
2) Runway 4-22 is needed as a capacity enhancement runway. It is considered a secondary runway by the FAA, which is an official determination documented in the FAA's System of Airports Reporting (SOAR) database, that justifies maintaining a runway at a higher standard than wind coverage alone would normally allow.
3) Runway 4-22 provides the most sophisticated instrument approach from the south, with an instrument landing system (ILS) approach to Runway 4 with visibility minimums down to ¾-mile.
4) Runway 4-22 currently accommodates activity by B-III and C/D-III aircraft, all of which justify maintaining the existing 100-foot-wide runway.

Working with the FAA, the airport developed a plan in 2010 to maximize runway length at MKC. Part of this project was the installation of EMAS beds on both ends of Runway 1-19. In this master plan, the runways were reanalyzed to take into consideration any changes to FAA design standards. It has been determined that maintaining the existing condition for both runways remain the best option to maximize runway length while providing an acceptable level of safety; therefore, no changes to the runway dimensions are planned.


Helicopter Parking
No-Taxi Island
U.S. 169
Richards Rd
NE Levee Rd
U.S. 169 Buck O'Neil Bridge
J
G
Add Elevated and In-Pavement Runway Guard Lights
K
M
Upgrade to PAPI-4
Possible Long Term Vertiport
No-Taxi Island
Helicopter Parking
G
G1
Runway 4-22 (5,050' x 100')
H
75' Wide
A
G
Runway 1-19 (6,827' x 150')
75' Wide
K
E
D
B
A
L1
L
L2
L3
D1
D2
Add Elevated Runway Guard Lights
Upgrade to PAPI-4
L
Upgrade to PAPI-4
B
Add Fuel Storage Capacity
NW Lou Holland Dr
NE Levee Rd
L
Aircraft Wash Rack
Add Fuel Storage Capacity
Missouri River
LEGEND
Airport Property Line
A Taxiway Designation
Airfield Pavement
Ultimate Roads/Parking Pavement
Ultimate Building
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SCALE IN FEET
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DECLARED DISTANCES

Declared distances are applied to both runways for object clearing and safety enhancement purposes. The landing threshold to Runway 1 is displaced by 299 feet to provide the required 600 feet of RSA prior to landing and for clearance over the Missouri River levee. Runway 19 is displaced by 301 feet to provide the required 600 feet of RSA prior to landing.

The landing threshold to Runway 4 is displaced by 500 feet to provide clearance over the levee. The landing threshold to Runway 22 is displaced by 699 feet to provide clearance over the perimeter fence and U.S. Highway 169. In addition, the accelerate stop distance available (ASDA) for Runway 4 is declared 280 feet short of the end of the runway to provide for the RSA beyond the takeoff end.

Table 5A documents the declared distances, as applied to and planned to be maintained for both runways at MKC.

TABLE 5A | DECLARED DISTANCES

Parameters	Runway 1	Runway 19	Runway 4	Runway 22
Takeoff Run Available (TORA)	6,827'	6,827'	5,050'	5,050'
Takeoff Distance Available (TODA)	6,827'	6,827'	5,050'	5,050'
Accelerate Stop Distance Available (ASDA)	6,827'	6,827'	4,770'	5,050'
Landing Distance Available (LDA)	6,528'	6,526'	4,270'	4,351'

RUNWAY DESIGN STANDARDS

All runways are inclusive of various imaginary safety surfaces. Primary among these are the RSA, runway object free area (ROFA), obstacle free zone (OFZ), and runway protection zones (RPZs).

Runway Safety Area (RSA)

The RSA enhances the safety of aircraft that undershoot, overrun, or veer off the runway, and provides greater accessibility for aircraft rescue and firefighting (ARFF) equipment responding to such incidents. The RSA is to be cleared and graded, with no potential hazards, ruts, humps, depressions, or other surface variations, and drained by grading or storm sewers. The elevation of any point within the RSA is to be no higher than the perpendicular elevation of the runway centerline.

In Chapter 4 - Alternatives, an RSA determination for both runways was undertaken, as outlined in FAA Order 5200.8, *Runway Safety Area Program*. Order 5200.8 outlines six alternatives to examine:

A. Construct the RSA to meet current design standards.
B. Relocate, shift, or realign the runway.
C. Reduce runway length where the existing runway length exceeds the length required for the existing or projected design aircraft.
D. Implement a combination of runway relocation, shifting, grading, realignment, or reduction.
E. Implement declared distances.
F. Install EMAS.

Once each alternative is examined and analyzed, one of the following determinations is made:

1) The existing RSA meets current standards contained in AC 150/5300-13, *Airport Design*, as amended.
2) The existing RSA does not meet standards, but it is practicable to improve the RSA so that it will meet current standards.
3) The existing RSA can be improved to enhance safety, but the RSA will still not meet current standards.
4) The existing RSA does not meet current standards, and it is not practicable to improve the RSA.

FAA AC 150/5220-22B, *Engineered Materials Arresting Systems (EMAS) for Airport Overruns*, states:

> "*The FAA does not require an airport operator to reduce the length of a runway or declare its length to be less than the actual pavement length to meet runway safety area standards if there is an adverse operational impact to the airport.*"

This means that an airport with a deficient RSA does not have to consider alternatives that would shorten the runway if the current runway length is shorter than or equal to the recommended length for the critical aircraft. Both runways at MKC would be shorter than the recommended length, given the current fleet mix, if the airport were not constrained from expansion by the levee and roads.

Runway 1-19 RSA

Runway 1-19 has a runway design code (RDC) of D-III-4000; therefore, the standard RSA length beyond the end of the runway is 1,000 feet and the width is 500 feet. When EMAS is installed, the length of the RSA beyond the runway end can be shorter; however, the presence of EMAS is not a substitute for the RSA width standard. There are two locations in which the RSA does not meet standard:

1) On the Runway 1 end, the perimeter fence and Lou Holland Drive pass through a small corner of the RSA.
2) On the Runway 19 end, the perimeter fence and the terrain grade penetrate the RSA.

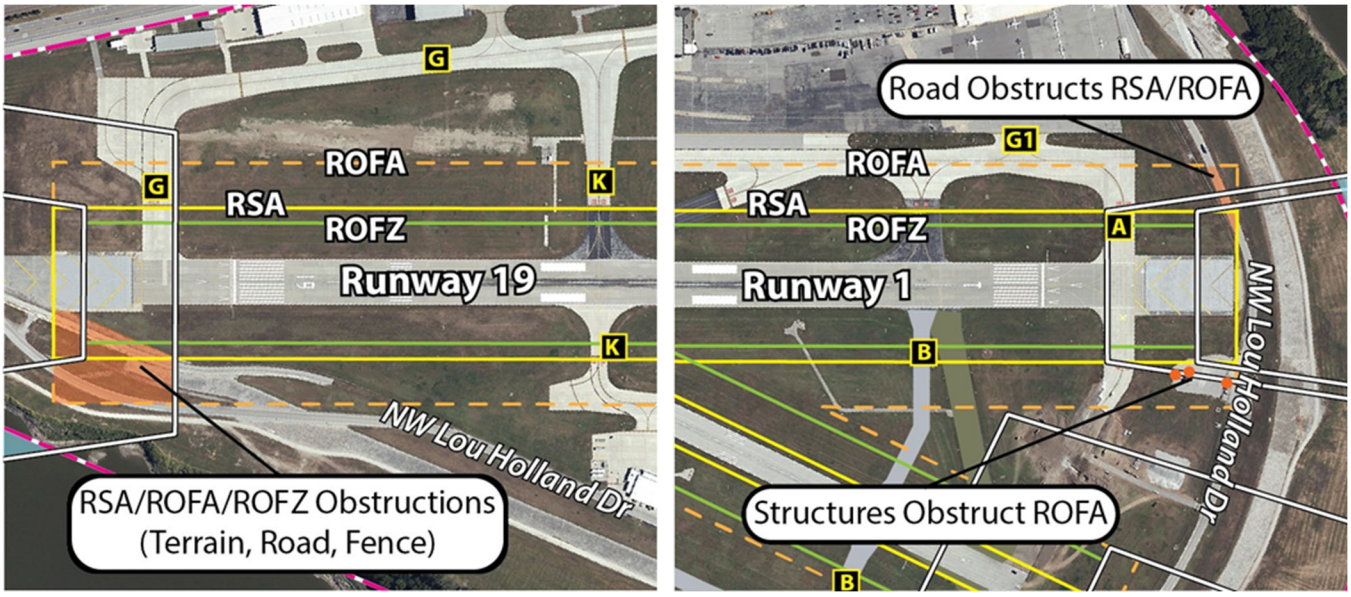

Figure 5.1 – Runway 1-19 Safety Surfaces

On the Runway 1 end where the RSA is penetrated by the perimeter fence and Lou Holland Drive, the most viable mitigation method would be to shorten the ASDA and the landing distance available (LDA) for operations using Runway 19. To accomplish this, the ASDA and LDA would have to be shortened by approximately 50 feet. Essentially, the end of the runway for operations to the south would be moved 50 feet to the north. Red runway end lights would typically be set to the side of the runway as a visual indicator of the end of the runway for pilots, but this solution is not viable because shortening the ASDA and LDA would shorten the operations length of the runway, to the detriment of the critical aircraft; therefore, this is not a viable solution.

On the Runway 19 end, the west side of the RSA slopes gently upward to its outer edge. This is a terrain penetration of the RSA, due to the presence of the Missouri River levee. This condition was analyzed during project design for the installation of the EMAS bed in 2010. It was determined that the terrain penetration of the RSA in this location is acceptable, as the levee cannot be lowered. FAA Order 5300.1G, *Modification to Agency Airport Design, Construction, and Equipment Standards*, states that "a Modification of Standards (MOS) may be considered for RSA grading where existing conditions may not allow for a feasible cost benefit solution." Because an MOS is reserved for new construction (including reconstruction), a MOS for the RSA grade is not required until the time Runway 1-19 is reconstructed.

Both of these non-standard RSA conditions are planned to remain in place because the potential alternative solutions would shorten the runway, and the airport is not required to shorten the runway if such an action would have a detrimental effect on operations by the critical aircraft. Therefore, the most appropriate RSA determination for Runway 1-19 is that the existing RSA does not meet current standards, and it is not practicable to improve the RSA. This condition will be noted on the airport layout plan (ALP).

Runway 4-22 RSA

Runway 4-22 has an RDC of B-II-4000; therefore, the standard RSA is 150 feet wide and extends 300 feet beyond the runway ends. South of the Runway 4 end, the full RSA meets standard. At the north end, the

RSA would extend through the perimeter fence and across roads; however, with the implementation of declared distances, the RSA meets standard. The ASDA for Runway 4 is declared to be 4,770 feet, which is 280 feet short of the full runway length. An additional distance of 20 feet is available beyond the pavement end; therefore, the full 300-foot RSA is available because of the existing declared distances.

The RSA determination for Runway 4-22 is that the existing RSA meets current standards contained in AC 150/5300-13, *Airport Design,* as amended.

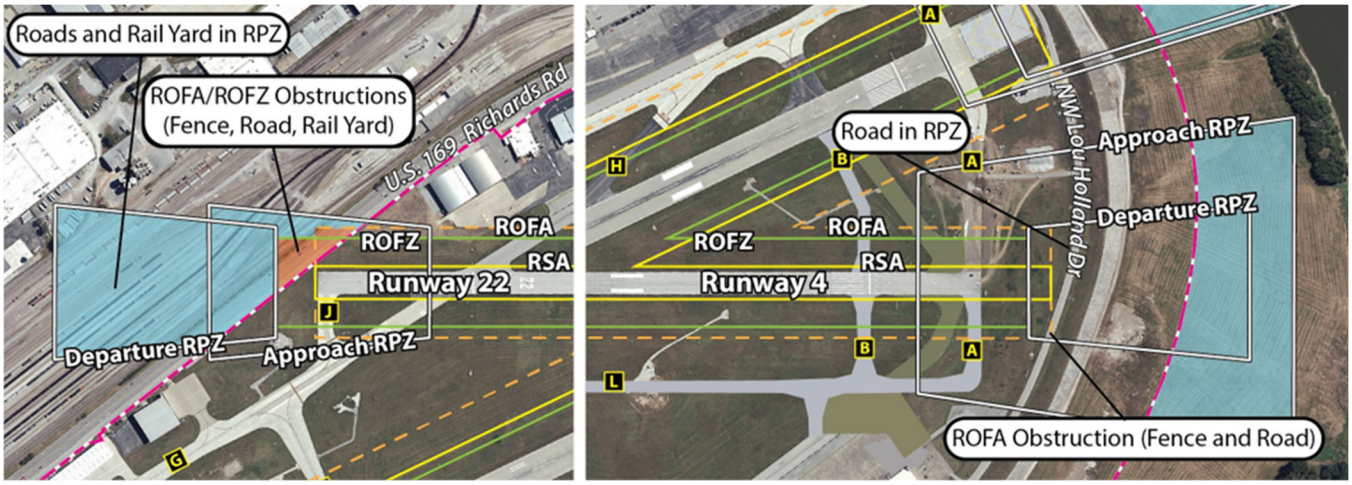

Figure 5.2 – Runway 4-22 Safety Surfaces

Runway Object Free Area (ROFA)

The ROFA is a buffer zone around runways to provide wingtip clearance in the event of a runway excursion into the RSA by an aircraft. The ROFA is to be clear of terrain or objects that rise above the lateral elevation of the RSA. The end of the ROFA is at the same location as the end of the RSA, regardless of the presence of EMAS or the implementation of declared distances.

Runway 1-19 ROFA

The end of the ROFA on the Runway 1 end is penetrated by the levee and perimeter fence, which is the same condition as the RSA. As noted in the RSA discussion, the levee cannot be lowered or relocated. Like the RSA, the ROFA cannot be shortened if such an action would shorten the runway to a length that would negatively impact operations of the critical aircraft; therefore, the non-standard ROFA condition is planned to remain in place and be noted on the ALP. When the runway is reconstructed, additional analysis should be undertaken to determine if the ROFA can be brought up to standard. If not, an MOS may be needed.

There are three small navigational aid (NAVAID) support structures in the ROFA on the west side of the runway near the Runway 1 end. If these structures are not required to be in the ROFA for air navigation purposes, they should be relocated outside the ROFA. The current non-standard ROFA condition will be noted on the ALP.

Runway 4-22 ROFA

On the Runway 4 end, the corner of the ROFA is penetrated by the perimeter fence and Lou Holland Road. The ROFA on the Runway 22 end is penetrated by the perimeter fence and Richards Road. These ROFA penetrations are to remain and be reevaluated the next time Runway 4-22 is to be reconstructed. This non-standard ROFA condition will be noted on the ALP.

Obstacle Free Zone (OFZ)

The runway obstacle free zone (ROFZ) dimensions are 400 feet wide and extend 200 feet beyond the pavement end. The ROFZ is set based on the established end of the runway, regardless of the operating direction. The ROFZ surrounding Runway 1-19 fully complies with FAA standards. The ROFZ on the Runway 4 end meets standard. Beyond the Runway 22 end, the ROFZ is penetrated by the perimeter fence and Richards Road. On the Runway 4 end, the ROFZ extends 200 feet beyond the pavement end because the pavement end is the established end of the runway for operations to the south and for takeoff operations to the north. On the Runway 22 end, the ROFZ extends 200 feet beyond the pavement end because the pavement end is the start of the runway for operations to the south. The non-standard ROFZ on the Runway 22 end will be noted on the ALP.

RSA/ROFA/ROFZ Summary

There are several non-standard conditions on the airfield when considering the RSA, ROFA, and ROFZ, which have been outlined above. **Table 5B** summarizes this information, and this table will be added to the ALP. These non-standard conditions are to remain in place, as the airport has already maximized these design surfaces through the following methods:

Runway 1-19

1) EMAS is installed on both ends of Runway 1-19.
2) The landing thresholds are displaced on both ends of Runway 1-19.
3) The runway is currently at the maximum length feasible and shortening it by any distance will negatively impact the operational capability of the runway.

Runway 4-22

1) The RSA meets current design standard because of the implementation of declared distances. Specifically, takeoff and landing operations using Runway 4 are declared shorter than the end of the runway, which allows the RSA to meet standard.
2) The ROFA ends where the RSA ends but is wider than the RSA; thus, the east corner of the ROFA, nearest the Runway 22 end, is non-standard. This condition is planned to remain; however, if the runway is planned to be reconstructed, the fleet mix using the runway would need to be reevaluated at that time.

3) The ROFZ is established based on the ends of the usable pavement and extends 200 feet beyond that pavement end. The beginning of Runway 22 is the pavement end; thus, the ROFZ extends 200 feet to the east. The declared distances (ASDA and LDA) that have been modified to account for the RSA (and partially for the ROFA) do not impact the ROFZ.

TABLE 5B | Non-Standard Runway Design Conditions

Description	Actual Dimensions	Standard Dimensions	Disposition/Proposed Improvement
RSA Obstructions – Runway 1 End	500' wide x 330' beyond end	500' wide x 1,000' beyond ends	EMAS present. Small corner of RSA penetrated by fence and road. Condition to remain because shortening the runway will negatively impact the critical aircraft.
RSA Obstructions – Runway 19 End	500' wide x 300' beyond end	500' wide x 1,000' beyond ends	EMAS present. Levee causes grading issue and fence penetration at the end of the RSA. Condition to remain because shortening the runway will negatively impact the critical aircraft.
ROFA Obstructions – Runway 1 End	800' wide x 330' beyond end	800' wide x 1,000' beyond ends	EMAS present. Small corner of ROFA penetrated by fence and road. Condition to remain because shortening the runway will negatively impact the critical aircraft.
ROFA Obstructions – Runway 19 End	800' wide x 300' beyond end	800' wide x 1,000' beyond ends	EMAS present. Levee causes grading issue and fence penetration at the end of the ROFA. Condition to remain because shortening the runway will negatively impact the critical aircraft.
ROFA Obstructions – Runway 22 End	500' wide x 70' beyond end	500' wide x 300' beyond end	ROFA obstructed by fence and road. Runway already declared shorter. Condition to remain because shortening the runway further will negatively impact current operations. MOS possibly needed upon reconstruction of the runway.
ROFZ Obstructions – Runway 22 End	400' wide by 0' beyond end	400' wide x 200' beyond end	East corner of ROFZ penetrated by fence and roads. Condition to remain because shortening the runway will negatively impact current operations.

Runway Protection Zone (RPZ)

The RPZs are trapezoidal land areas beyond the runway ends. The RPZs are established to protect people and property on the ground. Exhibit 3E (presented previously) showed the areas of incompatible land use, which include public roads and railroads, within the existing RPZ.

Recently published FAA guidance in AC 150/5190-4B, *Airport Land Use Compatibility Planning*, outlines the FAA's expectations regarding RPZ land use compatibility. The FAA expects airport sponsors to make every effort to provide compatible land uses within RPZs. Incremental improvements are encouraged, while allowing new incompatible land uses is discouraged. The FAA also understands that RPZ lands may be owned by others, which may limit the sponsor's ability to mitigate existing or future incompatible land uses within RPZs.

At MKC, the RPZs beyond the Runway 19 and 4 ends contain public roads and railroads, both of which are considered incompatible land uses. Analysis in this master plan has shown that it is not feasible to remove these incompatible land uses without significantly shortening the runway, which would have a negative impact on the operational capability of the critical aircraft; therefore, the RPZs are planned to remain in their current condition.

HOT SPOTS AND RUNWAY INCURSION MITIGATION (RIM) LOCATIONS

As outlined in Exhibit 1J, there are three FAA-designated hot spots on the airfield at MKC:

1) Hot Spot #1: Intersection of Runway 4-22 and Taxiway G – Taxiway G is at an unusual angle at the intersection with the runway. This has caused pilot confusion in the past.

2) Hot Spot #2: Intersection of Taxiways L, D, and F – Pilots taxiing south on Taxiway L need to be aware that they must utilize Taxiway F to access the Runway 1 threshold and must not inadvertently turn left on Taxiway D, which will cause them to accidentally enter the runway environment. Likewise, pilots taxiing northbound on Taxiway F must be sure to turn onto Taxiway L and not inadvertently enter the runway environment.

3) Hot Spot #3: Intersection of Taxiways A and B and the Runway 4 threshold – This is a confusing intersection with angled taxiways. The Taxiway L project was completed in summer 2023, which has partially rectified this unusual taxiway geometry. Taxiway B is scheduled to be reconstructed in 2025. Once this project is complete, this hot spot should then be removed from the FAA Hot Spot list. (Note: This master plan document is being developed under the assumption that the projects to fix this hot spot has already occurred.)

Hot Spot #1 was the subject of a detailed analysis in Chapter Four – Alternatives. It was further examined during a comparative safety assessment (CSA), which is included as **Appendix F**. The preferred alternative for Hot Spot #1 is to install both elevated runway guard lights and in-pavement runway guard lights.

Hot Spot #1 is also a designated RIM location. RIM locations are high-priority areas on the airfield that have reported runway safety events. The planned installation of elevated and in-pavement runway guard lights should mitigate the potential for operational incidents or incursions in this location.

The description above for Hot Spot #2 is from the FAA's official publication. It predates the Taxiway L extension project in 2024, which addressed this hot spot by creating a standard three-option intersection at the intersection of Taxiway D and Taxiway L. While the hot spot description does not directly address the fact that Taxiway D still allows direct access from an apron area to the runway, the CSA addressed this concern with a solution that will offset the portion of Taxiway D that is west of Taxiway L to the south, which will force pilots to turn onto Taxiway L before turning again toward the runway.

Hot Spot #3 is so designated because of the confusing nature of the intersection where Taxiway B intersects with the Runway 4 threshold and Taxiway A at a non-standard angle. The airport has scheduled a project for 2025 that will reorientate Taxiway B, so it no longer intersects with Taxiway A and the runway at this location. The completion of this project will resolve the issues at this hot spot by creating a standard geometry. Ultimately, this hot spot designation can be removed upon completion of the project.

TAXIWAYS

As discussed above, Taxiways D, G, and B are each associated with an existing hot spot and were the subject of the CSA. Solutions to those issues have been presented. This section will discuss resolutions of any remaining taxiway issues.

Taxiway H is the existing high-speed exit for aircraft landing on Runway 19 and heading to the southeast portion of the airport. Currently, this taxiway is at a 20-degree angle to the runway. The standard design for high-speed exits is 30 degrees; therefore, the recommendation is for Taxiway H to be reconstructed at the standard 30-degree angle at the time reconstruction is needed. In addition, Taxiway H allows for direct access from the apron to the runway, so a new no-taxi island is planned on the east side of Taxiway G at this location to prevent direct access to the runway environment.

Taxiway M is an angled exit from Runway 4 that leads to Taxiway G. This taxiway also allows direct access from an apron; therefore, a no-taxi island is also planned in this location. Taxiway M was the subject of the alternatives analysis because it is an angled taxiway, and 90-degree taxiway intersections are preferred. Taxiway M is a 30-degree-angled taxiway, which meets the standard for angled taxiways, and it provides a smooth transition from the runway to the taxiway system; therefore, Taxiway M is planned to remain in its current alignment and geometrical design.

The current critical aircraft for the airport falls into taxiway design group (TDG) 2B with a future TDG of 3. TDG 2B has a width standard of 35 feet, while TDG 3 has a width standard of 50 feet. All taxiways at MKC should have a minimum width of 50 feet; however, two taxiway locations are planned TDG 4, which is 75 feet wide.

Taxiway D between the runway and Taxiway L is of unusual geometry in that its north side is slightly angled, which makes this taxiway wider than standard. The recommendation is for this portion of Taxiway D to be slightly reconfigured at a true 90-degree angle and be maintained at 75 feet in width. The additional width is preferred to accommodate the occasional passage by larger charter aircraft, such as the 757. Taxiway B between Runway 1-19 and Taxiway G is also wider than standard; however, in this location, the 75-foot width is also planned to be maintained to allow for the occasional passage of charter aircraft. All other taxiways are planned to be maintained at their current widths until they need reconstruction, at which time they are planned at 50 feet in width.

HOLD APRON

Busy general aviation airports with high volumes of activity by smaller fixed-wing aircraft should make runup aprons available near the ends of the parallel taxiways for pilots to perform pre-flight checks and engine runups. Airfield capacity is a concern at MKC. The capacity analysis showed that operations represent more than 60 percent of the ASV, which is an important threshold to consider capacity-improving projects. Providing hold aprons can improve capacity; therefore, an examination of the existing hold apron capacity was examined, as well as opportunities to increase hold apron capacity.

The existing hold aprons at the north end of the airfield, which include a small hold apron at the north end of Taxiway L and a larger hold apron at the north end of Taxiway G, are planned to remain in their current locations. There are currently no hold aprons at the south end of the airfield.

The analysis in the alternatives chapter indicated a large hold apron could be placed along Taxiway A between the two runways, and holding aircraft would be clear of any obstacle clearing surfaces; therefore, a new holding apron is planned in this location.

INSTRUMENT APPROACHES

Instrument approach procedures are a set of predetermined approach maneuvers pilots can follow to land at an airport. The procedures outline cloud ceiling minimums and visibility minimums. The lower these minimums are, the more opportunity there is to land, especially in poor weather or visibility conditions. The lowest visibility minimum typically available to general aviation airports is a ½-mile visibility minimum, which requires an approach lighting system and other ground-based equipment, including a localizer and glideslope antenna (referred to as an instrument landing system [ILS]); however, the FAA is not installing new ILS systems, as it is moving toward global positioning system (GPS)-based instrument approaches. Without an approach lighting system, the lowest feasible visibility minimum is ¾-mile.

Table 5C shows the result of the instrument approach analysis, the detail of which is included in **Appendix C**. It is feasible to establish an instrument approach to Runway 1; however, certain mitigating efforts must also be included. Four options were discussed in detail in Chapter Four – Alternatives. Each option requires the approach to be offset by between one degree and 1.5 degrees from a straight-in approach. The analysis also considered three landing threshold scenarios: maintaining the current 300-foot displaced landing threshold, displacing the landing threshold a total of 550 feet, and displacing the landing threshold 650 feet.

Assuming no additional airspace obstacles, such as a new building, it is feasible to obtain cloud ceiling heights of 448 feet and visibility minimums of 1⅜-miles. If a specific building is removed, the minimums can be further lowered to 337-foot cloud ceilings and 1-mile visibility minimums. Several other scenarios would result in even lower visibility minimums. For the purposes of this master plan, an instrument approach with 1-mile visibility minimums will be planned.

TABLE 5C| Runway 1 Instrument Approach Options

Option	Obstacle Status	Retain Current Displaced Landing Threshold of 300' (1.0˚Offset FAC)	Displace Landing Threshold 550' (1.5˚ Offset FAC)	Displace Landing Threshold 650' (1.5˚Offset FAC)
		Cloud Height/Visibility Minimum		
A	No Changes to Obstacles	448' / 1⅜-mile	368' / 1-mile	250' / ¾-mile
B	Weld Building Replaced by 78' AGL Condos	337' / 1-mile	250' / ¾-mile	250' / ¾-mile
C	Eliminate/Reduce Height for On-Ramp Light Poles	448' / 1⅜-mile	455' / 1⅜-mile	250' / ¾-mile
D	Replace Weld Building and Reduce Light Poles	250' / ¾-mile	250' / ¾-mile	250' / ¾-mile

FAC: Final Approach Course

Source: LEAN Technology analysis

Runway 19 has an ILS with ¾-mile visibility minimums, which extends the capability of the airport to times of poor weather conditions. This approach is planned to be maintained.

Runway 4 is also served by an ILS approach with ¾-mile visibility minimums. This instrument approach is extremely important because it allows aircraft to approach and land from the south in poor weather conditions. This approach is planned to be maintained.

Runway 22 has a GPS approach with 1-mile visibility minimums. This approach is adequate and will be maintained.

NAVIGATIONAL AIDS

At busy airports, such as MKC, NAVAIDs can enhance safety. Visual approach slope indicator (VASI) lighting systems serve the approaches to Runways 1, 4, and 22. The VASIs are an older technology and are planned to be replaced with precision approach path indicator (PAPI) lighting systems. Runway 19 is already served by a PAPI system, which will be maintained.

The medium intensity approach lighting system with sequenced flashing lights (MALSF) serving Runway 19 is adequate to serve demand and is planned to be maintained.

Runway end identifier lights (REILs) are available on the Runway 1 and Runway 22 ends. REILs are not available on the Runway 19 end because the approach to this end already has an approach lighting system. The Runway 4 end does not currently have REILs, but provides the most sophisticated approach from the south, and REILs are planned to be added to enhance rapid identification of the landing threshold.

AIRSIDE SUMMARY

The runways are planned to remain in their current configuration. Runway 1-19 is planned to remain 6,827 feet long and 150 feet wide and the RDC will remain D-III-4000. The EMAS at both ends of the runway will remain in place and the declared distances will remain as they are today. This configuration for Runway 1-19 allows the longest runway length feasible in this orientation; as noted, it is still shorter than the optimal length for the critical aircraft.

Runway 4-22 is also planned to remain in its current configuration, measuring 5,050 feet long and 100 feet wide. The RDC will remain B-II-4000. This runway exceeds the minimum applicable design standards because it is a needed secondary runway and Runway 4 provides the most sophisticated instrument approach from the south.

The airfield has three FAA-identified hot spots, one of which is also a RIM location. The preferred development plan provides mitigation measures for all three locations. A CSA was undertaken, and a consensus of technical experts was achieved, regarding preferred alternatives.

Runway 1 is a visual runway. An analysis was undertaken to examine whether an instrument approach procedure could be implemented. The analysis indicated an instrument approach to Runway 1 was feasible. Airport management requested that such an instrument approach be developed and implemented by the FAA.

LANDSIDE CONCEPT

The landside concept includes planning for future hangar needs and various support facilities. As discussed in Chapter Four – Alternatives, planning for additional hangar needs should follow a philosophy of segmenting activity levels. High-activity facilities, such as large conventional hangars

(typically greater than 10,000 square feet), should be co-located and central to the runway system. Medium-activity hangars, such as box or executive hangars, should be located to the sides of or behind the high-activity conventional hangars. Low-activity hangars, such as T-hangars or small individual box hangars, should be located farther to the sides.

It is critical to maximize the developable land at any airport because aviation land is a limited resource; therefore, the recommended concept provides for the reservation of all land immediately adjacent to the runway and taxiway system for aviation purposes.

FUTURE HANGAR DEVELOPMENT

It has been nearly 10 years since any new hangars have been constructed on the airport. The west side general aviation hangars were constructed in 2008. The first portion of the Atlantic FBO hangar was completed in 2010, and the second portion was completed in 2015. Airport management reports that there has been demand for additional hangar space at the airport in those 10 years. A logical location that could support additional hangar development is where the very high frequency omnidirectional range (VOR) facility was located; the VOR was decommissioned and removed in 2021. The Taxiway L extension was completed in 2024 and approximately 20 acres of undeveloped property are now available for hangar development adjacent to Taxiway L.

The facility requirements chapter estimated that a total of 74,600 square feet of new hangar space would be needed over the next 20 years, based on the forecasts. This estimate is a function of new based aircraft growth. MKC is a stop for transcontinental and other itinerant operations. In addition, several current airport businesses would like to either build new facilities or expand current operations. Airport management also indicates a high level of interest from a variety of aviation businesses in developing the Taxiway L parcel; therefore, it is likely that a market exists for the development of more hangar space than the forecasts indicate.

Five potential hangar layouts were presented in the alternatives analysis. Three of the five presented alternatives were not constrained by existing long-term leases. Two of the alternatives were constrained by the existing lease lines. In all five alternatives, the undeveloped parcel was planned for larger executive and conventional hangars, based on the inquiries airport management has received. Alternative 5 (previously detailed on Exhibit 4N) was selected as an example of what might be feasible. The actual development is likely to be different from this specific layout, as the Alternative 5 layout is a concept meant to convey that larger open-span hangars are the preferred hangar type for this area. This layout provides 247,400 square feet of hangar space.

Surface road access to the 20-acre development parcel is planned from an egress point on Lou Holland Drive immediately north of Building/Hangar 8. This location is an existing lease parcel line that the tenant has agreed to allow to be used for the access road.

One potential development possibility for the other areas on the southwest side that are already under lease is shown in the preferred development plan. It includes three T-hangar buildings and several executive hangars on undeveloped land. To the south, several larger conventional hangars are shown as redevelopment of older hangars and buildings. This part of the preferred development plan was originally included on Alternative 4 (Exhibit 4M). This additional development provides approximately 50,000 square

feet of T-hangar space and approximately 148,000 square feet of executive and conventional hangar space. The total new hangar area shown is 445,400 square feet. Only one aircraft hangar (Hangar 9, which encompasses approximately 40,000 square feet) is removed, so more than 400,000 square feet of net new hangar space is available in the southwest area of the airport.

On the east side of the airfield, there is some opportunity for additional infill hangar development. Two executive hangars are shown, each of which is approximately 15,000 square feet. These hangars are shown on an existing parking lot and are on an existing leasehold.

AIRPORT TRAFFIC CONTROL TOWER

The existing airport traffic control tower is aging and does not meet current tower design standards, including compliance with the *Americans with Disabilities Act* (ADA). In the alternatives chapter, four sites were considered for a replacement tower. Any of the four sites would be acceptable for a replacement tower. The existing tower site would also be an acceptable location. For the purposes of this master plan, the existing site will be shown.

The control tower is an FAA-owned and operated facility. Only the FAA can determine the timing for replacement of the tower, as well as the height of the tower. The airport's responsibility is to provide adequate land area for a future replacement tower. If the FAA indicates it plans to build a replacement tower in the future, it will undertake a tower siting study limited to potential sites available at that time.

HANGARS 5A AND 5B

Hangars 5A and 5B, located at the north end of the east side apron, penetrate the Part 77 Primary Surface surrounding Runway 4-22. It is recommended that the primary surface be free of obstructions. These hangars are old and in disrepair and should be razed when they reach the end of their useful lives. Replacement hangars shall not be constructed on this same site.

VERTIPORT

A vertiport is a defined helicopter and advanced air mobility (AAM) landing and departure area. Currently, there is not a dedicated vertiport at the airport. Helicopters utilize various apron areas and runways for arrivals and departures. MKC experiences regular helicopter operations and does not currently need a dedicated vertiport. With the forecast for the addition of more helicopters to the airfield and the possibility of the introduction of AAM aircraft, a time may come when a dedicated vertiport is needed to accommodate demand. One possible vertiport location is shown on the east side apron, which is a low-activity apron area that is primarily used to park large charter aircraft. Other locations, as discussed in the Alternatives chapter, may also be considered. The ALP will not include a specific location for a vertiport at this time. Ultimately, as demand dictates, the airport (or a private developer) may wish to develop a vertiport. At that time, the vertiport should be designed to meet FAA design standards for safety areas and airspace protection and the ALP will need to be updated.

FUEL FARM EXPANSION

There are two primary fuel farms on the airfield: one at the southwest corner and one at the northwest corner of the airfield. Both locations are managed by local FBOs. The facility requirements chapter indicated that there could be a need for additional fuel storage capacity through the long-term planning period. Both existing fuel farm locations have space available for expansion, if needed. Both also have the capability to accommodate new tanks dedicated to alternative fuels, such as unleaded or hydrogen fuel.

In addition, a self-serve fueling system with credit card readers is available in the general aviation apron area. This system is owned and operated by the city and is planned to be maintained.

WASH RACK

Busier general aviation airports often make aircraft wash rack systems available. A wash rack may include a water recovery system and an oil separator to enhance pollution prevention, and provide an environmentally friendly method to contain cleaning fluids. Generally, wash racks are located in proximity to hangar facilities. A location is identified for a wash rack on the preferred development plan; however, other sites may be considered.

ON-AIRPORT LAND USE

Airports provide land for aeronautical uses, first and foremost. If an airport has excess land that is not on a flightline or is not needed for future aeronautical activity, that land may be used for non-aeronautical revenue support. Only one parcel at the airport is currently used in a non-aeronautical function – the old passenger terminal building on the east side, which currently houses an international marketing firm.

Because of the constrained condition of the airport, only two land use designations are necessary: airfield operations and aviation-related development.

The Airfield Operations designation includes those portions of airport property that encompass the major airside elements, such as the runways, taxiways, runway safety area, runway object free area, runway obstacle free zone, runway protection zone (on airport property), taxiway safety area, taxiway object free area, and any NAVAID critical areas. Airfield operations land uses are intended for the safe and efficient movement of aircraft to and from the airfield. This land use designation includes the various object clearing areas, and only elements necessary for aircraft navigation can be located here.

Aviation Related Development includes those areas that should be reserved for development that requires access to the airfield operations area (AOA). Any businesses or tenants that need access to the runway and taxiway system should locate in these areas. Generally, any land adjacent to the runway/taxiway system should be reserved for current and future aviation purposes. All airport property that is not included in the Airfield Operations classification is reserved for aviation-related development.

SUMMARY

The preferred development plan has been developed with significant input from the planning advisory committee (PAC), the public, and technical participants in a comparative safety assessment. The PAC was comprised of a wide range of airport stakeholders, including airport management, FAA personnel, airport tenants, and airport businesses. Several public information workshops were advertised and held to solicit input from the public. The preferred development plan provides the necessary development to accommodate and satisfy anticipated growth over the next 20 years and beyond.

The airfield plan preserves the existing runway orientations and dimensions. EMAS beds at the ends of Runway 1-19 are planned to be preserved to maintain the maximum possible runway length needed to accommodate the critical aircraft. A new instrument approach to Runway 1 was determined to be feasible during the study; however, the FAA will make a final determination. The FAA has been asked to make that determination and implement an instrument approach to Runway 1, which will be a significant improvement to the airport.

With the completion of the Taxiway L extension, a new 20-acre undeveloped parcel is now available for development. This is the first parcel to become available in the last decade at MKC. There is much interest in this parcel, and the preferred development plan shows large executive and conventional hangars for the site because these types of hangars appear to be what is needed to meet demand. Ideas have also been put forth for additional development on land already under lease.

Additional analysis was undertaken that takes into consideration the preferred development plan. An environmental overview is included in **Appendix H**. Off-airport land use compatibility analysis is presented in **Appendix J**. General recommendations for how to address and promote sustainability measures, primarily through a recycling program, are presented in **Appendix K.**

An important outcome of this master plan study is a new Airport Layout Plan (ALP). The ALP set based on the preferred development concept, is presented in **Appendix L**.

The next chapter of this master plan will consider strategies for funding the preferred development plan and will provide a schedule for implementing recommended capital improvements.