



STAFF REPORT

DATE: 4/3/2018

CONSENT

ITEM #: 3

TO: City Council

FROM: Emily Becker, Planning Director

AGENDA ITEM: Draft Federal Environmental Assessment/State of Minnesota Environmental Assessment Worksheet for Runway 14-32 Relocation and Associated Improvements at Lake Elmo Airport in Baytown and West Lakeland Townships, MN

REVIEWED BY: Kristina Handt, City Administrator
Jack Griffin, City Engineer

BACKGROUND:

MAC recently completed a Long-Term Comprehensive Plan (LTCP) in 2016 for the Lake Elmo Airport, located east of Lake Elmo in Baytown and West Lakeland Townships, owned and operated by Metropolitan Airports Commission (MAC). The LTCP identified need for many improvements. As a result, the MAC is proposing the following improvements to the airport:

- Relocate Runway 14/32 by shifting 615 feet to the northeast and extend to 3,500 feet, including grading, clearing, and runway lighting.
- Extinguish existing prescriptive easement for 30th Street North and seek, as appropriate, a land release from the
- Federal Aviation Administration (FAA) to allow realignment of 30th Street North around the new Runway 32
- Runway Protection Zone (RPZ) to reconnect with the existing Neal Avenue North intersection.
- Relocate the Airport perimeter fence to reflect the new Runway 32 RPZ.
- Remove the existing north side taxiway and compass calibration pad and construct a new cross-field taxiway to serve the new Runway 14 end, including taxiway lighting and/or reflectors.
- Convert existing Runway 14/32 to a partial parallel taxiway and remove the portion of the existing parallel taxiway south of the Runway 04 threshold.
- Reconstruct Runway 4/22 and extend to 2,750 feet, including necessary lighting and taxiway connectors.
- Construct other taxiways and engine run-up pads as needed to support the relocated Runway 14/32 and

- Extended Runway 04/22, including connector taxiways and a full-length parallel taxiway on the north side of the relocated Runway 14/32, and install taxiway lighting and/or reflectors.
- Relocate the compass calibration pad adjacent to the new partial parallel taxiway (converted Runway 14/32).
- Establish non-precision GPS-based instrument approach procedures to all runway ends not already equipped.
- Provide Runway 14/32 lighting systems with the relocated runway.
- Install medium intensity runway edge lights (MIRL) on Runway 04/22, precision approach path indicators (PAPIs) on the Runway 04, 14, and 22 ends, and runway end identifier lights (REIL) on each end of Runway 04/22.
- Remove approximately 20 acres of on-Airport trees and individual off-Airport trees as necessary to clear trees
- That penetrate FAA Threshold Siting Surfaces (TSS)/Part 77 approach and transitional surfaces.
- Install obstruction lighting on fixed base operator (FBO) and hangar buildings in the United States Standard for
- Terminal Instrument Procedures (TERPS) departure surface areas beyond Runway 04, 14, and 22 ends.
- Construct an on-Airport access road connecting the north and west building areas.
- Voluntarily explore creation of Rusty Patched Bumble Bee/pollinator habitat on Airport property southwest of proposed 30th Street North realignment.

Federal financial participation in projects listed in the LTCP requires environmental review under the National Environmental Policy Act (NEPA). An environmental assessment (EA) is a document that determines and evaluates the effects of a proposed action on the surrounding natural, social, and economic environments. Additionally, an Environmental Assessment Worksheet (EAW) is mandatory under the Minnesota Environmental Policy Act (MEPA) because of the construction of a new airport runway.

The EA/EAW is prepared in accordance with the provisions procedural provisions of NEPA and MEPA, and the Federal Aviation Administration (FAA) must evaluate the EA/EAW under NEP and issue a Finding of No Significant Impact (FONSI), and a Negative Declaration on the Need for an Environmental Impact Statement (EIS) must be issued, or otherwise an EIS must be prepared.

A number of federal and state approvals are necessary in order for the project to move forth. A public hearing for the EA/EAW will be held April 4, and written statements regarding the EAW will be accepted by MAC through April 19.

ISSUE BEFORE COUNCIL:

Staff has no comment regarding the Draft Federal Environmental Assessment/State of Minnesota Environmental Assessment Worksheet for Runway 14-32 Relocation and Associated Improvements at Lake Elmo Airport in Baytown and West Lakeland Townships, MN.

PROPOSAL DETAILS/ANALYSIS:

Need. The need for the proposed improvements is based on the following deficiencies at the existing facility:

- 1) The existing runway and taxiway pavement is deteriorating and needs to be replaced.
- 2) Runway 14/32 has several incompatible land uses within its runway protection zones (RPZs), including a railroad and two public roads.
- 3) The existing pavement and airfield geometry, including runway lengths, aprons, taxiways, engine run-up pads, and other associated pavements, do not meet the needs of Airport users and aircraft.
- 4) The existing instrument approach procedures do not use the latest available navigational technology.

The proposed action should address these deficiencies by achieving the project goals and the following four supporting objectives:

- 1) Improve the runway and taxiway pavement condition;
- 2) Minimize incompatible land uses in the RPZs;
- 3) Meet runway length needs for users; and
- 4) Upgrade the instrument approach procedures.

Comment. Staff has no comments regarding the proposed improvements. In the long term, the proposed improvements will be of benefit to the city, particularly in regards to minimizing incompatible land uses in the RPZs. Aside from a small reduction of habitat for birds and wildlife, no significant climate impacts, impacts to farmlands, hazardous materials or solid waste impacts, environmental justice or disproportionate health or expected safety risks to children, significant visual effects, impacts to archaeological resources are anticipated. Construction noise would be temporary and minimized and mitigated through implementation of appropriate construction practices, and there will be contract provisions requiring noise mitigation. Mitigation practices will be made to protect relevant federal and state protected species, biological resources, and wetlands. Best management practices will be in place to manage and treat runoff and control erosion and exposed soils.

RECOMMENDATION:

Staff recommends, as part of tonight's consent agenda, that the City make no comment regarding Draft Federal Environmental Assessment (EA)/State of Minnesota Environmental Assessment Worksheet for Runway 14/32 Relocation Extension & Associated Improvements. If removed from the consent agenda, the following recommended motion may be made:

“Move to make no comment regarding the Draft Federal Environmental Assessment (EA)/State of Minnesota Environmental Assessment Worksheet for Runway 14/32 Relocation Extension & Associated Improvements.”

ATTACHMENTS:

1. Draft Federal Environmental Assessment (EA)/State of Minnesota Environmental Assessment Worksheet for Runway 14/32 Relocation Extension & Associated Improvements

DRAFT FEDERAL ENVIRONMENTAL ASSESSMENT (EA) /
STATE OF MINNESOTA ENVIRONMENTAL ASSESSMENT WORKSHEET (EAW)
FOR
RUNWAY 14/32 RELOCATION/EXTENSION & ASSOCIATED IMPROVEMENTS
at Lake Elmo Airport in Baytown & West Lakeland Townships, Minnesota
prepared by Mead & Hunt, Inc. under contract with the Metropolitan Airports Commission
February 2018

The proposed action consists of the following components:

- Relocate Runway 14/32 by shifting 615 feet to the northeast and extend to 3,500 feet, including grading, clearing, and runway lighting.
- Extinguish existing prescriptive easement for 30th Street North and seek, as appropriate, a land release from the Federal Aviation Administration (FAA) to allow realignment of 30th Street North around the new Runway 32 Runway Protection Zone (RPZ) to reconnect with the existing Neal Avenue North intersection.
- Relocate the Airport perimeter fence to reflect the new Runway 32 RPZ.
- Remove the existing north side taxiway and compass calibration pad and construct a new cross-field taxiway to serve the new Runway 14 end, including taxiway lighting and/or reflectors.
- Convert existing Runway 14/32 to a partial parallel taxiway and remove the portion of the existing parallel taxiway south of the Runway 04 threshold.
- Reconstruct Runway 4/22 and extend to 2,750 feet, including necessary lighting and taxiway connectors.
- Construct other taxiways and engine run-up pads as needed to support the relocated Runway 14/32 and extended Runway 04/22, including connector taxiways and a full-length parallel taxiway on the north side of the relocated Runway 14/32, and install taxiway lighting and/or reflectors.
- Relocate the compass calibration pad adjacent to the new partial parallel taxiway (converted Runway 14/32).
- Establish non-precision GPS-based instrument approach procedures to all runway ends not already equipped.
- Provide Runway 14/32 lighting systems with the relocated runway.
- Install medium intensity runway edge lights (MIRL) on Runway 04/22, precision approach path indicators (PAPIs) on the Runway 04, 14, and 22 ends, and runway end identifier lights (REIL) on each end of Runway 04/22.
- Remove approximately 20 acres of on-Airport trees and individual off-Airport trees as necessary to clear trees that penetrate FAA Threshold Siting Surfaces (TSS)/Part 77 approach and transitional surfaces.
- Install obstruction lighting on fixed base operator (FBO) and hangar buildings in the *United States Standard for Terminal Instrument Procedures* (TERPS) departure surface areas beyond Runway 04, 14, and 22 ends.
- Construct an on-Airport access road connecting the north and west building areas.
- Voluntarily explore creation of Rusty Patched Bumble Bee/pollinator habitat on Airport property southwest of proposed 30th Street North realignment.

Chad E. Leque
Director of Environment
Metropolitan Airports Commission

Date

This becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official.

Joshua Fitzpatrick
Environmental Protection Specialist
Federal Aviation Administration

Date

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature 

Date 2-21-18

Title Director - Environment

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Lake Elmo Airport (Federal Aviation Administration (FAA) identifier 21D) is located in east central Minnesota, within Washington County and approximately 20 miles east of downtown St. Paul. See **Figures 1-1** and **1-2** for graphic depictions of the Airport's location. The Airport is owned and operated by the Metropolitan Airports Commission (MAC). Current 21D facilities include two paved runways. Runway 14/32, the primary runway, is 2,849 feet long by 75 feet wide, has a gross weight bearing capacity for single wheel landing gear aircraft of 12,500 pounds or less maximum gross takeoff weight (MGTOG), and has Medium Intensity Runway Edge Lights (MIRL). Runway 04/22, the crosswind runway, is 2,496 feet long by 75 feet wide, has a gross weight bearing capacity for single wheel landing gear aircraft of 12,500 pounds or less MGTOG, and is not lighted. See **Figure 1-3** for a graphic depiction of the current airfield layout.

In addition to the runways, airside facilities at 21D consist of a taxiway system that provides access between the airfield and two landside aviation use areas on the north and west sides of the Airport. A full parallel taxiway (Taxiway "A") is located on the southwest side of Runway 14/32, and a full parallel taxiway (Taxiway "B") is located on the northwest side of Runway 04/22. Both taxiways are 30 to 40 feet wide, constructed of asphalt, and have entrance/exit taxiways connecting to the runways. There is also a north side taxiway that crosses the Runway 14 threshold to connect the two landside areas. 21D does not have an on-site Air Traffic Control Tower (ATCT) facility, and with no ATCT there are limited records that provide detailed information concerning aviation activity at the Airport. The Airport's most recent FAA Form 5010-1, *Airport Master Record*, reports 192 based aircraft, including 183 single-engine aircraft, 6 multi-engine aircraft, and 3 helicopters.

The MAC recently completed a Long-Term Comprehensive Plan (LTCP) for the Airport, which was approved by the MAC Board in September 2016. The LTCP evaluated all aspects of the Airport, including both airside and landside facilities. The LTCP concluded that Runway 14/32 needs to be relocated and extended to 3,500 feet, and that Runway 04/22 needs to be extended to 2,750 feet. The LTCP also identified the need for GPS-based non-precision instrument approach procedures serving both runways.

Federal financial participation in projects listed in the LTCP, through the Airport and Airway Improvement Act of 1982 (AIP), requires environmental review under the National Environmental Policy Act (NEPA) and FAA approval of the Airport Layout Plan elements associated with the proposed action evaluated under NEPA. An Environmental Assessment (EA) is a document that determines and evaluates the effects of a proposed action on the surrounding natural, social, and economic environments. This EA has been prepared in accordance with the requirements of Title V of Public Law 97-248 of the Airport and Airway Improvement Act of 1982, NEPA, and FAA Order 5050.4B, *National Environmental Policy Act Implementing Instructions for Airport Actions* (April 2006). The document also meets the requirements of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, dated July 2015.

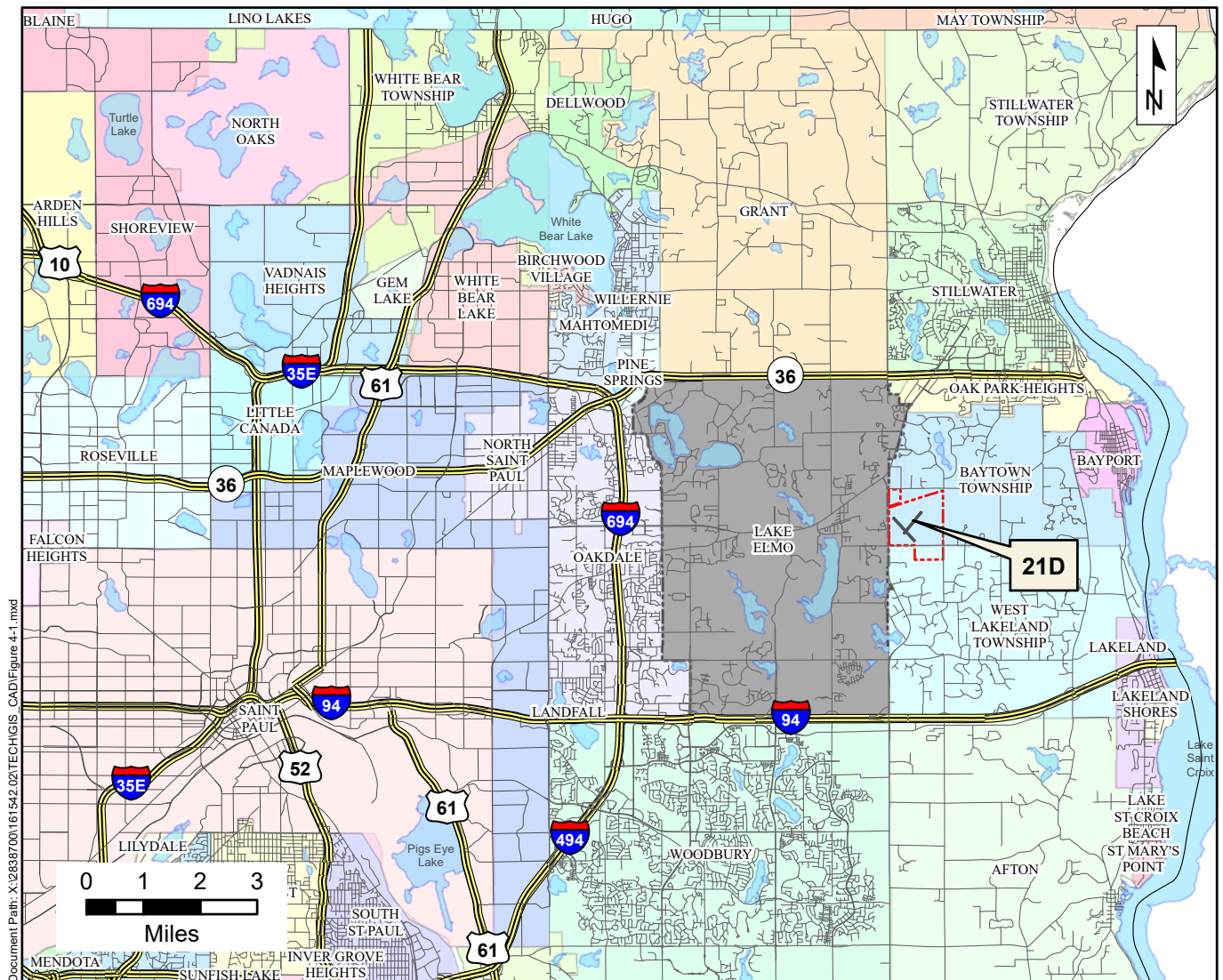
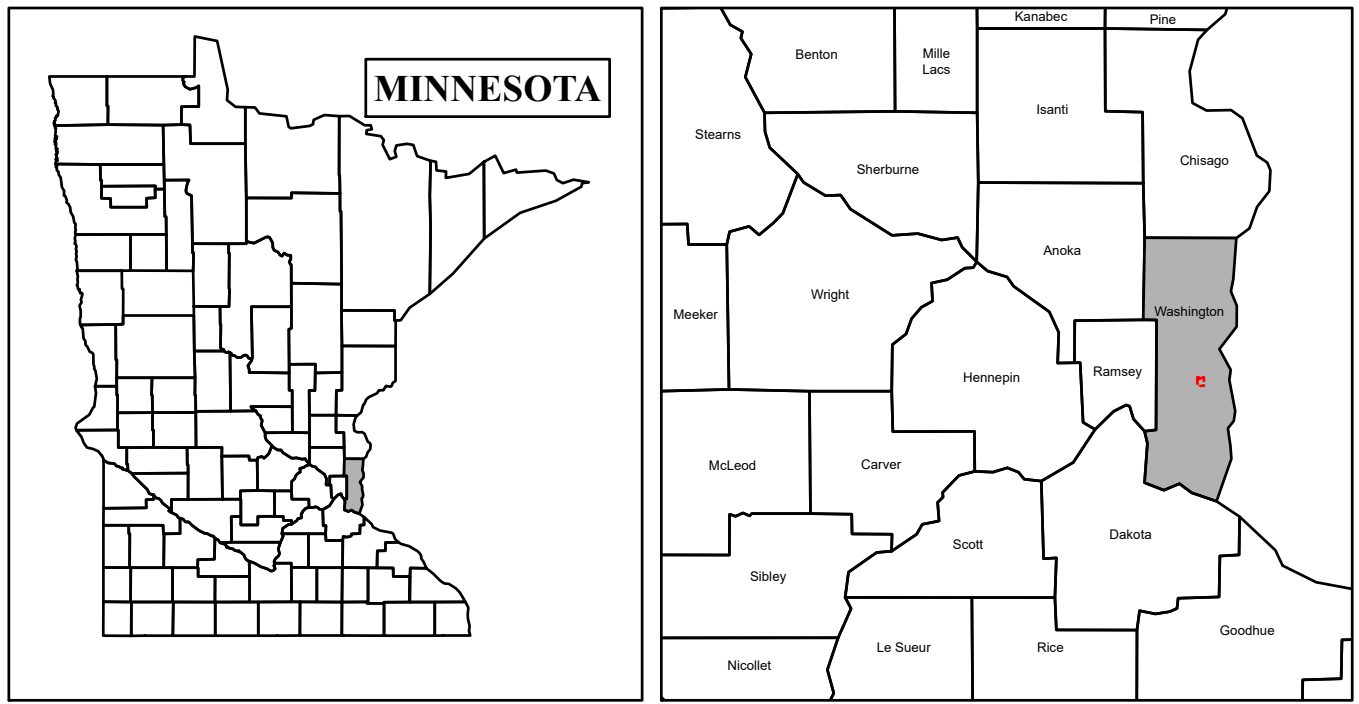
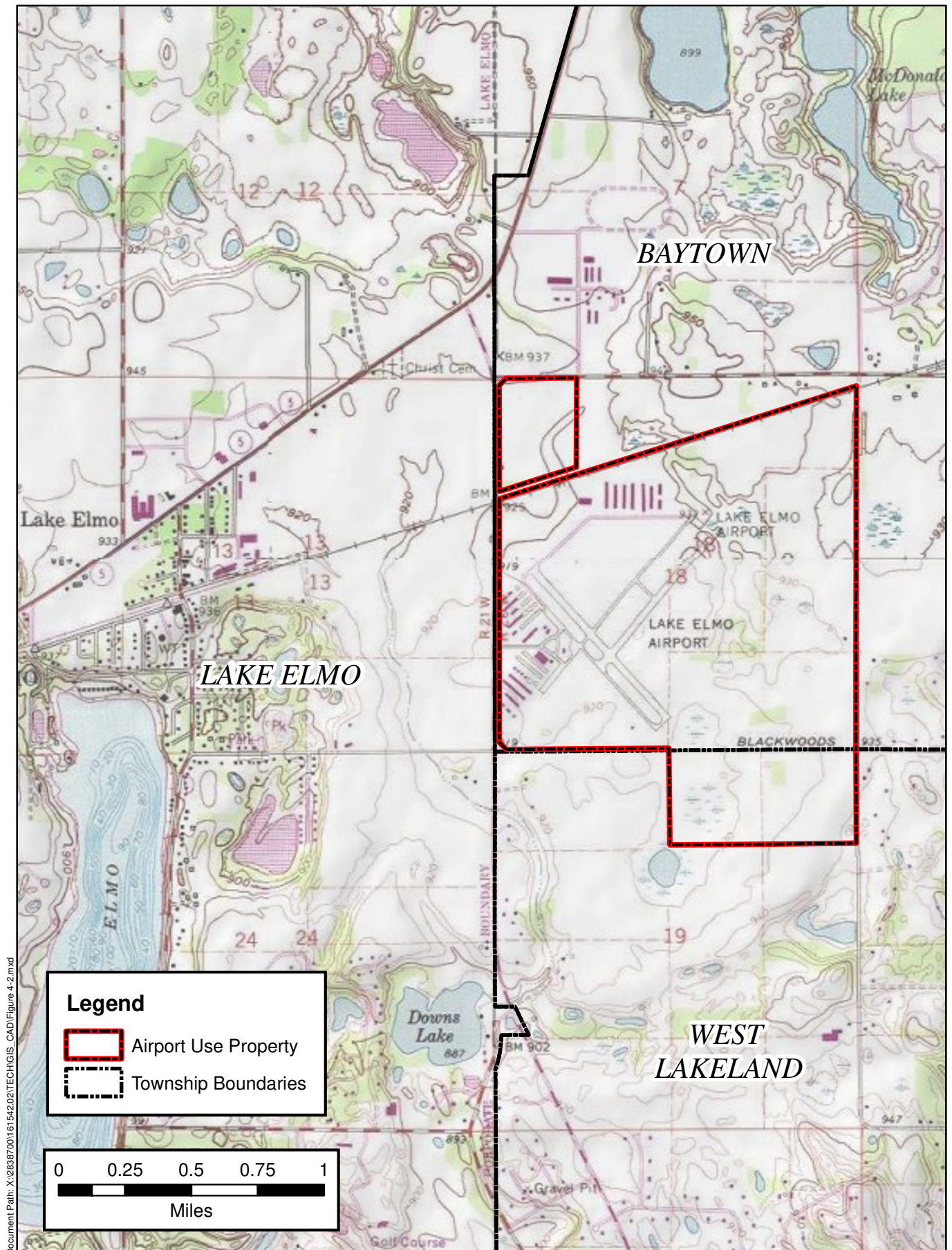
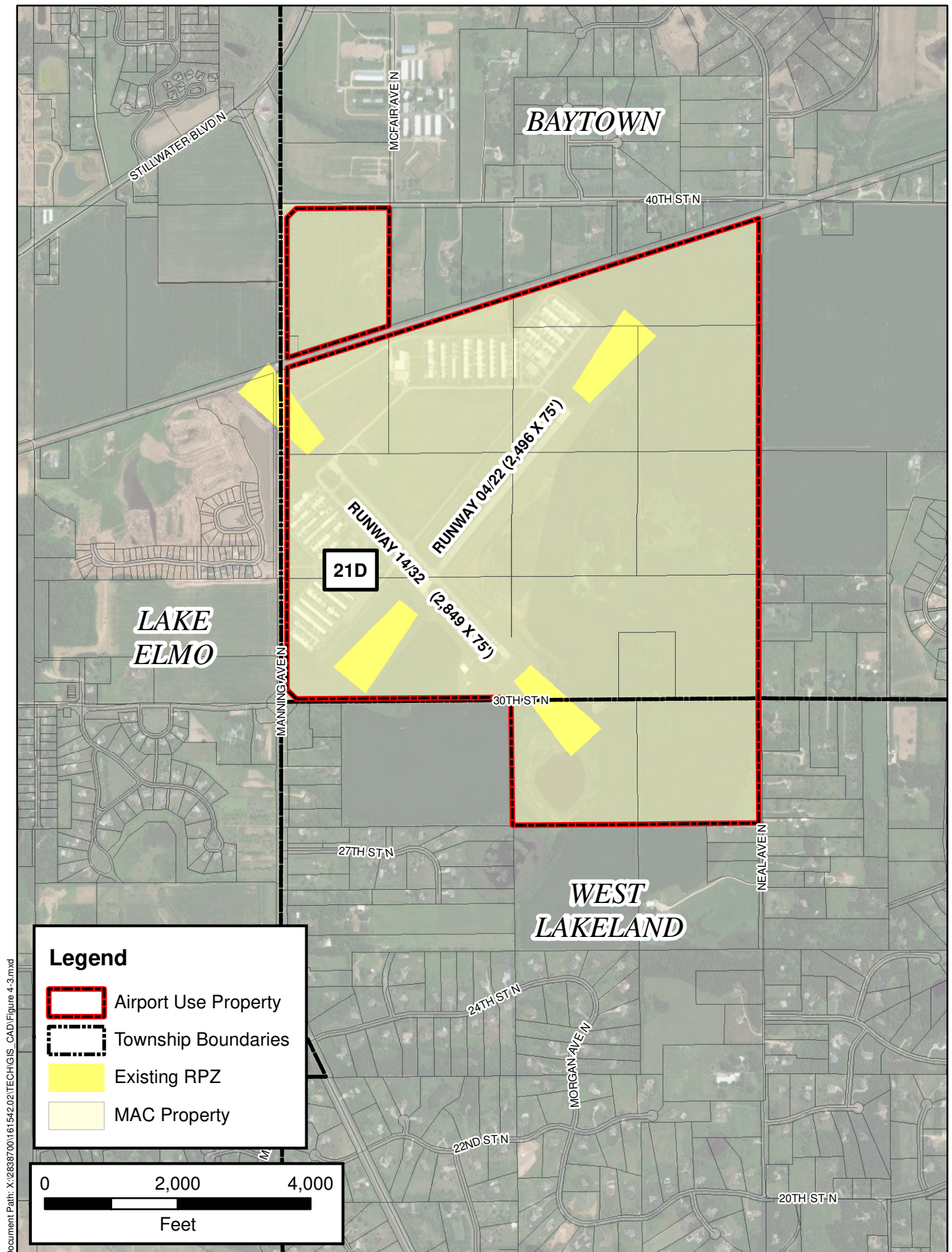


FIGURE 1-1
 County Location
 Lake Elmo Airport
 Environmental Assessment



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FIGURE 1-2
Topographic Map
Lake Elmo Airport
Environmental Assessment



Washington County, MN - GIS Data Downloads at
http://maps.co.washington.mn.us/arcgis/services/Public/Public_Parcels

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar
 Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
 GIS User Community

FIGURE 1-3
 Current Airfield
 Lake Elmo Airport
 Environmental Assessment

This document has also been prepared under the Minnesota Environmental Policy Act (MEPA), which requires the Minnesota Department of Transportation (MnDOT) and other state agencies to consider the environmental effects of its actions. Based on criteria contained in Minnesota Rule 4410, Subpart 21, an Environmental Assessment Worksheet (EAW) is mandatory under MEPA “for construction of a paved, new airport runway.” According to Minnesota Rule 4410.1300, the MAC may circulate a federal EA in place of the EAW form, provided the EA addresses each of the environmental effects identified in the EAW form. This EA fulfills the informational requirements of the EAW and contains the Minnesota EAW content, as provided in Minnesota Rule 4410.1200. Informational requirements for each section of the EAW form are cross referenced with appropriate sections of this EA/EAW in Chapter 6.

Because this EA addresses both NEPA and MEPA, the document is hereinafter referred to as the “EA/EAW.” The intent of the EA/EAW is to provide the environmental documentation necessary to assist local, state and federal officials in evaluating the proposed action at 21D. The proposed action is evaluated along with a full range of alternatives to identify a preferred alternative which meets the project purpose and need. This analysis includes identification of measures to avoid, minimize, and mitigate possible environmental impacts.

The EA/EAW is prepared in accordance with the procedural provisions of NEPA and MEPA. The FAA must evaluate this EA/EAW under NEPA and issue a Finding of No Significant Impact (FONSI), or prepare a federal Environmental Impact Statement (EIS). The MAC must evaluate this EA/EAW under MEPA and issue a Negative Declaration on the Need for an EIS or prepare a Minnesota EIS.

Several federal approvals are required before the proposed improvements at 21D are implemented. The FAA Airports Division is responsible for the approval of airport plans, administration of airport development grants, and environmental approvals under NEPA. These approval decisions include approval of an Airport Layout Plan that reflects the proposed action, as well as environmental concurrence to support issuance of federal grant-in-aid funds to the MAC for eligible airport development projects. Similarly, several state approvals are required before the proposed improvements at 21D are implemented. A list of all federal and state approvals necessary for the proposed project is found in Chapter 5, Table 5-6 of this EA/EAW.

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2.1 Purpose

The purpose of the proposed action at Lake Elmo Airport (Federal Aviation Administration (FAA) identifier 21D, or “the Airport”) is to pursue the following three general infrastructure goals:

- 1) Address failing, end-of-life infrastructure;
- 2) Enhance safety for Airport users and neighbors; and
- 3) Improve facilities for the family of aircraft using the Airport.

2.2 Need

The need for the proposed action is based on the following four deficiencies at the existing facility:

- 1) The existing runway and taxiway pavement is deteriorating and needs to be replaced.
- 2) Runway 14/32 has several incompatible land uses within its runway protection zones (RPZs), including a railroad and two public roads.
- 3) The existing pavement and airfield geometry, including runway lengths, aprons, taxiways, engine run-up pads, and other associated pavements, do not meet the needs of Airport users and aircraft.
- 4) The existing instrument approach procedures do not use the latest available navigational technology.

The proposed action should address these deficiencies by achieving the project goals and the following four supporting objectives, as defined in the following subsections:

- 1) Improve the runway and taxiway pavement condition;
- 2) Minimize incompatible land uses in the RPZs;
- 3) Meet runway length needs for users; and
- 4) Upgrade the instrument approach procedures.

2.2.1 Improve the Runway and Taxiway Pavement Condition

Lake Elmo Airport’s primary runway (Runway 14/32) was originally paved in 1951 and its crosswind runway (Runway 04/22) was originally paved in 1967. Since the original construction, the runway pavement has been maintained, repaired, and rehabilitated as needed but has never been fully reconstructed. A pavement evaluation completed for the Airport in 2016 assigned average pavement condition index (PCI) ratings between 41 and 60 for both runways, and PCI ratings ranging from 21 to 60 for several taxiways. The PCI indicates the condition of an airport pavement on a scale ranging from zero to 100 based on visual inspection, with zero representing pavements that are not usable because of advanced deterioration and 100 representing pavements in excellent condition.

The standard PCI rating scale identified by FAA guidance is summarized in **Table 2.1**. The 2016 Airport PCI map is shown in **Figure 2.1**. The subgrade material for both runways, as well as associated parallel and connector taxiways, has been compromised over time. In addition, the freeze-thaw movements of the pavement in the spring and fall are causing a growing safety risk for Airport users and maintenance personnel, as cracks shift up and down, creating edges that can catch a snowplow blade. Once pavement reaches fair condition, pavement deterioration begins to accelerate and pieces of loose aggregate often become present in the airport operating environment. Loose aggregate can cause aircraft damage and personal injury by cutting aircraft tires, being ingested by aircraft engines, lodging in mechanisms affecting airport operations, or being thrown by aircraft propellers and engines. Once the PCI falls below 40, reconstruction is imminent. As such, in this case the proposed action should include replacing the pavement for both runways, as well as their associated parallel and connector taxiways, to facilitate continued use of the runways throughout a 20-year design life. In pavement design, the term “design life” typically refers to the period that the pavement is able to provide an acceptable level of service. The FAA standard for airfield pavement design life is 20 years.

Table 2.1. Standard Pavement Condition Index (PCI) Rating Scale

PCI Rating	Condition
0-10	Failed
11-25	Serious
26-40	Very Poor
41-55	Poor
56-70	Fair
71-85	Satisfactory
86-100	Good

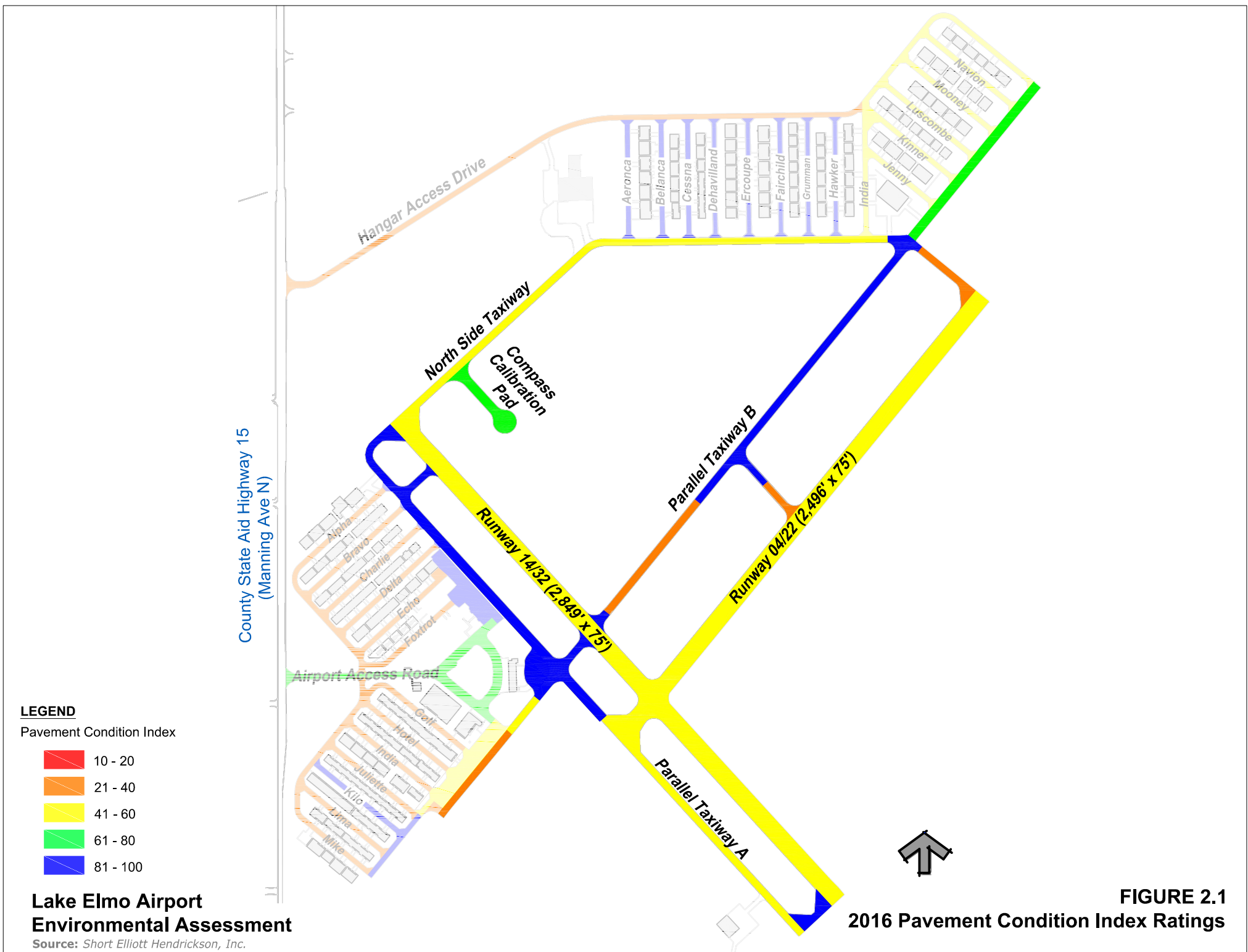
Source: FAA Advisory Circular 150/5380-7B, Airport Pavement Management Program

2.2.2 Minimize Incompatible Land Uses in the RPZs

Runway protection zones (RPZs) are trapezoidal areas prior to the runway threshold or beyond the runway end, the purpose of which is to enhance the safety and protection of people and property on the ground. In September 2012, the FAA issued new guidance regarding land uses within an RPZ. This new guidance states that coordination with the regional and national FAA offices is required when specific incompatible land uses would enter the limits of an RPZ because of:

- An airfield project (e.g. runway extension, runway shift);
- A change in the critical design aircraft that increases the RPZ dimensions;
- A new or revised instrument approach procedure that increases the RPZ dimensions; or
- A local development proposal in the RPZ (either new or reconfigured).

Coordination with FAA is required for new or modified land uses in an RPZ, which must be formally accepted by FAA prior to development. The purpose of this coordination is to minimize risk associated with location of incompatible land uses within the RPZ. Land uses requiring FAA coordination include transportation facilities such as railroads, public roads, and highways, buildings and structures, recreational land uses, fuel storage facilities, hazardous materials storage, wastewater treatment facilities, and aboveground utility infrastructure. As described in FAA’s September 2012 policy memorandum, “although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses.”



Lake Elmo Airport is bordered by the Union Pacific Railroad to the north, County State Aid Highway (CSAH) 15 (Manning Avenue North) to the west, and 30th Street North to the south, all of which enter the Runway 14/32 RPZs as shown on **Figure 2.2**. A recent safety improvement study completed by Washington County has identified the need to expand CSAH 15 from two lanes to four lanes, which would require FAA approval if it were to occur within the RPZ. There is also private property in the Runway 14 RPZ west of CSAH 15. Because the MAC does not control this property by either fee simple ownership or easement, there is potential for RPZ incompatibility should development be proposed on this property. The proposed action should remove or mitigate existing incompatible uses in the RPZs, and prevent future incompatible uses from entering the RPZs.

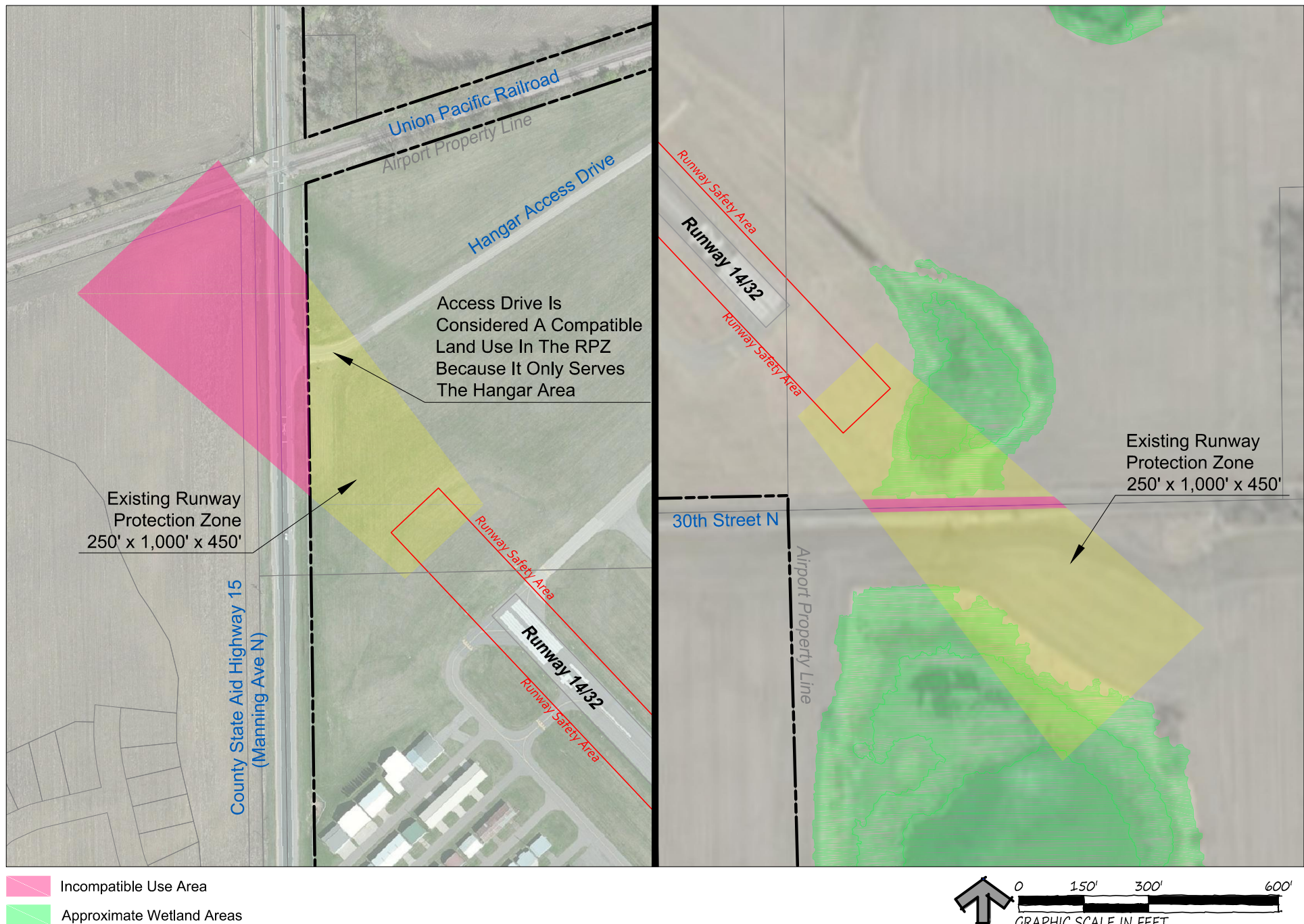
2.2.3 Meet Runway Length Needs for Aircraft Users

Runway 14/32 is currently 2,849 feet long, and Runway 04/22 is currently 2,496 feet long. These lengths do not meet Airport user needs associated with the critical aircraft for each runway. Runway length at a specific airport is defined based on the performance requirements of its critical aircraft types. Aircraft performance requirements vary based on weather conditions, flight origin or destination, and desired fuel, passenger, and cargo loads. The “critical aircraft” with respect to runway length is defined by FAA Advisory Circular (AC) 150/5000-17, *Critical Aircraft and Regular Use Determination*, as “the single aircraft, or grouping of aircraft with similar operational requirements, that have the longest runway length requirement that makes regular use of the runway.”

According to FAA AC 150/5325-4B, *Runway Length Recommendations for Airport Design*, Section 103, “the design objective for the main primary runway is to provide a runway length for all airplanes that will regularly use it without causing operational weight restrictions.” Section 104 of the AC states that crosswind runway lengths at general aviation airports such as 21D should be determined based on the “lower crosswind capable airplanes using the primary runway.”

Primary Runway Length

The operational fleet at Lake Elmo Airport consists of propeller-driven aircraft that weigh less than 12,500 pounds and have fewer than 10 passenger seats. FAA AC 150/5325-4B states that the length of primary runways intended for aircraft weighing less than 12,500 pounds should be designed based on a family grouping of small airplanes. The critical aircraft for determining runway length is “the listing of airplanes (or a single airplane) that results in the longest recommended runway length.” The family of aircraft used to determine the appropriate primary runway length at 21D includes the turboprop and multi-engine piston aircraft types listed in **Table 2.2** on Page 2-6, which represent the more demanding aircraft within the operational fleet. A detailed runway length analysis was completed for this family of airplanes and is found in **Appendix A**.



0 150' 300' 600'

GRAPHIC SCALE IN FEET

FIGURE 2.2
Existing RPZ Incompatible Land Uses

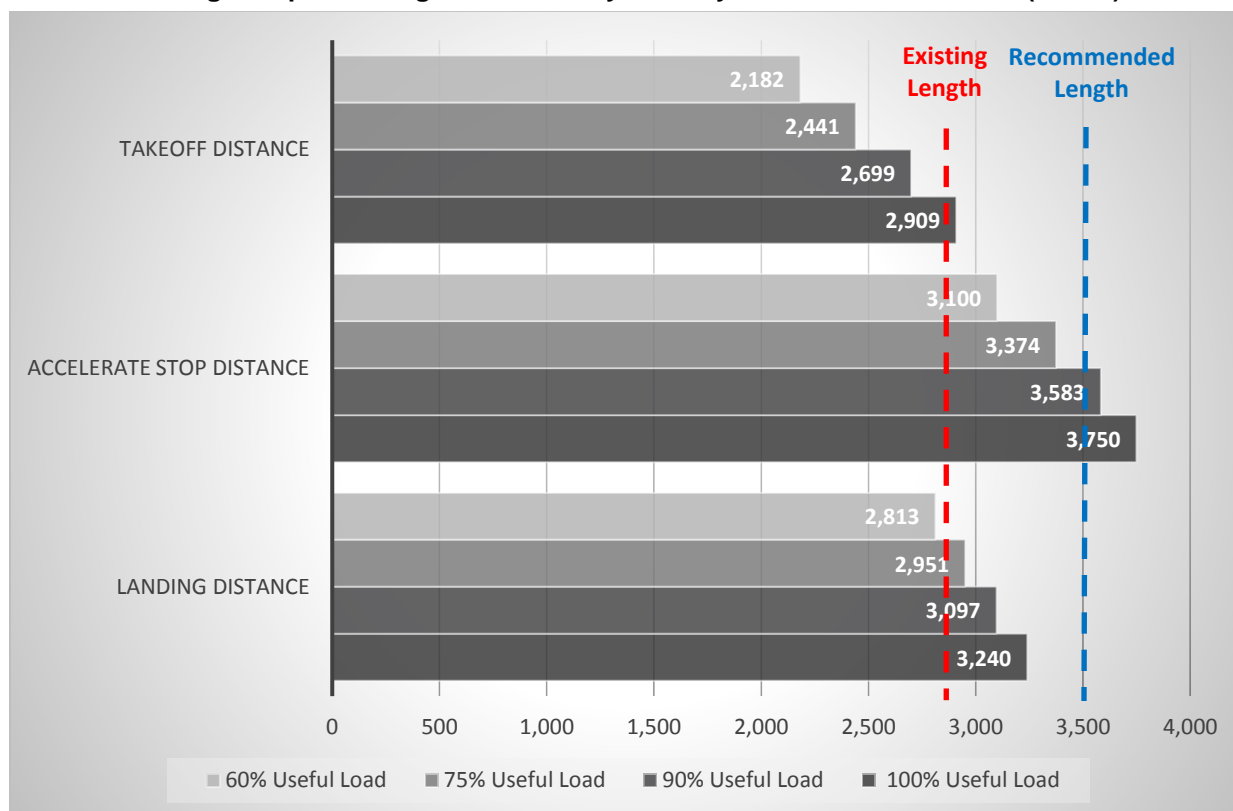
Table 2.2. Primary Runway Critical Aircraft					
Aircraft Model	Engine Type	Maximum Takeoff Weight (pounds)	Operating Empty Weight (pounds)	Maximum Useful Load (pounds)	Passenger Seat Range
Beechcraft King Air 200	Multi - Turboprop	12,500	8,750	3,750	7 to 9
Pilatus PC-12	Single - Turboprop	9,921	5,468	4,453	7 to 9
Cessna 421C	Multi - Piston	7,450	4,501	2,949	6 to 8
Socata TBM 700	Single - Turboprop	7,394	6,032	1,362	4 to 6
Piper PA 31P-350 Chieftain	Multi - Piston	7,000	4,319	2,681	5 to 7
Cessna 414A	Multi - Piston	6,750	4,365	2,385	6 to 8
Cessna 340	Multi - Piston	6,000	3,921	2,079	4 to 5
Cessna 310R	Multi - Piston	5,500	3,260	2,240	5 to 6
Beechcraft Baron G58	Multi - Piston	5,500	4,030	1,470	4 to 6
Piper PA-30 Twin Comanche	Multi - Piston	3,600	2,160	1,440	4 to 6

Sources: Aircraft Manufacturers

The primary runway length analysis considered critical aircraft needs for three operational scenarios:

- 1) *takeoff distance*, which represents the length required for an airplane to accelerate from a stopped position past lift off to start of takeoff climb;
- 2) *accelerate stop distance*, which represents the length required for an airplane to accelerate to a specified velocity and then decelerate to a stop (also known as aborted takeoff distance); and
- 3) *landing distance*, which represents the distance from the threshold required for an airplane to complete the approach, touchdown, and decelerate to a stop.

These distances were calculated for all primary runway critical aircraft types listed in **Table 2.2** based on the actual 21D airport elevation, typical summer month average high temperatures, and still air conditions. Landing distance calculations were also adjusted to account for reduced braking action associated with wet and slippery pavement conditions, as well as to allow landing within 70 percent of the available runway length. Each distance was determined for various useful loads (consisting of passengers, cargo, and fuel) ranging from 60 to 100 percent. The average operational distances for the primary runway critical aircraft types are summarized in **Chart 2.1** on Page 2-7. The length of the existing primary runway at Lake Elmo Airport is 2,849 feet. Based on the distances shown in this chart, the proposed action should provide a primary runway length of 3,500 feet to allow a measure of safety for aborted takeoff operations at Lake Elmo Airport, as well as a measure of safety for landing operations when the runway is wet and slippery.

Chart 2.1: Average Required Lengths for Primary Runway Critical Aircraft at 21D (in feet)

Source: Aircraft Manufacturers, Mead & Hunt

Crosswind Runway Length

The family of aircraft used to determine the appropriate crosswind runway length at 21D includes the single-engine piston aircraft types listed in **Table 2.3** on Page 2-8, which represent the lower crosswind capable airplanes using the primary runway. Small aircraft are particularly vulnerable to crosswind hazards, especially when taking off and landing, because of their lighter weight and slower speeds. The crosswind runway length analysis only considered takeoff distance at maximum takeoff weight, given the relatively lightweight nature of the aircraft and longer distances required for takeoff when compared to landing. These distances are listed for each aircraft in **Table 2.3**. The length of the existing crosswind runway at Lake Elmo Airport is 2,469 feet. Based on the recommended takeoff lengths for the smaller and lighter aircraft types identified in **Table 2.3**, an extended runway length of 2,750 feet would more adequately accommodate crosswind operations at Lake Elmo Airport.

Table 2-3. Crosswind Runway Critical Aircraft		
Aircraft Model	Maximum Takeoff Weight (pounds)	Takeoff Distance Requirements¹ (feet)
Piper PA-34 Seneca	4,570	3,000
Piper PA-46 Malibu	4,340	2,800
Lancair IV	3,850	2,800
Piper PA-30 Twin Comanche	3,600	3,600
Cirrus SR22	3,600	3,300
Beechcraft Bonanza 33	3,400	2,750
Mooney M20TN	3,368	2,450
Piper PA-28 Cherokee	2,550	2,300
Cessna 172	2,300	1,750

¹ Takeoff Length based on: Airport Elevation of 932 MSL, 30° Celsius, 10 knot headwind

Source: Aircraft Manufacturers, Mead & Hunt

2.2.4 Upgrade the Instrument Approach Procedures

Satellite-based global positioning system (GPS) technology has improved to the point where it provides instrument approach performance comparable to ground-based, on-airport electronic navigational aids, without changing geometric airport design or lighting requirements. The south end of the primary runway at Lake Elmo Airport (Runway 32) currently supports a GPS-based instrument approach procedure. However, there are no GPS-based approaches to any of the other three runway ends at the Airport. The proposed action should establish GPS-based instrument approach procedures to the Runway 14, 04, and 22 ends. This would allow safer aviation access to the Airport, especially during inclement weather, and would position the Airport to better serve its users in the future.

To maximize the effectiveness of these procedures, medium intensity runway edge lights (MIRL) should be installed on Runway 04/22; precision approach path indicators (PAPI) should be installed on the Runway 04, 14, and 22 ends; and runway end identifier lights (REIL) should be installed at each end of Runway 04/22. The REIL systems would provide effective identification of the runway end for pilots approaching the Airport; the PAPI systems would provide visual approach slope information to help pilots maintain a stabilized approach along the prescribed glide path; and the MIRL systems would outline the edges of the runways in periods of darkness or under restricted visibility conditions.

The proposed action will also remove any trees that penetrate the FAA Threshold Siting Surfaces (TSS)/Part 77 approach and transitional surfaces for each runway end. Removing these trees is designed to reduce potential visibility and cloud ceiling minimums for the new instrument approach procedures, thereby increasing their availability during inclement weather.

FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, provides specific direction on the consideration of alternatives in an EA under NEPA. The alternatives chapter of an EA is based on the purpose and need statement; compares the no action, the proposed action, and reasonable alternatives (if any); and identifies each reasonable alternative's expected environmental effects. This chapter compares a range of alternatives and evaluates them based on operational, environmental, and implementation feasibility factors. The result of the evaluation is the selection of a preferred alternative for further evaluation of environmental impacts. The alternatives are presented and analyzed in the following sections:

- Process for Identifying Alternatives, Section 3.1;
- Range of Alternatives Considered, Section 3.2;
- Evaluation of Primary Runway Alternatives, Section 3.3; and
- Preferred Alternatives / Proposed Action, Section 3.4.

MEPA does not require that an EAW consider alternatives.

3.1 Process for Identifying Alternatives

In 2016, the MAC adopted a Long Term Comprehensive Plan (LTCP) for Lake Elmo Airport. The LTCP identified future facility needs for the 20-year planning period between the years 2015 and 2035, and included an extensive analysis of alternatives for achieving the same objectives described in Chapter 2 of this EA/EAW. A Draft 2035 LTCP was issued for public review and comment on June 22, 2015, which identified a preferred alternative for meeting these objectives. The MAC held two public information meetings in July 2015 to provide information about the draft plan to interested citizens. The initial public comment period closed on September 16, 2015, after being extended to provide additional time for community input.

In response to community input, the MAC developed a refined preferred alternative. An Addendum to the Draft 2035 LTCP was prepared to describe the features of and rationale behind the development of the refined preferred alternative. The MAC issued this Addendum for public review and comment on January 25, 2016. The MAC held a supplemental public information meeting in February 2016 to provide additional information to interested citizens about the refined development concept. The second public comment period closed on March 9, 2016, and the Final LTCP was adopted by the MAC Board in September 2016.

The LTCP process is a planning process. It is not an environmental review process and does not satisfy the requirements of NEPA or MEPA. As a result, when the MAC decided in early 2017 to move forward with upgrades at the Lake Elmo Airport, the MAC commenced an environmental review process under NEPA and MEPA.

At the outset of the NEPA and MEPA process in early 2017, the MAC decided to take a fresh look at the Final LTCP preferred alternative and generate supplemental alternatives, as appropriate, for inclusion in this EA/EAW. The purpose of this supplemental planning effort was to: 1) respond to public comments received during the second LTCP public comment period; 2) confirm the range of alternatives developed for the LTCP is adequate for compliance with NEPA and MEPA; and 3) identify any refinements to the project concept that may reduce environmental impacts when compared to the Final LTCP preferred alternative.

3.2 Range of Alternatives Considered

This section summarizes the range of alternatives considered by this EA/ EAW, which resulted from the recently completed LTCP and supplemental planning processes described in Section 3.1. FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, states that each alternative considered “must meet basic criteria for any alternative: it must be reasonable, feasible, and achieve the project purpose.” For this EA/ EAW, the range of alternatives is limited by the following criteria:

- 1) **Avoid or Minimize Changes to Airport Use and Aircraft Flight Patterns.** Alternatives that would substantially change airport use or aircraft flight patterns are not considered reasonable or feasible by this EA/ EAW.
- 2) **Maintain Runway 14/32 and 04/22 Orientations.** Re-orienting either of the runways would substantially increase the cost of the project because much of the existing airport infrastructure would need to be reconstructed along the new orientations. Therefore, alternatives that would re-orient either runway are not considered reasonable or feasible by this EA/ EAW.
- 3) **Avoid or Minimize Land Acquisition.** Because alternatives exist that would meet the purpose and need without requiring land acquisition, alternatives that would require land acquisition are not considered reasonable or feasible by this EA/EAW.

The range of alternatives considered by this EA/EAW include the following:

- No-Action Alternative
- Off-Site Alternatives
- Primary Runway Alternatives
- 30th Street North Alternatives
- Crosswind Runway Alternatives
- Instrument Approach Alternatives

3.2.1 No-Action Alternative

The no-action alternative represents what would occur if the MAC were to maintain the existing airfield configuration and runway lengths at Lake Elmo Airport, including reconstruction of the existing runway and taxiway pavements, to maintain safety and operational capacity. This alternative was eliminated from further consideration because it: 1) does not meet the runway length needs of Airport users; and 2) does not address existing incompatible land uses in both runway protection zones (RPZs) for Runway 14/32. This alternative is not recommended by this EA/EAW because it would not meet the purpose and need. However, as the CEQ regulations require, this alternative will be carried forward for comparison with the other alternatives. The no-action alternative is studied in more detail under Section 3.3.2 of this EA/EAW.

3.2.2 Off-Site Alternatives

Relocate Airport. It is considered impractical to find a suitable site in the northeastern part of the metro area that would accommodate the based and transient general aviation users of Lake Elmo Airport. The site would have to be in a rural area (such as the current site when it was acquired in 1949) with the ability to control existing and future land use around the Airport and maintain compatibility with Airport operations. The Airport currently comprises approximately 640 acres of land. The development of a new site to replace the Airport's size and function would likely require substantial impacts to one or more environmental resources such as wetlands, woodlands, surface waters, natural areas, farmlands, public parks, and existing urban infrastructure. Relocating the Airport may also result in incompatible land uses when considering FAA and MnDOT design standards and zoning criteria. Closing the Airport would mean abandoning substantial public and private investment in the Airport site and burden existing tenants by forcing them to relocate to the new airport. Furthermore, because of land acquisition and other costs associated with construction of a new airport, this alternative is not practicable or feasible. For these reasons, this alternative was not considered further.

Utilize Alternate Existing Airports. Under Minnesota Statutes 473.602, the MAC is invested with a legislative mandate to “promote the public welfare and national security; serve public interest, convenience, and necessity; promote air navigation and transportation, international, national, state, and local, in and through this state; promote the efficient, safe, and economical handling of air commerce; assure the inclusion of this state in national and international programs of air transportation; and to those ends to develop the full potentialities of the metropolitan area in this state as an aviation center, and to correlate that area with all aviation facilities in the entire state so as to provide for the most economical and effective use of aeronautic facilities and service in that area.” In addition, under Minnesota Statutes 473.608, subd. 27, the MAC must “develop and implement a plan to divert the maximum feasible number of general aviation operations from Minneapolis-St. Paul International Airport to those airports designated by the federal aviation administration as reliever airports for Minneapolis-St. Paul International Airport.”

Lake Elmo Airport is an important part of the MAC's general aviation reliever airports system and serves a vital function in helping MAC fulfill its legislative mandates. It is designated by FAA as a reliever airport for MSP and is one of six MAC system general aviation reliever airports in the Twin Cities metropolitan area. The six relievers include St. Paul Downtown (STP), Anoka County-Blaine (ANE), Flying Cloud (FCM), Crystal (MIC), Airlake (LVN), and Lake Elmo (21D). The purpose of these airports is to relieve congestion at Minneapolis-St. Paul International Airport (MSP) by providing infrastructure to accommodate the region's general aviation needs. To preserve capacity at MSP, it is vital that corporate aviation services be provided at the key relievers (STP, ANE, and FCM). The remaining reliever airports (MIC, LVN, and 21D) complement the key relievers by accommodating personal, recreational, and some business aviation users within a specific service area. Lake Elmo Airport is intended for use primarily by small propeller-driven aircraft. It is the only reliever airport in Washington County, providing the sole direct air connection to the northeast suburbs and outlying areas of the Twin Cities. Use of other reliever airports in lieu of improving Lake Elmo Airport would not address the needs of the metropolitan airport system and would detract from each airport's ability to serve its intended users and area.

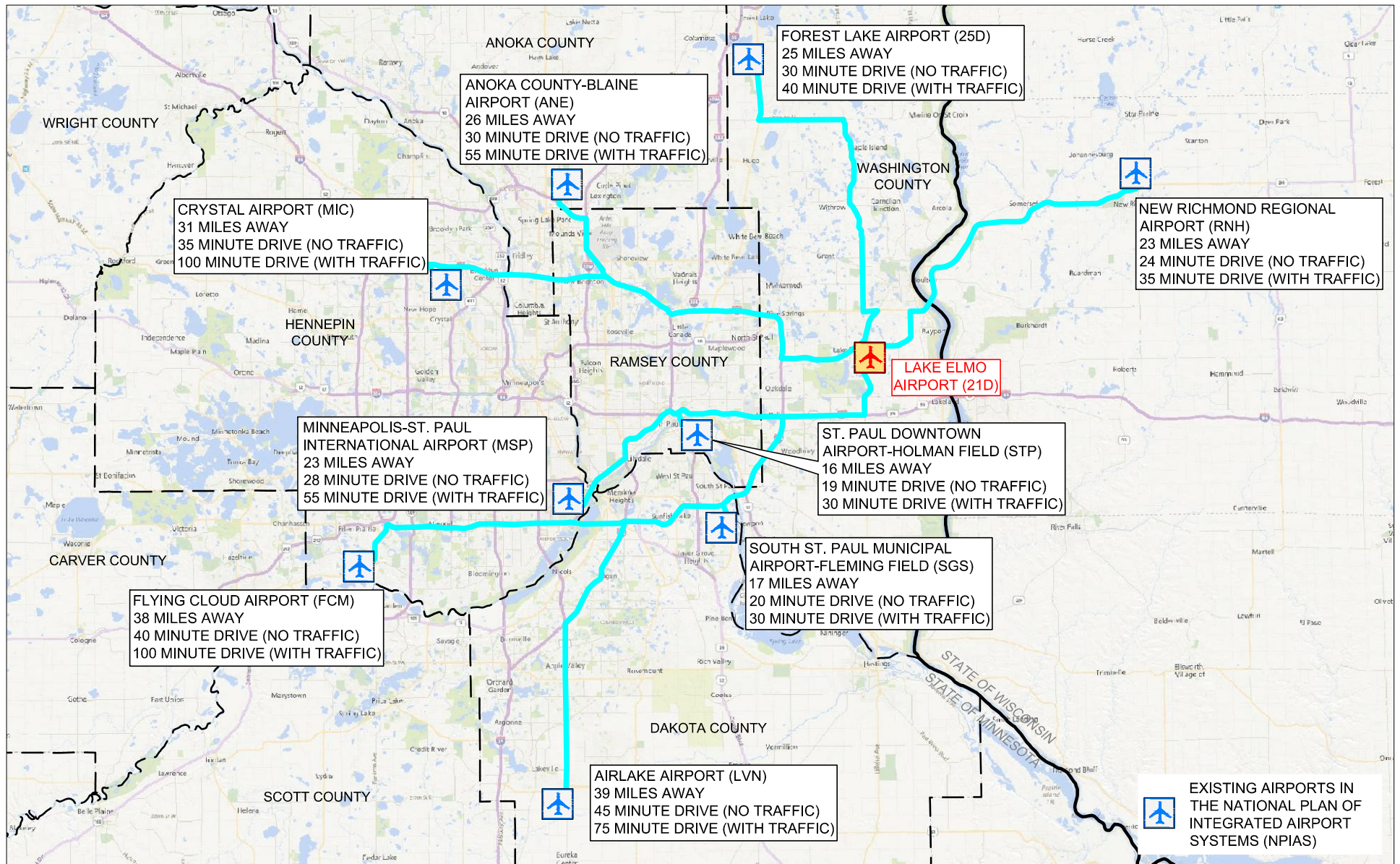
The reliever airports were originally located to accommodate based and transient general aviation users in each airport's service area. FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, states that an airport should be included in the NPIAS if it is more than a 20-mile driving distance, or 30-minute drive time, from the nearest existing or proposed NPIAS airport. The approximate drive distances and times from Lake Elmo Airport to the other six MAC system airports, as well as South St. Paul-Fleming Field (SGS), Forest Lake Airport (25D), and New Richmond Regional Airport (RNH), are listed in **Table 3-1** and shown in **Figure 3-1**. The drive times shown are based on typical current conditions and do not consider future increases in traffic or congestion levels. As shown in the table and figure, peak traffic drive times from Lake Elmo Airport to all nine airports are 30 minutes or greater. Based on this metric, Lake Elmo Airport not only serves a specific function as a reliever airport in MAC's system of airports but also serves a specific geographic area that cannot be adequately served by another existing airport.

Table 3-1: Drive Distances and Times from Lake Elmo Airport to Other Airports			
Airport	Drive Distance	Drive Time	
		No Traffic	With Traffic
St. Paul Downtown (STP)	16 miles	19 minutes	30 minutes
South St. Paul (SGS)	17 miles	20 minutes	30 minutes
New Richmond Regional (RNH)	23 miles	24 minutes	35 minutes
Minneapolis-St. Paul International (MSP)	23 miles	28 minutes	55 minutes
Forest Lake (25D)	25 miles	30 minutes	40 minutes
Anoka County-Blaine (ANE)	26 miles	30 minutes	55 minutes
Crystal (MIC)	31 miles	35 minutes	100 minutes
Flying Cloud (FCM)	38 miles	40 minutes	100 minutes
Airlake (LVN)	39 miles	45 minutes	75 minutes

Source: Google. Note: Drive time scenarios reflect the shortest (no traffic) and longest (with traffic) travel times associated with either morning rush (7am-9am) or evening rush (3pm-6pm) traffic periods for a typical business day, using the departure time and date function.

As noted above, the FAA designates Lake Elmo Airport as a Reliever Airport for MSP, which is defined under 49 U.S. Code §47102 as “an airport the Secretary designates to relieve congestion at a commercial service airport and to provide more general aviation access to the overall community.” The FAA further designates Lake Elmo Airport as a Regional General Aviation Airport, which is defined by the 2012 FAA ASSET study as an airport that “supports regional economies by connecting communities to statewide and interstate markets.” Therefore, Lake Elmo Airport plays important roles within the FAA airport system that cannot be substituted by another airport in the region.

The distances to other airports, the nature of the separate airport functions, and the service areas for each airport limit the feasibility of using one of the airports to off-set the services provided by another. In addition, use of alternate existing airports in lieu of improving Lake Elmo Airport would not meet the project purpose, because it would not: 1) address failing, end-of-life infrastructure; 2) enhance safety for Airport users and neighbors; or 3) improve facilities for the family of aircraft using the Airport. Use of alternate airports would not meet or reduce the needs of based and transient Lake Elmo Airport users. For these reasons, this alternative was not considered further.



3.2.3 Primary Runway Alternatives

This section provides an overview of the primary runway alternatives screened by the LTCP and supplemental alternatives generated at the outset of the NEPA/MEPA process. Each alternative is then evaluated based on a set of screening criteria to determine which alternatives should be discarded and which should be analyzed further.

Draft LTCP Alternatives

The primary runway alternatives from the Draft LTCP are shown in **Figure 3-2** and summarized below.

Primary Runway Alternative A: Extend Runway 04/22 to 3,200 feet

Alternative A considered re-designating Runway 04/22 as the primary runway and Runway 14/32 as the crosswind runway, given there are fewer obstacles to extending Runway 04/22. This alternative would extend Runway 04/22 by 704 feet to the northeast, increasing the runway length from 2,496 to 3,200 feet. Runway 14/32 would be maintained at its existing length and configuration. This was identified as the preferred alternative by the previous LTCP adopted in 2008. This alternative was eliminated from further consideration because it 1) does not meet the runway length needs of Airport users, 2) does not address existing incompatible land uses in both Runway 14/32 RPZs, and 3) does not provide optimal wind coverage on the longer (primary) runway.

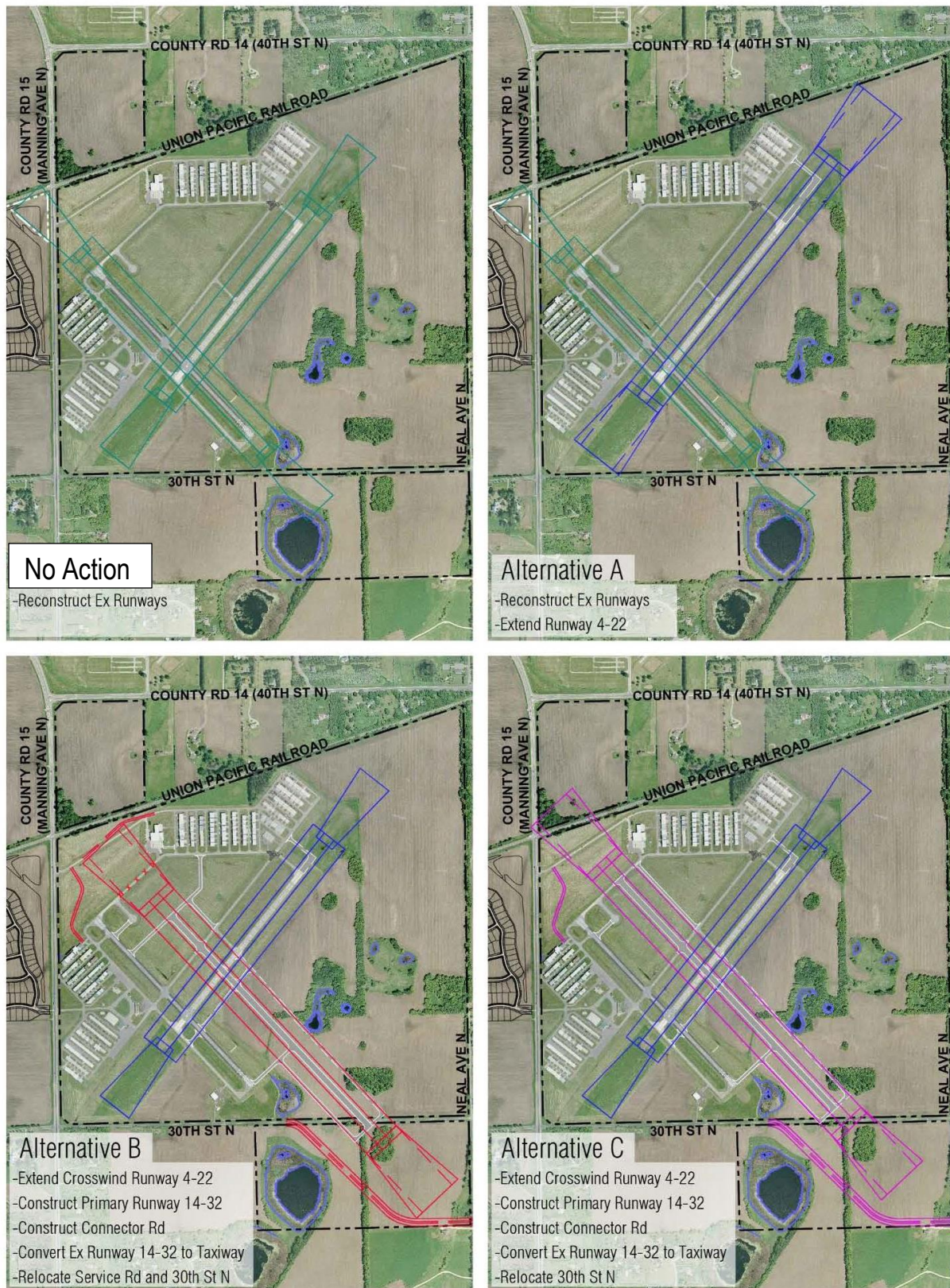
Primary Runway Alternative B: Relocate Runway 14/32 by 700 feet and Extend to 3,600 feet

Alternative B would relocate Runway 14/32 by 700 feet to the northeast and extend the runway by 751 feet to the southeast, increasing the runway length from 2,849 to 3,600 feet. Runway 4/22 would also be extended 254 feet to the northeast for an overall length of 2,750 feet. This was identified as the preferred alternative in the Draft LTCP. Based on public comments received in response to the Draft LTCP, a modified version of this alternative was developed and recommended as described under the Final LTCP Preferred Alternative B1 section below. This alternative is studied in more detail under Section 3.3.3 of this EA/EAW.

Primary Runway Alternative C: Relocate Runway 14/32 by 700 feet and Extend to 3,900 feet

Alternative C would relocate Runway 14/32 by 700 feet to the northeast and extend the runway to 3,900 feet by placing the Runway 14 end at the existing north side taxiway. This represents the “legacy” alternative that has been shown on Lake Elmo Airport Layout Plans for several decades. Like Alternative B, Runway 4/22 would be extended 254 feet to the northeast for an overall length of 2,750 feet. This alternative was eliminated from further consideration because 1) it extends the runway beyond the length recommended in the facility requirements analysis for the fleet at Lake Elmo Airport, and 2) it does not address existing incompatible land uses in the Runway 14 RPZ.

Figure 3-2: Draft LTCP Alternatives



Final LTCP Preferred Alternative B1: Relocate Runway 14/32 by 615 feet and Extend to 3,500 feet

The Final LTCP preferred alternative (Alternative B1) is shown in **Figure 3-3**. Alternative B1 would relocate Runway 14/32 by 615 feet to the northeast and extend the runway by 651 feet to the southeast, increasing the runway length from 2,849 to 3,500 feet. This alternative also designates Runway 14/32 as a “utility” runway for aircraft less than 12,500 pounds, which reduces the size of the RPZs. This concept was developed as a modified version of Alternative B to 1) move the Runway 32 threshold further from residential neighborhoods to the southeast, and 2) allow for a modified 30th Street North realignment concept that ties in with the existing intersection with Neal Avenue North (see Section 3.2.4). As under Alternative B, under Alternative B1 Runway 4/22 would be extended 254 feet to the northeast for an overall length of 2,750 feet. This alternative is studied in more detail under Section 3.3.4.

Supplemental Alternatives

Many of the comments received from the public during the LTCP process expressed concerns regarding aircraft noise, changes to aircraft flight patterns, and potential reductions in property values associated with the proposed relocation and extension of Runway 14/32. Other comments expressed concerns regarding future safety zoning associated with the runway relocation and extension, which typically restricts land uses and structure heights in the approaches to a runway. Therefore, the supplemental alternatives presented below consider ways to reduce aircraft noise and land use impacts by moving the proposed Runway 32 threshold further away from residential neighborhoods southeast of the Airport.

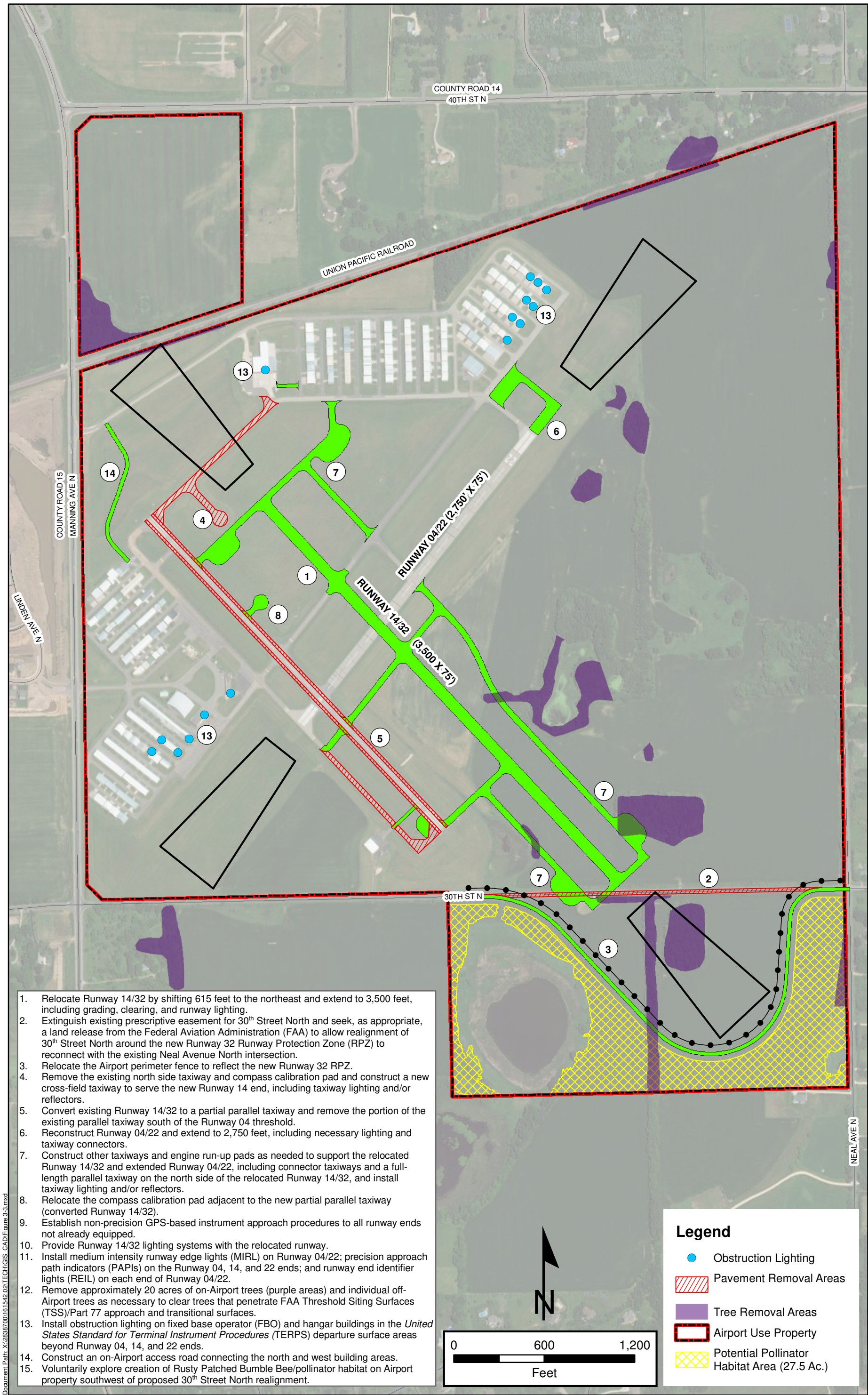


FIGURE 3-3
Final LTCP Preferred Alternative (Alternative B1)
Lake Elmo Airport
Environmental Assessment

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The supplemental primary runway alternatives are shown in **Figure 3-4** and summarized below.

Primary Runway Alternative B2: Relocate Runway 14/32 by 615 feet, Extend to 3,500 feet, and Displace Runway 32 Threshold by 300 feet

Alternative B2 would displace the Runway 32 threshold by 300 feet and limit landing distance available (LDA) to 3,200 feet for Runway 32 landings. The intent of this alternative is to explore potential reduction in aircraft noise experienced by those below the flight path. The 3,200-foot LDA would meet the average design aircraft landing length needs presented in Section 2.2.3. This alternative would maintain the proposed 3,500-foot length for all other operations on Runway 14/32, and is identical to Alternative B1 in every other respect.

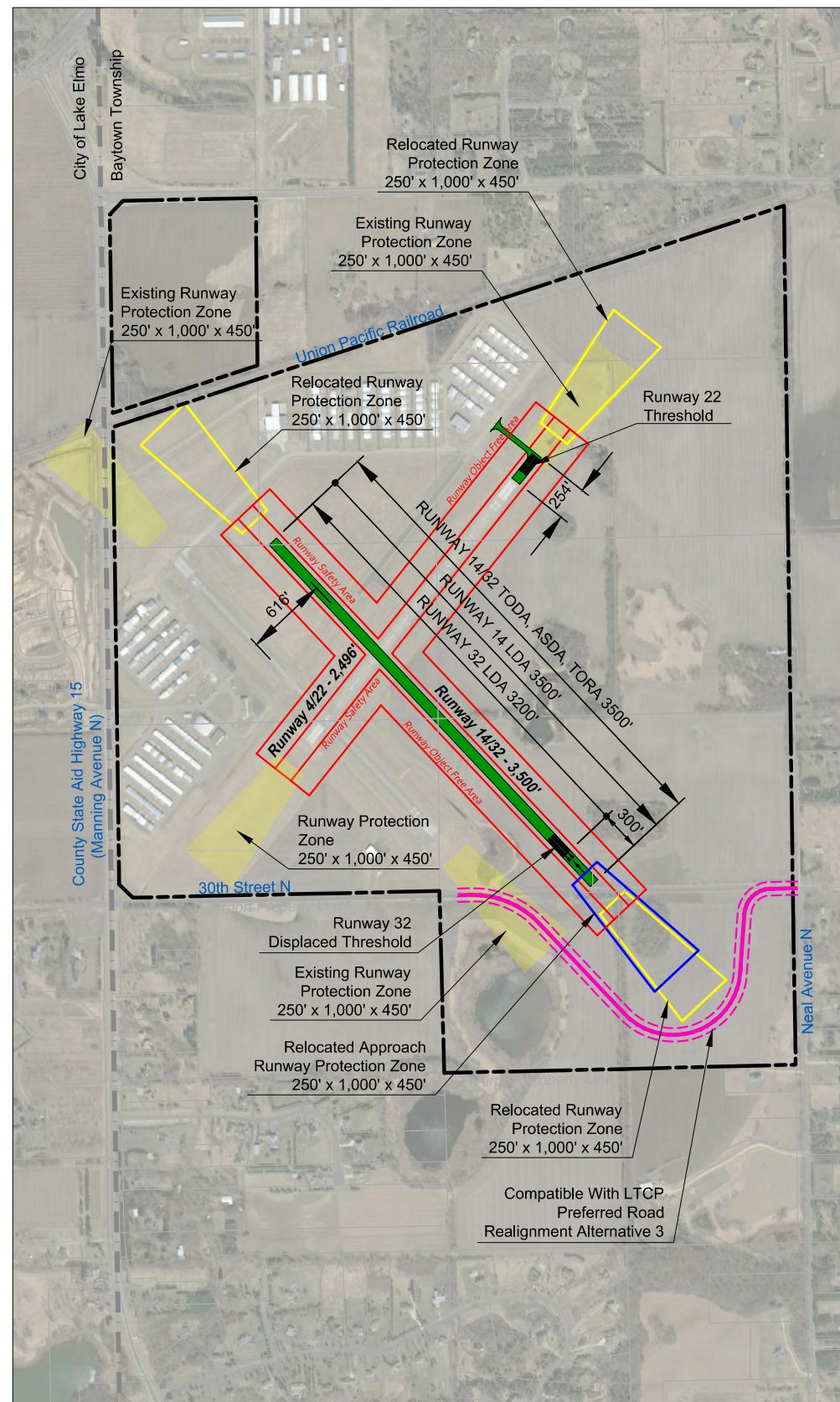
Primary Runway Alternative D: Relocate Runway 14/32 by 308 feet and Extend to 3,500 feet

Alternative D would further reduce the northeasterly shift of Runway 14/32 from the 615 feet proposed by Alternative B1 to 308 feet. This is the minimum runway shift required to move the Runway 14 RPZ onto Airport property. The intent of this alternative is to reduce the change in aircraft flight patterns and associated noise southeast of the Airport when compared with Alternative B1. This alternative was eliminated from further consideration because it would prevent a 30th Street North re-alignment alternative that avoids land acquisition and minimizes impacts to wetlands south of the Airport.

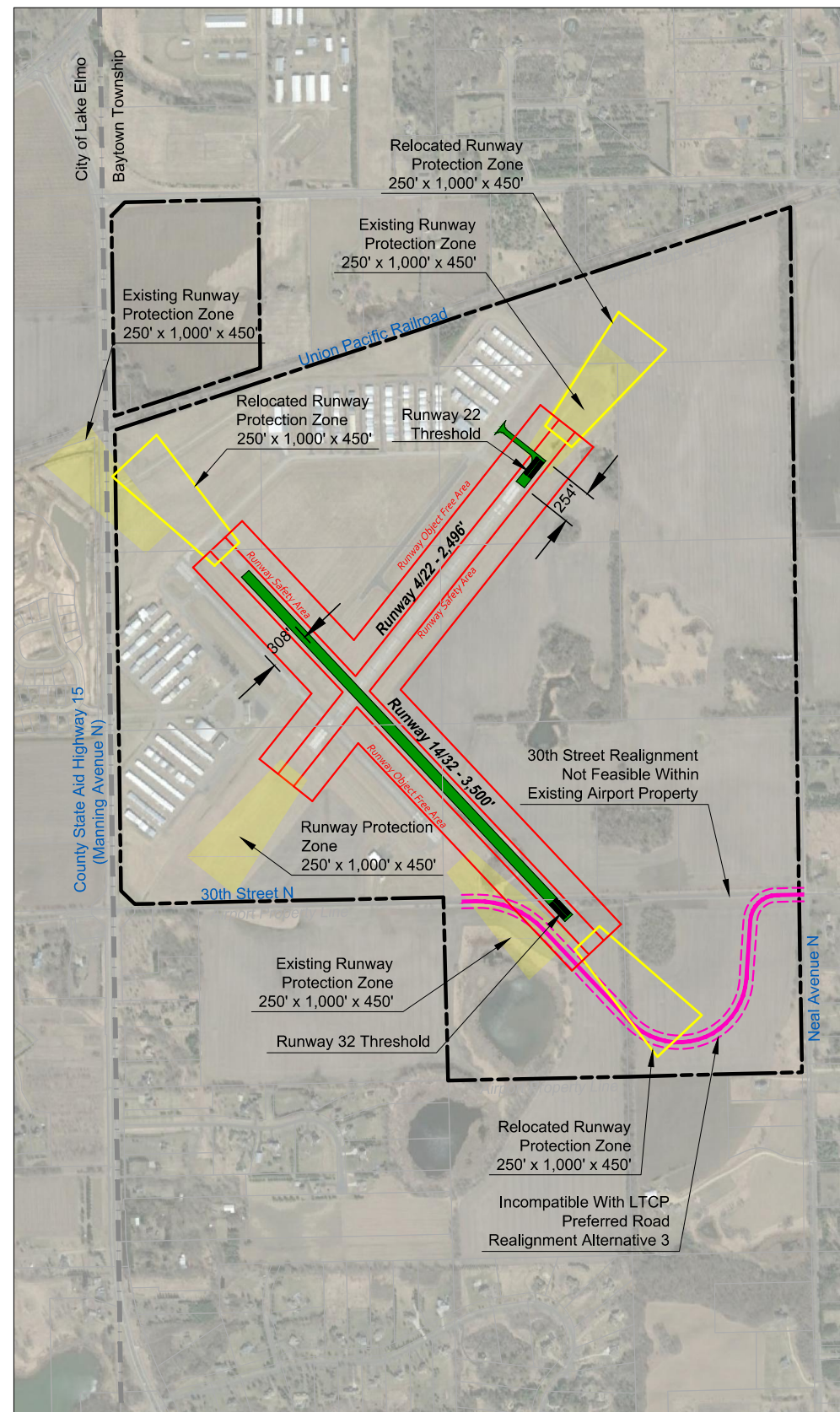
Primary Runway Alternative E: Extend Existing Runway 14/32 to 3,500 feet

Alternative E considers extending existing Runway 14/32 by 651 feet to the southeast. This alternative was eliminated from further consideration because 1) it would not address existing incompatible land uses in both Runway 14/32 RPZs; 2) it would prevent a 30th Street North re-alignment alternative that avoids land acquisition and minimizes impacts to wetlands south of the Airport; and 3) it would increase wildlife hazards for approaching and departing aircraft by moving the Runway 32 threshold into a large wetland area. This alternative also would not meet FAA design standards intended to promote the safety of aircraft operations, as it would not provide a standard runway object free area, standard runway-to-parallel-taxiway separation, and a clear 14 C.F.R. Part 77 transitional surface, all of which are provided by Alternatives B, B1, B2, C, and D.

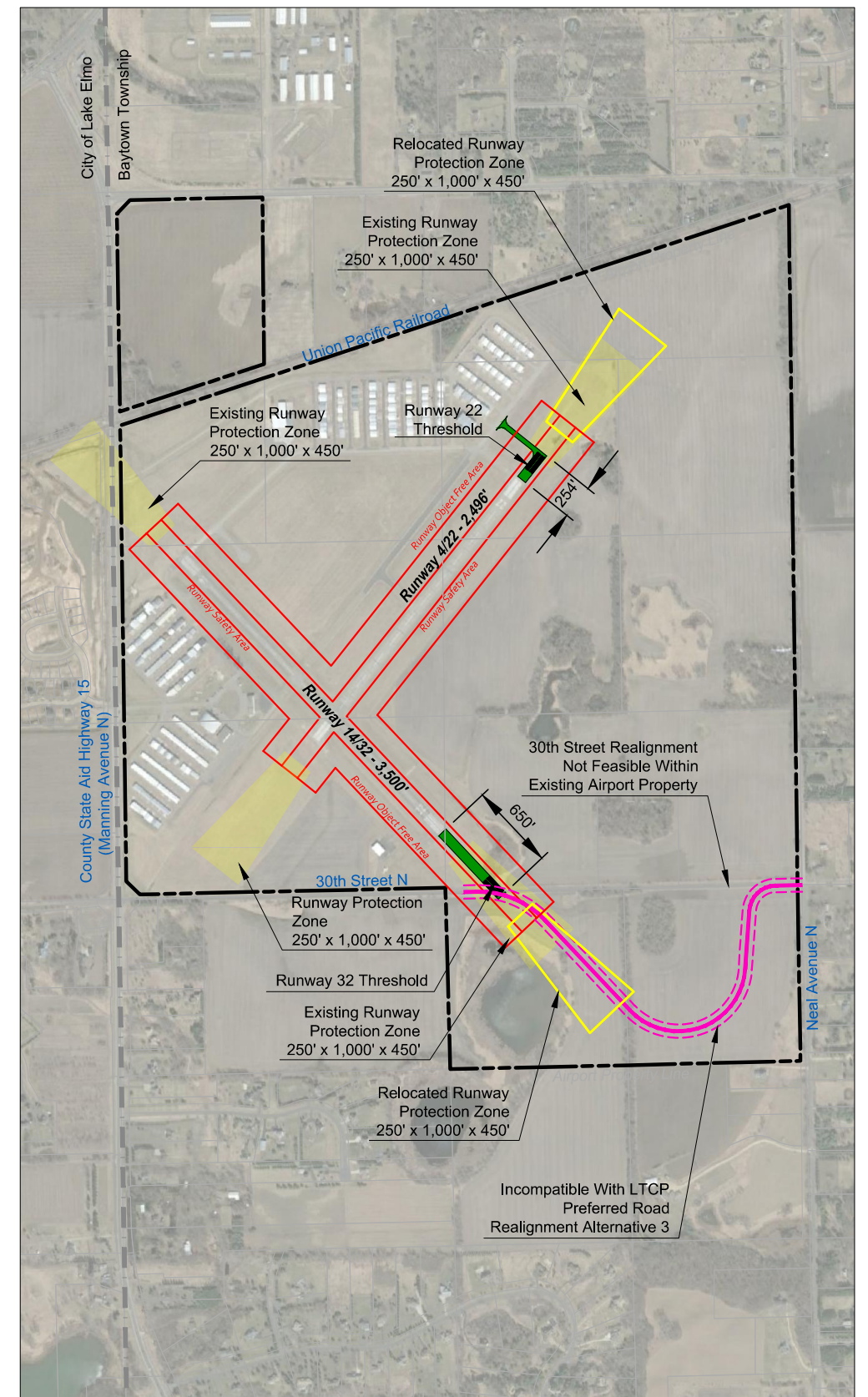
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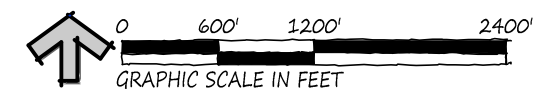
Primary Runway Alternative B2



Primary Runway Alternative D



Primary Runway Alternative E



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Primary Runway Alternatives Screening

The range of primary runway alternatives considered was evaluated against the following three screening criteria to determine whether each alternative should be analyzed further:

- 1) **Does it meet the Purpose and Need?** Alternatives that do not meet all four objectives identified in Chapter 2, *Purpose and Need*, will be discarded and not considered further. These objectives are to 1) improve the runway and taxiway pavement condition, 2) minimize incompatible land uses in the RPZs, 3) meet runway length needs for aircraft users, and 4) upgrade the instrument approach procedures.
- 2) **Is it compatible with a viable 30th Street North realignment alternative?** 30th Street North is classified as a major collector roadway and is an important local traffic corridor that must be maintained. Therefore, alternatives that are not compatible with a viable 30th Street North realignment alternative (see Section 3.2.4) will not be considered further.
- 3) **Does it conform to FAA airport design standards?** The FAA establishes airport design standards for the efficient development of airports that are consistent with local, state, and national goals. If a federally-obligated airport sponsor does not conform to these standards, it would violate the grant assurances it has agreed to when accepting funds from FAA-administered airport financial assistance programs. These assurances require that airport sponsors maintain and operate their facilities in accordance with specified conditions for the duration of the facility's useful life. For this reason, any alternative that would not conform to FAA airport design standards will not be considered further. Relevant airport design standards on which the alternatives differ include declared distance and runway protection zone (RPZ) standards.

The primary runway alternatives presented above are compared to the screening criteria in **Table 3-2**.

Alternative	Purpose & Need Objective 1	Purpose & Need Objective 2	Purpose & Need Objective 3	Purpose & Need Objective 4	Conform to FAA Airport Design Standards	Compatible with a Viable 30th Street North Realignment Alternative
	Improve the runway pavement condition	Minimize incompatible land uses in the RPZs	Meet runway length needs for users	Upgrade the instrument approach procedures		
No-Action Alternative	Yes	No	No	No	No	Yes
Alternative A	Yes	No	No	Yes	No	Yes
Alternative B	Yes	Yes	Yes	Yes	Yes	Yes
Alternative B1	Yes	Yes	Yes	Yes	Yes	Yes
Alternative B2	Yes	Yes	Yes	Yes	No	Yes
Alternative C	Yes	No	Yes	Yes	No	Yes
Alternative D	Yes	Yes	Yes	Yes	No	No
Alternative E	Yes	No	Yes	Yes	No	No

Alternatives B and B1 will be analyzed further and compared to the no-action alternative in Section 3.3.

Alternatives A, B2, C, D, and E will not be considered further for the reasons described below.

Alternatives A and C will be discarded based on Purpose & Need Objective 2, because they would not eliminate existing incompatible land uses in the RPZ, and/or would not prevent potential future incompatible land uses in the RPZ. Alternative A also does not achieve Purpose & Need Objective 3, because it would not provide the needed primary runway length.

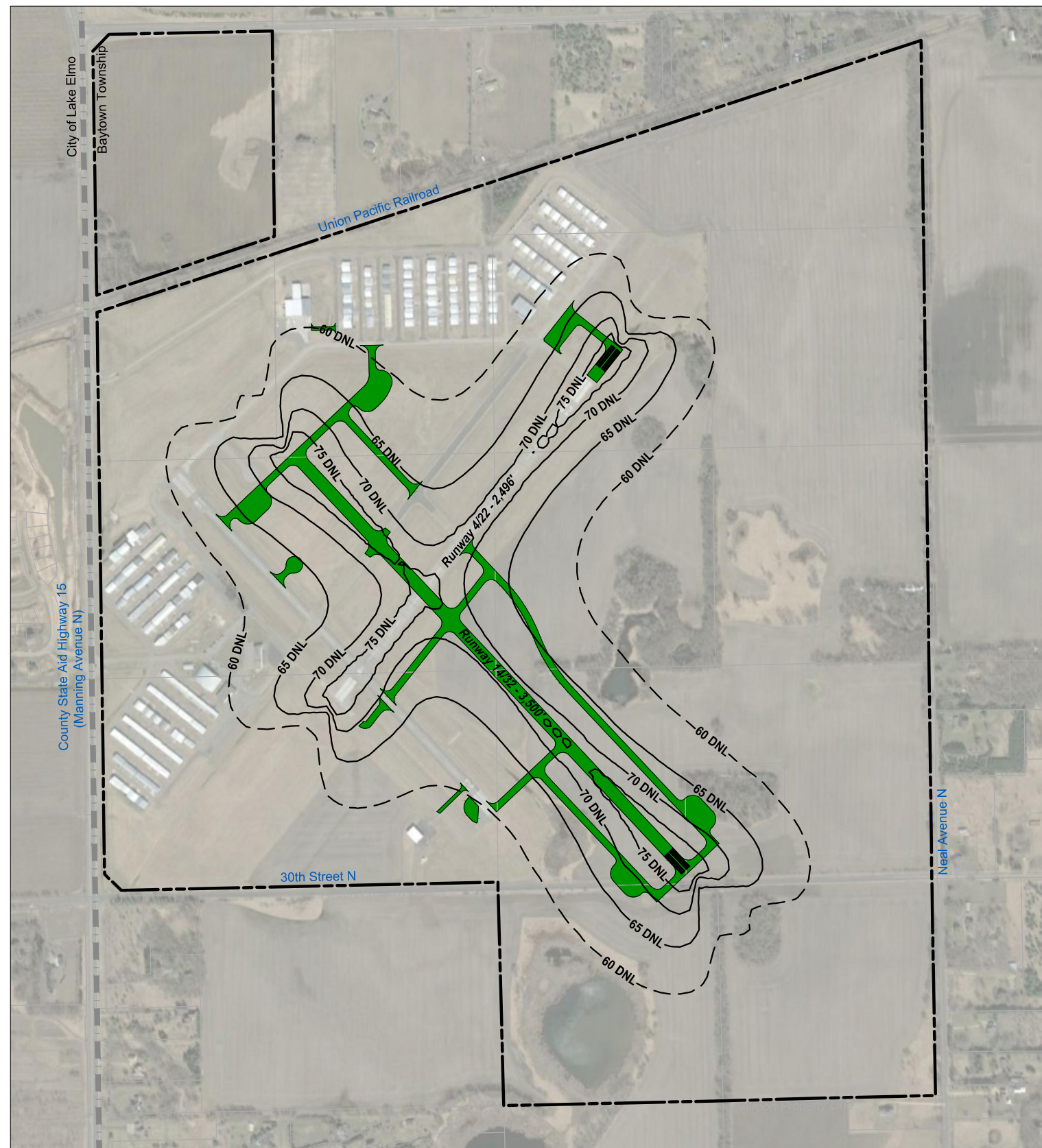
Alternative B2 will be discarded because it does not conform to FAA airport design standards for implementing a displaced threshold. According to FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, declared distances may only be used where it is impractical to meet airport design standards or mitigate environmental impacts by other means. FAA will consider displacing a threshold for any one of the following reasons, none of which apply for this alternative:

- 1) To provide proper clearance for landing aircraft over existing obstacles while on approach to landing.
- 2) To obtain additional runway safety area (RSA) and/or runway object free area (ROFA) prior to the threshold.
- 3) To locate the RPZ such that incompatible land uses are mitigated.
- 4) To mitigate environmental impacts.

Alternative B2 was considered solely to potentially reduce aircraft noise southeast of the airport when compared to Alternative B1. However, based on noise impact significance thresholds established by FAA there is no significant noise impact under Alternative B1. The 1979 Aviation Safety and Noise Abatement Act established a congressional directive for the FAA to adopt a single system for measuring and determining noise exposure and identifying incompatible land uses within various noise exposures around US airports. The result of this congressional direction was FAA adoption of 14 C.F.R. Part 150, which establishes land use compatibility criteria around airports for considering noise impacts using Day-Night Average Sound Level (DNL). DNL is defined by FAA as the 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7 a.m., and between 10 p.m. and midnight, local time. The FAA considers the 65 DNL contour to be the threshold of significance for noise impacts around airports. As such, sensitive land use areas (e.g., residential) around airports that are located within the 65 dB or greater DNL contours are considered by the FAA as incompatible.

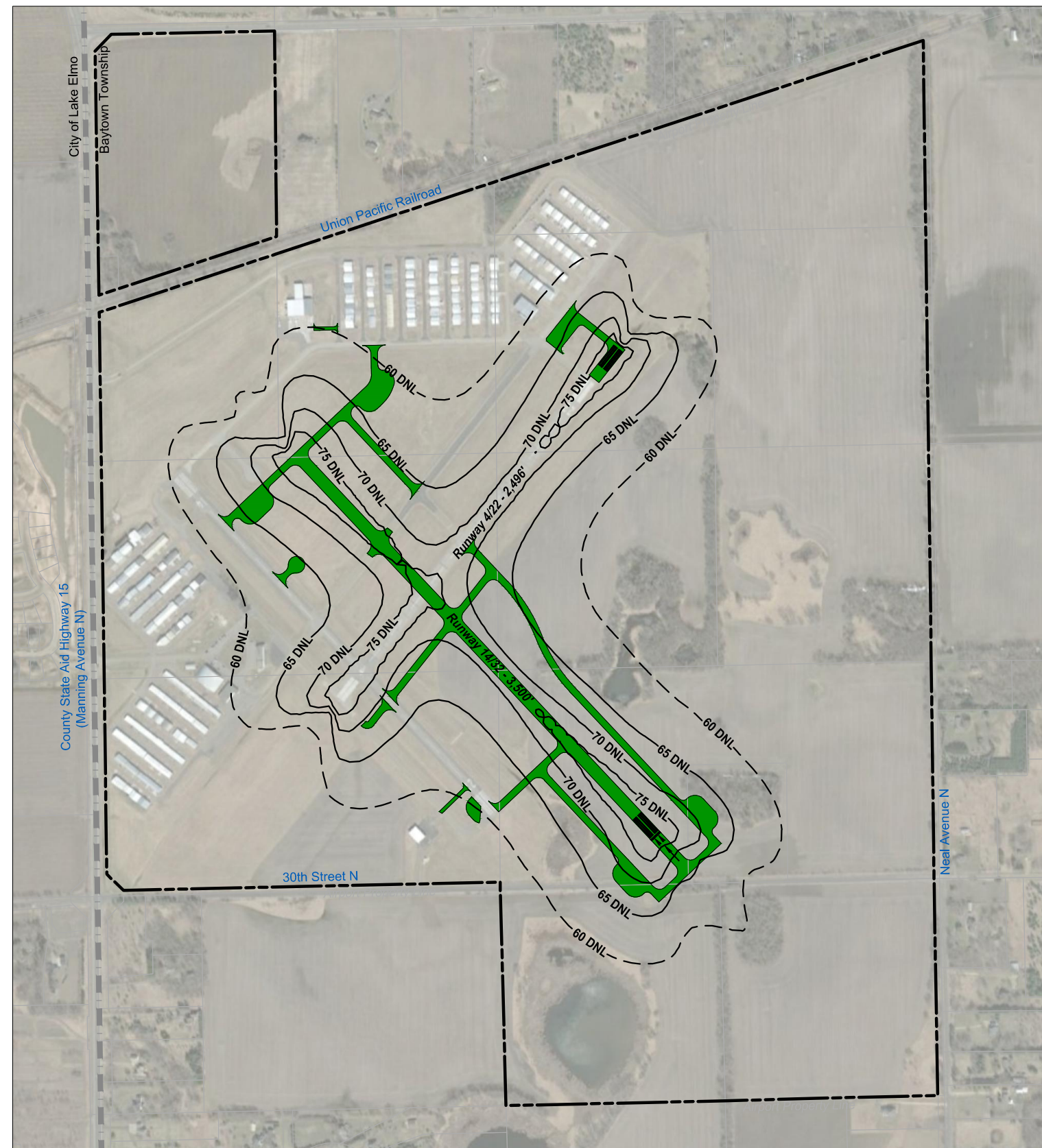
Projected 2025 aircraft noise contours for Alternative B2 are compared to those for Alternative B1 in **Figure 3-5**. As shown in the graphic, the 65 DNL contour is contained entirely on Airport property under Alternative B1. Therefore, because there are no significant noise impacts under Alternative B1, Alternative B2 does not conform to FAA airport design standards for implementing a displaced threshold and will not be considered further.

Alternatives D and E will be discarded because there is no viable 30th Street North alternative that, when combined with either of these alternatives, both conforms to FAA airport design standards and avoids acquiring land (see Section 3.2.4).

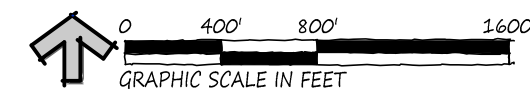


Note: Aircraft noise contour 60 DNL is shown for informational purposes only.

Primary Runway Alternative B1



Primary Runway Alternative B2



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3.2.4 30th Street North Alternatives

Primary runway Alternatives B and B1 are in direct conflict with the existing alignment of 30th Street North, as the street is within the areas that must be protected for runway and taxiway safety purposes. The LTCP evaluated several concepts for realigning 30th Street North outside of these areas. The implications of realigning 30th Street North was one of the major community concerns identified during the LTCP process. As a result, the 30th Street North alternatives evaluation process presented in this chapter utilizes criteria that flow directly from concerns articulated by residents and community engagement panel (CEP) members as part of the stakeholder engagement process. This section provides an overview of the realignment alternatives considered by the LTCP and supplemental alternatives generated at the outset of the NEPA process, and identifies the preferred alternative.

LTCP Alternatives

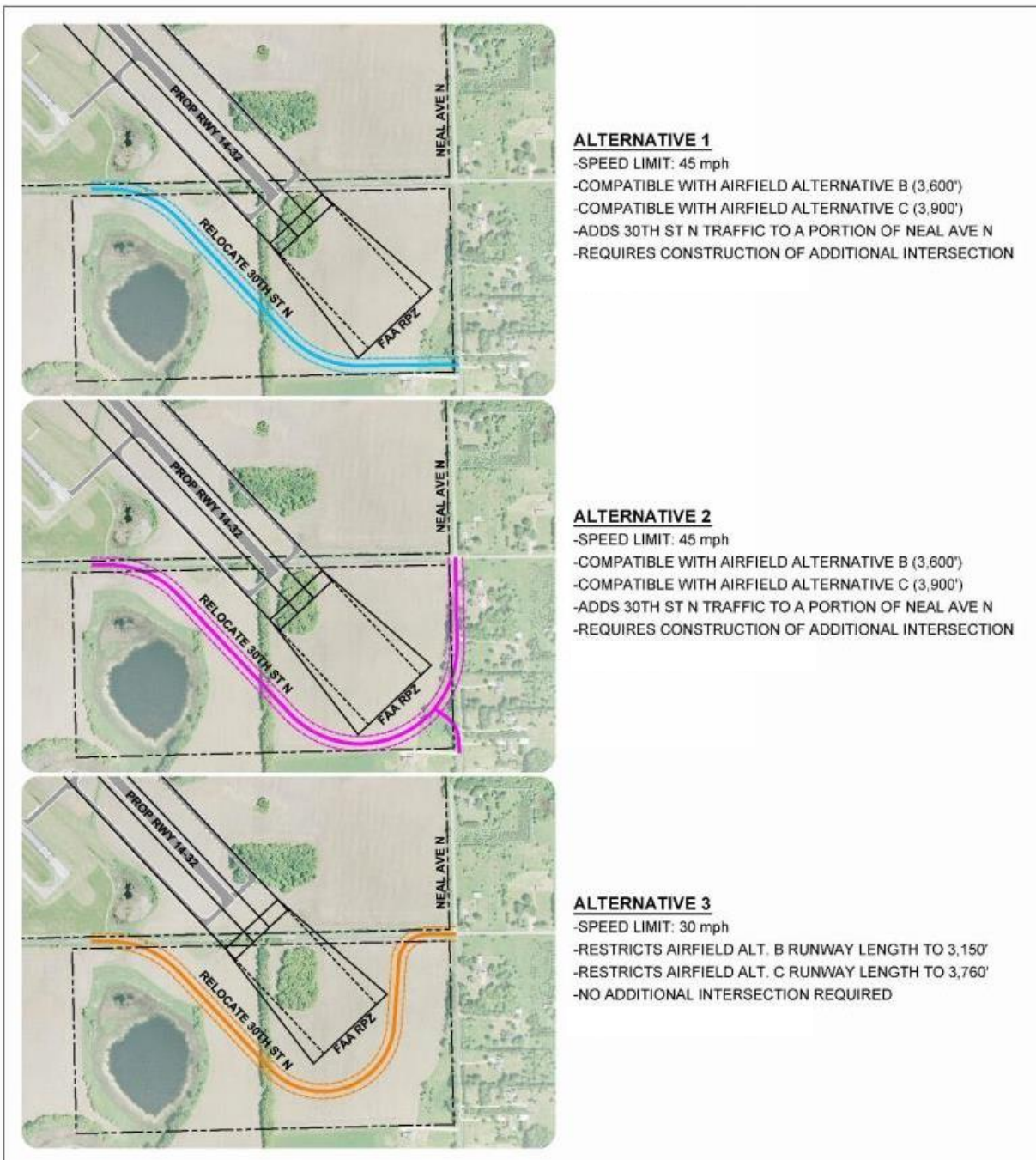
The 30th Street North alternatives presented in the LTCP are shown in **Figure 3-6** and summarized below.

30th Street North Alternative 1: New T-Intersection with Stop Sign on 30th Street

This alternative would realign 30th Street North southeast of the relocated Runway 32 RPZ such that it intersects at a new T-intersection with Neal Avenue North approximately ¼-mile south of the existing intersection. Through traffic on 30th Street North would experience two additional turning movements in each direction and an increase in total travel distance of about 1,800 feet. In addition, 30th Street through traffic would be introduced onto the segment of Neal Avenue between the intersections. Local trips between Manning Avenue and residences south of the new intersection would be removed from this segment of Neal Avenue and benefit from a reduced travel distance. This was identified as the preferred alternative in the Draft LTCP, but was later withdrawn in response to public comments received in response to the Draft LTCP.

30th Street North Alternative 2: New T-Intersection with Stop Sign on Neal Avenue

This alternative is a modified version of Alternative 1 that continues the curve of 30th Street North such that the roadway merges with the existing Neal Avenue North alignment and allows continuous movement between the existing intersections of 30th Street with Manning Avenue and Neal Avenue. Through traffic on 30th Street would experience one additional turning movement in each direction and an increase in total travel distance of about 1,500 feet. Access to existing Neal Avenue southeast of the Airport would be maintained by constructing a new T-intersection approximately ¼-mile south of the existing intersection with 30th Street. The main difference from Alternative 1 is that a new stop sign would be installed on the Neal Avenue approach from the south, rather than on the 30th Street approach from the west. Impacts to local traffic flowing between Manning Avenue and residences southeast of the Airport would be the same as under Alternative 1.

Figure 3-6: LTCP 30th Street North Realignment Alternatives

30th Street North Alternative 3: Final LTCP Preferred Alternative

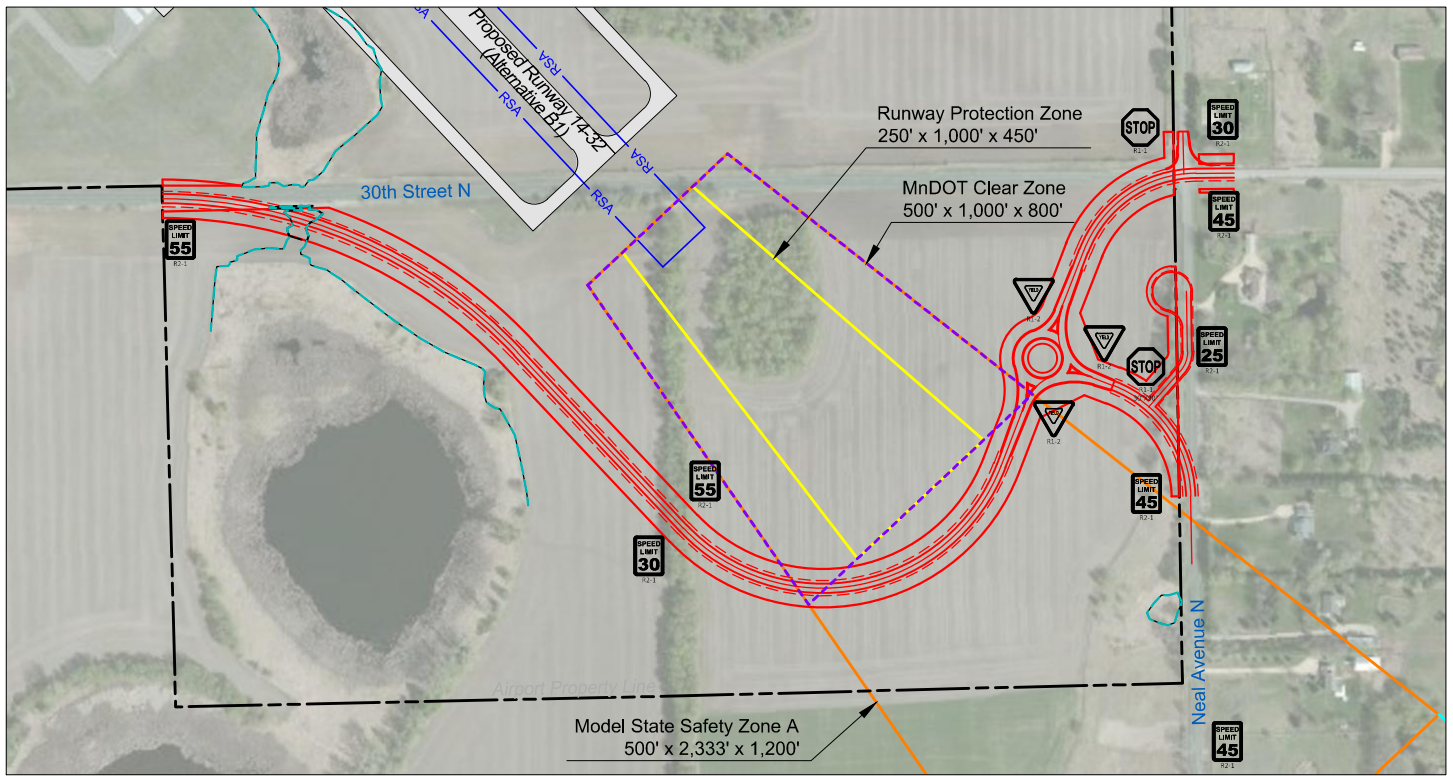
This alternative maintains the existing intersection at 30th Street North and Neal Avenue North by tightening the curves around the relocated Runway 32 RPZ, preserving the continuity necessary for 30th Street North to fulfill its role as a major collector roadway. Because of the tighter curves, the design speed for the relocated roadway would be reduced from 45 to 30 miles per hour. This alternative does not introduce any new intersections or turning movements for through traffic on 30th Street, and no new traffic is introduced onto Neal Avenue. This alignment does not allow for the relocated Runway 14/32 to be extended to its recommended length of 3,600 feet as originally proposed by Alternative B, and was designed specifically for a shortened 3,500-foot runway as proposed by Alternative B1. Based on public comments received in response to the Draft LTCP, Alternative 3 was recommended as the Final LTCP preferred alternative.

Supplemental Alternatives

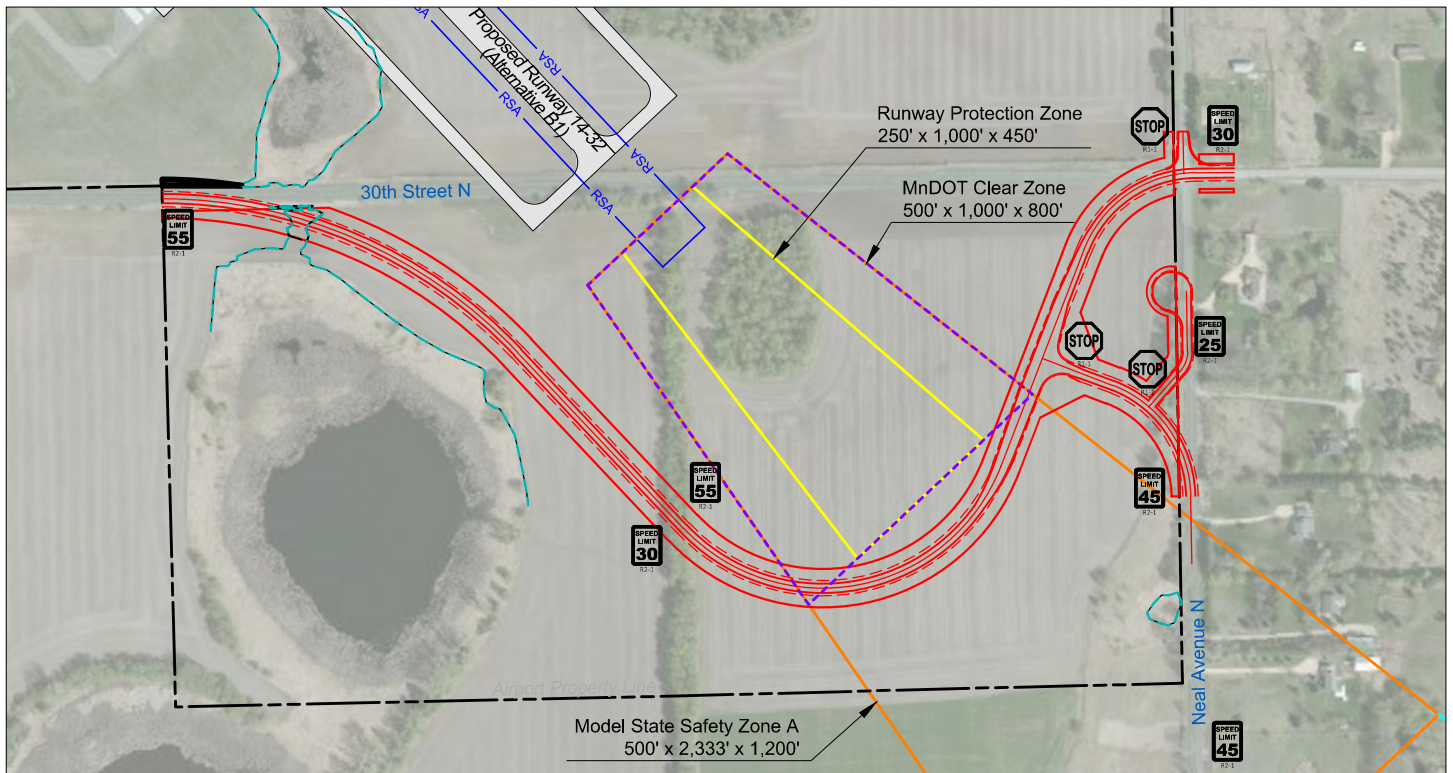
Many of the comments received from the public during the LTCP process expressed concerns regarding traffic flow disruptions, traffic increases, environmental impacts, emergency response times, and local maintenance burdens that may result from the proposed realignment concept. Therefore, the supplemental alternatives presented below consider ways to minimize impacts by refining the Final LTCP preferred alternative street design, based on concerns articulated by residents and CEP members as part of the stakeholder engagement process conducted for this EA/EAW. The supplemental 30th Street North alternatives are shown in **Figure 3-7** and summarized below. These alternatives are compatible with the reduced primary runway length represented by Primary Runway Alternative B1, and are not compatible with the other primary runway alternatives. For more information regarding these alternatives and a more detailed comparison to the Final LTCP preferred alternative, see **Appendix B**.

30th Street North Alternative 4A: Modified Hybrid with New Roundabout

This alternative is a modified hybrid version of Alternatives 2 and 3, which would shift the Final LTCP preferred alternative 30th Street North alignment to the northwest to introduce a longer straight section, and would realign a portion of Neal Avenue North to the northwest. These refinements would allow for construction of a roundabout at the intersection of realigned 30th Street N and Neal Avenue North approximately 600 feet southwest of the existing intersection. A secondary roadway would be constructed to the immediate east of the intersection to provide continued access for the two residential properties located immediately southeast of the existing 30th/Neal intersection. When compared to the Final LTCP preferred alternative, it would increase the radii of the new horizontal curves on 30th; minimize the number of vehicular conflict points at the intersection of 30th and Neal by replacing the four-way stop with a roundabout; require a narrower field of vision for vehicles approaching the intersection; reduce travel time increases in all directions; and allow continuous through traffic on 30th, as well as on Neal south of 30th. All of this would be accomplished while avoiding introduction of new vehicle trips on Neal Avenue, as intended by the Final LTCP preferred alternative.



Alternative 4A



Alternative 4B

- Proposed Realignment
- Approximate Wetland Areas (U.S. Fish and Wildlife Service National Wetlands Inventory)
- Delineated Wetland Boundary



30th Street North Alternative 4B: Modified Hybrid with New T-Intersection

This alternative is identical to Alternative 4A, except that the proposed roundabout would be replaced by a T-intersection. The purpose of this minor design change is to decrease traffic delay on 30th Street North by eliminating the need to navigate the roundabout.

30th Street North Alternatives Screening & Preferred Alternative

Alternatives 1, 2, 4A, and 4B will not be considered further for the reasons described below.

During the initial LTCP public comment period, there was significant public opposition to Alternatives 1 and 2 because of increased travel distances, additional turning movements, new vehicle trips on Neal Avenue North, and proximity of the realigned 30th Street North to residences southeast of the Airport. In addition, these alternatives did not consider the adverse effects of grade changes and an isolated wetland in the extreme southwest corner of Airport property, impacts that Alternatives 3, 4A, and 4B avoid. For these reasons, Alternatives 1 and 2 will not be considered further.

At CEP meetings held on May 25 and August 8, 2017, there was not a consensus among the panel members that the adjustments made under Alternatives 4A and 4B would be preferable to the design concept represented by Alternative 3. Because Alternatives 4A and 4B would be more expensive to construct than Alternative 3, it was determined that the additional investment required by these alternatives would not be justified based on CEP input. For these reasons, Alternatives 4A and 4B will not be considered further.

Alternative 3 will be carried throughout the EA/EAW as the preferred alternative, for comparison with the no-action alternative.

3.2.5 Crosswind Runway Alternatives

The LTCP only considered one alternative for extending the crosswind Runway 04/22 to the 2,750-foot length identified in the purpose and need. This alternative would extend the runway by 254 feet to the northeast as shown in the Final LTCP preferred alternative (see **Figure 3-3**) as recommended by the crosswind runway length analysis in Chapter 2, Section 2.2.3 of this EA/EAW. Extending the runway to the northeast was considered preferable to extending to the southwest, as both RPZs would remain on Airport property. The cost of extending the runway by 254 feet is estimated at approximately \$600,000.

Crosswind Runway Alternatives Screening & Preferred Alternative

Other than no action, there are no alternatives for meeting crosswind runway length requirements that satisfy the basic threshold criteria identified by FAA Order 1050.1F, as discussed in Section 3.2. Therefore, the alternative to extend Runway 04/22 by 254 feet to the northeast will be carried throughout the EA/EAW for comparison with the no-action alternative.

Based on field-delineated wetland boundary data collected in June 2017, there are three small isolated wetlands that would be within the grading area for the proposed crosswind runway and parallel taxiway extension. The total size of the affected wetlands is 0.38 acres.

There would also be some on-Airport tree clearing required to remove obstructions to the approach, departure, and transitional surfaces for the extended runway. These trees are included in the tree clearing acreage estimates for Alternatives B and B1 (see Sections 3.3.3 and 3.3.4, respectively). Approximately 0.6 acres of on-Airport tree clearing would need to occur in wetlands near the Runway 22 end that have been identified by the U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory database as Type 1 seasonally flooded basins. These wetlands were not delineated by the 2017 wetland boundary survey. More recent field observations indicate that Type 1 is the appropriate classification and that the wetlands will remain Type 1 following removal of any trees. Wetland boundaries and types in these areas will be confirmed by field delineation in the spring of 2018 and any required mitigation will be identified prior to publication of the Final EA/EAW document.

According to obstruction survey data collected in 2013, there were no off-Airport trees penetrating approach or departure threshold siting surfaces for the planned future Runway 04/22 ends. Updated survey data collected and analyzed in late 2017 indicate that approximately 12 off-Airport trees would need to be removed in the approaches to the crosswind runway. These would be carefully targeted individual trees and would not involve clear-cutting stands of trees.

3.2.6 Instrument Approach Alternatives

The LTCP only considered one alternative for upgrading the instrument approach procedures. This alternative would establish a non-precision GPS-based instrument approach procedure with not less than one-mile visibility minimums to the Runway 14 end, and upgrade the existing Runway 04 approach procedure to an RNAV (GPS) type. Although not specifically considered by the LTCP, this EA/EAW also considers establishing a non-precision GPS-based procedure to Runway 22. This alternative proposes installation of runway edge lights, precision approach path indicator (PAPI) lights, and runway end identifier lights (REIL) on Runway 04/22 to allow better identification of the runway environment by pilots during Instrument Flight Rule (IFR) conditions.

Instrument Approach Alternatives Screening & Preferred Alternative

The instrument approach alternative to establish non-precision GPS-based instrument approach procedures to all runway ends not already equipped would improve Airport safety by allowing pilots to fly a stabilized straight-in approach to the most viable runway end during inclement weather. There are no other available alternatives that meet the purpose and need. Therefore, this alternative will be carried throughout the EA/ EAW for comparison with the no-action alternative.

3.3 Evaluation of Primary Runway Alternatives

This section evaluates the remaining primary runway alternatives for practicability and environmental effects. These alternatives include the following:

- No-Action Alternative
- Alternative B: Relocate Runway 14/32 by 700 feet and Extend to 3,600 feet
- Alternative B1: Relocate Runway 14/32 by 615 feet and Extend to 3,500 feet

3.3.1 Primary Runway Alternatives Evaluation Criteria

This section explains the criteria used to further evaluate Alternatives B and B1, and the no-action alternative.

Practicability Factors.

An alternative is practicable if it can be implemented when considering cost, existing technology, logistics, and the overall project purpose. The following practicability factors were considered for each remaining primary runway alternative:

- **Financial Factors.** Construction cost estimates were developed for each alternative. For the no-action alternative, this estimate includes cost associated with pavement reconstruction needed to maintain the existing facilities in a manner that ensures safety and existing levels of service. For Alternatives B and B1, these estimates do not include the cost to extend Runway 4/22 or reconstruct any existing airfield pavements, which may need to occur concurrently, because these alternatives are specific to the primary runway alone.
- **Logistical Factors.** Each alternative was evaluated to determine whether there are unique feasibility issues to consider, given existing technology, site characteristics, and local conditions.

Environmental Factors.

The following environmental factors were considered for each remaining primary runway alternative:

- **Wetlands.** A preliminary estimate of wetland impacts was developed for each alternative based on field delineated wetland boundary data collected in June 2017.
- **Tree Removal.** A preliminary estimate of tree removal acreage was developed for each alternative based on existing survey data and FAA obstruction removal standards. Survey data collected and analyzed for the LTCP indicate that there are on-Airport trees penetrating departure threshold siting surfaces prescribed by FAA AC 150/5300-13A, *Airport Design*, and transitional surfaces prescribed by Federal Aviation Regulations (FAR) Part 77 (14 C.F.R. Part 77). The no-action alternative includes removal of any on-Airport trees that penetrate these surfaces for both runways. Alternatives B and B1 include removal of on-Airport trees that penetrate these surfaces, as well as trees that penetrate approach threshold siting surfaces and Part 77 approach surfaces. According to obstruction survey data collected in 2013, there were no off-Airport trees penetrating approach or departure threshold siting surfaces for the planned future Runway 14/32 ends. Updated survey data collected and analyzed in late 2017 indicate that no off-Airport trees would need to be removed in the approaches to the primary runway under the no-action alternative, Alternative B, or Alternative B1.
- **Land Use.** Effects to existing and planned neighboring land uses were identified using the Model State Safety Zones A and B promulgated under Minnesota Rule 8800.2400 as a guide. These zones are not currently in effect at the Airport. Safety Zone A typically prevents erection of new structures or expansion of existing structures, and Safety Zone B typically prevents small lot residential development using density standards. Before completing the EA/EAW process, the MAC will start convening a Joint Airport Zoning Board (JAZB) under Minnesota Statutes Chapter 360. The process will consider public input as part of developing an airport zoning ordinance. This process may result in a zoning ordinance recommendation to the MnDOT Office of Aeronautics that deviates from the state's model zoning ordinance.

- **Aircraft Noise.** A detailed noise analysis was conducted for each alternative using the Aviation Environmental Design Tool (AEDT), to determine whether the alternative is expected to have significant noise impacts on neighboring land uses.

These factors were chosen based on their relevance to the proposed project and airport environs, and do not represent a comprehensive list of environmental analysis categories required under federal and state regulations. A more comprehensive analysis of environmental effects will be completed for the no-action and preferred alternatives in Chapter 5, *Environmental Consequences*. These factors and the findings for each factor that would be considered desirable were developed in coordination with the CEP.

Alternatives B and B1 also include several additional components not considered in detail by the summary description of alternatives in Section 3.2. These components include:

- **Construct dual parallel taxiways for Runway 14/32.** When accessing the Runway 32 end from the north building area or accessing the north building area from the Runway 32 end, aircraft operators currently must cross both runways. This increases the likelihood of runway incursions and is inconvenient for Airport users. Alternatives B and B1 include a second full parallel taxiway on the north side of Runway 14/32 to reduce the frequency of runway crossings at the Airport.
- **Remove the southern portion of Runway 14/32 parallel taxiway.** This portion of taxiway would be replaced by converting the existing Runway 14/32 to a parallel taxiway.
- **Remove and replace the north side taxiway.** This taxiway would be in the Runway 14 approach/departure area for both alternatives and would be replaced with a new north side taxiway perpendicular to the relocated Runway 14 threshold.
- **Relocate compass calibration pad.** The compass calibration pad would also be in the Runway 14 approach/departure area for both alternatives and would be relocated adjacent to the new Runway 14/32 parallel taxiway.
- **Construct on-Airport connector road.** There is currently no on-Airport roadway connecting the north and west building areas on the Airport, which requires Airport users and staff to use Manning Avenue North to move between these two areas. The proposed action would provide for placement of a landside connector roadway between the north and west building areas, so that these areas are mutually accessible without using Manning Avenue.
- **Relocate perimeter fence.** The portion of the perimeter fence along 30th Street North would have to be relocated along the north side of the realigned road to maintain security and wildlife hazard prevention along the southern boundary of the airfield.
- **Install obstruction lighting.** Various existing on-Airport structures would penetrate the departure threshold siting surfaces for all three alternatives. Based on consultation with FAA, installing steady-burning red obstruction lights on top of these structures would mitigate these penetrations and is proposed for all on-Airport structures penetrating the departure threshold siting surfaces.

3.3.2 No-Action Alternative

Expected environmental effects of this alternative are shown in **Figure 3-8**.

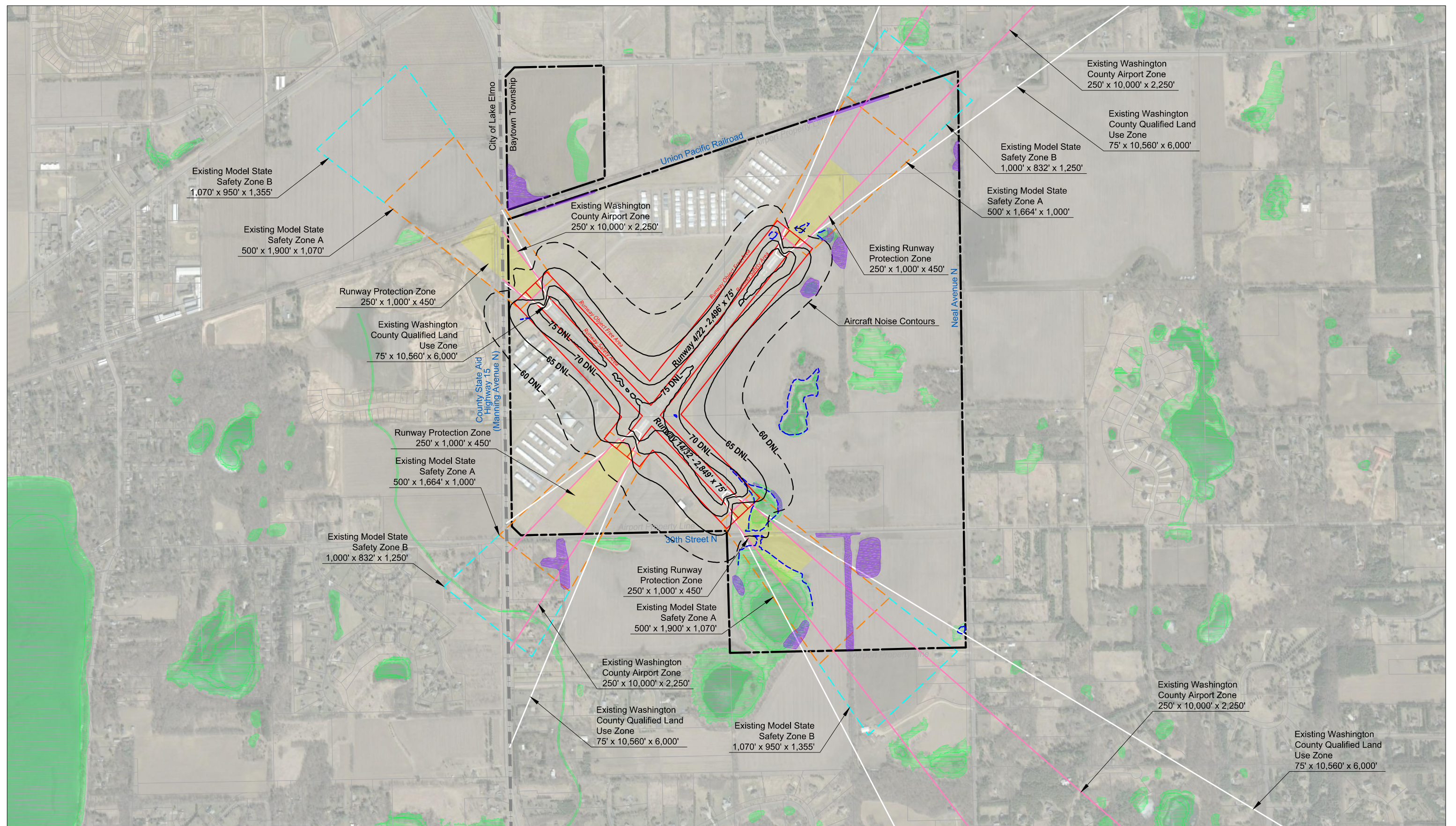
Practicability.


- **Financial Factors.** Total construction cost for this alternative is approximately \$5.4 million. This estimate includes all costs associated with reconstruction of the existing airfield in its current configuration.
- **Logistical Factors.** Washington County plans to widen Manning Avenue North from two to four lanes within the next five years. This local project would trigger an FAA RPZ alternatives review because of the additional travel lanes and/or turn lanes are planned within the Runway 14 RPZ.


Environmental Effects.

- **Wetlands.** There are no wetlands affected by this alternative.
- **Tree Removal.** An estimated 13 acres of trees on Airport property would need to be removed to allow for clear departure and transitional surfaces. As noted previously, no off-Airport trees would need to be removed in the approaches to the existing primary runway under this alternative.
- **Land Use.** There are currently no houses in Model Safety Zone A and two houses in Model Safety Zone B for Runway 14/32, when considering both ends of the primary runway. Note: counts of houses are based on structures within the zones.
- **Aircraft Noise.** This alternative would not change future aircraft noise patterns at Lake Elmo Airport.

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 Approximate Tree Removal

 Approximate Wetland Areas (U.S. Fish and Wildlife Service National Wetlands Inventory)

 Delineated Wetland Boundary

Lake Elmo Airport Environmental Assessment

A horizontal graphic scale bar with a north arrow pointing upwards on the left. The scale is marked with 0, 500', 1000', and 2000'. The bar is divided into segments: a white segment from 0 to 500', a black segment from 500' to 1000', and a white segment from 1000' to 2000'. Below the bar, the text "GRAPHIC SCALE IN FEET" is written.

FIGURE 3-8
No-Action Alternative

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3.3.3 Alternative B: Relocate Runway 14/32 by 700 feet and Extend to 3,600 feet

Expected environmental effects of this alternative are shown in **Figure 3-9**.

Practicability.

- **Financial Factors.** Total construction cost for this alternative is approximately \$9.6 million. This includes the cost to realign 30th Street North as proposed under 30th Street North Alternative 1.
- **Logistical Factors.** Because of the proposed runway length and larger RPZ size, this alternative is not compatible with 30th Street North Alternative 3, the preferred alternative for realigning 30th Street North.

Environmental Effects.

- **Wetlands.** This alternative would require filling of approximately 2.44 acres of wetlands, including 1.49 acres for the west parallel taxiway, 0.71 acres for the east parallel taxiway, and 0.24 acres for realignment of 30th Street North as proposed by 30th Street North Alternative 1.
- **Tree Removal.** An estimated 22 acres of trees on Airport property would need to be removed to allow for construction of the new runway and clear its approach, departure, and transitional surfaces. As noted previously, no off-airport trees would need to be removed in the approaches to the relocated primary runway under this alternative.
- **Land Use.** There are six houses in Model Safety Zone A and nine houses in Model Safety Zone B for this alternative, when considering both ends of the primary runway. Note: counts of houses are based structures within the zones.
- **Aircraft Noise.** The 65 DNL contour for this alternative is contained entirely on Airport property. Therefore, there are no significant noise impacts associated with this alternative.

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3.3.4 Alternative B1: Relocate Runway 14/32 by 615 feet and Extend to 3,500 feet

Expected environmental effects of this alternative are shown in **Figure 3-10**.

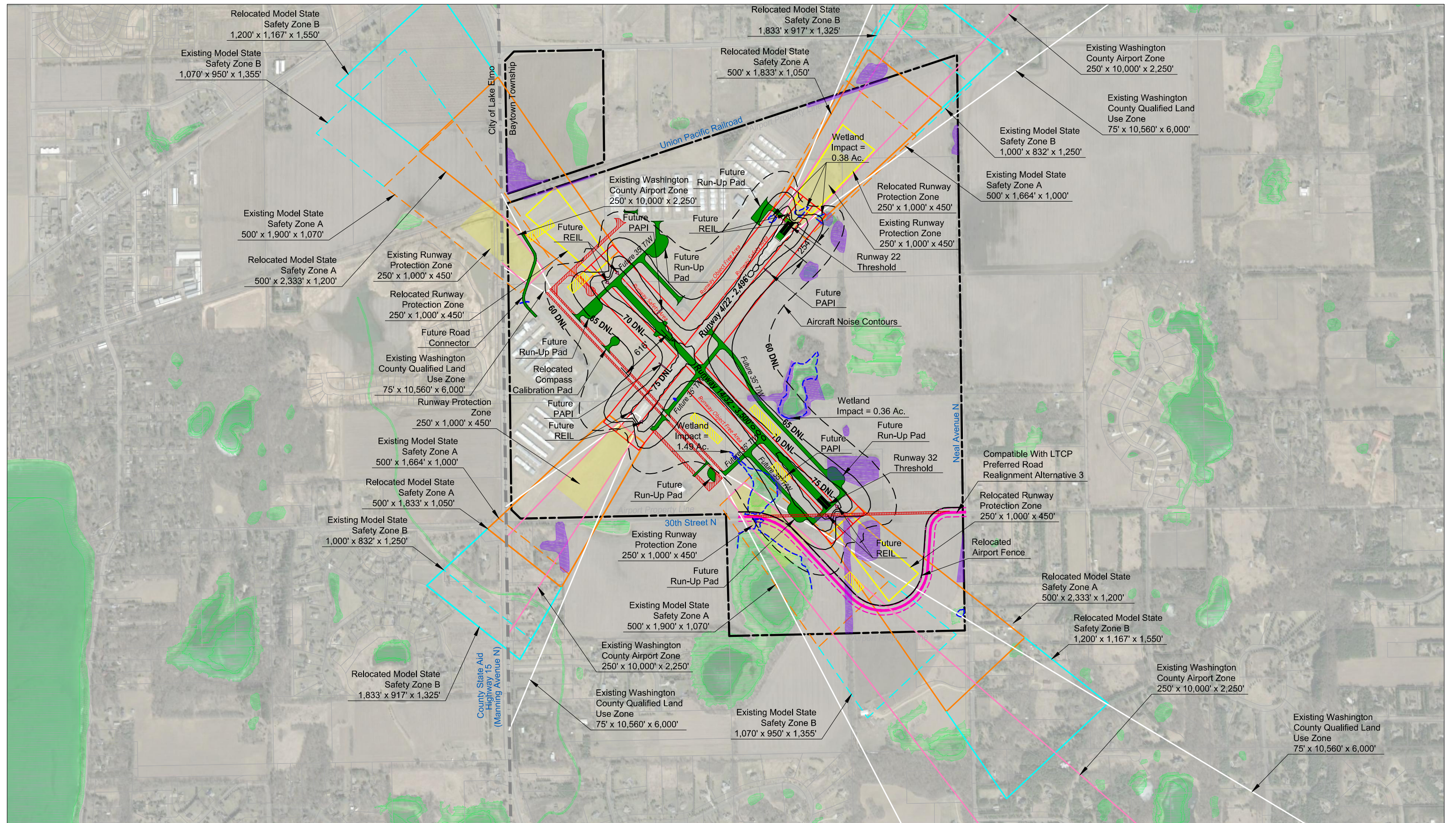
Practicability.

- **Financial Factors.** Total construction cost for this alternative is approximately \$9.3 million. This includes the cost to realign 30th Street North as proposed under 30th Street North Alternative 3, the preferred alternative for the street's realignment.
- **Logistical Factors.** There are no unique logistical factors associated with this alternative.

Environmental Effects.

- **Wetlands.** This alternative would require filling of approximately 1.97 acres of wetlands, including 1.49 acres for the west parallel taxiway, 0.36 acres for the east parallel taxiway, and 0.12 acres for realignment of 30th Street North as proposed by 30th Street North Alternative 3, the preferred alternative for the street's realignment.
- **Tree Removal.** An estimated 20 acres of trees on Airport property would need to be removed to allow for construction of the new runway and clear its approach, departure, and transitional surfaces. As noted previously, no off-Airport trees would need to be removed in the approaches to the relocated primary runway under this alternative.
- **Land Use.** There are three houses in Model Safety Zone A and ten houses in Model Safety Zone B for this alternative, when considering both ends of the primary runway. Note: counts of houses are based on structures within the zones.
- **Aircraft Noise.** The 65 DNL contour for this alternative is contained entirely on Airport property. Therefore, there are no significant noise impacts associated with this alternative.

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Note: Aircraft noise contour 60 DNL is shown for informational purposes only.

- | | | |
|--|-----------------------------|---|
| Approximate Tree Removal | Delineated Wetland Boundary | New/Reconstructed Pavements |
| Approximate Wetland Areas (U.S. Fish and Wildlife Service National Wetlands Inventory) | Pavement To Be Removed | Proposed Infiltration Basin & Temporary Storage |



**Lake Elmo Airport
Environmental Assessment**

**FIGURE 3-10
Alternative B1**

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3.3.5 Primary Runway Alternatives Comparison

The no-action alternative and Alternatives B and B1 are compared in **Table 3-3** with respect to each evaluation criterion. Alternative B1 either outperforms or is nearly identical to Alternative B when judged against all practicability and environmental evaluation factors. Therefore, Alternative B1 is selected as the preferred primary runway alternative for this EA/EAW and will be carried forward for full NEPA review in comparison with the no-action alternative.

Table 3-3: Primary Runway Alternatives Comparison Matrix				
Criterion		No-Action Alternative	Alternative B	Alternative B1
			Relocate 700' & Extend to 3,600'	Relocate 616' & Extend to 3,500'
Practicability Factors	Construction Cost	\$5.4 million	\$9.6 million	\$9.3 million
	Logistical Factors	Future Manning Avenue widening will trigger FAA RPZ review	Not compatible with preferred 30th Street North alternative	None
Environmental Factors	Wetland Fill and Conversion Area (approx.)	NA	2.83 acres	2.36 acres
	Tree Clearing Area (approx.)	13 acres	22 acres	20 acres
	Residential Parcels with Structures in Model Safety Zone A	0	6	3
	Residential Parcels with Structures in Model Safety Zone B	2	9	10
	Private Properties within 65 DNL	None	None	None

Note: Wetland fill/conversion areas and tree clearing areas shown in this table include those associated with crosswind Runway 04/22 extension. For a more apples-to-apples comparison of the primary runway component of the project, cost estimates and residential parcel counts shown in this table do not include those associated with crosswind Runway 04/22 extension. For more information on crosswind runway cost estimates, see Section 3.2.5. For more information on residential parcel counts for the entire project, see Section 5.9.1.

3.4 Preferred Alternatives / Proposed Action

Based on the set of preferred alternatives selected in this chapter, the proposed action to be evaluated by this EA/EAW includes the following:

- Relocate Runway 14/32 by shifting 615 feet to the northeast and extend to 3,500 feet, including grading, clearing, and runway lighting.
- Extinguish existing prescriptive easement for 30th Street North and seek, as appropriate, a land release from the Federal Aviation Administration (FAA) to allow realignment of 30th Street North around the new Runway 32 Runway Protection Zone (RPZ) to reconnect with the existing Neal Avenue North intersection.
- Relocate the Airport perimeter fence to reflect the new Runway 32 RPZ.
- Remove the existing north side taxiway and compass calibration pad and construct a new cross-field taxiway to serve the new Runway 14 end, including taxiway lighting and/or reflectors.
- Convert existing Runway 14/32 to a partial parallel taxiway and remove the portion of the existing parallel taxiway south of the Runway 04 threshold.
- Reconstruct Runway 4/22 and extend to 2,750 feet, including necessary lighting and taxiway connectors.
- Construct other taxiways and engine run-up pads as needed to support the relocated Runway 14/32 and extended Runway 04/22, including connector taxiways and a full-length parallel taxiway on the north side of the relocated Runway 14/32, and install taxiway lighting and/or reflectors.
- Relocate the compass calibration pad adjacent to the new partial parallel taxiway (converted Runway 14/32).
- Establish non-precision GPS-based instrument approach procedures to all runway ends not already equipped.
- Provide Runway 14/32 lighting systems with the relocated runway.
- Install medium intensity runway edge lights (MIRL) on Runway 04/22; precision approach path indicators (PAPIs) on the Runway 04, 14, and 22 ends; and runway end identifier lights (REIL) on each end of Runway 04/22.
- Remove approximately 20 acres of on-Airport trees and individual off-Airport trees as necessary to clear trees that penetrate FAA Threshold Siting Surfaces (TSS)/Part 77 approach and transitional surfaces.
- Install obstruction lighting on fixed base operator (FBO) and hangar buildings in the *United States Standard for Terminal Instrument Procedures* (TERPS) departure surface areas beyond Runway 04, 14, and 22 ends.
- Construct an on-Airport access road connecting the north and west building areas.
- Voluntarily explore creation of Rusty Patched Bumble Bee/pollinator habitat on Airport property southwest of proposed 30th Street North realignment.

Project construction is expected to commence in 2019 and would occur in annual phases over the course of approximately five years.

This chapter provides background information regarding the surrounding community and environment for Lake Elmo Airport. The chapter contains the following sections:

- Airport Location and Description
- Local Population
- Geology, Soils, and Topography
- Land Uses and Zoning
- Water Resources
- Biotic Communities
- Historic, Archaeological, and Cultural Resources
- Past, Present, and Reasonably Foreseeable Actions

4.1 Airport Location and Description

Located in Washington County east of St. Paul, Minnesota, Lake Elmo Airport is a 640-acre public airport owned and operated by the Metropolitan Airports Commission (MAC). The MAC is an airport authority created by state law in 1943 to provide coordinated aviation services within the Twin Cities Metropolitan Area. The MAC owns and operates seven airports in the metropolitan area including Lake Elmo, which was established in 1951 and is classified by the MAC as a “complimentary reliever.” The primary role of Lake Elmo Airport is to accommodate personal, recreational, and some business aviation users in Washington County and the eastern portion of the metropolitan area. Approximately 560 acres of Airport land are in Baytown Township, Minnesota, with the remaining 80 acres located in West Lakeland Township south of 30th Street North. The City of Lake Elmo is adjacent to the Airport west of Manning Avenue North. Situated one mile east of downtown Lake Elmo, the Airport is accessed via Manning Avenue North and 33rd Street North. Airport location, topographic, and airfield layout maps are shown in **Figures 4-1, 4-2, and 4-3**, respectively.

The primary runway at Lake Elmo is Runway 14/32. Runway 14/32 is 2,849 feet long and 75 feet wide. The asphalt runway is accompanied by a full-length 30-foot wide parallel taxiway with four connectors leading to and from Runway 14/32, as well as to hangars located on the west side of the Airport. Runway 4/22, Lake Elmo’s crosswind runway, is 2,496 feet long and 75 feet wide with an asphalt surface and full-length 30-foot wide parallel taxiway. Runway 4/22’s taxiway has three connectors with one connector directly off the Runway 22 end leading to hangars located on the north side of the Airport. The non-towered Airport is served by one fixed-based operator (FBO), Valters Aviation, which offers maintenance and 24-hour 100LL fuel.

Both runways at Lake Elmo have runway protection zones (RPZs) beginning 200 feet beyond the runway end with dimensions of 250’ x 1,000’ x 450’. An RPZ is a trapezoidal shaped area beyond a runway end with the purpose of protecting pilots as well as individuals and property on the ground. The Runway 14 RPZ extends beyond Manning Avenue North into the City of Lake Elmo. The Union Pacific Railroad is also located within the Runway 14 RPZ. The Runway 32 RPZ extends beyond 30th Street North into West Lakeland Township. Both RPZs for Runway 4/22 are located within Airport property boundaries.

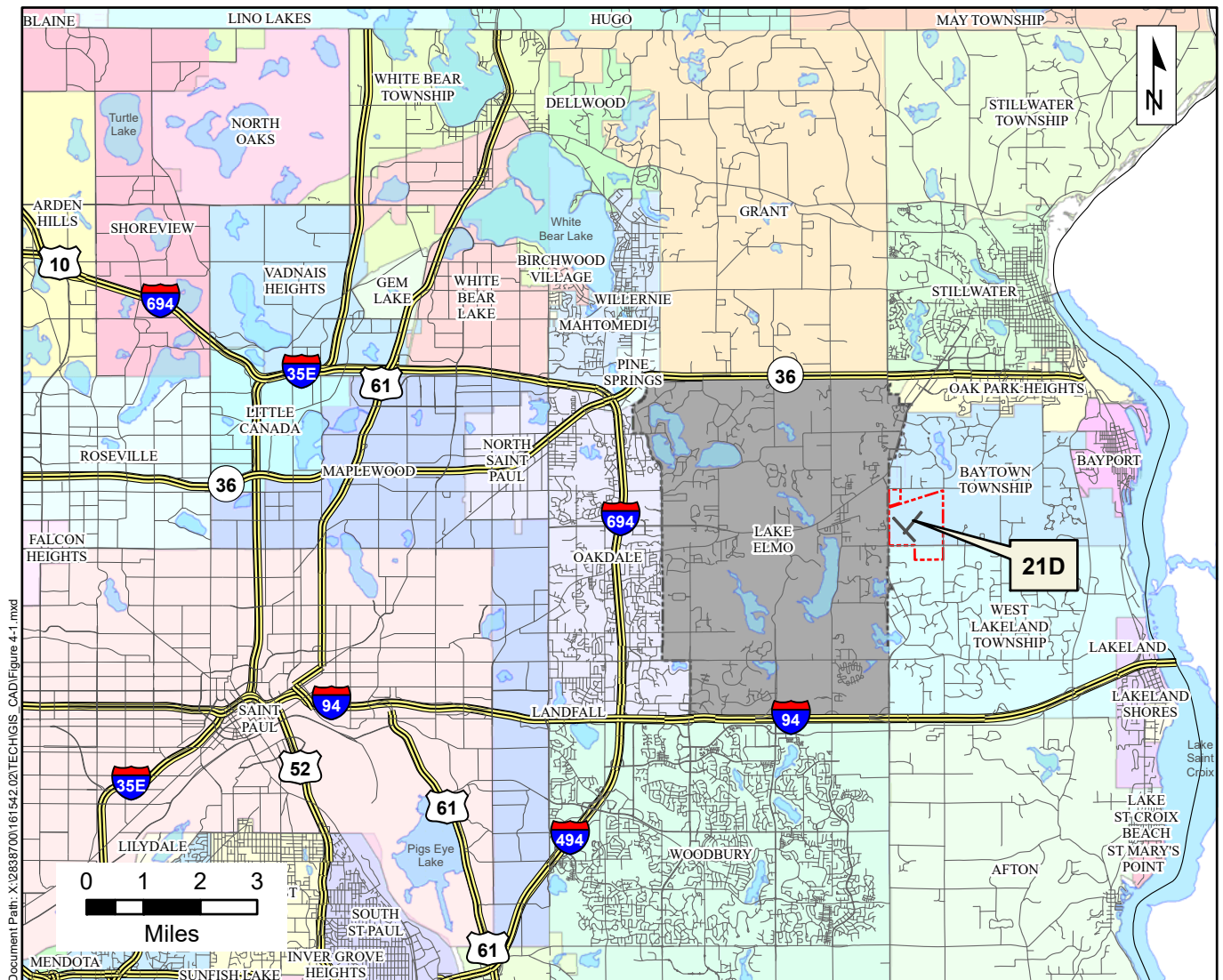
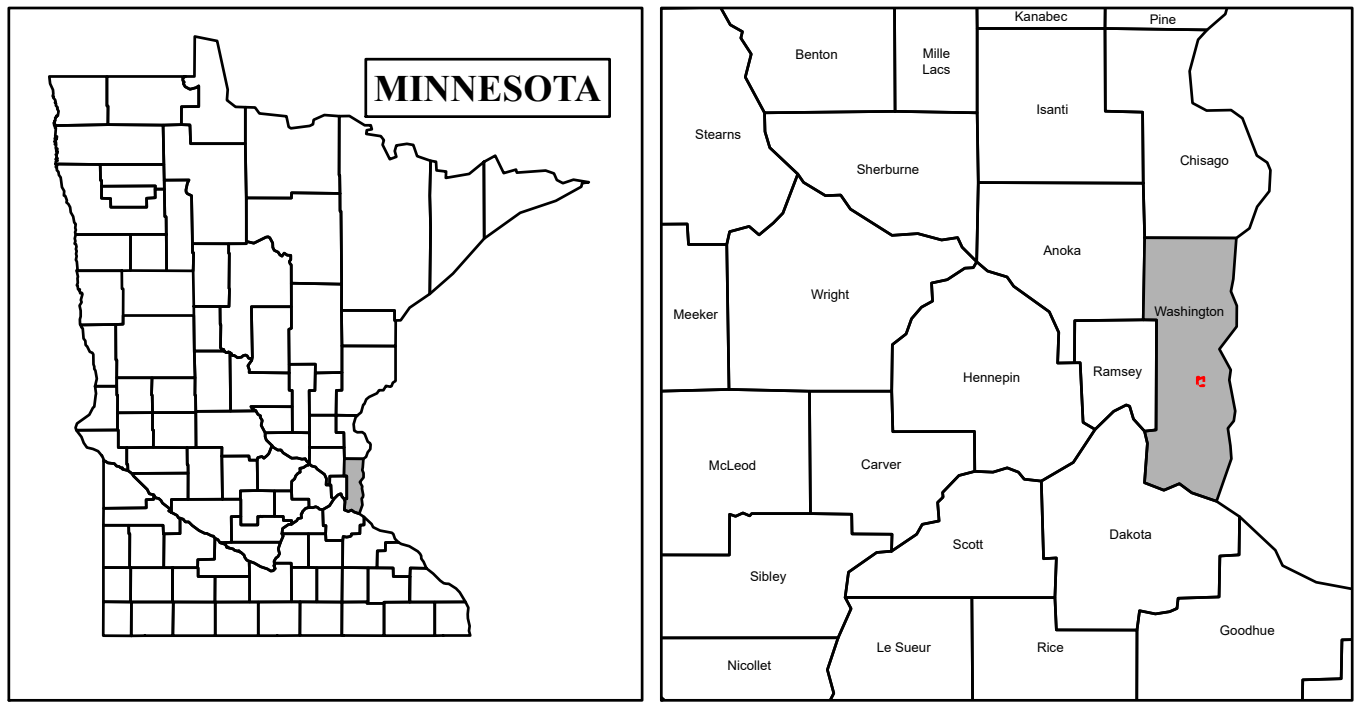


FIGURE 4-1
County Location
Lake Elmo Airport
Environmental Assessment

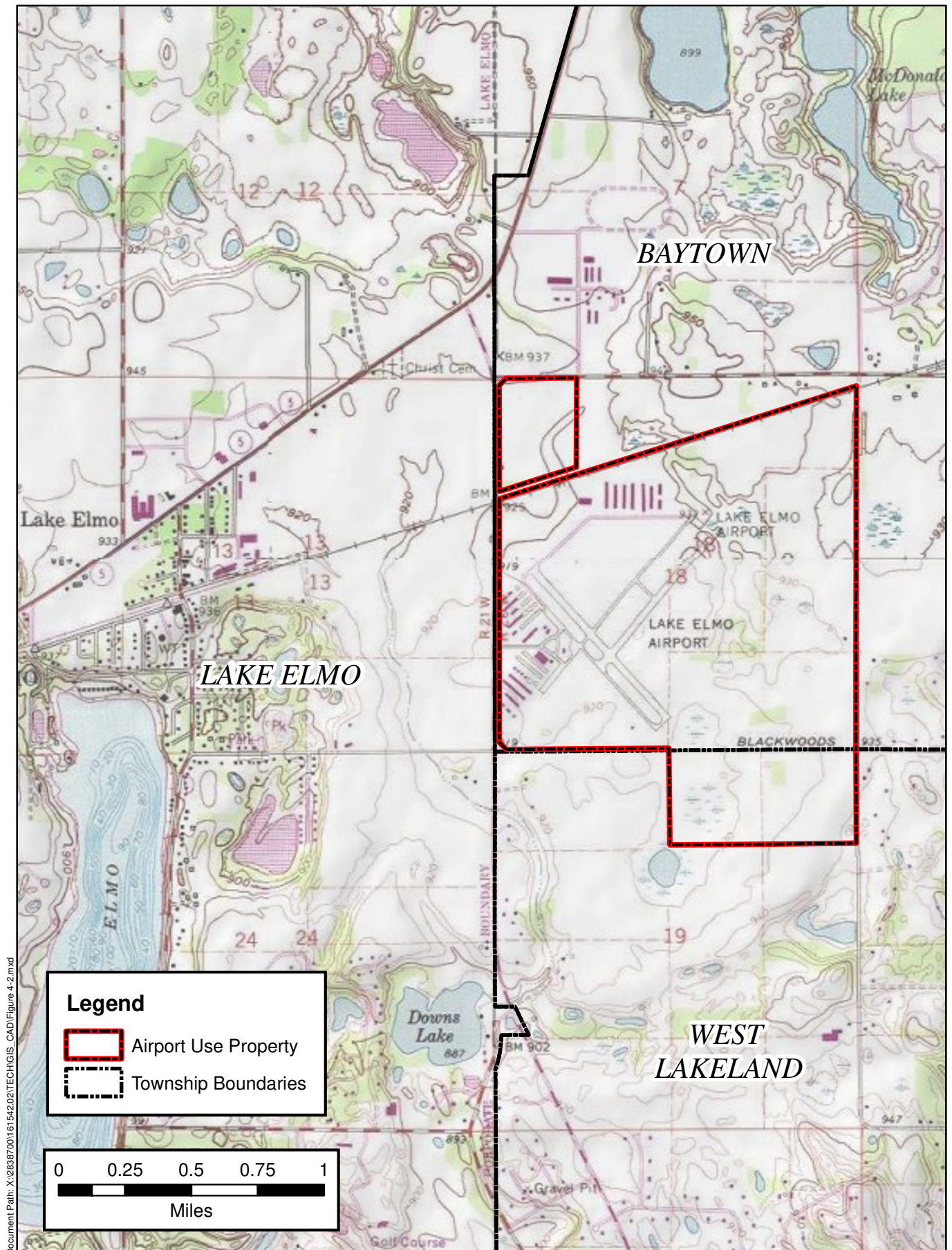
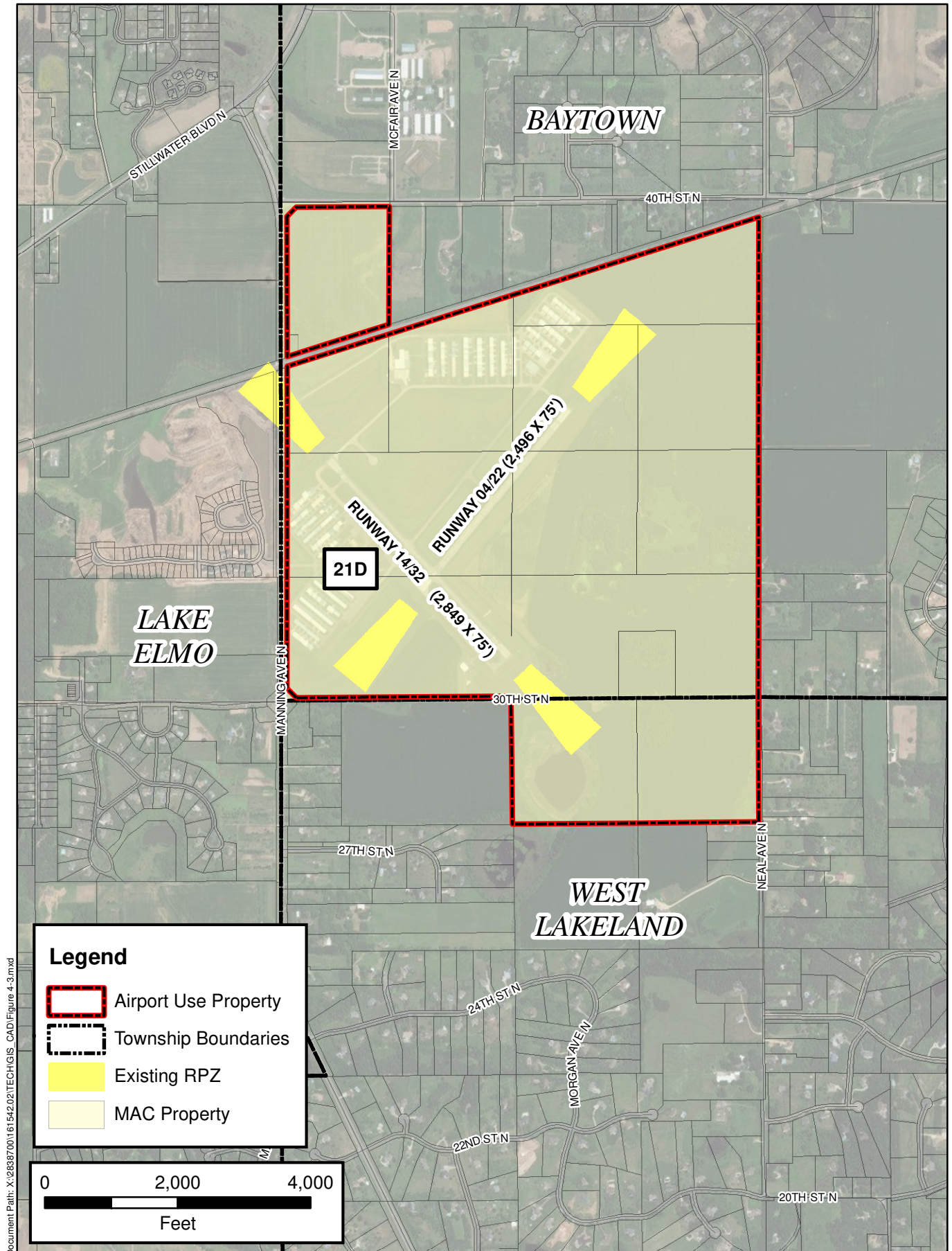


FIGURE 4-2
Topographic Map
Lake Elmo Airport
Environmental Assessment



Washington County, MN - GIS Data Downloads at
http://maps.co.washington.mn.us/arcgis/services/Public/Public_Parcels

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar
 Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
 GIS User Community

FIGURE 4-3
 Current Airfield
 Lake Elmo Airport
 Environmental Assessment

The Runway Design Code (RDC) signifies the design standards to which a runway is built and is comprised of three elements: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and visibility minimums. The AAC is represented by a letter ranging from A - E, for which every letter represents a range of aircraft approach speeds. Denoted by a roman numeral ranging from I-VI, the ADG classifies aircraft based on wingspan and tail height. Visibility minimums are primarily expressed in numerical values (1200, 1600, 2400, 4000, 5000, VIS) and are used to signify the minimum visibility conditions in which a runway can be used. Runway design standards are based on a single aircraft or family of aircraft that regularly uses the runway and accounts for 500 annual operations not including touch-and-go operations. The RDC for both runways at Lake Elmo Airport is based a family of small propeller-driven aircraft with fewer than 10 passenger seats, resulting in an A/B-II-5000 designation (small aircraft only). Aircraft Approach Categories A and B include aircraft with an approach speed of less than 91 knots (A), as well as an approach speed of 91 knots or more, but less than 121 knots (B.) Airplane Design Group II signifies aircraft with a tail height of 20 feet or more, but less than 30 feet and a wingspan of 49 feet or more, but less than 79 feet. Lake Elmo's 5,000-foot visibility minimum denotes landing is permissible if visibility conditions are not lower than one statute mile. This visibility minimum is only available for straight-in global positioning system (GPS) approaches to Runway 32, straight-in non-directional beacon (NDB) approaches to Runway 04, and circling GPS and NDB approaches to all four runway ends. Runways 14 and 22 currently do not have straight-in instrument approach procedures and therefore straight-in approaches to these runway ends are only permissible above Visual Flight Rules (VFR) minimums (3 statute mile visibility and 1,000-foot cloud ceiling).

Table 4-1 details estimated aircraft operations by user type and based aircraft by aircraft type for the 12-month period ending October 2016, as recorded in the Airport's FAA Airport Master Record.

Table 4-1: Lake Elmo Airport Aircraft Operations and Based Aircraft					
Based Aircraft	Single-Engine	183	Itinerant Aircraft Operations	Air Carrier	0
	Multi-Engine	6		Air Taxi	1,147
	Jet	0		Military	14,561
	Rotorcraft	3		General Aviation	169
	Other (including sailplanes)	0	Local Aircraft Operations	General Aviation	10,621
	Total Based Aircraft	192		Military	0
			Total Aircraft Operations		26,498

Source: FAA Form 5010-1, operations for the 12 months ending 10/31/2016

4.2 Local Population

Lake Elmo Airport is located mostly in Baytown Township and is bordered by West Lakeland Township to the south and the City of Lake Elmo to the west, all three of which are in Washington County. Population statistics for these four jurisdictions are presented below.

4.2.1 Washington County

The U.S. Census Bureau conducts a census every ten years, with population estimates for the years in between. The last census for Washington County was conducted in 2010 and documented total population of 238,136, or approximately 563 people per square mile. Another provider of demographic

data is the Minnesota State Demographic Center (MSDC). The MSDC, in coordination with the Metropolitan Council, produce population and household estimates for the census between years. **Table 4-2** displays 2000 and 2010 U.S. Census information for Washington County and more recent population estimates from both the Census Bureau and MSDC. County population has steadily increased since the 2010 Census according to United States Census Bureau and the MSDC.

Table 4-2: Washington County Population				
Year	Population (U.S. Census)		Average Annual Growth, 2000 to 2010	
2000	201,130		1.70 percent	
2010	238,136			
Year	Population (U.S. Census Estimate)	Average Annual Growth, 2010 to current year	Population (MSDC Estimate)	Average Annual Growth, 2010 to current year
2012	244,011	1.23 percent	243,313	1.08 percent
2014	249,026	1.12 percent	249,109	1.13 percent
2016	253,117	1.02 percent	253,128	1.02 percent

4.2.2 Baytown Township

Organized in 1858, Baytown Township is situated north of 30th Street North and is where Lake Elmo Airport's facilities currently reside, including Runways 14/32 and 4/22. In 2010, the total population was 1,723, or approximately 180 people per square mile. Though the MSDC estimated a slight decrease in population from 2010 to 2012, population has steadily increased in subsequent years, as shown in **Table 4-3**.

Table 4-3: Baytown Township Population		
Year	Population (U.S. Census)	Average Annual Growth, 2000 to 2010
2000	1,533	0.53 percent
2010	1,617	
Year	Population (MSDC Estimate)	Average Annual Growth, 2010 to current year
2012	1,615	-0.06 percent
2014	1,730	1.70 percent
2016	1,830	2.08 percent

4.2.3 West Lakeland Township

West Lakeland Township was originally part of Lakeland Township, which was established in 1858, but split off and organized as a separate entity in 1950 when Lakeland incorporated as a village. In 2010, the total population was 4,046, or approximately 321 people per square mile. **Table 4-4** depicts West Lakeland Township population since 2000.

Table 4-4: West Lakeland Township Population		
Year	Population (U.S. Census)	Average Annual Growth, 2000 to 2010
2000	3,547	1.32 percent
2010	4,046	
Year	Population (MSDC Estimate)	Average Annual Growth, 2010 to current year
2012	4,091	0.55 percent
2014	4,256	1.27 percent
2016	4,144	0.40 percent

4.2.4 City of Lake Elmo

The City of Lake Elmo was established in 1852. With a 2010 Census population of 8,069, or approximately 331 people per square mile, the City is more densely populated than the two townships, as shown in **Table 4-5**.

Table 4-5: City of Lake Elmo Population		
Year	Population (U.S. Census)	Average Annual Growth, 2000 to 2010
2000	6,863	1.63 percent
2010	8,069	
Year	Population (MSDC Estimate)	Average Annual Growth, 2010 to current year
2012	7,997	-0.45 percent
2014	8,594	1.59 percent
2016	8,748	1.36 percent

4.3 Geology, Soils, and Topography

The topography of the Airport site is relatively flat, ranging in elevation from approximately 910 to 950 feet above mean sea level. Soils to be disturbed by the project consist primarily of Antigo silt loam and Crystal Lake silt loam, which have low slopes, are moderately to well drained, and are well suited for building upon because of their combination of sand, silt, and clay.

The surface geology on and near the Airport is fine-grained sand, silt, and clay deposited by the most recent glacier to extend into the area approximately 30,000 years ago. This glacier is known as the Superior lobe, which passed over Precambrian crystalline bedrock, Cambrian sandstone, and basalt in northeastern Minnesota, and Paleozoic sedimentary rock in east-central Minnesota. After a warming period that saw the glacier's retreat north to Chisago County, the ice re-advanced approximately 20,000 years ago and formed the St. Croix moraine. During the period following the re-advance, known as the St. Croix phase of the Superior lobe, the moraine stagnated for an unknown duration. Large, well-developed, subglacial fluvial channels, or tunnel valleys, formed at the glacial margin; large lakes were formed when the glacier pressed blocks of ice into the sediment below, commonly in tunnel valleys; and smaller lakes and wetlands were formed by thawed permafrost, creating irregular topography at or below the water table. The Airport is located on a broad plateau that was formed during the St. Croix phase by stagnation of the moraine and a resulting ice-walled lake plain. This relatively flat plain is perched above surrounding depressions and is underlain primarily by laminated, red clay and light brown, fine-grained sandy silt, capped by brown, fine-grained sand.

The average depth to bedrock on and near the Airport is 50 to 100 feet. The bedrock geology is the Shakopee Formation of the Prairie du Chien Group (Lower Ordovician), which is a heterolithic unit composed mainly of light brown, thin-to-medium bedded dolostone, sandstone, and shale. It contains oolites, intraclasts, fossilized microbial mounds, chert nodules, quartz sandstone, and green-gray shale pairings. The Prairie du Chien Group is dominated by thick units of carbonate rock with less sandstone and shale than other Paleozoic rocks. Because carbonate rock is soluble, and because the area has been exposed to varying water table elevations over recent millennia, there is a moderately high likelihood of karst conditions within the bedrock. Formation of sinkholes on the Airport is possible, although sinkholes tend to form in areas with a shallower depth to bedrock than is present at the Airport. Potential sinkhole locations are difficult to determine without extensive geotechnical work.

4.4 Land Uses and Zoning

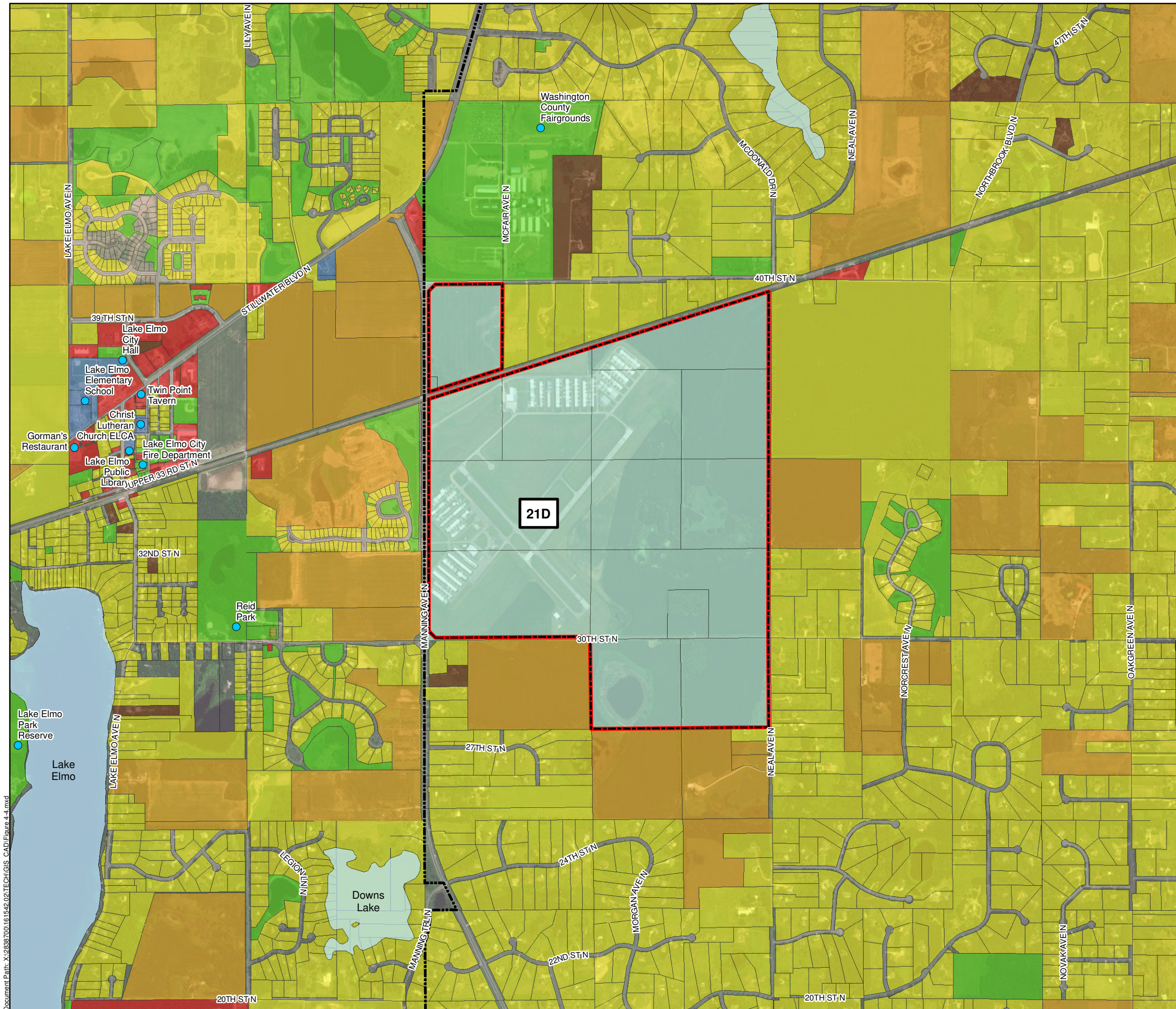
This section identifies land uses and zoning designations for the Airport and its surrounding environment. General land cover estimates for Airport property are summarized in **Table 4-6**, based on data from the Minnesota Land Cover Classification System (MLCCS).

Figure 4-4 depicts the current land use of the Airport and surrounding community.

Table 4-6: Airport Land Cover		
General Land Cover Type	Acres	Percentage
Impervious Surface	58.7	9.2 percent
Agricultural (leased)	300.6	47.0 percent
Grassy Areas	208.8	31.0 percent
Wooded	35.2	5.5 percent
Wetland	36.7	5.7 percent
Total	640.0	

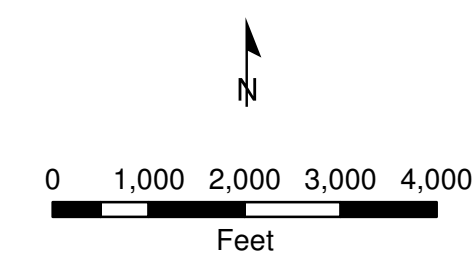
Source: Minnesota Land Cover Classification System, Mead & Hunt

- *Places of Public Assembly* – Most places of public assembly near the Airport are in Lake Elmo. Between 39th Street North and Upper 33rd Street North, about two miles west of the Airport, are restaurants including Gorman's and Twin Point Tavern, Lake Elmo City's Fire Department, Lake Elmo Public Library, Lake Elmo Elementary School, and Lake Elmo City Hall. Oak Land Middle School and all churches in the near vicinity, including Christ Lutheran Church ELCA, Common Ground Church, and St. Lucas Community Church, are in Lake Elmo. The Washington County Fairgrounds are located one mile north of the Airport in Baytown Township. None of these places of public assembly is within the approach and departure areas at the Airport.
- *Public Parks/Recreational Areas* – The nearest parks/recreational areas are Reid Park and Lake Elmo Park Reserve. Reid Park is a 30-acre community park equipped with a playground and several fields for sporting events such as soccer, football, and softball. Lake Elmo Park Reserve is 2,165 acres with 80 percent of the acreage set aside and devoted to preservation and protection. Some activities allowed at the park reserve are bicycling, boat launching, camping, and archery. Neither of these parks is in the approach or departure areas at the Airport.
- *Farmland* – Soils at Lake Elmo Airport are classified in **Figure 4-5** and primarily consist of prime farmland and farmland of statewide importance. Prime farmland is land that does not flood frequently and has the best chemical and physical characteristics for producing food, feed, fiber, oilseed crops, and forage. Prime farmland's soil allows both water and air to pass through and has the characteristics needed to produce and sustain high yields of crops. Farmland of statewide importance is land that does not meet the criteria for prime or unique farmland, but is of statewide importance to produce food, feed, fiber, forage, and oil seed crops. Farmland of statewide importance is also capable of producing high-yield crops when treated and managed.
- *Hospital* – Lakeview Hospital in Stillwater, Minnesota is 5.6 miles northeast of the Airport and is the closest hospital to the Airport. The hospital is not within any runway approach or departure paths at the Airport.



Legend

- Airport Use Property
- Lake Elmo Boundary
- Parcels
- Airport
- Single Family Detached
- Agricultural
- Multi-Family
- Institutional
- Commercial/Industrial
- Public/Park
- Points Of Interest

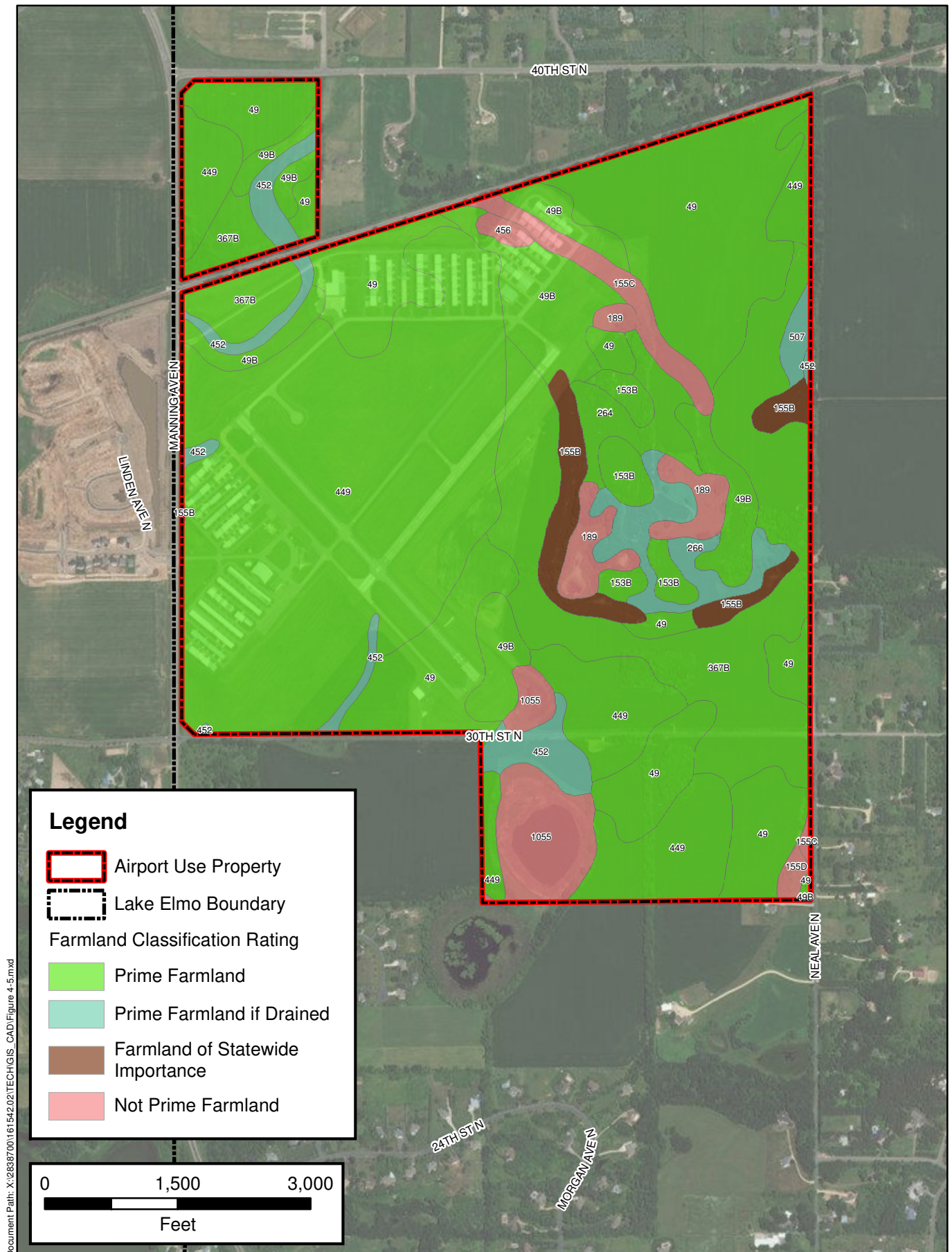


Washington County, MN - GIS Data Downloads at
http://maps.co.washington.mn.us/arcgis/services/Public/Public_Parcels

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 4-4
 Land Use
 Lake Elmo Airport
 Environmental Assessment

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United States Department of Agriculture - Web Soil Survey
<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 4-5
 Soils Map
 Lake Elmo Airport
 Environmental Assessment

The following subsections describe land use and zoning designations for Baytown Township, West Lakeland Township, and the City of Lake Elmo, as well as a discussion of airport-related zoning overlays. This is presented for informational purposes, as the MAC, pursuant to its statutory powers, does not concede jurisdiction regarding zoning of MAC-owned property, does not recognize zoning designations of MAC-owned property made by local jurisdictions, and does not seek zoning-related permits from local jurisdictions.

4.4.1 Baytown Township Land Uses & Zoning

As previously noted, most of Lake Elmo Airport is located in Baytown Township and all of the Airport's facilities, including Runway 14/32, Runway 4/22, hangars, and taxiways are situated in Baytown Township. As required by the Minnesota Metropolitan Land Planning Act, Baytown Township is currently in the process of updating its 2040 Comprehensive Plan. The draft 2040 Comprehensive Plan shows Lake Elmo Airport as public land within the agriculture district. Public land is land owned and/or operated by a governmental unit.

The township has a zoning ordinance which was updated in April 2017. The zoning ordinance states the Township is divided into six districts: Agriculture Preserve; Agriculture; Rural Residential; Single Family Estate' Transition Zone; St. Croix River; and Shoreland Overlay Districts. All six districts have primary uses, uses allowed with a certificate of compliance, and uses allowed with a conditional use permit. Under the comprehensive plan and 2013 zoning map, Lake Elmo Airport is located in the agriculture district. The agriculture district permits agricultural and related uses to preserve the rural character of the township. Baytown Township was once primarily agricultural land before residential development grew over the years. Primary uses in the agriculture district are agriculture and single family detached residential. Though agriculture land use is devoted to the production of fruits, vegetables, raising domestic farm animals, etc., these activities do not have to be the principal use. If a certificate of compliance is issued, other permitted uses include, but are not limited to: accessory apartments, home occupation, place of worship, livestock and livestock operations. A conditional use permit allows golf courses, multi-family residential development, open space development, schools, and other development.

The primary land use in Baytown Township is large lot single-family residential which is primarily located within the single-family estate district to the north and east of the Airport. Residences nearest to the Airport in Baytown Township are along 40th Street North, Manning Avenue North, Neal Avenue North, and McDonald Drive North. The Township does not plan to change its zoning districts near the Airport. There is no commercial land use near the Airport, and no commercial zoning district within the township.

4.4.2 West Lakeland Township Land Uses & Zoning

West Lakeland Township also has a goal of maintaining a rural residential character. According to its comprehensive plan and current zoning map, land use within the township is primarily rural residential single-family homes. No Airport facilities are currently located in West Lakeland Township except for the 80 acres of unused land. The 80-acre portion of Airport property and Airport Overlay District are located within the single-family estates district. Primary uses within the single-family estate district are agriculture and single-family estates. Uses such as golf courses, livestock and livestock operations, and essential

services including government uses require a conditional use permit. Commercial activities are limited throughout the Township by the zoning ordinance.

4.4.3 City of Lake Elmo Land Uses & Zoning

The Runway 04 and 14 approaches and a portion of the Runway 14 RPZ are located west of the Airport in the City of Lake Elmo, which has also established a comprehensive plan and zoning code. The current land use within the RPZ and state safety zones under the comprehensive plan is rural area development. The rural area development category represents large areas of rural development and agricultural uses within Lake Elmo.

The City zoning code lists the areas in the approach to Runway 14 as urban low density residential (LDR) and rural development transitional (RT) zoning districts. The LDR district provides single-family dwellings on moderately sized lots and is the most restrictive of the urban residential districts. The district intends to provide areas for lower density residential development in areas served by public sewer and water services. Uses such as parks and open areas, home occupation, group homes, and single-family detached dwellings are permitted within the LDR district. Other uses such as broadcasting or communication facilities, golf courses, and schools are allowed with a conditional use permit. The RT district is an interim holding zone to regulate land uses within the city that will connect to regional sewer service. There are a few agriculture zoned districts scattered throughout Lake Elmo, but none are affected by or adjacent to the Airport.

4.4.4 Washington County Zoning

The Washington County zoning ordinance includes an Airport Overlay District applying to both public and private land. The regulations of the Airport Overlay District are in addition to regulations enforced by other districts covering the same land and are designed to minimize land development adjacent to and near the airfield. The Airport Overlay District consists of two zones: Qualified Land Use Zone and Airport Zone. The Qualified Land Use Zone prohibits structures or uses that will cause assembly of persons, manufacturing or storage of materials which will explode on contact, or the storage of flammable liquid above ground. The zone does permit primary uses, uses permitted with a certificate of compliance, accessory uses, and uses permitted with a conditional use permit from underlying zoning districts. However, the Qualified Land Use Zone prohibits educational, institutional, amusement, and recreational uses as well as any use that would result in electrical interference with radio communications, airport light interference, or impaired visibility. The Airport Zone prohibits growth, construction, maintenance, or alteration of trees and structures above the Part 77 imaginary surfaces (horizontal, conical, primary, approach, and primary).

4.4.5 Minnesota State Standard Airport Zoning

Airport zoning allows the Airport to minimize and possibly eliminate any incompatible land use or development which would cause a negative impact to the surrounding airspace and disturbance to those using the Airport. Though the power to implement zoning laws and regulations rests with the Airport in conjunction with state and local governments, the FAA is a catalyst for minimizing and eliminating incompatible land uses via grant assurances, which must be agreed to by airport sponsors prior to receiving federal funding. FAA Grant Assurance 21, Compatible Land Use, states the airport sponsor

agrees, to the extent reasonable, to restrict the use of land and activities adjacent to the airport or in the immediate vicinity that do not comply with normal airport operations.

Minnesota, under Chapter 360.063 of the Minnesota Statutes, grants authority to all municipalities within an airport hazard area to enforce airport zoning regulations, which may specify or restrict land use, tree removal or growth, and/or height of structures. Within the airport hazard area under approach zones, the municipality may regulate location, size, and use of buildings and population within two miles of airport boundaries. Under Chapter 360.015, subdivision 10, “it shall be the duty of the commissioner, the commissioner's assistant, and all employees of the Department of Transportation and every state, county, and municipal officer charged with the enforcement of state and municipal laws to enforce and assist in the enforcement of sections 360.01 to 360.074...” Sections 360.01 to 360.074 include airport zoning. The state enacted its first model airport zoning ordinance in 1946 and amended it in 1990. The model ordinance is a guide for municipalities to enact and enforce zoning, but has not been adopted at Lake Elmo Airport.

Before completing the EA/EAW process, the MAC will start convening a Joint Airport Zoning Board (JAZB) under Minnesota Statutes Chapter 360. Members of the JAZB are expected to include representatives from the City of Lake Elmo, Baytown Township, West Lakeland Township, Washington County, and any other local government jurisdiction affected by the proposed zoning ordinance. The process will consider public input as part of developing an airport zoning ordinance. This process may result in a zoning ordinance recommendation to the MnDOT Office of Aeronautics that deviates from the state's Model Zoning Ordinance.

4.5 Water Resources

The Valley Branch Watershed District (VBWD) is responsible for protecting water resources on and near the Airport, including lakes, ponds, creeks, streams, wetlands, drainages, and groundwater. The district covers 70 square miles located on the northeastern edge of the Minneapolis-St. Paul metropolitan area. One square mile of the District is in Ramsey County, but the remaining area is in Washington County, including Baytown Township, West Lakeland Township, and the City of Lake Elmo. All lakes, rivers, and streams within the VBWD flow into the St. Croix River. The VBWD was created in 1968 and is governed by a Board of Managers consisting of five personnel: four managers appointed by Washington County and one by Ramsey County. Water resources on and near the Airport are described in the following sections:

- Groundwater
- Lakes
- Rivers and Streams
- Impaired Waters
- Watersheds
- County Ditches
- Wetlands
- Floodplains

4.5.1 Groundwater

Groundwater is found underground within cracks and spaces of soil and rock. Groundwater is a crucial source of water supply in Washington County and is contained mostly in bedrock aquifers. Four aquifers are primarily used in the VBWD: Tunnel City-Wonewoc, Prairie du Chien-Jordan Sandstone, Mt. Simon, and a quaternary. Tunnel City-Wonewoc (formerly known as Franconia-Ironton-Galesville aquifer), Prairie du Chien-Jordan Sandstone, and Mt. Simon are all within bedrock. These bedrock aquifers are under artesian pressure, which causes the water to move from high to lower pressure elevations. Tunnel City-Wonewoc underlies most of the VBWD while Mt. Simon underlies all of the VBWD. Prairie du Chien and Jordan Sandstone are the aquifers predominantly used for drinking water within Washington County. Because of the lack of regional-confining bed to separate the two aquifers, they act as one aquifer that expands to an approximate maximum width of 200 feet in some sections of the county. The fourth aquifer is a quaternary, which is a water table under atmospheric pressure. Ground water within the VBWD generally flows from the northwest to west and then east toward and into the St. Croix River.

Baytown Township, West Lakeland Township, and the City of Lake Elmo are currently under a Minnesota Department of Health (MDH) enforced well advisory because of ground water contamination by volatile organic chemicals (VOC). The VOC contaminant is a solvent called trichloroethylene (TCE), which is a chemical that was commonly used in paints and adhesives, and as a degreasing and cleaning agent. The original source of the TCE contamination was a former metal working shop in Lake Elmo. The plume of TCE contamination spread in the groundwater, moving east through the Airport area to the center of Baytown Township. Sensitivity of groundwater systems to pollution have been established for some of the aquifers as part of the Washington County Geologic Atlas. Within Baytown Township, the quaternary aquifer is primarily rated as “high” with a few areas in the west as “very high.” A high rating means “contaminants will probably reach the water table in weeks to years” while a very high rating signifies “contaminants will almost certainly reach the water table in hours to months.” Half of Baytown Township rests over the quaternary aquifer. The Prairie du Chien-Jordan Sandstone aquifer ranges from high to low-moderate, with low-moderate indicating “contaminants will probably not reach the water table for more than a decade.”

The MDH is responsible for ensuring proper well construction and sealing of groundwater wells. Most residences in Baytown Township rely on private wells leaving private well owners responsible for their drinking water quality. Under the 2040 Baytown Township comprehensive plan, the township has no plans to provide municipal water services. The Airport is outside any wellhead protection areas identified by the MDH. The MDH Minnesota Well Index identifies Lake Elmo Airport as having roughly 26 wells on the airfield drawing from all four area aquifers with only a few wells reported sealed or abandoned. The MAC adopted a sanitary sewer and water policy for the Airport requiring all noncompliant wells be sealed. Because of the Minnesota Pollution Control Agency (MPCA) suspected the Airport of being a source of TCE, in May 1988 the MPCA issued a request for information to the MAC. The MAC investigated the Airport’s groundwater from 1988 – 1991. TCE was found in the drinking water aquifer beneath the Airport. The MAC was declared to be the responsible party in 1991. The MAC and the MPCA conducted further investigations from 1992 to 1998. The MAC completed a 1999 feasibility study which recommended the installation of point-of-use granulated activated carbon filters (GAC). MPCA approved the GAC filters as a remedial action at the Airport. The MAC began installing GAC filter systems on private wells to meet the

TCE drinking water standard at that time. The MPCA took over the program in 2007 after contamination was discovered at the former metal working shop in Lake Elmo. Additional investigation has convinced the MPCA that the Airport is neither the sole, nor most significant source of the Baytown contamination plume. The original Record of Decision was amended in July 2007 to reflect the final cleanup decision and public input. **Figure 4-6** depicts well data for the Lake Elmo Airport.

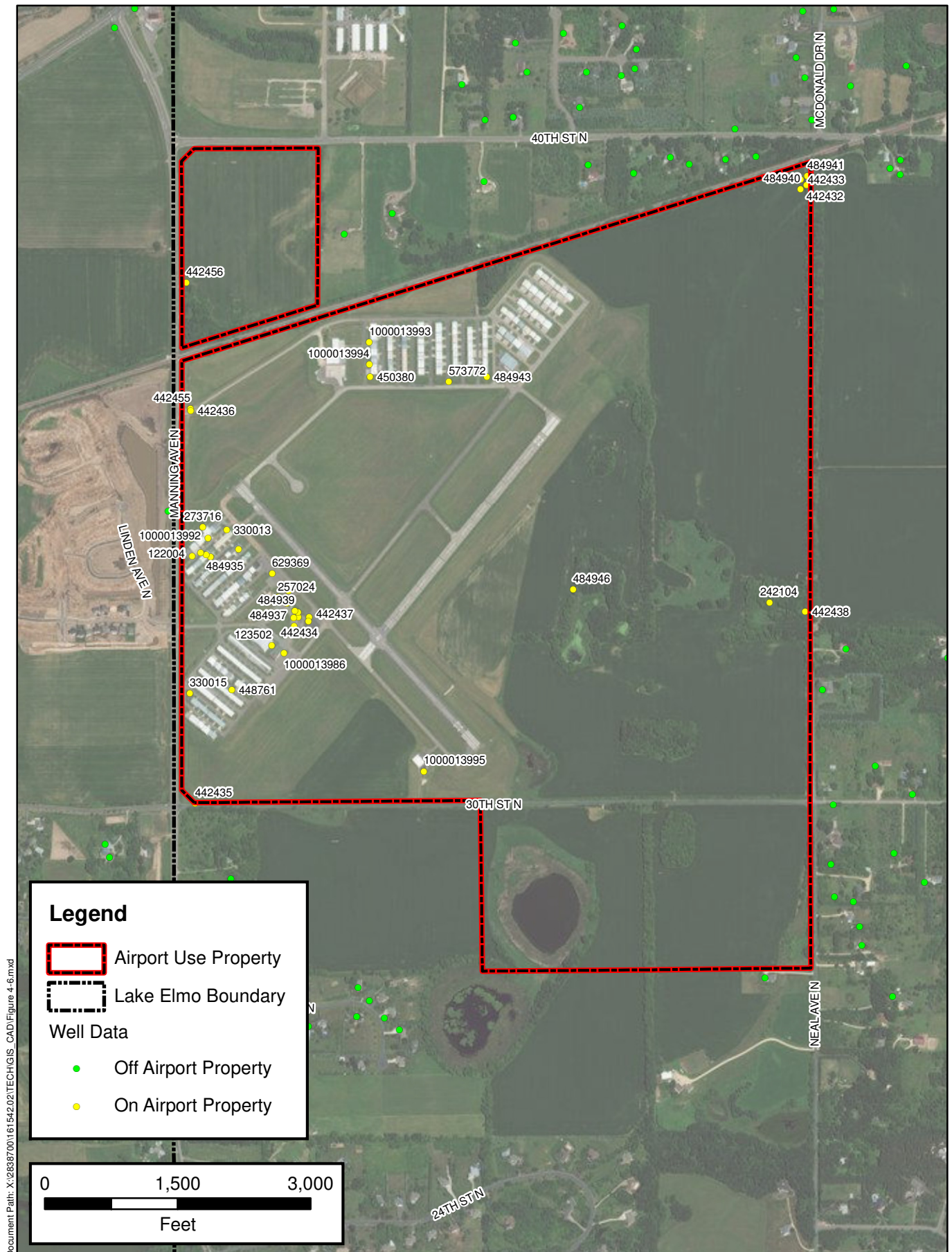
4.5.2 Lakes

There are six lakes within a two-mile radius of the Airport: Cloverdale Lake, Lake Elmo, Downs Lake, Sunfish Lake, McDonald Lake, and Horseshoe Lake. MDNR Public Waters Inventory (PWI) map for Washington County identifies three of the surrounding lakes as protected waters and assigns them Public Water Identifiers. The protected lakes and their identifiers are as follows: Lake Elmo 106P, Sunfish Lake 107P, and Horseshoe Lake 74P. Under the PWI, McDonald and Cloverdale Lakes are considered public water wetlands, with the following identifiers: 10W and 9W. None of the lake shorelines border Airport property.

4.5.3 Rivers and Streams

The upper 200 miles of the St. Croix River are considered a National Scenic Riverway and are managed by the National Park Service. The upper St. Croix River is also considered an Outstanding Resource Value Water Minnesota Rules 7050. The St. Croix River has a drainage area of approximately 7,760 square miles. The Valley Branch Watershed District is a tributary to the St. Croix River, but the Airport does not drain to the upper 200 miles of the river.

An intermittent stream one mile north of Downs Lake at the Union Pacific Railroad flows south and feeds into the Downs Lake subwatershed. There is also an unnamed MDNR public water stream, though often referred to as the Lake Elmo Creek, between Lake Elmo and Horseshoe Lake. Though these streams are near the Airport, the Airport does not drain to either of them.



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FIGURE 4-6

Well Data
Lake Elmo Airport
Environmental Assessment

Minnesota Department of Health - Minnesota Well Index
<https://apps.health.state.mn.us/cwi>

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the
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4.5.4 Impaired Waters

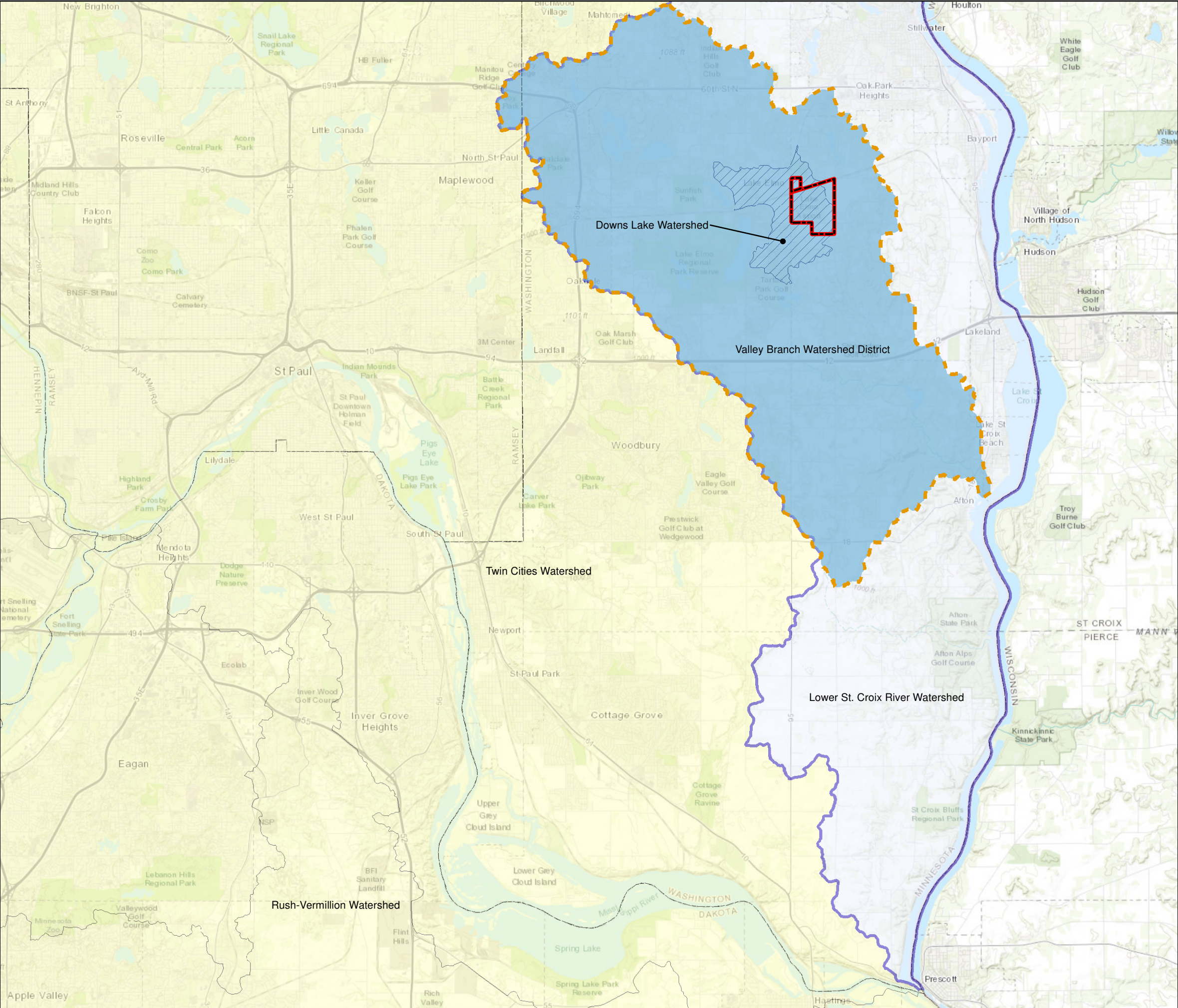
The Clean Water Act was established to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” So-called “impaired waters” are any bodies of water that do not meet water quality standards or fully support the waterbody’s beneficial use. Section 303(d) of the Clean Water Act requires states to assess and list impaired waters and establish priority ranking by considering the water’s uses and pollutant levels. The Clean Water Act allows states to adopt water quality standards. Minnesota has done so under Chapter 7050 of Minnesota Rules, which is administered by the Minnesota Pollution Control Agency (MPCA). These standards designate beneficial uses, known as designated uses, to every water body. Minnesota waters are to be protected as well as their assigned designated uses, whether for drinking water, recreation, fish consumption, or aquatic life. Not only do water quality standards establish designated uses, they also establish criteria which must be met within the bodies of water so water quality is maintained to support their designated uses.

Every even-numbered year, MPCA must produce an impaired waters list. In 2016, the MPCA declared two of the lakes within a two-mile radius of the Airport as impaired: Lake Elmo and Downs Lake. The Lake Elmo Airport’s drainage flows into Downs Lake. The MPCA also declared the St. Croix River as impaired in certain areas. Lake Elmo was assigned the assessment unit identifier 82-0106-00 and added to the impaired waters list in 1998 and 2008. The deep lake is listed as an impaired water because of perfluorooctane sulfonate found in fish tissue in 1998 and for mercury found in fish tissue in 2008. Perfluorochemicals were once used in products to resist heat, oil, stains, grease, and water. Downs Lake is a shallow lake that was given the assessment unit identifier of 82-0110-00 and added to the list of impaired waters in 2012. The MPCA currently lists the lake as impaired because of nutrients, eutrophication, and biological indicators affecting its aquatic recreation. Nutrients are essential within a waterbody, but excessive amounts can cause degradation. According to Minnesota Rules 7050.0150, eutrophication is characterized by increased growth and abundance of algae and other aquatic plants, reduction or loss of dissolved oxygen, reduced transparency in water, and other chemical and biological changes. Four sections of the St. Croix River were added to the impaired waters list in 1998 because of the discovery of mercury in fish tissue. The same four sections were also added to the list in 2006 because of polychlorinated biphenyls found in fish tissue.

4.5.5 Watersheds

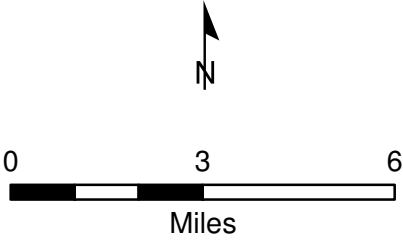
Washington County is within three watersheds: Twin Cities, Lower St. Croix, and Rush-Vermillion. Though Washington County rests within these watersheds, Lake Elmo Airport is located entirely within the Lower St. Croix River Watershed. The Lower St. Croix River Watershed covers 585,735 acres and all of its streams and rivers flow into the St. Croix River from Taylor Falls and St. Croix Falls to the confluence of the St. Croix and Mississippi Rivers in Prescott, Wisconsin. The drainage from Lake Elmo Airport flows into Downs Lake, which is a basin within the Downs Lake Subwatershed. As shown in **Figure 4-7**, the Downs Lake Subwatershed is a 2,339-acre tributary watershed located in the Valley Branch Watershed District (VBWD), and is entirely tributary to the St. Croix River. Downs Lake is in eastern Lake Elmo near the city’s border along West Lakeland Township.

An intermittent stream located one mile north of Downs Lake at the Union Pacific Railroad accounts for most of the drainage into the lake. Downs Lake does not begin to flow from the Downs Lake Watershed until a discharge elevation of 891.5 feet has been reached. Once this elevation has been reached, Downs Lake begins to discharge into a wetland between Downs Lake and 20th Street, which overflows south into Golf Course Pond.



Legend

- Airport Use Property
- Downs Lake Watershed
- Valley Branch Watershed District
- Surrounding Watershed Areas
- Lower St. Croix River Watershed



U.S. Fish & Wildlife Service - National Wetlands Inventory
<https://www.fws.gov/wetlands/Data/Mapper.html>

Minnesota Department of Natural Resources - MNDNR Watershed Suite
<https://gisdata.mn.gov/dataset/geos-dnr-watersheds>

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

FIGURE 4-7
Watershed Districts
Lake Elmo Airport
Environmental Assessment

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4.5.6 Wetlands

Wetlands are a valuable resource to human, animal, and plant communities. They are responsible for providing a home to a variety of insects, mammals, vegetation, fish, birds, and microbes. Wetlands perform physical, chemical, and ecological functions while varying in shapes, sizes, and types. The U.S. Army Corps of Engineers defines wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands are not limited to swamps, marsh, and similar areas, as a temporarily flooded pothole may also be a wetland if certain soils and vegetation are present. Section 404 of the Clean Water Act requires that those who deposit dredged or fill material into the waters of the United States, including wetlands, must receive a permit before depositing dredged or fill material. The U.S. Army Corps of Engineers is responsible for administering Section 404 and the authorization process. Other agencies responsible for regulating wetlands include but are not limited to the MDNR and the U.S. Fish and Wildlife Service.

Wetlands are also regulated by the Wetland Conservation Act (WCA), a wetland protection law passed by the Minnesota state legislature in 1991. The purpose of the WCA is to maintain and protect Minnesota wetlands and the benefits they provide. It does so by requiring those proposing to drain, excavate, dredge, or fill a wetland to 1) first try to avoid disturbing the wetland, then 2) try to minimize the impact on the wetland, and finally 3) replace any lost wetland acres, functions, and values. The Minnesota Board of Water and Soil Resources administers WCA, with the assistance of local governmental units (typically Minnesota watershed districts).

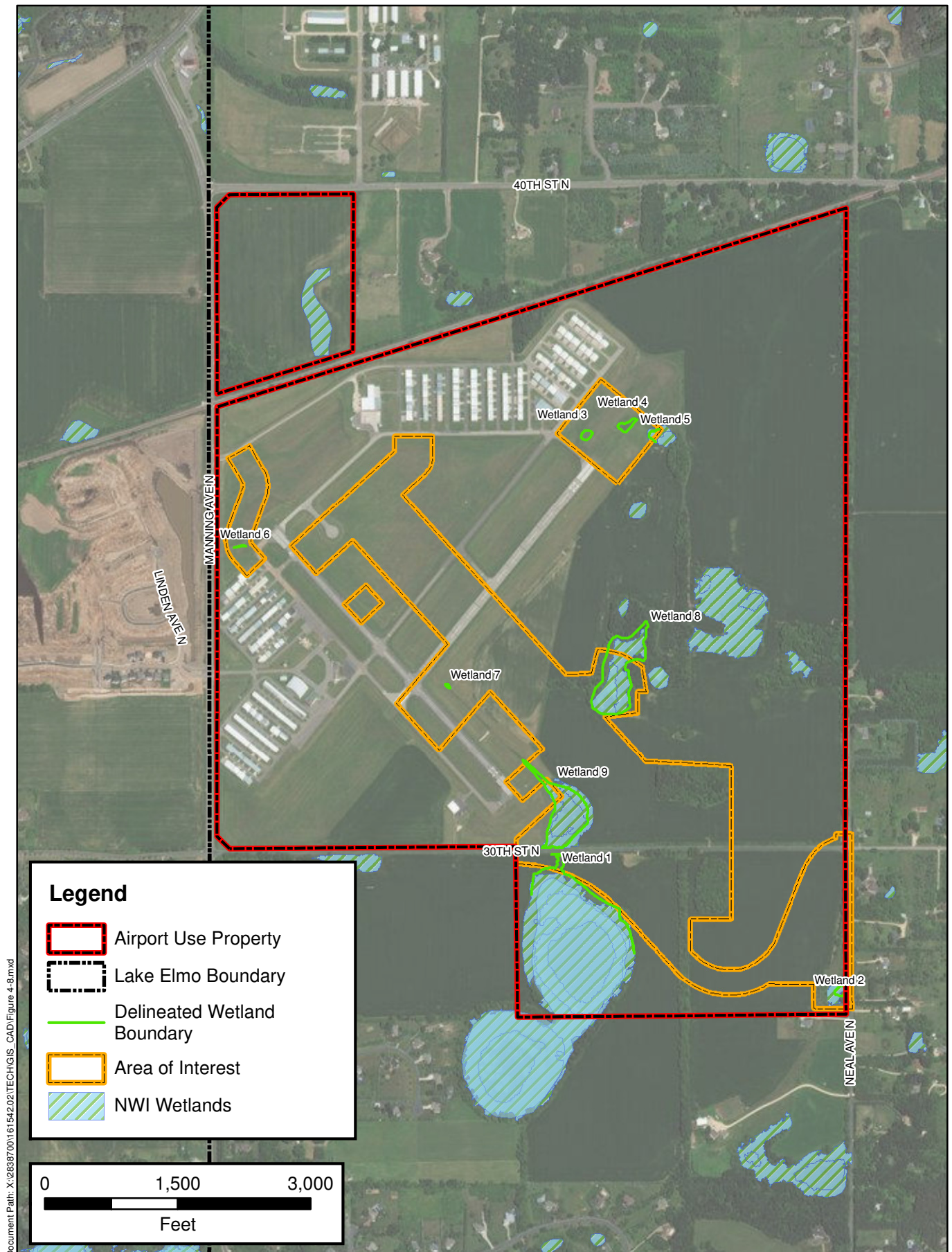
The VBWD adopted rules and regulations on December 31, 1990, which included provisions for wetland protection. These rules and regulations require persons to obtain permits for the act of dredging, filling, excavating, and/or ditching wetlands with WCA's jurisdiction. The rules also require those with a permit to replace the wetland, at a ratio specified by the VBWD or WCA, in the event alterations cannot be avoided. The VBWD is currently the local governmental unit (LGU) administering the WCA within its 70 square mile boundaries. The VBWD adopted the WCA rules (Minnesota Rules Chapter 8420) on November 9, 1994, but also enforces its own wetland protection rules. VBWD's rules require those submitting construction plans to perform an inventory of wetlands within the proposed project site. Responsibilities of the VBWD include making determinations on the accuracy of wetland delineations, evaluating wetland functions and values assessments, and reviewing wetland replacement plans. VBWD also completes wetland inventories and assessments of target areas as necessary.

Mead & Hunt completed a Wetland Delineation and Functional Assessment report for Lake Elmo Airport in the summer of 2017. The report identified nine wetlands on the Airport within the area of interest (AOI) for the preferred alternative. **Table 4-7** details the type, dominant vegetation, and wetland area within the AOI. The nine identified wetlands represent four distinct wetland types. All four are of the Circular 39 Classification System developed by the U.S. Fish and Wildlife Service. According to Circular 39, type 1 wetlands are represented by either seasonally flooded basins or floodplains. Type 1 wetland vegetation and flooding vary according to the season, but the benefit of groundwater recharge and discharge, water quality protection, and wildlife habitat remain constant. Type 2 wetlands are wet meadows saturated below the surface with no standing water in the soil. Common vegetation found in type 2 wetlands are

grasses, sedges, and broad-leaved plants. Shallow marshes where soil is saturated in the spring and allows for vegetation such as cattails, arrowheads, and grasses are considered type 3 wetlands. Type 6 wetlands are shrub swamps and are waterlogged much of the growing season. **Figure 4-8** maps the wetlands locations and data sampling points.

Table 4-7: 2017 Wetland Delineation			
Wetland	Wetland Type	Dominant Vegetation	Area within AOI (acres)
1	Type 1 Seasonally Flooded Basin	Agricultural Field	0.187
2	Type 2 Fresh (wet) Meadow	Reed Canary Grass	0.117
3	Type 2 Fresh (wet) Meadow	Tall buttercup, horsetail, and broom sedge	0.110
4	Type 2 Fresh (wet) Meadow	Path rush, American manna grass	0.167
5	Type 2/ Type 6 Fresh (wet) Meadow / Shrub-Carr	Reed canary grass	0.094
6	Type 1 Seasonally Flooded Basin (Ditch Wetland)	American manna grass, reed canary grass	0.009
7	Type 1 Seasonally Flooded Basin (Ditch Wetland)	Reed Canary Grass	0.013
8	Type 2/ Type 3 Fresh (wet) Meadow / Shallow Marsh	Reed canary grass, black willow, box elder	2.598
9	Type 2/ Type 3 Fresh (wet) Meadow/ Shallow Marsh	Reed canary grass, sensitive fern	2.614

Source: Mead & Hunt Wetland Delineation and Function Assessment Report



Document Path: X:\28387001\16154202\TECH\GIS CAD\Figure 4-8.mxd

Minnesota Department of Natural Resources - Public Waters Inventory (PWI) Map
http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html

U.S. Fish & Wildlife Service - National Wetlands Inventory
<https://www.fws.gov/wetlands/Data/Mapper.html>

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 4-8
 Field Delineated Wetlands
 Lake Elmo Airport
 Environmental Assessment

Wetland 1

Wetland 1 is a shallow basin located south of 30th Street off the Runway 32 end. The U.S. Fish & Wildlife Service National Wetland Inventory (NWI) mapped Wetland 1 as having two central open water cores: seasonally-flooded and temporary flooded emergent. The inner ring is considered seasonally-flooded emergent while the outer ring is mapped as temporary flooded emergent. Wetland 1 receives runoff from surrounding fields in addition to a 24-inch culvert that runs under 30th Street from the north. While surveying the wetland, reed canary grass was found to heavily populate the fringe along with a presence of stinging nettle and water smart weed. Though there was no surface water, saturation, or high water table present during the time of observation, there were oxidized rhizospheres discovered on living roots. Other indicators of wetland hydrology include drift deposits, water-stained leaves, and surface soil cracks. Crystal Lake and Comstock silt loams soil cover the wetland area, while Aquolls and Histosols (ponded) soils were found within the basin.

Wetland 2

Wetland 2 contains Chetek sandy loam and Antigo silt loam soil and is mapped by NWI as emergent temporary flooded. The wetland is located at the base of a steep hillslope west of Neal Avenue North and is a depressional emergent wetland community consisting entirely of reed canary grass on the fringes. Elm was located higher on the slope on the western side while small samples of aspen and buckthorn were observed in the southeast corner. Surface runoff from the surrounding hill slope flows over the area and exits to the south. Indicators of wetland hydrology were saturation and a high water table.

Wetland 3

Wetland 3 is located north of the Runway 22 end at the base of a narrow knoll on the east, a shallow swale on the west, and a fill slope of the connecting taxiway. Surface runoff from slopes of the east and south collects in the wetland and enters directly into the subsoil without further travel. The wetland is predominantly populated with tall buttercup, field horsetail, broom sedge with a few selfheal, path rush, grass-leaf starwort, and Kentucky blue grass, and is mowed frequently.

Wetland 4

Wetland 4 is an emergent wetland community located north of the Runway 22 end. It is also located between two knolls with slopes that rise six to eight feet on three sides and as a result collect surface runoff. In addition to the surface runoff deposits, Wetland 4 receives drainage from the north before exiting on the eastern side where a narrow neck carries flow over to Wetland 5. Both Wetland 3 and 4 are frequently mowed with Antigo silt loam underlying the wetlands accompanied by an observation of sandy soil. Unlike Wetland 3, rutting and soil disturbance were identified. Wetland 4's dominant vegetation includes path rush and American manna grass with siting of wooly-fruit sedge, horsetail, reed canary grass, and broom sedge. The primary cause of hydrology appears to be saturation to a depth of 6 inches.

Wetland 5

Located north of the Runway 22 end at the base of knolls on both the northwest and east sides, Wetland 5 is a type 2 shallow basin with a deep fringe comprised of emergent vegetation and dominated by reed canary grass. Wetland 5 is mapped by the NWI as temporary flooded emergent/shrub with poorly drained Auburndale silt loam. Wetland 5's drainage flows southeast through a shrub-carr outside of the AOI and

its wetland hydrology is solidified by a high water table to three inches in depth and saturation at the surface.

Wetlands 6 & 7

Wetland 6 & 7 were not sampled by the Mead & Hunt team; however, both are considered isolated ditch wetlands located at the base of culverts on the airfield. An 18-inch culvert carries drainage from the infield to Wetland 6 which continues along a shallow swale and drains south just before exiting under Manning Avenue. The approximately 400 square foot wetland located near the Runway 14 end rests at the base of the parallel taxiway fill scope and is covered by Crystal Lake silt loam with present saturation. American manna grass, reed canary grass, and water smartweed are the dominant vegetation.

Wetland 7 is approximately 550 square feet and located east of the runway intersection where it is fed by a 30-inch culvert that drains to a wide shallow swale flowing east. During the observation, the wetland was saturated and standing water was present at the base of the culvert. Wetland 7's primary vegetation is reed canary grass with Crystal Lake silt loam.

Wetland 8

Wetland 8 is located east of Runway 4/22 and its interior is characterized by open water with mature tree cover and emergent vegetation in its fringes. Box elder and back willow are dominant vegetation within the tree layer while reed canary grass is just as dominant in the herbaceous layers. Other trees reported include swamp white oak, quaking aspen, American elm, and buckthorn. Unlike Wetlands 6 & 7, Wetland 8 is mapped by the NWI as temporary flooded emergent and seasonally-flooded emergent. Surface water to a depth of 2 inches, high water table to a depth of 8 inches, and saturation were all present in the shallow basin. There were also oxidized rhizospheres on living roots. Drainage from wooded areas and topographically-higher farm fields collect in Wetland 8 which has no outlet.

Wetland 9

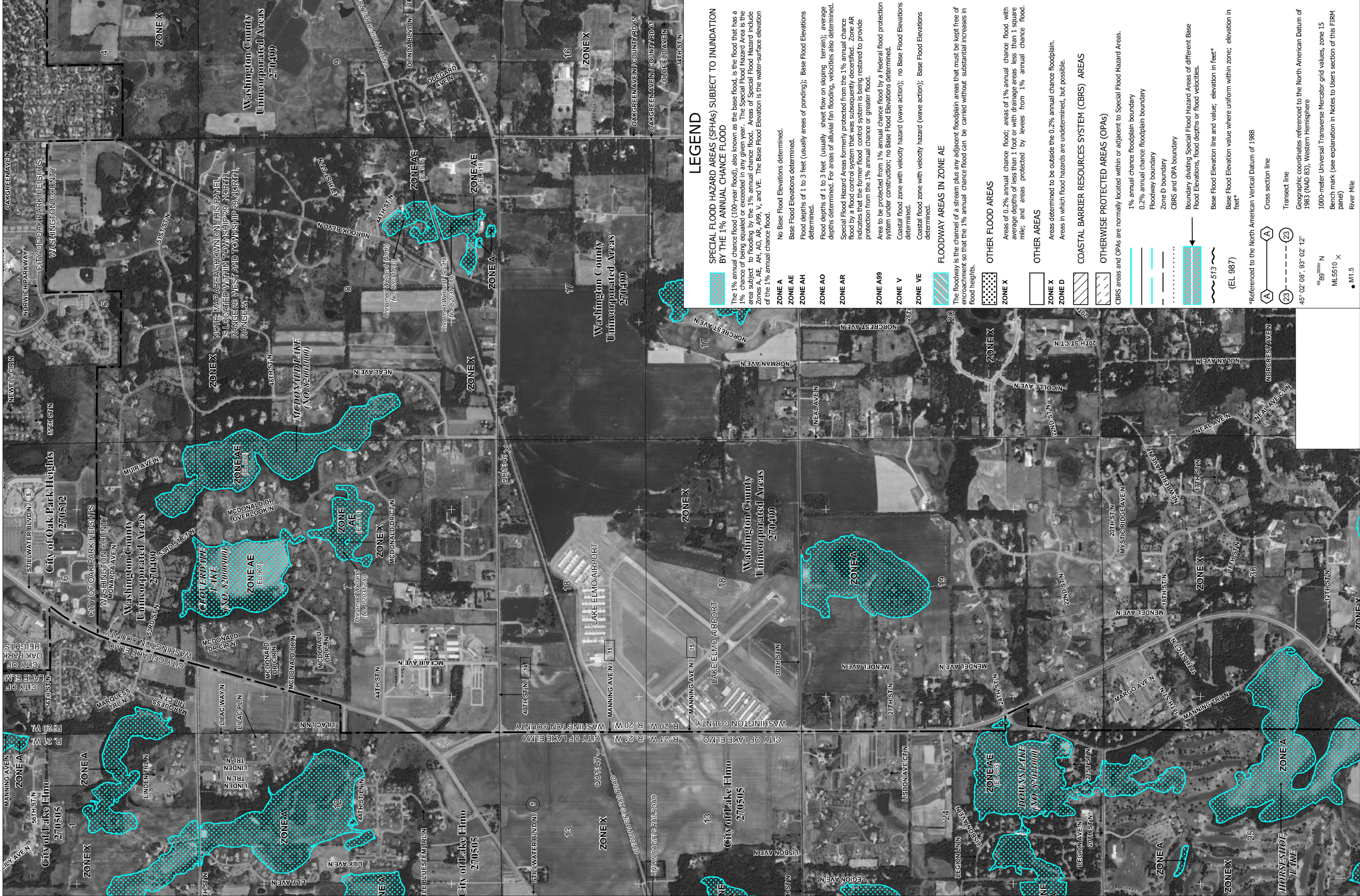
Wetland 9 is a shallow basin directly east of the Runway 32 end with an open water core filled with cattails and reed canary grass and box elders within the fringes. The NWI maps the wetland as temporarily flooded emergent and seasonally flooded emergent. During the sampling of Wetland 9, saturation at soil surface, high water table of 8 inches, and surface water depth of 4 inches were present along with ponded Aquolls and Histosols soil. Drained by a 24-inch culvert under 30th Street, Wetland 9 drainage flows from the west through a swale north of Runway 14/32, from turf grass areas at the end of the runway, and runoff from surrounding fields on the north and east.

4.5.7 Floodplains

A floodplain is any land area, typically a flat area adjacent to a body of water, that is susceptible to inundation by flood waters. As part of the National Flood Insurance Program, the Federal Emergency Management Agency (FEMA) produces Flood Insurance Rate Maps (FIRM) which serve as official flood maps depicting Special Flood Hazard Areas (SFHA). According to FEMA's Flood Map Service Center, Lake Elmo Airport is found on two separate flood maps: Panels 27163C0355E and 27163C0265E. These two flood maps are shown in **Figure 4-9**. The following discussion identifies the flood maps as Flood Map 1 and Flood Map 2, respectively.

There are two SFHA listed near the Airport: Zone X and Zone A. Zone X is a minimal flood hazard area determined to be outside the 0.2 percent annual chance floodplain. Zone A is an area subject to flooding by the 1 percent annual chance flood with no base elevation determined.

Flood Map 1 shows a portion of the east side of the Airport as a Zone X SFHA and as a Zone A SFHA south of the airfield within Runway 32's RPZ. Flood Zone Map 2 depicts Zone AE and Zone X north of the airport, but not on Airport property or within Runway 22's RPZ. **Figure 4-10** depicts the Floodplain Zones as they relate to the Airport boundary and other water resources in the area.

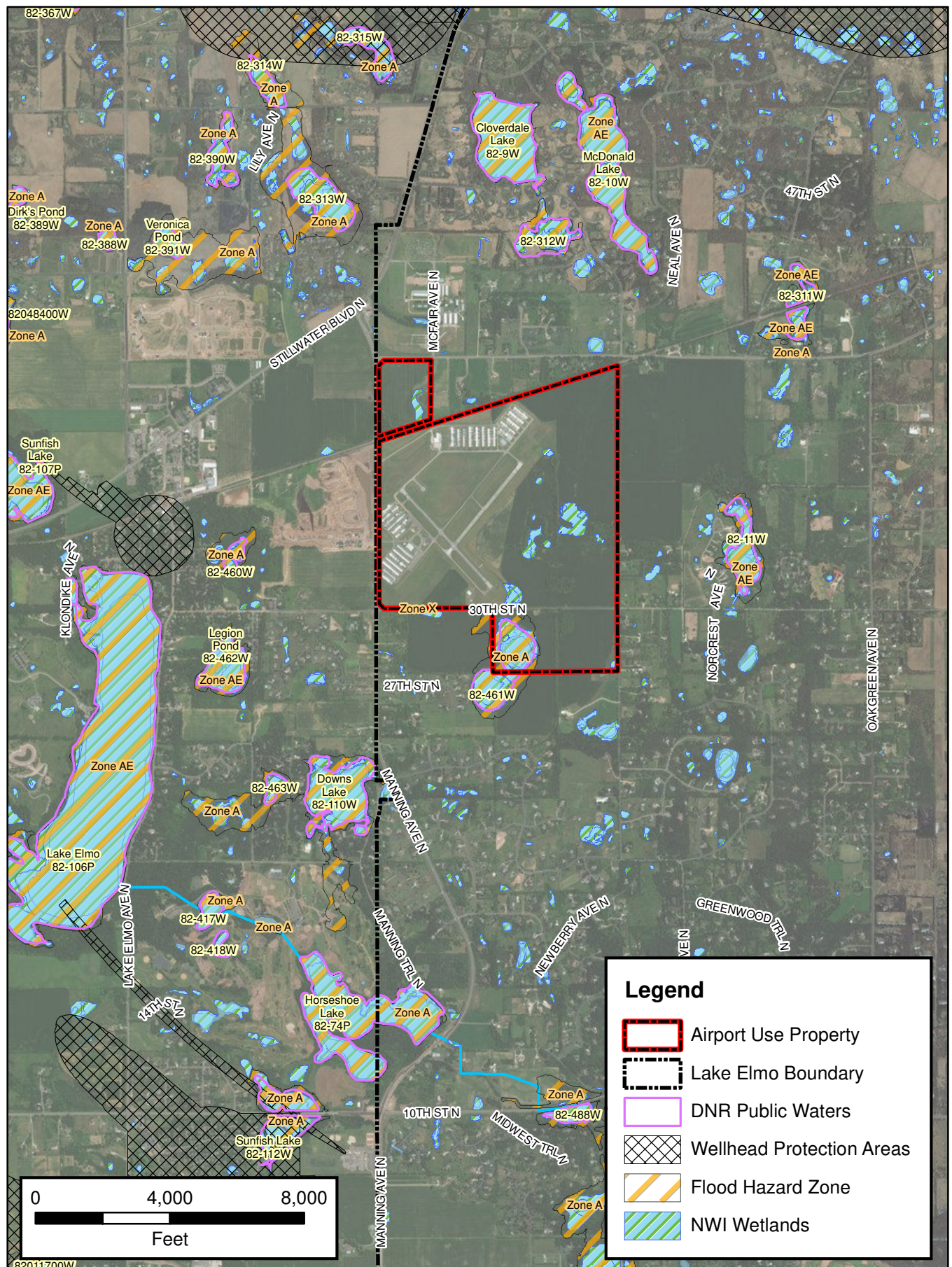


FEMA Map Numbers 27163C0265E & 27163C0355E

Lake Elmo Airport
Environmental Assessment

FIGURE 4-9
FEMA Flood Maps

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Minnesota Department of Natural Resources - Digital Floodrate Insurance Maps (DFIRM)
<https://gisdata.mn.gov/dataset/water-dnr-fema-dfirm>
 Minnesota Department of Natural Resources - Public Waters Inventory (PWI) Map
http://www.dnr.state.mn.us/waters/watergmt_section/pwi/maps.html
 U.S. Fish & Wildlife Service - National Wetlands Inventory
<https://www.fws.gov/wetlands/Data/Mapper.html>
 Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 4-10
 Surface Water
 Lake Elmo Airport
 Environmental Assessment

4.6 Biotic Communities

The MDNR lists Washington County as within the Eastern Broadleaf Forest province. This province covers close to 12 million acres of central and southeastern Minnesota. The northeastern boundary of the province gradually transitions from deciduous forest and mixed conifer-deciduous forests, while the western boundary transitions from forest and woodland to open grassland. The St. Croix River and lower parts of the Mississippi River are glacial lakes resulting from the last glaciation known as the Pleistocene Glaciation, or the Ice Age. During this time, the Laurentide Ice Sheet covered the majority of Northern America, but because of Minnesota being on the edge of the ice sheet the state was not always completely covered with ice.

The Airport is located within Minnesota Archaeological Region 4e, also known as the Central Lake Deciduous Region. This region consists of moraines, till plains, and outwash plains. In the past, vegetation within the southern and western parts of this region would have heavily consisted of Big Woods, prairie, and wood oak species. The Mille Lacs-Highland Moraine Association contains the bedrock geology associated with the project area. As seen in the wetlands on and near the Airport, there are various types of soils within the project area. These soil types include: Antigo Silt Loam, Campia Silt Loam, Chetek Sandy Loam, Comstock Silt Loam, and Crystal Lake Silt Loam, Freer Silt Loam, and Santiago Silk Loam. This region has a varying climate with annual precipitation levels ranging from 22 to 28 inches.

The Airport maintenance staff person indicates that most recent wildlife strikes at the Airport have been sparrows (seed eaters) and barn swallows (insect eaters) that nest in or near the hangars. Strike data recorded by Airport staff indicate that, over a seven-year period, at least two to three strike events have included multiple birds per strike. Other strikes recorded indicate that single birds were struck in other events. According to the strike data, no more than six strikes have occurred in the last seven years. Most deer observations at the Airport occur during the daylight hours and tend to congregate north and northeast of the Aircraft Operations Area (AOA) near trees. Additional wildlife observed at the Airport include fox, coyote, deer, thirteen-lined ground squirrel, gopher, red-tailed hawk, crow, killdeer, rock pigeon, and starlings. Additional attractants near the Airport include the fairground approximately one mile away, which attracts Canada geese, and a pond on the south side of the Airport across 30th Street that harbors waterfowl, shorebirds and some red-winged blackbirds. No significant man-made wildlife attractants (such as golf courses, wastewater treatment facilities, landfills or waste transfer stations) are located within one mile of the Airport.

Mowing of the safety area and hangar lands occurs approximately three days per week and encompasses 180 acres. Some mowing is outsourced to a local entity. The project area contains approximately 56 acres of land currently in agricultural production. Current agricultural production includes corn and soybean on a rotational basis.

Subdivision 1 of Minnesota Statute 84.0894, *Protection of Threatened and Endangered Species*, states, “A person may not take, import, transport, or sell any portion of an endangered species of wild animal or plant, or sell or possess with intent to sell an article made with any part of the skin, hide, or parts of an endangered species of wild animal or plant, except as provided in subdivision 2 and 7.”

The U.S. Fish and Wildlife Service (USFWS) is a federal agency within the U.S. Department of Interior whose mission is to conserve, protect, and enhance fish, wildlife, plants and habitats for the continuing benefit of the American people. According to the USFWS Environmental Conservation Online System, there is one threatened species and five endangered species located in Washington County. These six species include: Northern Long-Eared Bat/*Myotis septentrionalis* (threatened), Higgins Eye/ *Lampsilis Higginsii* (endangered), Winged Mapleleaf/ *Quadrula fragosa* (endangered), Spectaclecase/ *Cumberlandia Monodonta* (endangered), Snufflebox Mussel/*Epioblasma triquetra* (endangered), and the Rusty Patched Bumble Bee/*Bombus affinis* (endangered). The USFWS suggested that the MAC consider managing a portion of Airport property to encourage native flowering species that would provide nectar and pollen sources for RPBB and other pollinator populations that may be in the area. In response to this suggestion, the MAC is exploring the possibility of creating tall grass prairie in a 27.5-acre area south of the planned realignment of 30th Street North (see **Figure 3-3**). The tall grass prairie may have additional environmental benefits by reducing wildlife hazards, increasing on-site stormwater infiltration, and reducing the Airport's carbon footprint. For more information, see Section 5.2.2.

The MDNR Natural Heritage Information System (NHIS) is a collection of databases containing information about rare and natural resources in Minnesota and is maintained by the MDNR Division of Ecological and Water Resources. Mead & Hunt contacted MDNR to query the NHIS to determine whether there are any records of rare species or other significant natural features within an approximate one-mile radius of the Airport. The MDNR responded with correspondence # ERDB 20170278-0002 (see **Appendix F**). The NHIS identified the Rusty Patched Bumble Bee as a federally-listed endangered species that has been documented within 2.5 miles of the Airport. The MDNR NHIS also identified Blanding Turtles (*Emydoidea blandingii*) as a state-listed threatened species that has been reported near the Airport and may be encountered on site.

4.7 Historic, Archaeological, and Cultural Resources

As required by FAA regulation, Lake Elmo Airport must comply with Section 106 of the National Historic Preservation Act of 1966. Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to consider effects to historic properties. Historic properties are considered those included on the National Register of Historic Places (NRHP) or those that meet the criteria for inclusion on the NRHP. If it is determined that no type of activity or disturbance will impact the historic property, the federal agency has no further Section 106 obligations.

Qualified historians from Mead & Hunt worked with the FAA to delineate the Area of Potential Effect (APE) for Section 106. The APE included areas which would be affected by ground disturbance activities for the runway, taxiway, tree removal, and road construction. Included in the APE are the Airport's land and properties adjacent to the airfield that are 45 years or older. Prior to conducting fieldwork, the Mead & Hunt team conducted a literature review to identify any previously surveyed architecture/history properties within the APE. The team concluded the Edward Flynn house was previously identified in the approach to Runway 22, approximately 3,000 feet from the proposed runway end.

Mead & Hunt conducted fieldwork on May 30, 2017, and identified thirteen historic-age resources within the APE, including the Edward Flynn house. Of the thirteen historic-age resources, twelve are

recommended not eligible for the NRHP. However, the Union Pacific Railway was recommended for further study because of its association with the railroad transportation in Minnesota and Washington County. The 1872 railroad was historically known as the St. Paul, Stillwater, & Taylor's Falls Railroad used to transport lumber, freight, and passengers from the Twin Cities to places including Chicago and Omaha. According to the Railroads in Minnesota 1862-1956 Multiple Property Documentation Form (MPD), the railroad may have significance under National Register Criterion A as a Railroad Corridor Historic District, because it provided a connection between the manufacturing/commerce nodes at Stillwater and the Twin Cities and it was an important component of Minnesota's railroad network that provided an early link between the Twin Cities, Stillwater and wider markets. There will be tree removal adjacent to the railroad. However, the tree removal will not impact or change the historic character or value of the railroad. There will be no noise impacts or indirect visual effects to the railroad. Because of the limited potential impacts on the railroad, an intensive-level review is not needed.

In summer 2017, the Mississippi Valley Archaeology Center (MVAC) performed a Phase 1 archaeological survey for the proposed expansion of Lake Elmo Airport. MVAC performed a pre-field investigation to identify known archaeological sites, reviewing historical photos and plat maps, and surveying areas that would potentially be affected by the proposed expansion and development of the airfield, as well as by the realignment of 30th Street North. The APE for archaeology includes all areas that will undergo ground disturbance because of the project. The APE consists of wooded areas, agricultural land, and portions of the existing airfield. The plowed and wooded areas south of 30th Street North contained soybeans four to six inches tall with remnants of corn stalk. Underground utilities were discovered within the area 50 feet from the centerline of Neal Avenue North. The Phase I archaeology survey was completed by both pedestrian survey and shovel testing. Shovel tests were excavated into sterile subsoil in several areas of the airfield, wooded areas in plowed fields north and south of 30th Street North, and wooded areas adjacent to the plowed fields north and south of 30th Street North.

MVAC reported two new historic sites: 21WA0119 and 21WA0120. Site 21WA0119 is located immediately north of 30th Street North near the future Runway 32 end. The site contains two foundations, with a depth of three feet, discovered in the groves of trees while completing shovel surveys. Upon further inspection, a concrete addition was found attached to the northwest corner of the limestone foundation. The concrete addition had a metal waterspout, a copper pipe, and electrical plugins. West of the first foundation lay a concrete slab, the purpose of which could not be identified. Southwest of this slab lay the remains of the second foundation discovered in site 21WA0119. Unlike the first foundation, this foundation is comprised of concrete/cinder block. MVAC reviewed historical maps and photos, topographic maps, and plat maps of the Airport. An 1874 plat map does not show the discovered foundations, but a 1901 plat map, 1964 aerial images, and a 1967 topographic map do show buildings corresponding to the foundations identified. A 1938 plat map not only indicates a driveway leading from 30th Street North (then Blackwoods Avenue) to the west of the limestone foundation, but also shows site 21WA0119 and surrounding land was owned by the Jacob Schmidt Brewing Company, which was once ranked the seventh largest brewery in the United States.

Site 21WA0120 is located south of 30th Street North in West Lakeland Township. The site consists of two concrete foundations which were discovered while shovel testing in groves of trees. The first foundation

was approximately twenty feet inside of a tree line in the northeast corner of the grove of trees, while the second foundation is near the southwest corner of the grove of trees. The second foundation was divided by another foundation twelve feet from the southern end of the building causing the surveyors to believe there were once two rooms present. Within a 50-60-foot radius, historic post 1950 debris was found including a wood stove. Historic plat maps from 1874 to 1900 do not illustrate the structures identified by MVAC, but the structures do appear on a 1901 plat map, and 1938 aerial photos indicate a driveway leading from 30th street north to the second foundation. According to the plat map, this area was also once owned by the Jacob Schmidt Brewing Company.

4.8 Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable future actions to be considered in a NEPA evaluation include all public and private development activity, regardless of federal involvement. According to FAA Order 5050.4B, reasonably foreseeable actions include those “on or off-airport that a proponent would likely complete and that has been developed with enough specificity to provide meaningful information to decision makers and the interested public.” A MEPA evaluation analyzes past and present actions in a manner similar to NEPA. However, for future actions, MEPA considers only projects that are “actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects.” Minnesota Rule 4410.0200, subp. 11a.

Since its initial settlement in the late 19th century, the area has been subjected to numerous disturbances associated with farming, forestry, drainage, road building, and grading and fill for general development. Prior to 1960, the Airport and its environs was almost entirely agricultural. However, significant residential development has occurred since that time. Based on Washington County geographic information systems (GIS) data, approximately 1,720 parcels have been developed since 1964 within two miles of the runway ends proposed by the preferred alternative.

The recent extension of municipal water and sanitary sewer facilities into the southeastern portion of the City of Lake Elmo is likely to support additional urban development in the future. The City Council adopted a Village Master Plan in April 2007 for this area, located immediately west of Manning Avenue North from the Airport. The Village Master Plan considered three different development scenarios for this area (Scenario A – 600 residential units, B – 1,000 residential units, and C – 1,600 residential units) and one scenario based on the City Comprehensive Plan (D – 906 residential units). Each of the scenarios also included 300,000 square feet of commercial space (neighborhood-scale retail), 150,000 square feet of office space, and 200,000 square feet of institutional space (YMCA, library, city hall). The Village Master Plan estimated that 14 percent of the Village area was existing built area in 2007. For the remainder, the Village Master Plan reserves 47 percent of the area for parks and open space, 7 percent for new commercial and institutional use, and 32 percent for new residential use.

In 2014, Washington County completed a Manning Avenue (CSAH 15) Corridor Management and Safety Improvement Project Study. The study recommended the expansion of Manning Avenue from two-lane undivided roadway to four-lane divided roadway between TH 5 and CSAH 10, and the realignment of TH 5 at Manning Avenue and CSAH 14. The recommended road project is intended to improve safety, provide adequate near- and long-term capacity while maintaining the viability of commercial and

residential growth along the Manning Avenue corridor, and develop Manning as a north-south arterial from Interstate 94 to TH 36.

Baytown Township and West Lakeland Township are rural residential communities consisting almost entirely of agricultural, conservation, and large lot, low-density residential land uses, although some cluster development (also called open space subdivisions) are also permitted by zoning ordinance. Both townships desire to preserve this rural residential character. Baytown Township has requested that the Metropolitan Council staff remove the township from the Metropolitan Council's long-term sewer service area map as part of an on-going comprehensive planning process, and West Lakeland Township's comprehensive plan states that the need for public facilities should be kept to a minimum with on-site sewer and water preferred for existing and future development. Without changes to the zoning ordinances or establishment of municipal water and sanitary sewer services, significant future changes in the character of existing development within the townships are unlikely to occur.

No major projects have been completed at Lake Elmo Airport since the north hangar area was expanded in the 1990s. There are no other major future projects depicted on the Airport Layout Plan for the Lake Elmo Airport other than those considered under the proposed action. Additional off-Airport tree removal beyond that in the proposed action may be required in the future to maintain clear approaches to each runway end.

Environmental Consequences

This chapter compares the environmental consequences of the preferred alternative to the no-action alternative. This includes appropriate analysis of all environmental impact categories required by FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* implementing NEPA, as well as by Minnesota Environmental Quality Board (EQB) rules implementing MEPA. None of the impacts exceed thresholds of significance as defined by FAA Order 1050.1F. This chapter also identifies required permits and mitigation activities for the preferred alternative. The environmental impact categories include the following:

- Air Quality
- Biological Resources (including fish, wildlife, and plants)
- Climate Change
- Coastal Resources
- DOT Section 4(f) Lands
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historic, 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
- Visual Effects
- Water Resources
- Cumulative Impacts and Cumulative Potential Effects

5.1 Air Quality

According to the FAA Air Quality Handbook, "an EA or EIS typically includes an air quality assessment commensurate with the project air quality impact to help evaluate and disclose the potential effects on air quality associated with the project." An EAW under MEPA also must consider air quality impacts (Minnesota Rule 4410.1200). Runway and taxiway improvements may cause or create reasonably foreseeable increases in emissions by changing aircraft and vehicle traffic patterns.

When determining air quality impacts, it is important to establish the attainment/nonattainment status of the project study area with reference to the National Ambient Air Quality Standards (NAAQS), and, if applicable, to identify those pollutants for which the area is designated nonattainment/attainment. As of June 20, 2017, the EPA Green Book indicates that Washington County is in an attainment area for sulfur dioxide, and a portion of Washington County (all cities and townships except Denmark Township) is in an attainment area for carbon monoxide. If an action may cause or create a reasonably foreseeable emission increase and is in an EPA-designated nonattainment or attainment area, an emissions inventory should be completed and the results disclosed.

An aviation operational emissions inventory was developed using the FAA Aviation Environmental Design Tool (AEDT) model under the same scenarios analyzed for aircraft noise under Section 5.11 below. In addition, a construction emissions inventory was developed using the Airport Construction Emissions Inventory Tool (ACEIT). The ACEIT inventory uses general assumptions for the runway and taxiway construction phases based on the MAC's latest capital improvement plan for the Airport. The results of these inventories are presented below.

5.1.1 Operational Emissions

Emissions were calculated for the 2016 baseline (existing conditions) and 2025 forecast (preferred alternative and no-action alternative) scenarios. Annual operations were entered by aircraft type into the AEDT model and split between arrival, departure, and touch-and-go operations. The results are presented in **Table 5-1**. The AEDT model estimates an overall decrease in pollutant emissions between the 2016 baseline estimate and 2025 forecast aircraft operations. This slight decrease results from the forecasted decline in aircraft operations from 2016 to 2025. A marginal increase in aircraft operations is expected following 2025, but this increase would not substantially change operational emissions.

The projected changes in operational emissions associated with the preferred alternative and no-action alternative would not exceed the *de-minimis* thresholds contained in the FAA's Aviation Emissions and Air Quality Handbook Version 3, Update 1 (January 2015), as expressed in annual tons. Therefore, there are no significant air quality impacts for the preferred alternative or no-action alternative associated with changes in operations at the Airport.

Table 5-1: Operational Emissions Inventory							
Emissions Source	Pollutant Emissions (tons)						
	CO	VOC	NO_x	CO₂	SO₂	PM_{2.5}	PM₁₀
2016 Baseline Operational Emissions							
Aircraft - Taxi Out	10.978	0.563	0.016	42.456	0.016	0.005	0.005
Aircraft - Takeoff and Climb out	80.428	0.646	0.143	225.466	0.084	0.061	0.061
Aircraft - Approach and Landing	131.655	1.063	0.194	377.123	0.14	0.084	0.084
Aircraft - Taxi In	5.444	0.279	0.008	21.055	0.008	0.002	0.002
TOTAL	228.506	2.551	0.361	666.100	0.247	0.153	0.153
2025 Forecast Operational Emissions (Preferred Alternative)							
Aircraft - Taxi Out	10.764	0.703	0.019	46.537	0.017	0.006	0.006
Aircraft - Takeoff and Climb out	75.117	0.606	0.150	216.373	0.08	0.059	0.059
Aircraft - Approach and Landing	123.857	1.037	0.210	365.784	0.136	0.082	0.082
Aircraft - Taxi In	5.322	0.341	0.009	22.961	0.009	0.003	0.003
TOTAL	215.059	2.687	0.388	651.654	0.242	0.149	0.150
Difference from 2016 Baseline	-13.447	0.092	0.027	-14.446	-0.005	-0.004	-0.003
2025 Forecast Operational Emissions (No-Action Alternative)							
Aircraft - Taxi Out	10.257	0.559	0.014	39.582	0.015	0.005	0.005
Aircraft - Takeoff and Climb out	75.208	0.605	0.135	211.055	0.078	0.057	0.057
Aircraft - Approach and Landing	123.022	1.020	0.181	351.691	0.131	0.079	0.079
Aircraft - Taxi In	5.082	0.275	0.007	19.598	0.007	0.002	0.002
TOTAL	213.570	2.459	0.337	621.927	0.231	0.143	0.143
Difference from Preferred Alternative	-1.489	-0.228	-0.051	-29.728	-0.011	-0.007	-0.007

Sources: FAA Aviation Environmental Design Tool (AEDT), Mead & Hunt

5.1.2 Construction Emissions

The Airport Construction Emissions Inventory Tool (ACEIT) was used to model construction activities at the Airport associated with the preferred alternative. The results are presented in **Table 5-2**.

Table 5-2: Construction Emissions Inventory									
Construction Year	Pollutant Emission (tons)								
	CO	NO_x	SO₂	PM₁₀	PM_{2.5}	VOC	CO₂	CH₄	N₂O
2019	4.997	5.061	0.033	0.933	0.25	18.429	3,035.95	0.078	0.015
2020	9.618	8.935	0.065	2.238	0.435	36.639	6,093.56	0.144	0.03
2021	4.717	4.004	0.033	1.091	0.191	18.359	3,186.53	0.067	0.015
2022	0.095	0.067	0	0.045	0.003	0.015	66.562	0.004	0.001
TOTAL	19.427	18.068	0.131	4.308	0.879	73.443	12,382.61	0.292	0.06
Annual De minimis threshold for attainment areas (tons/yr)	100	100	100	100	100	100	NA	NA	NA

Sources: FAA Airport Construction Emissions Tool (ACEIT), Mead & Hunt

Total emissions associated with all years of construction are not expected to exceed the *de-minimis* thresholds for those pollutants with *de minimis* thresholds listed in the FAA's Aviation Emissions and Air Quality Handbook Version 3, Update 1 (January 2015), as expressed in annual tons and shown in Table 5-2. Increased emissions associated with project construction will be offset through use of voluntary best management practices (BMPs) such as engine idling restrictions and maintenance requirements, and other control strategies identified in the *U.S. Environmental Protection Agency Diesel Emission Restriction Checklist*. Therefore, there are no significant air quality impacts associated with construction of the preferred alternative.

5.2 Biological Resources (including fish, wildlife, and plants)

During multiple days of field work in June 2017 conducted by two Mead & Hunt biologists to identify and delineate wetlands, a variety of plant and animal species were identified within the study area. These species include insects, arachnids, birds, mammals, amphibians, and wetland and upland vegetation. Birds identified within the study area included, but were not limited to, American crows, red-winged blackbirds, blue jays, chickadees, vireos, swifts/swallows, and multiple sparrow species. One female white-tailed deer was observed and photographed, and frogs were observed in wetland areas. Wetland vegetation is documented in the wetland data sheets and related report completed in September 2017. Upland herbaceous vegetation was dominated by Kentucky bluegrass, red clover, dandelion, oxeye daisy, yarrow, thistle and plantains. Areas with these dominant plants are frequently mowed and maintained.

Biological resources potentially affected by the preferred alternative are related to vegetation management and listed species. Relevant considerations for these resources are discussed below.

5.2.1 Vegetation Management

The proposed action will require the removal of trees on Airport property for construction of the runway and clearance of associated approach and departure surfaces. There are four populations of deciduous trees that will be cleared in association with the proposed action, as shown in Chapter 3, *Alternatives*, Figure 3-10. The groups of multiple species range in age from saplings, with a diameter at breast height of less than three inches to large, mature trees of 40 feet or more in height. Most of the trees to be removed are in upland areas along fence rows and in agricultural fields, with only spot clearing to occur within surrounding fresh meadow wetlands. Standing and downed dead trees are also present within these areas. Trees and woody shrubs located within the purple polygons in **Figure 3-10** include but are not limited to the species listed in **Table 5-3**.

Table 5-3: Trees and Woody Shrubs Observed at Lake Elmo Airport			
Common Name	Scientific Name	Height	Habit / Dominant
Boxelder	<i>Acer negundo</i>	40-60 feet	Tree / Yes
Silver maple	<i>Acer saccharinum</i>		Tree / No
Redosier dogwood	<i>Cornus sericea</i>		Shrub / No
White ash	<i>Fraxinus americana</i>		Tree / No
Green ash	<i>Fraxinus pennsylvanica</i>	40 feet	Tree / No
Eastern cottonwood	<i>Populus deltoides</i>		Tree / No
Quaking aspen	<i>Populus tremuloides</i>	Up to 80ft	Tree / No
Black cherry	<i>Prunus serotina</i>	Up to 15ft	Tree / No
Burr oak	<i>Quercus macrocarpa</i>	50 feet	Tree / Yes
Pin oak	<i>Quercus palustris</i>	30-50 feet	Tree / No
Common buckthorn	<i>Rhamnus cathartica</i>	Up to 20 feet	Shrub / Yes
Missouri gooseberry	<i>Ribes missouriense</i>	Up to 6 feet	Shrub / Yes
Black willow	<i>Salix nigra</i>		Tree / No
American black elderberry	<i>Sambucus nigra ssp. canadensis</i>	Up to 12 feet	Shrub / Yes
American elm	<i>Ulmus americana</i>	40-60 feet	Tree / Yes
Slippery elm	<i>Ulmus rubra</i>		Tree / No
Common pricklyash	<i>Zanthoxylum americanum</i>	8-10 feet	Shrub / No

Source: Mead & Hunt

According to obstruction survey data collected in 2013, there were no off-Airport trees penetrating approach or departure threshold siting surfaces for the planned future runway ends. Updated survey data collected and analyzed in late 2017 indicate that approximately 12 off-Airport trees would need to be removed in the approaches to the crosswind runway, and no off-Airport trees would need to be removed in the approaches to the primary runway. These would be carefully targeted individual trees and would not involve clear-cutting stands of trees. The off-Airport trees to be removed are located on the following County tax parcels:

- 18.029.20.11.0002
- 18.029.20.11.0004
- 18.029.20.12.0002

- 19.029.20.21.0001
- 19.029.20.22.0008
- 19.029.20.22.0010

Current vegetation management practices at the airport include mowing of all infield areas on a regular basis. Other areas on Airport property are in agricultural production with the exception of identified wetland areas and several wood lots. Many of these wetland areas are dominated by two invasive species: reed canary grass (*Phalaris arundinacea*) and cattail (*Typha angustifolia*).

Introduction and spread of invasive species at the Airport would be minimized prior to, during, and after construction of the proposed project through a variety of best management practices. Prior to construction, standard cleaning procedures of equipment used on-site would serve to minimize the introduction of exotic invasive species from outside the airport. Storage and/or cleaning of equipment and materials in established staging areas during construction would also minimize the spread of invasive plant seeds to off-site areas or other areas on-site.

One large shallow marsh wetland dominated by reed canary grass and cattail lies near the proposed relocated Runway 14/32 and associated taxiways. Standard erosion control practices such as silt fencing act to prevent soil erosion and limit water-borne movement of seeds from this area and other areas on-site during construction.

Areas disturbed during construction will be seeded with a variety of turf grasses. Vegetation management post-construction of the proposed project in in-field areas will continue as before with regular mowing. This practice serves to minimize wildlife hazards while also minimizing the introduction and establishment of invasive species.

5.2.2 Listed Species

As of September 18, 2017, there were six federally-listed species with habitat in Washington County. Four of these species are freshwater mussels with habitat in either the Mississippi or the St. Croix Rivers, and would not be affected by the proposed action. The FAA made a no-effect determination for these four freshwater mussels on November 3, 2017, and the U.S. Fish & Wildlife Service (USFWS) concurred with this determination in an email dated December 7, 2017 (see **Appendix E**). The other two species are the Northern long-eared bat (listed as threatened) and the Rusty patched bumble bee (listed as endangered).

There are numerous state-listed species in Washington County as well. A Natural Heritage Information System (NHIS) data request was submitted in summer 2017 to the Minnesota Department of Natural Resources (MDNR), to determine if there are any known occurrences of state-listed species near the proposed action. The response from MDNR indicates that there is one state protected species, Blanding's turtle, documented as occurring within a one-mile radius of the Airport (see **Appendix F**).

Based on the above, all relevant federal and state protected species associated with Lake Elmo Airport are listed in **Table 5-4**. These three species have potential habitat at or near Lake Elmo Airport, and/or

have been documented as occurring within a 2.5-mile radius of the project area. Characteristics, habitat, and mitigation measures associated with each of these species are discussed below.

Table 5-4: Federal and State Protected Species with Potential Habitat at or near Lake Elmo Airport			
Common Name	Scientific Name	Federal Status	State Status
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	Not Listed
Rusty patched bumble bee	<i>Bombus affinis</i>	Endangered	Not Listed
Blanding's turtle	<i>Emydoidea blandingii</i>	Not Listed	Threatened

Sources: U.S. Fish & Wildlife Service, Minnesota Department of Natural Resources, Mead & Hunt

Northern long-eared bat

The northern long-eared bat (*Myotis septentrionalis*, NLEB) is listed as threatened throughout its extensive range, including all of Minnesota, 36 other states, and multiple southeastern Canadian provinces. The predominant threat is white-nose syndrome, a fungal disease which has eliminated up to 99 percent of NLEB populations in the northeastern United States. White-nose syndrome has been reported in Washington County.

During summer, the NLEB typically roosts singly or in colonies under the bark, in cavities or in crevices of living and dead trees. Males and non-reproductive females may also roost in caves and mines during the summer. Most hibernate during winter in caves and mines with constant temperatures, high humidity and no air currents. No critical habitat has been designated for this bat. Potential habitat for the NLEB is present within the proposed action area and may be present in areas in which trees will be removed. As noted in Section 5.2.1, the proposed action will require the removal of approximately 20 acres of deciduous trees on Airport property for construction of the runway and clearance of associated approach and departure surfaces.

The “4(d) rule” is one of many tools found within the Endangered Species Act (ESA) for protected species listed as “threatened.” The rule derives its name from Section 4(d) of the ESA, which directs the USFWS to issue regulations deemed “necessary and advisable to provide for the conservation of threatened species.” The 4(d) rule for the NLEB stipulates that incidental take for projects inside the white-nose syndrome zone is not prohibited. A federal agency may rely upon the finding of the programmatic biological opinion for the final 4(d) rule to fulfill its project-specific responsibilities under Section 7 of the ESA. The following Avoidance and Minimization Measures (AMMs) from the *Range-Wide Biological Assessment for Transportation Projects for Indiana Bat and Northern Long-Eared Bat* (USFWS/USDOT, April 2015) are proposed for the tree removal activities.

Tree Removal AMM 2 - To avoid and minimize impacts to the NLEB, tree clearing will be completed between October 1 and April 30, which is the dormant season for the bat at this latitude.

Tree Removal AMM 3 - Tree removal will be limited to that specified in project plans. Tree removal limits will be clearly indicated in the field by bright orange flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits. Tree clearing limitations will be discussed with

contractors at the pre-construction meeting to ensure that they understand clearing limits and how they are marked in the field.

The FAA determined the preferred alternative “may affect, [but is] not likely to adversely affect” the NLEB on November 3, 2017, and the USFWS concurred with this determination in an email dated December 7, 2017 (see **Appendix E**).

Rusty patched bumble bee

Rusty patched bumble bees (*Bombus affinis*, RPBB) live in colonies that have an annual cycle. The bees gather pollen and nectar from a variety of flowering plants and prefer tallgrass prairie habitat. Historically, the bees’ range included 28 states, the District of Columbia, and two provinces in Canada. Since 2000, the RPBB has been reported in only 13 states and one Canadian province. The RPBB is a vital source in our food security and ecosystem. It plays a major role in wildflower reproduction, pollinate blueberries, cranberries, and clover, and are virtually the only insect that pollinates tomatoes. The bees once occupied grasslands and tall grass prairies of the Upper Midwest and Northeast, but most grasslands have been converted to monoculture farms, cities, or roads. Other contributors to RPBB habitat loss include intensive farming causing a heavy increase of pesticide usage, to which RPBB may be vulnerable. A combination of the loss of habitat and related diversity of flowering plants because of intense farming and general development, along with pesticide use, led to the listing of this species as endangered in January 2017.

No critical habitat has been designated for the RPBB, and the Airport is in a low potential habitat zone according to the USFWS website. There are no areas of tallgrass prairie within the study area, and areas dominated by grasses and flowering forbs are mowed on a regular basis. Therefore, there are no potential vegetation types that provide habitat for the RPBB that would be affected by the preferred alternative. The USFWS Information for Planning and Consultation (IPaC) online tool does not identify this species as present within the limits of ground disturbance.

The FAA determined the preferred alternative “may affect, [but is] not likely to adversely affect” the RPBB on November 3, 2017, and the USFWS concurred in this determination by email dated December 7, 2017 (see **Appendix E**). In its December 7 email correspondence, the USFWS suggested that the MAC consider managing a portion of Airport property to encourage native flowering species that would provide nectar and pollen sources for RPBB and other pollinator populations that may be in the area. In response to this suggestion, the MAC is exploring creation of tall grass prairie in a 27.5-acre area south of the planned realignment of 30th Street North (see **Figure 3-3**). The prairie would be designed as foraging habitat for the RPBB and other pollinators. The tall grass prairie may have additional environmental benefits by reducing wildlife hazards, increasing on-site stormwater infiltration, and reducing the Airport’s carbon footprint.

Blanding’s turtle

Blanding’s turtles are about 5 to 10 inches in diameter with black/dark blue dome-shaped shells with yellows spots/bars and yellow chins and necks. It tends to use uplands areas and type 1-3 wetlands including marshes, shrub swamps, and ponds as their homes. It travels long distances from wetland habitats to nest in open grassy or bushy-sandy uplands. It often nests in farmland areas, gardens, road

shoulders, and under powerlines. Nesting in Minnesota typically occurs during June. Blanding Turtles have a low reproduction rate. Females will lay six to fifteen eggs, which take about two months to hatch. Hatchlings leave the nests from Mid-August through early October.

A Blanding's turtle requires both wetland and upland habitats to complete its life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation are preferred. Small temporary wetlands are frequently used in spring and summer, which provides an important food source for Blanding's turtles. The turtle is listed as state threatened because of the loss of wetland and upland habitat, human disturbance including collecting for the pet trade and road kill, and an increase in predator populations which prey on nests and young.

The prime reason for decline in Blanding Turtles population results from collisions with vehicles. In Minnesota, pregnant females mostly travel during the late afternoon and dusk looking for a place to lay eggs. Wetland drainage and degradation, increased in predator populations, and development of upland habitat are also causes of the recent decline in the Blanding's turtle population. The proposed project may potentially disrupt habitat because of dewatering, excavation, filling, or other construction activities. Ways to possibly avoid or minimize disruption include, but are not limited to: avoiding type 1-3 wetland disturbance especially during the winter, turtle monitoring during construction and reporting sightings to MDNR, and using wildlife friendly erosion control methods

The wetlands within the project area may provide habitat for the Blanding's turtle. Avoidance measures for the turtle listed in the MDNR Environmental Review Fact Sheet are included in **Appendix F** and will be posted at construction sites.

5.2.3 Biological Resources Conclusion

Based on the information above and established FAA and MEPA thresholds of significance, there are no significant impacts to biological resources associated with the preferred alternative or no-action alternative.

5.3 Climate Change

Considering greenhouse gas (GHG) emissions for a NEPA and MEPA review should follow the basic procedure of considering the potential incremental change in carbon dioxide equivalent (CO₂e) emissions that would result from the proposed action compared to the no-action alternative for the same timeframe. An EA/EAW should also discuss the context for interpreting and understanding the potential changes.

Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) are the primary contributors to CO₂e. Based on the air quality analysis presented in Section 5.1, the proposed action will result in temporary increases in direct on-site CO₂e emissions attributable to construction equipment. Total construction CO₂e emissions are estimated at approximately 12,400 tons over a five-year period. On-site operational CO₂e emissions attributable to aircraft operations in 2025 under the preferred alternative are expected to decrease by approximately 15 tons per year, from approximately 667 tons per year in 2016 to 652 tons

per year in 2025. Aircraft operations are expected to slightly increase emissions in the years after 2025 compared to the no-action alternative. In its January 2017 biennial GHG emissions report to the state legislature, the Minnesota Pollution Control Agency (MPCA) estimated statewide CO₂e emissions in 2014 at 158.3 million tons, while the U.S. Environmental Protection Agency (EPA) estimated nationwide CO₂e emissions in 2014 at 6,870 million tons. Based on these estimates of CO₂e emissions, the potential for the preferred alternative to affect future climate conditions is very limited when considering the amount of CO₂e emissions attributable to other sources in Minnesota and throughout the United States.

There are no analytical or modeling tools available that reliably evaluate the incremental effect of a proposed action's discrete GHG emissions on the global and regional climate. In addition, there are no analytical or modeling tools available that reliably evaluate any cascading effects, or cumulative effects, from a proposed action's GHG emissions on natural ecosystems and human economic systems in each state or region. Potential climate changes for the upper Midwest are mostly associated with more intense precipitation resulting in increased flooding and some changes in temperature. Increased temperatures and precipitation may have effects on wetlands, forests, and other cover types that are likely to affect carbon storage and sequestration in the ecosystem. There could be localized impacts because of meteorological changes.

Based on the above estimates of marginal changes in CO₂e emissions, there are no significant climate impacts with the preferred alternative or no-action alternative.

5.4 Coastal Resources

Coastal regulations as defined by the FAA are not applicable to, and would not be affected by, the preferred alternative or no-action alternative.

5.5 Department of Transportation Act, Section 4(f)

Based on the information presented in Chapter 4, *Affected Environment*, there are no Section 4(f) resources (publicly owned parks, recreation areas, wildlife and water fowl refuges, or public and private historic properties) that would be affected by the preferred alternative or no-action alternative.

5.6 Farmlands

Projects involving impacts to farmland require coordination with the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), including submittal of USDA Farmland Conversion Impact Rating Form AD-1006. These actions are necessary to follow the guidelines set forth in the Farmland Protection Policy Act (FPPA) of 1984. FPPA is intended to minimize unnecessary and irreversible conversion of farmland to non-agricultural use by federal actions.

Farmland impacts are considered significant if directly impacted farmlands receive a total combined farmland conversion impact rating of between 200 and 260. Impact severity increases as the total score approaches 260. The NRCS determines the score of a site's relative value of up to 260 points, composed of up to 100 points for relative value and up to 160 points for the site assessment. The USDA recommends:

- Sites with the highest combined scores be regarded as most suitable for protection under these criteria and sites with the lowest scores, as least suitable; and
- Sites receiving a total score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated.

In October 2017, information regarding farmland to be converted as part of the preferred alternative was provided to the NRCS office in Rochester, Minnesota, on USDA Form AD-1006, *Farmland Conversion Impact Rating*. The NRCS determined that 42.28 acres of farmland would be directly converted by the preferred alternative. This represents approximately one sixth of farmland currently in production on Airport property. Nearly all 42.28 acres are considered prime and unique farmland. Based on NRCS farmland evaluation criteria, the farmland to be converted as a result of the preferred alternative has a total value of 124 points, which does not exceed the 160-point threshold for additional consideration and analysis of farmland protection or alternative sites. A copy of the completed Form AD-1006 and associated background information are included in **Appendix G**. Based on farmland value scores calculated in coordination with the USDA NRCS, there are no significant impacts associated with either the no-action or preferred alternatives, as defined by the Federal Farmland Protection Policy Act, NEPA, and MEPA.

5.7 Hazardous Materials, Solid Waste, and Pollution Prevention

Mead & Hunt conducted a Phase I Environmental Site Assessment in summer 2017 for areas to be disturbed by the proposed action. This included a site visit and associated literature review and research, using state and federal on-line sources, to determine if there are any hazardous materials or potential for pollution within the project area. The overall purpose of the Phase I is to investigate and identify recognized environmental conditions (RECs) within the project area. RECs include, but are not limited to: hazardous/toxic wastes or raw chemicals stored, dumped, or spilled within the project area; aboveground storage tanks (ASTs) and underground storage tanks (USTs) containing hazardous materials; friable asbestos in building materials/structures; and off-site sources of hazardous waste contamination, such as industrial facilities adjacent to the project area. The only relevant environmental concern identified in the area is groundwater contamination with trichloroethylene (TCE), which has been consistently monitored and regulated since the 1980s and would not be affected by the preferred alternative because of its depth below the ground surface. No hazardous materials sites were identified in the project area that could be considered a pollutant source requiring further evaluation or mitigation. The full Phase I report is included in **Appendix H**.

The preferred alternative would produce construction debris such as dirt, concrete, and asphalt, and maintenance activities for the new airside facilities would produce other sources of solid waste. Construction materials and other solid waste will be disposed of at a commercial landfill capable of handling disposal as required by Minnesota Rule 7035.0805, *Renovation and Demolition*. Local disposal facilities are expected to have capacity to accept solid waste volumes that would be produced by construction and operation of the proposed action.

Based on the information above, there are no hazardous materials or solid waste impacts expected for either the preferred alternative or the no-action alternative.

5.8 Historical, Architectural, Archeological, and Cultural Resources

Investigation of potential historical and archaeological resources in the Area of Potential Effect (APE) for the proposed action was completed in compliance with the requirements of Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-655), as amended, and 36 CFR, part 800, *Protection of Historic Properties*, and MEPA. Mead & Hunt determined the APE for historical/architectural and archeological resources in coordination with the FAA Environmental Specialist, including the area of proposed ground disturbance and structures that may be directly or indirectly affected by the preferred alternative. Architectural historians from Mead & Hunt completed a survey of structures within the APE that may be affected. In addition, a Phase I Archeological Survey was prepared by Mississippi Valley Archaeology for areas that may be disturbed by the new runway, taxiways, roads, and associated infrastructure. Reports documenting these findings are included in **Appendix D**.

Historians identified and documented 13 historic-age properties within the APE. Twelve of these properties are unlikely to be eligible for listing in the National Register of Historic Places (NRHP), as they do not appear to possess a significant association with an important historic theme or person, and do not possess architectural significance. The thirteenth property, the St. Paul, Stillwater, & Taylors Falls Railroad, may be eligible for the NRHP. However, as project activities will not impact the railroad, NEPA and MEPA do not require a more thorough review of the railroad corridor's historic significance as part of this EA/EAW.

Archaeologists identified two sites while shovel testing in two groves of trees north and south of 30th Street North. These sites coincide with building foundations noted on aerial photographs from 1938 through 1960, and plat maps from 1901 and later. Given their age, intact foundation material, and some type of relationship to the Jacob Schmidt Brewing Company, the two sites may be potentially eligible for listing on the NRHP under Criterion D, as they may provide important information about the past. However, since ground disturbing activities will avoid the foundations, the sites were not formally evaluated for NRHP eligibility. The groves of trees surrounding the sites will be clear cut and to avoid any inadvertent disturbance to the foundations, trees in and immediately around the foundations be hand cut with no heavy equipment near the foundations. If future ground disturbance is planned in these areas, the Minnesota State Historic Preservation Office (SHPO) should be consulted to determine if further evaluation is necessary.

Based on the findings described above, there are no impacts to historical/architectural or archeological resources associated with the preferred alternative or the no-action alternative. The FAA has determined that a Section 106 finding of No Historic Properties Affected is applicable for the preferred alternative, and submitted this finding to the SHPO, the Lower Sioux Indian Community Tribal Historic Preservation Office (THPO), the Upper Sioux Indian Community THPO, the Prairie Island Indian Community THPO, the Mille Lacs Band of Ojibwe THPO, and the Shakopee Mdewakanton Sioux Community THPO, on October 20, 2017. The SHPO concurred in the FAA finding in a letter dated December 28, 2017. The FAA finding and SHPO concurrence letter are included in **Appendix D**.

If cultural resources or human remains are discovered during construction, the Airport will notify the SHPO, the above-mentioned THPOS, and the FAA Dakota-Minnesota Airports District Office (ADO). The

Airport sponsor will protect the area until concerns have been appropriately addressed and the Airport will comply with the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act, as appropriate.

Based on the information above, there are no significant impacts to historical/architectural or archeological resources associated with the preferred alternative or no-action alternative.

5.9 Land Use

Primary land use concerns associated with the preferred alternative include residential land uses, ground transportation land uses, and wildlife attractants. Impacts associated with the preferred alternative are summarized in the following subsections.

5.9.1 Residential Land Use

The preferred alternative would move the Runway 14 threshold approximately 750 feet east-northeast and move the Runway 32 threshold approximately 1,200 feet east-southeast. Visual flight rules (VFR) traffic pattern airspace at the Airport would extend 1.5 nautical miles (9,114 feet) laterally and longitudinally from the runway endpoints under both the no-action and preferred alternatives. Because the preferred alternative would not substantially alter the VFR traffic pattern airspace, impacts to surrounding land uses are minimal.

Before completing the EA/EAW process, the MAC will start convening a Joint Airport Zoning Board (JAZB) under Minnesota Statutes Chapter 360. Members of the JAZB are expected to include representatives from the City of Lake Elmo, Baytown Township, West Lakeland Township, Washington County, and any other local government jurisdiction affected by the proposed zoning ordinance. The process will consider public input as part of developing an airport zoning ordinance. This process may result in a zoning ordinance recommendation to the MnDOT Office of Aeronautics that deviates from the state's Model Zoning Ordinance.

Effects to existing and planned neighboring land uses were identified in Chapter 3, *Alternatives*, for the no-action and preferred alternative using the Model State Safety Zones A and B promulgated under Minnesota Administrative Rules 8800.2400 as a guide. These zones are not currently in effect at the Airport. Safety Zone A typically prevents erection of new structures, and Safety Zone B typically prevents small lot residential development using density standards. This analysis determined that, under the no-action alternative, there are no houses in Model Safety Zone A and two houses in Model Safety Zone B for Runway 14/32, and no houses in Model Safety Zone A and eight houses in Model Safety Zone B for Runway 04/22. For the preferred alternative, there would be three houses in Model Safety Zone A and ten houses in Model Safety Zone B for Runway 14/32, and two houses in Model Safety Zone A and ten houses in Model Safety Zone B for Runway 04/22. The Model Safety Zones for both the no-action and preferred alternatives are shown and analyzed further in Chapter 3, *Alternatives*.

5.9.2 Ground Transportation Land Use

Mead & Hunt conducted a study to determine whether the realignment of 30th Street North will have an adverse impact to traffic safety/efficiency and emergency response. This study (see **Appendix B**)

included review of existing traffic data and emergency routes, analysis of traffic counts and forecasts, and computation and documentation of emergency response times. The 30th Street North roadway east of Manning Avenue North is classified as a major collector based on the Functional Classification System prepared by the Metropolitan Council in September 2014. This classification was used to determine appropriate dimensions, curvature, speed limits, and design for the realigned roadway. Based on traffic counts conducted in 2016, the affected segment of 30th Street North accommodates approximately 1,500 total vehicle trips on a typical weekday. The 2014 Manning Avenue corridor study completed by Washington County forecasts that daily volume on 30th Street North will increase to 2,000 total vehicle trips per day by 2030. The proposed design of the realigned 30th Street North will be adequate to accommodate this traffic forecast.

The proposed realignment of 30th Street North will increase the average travel time along 30th Street North by approximately 46 seconds in either direction. This incremental increase in travel time would not place an undue burden on local roadway users. Based on discussion with the Bayport Fire Department, the primary effect on emergency response associated with the realignment will be increasing the time necessary to access fire hydrants west of Manning Avenue when responding to fires east of Manning Avenue. Because multiple jurisdictions respond to emergencies in the area under a mutual aid agreement and numerous firefighting vehicles would be present in the event of a fire, the increase in travel time is not expected to have an adverse impact on emergency response.

Relocation of 30th Street North will require approval from FAA as a land release of dedicated Airport property. The proposed realignment of 30th Street North will benefit and be compatible with the needs of civil aviation at the Airport by removing incompatible land uses from the runway protection zones on both ends of the runway (Manning Avenue and railroad removed from the Runway 14 RPZ, 30th Street North removed from the Runway 32 RPZ).

5.9.3 Wildlife Attractants

A site visit was conducted by a certified wildlife biologist from Mead & Hunt in October 2017 to observe and characterize wildlife attractants at and surrounding the Airport. A report regarding the findings of this visit is in **Appendix I**. This report indicates that the proposed project would not result in any new hazardous wildlife concerns at the Airport. The MAC provided the report to the local USDA Animal and Plant Health Inspection Services (APHIS) Wildlife Services (WS) division office on November 8, 2017.

Wildlife observed in October 2017 included the American crow (4), eastern wood-pewee (12), Canada goose (400+) continuous morning flights traveling south to north, blue jay (5) and approximately 300 red-winged blackbirds. Additional wildlife observed at the Airport include fox, coyote, deer, 13-lined ground squirrel (numerous), gopher, red-tailed hawk, crow, killdeer, rock pigeon, and starlings.

Attractants on the Airport include agricultural land and wetlands. Approximately 300 acres of the Airport are leased for farming with soybean and/or corn planted on a rotating basis. Grass/alfalfa hay is also harvested onsite in areas not planted with corn or soybeans. During wet periods of the year, the wetlands located onsite support ducks, shorebirds, passerines and other wildlife dependent on wetland habitats. Other attractants near the Airport include the fairgrounds approximately one mile north, which attracts

Canada geese. Most deer are observed during the daylight hours and tend to congregate north and northeast of the Aircraft Operations Area (AOA) near trees. No golf courses, wastewater treatment facilities, landfills or waste transfer stations are within one mile of the Airport.

The Airport maintenance staff person indicates that deer have been observed on the Airport, and that Canada geese are increasing in numbers because of suburban development near the Airport, which includes a new stormwater detention pond and open space. Most recent wildlife strikes during the maintenance staff person's tenure at the Airport have been sparrows (seed eaters) and barn swallows (insect eaters) that nest in or near the hangars. Strike data recorded over the most recent seven-year period indicate at least two or three strike events have included multiple birds per strike, with other strikes recorded indicate that single birds were struck. No more than six strikes have occurred during the tenure of the current Airport maintenance staff person.

The expansion of the airfield and associated hardscapes and safety areas will reduce habitat for birds and wildlife at the Airport. However, the dislocated deer will continue to congregate near the remaining areas with trees. Agricultural crops will be reduced by approximately 50 acres, which will reduce potential bird strikes (sparrows and swallows) near hardscapes and associated safety areas. The proposed project will not reduce Canada goose strike potential other than reducing risk by eliminating existing agricultural crops.

5.9.4 Land Use Conclusion

Land use impacts associated with the preferred alternative will not be significant based on results of the analysis described above. Under the no-action alternative, incompatible land uses will remain in the Runway 14/32 RPZs, as discussed in Chapter 3.

5.10 Natural Resources and Energy Supply

According to FAA Order 1050.1F, "the FAA has not established a significance threshold for natural resources and energy supply; however, the FAA has identified a factor to consider when evaluating the context and intensity of potential environmental impacts for natural resources and energy supply." This factor "includes, but is not limited to, situations in which the proposed action...would have the potential to cause demand to exceed available or future supplies of these resources. For most actions, changes in energy demands or other natural resource consumption for FAA projects will not result in significant impacts."

Airport construction projects often change an airport's demand on local energy and natural resource supplies. The following impact categories should be included in an EA/EAW, as needed:

- impacts of the proposed action on local electric, gas, and water utilities;
- construction material required for the proposed action, and its availability from local suppliers; and
- impact of the proposed action on aircraft and ground vehicle fuel use.

Consumption of energy and natural resources during the construction phase of the proposed action would consist mainly of construction machinery fuel and construction materials. This consumption will not

exceed locally available supplies, and some construction materials may be recyclable. Efforts would be made during design to identify opportunities for recycling pavements and underlying base material. Estimated quantities of required construction materials include 15,400 tons of bituminous pavement, 28,000 tons of crushed aggregate base course, 49,500 cubic yards of aggregate subbase, and 23,250 linear feet of six-inch underdrain pipe. Other required materials include topsoil, seeding mixtures, fertilizer, soil stabilizer, light fixtures, airfield signs, and painted/reflective pavement markings.

Operation and maintenance of the proposed improvements are expected to require minor increases in energy and natural resource demand. No significant increases in aircraft or ground vehicle fuel usage are expected under the preferred alternative. In addition, the minor increases in utility demand for airfield lighting and maintenance equipment under the preferred alternative are not expected to have a negative impact on local energy or natural resource supplies. The existing incandescent airfield lighting systems currently require approximately 35,000 kilowatt hours (kWh) of electricity to operate annually. If replaced with similar incandescent systems, and if the lighting systems to be added by the proposed action are also incandescent systems, the annual electricity requirements are expected to increase by more than two and a half times to approximately 128,000 kWh per year. However, energy-efficient light-emitting diode (LED) fixtures were recently approved by FAA for all planned airfield lighting systems considered by the proposed action. If LED fixtures were to be installed instead of incandescent fixtures for all proposed airfield lighting systems, the annual electricity needs are expected to decrease by five percent to approximately 33,000 kWh per year. This difference in electricity consumption will inform consideration of specific light systems at the time of project design.

In a letter dated February 27, 2017, the EPA encouraged the proposed project to use energy efficient lighting systems, sustainable building materials, and renewable energy sources (see **Appendix K**). The preferred alternative includes relocation and/or installation of runway edge lights, runway end identifier lights (REILS), and precision approach path indicator (PAPI) units for both runways. In recent decades, new airfield lighting options have emerged that use light-emitting diode (LED) light fixtures. The use of LED light fixtures provides for considerable energy and maintenance savings because of the lower wattage and increased lamp life over standard incandescent lamped fixtures. However, LED lamps are only approved for certain airfield lighting systems because of the relative youth of the LED technology. LED lighting systems would be considered during project design.

The February 27, 2017, EPA letter also recommended that pavement and structural materials be reclaimed for future use for this project or elsewhere. The MAC will identify design best management practices such as recycling (crushing) pavement for use as base-course and other practices to reduce natural resource impacts.

The required quantities of natural resources and energy supplies required by the preferred alternative and no-action alternative would not exceed available natural resources or energy supplies.

5.11 Noise and Compatible Land Use

The Federal Aviation Administration Office of Environment and Energy (FAA-AEE) recognizes that the environmental consequences stemming from aircraft operations – primarily noise, emissions, and fuel consumption – are highly interdependent and occur simultaneously throughout all phases of flight. The Aviation Environmental Design Tool (AEDT) is the FAA-approved software system that dynamically models aircraft performance in space and time to produce fuel burn, emissions and noise estimates.

Based on the 2016 baseline and 2025 forecast operations counts identified in **Appendix A** for the no-action and preferred alternatives, noise contours were developed to identify expected future aircraft noise impact areas, both with and without the proposed project. AEDT (Version 2d) was used to model noise exposure contours for this analysis. The following scenarios were evaluated:

1. Baseline 2016 – no project – existing conditions
2. No Action 2025 – no project – future conditions
3. Preferred Alternative 2025 – five years following approximate runway opening

AEDT is designed to estimate the long-term effects of noise using average annual input conditions. The model uses the Federal Aviation Regulations (FAR) Part 150 (14 C.F.R. Part 150) yearly day-night average sound level (DNL) metric, which is measured in decibels (dB). DNL is a cumulative noise metric that represents the average daily noise level, accounting for the added intrusiveness of noise at night compared to during the day. A nighttime penalty (equivalent to increasing decibel levels by ten) for increased annoyance is added to flights occurring between 10:00pm and 7:00am.

AEDT requires a variety of user-supplied data, including physical airfield facilities, aircraft activity, fleet mix, day-night split, runway use, and flight tracks. Based upon the input data, AEDT generates the noise contours by plotting points of the noise level events that represent the average-annual day. The points are then connected to graphically represent the noise contours that the aircraft generate. The FAA, EPA, and the United States Department of Housing and Urban Development (HUD) established the 65 DNL as the threshold indicating significant cumulative noise impacts. A baseline 65 DNL noise contour for calendar year 2016 is shown on **Figure 5-1**. **Figure 5-2** represents the no action alternative 65 DNL noise contour for 2025, and **Figure 5-3** represents the preferred alternative 65 DNL contour for 2025.

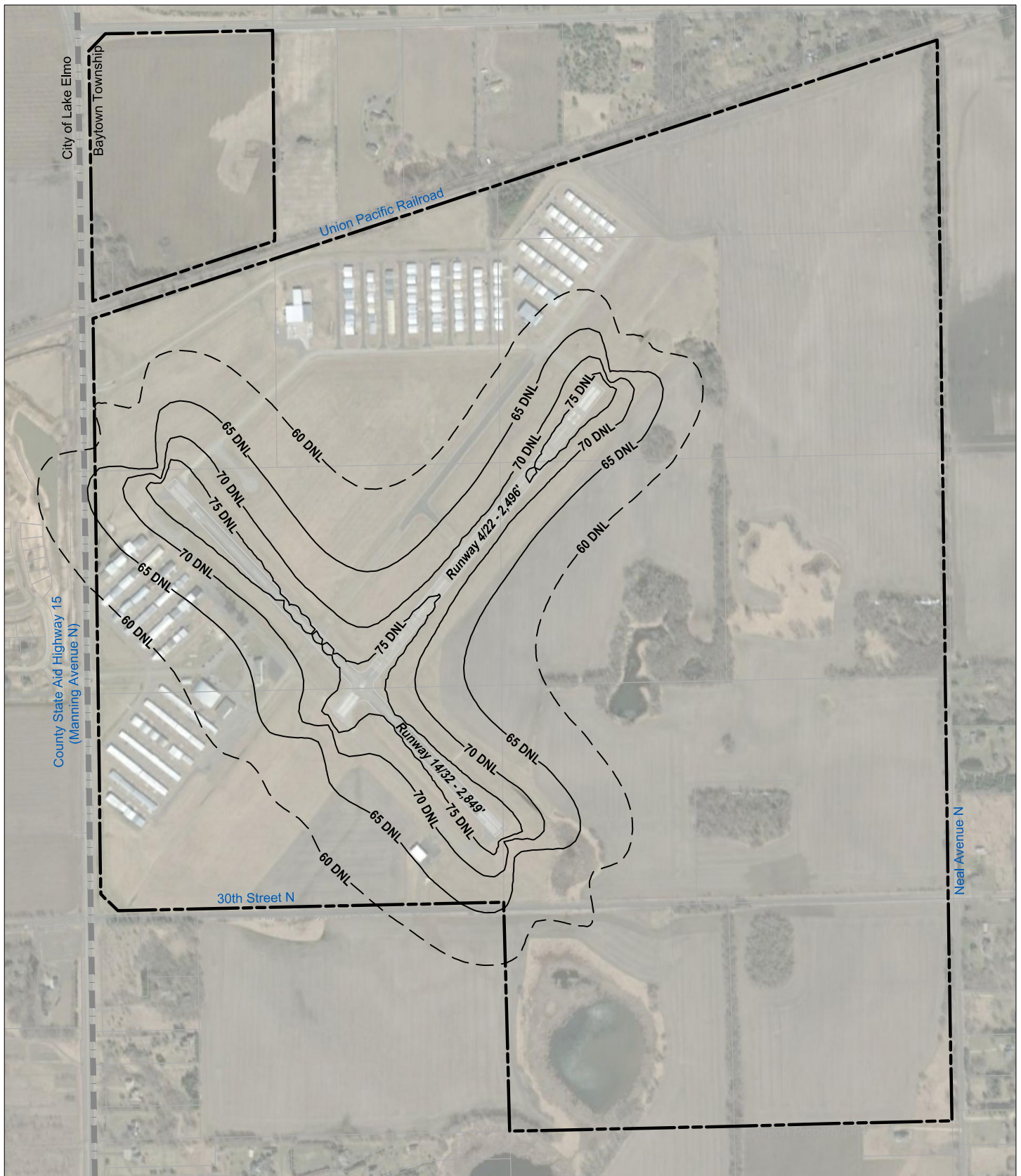
As shown in the figures, the 65 DNL contour is currently (2016) contained entirely on Airport property. Similarly, under both the 2025 no action alternative and 2025 preferred alternatives, the 65 DNL contour will be contained entirely on Airport property. As a result, there will be no significant aircraft noise impacts under the no-action or preferred alternatives. Noise contours were developed for the 60 DNL for informational purposes only, as FAA does not consider the 60 DNL significant. The 60 DNL contour extends west of Airport property in the baseline 2016 (**Figure 5-1**) and no action 2025 (**Figure 5-2**) scenarios, but is contained entirely on Airport property in the preferred alternative 2025 scenario (**Figure 5-3**). **Appendix J** includes a detailed description of the assumptions and inputs used to generate the noise contours shown in **Figures 5-1, 5-2, and 5-3**, including aircraft fleet mix, runway usage, day/night split, and flight tracks.

Construction equipment noise would be temporary and would be minimized and mitigated through implementation of appropriate construction practices specified in FAA Advisory Circular (AC) 150/5370-10E, *Standards for Specifying Construction of Airports*. The MAC will also include contract provisions requiring construction noise mitigation. As a result, there will be no significant construction noise impacts for the no-action or preferred alternatives.

5.12 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety

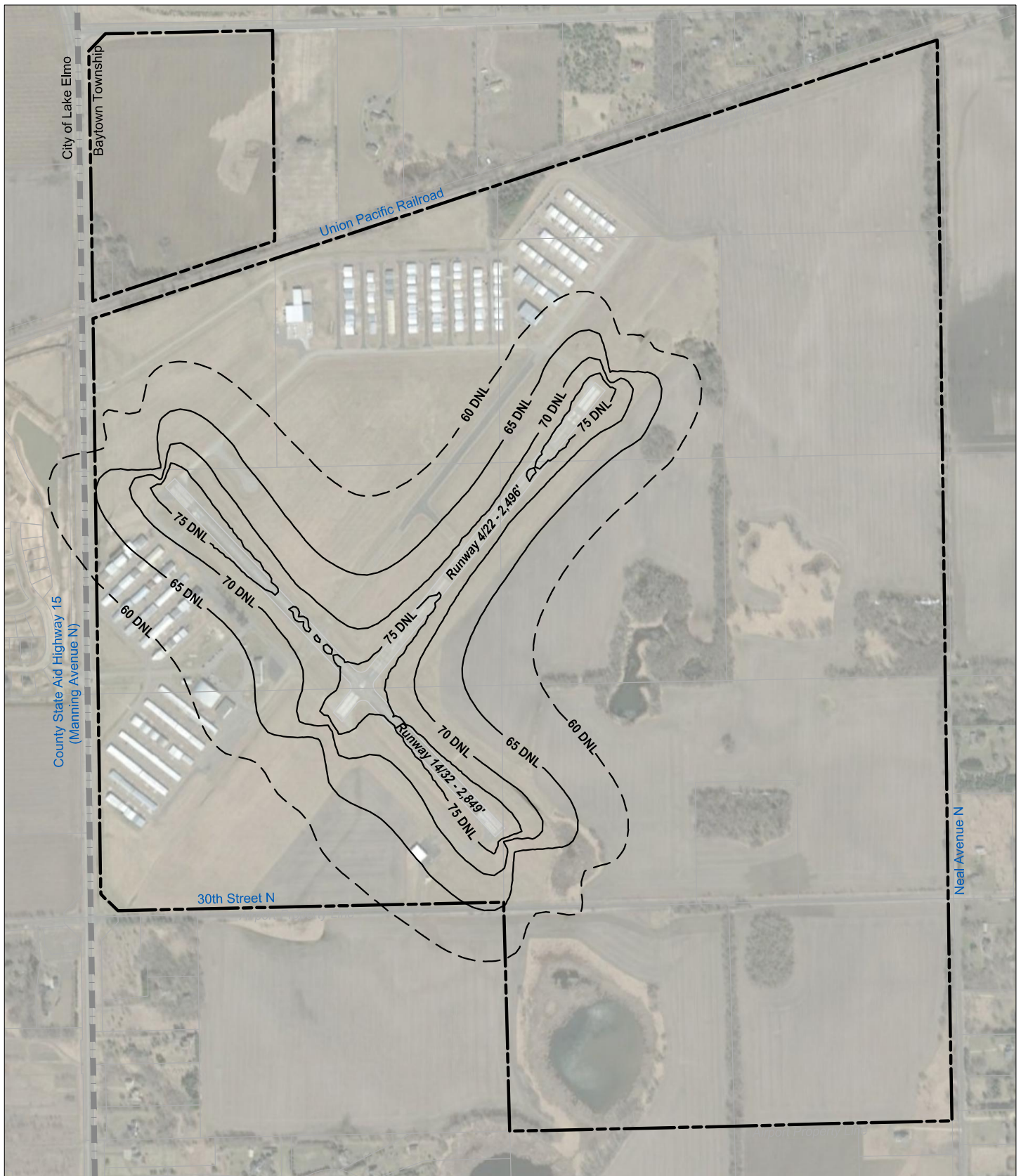
The project occur entirely on existing Airport property. The scale and nature of the project is not expected to result in any direct socioeconomic impacts, such as shifts in patterns of population movement or growth, public service demands, or changes in business and economic activities. The proposed action includes extinguishing the prescriptive easement for 30th Street North and seeking, as appropriate, a land release from the Federal Aviation Administration (FAA) to allow realignment of 30th Street North near the new Runway 32 Runway Protection Zone (RPZ) to reconnect with the existing Neal Avenue North intersection. Realignment of the township collector road 30th Street North and conveyance of an appropriate property interest to the appropriate local government authority/authorities will be determined following completion of this EA/EAW. Marginal increases in aircraft activity resulting from the preferred alternative would not produce any significant induced or secondary socioeconomic impacts.

There are no low-income or minority populations near the project, and therefore no environmental justice impacts associated with either the no-action or preferred alternatives. No potential disproportionate health or safety risks to children are expected.



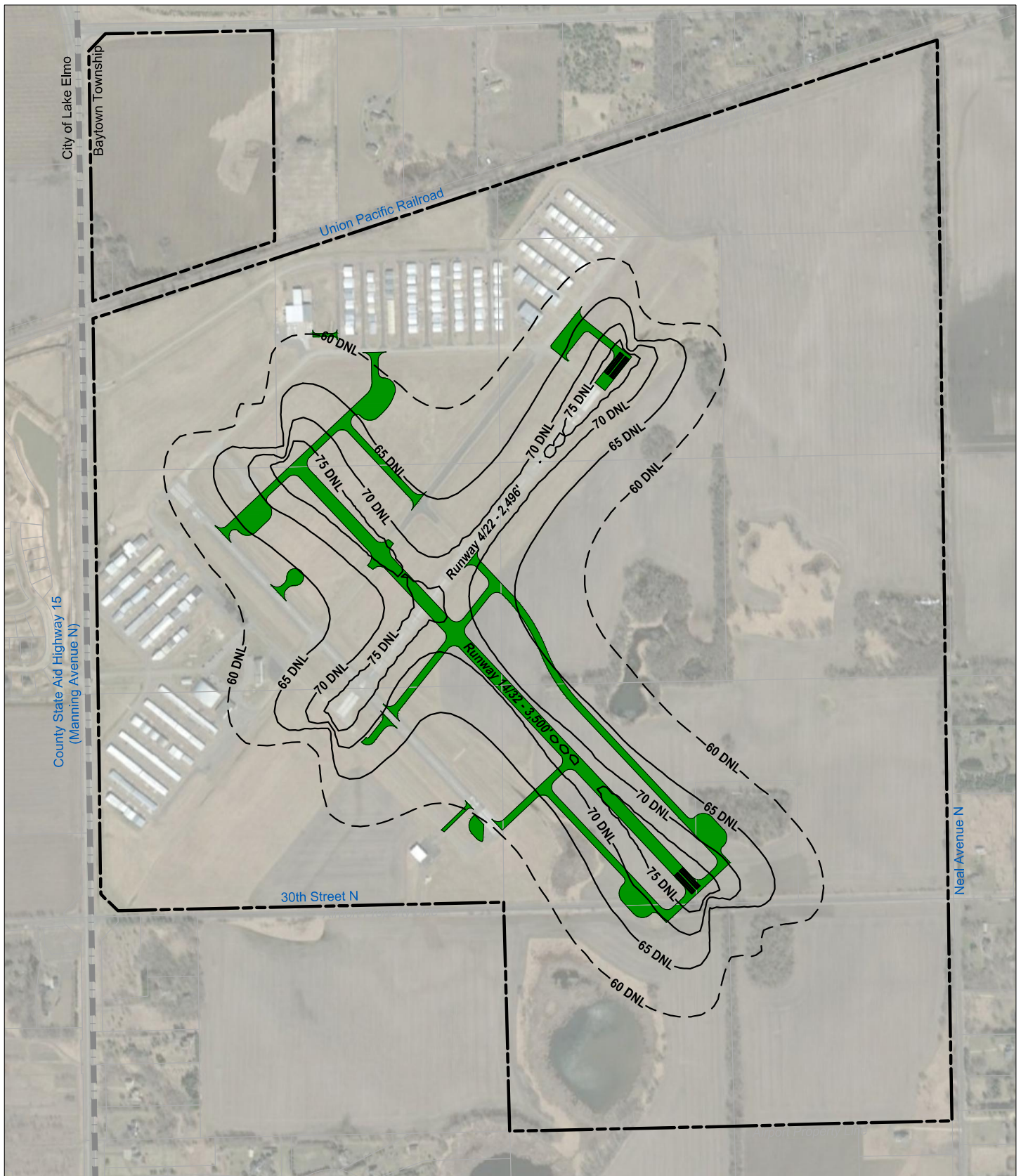
Note: Aircraft noise contour 60 DNL is shown for informational purposes only.





Note: Aircraft noise contour 60 DNL is shown for informational purposes only.





Note: Aircraft noise contour 60 DNL is shown for informational purposes only.



5.13 Visual Effects (including light emissions)

Airport related lighting facilities and activities have the potential to affect light sensitive areas such as residential neighborhoods, parks, and recreational facilities. According to FAA Order 1050.1F, light emissions analysis should consider the degree to which the proposed action would have potential to create annoyance or interfere with normal activities, and to affect the visual character of the area. The MEPA EAW form requires description of any project-related visual effects such as vapor plumes or glare from intense lights; potential visual effects from the project; and any measures to avoid, minimize, or mitigate visual effects. Although there are no federal or state standards that specifically define the significance of light emissions impacts, the location of lighting systems, brief descriptions of the purpose and characteristics of the lighting systems, and proposed measures to lessen annoyance should be included in an EA/EAW.

The preferred alternative will relocate and extend existing medium intensity runway edge lighting (MIRL) systems, precision approach path indicator (PAPI) lights, and runway end identifier lights (REIL) associated with Runway 14/32 and installation of MIRL, PAPI, and REIL systems on Runway 04/22. Runway and taxiway edge lights define the edge of usable pavement; PAPI lights provide vertical glideslope information to pilots on approach to a runway; and REIL provide positive identification of the runway end at night and in inclement weather. Runway and taxiway edge lights and PAPI lights are continuously burning lights, while REIL are synchronized flashing lights. Runway and taxiway edge lights are omnidirectional (emit light in all directions), while PAPI and REIL are aimed into the approach area beyond the end of the runway. PAPI lights are aimed upward and outward along the extended runway centerline, while the REILs are aimed upward and at 15 degree lateral angles from the extended centerline.

The preferred alternative would move the Runway 14/32 MIRL, PAPI, and REIL systems closer to residential areas southeast of the Airport. The new MIRL, PAPI, and REIL systems on either end of Runway 04/22 would be a similar distance from residences northeast and southwest of the Airport. These residential areas are currently shielded from airport light emissions because they are more than a half mile from the existing runway ends, with mature trees in between. The distance from the Runway 32 end to the Airport property line, when measured along the extended runway centerline, would be reduced from approximately 2,400 feet to 1,900 feet under the preferred alternative. The distance from the Runway 22 end to the Airport property line would be reduced from 2,250 feet to 2,000 feet.

Tree removal associated with the project will eliminate an existing visual screen between the runways and residential areas southeast and northeast of the Airport. However, lighting impacts from the MIRL and PAPI will likely be minimal given their location and steady illumination. Impacts from REIL systems, which are directional strobing lights, can sometimes be mitigated by adding baffles to reduce visible glare and installing solid fence in the runway approaches to block additional light not captured by the baffles.

Lighting systems at the Airport can be remotely activated by pilots via radio, so the systems need be only in full effect when in use by approaching and departing aircraft. Under both the no-action and preferred alternatives, the runway and taxiway edge lights would be preset to low intensity and would only increase in intensity when in use, while the REILs and PAPIs would not be illuminated at all when not in use.

Based on frequency of IFR conditions and nighttime operations at the Airport, less than 15 percent of aircraft operations (approximately 4,000 annual operations or less) are expected to occur during nighttime or in inclement weather conditions.. Unnecessary light can be further reduced by illuminating the REIL systems only when the pilots activate the highest intensity setting. As high intensity lighting at night can be disorienting for pilots, the high-intensity setting is typically used by pilots only to aid in initially locating an airport. After the pilot has positively identified the Airport, it is common to reduce the lighting intensity to complete the approach and landing.

The preferred alternative also includes installation of obstruction lighting on top of approximately a dozen on-Airport structures that would penetrate the departure threshold siting surfaces beyond the Runway 04, 14, and 22 ends. These would be steady-burning red lights to increase conspicuity from the air during nighttime. Given their performance characteristics and distance from light-sensitive receptors, these lights are not expected to create annoyance or interfere with normal activities.

Based on the information above, there are no significant visual effects associated with the preferred alternative or no-action alternative.

5.14 Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)

This section is divided into five parts: wetlands; stormwater; floodplains; other water resources; and a conclusion. Impacts from the preferred alternative and no-action alternative are discussed.

5.14.1 Wetlands

A wetland delineation and functional assessment was conducted by Mead & Hunt wetland scientists in summer 2017 to document wetland types and boundaries within the project area (see **Appendix C**). Coordination with the Valley Branch Watershed District (VBWD), which is the Local Government Unit (LGU) for Minnesota Wetland Conservation Act (WCA) purposes, as well as the US Army Corps of Engineers and Section 404 Technical Evaluation Panel (TEP), was initiated with an application for a jurisdictional determination and wetland boundary review on September 25, 2017. On November 9, 2017, the VBWD issued a WCA Notice of Decision approving the wetland boundaries and types indicated in the Mead & Hunt wetland delineation report. On January 25, 2018, the VBWD issued a supplemental Notice of Decision approving a no-loss incidental wetland determination for Wetlands 3, 6, and 7, which indicates that any project work within these areas would not be regulated as wetland impacts under WCA. The Notices are included in **Appendix C**. The U.S. Army Corps of Engineers will issue a jurisdictional determination prior to publication of the Final EA/EAW.

Wetland impact areas for the preferred alternative were estimated using the surface grading criteria for approach category B found in FAA Advisory Circular (AC) 150/5300-13A, paragraphs 313 and 418. Based on the wetland boundary data collected during the delineation, there would be approximately 2.36 acres of direct wetland impact associated with the preferred alternative. Of these 2.36 acres, 1.85 are associated with the primary runway and associated taxiways, 0.12 acres are associated with the realignment of 30th Street North, 0.38 acres are associated with the crosswind runway extension, and 0.01 acres are associated with the planned access road. The total 2.36-acre impact is divided between

about 0.06 seasonally flooded basin (Type 1), 1.66 acre of fresh wet meadow (Type 2), and 0.65 acres of shallow marsh (Type 3) wetland. The direct wetland impacts are illustrated on **Figure 5-4**.

Although there would also be tree clearing in wetlands not directly affected by the project, in nearly all cases they would be individual trees within Type 1 wetlands. The Type 1 wetlands are dominated by low-lying emergent vegetation and the tree clearing would not result in a conversion of wetland type. Furthermore, the trees would be removed during winter and would not result in a discharge of dredged and fill material to wetlands. One possible exception applies to approximately 0.6 acres of on-Airport tree clearing near the Runway 22 end in areas that have been identified by the USFWS National Wetland Inventory (NWI) database as Type 1 seasonally flooded basins. These wetlands were not delineated by the 2017 wetland boundary survey, but Mead & Hunt field observations indicate that Type 1 is the appropriate classification and that the wetlands would remain Type 1 following removal of any trees. Wetland boundaries and types in these areas will be confirmed by field delineation in spring 2018 and any required mitigation will be identified before publication of the Final EA/EAW document.

Wetland mitigation will be required as a condition of an Individual Permit under Section 404 of the Clean Water Act. Mitigation will also be a condition of any permit or approval necessary for MDNR wetlands and for any wetlands under the jurisdiction of the Minnesota Wetland Conservation Act (WCA). Under WCA, wetland mitigation ratios for counties with fewer than 50 percent of pre-settlement wetland acreage remaining, such as Washington County, are 2.5:1. Minnesota Rule 8420.0522. If the Airport sponsor replaces wetlands within mitigation Bank Service Area (BSA) 6, this ratio may be reduced to 2:1.

The MAC will consider wetland banking opportunities during the permitting process according to the wetland replacement priorities defined in the WCA statute. As of November 27, 2017, the Minnesota Board of Water and Soil Resources (BWSR) website indicates there are sufficient available wetland bank credits to mitigate for wetland impacts associated with the preferred alternative. The available wetland credit types correspond to the wetlands impacted by the preferred alternative and exceed the required mitigation for each wetland type. Purchase of wetland bank credits would occur after the exact wetland impact area is determined during design engineering, a process which may slightly change the estimated wetland impact and consequent wetland credit need.

The VBWD also requires a minimum 25-foot wide vegetative buffer between wetlands and impervious surfaces, which is considered by the preferred alternative conceptual design. Because the 0.12-acre portion of wetland impacts south of 30th Street North are associated with a water body identified in the MDNR Public Waters Inventory (PWI), a MDNR Public Waters Permit may be required.

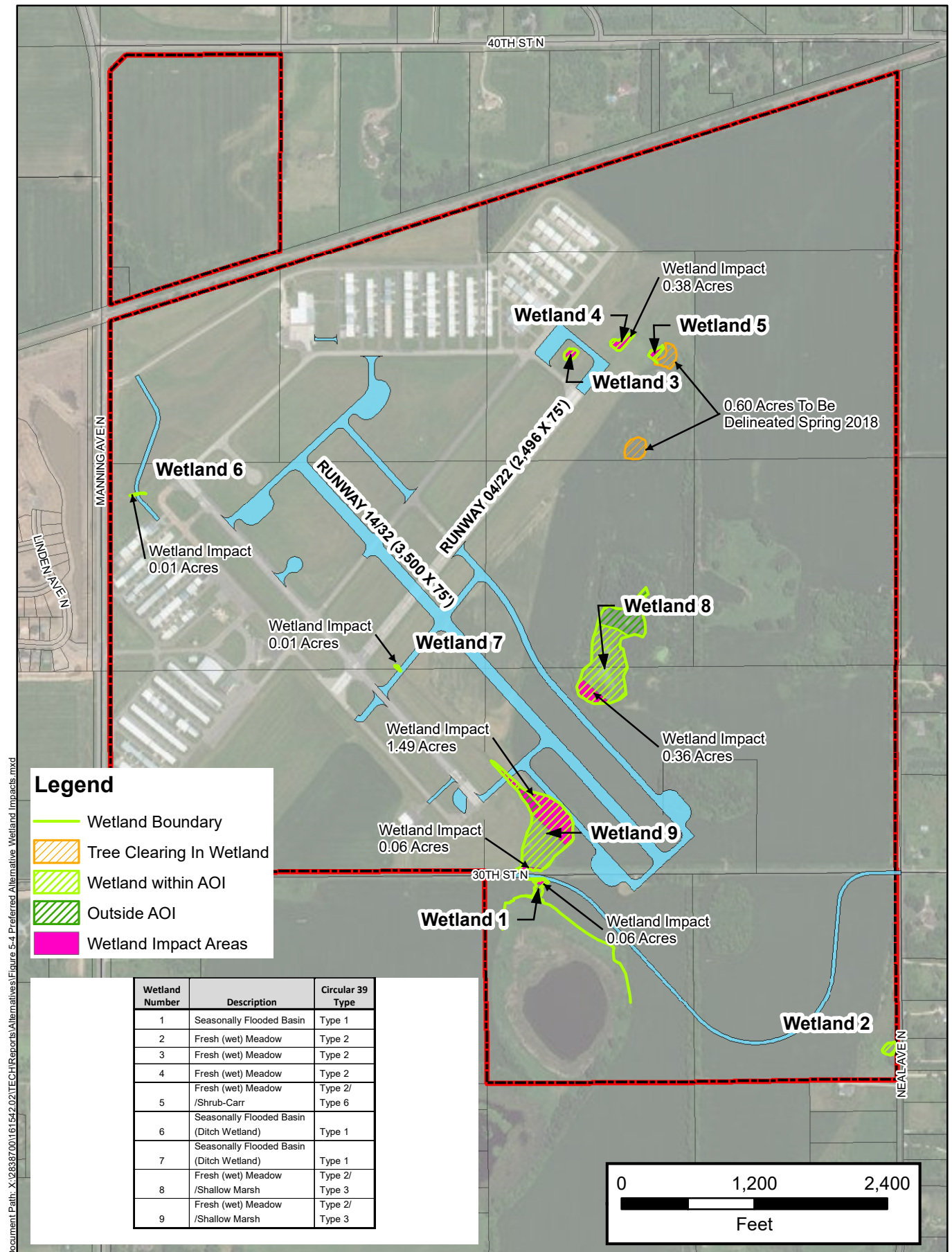


FIGURE 5-4
Preferred Alternative Wetland Impacts
Lake Elmo Airport
Environmental Assessment

5.14.2 Stormwater

The location of the new impervious surfaces with relation to existing Airport drainage subwatersheds, hydrology, and topography is shown in **Figure 5-5**. The preferred alternative will add approximately 850,000 square feet of impervious surface associated with construction of the runways, taxiways, and roads. However, approximately 300,000 square feet of existing impervious surface will also be removed, for a net increase of 550,000 square feet (12.6 acres) of impervious surface.

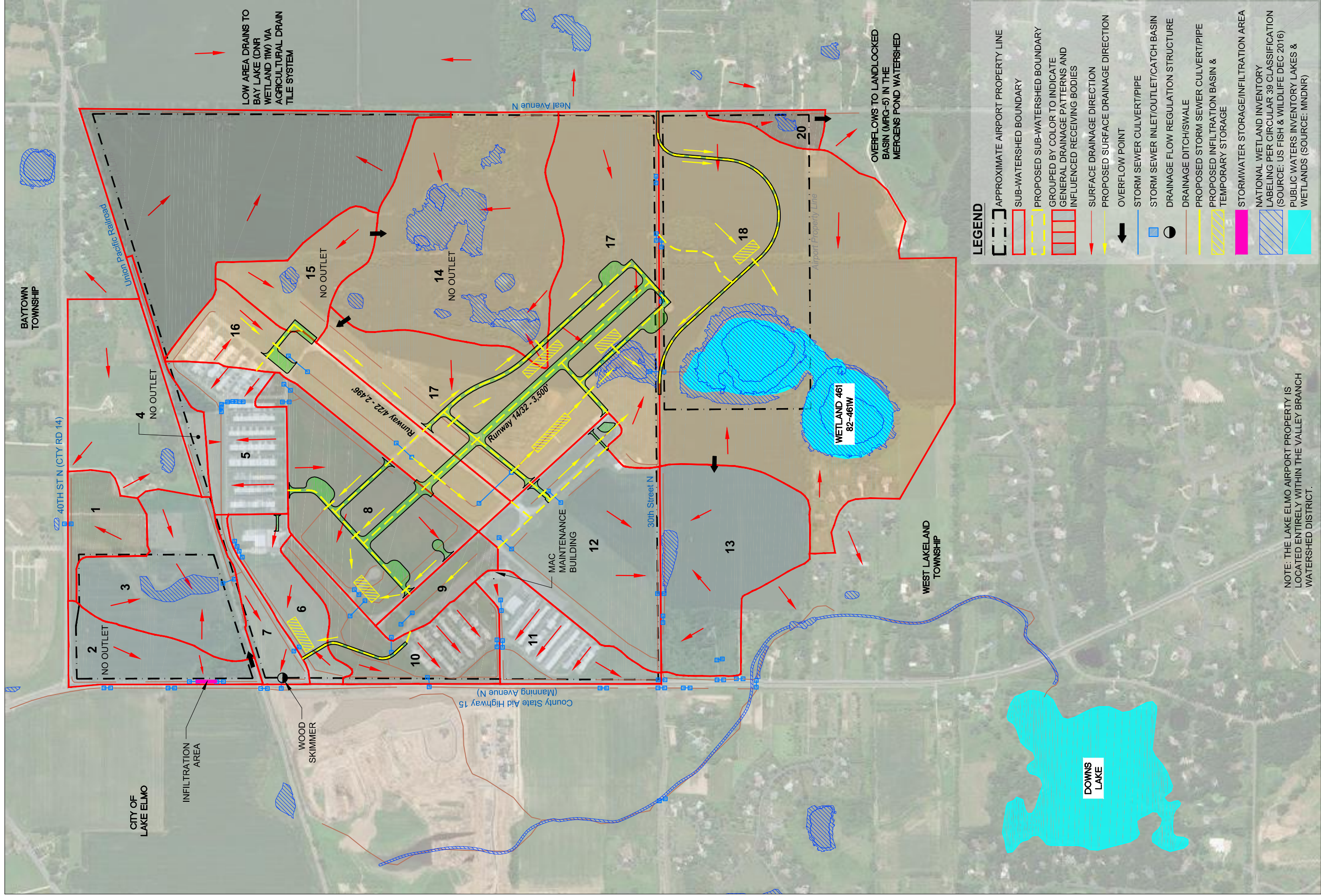
The Airport is located within and subject to the stormwater management requirements of the VBWD, Baytown Township, and West Lakeland Township. The Town of Baytown is subject to the VBWD stormwater requirements, while West Lakeland Township is an MS4 permit holder and has more stringent requirements. MS4 permits are designed to reduce the amount of sediment and pollution that enters surface and ground water from storm sewer systems to the maximum extent possible. As an MS4 permit holder, West Lakeland Township is subject to a National Pollutant Discharge Elimination System (NPDES) Phase II permitting requirement, which includes post-construction stormwater management for new development and redevelopment projects where total land disturbance is one acre or more. Therefore, post construction stormwater management measures will be required to meet the Clean Water Act. These stormwater management measures are stringent than Minnesota Pollution Control Agency (MPCA) NPDES stormwater construction permit requirements.

Stormwater quantity and quality impacts will result because of the change in land cover. Estimated acreage of on-Airport land cover by type under the no-action and preferred alternatives are compared in **Table 5-5**.

Table 5-5: Airport Land Cover Comparison				
General Land Cover Type	No-Action Alternative		Preferred Alternative	
	Acres	Percentage	Acres	Percentage
Impervious Surface	58.7	9.2%	71.3	11.1%
Agricultural (leased)	300.6	47.0%	257.6	40.3%
Grassy Areas	221.8	34.7%	261.7	40.9%
Wooded	22.2	3.5%	15.2	2.4%
Wetland	36.7	5.7%	34.2	5.3%
Total	640.0	100.0%	640.0	100.0%

Sources: Minnesota Land Cover Classification System (MLCCS), Mead & Hunt

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Sources: SEH and HNTB



FIGURE 5-5
Airfield Drainage Map

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For projects involving new and fully reconstructed impervious surfaces of 6,000 square feet or more, the VBWD requires a treatment standard of 1.1 inches of runoff retained on site from the new or reconstructed surfaces. The VBWD also regulates peak rates of stormwater runoff during construction. Stormwater volume and rate control requirements would be identified as part of a watershed district permit to be acquired by the MAC prior to construction.

The Clean Water Act's NPDES program includes a permit addressing stormwater effects of construction disturbances on one acre or more. In Minnesota, this program is administered by the Minnesota Pollution Control Agency (MPCA). NPDES stormwater construction permits must be obtained before commencing construction. To comply with NPDES stormwater permit requirements, the Airport will create a stormwater pollution prevention plan (SWPPP) that describes the best management practices to be used during construction to control stormwater runoff.

Stormwater facilities will be designed to meet the most stringent requirements at the time of construction, which may be the VBWD criteria, the Township of West Lakeland requirements, or the NPDES stormwater construction permit. Today, the most stringent requirements for stormwater management are found in the code of West Lakeland Township. The code requires capturing and retaining the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surface on the site; or
- 1.1 inches of runoff from the net increase in impervious area on the site.

The West Lakeland Township's Erosion Water Management and Land Alteration code also dictates that the site design shall provide on-site treatment during construction and post-construction. The required treatment is to ensure no increase in offsite peak discharge for the 1-, 2-, 10- and 100-year 24-hour storm events, based on Atlas 14 precipitation frequency events.

To meet the West Lakeland Township requirements, the site development plan will include both structural and non-structural best management practices (BMPs). These BMPs will manage and treat runoff, and control erosion and exposed soils.

Because the West Lakeland Township requirements mandate the control of peak flow rates and total stormwater volume, the project design will include an analysis of site runoff versus runoff expected from impervious surfaces, slopes, and other site drainage features. The design will also address the expected amount, frequency, intensity, and duration of precipitation. The stormwater design would create no additional impacts to wetlands.

Wet detention, an effective BMP, is not recommended within five miles of the Aircraft Operating Area because of wildlife attractant potential. However, stormwater detention for control of flow released may be considered if the ponds can be drawn down within 48 hours. Figure 5-5 depicts conceptual stormwater infiltration basin sizes and locations for the preferred alternative. These basins would be designed to drain within 24 hours of a storm, or sooner depending on the amount of precipitation, to avoid attracting wildlife. The stormwater management system will also be designed in accordance with FAA AC 150/5200-33B,

Hazardous Wildlife Attractants on or Near Airports. Final treatment methods will be determined upon final design.

Temporary impacts to water quality could occur during construction of the proposed project, including surface water runoff, accidental release of fuel/hydraulic fluids, and sedimentation from soil erosion. BMPs for stormwater management and sediment control would be implemented during construction. In addition, the contractor would be required to comply with FAA AC 150/5370-10C, *Standards for Specifying Construction of Airports*, and specifically, Item P-156, *Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, which sets standards for environmental protection and water pollution control during construction. An Erosion and Sediment Control Plan will specify the temporary and permanent erosion control measures, in compliance with local, state, and federal regulations.

Care will be taken to contain construction disturbance to practical limits. Construction practices would take necessary precautions to prevent pollution of water resources with fuels, oils, bitumen, chemicals, or other harmful materials, and to reduce air pollution from particulate and gaseous matter. Other precautions would include use of silt fences, inlet protection, sediment basins, ditch checks, and erosion mats as appropriate.

In its February 27, 2017 letter, the EPA recommended that FAA and the Airport sponsor account for increased storm frequency and intensity during project design by considering appropriate green infrastructure. This may include natural elements such as green space and trees, as well as elements of the constructed environment such as bioswales. These design elements will be considered during project design and engineering.

The Airport's current SWPPP, a requirement of the MPCA's Industrial Stormwater Program to reduce the amount of pollution that enters surface and ground water from industrial facilities, will be revised to reflect the additional impervious surface on the airfield and any associated new mitigation practices. With the mitigation measures required by the NPDES General Stormwater Construction Permit there are no water quality impacts associated with the preferred alternative. Provisions required to mitigate the environmental consequences of the construction work would be included in the MAC contract specifications.

5.14.3 Floodplains

Executive Order 11988, *Floodplain Management* (May 24, 1977), defines floodplains as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year." Executive Order 11988 bans federal actions in a floodplain unless no practicable alternative exists, and requires measures to minimize unavoidable short-term and long-term impacts if the proposed action occurs in a floodplain. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) were reviewed to determine if the proposed action would result in development within a 100-year floodplain. The FIRMs indicate a potential flood hazard zone (Zone A, see Chapter 4) within the preferred alternative area of ground disturbance south of 30th Street North. The total wetland fill footprint in this area is estimated to be 0.06 acre. The estimated net loss of floodplain storage is insignificant when considering

the flood volumes associated with a 100-year event, and there would be no notable adverse impacts on natural and beneficial floodplain values, as defined by DOT Order 5650.2, *Floodplain Management and Protection*, associated with preferred alternative. The watershed district permit will be acquired by the MAC prior to construction and will fulfill permitting requirements related to floodplains.

5.14.4 Other Water Resources

The preferred alternative does not have potential for impacts to water bodies listed as impaired under Section 303(d) of the Clean Water Act and will not contribute to the listing of any waterbodies as impaired. The preferred alternative will not substantially diminish natural and beneficial surface water or groundwater resource values, and no MDNR public waters or wild and scenic rivers would be affected.

5.14.5 Water Resources Conclusion

Based on the information above, the established FAA thresholds of significance under NEPA, and the significance thresholds under MEPA, there are no significant impacts to water resources associated with the preferred alternative or no-action alternative.

5.15 Cumulative Impacts and Cumulative Potential Effects

NEPA requires the analysis of “cumulative impacts.” Cumulative impacts are impacts on the environment that result from the incremental impact of the action when added to past, present, and reasonably foreseeable development in the area that is not directly associated with the preferred alternative, regardless of what agency or person undertakes such actions. MEPA requires the analysis of “cumulative potential effects.” Cumulative potential effects are effects on the environment that result from the incremental effects of the project under review in addition to other projects in the “environmentally relevant area” that might “reasonably be expected to affect the same environmental resources.” In other words, the cumulative potential effects analysis examines whether the incremental effects of a proposed project, combined with other projects in the same geographic area and taking place over the same period of time, will have a significant effect on the same environmental resources. Minnesota Rule 4410.0200, subp. 11a provides that the “other projects” include “future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects.” Under the rule, a basis of expectation is laid for a future project if the project is “reasonably likely to occur” and, if so, whether “sufficiently detailed information is available about the project to contribute to the understanding of cumulative potential effects.”

Information was gathered on construction and other development projects that have recently been completed in addition to those that under NEPA may reasonably be expected in the future or under MEPA are actually planned. These actions are identified in Chapter 4, *Affected Environment*, and include the following:

- An estimated 1,720 parcels have developed within two miles of proposed runway ends since 1964.
- Extension of municipal water and sanitary sewer systems to the area west of Airport occurred within the last ten years and will contribute to continued urban development of the City of Lake Elmo for the foreseeable future.

- Washington County proposes to expand Manning Avenue North (CSAH 15) from two to four lanes within the next five years, which will contribute to continued urban development in the CSAH 15 corridor.
- Future development in Baytown and West Lakeland Townships will be limited based on current comprehensive plans and zoning regulations, and lack of municipal water and sanitary sewer services.
- The last major project at the Airport was expansion of the north hangar area in the 1990s, and there are no other major future projects depicted on the Airport Layout Plan apart from those considered under the proposed action for this EA/EAW.

The chief environmental effect of the proposed action is the filling of a total of approximately 2.36 acres of wetlands on Airport property. It is nearly impossible to predict the extent and location of projects in the vicinity of the Airport with potential wetland impacts, especially because private developments. However, a reasonable assessment of the potential for cumulative wetland impacts may be extrapolated from available U.S. Fish & Wildlife Service National Wetland Inventory data. These data provide context for the wetland impact associated with the preferred alternative, as they may be used to estimate total existing wetlands in the larger geographic area within which the project will take place. Cumulative impacts to wetlands were examined by analyzing National Wetland Inventory data for the geographic limits of the Valley Branch Watershed District (VBWD) and Washington County.

According to the most recent National Wetland Inventory data, there are approximately 22,271 acres of wetlands in Washington County and approximately 1,985 acres of wetlands within the VBWD, other than those classified as open waters such as lakes, ponds, and rivers. Wetland loss areas for each county in Minnesota are established by state statute based on a 1984 report that compared the percentage of wetlands remaining in each county to the amount of wetlands that county contained prior to European settlement. Although the study is now more than 30 years old, the BWSR's most recent report to the Minnesota legislature indicates the study remains the only statewide estimate of pre-settlement versus existing wetlands. The 1984 report indicated that approximately 42.9 percent of pre-settlement wetlands remain in Washington County because of wetland conversion associated with urban and rural land uses. Assuming this percentage is roughly equivalent to existing conditions when compared to pre-settlement conditions for Washington County and VBWD, Washington County has lost 29,643 acres of wetlands and VBWD has lost 2,642 acres of wetlands since initial settlement. The wetland loss associated with the proposed action is less than 0.1 percent of wetland loss since pre-settlement in the VBWD, and less than 0.01 percent when considering all of Washington County.

Given excess capacity in the wetland banking system and a demonstrated preference for wetland banking by the state and federal permitting agencies in Minnesota, there is no potential for adverse cumulative effects on wetlands within Bank Service Area 6 that cannot be mitigated.

Therefore, no single impact, even when considered with past or future actions, represents a substantial impact that cannot be mitigated. As a result, neither permanent adverse nor significant impacts are expected with the implementation of the preferred alternative. All future actions would be subject to avoidance and minimization studies and would undergo agency permitting as required. Every effort will be

made to avoid or reduce impacts where feasible. No significant cumulative impacts or cumulative potential effects are associated with the no-action alternative or the preferred alternative.

5.16 Summary

A summary of the impacts presented in this section is set forth in **Table 5-6**. The table includes the impacts from the no-action and preferred alternatives, as well as any required mitigation techniques or permits.

Table 5-6: Summary of Environmental Consequences

Environmental Impact Category		Impacts: No-Action Alternative	Impacts: Preferred Alternative	Required Permitting/Mitigation & Associated Actions
Air Quality		None	Minimal impacts during construction	Implement EPA-recommended best management practices (BMPs) and control strategies during construction.
Biological Resources (including fish, wildlife, and plants)		None	Tree removal	<ul style="list-style-type: none"> • Tree removal to occur during NLEB dormant season (October 1 – April 30). • Implement April 2015 USFWS/USDOT NLEB avoidance and minimization measures. • Implement MDNR Blanding's turtle avoidance measures.
Climate		None	None	None
Coastal Resources		NA	NA	None
DOT Section 4(f) Lands		NA	NA	None
Farmlands		None	42.28 acres directly converted	None
Hazardous Materials, Solid Waste, and Pollution Prevention		None	None	Dispose of construction materials and solid waste in accordance with state and local laws.
Historic/Architectural & Archeological Resources		None	None	Hand cut trees near archeological building foundations.
Land Use	Residential	Potential zoning conflicts	Potential zoning conflicts	Convene Joint Airport Zoning Board (JAZB) to develop an Airport Zoning ordinance.
	Ground Transportation	RPZ conflicts	Increased travel time on 30 th Street	None
	Wildlife Attractants	Wetlands near runway approach	Wetlands near runway approach	Use FAA-approved seed mixes in turf grass areas.
Natural Resources and Energy Supply		None	None	None
Noise and Compatible Land Use		None	None	<ul style="list-style-type: none"> • Establish airport advisory commission. • Update voluntary noise abatement plan and hold educational briefings with pilots.
Socioeconomics, Environmental Justice, and Children's Health & Safety		None	None	None
Visual Effects (including light emissions)		None	New airfield light systems	<ul style="list-style-type: none"> • Install light baffles for REILs. • Install solid fencing in runway approaches. • Implement low, medium, and high intensity light settings to reduce frequency of light emissions.

Table 5-6: Summary of Environmental Consequences				
Environmental Impact Category		Impacts: No-Action Alternative	Impacts: Preferred Alternative	Required Permitting/Mitigation & Associated Actions
Water Resources	Wetlands	None	2.36 acres direct wetland impact	<ul style="list-style-type: none"> • Compensatory Mitigation Plan (assume impact will be banked). • USACOE 404 Army Corps permit. • Compliance with Minnesota Wetland Conservation Act. • MDNR Public Waters permit.
	Stormwater	None	12.6 acres increased impervious area	<ul style="list-style-type: none"> • Stormwater Pollution Prevention Plan. • Onsite Best Management Practices. • MPCA CWA Section 401 Water Quality Certification and NPDES permit. • VBWD permit.
	Floodplains	None	0.06-acre wetland fill in floodplain	VBWD permit
Cumulative Impacts		No substantial impacts	No substantial impacts	None

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State Environmental Assessment Worksheet (EAW) Content

As explained in Chapter 1, this EA/EAW is being circulated in place of the State EAW form, as it addresses each of the environmental effects identified in the EAW form. Informational requirements for each section of the EAW form are cross referenced with appropriate sections of this EA/EAW below:

1. **Project Title:** Runway 14/32 Relocation/Extension & Associated Improvements.
2. **Project Proposer:** Metropolitan Airports Commission
 - The project proposer contact is Chad Leqve, Director of Environment for the MAC. Mr. Leqve's mailing address is 6040 28th Avenue South, Minneapolis, MN, 55450. Mr. Leqve can be reached via email at chad.leqve@mspmac.org or via phone at 612-725-6326.
3. **Responsible Government Unit (RGU):** Metropolitan Airports Commission
4. **Reason for EAW Preparation:** Mandatory EAW under Minnesota Rule 4410.4300, Subpart 21
5. **Project Location**
 - County: Washington County
 - City/Township: Baytown Township & West Lakeland Township
 - PLS Location: Township 29, Range 20, Sections 18 & 19
 - Watershed (81 major watershed scale): St. Croix River - Stillwater
 - GPS Coordinates: Latitude N 44° 59' 50.973" and Longitude W 92° 51' 20.453"
 - Tax Parcel Number: Washington County PIN 18.029.20.31.0001, 18.029.20.33.0001, 18.029.20.22.0001, 18.029.20.23.0002, 18.029.20.24.0002, 18.029.20.13.0001, 18.029.20.42.0001, 18.029.20.11.0001, 18.029.20.14.0001, 18.029.20.41.0001, 18.029.20.43.0001, 18.029.20.44.0001, 19.029.20.11.0001, 19.029.20.12.0001
 - County map: see Figure 1-1
 - U.S. Geological Survey map: see Figure 4-2
 - Site plans showing all significant project and natural features: see Chapter 3, *Alternatives*, Figure 3-10
6. **Project Description**
 - Brief project summary to be published in the EQB Monitor (approximately 50 words):
Relocate and extend Runway 14/32 from 2,849 to 3,500 feet, extend Runway 04/22 from 2,496 to 2,750 feet, realignment of 30th Street around the new Runway 32 runway protection zone (RPZ), and establish GPS-based non-precision instrument approach procedures to all four runway ends.
 - Complete description of the proposed project and related new construction:
 - Relocate Runway 14/32 by shifting 615 feet to the northeast and extend to 3,500 feet, including grading, clearing, and runway lighting.
 - Extinguish existing prescriptive easement for 30th Street North and seek, as appropriate, a land release from the Federal Aviation Administration (FAA) to allow realignment of 30th Street North to reflect the new Runway 32 Runway Protection Zone (RPZ) to reconnect with the existing Neal Avenue North intersection.
 - Relocate the Airport perimeter fence around the new Runway 32 RPZ.
 - Remove the existing north side taxiway and compass calibration pad and construct a new cross-field taxiway to serve the new Runway 14 end, including taxiway lighting and/or reflectors.

- Convert existing Runway 14/32 to a partial parallel taxiway and remove the portion of the existing parallel taxiway south of the Runway 04 threshold.
 - Reconstruct Runway 4/22 and extend to 2,750 feet, including necessary lighting and taxiway connectors.
 - Construct other taxiways and engine run-up pads as needed to support the relocated Runway 14/32 and extended Runway 04/22, including connector taxiways and a full-length parallel taxiway on the north side of the relocated Runway 14/32, and install taxiway lighting and/or reflectors.
 - Relocate the compass calibration pad adjacent to the new partial parallel taxiway (converted Runway 14/32).
 - Establish non-precision GPS-based instrument approach procedures to all runway ends not already equipped.
 - Provide Runway 14/32 lighting systems with the relocated runway.
 - Install medium intensity runway edge lights (MIRL) on Runway 04/22, precision approach path indicators (PAPIs) on the Runway 04, 14, and 22 ends, and runway end identifier lights (REIL) on each end of Runway 04/22.
 - Remove approximately 20 acres of on-Airport trees and individual off-Airport trees as necessary to clear trees that penetrate FAA Threshold Siting Surfaces (TSS)/Part 77 approach and transitional surfaces.
 - Install obstruction lighting on fixed base operator (FBO) and hangar buildings in the *United States Standard for Terminal Instrument Procedures* (TERPS) departure surface areas beyond Runway 04, 14, and 22 ends.
 - Construct an on-Airport access road connecting the north and west building areas.
 - Voluntarily pursue creation of Rusty Patched Bumble Bee/pollinator habitat on Airport property southwest of proposed 30th Street North realignment.
 - Project construction is expected to commence in 2019 and would occur in annual phases over the course of approximately five years.
 - For information on project purpose, see Chapter 2, *Purpose & Need*.
 - For information on project magnitude, see Chapter 3, *Alternatives*.
 - For information on construction, operation methods, and features that will cause physical manipulation of the environment or will produce wastes, see Chapter 5, *Environmental Consequences*.
 - There are no future stages of this development that would include development on other property.
 - This project is not a subsequent stage of an earlier project.
7. **Cover Types**
- For information on existing cover types, see Chapter 4, *Affected Environment*, Section 4.4.
 - For information on cover types under the no-action and preferred alternatives, see Chapter 5, *Environmental Consequences*, Section 5.14.2.
8. **Permits and Approvals Required:** Government approvals and permits needed for the project are summarized in Chapter 5, *Environmental Consequences*, Table 5-6. For information on specific permits and approvals, see the relevant sections of Chapter 5. The project would be self-funded by aviation users by FAA or Minnesota Department of Transportation grant programs, or both, as well as Metropolitan Airports Commission funds. No local sales or property taxes will be used to fund airport improvements.

9. Land Use

- For information on existing land uses, municipal plans, and zoning, see Chapter 4, *Affected Environment*, Section 4.4.
- For information on the project's compatibility with nearby land uses, plans, and zoning, as well as measures incorporated into the project to mitigate potential incompatibility, see Chapter 5, *Environmental Consequences*, Section 5.9.

10. Geology, Soils, and Topography/Land Forms

- For information on existing geology, soils, and topography/land forms, see Chapter 4, *Affected Environment*, Section 4.3.
- For information on measures to minimize soil erosion during construction, see Chapter 5, *Environmental Consequences*, Section 5.14.2.

11. Water Resources

- For information on existing water resources, including both surface water and groundwater, see Chapter 4, *Affected Environment*, Section 4.5.
- For information on effects to water resources and measures to minimize or mitigate effects, see Chapter 5, *Environmental Consequences*, Section 5.14.

12. Contamination/Hazardous Materials/Waste

- For information on pre-project site conditions and project-related generation/storage of solid wastes and hazardous materials, see Chapter 5, *Environmental Consequences*, Section 5.7.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features)

- For information on existing biotic communities and rare features on and near the site, see Chapter 4, *Affected Environment*, Section 4.6.
- For information on effects to biotic communities and rare features, and associated measures that will be taken to avoid, minimize, or mitigate adverse effects, see Chapter 5, *Environmental Consequences*, Section 5.2.

14. Historic Properties

- For information on historic properties on and near the site, see Chapter 4, *Affected Environment*, Section 4.7.
- For information on effects to historic properties, see Chapter 5, *Environmental Consequences*, Section 5.8.

15. Visual

- For information on project-related visual effects, see Chapter 5, *Environmental Consequences*, Section 5.13.

16. Air

- For information on project-related emissions, see Chapter 5, *Environmental Consequences*, Sections 5.1 and 5.3.

17. Noise

- For information regarding existing and future aircraft noise at the Airport, see Chapter 5, *Environmental Consequences*, Section 5.11.

18. Transportation

- For information on ground transportation improvements associated with the project, see Chapter 3, *Alternatives*.
- For information on effects to the regional transportation system, see Chapter 5, *Environmental Consequences*, Section 5.9.

19. Cumulative Potential Effects

- For information on past, present, and reasonably foreseeable actions on and near the Airport, see Chapter 4, *Affected Environment*, Section 4.8.
- For information on cumulative effects, see Chapter 5, *Environmental Consequences*, Section 5.15.

20. Other Potential Environmental Effects

- For information on effects to farmland associated with the project, see Chapter 5, *Environmental Consequences*, Section 5.6.

Public Involvement and Agency Coordination

This chapter provides a summary of the public involvement and agency coordination efforts that have taken place throughout this Environmental Assessment (EA) / Environmental Assessment Worksheet (EAW) process.

Prior to initiating the environmental review process, the Metropolitan Airports Commission (MAC) completed a Long-Term Comprehensive Plan (LTCP) that included robust public outreach. Initial stakeholder outreach efforts for the LTCP involved meetings with partner agencies, municipal representatives, and Airport tenants before the Draft LTCP was completed. These meetings provided information regarding the plan's purpose, process, preliminary findings, and timeline. The next phase of stakeholder outreach consisted of the formal public review period after the Draft LTCP was completed and the MAC Board approved it for distribution. A Draft LTCP was issued for public review and comment on June 22, 2015. Two public information meetings were held in July 2015 to provide information regarding the Draft LTCP to interested citizens. This initial public comment period closed on September 16, 2015, after being extended to provide additional time for community input. During the initial public comment period, the MAC received 104 written comments, of which 99 were from members of the public. Twelve of the 99 commenters supported the plan, and 87 opposed.

The remaining five comments were from municipalities and agencies. West Lakeland Township and Baytown Townships passed resolutions opposing the plan, while Washington County, the Metropolitan Council, and the Valley Branch Watershed District submitted neutral comments. The City of Lake Elmo considered a resolution opposing the preferred plan but did not take action and did not submit formal comments.

Common themes from concerned area residents included:

- 30th Street N realignment and the possible associated impacts from noise, traffic, and potential right-of-way taking of their property on Neal Avenue;
- increased aircraft traffic and aircraft noise levels, including concerns the role of the Airport would change and introduce significant numbers of jet aircraft flights, impacting property values;
- concerns regarding possible adverse environmental impacts to wetlands and wildlife habitat; and
- questions regarding the overall justification for the improvements, including skepticism regarding the estimates of Airport activity levels.

In response to community input received during the initial formal LTCP public comment period, MAC staff developed a refined preferred alternative (Alternative B1) which included shortening the proposed length of Runway 14/32 from 3,600 to 3,500 feet and a different realignment concept for 30th Street N, as described in Chapter 3 of this EA/EAW. An Addendum to the Draft LTCP was prepared to describe the features of and rationale behind the development of the refined preferred alternative. Public review and comment on the Addendum opened on January 25, 2016. A supplemental public information meeting was held on February 11, 2016, to provide additional information about the refined development concept to interested citizens. The public comment period on the Addendum closed on March 9, 2016.

During the supplemental LTCP public comment period, the MAC received 104 written comments, of which 102 were from members of the public. Thirty-nine of the comments supported the plan, and 62 were opposed. One public comment was neutral. The remaining two comments were received from municipalities. West Lakeland Township affirmed its opposition to the plan, while Washington County expressed support for the refined alternative. Neither Baytown Township nor the City of Lake Elmo submitted written comments during the supplemental public comment period.

Although most of the common themes expressed by concerned area residents during the supplemental LTCP public comment period were similar to those expressed during the initial public comment period, a few new themes emerged, including the following:

- revised 30th Street N realignment to connect back to the existing intersection with Neal Avenue is still too disruptive to the community and the curves will introduce safety concerns;
- the 100-foot reduction in runway length is not enough of a compromise; the replacement runway should be shorter; and
- if the existing runway cannot be reconstructed in its current location, the Airport should be closed.

The Final Draft LTCP was submitted to the Metropolitan Council on May 9, 2016, as required under Minnesota Statutes 473.165 and 473.611. The Metropolitan Council reviews LTCPs for each airport owned and operated by the MAC for consistency with the metropolitan development guide, including Thrive MSP 2040 and the Transportation Policy Plan. Metropolitan Council staff concluded that since the preferred alternative for Lake Elmo Airport retains its system role as a minor general aviation facility, supports the regional aviation system, and is responsive to the needs and conditions of the Airport, it is consistent with the Thrive MSP 2040 and the Transportation Policy Plan. The full Metropolitan Council provided its determination of consistency on August 11, 2016. The MAC Board voted to formally adopt the LTCP on September 19, 2016.

At the outset of the environmental review process on February 8, 2017, MAC staff solicited initial comments from various federal, state, and local agencies via electronic mail as it relates to each agency's area of expertise. Agencies were asked to submit comments for consideration during the environmental review process, and were invited to an in-person agency scoping meeting held at the Lake Elmo Public Library on February 21, 2017. Agencies receiving this correspondence included the following:

- Minnesota Department of Agriculture
- Minnesota Department of Commerce
- Minnesota Department of Health – Environmental Health Division
- Minnesota Department of Natural Resources – Environmental Review Unit
- Minnesota Pollution Control Agency – Environmental Review Unit
- Minnesota Department of Transportation – Office of Environmental Stewardship
- Minnesota Board of Soil and Water Resources
- U.S. Army Corps of Engineers – Regulatory Branch
- U.S. Environmental Protection Agency – Office of Enforcement and Compliance Assurance
- U.S. Fish & Wildlife Service – Twin Cities Field Office
- Metropolitan Council – Local Planning Assistance

- Valley Branch Watershed District
- Washington Conservation District

Representatives from the Valley Branch Watershed District, Washington Conservation District, and Minnesota Department of Natural Resources attended the February 21, 2017, agency scoping meeting, and written scoping comments from the U.S. Environmental Protection Agency were received on February 27, 2017. Comments received from these agencies were incorporated into the scope of work for the EA/EAW. The agency scoping meeting minutes and associated correspondence are included in **Appendix K**.

Prior to initiating the environmental review process in early 2017, the MAC created a standalone website for sharing information related to the project with the public. This website provides information regarding stakeholder outreach activities, project documentation, relevant internet links, and answers to frequently asked questions. The website has been continually updated throughout the EA/EAW process and may be visited at the following URL: <https://www.metroairports.org/General-Aviation/Lake-Elmo-Environmental-Assessment.aspx>.

The MAC also developed a formal Stakeholder Engagement Plan in early 2017. The plan included coordinated efforts to inform, educate, and engage the public and Airport users as part of the EA/EAW process. The plan also explained the MAC's approach for documenting the outreach process. MAC published the plan on the project website and used it as a dynamic guide for administering a thorough and effective public involvement program. The stakeholder engagement plan is included in **Appendix L**.

The MAC convened a Community Engagement Panel (CEP) for the project, which met periodically throughout the development of the Draft EA/EAW. The CEP is an advisory board representing major community stakeholder groups that are more closely involved in the EA/EAW project than the public at large. Stakeholder groups represented on the CEP included:

- Airport Tenants/Users (2)
- Metropolitan Airports Commission Staff (2)
- City of Lake Elmo (1 staff & 1 resident)
- Baytown Township (1 board member & 1 resident)
- West Lakeland Township (1 board member & 1 resident)
- MAC District F Commissioner (1)
- Greater Stillwater Chamber of Commerce (1)
- Washington County Public Works (1)

The CEP serves several important functions including: representing a broad range of stakeholder groups in the EA; receiving information about the EA/EAW and sharing it with constituencies; providing input to the EA/EAW as the voice of key stakeholders; and in some cases, providing technical advice to the project team. The CEP offers opinions, advice, and guidance, but the MAC has sole discretion to act on CEP recommendations. Five CEP meetings were held on February 21, May 25, August 8, and October 19, 2017, and January 16, 2018. The CEP met on these dates because they occurred at key

milestones prior to release of the Draft EA/EAW. Agendas, presentation materials, and minutes from these meetings are included in **Appendix L**.

The MAC also held three public meeting events at key milestones prior to release of the Draft EA/EAW on May 11, August 17, and November 6, 2017. These public meetings presented the same information provided at CEP meetings. Agendas, presentation materials, handouts, and minutes from these events are included in **Appendix L**.

On May 2, 2017, under its 36 Code of Federal Regulations (CFR) Part 800 obligations, the FAA solicited comments from various Native American tribes regarding the proposed project by electronic mail. Tribes contacted included the Prairie Island Indian Community, the Shakopee Mdewakanton Sioux Community, and the Mille Lacs Band of Ojibwe. These emails are included in **Appendix D**. No responses were received.

The Draft EA/EAW document was released for public review and comment on February 26, 2018. The mailing list for the draft document included all government agencies that received invitations to the February 21, 2017, scoping meeting. The notice of availability of the draft document and public hearing to be held April 4, 2018, was published in the local newspaper and the Minnesota Environmental Quality Board (EQB) *Monitor* newsletter. Hard copies of the Draft EA/EAW are available for public review at the MAC General Offices, Lake Elmo City Hall, and at Lake Elmo Public Library. Electronic PDF versions of the Draft EA/EAW documents are available for public review on the project website at <https://www.metroairports.org/General-Aviation/Lake-Elmo-Environmental-Assessment.aspx>.

The MAC will accept written statements regarding the Draft EA/EAW from local, state, and federal government agencies, as well as from the general public, from February 26 through April 19, 2018, a period of 53 days. Comments received will be included and addressed in the final EA/EAW.

The public involvement process was inclusive of all residents and population groups in the study area and did not exclude any persons based on income, race, color, religion, national origin, age, or handicap.

The responsibility for the Environmental Assessment (EA) under the National Environmental Policy Act rests with the FAA Airports District Office in Minneapolis, Minnesota. The responsibility for the Environmental Assessment Worksheet (EAW) under the Minnesota Environmental Policy Act rests with the Metropolitan Airports Commission. This EA/EAW was prepared by Mead & Hunt, Inc. under contract with the Metropolitan Airports Commission.

The following Metropolitan Airports Commission staff members guided preparation of this EA/EAW.

- **Chad Leqve**, Director of Environment
- **Dana Nelson**, Manager – Noise, Environment & Planning
- **Bradley Juffer**, Assistant Manager – Noise, Environment & Planning
- **Neil Ralston, A.A.E.**, Airport Planner – Planning & Development
- **Gary Schmidt**, Director – Reliever Airports
- **Joe Harris**, Manager – Reliever Airports
- **Melissa Scovronski**, Manager – Public Affairs & Marketing
- **Christene Sirois Kron**, Coordinator – Sustainability & Strategy
- **Evan L. Wilson**, Senior Attorney

The following Mead & Hunt staff members were directly responsible for preparing the contents of this document.

Evan Barrett, AICP – Project Manager

Mr. Barrett has more than ten years of experience with NEPA documentation, airfield planning studies, and airport master plans.

Colleen Bosold – Stakeholder Outreach Coordinator

Ms. Bosold has more than ten years of experience in managing development of stakeholder communication materials for airport planning, engineering, and architecture projects.

Laura Morland, PE – National Environmental Practice Leader, Aviation Services

Ms. Morland has more than 30 years of experience and specializes in aviation environmental issues. Her airport experience includes planning and design, resident engineering, NEPA documentation, and environmental compliance. She develops monitoring programs for regulatory compliance and has participated in numerous feasibility and planning studies.

Stephanie A.D. Ward, AICP – Aviation Planning Services Manager

Ms. Ward has more than 25 years of experience in environmental projects. She has extensive experience developing community support and understanding of airports within their host communities.

Corbett Smith, CM – Aviation Planner

Mr. Smith has over seven years of experience as an airport planner. He is responsible for conducting technical research and analyses, designing aviation-related facilities, technical report writing and preparing airport noise contours and emissions inventories for airport planning and airport environmental projects.

Robert Sims – Aviation Planner

Mr. Sims is an airport planner with airport operations experience. He has managed Stormwater Pollution Prevention Plan and Community Emergency Response projects. He is also familiar with regulatory compliance, planning documentation, and required airfield inspections.

Eunique W. Jackson – Aviation Planner

Ms. Jackson recently graduated from Jacksonville University with a Bachelor's Degree in Aviation Management. During her collegiate career, she completed a yearlong internship with both the Cheyenne Regional Airport and Wyoming Department of Transportation's aeronautics division.

Mark Sauer, AICP – Planner

Mr. Sauer has worked on diverse projects in the planning, engineering and architecture fields both domestically and internationally for over six years. He has experience in comprehensive, sub-area and land/ site planning, architectural package submittals, construction documentation, land division and zoning change procedures, public involvement, urban design and hand and computer-generated presentation visualizations. He has a working knowledge of NEPA and has prepared numerous environmental documents including Categorical Exclusions, Environmental Reports, Environmental Assessments, and Indirect and Cumulative Effects Analyses.

Chris Rossmiller, PE – Civil Engineer

Mr. Rossmiller has more than 17 years of experience with transportation engineering in the design of rehabilitation projects, rural and urban reconstruction projects, interchange reconstruction projects, corridor preservation projects, storm water management and storm sewer systems, traffic signal layouts, roundabouts, and the preparation of final plans, specification and estimate (PS&E) for construction.

Troy Pankratz, PE – Roadway Design Discipline Leader

Mr. Pankratz has more than 17 years of experience in managing highway projects with a high level of involvement in roadway design. Troy has managed plans, specifications, and estimates for projects ranging from simple overlays to complex interstate interchange projects. He is well versed with various state DOT standards and processes, and has developed extensive expertise in developing innovative intersection designs to minimize conflict points for all users.

Greg Stern, PE – Civil Engineer

Mr. Stern has 18 years of experience as an engineer and planner on a wide variety of aviation and transportation improvement projects. His work in aviation includes services to both air carrier and general aviation airports. Past projects include the design and construction of airfield pavements, hangar site developments, navigational aids, airport roadways, terminal parking and bulk fuel storage facilities. Greg's experience also extends to environmental planning with work on a wide variety of airport layout plans and environmental assessment documents.

Karen Wiener, PE – Civil Engineer

Ms. Wiener is a professional civil engineer with 29 years of extensive experience in water resources and municipal projects. She is skilled at providing project design and technical support with an emphasis on civil and heavy-civil of water resources projects for cities, counties and federal agencies.

Scott Sengstock – Airport Surveyor

Mr. Sengstock has more than 20 years of experience as a survey chief for airport design and construction projects. He has worked on projects ranging in size from general aviation to air carrier facilities, as well as complex military projects. Scott's experience includes planning, design, construction and obstruction surveys.

Nathaniel A. Kitzrow – CAD Technician

Mr. Kitzrow has 16 years of experience as a CAD Technician in the civil engineering industry working in the residential, commercial, agricultural and aviation markets. In support of the various projects in these markets, Nat has been involved in the layouts and designs of utilities, roadways, runways, taxiways, aprons and airport infrastructures, site grading, plan set coordination and creation, exhibit drawings for presentations, writing legal descriptions for plats, and survey assistance.

Brauna Hartzell, GISP – GIS Analyst

Ms. Hartzell has more than 28 years of experience applying GIS software and database design techniques to support wetlands and water resources, historic preservation, community planning, transportation, aviation and military planning, and municipal infrastructure and storm water management. She also has more than ten years of experience in wetland delineation, wetland permitting, and restoration projects. She performs wetland and field delineations conforming to current United States Army Corps of Engineers (USACE) and State standards including the Northcentral and Northeast Regional Supplements, designs custom field data collection applications, collects field data using hand-held Global Positioning Systems (GPS) data collectors and tablets, and prepares NEPA documentation. Brauna has successfully guided numerous projects through the Section 404 permitting process.

Kimberly Shannon – Environmental Scientist

Ms. Shannon is an environmental scientist with over a decade of experience. She has professional experience in coordinating and completing a variety of project types including oil and gas, electric transmission, nuclear, transportation, commercial development, and local government. Her technical expertise includes identification, mapping, and delineation of streams and wetlands; 404 permitting and compensatory mitigation; United States Army Corps of Engineers (USACE) coordination; and assisting various clients through the 404 permitting process. She also has professional experience in the preparation and coordination of environmental assessment and categorical exclusion documents in support of the NEPA process, habitat evaluation for threatened and endangered species, and technical writing and editing.

Louis J. Bridges, Ph.D., PWS, CWB – Senior Environmental Professional

Mr. Bridges has over 25 years of experience focusing on large-scale environmental strategic planning and project management for clients with projects involving federal natural resource agencies; environmental policy analysis and compliance system development; management of numerous NEPA

compliance, permitting, and documentation efforts working with federal, state, and tribal resource management and regulatory agencies.

Kathryn Ohland – Cultural Resource Specialist

Ms. Ohland is an architectural historian with experience in conducting historic resource surveys, which includes field surveys, photographic documentation, historical research, and report preparation. Katie is also responsible for completing Section 106 compliance including the identification and evaluation of historic resources while applying the National Register Criteria. Katie exceeds the *Secretary of the Interior's Standards* in history and architectural history.

Katherine Haun – Cultural Resource Specialist

Ms. Haun is a cultural historian with over seven years of experience with Section 106 documentation.

Vicki Twinde-Javner – Senior Research Archaeologist, Mississippi Valley Archaeology Center

Ms. Twinde-Javner is an archaeologist that specializes in cultural resource management, midwestern archaeology, and historic archaeology. She holds a Master's Degree in anthropology from the University of Wisconsin-Milwaukee.

Vicky Valley – Administrative Assistant

Ms. Valley is responsible for report format, review, and compilation.