DRAFT
Airlake Airport
2035 Long-Term Comprehensive Plan (LTCP)

Narrative Report
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Prepared jointly by the Airport Development, Environment, and Reliever Departments
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ES  EXECUTIVE SUMMARY

ES.1 INTRODUCTION

Airlake Airport is one of seven airports owned and operated by the Metropolitan Airports Commission (MAC). The airport is located in Dakota County, approximately 17 miles south of the Minneapolis–St. Paul International Airport (MSP), 20 miles south of the City of Minneapolis, and approximately 25 miles southwest of the City of St. Paul. It lies within the borders of Eureka Township and abuts the southern border of the City of Lakeville. A small portion of the airport does lie within the City of Lakeville municipal boundary.

Airlake Airport plays an important role in the MAC system of airports and serves to relieve congestion at MSP by attracting general aviation traffic away from this larger airport.

Airlake Airport began operating in 1967 as a privately-owned airfield serving the Airlake Industrial Park. The MAC acquired the airport in 1981 to provide a training facility for conducting general aviation instrument approaches, which had been occurring at MSP Airport.

In 2015, approximately 137 aircraft were based at Airlake Airport. The facility also accommodated approximately 37,000 aircraft operations (takeoffs and landings). It encompasses 595 acres and has one (1) paved runway (Runway 12-30) that is 4,099 feet long and 75 feet wide. The current airport layout is depicted in Figure ES-1.

The most recent Long-Term Comprehensive Plan (LTCP) for Airlake Airport is dated December 2008, with a planning year of 2025 (2025 LTCP). It was prepared by the MAC and approved by the Metropolitan Council. However, none of the recommendations have been implemented. The 2025 LTCP recommended extending the airport's one runway from an existing length of 4,099 feet to 5,000 feet. This plan required rerouting Cedar Avenue - with corresponding land acquisition - and relocation of a township road. As part of the runway extension, the instrument landing system (ILS) approach minimums were proposed to be reduced to ½ mile. This reduction would have required the runway to be widened to 100 feet.

The purpose of the Airlake Airport 2035 Long-Term Comprehensive Plan is to update, as needed, the findings of the 2025 LTCP, and to extend the planning horizon an additional ten years.

An LTCP is an infrastructure planning tool that is updated on a regular basis. It is forward-looking in nature and does not authorize actual construction. The 2035 Airlake Airport LTCP aims to:

- Better accommodate business aircraft needs by maximizing the airfield's operational capabilities and property footprint;
- Maintain or improve Runway Protection Zone (RPZ) land use compatibility;
- Mitigate existing issues with airspace penetrations, such as trees and buildings, to the extent practical; and
• Update the taxiway layout to reflect current industry best practices and thus enhancing airfield safety.

The 2035 plan will provide a “road map” to guide the MAC’s development of Airlake Airport over the next 5-10 years. To accomplish this, the plan will provide updated activity (operations) forecasts, confirm facility needs and refine alternatives identified from the previous LTCP to meet those needs.

ES.2 AIRPORT ROLE

Operating within a diverse system of metropolitan area airports, Airlake Airport’s primary role is to serve personal, recreational, and business aviation users in the southern metropolitan areas of Dakota and Scott Counties. Examples of business services provided at Airlake Airport include flight training, aircraft rentals, charter flights, aircraft management services, and medical flight transportation.

The primary role of Airlake Airport is not expected to change between now and 2035. The Airport’s classification will continue to be that of:

• A Complimentary Reliever in the Metropolitan Airports Commission (MAC) system;
• An Intermediate Airport per Minnesota Department of Transportation/Office of Aeronautics (MnDOT); and
• A Minor Airport per the Metropolitan Council Regional Aviation System Plan.

The aircraft anticipated to use Airlake Airport will continue to range from small single-engine piston airplanes used primarily for personal, recreational, and flight training purposes up to mid-size corporate jets used primarily for business purposes.

Airlake Airport is unique in that it is the only Intermediate-category airport in Minnesota with an Instrument Landing System (ILS) precision instrument approach1.

The proposed 2035 plan does not recommend changing the airport’s role to accommodate larger aircraft or scheduled passenger or cargo flights.

1 A precision instrument approach system that is based on two radio beams which together provide pilots with both vertical and horizontal guidance during an approach to landing.
Figure ES-1: Existing Airport Layout
ES.3 FORECASTS

For this draft LTCP, forecasts were prepared for the number of aircraft based at the airport and for total expected operations.

Forecast calculations take into account assumptions related to the economy, fuel costs, trends in aircraft ownership, trends in general aviation aircraft fleets, and general aviation taxes and fees. The forecasts assume reasonable growth in all of these categories.

For both based aircraft and total operations forecasts, there is a Base Case, a High and Low forecast, and a forecast associated with an Extended Runway. The same forecast approach used for the Base Case was also used for the High and Low scenarios, but alter assumptions related to socioeconomic conditions to reflect either a more aggressive or more conservative outlook. The Extended Runway scenario was prepared to evaluate the potential impact associated with lengthening the runway at Airlake Airport from 4,099 feet to 5,000 feet.

Table ES-1 compares the total number of based aircraft and operations under different scenarios.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Based Aircraft</th>
<th>Total Number of Operations</th>
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<tbody>
<tr>
<td></td>
<td>Base Case</td>
<td>High Range</td>
</tr>
<tr>
<td>2015 (a)</td>
<td>137</td>
<td>137</td>
</tr>
<tr>
<td>2020</td>
<td>135</td>
<td>137</td>
</tr>
<tr>
<td>2025</td>
<td>134</td>
<td>141</td>
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<tr>
<td>2030</td>
<td>133</td>
<td>143</td>
</tr>
<tr>
<td>2035</td>
<td>131</td>
<td>145</td>
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Average Annual Growth Rate

<table>
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<th></th>
<th>-0.2%</th>
<th>0.3%</th>
<th>-0.7%</th>
<th>-0.1%</th>
<th>-0.2%</th>
<th>0.3%</th>
<th>-0.6%</th>
<th>0.2%</th>
</tr>
</thead>
</table>

Notes:
(a) 2015 operations represent twelve months ending June 2015. Includes estimate of nighttime activity.

Sources: HNTB Analysis.

Recent activity levels at Airlake Airport indicate that the number of based aircraft and aircraft operations have started to grow again after stabilizing in 2012. Based on the economic outlook for Dakota and Scott counties, as well as the Seven-County Metropolitan Area, and given projected trends for general aviation, the forecasts predict
a stable (Base Case scenario) to slow growth (Extended Runway scenario) activity levels at Airlake Airport.

The forecast scenarios indicate that future economic growth, fuel prices, technology, and national aviation policy could have a significant impact – either up or down – on the development of general aviation.

Minor fluctuations in activity levels above or below the long-term forecast will not affect the overall recommendations of the LTCP, just possibly how quickly the proposed improvements need to be made.

ES.4 FACILITY REQUIREMENTS

Airside Facilities

Based on forecasts, a future that includes an extended runway at Airlake Airport would provide facilities for regular use by small to mid-size aircraft used for business aviation purposes that weigh more than 12,500 pounds but less than 60,000 pounds. This family of aircraft is best represented by the Cessna Citation III/650 business jet.

Based on guidance from the Federal Aviation Administration (FAA) regarding runway length, Airlake Airport’s runway should be approximately 4,700 feet if it is to accommodate most of the aircraft designed for the runway at a 60 percent useful load\(^2\). Adjusting for effective runway gradient during takeoff operations or wet and slippery conditions during landing operations, yields a suggested runway length of 4,800 to 5,400 feet for takeoff and landing, respectively.

However, Minnesota Statutes Section 473.641, Subdivision 4 prohibits the MAC from extending runway lengths at its minor airports (like Airlake Airport) beyond 5,000 feet without prior legislative authorization. Thus, the maximum feasible runway length at this time is 5,000 feet.

While the FAA’s guidance serves as a good baseline, detailed information related to runway length requirements can be derived from aircraft manufacturer performance charts. An assessment of these charts for several aircraft types expected to operate at Airlake Airport suggests that, while a length of 5,000 feet would be ideal, a runway that is less than 5,000 feet but more than 4,099 feet could yield significant operational benefits and enhance the airfield’s utility for business operators.

As for runway width, the FAA requires a minimum of 75 feet for runways with \(\frac{3}{4}\) mile or more visibility. Runway 12-30 is currently 75 feet wide. An increase in width to 100 feet would only be justified if the runway’s visibility minimums were to decrease to below \(\frac{3}{4}\) mile. Unlike in the 2025 plan, this plan does not include a recommendation to upgrade the instrument approach capabilities to provide minimums of less than \(\frac{3}{4}\) mile.

Runway grooving could also be considered to improve friction and braking performance when the runway is wet, particularly given the shortened landing distance available on Runway 30 due to its displaced threshold.

\(^2\) Useful load is defined as the aircraft maximum takeoff weight minus the aircraft empty weight. An aircraft’s useful load can be used to transport either fuel or payload (passengers, baggage, and/or cargo).
The Runway 12-30 alignment provides adequate wind coverage during all weather conditions. Therefore, the addition of a crosswind runway is not justified at Airlake Airport.

From an airspace perspective, train cars on the railroad track along the west side of the Airport penetrate the Runway 12 airspace obstacle clearance surfaces. While this falls into a low risk category it will still require long-term mitigation. A proposed interim solution is the installation of a new Precision Approach Path Indicator (PAPI) system on Runway 12. This would provide a clear obstacle clearance surface over the railroad tracks. From a longer-term perspective, the most comprehensive solution is to displace the Runway 12 threshold by an additional 120 feet to provide the necessary clearance over the railroad tracks. This displacement will be considered as an element of the preferred airfield development concept.

Landside Facilities
Airlake Airport currently has one primary hangar storage area (North Building Area) on the northeast side of the airport that provides approximately 136 indoor aircraft storage spaces. This number includes an assumption that some, but not all, airport tenants sublease extra space for additional aircraft within their hangar.

According to the aviation activity forecast results, the number of based aircraft is anticipated to decline slightly through 2035. By 2035, the number of based aircraft is forecasted to be between 131 and 135 aircraft in the Base Case and Extended Runway scenarios, respectively.

It appears that nearly all available hangar capacity at Airlake Airport is occupied today and will continue to be so throughout the planning horizon. In addition, there could be demand for construction of certain hangar types and/or sizes that are not currently available. Once utilities are established, it is envisioned that construction of new hangars will occur in the South Building Area. It is important to note that including additional hangar space in this LTCP is not a commitment to build or fund such a development.

The existing Fixed Base Operator (FBO) apron is relatively small and often congested. According to the activity forecasts, peak-hour operations at Airlake Airport could increase to 28 within the planning period. Assuming that 60% of these aircraft are itinerant, the apron should be sized to accommodate approximately 17 aircraft simultaneously. To accommodate this number of aircraft, the apron size at Airlake Airport should be approximately 14,700 square yards. The existing apron area is approximately 9,400 square yards, approximately 5,300 square yards below this recommendation.

The existing MAC Maintenance facility is in good condition, particularly after the improvements made to it in 2014, and provides adequate capacity to accommodate newer-generation snow removal equipment that in many cases are longer and taller than older models. According to a recently-completed building assets report, the facility will require just over $1,000,000 of renewal investments through 2035.

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3 A displaced threshold directs pilots to land further down a runway – allowing them to stay higher in the air longer - than typical so as to avoid obstacles associated with landing at the closer approach end of a runway.
ES.5 ALTERNATIVES ANALYSIS

The 2025 LTCP for Airlake Airport was finalized in December 2008 and evaluated several concepts for future airfield improvements:

- Leave the airport as is with only hangar area development;
- Leave the runway length as is but reduce the ILS approach minimums to 1/2 mile visibility, with hangar area development; and,
- Extend Runway (12-30) from 4,099 feet to 5,000 feet, with hangar area development.

After reviewing all of the concepts, costs, benefits and negative considerations, the preferred alternative formally adopted by the Commission for the Airlake Airport in December 2008 was to:

- Construct new hangar area to accommodate the 2025 needs;
- Extend Runway 12-30 and Taxiway A to 5,000 feet, including runway lighting and PAPI systems;
- Reduce the ILS approach minimums to ½ mile, including runway widening and runway light relocation; and
- Reconstruct the existing runway pavement.

The runway extension contemplated in the 2025 LTCP study identified that Cedar Avenue would be impacted and realigned around the relocated runway end. Although the runway extension and roadway realignment were not imminent, the owners of currently undeveloped property along Cedar Avenue desired to know the future alignment in order to consider it in their property development plans. Since a State Environmental Impact Statement (EIS) is required by state law for a runway length of 5,000 feet or longer, an EIS Final Scoping Decision Document was completed by MAC in 2011 to establish a vision for the corridor needed to relocate Cedar Avenue around the extended runway end and account for its future expansion into a four lane divided highway without negatively impacting the Vermillion River. The Vermillion River and its associated wetlands are located approximately ½ mile south of the airport and the river is a DNR-protected trout stream tributary. The current river bridge crossing would be used in order to limit the impacts on the river. The estimated cost to relocate Cedar Avenue and 225th Street was between $5.9 and $6.8 million in 2010 dollars, not including property acquisition costs.

The 2025 LTCP Preferred Alternative concept is shown in Figure ES-2.

The FAA issued a memorandum for Interim Guidance on Land Uses within an RPZ dated September 27, 2012. This memorandum clarifies the FAA’s current position on allowable land use compatibilities within the RPZ. The memorandum describes the coordination and processes that are required to determine whether new or modified land uses in the RPZ are allowable. Included within the process is a comprehensive alternatives analysis that assesses the benefits, costs, and implications of the alternatives.

The recommended development plan from the 2025 LTCP to extend the runway to a length of 5,000 feet would realign both Cedar Avenue and 225th Street through the
relocated RPZ, which would represent a triggering event to necessitate an RPZ Alternatives Analysis under the current FAA guidance. With the 2025 LTCP plan, MAC staff believes that FAA would expect the realignment of Cedar Avenue completely around the outside of the RPZ as an alternative, along with justification as to why that option is or is not feasible.

Relocating Cedar Avenue completely outside the extended runway RPZ to comply with FAA guidance would be an extensive undertaking. A high-level review suggests that the cost for this relocation would be upwards of $16,000,000, not including the nearly 40 acres of property acquisition that would be required for right-of-way. For context, relocating the railroad and Highview Avenue on the west side to clear the Runway 12 RPZ are costly propositions as well – approximately $5,000,000 for the railroad and $1,500,000 for Highview Avenue.

In addition, the FAA has issued new or clarified guidance on several matters pertinent to the airfield configuration at Airlake. The previous LTCP Preferred Alternative does not account for the following FAA guideline changes:

- The Alternative did not address the Railroad penetration to the Runway 12 airspace obstacle clearance surfaces and may introduce new penetrations to other approach/departure surfaces; and
- Based upon the update to the FAA’s Airport Design Advisory Circular (AC), there are taxiway geometry issues that need to be addressed to comply with current industry best practices.

Given the extensive costs and community disruption required to implement the previous plan, this LTCP takes a fresh look at some available options to provide additional runway length that do not require changes to RPZ locations or require moving Cedar Avenue, Highview Avenue, or the railroad track. These options are described below.

**Provide Stopways for Runway 12-30**

Pavement designated as stopway can be considered as useable length for decelerating an aircraft during an aborted takeoff. Stopway pavement can be used for accelerate-stop distance calculations, but not for other takeoff or landing distance calculations.

Providing stopways on both ends of Runway 12-30 may allow some aircraft to depart at a higher takeoff weight when accelerate-stop distance is a limiting factor, and would promote safety by formally making this pavement available for use in the event of an aborted takeoff attempt. Stopways do not change the published runway length.

By providing stopways, the accelerate-stop distance would increase to approximately 4,400 feet for Runway 30 and nearly 4,600 feet for Runway 12. The published runway length would remain as 4,099 feet. Providing stopways would include the addition of stopway edge lighting (red unidirectional lights), relocating the existing runway threshold lights to be outboard of the pavement footprint, and grading the Runway Safety Area (RSA) beyond the stopway ends.
While this concept would provide an improvement over the existing condition, it would have limited usefulness for the majority of operators at the airport for whom accelerate-stop distance is not typically a limiting factor. This concept is shown in Figure ES-3.

**Extend Runway 12-30 with Declared Distances**

Another concept evaluated for the 2035 LTCP proposes to use declared distances to maximize runway length for existing users in a manner that does not require the relocation of Cedar Avenue on the east side of the airfield, or Highview Avenue and the railroad track on the west side.

This concept considers runway extensions of 271 feet on the Runway 12 end and 480 feet on the Runway 30 end – the maximum extensions that can be provided while meeting all Runway Safety Area (RSA) and Runway Object Free Area (ROFA) standards. The published runway length would be 4,850 feet. Declared distances would be applied and published, meaning that not all of the published pavement would be available for landing and takeoff movements in each direction. Taxiway extensions would be added to the ends of the extended runway pavement.

In this case, the runway extensions would be available for all aircraft beginning the takeoff roll or completing the landing rollout. It would also be available to accommodate accelerate-stop distance requirements. The existing Runway 30 displaced landing threshold would not change. The end result would be an 872-foot displaced threshold and no change to the existing approach RPZ location.

Similarly, to avoid moving the departure RPZs off each end, declared distances will be used so that the designated end of takeoff run distance does not change from the existing condition. This will result in the designated takeoff run distance ending before the physical end of the pavement in the direction of the takeoff roll.

The existing roads that traverse the Runway 30 RPZ – Cedar Avenue and 225th Street – predate the FAA’s current RPZ compatibility guidance. The FAA’s guidance only addresses the introduction of new or modified land uses to an RPZ and proposed changes to the RPZ size or location. Under this guidance, the existing roads are acceptable to remain in the RPZ as an existing condition. The triggering action for having to consider removing Cedar Avenue from the RPZ would be when the roadway needs to be widened or otherwise expanded to provide additional capacity. Based on existing and projected future traffic levels, there is no current plan to widen or expand the capacity of this section of Cedar Avenue within the planning period. Rehabilitation of the existing roadway footprint would not constitute a triggering event for an RPZ analysis.

In order to clear the Part 77 Primary Surface, a portion of 225th Street would have to be relocated to a new intersection with Cedar Avenue. New turn lanes would be constructed on Cedar Avenue to serve the intersection.

As noted, this alternative does not provide 5,000 feet of runway length, but provides nearly 4,600 feet of takeoff run distance and 4,850 feet of accelerate-stop distance for Runway 30. In the Runway 12 direction, it provides nearly 4,400 feet of takeoff run distance but preserves 4,850 feet for accelerate-stop.
An assessment of available aircraft performance chart data, along with input from users, confirms that while 5,000 feet of runway would be ideal, even a lesser improvement in available runway length could yield significant operational benefits and enhance the airfield’s utility for corporate operators. This concept is shown in Figure ES-4.

**Taxiway Configurations**
For the 2035 LTCP, the following taxiway changes are being considered:

- Relocate the western-most apron access taxilane to eliminate direct access from the apron to the runway;
- Adjust hold position markings on connector taxiways to be 200 feet from the Runway 12-30 centerline to provide more space to hold on the connectors and install Precision Obstacle Free Zone (POFZ) hold position markings and signs on Taxiway A near the Runway 30 end;
- Install lighting on Taxiway A to promote situational awareness during low-visibility conditions. In addition, the installation of runway guard lights, enhanced centerline markings, and/or surface painted markings at select locations may help to further mitigate the risk of pilot confusion and incursion potential.

**Apron Expansion**
An expansion to the existing FBO apron to better accommodate existing and future itinerant aircraft activity appears warranted. The existing apron has an estimated deficiency of approximately 5,300 square yards. The costs for expanding the apron would be borne by the tenant.

Expanding the existing apron further to the northwest is constrained by the existing protected trout stream buffer area. However, as a first phase, the apron could be expanded approximately 45 feet towards the stream while still retaining the required 50-foot stream buffer. This would yield approximately 1,000 square yards of additional apron area for aircraft storage. Any subsequent apron expansion would require relocating the stream or enclosing an additional section of it in a culvert and expanding the apron over the top. This would require coordination with and approvals from the appropriate water quality agencies, including the Vermillion River Watershed Joint Powers Organization (VRWJPO), U.S. Army Corps of Engineers, DNR, Dakota County Soil and Water Conservation District, and the City of Lakeville.

If expansion of the existing apron to the west is not feasible beyond the first phase described above, another potential site for additional apron area is adjacent to the access taxiways in the South Building Area. This site offers the most flexibility and least number of constraints to construct an efficient apron. However, it would require crossing Runway 12-30 to travel between the FBO and the apron. Also, there is no existing landside access to this site, so all vehicular traffic to the apron would have to cross the airfield until landside access via 225th Street is provided. Alternatively, an airfield access roadway around the Runway 12 end could be considered to minimize runway crossings.
2035 LTCP Preferred Alternative Summary
The 2035 LTCP Preferred Alternative for airfield improvements at Airlake Airport includes the following items:

- Displace Runway 12 threshold to provide airspace clearance over railroad tracks.
- Extend Runway 12-30 with declared distances to maximize overall airfield utility for existing users in a manner that does not require the relocation of Cedar Avenue or the railroad tracks.
- Taxiway configuration changes noted above.
- Apron Expansion area to better accommodate itinerant aircraft.

This recommendation does not preclude the eventual extension of Runway 12-30 to 5,000 feet as recommended in the 2025 LTCP. The appropriate time to evaluate the need for an extension to 5,000 feet will be when Dakota County proposes to widen or otherwise improve the section of Cedar Avenue that runs through the Runway 30 Runway Protection Zone (RPZ).

Finally, it is important to note that the LTCP is a planning document and does not authorize any construction. Adoption of the LTCP is only the first step in the project implementation process. Before any construction can begin, the project(s) must first be evaluated through an environmental review process and then compete for funding through Federal Aviation Administration and/or State grant programs. In order to compete effectively for funding, the project(s) must have solidly documented justification. Once funding is secured, final project engineering and design will take approximately one year to complete. Based on this timeline, it is feasible that construction could occur sometime during the 2022-2023 timeframe (subject to change).
Figure ES-2: 2025 LTCP Preferred Development Alternative
Figure ES-3: Runway 12-30 Stopway Concept
Figure ES-4: Extended Runway 12-30 with Declared Distance Concept
ES.6 ENVIRONMENTAL CONSIDERATIONS

Prior to any construction taking place, the MAC will complete an Environmental Assessment (EA) and/or an Environmental Assessment Worksheet (EAW) in compliance with state statutes and FAA requirements for utilizing Airport Improvement Program (AIP) grant funds.

Noise

To evaluate potential aircraft noise impacts associated with the 2035 LTCP Preferred Development Alternative, the MAC prepared Baseline Condition noise contours for Airlake Airport, along with 2035 Final Preferred Alternative Condition noise contours for comparison. The contours represent noise levels, expressed in the Day-Night Average Sound Level (DNL) metric. The FAA requires the DNL noise metric for determining and analyzing noise exposure to aid in the determination of aircraft noise and land use compatibility issues around United States airports.

The FAA suggests three different DNL levels (65, 70, and 75 DNL) be modeled but considers the 65 dB DNL contour line as the threshold of significance for noise impact. As such, sensitive land use areas (e.g., residential) around airports that are located in the 65 dB or greater DNL contours are considered by the FAA as incompatible.

The Metropolitan Council suggests that the 60 DNL contour be included for airports in an urban environment and the 55 DNL in cases where airports are located outside the Metropolitan Urban Service Area (MUSA). Currently, Airlake Airport lies outside of the MUSA, so the 55 DNL noise contour will be shown for advisory purposes. However, it is not linked to any requirements for noise attenuation or mitigation.

In summary, when the 2035 Preferred Alternative Condition contours are compared to the Baseline (existing) Condition contours:

- For the 65 DNL contour, the acreage contained within the contour increases by 60 acres, with no residential parcels contained in the contour under either condition. The 65 DNL contour is contained on airport property in the Baseline Condition, but extends off airport property in the 2035 Preferred Alternative Condition. This change is largely due to the increased flight activity forecasted in 2035.

- For the 60 DNL contour, the acreage contained within the contour increases by 148 acres, with no residential parcels contained in the contour under either condition. The 60 DNL contour extends off airport property in both conditions. Again, this change is largely due to the increased flight activity forecasted in 2035.

- For the 55 DNL contour, the acreage contained within the contour increases by 422 acres, with no residential parcels contained in the contour under either condition.

The 2035 LTCP Preferred Alternative noise contours are shown in Figure ES-5. A comparison of the Baseline and 2035 Preferred Alternative Condition noise contours is shown in Figure ES-6.
Figure ES-5: 2035 Preferred Alternative Noise Contour
Figure ES-6: Noise Contour Comparison
**Drainage**

Airlake Airport lies within the Vermillion River Watershed, which is managed by the Vermillion River Watershed Joint Powers Organization (VRWJPO). While the Vermillion River is located approximately one-half mile south of Runway 30, one of its tributaries runs directly through airport property. This channel is named the South Tributary of South Creek. It is a designated trout stream. In 1998 when the grading for a new building area was started south of the runway, this intermittent stream was relocated via a permit from the Department of Natural Resources (DNR). The tributary still exists on airport property, but now routes around a new detention basin for storm water runoff from the future building area. The detention pond is intended to allow an area for infiltration of storm water versus direct runoff into the stream.

**Municipal Utilities**

The majority of Airlake Airport currently lies outside the city limits of Lakeville, with the exception of the area immediately surrounding the FBO facilities. Therefore, the majority of the airport does not have municipal services available for sanitary sewer or water. The MAC maintenance building and the FBO were connected to the city system many years ago, and are billed directly from the City. When these buildings were connected to the system, stubs for both the watermain and the sanitary sewer were extended to the south under the runway. In 1990, a watermain pipe was allowed by the City to be extended into the North Building Area as a fire protection line. There are no private services off of this line. It serves only fire hydrants. In 1994, this fire protection watermain line was extended when the building area was expanded.

Existing tenants that have legal wells and septic holding tanks have been allowed to keep them. The MAC maintenance building also has a well and holding tank. Tenants with illegal sandpoint wells or drain fields were required to remove or abandon them after MAC adopted its Sanitary Sewer and Water Policy in 1998, and subsequent revision in October 2000. Consistent with that policy, no new wells or holding tanks have been allowed at the airport. Once utilities are established, it is envisioned that construction of new hangars will occur in the South Building Area.

The installation of domestic water and sanitary sewer utilities to areas not within the Lakeville city boundary, including the future South Building Area, will not be feasible until the airport is annexed into the City of Lakeville or a Joint Powers or Cooperative Agreement is established for the extension of utilities beyond the Lakeville city boundary. Discussions about the process and timeline for extending utilities to areas not currently within the Lakeville city boundary are underway between MAC, Lakeville, and Eureka Township.

**Other Environmental Considerations**

The MAC will conduct an environmental review per federal National Environmental Policy Act (NEPA) and Minnesota Environmental Policy Act (MEPA) requirements to more specifically identify the environmental footprint of the proposed improvements before construction can begin. During this process, alternatives must be reviewed and any potential impacts must be avoided if possible. If impacts cannot be avoided, they must be minimized to the extent possible and mitigated in full compliance with federal and state requirements.
The following impact categories will be assessed during the environmental review:

- Air Quality;
- Biological resources (including fish, wildlife, and plants);
- Climate;
- Department of Transportation Section 4(f) Properties (park and recreational lands, wildlife and waterfowl refuges, and historic sites);
- Farmlands;
- Hazardous materials, solid waste, and pollution prevention;
- Historical, architectural, archeological, and cultural resources;
- Land use;
- Natural resources and energy supply;
- Noise and compatible land use;
- Socioeconomics, environmental justice, and children’s environmental health and safety risks;
- Visual effects (including light emissions);
- Water resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers);
- Construction impacts; and
- Cumulative effects.

An environmental review process cannot begin until there is a sufficiently detailed plan available to evaluate. MAC envisions initiating the environmental review for the proposed Airlake Airport improvements soon after the plan is reviewed by the Metropolitan Council and formally adopted by the MAC Board. A full study of these environmental impact items at this time falls outside the scope of this long-term planning document.

**ES.7 LAND USE COMPATIBILITY**

The proposed improvements at Airlake Airport will result in changes to the noise contour (described in Section ES.6), along with the locations of the Model State Safety Zones, which are described below.

The State of Minnesota Department of Transportation, Office of Aeronautics (MnDOT) has established regulations that control the type of development allowed off runway ends in order to prevent incompatible development. These guidelines are meant to be used to establish zoning ordinances to protect areas around an airport.

The most restrictive areas created by MnDOT regulations are called Safety Zones A and B. The recommended safety zones should exist off each runway end and follow the approach zones out to the total length of the respective runway. The length of Safety Zone A is 2/3 of the total runway length; Safety Zone B is 1/3 of the total runway length and extends from Safety Zone A. There is also an area called Safety Zone C, which is a
Airlake Airport’s future development plan is finalized, and the process to update the state’s airport zoning regulations is complete, MAC intends to establish a Joint Airport Zoning Board (JAZB) that will include the respective Responsible Governmental Units that control land use development around Airlake Airport. Through a collaborative process, the JAZB will seek to develop an Airport Zoning ordinance, in accordance with state statutes and administrative rules, that considers land uses around Airlake Airport to achieve a balance between providing a reasonable level of public safety and facilitating compatible off-airport development.

For this report, the existing MnDOT models for the size and shape of State Safety Zones A and B were used for the purpose of analyzing land use compatibility. The sizes, shapes and/or locations of these zones may be revised by the JAZB during development of the Airport Zoning Ordinance for Airlake Airport. However, it should be noted that these zones are not currently in effect at Airlake Airport.

In summary, when the 2035 Preferred Alternative Condition is compared to the Baseline Condition from a land use compatibility perspective:

- The Baseline Condition RPZs and the 2035 Preferred Alternative RPZs both have 1.2 acres off-airport property – a change of less than 0.1 acres. As a result of displacing the Runway 12 landing threshold to mitigate airspace penetrations, approximately 0.1 acres of off-airport property would be introduced into the Approach RPZ. This includes additional sections of 220th Street and Highview Avenue being introduced into the RPZ, along with a small section of an off-airport truck staging lot associated with an adjacent industrial land use.

- The Baseline Condition Model State Safety Zones have 79.1 acres of off-airport property, while 188.7 acres are off-airport property in 2035 Preferred Alternative Condition – an increase of 109.6 acres.

- Existing land uses surrounding Airlake Airport are compatible with both the Baseline and 2035 Preferred Alternative Condition and the resultant aircraft operations considering airport noise impacts as outlined in the FAA and Metropolitan Council guidelines.

**Figure ES-7** shows the 2035 Preferred Alternative RPZs, Model State Safety Zones, and Noise Contours over planned future land use data. A comparison of the Baseline and
2035 Final Preferred Alternative RPZs, Model State Safety Zones, and Noise Contours is shown in Figure ES-8.
Figure ES-7: 2035 Preferred Alternative RPZs, Model State Safety Zones, and Noise Contours
Figure ES-8: Baseline to 2035 Preferred Alternative RPZ, Model State Safety Zone, and Noise Contour Comparison
ES.8 IMPLEMENTATION PLAN

The LTCP is a planning document and does not authorize construction. Adoption of the LTCP is simply the first step in the project implementation process. Before any construction can begin, the project(s) must first be depicted on an approved Airport Layout Plan (ALP), evaluated via an environmental review process, and then compete for funding through FAA and/or State grant programs. Once funding is secured, final project engineering and design will take approximately one year to complete with contractor bidding and construction following thereafter.

Near-Term Development encompasses the project elements necessary to maintain the existing facility within the next five years.

MAC maintains an ongoing Capital Improvement Program (CIP) which assigns projects to a given year, currently looking out to 2023. Projects in the current CIP include:

- Runway 12 Precision Approach Path Indicator (PAPI) system and Hangar Obstruction Light installations in 2017; and
- Materials Storage Building construction in 2018; and
- MAC Maintenance Building improvements in 2019; and
- Public Restroom Facility and Aircraft Wash Pad construction in 2019; and
- South Building Area Development - Phase 1 in 2020.

However, these timelines may vary according to the environmental review process and availability of funding sources.

Mid to Long-Term Development encompasses the project elements necessary to extend Runway 12-30 and make the other recommended airfield improvements. It is anticipated that this development may occur in the 6-20 year timeframe. The current CIP includes projects to reconstruct and extend Runway 12-30 in 2022.

A combination of traditional airport funding sources and financing mechanisms including federal Airport Improvement Program (AIP) grants, state Airport Construction Program grants, and local MAC monies could be used to fund implementation of the Preferred Alternative. It is anticipated that a majority of the funding would come in the form of AIP discretionary grants, which are awarded to airports on the basis of priority and available funding.

Project cost estimates for the 2035 Preferred Alternative are summarized in Table ES-2.
<table>
<thead>
<tr>
<th>Item #</th>
<th>Project Element</th>
<th>Estimated Cost</th>
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<tbody>
<tr>
<td>1</td>
<td>Runway 12 PAPI and Hangar Obstruction Lights</td>
<td>$150,000</td>
</tr>
<tr>
<td>2</td>
<td>Materials Storage Building</td>
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<td>3</td>
<td>MAC Building Improvements</td>
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<td>4</td>
<td>Public Restroom Facility and Plane Wash Pad</td>
<td>$450,000</td>
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<tr>
<td>5</td>
<td>South Building Area Development - Phase 1</td>
<td>$3,200,000</td>
</tr>
<tr>
<td></td>
<td><strong>Near-Term Development Total:</strong></td>
<td><strong>$4,400,000</strong></td>
</tr>
<tr>
<td>6</td>
<td>Reconstruct Existing Runway 12-30</td>
<td>$2,150,000</td>
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<td>7</td>
<td>Runway 12-30 Extension and Associated Taxiways, including electrical</td>
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<td>8</td>
<td>Relocate 225th Street</td>
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</tr>
<tr>
<td>9</td>
<td>South Building Area Development - Phase 2</td>
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<td>10</td>
<td>Expand FBO Apron (Tenant Cost)</td>
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<tr>
<td>11</td>
<td>Hangar Development (Tenant Cost)</td>
<td>---</td>
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<tr>
<td>12</td>
<td>Obstacle Removal</td>
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<td></td>
<td><strong>Mid/Long-Term Development Total:</strong></td>
<td><strong>$9,200,000</strong></td>
</tr>
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**Total Development Cost:** $13,600,000

Notes: Cost estimates reflect 2017 pricing and include engineering costs and contingencies.

Source: SEH and MAC cost estimates

This summary provides a guide for the MAC when planning the CIP, which is updated on an annual basis. Costs for Reliever Airport projects must be programmed carefully to ensure all necessary funding is available. Those projects that will be eligible for federal or state funding will be placed in years when the opportunity to receive such funds is greatest. Projects that are not eligible for federal or state funds must have other funding sources identified prior to implementation.

**Figure ES-9** illustrates the next steps for the planning and project implementation process, including at what points additional approvals are needed and at what points public feedback will be solicited.
Figure ES-9: Planning and Project Implementation Process
ES.9 PUBLIC INVOLVEMENT PROCESS

In order to fulfill a Guiding Principle related to Stakeholder and Community Engagement, a series of meetings have been conducted throughout the development of the 2035 LTCP for Airlake Airport.

Initial stakeholder outreach efforts involved meeting with partner agencies, municipal representatives, and airport tenants before the draft LTCP report was finalized in order to provide information about the plan’s purpose, process, preliminary findings, and timeline.

Initial stakeholder outreach meetings are listed in Table ES-3.

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<thead>
<tr>
<th>Audience</th>
<th>Materials Covered</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
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<td>FAA, MnDOT, Met Council</td>
<td>LTCP Review of Runway Alternatives</td>
<td>4/13/2016</td>
<td>FAA</td>
</tr>
<tr>
<td>Tenants/Users, Agencies</td>
<td>Proposed Airfield Configuration</td>
<td>9/8/2016</td>
<td>Airport</td>
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<tr>
<td>Civil Air Patrol</td>
<td>Operational Assessment (full day facilitated panel)</td>
<td>10/11/2016</td>
<td>Airport</td>
</tr>
<tr>
<td>MAC Reliever Advisory Council</td>
<td>LTCP Process, Review of Alternatives, Preliminary Findings</td>
<td>3/14/2017</td>
<td>MAC</td>
</tr>
<tr>
<td>Municipal Planners (City, County, Township)</td>
<td>LTCP Process, Review of Alternatives, Preliminary Findings</td>
<td>3/27/2017</td>
<td>Lakeville City Hall</td>
</tr>
<tr>
<td>MAC PD&amp;E Committee</td>
<td>LTCP Process, Review of Alternatives, Preliminary Findings</td>
<td>5/1/2017</td>
<td>MAC</td>
</tr>
</tbody>
</table>

The second phase will consist of the formal public review period after the draft plan has been completed and the MAC Board has approved it for public distribution. This public review period will include a 45-day written comment period with two public information meetings scheduled during this timeframe.

The third phase will occur after the public comment period closes. During this time, public feedback will be considered and incorporated into the plan as appropriate. The end result will be a final draft LTCP for Commission adoption and Metropolitan Council formal review. During this time, stakeholder outreach will continue to occur on an as-needed basis.
SECTION 1:

INTRODUCTION AND BACKGROUND
1. INTRODUCTION AND BACKGROUND

1.1 OVERVIEW

The Metropolitan Airports Commission (MAC) was created in 1943 by the Minnesota Legislature to promote air transportation in the seven-county metropolitan area. The MAC’s 15-member board of commissioners, which sets the MAC’s policies, consists of 13 appointments by Minnesota's Governor and one appointment each by the mayors of Minneapolis and St. Paul. The MAC’s policies are implemented by the MAC’s Executive Director/Chief Executive Officer and staff.

Airlake Airport is one of seven airports owned and operated by the MAC (Figure 1-1). The airport identifier is LVN. The airport is located in Dakota County, approximately 17 miles south of the Minneapolis–St. Paul International Airport (MSP), 20 miles south of the City of Minneapolis, and approximately 25 miles southwest of the City of St. Paul. It lies within the borders of Eureka Township and abuts the southern border of the City of Lakeville. A small portion of the airport does lie within the City of Lakeville municipal boundary. County Road 23, otherwise known as Cedar Avenue, runs along the eastern border of the airport, and 220th Street W. borders the airport on the north. The south boundary is set by 225th Street W., and both Highview Avenue and railroad tracks run on the western side of the airport. MAC does own property to the east of County Road 23/Cedar Avenue and to the west of the railroad tracks as approach protection. (Figure 1-2). Airlake Airport consists of approximately 595 acres of land.

Airlake Airport plays an important role in the MAC system of airports and serves to relieve congestion at MSP by attracting general aviation traffic away from this larger airport.

Airlake Airport began operating in 1967 as a privately-owned airfield serving the Airlake Industrial Park. The MAC acquired the airport in 1981 to provide a training facility for conducting general aviation instrument approaches, which had been occurring at MSP Airport.

MAC prepared a Comprehensive Development Plan for Airlake Airport in 1989, and then updated it with a Long-Term Comprehensive Plan (LTCP) in 1997. Since a full plan had been prepared in 1989, the 1997 document focused only on updating the aviation forecasts and facility requirements for the airport, including some analysis of environmental related issues of noise and water quality.

The most recent Long Term Comprehensive Plan (LTCP) for Airlake Airport is dated December 2008, with a planning year of 2025 (2025 LTCP). It was prepared by the MAC and approved by the Metropolitan Council. However, none of the recommendations have been implemented. The 2025 LTCP recommended extending the airport’s one runway from an existing length of 4,099 feet to 5,000 feet. This plan required rerouting Cedar Avenue - with corresponding land acquisition - and relocation of a township road. As part of the runway extension, the instrument landing system (ILS) approach minimums were proposed to be reduced to ½ mile. This reduction would have required the runway to be widened to 100 feet.
The purpose of the Airlake Airport 2035 Long-Term Comprehensive Plan is to update, as needed, the findings of the 2025 LTCP, and to extend the planning horizon an additional ten years. The LTCP is an infrastructure planning tool updated on a regular basis. It is forward-looking in nature, and does not authorize actual construction.

The 2035 plan will provide a “road map” to guide the MAC’s development of Airlake Airport over the next 5-10 years. To accomplish this, the plan will provide updated activity (operations) forecasts, confirm facility needs and refine alternatives identified from the previous LTCP to meet those needs.

A glossary of terms used throughout this report is provided in Appendix 1.

1.2 GUIDING PRINCIPLES

Guiding principles establish a foundation for and parameters against which planning-related decisions are evaluated. These principles provide focus and direction in formulating a recommended development plan – in this case, for Airlake Airport. The principles also act as a high-level explanation of the purpose and objectives of the planning process.

By nature, these guiding principles are dynamic and may be adjusted over time.

Airport Role

Operating within a diverse system of metropolitan area airports, Airlake Airport’s primary role is to serve personal, recreational, and business aviation users in the south metropolitan areas of Dakota and Scott Counties. Examples of business services provided at Airlake Airport include flight training, aircraft rentals, charter flights, aircraft management services, and medical flight transportation.

The primary role of Airlake Airport is not expected to change between now and 2035. The Airport’s classification will continue to be that of:

- A Complimentary Reliever in the Metropolitan Airports Commission (MAC) system;
- An Intermediate Airport per Minnesota Department of Transportation/Office of Aeronautics (MnDOT); and
- A Minor Airport per the Metropolitan Council Regional Aviation System Plan.

The aircraft anticipated to use Airlake Airport will continue to range from small single-engine piston airplanes used primarily for personal, recreational, and flight training purposes up to mid-size corporate jets used primarily for business purposes.

The proposed 2035 plan does not recommend changing the airport’s role to accommodate larger aircraft or scheduled passenger or cargo flights.
**Airport Infrastructure**

Key airfield improvement objectives for Airlake Airport are to:

- Better accommodate business aircraft needs by maximizing the airfield’s operational capabilities and property footprint;
- Maintain or improve Runway Protection Zone (RPZ) land use compatibility;
- Mitigate existing issues with airspace penetrations, such as trees and buildings, to the extent practical; and
- Update the taxiway layout to reflect current industry best practices and thus enhancing airfield safety.

The planning process will ensure proposed airfield development conforms to Federal Aviation Administration (FAA) and MnDOT regulations, design standards, and system plans to the extent practical and feasible.

Wherever prudent, development plans will make use of existing facilities through renewal, modernization and/or infill development.

**Stakeholder and Community Engagement**

The planning process will seek to foster consensus among stakeholders, including tenants and users, the FAA, MnDOT, the Metropolitan Council, the Metropolitan Airports Commission, and local governmental bodies.

Airport development and maintenance plans should consider the objectives of local governmental bodies, including partnering with these bodies to promote regional economic development and local land use compatibility.

The planning process will include a public involvement program to inform and educate interested parties of possible plans for Airlake Airport’s future and any associated community impacts, and to consider community feedback received.

**Land Use Compatibility & Environmental Considerations**

A significant investment has been made in Airlake Airport, warranting the need to protect the facility from new non-compatible off-airport developments that could impact existing and future operations at the Airport.

Zoning and land use controls should be implemented to facilitate the long-term plan implementation in a manner that acknowledges the rural character of the neighborhoods surrounding Airlake Airport and encourages compatible development.

In service to all parties, operation and development of Airlake Airport will promote initiatives to incorporate environmental stewardship and infuse sustainable thinking.

**Financial Viability**

Development at Airlake Airport will continue to be self-funded by users of the airport and aviation system; no local sales or property taxes will be used to fund airport improvements.
• All facility improvements will be funded through pursuing FAA and MnDOT grants first, with MAC funding as a secondary source.

• Future development at Airlake Airport should promote financial self-sufficiency to the maximum extent practical, including strategies to encourage tenant investments in facility improvements and/or new facilities, and other non-aeronautical revenue generation.

1.3 AIRPORT HISTORY

Airlake Airport was constructed by Hitchcock Industries as an integral part of the Airlake Industrial Park. Originally, farms and farmland occupied the area now occupied by the industrial park and airport. Hitchcock Industries acquired approximately 1,500 acres of land from 17 different property owners to facilitate the development. The airport opened in 1967 as a privately owned/private use facility with a paved runway that was 5,000 feet long to accommodate aircraft associated with business park activities. In 1969, Hitchcock Industries further improved the airport with the establishment of a Fixed Base Operator (FBO) to provide tie-down areas and provide fueling services. Later, Hitchcock Industries changed the designation of the airport to that of a privately owned, public use facility, opening up the facility to aircraft not associated with the industrial park as well.

In August 1979, the Federal Aviation Administration (FAA) announced the Satellite Airport Development Program which was intended to upgrade air safety by improving satellite airports in major metropolitan areas. The purpose was to relieve congestion and reduce the mix of commercial and non-commercial aircraft at major hub airports by making neighboring satellite fields more attractive to private and business flyers. The Minneapolis metropolitan area was included in this program, with MSP as its hub airport. The FAA stated that the new program would give priority to short-term development projects that would yield the quickest benefits in terms of increasing capacity and capabilities of satellite airfields. Included in the priority items was the installation of an Instrument Landing System (ILS) at the satellite fields as the ILS’s at major hub airports were being utilized for training purposes. ILS training is incompatible with normal operations at air carrier airports due to the interaction of larger, faster commercial jetliners with single and twin-engine propeller aircraft used for flight training. Reducing ILS training activity at MSP was expected to diminish airspace conflicts between faster jet airliners and small aircraft, resulting in a safer airport environment for all users.

The FAA and the Minnesota Department of Transportation, Division of Aeronautics, evaluated potential locations for a training ILS in the metropolitan area. Due to existing airspace, physical or environmental constraints, it was determined that none of the then-present reliever airports were suitable locations for this instrumentation. The evaluation then considered alternate ways to achieve the same goal, and the conclusion was reached that Airlake Airport showed the greatest potential. This was based on the following factors:

• Airlake was an existing airport which would only require a change in ownership rather than the development of a new airport;

• The airfield was physically capable of accommodating the ILS;
The airport was included in the Metropolitan Council’s Airport Development Guide, in a role compatible with its potential function; and

Acquisition would help to maintain the capacity of the metropolitan airport system by ensuring that Airlake Airport continued in operation.

In January 1981, MAC purchased approximately 565 acres of land in and around the airport from the Airlake Industrial Park (Hitchcock Industries) and various landowners to avoid encroachment and maintain approach and clear zones. At the time of acquisition, it was estimated that there were approximately 8,000 annual aircraft operations at Airlake Airport.

In 1982, the runway length was reduced from 5,000 to approximately 4,100 feet. The reduction in length was required to provide clear approach surfaces to the extent required by FAA to provide proper clearances over Cedar Avenue and 225th Street to the southeast and the railroad tracks to the northwest without relocating these existing transportation features. The ILS and associated approach lighting system was installed in 1984, allowing Airlake Airport to fulfill its intended purpose.

Throughout its history, there has been a single full-service FBO in operation at Airlake Airport. Originally operated by Hitchcock Industries as a part of the Airlake Industrial Park, the FBO was later operated by Flytline Services before being acquired by Aircraft Resource Center (ARC) in 2003. In 2016, ARC changed its name to Waypoint Flight Services (Waypoint).

In 2016, the City of Lakeville prepared a video that summarized the development history of Airlake Industrial Park. This video can be viewed from the link below:

http://www.ci.lakeville.mn.us/606/History-of-Lakeville-segments

Several additional historical airport planning records are reproduced in Appendix 2.

Table 1-1 summarizes key airfield development milestones at Airlake Airport.
### Table 1-1: Airfield Development Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966</td>
<td>Runway constructed with Airlake Industrial Park at 5,000 feet long with a partial parallel taxiway 200 feet from runway, approximately 1,000 feet long.</td>
</tr>
<tr>
<td>1969</td>
<td>FBO constructed with its own access to runway.</td>
</tr>
<tr>
<td>1981</td>
<td>Airport purchased by MAC.</td>
</tr>
<tr>
<td>1982</td>
<td>Runway rehabilitated and thresholds displaced to 4,098 feet. Project included grading for new ILS and installation of MALSR system.</td>
</tr>
<tr>
<td>1983-1984</td>
<td>Northeast Building area constructed with 6 hangar rows, access road and a partial parallel taxiway at 300 feet from runway connecting the building area to the FBO and SE runway end.</td>
</tr>
<tr>
<td>1984</td>
<td>ILS installed.</td>
</tr>
<tr>
<td>1986</td>
<td>FBO relocated to allow for full parallel taxiway construction (connecting the two pieces at either end). Four taxiway connectors were also built.</td>
</tr>
<tr>
<td>1981 – 1990</td>
<td>MAC purchases most of the buildings on the northwest end of the runway. These are ultimately demolished prior to 1990 because they are obstructions.</td>
</tr>
<tr>
<td>1994</td>
<td>Northeast building area extended, along with access road and watermain.</td>
</tr>
<tr>
<td>1998</td>
<td>South building area grading completed, including 13 hangar rows. Project also included payment to Northern Natural Gas for the lowering-in-place of the two existing pipelines so construction could take place.</td>
</tr>
<tr>
<td>1999</td>
<td>Runway 11-29 renumbered to 12-30 for changed magnetic declination.</td>
</tr>
<tr>
<td>2001</td>
<td>Runway pavement reconstructed.</td>
</tr>
<tr>
<td>2000-2002</td>
<td>Last two remaining obstructions (buildings) on northwest end are demolished.</td>
</tr>
<tr>
<td>2003</td>
<td>South partial parallel taxiway paved with two connectors. Project did not include the rest of the building area.</td>
</tr>
<tr>
<td>2008</td>
<td>New FBO aircraft storage hangar constructed and tiedown area alleyway paved</td>
</tr>
</tbody>
</table>

Source: MAC records

### 1.4 AIRPORT CLASSIFICATION AND CONTEXT

The definition of “classification” for an airport differs slightly between the MAC, FAA, MnDOT, and the Metropolitan Council.

#### 1.4.1 MAC Classification

In January 2006, the MAC accepted the *Recommendations Regarding the Future Operation and Development of the Reliever Airport System* prepared by the MAC Reliever Airports Task Force. That document identifies Airlake Airport as a “complimentary reliever” in the MAC-owned airport system. Other “complimentary reliever” airports listed
are Crystal Airport and Lake Elmo Airport in Washington County. The other MAC-owned relievers, the St. Paul Downtown Airport, the Anoka County – Blaine Airport and the Flying Cloud Airport in Eden Prairie, are “primary relievers”. By the MAC’s definition, this “primary reliever” classification identifies them as better equipped to serve small business jets and corporate aircraft in addition to general aviation.

1.4.2 FAA Classification

The FAA’s National Plan of Integrated Airport Systems (NPIAS) identifies airports that are significant to national air transportation. Airports designated as part of the NPIAS are eligible for FAA Airport Improvement Program (AIP) funding. The NPIAS is updated by the FAA every two years and comprises all commercial airline service airports, reliever airports and qualifying general aviation airports.

In cooperation with the aviation community, the FAA completed two top-down reviews of the existing network of general aviation facilities included in the NPIAS. The results of these efforts are contained in the May 2012 report titled General Aviation Airports: A National Asset (ASSET 1) and the March 2014 report entitled ASSET 2: In-Depth Review of 497 Unclassified Airports.

As part of these efforts, the FAA documented the important airport roles and aeronautical functions these facilities provide to their communities and the national airport system. These functions include emergency preparedness and response, direct transportation of people and freight, commercial applications such as agricultural spraying, aerial surveying and oil exploration, and many others. Many of these functions cannot be supported efficiently or economically at larger commercial service airports.

The latest version of the NPIAS, which was released in October 2016 and covers the five-year period between 2017 and 2021, identifies both a Service Level and Asset Role for each airport in the plan. The Service Level describes the type of service the airport currently provides to the community and is anticipated to provide at the end of the five-year planning period. The Asset Role was assigned using operational categories developed in the ASSET 1 report.

In the 2017-2021 NPIAS, the FAA classifies Airlake Airport as follows:

- Service Level: Reliever

The FAA has encouraged the development of high-capacity general aviation airports in major metropolitan areas. These specialized airports, called relievers, provide pilots with attractive alternatives to using congested commercial airports. They also provide general aviation access to the surrounding area. To be eligible for reliever designation, these airports must be open to the public, have 100 or more based aircraft, or have 25,000 annual itinerant operations.

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4 Additional information is available at: http://www.faa.gov/airports/planning_capacity/npias/reports/
5 Additional information is available at: http://www.faa.gov/airports/planning_capacity/ga_study/
Asset Role: Regional

Regional airports support regional economies by connecting communities to statewide and interstate markets. These airports accommodate a full range of regional and local business activities. They serve corporate and multi-engine aircraft, as well as single-engine propeller aircraft.

Definitions for other FAA airport classification categories are provided in the Glossary of Terms (Appendix 1) under the term “Airport Classifications”.

1.4.3 MnDOT Classification

MnDOT classifies Airlake Airport as an Intermediate Airport. Intermediate Airports have a paved and lighted primary runway that is less than 5,000 feet in length. These airports are capable of accommodating all single-engine aircraft, some multi-engine aircraft (including turboprops), and some business jets. Intermediate Airports serve as landing facilities for flight training, aircraft maintenance, and general aviation aircraft up to the smaller business jet size.

Of the other relievers in the MAC system, Crystal and Lake Elmo are also classified as Intermediate Airports per MnDOT criteria. Definitions for other MnDOT airport classification categories are provided in the Glossary of Terms (Appendix 1) under the term “Airport Classifications”.

1.4.4 Metropolitan Council Classification

The Metropolitan Council has been involved in aviation system planning since the 1970s. The Council develops a regional development framework every 10 years, the most recent being Thrive MSP 2040, which was adopted in 2014. The regional Transportation Policy Plan (TPP), which provides transportation policy guidance to regional governmental units, is updated every four years. Included in the TPP is the aviation system plan, which is updated every eight years. The Council prepares and maintains the plan, which provides strategies to help the Twin Cities enhance access to domestic and international markets. The last update to the Regional Aviation System Plan was the 2030 Twin Cities Aviation System Technical Report (December 2009). The Council works closely with the Metropolitan Airports Commission (MAC) and other airport owners to ensure that the region’s airports provide state-of-the-art, secure and affordable services for business and leisure travelers, freight transport and general aviation activities. The Council coordinates aviation planning and community development with local, state and federal governmental units, airport users and citizens.

The Metropolitan Council classifies Airlake Airport as a Minor Airport. Under this definition, the airport has a primary runway length between 2,500 and 5,000 feet, with either a precision or non-precision approach. The airport can accommodate personal use and recreational aircraft, business general aviation and air taxi traffic, flight training and military operations. All of the other relievers in the MAC system, with the exception of the St. Paul Downtown Airport, are classified as Minor Airports per Metropolitan Council criteria. Definitions for other Metropolitan Council airport classification categories are provided in the Glossary of Terms (Appendix 1) under the term “Airport Classifications”.

1-6
1.4.5 Airport Context

According to the latest *Minnesota State Aviation System Plan (SASP)*\(^6\) published in 2013, Airlake Airport is one of 83 Intermediate Airports in the state. Of these 83 Intermediate Airports, Airlake Airport ranked:

- 4\(^{th}\) in terms of the number of total based aircraft; and
- 4\(^{th}\) in terms of the number of general aviation aircraft operations.

\(^6\) Additional information available at: [http://www.dot.state.mn.us/aero/planning/sasp.html](http://www.dot.state.mn.us/aero/planning/sasp.html)
Figure 1-1: Metropolitan Airports Commission Airports in the Seven-County Area
Figure 1-2: Airport Vicinity
SECTION 2:

EXISTING CONDITIONS
2. EXISTING CONDITIONS

2.1 INTRODUCTION
This chapter summarizes the existing facility, land use, infrastructure, and environmental data that are relevant to the preparation of this LTCP. The information presented in this chapter is current as of October 2016, except where noted.

2.2 IMPROVEMENTS SINCE LAST LTCP
The following facility improvements have been completed at Airlake Airport since the completion of the last LTCP:

- Airfield pavement rehabilitation in 2013 (full depth crack repairs and crack sealing of the runway and taxiway pavements);
- MAC Maintenance Building improvements in 2014; and
- Taxiway A pavement rehabilitation in 2016.

2.3 EXISTING AIRSIDE FACILITIES
Airside facilities include the operational aircraft areas of runways, taxiways, and aprons. These are areas where vehicular traffic is generally not allowed due to safety concerns of mixing with aircraft. Airside facilities also include airfield lighting and navigational aids.

2.3.1 Pavement Areas and Design Standards
Airlake Airport has one paved runway, Runway 12-30, that is 4,099 feet long and 75 feet wide. It has a full length parallel taxiway 40 feet wide with five connector taxiways.

The runway was originally constructed at 5,000 feet long. Due to obstructions and the planned installation of an instrument landing system (ILS), the runway was shortened to 4,099 feet. Portions of the bituminous pavement were kept in place beyond the new threshold as blast pad.

The airport has one apron area that is under the control of the Fixed Base Operator (FBO) as part of their leased property. Run-ups and pilot checks can also be performed in the two pavement areas at each end of the runway.

The existing airport layout is depicted in Figure 2-1.

All of the airfield areas at Airlake are asphalt, but vary in pavement age, thickness, and typical section. Over time, pavement overlays, rehabilitation, reconstruction and/or crack repair methods have changed the characteristics of the pavement from section to section.

The Airport Pavement Management Program for the MAC Relievers has included periodic pavement condition inspections, most recently in 2016. The inspections utilized the Pavement Condition Index (PCI) method. PCI evaluation includes a visual inspection of pavements and assignment of a numerical indicator that reflects the structural and operational condition of the pavement, including the type, severity, and quantity of

2-1
pavement distress. The numerical PCI value range for a specific, distinct section of airfield pavement can be defined as follows:

- PCI 81-100: Pavement in Excellent Condition (No or Minor Stress) – 27 percent of existing pavement areas;
- PCI 61-80: Pavement in Satisfactory Condition (Minor Stress) – 42 percent of existing pavement areas;
- PCI 41-60: Pavement in Fair Condition (Moderate Stress) – 31 percent of existing pavement areas;
- PCI 21-40: Pavement in Poor Condition (Major Stress) – No airfield pavement areas fall within this classification; and
- PCI 0-20: Pavement in Serious Condition (Failed) – No airfield pavement areas fall within this classification.

An exhibit depicting the condition of pavements by PCI at Airlake Airport is provided in Figure 2-2.

Table 2-1 provides a summary of existing runway characteristics at Airlake Airport.

<table>
<thead>
<tr>
<th>Runway Characteristics</th>
<th>12-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runway Length (feet)</td>
<td>4,099</td>
</tr>
<tr>
<td>Runway Width (feet)</td>
<td>75</td>
</tr>
<tr>
<td>Published Pavement Strength (lbs.)</td>
<td></td>
</tr>
<tr>
<td>Single-Wheel Loading (SW)</td>
<td>31,000</td>
</tr>
<tr>
<td>Dual-Wheel Loading (DW)</td>
<td>47,000</td>
</tr>
<tr>
<td>Pavement Classification Number (PCN)</td>
<td>11</td>
</tr>
<tr>
<td>Pavement Type</td>
<td>Asphalt</td>
</tr>
<tr>
<td>Effective Gradient</td>
<td>0.22%</td>
</tr>
<tr>
<td>Runway End Elevation (ft. AMSL)</td>
<td>960.6</td>
</tr>
</tbody>
</table>

Note: AGIS Aeronautical Survey (2013); FAA Airport Master Record; MAC Records
**FAA Design Standards**

FAA airport design standards provided in Advisory Circular (AC) 150/5300-13A, Change 1, *Airport Design*, provide basic guidelines for a safe and efficient airport system. Conformity to the FAA’s standards ensures that aircraft in a particular category can safely operate at the airport.

Planning improvements to an existing airport requires the selection of one or more “design aircraft” that represent a collection, or composite family, of aircraft that are intended to be accommodated by the airport on a regular basis. In the case of an airport with multiple runways, a design aircraft is selected for each runway.

For the purposes of airport geometric design, the design aircraft is classified by three parameters:

- Aircraft Approach Category (AAC): A classification of aircraft based on a referenced approach landing speed;
- Airplane Design Group (ADG): A classification of aircraft based on wingspan and tail height; and

The selected AAC, ADG, and desired approach visibility minimums (generally expressed in statute miles or feet) are combined to form the Runway Design Code (RDC) for a particular runway. The RDC is used to determine the standards that apply to a specific runway and parallel taxiway to allow unrestricted operations by the design aircraft under defined meteorological conditions.

The Airport Reference Code (ARC) is a designation that signifies the airport’s highest RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport. In the case of Airlake Airport, the existing design aircraft is represented by a composite family of turbine-powered aircraft used for business aviation purposes. From an airfield facility requirements perspective, this composite aircraft family is represented by the Beechcraft King Air 350 (ARC B-II), Pilatus PC-12 (ARC A-II), Cessna Citation Jet 525 (ARC B-I), and the Cessna Citation 650/III (ARC B-II).

Design parameters associated with this composite aircraft family are as follows:

- AAC: A/B (approach speed less than 121 knots);
- ADG: I/II (wingspan up to but not including 79 feet and tail height less than 30 feet);
- TDG: 2 (main landing gear width 20 feet or less and cockpit-to-main gear distance less than 64 feet); and
- Approach visibility minimums: 4,000 feet, which corresponds to visibility minimums of lower than one statute mile but not lower than ¾ mile.

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7 Regular use is considered as at least 500 or more annual itinerant operations of the runway by the critical design aircraft.
The corresponding RDC for Runway 12-30 is B-II-4,000. Table 2-2 summarizes selected FAA runway design standards for RDC A/B-II-4,000 facilities.

### Table 2-2: FAA Runway Design Standards

<table>
<thead>
<tr>
<th>Design Standard</th>
<th>RDC A/B-II-4,000</th>
<th>Dimension (Fig. 2-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Runway Protection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway Safety Area (RSA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length Beyond Departure End (feet)</td>
<td>300</td>
<td>R</td>
</tr>
<tr>
<td>Length Prior to Threshold (feet)</td>
<td>300</td>
<td>R</td>
</tr>
<tr>
<td>Width (feet)</td>
<td>150</td>
<td>B</td>
</tr>
<tr>
<td>Runway Object Free Area (ROFA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length Beyond Runway End (feet)</td>
<td>300</td>
<td>R</td>
</tr>
<tr>
<td>Length Prior to Threshold (feet)</td>
<td>300</td>
<td>R</td>
</tr>
<tr>
<td>Width (feet)</td>
<td>500</td>
<td>A</td>
</tr>
<tr>
<td>Runway Obstacle Free Zone (ROFZ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length Beyond Runway End (feet)</td>
<td>200</td>
<td>n/a</td>
</tr>
<tr>
<td>Width (feet)</td>
<td>400</td>
<td>C</td>
</tr>
<tr>
<td><strong>Runway Separation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centerline to Holding Position (feet)</td>
<td>200</td>
<td>n/a</td>
</tr>
<tr>
<td>Centerline to Parallel Taxiway (feet)</td>
<td>240</td>
<td>n/a</td>
</tr>
<tr>
<td>Centerline to Aircraft Parking (feet)</td>
<td>250</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**Notes:**
- Standards listed are for visibility minimums not less than 3/4 mile
- See Figure 2-3 for a graphical depiction of these dimensions

**Runway Safety Areas, Object Free Areas, and Obstacle Free Zones**

The Runway Safety Area (RSA) is a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.

Existing RSAs at Airlake Airport extend 300 feet beyond each runway end and are 150 feet wide. The existing RSAs meet FAA standards for the specified RDC.

The Runway Object Free Area (ROFA) is an area centered on the runway provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes.
Existing ROFAs at Airlake Airport extend 300 feet beyond each runway end and are 500 feet wide. The existing ROFAs meet FAA requirements for the specified RDC. The Runway Obstacle Free Zone (ROFZ) is three-dimensional airspace along the runway and extended runway centerline that is required to be clear of obstacles, including aircraft, for protection of landing takeoff operations from the runway and for missed approaches.

Existing ROFZs at Airlake Airport extend 200 feet beyond each runway end and are 400 feet wide. The existing ROFZs meet FAA requirements for the specified RDC.

The RSA, ROFA, and ROFZ layout is depicted in Figure 2-3.

In addition, Airlake Airport has an Inner-Approach Obstacle Free Zone (OFZ) for Runway 30 because this runway has an approach lighting system. The Inner Approach OFZ begins 200 feet from the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the approach light system. Its width is the same as the ROFZ and it rises at a slope of 50 (horizontal) to 1 (vertical) from its beginning. FAA design standards also include an Inner Transitional OFZ; however, as this standard only applies to runways with lower than ¾ mile visibility minimums, it does not apply to Airlake Airport.

Finally, Airlake Airport has a Precision Obstacle Free Zone (POFZ) for Runway 30 that is in effect when:

- The approach includes vertical guidance (both the ILS and LPV approaches to Runway 30 provide vertical guidance);
- The reported ceiling is below 250 feet or visibility is less than ¾ statute mile (the LPV approach to Runway 30 provides minimums down to 200 feet); and
- An aircraft is on final approach within two miles of the runway threshold.

The POFZ is the volume of airspace beginning at the runway threshold at the threshold elevation and centered on the runway centerline that is 200 feet long and 800 feet wide. When the POFZ is in effect, a wing of an aircraft holding on a taxiway waiting for runway clearance may penetrate the POFZ; however, neither the fuselage nor the tail may penetrate. At Airlake, Taxiway A traverses the POFZ adjacent to the eastern-most hangar row. All of the hangar structures are clear of the POFZ. Vehicles up to 10 feet in height necessary for maintenance are also permitted in the POFZ.

The runway hold short markings on the connector taxiways are currently positioned 250 feet from the runway centerline, meeting FAA criteria for approach visibility minimums of less than ¾ mile. FAA criteria for placement of runway hold short markings for runways with visibility minimums not lower than ¾ mile (the current condition at Airlake Airport) is 200 feet from the runway centerline.

**Runway Protection Zones**

The Runway Protection Zone (RPZ) is an area at ground level prior to the threshold or beyond the departure runway end to enhance the safety and protection of people and property on the ground. According to the FAA, this is best achieved through airport owner control over RPZs. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ and includes clearing of RPZ areas and maintaining them...
clear of incompatible objects and activities. The FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses in the RPZ.

The RPZ is trapezoidal in shape and centered about the extended runway centerline. It is comprised of two components. The Central Portion of the RPZ extends from the beginning to the end of the RPZ at a width equal to the width of the ROFA. The Controlled Activity Area is the remaining area of the RPZ on either side of the Central Portion. The RPZ dimension for a given runway end is defined by the RDC. The RPZ layout is depicted in Figure 2-3.

Runway 30 has both approach and departure RPZs in place due to the threshold displacement.

RPZs at Airlake Airport have dimensions as listed in Table 2-3:

Table 2-3: Existing RPZ Dimensions

<table>
<thead>
<tr>
<th>Runway End</th>
<th>Distance from End/Threshold (feet)</th>
<th>Inner Width (feet)</th>
<th>Outer Width (feet)</th>
<th>Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runway 12 RPZ</td>
<td>200</td>
<td>500</td>
<td>700</td>
<td>1,000</td>
</tr>
<tr>
<td>Runway 30 RPZ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approach RPZ</td>
<td>200</td>
<td>1,000</td>
<td>1,510</td>
<td>1,700</td>
</tr>
<tr>
<td>Departure RPZ</td>
<td>200</td>
<td>500</td>
<td>700</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Source: FAA Advisory Circular 150/5300-13A, Change 1; FAA Airport Master Record

In 2012, the FAA issued Interim Guidance to clarify its policy on what constitutes a compatible land use within an RPZ and how to evaluate proposed land uses that would reside in an RPZ\(^8\). Coordination with the FAA in the form of an Alternatives Analysis is required when any of the following land uses would enter the limits of the RPZ due to a triggering airfield project, an off-airport development proposal, or other operational change at the airport:

- Buildings and Structures;
- Recreational Land Uses;
- Transportation Facilities, including rail facilities, public roadways, and vehicular parking facilities;
- Fuel storage facilities;
- Hazardous materials storage;

\(^8\) Additional information available at: https://www.faa.gov/airports/planning_capacity/media/interimLandUseRPZGuidance.pdf
• Wastewater treatment facilities; and
• Above-ground utility infrastructure, including solar panel installations.

The existing RPZ’s at Airlake Airport include several land uses that are not automatically considered compatible under the FAA’s current guidance. However, since these land uses predate the FAA’s current guidance, they are acceptable to remain as an existing condition.

• Runway 12 End
  o Two low-volume public roadways (Highview Avenue and 220th Street), Progressive Rail railroad track, and a private drive providing access to an agricultural field;
  o Highview Avenue is a local north/south road in Eureka Township located to the east of Runway 12 that accommodates an estimated 2,000 vehicles per day;
  o 220th Street is an east/west city street located north of the airport that accommodates approximately 1,500 vehicles per day; and
  o Progressive Rail operates almost 80 miles of track in the south Twin Cities Metro Area. In the Lakeville area where Airlake Airport is located, it moves a wide variety of commodities – everything from heavy equipment to building products. Its lines are a mix of former Union Pacific and Canadian Pacific lines and it continues to interchange with both. According to the MnDOT Rail Office, two trains operate per weekday and operations are occasional on weekends.

• Runway 30 End
  o County Road 23 / Cedar Avenue is located on the east side of airport property. It is an important north/south arterial road that serves the southeast quadrant of the Twin Cities Metropolitan Area by providing mobility and connectivity across and through the region. This corridor crosses the Minnesota River and provides accessibility to the MSP Airport. According to the 2030 Transportation Plan for Dakota County, traffic on the two-lane section of Cedar Avenue (County State Aid Highway 23) in the vicinity of the Runway 30 RPZ accommodates approximately 6,800 vehicles per day, and is projected to reach about 12,000 vehicles per day by 2030. There is no current plan to widen or expand the capacity of this section of Cedar Avenue adjacent to Airlake Airport within the planning period.
  o 225th Street is an east/west corridor that borders airport property on the south. It is a gravel-surfaced township road that provides local land access and connectivity to other roadways, such as Cedar Avenue, that serve a mobility function. This road is currently the controlling obstacle for the Runway 30 displaced threshold.

**Runway Separation Standards**
For Runway 12-30, the separation distance to north parallel Taxiway A is currently 300 feet, while the separation to partial parallel Taxiway B (South Building Area) is 540 feet, meeting FAA design criteria for approach minimums lower than ¾ mile.
Runway Shoulders
Runway shoulders are intended to provide a transition surface between the runway pavement and the adjacent surface, to support aircraft running off the pavement, provide blast protection, and enhance erosion control and drainage. For RDC A/B-II-4,000, the required runway shoulder width is 10 feet. Airlake Airport provides 10-foot wide stabilized turf shoulders.

Taxiway Standards
The FAA design standard for TDG-2 width is 35 feet. Taxiways at Airlake Airport are currently 40 feet wide. These taxiways exceed FAA width criteria for the specified RDC9.

The Taxiway Safety Area (TSA) width for ADG II aircraft is 79 feet, which is met for all taxiways.

The Taxiway Object Free Area (TOFA) width for ADG II aircraft is 131 feet (65.5 feet each side of centerline), which is met for all taxiways.

The FAA-recommended Taxilane OFA width is 115 feet for ADG II. However, the majority of the hangar areas at Airlake Airport were designed for smaller ADG I aircraft, and therefore, the paved alleyways between hangar buildings offer less clearance (79 feet).

Paved or stabilized shoulders are recommended along taxiways. ADG II aircraft require 15-foot shoulders. Existing taxiways at Airlake Airport provide 15-foot stabilized turf shoulders.

Table 2-4 summarizes selected FAA taxiway design standards for Taxiway Design Group 2/Airplane Design Group II facilities.

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9 The current MAC standard for minimum taxiway width at the Reliever Airports is 40 feet.
### Table 2-4: FAA Taxiway Design Standards

<table>
<thead>
<tr>
<th>Taxiway Design Standard</th>
<th>TDG-2 / ADG-II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxiway Width (feet)</td>
<td>35</td>
</tr>
<tr>
<td>Taxiway Edge Safety Margin (feet)</td>
<td>7.5</td>
</tr>
<tr>
<td>Taxiway Shoulder Width (Turf) (feet)</td>
<td>15</td>
</tr>
<tr>
<td><strong>Taxiway Protection</strong></td>
<td></td>
</tr>
<tr>
<td>Taxiway/Taxilane Safety Area Width (feet)</td>
<td>79</td>
</tr>
<tr>
<td>Taxiway Object Free Area Width (feet)</td>
<td>131</td>
</tr>
<tr>
<td>Centerline to Object (feet)</td>
<td>65.5</td>
</tr>
<tr>
<td>Wingtip Clearance (feet)</td>
<td>26</td>
</tr>
<tr>
<td>Taxilane Object Free Area Width (feet)</td>
<td>115</td>
</tr>
<tr>
<td>Centerline to Object (feet)</td>
<td>57.5</td>
</tr>
<tr>
<td>Wingtip Clearance (feet)</td>
<td>18</td>
</tr>
<tr>
<td>Taxiway To Taxiway/Taxilane Centerline Separation (feet)</td>
<td>105</td>
</tr>
<tr>
<td>Taxilane to Taxilane Centerline Separation (feet)</td>
<td>97</td>
</tr>
</tbody>
</table>

**Notes:**
- Taxilanes provide access from taxiways to aircraft parking areas.
- Taxilanes are designed for low speed and precise taxiing, making reduced clearances acceptable.

**Source:** FAA Advisory Circular 150/5300-13A, Change 1

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**Airfield Geometry**

Improving runway safety continues to be one of the FAA’s highest priorities, and the agency is working with airport sponsors to further reduce runway risks through risk-based decision making. Risk factors that contribute to runway incursions\(^\text{10}\) may include unclear taxiway markings, airport signage, and more complex issues such as the runway or taxiway layout.

Although the airfield geometry at Airlake Airport is relatively straightforward due to the one-runway configuration, there is an aligned taxiway at the Runway 12 end that does not comply with the latest guidelines. There is also a connector taxiway that leads directly from the FBO aircraft parking apron to the runway, which can lead to a loss of situational awareness.

---

\(^{10}\) Runway incursions occur when an aircraft, vehicle, or person enters the protected area of an airport designated for aircraft landings and take offs.
awareness. Options to improve these geometry items will be considered when preparing airfield development concepts.

### 2.3.2 Lighting and Visual Approach Aids

Runway lighting and visual approach aids are intended to guide pilots from point to point, increase the visibility of runway features, and control runway activity both on the ground and in the air.

The runway has High Intensity Runway Edge Lights (HIRLs). These lights increase the visibility of runway edges during nighttime or restricted-visibility conditions when instrument approach procedures are in use. The runway edge lights are white, except where yellow replaces white on the last 2,000 feet or half the runway length, whichever is less, to form a caution zone for landings. The lights marking the ends of the runway emit red light toward the runway to indicate the end of the pavement to a departing aircraft and emit green outward from the pavement end to indicate the threshold to landing aircraft. The runway lights are radio controlled, and can be clicked to low, medium or high intensity by the pilots.

Runway 30 is equipped with a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), which extends 2,400 feet prior to the landing threshold. This system consists of a combination of flashing and steady burning lights and gives visual indicators during landing at the facility to transition from instrument flight to visual conditions.

Runway 12 has Runway End Identifier Lights (REILs). These synchronized flashing lights help pilots visually acquire the runway end as they approach for landing.

There is currently no taxiway lighting at Airlake, with the exception of the taxiway connector exits from Runway 12-30, which are lit. The remaining sections of taxiway have blue guidance reflectors.

Runway 30 is equipped with a Precision Approach Path Indicator (PAPI), while Runway 12 is equipped with an older-technology VASI (Visual Approach Slope Indicator). These systems use a combination of red and white lights visible at certain angles that help pilots determine an appropriate descent glide slope that will result in the aircraft crossing the landing threshold at a height of approximately 20 to 45 feet. These visual glide slope indicators are owned and maintained by FAA. **Table 2-5** provides information about the units at Airlake.

Finally, the airport has a lighted airfield beacon and a lighted wind cone.
### Table 2-5: Visual Glideslope Indicators

<table>
<thead>
<tr>
<th>Runway</th>
<th>Visual Glide Slope Indicator Type</th>
<th>Visual Glide Slope Angle (degrees)</th>
<th>Threshold Crossing Height (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runway 12</td>
<td>VASI</td>
<td>3.25</td>
<td>37</td>
</tr>
<tr>
<td>Runway 30</td>
<td>PAPI</td>
<td>3.00</td>
<td>36</td>
</tr>
</tbody>
</table>

Source: FAA records

#### 2.3.3 Airspace

The national airspace structure is complex and requires the use of highly technical air traffic control (ATC) procedures. Airspace is either controlled or uncontrolled. Controlled airspace is managed by ground-to-air communications, NAVAIDS and air traffic services. **Figure 2-4** provides a graphical overview of the National Airspace System.

Airlake Airport is located in what is considered Class E controlled airspace. Class E airspace is a general category of controlled airspace that is intended to provide air traffic service and separation for Instrument Flight Rules (IFR) aircraft from other aircraft. IFR means that the pilot is certified to fly under Instrument Meteorological Conditions (IMC) (under three miles visibility and 1,000 foot ceilings). Pilots rated only for Visual Flight Rules (VFR) can operate in Class E airspace only when visibility is three statute miles and above and cloud heights are 1,000 feet above ground level (AGL) and higher. These pilots are not required to maintain contact with ATC. Class E is a common classification for airports without air traffic control towers (ATCTs). Class E airspace extends to 18,000 feet mean sea level (MSL) and generally fills in the gaps between other classes of airspace in the United States.

Airlake Airport lies under Minneapolis-St. Paul International Airport’s (MSP) Class B Airspace which consists of controlled airspace extending upward from different floor elevations to a ceiling height of 10,000 feet MSL. There are very specific operating instructions and rules pilots must follow when flying within this airspace. Airlake Airport lies under the area where the floor elevation is 4,000 feet MSL. As long as pilots stay below 4,000 feet they remain outside this MSP airspace.

Enroute navigational aids utilize ground-based transmission facilities to provide navigational fix information to properly-equipped aircraft. There are two Very High Frequency Omni-Directional Range (VOR) stations in the area; one located near the Airlake Airport called Farmington and the other at the Flying Cloud Airport in Eden Prairie. A VOR transmits radio signals 360 degrees in azimuth on a designated frequency. This information provides a tool for pilots to navigate point-to-point within the National Airspace System (NAS). This is particularly useful for low altitude and high altitude airway vectoring through the airspace surrounding the airport, as well as transition navigation into or out of the enroute airspace structure at Airlake Airport. In addition to providing enroute
navigational assistance to aircraft, VORs also allow for non-precision approaches thereby enhancing the capability of the airport.

**Figure 2-5** shows the airports, airspace and navigational aids in the vicinity of Airlake Airport.

Airlake Airport does not have its own Air Traffic Control Tower (ATCT). Instead, air traffic control services are provided by Minneapolis Approach/Departure Control at Minneapolis-St. Paul International Airport, Minneapolis Route Traffic Control Center (ARTCC) at Farmington and the Flight Service Station (FSS) at Princeton, Minnesota.

Aircraft operating at Airlake are advised to broadcast their intentions and monitor Common Traffic Advisory Frequency (CTAF) frequency, which is also the UNICOM frequency (123.0). Pilots can also use this frequency to control the intensity of the airfield lighting. Pilots making instrument approaches to Runway 30 are in contact with Minneapolis Approach Control.

The local traffic pattern altitude at Airlake Airport is 1,760 feet Mean Sea Level (MSL), which is 800 feet above the airport elevation. The Runway 30 traffic pattern operates in a standard left hand flow, while the Runway 12 traffic pattern operates in a non-standard right hand flow to avoid flying over the City of Lakeville.

When the winds are calm (less than 5 knots), the preferred runway is Runway 30. Intersection takeoffs at Airlake Airport are discouraged at all times, as are training flights in the traffic pattern between the hours of 2400 and 0700 local time.

A voluntary Noise Abatement Plan is in place to promote aircraft operating procedures that help reduce aircraft noise and overflights for residents living near Airlake Airport. Pilots may also reference the pilot guide for easy access to noise abatement information. The pilot guide is available at:


### 2.3.4 Approach Instrumentation

Runway 30 is equipped with an Instrument Landing System (ILS). There are two main ground-based components to an ILS – a localizer (LOC) providing horizontal approach information and a glide slope indicator (GS) providing vertical slope information. Using the ILS, a pilot can determine position relative to the runway centerline and angle of approach. Other components help a pilot determine when to begin the descent (outer marker beacon) and to visually acquire the runway (approach lighting system). The ILS visibility minimums at Airlake are 3/4 mile. Runway 30 is also equipped with a GPS-based Localizer Performance with Vertical Guidance (LPV) instrument approach with 3/4 mile visibility minimums.

The ILS qualifies as a precision instrument approach because it provides both course and glidepath deviation information meeting international standards. Airlake is unique in that it is the only Intermediate-category airport in Minnesota with an ILS precision instrument approach.

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11 At the time of the previous LTCP, the ILS approach minimums were 1 mile.
approach. As originally intended, the ILS continues to be used heavily by flight training operations\textsuperscript{12}. Although an LPV approach provides similar course and glideslope deviation information when compared to an ILS, it is not categorized as a precision approach because it does not meet international precision approach standards.

The MALSR approach light system allows visibility minimums to be decreased for the published approaches to Runway 30.

Runway 12 is equipped with two non-precision instrument approaches that provide 1-mile visibility minimums. The first is a GPS-based LPV approach, and the second is a VOR approach\textsuperscript{13}.

Table 2-6 summarizes the approach minimums for these approaches. The instrument approach charts for these procedures are reproduced in Figure 2-6.

Airlake Airport has standard IFR takeoff minimums (one statute mile for aircraft having two or less engines). No specific Obstacle Departure Procedures are published.

2.3.5 14 CFR Part 77 Airspace Surfaces

Regulations for the protection of airspace around a public-use civilian or military airport are specified in 14 CFR Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77). These defined surfaces are used by the FAA to identify obstructions to airspace around an airport facility. Part 77 surfaces are comprised of primary, approach, transitional, horizontal and conical three-dimensional imaginary surfaces.

Figure 2-7 illustrates these surfaces in a general nature; their exact configuration varies based upon the category and type of approach to the runway. Obstructions are defined as objects that penetrate these surfaces. Mitigation measures such as obstruction marking/lighting, removal or relocation may be required for obstructions that are studied and not determined to be a hazard to air navigation.

The requirements for filing an aeronautical study with the Federal Aviation Administration (FAA) for proposed structures in the vicinity of Airlake Airport vary based on a number of factors: site elevation, structure height, proximity to an airport, and frequencies emitted from the structure, etc. The FAA provides a “Notice Criteria Tool” on its Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) website that can be used to determine if an aeronautical study is warranted. The OE/AAA website can be accessed via the following link: https://oeaaa.faa.gov/oeaaa/external/portal.jsp

\textsuperscript{12} The check ride for an ATP rating, instrument rating, or instrument proficiency check must include a precision approach. Even though two other airports in the south metro also have ILS approaches (STP and FCM), pilots training and on check rides at those airports are often times not able to fully fly the ILS and are usually instructed to “break off” before completing the approach or missed approach. These two airports have more complicated airspace because of multiple runways and proximity to MSP. These training flights primarily occur during VFR weather conditions, so VFR traffic also becomes a factor. Also, the ILS allows LVN to be filed as an alternate airport with lower ceilings than an LPV-only approach would offer.

\textsuperscript{13} Because train cars on the railroad track along the west side of the Airport penetrate the Runway 12 airspace obstacle clearance surfaces, the FAA has determined that the Runway 12 LPV and LNAV/VNAV instrument approach procedures are not authorized for use until further notice; further, no straight-in instrument or circling approaches are authorized during nighttime hours. MAC is seeking to remedy these restrictions by installing a new PAPI visual glideslope indicator for Runway 12 that will provide a clear obstacle clearance surface over the railroad track.
Table 2-6: Instrument Approach Minimums

<table>
<thead>
<tr>
<th>Runway Approach</th>
<th>Ceiling (ft. MSL)</th>
<th>Ceiling (ft. AGL)</th>
<th>Visibility (Miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWY 30 ILS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight-In</td>
<td>1,208</td>
<td>250</td>
<td>3/4</td>
</tr>
<tr>
<td>Circling</td>
<td>1,500</td>
<td>540</td>
<td>1.0</td>
</tr>
<tr>
<td>RWY 30 RNAV GPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPV Straight-In</td>
<td>1,158</td>
<td>200</td>
<td>3/4</td>
</tr>
<tr>
<td>Circling</td>
<td>1,500</td>
<td>540</td>
<td>1.0</td>
</tr>
<tr>
<td>RWY 12 RNAV GPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPV Straight-In</td>
<td>1,210</td>
<td>250</td>
<td>1.0</td>
</tr>
<tr>
<td>Circling</td>
<td>1,500</td>
<td>540</td>
<td>1.0</td>
</tr>
<tr>
<td>RWY 12 VOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight-In</td>
<td>1,660</td>
<td>700</td>
<td>1.0</td>
</tr>
<tr>
<td>Circling</td>
<td>1,660</td>
<td>700</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Notes: Minimums listed for Approach Category B aircraft
MSL - above Mean Sea Level; AGL - Above Ground Level

Source: FAA Instrument Approach Procedure Charts

The Airport Layout Plan (ALP) for Airlake Airport, which will be developed and published separately from this report, depicts the location and future disposition of known obstructions to Part 77 surfaces.

Based on Part 77 criteria, all runways are categorized as either Utility or Other-Than-Utility (OTU). A Utility Runway is a runway that is constructed for, and intended to be used by, propeller-driven aircraft of 12,500 pounds maximum gross weight and less. An OTU Runway is a runway that is intended to be used by propeller-driven aircraft with a maximum gross weight greater than 12,500 pounds and/or jet aircraft of any gross weight. Runway 12-30 at Airlake Airport is currently designated as OTU.

The primary surface is longitudinally centered on a runway and extends 200 feet beyond each runway end. Since Runway 12-30 has a precision approach and is designated as OTU, the primary surface is 1,000 feet wide (500 feet on either side of the runway centerline).

There are currently 23 buildings on the north side of Runway 12-30 that are partially or fully within the primary surface, with penetrations ranging from 4 to 29 feet. The original configuration for the airport, prior to MAC ownership and ILS installation, was based on a 500-foot wide primary surface (250 feet either side of the runway centerline). Thus, a
number of structures, both on the airport and immediately adjacent to it, were 
encompassed in the primary surface when it was widened from 500 to 1,000 feet for 
installation of the ILS. Several of the buildings closest to the runway were removed; 
however, based on airport design standards in place at the time of MAC acquisition, it 
was determined that structures were allowable in the primary surface so long as they 
were clear of a designated building restriction line and determined by the FAA not to be 
a hazard to air navigation or interfere with ILS electronic signals. Based on this criteria, 
one of the existing FBO hangars within the primary surface was not relocated.

The north hangar area was developed with the first row of hangars located 400 feet from 
the runway centerline, within the primary surface. Subsequent FAA reviews confirmed 
that hangar development within the primary surface was safe provided that buildings were 
constructed not less than 400 feet from the runway centerline and did not penetrate an 
instrument approach surface.

Several of the “no objection” airspace determinations for hangars within the primary 
surface contained a condition for the installation of obstruction lighting on the hangars as 
a mitigation measure. However, the obstruction lights were not installed. MAC has 
include a project in its 2017 Capital Improvement Program (CIP) to remedy this by 
installing solar-powered obstruction lighting on the row of hangar buildings closest to the 
runway.

Table 2-7 provides dimensional information for selected 14 CFR Part 77 surfaces.

### Table 2-7: Existing 14 CFR Part 77 Surface Dimensions

<table>
<thead>
<tr>
<th>Part 77 Surface</th>
<th>RWY 12</th>
<th>RWY 30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Surface</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width (feet)</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Length Beyond End (feet)</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td><strong>Approach Surface</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner Width (feet)</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Outer Width (feet)</td>
<td>3,500</td>
<td>16,000</td>
</tr>
<tr>
<td>Length (feet)</td>
<td>10,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Slope</td>
<td>34:1</td>
<td>50:1 / 40:1</td>
</tr>
<tr>
<td><strong>Part 77 Category</strong></td>
<td>OTU-NP</td>
<td>OTU-P</td>
</tr>
</tbody>
</table>

Notes: OTU - Other Than Utility; NP - Non-Precision Approach; P - Precision Approach

Precision Approach slope is 50:1 for 10,000 feet, then 40:1 for 40,000 feet

Source: 14 CFR Part 77

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14 Based on then-current Advisory Circular 150/5300-4B, the building restriction line was to be located such that it would preclude any part of a building, 
tree or parked aircraft from penetrating surfaces originating 300 feet from the runway centerline and sloping laterally outward at a 4:1 slope. Thus, the 
building restriction line was set at 380 feet from the runway centerline.
2.4 EXISTING LANDSIDE FACILITIES

Landside facilities include aircraft storage hangar areas, aprons, Fixed Base Operator (FBO) areas, terminal buildings, airport maintenance equipment storage areas, roadway access to the airport, and vehicle parking areas.

2.4.1 Fixed Base Operator (FBO)

Throughout its history, there has been a single full-service FBO in operation at Airlake Airport. Originally operated by Hitchcock Industries as a part of the Airlake Industrial Park, the FBO was later operated by Flytline Services before being acquired by Aircraft Resource Center (ARC) in 2003. In 2016, ARC changed its name to Waypoint Flight Services (Waypoint). The FBO is located on the north side centered along the runway, to the west of the north building area (Figure 2-8). Traditional FBO services offered by Waypoint include fueling, aircraft maintenance, aircraft storage and line services, aircraft rental, charters, and pilot accessory sales. Waypoint’s business model is evolving, however, to also include an increasing number of aircraft sales and corporate aircraft management accounts.

In addition to the general aviation terminal/office building (chalet), the FBO complex includes two aircraft storage hangars. Additional tenants co-located with the FBO include AirTrek North (flight school operator), North Memorial (helicopter medical flight services), and Wentworth Aircraft Recovery and Storage (aircraft recovery services).

Aircraft fueling is provided by Waypoint. Waypoint owns and maintains two 12,000 gallon underground tanks, one for 100LL avgas and one for Jet A fuel. An additional 5,000-gallon tank is also available but not currently in use. The fuel tanks and dispensing equipment are located just to the west of the FBO building, near the center of the apron. Waypoint provides both into-plane fueling via trucks and self-service fueling options.

Waypoint offers aircraft parking and storage as one of its services with both indoor storage and outdoor apron/tie-down parking available. Outdoor apron storage typically accommodates short-term parking for transient aircraft or for parking of planes awaiting maintenance or other services. It can also be used for long-term storage of aircraft.

The existing apron at Airlake can be divided into two functional areas – the east and west aprons, with the dividing point being the fueling island. The west apron provides approximately 4,500 square yards of apron area and is primarily used to maneuver aircraft to and from the large FBO hangar, and for North Memorial medical helicopter operations. Due to the fluid nature of these activities, transient aircraft generally are not parked on the west apron. Further expansion of the west apron to the west is constrained by the adjacent trout stream and its associated buffer area.

The east apron provides approximately 4,900 square yards of apron area and is primarily used for transient aircraft circulation and short-term parking. Circulation is provided by means of an internal apron taxilane marked with a continuous yellow centerline that connects to Taxiway A on both ends. The east apron is relatively small and is often congested due to its configuration. Constraints include:

15 Excludes pavement areas associated with the fueling island and in front of the North Memorial operations area
• A hangar not under FBO lease at the east side of the apron;

• Location of the fueling island, which can result in fueling aircraft impeding efficient circulation to and from the internal apron circulation taxilane; and

• The south edge of the apron was established using the legacy Building Restriction Line (BRL), which was set at 380 feet from the runway centerline. This limits the depth of the apron in front of the FBO. The area between the apron edge and Taxiway A also contains storm water drainage swales, further limiting expansion potential.

The capacity of the east apron is limited to approximately 10 single or small twin-engine aircraft simultaneously, and even fewer if a larger twin-engine piston, turboprop, or jet is parked or fueling.

For outdoor parking, a turf area northeast of the FBO is reserved for longer-term tie-down storage. This area can accommodate approximately 20 small single or twin-engine aircraft simultaneously, although not all parking positions are equipped with tie-downs. Tie-downs are small metal rings set into the grass with ropes that tie to the underside of wings and the aircraft tail. Most planes being stored outdoors want tie-downs to protect the aircraft from wind damage. In Minnesota, pilots prefer indoor storage for both long and short-term periods because of the summer storms with wind and hail, and in the winter because of cold and snow. A paved taxilane was added through the middle of the turf tie-down area in 2008, further improving access to the tie-downs and opening up additional space for hangar development.

2.4.2 Hangar Storage Areas

Airlake Airport currently has one primary hangar storage area (North Building Area) on the northeast side of the airport (Figure 2-8).

The west half of the North Building Area contains six hangar rows and was originally constructed in 1983-1984. The east half of the north building area contains another six hangar rows, which were constructed between 1994 and 2000. A fuel pipeline runs under the North Building Area, precluding the construction of hangars within a buffer area above the pipeline. This area contains five T-hangars with 15 single aircraft storage units, and 86 conventional storage hangars of various sizes. In total, the North Building Area contains 91 buildings that provide storage spaces for approximately 114 aircraft.

There are six additional hangars in the vicinity of the FBO facility. Two of these hangars are on Waypoint’s leasehold and are used for traditional aircraft storage. Three hangars are on Wentworth’s leasehold and are used to support their aircraft recovery and storage business. The remaining hangar in this area is conventional in nature and was constructed in 2013. In total, the FBO area contains six buildings that provide storage spaces for approximately 22 aircraft.

MAC allows tenants to sublease space within a hangar if they choose. However, not all tenants sub-lease extra hangar space, nor is it required for them to do so. For this reason, the number of aircraft storage spaces is presented as a range. The low occupancy scenario assumes minimal sub-leasing of available space in conventional hangars, while the maximum occupancy scenario assumes that all available space in conventional
hangars is sub-leased. The practical capacity scenario is an average of the low and high scenarios to represent the variance in tenant hangar occupancy practices.

Table 2-8 summarizes the aircraft hangar storage capacity at Airlake Airport.

Table 2-8: Indoor Aircraft Storage Summary

<table>
<thead>
<tr>
<th>Hangar Types</th>
<th>Buildings</th>
<th>Spaces - Low Occupancy</th>
<th>Spaces - Maximum Occupancy</th>
<th>Spaces - Practical Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North Building Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-Hangars</td>
<td>5</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Conventional Hangars</td>
<td>86</td>
<td>86</td>
<td>112</td>
<td>99</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>91</td>
<td>101</td>
<td>127</td>
<td>114</td>
</tr>
<tr>
<td><strong>FBO Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FBO Conventional Hangars</td>
<td>2</td>
<td>14</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Tenant Conventional Hangars</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>6</td>
<td>19</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total T-Hangars</strong></td>
<td>5</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total Conventional Hangars</strong></td>
<td>92</td>
<td>105</td>
<td>136</td>
<td>121</td>
</tr>
<tr>
<td><strong>Total Hangars</strong></td>
<td>97</td>
<td>120</td>
<td>151</td>
<td>136</td>
</tr>
</tbody>
</table>

Notes:
Two tenant conventional hangars are used to support aeronautical business functions other than aircraft storage

Source: MAC Data and Field Observations

Site preparation in the South Building Area was completed in 1998, and connector taxiways were added in 2003. Items remaining to be completed in this area include access taxilanes/alleyways, paved landside access, and water/sewer utilities. When built-out, this area will provide space for 70 to 80 additional aircraft hangars.

2.4.3 Maintenance and Equipment Areas
MAC operates one maintenance and equipment storage building at Airlake. It is located on the north side of the runway, west of the FBO, and contains six bays for equipment and an office area. Included within the office is a restroom and shower facility for the maintenance crew. The restroom and shower facilities were upgraded in 2014.

There is a fuel farm in this location which contains diesel and unleaded fuel for MAC equipment. There is also a contained recycling area for tenants to dispose of used aircraft oil.

2.4.4 Roadway Access and Vehicle Parking Areas
As shown in Figure 1-2, Airlake Airport lies in Dakota County, with most of the facility adjacent to the City of Lakeville in Eureka Township. Roadway access from 215th Street/County Road 70 and Hamburg Avenue in Lakeville leads to the FBO and existing building area. Primary roadway access to the airport is from County Road 23, otherwise
known as Cedar Avenue, from the east, and from the west via Interstate 35. These main roads link the airport to the metropolitan area and the entire region. The south side of the airport can be accessed from a township road, 225th Street W.

The FBO parking lots are accessible to the public and can accommodate approximately 60 vehicles. There is space available adjacent to the maintenance building for three vehicles, but given the location of the building, it is only useful for visitors to the MAC building.

All privately owned hangars are accessed via paved alleyways, with tenants parking inside or adjacent to their individual hangars.

### 2.5 AIRPORT ENVIRONMENT

This section highlights the airport environment, including available utilities, drainage, and local services provided.

#### 2.5.1 Drainage

Airlake Airport is located on former farmland. Soils are generally described as well-drained to excessively-drained silty and loamy sediments. The airport lies within the Vermillion River Watershed, which is managed by the Vermillion River Watershed Joint Powers Organization (VRWJPO).

While the Vermillion River is located approximately one-half mile south of Runway 30, one of its tributaries runs directly through airport property. This channel is named the South Tributary of South Creek, and it has only intermittent flows. South Tributary of South Creek is formally designated as a trout stream by DNR (waters of the state). The trout stream designation does not extend beyond the airport boundary to the west.

There are two types of buffers that affect designated trout streams:

- **VRWJPO Watershed Buffer Standards:**
  - Aquatic Corridor – Principal Connector with Trout Stream Designation requires a 100 foot vegetated buffer on either side of stream;
  - Buffer provisions do not apply to any lot of record as of March 22, 2007 until such lot is subdivided; and
  - This buffer is not currently in effect at Airlake Airport as the property has not been subdivided since March 22, 2007

- **2015 Minnesota Buffer Law:**
  - Applies to public waters, which the stream is by virtue of the trout stream/waters of the state designation;
  - Requires the more restrictive of the following:
    - 50-foot average width, 30-foot minimum width, continuous buffer of perennially rooted vegetation; or
    - State Shoreland standards and criteria:
- State Shoreland standards are implemented through the Dakota County Shoreland and Floodplain Management Ordinance; and
- Requires 50-foot vegetative buffer on either side of the stream (buffer averaging not allowed).

The State Shoreland standards, as implemented through the Dakota County Shoreland and Floodplain Management Ordinance, are the more restrictive criteria and thus define the current 50-foot buffer in place around the tributary stream at Airlake.

In 1998, when the grading for the South Building Area was started south of the runway, this intermittent stream was relocated via a permit from the Department of Natural Resources (DNR). The tributary still traverses airport property, but now routes around a new detention basin for storm water runoff from the future building area. The detention pond is intended to allow an area for infiltration of storm water versus direct runoff into the stream.

The airport site drains primarily from south to north. Most of the airfield drainage infiltrates into the ground or is routed into ditches. These ditches outlet into the trout stream tributary on airport property, which doubles as the local ditch system that runs to the north and east, eventually to South Creek and the Vermillion River. Approximately 85 percent of the site flows in this direction. The remaining MAC-owned parcels are either undeveloped raw land or leased out for farming. These areas drain to the south through ditches or drain tile ultimately to the Vermillion River.

In addition to airport drainage, portions of the adjacent industrial park also drain onto the airport. Through an agreement with MAC, the City designed and built an infiltration basin on airport property to collect and infiltrate storm water runoff from the industrial park. Only overflows from a large storm event exit this pond and drain through the South Tributary.

There are a few wetland areas around the airport. Unlike the trout stream that is regulated by the DNR, the wetlands are regulated under the Wetland Conservation Act (WCA). The City of Lakeville and Eureka Township currently serve as the local government unit (LGU) for administering the WCA wetlands within their respective boundaries. A field delineation of on-airfield wetlands was completed in 1998. Approximately 33 acres of wetlands were identified within airport property, with varying wetland types. Figure 2-9 shows the general ditch drainage, direction of flows, and inventoried wetland areas.

There is a designated flood plain area on the Airport associated with the intermittent trout stream tributary. A small portion of the southern parcel east of Cedar Avenue also lies within the 100-year floodplain of the Vermillion River.

The MAC has a Multi-Sector General stormwater discharge Permit (MSGP) from the Minnesota Pollution Control Agency (MPCA) and maintains a Stormwater Pollution Prevention Plan (SWPPP) and a voluntary Spill Prevention Control and Countermeasure (SPCC) Plan. These documents include Best Management Practices (BMPs) for protecting the stormwater conveyances, wetlands, and groundwater related to MAC industrial activity. Permit details along with water quality results for Airlake Airport (Permit MNR0539XL) can be found on the following website:
Depending on FBO and tenant activities, they may be required to obtain and maintain their own MSGP from the MPCA, along with other requirements, such as an SPCC plan.

Chemicals used in deicing activities at airports is of concern because of the potential effects on receiving water bodies. There is little to no aircraft deicing at Airlake. Most aircraft can be stored inside heated hangars prior to takeoff or cannot fly when icing conditions exist, which eliminates the need for glycol use. MAC uses minor amounts of urea or other types of pavement deicing materials applied only on runways during icing conditions. The amount is, on average, less than approximately 500 pounds annually. Salt is not used due to its corrosive nature. Sand is used on a limited basis depending on weather conditions. Stormwater runoff from paved surfaces is routed through on-airport ditches that act as infiltration and sediment basins. This provides some treatment in addition to rate and volume control of flow off the airport. Given these efforts and minor use of deicers, the potential impact on water quality from the airport is minimal.

2.5.2 Utilities

Most of Airlake Airport currently lies outside the city limits of Lakeville, with the exception of the area immediately surrounding the FBO facilities. Therefore, the majority of the airport does not have services available for sanitary sewer or water. The MAC maintenance building and the FBO were connected to the city system many years ago, and are billed directly from the City. When these buildings were connected to the system, stubs for both the watermain and the sanitary sewer were extended to the south under the runway. In 1990, a watermain pipe was allowed by the City to be extended into the North Building Area as a fire protection line. There are no private services off of this line. It serves only fire hydrants. In 1994, this fire protection watermain line was extended when the building area was expanded.

The installation of domestic water and sanitary sewer utilities to areas not within the Lakeville city boundary, including the future South Building Area, will not be feasible until the airport is annexed into the City of Lakeville or a Joint Powers or Cooperative Agreement is established for the extension of utilities beyond the Lakeville city boundary. Discussions about the process and timeline for extending utilities to areas not currently within the Lakeville city boundary are underway between MAC, Lakeville, and Eureka Township.

A sanitary sewer interceptor pipe was installed along the northern boundary of the Airport by Metropolitan Council Environmental Services in 2011. Airport facilities are not currently tied into this system.

Existing tenants that have legal wells and septic holding tanks have been allowed to keep them. The MAC maintenance building also has a well and holding tank. Tenants with illegal sandpoint wells or drain fields were required to remove or abandon them after MAC adopted its Sanitary Sewer and Water Policy in 1998, and subsequent revision in October 2000. Consistent with that policy, no new wells or holding tanks have been allowed at the airport.
Most tenants at the Airport have either electric or natural gas service. The electrical lines are above ground in some locations at the airport, and below ground in others. The tenants are billed directly by the utility companies.

There are several underground natural gas pipelines within airport property. The ownership varies, and the ability to construct hangars is limited by their locations. MAC has paid to relocate some of these pipelines in the past to facilitate hangar development. In other areas, vacant land remains where pipeline easements still exist between hangars. Figure 2-8 shows the locations of these pipelines in the vicinity of the hangar areas.

The City of Lakeville and Eureka Township both offer emergency services for the Airport, including fire and rescue. Response is based on the location of the emergency. Police and law enforcement are provided by the Dakota County Sheriff’s Office.

### 2.6 OFF-AIRPORT LAND USE

One of the most significant challenges facing airports today is the presence of incompatible land use, either adjacent to the airport or in runway flight paths. Working closely with municipal officials, airport users, developers, and any nearby residents, airports can reduce these types of conflicts through the use of zoning regulations that disallow certain types of nearby development.

In general, land use around Airlake Airport is compatible with aircraft operations. Existing land uses parallel to the Runway 12-30 on the north side are primarily industrial. There is a small section of commercial use and some undeveloped areas within the industrial park. Surrounding the rest of the airport, land use is primarily agricultural with scattered farmsteads and single family rural residential. A new area of industrial park development is under construction to the east of the airport, across Cedar Avenue. There is a cemetery located adjacent to the South Building Area.

The City of Lakeville and Eureka Township have zoning jurisdiction in and around the airport. Both municipalities have adopted Comprehensive Plans that address land uses in the vicinity of Airlake Airport. Links to these Comprehensive Plans are provided in Section 7.3.

Existing land uses in the vicinity of Airlake Airport are depicted on Figure 2-10.

### 2.7 ECONOMIC IMPACTS

Development at Airlake Airport will continue to be self-funded by users of the airport and aviation system; no local sales or property taxes are or will be used to fund airport improvements.

MAC expends approximately $300,000 annually to operate and maintain Airlake Airport to a high level of safety and operational efficiency with no direct cost to local taxpayers.

MAC-owned land that is not leased to airport users or tenants is exempt from property taxes under State law. Leaseholds and the structures located within those leases are subject to property taxes which are paid by the tenants.
Dakota County assesses property taxes on hangar owners based on the taxable market value of the hangars. For 2016, the total property tax billed on hangars at Airlake Airport was approximately $230,000.00\(^{16}\). Of these tax revenues, the largest recipient is School District 194, which received approximately $117,000.00 from airport tenants. Dakota County received approximately $69,000.00 in revenue as well, and Eureka Township approximately $30,000.00. The remaining tax revenues supported the City of Lakeville, Metropolitan Council, and Mosquito Control.

MnDOT Aeronautics provides an Airport Economic Impact Calculator to estimate the economic value of airports in the State: [http://www.dot.state.mn.us/aero/econimpactcalc.html](http://www.dot.state.mn.us/aero/econimpactcalc.html).

According to output obtained from this tool, the total economic impact from activity occurring at Airlake Airport is nearly $1,800,000.00 annually and accounts for approximately 50 jobs in the county.

This is based on the following activity inputs:

- $298,000.00 average annual operations and maintenance (O&M) expenses;
- $201,000.00 average annual capital expenses;
- Tenant activities: 9 full-time employees, 31 part-time employees, 9 owned aircraft;
- 416 annual transient overnight aircraft;
- 260 annual charter visitors; and
- One non-profit organization aircraft (Civil Air Patrol).

\(^{16}\) Not including state general tax and fiscal disparity tax payments
Figure 2-1: Airport Layout
Figure 2-2: Airlake Airport Pavement Condition Index (2016 PCI)
Figure 2-3: Runway Safety Area, Object Free Area, and Protection Zone Key Map

(See Table 2-2 for dimensions)
Figure 2-4: National Airspace System Overview
Figure 2-5: Regional Airspace

- **St. Paul Downtown Airport (STP)**
- **Minneapolis - St. Paul International Airport (MSP)**
- **South St. Paul Airport (SGS)**
- **Airlake Airport (LVN)**

**I-MSP (6 NM)**
- Ceiling 10,000 FT MSL
- Floor (Surface)

**I-MSP (8.5 NM)**
- Ceiling 10,000 FT MSL
- Floor 2,300 FT MSL

**I-MSP (12 NM)**
- Ceiling 10,000 FT MSL
- Floor 3,000 FT MSL

**I-MSP (20 - 30 NM)**
- Ceiling 10,000 FT MSL
- Floor 4,000 FT MSL
Figure 2-6: Instrument Approach Procedures
Figure 2-7: FAR Part 77 Airspace Surfaces

NOTE:
DIMENSIONS FOR THESE SURFACES VARY
AND CAN BE FOUND IN FAR 14 CFR PART 77
Figure 2-8: Airlake Airport Building Areas

North Building Area

EXISTING NORTH BUILDING AREA
South Building Area
Figure 2-9: Airport Drainage and Wetlands
Figure 2-10: Existing Off-Airport Land Use
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SECTION 3:

AVIATION FORECASTS
3. AVIATION FORECASTS

3.1 INTRODUCTION

This chapter summarizes the LTCP activity forecast for Airlake Airport. The base year is represented by the twelve months ending June 2015 and forecasts were prepared for 2020, 2025, 2030, and 2035. These forecasts assume an unconstrained demand for aviation services but assume that the type of aircraft that can fly in and out of the airport is constrained by the lengths of the existing runways. The chapter begins with a description of the forecast approach, followed by a discussion of the forecasts for based aircraft and aircraft operations, and then concludes with a set of alternative forecast scenarios.

The assumptions inherent in the following calculations are based on data provided by the MAC, federal and local sources, and professional experience. Forecasting, however, is not an exact science. Departures from forecast levels in the local and national economy and in the aviation industry would have a significant effect on the forecasts presented herein.

A summary of the methodology used to prepare the aviation activity forecasts is presented in Appendix 3. The complete Minneapolis-St. Paul Reliever Airport: Activity Forecasts – Technical Report (October 2015) that contains full forecast development documentation can be downloaded from the MAC website through the following link:


3.2 HISTORICAL ACTIVITY LEVELS

The total number of aircraft based at Airlake Airport rose from 1990 to 2003, and then began to decline before stabilizing after 2012. Based aircraft at Airlake currently stand at 137. Aircraft operations fell more rapidly than based aircraft over the same period, but are recovering as well. A number of factors have contributed to the decline during the 2000’s, including the slowing economy, increased fuel prices and other operating costs, and reduced interest in recreational flying by younger generations.

Table 3-1 summarizes historical based aircraft and aircraft operations at Airlake Airport.
Table 3-1: Historical Activity Levels

<table>
<thead>
<tr>
<th>Year</th>
<th>Based Aircraft</th>
<th>Aircraft Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>140</td>
<td>67,980</td>
</tr>
<tr>
<td>1995</td>
<td>179</td>
<td>75,397</td>
</tr>
<tr>
<td>2000</td>
<td>175</td>
<td>76,418</td>
</tr>
<tr>
<td>2003</td>
<td>190</td>
<td>58,108</td>
</tr>
<tr>
<td>2005</td>
<td>163</td>
<td>51,678</td>
</tr>
<tr>
<td>2010</td>
<td>147</td>
<td>35,662</td>
</tr>
<tr>
<td>2011</td>
<td>131</td>
<td>34,270</td>
</tr>
<tr>
<td>2012</td>
<td>147</td>
<td>34,560</td>
</tr>
<tr>
<td>2013</td>
<td>127</td>
<td>31,346</td>
</tr>
<tr>
<td>2014</td>
<td>129</td>
<td>34,327</td>
</tr>
<tr>
<td>2015</td>
<td>137</td>
<td>36,757(a)</td>
</tr>
</tbody>
</table>

Notes:
(a) Twelve months ending June 2015. Includes estimate of nighttime activity.

Source: MAC Records, HNTB Activity Forecasts

Airlake Airport is experiencing an upward trend in high-performance corporate and general aviation itinerant activity with turbine equipment. During 2015 there were 4 jets and 1 turboprop aircraft based at Airlake Airport:

- One Cessna Citation I/SP (C501)
- One Cessna CitationJet/CJ1 (C525)
- Two Cessna Citation IIIs (C650)
- One Piper Malibu Meridian (P46T)

To document the existing fleet mix at Airlake, FAA Traffic Flow Management System Counts (TFMSC) were collected for CY2015. Traffic Flow Management System Counts (TFMSC) collect data for Instrument Flight Rules (IFR) flights captured by the FAA’s enroute computers. VFR (Visual Flight Rules) flights are not included in the TFMSC data set. For CY2015, there were approximately 2,000 operations identified that contain known aircraft types. Of these recorded operations, 284 were jets and 230 were turboprops, for a combined total of 514 turbine operations. Operational trends for turbine aircraft at Airlake between 2011 and 2015 are illustrated on the following graphic.
This graphic illustrates the growth realized in jet aircraft operations over the past five years, showcasing an evolution in the fleet mix at Airlake Airport and the emerging demand for business-related aviation services. While the existing runway length is generally adequate for most turboprop operations, it is marginal for many jet operations, particularly for takeoff and Part 135 landing requirements. As the demand for jet operations grows, the runway length will become an increasing constraint on the airport’s ability to fully fulfill its designated role as a south-metro area reliever.

The steady increase in jet operations is largely attributable to an evolving business model by the airport’s Fixed Based Operator (FBO), but also reflects improved economic conditions and growth in the demand for business-related flying in the south metropolitan area. However, it is doubtful that jet aircraft operations will reach a threshold of 500 annually with the existing runway length.

In discussions with the owner of the FBO who offers aircraft management, aircraft sales, and charter services at Airlake Airport, the aircraft types most in demand from their clientele are mid-sized corporate jets such as the Cessna Citation III and Dassault Falcon 20. The operational capabilities of these aircraft types are constrained by the existing runway length at Airlake Airport. At times, aircraft based at Airlake Airport must reposition to another area airport with a longer runway in order to depart with enough fuel and payload to reach destinations beyond an approximately 500 nautical mile stage length. Based on flight track data, it appears that several flights per month (approximately 80 total flights in CY2015) are repositioning from Airlake Airport to another airport due to runway length limitations. Operating in this manner is both inefficient and unproductive for users of the regional airport system.
During 2015, FAA records indicate that approximately 1,900 flights at Airlake Airport, or about 5% of total operations, filed an instrument flight plan. Aircraft operating on an instrument flight plan are more likely flying for a business-related purpose than aircraft filing visual flight plans. However, user input suggests that the number of instrument approaches conducted at Airlake is significantly higher because many approaches conducted for flight training are conducted in visual flight rule (VFR) conditions and thus no instrument flight plan is filed.

3.3 SOCIOECONOMIC PROJECTIONS

Population forecasts from the Metropolitan Council and per capita income forecasts from Woods & Poole Economics were used to develop hybrid income forecasts for each county in the metropolitan area. The income forecasts were used to estimate the share of based aircraft growth accounted for by each county. A summary of key socioeconomic projections for Dakota County and adjacent Scott County is provided in Table 3-2.

Table 3-2: Dakota & Scott County Socioeconomic Growth Trends

<table>
<thead>
<tr>
<th>Socioeconomic Indicator</th>
<th>2013</th>
<th>2035</th>
<th>Change</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>408,509</td>
<td>502,076</td>
<td>93,567</td>
<td>23%</td>
</tr>
<tr>
<td>Employment</td>
<td>240,467</td>
<td>314,826</td>
<td>74,359</td>
<td>31%</td>
</tr>
<tr>
<td>Real Personal Income</td>
<td>$20,982,319</td>
<td>$32,508,327</td>
<td>$11,526,008</td>
<td>55%</td>
</tr>
<tr>
<td>Per Capita Personal Income</td>
<td>$51,363</td>
<td>$64,748</td>
<td>$13,385</td>
<td>26%</td>
</tr>
</tbody>
</table>

Source: HNTB Activity Forecasts

<table>
<thead>
<tr>
<th>Socioeconomic Indicator</th>
<th>2013</th>
<th>2035</th>
<th>Change</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>137,232</td>
<td>188,738</td>
<td>51,506</td>
<td>38%</td>
</tr>
<tr>
<td>Employment</td>
<td>58,151</td>
<td>82,506</td>
<td>24,355</td>
<td>42%</td>
</tr>
<tr>
<td>Real Personal Income</td>
<td>$6,560,047</td>
<td>$10,923,245</td>
<td>$4,363,198</td>
<td>67%</td>
</tr>
<tr>
<td>Per Capita Personal Income</td>
<td>$47,803</td>
<td>$57,875</td>
<td>$10,073</td>
<td>21%</td>
</tr>
</tbody>
</table>

Source: HNTB Activity Forecasts

A comparison of the projected socioeconomic indicator growth rates for Dakota County, adjacent Scott County, the Seven-County Metropolitan Area, and the United States as a whole is presented in Table 3-3.
Table 3-3: Comparison of Project Socioeconomic Growth Rates

<table>
<thead>
<tr>
<th>Socioeconomic Indicator</th>
<th>Dakota County</th>
<th>Scott County</th>
<th>7-County Metro</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>0.8%</td>
<td>1.3%</td>
<td>0.8%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Employment</td>
<td>1.3%</td>
<td>1.5%</td>
<td>1.1%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Real Personal Income</td>
<td>2.0%</td>
<td>2.2%</td>
<td>2.2%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Per Capita Personal Income</td>
<td>1.0%</td>
<td>0.8%</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Source: HNTB Activity Forecasts

Based on this analysis, Dakota County is expected to experience near-average growth in population, real personal income, and per capita personal income, and above-average growth in employment throughout the forecast period. Also, adjacent Scott County is expected to experience above-average growth in population and employment.

Meanwhile, the City of Lakeville is one of the fastest-growing cities in the metropolitan area. Between 2010 and 2014, the population of Lakeville grew by nearly seven percent to 59,866, and it is expected to grow to over 80,000 by 2040. Likewise, steady growth is anticipated in both the number of households and employment. Commercial development is surging as well, with several recent business expansions or developments in the vicinity of the Airport including Menasha Packaging and FedEx Freight.

These trends can be viewed as an overall positive indicator for the continued viability of aviation demand in the vicinity of Airlake Airport.

3.4 BASE CASE FORECAST

Forecasts include based aircraft and operations for each major category: single-engine piston, multi-engine piston, turboprop, jets, helicopters, sport aircraft, experimental, and other. It was assumed that the share of each county’s registered aircraft in every aircraft category based at all of the airports under study will remain constant.

In the Base Case forecast scenario, the number of based aircraft at Airlake Airport is projected to decline slightly, from 137 aircraft in 2015 to 131 aircraft in 2035. The dominant aircraft in the fleet, piston engine aircraft, are projected to decline, consistent with the FAA Aerospace Forecast Fiscal Years 2015-2035. Jets, helicopters, sport, and experimental aircraft are expected to increase but not fast enough to offset the decline in the piston category. Table 3-4 provides a summary of the based aircraft forecast.

Operations at Airlake Airport are projected to decrease slightly from 36,757 in 2015 to 35,658 in 2035. Increases are projected in all categories except single-engine and multi-engine piston aircraft, for which the anticipated decrease in the based aircraft offsets
slightly higher utilization forecasted by the FAA. Jet, helicopter and sport operations are expected to increase the fastest.

Table 3-5 provides a summary of the aircraft operations forecast.

### Table 3-4: Summary of Based Aircraft Forecast (Base Case)

<table>
<thead>
<tr>
<th>Aircraft Category</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>AAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Engine Piston</td>
<td>99</td>
<td>96</td>
<td>92</td>
<td>89</td>
<td>87</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Multi-Engine Piston</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Jets</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>2.8%</td>
</tr>
<tr>
<td>Helicopter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>28</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>137</td>
<td>135</td>
<td>134</td>
<td>133</td>
<td>131</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

Notes:
- AAG - Average Annual Growth Rate from 2015 to 2035
- Other category includes experimental and light sport aircraft types

Source: HNTB Activity Forecasts

### Table 3-5: Summary of Aircraft Operations Forecast (Base Case)

<table>
<thead>
<tr>
<th>Aircraft Category</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>AAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Engine Piston</td>
<td>31,865</td>
<td>29,406</td>
<td>28,208</td>
<td>27,629</td>
<td>27,722</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Multi-Engine Piston</td>
<td>834</td>
<td>814</td>
<td>731</td>
<td>754</td>
<td>707</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>271</td>
<td>276</td>
<td>285</td>
<td>304</td>
<td>331</td>
<td>1.0%</td>
</tr>
<tr>
<td>Jets</td>
<td>202</td>
<td>221</td>
<td>347</td>
<td>349</td>
<td>408</td>
<td>3.6%</td>
</tr>
<tr>
<td>Helicopter</td>
<td>1,525</td>
<td>1,843</td>
<td>2,100</td>
<td>2,359</td>
<td>2,650</td>
<td>2.8%</td>
</tr>
<tr>
<td>Other</td>
<td>2,059</td>
<td>2,251</td>
<td>2,971</td>
<td>3,711</td>
<td>3,840</td>
<td>3.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>36,756</td>
<td>34,811</td>
<td>34,642</td>
<td>35,106</td>
<td>35,658</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

Notes:
- AAG - Average Annual Growth Rate from 2015 to 2035
- Other category includes experimental and light sport aircraft types

Source: HNTB Activity Forecasts
The peak month operations percentage at Airlake was assumed to be the average for ANE, MIC, FCM, and STP from 2011 to 2014. Average Day Peak Month (ADPM) operations were estimated by dividing by 31 days. Peak hour operations were estimated at 19.2 percent of ADPM operations based on MAC aircraft operations counts. As shown in Table 3-6, peak hour operations are projected to fluctuate between 25 and 26 operations.

<table>
<thead>
<tr>
<th>Peak Periods</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Operations</td>
<td>36,757</td>
<td>34,811</td>
<td>34,642</td>
<td>35,106</td>
<td>35,658</td>
</tr>
<tr>
<td>Peak Month Operations</td>
<td>4,241</td>
<td>4,016</td>
<td>3,997</td>
<td>4,050</td>
<td>4,114</td>
</tr>
<tr>
<td>ADPM Operations</td>
<td>137</td>
<td>130</td>
<td>129</td>
<td>131</td>
<td>133</td>
</tr>
<tr>
<td>Peak Hour Operations</td>
<td>26</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>26</td>
</tr>
</tbody>
</table>

Notes:
ADPM - Average Day of the Peak Month

Source: HNTB Activity Forecasts

### 3.5 FORECAST SCENARIOS

Historically, general aviation activity has been difficult to forecast, since the relationships with economic growth and pricing factors are more tenuous than in other aviation sectors, such as commercial aviation. This uncertainty is likely to carry over into the near future, given the volatility of fuel prices and the continued shift in General Aviation from personal and recreational use to business use. To address these uncertainties, and to identify the potential upper and lower bounds of future activity at the study airports, detailed high and low scenarios are presented. These scenarios use the same forecast approach that was used in the Base Case, but alter the assumptions to reflect either a more aggressive or more conservative outlook.

The high forecast scenario is based on the assumption that income would grow 0.5 percent per year faster than in the Base Case. All other assumptions are the same as in the Base Case. The low forecast scenario is based on the assumption that income would grow 0.5 percent more slowly each year than under the Base Case.
An extended runway scenario was prepared to evaluate the potential impact associated with lengthening the main runway at Airlake from 4,099 feet to 5,000 feet\textsuperscript{17}. All other forecast assumptions are the same as in the Base Case. An examination of registered jets within Airlake’s current catchment area for piston aircraft indicated that there were several that could operate at reasonable payloads with a 5,000 foot runway. Based on this analysis, it was estimated that the number of based jet aircraft at Airlake Airport would increase from 7 under the baseline forecast to 10 under the extended runway scenario, and turboprops from 1 to 2.

The current ratio of operations to based aircraft for jets at Airlake is unusually low. Based aircraft account for the majority of all jet operations, with a relatively small amount of activity from transient operators.

It was considered unlikely that the ratio would remain at its current level if the runway were extended to 5,000 feet, as both based and transient operators would be more likely to take advantage of the facility. As a result, using the current ratio of jet operations to based aircraft would probably understate noise and other environmental impacts associated with a 5,000 foot scenario.

Due to the existing runway length, it is not possible to use historical data to estimate an operations to based aircraft ratio that is defensible. Absent useful historical data, the next best option is to identify airports with characteristics similar to Airlake after a runway extension to 5,000 feet. Flying Cloud (FCM) and Anoka County (ANE) were determined to be the most similar airports since they currently have 5,000 foot runways and, along with Airlake, serve the Minneapolis-St. Paul metropolitan area. In addition, since these airports have air traffic control towers, more accurate operations data is available.

Airlake, Flying Cloud and Anoka County have overlapping service areas since they all serve the Minneapolis-St. Paul metropolitan area. Airlake is slightly more distant at approximately 23 miles from the downtown St. Paul center and 24 miles from the downtown Minneapolis center. Flying Cloud is about 14 miles from the downtown Minneapolis center and about 20 miles from the downtown St. Paul center, while Anoka County is about 12 miles from the downtown St. Paul center and about 15 miles from the downtown Minneapolis center.

Airlake is located in Dakota County, and owners of aircraft based at Airlake live primarily in Dakota (46\%), Scott (20\%), Ramsey (14\%), and Hennepin Counties (11\%). Flying Cloud is located in Hennepin County and owners of aircraft based at FCM live primarily in Hennepin (67\%), Scott (6\%), and Dakota Counties (4\%). Anoka County is located in Anoka County, and owners of aircraft based at Anoka County live primarily in Hennepin (37\%), Ramsey (24\%) and Anoka Counties (20\%). Although each of the airports tend to serve the communities that are closest, they all serve residents located throughout the metropolitan area and serve as reliever airport to MSP. Average per capita income in 2013 ranged from a low of $42,799 in Anoka County (where ANE is located) to a high of

\textsuperscript{17} Minnesota Statutes Section 473.641 subdivision 4 prohibits the MAC from extending runway length at its minor airports beyond 5,000 feet without prior legislative authorization.
$61,409 in Hennepin County (where FCM is located). As a comparison, the per capita income in Dakota County (where Airlake Airport is located) was $51,363, approximately midway between Anoka and Hennepin Counties.

In order to estimate impact of a runway extension at Airlake Airport on aircraft operations, data was used from FCM and ANE airports because of the anticipated similarity in facilities and shared socioeconomic characteristics. Based on the above analysis, it was anticipated that the extended runway at Airlake would attract more itinerant operations by high performance turboprops and jets. After the extension at Airlake, the maximum runway lengths at Airlake, Flying Cloud, and Anoka County would be equivalent and it was therefore assumed that the ratios of turboprop and jet operations to based aircraft at Airlake would become the same as the regional average for airports with 5,000-foot runways. The forecast operations fleet mix for jets and turboprops also assumes FBO and other GA amenities, including sufficient apron parking space, comparable to Flying Cloud and Anoka County, would be in place at Airlake. Tables 3-7, 3-8, and 3-9 show the extended runway condition forecast for based aircraft, aircraft operations, and peak hour activity levels at Airlake.

**Table 3-7: Summary of Based Aircraft Forecast (Extended Runway)**

<table>
<thead>
<tr>
<th>Aircraft Category</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>AAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Engine Piston</td>
<td>99</td>
<td>96</td>
<td>92</td>
<td>89</td>
<td>87</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Multi-Engine Piston</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3.5%</td>
</tr>
<tr>
<td>Jets</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>4.7%</td>
</tr>
<tr>
<td>Helicopter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>28</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>137</td>
<td>135</td>
<td>137</td>
<td>136</td>
<td>135</td>
<td>-0.1%</td>
</tr>
</tbody>
</table>

**Notes:**
- AAG - Average Annual Growth Rate from 2015 to 2035
- Other category includes experimental and light sport aircraft types

**Source:** HNTB Activity Forecasts
Table 3-8: Summary of Aircraft Operations Forecast (Extended Runway)

<table>
<thead>
<tr>
<th>Aircraft Category</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>AAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Engine Piston</td>
<td>31,865</td>
<td>29,406</td>
<td>28,208</td>
<td>27,629</td>
<td>27,722</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Multi-Engine Piston</td>
<td>834</td>
<td>814</td>
<td>731</td>
<td>754</td>
<td>707</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>271</td>
<td>276</td>
<td>576</td>
<td>739</td>
<td>757</td>
<td>5.3%</td>
</tr>
<tr>
<td>Jets</td>
<td>202</td>
<td>221</td>
<td>1,314</td>
<td>2,181</td>
<td>2,734</td>
<td>13.9%</td>
</tr>
<tr>
<td>Helicopter</td>
<td>1,525</td>
<td>1,843</td>
<td>2,100</td>
<td>2,359</td>
<td>2,650</td>
<td>2.8%</td>
</tr>
<tr>
<td>Other</td>
<td>2,059</td>
<td>2,251</td>
<td>2,971</td>
<td>3,711</td>
<td>3,840</td>
<td>3.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36,756</strong></td>
<td><strong>34,811</strong></td>
<td><strong>35,900</strong></td>
<td><strong>37,373</strong></td>
<td><strong>38,410</strong></td>
<td><strong>0.2%</strong></td>
</tr>
</tbody>
</table>

Notes:
- AAG - Average Annual Growth Rate from 2015 to 2035
- Other category includes experimental and light sport aircraft types

Source: HNTB Activity Forecasts

Table 3-9: Peak Period Forecasts (Base Case)

<table>
<thead>
<tr>
<th>Peak Periods</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Operations</td>
<td>36,757</td>
<td>34,811</td>
<td>35,900</td>
<td>37,373</td>
<td>38,410</td>
</tr>
<tr>
<td>Peak Month Operations</td>
<td>4,241</td>
<td>4,016</td>
<td>4,142</td>
<td>4,312</td>
<td>4,432</td>
</tr>
<tr>
<td>ADPM Operations</td>
<td>137</td>
<td>130</td>
<td>134</td>
<td>139</td>
<td>143</td>
</tr>
<tr>
<td>Peak Hour Operations</td>
<td>26</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
</tr>
</tbody>
</table>

Notes:
- ADPM - Average Day of the Peak Month

Source: HNTB Activity Forecasts

Table 3-10 compares the total number of aircraft and operations under different scenarios for Airlake, including the FAA’s Terminal Area Forecast (TAF) that was released in January 2017. FAA has determined that the LTCP forecast is consistent with the TAF and concurs with its use for planning purposes. Additional forecast details are presented in Appendix 3.

18 An airport’s forecast is considered to be consistent with the FAA TAF if it differs by less than 10% in the 5-year forecast period and less than 15% in the 10-year and beyond forecast periods.
<table>
<thead>
<tr>
<th>Year</th>
<th>Total Based Aircraft</th>
<th>Total Number of Operations</th>
<th>Variance from TAF (Operations)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base Case</td>
<td>High Range</td>
<td>Low Range</td>
</tr>
<tr>
<td>2015</td>
<td>137</td>
<td>137</td>
<td>137</td>
</tr>
<tr>
<td>2020</td>
<td>135</td>
<td>137</td>
<td>131</td>
</tr>
<tr>
<td>2025</td>
<td>134</td>
<td>141</td>
<td>128</td>
</tr>
<tr>
<td>2030</td>
<td>133</td>
<td>143</td>
<td>126</td>
</tr>
<tr>
<td>2035</td>
<td>131</td>
<td>145</td>
<td>120</td>
</tr>
</tbody>
</table>

**Average Annual Growth Rate**

-0.2% 0.3% -0.7% -0.1% -0.2% 0.3% -0.6% 0.2% 1.2%

**Notes:**
TAF - 2017 Terminal Area Forecast published by FAA
The LTCP forecast is considered to be consistent with the FAA TAF if it differs by less than 10% in the 5-year forecast period and less than 15% in the 10-year and beyond forecast periods.

**Sources:** HNTB Analysis.
3.6 FORECAST SUMMARY

Recent activity levels at Airlake Airport indicate that the number of based aircraft and aircraft operations have started to grow again after stabilizing in 2012. Based on the economic outlook for Dakota and Scott counties, as well as the Seven-County Metropolitan Area, and given projected trends for general aviation, the forecasts predict a stable (Base Case scenario) to slow growth (Extended Runway scenario) activity levels at Airlake Airport.

The forecast scenarios indicate that future economic growth, fuel prices, technology, and national aviation policy could have a significant impact – either up or down – on the development of general aviation.

Minor fluctuations in activity levels above or below the long-term forecast will not affect the overall recommendations of the LTCP, just possibly how quickly the proposed improvements need to be made.
SECTION 4:

FACILITY REQUIREMENTS
4. FACILITY REQUIREMENTS

4.1 INTRODUCTION
This chapter describes the facility requirements needed to accommodate the demand forecasts for year 2035. The sections of this chapter are intended to:

- Describe relevant design criteria;
- Present airfield requirements in context of the critical aircraft;
- Review NAVAID requirements;
- Identify general aviation facility requirements;
- Review parking and airport access needs;
- Review obstruction issues; and
- Present miscellaneous requirements for the airport.

4.2 CRITICAL AIRCRAFT FAMILY DESIGN CRITERIA
The future critical aircraft expected to use Airlake Airport on a regular basis with a runway extension in place is a composite ARC B-II aircraft family used for business aviation purposes. Table 4-1 highlights physical characteristics for several representative types, while Figure 4-1 at the end of this section depicts several aircraft within this family by their Approach Category and Design Group.

Table 4-1: Representative Types in Critical Aircraft Family

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Configuration</th>
<th>Wingspan</th>
<th>Maximum Takeoff Weight (lbs.)</th>
<th>Typical Passenger Seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beechcraft King Air 350</td>
<td>Turboprop</td>
<td>57' 11&quot;</td>
<td>15,000</td>
<td>9-11</td>
</tr>
<tr>
<td>Cessna Citation II/550</td>
<td>Jet</td>
<td>52' 02&quot;</td>
<td>14,100</td>
<td>7-9</td>
</tr>
<tr>
<td>Cessna Citation Excel/560</td>
<td>Jet</td>
<td>55' 08&quot;</td>
<td>20,000</td>
<td>8-11</td>
</tr>
<tr>
<td>Cessna Citation III/650</td>
<td>Jet</td>
<td>53' 06&quot;</td>
<td>22,000</td>
<td>7-13</td>
</tr>
<tr>
<td>Dassault Falcon 20/200</td>
<td>Jet</td>
<td>53' 06&quot;</td>
<td>28,660</td>
<td>8-10</td>
</tr>
<tr>
<td>Dassault Falcon 50</td>
<td>Jet</td>
<td>61' 10&quot;</td>
<td>40,780</td>
<td>9-19</td>
</tr>
<tr>
<td>Dassault Falcon 900</td>
<td>Jet</td>
<td>63' 05&quot;</td>
<td>45,500</td>
<td>12-19</td>
</tr>
</tbody>
</table>

Source: Aircraft Manufacturer Data

From an airfield facility requirements perspective, this composite aircraft family is represented by the Cessna Citation III/650 and/or the Dassault Falcon 20/200. Letters of support obtained from airport users to document the likelihood of Airlake Airport
accommodating at least 500 annual operations of these, or similar, aircraft types within the first five years of an extended runway being in place are provided in Appendix 4.

Based upon this fleet mix, Chapter 3 of AC 150/5325-4B runway length requirements for Airplanes within a Maximum Certificated Takeoff Weight of More than 12,500 Pounds Up To and Including 60,000 Pounds would be the critical aircraft grouping to use for future runway length requirements. This is the same grouping that was used in the 2025 LTCP analysis. Design parameters associated with this aircraft family will be as follows:

- Aircraft Approach Category (AAC): B (approach speed less than 121 knots);
- Airplane Design Group (ADG): II (wingspan up to but not including 79 feet and tail height less than 30 feet); and
- Taxiway Design Group (TDG): 2 (main landing gear width 20 feet or less and cockpit-to-main gear distance less than 64 feet); and
- Approach visibility minimums: 4,000 feet, which corresponds to visibility minimums of lower than one statute mile but not lower than ¾ mile.

FAA airfield design standards for this family of critical aircraft are summarized in Table 2-2 of the Existing Conditions chapter.

### 4.3 METEOROLOGICAL DATA, WIND COVERAGE, AND RUNWAY ORIENTATION

Weather conditions have a significant influence on the operational capabilities at an airport. Wind speed and direction help determine runway orientation. Temperature plays a role in determining runway length; higher temperatures in the summer months result in longer runway length requirements. Cloud cover and low visibility are factors used to determine the need for navigation aids and instrument approaches.

Aircraft generally take off and land directly into the wind, or at least as directly into the wind as a given runway alignment allows. The FAA recommends that the primary runway provide at least 95 percent wind coverage for the aircraft anticipated to use the airport. If the primary runway does not provide this level of coverage, a crosswind runway may be justified.

Because larger, heavier and more powerful aircraft need a crosswind runway less often than smaller, lighter and less powerful ones, different wind speeds are used in the crosswind runway analysis for different aircraft. These different wind speeds are called crosswind components. Crosswind components are defined by wind direction and speed taken at a right angle to a runway.

Per FAA criteria, the maximum allowable crosswind component for Reference Code A/B-I aircraft is 10.5 knots and 13 knots for Reference Code A/B-II aircraft.

Data from the Airlake Airport Automated Weather Observing System (AWOS) was obtained to analyze the amount of wind coverage provided by the current runway system. Table 4-2 summarizes the wind coverage of runways for the applicable crosswind components and weather conditions:
Table 4-2: Wind Coverage Summary

<table>
<thead>
<tr>
<th>Wind Coverage</th>
<th>All Weather Conditions</th>
<th>VFR Conditions</th>
<th>IFR Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5 Kt. Crosswind Component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 12-30</td>
<td>96.3%</td>
<td>96.4%</td>
<td>95.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Kt. Crosswind Component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 12-30</td>
<td>98.4%</td>
<td>98.5%</td>
<td>97.8%</td>
</tr>
<tr>
<td>Total Number of Hourly Observations</td>
<td>256,416</td>
<td>234,266</td>
<td>22,644</td>
</tr>
</tbody>
</table>

Notes: Bold numbers reflect 95% or greater wind coverage

Source: LVN AWOS Wind Data 2006 - 2015

This analysis indicates that the Runway 12-30 alignment provides the desired 95 percent wind coverage for both crosswind component categories and during all weather conditions. Since the single-runway configuration provides the desired 95 percent wind coverage in all configurations, construction of a crosswind runway is not justified at Airlake.

Table 4-3 evaluates the wind coverage provided by the specific runway end orientations.

Table 4-3: Wind Coverage By Runway End

<table>
<thead>
<tr>
<th>Wind Coverage</th>
<th>All Weather Conditions</th>
<th>VFR Conditions</th>
<th>IFR Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5 Kt. Crosswind Component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 12</td>
<td>56.0%</td>
<td>55.0%</td>
<td>65.8%</td>
</tr>
<tr>
<td>Runway 30</td>
<td>64.1%</td>
<td>65.1%</td>
<td>52.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Kt. Crosswind Component</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 12</td>
<td>57.3%</td>
<td>56.3%</td>
<td>66.9%</td>
</tr>
<tr>
<td>Runway 30</td>
<td>65.0%</td>
<td>65.9%</td>
<td>53.8%</td>
</tr>
<tr>
<td>Total Number of Hourly Observations</td>
<td>256,416</td>
<td>234,266</td>
<td>22,644</td>
</tr>
</tbody>
</table>

Notes: Bold numbers reflect 60% or greater wind coverage

Source: LVN AWOS Wind Data 2006 - 2015

This data indicates that during VFR conditions, the best wind coverage is provided by the Runway 30 alignment. However, during IFR conditions, this reverses and the best wind coverage is provided by the Runway 12 alignment. As indicated in Section 2.3.4,
Runway 30 currently provides better approach capabilities than Runway 12, primarily due to the approach lighting system supporting the ILS.

The all-weather wind rose for Airlake Airport is shown in Figure 4-2.

As indicated in Table 4-4, Visual Flight Rule (VFR) conditions occur at Airlake Airport nearly 92 percent of the time. Instrument Flight Rule (IFR) conditions occur during the remaining 8 percent of the time. During IFR conditions, cloud ceilings or visibility minimums preclude use of the best approach to Runway 30 approximately 1% of the time, and the best approach to Runway 12 approximately 1.5% of the time.

<table>
<thead>
<tr>
<th>Weather Condition</th>
<th>% of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR &gt;= 1,000’ and &gt;= 3 SM</td>
<td>91.9%</td>
</tr>
<tr>
<td>IFR &lt; 1,000’ or &lt; 3 SM</td>
<td>8.1%</td>
</tr>
<tr>
<td>Below existing RWY 12 LPV (&lt; 250’ or &lt; 1 SM)</td>
<td>1.5%</td>
</tr>
<tr>
<td>Below existing RWY 30 ILS (&lt; 250’ or &lt; 0.75 SM)</td>
<td>1.3%</td>
</tr>
<tr>
<td>Below existing RWY 30 LPV (&lt; 200’ or &lt; 0.75 SM)</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

Notes: Time period 1/1/2006 to 11/30/2015. SM = statute mile

Source: HNTB analysis of NOAA NCDC Integrated Surface Database, Hourly, Global

Another important factor to consider when planning facilities at airports is temperature. The standard used is the mean daily maximum temperature of the hottest month at the Airport. For Airlake Airport, the hottest month of the year is typically July. Based on long-term temperature trends available from the nearest National Climatic Data Center (NCDC) reporting station (Farmington 3 NW) for the 30-year period between 1981 and 2010, the mean maximum daily temperature in the month of July is 82.3° F (27.9° C)\(^{19}\).

\[^{19}\] This compares to a mean maximum daily temperature in the month of July of 83.6° (28.7° C) for the previous 20-year reporting period (1971-2000).

4.4 AIRFIELD CAPACITY

Airfield capacity is defined as the maximum number of operations that can be accommodated by a particular airfield configuration during a specified interval of time when there is constant demand. Annual Service Volume (ASV) is one capacity measure and the average hourly capacity is another.

The ASV for a given airport is the annual level of aircraft operations that can be accommodated with minimal delay. For an airport with annual operations below its ASV, delay is minimal within one to four minutes per operation. Anything above four minutes of delay per operation can result in increased congestion that can adversely impact airfield capacity.
An airfield system’s capacity is determined by a multitude of various factors, including prevailing winds and associated orientation of runways, number of runways, taxiway system, fleet mix, operational characteristics of based aircraft and weather conditions.

Airlake Airport’s ASV is currently estimated to be between approximately 150,000 and 190,000 operations annually, which is well above its current and projected future levels of annual operations. Even if the high forecast level of operations materializes (approximately 39,000), the airport will operate well below its annual service volume.

Using a spreadsheet-based airfield capacity modeling tool recently developed by the Airport Cooperative Research Program (ACRP)\(^{20}\), Airlake Airport’s average hourly capacity is estimated to be between approximately 60 and 85 operations during VFR conditions and approximately 42 operations during IFR conditions. Peak activity forecasts show 28 average day peak month hourly operations for the year 2035 under the Extended Runway scenario.

Thus, Airlake Airport has adequate runway capacity to support all of the forecast scenarios. This means that additional runway capacity will not be a contributing factor to any airport improvements throughout the planning period.

4.5 AIRFIELD FACILITY REQUIREMENTS

4.5.1 Runway Requirements

Runway length requirements are based on several factors, including the type of aircraft using or expected to use an airport, temperature, airport elevation, wind direction and velocity, and runway gradient. In addition, runway surface conditions also impact runway requirements. This last factor is an important consideration for determining runway lengths at airports in northern climates where wet and icy conditions exist.

FAA Advisory Circular (AC) 150/5325-4B, *Runway Length Requirements for Airport Design*, recommends identifying a critical family of aircraft. Although this methodology is general in nature, it recognizes that there is uncertainty about the precise composition of the airport’s fleet mix during the forecast period. Determining runway length based on an aircraft family ensures the greatest measure of flexibility.

As outlined in Section 4.2, the airplane weight category of over 12,500 pounds but less than 60,000 pounds is the critical grouping used to calculate runway length requirements based upon the forecasts. The design objective for the runway is to provide a length that will not result in operational weight restrictions for this family of aircraft.

According to Figures 3-1 and 3-2 of AC 150/5325-4B (reproduced in Appendix 4), the runway length should be approximately 4,700 feet to accommodate 75 percent of the fleet at a 60 percent useful load\(^{21}\). An adjustment is added for effective runway gradient of 10 feet per foot of elevation difference for takeoff operations or 15 percent is added for wet and slippery conditions for landing operations, yielding an adjusted runway length of

\(^{20}\) Per ACRP Report 79, *Evaluating Airfield Capacity*

\(^{21}\) Useful load is defined as the aircraft maximum takeoff weight minus the aircraft empty weight. An aircraft’s useful load can be used to transport either fuel or payload (passengers, baggage, and/or cargo).
approximately 4,800 to 5,400 feet for takeoff and landing, respectively. To accommodate 75 percent of the fleet at a 90 percent useful load, the runway length should be approximately 6,300 feet adjusted to a length of approximately 6,400 to 7,200 feet.

For illustrative purposes, Table 4-5 summarizes takeoff length requirements for several representative aircraft types in the critical aircraft family for Airlake Airport. Takeoff distance requirements are presented for several different takeoff weights representing percentages of the aircraft’s total useful load. Representative aircraft performance charts used for this analysis are reproduced in Appendix 4.

Table 4-5: Typical Takeoff Length Requirements

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Maximum Takeoff Weight (lbs.)</th>
<th>Takeoff Distance (ft.) for % Useful Load</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Cessna Citation Excel/XLS</td>
<td>20,000</td>
<td>4,233</td>
</tr>
<tr>
<td>Cessna Citation III</td>
<td>22,000</td>
<td>7,058</td>
</tr>
<tr>
<td>Dassault Falcon 20/200</td>
<td>28,660</td>
<td>5,843</td>
</tr>
<tr>
<td>Dassault Falcon 900</td>
<td>45,500</td>
<td>6,500</td>
</tr>
<tr>
<td>Average Length</td>
<td></td>
<td>5,908</td>
</tr>
<tr>
<td>Runway Gradient Adjustment (+92°)</td>
<td>6,000</td>
<td>5,313</td>
</tr>
<tr>
<td>Wet/Slippery Runway Adjustment (115%)</td>
<td>6,794</td>
<td>6,005</td>
</tr>
</tbody>
</table>

Notes: Takeoff Distance based on Balanced Field length from aircraft performance manuals. Takeoff distance calculations based on the following conditions:
- Temperature = 82.3°F, Field Elevation = 960 feet MSL, Flaps = Typical takeoff

Source: Aircraft Performance Manuals/Data

It should be noted that Minnesota Statutes Section 473.641, Subdivision 4 prohibits MAC from extending runway length at its minor airports beyond 5,000 feet without prior legislative authorization. Thus, the maximum feasible length at Airlake is 5,000 feet. Further, an assessment of aircraft performance charts for several representative aircraft types expected to operate at Airlake suggests that while a length of 5,000 feet would be ideal, even an extension to nearly 5,000 feet could yield significant operational improvements.

The FAA establishes 75 feet as the required width for RDC B-II-4,000 runways with ¾ mile visibility minimums. Runway 12-30 is currently 75 feet wide. This width should be maintained in the future. An increase in width to 100 feet is only justified when a runway’s visibility minimums decrease to below ¾ mile.
Runway grooving could also be considered as a safety enhancement to improve friction and braking performance when the runway is wet, particularly given the shortened landing distance available on Runway 30 due to the displaced threshold.

**Runway Separation Standards**
In the future, a minimum of 240 feet of separation should be provided between runways and parallel taxiways. The current runway-to-taxiway separations exceed this standard and should be maintained.

**Runway Shoulders**
For RDC B-II-4,000, the required shoulder width is 10 feet. The airport provides 10-foot wide turf shoulders on both runways. All future conditions should continue to meet or exceed FAA standards.

**Runway Safety Areas, Object Free Areas, and Obstacle Free Zones**
The existing Runway Safety Areas (RSAs) and Runway Object Free Areas (ROFAs) at Airlake Airport meet FAA standards for RDC B-II-4000. All future conditions should continue to meet or exceed FAA standards.

The existing Runway Object Free Zones (ROFZs) for Runway 30 meet FAA requirements for the specified RDC. All future conditions should continue to meet or exceed FAA standards. The Precision Obstacle Free Zone (POFZ) for Runway 30 meets FAA requirements; however, POFZ hold position markings and signs should be installed on Taxiway A.

**Runway Protection Zones**
As described in Section 2.3.1, the FAA issued a memorandum for Interim Guidance on Land Uses within an RPZ dated September 27, 2012. This memorandum clarifies the FAA’s current position on allowable land use compatibilities within the RPZ.

The existing RPZs at Airlake contain a railroad and public roads. Both of these land uses require coordination with the FAA per the guidance in the above memorandum. Incompatible land uses should be minimized or avoided when reviewing alternatives for the proposed runway extension.

The recommended development plan from the 2025 LTCP to extend the runway to a length of 5,000 feet would realign both Cedar Avenue and 225th Street through the relocated RPZ, which would represent a triggering event to necessitate an RPZ Alternatives Analysis under the current FAA guidance. In order to obtain approval, MAC would need to study a full range of concepts to avoid impacts to the RPZ, including re-routing Cedar Avenue around the RPZ in its entirety.

Figure 4-3 depicts a conceptual layout to realign Cedar Avenue completely outside of the Runway 30 RPZ (blue line), versus through it as previously proposed. A high-level cost estimate for this realignment is approximately $16,000,000, not including 47 acres of land acquisition.

Based on Dakota County’s current transportation plan, the existing and forecasted volumes on Cedar Avenue will not likely warrant expansion from two lanes to four before...
the 2030 timeframe. So, there is no pressing demand to expand or improve this section of Cedar Avenue that would qualify as a triggering event for an RPZ alternatives analysis.

For context, Figure 4-3 also shows conceptual realignments of the railroad and Highview Avenue on the west side to clear the Runway 12 RPZ as well. The estimated costs for these relocations are approximately $5,000,000 for the railroad and $1,500,000 for Highview Avenue.

Given the extensive costs and community disruption required to realign these existing traverse ways outside of the RPZs, this LTCP will take a fresh look at some available options to provide additional runway length that do not require changes to RPZ locations or require moving Cedar Avenue, Highview Avenue, or the railroad track.

**Runway Edge Lighting**
It is recommended that the existing High-Intensity Runway Lights (HIRL) be maintained on Runway 12-30 to support the existing instrument approach procedures with visibility minimums down to ¾ mile and ceiling heights to 200 feet.

**Navigational Aids**
Currently, there is a PAPI system on Runway 30. The existing VASI on Runway 12 is scheduled to be replaced with a PAPI during 2017. The MALSR at the Runway 30 end should remain in place to serve both the ILS and LPV approaches.

**Airfield Geometry**
Concepts to remove the existing aligned taxiway at the Runway 12 end should be considered when evaluating future airfield development concepts.

### 4.5.2 Taxiway Requirements

As noted in Section 4.2, the existing and future critical design aircraft family for Airlake Airport is within the parameters of the FAA’s Taxiway Design Group (TDG) 2 (main landing gear width 20 feet or less and cockpit-to-main gear distance less than 64 feet).

**Taxiway Width**
The FAA design standard for TDG-2 width is 35 feet. Taxiways A and B are 40 feet wide. This means these taxiway widths exceed FAA design standards for width. This is a conscientious decision by MAC to provide an additional five feet of taxiway pavement width beyond the FAA standard. MAC acknowledges that FAA funding participation is limited to a pavement width of 35 feet.

**Taxiway Safety and Object Free Areas**
The existing Taxiway Safety Areas (TSAs) and Taxiway/Taxilane Object Free Areas (TOFAs) at Airlake Airport meet or exceed FAA standards. All future conditions should meet or exceed FAA standards.

**Taxiway Shoulders**
Paved or stabilized shoulders are recommended along taxiways. TDG II aircraft require 15-foot stabilized shoulders. Airlake Airport has 15-foot-wide turf shoulders on its taxiways, which should be maintained.
**Taxiway Connectors**

Taxiway connectors should be present to facilitate efficient aircraft exit off of the supported runway, to reduce incursions and to minimize time on the runway. However, one of the connector taxiways provides direct access from the FBO apron to the runway. FAA has issued guidance stating that it is not desirable to design taxiways that lead directly from an apron to a runway without requiring a turn, as these configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway but instead accidently enters a runway. Options to improve this geometry item will be considered when preparing airfield development concepts.

**Taxiway Lighting**

There is currently no taxiway lighting at Airlake, with the exception of the taxiway connector exits from Runway 12-30, which are lit. The remaining sections of taxiway have blue guidance reflectors. It is recommended that the potential for installation of taxiway lighting be considered in the future. This would improve safety during the evening and after a light snowfall and also aid pilots who are unfamiliar with the airport.

### 4.5.3 Instrument Approaches

As outlined in Section 2.3.4, Airlake Airport has instrument approaches for both runway ends that can be used during Instrument Meteorological Conditions. The lowest visibility minimums available are ¾ mile.

Upgrading instrument approach capabilities to provide minimums of less than ¾ mile are not contemplated with this plan due to the corresponding increase in the dimensions of the RSAs, ROFAs, and RPZs that would have to be provided. The required runway width would increase from 75 feet to 100 feet as well.

Similarly, the feasibility of improving the Runway 12 approach minimums to match the Runway 30 end (down to ¾ mile) is not contemplated due to the corresponding increase in the dimensions of the Runway 12 Approach RPZ that would have to be provided.

### 4.5.4 Obstacles

The FAA recently consolidated its position, notification process, and mitigation process for obstacles identified as penetrations to the 20:1 Visual Area Surface. The FAA has long maintained the position that airports should keep obstacles clear, marked, or lit for those that penetrate a variety of surfaces including Part 77, Threshold Siting Surface, and TERPS Departure Surface, among others. While these other surfaces are dealt with as instrument procedures are developed, the 20:1 Visual Surface Area can be widely applied to all airports. As such, a formal procedure and process was outlined to notify airports of the obstacles that the FAA identifies that penetrate the 20:1, and required a period of review and mitigation to enable procedures to remain in place.

Train cars on the railroad track along the west side of the Airport penetrate the Runway 12 20:1 straight-in Visual Approach Surface by less than 3 feet, falling into a low risk category but still requiring long-term mitigation.

Installation of a PAPI on Runway 12 that provides a clear obstacle clearance surface over the railroad tracks has been proposed as an interim mitigation strategy for these low-risk penetrations and is programmed for installation in 2017. From a longer-term perspective,
the most comprehensive solution is to displace the Runway 12 threshold by an additional 120 feet to provide the necessary clearance over the railroad tracks. This displacement should be considered as an element of the preferred airfield development concept.

FAA has also established requirements for airport sponsors to develop an “Obstacle Action Plan” (OAP) that details how and when each of the approach and departure surfaces will be cleared and maintained. As this is a new requirement, the OAP for Airlake Airport will be developed along with the Airport Layout Plan (ALP).

4.6 LANDSIDE FACILITY REQUIREMENTS

4.6.1 Hangar Facilities

Airlake Airport, like all of the MAC airports, has a wide variety of hangar sizes. Over the years, the MAC has attempted to standardize the size of hangars within new hangar areas. However, aircraft also come in many different sizes, and trying to accommodate every one leads to variability. As depicted in Table 2-8, Airlake Airport is estimated to have approximately 136 indoor aircraft storage spaces. This number includes an assumption that some, but not all, airport tenants sublease extra space for additional aircraft within their hangar.

Tenants own their hangars and lease the ground space from the MAC. Currently, it is the MAC’s policy that no tenant can lease more space than they can justify with actual aircraft ownership. This practice has reduced the number of large hangar demands, and subsequently, reduces some of the subleasing opportunities at the airport.

According to the forecast results reported in Table 3-10, the number of based aircraft is anticipated to decline slightly through 2035. By 2035, the number of based aircraft is forecasted to be between 131 and 135 aircraft in the Base Case and Extended Runway scenarios, respectively.

It appears that nearly all available hangar capacity at Airlake Airport is occupied today and will continue to be so throughout the planning horizon. In addition, there could be demand for construction of certain hangar types and/or sizes that are not currently available. Once utilities are established, it is envisioned that construction of new hangars will occur in the South Building Area. The issues related to establishing sanitary sewer and water services in the South Building Area are discussed in Section 6.3.

4.6.2 Fixed Base Operator/Apron

The updated forecasts do not suggest that existing or anticipated future demand levels are sufficient to support more than one full-service FBO facility at Airlake Airport.

As noted in Section 2.4.1, the existing FBO apron is relatively small and often congested. According to the activity forecasts provided in Section 3, peak-hour operations at Airlake Airport could increase to 28 within the planning period. Assuming that 60% of these aircraft are itinerant, the apron should be sized to accommodate approximately 17 aircraft simultaneously. Assuming that three-quarters (13) of these aircraft would be smaller Design Group I aircraft, and that the remaining one-quarter (4) would be larger Design Group II aircraft, the apron size at Airlake Airport should be approximately 14,700 square
yards. The existing apron area is approximately 9,400 square yards, approximately 5,300 square yards below this recommendation. An evaluation of potential sites to accommodate approximately 5,300 square yards of additional apron area is included in Section 5.

4.6.3 Airport Access, Roadway Circulation, and Parking

At this time, airport access and parking facilities appear to be adequate.

Local roadway access from 215th Street W/County Road 70 and Hamburg Avenue in Lakeville leads to the FBO and existing building area. According to the City of Lakeville’s Comprehensive Plan, County Road 70 is a roadway that has the potential to be upgraded to a four-lane principal arterial in the future due to the growth expected in this portion of the City and County. The County’s Comprehensive Plan also identifies County Road 70 north of the Airport as a section of roadway that will likely approach its capacity within the planning period without expansion.

The County’s plan also indicates that traffic on the two-lane section of Cedar Avenue (County Road 23) adjacent to Airlake Airport accommodates approximately 6,800 vehicles per day, and is projected to reach about 12,000 vehicles per day by 2030. According to the County, the threshold for expanding a roadway from two to four lanes is when traffic exceeds approximately 15,000 vehicles per day. There is no current plan to expand or improve this section of Cedar Avenue.

The proposed South Building Area will gain access from the township road, 225th Street. It is anticipated that the section of this road leading to the South Building Area will be paved to accommodate airport-generated traffic.

4.6.4 Maintenance and Fuel Storage Areas

The existing MAC Maintenance facility is in good condition, particularly after the improvements made to it in 2014, and provides adequate capacity to accommodate newer-generation snow removal equipment that in many cases are longer and taller than older models.

According to a recently-completed building assets report, the facility will require just over $1,000,000 of renewal investments through 2035. Major investments are predicted to be needed in 2025 and 2035. Appendix 5 includes a listing of the specific renewal investment items identified for the Airlake Maintenance facility.

Aircraft fueling facilities provided by Waypoint, which include two 12,000 gallon underground tanks, one for 100LL avgas and one for Jet A fuel, along with an additional 5,000-gallon tank, available but not currently in use, are expected to provide adequate capacity throughout the planning period.

4.6.5 Security Requirements

There is no security fence or access gates at the Airlake Airport. At this time, there is no known demand or requirement for security related improvements at the airport. This

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22 An apron area of 700 square yards is assumed for Design Group I aircraft (wingspan <49 feet), and an apron area of 1,400 square yards is assumed for Design Group II aircraft (wingspan 49-79 feet).
should be monitored, however, in future long term plan updates if there are any changes to national aviation security recommendations or local issues generate a need for such improvements. In particular, the introduction of security fencing and access gates may be warranted during construction of the South Building Area.
## Figure 4-1: Representative Aircraft Types

### Airport Reference Code A-I

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>MTOW (lbs.)</th>
<th>Approach Speed (knots)</th>
<th>Wingspan</th>
<th>Tail Height</th>
<th>Aircraft Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cessna 172</td>
<td>2,550</td>
<td>62</td>
<td>36'-1&quot;</td>
<td>8'-11&quot;</td>
<td>Single-Engine</td>
</tr>
<tr>
<td>Cirrus SR22</td>
<td>3,400</td>
<td>78</td>
<td>38'-4&quot;</td>
<td>8'-11&quot;</td>
<td>Single-Engine</td>
</tr>
<tr>
<td>Diamond DA42</td>
<td>4,189</td>
<td>79</td>
<td>44'-4&quot;</td>
<td>8'-2&quot;</td>
<td>Multi-Engine</td>
</tr>
<tr>
<td>Eclipse 550</td>
<td>6,000</td>
<td>77</td>
<td>37'-11&quot;</td>
<td>11'-0&quot;</td>
<td>Very Light Jet</td>
</tr>
<tr>
<td>TBM 850</td>
<td>7,394</td>
<td>85</td>
<td>41'-7&quot;</td>
<td>14'-4&quot;</td>
<td>Single-Engine Turbo</td>
</tr>
</tbody>
</table>

### Airport Reference Code A-II

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>MTOW (lbs.)</th>
<th>Approach Speed (knots)</th>
<th>Wingspan</th>
<th>Tail Height</th>
<th>Aircraft Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cessna Caravan 208</td>
<td>8,000</td>
<td>79</td>
<td>52'-1&quot;</td>
<td>14'-11&quot;</td>
<td>Single-Engine Turbo</td>
</tr>
<tr>
<td>Pilatus PC-12</td>
<td>10,450</td>
<td>87</td>
<td>53'-4&quot;</td>
<td>14'-0&quot;</td>
<td>Single-Engine Turbo</td>
</tr>
</tbody>
</table>

### Airport Reference Code B-I

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<tr>
<th>Aircraft</th>
<th>MTOW (lbs.)</th>
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<th>Wingspan</th>
<th>Tail Height</th>
<th>Aircraft Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piper PA-31-350 Chieftain</td>
<td>7,000</td>
<td>96</td>
<td>40'-8&quot;</td>
<td>13'-0&quot;</td>
<td>Multi-Engine</td>
</tr>
<tr>
<td>Cessna 421C</td>
<td>7,450</td>
<td>96</td>
<td>41'-1&quot;</td>
<td>11'-5&quot;</td>
<td>Multi-Engine</td>
</tr>
<tr>
<td>Cessna Citation Mustang</td>
<td>8,645</td>
<td>95</td>
<td>43'-2&quot;</td>
<td>13'-5&quot;</td>
<td>Very Light Jet</td>
</tr>
<tr>
<td>Piper PA-31T Cheyenne</td>
<td>9,000</td>
<td>98</td>
<td>42'-8&quot;</td>
<td>12'-9&quot;</td>
<td>Multi-Engine Turbo</td>
</tr>
</tbody>
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### Airport Reference Code B-II

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<thead>
<tr>
<th>Aircraft</th>
<th>MTOW (lbs.)</th>
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<th>Wingspan</th>
<th>Tail Height</th>
<th>Aircraft Type</th>
</tr>
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<tbody>
<tr>
<td>Cessna 441</td>
<td>9,850</td>
<td>99</td>
<td>49'-4&quot;</td>
<td>13'-2&quot;</td>
<td>Multi-Engine Turbo</td>
</tr>
<tr>
<td>Raytheon Beechcraft King Air 200/250</td>
<td>12,500</td>
<td>103</td>
<td>57'-11&quot;</td>
<td>14'-10&quot;</td>
<td>Multi-Engine Turbo</td>
</tr>
<tr>
<td>Cessna Citation II/550</td>
<td>14,100</td>
<td>112</td>
<td>52'-2&quot;</td>
<td>15'-0&quot;</td>
<td>Jet</td>
</tr>
<tr>
<td>Raytheon Beechcraft King Air 300/350</td>
<td>15,000</td>
<td>100</td>
<td>57'-11&quot;</td>
<td>14'-4&quot;</td>
<td>Multi-Engine Turbo</td>
</tr>
<tr>
<td>Cessna Citation Excel/560</td>
<td>20,000</td>
<td>107</td>
<td>55'-8&quot;</td>
<td>17'-3&quot;</td>
<td>Jet</td>
</tr>
<tr>
<td>Cessna Citation III/650</td>
<td>22,000</td>
<td>114</td>
<td>53'-6&quot;</td>
<td>16'-10&quot;</td>
<td>Jet</td>
</tr>
<tr>
<td>Falcon 50</td>
<td>40,780</td>
<td>113</td>
<td>61'-10&quot;</td>
<td>22'-11&quot;</td>
<td>Jet</td>
</tr>
</tbody>
</table>

1 Small aircraft = Maximum Takeoff Weight (MTOW) less than or equal to 12,500lbs.
Figure 4-2: Airlake Airport All-Weather Wind Rose (2006-2015)

10.5 Knot Crosswind Component
Figure 4-3: Conceptual Roadway/Railroad Relocations to Clear RPZs
SECTION 5:

ALTERNATIVES ANALYSIS
5. ALTERNATIVES ANALYSIS

5.1 INTRODUCTION
Within this chapter, several potential development options are analyzed for Airlake Airport. While the number of concepts could be infinite, those included in this chapter have been developed taking into consideration existing facilities and constraints, facility requirements, and forecasted activity levels.

5.1.1 Development Alternative Objectives
Key objectives behind the analysis of refinements to the preferred development alternative include the following:

- Maintain ARC B-II large aircraft design standards and ¾ mile ILS visibility minimums;
- Maintain or improve RPZ compatible land use;
- Clear, improve, and/or mitigate approach and departure surface penetrations where feasible; at a minimum, maintain existing conditions;
- Mitigate the aligned taxiway on the Runway 12 end;
- Mitigate direct ramp access connector taxiway;
- Improve runway length for design aircraft family;
- No impacts to existing ILS approach procedure or minimums; and
- No future development within the Part 77 Primary Surface.

5.2 DEVELOPMENT ALTERNATIVES CONSIDERED

5.2.1 2025 LTCP Preferred Alternative
The 2025 LTCP for Airlake Airport was finalized in December 2008 and evaluated several concepts for future airfield improvements:

- Leave the airport as is with only hangar area development;
- Leave the runway length as is but reduce the ILS approach minimums to 1/2 mile visibility, with hangar area development; and,
- Extend Runway (12-30) from 4,099 feet to 5,000 feet, with hangar area development.

After reviewing all of the concepts, costs, benefits and negative considerations, the preferred alternative formally adopted by the Commission for the Airlake Airport in December 2008 was to:

- Construct a new South Building Area to accommodate the 2025 needs;
- Extend Runway 12-30 and Taxiway A to 5,000 feet, including runway lighting and PAPI systems;
- Reduce the ILS approach minimums to ½ mile, including runway widening and runway light relocation; and
- Reconstruct the existing runway pavement.

The runway extension contemplated in the 2025 LTCP study identified that Cedar Avenue would be impacted and realigned around the relocated runway end. Although the runway extension and roadway realignment were not imminent, the owners of currently undeveloped property along Cedar Avenue desired to know the future alignment in order to consider it in their property development plans. Since a State Environmental Impact Statement (EIS) is required by state law for a runway length of 5,000 feet or longer, an EIS Final Scoping Decision Document was completed by MAC in 2011 to establish a vision for the corridor needed to relocate Cedar Avenue around the extended runway end and account for its future expansion into a four lane divided highway without negatively impacting the Vermillion River. The Vermillion River and its associated wetlands are located approximately ½ mile south of the airport and the river is a DNR-protected trout stream tributary. The current river bridge crossing would be used in order to limit the impacts on the river. The estimated cost to relocate Cedar Avenue and 225th Street was between $5.9 and $6.8 million in 2010 dollars, not including property acquisition costs.

The 2025 LTCP Preferred Alternative concept is shown in Figure 5-1.

The FAA issued a memorandum for Interim Guidance on Land Uses within an RPZ dated September 27, 2012. This memorandum clarifies the FAA’s current position on allowable land use compatibilities within the RPZ. The memorandum describes the coordination and processes that are required to determine whether new or modified land uses in the RPZ are allowable. Included within the process is a comprehensive alternatives analysis that assesses the benefits, costs, and implications of the alternatives.

The recommended development plan from the 2025 LTCP to extend the runway to a length of 5,000 feet would realign both Cedar Avenue and 225th Street through the relocated RPZ, which would represent a triggering event to necessitate an RPZ Alternatives Analysis under the current FAA guidance. With the 2025 LTCP plan, MAC staff believes that FAA would expect the realignment of Cedar Avenue completely around the outside of the RPZ as an alternative, along with justification as to why that option is or is not feasible.

Relocating Cedar Avenue completely outside the extended runway RPZ to comply with FAA guidance would be an extensive undertaking. A high-level review suggests that the cost for this relocation would be upwards of $16,000,000, not including the nearly 40 acres of property acquisition that would be required for right-of-way.

In addition, the FAA has issued new or clarified guidance on several matters pertinent to the airfield configuration at Airlake. The previous LTCP Preferred Alternative does not account for the following FAA guideline changes:

- The Alternative did not address the Railroad penetration to the 20:1 Visual Approach Surface and may introduce new penetrations to other approach/departure surfaces
Based upon the update to the FAA’s Airport Design AC 150/5300-13A, Change 1, there are taxiway geometry issues that need to be addressed, including the aligned taxiway at the Runway 12 approach end.

The extended runway concept proposed in the 2025 LTCP results in the following:

<table>
<thead>
<tr>
<th>2025 LTCP Preferred Alternative – Extend Runway 12-30 to 5,000 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td>- Provides maximum runway length available per state statute (5,000 feet)</td>
</tr>
<tr>
<td>- Reduced ILS approach minimums (down to ½ mile)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*Estimated Development Cost: $10,300,000.00 - $12,600,000.00*

### 5.2.2 Additional Alternatives Evaluated

**Runway 12 End Displaced Threshold**

As outlined in Section 4.5.4, train cars on the railroad track along the west side of the Airport penetrate the Runway 12 20:1 straight-in Visual Approach Surface. Additionally, the aligned taxiway leading up to the Runway 12 end no longer meets airport design standards (Section 4.5.1).

If the Runway 12 landing threshold were displaced by an additional 120 feet, the 20:1 Visual Area Surface would clear the adjacent railroad tracks. The pavement leading up to the threshold could be designated as runway pavement available for takeoff roll in the Runway 12 direction and landing rollout in the Runway 30 direction, eliminating the section of aligned taxiway.

This concept would reduce the landing distance available on Runway 12 from 4,099 feet to 3,979 feet. Reducing available landing length does not fit within the objectives of this LTCP, so this concept is not recommended as a stand-alone improvement. However, it should be incorporated into a subsequent alternative that provides additional runway length.

As a result of displacing the runway threshold to mitigate the 20:1 Visual Approach Surface, approximately 2,000 square feet of off-airport area would be introduced into the

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23 Cost estimate range does not consider the impact of relocating Cedar Avenue fully around the extended Runway 30 end RPZ.
Runway 12 Approach RPZ. Of this area, approximately 90 square feet is within an off-airport truck staging lot associated with an adjacent industrial land use.

As an interim measure, MAC is proposing to replace the existing visual glideslope indicator equipment (VASI) with a new PAPI unit that is located so the visual glideslope clears the railroad tracks. Efforts should also be made to site the new PAPI so that it can serve the future displaced runway end without having to be relocated.

The Runway 12 Displaced Threshold concept is shown in Figure 5-2.

**Provide Stopways for Runway 12-30**

Pavement designated as stopway can be considered as useable length for decelerating an aircraft during an aborted takeoff. Stopway pavement can be used for accelerate-stop distance calculations, but not for other takeoff or landing distance calculations.

Providing stopways on both ends of Runway 12-30 may allow some aircraft to depart at a higher takeoff weight when accelerate-stop distance is a limiting factor, and will promote safety by formally making this pavement available for use in the event of an aborted takeoff attempt. Stopways do not change the published runway length.

By providing stopways, the accelerate-stop distance would increase to approximately 4,400 feet for Runway 30 and nearly 4,600 feet for Runway 12. The published runway length will remain as 4,099 feet. Providing stopways will include the addition of stopway edge lighting (red unidirectional lights), relocating the existing runway threshold lights to be outboard of the pavement footprint, and grading the Runway Safety Area (RSA) beyond the stopway ends.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increases ASDA to nearly 4,600 feet</td>
<td>Does not improve RPZ incompatibilities</td>
</tr>
<tr>
<td>No change to existing runway ends (published runway length does not change)</td>
<td>Limited usefulness as stopways do not increase Landing Distance Available (LDA), Takeoff Run Available (TORA), or Takeoff Distance Available (TODA)</td>
</tr>
<tr>
<td>No change to Runway 30 Approach/Departure RPZ or Runway 12 Departure RPZ locations</td>
<td>Capital costs to construct stopway pavement, add stopway lighting, and conduct additional RSA and ROFA grading.</td>
</tr>
<tr>
<td>Does not change the existing departure surfaces or procedures</td>
<td></td>
</tr>
<tr>
<td>Limited operational impacts during construction</td>
<td></td>
</tr>
<tr>
<td>Does not impact the existing ILS approach procedure</td>
<td></td>
</tr>
</tbody>
</table>

**Estimated Development Cost: $3,100,000.00**

The Runway 12-30 Stopway concept is shown in Figure 5-3.
**Extend Runway 12-30 with Declared Distances**

Another concept evaluated for the 2035 LTCP proposes to use declared distances to maximize runway length for existing users in a manner that does require the relocation of Cedar Avenue on the east side of the airfield, or Highview Avenue and the railroad track on the west side.

This concept considers runway extensions of 271 feet on the Runway 12 end and 480 feet on the Runway 30 end – the maximum extensions that can be provided while meeting all Runway Safety Area (RSA) and Runway Object Free Area (ROFA) standards. The published runway length would be 4,850 feet. Declared distances would be applied and published, meaning that not all of the published pavement would be available for landing and takeoff movements in each direction. Taxiway extensions would be added to the ends of the extended runway pavement.

In this case, the runway extensions would be available for aircraft beginning the takeoff roll or completing the landing rollout. It would also be available to accommodate accelerate-stop distance requirements. The existing Runway 30 displaced landing threshold would not change. The end result would be an 872-foot displaced threshold and no change to the existing approach RPZ location.

Similarly, to avoid moving the departure RPZs off each end, declared distances will be used so that the designated end of takeoff run distance does not change from the existing condition. This will result in the designated takeoff run distance ending before the physical end of the pavement in the direction of the takeoff roll.

The existing roads that traverse the Runway 30 RPZ – Cedar Avenue and 225th Street – predate the FAA’s current RPZ compatibility guidance. The FAA’s guidance only addresses the introduction of new or modified land uses to an RPZ and proposed changes to the RPZ size or location. Under this guidance, the existing roads are acceptable to remain in the RPZ as an existing condition. The triggering action for having to consider removing Cedar Avenue from the RPZ would be when the roadway needs to be widened or otherwise expanded to provide additional capacity. Based on existing and projected future traffic levels, there is no current plan to widen or expand the capacity of this section of Cedar Avenue within the planning period. Rehabilitation of the existing roadway footprint would not constitute a triggering event for an RPZ analysis.

A comparison of existing and proposed runway lengths by movement is provided in Table 5-1 below:
Table 5-1: Comparison of Runway Lengths

<table>
<thead>
<tr>
<th>Aircraft Movement</th>
<th>Existing Runway</th>
<th>Declared Distance Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Landing Distance Available (LDA)</td>
<td>4,099’</td>
<td>3,707’</td>
</tr>
<tr>
<td>Takeoff Run Available (TORA)</td>
<td>4,099’</td>
<td>4,099’</td>
</tr>
<tr>
<td>Takeoff Distance Available (TODA)</td>
<td>4,099’</td>
<td>4,099’</td>
</tr>
<tr>
<td>Accelerate-Stop Distance Available (ASDA)</td>
<td>4,099’</td>
<td>4,099’</td>
</tr>
</tbody>
</table>

Source: HNTB Analysis

Extend Runway 12-30 with Declared Distances

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No relocation of Cedar Avenue, Highview Avenue, or railroad track</td>
<td>• Implements declared distances, increasing complexity for pilots</td>
</tr>
<tr>
<td>• No change to Runway 30 Approach/Departure RPZ or Runway 12 Departure RPZ locations</td>
<td>• May require National Change Program (NCP) approval since the localizer does not provide the recommended 600 feet of jet blast protection from the departure end of runway. Actual distance proposed is 370 feet from the end of the pavement.</td>
</tr>
<tr>
<td>• Improves Runway 30 RPZ incompatibilities by relocating 225th St. entirely outside of the RPZ</td>
<td>• Increases existing pavement maintenance burden by adding taxiway extensions</td>
</tr>
<tr>
<td>• Improves Runway 30 Threshold Siting Surface (TSS) approach and Runway 12 departure by removing the controlling obstacle (225th Street)</td>
<td>• Capital costs to construct runway and parallel taxiway extensions, runway lighting, signage, and marking adjustments, additional RSA and ROFA grading, 225th St relocation, etc.</td>
</tr>
<tr>
<td>• Does not change the existing departure surfaces or procedures</td>
<td>• Increases operational impacts during construction</td>
</tr>
<tr>
<td>• Increases ASDA to approximately 4,850 feet</td>
<td>• May require the holding position to be located further away from the runway due to a need to keep aircraft out of approach surfaces</td>
</tr>
<tr>
<td>• Increases all landing and takeoff distances available; optimizes operational capability for airport users</td>
<td>• Requires tributary stream relocation near South Building Area</td>
</tr>
</tbody>
</table>

Estimated Development Cost: $5,700,000.00\(^{25}\)

\(^{25}\) Includes cost to reconstruct existing Runway 12-30 pavement
The Runway 12-30 Extended Runway with Declared Distance concept is shown in Figure 5-4.

As noted, this alternative does not provide 5,000 feet of runway length, but provides nearly 4,600 feet of takeoff run distance and 4,850 feet of accelerate-stop distance for Runway 30. In the Runway 12 direction, it provides nearly 4,400 feet of takeoff run distance but preserves 4,850 feet for accelerate-stop.

In order to assess the magnitude of difference in utility between runway lengths, an assessment of aircraft performance charts for several of the more demanding aircraft expected to use the airport was completed to determine the percentage of an aircraft’s total useful load that could be carried by aircraft departing Airlake Airport on a typical summer day (82.3° F at field elevation) under four runway conditions – the existing length of 4,099 feet, 4,579 feet (Runway 30 TORA/TODA maximum), 4,850 feet (Runway 12 and 30 ASDA maximum), and 5,000 feet. Table 5-2 provides the results of this assessment.

<table>
<thead>
<tr>
<th>Aircraft Type</th>
<th>Maximum Takeoff Weight (lbs.)</th>
<th>4,099' %</th>
<th>4,579' %</th>
<th>4,850' %</th>
<th>5,000' %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cessna Citation II</td>
<td>14,100</td>
<td>78%</td>
<td>90%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Dassault Falcon 10</td>
<td>18,740</td>
<td>65%</td>
<td>79%</td>
<td>86%</td>
<td>90%</td>
</tr>
<tr>
<td>Cessna Citation III</td>
<td>22,000</td>
<td>42%</td>
<td>57%</td>
<td>64%</td>
<td>68%</td>
</tr>
<tr>
<td>Dassault Falcon 20</td>
<td>28,660</td>
<td>56%</td>
<td>72%</td>
<td>79%</td>
<td>82%</td>
</tr>
<tr>
<td><strong>Group Average</strong></td>
<td></td>
<td><strong>60%</strong></td>
<td><strong>74%</strong></td>
<td><strong>82%</strong></td>
<td><strong>85%</strong></td>
</tr>
</tbody>
</table>

Notes: Takeoff Distance based on Balanced Field length from aircraft performance manuals. Takeoff distance calculations based on the following conditions: Temperature = 82.3°F, Field Elevation = 960 feet MSL, Flaps = Typical takeoff

Source: Aircraft Performance Manuals/Data

The results indicate that even with a runway length of 5,000 feet, only the smaller Cessna Citation II would be able to depart at its maximum useful load. Assuming that ASDA is the critical balanced field length for many corporate jet takeoff calculations, the loss in useful load capability at 4,850 feet versus 5,000 feet is approximately 3% on average for this aircraft grouping. Meanwhile, the gain in useful load capability at 4,850 feet is approximately 22% percent over the existing runway length.

At a typical small business jet fuel burn rate, the departure payload gain facilitated by a 4,850-foot runway could equate to an additional 1 to 1.5 hours of flight time when fuel reserves are considered.
This assessment confirms that while 5,000 feet of runway would be ideal, even a lesser improvement in available runway length could yield significant operational benefits and enhance the airfield’s utility for corporate operators.

In October 2016, MAC submitted a formal Runway Protection Zone (RPZ) Alternatives Analysis to FAA seeking favorable consideration of this Declared Distance concept even though the RPZs for both runway ends maintain existing land uses and will not be clear in a manner that fully complies with FAA guidance. In the analysis, MAC’s rationale for pursuing an airfield development concept that extends Runway 12-30 through the use of declared distances and maintains existing land uses in the RPZs is as follows:

- While additional pavement is being added to the Runway 30 end, the approach and departure RPZs are not changing based on the proposed use of declared distances. Traffic volumes on Cedar Avenue do not warrant expansion of the corridor from two to four lanes. The risk of an airplane crash within the RPZ when a vehicle would be present is no greater than it would be today. Removing Cedar Avenue from the RPZ can be reevaluated if/when the corridor is proposed for expansion.

- Highview Avenue and 220th Street are low volume, local roads. The risk of an airplane crash within the RPZ when a vehicle is present is low. Realignment outside of the RPZ is not viable given the existing industrial development and location of the Progressive Rail line.

- The Progressive Rail line has, at most, two trains a day on the line. It serves an adjacent spur line and industrial development. Realigning the railroad to required design standards would cause significant impacts due to the built up urban area to the north and agricultural area to the south and west of Airlake Airport.

- MAC is willing to consider the installation of “Low Flying Aircraft/No Parking” signage on Cedar Avenue, Highview Avenue, and 220th Street at the edges of the RPZ as a mitigating strategy, but this will require coordination with and approval from the municipalities with roadway jurisdiction.

- At an estimated cost of less than $6,000,000 (including reconstruction of the existing runway), the proposed concept is much less costly than any alternative that involves relocating Cedar Avenue or the adjacent Progressive Rail tracks. At the same time, input from turbine aircraft operators suggests that the longer runway as proposed would ease current operational constraints and open the door for additional mid-size corporate jet operators that bypass Airlake Airport today for other area airports with additional runway length.

In January 2017, the FAA provided its concurrence with MAC’s RPZ Alternatives Analysis.

Both the RPZ Alternatives Analysis and the FAA response are reproduced in Appendix 6.

The proposed use of declared distances at Airlake Airport was subjected to an Operational Assessment as a formalized and proactive approach to manage safety and
for continued maintenance of stakeholder confidence. A panel of subject matter experts (SME) conducted an assessment on Thursday September 8th, 2016.

First the panel evaluated the effectiveness and suitability of declared distances aimed at identification of defects, gaps, and areas of risk. Second, it provided a realistic forecasted measure of expected output should the proposed change be implemented. The assessment was limited in scope to discuss risks and opportunities associated with implementation of the change. The panel did recognize concerns, but did not consider feasibility or possible environmental impacts of the proposed change. At the conclusion of the panel, members stated their position referencing the implementation of declared distances at Airlake Airport. The panel was said to be either neutral or in favor of the proposed change. There were none in opposition to the change.

A copy of the Operational Assessment Report is included within the RPZ Alternatives Analysis documentation included in Appendix 6.

In order to clear the Part 77 Primary Surface, a portion of 225th Street would have to be realigned to a new intersection with Cedar Avenue. Figure 5-5 illustrates a feasible concept for the realignment.

**Taxiway Configurations**
For the 2035 LTCP, the following taxiway changes are being considered:

- Relocate the western apron access taxilane to eliminate direct access from the apron to the runway (Detail “A” on Figure 5-6);
- Install POFZ hold position markings and signs on Taxiway A (Detail “B” on Figure 5-6);
- Adjust hold position markings on connector taxiways to be 200 feet from the Runway 12-30 centerline to provide more space to hold on the connectors (Detail “C” on Figure 5-6); and
- Install lighting on Taxiway A to promote situational awareness during low-visibility conditions (Detail “D” on Figure 5-6).

**Apron Expansion**
An expansion to the existing FBO apron to better accommodate existing and future itinerant aircraft activity appears warranted. The existing apron has an estimated deficiency of approximately 5,300 square yards. The costs for expanding the apron would be borne by the tenant.

Locations that could be considered for construction of additional apron for itinerant aircraft parking include the following:

- Site A: Expanding the existing apron to the northwest. This concept is constrained by the existing trout stream that is located adjacent to the apron. However, as a first phase, the apron could be expanded approximately 45 feet towards the stream while still retaining the required 50-foot stream buffer. This would yield approximately 1,000 square yards of additional apron area for aircraft storage. Any subsequent apron expansion would require relocating
the stream or enclosing an additional section of it in a culvert and expanding
the apron over the top. This would require coordination with and approvals from
the appropriate water quality agencies, including the Vermillion River
Watershed Joint Powers Organization (VRWJPO), U.S. Army Corps of
Engineers, DNR, Dakota County Soil and Water Conservation District, and the
City of Lakeville.

- Site B: Adjacent to Taxiway A on the west side of the trout stream. The site
  between the trout stream and the MAC Maintenance Building is too small when
  the stream buffer is accounted for. This leaves the area to the west of the
  Maintenance Building. From a layout perspective, this site would only allow
  construction of a long, linear apron with limited operational flexibility due to the
  adjacency of a public roadway (219th Street); furthermore, it is not contiguous
to or visible from the FBO. The lack of security fencing may make some pilots
reluctant to leave their aircraft there if unattended.

- Site C: Adjacent to the access taxiways in the South Building Area. This site
  offers the most flexibility and least number of constraints to construct an
  efficient apron. While not contiguous to the existing FBO, aircraft on the apron
  would still be visible from the existing site. However, there is no existing
  landside access to this site, so all vehicular traffic to the remote apron would
  have to cross the airfield until landside access via 225th Street is provided.
  Alternatively, an airfield access roadway around the Runway 12 end could be
  considered to minimize runway crossings.

The apron expansion locations described above are shown on Figure 5-7. If agency
coordination reveals that expanding the existing apron to the northwest beyond the first
phase described above is not feasible due to the trout stream, the next best option
appears to be developing a new apron in the South Building Area.

5.3 PREFERRED DEVELOPMENT ALTERNATIVE

The 2035 LTCP Preferred Alternative for airfield improvements at Airlake Airport includes
the following items:

- Displace Runway 12 threshold to provide airspace clearance over railroad
  tracks;
- Extend Runway 12-30 with declared distances to maximize overall airfield utility
  for existing users in a manner that does not require the relocation of Cedar
  Avenue or the railroad tracks;
- Taxiway configuration changes noted above; and
- Apron Expansion area to better accommodate itinerant aircraft.

The improvements associated with the 2035 LTCP Preferred Alternative are shown
together on Figure 5-8.

This recommendation does not preclude the eventual extension of Runway 12-30 to
5,000 feet as recommended in the 2025 LTCP. The appropriate time to evaluate the
need for an extension to 5,000 feet will be when Dakota County proposes to widen or
otherwise improve the section of Cedar Avenue that runs through the Runway 30 Runway
Protection Zone (RPZ).
Finally, it is important to note that the LTCP is a planning document and does not authorize any construction. Adoption of the LTCP is only the first step in the project implementation process. Before any construction can begin, the project(s) must first be evaluated through an environmental review process and then compete for funding through Federal Aviation Administration and/or State grant programs. In order to compete effectively for funding, the project(s) must have solidly documented justification. Once funding is secured, final project engineering and design will take approximately one year to complete. Based on this timeline, it is feasible that construction could occur sometime during the 2022-2023 timeframe (subject to change).
Figure 5-1: 2025 LTCP Preferred Alternative
Figure 5-2: Runway 12 Displaced Threshold Concept
Figure 5-3: Runway 12-30 Stopway Concept
Figure 5-4: Runway 12-30 Extended Runway with Declared Distance Concept

Note: Declared distances are the runway lengths available for landing or departing aircraft.

LDA = Landing Distance Available
TORA = Takeoff Run Available
ASA = Accelerate-Stop Distance Available
Figure 5-5: 225th Street Realignment Concept
Figure 5-6: Taxiway Configuration Changes
Figure 5-7: Apron Expansion Areas
Figure 5-8: 2035 Preferred Development Alternative

- Runway 12 ASDA 4,850'
- Runway 12 TORA / TODA 4,370'
- Runway 12 LDA 4,459'

391' Displaced Threshold

- Runway 30 LDA 3,978'
- Runway 30 TORA / TODA 4,579'
- Runway 30 ASDA 4,855'

872' Displaced Threshold

NOTE:
1) DECLARED DISTANCES ARE THE RUNWAY LENGTHS AVAILABLE FOR LANDING OR DEPARTING AIRCRAFT.

LDA = LANDING DISTANCE AVAILABLE
TORA = TAKEOFF RUN AVAILABLE
TODA = TAKEOFF DISTANCE AVAILABLE
ARPA = ACCELERATE-STOP DISTANCE AVAILABLE

DRAWING LEGEND

SCALE IN FEET

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SECTION 6:

ENVIRONMENTAL CONSIDERATIONS
6. ENVIRONMENTAL CONSIDERATIONS

6.1 INTRODUCTION

An integral part of the airport planning process focuses on the manner in which the airport and any planned enhancements to the facility pose environmental impacts. This chapter provides a high-level introductory assessment of potential environmental implications of the planned operation and development of Airlake Airport. Prior to any construction taking place, the MAC will complete an Environmental Assessment (EA) and/or an Environmental Assessment Worksheet (EAW) in compliance with state statutes and FAA requirements for utilizing Airport Improvement Program (AIP) grant funds.

6.2 AIRCRAFT NOISE

6.2.1 Quantifying Aircraft Noise

**Basics of Sound**

Sound is a physical disturbance in a medium; a pressure wave typically moving through a fluid - air. A sound source vibrates or otherwise disturbs the air immediately surrounding the source, causing variations in pressure above and below the static (at-rest) value of atmospheric pressure. These disturbances force air to compress and expand setting up a wavelike movement of air particles that move away from the source. Sound waves, or fluctuations in pressure, vibrate the eardrum creating audible sound.

The decibel, or dB, was introduced as a measure of sound pressure level that is compressed into a convenient range, the tremendous span of human sensitivity to pressure. Using a logarithmic relationship, and the ratio of sensed pressure compared against a fixed reference pressure value, the dB scale accounts for the range of hearing with values from 0 to around 200. Most human sound experience falls into the 30 dB - 120 dB range.

Decibels are logarithmic, and thus cannot be added directly. Two identical noise sources each producing 70 dB do not add to a total of 140 dB, but to 73 dB. Each time the number of sources is doubled, the sound pressure level is increased 3 dB.

- 2 sources: $70 \text{ dB} + 70 \text{ dB} = 73 \text{ dB}$
- 4 sources: $73 \text{ dB} + 73 \text{ dB} = 76 \text{ dB}$
- 8 sources: $76 \text{ dB} + 76 \text{ dB} = 79 \text{ dB}$

The just-noticeable change in loudness for normal hearing adults is about 3 dB. That is, changes in sound level of 3 dB or less are difficult to notice. A doubling of loudness for the average listener of A-weighted sound is about 10 dB$^{26}$. Measured, A-weighted sound levels changing by 10 dBA effect a subjective perception of being “twice as loud”$^{27}$.

**Figure 6-1** provides the noise levels for various common sources.

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26 A-weighted decibels represent noise levels that are adjusted relative to the frequencies that are most audible to the human ear.

27 Peppin and Rodman, Community Noise, p. 47-48; additionally, Harris, Handbook, Beranek and Vér, Noise and Vibration Control Engineering, among others.
**Day-Night Average Sound Level (DNL)**


As detailed above, the FAA currently requires the DNL noise metric to determine and analyze noise exposure and aid in the determination of aircraft noise and land use compatibility issues around United States airports. Because the DNL metric correlates well with the degree of documented community annoyance from aircraft noise, DNL has been formally adopted by most federal agencies dealing with noise exposure. In addition to the FAA, these agencies include the U.S. Environmental Protection Agency (EPA), U.S. Department of Defense, U.S. Department of Housing and Urban Development, and Veterans Administration.

The DNL metric is calculated by cumulatively averaging sound levels over a 24-hour period. This average cumulative sound exposure includes the application of a 10-decibel penalty to sound exposures occurring during the nighttime (10:00 PM to 7:00 AM). The night sound exposures are increased by 10 decibels because nighttime noise is more intrusive.

**Figure 6-2** provides examples of typical DNL levels in various environments.

The FAA currently considers the 65 dB DNL contour line as the threshold of significance for noise impact. As such, sensitive land use areas (e.g., residential) around airports that are located in the 65 dB or greater DNL contours are considered by the FAA as incompatible structures.

**Integrated Noise Model (INM)**

The FAA’s Integrated Noise Model (INM) version 7.0d was used for evaluating aircraft noise impacts in this plan.

The model utilizes flight track information, runway use information, operation time of day data, aircraft fleet mix, standard and user-defined aircraft profiles, and terrain as inputs. The INM model produces DNL noise exposure contours that are used for land use compatibility maps.

The INM considers multiple airport and aircraft operational and noise propagation variables. The primary inputs into the model include aircraft activity levels, fleet mix, day/night split of operations, runway use and flight tracks.
6.2.2 Noise Contour Development

The noise contours presented in this document were developed using INM Version 7.0d. The contours represent noise contours, expressed in DNL. The FAA currently suggests that three different DNL levels (65, 70, and 75 DNL) be modeled but considers the 65 dB DNL contour line as the threshold of significance for noise impact. The Metropolitan Council suggests that the 60 DNL contour be included for airports in an urban environment and the 55 DNL in cases where airports are located outside the Metropolitan Urban Service Area (MUSA). Currently, Airlake Airport lies outside of the MUSA, so the 55 DNL noise contour will be shown for advisory purposes. However, it is not linked to any requirements for noise attenuation or mitigation.

The Metropolitan Airports Commission (MAC) owns and operates a Noise and Operations Monitoring System (MACNOMS) at Minneapolis-St. Paul International Airport (MSP). In addition to monitoring noise levels at 39 remote noise monitoring towers located around MSP, the system collects flight track data to approximately 40 miles around MSP up to 20,000 feet. Airlake Airport is located approximately 17 miles from MSP. As such, flight track data in the vicinity of Airlake Airport were provided by MACNOMS to aid in the INM input file development process.

MACNOMS flight track data from the 12-month period ending in June 2015 was used to develop the Baseline Condition INM Inputs. Due to the existing constraints in the flight tracking system in the vicinity of Airlake Airport, acquisition and availability of detailed flight track data is reduced. However, for the year ending June 2015, MACNOMS reported approximately 27,407 aircraft operations in the vicinity of Airlake Airport which represents approximately 74.6 percent of total estimated operations in 2015. This provided an adequate data sample for purposes of contributing to the construction of the INM inputs.

The following details the methodology utilized in developing the data inputs for the INM contour modeling.

Aircraft Activity Levels
As summarized in Table 3-10 in Chapter 3, the total number of Airlake Airport operations in the Baseline Condition is estimated to be 36,757 and the 2035 Preferred Alternative Condition forecast number of total operations is 38,410.

Fleet Mix
Using the MACNOMS flight track data available in the vicinity of Airlake Airport for a 12-month period ending June 2015, various data processing steps were taken to develop the Baseline Condition fleet mix. The flight track analysis process began by first excluding all MSP air carrier jet flight tracks. Then all flight tracks with a start point or end point that did not fall within a 5km (3.1 mile) radius and 1km (0.6 mile) ceiling (above ground level) around Airlake Airport were filtered out of the data. If the starting point of a track was within the radius and ceiling thresholds, it was considered a departure operation. If the endpoint of a track was within the radius and ceiling thresholds, it was considered an arrival operation. If both start and end points of a track were within the radius and ceiling thresholds, it was considered a touch and go operation. The aircraft type information from the MACNOMS flight track system was then adjusted to reflect the number of operations per aircraft category from the Base Case Year 2015 operations estimates, as
described in Appendix 3 to develop the Baseline Condition fleet mix. The Baseline Condition fleet mix was then scaled to reflect the forecast assumptions outlined in Chapter 3 to arrive at the projected Forecast 2035 fleet mix.

A summary of the Baseline Condition and Forecast 2035 fleet mixes is provided in Table 6-1. A more detailed presentation of the Baseline Condition and 2035 Preferred Alternative Condition aircraft fleet mixes is provided in Appendix 7.

**Day/Night Split of Operations**

Based on the MACNOMS flight track data for Airlake Airport, the split of day and nighttime operations was determined. Daytime hours are defined as 7:00 AM to 9:59:59 PM and nighttime hours are 10:00 PM to 6:59:59 AM.

The day/night operations distribution derived from the MACNOMS flight track data was then applied to the total number of operations to develop the Baseline Condition day/night split.

The Baseline Condition day/night split was used to arrive at the 2035 Preferred Alternative Condition day/night split. The day/night split is not expected to change significantly throughout the forecast period.

A summary of the Baseline Condition and 2035 Preferred Alternative Condition day/night splits is also provided in Table 6-1. A more detailed presentation of the Baseline Condition and 2035 Preferred Alternative Condition day/night splits is provided in Appendix 7.
Table 6-1: Summary of Average Daily Flight Operations

<table>
<thead>
<tr>
<th>Average Daily Flight Operations</th>
<th>Day</th>
<th>Night</th>
<th>Total</th>
<th>% of Total Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline Condition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helicopter</td>
<td>3.1</td>
<td>0.7</td>
<td>3.8</td>
<td>4.8%</td>
</tr>
<tr>
<td>Multi-Engine Piston</td>
<td>1.9</td>
<td>0.1</td>
<td>2.0</td>
<td>2.5%</td>
</tr>
<tr>
<td>Single-Engine Piston</td>
<td>71.1</td>
<td>2.3</td>
<td>73.4</td>
<td>91.2%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>0.7</td>
<td>0.1</td>
<td>0.7</td>
<td>0.9%</td>
</tr>
<tr>
<td>Jet</td>
<td>0.5</td>
<td>0.1</td>
<td>0.6</td>
<td>0.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>77.2</td>
<td>3.3</td>
<td>80.5</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total Operations</td>
<td>95.9%</td>
<td>4.1%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td><strong>2035 Preferred Alternative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helicopter</td>
<td>5.4</td>
<td>1.3</td>
<td>6.7</td>
<td>7.7%</td>
</tr>
<tr>
<td>Multi-Engine Piston</td>
<td>1.6</td>
<td>0.1</td>
<td>1.7</td>
<td>2.0%</td>
</tr>
<tr>
<td>Single-Engine Piston</td>
<td>66.3</td>
<td>2.0</td>
<td>68.3</td>
<td>79.2%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>1.8</td>
<td>0.2</td>
<td>2.1</td>
<td>2.4%</td>
</tr>
<tr>
<td>Jet</td>
<td>6.7</td>
<td>0.8</td>
<td>7.5</td>
<td>8.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>81.7</td>
<td>4.5</td>
<td>86.2</td>
<td>100.0%</td>
</tr>
<tr>
<td>% of Total Operations</td>
<td>94.8%</td>
<td>5.2%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Totals may not add due to rounding

Source: MACNOMS Data Analysis, HNTB Activity Forecasts

**Runway Use**

Using the Airlake Airport flight track data, a runway use analysis was conducted. Runway assignments were made utilizing trapezoids off the end of each runway to determine on which runway a flight operated. Each trapezoid runs along the axis of the centerline beginning at the runway end and extending 5km (3.1 miles). The trapezoid is 500m (.31 miles) wide at the runway end and 1,800m (1.1 miles) wide at the extent furthest from the runway. For the purpose of the runway use analysis, the last five or first five data points of each flight track in the vicinity of Airlake Airport were analyzed relative to the runway trapezoids.

In cases when the last five radar points of a track were in the vicinity of Airlake Airport, and at least one of the radar points was located within a respective runway trapezoid, the track was assigned as an arrival operation on that runway. Conversely, in cases when the first five radar points were in the vicinity of Airlake Airport, and at least one of the radar points was located within a respective runway trapezoid, the track was assigned as a departure operation on that runway. In cases when the last five and first five radar points were in the vicinity of Airlake Airport, and at least one of the last and at least one of the first radar points were located within a respective runway trapezoid, the track was assigned as a touch and go operation on the respective runway(s).
The Baseline Condition runway use assumptions were then adjusted to arrive at the projected 2035 Preferred Alternative runway use.

A summary of the Baseline Condition and 2035 Preferred Alternative Condition runway use percentages is provided in Table 6-2. A more detailed presentation of the Baseline Condition and 2035 Preferred Alternative Condition runway use is provided in Appendix 7.

**Flight Tracks**

The Baseline Condition INM flight track locations were developed based on the trends established by the MACNOMS flight tracks that met the fleet mix data sample criteria for Airlake Airport.

The Baseline Condition INM flight tracks were then adjusted to reflect the final airfield configuration per the Preferred Alternative, as detailed in Section 5.

Figures depicting flight track locations and additional detail related to flight track use for the Baseline and 2035 Preferred Alternative Conditions are provided in Appendix 7.
### Table 6-2: Summary of Average Annual Runway Use

<table>
<thead>
<tr>
<th>Average Annual Runway Use %</th>
<th>Arrivals</th>
<th></th>
<th></th>
<th></th>
<th>Departures</th>
<th></th>
<th></th>
<th></th>
<th>Touch and Gos</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day</td>
<td>Night</td>
<td>Total</td>
<td>Day</td>
<td>Night</td>
<td>Total</td>
<td>Day</td>
<td>Night</td>
<td>Total</td>
<td>Day</td>
<td>Night</td>
</tr>
<tr>
<td>Baseline Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 12</td>
<td></td>
<td>36.4%</td>
<td>22.2%</td>
<td>35.6%</td>
<td>37.8%</td>
<td>35.5%</td>
<td>37.7%</td>
<td>50.7%</td>
<td>50.0%</td>
<td>50.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 30</td>
<td></td>
<td>63.6%</td>
<td>77.8%</td>
<td>64.4%</td>
<td>62.2%</td>
<td>64.5%</td>
<td>62.3%</td>
<td>49.3%</td>
<td>50.0%</td>
<td>49.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2035 Preferred Alternative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 12</td>
<td></td>
<td>38.0%</td>
<td>20.8%</td>
<td>36.8%</td>
<td>38.1%</td>
<td>36.2%</td>
<td>38.0%</td>
<td>50.6%</td>
<td>-</td>
<td>50.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway 30</td>
<td></td>
<td>62.0%</td>
<td>79.2%</td>
<td>63.2%</td>
<td>61.9%</td>
<td>63.8%</td>
<td>62.0%</td>
<td>49.4%</td>
<td>-</td>
<td>49.4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Totals may not add due to rounding

Source: MACNOMS Data Analysis
6.2.3 Baseline Condition Noise Impacts

In the Baseline Condition noise contours, there are no residential parcels located within the 65, 60, or 55 DNL noise contours around Airlake Airport. The 65 DNL contour contains approximately 86 acres, all on airport property, while the 60 DNL contour contains approximately 169 acres and the 55 DNL contour contains approximately 391 acres. The entire 75, 70 and 65 DNL contours are contained on the airport property, essentially overlying the areas immediately adjacent to the runways. The 75 and 70 DNL contours contain approximately 10 and 42 acres respectively.

The Baseline Condition noise contours are shown in Figure 6-3.

A summary of the Baseline Condition noise impact is provided in Table 6-3.

Table 6-3: Baseline Condition Noise Impact Summary

<table>
<thead>
<tr>
<th>Noise Impact Summary by Contour</th>
<th>75 DNL</th>
<th>70 DNL</th>
<th>65 DNL</th>
<th>60 DNL</th>
<th>55 DNL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contour Overall Area (Acres)</td>
<td>10.2</td>
<td>41.8</td>
<td>86.3</td>
<td>168.9</td>
<td>391.1</td>
</tr>
<tr>
<td>ContourContained on Airport?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Number of Residential Parcels</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: MAC Analysis

6.2.4 2035 Preferred Alternative Condition Noise Impacts

In the 2035 Preferred Alternative noise contours there are no residential parcels located within the 65, 60, or 55 DNL noise contours around Airlake Airport. The 65 DNL contour contains approximately 146 acres, mostly but not fully on airport property, while the 60 DNL contour contains approximately 317 acres and the 55 DNL contour contains approximately 813 acres. The entire 75 and 70 DNL contours are contained on the airport property, essentially overlying the areas immediately adjacent to the runways. The 75 and 70 DNL contours contain approximately 22 and 70 acres respectively.

The 2035 Preferred Alternative noise contours are shown in Figure 6-4.

A summary of the 2035 Preferred Alternative noise impact is provided in Table 6-4.
### Table 6-4: 2035 Preferred Alternative Condition Noise Impact Summary

<table>
<thead>
<tr>
<th>Noise Impact Summary by Contour</th>
<th>75 DNL</th>
<th>70 DNL</th>
<th>65 DNL</th>
<th>60 DNL</th>
<th>55 DNL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2035 Preferred Alternative Condition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contour Overall Area (Acres)</td>
<td>22.2</td>
<td>70.1</td>
<td>145.9</td>
<td>316.9</td>
<td>813.0</td>
</tr>
<tr>
<td>Contour Contained on Airport?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Number of Residential Parcels</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: MAC Analysis

A comparison of the Baseline and 2035 Preferred Alternative noise contours is shown in Figure 6-5. Table 6-5 provides a comparison of noise impacts from the Baseline to the 2035 Preferred Alternative Condition.

### Table 6-5: Noise Contour Comparison (Baseline to 2035 Preferred Alternative)

<table>
<thead>
<tr>
<th>Noise Impact Comparison by Contour</th>
<th>75 DNL</th>
<th>70 DNL</th>
<th>65 DNL</th>
<th>60 DNL</th>
<th>55 DNL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change from Baseline to 2035 Preferred Alternative Conditions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contour Overall Area (Acres)</td>
<td>12.0</td>
<td>28.3</td>
<td>59.6</td>
<td>148.0</td>
<td>421.9</td>
</tr>
<tr>
<td>Percentage Change</td>
<td>118%</td>
<td>68%</td>
<td>69%</td>
<td>88%</td>
<td>108%</td>
</tr>
<tr>
<td>Number of Residential Parcels</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: MAC Analysis

In summary, when the 2035 Preferred Alternative Condition contours are compared to the Baseline Condition contours:

- For the 65 DNL contour, the acreage contained within the contour increases by approximately 60 acres, with no residential parcels contained in the contour under either condition. The 65 DNL contour is contained on airport property in the Baseline Condition, but extends off airport property in the 2035 Preferred Alternative Condition. This change is largely due to the increased flight activity forecasted in 2035.

- For the 60 DNL contour, the acreage contained within the contour increases by approximately 148 acres, with no residential parcels contained in the contour under either condition. The 60 DNL contour extends off airport property in both
conditions. Again, this change is largely due to the increased flight activity forecasted in 2035.

- For the 55 DNL contour, the acreage contained within the contour increases by approximately 422 acres, with no residential parcels contained in the contour under either condition.

### 6.3 SANITARY SEWER AND WATER

Most of Airlake Airport, including the North and South Building Areas, currently lie outside of the Metropolitan Urban Services Area (MUSA). However, the Metropolitan Council Environmental Services (MCES) agency has requested that the MAC provide sanitary sewer and water services for all of the hangar areas in the Reliever system, including Airlake Airport. This request was primarily related to concerns about the possibility of noncompliant well and septic systems that may be in existence at the airports.

Existing tenants that have legal wells and septic holding tanks have been allowed to keep them. The MAC maintenance building also has a well and holding tank. Tenants with illegal sandpoint wells or drain fields were required to remove or abandon them after MAC adopted its Sanitary Sewer and Water Policy in 1998, and subsequent revision in October 2000. Consistent with that policy, no new wells or holding tanks have been allowed at the airport.

The FBO and MAC maintenance building are connected to sewer and water as they are within the Lakeville municipal boundary. When these buildings were connected to the system, stubs for both the watermain and the sanitary sewer were extended to the south under the runway. The North Building Area at Airlake does not have services available for tenant connection, but does have a watermain line and hydrants installed for fire protection.

In 1997, the MAC prepared a Water and Sanitary Sewer Master Plan for the Airlake Airport. The alternatives discussed in the report included the construction of public restroom facilities, fire protection via a hydrant line, and installing sanitary sewer and water services.

The 2025 LTCP identified the following steps for installation of sanitary sewer and water facilities at Airlake:

- Pursue an agreement with the City of Lakeville and Eureka Township for the provision of sanitary sewer and water to the airport;
- Provide sanitary sewer and water services to a portion of the South Building Area, construct a stand-alone restroom facility, and designate the remaining hangar spots as a non-service area. This should accommodate those tenants that want connection and any corporate hangars constructed, along with reducing the overall cost of installation;
- As part of South Building Area installation, loop the watermain such that hydrants can be installed throughout the hangar area for fire protection;
- Designate the existing north hangar area as a non-service area, but construct a stand-alone restroom for tenant use that is connected to the sanitary sewer and water system.

Discussions about the process and timeline for extending utilities to areas not currently within the Lakeville city boundary are underway between MAC, Lakeville, and Eureka Township.

The Capital Improvement Program (CIP) for Airlake Airport includes the following projects that are dependent upon water and sanitary sewer service:

- Construction of a Public Restroom Facility and Aircraft Wash Pad in 2019

MAC provides stand-alone public restroom facilities within hangar areas at several of its airports, including Anoka County – Blaine, Flying Cloud, and Crystal that can be used by tenants who do not have sewer and water at their hangar. A site selection study was completed in 2014 to identify a location for a similar stand-alone restroom facility at Airlake Airport. Of several options considered, the preferred site for a stand-alone public restroom facility to serve hangars in the North Building Area was identified north of Hangar Row Charlie along the vehicle access road. This site provided the best balance between overall cost and proximity to the Hangar Area. However, as this site is not within the City, an agreement will need to be reached with Lakeville to provide water and sewer services at this site. The preliminary concept for the public restroom facility is shown in Figure 6-6.

It is anticipated that the Aircraft Wash Pad will be located in the vicinity of the existing FBO site.

- South Building Area Development - Phase 1 in 2020

This project involves extension of sanitary sewer and water mains to a portion of the South Building Area, along with construction of two hangar access taxilanes and the south entrance road connecting to 225th Street W. A site concept is shown in Figure 6-7.

6.4 WETLANDS

As noted in Section 2.5.1, Airlake Airport lies within the Vermillion River Watershed, which is managed by the Vermillion River Watershed Joint Powers Organization (VRWJPO). While the Vermillion River is located approximately one-half mile south of Runway 30, one of its tributaries runs directly through airport property. This channel is named the South Tributary of South Creek, and it has only intermittent flows. It is a designated trout stream.

As described in Section 2.5.1, the Minnesota Buffer Law requires 50 feet of permanent vegetation on either side of the stream bank. The South Building Area grading and stream/ditch relocation was completed in 1998 under a permit received from the DNR. Additionally, the intermittent stream flows through an existing culvert under Runway 12-
30. Coordination with the VRWJPO, the City of Lakeville, Eureka Township, Dakota County Soil and Water Conservation District, the Army Corps of Engineers, and the Department of Natural Resources will be required for projects in the vicinity of the tributary to ensure there are no impacts to the stream.

There are also wetland areas on airport property. The wetlands are regulated under the Wetland Conservation Act (WCA). The City of Lakeville and Eureka Township currently serve as the Local Government Unit (LGU) for administering the WCA wetlands within their respective boundaries. Approximately 33 acres of wetlands were identified within airport property, with varying wetland types. Figure 2-9 contains a graphic showing the wetland areas.

A small portion of the MAC-owned southern parcel east of Cedar Avenue lies within the 100-year floodplain of the Vermillion River. There may also be designated floodplain areas on the airport associated with the South Tributary.

Any projects completed at the airport require conformance with the VRWJPO, Army Corps of Engineers, WCA and/or DNR regulations regarding wetlands. The projects proposed in the preferred alternative require environmental review, at which time, avoidance, minimization and any required mitigation efforts will be discussed if wetland impacts are suspected. Appropriate mitigation will also be discussed should wetland impacts arise from any of the proposed projects.

Any environmental review will also include plans for storm water quality. Previous airport projects have required rate and volume controls, infiltration or other means to enhance water quality. These and other best management practices will continue with future projects identified as the preferred alternative.

6.5 OTHER ENVIRONMENTAL CONSIDERATIONS

The MAC will conduct an environmental review per federal National Environmental Policy Act (NEPA) and Minnesota Environmental Policy Act (MEPA) requirements to more specifically identify the environmental footprint of the proposed improvements before construction can begin. During this process, alternatives must be reviewed and any potential impacts must be avoided if possible. If impacts cannot be avoided, they must be minimized to the extent possible and mitigated in full compliance with federal and state requirements.

The following impact categories will be assessed during the environmental review:

- Air Quality;
- Biological resources (including fish, wildlife, and plants);
- Climate;
- Department of Transportation Section 4(f) Properties (park and recreational lands, wildlife and waterfowl refuges, and historic sites);
- Farmlands;
- Hazardous materials, solid waste, and pollution prevention;
• Historical, architectural, archeological, and cultural resources;
• Land use;
• Natural resources and energy supply;
• Noise and compatible land use;
• Socioeconomics, environmental justice, and children’s environmental health and safety risks;
• Visual effects (including light emissions);
• Water resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers);
• Construction impacts; and
• Cumulative effects.

An environmental review process cannot begin until there is a sufficiently detailed plan available to evaluate. MAC envisions initiating the environmental review for the proposed Airlake Airport improvements after the plan is reviewed by the Metropolitan Council and formally adopted by the MAC Board. A full study of these environmental impact items at this time falls outside the scope of this long-term planning document.
Figure 6-1: Sound Levels of Typical Noise Sources

Source: Aircraft sound levels are average measured $L_{max}$ values for arrival events at MSP remote monitoring towers 5 and 6 between January 2010 and May 2017 for the aircraft type depicted. RMT 5 is 1.28 miles from the arrival threshold of Runway 12R. RMT 6 is .90 miles from the arrival threshold of Runway 12L.
Figure 6-2: Typical Outdoor Community Day-Night Average Sound Levels

Figure 6-3: Baseline Condition Noise Contours
Figure 6-4: 2035 Preferred Alternative Noise Contour
Figure 6-6: North Building Area Public Restroom Conceptual Layout

ALTERNATIVE 2

PROJECT ELEMENTS:
- CONSTRUCTION OF A PERMANENT CENTRAL PUBLIC RESTROOM
- CONSTRUCTION OF SITE IMPROVEMENTS TO ALLOW PUBLIC ACCESS

PROJECT BENEFITS:
- PROVIDES PUBLIC RESTROOM LOCATED IN HANGAR AREA
- LOW PROJECT COST

PROJECT CHALLENGES:
- MAY REQUIRE CITY OF LAKEVILLE ANNEXATION
- DOES NOT PROVIDE SERVICES TO HANGARS

ESTIMATED PROJECT COST = $225,000
Figure 6-7: South Building Area – Phase 1 Layout
SECTION 7:

LAND USE COMPATIBILITY
7. LAND USE COMPATIBILITY

7.1 INTRODUCTION

Planning for the maintenance and development of airport facilities is a complex process. Successfully developing airports requires insightful decision-making predicated on various facts that drive the need for the development of additional airport infrastructure. Furthermore, these efforts should consider surrounding community land uses. Airports cannot be developed in a vacuum; the development effort must consider the needs of the surrounding populations and the land uses in the area surrounding the airport. The success of airport planning relies on close consideration and coordination of surrounding land use to ensure compatibility with the community surrounding the airport.

As city governments are responsible for the development and enhancement of city infrastructure, airport proprietors are responsible for the federally-endorsed enhancement of our nation’s airport system. Airport operators would be remiss in their duties if such efforts did not consider the land use consequences of decisions made regarding airport development.

This chapter evaluates the land use implications of the planned operation and development of Airlake Airport.

7.2 LAND USE COMPATIBILITY CRITERIA

The Federal Aviation Administration (FAA) has established Land Use Compatibility criteria in 14 CFR Part 150 detailing acceptable land uses around airports considering noise impacts in terms of DNL. In the case of airports located in the Minneapolis-St. Paul Metropolitan Area, additional criteria also must be evaluated in relation to noise exposure as established by the Metropolitan Council’s Transportation Policy Plan (TPP).

7.2.1 Federal Aviation Administration Land Use Compatibility Guidelines

Federal guidelines for compatible land use that take into account the impact of aviation noise have been developed for land near airports. They were derived through an iterative process that started before 1972. Independent efforts by the FAA, U.S. Department of Housing and Urban Development, U.S. Air Force, U.S. Navy, U.S. Environmental Protection Agency and other Federal agencies to develop compatible land use criteria were melded into a single effort by the Federal Interagency Committee on Urban Noise in 1979, and resulted in the FICUN Guidelines document (1980). The Guidelines document adopted DNL as its standard noise descriptor, and the Standard Land Use Coding Manual (SLUCM) as its standard descriptor for land uses. The noise-to-land use relationships were then expanded for FAA’s Advisory Circular (AC) 150/5020-1, Noise Control and Compatibility Planning for Airports. The current individual agency compatible land use criteria have been, for the most part, derived from those in the FICUN Guidelines. Only certain categories of these guidelines\(^\text{28}\) pertain to airport environments.

In 1985 the FAA adopted 14 CFR Part 150 outlining land use compatibility guidelines around airports. Table 7-1 provides the land use compatibility guidelines as established by the FAA.

According to FAA standards, areas with noise levels less than 65 DNL are considered compatible with residential development.
### Table 7-1: FAA Aircraft Noise and Land Use Compatibility Guidelines

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Yearly day-night average sound level (DNL) in decibels</th>
<th>Below 65</th>
<th>65-69</th>
<th>70-74</th>
<th>75-79</th>
<th>80-84</th>
<th>Over 85</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residential</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential, other than mobile homes and transient lodgings</td>
<td></td>
<td>Y</td>
<td>N(1)</td>
<td>N(1)</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Mobile home park</td>
<td></td>
<td>Y</td>
<td>N</td>
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<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Transient Lodgings</td>
<td></td>
<td>Y</td>
<td>N(1)</td>
<td>N(1)</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td><strong>Public Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schools</td>
<td></td>
<td>Y</td>
<td>N(1)</td>
<td>N(1)</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Hospitals and nursing homes</td>
<td></td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Churches, auditoriums, and concert halls</td>
<td></td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Governmental services</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Y(2)</td>
<td>Y(3)</td>
<td>Y(4)</td>
<td>Y(4)</td>
</tr>
<tr>
<td>Parking</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Y(2)</td>
<td>Y(3)</td>
<td>Y(4)</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Commercial Use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offices, business and professional</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Wholesale and retail–building materials, hardware and farm equipment</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Y(2)</td>
<td>Y(3)</td>
<td>Y(4)</td>
<td>N</td>
</tr>
<tr>
<td>Retail trade–general</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
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<tr>
<td>Utilities</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Y(2)</td>
<td>Y(3)</td>
<td>Y(4)</td>
<td>N</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td><strong>Manufacturing and Production</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing, general</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Y(2)</td>
<td>Y(3)</td>
<td>Y(4)</td>
<td>N</td>
</tr>
<tr>
<td>Photographic and optical</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
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<tr>
<td>Agriculture (except livestock) and forestry</td>
<td></td>
<td>Y</td>
<td>Y(6)</td>
<td>Y(7)</td>
<td>Y(8)</td>
<td>Y(8)</td>
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</tr>
<tr>
<td>Livestock farming and breeding</td>
<td></td>
<td>Y</td>
<td>Y(6)</td>
<td>Y(7)</td>
<td>N</td>
<td>N</td>
<td>N</td>
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<tr>
<td>Mining and fishing, resource production and extraction</td>
<td></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Land Use</td>
<td>Yearly day-night average sound level (DNL) in decibels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Below 65</td>
<td>65-69</td>
<td>70-74</td>
<td>75-79</td>
<td>80-84</td>
<td>Over 85</td>
<td></td>
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<tr>
<td>Recreational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor sports arenas and spectator sports</td>
<td>Y</td>
<td>Y(5)</td>
<td>Y(5)</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
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<tr>
<td>Outdoor music shells, amphitheaters</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
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<tr>
<td>Nature exhibits and zoos</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Amusements, parks, resorts and camps</td>
<td>Y</td>
<td>Y</td>
<td>25</td>
<td>30</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Golf courses, riding stables, and water recreation</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

*The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

**Table Key**

Y (Yes) | Land use and related structures compatible without restrictions.
N (No)  | Land use and related structures are not compatible and should be prohibited.
NLR  | Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35 | Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Table Notes on Following Page
Table Notes

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

Source: 14 CFR Part 150
7.2.2 Metropolitan Council Land Use Compatibility Guidelines

The Metropolitan Council has developed a set of land use planning guidelines for responsible community development in the Minneapolis-St. Paul Metropolitan Area. The intent is to provide city governments with a comprehensive resource with regard to planning community development in a manner that considers adequacy, quality and environmental elements of planned land uses.

Specifically, the Minnesota State Land Planning Act, the underlying law that requires local units of government to prepare a comprehensive plan and submit it for Metropolitan Council review, was enacted in 1976. By 1980, all community plans had been approved. The 1973 Aviation Chapter of the Metropolitan Development Guide was updated in 1977. In 1983, the Metropolitan Council amended the Aviation Policy Plan to include “Land Use Compatibility Guidelines for Aircraft Noise.”

In 1994, the Land Planning Act of 1976 had been amended to require communities to update their comprehensive plans at least every 10 years. Therefore, all Metropolitan Development Guide chapters were updated by December 1996.

Under the 1976 legislation, communities designated land uses and defined the zoning applicable to the particular land use parcel; the zoning took precedence. The land use measure was a request that local jurisdictions review existing zoning in Airport Noise Zones to determine their consistency with the regional compatibility guidelines, and rezone the property for compatible development if consistent with other development factors. This policy changed in 1994.

Under the amended Land Planning Act, communities determine the land use designation, and the zoning must be consistent with that designation. Thus, the communities had to re-evaluate designated use, permitted uses within the designation, zoning classifications, and adequacy.

In 2004 the Aviation Policy Plan was incorporated into the Transportation Policy Plan (TPP) of the Metropolitan Development Guide. In January 2015 the Metropolitan Council adopted the 2040 TPP land use compatibility guidelines for all metropolitan system airports that are included in the TPP.

In the case of airports located in the Minneapolis-St. Paul Metropolitan Area, the Metropolitan Council Development Guidelines in relation to airport noise exposure need to be considered. The TPP provides land use guidelines based on four noise zones around an airport. The following provides the Metropolitan Council’s description of each noise zone:

- **Zone 1** – Occurs on and immediately adjacent to the airport property. Existing and projected noise intensity in the zone is severe and permanent. It is an area affected by frequent landings and takeoffs and subjected to aircraft noise greater than 75 DNL. Proximity of the airfield operating area, particularly runway thresholds, reduces the probability of relief resulting from changes in the operating characteristics of either the aircraft or the airport. Only new, non-sensitive land uses should be considered – in addition to preventing future noise problems the severely noise-impacted areas should be fully evaluated to
determine alternative land use strategies including eventual changes in existing land uses.²⁹

- Zone 2 – Noise impacts are generally sustained, especially close to runway ends. Noise levels are in the 70 to 74 DNL range. Based upon proximity to the airfield, the seriousness of the noise exposure routinely interferes with sleep and speech activity. The noise intensity in this area is generally serious and continuing. New development should be limited to uses that have been constructed to achieve certain exterior-to-interior noise attenuation and that discourage certain outdoor uses.³⁰

- Zone 3 – Noise impacts can be categorized as sustaining. Noise levels are in the 65 to 69 DNL range. In addition to the intensity of the noise, location of buildings receiving the noise must also be fully considered. Aircraft and runway use operational changes can provide some relief for certain uses in this area. Residential development may be acceptable if it is located outside areas exposed to frequent landings and takeoffs, is constructed to achieve certain exterior-to-interior noise attenuation, and is restrictive as to outdoor use. Certain medical and educational facilities that involve permanent lodging and outdoor use should be discouraged.³¹

- Zone 4 – Defined as a transitional area where noise exposure might be considered moderate. Noise levels are in the 60 to 64 DNL range. The area is considered transitional since potential changes in airport and aircraft operating procedures could lower or raise noise levels. Development in this area can benefit from insulation levels above typical new construction standards in Minnesota, but insulation cannot eliminate outdoor noise problems.³²

- Noise Buffer Zones: Additional area that can be protected at the option of the affected community; generally, the buffer zone becomes an extension of noise zone 4. At MSP, a one-mile buffer zone beyond the DNL 60 has been established to address the range of variability in noise impact, by allowing implementation of additional local noise mitigation efforts. A buffer zone out to DNL55 is optional at those reliever airports with noise policy areas outside the MUSA.³³

The listed noise zones also use the DNL noise exposure metric. The Metropolitan Council Land Use Compatibility Guidelines for Aircraft Noise are provided in Table 7-2.

The Metropolitan Council suggests that the 60 DNL contour be used for planning purposes in areas inside the MUSA. However, Airlake Airport is located outside the MUSA; as such, the 55 DNL contour is provided in the context of evaluating Land Use Compatibility considerations.

²⁹ Metropolitan Council 2040 Transportation Policy Plan, Appendix L, January 2015.
³⁰ Ibid.
³¹ Ibid.
³² Ibid.
³³ Ibid.
## Table 7-2: Metropolitan Council Land Use Compatibility Guidelines for Aircraft Noise

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>New Development and Major Redevelopment</th>
<th>Infill Development and Reconstruction or Additions to Existing Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>DNL</td>
<td>DNL</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single / Multiplex with Individual Entrance</td>
<td>INCO</td>
<td>INCO</td>
</tr>
<tr>
<td>Multiplex / Apartment with Shared Entrance</td>
<td>INCO</td>
<td>INCO</td>
</tr>
<tr>
<td>Mobile Home</td>
<td>INCO</td>
<td>INCO</td>
</tr>
<tr>
<td>Educational, Medical, Schools, Churches, Hospitals, Nursing Homes</td>
<td>INCO</td>
<td>INCO</td>
</tr>
<tr>
<td>Cultural / Entertainment / Recreational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor</td>
<td>COND</td>
<td>COND</td>
</tr>
<tr>
<td>Outdoor</td>
<td>COND</td>
<td>COND</td>
</tr>
<tr>
<td>Office / Commercial / Retail</td>
<td>COND</td>
<td>PROV</td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation-Passenger Facilities</td>
<td>COND</td>
<td>PROV</td>
</tr>
<tr>
<td>Transient Lodging</td>
<td>INCO</td>
<td>COND</td>
</tr>
<tr>
<td>Other Medical, Health &amp; Educational</td>
<td>COND</td>
<td>PROV</td>
</tr>
<tr>
<td>Other Services</td>
<td>COND</td>
<td>PROV</td>
</tr>
<tr>
<td>Industrial / Communication / Utility</td>
<td>PROV</td>
<td>COMP</td>
</tr>
<tr>
<td>Agriculture Land / Water Areas / Resource Extraction</td>
<td>COMP</td>
<td>COMP</td>
</tr>
</tbody>
</table>

Notes: Table Key on Following Page
Table Key:

COMP - "Compatible" - Uses are acoustically acceptable for both indoors and outdoors.

PROV - "Provisional" - Uses that should be discouraged if at all feasible; if allowed, must meet certain structural performance standards to be acceptable according to MS 473.192 (Metropolitan Area Aircraft Noise Attenuation Act). Structures built after December 1983 shall be acoustically constructed so as to achieve interior sound levels as follows (per Metropolitan Council’s 2040 Transportation Policy Plan, Appendix L, Table L-4):

- Residential, Educational and Medical = 45 dBA Interior Sound Level
- Cultural, Entertainment, Recreational, Office, Commercial, Retail and Services = 50 dBA Interior Sound Level
- Industrial, Communications, Utility, Agricultural Land, Water Areas, Resource Extraction = 60 dBA Interior Sound Level

Each local government unit having land within the airport noise zones is responsible for implementing and enforcing the structure performance standards in its jurisdiction.

COND - "Conditional" - Uses that should be strongly discouraged; if allowed, must meet the structural performance standards, and requires a comprehensive plan amendment for review of the project under the factors described in the Metropolitan Council’s 2040 Transportation Policy Plan, Appendix L, Table L-3.

INCO - "Incompatible" - Land uses that are not acceptable even if acoustical treatment were incorporated in the structure and outside uses restricted.

Source: Metropolitan Council 2040 Transportation Policy Plan, Appendix L - January 2015.
7.2.3 MnDOT Aeronautics Model State Safety Zones

The State of Minnesota Department of Transportation, Office of Aeronautics (MnDOT) has established regulations that control the type of development allowed off runway ends in order to prevent incompatible development. These guidelines are meant to be used to establish zoning ordinances to protect areas around an airport.

The most restrictive areas created by MnDOT regulations are called Safety Zones A and B. The recommended safety zones should exist off each runway end and follow the approach zones out to the total length of the respective runway. The length of Safety Zone A is 2/3 of the total runway length; Safety Zone B is 1/3 of the total runway length and extends from Safety Zone A. There is also an area called Safety Zone C, which is a horizontal plane established 150 feet above the established airport elevation for a specified distance from each runway end.

A complete description and copy of the Minnesota Rules Chapter 8800 Department of Transportation Aeronautics Section 2400 Airport Zoning Standards can be accessed via the following website link: https://www.revisor.mn.gov/rules/?id=8800.2400.

MnDOT has undertaken efforts to update the state’s airport zoning regulations. It is anticipated that revisions to the statutes governing airport zoning will be considered during a future Minnesota Legislative session. The administrative rules used to implement the zoning regulations and define the particulars of the Safety Zones will likely be updated after the statutory changes are complete.

Once Airlake Airport’s future development plan is finalized, and the process to update the state’s airport zoning regulations is complete, MAC intends to establish a Joint Airport Zoning Board (JAZB) that will include the respective Responsible Governmental Units that control land use development around Airlake Airport. Through a collaborative process, the JAZB will seek to develop an Airport Zoning ordinance, in accordance with state statutes and administrative rules, that considers land uses around Airlake Airport to achieve a balance between providing a reasonable level of public safety and facilitating compatible off-airport development.

For this report, the existing MnDOT models for the size and shape of State Safety Zones A and B were used for the purpose of analyzing land use compatibility. The sizes, shapes and/or locations of these zones may be revised by the JAZB during development of the Airport Zoning Ordinance for Airlake Airport. However, it should be noted that these zones are not currently in effect at Airlake Airport.

MnDOT Aeronautics promotes the preservation of Clear Zones off runway ends to enhance operational safety of aircraft and to protect life and property in runway approach areas. The MnDOT Clear Zones are shown in Figure 7-1. MnDOT Clear Zones should be kept clear of incompatible land uses to the extent practical.

7.3 LAND USE COMPATIBILITY ANALYSIS

Airlake Airport lies within the borders of Eureka Township and abuts the southern border of the City of Lakeville. A small portion of the airport does lie within the City of Lakeville municipal boundary. Eureka Township, the City of Lakeville, and Dakota County all
maintain comprehensive plans that address land use and transportation infrastructure in the vicinity of Airlake Airport.

**Eureka Township**

The Eureka Township 2030 Comprehensive Plan was updated in 2008 and contains a section in Chapter 5 on aviation pertaining to Airlake Airport. Eureka’s plan illustrates the State Model Safety Zone A and B areas included in the 2025 Airport LTCP for informational purposes. The plan reiterates the Township’s support of general airspace protection provisions, including Township review of all applications for development. If proposed structures trigger notification to the FAA or MnDOT, applicants are required to do so.

The full Eureka Township 2030 Comprehensive Plan can be accessed via the following website link:

http://eurekatownship-mn.us/comprehensive-plan/

Eureka Township is currently in the process of updating its Comprehensive Plan to the 2040 planning horizon. The Draft 2040 Comprehensive Plan document is available via the following website link:

http://eurekatownship-mn.us/2017/02/02/draft-2040-comprehensive-plan/

In addition, Eureka Township has recently completed a Boundary Protection Study that was commissioned in part due to concerns about the potential impacts of a regional sewer extension to serve Airlake Airport. The study states the Township is concerned that the regional sewer extension to the Airport may lead adjacent cities or landowners to annex portions of the Township including the airport and adjacent area to the City of Lakeville. The study recommends that the Town Board should seek a Joint Powers Agreement with the City of Lakeville to address the potential extension of municipal sewer service to Airlake Airport that would include provisions that the Airport remain in the Township while permitting extension of municipal sewer and water services to the Airport.

The Eureka Township Boundary Protection Study document can be accessed via the following website link:

http://eurekatownship-mn.us/2017/05/30/eureka-township-boundary-protection-study/

**City of Lakeville**

The City of Lakeville maintains a Comprehensive Land Use Plan that address land uses and transportation infrastructure in the vicinity of Airlake Airport. Last updated in 2008, the plan includes the following policies regarding Airlake Airport:

- Regulate land uses within and surrounding the Airlake Airport to ensure they are compatible with its function and where incompatibility exists, affected agencies and jurisdictions should jointly participate in developing a program to mitigate the incompatibility;
• State and Federal environmental standards and adopted Metropolitan Council policies shall be major considerations in the planning, design and operation of Airlake Airport;

• Cooperate with Metropolitan Airports Commission to regulate airport land uses in a manner consistent with the 2030 Comprehensive Land Use Plan and Zoning Ordinance;

• Prevent the construction, erection, alteration, or growth of any structure, tree or other object in the approach areas of the runway of the airport that would constitute an airport hazard;

• Restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft;

• Guide land uses surrounding Airlake Airport to maximize compatibility with normal airfield noise and airport operations;

• Maintain Airlake Airport as a minor reliever airport and do not improve the facility beyond the design criteria of this functional classification;

• Focus airport improvements on the improvement of public safety and the potential for economic development in Lakeville; and

• Establish limits for airport operations and noise levels and a commitment that these projections will not be exceeded should be agreed upon between the City and Metropolitan Airports Commission.

Further, the 2008 plan states that Lakeville supports continued operation and planned expansion of Airlake Airport as an amenity for planned Office Park and Industrial uses in the community as follows:

• The City of Lakeville currently provides water and sanitary sewer service for the area of Airlake Airport (Aircraft Resource Center as the Fixed Base Operations Center) that is within the corporate limits of the City. Any future extension of urban water and sanitary sewer services to the Airlake Airport property currently outside the corporate limits of the City will only be allowed with the annexation of the area being serviced into the City of Lakeville.

• There is support for the preferred alternative for Airlake Airport to extend the existing runway to 5,000 feet. However, if the runway extension is to be pursued, the Metropolitan Airports Commission should commit to the project and an agreement to secure or reserve the additional land area needed for the realignment of Cedar Avenue east of the airport should be reached with the affected property owners in the near term.

• Airport noise should be monitored in the future to ensure compliance with the noise level contours indicated in the Airlake Airport Comprehensive Plan after the runway extension has been completed. If, in the near future, the boundaries of the 55 DNL expand beyond what is shown in the plan and include more residential structures, Lakeville would request that homeowners be provided noise mitigation assistance for their homes.
The full 2008 Land Use Comprehensive Plan can be accessed from the website link below:

http://www.ci.lakeville.mn.us/DocumentCenter/View/572

The City has initiated efforts to update its Comprehensive Plan to the 2040 planning horizon.

**Dakota County**

Finally, Dakota County also maintains a Comprehensive Plan that was last updated in 2008. As County Road 23 / Cedar Avenue is a County roadway, this plan contains activity projections for the section of this road adjacent to Airlake Airport. According to the plan, the two-lane section of Cedar Avenue in the vicinity of the Airport accommodates approximately 6,800 vehicles per day, and is projected to reach about 12,000 vehicles per day by 2030. There is no current plan to widen or expand the capacity of this section of Cedar Avenue adjacent to Airlake Airport within the planning period.

The full Dakota County Comprehensive Plan can be accessed from the website link below:

https://www.co.dakota.mn.us/Government/Planning/CompPlan

The County has initiated efforts to update its Comprehensive Plan to the 2040 planning horizon.

7.3.1 **Existing Condition Land Use Compatibility**

In general, the area around the airport consists of compatible land uses. Existing land use parallel to Runway 12-30 on the north side is industrial. There is a small section of commercial use and some undeveloped areas within the industrial park. Surrounding the rest of the airport land use is primarily agricultural with scattered farmsteads and single family rural residential. There is a cemetery located adjacent to the south building area.

**Land Use Compatibility and Airport Noise Considerations**

Figure 7-2 illustrates the Baseline Condition 55 and greater DNL noise contours around Airlake Airport (from Section 6.2.3) with existing RPZs and Model State Safety Zones over existing land use data provided by the Metropolitan Council.

Existing land uses around Airlake Airport are compatible with airport operations considering airport noise impacts as outlined in the FAA land use guidelines in Table 7-1 and the Metropolitan Council land use guidelines in Table 7-2.

The Baseline Condition 65 and greater DNL noise contours are fully contained on airport property. The 55 and 60 DNL contours encompass additional areas of industrial and agricultural uses to the northwest and southeast of the airport.

**Land Use Compatibility and Existing Runway Protection/Safety Zones**

The existing RPZs and Model State Safety Zones A and B for Runway 12-30 at Airlake Airport encompass areas of airport property in addition to commercial/industrial, agricultural, and undeveloped land uses.
The existing RPZ’s at Airlake Airport include several land uses that would not be considered compatible under the FAA’s current guidance. However, since these land uses predate the FAA’s current guidance, they are acceptable to remain as an existing condition.

- **Runway 12 End: Two low-volume public roadways (Highview Avenue and 220th Street), Progressive Rail railroad track, and a private drive providing access to an agricultural field.**
  - Highview Avenue is a local north/south road in Eureka Township located to the east of Runway 12 that accommodates an estimated 2,000 vehicles per day.
  - 220th Street is an east/west city street located north of the airport that accommodates approximately 1,500 vehicles per day.
  - Progressive Rail operates almost 80 miles of track in the south Twin Cities Metro Area. In the Lakeville area where Airlake Airport is located, it moves a wide variety of commodities – everything from heavy equipment to building products. Its lines are a mix of former Union Pacific and Canadian Pacific lines and it continues to interchange with both. According to the MnDOT Rail Office, two trains operate per weekday and operations are occasional on weekends.

- **Runway 30 End: County Road 23 / Cedar Avenue and 225th Street**
  - County Road 23 / Cedar Avenue is located on the east side of airport property. It is an important north/south arterial road that serves the southeast quadrant of the Twin Cities Metropolitan Area by providing mobility and connectivity across and through the region. This corridor crosses the Minnesota River and provides accessibility to the MSP Airport. As noted above, this section of Cedar Avenue in the vicinity of the Runway 30 RPZ accommodates approximately 6,800 vehicles per day, and is projected to reach about 12,000 vehicles per day by 2030.
  - 225th Street is an east/west corridor that borders airport property on the south. It is a gravel-surfaced township road that provides local land access and connectivity to other roadways, such as Cedar Avenue, that serve a mobility function. This road is currently the controlling obstacle for the Runway 30 displaced threshold.

Table 7-3 provides existing land use acreages encompassed by the Baseline Condition RPZs and Safety Zones.
### Table 7-3: Baseline Condition Land Use Impacts

<table>
<thead>
<tr>
<th>Land Use Acreage</th>
<th>RWY 12</th>
<th>RWY 30</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline Condition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway Protection Zone (Acres)</td>
<td>13.8</td>
<td>49.0</td>
<td>62.8</td>
</tr>
<tr>
<td>Agricultural</td>
<td>2.8</td>
<td>27.1</td>
<td>29.9</td>
</tr>
<tr>
<td>Airport</td>
<td>10.8</td>
<td>21.8</td>
<td>32.6</td>
</tr>
<tr>
<td>Industrial and Utility</td>
<td>0.2</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>On-Airport</strong></td>
<td>12.6</td>
<td>49.0</td>
<td>61.6</td>
</tr>
<tr>
<td><strong>Off-Airport</strong></td>
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<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Model State Safety Zone A (Acres)</strong></td>
<td>88.5</td>
<td>88.5</td>
<td>176.9</td>
</tr>
<tr>
<td>Agricultural</td>
<td>63.4</td>
<td>62.2</td>
<td>125.6</td>
</tr>
<tr>
<td>Airport</td>
<td>18.7</td>
<td>13.7</td>
<td>32.4</td>
</tr>
<tr>
<td>Industrial and Utility</td>
<td>6.3</td>
<td>0.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>0.0</td>
<td>12.6</td>
<td>12.6</td>
</tr>
<tr>
<td><strong>On-Airport</strong></td>
<td>79.8</td>
<td>88.0</td>
<td>167.7</td>
</tr>
<tr>
<td><strong>Off-Airport</strong></td>
<td>8.7</td>
<td>0.5</td>
<td>9.2</td>
</tr>
<tr>
<td><strong>Model State Safety Zone B (Acres)</strong></td>
<td>63.5</td>
<td>63.5</td>
<td>127.0</td>
</tr>
<tr>
<td>Agricultural</td>
<td>37.8</td>
<td>37.1</td>
<td>74.9</td>
</tr>
<tr>
<td>Industrial and Utility</td>
<td>21.7</td>
<td>0.0</td>
<td>21.7</td>
</tr>
<tr>
<td>Open Water</td>
<td>0.0</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>4.0</td>
<td>25.8</td>
<td>29.8</td>
</tr>
<tr>
<td><strong>On-Airport</strong></td>
<td>29.7</td>
<td>27.5</td>
<td>57.1</td>
</tr>
<tr>
<td><strong>Off-Airport</strong></td>
<td>33.8</td>
<td>36.0</td>
<td>69.9</td>
</tr>
</tbody>
</table>

**Notes:**
- Totals may not add due to rounding.
- Acreage calculations based on existing land use data.

**Source:** MAC Analysis

#### 7.3.2 2035 Preferred Alternative Land Use Compatibility

The 2035 Preferred Alternative for Airlake Airport includes the extension of Runway 12-30 to a published length of 4,850 feet with declared distances in effect. This development, coupled with changes in the aircraft fleet mix, will result in changes to the noise contour, RPZs and Model State Safety Zone considerations.
**2035 Preferred Alternative Land Use Compatibility and Airport Noise Considerations**

Figure 7-3 provides the 2035 Preferred Alternative forecast 55 and greater DNL noise contours around Airlake Airport (from Section 6.2.4) with forecast RPZs and Model State Safety Zones over planned land use data provided by the Metropolitan Council.

There are minor changes proposed in future land uses within the 2035 noise contours: industrial and utility, undeveloped and some agricultural land to the northwest of the airport are planned to become mixed use; undeveloped areas to the south and southeast are planned to become agricultural.

The Preferred Development Alternative does not include residential structures in recognized airport noise areas.

**Land Use Compatibility and 2035 Preferred Alternative Runway Protection/Safety Zones**

The 2035 Preferred Alternative RPZs and model State Safety Zones A and B for Runway 12-30 at Airlake Airport continue to encompass areas of airport property in addition to commercial/industrial, agricultural, and undeveloped land uses.

Additional analysis was conducted relative to the planned land uses around Airlake Airport as provided by the Metropolitan Council. The proposed changes in land uses within the Preferred Alternative RPZs and Model State Safety Zones include industrial and utility, undeveloped and agricultural land to the northwest of the airport are planned to become mixed use and undeveloped area to the southeast are planned to become agricultural.

**Table 7-4** provides existing land use acreages encompassed by the 2035 Preferred Alternative Condition RPZs and Model State Safety Zones.

**Table 7-5** provides a comparison of on-airport and off-airport land use impacts from the Baseline to the 2035 Preferred Alternative Condition.

A comparison of the Baseline and Preferred Alternative RPZs, Model State Safety Zones, and noise contours is shown in **Figure 7-4**.
### Table 7-4: 2035 Preferred Alternative Land Use Impacts

<table>
<thead>
<tr>
<th>Land Use Acreage</th>
<th>RWY 12</th>
<th>RWY 30</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2035 Preferred Alternative Condition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway Protection Zone (Acres)</td>
<td>15.7</td>
<td>49.0</td>
<td>64.6</td>
</tr>
<tr>
<td>Agricultural</td>
<td>2.9</td>
<td>27.1</td>
<td>30.0</td>
</tr>
<tr>
<td>Airport</td>
<td>12.6</td>
<td>21.8</td>
<td>34.4</td>
</tr>
<tr>
<td>Industrial and Utility</td>
<td>0.2</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>On-Airport</strong></td>
<td>14.4</td>
<td>49.0</td>
<td>63.4</td>
</tr>
<tr>
<td><strong>Off-Airport</strong></td>
<td>1.2</td>
<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Model State Safety Zone A (Acres)</strong></td>
<td>110.2</td>
<td>110.2</td>
<td>220.4</td>
</tr>
<tr>
<td>Agricultural</td>
<td>87.5</td>
<td>78.4</td>
<td>165.9</td>
</tr>
<tr>
<td>Airport</td>
<td>12.2</td>
<td>4.3</td>
<td>16.5</td>
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<tr>
<td>Industrial and Utility</td>
<td>8.6</td>
<td>0.0</td>
<td>8.6</td>
</tr>
<tr>
<td>Open Water</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Undeveloped</td>
<td>1.9</td>
<td>27.5</td>
<td>29.4</td>
</tr>
<tr>
<td><strong>On-Airport</strong></td>
<td>97.3</td>
<td>95.4</td>
<td>192.7</td>
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<tr>
<td><strong>Off-Airport</strong></td>
<td>12.9</td>
<td>14.9</td>
<td>27.7</td>
</tr>
<tr>
<td><strong>Model Safety Zone B (Acres)</strong></td>
<td>82.1</td>
<td>82.1</td>
<td>164.3</td>
</tr>
<tr>
<td>Agricultural</td>
<td>43.6</td>
<td>54.1</td>
<td>97.8</td>
</tr>
<tr>
<td>Industrial and Utility</td>
<td>20.1</td>
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<td>20.1</td>
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<tr>
<td>Open Water</td>
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<td>2.2</td>
<td>2.2</td>
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<tr>
<td>Undeveloped</td>
<td>11.9</td>
<td>25.8</td>
<td>37.8</td>
</tr>
<tr>
<td>Single Family Detached</td>
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<td>4.9</td>
</tr>
<tr>
<td>Park, Recreational, or Preserve</td>
<td>1.7</td>
<td>0.0</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>On-Airport</strong></td>
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<td>0.3</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Off-Airport</strong></td>
<td>79.1</td>
<td>81.8</td>
<td>161.0</td>
</tr>
</tbody>
</table>

**Notes:**
- Totals may not add due to rounding.
- Acreage calculations based on existing land use data.

**Source:** MAC Analysis
Table 7-5: Change in Land Use Impacts (Baseline to 2035 Preferred Alternative)

<table>
<thead>
<tr>
<th>Land Use Impacts</th>
<th>RWY 12</th>
<th>RWY 30</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change from Baseline to 2035 Preferred Alternative Condition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runway Protection Zone (Acres)</td>
<td>1.9</td>
<td>0.0</td>
<td>1.9</td>
</tr>
<tr>
<td>On-Airport</td>
<td>1.8</td>
<td>0.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Off-Airport</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Model State Safety Zone A (Acres)</td>
<td>21.8</td>
<td>21.8</td>
<td>43.5</td>
</tr>
<tr>
<td>On-Airport</td>
<td>17.6</td>
<td>7.4</td>
<td>24.9</td>
</tr>
<tr>
<td>Off-Airport</td>
<td>4.2</td>
<td>14.4</td>
<td>18.6</td>
</tr>
<tr>
<td>Model State Safety Zone B (Acres)</td>
<td>18.6</td>
<td>18.6</td>
<td>37.3</td>
</tr>
<tr>
<td>On-Airport</td>
<td>-26.7</td>
<td>-27.2</td>
<td>-53.8</td>
</tr>
<tr>
<td>Off-Airport</td>
<td>45.3</td>
<td>45.8</td>
<td>91.1</td>
</tr>
</tbody>
</table>

Notes:
- Totals may not add due to rounding.
- Acreage calculations based on existing land use data.

Source: MAC Analysis

In summary, when the 2035 Preferred Alternative Condition is compared to the Baseline Condition from a land use compatibility perspective:

- The Baseline Condition RPZs and the 2035 Preferred Alternative RPZs both have 1.2 acres off airport property – a change of less than 0.1 acres. As a result of displacing the Runway 12 landing threshold to mitigate airspace penetrations, approximately 0.1 acres of off-airport property would be introduced into the Approach RPZ. This includes additional sections of 220th Street and Highview Avenue being introduced into the RPZ, along with a small section of an off-airport truck staging lot associated with an adjacent industrial land use.

- The Baseline Condition Model State Safety Zones have 79.1 acres off airport property, while 188.7 acres are off airport property in 2035 Preferred Alternative Condition – an increase of 109.6 acres.

- Existing land uses surrounding Airlake Airport are compatible with both the Baseline and 2035 Preferred Alternative Condition and the resultant aircraft operations considering airport noise impacts as outlined in the FAA and Metropolitan Council guidelines.
7.4 NON-AERONAUTICAL LAND USE AREAS AVAILABLE ON AIRPORT PROPERTY

MAC continues to analyze the potential for non-aeronautical revenue-generating development at Airlake Airport. Any parcels reviewed by the MAC at Airlake Airport will be compatible with ongoing airport operations and the MAC will work with the surrounding communities to ensure proper zoning exists. Also, in order to maintain compliance with Grant Assurances, FAA review and approval is required prior to the release of property or execution of any agreements for development. An update to the Exhibit A Airport Property Map showing the parcels released for non-aeronautical development would be required as well.

Figure 7-6 illustrates potential non-aeronautical development parcels.

If MAC pursues non-aeronautical development, discussions will be initiated with the surrounding municipalities to discuss the potential uses and how the cities feel the parcels could best be utilized. If a modification is required for zoning, MAC will work with the cities to make changes as appropriate. The development of non-aeronautical uses will not only benefit MAC, but it will also generate a tax base for the local municipality in which the parcel lies.
Figure 7-1: MnDOT Clear Zones
Figure 7-2: Baseline Condition RPZs, Model State Safety Zones, and Noise Contours
Figure 7-3: 2035 Preferred Alternative RPZs, Model State Safety Zones, and Noise Contours
Figure 7-4: Baseline to 2035 Preferred Alternative RPZ, Model State Safety Zone, and Noise Contour Comparison
Figure 7-5: Potential Non-Aeronautical Development Parcels
SECTION 8:

IMPLEMENTATION PLAN
8. IMPLEMENTATION PLAN

8.1 INTRODUCTION
This chapter provides information related to the estimated costs and potential phasing for the 2035 Preferred Alternative at Airlake Airport.

The LTCP is a planning document and does not authorize construction. Adoption of the LTCP is simply the first step in the project implementation process. Before any construction can begin, the project(s) must first be depicted on an FAA-approved Airport Layout Plan (ALP), evaluated via an environmental review process, and then compete for funding through FAA and/or State grant programs. Once funding is secured, final project engineering and design will take approximately one year to complete with contractor bidding and construction following thereafter.

8.2 CAPITAL IMPROVEMENT PROGRAM COSTS AND FUNDING SOURCES
Near-Term Development encompasses the project elements necessary to maintain the existing facility within the next five years.

MAC maintains an ongoing Capital Improvement Program (CIP) which assigns projects to a given year, currently looking out to 2023. Projects in the current CIP include:

- Runway 12 Precision Approach Path Indicator (PAPI) system and Hangar Obstruction Light installations in 2017;
- Materials Storage Building construction in 2018;
- MAC Maintenance Building improvements in 2019;
- Public Restroom Facility and Aircraft Wash Pad construction in 2019; and
- South Building Area Development - Phase 1 in 2020.

However, these timelines may vary according to the environmental review process, availability of funding sources, and status of providing municipal utilities.

Mid to Long-Term Development encompasses the project elements necessary to extend Runway 12-30 and make the other recommended airfield improvements. It is anticipated that this development may occur in the 6-20 year timeframe. The current CIP includes projects to reconstruct and extend Runway 12-30 in 2022.

A combination of traditional airport funding sources and financing mechanisms including federal Airport Improvement Program (AIP) grants, state Airport Construction Program grants, and local MAC monies could be used to fund implementation of the Preferred Alternative. It is anticipated that a majority of the funding would come in the form of AIP discretionary grants, which are awarded to airports on the basis of priority and available funding.

Project cost estimates for the 2035 Preferred Alternative are summarized in Table 8-1.
Table 8-1: Preferred Alternative Cost Estimates

<table>
<thead>
<tr>
<th>Item #</th>
<th>Project Element</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Near-Term Development (Plan Years 1 - 5)</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Runway 12 PAPI and Hangar Obstruction Lights</td>
<td>$150,000</td>
</tr>
<tr>
<td>2</td>
<td>Materials Storage Building</td>
<td>$200,000</td>
</tr>
<tr>
<td>3</td>
<td>MAC Building Improvements</td>
<td>$400,000</td>
</tr>
<tr>
<td>4</td>
<td>Public Restroom Facility and Plane Wash Pad</td>
<td>$450,000</td>
</tr>
<tr>
<td>5</td>
<td>South Building Area Development - Phase 1</td>
<td>$3,200,000</td>
</tr>
<tr>
<td></td>
<td><strong>Near-Term Development Total:</strong></td>
<td>$4,400,000</td>
</tr>
<tr>
<td></td>
<td><strong>Mid/Long-Term Development (Plan Years 6 - 20)</strong></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Reconstruct Existing Runway 12-30</td>
<td>$2,150,000</td>
</tr>
<tr>
<td>7</td>
<td>Runway 12-30 Extension and Associated Taxiways, including electrical</td>
<td>$1,850,000</td>
</tr>
<tr>
<td>8</td>
<td>Relocate 225th Street</td>
<td>$1,700,000</td>
</tr>
<tr>
<td>9</td>
<td>South Building Area Development - Phase 2</td>
<td>$3,200,000</td>
</tr>
<tr>
<td>10</td>
<td>Expand FBO Apron (Tenant Cost)</td>
<td>---</td>
</tr>
<tr>
<td>11</td>
<td>Hangar Development (Tenant Cost)</td>
<td>---</td>
</tr>
<tr>
<td>12</td>
<td>Obstacle Removal</td>
<td>$300,000</td>
</tr>
<tr>
<td></td>
<td><strong>Mid/Long-Term Development Total:</strong></td>
<td>$9,200,000</td>
</tr>
<tr>
<td></td>
<td><strong>Total Development Cost:</strong></td>
<td>$13,600,000</td>
</tr>
</tbody>
</table>

Notes: Cost estimates reflect 2017 pricing and include engineering costs and contingencies.

Source: SEH and MAC cost estimates

This summary provides a guide for the MAC when planning the CIP, which is updated on an annual basis. Costs for Reliever Airport projects must be programmed carefully to ensure all necessary funding is available. Those projects that will be eligible for federal or state funding will be placed in years when the opportunity to receive such funds is greatest. Projects that are not eligible for federal or state funds must have other funding sources identified prior to implementation.

8.3 STAKEHOLDER ENGAGEMENT AND PUBLIC INFORMATION PROCESS

In order to fulfill a Guiding Principle related to Stakeholder and Community Engagement, a series of meetings have been conducted throughout the development of the 2035 LTCP for Airlake Airport.

Initial stakeholder outreach efforts involved meeting with partner agencies, municipal representatives, and airport tenants before the draft LTCP report was finalized in order to provide information about the plan’s purpose, process, preliminary findings, and timeline.

Initial stakeholder outreach meetings are listed in Table 8-2.
Table 8-2: Initial Stakeholder Engagement Meetings

<table>
<thead>
<tr>
<th>Audience</th>
<th>Materials Covered</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAA, MnDOT, Met Council</td>
<td>LTCP Review of Runway Alternatives</td>
<td>4/13/2016</td>
<td>FAA</td>
</tr>
<tr>
<td>Tenants/Users, Agencies</td>
<td>Proposed Airfield Configuration</td>
<td>9/8/2016</td>
<td>Airport</td>
</tr>
<tr>
<td>Civil Air Patrol</td>
<td>Operational Assessment (full day facilitated panel)</td>
<td>10/11/2016</td>
<td>Airport</td>
</tr>
<tr>
<td>MAC Reliever Advisory Council</td>
<td>LTCP Process, Review of Alternatives, Preliminary Findings</td>
<td>3/14/2017</td>
<td>MAC</td>
</tr>
<tr>
<td>Municipal Planners (City, County, Township)</td>
<td>LTCP Process, Review of Alternatives, Preliminary Findings</td>
<td>3/27/2017</td>
<td>Lakeville City Hall</td>
</tr>
<tr>
<td>MAC PD&amp;E Committee</td>
<td>LTCP Process, Review of Alternatives, Preliminary Findings</td>
<td>5/1/2017</td>
<td>MAC</td>
</tr>
</tbody>
</table>

The second phase will consist of the formal public review period after the draft plan has been completed and the MAC Board has approved it for public distribution. This public review period will include a 45-day written comment period with two public information meetings scheduled during this timeframe.

The third phase will occur after the public comment period closes. During this time, public feedback will be considered and incorporated into the plan as appropriate. The end result will be a final draft LTCP for Commission adoption and Metropolitan Council formal review. During this time, stakeholder outreach will continue to occur on an as-needed basis.

Materials from these phases of the stakeholder engagement process will be included in Appendix 8 at a later date.

Appendix 9 will include a reproduction of each public comment received in its entirety. General responses will be developed to address questions and concerns that were consistent among the comments received. Specific responses to comments received from municipalities and agencies will also be provided in Appendix 9.

Figure 8-1 illustrates the next steps for the planning and project implementation process, including at what points additional approvals are needed and at what points public feedback will be solicited.
Figure 8-1: Planning and Project Implementation Process
LIST OF APPENDICES

Appendix 1: Glossary of Terms
Appendix 2: Historical Airport Planning Documents
Appendix 3: Airlake Airport Activity Forecast Methodology
Appendix 4: Runway Length Calculation Details
Appendix 5: Cost Estimates
Appendix 6: Runway Protection Zone (RPZ) Alternatives Analysis
Appendix 7: Noise Contour Input Details
Appendix 8: Stakeholder Engagement Program Documentation
Appendix 9: Public Comments and Responses
Appendix 1: Glossary of Terms

<table>
<thead>
<tr>
<th>Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glossary of Terms</td>
<td>1-1</td>
</tr>
</tbody>
</table>
Glossary of Terms

A-Weighted Decibels (dBA): A measure of noise levels adjusted relative to the frequencies most audible to the human ear.

Above Ground Level (AGL): A height above the ground as opposed to above Mean Sea Level (MSL).

Accelerate-Stop Distance: The runway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff.

Advisory Circular: External publications issued by the FAA consisting of non-regulatory material providing for the recommendations relative to a policy and guidance and information relative to a specific aviation subject.

Aircraft Approach Category (AAC): An alphabetic classification of aircraft based upon 1.3 times the stall speed in a landing configuration at their maximum certified landing weight. The categories are as follows:

- Category A: Approach speed less than 91 knots
- Category B: Approach speed 91 knots or more but less than 121 knots
- Category C: Approach speed 121 knots or more but less than 141 knots
- Category D: Approach speed 141 knots or more but less than 166 knots
- Category E: Approach speed 166 knots or more

Airplane Design Group (ADG): A classification of aircraft based on wingspan and tail height. The groups are as follows:

- Group I: Wingspan up to but not including 49 feet or tail height up to but not including 20 feet
- Group II: Wingspan 49 feet up to but not including 79 feet or tail height from 20 feet up to but not including 30 feet
- Group III: Wingspan 79 feet up to but not including 118 feet or tail height from 30 feet up to but not including 45 feet
- Group IV: Wingspan 118 feet up to but not including 171 feet or tail height from 45 feet up to but not including 60 feet
- Group V: Wingspan 171 feet up to but not including 214 feet or tail height from 60 feet up to but not including 66 feet
- Group VI: Wingspan 214 feet up to but not including 262 feet or tail height from 66 feet up to but not including 80 feet
Aircraft Operation: The landing, takeoff, or touch-and-do procedure by an aircraft on a runway at an airport.

Airport Classifications: Definitions of airport classifications vary by agency. Classifications relevant to the Airlake Airport are highlighted in italicized text.

- **Federal Aviation Administration (FAA) General Aviation Airport Classifications:**
  - National: National airports support the national and state system by providing communities with access to national and international markets. They accommodate a full range of aviation activity including large corporate jet and multi-engine aircraft operations, significant charter passenger services, or all-cargo operations. They often work in conjunction with, and in support of, hub airports serving the aviation needs of larger metropolitan areas.
  
  - Regional: Regional airports support regional economies by connecting communities to statewide and interstate markets. These airports accommodate a full range of regional and local business activities, limited scheduled passenger service, or cargo operations. They serve corporate jet and multi-engine aircraft, as well as single-engine propeller aircraft.
  
  - Local: Local airports supplement communities by providing access to primarily intrastate and some interstate markets. These airports accommodate small businesses, flight training, emergency service, charter service, cargo operations, and personal flying activities. They typically accommodate smaller general aviation aircraft.
  
  - Basic: Basic airports support general aviation activities such as emergency service, charter or critical passenger service, cargo operations, flight training, and personal flying. These airports typically accommodate mostly single-engine propeller aircraft. They may be located in and provide service to remote areas of the United States with limited or no surface transportation options, and therefore may be critical to the transportation of goods required for local day-to-day life.

- **Minnesota State Aviation System Plan (SASP) Classifications:**
  - Key Airports: These airports have paved and lighted primary runways 5,000 feet or longer in length. They are capable of accommodating all single-engine aircraft along with larger multi-engine aircraft and most corporate jets.
    - Key Airports include Minneapolis-St. Paul International, St. Paul Downtown, Flying Cloud, and Anoka County – Blaine Airports.
  
  - Intermediate Airports: These airports have paved and lighted runways all of which are between 2,500 and 5,000 feet long. Intermediate airports can
accommodate all single engine aircraft, some multi-engine aircraft, and most corporate jets.

- Intermediate Airports include Airlake, Lake Elmo, and Crystal Airports.

  - Landing Strips: These airports have turf runways which can accommodate most single-engine aircraft and some twin engine aircraft. They may be unusable during wet weather, winter months, and during the spring melt.

- Metropolitan Council Regional Aviation System Plan (RASP) Classifications:

  - Major Airport: An airport with a primary runway length of 8,000 feet or greater with a precision approach. A Major Airport serves a primary air service access area that is international and national in scope. Its role in the airport system is to provide facilities and services primarily to scheduled air carrier and regional commuter users, but also includes air cargo and charter carriers.

    - Major Airports include Minneapolis-St. Paul International Airport.

  - Intermediate Airport: An airport with a primary runway length between 5,000 and 8,000 feet with a precision approach. The role of an Intermediate Airport is to provide facilities and services primarily to corporate and business general aviation aircraft. Typical users of these airports fly a variety of business jets, turboprop aircraft, and single- and twin-engine piston aircraft.

    - Intermediate Airports include St. Paul Downtown Airport.

  - Minor Airport: An airport with runways all of which are 5,000 feet in length or less. Their system role is to provide general aviation facilities and services primarily to personal, business, and instructional users. The most common users of these airports fly single-engine and light twin-engine aircraft. Minnesota state statute prohibits upgrading a minor airport to intermediate airport status without legislative approval.

    - Minor Airports include Flying Cloud, Anoka County – Blaine, Airlake, Lake Elmo, and Crystal Airports.

  - Special Purpose Airport: A facility open to public use, including heliports, seaplane bases, or airport landing areas whose primary geographic and service focus is normally state and metropolitan in scope. Personal, business and instruction uses are accommodated at these facilities.

- Metropolitan Airports Commission (MAC) Reliever Airport Classifications:

  - Primary Relievers: MAC Reliever airports that provide the infrastructure and serves that are key to corporate aviation needs.

    - Primary Relievers include St. Paul Downtown, Flying Cloud, and Anoka County – Blaine Airports.
Complimentary Relievers: MAC Reliever airports that provide limited MSP relief and complement the three Primary Relievers by offering options for aviation activity but not to the level of infrastructure and services typically expected at a Primary Reliever.

- Complimentary Relievers include Airlake, Lake Elmo, and Crystal Airports.

Airport Elevation: The highest point of an airfield’s usable landing area measured in feet above Mean Sea Level (MSL).

Airport Layout Plan (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of an airport.

Airport Reference Code (ARC): A designation that signifies the airport’s highest Runway Design Code (RDC). The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport.

Air Route Traffic Control Center (ARTCC): A facility established to provide air traffic control service to aircraft operating on Instrument Flight Rule (IFR) flight plans within controlled airspace and principally during the en-route phase of flight.

Air Traffic Control (ATC): A service provided for the purpose of promoting the safe, orderly, and expeditious flow of air traffic, including airport, approach, and en-route air traffic control services.

Air Traffic Control Tower (ATCT): A structure from which air traffic control personnel control the movement of aircraft on or around the airport.

Annual Service Volume (ASV): The number of annual operations that can be reasonably expected to occur at an airport based on a given level of delay.

Approach Surface: An imaginary obstruction-limiting surface defined in 14 CFR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based on the type of available or planned approach by aircraft to a runway. See Figure 2-6.

Approach Visibility Minimums: A set of conditions specified for operations of aircraft during Instrument Flight Rule (IFR) weather conditions.

Apron: A specified portion of an airfield used for aircraft parking and the refueling, maintenance, servicing, and loading/unloading of aircraft.

Area Navigation (RNAV): A method of navigation that permits aircraft operations on any desired course within the coverage of station-referenced navigation signals.

Automated Weather Observation System (AWOS): Equipment that takes and broadcasts automated weather readings at an airport.
Average Day Peak Month (ADPM): Defined as peak month passengers or operations divided by the number of days in the month.

Based Aircraft: The general aviation aircraft that use a specific airport as a home base.

Circling Approach: A maneuver initiated by a pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable.

Clear Zone: As defined by MnDOT Aeronautics, Clear Zones off runway ends are intended to enhance operational safety of aircraft and to protect life and property in runway approach areas. The MnDOT Clear Zones have a similar function to, but are not always the same dimensions, as the FAA Runway Protection Zone (RPZ).

Common Traffic Advisory Frequency (CTAF): A radio frequency designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower.

Compass Calibration Pad: An airport facility used for calibrating an aircraft compass.

Crosswind Runway: An additional runway at an airport that compensates for primary runways that provide less wind coverage than desired.

Day-Night Average Sound Level (DNL): The predicted average sound effect on an area near the airport for a typical 24-hour period. A weighting factor equivalent to a penalty of 10 decibels is applied to aircraft operations occurring between 10:00 PM and 7:00 AM.

Decibel (dB): A unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.

Declared Distances: Distances for a runway representing the maximum lengths available and suitable for meeting takeoff and landing distance requirements. They are determined in accordance with FAA design standards, with length added to or subtracted from the physical length of the runway to provide standard safety areas and protection zones. As a result, the declared distances for a runway may be more or less than the physical length of the runway depicted on aeronautical charts. There are four defined declared distances:

- Takeoff run available (TORA) – length for the ground run of a departing aircraft;
- Takeoff distance available (TODA) – length through the start of the takeoff climb;
- Accelerate stop distance available (ASDA) – length for acceleration to takeoff speed and then deceleration associated with an aborted takeoff; this is often the longest length for twins and turbines
- Landing distance available – length suitable for landing an aircraft
Design Aircraft: An aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, apron, or other facility. This aircraft can be a specific aircraft model or a composite of several aircraft using, expected, or intended to use the airport or part of the airport (also called critical aircraft or critical design aircraft).

Dual Wheel Gear (DW): The configuration of an aircraft landing gear where two wheels are used at each wheel position to support the aircraft load.

Federal Aviation Administration (FAA): The federal agency responsible for the safety and efficiency of the national airspace and air transportation system.

Federal Aviation Regulations (FAR): The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

Fixed Base Operator (FBO): A commercial business enterprise located on an airport that provides services to pilots including aircraft rental, training, fueling, maintenance, parking, and the sale of pilot supplies. Also known as a Full Service Commercial Operator.

Fleet Mix: A collective term generally used to describe the proportions of aircraft types operating at an airport.

Flight Service Station (FSS): Air traffic facilities which provide pilot briefings, flight plan processing, inflight radio communications, search and rescue (SAR) services, and assistance to lost aircraft and aircraft in emergency situations.

General Aviation: The segment of aviation that encompasses all aspects of civil aviation except for certified air carriers and other commercial operators such as air cargo.

Global Positioning System (GPS): A satellite based navigational system that provides signals in the cockpit of aircraft defining aircraft position in terms of latitude, longitude, and altitude.

Instrument Flight Rules (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rule weather minimums. The term IFR is often used to define weather conditions and the type of flight plan under which an aircraft is operating.

Instrument Landing System (ILS): A precision instrument approach system that is based on two radio beams which together provide pilots with both vertical and horizontal guidance during an approach to landing. An ILS normally consists of the following electronic components and visual aids: localizer, glide slope, marker beacons, and approach lights.
Instrument Meteorological Conditions (IMC): Meteorological conditions expressed in
terms of specific visibility and ceiling conditions that are less than the minimums specified
for visual meteorological conditions.

Integrated Noise Model (INM): The INM is a computer model that evaluates aircraft noise
impacts in the vicinity of airports. It was developed based on the algorithm and framework
from the SAE AIR 1845 standard, which uses noise-power-distance (NPD) data to
estimate noise accounting for specific operation mode, thrust setting, and source-receiver
geometry, acoustic directivity, and other environmental factors.

Itinerant Operation: An aircraft operation where the destination point is greater than 20
miles from the aircraft’s point of origin.

Joint Airport Zoning Board (JAZB): A Joint Airport Zoning Board is comprised of the
municipality that owns or controls an airport along with surrounding municipalities within
which an airport hazard area may be located. Once formed, the Joint Airport Zoning
Board has the power to adopt, administer, and enforce airport zoning regulations
applicable to the airport hazard areas in its jurisdiction.

Knots: Nautical miles per hour, equal to 1.15 statute miles per hour.

Lateral Navigation (LNAV): Azimuth navigation without positive vertical guidance. This
type of navigation is associated with non-precision approach procedures.

Local Operation: An aircraft operation that remains in the local traffic pattern, executes
simulated instrument approaches or low passes at the airport, and operations to or from
the airport and a designated practice area within a 20-mile radius of the tower.

Localizer Performance with Vertical Guidance (LPV): The highest precision GPS-enabled
instrument approach procedure available without specialized aircrew training
requirements. Although precise and accurate, LPV approaches are still considered to be
non-precision approaches.

Long-Term Comprehensive Plan (LTCP): The airport sponsor’s concept of the long-term
development and use of an airport’s land and facilities.

LVN: The FAA airport location identifier for Airlake Airport.

MACNOMS: The MAC Noise and Operations Monitoring System collects aircraft noise
levels at 39 remote noise monitoring towers located around the Minneapolis-St. Paul
International Airport (MSP). In addition, the system collects flight track data to
approximately 40 miles around MSP up to 20,000 feet.

Metropolitan Airports Commission (MAC): The owner and operator of the Lake Elmo
Airport. The Metropolitan Airports Commission (MAC) was created in 1943 by the
Minnesota Legislature to promote air transportation in the seven-county metropolitan
area.
Microjet: A category of small jet aircraft approved for single-pilot operation, typically seating 4-8 people, with a maximum takeoff weight of under 10,000 pounds. Also referred to as very light jets or personal jets.

Medium Intensity Runway Lights (MIRL): Lights that are located along the edge of a runway to assist pilots in identifying the edge of the surface available for takeoffs and landings.

Modification to Design Standards (MOS): Any approved nonconformance to FAA standards applicable to an airport design, construction, or equipment procurement project that is necessary to accommodate an unusual local condition for a specific project on a case-by-case basis while maintaining an acceptable level of safety.

Mean Seal Level (MSL): A measure used in aviation for pilots to identify the flight or airfield elevation above sea level as opposed to above ground level (AGL).

Movement Area: The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, takeoff, and landing of aircraft including helicopters, exclusive of aprons and aircraft parking areas.

MSP: Minneapolis-St. Paul International Airport

National Climatic Data Center (NCDC): The federal agency responsible for preserving, monitoring, assessing, and providing public access to the Nation's climate and historical weather data and information.

National Plan of Integrated Airport Systems (NPIAS): The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

Navigational Aid (NAVAID): A visual or electronic facility or device used as, available for use as, or designed for use as an aid to air navigation.

Non-Directional Beacon (NDB): A general purpose, low-frequency radio beacon that can be used by a pilot to determine a bearing from the transmitter.

Non-Precision Approach: A straight-in instrument approach procedure that provides course guidance, without without vertical path guidance, with visibility minimums not later than ¾ mile.

Object Free Area (OFA): An area centered on the ground on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by remaining clear of objects except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.
Obstacle Free Zone (OFZ): The OFZ is the three-dimensional airspace along the runway and extended runway centerline that is required to be clear of obstacles for protection for aircraft landing or taking off from the runway and for missed approaches.

Other-Than-Utility Runway: A runway that is intended to be used by propeller driven aircraft with a maximum gross weight greater than 12,500 pounds and/or jet aircraft of any gross weight.

Part 77: Regulations for the protection of airspace around a public-use civilian or military airport are specified in 14 CFR Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace. These defined surfaces are used by the FAA to identify obstructions to airspace around an airport facility. Part 77 surfaces are comprised of primary, approach, transitional, horizontal and conical three-dimensional imaginary surfaces.

Pavement Condition Index (PCI): PCI evaluation includes a visual inspection of pavements and assignment of a numerical indicator that reflects the structural and operational condition of the pavement including the type, severity, and quantity of pavement distress.

Precision Approach: An instrument approach procedure that provides course and vertical path guidance with visibility below 3/4 mile.

Precision Approach Path Indicator (PAPI): A navigational aid to visually identify the glideslope to the touchdown zone of the runway.

Precision Obstacle Free Zone (POFZ): A volume of airspace above an area beginning at the runway threshold, at the threshold elevation, and centered on the extended runway centerline, 200 feet long by 800 feet wide.

Primary Runway: A runway constructed to meet airport capacity needs. The design objective for a primary runway is to provide a runway length that will not result in operational weight restrictions.

Primary Surface: An imaginary obstruction limiting surface defined in 14 CFR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. (See Figure 2-7.)

Regular Use: Regular use is considered as at least 500 or more annual itinerant operations of the runway by the critical design aircraft.

Reliever Airport: General Aviation airports in major metropolitan areas that provide pilots with attractive alternatives to using congested hub airports. To be eligible for reliever designation, an airport must be open to the public, have 100 or more based aircraft, or have 25,000 annual itinerant operations.
Remote Transmitter/Receiver (RTR): An air-to-ground communications system having transmitters and/or receivers and other ancillary equipment. These on-airport facilities allow radio communications between a pilot and ATCT and are usually located at non-towered airports.

Runway: A defined rectangular area at an airport designated for the landing and takeoff of an aircraft.

Runway Design Code (RDC): The selected AAC, ADG, and desired approach visibility minimums (in feet of runway visual range) are combined to form the Runway Design Code (RDC) for a particular runway. The RDC is used to determine the standards that apply to a specific runway and parallel taxiway to allow unrestricted operations by the design aircraft under defined meteorological conditions.

Runway End Identifier Lights (REIL): Two synchronized flashing lights, one of each side of a runway threshold, which provide positive identification of the runway approach end.

Runway Object Free Area (ROFA): An area centered on the ground on a runway centerline provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes.

Runway Object Free Zone (ROFZ): The ROFZ is the three-dimensional airspace along the runway and extended runway centerline that is required to be clear of obstacles for protection for aircraft landing or taking off from the runway and for missed approaches.

Runway Protection Zone (RPZ): An area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground.

Runway Safety Area (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.

Runway Visual Range (RVR): An estimate of the maximum distance at which the runway, or the specified lights or markers delineating it, can be seen from a position above a specific point on the runway centerline.

Single Wheel Gear (SW): The configuration of an aircraft landing gear where a single wheel is used at each wheel position to distribute the aircraft load.

Small Aircraft: An aircraft with a maximum certificated takeoff weight of 12,500 pounds or less.
State Airport System Plan (SASP): The primary objective of the Minnesota State Aviation System Plan is to provide the state with excellent planning tools to assist in making informed decisions guiding the development of Minnesota’s system of airports and expending funds in a cost-effective manner.

State Safety Zones: Model standards promulgated by the Minnesota Department of Transportation per Minnesota Administrative Rules Chapter 8800, Section 2400 for the zoning of public airports as to airspace, land use safety, and noise sensitivity. A complete description and copy of the Minnesota Rules (Chapter 8800 Department of Transportation Aeronautics, Section 2400 Airport Zoning Standards) can be accessed via the following website link: https://www.revisor.mn.gov/rules/?id=8800.2400.

T-Hangar: A linear structure with interior bays that are of a “T” shape and provide shelter for aircraft.

Taxiilane: A taxiway designed for low speed and precise taxiing. Taxiilanes are usually, but not always, located outside the movement area, providing access from taxiways to aircraft parking positions and other terminal areas.

Taxiway: A defined path established for the taxiing of aircraft from one part of an airport to another.

Taxiway Design Group (TDG): A classification of airplanes based on outer-to-outer main landing gear width and cockpit to main gear distance.

Taxiway/Taxiilane Safety Area (TSA): A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft deviating from the taxiway.

Threshold: The beginning of that portion of the runway available for landing. In some cases, the threshold may be displaced from the physical end of the runway.

Touch and Go: A practice maneuver consisting of a landing and a takeoff performed simultaneously without coming to a complete stop. A touch and go is defined as two aircraft operations.

Traffic Pattern: Projections on the ground of the aerial path associated with an aircraft flying the crosswind, downwind, base, and final approach legs of the takeoff and landing process.

Turbine-Powered Aircraft: Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft, rotary-wing aircraft. Such aircraft normally use Jet-A fuel.

Uncontrolled Airport: An airport without an airport traffic control tower at which the control of Visual Flight Rules (VFR) traffic is not exercised.
Useful Load: The aircraft maximum takeoff weight minus the aircraft empty weight. An aircraft’s useful load can be used to transport either fuel or payload (passengers, baggage, and/or cargo).

Utility Runway: A runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less.

Visual Flight Rules (VFR): Procedures for the conduct of flights in weather conditions above Visual Flight Rules (VFR) weather minimums. The term VFR is often used to define weather conditions and the type of flight plan under which an aircraft is operating.

Visual Meteorological Conditions (VMC): Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

Visual Runway: A runway without an existing or planned straight-in instrument approach procedure.
# Appendix 2: Historical Airport Planning Documents

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Pursuant to notice duly published and mailed, a public hearing was held on October 4, 1979 at which testimony was taken and other evidence introduced on the issue of whether or not the Metropolitan Airports Commission (hereinafter "MAC") should acquire interests in real property located in Dakota County, Minnesota, commonly known as Airlake Airport, and certain adjacent land, described as set forth in Exhibit A (hereinafter collectively referred to as "SUBJECT PROPERTY").

The hearing was commenced at the time and place designated in said notice, at 7:30 p.m. in the commons area of the Lakeville High School, located in Lakeville, Minnesota. The hearing was conducted by Commissioner Jack Jorgensen, Sr., pursuant to formal action of the Commission taken on April 16, 1979. The Commission was represented at the hearing by its legal counsel, Thomas W. Anderson, Oppenheimer, Wolff, Foster, Shepard and Donnelly.

Testimony and evidence was first presented by Mr. Raymond G. Glumack, Executive Director, MAC; Mr. Nigel D. Finney, MAC Planning/Construction Engineer; and Mr. Steve Hurvitz, Minnesota Department of Transportation. Following the foregoing testimony and the questioning of Mr. Glumack by members of the public, all of those in attendance and wishing to do so had the opportunity to testify and to introduce evidence regarding the proposed acquisition by the MAC of the SUBJECT PROPERTY.

Twenty-three (23) exhibits were offered and received into
the record at the public hearing. The hearing record was kept open until October 11, 1979 and eight (8) additional exhibits were received by the MAC into the record.

NOW, THEREFORE, having given due consideration to the testimony, exhibits and other evidence submitted and made a part of the record, the MAC makes the following FINDINGS, CONCLUSIONS AND ORDER:

FINDINGS AND CONCLUSIONS

1. The MAC is a public corporation operating under Minn. Stat. Chapter 473 for the purposes of promoting the public welfare and national security; serving the public interest, convenience, and necessity; promoting air navigation and transportation, international, national, state, and local; promoting the efficient, safe and economical handling of air commerce; developing the full potentialities of the metropolitan area in this state as an aviation center; and assuring the residents of the metropolitan area of the minimum environmental impact from air navigation and transportation.

2. The MAC area of jurisdiction extends 35 miles from the city halls of Minneapolis and St. Paul and over the seven-county metropolitan area. The MAC presently operates a system of six airports, set out in the Metropolitan Development Guide, Aviation Chapter as: Minneapolis/St. Paul International Airport (Wold-Chamberlain Field), an air carrier airport; St. Paul Downtown Airport (Hokman Field), an Intermediate airport; Flying Cloud Field, a minor airport; Crystal Airport, a minor airport; Anoka County-Blaine Airport (Janes Field), an intermediate airport; and Lake Elmo Airport, a minor airport.

3. In early 1979, the Federal Aviation Administration ("FAA") announced the creation of a national program to increase safety at
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major airports by attempting to separate general aviation and air carrier aircraft to the greatest extent possible. Although MAC has an excellent reliever system to attract general aviation away from Minneapolis/St. Paul International Airport, certified pilots wishing to train on an Instrument Landing System ("ILS") in single engine, or light twin-engine aircraft, must do so at Minneapolis/St. Paul International Airport, which leads to an incompatible mix of general aviation training activity with scheduled airline passenger flights.

4. The FAA has proposed to install a training ILS at a reliever airport in the Minneapolis/St. Paul metropolitan area to help separate general aviation and air carrier activity. In conjunction with the Minnesota Department of Transportation ("MnDOT"), the FAA looked at the Twin Cities area for the most appropriate airport on which to install a training ILS. None of the existing MAC reliever airports were determined to be appropriate at this time for installation of a training ILS, due to air space, physical, or environmental constraints. It was the determination of the FAA and MnDOT that the SUBJECT PROPERTY encompassing a privately-owned minor airport located in Dakota County, Minnesota, was the most appropriate location in the Twin Cities metropolitan area for installation of this system.

5. Because the FAA is prohibited from using federal funding at private airports, it approached the MAC as the regional airport operating agency requesting that MAC acquire the SUBJECT PROPERTY.

6. The SUBJECT PROPERTY is located in central Dakota County approximately 18 miles south of Minneapolis/St. Paul International Airport (Wold-Chamberlain Field), approximately 1 mile southeast
Findings, Conclusions and Order

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of Lakeville and 4 miles west of Farmington, Minnesota. The
SUBJECT PROPERTY straddles the boundary between the City of Lake-
ville and Eureka Township.

7. The terrain around the SUBJECT PROPERTY is generally
flat with some rolling areas. The airfield proper consists of a runway
5,000 feet long and 75 feet wide, equipped with a MIRLS with REILS
at each runway end.

8. The role each airport is to play in the Metropolitan
Airport System is defined by the Metropolitan Council in the
Metropolitan Development Guide - Aviation Chapter. Airlake Airport
is presently included in the Metropolitan Airport System as a
privately-owned, minor airport.

9. The MDG-Airports Chapter indicates a concern regarding
the possible loss of privately-owned airports and the resulting diminu-
tion in metropolitan airport system capacity, and suggests that public
acquisition and ownership is one mechanism to maintain these airports
in the Metropolitan System.

10. The MAC must operate the SUBJECT PROPERTY consistent with
its role in the metropolitan system (Minor Airport) and must also com-
ply with design criteria of the Federal Aviation Administration and
Minnesota Department of Transportation/Division of Aeronautics.

a) Runway length. The present 5,000 foot runway
is designed for business jets. Based upon the needs
of the type of aircraft normally using a Minor Airport,
a runway of approximately 4,150 feet would be sufficient.

b) Parallel taxiway. A parallel taxiway along
the north side of the runway approximately 200 feet
from the runway centerline is required.
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(c) Approach zone requirements. These requirements vary according to use of the runway and summarized as follows:

Clear Zone - an area off the runway and coincident with the inner portion of the approach surface within which the airport owner must be able to control structures; this area extends 2,700 feet from the southeast runway end and 1,200 feet from the northwest runway end.

Approach clearance - an approach slope beginning 200 feet from the runway end which should not be penetrated by any obstructions; a 50:1 slope applies at the southeast runway end and should provide a 15 foot clearance over Cedar Avenue, and a 20:1 slope applies at the northwest runway end and should provide a 23 foot clearance over the railroad.

(d) Lateral clearances. Federal regulations for lateral clearances on precision utility runways indicates that no buildings or structures should be located within an area 300 feet from the runway centerline, nor should buildings penetrate a 4:1 slope starting at the 300 foot line. In the area between the 300 foot line and the edge of the primary surface for a precision runway, the FAA must evaluate each structure and make a determination as to whether or not it is a hazard to air navigation or would interfere with the ILS electronic signals; a positive determination would require removal of the structure.

11. Acquisition of the SUBJECT PROPERTY by the MAC will permit the FAA to install an ILS and Control Tower, could divert
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approximately 8,000 small aircraft ILS training operations per year. There are presently approximately 8,000 annual operations at Airlake Airport. Based upon the above, it is expected that operation of the SUBJECT PROPERTY by the MAC as a Minor Airport would have the following effects:

(a) Safety. Acquisition of the SUBJECT PROPERTY by the MAC and installation of an ILS and Control Tower by the FAA could increase the level of safety at AIRLAKE AIRPORT, by converting what is presently uncontrolled air space into controlled air space.

(b) Aircraft noise.

1. Base case. Assuming the present level of aircraft activity plus the immediate diversion of 8,000 annual ILS training operations, neither the federal (Ldn) nor the state (L10) methodologies produce contours, indicating no noise impact using these methodologies.

2. Assuming an historical growth rate equivalent to other comparable MAC airports, there will be an approximate doubling of annual operations over a 10 to 15 year period, which will produce Ldn 55 and L10 65 noise contours entirely within the boundaries of the SUBJECT PROPERTY.

(c) Airport zoning. Minn. Stat. Chapter 360 requires zoning of specified areas adjacent to airports through a Joint Airport Zoning Board, composed of the airport operator and all affected communities. Under regulations of the MnDOT, this zoning must divide affected property into A, B and C zones, in which, respectively, (a) no development may take
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place, (b) development may take place with specified
density and use restrictions, and (c) development may
not electronically or visually interfere with the air-
port operations.

12. Based upon the appraisal of Davis and Lagerman, Inc., the
cost of acquisition of the SUBJECT PROPERTY, excluding costs of
relocating existing buildings and as limited as set forth in Davis
and Lagerman’s appraisal, would be in the range of $4,800,000 to
$5,500,000.

13. Acquisition of the SUBJECT PROPERTY by the MAC is
consistent with the objectives of Minn. Stat. §473.602, in that
acquisition of the SUBJECT PROPERTY by the MAC would

(a) Serve public interest, convenience, and
necessity;

(b) Promote air navigation and transportation
in and throughout this state;

(c) Promote the efficient, safe and economical
handling of air commerce; and

(d) Help develop the full potentialities of
the metropolitan area in this state as an aviation
center.

Based upon the above FINDINGS AND CONCLUSIONS, and all of the
testimony, exhibits and other evidence presented, IT IS HEREBY ORDERED

1. That the Metropolitan Airports Commission be authorized to
acquire title in fee simple absolute or some lesser interest, either
Findings, Conclusions and Order
Page Eight

by purchase, if purchase can be made within the limits of appraisals
made by independent, outside appraisers retained by the MAC and upon
terms acceptable to the MAC or, to the extent acquisition by negotiated
purchase is not practical, then through eminent domain proceedings, to
all or part of the SUBJECT PROPERTY.

DATED: December 17, 1979

CHAIRMAN

SECRETARY
Appendix 3: Airlake Airport Activity Forecast Methodology

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<td>FAA Forecast Approval Letter</td>
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Note: The complete *Minneapolis-St. Paul Reliever Airport: Activity Forecasts – Technical Report* that contains full forecast development documentation can be downloaded from the MAC website at:

1. Introduction

This chapter summarizes the LTCP activity forecast for Airlake Airport (LVN). The base year is represented by the twelve months ending June 2015 and forecasts were prepared for 2020, 2025, 2030, and 2035. The forecasts for the airport are unconstrained, except for runway length, and assume that the necessary facilities will be in place to accommodate demand. The chapter begins with a description of the forecast approach, followed by a discussion of the forecasts for based aircraft and aircraft operations, and then concludes with a set of alternative forecast scenarios.

The assumptions inherent in the following calculations are based on data provided by the MAC, federal and local sources, and professional experience. Forecasting, however, is not an exact science. Departures from forecast levels in the local and national economy and in the aviation industry would have a significant effect on the forecasts presented herein.

2. Historical Trends

Table 1 shows historical based aircraft and aircraft operations at LVN from 1990 through 2015.

<table>
<thead>
<tr>
<th>Year</th>
<th>Based Aircraft</th>
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<tr>
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<tr>
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<td>2009</td>
<td>147</td>
<td>35,802</td>
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<tr>
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<td>2014</td>
<td>129</td>
<td>34,327</td>
</tr>
<tr>
<td>2015</td>
<td>137</td>
<td>36,757(b)</td>
</tr>
</tbody>
</table>

(a) MAC estimates.
(b) Twelve months ending June 2015.
Source: MAC and FAA ATADS.
The total number of aircraft based at Airlake Airport rose from 1990 to 2003. They then declined to 2013 but have since begun to increase again. Based aircraft at LVN currently stand at 137. Aircraft operations fell more rapidly than based aircraft over the same period, but are recovering as well. A number of factors have contributed to the decline during the 2000’s, including the slowing economy, increased fuel prices and other operating costs, and reduced interest in recreational flying by younger people.

LVN is experiencing an upward trend in high-performance corporate and general aviation itinerant activity with turbine equipment. To document the existing fleet mix at LVN, FAA Traffic Flow Management System Counts (TFMSC) were collected for CY2015. Traffic Flow Management System Counts (TFMSC) collect data for Instrument Flight Rules (IFR) flights captured by the FAA’s enroute computers. VFR (Visual Flight Rules) flights are not included in the TFMSC data set. For CY2015, there were approximately 2,000 operations identified that contain known aircraft types. Of these recorded operations, 284 were jets and 230 were turboprops, for a combined total of 514 turbine operations. Figure 1 depicts operational trends for turbine aircraft at LVN over the past five years.

![Figure 1: Airlake Airport Turbine Aircraft Operations Trend (2011-2015)](image)

This figure illustrates the growth realized in jet aircraft operations over the past five years, showcasing an evolution in the fleet mix at LVN and the emerging demand for business-related aviation services. While the existing runway length is generally adequate for most turboprop operations, it is marginal for many jet operations, particularly for takeoff and Part 135 landing requirements. As the demand for jet operations grows, the runway length will become an increasing constraint on the airport’s ability to fully fulfill its designated role as a south-metro area reliever.
3. Forecast Approach

The Minneapolis-St. Paul metropolitan area is served by a system of airports. These airports provide a variety of roles and therefore both complement and compete with each other. Since these airports operate as a system, they were forecast as a system so that the interrelationships between the airports could be properly captured. The forecast focused on five of the airports in the MAC system – Crystal (MIC), Airlake, Anoka County (ANE), Flying Cloud (FCM), and St. Paul Downtown (STP) – but also incorporated the other MAC airports – Minneapolis-St. Paul International (MSP) and Lake Elmo (21D) into the analysis. The details of the forecast approach are provided in the main forecast report, *Minneapolis-St. Paul Reliever Airport: Activity Forecasts – Technical Report*, and are summarized below:

1. Identify Catchment Areas – Airlake Airport is located in Dakota County and most of the based aircraft owners reside in the same county as the airport they use. Nevertheless, there is some overlap between the airport catchment areas. Jet and turboprop aircraft owners that require longer runways and more extensive maintenance and fueling facilities tend to gravitate towards airports such as St. Paul Downtown (STP) and Flying Cloud Airport (FCM). Likewise, operators of small single engine piston aircraft often shy away from larger more commercial airports because of congestion and costs, even though these airports may be closer to their place of residence. Aircraft registration data from the Minnesota Department of Transportation (MnDOT) and the Metropolitan Airports Commission (MAC) was used to identify the percentage of LVN based aircraft owners that resided in each county.

2. Develop Socioeconomic Projections – Population forecasts from the Metropolitan Council (Met Council) and per capita income forecasts from Woods & Poole Economics (W&P) were used to develop hybrid income forecasts for each county in the metropolitan area. The income forecasts were used to estimate the share of based aircraft growth accounted for by each county.

3. Project the number of based aircraft registered in each county by aircraft category based on the county income forecasts and the FAA Aerospace forecast adjusted for Minneapolis-St. Paul trends.

4. Allocate the projected based aircraft to each MAC-airport according to the existing distribution pattern for each aircraft category (piston, turboprop, jet, helicopter, etc.).

5. Estimate the number of aircraft on waiting list that would be added assuming airport capacity is unconstrained. MAC records indicated LVN had 10 aircraft on their hangar waiting list in 2015. Based on consultation with MAC staff, it was assumed that 50 percent of the aircraft owners and operators who signed up on the waiting list since 2012 would base their aircraft at LVN under unconstrained conditions.

6. Redistribute aircraft from the constrained MAC airports (MSP) to the remaining unconstrained airports based on the existing distribution patterns of the airports. Although MSP has sufficient airfield capacity to accommodate growth, the facilities that can accommodate based general aviation (GA) aircraft are limited.

7. Identify base year aircraft operations. Airlake does not have an air traffic control tower (ATCT) and direct counts of aircraft operations are therefore not available. The MAC’s noise and operations monitoring system (MACNOMS) flight tracking system is currently able to track about 60 to 70 percent of actual operations. The ratio of total aircraft operations to MACNOMS operations was calculated for Flying Cloud (a towered airport), and then applied to the Airlake MACNOMS count to arrive at an estimate of total Airlake aircraft operations.

8. Project future year aircraft operations. In each aircraft category, operations per active aircraft were projected to increase at the same rate as the FAA forecast of hours flown per based aircraft, implicitly assuming that the number of operations per hours flown remain...
constant. The percentage of touch and go operations in each aircraft category was assumed to remain constant.

Forecasts include based aircraft and operations for each major category: single engine piston, multi-engine piston, turboprop, jets, helicopters, sport aircraft, experimental, and other. It was assumed that the share of each county’s registered aircraft in every aircraft category based at all of the airports under study will remain constant.

### 4. Forecast Results

**Table 2** shows the forecast of based aircraft for Airlake. The number of based aircraft at Airlake is projected to decline slightly, from 137 aircraft in 2015 to 131 aircraft in 2035. The dominant aircraft in the fleet, piston engine aircraft, are projected to decline, consistent with the FAA Aerospace Forecast: Fiscal Years 2015-2035. Jets, helicopters, sport, and experimental aircraft are expected to increase but not fast enough to offset the decline in the piston category.

**Table 3** shows the forecast of aircraft operations at LVN. Total aircraft operations at Airlake are forecast to decrease from 36,757 in 2015 to 34,642 in 2025 and then increase to 35,658 in 2035. Increases are projected in all categories except single-engine and multi-engine piston aircraft, for which the anticipated decrease in the based aircraft offsets slightly higher utilization forecasted by FAA. Jet, helicopter and sport operations are expected to increase the fastest.

The peak month operations percentage at Airlake was assumed to be the average for ANE, MIC, FCM, and STP from 2011 to 2014. Average Day Peak Month (ADPM) operations were estimated by dividing by 31 days. Peak hour operations were estimated at 19.2 percent of ADPM operations based on MAC aircraft operation counts. As shown in **Table 4**, peak hour operations are projected to fluctuate between 25 and 26 operations.
### Table 2: Summary of Based Aircraft Forecast (Airlake Base Case Condition).

<table>
<thead>
<tr>
<th>Year</th>
<th>Single Engine Piston</th>
<th>Multi-Engine Piston</th>
<th>Turboprop</th>
<th>Jets</th>
<th>Rotor</th>
<th>Sport</th>
<th>Experimental - Excluding Ultralights</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>99</td>
<td>10</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>18</td>
<td>3</td>
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<tr>
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<td>10</td>
<td>1</td>
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<td>135</td>
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<td>1</td>
<td>6</td>
<td>0</td>
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<tr>
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<td>7</td>
<td>0</td>
<td>4</td>
<td>21</td>
<td>3</td>
<td>131</td>
</tr>
</tbody>
</table>

**Average Annual Growth Rate**

- Single Engine Piston: -0.6%
- Multi-Engine Piston: -1.1%
- Turboprop: 0.0%
- Jets: 2.8%
- Rotor: -
- Sport: 3.5%
- Experimental - Excluding Ultralights: 0.8%
- Other: 0.0%
- Total: -0.2%

### Table 3: Summary of Operations Forecast (Airlake Base Case Condition)

<table>
<thead>
<tr>
<th>Year</th>
<th>Single Engine Piston</th>
<th>Multi-Engine Piston</th>
<th>Turboprop</th>
<th>Jets</th>
<th>Rotor</th>
<th>Sport</th>
<th>Experimental - Excluding Ultralights</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>29,732</td>
<td>778</td>
<td>332</td>
<td>141</td>
<td>1,422</td>
<td>960</td>
<td>961</td>
<td>-</td>
<td>34,327</td>
</tr>
<tr>
<td>2015</td>
<td>31,865</td>
<td>834</td>
<td>271</td>
<td>202</td>
<td>1,525</td>
<td>1,029</td>
<td>1,030</td>
<td>-</td>
<td>36,757</td>
</tr>
<tr>
<td>2020</td>
<td>29,406</td>
<td>814</td>
<td>276</td>
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<td>34,811</td>
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<tr>
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<td>285</td>
<td>347</td>
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<td>1,673</td>
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<td>-</td>
<td>34,642</td>
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<td>-</td>
<td>35,106</td>
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<td>707</td>
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<td>2,650</td>
<td>2,399</td>
<td>1,441</td>
<td>-</td>
<td>35,658</td>
</tr>
</tbody>
</table>

**Average Annual Growth Rate**

-0.7% -0.8% 1.0% 3.6% - 4.3% 1.7% - -0.2%

Table 4: Peak Activity Forecast (Airlake Base Case Condition)

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Operations</th>
<th>Peak Month Operations</th>
<th>ADPM Operations</th>
<th>Peak Hour Operations</th>
</tr>
</thead>
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<tr>
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<td>2035</td>
<td>35,658</td>
<td>4,114</td>
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<td>26</td>
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</table>


5 Scenarios

General aviation activity has historically been difficult to forecast, since the relationships with economic growth and pricing factors are more tenuous than in other aviation sectors, such as commercial aviation. This uncertainty is likely to carry over into the near future, given the volatility of fuel prices and the continued shift in GA from personal and recreational use to business use. To address these uncertainties, and to identify the potential upper and lower bounds of future activity at the study airports, detailed high and low scenarios are presented. These scenarios use the same forecast approach that was used in the base case, but alter the assumptions to reflect either a more aggressive or more conservative outlook.

The high forecast scenario is based on the assumption that income would grow 0.5 percent per year faster than in the base case. All other assumptions are the same as in the base case. The low forecast scenario is based on the assumption that income would grow 0.5 percent more slowly each year than under the base case.

An extended runway scenario was prepared to evaluate the potential impact associated with lengthening the main runway at LVN from 4,099 feet to 5,000 feet. All other forecast assumptions are the same as in the base case. An examination of registered jets within LVN’s current catchment area for piston aircraft indicated that there were several that could operate at reasonable payloads with a 5,000 foot runway. Based on this analysis, it was estimated that the number of based jet aircraft at LVN would increase from 7 under the baseline forecast to 10 under the extended runway scenario, and turboprops from 1 to 2.

---

1 Minnesota Statutes Section 473.641 subdivision 4 prohibits the MAC from extending runway length at its minor airports beyond 5,000 feet without prior legislative authorization.
The current ratio of operations to based aircraft for jets at Airlake (LVN) is unusually low. Based aircraft account for the majority of all jet operations, with a relatively small amount of activity from transient operators.

It was considered unlikely that the ratio would remain at its current level if the LVN runway were extended to 5,000 feet, as both based and transient operators would be more likely to take advantage of the facility. As a result, using the current ratio of jet operations to based aircraft would probably understate noise and other environmental impacts associated with a 5,000 foot scenario.

Due to the existing runway length, it is not possible to use historical data to estimate an operations to based aircraft ratio that is defensible. Absent useful historical data, the next best option is to identify airports with characteristics similar to LVN after a runway extension to 5,000 feet. Flying Cloud (FCM) and Anoka County (ANE) were determined to be the most similar airports since they currently have 5,000 foot runways and, along with Airlake, serve the Minneapolis-St. Paul metropolitan area. In addition, since these airports have air traffic control towers, more accurate operations data is available.

LVN, FCM, and ANE have overlapping service areas since they all serve the Minneapolis-St. Paul metropolitan area. LVN is slightly more distant at approximately 23 miles from the downtown St. Paul center and 24 miles from the downtown Minneapolis center. FCM is about 14 miles from the downtown Minneapolis center and about 20 miles from the downtown St. Paul center, while ANE is about 12 miles from the downtown St. Paul center and about 15 miles from the downtown Minneapolis center.

LVN is located in Dakota County, and owners of aircraft based at LVN live primarily in Dakota (46%), Scott (20%), Ramsey (14%), and Hennepin Counties (11%). FCM is located in Hennepin County and owners of aircraft based at FCM live primarily in Hennepin (67%), Scott (6%), and Dakota Counties (4%). ANE is located in Anoka County, and owners of aircraft based at Anoka County live primarily in Hennepin (37%), Ramsey (24%) and Anoka Counties (20%). Although each of the airports tend to serve the communities that are closest they all serve residents located throughout the metropolitan area and serve as reliever airport to MSP. Average per capita income in 2013 ranged from a low of $42,799 in Anoka County (where ANE is located) to a high of $61,409 in Hennepin County (where FCM is located). As a comparison, the per capita income in Dakota County (where LVN is located) was $51,363, approximately midway between Anoka and Hennepin Counties.

In order to estimate impact of a runway extension at LVN on aircraft operations, data was used from FCM and ANE airports because of the anticipated similarity in facilities and shared socioeconomic characteristics. Based on the above analysis, it was anticipated that the extended runway at LVN would attract more itinerant operations by high performance turboprops and jets. After the extension at LVN, the maximum runway lengths at LVN, FCM, and ANE would be equivalent and it was therefore assumed that the ratios of turboprop and jet operations to based aircraft at LVN would become the same as the regional average for airports with 5,000-foot runways. The forecast operations fleet mix for jets and turboprops also assumes FBO and other GA amenities, including sufficient apron parking space, comparable to FCM and ANE, would be in place at LVN. Table 5 shows the extended runway condition forecast of aircraft operations at LVN.
### Table 5: Summary of Operations Forecast (LVN Extended Runway Condition)

#### Extended Runway Forecast: Airlake

<table>
<thead>
<tr>
<th>Year</th>
<th>Single Engine Piston</th>
<th>Multi-Engine Piston</th>
<th>Turboprop</th>
<th>Jets</th>
<th>Rotor</th>
<th>Sport</th>
<th>Experimental - Excluding Ultralights</th>
<th>Other</th>
<th>Total</th>
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<tbody>
<tr>
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<td>4</td>
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<tr>
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<td>-</td>
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<td>3</td>
<td>135</td>
</tr>
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</table>

#### Forecast of Total Operations

<table>
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<tr>
<th>Year</th>
<th>Single Engine Piston</th>
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<th>Turboprop</th>
<th>Jets</th>
<th>Rotor</th>
<th>Sport</th>
<th>Experimental - Excluding Ultralights</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
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<td>778</td>
<td>332</td>
<td>141</td>
<td>1,422</td>
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<td>961</td>
<td>-</td>
<td>34,327</td>
</tr>
<tr>
<td>2015</td>
<td>31,865</td>
<td>834</td>
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<td>202</td>
<td>1,525</td>
<td>1,029</td>
<td>1,030</td>
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<td>36,757</td>
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<tr>
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<td>276</td>
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<td>37,373</td>
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<td>707</td>
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<td>2,734</td>
<td>2,650</td>
<td>2,399</td>
<td>1,441</td>
<td>-</td>
<td>38,410</td>
</tr>
</tbody>
</table>

Source: HNTB analysis.
Table 6 compares the total number of aircraft and operations under different scenarios for LVN.

Figure 2 provides a graphic comparison of the base, high and low operations forecasts, along with the FAA’s Terminal Area Forecast (TAF) for the airport.
### Table 6: Forecast Comparison by Scenario – LVN

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Based Aircraft</th>
<th>Total Number of Operations</th>
<th>Variance from TAF (Operations)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base Case</td>
<td>High Range</td>
<td>Low Range</td>
</tr>
<tr>
<td>2015</td>
<td>137</td>
<td>137</td>
<td>137</td>
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<tr>
<td>2020</td>
<td>135</td>
<td>137</td>
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<tr>
<td>2035</td>
<td>131</td>
<td>145</td>
<td>120</td>
</tr>
</tbody>
</table>

**Average Annual Growth Rate**

|                       | -0.2% | 0.3% | -0.7% | -0.1% | -0.2% | 0.3% | -0.6% | 0.2% | 1.2% |

**Notes:**

- TAF - 2017 Terminal Area Forecast published by FAA
- The LTCP forecast is considered to be consistent with the FAA TAF if it differs by less than 10% in the 5-year forecast period and less than 15% in the 10-year and beyond forecast periods

**Sources:** HNTB Analysis.
Figure 2: Airlake Forecast Comparison

[Graph showing aircraft operations over years with different scenarios indicated by lines of different colors and styles, with labels for each scenario.]
June 28, 2017

Mr. Neil Ralston, A.A.E., Airport Planner
Metropolitan Airports Commission
6040 28th Avenue South
Minneapolis, MN 55450

Airlake Airport (LVN) – Lakeville, MN
Approval of Master Plan Forecast & Critical Design Aircraft

Dear Mr. Ralston:

The aviation forecast has been determined to be consistent with the FAA Terminal Area Forecast and is approved. The critical design aircraft is also approved. A summary of this information is provided in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Base Case (2015)</th>
<th>Base Case 20 Year Forecast (2035)</th>
<th>Master Plan Source</th>
</tr>
</thead>
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<tr>
<td>Based Aircraft *</td>
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<td>131</td>
<td>Table 3-10</td>
</tr>
<tr>
<td>Aircraft Operations</td>
<td>36,757</td>
<td>35,658</td>
<td>Table 3-10</td>
</tr>
<tr>
<td>Critical Design Aircraft</td>
<td>Design Group B-II (Beechcraft King Air 350)</td>
<td>Design Group B-II (Cessna Citation III/650 &amp;/or Dassault Falcon 20/200)</td>
<td>Section 2.3.1 Section 4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Airlake Airport Long Term Comprehensive Plan dated July 2017
* Total excludes ultralight/experimental aircraft

If you have any questions or would like to discuss this information further, please feel welcome to contact me at (612) 253-4641 or gina.mitchell@faa.gov.

Sincerely,

Gina M. Mitchell, AICP, Community Planner
Dakota-Minnesota Airports District Office, Minneapolis Office

cc: Nancy Nistler, FAA (email)
    Rylan Juran, MnDOT Aeronautics (email)
    Dan Boerner, MnDOT Aeronautics (email)
    Bob Burrell, MnDOT Aeronautics (email)

enc. Table 3-10: Forecast Comparison by Scenario
### Table 3-10: Forecast Comparison by Scenario

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Based Aircraft</th>
<th>Total Number of Operations</th>
<th>Variance from TAF (Operations)</th>
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</thead>
<tbody>
<tr>
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<td>Base Case</td>
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<td>Low Range</td>
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<tr>
<td>2035</td>
<td>131</td>
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<td>120</td>
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| Average Annual Growth Rate | -0.2% | 0.3% | -0.7% | -0.1% | -0.2% | 0.3% | -0.6% | 0.2% | 1.3% |

**Notes:**
- TAF - 2015 Terminal Area Forecast published by FAA
- A LTCP forecast is considered to be consistent with the FAA TAF if it differs by less than 10% in the 5-year forecast period and less than 15% in the 10-year and beyond forecast periods

**Sources:** HNTB Analysis
Appendix 4: Runway Length Calculation Details

<table>
<thead>
<tr>
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<tr>
<td>FAA Advisory Circular 150/5325-4B Runway Length Chart</td>
<td>4-1</td>
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<td>Cessna Citation Excel Model 560XL Takeoff Performance Data</td>
<td>4-2</td>
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<td>Cessna Citation III Model 650 Takeoff Performance Data</td>
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<td>Dassault Falcon 20 Takeoff Performance Data</td>
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<td>Dassault Falcon 900 Takeoff Performance Data</td>
<td>4-5</td>
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</table>

Note: Assumptions used to assess runway length requirements include the following:

- Temperature: 82.3°F, 27.9°C
- Pressure Altitude: 960 feet AMSL
- Flap Setting: Typical
Figure 3-1. 75 Percent of Fleet at 60 or 90 Percent Useful Load

Mean Daily Maximum Temperature of Hottest Month of the Year in Degrees Fahrenheit:

75 percent of fleet at 60 percent useful load          75 percent of fleet at 90 percent useful load

FAA Advisory Circular 150/5325-4B Runway Length Chart for airplanes with a maximum certificated takeoff weight of more than 12,500 Pounds up to and including 60,000 pounds
# TAKEOFF PERFORMANCE

## TAKEOFF FIELD LENGTH - 15° FLAPS *

(Distance to 35 Feet Above the Runway)
Zero Wind, Anti-Ice Systems Off, Cabin Bleed Air On

### Elevation = Sea Level

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<th>Takeoff Weight (lbs)</th>
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</thead>
<tbody>
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<td>20,000 9,500 19,000 18,500 17,500 16,500 15,500 14,500</td>
</tr>
<tr>
<td>0 / 32</td>
<td>3430 3290 3160 3020 2770 2520 2280 2050</td>
</tr>
<tr>
<td>10 / 50</td>
<td>3540 3400 3260 3120 2850 2600 2350 2150</td>
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<tr>
<td>15 / 59</td>
<td>3580 3450 3310 3170 2900 2650 2400 2160</td>
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<td>3650 3510 3380 3240 2970 2720 2470 2240</td>
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<td>50 / 122</td>
<td>4820 4160 3660 3220</td>
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</table>

**Climb Wght Temp Limits °C/°F**
42/108 44/111 46/115 47/117 51/124 54/129

**Field Length at Temp Limits (ft)**
5270 5260 5290 5070 4970 4670 4000 3490

### Elevation = 1,000 Feet

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<th>Takeoff Weight (lbs)</th>
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<td>°C / °F</td>
<td>20,000 19,500 19,000 18,500 17,500 16,500 15,500 14,500</td>
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<td>50 / 122</td>
<td>4640 4010 3500</td>
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**Climb Wght Temp Limits °C/°F**
40/104 41/106 43/109 44/111 48/118 52/126 52/128 52/128

**Field Length at Temp Limits (ft)**
5530 5350 5350 5160 5100 4930 4200 3660

---

*Above takeoff tables reflect aircraft with rudder bias system installed (SB560XL-27-06).*

---

Cessna Citation Excel Model 560XL Takeoff Performance Data
### Cessna Citation III Model 650 Takeoff Performance Data

**ENGINE BLEED AIR OFF**

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**Airlake Airport 2035 LTCP**

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**TAKEOFF Zero Wind or Gradient 1000 FT FLAPS 20°**

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**Airlake Airport 2035 LTCP**

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**TAKEOFF Zero Wind or Gradient SEA LEVEL FLAPS 20°**

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**Airlake Airport 2035 LTCP**

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Citation N92 with TFE731-2C Engines

Citation III/VI Operating Handbook
Developed for Training Purposes August 2007

F-21

Citation III/VI Operating Handbook
Developed for Training Purposes August 2007

F-29
## Dassault Falcon 20 Takeoff Performance Data

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### Conditions:
- No Wind, No Slope, APR Armed, Anti-Skid
- Anti-skid inoperative, add 1,000 ft to BFL.
4.3 Takeoff - FALCON 900A

Dassault Falcon 900 Takeoff Performance Data
March 15, 2016

Metropolitan Airports Commission
Airport Development Department
6040 28th Avenue South
Minneapolis, MN 55450

RE: Statement of Support for Additional Runway Length at Airlake Airport (LVN)

To Whom It May Concern:

Waypoint Flight Services (formerly Aviation Resource Center) is the full-service Fixed Base Operator (FBO) at LVN. Our FBO services include on-demand charter, aircraft service, sales and rentals, aircraft fuel and storage, and maintenance. A growing segment of our business involves managing and operating corporate jet aircraft for fractional owners. We currently have three such aircraft based at LVN – two Cessna Citation III’s and a Citation 501 – and are actively seeking to increase the fleet. These three aircraft alone account for approximately 130-140 annual flight operations at LVN.

The aircraft types most in demand from our clientele are mid-sized corporate jets such as the Cessna Citation III and Dassault Falcon 20. However, the existing runway length at LVN constrains our operation of these aircraft types to flights with short stage lengths – generally 500 nautical miles or less – and minimal payload. For flights to farther destinations, we frequently re-position the aircraft from LVN to another area airport in order to depart with the necessary fuel and payload. For example, we have recently had to reposition aircraft from LVN to Flying Cloud Airport (FCM) for flights to Milwaukee, WI (MKE), Chicago-Midway, IL (MDW), Sarasota-Bradenton, FL (SRQ), and Fort Myers, FL (FMY). Even though MKE and MDW represent relatively short stage length flights from LVN, we were not able to depart LVN with the required payload. This is both inefficient and unproductive.

We are aware that the Metropolitan Airports Commission (MAC) is in the process of preparing the 2035 Long-Term Comprehensive Plan (LTCP) for LVN, and that part of the plan is evaluating feasible alternatives to provide additional runway length, in the range of 4,600 to 4,900 feet.

Please accept this letter in support of these efforts to provide additional runway length, as a longer runway will ease our current operational constraints and allow us to build our aircraft management business at LVN based on market-driven demand. Based on our current business plan, we envision the potential for up to seven mid-sized corporate jet aircraft based at LVN that could account for an additional 450-500 annual flight operations shortly after runway improvements are in place.

In addition, a longer runway will open the door to additional itinerant aircraft operations with similar mid-sized corporate jets that bypass LVN today for other area airports with additional runway length.
We recently became members of the Corporate Aircraft Association (CAA), which allows us to advertise significant fuel discounts for other members. We have seen a limited number of itinerant jet aircraft operations due to the current runway length, but, based on our market research, we believe that several hundred corporate jet aircraft could opt to use LVN annually with a longer runway in place. This increased activity will drive the need for additional itinerant aircraft parking, as well.

For context, we note that the City of Lakeville is one of the fastest-growing cities in the metropolitan area. Between 2010 and 2014, the population of Lakeville grew by nearly seven percent to 59,866, and it is expected to grow to over 80,000 by 2040. Likewise, steady growth is anticipated in both the number of households and employment. Commercial development is surging as well, with several recent business expansions or developments in the vicinity of the Airport including Menasha Packaging and FedEx Freight. We believe that these demographic trends will translate into growing demand for aviation services that LVN will be uniquely situated to serve.

Airlake Airport has great potential, and we look forward to the progressive development of the facility in the future.

Thank you.

Sincerely,

Tony Fiorillo
President
April 25, 2016

To Whom It May Concern:

Please accept this statement of support for long-term plans to provide additional runway length at Airlake Airport (LVN) in Lakeville Minnesota.

Flight Solutions, Inc. currently operates a fleet consisting of Cessna Citations, Dassault Falcon and Hawker type corporate jet aircraft. Based on the existing runway length at KLVN, our ability to operate these aircraft types at the airport is limited. While a runway length of 5,000 feet or more would be ideal, a future runway length in the range of 4,600 to 4,900 feet would allow us to consider using KLVN on a more frequent basis.

As the south metro area continues to grow, we envision that demand for our services could translate into approximately fifty (50) or more of annual flight operations with our fleet aircraft at LVN with a longer runway in place.

Thank you,

Sincerely,

Keith R. McCutcheon
President
Flight Solutions, Inc.
April 25th, 2016,

Please accept this statement of support for long-term plans to provide additional runway length at Airlake Airport (LVN) in Lakeville, MN.

Sky One Holdings, LLC, d/b/a PRIVAIRA currently operates a fleet of Challenger 601's, Falcon 50, Hawker 800XP's and BeechJet 400A's. Based on the existing runway length at LVN, our ability to operate these aircraft types at the airport is limited. While a runway length of 5,000 feet or more would be ideal, a future runway length in the range of 4,600 to 4,900 feet would allow us to consider using LVN on a more frequent basis.

As the south metro area continues to grow, we envision that demand for our services could translate into approximately 20 or more annual flight operations with our fleet of aircraft at LVN with a longer runway in place.

Thank you.

Sincerely,

T.J. Hinkle
Director Charter Sales
PRIVAIRA
April 26, 2016

To Whom It May Concern

Please accept this letter of support for long-term plans to provide additional length at Airlake Airport (KLVN) in Lakeville, Minnesota.

Jet Access Aviation currently operates a fleet of 13 aircrafts consisting of Citation S/II, Beechjet 400A, (2) Lear 31’s, Lear 45, (2) Lear 60’s, (2) Hawker 800XP’s, Citation Sovereign, Challenger 601-R, Gulfstream IV & Global Express.

Based on the existing runway length in KLVN our ability to operate these aircraft types at the airport is limited. While a runway length of 5,000 feet or more would be ideal, a future runway length of 4,600 to 4,900 feet would allow us to consider using KLNV on a more frequent basis.

While we are unable to predict how many times we would use Airlake Airport annually, I can tell you that we currently fly into the Minneapolis area an estimated four times a month.

Respectfully,

[Signature]

Jack Lambert
President
Jet Access Aviation
4-26-2016

To Whom it may concern:

Please accept this statement of support for long term plans to provide additional runway length at Airlake Airport (LVN) in Lakeville Minnesota.

Rectrix Aviation operates a fleet of Lear 45s and Challenger 300s – Based on the existing runway length at LVN, our ability to operate these aircraft at the airport is severely limited. While a runway length of 5000 feet or more would be ideal, a future runway length in the range of 4,600-4,900 feet would allow us to consider using LVN on a more frequent basis.

As the south metro area continues to grow, we envision that demand for our services could translate into some 50 or more annual operations to LVN with the longer runway.

Thanks for your consideration,

Sincerely

Chris Kelly
April 26, 2016

To Whom It May Concern:

Please accept this letter of support for long term plans to provide adequate runway lengths at Airlake Airport (KLVN) in Lakeville, MN.

Charter First, a FAA 135 operator based in MN operating multiple Cessna Citations, Bombardier Lear 45XR, a Dasssualt Falcon 50EX, and multiple King Airs. Existing runway lengths at KLVN mostly eliminates Charter First form utilizing KLVN for SAFE operations. Runway lengths greater than 5,000 at KLVN could equate to 2 current Charter First aircraft being KLVN based and increasing approximately 300 operations yearly. Runway lengths between 4,600ft to 4,900ft would increase our utility of KLVN by approximately 100 operations a year.

I feel strongly that KLVN’s Runway Lengths be extended. Extended for safety reasons and also as a much needed south metro reliever airport.

Kind Regards,

Pete Johnson
President
Charter First
Executive Air Charter / Aircraft Management
Main 800.862.6807 Cell 507.829.9656
petej@charter-first.com www.charter-first.com
IS-BAO ARGUS Platinum Operator
April 26, 2016

To Whom It May Concern

Please accept this letter of support for long-term plans to provide additional length at Airlake Airport <LVN> in Lakeville Minnesota.

DuPage Aerospace currently operates (2) Challenger 601s, (1) G-200, (4) Hawker 800XPs, (2) Hawker 800s, a Lear 45 and a Lear 35. Each of these 11 aircraft requires a minimum of 5000 feet of runway.

While we are unable to predict how many times we would use Airlake Airport annually, I can tell you that we currently fly into the Minneapolis area an estimated twice a month.

Respectfully,

[Signature]

John Bullock
Vice President
DuPage Aerospace
To Whom It May Concern:

Please accept this statement of support for long-term plans to provide additional runway length at Airlake Airport (LVN).

JETEX LLC currently operates a fleet of LR31’s, LR60’s, and G200’s. Based on the existing runway length at LVN, our ability to operate these aircraft types at the airport is limited. While a runway length of 5,000 feet or more would be ideal, a future runway length in the range of 4,600 to 4,900 feet would allow us to consider using LVN on a more frequent basis. As the south metro area continues to grow, we envision that demand for our services could translate into approximately 30 trips of annual flight operations with our fleet at LVN with a longer runway in place. Without a longer runway we will be forced to take our clients to another destination.

Thank you.

Sincerely,

Edward Layton  
Director of Operations  
JETEX LLC.
Appendix 5: Cost Estimates

<table>
<thead>
<tr>
<th>Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airfield Development Cost Estimates</td>
<td>5-1</td>
</tr>
<tr>
<td>MAC Building Asset Management Cost Estimates</td>
<td>5-2</td>
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</table>
Airfield Development - Cost Estimates

### Displaced Threshold, Runway Extension, Declared Distances, & 225th St. Relocation

<table>
<thead>
<tr>
<th>Item</th>
<th>Concept Element</th>
<th>Est. Cost</th>
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<tbody>
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<td>1</td>
<td>Reconstruct Existing Rwy 12-30 (4099' x 75')</td>
<td>$2,150,000</td>
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<tr>
<td>2</td>
<td>Runway Extension &amp; Taxiway Construction/Relocation</td>
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<td>3</td>
<td>Runway 12-30 Electrical Systems (HIRL &amp; Airfield Signage)</td>
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<td>4</td>
<td>Relocate 225th St.</td>
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<td><strong>Total:</strong></td>
<td><strong>$5,700,000</strong></td>
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3.0 Airlake Airport Facility
Asset Funding Needs Report
By Name

Client: Metropolitan Airports Commission (MAC)
Project Number: Airlake Airport
Asset: Maintenance Building
Asset Number: 1

Report is grouped by Year
Currency: USD

Address 1
City: Lakeville
Country: -
Address 2
State/Province/Region: Minnesota
ZIP: -

Current Replacement Value: 775,947
Size: 7,270 SF

Summary of Funding Needed by Requirement Type and Year

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<tr>
<th>Year</th>
<th>Renewal Requirements</th>
<th>Non-Renewal Requirements</th>
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<tr>
<td>2020</td>
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<tr>
<td>2024</td>
<td>13,143</td>
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<tr>
<td>2025</td>
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Detail of Funding Needed by Year

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<th>System</th>
<th>Requirement Name</th>
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<th>Non-Renewal</th>
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<td>C3030</td>
<td>Ceiling Finishes</td>
<td>ACT System - Standard (Original), Renewal</td>
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<td>D35050</td>
<td>Terminal and Package Units</td>
<td>Unit Heaters - Gas Fired Renewal</td>
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<td>D35050</td>
<td>Terminal and Package Units</td>
<td>Rooftop Unitary AC - Cooling w/ Gas Heat &lt; 10 Ton Renewal</td>
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<th>Year</th>
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<th>Requirement Name</th>
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<th>Non-Renewal</th>
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<td>D3422 - Lighting, Equipment</td>
<td>Lighting Fixtures - Light Density (Garage) Renewal</td>
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<td>Branch Wiring - Equipment &amp; Devices - Light Density Renewal</td>
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<td>Exit Signs - Low Density Renewal</td>
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<td>C3106 - Wall Finishes</td>
<td>Painted Finish - Average (1 Coat Primer - 2 Coats Finish)</td>
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<td>C3200 - Floor Finishes</td>
<td>VCT - Average</td>
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<td>Overhead Sectional Doors - Electric Operation</td>
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<td>CMU Block Walls - Plain</td>
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<td>D5092 - Emergency Light and Power Systems</td>
<td>Emergency Battery Pack Lights Renewal</td>
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<td>D2010 - Plumbing Fixtures</td>
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<td>D2010 - Plumbing Fixtures</td>
<td>Emergency Eyewash and Shower Units</td>
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<td>C3091 - Industrial Waste Systems</td>
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<td>D3022 - Lighting Equipment</td>
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<td>Aluminum Windows</td>
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<td>Unit Heaters - Gas Fired</td>
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<td>Non-Renewal</td>
<td>Total</td>
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<td>D0660 - Controls and instrumentation</td>
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<td>2034</td>
<td>D0622 - Lighting Equipment</td>
<td>Lighting Enemies - Light Density (Office)</td>
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<td>D0620 - Domestic Water Distribution</td>
<td>Water Heaters - Elec - Residential - 38 Gal</td>
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<td>Exhaust System - Restroom w/Roof Fan</td>
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<td>C0300 - Ceiling Finishes</td>
<td>ACT System - Standard (New)</td>
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<td>Overhead/Rolling Door - Large (Electric Operation)</td>
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<td>D0892 - Emergency Light and Power Systems</td>
<td>Exit Signs - Low Density Renewal</td>
<td>2,962</td>
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<td>D0892 - Emergency Light and Power Systems</td>
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<td>Exhaust System - General Building Renewal</td>
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Cost Curve Applied: Spiky 0

Note: All cost curves other than Spiky 0 will result in a change to the starting FCI that is displayed. For a full description of all Forecast Parameters applied to this funding scenario, see the final page of this report.

All costs in USD.
### Cost Curve Applied: Spiky 0

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<th>Replacement Cost</th>
<th>Renewal Cost</th>
<th>Backlog Deterioration</th>
<th>Total New Liability</th>
<th>New Backlog Total</th>
<th>Net Plant Value</th>
<th>Funding Reserve</th>
<th>FCI</th>
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*All costs in USD.*
### Target - Funding to reduce FCI to 15% in 20 years

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All costs in USD.

Copyright © 2015 VFA, Inc. All rights reserved. Dec 13, 2015
Client: Metropolitan Airports Commission (MAC)  
Asset: Maintenance Building  
Project Number: Airlake Airport  
Asset Number: 1

Assets are ordered by Asset Name  
Currency: USD

Statistics

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Photo

Building Exterior

Asset Description

**ARCHITECTURAL**

The Maintenance Building located at the AirLake Airport property was constructed in approximately 1975 with a garage addition constructed around 1983 and an office renovation project in 2014. There were no existing drawings or documents available for review at this facility at the time of the on-site review. Currently the building serves as a maintenance and storage facility for vehicles and equipment used at the airport facility as well as office space. The overall structure is comprised of one story and has approximately 7,200 square feet of space.
Per the 2012 International Building Code, Section 602, the building is classified as a Storage (S-2) Occupancy, having a Construction Type of Type IIB.

The handicapped accessibility for this facility was assessed utilizing ANSI 117.1.

SUBSTRUCTURE: Foundation walls and strip footings are believed to be comprised of reinforced poured concrete strip footings with concrete block foundation walls.

SUPERSTRUCTURE: The superstructure consists of load bearing concrete masonry units (CMU) supporting open web steel bar joist roof framing with steel roof decking.

BUILDING EXTERIOR

EXTERIOR WALLS: Exterior walls are comprised of un-insulated, single wythe, load bearing CMU construction at the office and vehicle storage areas. The CMU is in good condition but showing signs of moisture infiltration. The interior of the garage areas have some staining that is likely caused by moisture build-up in the uninsulated walls.

EXTERIOR WINDOWS: The windows consist of an aluminum framed units with insulated glass. The frames and glazing are in good condition.

EXTERIOR DOORS: The building main entry door is an aluminum storefront frame with a full glass swing door which is in fair condition. Entry doors into the garage spaces consist of hollow metal doors and frames and appear to be worn and near the end of their expected lifespan. Overhead sectional doors provide access to the vehicle storage and maintenance areas and are approximately 20 years old. The overhead doors are functioning adequately but are nearing the end of their useful life expectancy.

ROOFING: Roofing consists of a built-up ballasted membrane over rigid insulation. Parapets are capped with painted metal flashing and primary roof drainage is achieved through scuppers and downspouts. The roof membrane is beginning to show signs of cracking and deterioration.

BUILDING INTERIOR

PARTITIONS: Interior partitions within the building consist of CMU in the garage area and steel stud and gypsum board in the office area.

INTERIOR DOORS: Interior doors consist of wood doors set in hollow metal frames in the office area.

WALL FINISHES: The Interior walls consist of paint. A ceramic tiling wainscot can be found in the restroom.

FLOOR FINISHES: Flooring is a mixture of bare concrete in the vehicle storage and maintenance areas, ceramic tile in the restroom and vinyl composite tile (VCT) in the office areas.

CEILING FINISHES: The ceilings consist of exposed structure in the garage areas, painted gypsum board in the restroom and acoustical ceiling tile in a suspended grid in the office spaces. A portion of the suspended ceilings were replaced during the 2014 renovation and a portion of the original ceiling was reused.
**MECHANICAL**

HVAC: The building heating is achieved via gas fired unit heaters suspended from the roof structure in the garage areas. The office and restroom area is heated and cooled via a rooftop air handler unit.

The garage area is equipped with CO2/NO sensors connected to an exhaust unit and ductwork which appears to be in poor condition.

There are two water heater serving the building. A new 10 gallon electric water heater was installed during the 2014 renovation and serves the office and restroom areas. The remainder of the building is served via an entire 80 gallon electric unit located in the garage area.

**ELECTRICAL**

Electrical Service:
The electrical service is fed by a service drop from a pole that is northeast of the building. The service mast feeds an exterior meter socket on the exterior wall. The meter socket feeds through the wall to a 120/240 volt, 1 phase, 3-wire, 200 amp main circuit breaker panel in the shop area. That panel feeds a subpanel via an 80 amp, 2-pole circuit breaker. The panels are dated 2013 and 2014 and appear to be in excellent condition.

Another electrical service for the small buildings to the south is fed underground from the pole. There is a meter socket on the outside of one of the small buildings for that service. Those buildings were not part of this survey.

Telephone Service:
The telephone service is fed from below grade to an exterior telephone pedestal near the meter socket northeast of the office area. This supplies a telephone/data terminal cabinet in the janitor's closet within the office area. This equipment apparently is less than 3 years old and is in excellent condition. It has ample space and capacity for future expansion.

Office Area

Lighting: The office area was remodeled in 2014 and is in good shape. The lighting is generally recessed, T-8 fluorescent, with electronic ballasts. There are 2’ T-5 under cabinet lights in the kitchen. The bathroom has 1’ x 4’, T-8, surface mounted wrap around light fixtures, a 2’ T-8 vanity fixture, and a recessed incandescent shower light. There is one battery powered exit sign, and 3 emergency battery lights in this area. The lighting is controlled by manual switches.

Power and Communications: There are an adequate number of receptacles and telephone/data outlets throughout the area, and everything seems to be functional and in good condition. Some of the conduits and outlets are recessed within walls, and some are surface mounted.

Garage/Shop Area

Lighting: The lighting looks to be in good operational condition. General lighting is provided by low bay type metal halide light fixtures. There is also a T-8, 2 lamp wide, 8' fluorescent industrial, and two quartz flood lights in the shop area. There is also a 4’, 2 lamp fluorescent wrap around fixture with a missing lens in the small room in the southwest corner. There is one battery powered exit sign, with 2 emergency light heads built into the unit. There is no other emergency lighting.
although there is a non-electric exit sign at the southeast exit door. That sign should be illuminated by an emergency light or replaced with a battery powered exit sign. Lighting is controlled by manual switches.

Power: The branch circuit conduit, wiring, boxes, equipment, and devices appear to be operational and in fair to good condition. Some of the disconnect switches and starters in the garage areas are fairly old and may need to be replaced before too long.

Exterior
The exterior lights are wall mounted, HID wall packs that appear to be in good repair and operational. There is some yellowing of the lenses on these fixtures. There is an exterior alarm pushbutton and horn/beacon that looks fairly new and is in good shape. The exterior GFCI receptacle appears to work and is in good condition.

Requirements

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**Total** 280,929
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January 5, 2017

Mr. Neil Ralston, A.A.E., Airport Planner
Metropolitan Airports Commission
6040 28th Avenue South
Minneapolis, MN 55450

Airlake Airport (LVN) Runway Protection Zone Alternatives Analysis – Declared Distances

Mr. Ralston:

The FAA concurs with the Airlake Airport (LVN) Runway Protection Zone Alternatives Analysis (RPZ AA) for the use of declared distances as requested by the Metropolitan Airports Commission (MAC) and identified on Attachment 1.

The triggering event for this RPZ alternatives analysis is the proposed extension to Runway 12/30. Runway 12 is proposed to be extended by 271 feet, which will eliminate the aligned taxiway and displace the current threshold by an additional 120 feet to provide a clear glideslope qualification surface (GQS) and clear terminal instrument procedure surfaces (TERPS). The Runway 12 approach RPZ is proposed to be shifted due to the threshold displacement. The Runway 12 departure RPZ is proposed to remain in its existing location. Runway 30 is proposed to be extended by 480 feet and the existing Runway 30 threshold is proposed to remain in its current location. There are no proposed changes to the existing approach or departure RPZs. These proposed extensions would allow the accelerate stop distance available (ASDA) to increase to 4,850 feet in both directions to better serve the airport’s existing critical design aircraft.

Highview Avenue, 220th Street, and the Progressive Rail line, which are within the existing Runway 12 departure RPZ and future Runway 12 approach RPZ, are proposed to remain. Due to high costs and alignment of the rail, it is not feasible to realign the railroad outside of the RPZ. Highview Avenue and 220th Street have relatively low traffic volumes and would be costly to relocate. The intersection of 225th Street and Cedar Avenue is proposed to be relocated outside the Runway 30 approach and departure RPZs.

No new land uses are being introduced into the Runway 30 approach or departure RPZs. In the interim, the airport will work with the respective road authorities to consider the installation of “Low Flying Aircraft/No Parking” signage on Cedar Avenue, Highview Avenue, and 220th Street at the edges of the RPZ. Also, if in the future the traffic on Cedar Avenue necessitates a roadway expansion, a RPZ AA including relocation, will be completed at that time.
If you have any questions or would like to discuss this information further, please feel welcome to contact Gina Mitchell, Community Planner, at (612) 253-4641 or gina.mitchell@faa.gov.

Sincerely,

Lindsay Butler
Assistant Manager
Dakota-Minnesota Airports District Office, Minnesota Office

enc Declared Distances – Attachment 1

cc Mike Wilson, MAC, (by email)
Nancy Nistler, FAA (by email)
Paul Lo, FAA (by email)
Rylan Juran, MnDOT Aeronautics (by email)
Dan Boerner, MnDOT Aeronautics (by email)
Bob Burrell, MnDOT Aeronautics (by email)
Displace Threshold, Runway Extensions, Declared Distances, & 225th St. Relocation

### Proposed Runway 12 Declared Distances

- Runway 12 LDA 4,459'
- Runway 12 TORA / TODA 4,370'
- Runway 12 ASDA 4,850'

**NOTE:**
1. The Runway 12 approach (APPR) ROD changes due to the proposed 12L displaced threshold necessary to clear the area.
2. The Runway 30 LDA ROD and all departure (DER) ROD's do not change from existing conditions so as to not introduce new incompatible land uses.

### Proposed Runway 30 Declared Distances

- Runway 30 LDA 3,978'
- Runway 30 TORA / TODA 4,679'
- Runway 30 ASDA 4,850'

**NOTE:**
- The diagrams show the proposed changes to the displaced thresholds and the extension of the runways.

**Scale:**
- 1 inch = 500 feet

**Legend:**
- PROPOSED RUNWAY PAVEMENT
- PROPOSED TARMAC PAVEMENT
- ROAD RELLOCATION
- PROPOSED TARMAC PAVEMENT REMOVAL
- OTHER PAVEMENT IN LINE
- RUNWAY OBJECT FREE AREA
- RUNWAY PROTECTION ZONE
- PART 77 PRIMARY SURFACE
- RUNWAY SAFETY AREA
- EXISTING BUILDING
- WETLANDS
- 300' RAROFA
- 672' Displaced Threshold

**Flow Directions:**
- SE Flow
- NW Flow
Memo

DATE: 27 October 2016
TO: Gina Mitchell, ADO Community Planner
FROM: Neil Ralston, MAC Airport Planner
SUBJECT: Airlake Airport (LVN)
Runway Protection Zone Alternatives Analysis (RPZ AA) – Submittal for FAA Review

Request: The Metropolitan Airports Commission (MAC) staff is preparing a Long-Term Comprehensive Plan (LTCP) (i.e. 20-year master planning study) for Airlake Airport (LVN) and is proposing a concept to extend Runway 12-30 and use declared distances to better meet existing user needs. The resulting Runway Protection Zones (RPZs) will not be clear. MAC is seeking favorable consideration of the Runway Extension/Declared Distance Alternative depicted below to minimize impacts to adjacent private property owners, project costs, and the environmental footprint of the improvements. A larger view is provided in Attachment 1.
Runway 12 currently has an aligned taxiway prior to the runway threshold. The proposed concept eliminates the aligned taxiway portion by extending the runway by 271 feet and then displacing the current threshold by an additional 120 feet to clear the 30:1 GQS and 20:1 TERPS Visual Area Surface over the adjacent railroad tracks. Through the use of declared distances, the Runway 30 departure RPZ is not proposed to change from existing conditions. The Runway 12 approach RPZ change triggers an RPZ Alternatives Analysis (RPZ AA). The improvements on the Runway 12 end would leave a low volume township road (Highview Avenue), a railroad (Progressive Rail), and a private agricultural field access within the RPZ.

Runway 30 currently has a 392-foot displaced threshold. The controlling obstacle is 225th Street located south of the runway. MAC’s goal is to maximize the utility of the runway to meet existing user needs, without triggering the realignment of County State Aid Highway 23 (Cedar Avenue). The proposed concept includes adding 480 feet of additional pavement to the Runway 30 end. The end result would be an 872-foot displaced threshold and no change to the existing approach RPZ. Through the use of declared distances, the Runway 12 departure RPZ is not proposed to change from existing conditions. The ADO determined the additional pavement constitutes an “airfield project” thereby triggering an RPZ AA, even though there is no change proposed to the approach or departure RPZ on this runway end.

**Background Information:** LVN is currently one of six reliever airports owned and operated by MAC. LVN has one runway, 12-30, which is 4,099 feet long by 75 feet wide. It was formerly a private airport and was purchased by MAC in 1981 to provide a training facility for conducting ILS approaches to relieve some activity at MSP. The existing airport layout is depicted below.

![Airport Layout](image)

MAC’s previous (2008) LTCP planned for a future runway extension to a length of 5,000 feet. This length was based on forecasted user needs, however it was also limited by State Statute, which restricts the maximum runway length at intermediate-class airports to a maximum length of 5,000 feet.

LVN is experiencing an upward trend in high-performance turbine corporate and general aviation itinerant activity. The steady increase in jet operations is largely attributable to an evolving aircraft management business model by the airport’s Fixed Based Operator (FBO), but also reflects improved economic conditions and growth in the demand for business-related flying in the south metropolitan area. From an aircraft management perspective, the aircraft types most in demand by the FBO’s clientele are mid-sized corporate jets such as the Cessna Citation III and Dassault Falcon 20. The operational capabilities of these aircraft types are constrained by the existing runway length at LVN. At times, jet aircraft based at LVN must reposition to another area airport with a longer runway in order to depart with enough fuel and payload to reach destinations beyond an approximately 500 nautical mile stage length. Operating in this manner is both inefficient and unproductive for users of the regional airport system. Letters of support obtained from airport users document a strong likelihood of LVN accommodating at least 500 annual
operations of mid-size (ARC B-II) corporate jet aircraft within the first five years of an extended runway being in place.

As shown in the following graphic, the airport is bound by roads on all sides, as well as the railroad on the west side. Land uses to the north consist of industrial development within the City of Lakeville. Agricultural crop production exists on the other three sides of the airport, consistent with Eureka Township’s long standing land use vision.

**County State Aid Highway (CSAH) 23 / Cedar Avenue** is located on the east side of airport property. It is an important north/south arterial road that serves the southeast quadrant of the Twin Cities Metropolitan Area by providing mobility and connectivity across and through the region. This corridor crosses the Minnesota River and provides accessibility to the MSP Airport.

The runway extension planned in the 2008 LTCP study identified that Cedar Avenue would be impacted and realigned around the relocated runway end. Although the runway extension and roadway realignment were not imminent, the owners of currently undeveloped property along Cedar Avenue desired to know the future alignment in order to consider it in their property development plans. Since a State EIS is required by state law for a runway length of 5,000 feet or longer, an EIS Final Scoping Decision Document was completed in 2011 to establish a vision to expand the corridor from a two lane to
a four lane divided highway without negatively impacting the Vermillion River. The Vermillion River and its associated wetlands are located approximately ½ mile south of the airport and the river is a DNR protected trout stream. The current river bridge crossing would be used in order to limit the impacts on the river. The estimated cost to relocate Cedar Avenue and 225th Street was estimated to cost between $5.9 and $6.8 million in 2010 dollars, not including property acquisition costs.

According to the 2030 Transportation Plan for Dakota County, traffic on the two-lane section of Cedar Avenue (County State Aid Highway 23) adjacent to LVN Airport accommodates approximately 6,800 vehicles per day, and is projected to reach about 12,000 vehicles per day by 2030. According to the County, the threshold for expanding a roadway from two to four lanes is when traffic exceeds approximately 15,000 vehicles per day. There is no current plan to expand or improve this section of Cedar Avenue adjacent to LVN that would qualify as a triggering event for an RPZ Alternatives Analysis.

The FAA issued a memorandum for Interim Guidance on Land Uses within a RPZ dated September 27, 2012. This memorandum clarifies the FAA’s current position on allowable land use compatibilities within the RPZ. The memorandum describes the coordination and processes that are required to determine whether new or modified land uses in the RPZ are allowable. Included within the process is a comprehensive alternatives analysis that assesses the benefits, costs, and implications of the alternatives.

The recommended development plan from the 2025 LTCP to extend the runway to a length of 5,000 feet would realign both Cedar Avenue and 225th Street through the relocated RPZ, which would represent a triggering event to necessitate an RPZ Alternatives Analysis under the current FAA guidance.

As illustrated on the following image, relocating Cedar Avenue completely outside the RPZ for an extended Runway 30 would be an extensive undertaking. A high-level review suggests that the cost for this relocation would be upwards of $16,000,000, not including the nearly 40 acres of property acquisition that would be required for right-of-way.
In comparison, the 2035 LTCP study is considering a scaled-back concept to extend the runway pavement to length of approximately 4,850 feet (see Attachment 1). It proposes to use declared distances to maximize utility for existing users and does not change the existing Runway 30 approach or Runway 12 departure RPZs. In essence, MAC’s current plan is to add additional airfield pavement without relocating Cedar Avenue, because current traffic volumes on the corridor do not support expansion to four lanes until 2030 or later. The vision established in the 2025 LTCP and the subsequent 2011 EIS Scoping Decision Document did not consider the current 2012 RPZ guidance.

225th Street is an east/west corridor that borders airport property on the south. It is a gravel-surfaced township road that provides local land access and connectivity to other roadways, such as Cedar Avenue, that serve a mobility function. This road is currently the controlling obstacle for the Runway 30 displaced threshold.

MAC’s 2035 LTCP concept includes realigning 225th Street’s intersection with Cedar Avenue along an alignment located outside of the future primary surface and approach and departure RPZs to connect back with its current east/west alignment on the east side of Cedar.
MAC acknowledges that relocating 225th Street outside of both the primary surface and the RPZ will be necessary components of the project in order to obtain FAA concurrence.

Highview Avenue is a local north/south road in Eureka Township located to the east of Runway 12 that accommodates an estimated 2,000 vehicles per day.

220th Street is an east/west city street located north of the airport that accommodates approximately 1,500 vehicles per day.

Both roads are in the approach and departure RPZs of Runway 12. The estimated cost to relocate these roads outside of the RPZ is approximately $1,600,000, not including land acquisition costs for right-of-way. Given the existing industrial development, location of the railroad tracks, and low traffic volumes on these corridors, they are not proposed to be relocated.

Progressive Rail operates almost 80 miles of track in the south Twin Cities Metro Area. In the Lakeville area where LVN is located, according to the Draft Minnesota Comprehensive Statewide Freight and Passenger Rail Plan Freight Rail Supply Technical Memorandum, “…it moves a wide variety of commodities – everything from heavy equipment to building products, and also serves a large industrial park in Lakeville. Its lines are a mix of former Union Pacific and Canadian Pacific lines and it continues to interchange with both.” According to the MnDOT Rail Office, two trains operate per week day and operations are occasional on weekends.

Currently the rail line is a penetration to the Runway 12 30:1 GQS and 20:1 TERPS Visual Area Surface. MAC is proposing to mitigate the obstacle by siting a new PAPI in a location that would serve the existing and proposed condition. The estimated cost to relocate the railroad outside of the RPZ is approximately $5,200,000, not including land acquisition costs for right-of-way. Given the adjacent built up urban area to the north, the adjacent spur line serving existing industrial land uses, proximity of the airport, and railroad corridor alignment design requirements, it is not feasible to realign the railroad outside of the RPZ.
In summary, MAC’s rationale for pursuing an airfield development concept that extends the runway through the use of declared distances and maintains existing land uses in the RPZs is as follows:

- While additional pavement is being added to the Runway 30 end, the approach and departure RPZs are not changing based on the proposed use of declared distances. Traffic volumes on Cedar Avenue do not warrant expansion of the corridor from two to four lanes. The risk of an airplane crash within the RPZ when a vehicle would be present is no greater than it would be today. Removing Cedar Avenue from the RPZ can be reevaluated if/when the corridor is proposed for expansion.

- Highview Avenue and 220th Street are low volume, local roads. The risk of an airplane crash within the RPZ when a vehicle is present is low. Realignment outside of the RPZ is not viable given the existing industrial development and location of the Progressive Rail line.

- The Progressive Rail line has, at most, two trains a day on the line. It serves an adjacent spur line and industrial development. Realigning the railroad to required design standards would cause significant impacts due to the built up urban area to the north and agricultural area to the south and west of LVN.

- MAC is willing to consider the installation of “Low Flying Aircraft/No Parking” signage on Cedar Avenue, Highview Avenue, and 220th Street at the edges of the RPZ as a mitigating strategy, but this will require coordination with and approval from the municipalities with roadway jurisdiction.

- At an estimated cost of less than $6,000,000 (including reconstruction of the existing runway), the proposed concept is much less costly than any alternative that involves relocating Cedar Avenue or the adjacent Progressive Rail tracks. At the same time, input from turbine aircraft operators suggests that the longer runway as proposed would ease current operational constraints and open the door for additional mid-size corporate jet operators that bypass LVN today for other area airports with additional runway length.

- The proposed use of declared distances at LVN was subjected to an Operational Assessment as a formalized and proactive approach to manage safety and for continued maintenance of stakeholder confidence. A panel of subject matter experts (SME) conducted an assessment on Thursday September 8th, 2016 at LVN.

First the panel evaluated the effectiveness and suitability of declared distances aimed at identification of defects, gaps, and areas of risk. Second, it provided a realistic forecasted measure of expected output should the proposed change be implemented. The assessment was limited in scope to discuss risks and opportunities associated with implementation of the change. The panel did recognize concerns, but did not consider feasibility or possible environmental impacts of the proposed change. At the conclusion of the panel, members stated their position referencing the implementation of declared distances at LVN. The panel was said to be either neutral or in favor of the proposed change. There were none in opposition to the change. A copy of the Operational Assessment Report is included as Attachment 2.

We look forward to receiving FAA’s written determination on this matter. If you have any questions or would like to discuss this information further, please contact me at (612) 726-8129 or neil.ralston@mspmac.org.
Airlake Airport (LVN)

Operational Assessment:

Declared Distances

September 8th, 2016
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Executive Summary

The Metropolitan Airports Commission (MAC) has proposed, in conjunction with the Airlake Airport (LVN) 2035 Long-Term Comprehensive Plan (LTCP), to incorporate the use of declared distances in order to satisfy the following three objectives:

- Maximize operational capabilities of the existing airfield configuration to better accommodate turbine aircraft
- Maintain or improve upon existing Runway Protection Zone (RPZ) land use capability
- Mitigate existing runway 12 20:1 straight-in visual approach surface penetrations.

An operational assessment was recommended by the Dakota-Minnesota Airports District Office (ADO) as a formalized and proactive approach to manage safety and for continued maintenance of stakeholder confidence. A panel of subject matter experts (SME) conducted an assessment on Thursday September 8th, 2016 at the LVN airport. First the panel evaluated the effectiveness and suitability of declared distances aimed at identification of defects, gaps, and areas of risk. Second, it provided a realistic forecasted measure of expected output should the proposed change be implemented.

The assessment was limited in scope to discuss risks and opportunities associated with implementation of the change. The panel did recognize concerns, but did not consider feasibility or possible environmental impacts of the proposed change. Should the MAC continue with the proposed change, the panel recommends vetting capital improvements with a feasibility study as well as an Environmental Assessment (EA) in accordance with National Environment Policy Act (NEPA) of 1969, as amended by the U.S. Department of Transportation (DOT), Federal Aviation Administration (FAA) National Environmental Policy Act Implementing Instructions for Airport Actions, Order 5050.4B.

At the conclusion of the panel, members stated their position referencing the implementation of declared distances at Airlake Airport. The panel was said to be either neutral or in favor of the proposed change. There were none in opposition to the change.
Section 1- Current System

Airlake Airport is a public use airport located south of the Twin Cities, near Lakeville and Farmington MN. The airport is positioned adjacent to a large 1,500-acre contiguous industrial parks. The airport was purchased by the MAC in 1981. It has been deemed significant to the National Airspace System (NAS) and is listed in the National Plan of Integrated Airport System (NPIAS) as a reliever airport. The airport has a single 4,098-foot x75-foot runway with a full length parallel taxiway. LVN offers both precision and non-precision instrument approaches and serves to relieve congestion and increase capacity at the Minneapolis-St. Paul International Airport (MSP). Airlake also provides infrastructure for the region’s corporate aircraft and recreational aviation needs. The current airfield configuration is shown in Exhibit 1.

Section 2- Proposed Change

As result of changes in FAA airport design standards, the runway extension concept proposed in the previous 2025 Airlake Airport LTCP no longer meets the required design criteria. During the development of the 2035 LTCP the MAC, while recognizing the more restrictive design standards, explored various design concepts to gain efficiencies while considering the off airport geometrical constraints of Cedar Avenue to the east and the railroad tracks to the west. One of the concepts considered was runway extensions along with the application and publication of declared distances. This would maximize the utility of the airport’s physical footprint in a manner that complies with FAA design standards. Declared distances are the distances the airport owner, with agreement from the ADO, declares available for use in meeting an airplane’s takeoff run, takeoff distance, accelerate-stop distance, and landing distance requirements. Declared distances are used throughout the NAS and have been vetted through the Safety Management System (SMS) process on a national level. However, this assessment was recommended to evaluate the operational impact, and determine if there are risks with implementation that are specific to Airlake Airport.

Definitions:

- Takeoff Run Available (TORA) – the distance to accelerate from brake release to lift-off
- Takeoff Distance Available (TODA) – the distance to accelerate from brake release past lift-off to start takeoff climb
- Accelerate-Stop Distance Available (ASDA) – the distance to accelerate from brake release to rotation speed and then decelerate to a stop
- Landing Distance Available (LDA) – the distance from the threshold to complete the approach, touchdown, and decelerate to a stop
Exhibit 1: Current Airfield Configuration
The panel considered the following change:

Runway extensions of 271 feet on the Runway 12 end and 480 feet on the Runway 30 end. The Runway 30 landing threshold would remain in the current location. In order to avoid relocating the existing RPZs or the TERPS 40:1 Instrument Departure Surface, declared distances would be applied and published as illustrated in Figure 2. Further, a section of 225th Street along the southern boundary of the airfield would be relocated to clear the 14 CFR Part 77 Primary Surface and the RPZ. Finally, the Runway 12 threshold would be displaced to remove the 20:1 Straight-In Visual Approach Surface penetration created by the railroad track. As a by-product of the displacement, the location of the Runway 12 Approach RPZ would shift slightly as it is tethered to the threshold location.

The proposed airfield configuration is shown in Exhibit 2.

A summary of the runway lengths provided by the declared distance concept, compared to the existing runway length, is provided below:

<table>
<thead>
<tr>
<th></th>
<th>Existing Runway</th>
<th>Declared Distance Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Landing Distance Available (LDA)</td>
<td>4,099'</td>
<td>3,707'</td>
</tr>
<tr>
<td>Takeoff Run Available (TORA)</td>
<td>4,099'</td>
<td>4,099'</td>
</tr>
<tr>
<td>Takeoff Distance Available (TODA)</td>
<td>4,099'</td>
<td>4,099'</td>
</tr>
<tr>
<td>Accelerate-Stop Distance Available (ASDA)</td>
<td>4,099'</td>
<td>4,099'</td>
</tr>
</tbody>
</table>
Exhibit 2: Proposed Airfield Configuration

Proposed Runway 12 Declared Distances

Runway 12 LDA 4,459'
Runway 12 TORA / TODA 4,370'
Runway 12 ASDA 4,860'

Proposed Runway 30 Declared Distances

Runway 30 LDA 3,978'
Runway 30 TORA / TODA 4,578'
Runway 30 ASDA 4,850'

NOTE:
1) The Runway 12 approach 36°7'857 changes due to the proposed 127' displaced threshold necessary to clear the runway.
2) The Runway 30 AIP/FAA data does not reflect LDA improvements.
3) TOPMOA runway data is not applicable to the new runway configuration.
Section 3- Operational Assessment Panel

Neil Ralston, Change proponent

Neil is currently serves as the Airport Planner for the Metropolitan Airports Commission of Minneapolis-Saint Paul (MAC), a position he assumed in June 2014. In this role, Neil is responsible for coordinating planning initiatives for the MAC’s system of seven airports, including Minneapolis-Saint Paul International Airport (MSP) and six reliever facilities.

Neil began his career in 1998 by serving as an Airport Operations Supervisor at the Gulfport/Biloxi International Airport (GPT) in Gulfport, MS. Next, he moved to Milwaukee, WI to serve as the Noise Abatement Analyst for General Mitchell International Airport (MKE). Between 2000 and 2005, Neil worked for Crawford, Murphy & Tilly (CMT) consulting engineers in Springfield, IL as an Aviation Planner. Between 2006 and 2008, he worked for the Indianapolis Airport Authority (IAA) as the Planner for their system of airports. Before joining the MAC, Neil served on the management team at the Colorado Springs Airport (COS) as the Planning & Development Manager (2008 – 2013) and Interim Assistant Aviation Director for Planning & Development (2013 – 2014). Neil has attained the Accredited Airport Executive (AAE) designation from the American Association of Airport Executives (AAAE) and is also a licensed commercial pilot with an instrument rating.

Greg Albjerg, PE

Greg is HNTB’s national aviation planning leader. He is recognized industry-wide for his airspace and air traffic expertise and has prior experience as an FAA air traffic controller. He is also a registered professional engineer and an active licensed pilot with instrument rating.

Audry Wald

Audrey has nearly 28 years of experience with airport planning, engineering and environmental projects. She has worked on master plans, airport layout plans, environmental assessments, DBE programs, site selections and feasibility studies. She has her private pilot’s license and is a member of the Minnesota Council of Airports.

Todd Wright

Todd Wright is an experienced aviation planner with expertise in airspace analysis, airport planning and design, and navigational aid siting. He has over 13 years of experience and brings specific expertise to aviation planning due to his thorough understanding of instrument approach/departure procedures. Todd’s experience spans coast to coast at airports of all sizes.

Russ Owen

Russ Owen serves as Sr. Aviation Planner for the Metropolitan Council. He has been with the Council for 5 years, and previously spent 8 years as a consultant for a national Architectural and Engineering firm as an airport planner. He has been involved in Master Plans, Site Studies, environmental documentation, spaceport licensing, ALP work and ATC siting work.
Patrick Halligan

He was born and raised in north Minneapolis. He took his private pilot lessons at Anoka County Airport. Patrick attended the University of North Dakota, majoring in aviation and after graduating he taught flying lessons at Flying Cloud Airport.

He was picked for a MN Air National Guard pilot slot in 1978. He Flew T-37's and T-38's in pilot training and then the C-130 for the MN Air Guard. He was hired by Republic Airlines in 1980, merged with Northwest and then Delta. He retired after 32 years, in 2012, as an Airbus captain. He flies his own C-182 that is based at LVN. Patrick built and owned a hangar at LVN back in the 1990's. He now rents a hangar at KLVN. EAA Chapter 25 has a hangar on the field. He is a member and was representing their interests.

Randy Schoephoerster

Randy is the owner of Air Trek North Flight School & Maintenance at KFCM, KLVN, KSGS Airports. He serves as President of the MN Seaplane Pilots Association. Randy is a FAASTeam Lead Representative and field Director of the National Seaplane Pilots Association.

He is certified as ATP AMEL, ATP ASES, ATP ASEL, Gold Seal Flight Instructor, and has 10,000 hours of pilot total time.

Previously he has served as Marketing and Engineering Director at Emerson Electric, Shakopee City Commissioner, and VP MN Seaplane Pilots Association.

Randy received a Bachelor of Science in Electrical Engineering at NDSU and a MBA Marketing at University of St. Thomas.

Gina Mitchell

She is a Community Planner with the Dakota-Minnesota ADO, Minneapolis Office. Gina has been with the ADO over three years, and she works primarily on airport master planning projects and capital improvement planning for large airport development projects. Prior to joining FAA, she worked for eight years at a consulting firm managing airport, highway, and land use planning projects, and ten years in city and county government in the areas of land use and transportation planning. She is an accredited American Institute of Certified Planner (AICP).

Pat Mosites

He serves on the MAC Airport Development Staff as a Construction project Manager for airfield projects for MSP and our 7 Relievers airfields. He participates in the planning and execution of these projects making sure that all aspects of FAA safety requirements are fulfilled. He has a Bachelor of Science degree in Civil Engineering and has been at the MAC since Jan 2000.
Tom Fitzhenry

He serves as Director of Counterdrug Operations MN wing and Assistant Director of Emergency Services MN wing. Previously Tom was the Commander of the 130th squadron at KL VN. He serves as City Council member for the City of Richfield and has been a Council member ward from 2008. Tom Cochair's the MAC noise oversight committee. He is a mission pilot and owns a hangar at the Airlake Airport. He is a member of the EAA chapter 25. Tom is a retired Air National Guard Air Traffic Controller serving at KANE ATC (ANG), KANE Rapcon Chief (ANG), and working in TERPS (ANG).

Additional members extensive backgrounds and experience representing Airports District Office (ADO), FAA Flight Standards District Office (FSDO), Airlake Fixed Base Operator (FBO), and Minnesota Department of Aeronautics (MNDOT).

- **Nancy Nistler**: FAA ADO
- **Mike Wilson**: KL VN MAC Airport Manager
- **Chris Meyer**: MNDOT
- **Rylan Juran**: MNDOT
- **Lindsay Butler**: FAA ADO
- **Lindsay Reidt**: SEH Construction Services
- **Mark Mantley**: MAC
- **John Ostrom**: MAC
- **Tony Fiorollo**: Waypoint Flight Services: on-demand charter, aircraft service, aircraft sales and rentals, aircraft fuel and storage, maintenance.

**Facilitator: William Ratts**

William currently serves as the Northern Planes District Safety Risk Management Focal, Air Traffic Organization, FAA. He is employed as an Operation Supervisor at Flying Cloud Air Traffic Control Tower, and has pilot experience in part 121, 135, and 91 operations. He continues to fly fixed wing turbine aircraft in a corporate aviation setting.
Section 4- Operational Assessment Panel Findings

The panel analyzed the potential benefit and unintended negative consequences of the implementation of declared distances. Listed below is the panel’s finding broken into the appropriate categories.

Positive consequences:

1. The use of declared distances would aid in maximizing the runway footprint with in the surrounding geographical constraints.
2. This proposed change would provide a more efficient way to utilize the runway.
3. This approach is a realistic, feasible alternative. This design concept would have a diminished impact on surrounding area and community compared to other proposals. With that in mind, the panel recognized a comparative cost savings and viewed this as a fiscally viable solution.
4. The use of displaced thresholds located at both ends would be a visible image to pilots showing that obstructions were present therefore allowing them to adjust flight path accordingly.
5. The proposed change would increase safety margins for larger aircraft/ jet operations.
6. Increased runway use would positively impact revenue for the airport and community.
7. Compared to other design concepts, the panel believed that there would be less environmental impact.
8. The 20:1 visual surface that is currently impeded with the railroad west of the airport would be rectified.
9. There would be a reduction in frangible MALSR lights and an increase in in-pavement lighting, resulting in fewer above-ground objects within the RPZ.

Negative Consequences (with discussed assessment by the panel):

1. Pilots unfamiliar with the airport making midfield takeoffs/intersection departures wouldn’t realize where the end of the TORA/TODA occurs.
   a. This is a condition that already exists in the NAS and is not really impacted by the use of declared distances.
2. Stop-n-go’s could occur more often because of the increased runway length.
   a. This in a condition that already exists in the NAS. Other aircraft in the traffic pattern are of more concern than declared distances would be.
3. The panel recognized there could be confusion with an average non-professional pilot who has base level knowledge. There was also concern, albeit less, that there could be misapplication of declared distances with a professional pilot.
4. Lack of education/understanding of the declared distances concept, could lead to more incidents occurring at the airport.
   a. General consensus was that this can be alleviated with educational initiatives.

5. There would be additional mitigation costs (signage/markings/additional Taxiways) associated with a declared distance alternative.
   a. Operational impact, however there is no safety risks associated.

6. Transient aircraft operations could be decreased if pilots are concerned with the complexity of declared distances.
   a. The panel believed this was an operational impact only and would not degrade the level of safety.

7. Physical relocation of 225th Street.
   a. This was determined to pose no safety risk and the panel agreed to only consider post implementation issues. This would be evaluated during the environmental process associated with the runway alternative.

8. There are concerns about jet blast being closer to the localizer antenna.
   a. This was determined to pose no safety risk.

9. A lack of an Air Traffic Control Tower means pilots are making decisions about operations and could be unfamiliar with the airport environs.
   a. The panel believed that this already exists and therefore would be no additional resultant risk associated with the use of declared distances.

10. The proposed change does not address existing 14 CFR Part 77 primary surface penetrations (hangars located on the north side).
    a. This condition already exists today and is not a result of the implementation of declared distances.

11. The longer runway may cause a change in the fleet mix lessening the likelihood Airlake would remain a recreational airport.
    a. The panel believed the MAC should consider the impact to the fleet mix that other airports have had when lengthening a runway, however, it was agreed that there was no operational impact.

12. As the runway ends are extended the pavement will be closer to off-airport obstructions (roads/railroad).
a. The changes would still comply with all applicable FAA design standards.

13. No required visual indication (i.e. signage/marking) of TORA/TODA limitation.
    a. Signage, while not mandated, can be used to provide visual representation of limitations.

14. Operators may push the limits of the new runway length.
    a. This condition already exists today and is not a result of the implementation of declared distances.

**Section 5- Mitigation Recommendations:**

The panel, while conscientious of the operational impacts to stakeholders and the community, placed a high regard towards ensuring that the safety of the NAS not be degraded. The panel members believed that the implementation of DD’s at Airlake Airport created an acceptable risk. However, when possible, an effort was placed to reduce risk further through the following mitigation strategies.

1. Declared distance signage
   a. Declared distance informational signage on parallel taxiway.
   b. Consider declared distance informational signage on the runway as long as is not deemed a distraction to pilots.

2. Automated Weather Observations System (AWOS) should carry an informational message informing pilots that declared distances are in use.

3. Issuance of FDC NOTAM.

4. Addition of remarks referencing the declared distances in the 5010.

5. Change the airport diagram, applicable charts, and instrument approach plates to reflect the declared distances.

6. Identify the connector taxiways with appropriate signage.

7. Addition of a taxiway connector at Runway 12 displaced threshold to provide a visual cue as to location of Runway 30 TORA/TODA end.

8. Consider the effectiveness of a grooved runway.

9. Educational considerations:
   a. Local outreach
      i. Tenant letter
      ii. Informational flyer in lease review and posted in FBO building
      iii. Emails
      iv. EAA groups
v. Civil Air Patrol (CAP)
  b. FAASTeam training
  c. MN/DOT zero aviation death initiative.

10. Consider best practices from other reliever airports that have experienced growth.

11. Evaluate changing class G airspace to controlled class E airspace.

12. Review historical NTSB reports for aviation accidents/incidents in the vicinity of LVN to better understand the nature of these events in relation to the proposed airfield improvements

**Section 6- Summary**

At the beginning of the assessment panel members were asked to state whether they were for, against, or neutral towards the implementation of declared distances at Airlake airport. At the conclusion of the panel each member was asked to state their position again, and the results are as follows:

- Todd (HNTB)- in favor/same
- Greg(HNTB)- in favor/not present
- Patrick(EAA 25)- in favor/same
- Pat(MAC)- in favor/same
- Nancy(FAA ADO)-neutral/in favor
- Kevin(FAA FSDO)-neutral/in favor
- Mike(MAC)-in favor/same

- Randy(Air Trek)-neutral/neutral
- Tony(Waypoint)-in favor/not present
- Chris(MnDOT)-neutral/neutral
- Ryan(MnDOT)-neutral/neutral
- Mark(MAC)-in favor/same
- Neil(MAC)-in favor/same
- John(MAC)-neutral/in favor

- Tom(CAP)-neutral/leaning in favor
- Glenn(RAAC)-neutral/leaning in favor
- Lindsay(FAA ADO)-in favor/same
- Gina(FAA ADO)-neutral/in favor
- Audrey(HNTB)-in favor/not present
- Lindsa(SEH)-neutral/in favor
- Russ(Met Council)-neutral/in favor

*Panel member’s positions at the conclusion are in red.

In conclusion, the panel has completed a thorough consideration of the implications of declared distances at the Airlake Airport. Subsequently there have been no dissenting opinions stated.

**William Ratts**

William Ratts  
Northern Planes SRM Focal  
Air Traffic Organization, FAA  

10/10/2016  
Date
## Appendix 7: Noise Contour Input Details

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<td>Table A7-2: 2035 Preferred Alternative Condition Average Daily Flight Operations</td>
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<td>Table A7-3: Baseline Condition Average Annual Runway Use</td>
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<td>Table A7-4: 2035 Preferred Alternative Condition Average Annual Runway Use</td>
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<td>Table A7-5: Baseline Condition Departure Flight Track Use</td>
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<td>Table A7-6: 2035 Preferred Alternative Condition Departure Flight Track Use</td>
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<td>Figure A7-1: Baseline Condition INM Flight Tracks</td>
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<td>Figure A7-2: 2035 Preferred Alternative Condition INM Flight Tracks</td>
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### Table A7-1

#### Airline Airport 2035 LTCP

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**Total Operations**

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**Note:** Total may not add due to rounding.

Source: MAC/NSO Data Analysis, IHBT Activity Forecasts
Table A7-2
2035 Preferred Alternative Condition Average Daily Flight Operations

Aircraft Type

Aircraft ID

Helicopter
Agusta 109

A109

Robinson R22

R22

Multi-Engine Piston

Arrivals
Day

Total

2.13

0.90

3.03

2.13

0.82

2.94

0.69

Commander 500

AC50

Departures

Night

-

0.08

0.08

0.03

0.73

-

-

Touch and Gos

Night

Total

2.63

0.39

3.03

2.63

0.31

2.94

0.68
0.00

0.08

0.08

0.04

0.73

-

0.00

Day

Total Operations

Night

Total

0.60

-

0.60

5.36

1.29

6.66

0.60

-

0.60

5.36

1.13

6.49

0.24
-

-

0.24
-

Day

1.62
0.00

BEC58P

0.16

-

0.16

0.19

-

0.19

-

-

-

0.35

-

0.35

Beechcraft Duke Twin

BEC60

0.01

-

0.01

0.00

-

0.00

-

-

-

0.01

-

0.01

Cessna Twin 335

CNA335

0.00

0.00
-

0.12

0.23

-

0.12

0.37

0.02
0.00

0.00
0.02
0.00

0.00
-

0.00

-

-

-

0.00

0.03

-

-

-

0.04

0.00

-

-

-

0.01

0.00
-

0.01
-

0.23
0.37

0.00
0.05
0.01

Cessna 340 Twin

CNA340

0.02

0.02

0.01

0.00

0.02

-

-

-

0.03

0.00

0.04

Cessna 414 Twin

CNA414

0.10

0.01

0.11

0.09

0.01

0.11

-

-

-

0.19

0.02

0.22

Cessna Golden Eagle 421

CNA421

0.10

0.00

0.11

0.11

0.01

0.12

0.01

Diamond Twin Star

DA42

0.00

-

0.00

-

Grumman Cougar

GA7

0.00

-

0.00

0.01

-

0.01

-

-

-

0.01

-

0.01

Piper Aztec Twin

PA23AZ

0.00

-

0.00

0.00

-

0.00

-

-

-

0.01

-

0.01

Piper Navajo Twin

PA31

0.01

-

-

0.12

0.00

P-68 Observer

0.02

0.12

0.11

-

0.05
0.14

BEC76

0.05

-

0.16
1.70

BEC55

CNA310

-

0.11

0.16
0.08

BEC58

Beechcraft Duchess Twin

0.05

0.14

Total

Beechcraft Baron BE-55

-

0.06

Night

Beechcraft Baron BE-58

Cessna 310 Twin

0.00

Day

0.01

0.02

0.02

-

-

0.01

0.03

-

-

-

0.22

-

-

-

0.00

-

-

-

0.03

-

0.02

0.23
0.00

0.05

Piper Seneca Twin

PA34

0.02

-

0.02

0.02

-

0.02

-

-

-

0.04

-

0.04

Piper Seminole Twin

PA44

0.02

-

0.02

0.01

-

0.01

-

-

-

0.04

-

0.04

Single-Engine Piston

23.97

1.08

25.05

24.10

0.95

25.05

18.19

-

18.19

66.26

Grumman American Cheetah

AA5A

-

-

-

0.04

-

0.04

-

-

-

0.04

-

0.04

Beechcraft Musketeer

BEC23

-

-

-

0.04

-

0.04

-

-

-

0.04

-

0.04

Beechcraft Sierra/Sundowner

BEC24

0.03

-

0.03

0.04

Beechcraft Debonair/Bonanza

BEC33

0.37

-

0.37

0.18

0.04

3.53

0.18

Beechcraft Bonanza 35

BECM35

3.11

-

-

-

0.07

-

-

-

0.55

0.04
0.22

-

6.64

BL26

0.10

-

0.10

0.07

-

0.07

-

-

-

0.17

-

0.14

-

0.14

0.15

-

0.15

-

-

-

0.28

-

0.28

Cessna 152

CNA152

0.17

-

0.17

0.07

-

0.07

-

-

-

0.24

-

0.24

CNA172

4.53
0.27

Cessna Skywagon 180

CNA180

0.10

0.37
-

-

6.85
0.17

4.90

4.94

0.11

5.05

-

-

-

9.47

0.48

9.95

0.27

0.36

0.04

0.40

-

-

-

0.63

0.04

0.67

0.10

-

-

-

0.10

0.04

Cessna 206

CNA206

0.61

-

0.61

0.58

Cessna Centurion 210

CNA210

0.78

-

0.78

0.80

GA Single Engine Propeller Fixed

GASEPF

0.68

0.10

0.78

0.44

-

0.44

2.27

-

2.27

3.39

0.10

3.49

GA Single Engine Propeller Variable GASEPV

1.83

0.07

1.89

1.60

-

1.60

2.27

-

2.27

5.70

0.07

5.77

LA42

0.91
0.17

Piper Cherokee

PA28

3.18

Piper Arrow

PA28CA

0.47

Piper Warrior

PA28CH

0.95

Piper Cherokee Dakota

PA28DK

Piper Cherokee Six

PA32C6

Piper Lance/Saratoga

PA32SG

-

-

0.07

6.76

-

0.04

-

-

-

0.07

-

0.58

-

-

-

1.19

0.84

-

-

-

1.58

0.04

-

0.07

-

-

-

0.07

-

0.07

3.48

3.16

-

4.55

10.89

0.56

11.45

0.03

0.51

0.44

-

0.44

-

-

-

0.91

0.03

0.94

-

0.95

0.87

-

0.87

-

-

-

1.82

-

0.10

-

0.10

0.04

-

0.04

-

-

-

0.14

-

0.14

0.03

-

0.03

-

-

-

0.03

-

0.03

-

0.64

0.58

0.25

3.42

-

-

-

0.58

4.55

2.27

-

-

2.27

1.19
1.61

0.30

0.18

-

0.07

0.87

-

2.27

0.04

6.90

0.18

-

0.91

-

0.95

-

0.04

0.14

0.17

0.64

0.03

2.27

-

2.25

0.03

M20J

-

0.10

2.26

-

PA24

2.27

-

2.23
0.03

Lake LA-4-200 Buccaneer

2.36

-

CNA182
CNA185

Mooney M-20

0.11

-

Cessna Skylane 182
Cessna 185

Piper Comanche

0.03

-

0.07
0.59

CNA150

CNA177

3.71

-

Bellanca Super Viking

Cessna Skyhawk 172

3.14

0.04
0.22

68.28

Cessna 150

Cessna Cardinal 177

0.03

-

2.03

-

2.27

4.06
0.35

0.07
-

4.13
0.35

1.82

3.50

-

3.50

Piper Tomahawk

PA38

0.03

-

0.03

0.07

-

0.07

-

-

-

0.11

-

0.11

Piper Malibu

PA46

0.10

-

0.10

0.11

-

0.11

-

-

-

0.21

-

0.21

Rockwell Aero Commander 112

RWCM12

0.10

-

0.10

0.11

-

0.11

-

-

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0.21

-

0.21

Cirrus SR-22

SR22

2.30

0.10

2.40

2.47

0.15

2.62

0.90

0.13

1.04

0.94

0.10

1.04

Turboprop
Beechcraft 1900

1900D

0.01

Beechcraft King Air 200

BEC200

0.09

0.02

0.07

0.01

0.01

0.11

0.10

0.01

0.08

2.27
-

-

2.27
-

7.04

0.25

7.29

1.84

0.23

2.07

0.01

-

-

-

0.02

0.11

-

-

-

0.19

0.03

0.22

0.15

0.41

-

0.02

Beechcraft Super King Air 350/300B BEC30B

0.13

0.20

0.13

0.21

-

-

-

0.26

Beechcraft King Air 90

BEC90

0.08

-

0.08

0.12

-

0.12

-

-

-

0.19

-

0.19

Beechcraft Super King Air F90

BEC9F

0.03

-

0.03

0.03

-

0.03

-

-

-

0.05

-

0.05

Cessna 208

CNA208

0.09

Cessna Conquest 441

CNA441

0.02

0.03
-

0.13

0.08

-

0.08

-

-

-

0.17

0.02

0.02

-

0.02

-

-

-

0.03

De Havilland DH-6

DHC6

0.01

-

0.01

De Havilland DHC8

DHC8

0.01

-

0.01

0.01

0.01

Mitsubishi MU-2

MU2

0.01

-

0.01

Piper Malibu Meridian

P180

0.01

-

0.01

Piper PA-31T-2 Cheyenne I/II

PA31T

0.01

-

0.01

0.02

Pilatus PC-12

PC12

0.21

0.23

0.23

Rockwell Turbo Commander 690

RWCM69

0.01

-

0.01

Socata TBM 700

STBM7

0.20

-

0.20

0.19

3.75

3.26

0.07

0.07

0.30

0.23

0.26

0.25

Jets

3.41
Raytheon Beechjet 400

BEC400
Cessna Citation I Single Pilot Twin JeCNA501
Cessna Citation Mustang
CNA510
Cessna Citation Jet 525
CNA525C
Cessna Citation Jet 550
CNA55B
Cessna 560 Ultra
CNA560U
Cessna 560XL Citation Excel
CNA560XL
Cessna Citation Jet 650
CNA650
Cessna 750 Citation X
CNA750
Falcon 200
FAL200
Falcon 50
FAL50
Falcon 900
FAL900
LEAR45
Learjet 45 Twin Jet
Total

0.07
0.28
0.26

0.02

0.34
0.02
-

-

-

-

-

-

0.01

-

0.01

0.01
0.49
0.06
-

0.21
0.03

-

-

-

0.01

-

0.01

-

-

-

0.02

-

0.02

-

-

-

0.02

-

0.02

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-

-

0.01

-

0.01

-

-

-

0.03

-

0.24

-

-

-

0.44

-

-

-

0.02

-

-

0.03

0.03

0.03
0.47

-

-

-

0.01

-

0.01

0.19

-

-

-

0.39

-

0.39

3.75

-

-

-

6.67

0.07

-

-

-

0.15

0.29

-

-

-

0.51

0.25

-

-

-

0.51

0.82
0.08
-

7.49
0.15
0.59
0.51

0.04

0.00

0.04

0.02

0.01

0.03

-

-

-

0.06

0.02

0.07

0.32

0.24

0.56

0.46

0.08

0.54

-

-

-

0.78

0.32

1.10

0.60

-

0.60

0.39

0.19

0.58

-

-

-

0.98

0.19

1.17

0.52

-

0.52

0.51

0.51

-

-

-

1.03

1.27

1.16

1.31

-

-

-

2.36

1.19
-

0.07

0.22

1.03
2.58

0.04

-

0.04

-

-

-

0.04

-

0.04

-

0.04

0.04

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0.04

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-

-

0.07

-

0.07

0.04

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0.04

0.04

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0.04

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0.07

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0.07

0.04

-

0.04

0.04

-

0.04

-

-

-

0.07

-

0.07

0.02

-

0.02

0.02

-

0.02

-

-

-

0.04

-

33.58

31.61

33.58

19.03

-

19.03

81.74

2.49

-

0.15

-

0.04

31.10

-

-

1.97

4.46

0.04
86.20

Note: Total may not add due to rounding.

Source: MACNOMS Data Analysis, HNTB Activity Forecasts

Airlake Airport 2035 LTCP

Appendix 7

Page 7-2


Table A7-3
Baseline Condition Average Annual Runway Use

<table>
<thead>
<tr>
<th>Aircraft Group</th>
<th>Runway</th>
<th>Arrivals</th>
<th></th>
<th></th>
<th>Departures</th>
<th></th>
<th>Touch and Gos</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day</td>
<td>Night</td>
<td>Total</td>
<td>Day</td>
<td>Night</td>
<td>Total</td>
<td>Day</td>
</tr>
<tr>
<td>Helicopters</td>
<td>12</td>
<td>35%</td>
<td>9%</td>
<td>27%</td>
<td>25%</td>
<td>0%</td>
<td>22%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>65%</td>
<td>91%</td>
<td>73%</td>
<td>75%</td>
<td>100%</td>
<td>78%</td>
<td>50%</td>
</tr>
<tr>
<td>Piston</td>
<td>12</td>
<td>37%</td>
<td>28%</td>
<td>36%</td>
<td>38%</td>
<td>42%</td>
<td>38%</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>63%</td>
<td>72%</td>
<td>64%</td>
<td>62%</td>
<td>58%</td>
<td>62%</td>
<td>49%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>12</td>
<td>31%</td>
<td>19%</td>
<td>30%</td>
<td>49%</td>
<td>18%</td>
<td>46%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>69%</td>
<td>81%</td>
<td>70%</td>
<td>51%</td>
<td>82%</td>
<td>54%</td>
<td>-</td>
</tr>
<tr>
<td>Jets</td>
<td>12</td>
<td>32%</td>
<td>13%</td>
<td>31%</td>
<td>54%</td>
<td>69%</td>
<td>56%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>68%</td>
<td>88%</td>
<td>69%</td>
<td>46%</td>
<td>31%</td>
<td>44%</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Totals may not add up to 100% due to rounding.

Source: MAC Analysis
### Table A7-4

#### 2035 Preferred Alternative Condition Average Annual Runway Use

<table>
<thead>
<tr>
<th>Aircraft Group</th>
<th>Runway</th>
<th>Arrivals Day</th>
<th>Arrivals Night</th>
<th>Arrivals Total</th>
<th>Departures Day</th>
<th>Departures Night</th>
<th>Departures Total</th>
<th>Touch and Gos Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day</td>
<td>Night</td>
<td>Total</td>
<td>Day</td>
<td>Night</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Helicopters</td>
<td>12</td>
<td>35%</td>
<td>9%</td>
<td>27%</td>
<td>25%</td>
<td>0%</td>
<td>22%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>65%</td>
<td>91%</td>
<td>73%</td>
<td>75%</td>
<td>100%</td>
<td>78%</td>
<td>50%</td>
</tr>
<tr>
<td>Piston</td>
<td>12</td>
<td>37%</td>
<td>28%</td>
<td>36%</td>
<td>38%</td>
<td>42%</td>
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<td>64%</td>
<td>62%</td>
<td>58%</td>
<td>62%</td>
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<tr>
<td>Turboprop</td>
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<td>82%</td>
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<tr>
<td>Jets</td>
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<td>44%</td>
<td>56%</td>
<td>46%</td>
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<td>56%</td>
<td>44%</td>
<td>54%</td>
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</tr>
</tbody>
</table>

Note: Totals may not add up to 100% due to rounding.

Source: MAC Analysis
### Table A7-5
Baseline Condition Departure Flight Track Use

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<th>Runway</th>
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<th>Jets</th>
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<th>Helicopters</th>
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<th>Piston</th>
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<td>20%</td>
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<td>50%</td>
<td>20%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>25%</td>
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<td></td>
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<td>27%</td>
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</tbody>
</table>

Notes: Each departure track was dispersed to either side of the backbone tracks. Default INM Version 7.0d subtrack use percentages were used to assign aircraft to the subtracks created during dispersa. Totals may not add to 100% due to rounding.

Source: MAC Analysis
### Table A7-6
2035 Preferred Alternative Condition Departure Flight Track Use

<table>
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<tr>
<th>Runway</th>
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<td></td>
<td>Day</td>
<td></td>
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Notes: Each departure track was dispersed to either side of the backbone tracks. Default INM Version 7.0d subtrack use percentages were used to assign aircraft to the subtracks created during dispersa. Totals may not add to 100% due to rounding.

Source: MAC Analysis
Figure A7-1: Baseline Condition INM Flight Tracks
Figure A7-2: 2035 Preferred Alternative Condition INM Flight Tracks

Note: Each departure track was dispersed to either side of the backbone tracks shown. Default INM Version 7.0d subtrack use percentages were used to assign aircraft to the subtracks created during dispersal.
Appendix 8: Stakeholder Engagement Program Documentation

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Appendix 9: Public Comments and Responses

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