MERRILL FIELD AIRPORT MASTER PLAN UPDATE AND NOISE STUDY

Prepared for:

Merrill Field Airport
Municipality of Anchorage
Final December 2016

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Acronyms and Abbreviations

ACAIS	Air Carrier Activity Information System
ADAP	Airport Development Aid Program
ADEC	Alaska Department of Environmental Conservation
AFD	Anchorage Fire Department
AGIS	Airports Geographic Information System
AIDS	Accident/Incident Data System
AIP	Airport Improvement Plan
ALP	Airport Layout Plan
AMATS	Anchorage Metropolitan Area Transportation Solutions
AMC	Anchorage Municipal Code
AMP	Airport Master Plan
ANC	Ted Stevens Anchorage International Airport
AOA	aircraft operating area
ARC	airport reference code
ARFF	aircraft rescue and firefighting
ASD	Anchorage School District
ATCT	Air Traffic Control Tower
AWWU	Anchorage Water & Wastewater Utility
BRL	building restriction line
BTS	Bureau of Transportation Statistics
CE	Categorical Exclusion
CFR	Code of Federal Regulations
CO	carbon monoxide
CTAF	Common Traffic Advisory Frequency
dB	decibels
DME	distance measuring equipment
DNL	Day-night average sound level
DP	Departure Procedure
DOL&WD	Department of Labor and Workforce Development
DOT&PF	Department of Transportation and Public Facilities
DP	departure procedures
EA	environmental assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FATO	Final Approach and Takeoff Area
GA	general aviation
GIS	Geographic Information System
GO	General Obligation
GPS	Global Positioning System
GPS-A	Global Positioning System – Approach
IFR	Instrument Flight Rules
INM	Integrated Noise Model
ISER	Institute of Social and Economic Research
JBER	Joint Base Elmendorf-Richardson
LED	light-emitting diode
LUST	Leaking Underground Storage Tank
$\mu g/m^3$	micrograms per cubic meter
M&O	Maintenance and Operations

MAAAC	Municipal Airports Aviation Advisory Commission
MITL	Medium-Intensity Taxiway Lighting
ML&P	Municipal Lighting & Power
MOA	Municipality of Anchorage
MOS	Modification of Standards
MRI	Merrill Field Airport
MSL	Mean Sea Level
MTP	Metropolitan Transportation Plan
n/a	not applicable
NAAQS	National Ambient Air Quality Standards
NAVAIDs	Navigational Aids
NCP	Noise Compatibility Program
NEM	Noise Exposure Map
NEPA	National Environmental Policy Act
NextGen	next generation
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPIAS	National Plan of Integrated Airport Systems
NRHP	National Register of Historic Places
NTSB	National Transportation Safety Board
OFA	Object-Free Area
PA	public address
PAPI	Precision Approach Path Indicator
PCI	Pavement Condition Index
PFC	Passenger Facility Charge
PM	particulate matter
RDC	Runway Design Code
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object-Free Area
ROFZ	Runway Obstacle-Free Zone
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVZ	Runway Visibility Zone
SIAP	Standard Instrument Approach Procedure
STAR	Standard Terminal Arrival Routes
SWPPP	Storm Water Pollution Prevention Plan
SWS	Solid Waste Services
TACAN	Tactical Air Navigation
TAF	Terminal Area Forecast
TDG	Taxiway Design Group
TLOF	Touchdown and Liftoff Area
TOFA	Taxiway Object-Free Area
TSA	Taxiway Safety Area
UAA	University of Alaska Anchorage
UNICOM	universal communications
USPS	U.S. Postal System
UST	Underground Storage Tank
VASI	Visual Approach Slope Indicators
VFR	Visual Flight Reference
VHF-VOR	Very High Frequency Omnidirectional Radio range
VORTAC	Collocation of VOR and TACAN
VPD	Vehicle Pedestrian Deviation

1.0 OVERVIEW AND BACKGROUND

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1.1 Introduction

Since its beginnings in 1930, Merrill Field (MRI), owned by the Municipality of Anchorage (MOA), has been a key component of Alaska's aviation system. To ensure MRI continues to meet the needs of its users, the MOA initiated an Airport Master Plan (AMP) Update to provide guidance for the continued improvement of MRI for the 20-year planning horizon and beyond.

1.2 Purpose of the Plan

The purpose of this plan is to analyze trends in aviation activity, assess facility needs, forecast aviation activity and identify a future vision for MRI.

This AMP Update is organized as follows:

- **Overview and Background** summarizes the MRI setting, role, and history as well as the issues and objectives of the AMP update.
- **Inventory and Existing Conditions** documents the condition of current physical facilities at MRI.
- **Aviation Demand Forecast** provides an overview of historical and forecast aircraft operations from 1990 and a forecast of aircraft operations through a 20-year planning horizon (2033).
- **Airport Facilities Requirements** will identify what, if any, additional facilities are needed to accommodate the forecasted activity and Federal Aviation Administration (FAA) standards.
- **Alternative Airport Development Concepts** will present the alternative ways to address the identified facility needs.
- **Recommended Airport Master Plan** presents the recommended concept and the reasons why it is preferred over the other concepts.
- **Coordination and Involvement** summarizes stakeholder outreach and coordination activities completed as part of the master planning process.

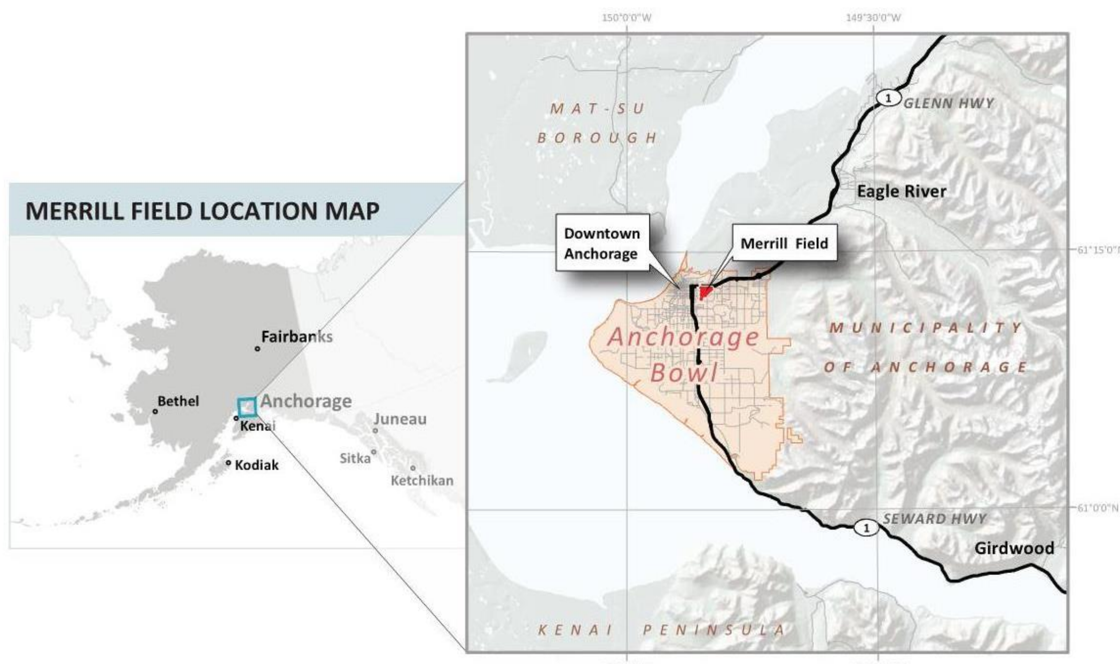
1.3 Airport Setting

MRI is owned and operated by the MOA under the administration of the Airport Manager. The Municipal Airports Aviation Advisory Commission (MAAAC) serves only as an advisory board (not regulatory) to the MOA for airport and aviation-related issues. Airport regulation is through the MOA's legislative body (MOA Assembly) with 11 members. As shown on Figure 1-1, MRI is located approximately 1.5 miles east of downtown Anchorage. MRI is included in the FAA's *National Plan of Integrated Airport Systems* (NPIAS) as a non-hub Commercial Service – Primary airport. Commercial service airports are public airports with scheduled passenger service and that have 2,500 or more enplaned passengers annually (NPIAS 2011).

MRI is identified as a non-hub airport, which means that it enplanes less than 0.05 percent of all commercial enplanements and has more than 10,000 annual enplanements (NPIAS 2011). Nationally, there are 244 non-hub primary airports. These airports account for approximately 3 percent of all enplanements, but are heavily used by general aviation aircraft.

The *Alaska Aviation System Plan* classifies MRI as a Local NPIAS "High Activity" airport. According to the *Plan*, "local airports accommodate mostly general aviation activity. They supplement International, Regional, and Community airports by providing additional general aviation capacity in the more densely populated parts of the state, and they serve low population areas where a Community airport is not warranted. Runway size and landside facilities and services depend on the type and quantity of

Figure 1-1 Airport Setting



aircraft using the airport. Capability for instrument approaches or nighttime use is less often necessary at Local airports than at Regional and Community airports. Local airports are subdivided into NPIAS High Activity, NPIAS Lower Activity, and Non-NPIAS classes." (WHPacific 2011) In addition to MRI, there are 10 other Local NPIAS High Activity airports in Alaska, making this classification the smallest of the three.

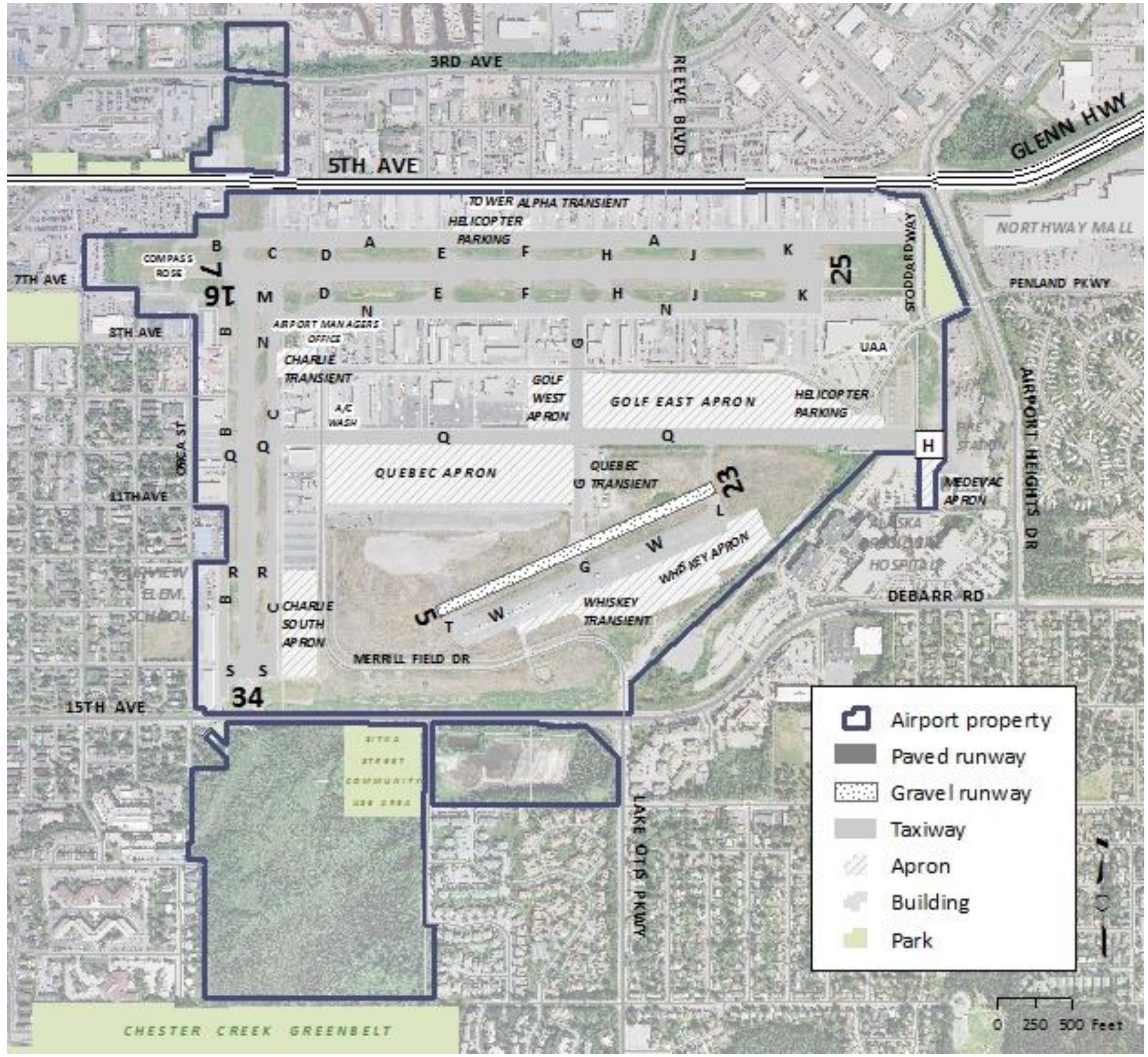
1.4 Airport Site

MRI occupies an approximately 440-acre site roughly bounded by 5th Avenue to the north, Orca Street to the west, 15th Avenue/Debarr Road to the south, and Airport Heights Drive to the east (see Figure 1-2).

1.5 History

Established in the mid 1920s, the first airstrip in Anchorage was located on what is now the Delaney Park Strip. Within a few years, it became apparent that Anchorage and its aviation needs were growing and could

Figure 1-2 Airport Site



no longer be met by this airstrip. Efforts to relocate the airstrip began and in August 1929 "Aviation Field" was available for use and is considered Anchorage's first true airport. In 1931, Aviation Field was renamed Merrill Field to honor one of Anchorage's aviation pioneers, Russell Merrill (Figure 1-3).

Figure 1-3 Russell Merrill

Russell Merrill was a pioneer of Alaska aviation. He was the first to fly across the Gulf of Alaska, across the Alaska Range, and over the Kuskokwim River.

By 1935, six airlines were operating out of Merrill Field. The field was handling approximately 25 percent of all air traffic in Alaska. By the end of 1939, both main runways were expanded. Also in the 1930s, Merrill Field saw a lot of military activity, as plans were made to locate military facilities in the Anchorage area. When Elmendorf's north/south runway was opened in 1941, military traffic moved from MRI to Elmendorf. Air traffic at MRI was expected to decrease, but this did not occur. In 1942, MRI had more traffic than New York's La Guardia Field. Shortly afterwards, Anchorage passed a resolution to assume control of MRI's management and security. As a result, an aviation committee was established and an airport manager hired.

In 1946, the Civil Aeronautics Board announced that three new air routes would converge in Anchorage, which would become a junction point for international flights. Merrill Field needed to expand to accommodate the demand. In 1947, a control tower was built and manned. By that point, MRI also had a paved 3,960-foot east/west runway and a 3,260-foot gravel north/south runway, 125 based aircraft, and approach lighting. Even with these improvements, expansion of Merrill Field was limited. Due to nearby development and safety concerns, Merrill Field was unable to increase its facilities to accommodate the large transport planes, and the decision was made to establish an international airport in Anchorage. With the opening of Anchorage International Airport, air traffic at MRI was again expected to decline. However, MRI continued to grow as a major general aviation facility and was one of the busiest airports on the west coast at the time. To accommodate this growth, by 1953 the east/west runway had been increased to 4,000 feet and the north/south decreased to 2,460 feet.

Since then, MRI has continued to expand and improve its facilities. Over the last 20 years, MRI has been acquiring land on the west side of the airport to meet runway and taxiway object free areas and runway protection zone (RPZ) standards. MRI has also increased the number of hangars and office/retail facilities. A new air traffic control tower was commissioned in October 1999. A gravel/ski strip was added in 2001.

1.6 MRI Mission Statement and Goals

MRI's mission statement is "Merrill Field Airport is committed to operating and maintaining a safe and efficient airport that meets the aviation and business needs of the community."

In order to achieve this mission, MRI has developed the following goals:

- Enhance the Airport's role as the major general aviation transportation facility serving Anchorage and outlying areas within Alaska by providing services that promote and encourage use of the Airport by the general aviation community
- Develop an overall Airport strategy, including leasing policies that attract aviation support services and related businesses to Merrill Field and encourage long and short term private sector investments. This, plus sound fiscal management, will enable Merrill Field to increase its value, both to its customers and to its owner, the Municipality of Anchorage.
- Understand and be responsive to our customers. This will allow us to better meet their needs by providing the services and facilities they desire. Maintain those facilities in a fully functional, efficient and safe condition by continually improving their utility, quality, and appearance.
- Maximize the use of Federal Airport Improvement Program (AIP) grants to provide facilities that will safely and adequately meet the needs of general aviation.

1.7 Public Outreach Summary

To obtain stakeholder input into the process, a variety of outreach tools were used. Below is a summary of the various methods used to reach interested stakeholders.

A more complete description of the stakeholder outreach activities can be found in Chapter 7 and Appendix A.

- Project Website
- Project Advisory Group
- Presentations at Community Council Meetings
- Host Public Meetings
- Host Noise Exposure Workshops
- Maintain project email list
- Provide Project Newsletters and other handouts
- Articles in the MRI newsletter
- Participation in Municipal Airports Advisory Commission meetings

1.8 Issues

The Municipal Airports Aviation Advisory Commission, the MRI Airport

Master Plan Update Advisory Committee, MRI stakeholders, and the public provided input on issues to be addressed during the AMP update.

At a series of meetings in May and June, 2012, the following were identified as issues to be addressed:

- **Review overall signage and identification.** Review the signage and identification system at MRI to identify any needed improvements.
- **Snow storage**. Review snow storage practices to identify ways to increase efficiency and capacity.
- **Airport infrastructure development.** Identify existing and future infrastructure needs to support MRI operations.
- **Avigation easements/property acquisition.** Identify needed avigation easements and property acquisitions.
- **Active marketing of MRI.** Identify potential economic opportunities.
- **Compatibility with other airports.** Address issues that result from multiple airports being in close proximity.
- **Compatibility with other planned developments.** Ensure developments on MRI and in adjacent areas do not conflict with aviation activity.
- **Access and security.** Identify ways to maintain/increase access and security at MRI.
- **Helicopter operations and infrastructure.** Identify future helicopter needs.
- **Compliance with FAA grant assurances.** Remain in compliance with FAA grant requirements.
- **Meet regulatory requirements.** Identify improvements to meet applicable federal, state, and local requirements such as regulations regarding stormwater disposal.
- **Be a good neighbor.** Continue to work with adjacent communities to address noise, land use, and similar concerns. Continue to provide community purpose areas where they do not conflict with airport needs.
- **Lifting of weight restrictions.** Consider allowing aircraft that exceed the current 12,500-pound limit.
- **Safety.** Identify improvements to keep all MRI users safe (including pedestrians, vehicles, and aircraft).
- **Understanding of existing/future demand.** Identify needed changes at MRI as the result of declining operations, changes in uses, etc.
- **Maintain financial self-sufficiency of MRI.** Identify changes to allow MRI to generate sufficient revenue to meet its expenses.

2.0 INVENTORY AND EXISTING CONDITIONS

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2.1 Introduction

The purpose of this chapter is to document the existing facilities and conditions at MRI. This information was collected through on-site airfield inspections, interviews with FAA and MRI staff, advisory groups, and the review of the following previously prepared documents: MRI's 2000 AMP, *MRI's Airport Master Record,* the current Airport Layout Plan (ALP), the 2012 Updated Airfield Inspection Report, environmental data collected for the Alaska Department of Transportation and Public Facilities (DOT&PF) Highway-to-Highway project, and from other existing MOA planning documents. The data and information contained in this report reflects information collected in 2012 and 2016 when the MRI Master Plan Update was initiated and is in accord with FAA AC 150/5070-6B Change 2.

Collectively, this information provides the basis for assessing existing conditions and future airport facility requirements.

2.2 Existing Conditions

This section presents the existing facilities and conditions at MRI that are important to the AMP update process. These topics include the following:

- Airfield
- Airport access, circulation, parking, security, and safety
- General aviation
- Airport support facilities
- Avigation facilities and procedures
- Utilities
- Airport maintenance and operations (M&O)
- Environmental considerations
- Meteorological data
- Land use
- Related plans, programs, and projects
- Financial data

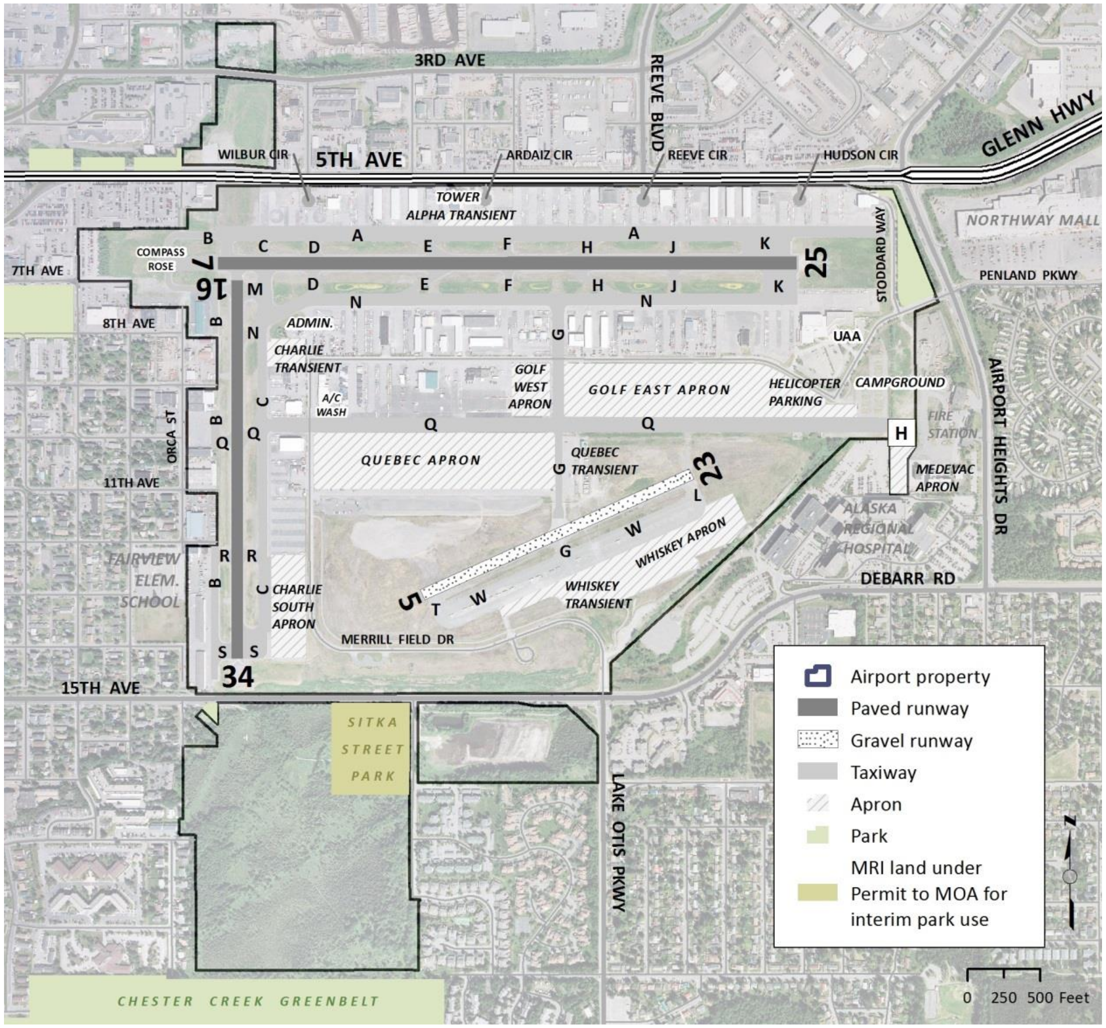
2.2.1 Airfield

This section documents the existing airfield characteristics in accord with FAA AC 150/5070-6B Change 1 (Section 603 b.1). Topics include: the functional use and geometry of runways, taxiways, aprons; lighting, marking, and signing of runways and taxiways.

2.2.2 Runways

The existing airfield consists of three runways: two asphalt paved runways, Runways 7/25 and 16/34; and one gravel runway, Runway 5/23. The runways and their parallel taxiways are depicted in Figure 2-1 and key data is summarized in Table 2-1.

Figure 2-1 Runways and Taxiways



Source: FAA Airport Diagram (AK, 26 JUL 2012 to 10 SEP 2012), Revised ALP 2010

Runway 7/25 is the primary runway. It is oriented in an east-west direction and is 4,000 feet long by 100 feet wide. It has an effective gradient of 0.25 percent. The runway is asphalt paved, in good condition, painted with precision instrument runway markings, and has a medium intensity runway edge lighting system. Both ends of the runway have VASI. On Runway 7, the threshold crossing height of the visual glideslope indicator equipment is 43 feet; on Runway 25, it is 21 feet. The visual glide angle for Runway 7 is 3.75, for Runway 25 it is 3.00. The runway does not have centerline or touchdown line lights. Both ends have runway end identifier lights. The runway safety area is 4,600 feet long by 150 feet wide. The ROFA for Runway 7/25 is 4,600 feet long and 500 feet wide.

Table 2-1 Summary of Existing Runway Data

	Runway 7/25	Runway 16/34	Runway 5/23
Runway length (feet)	4,000	2,640	2,000
Runway width (feet)	100	75	60
Runway end elevation (feet above MSL)	124.4 ft/136.9 ft (MSL)	124.4 ft/117.1 ft (MSL)	128.50 ft/133.65 ft (MSL)
Surface type	Asphalt	Asphalt	Gravel
Surface condition	Good	Good	Good
Runway markings	Precision Instrument	Basic	–
Runway lighting	Medium	Medium	–
Centerline lights	None	None	–
Touchdown lights	None	None	–
Visual and Instrument Navigational aids	VASI 2L/VASI 2L REIL, REIL	VASI 2R/PAPI 2L REIL, REIL	–
Runway safety area width (feet)	150	120	120
Runway safety area length (feet)	4,600	3,043	2,480
Runway safety area length beyond the threshold (feet)	300	240/163	240
Landing Gear Gross Weight Strength (Single Wheel)(lbs)	50,000	20,000	< 12,500
Landing Gear Gross Weight Strength (Dual Wheel)(lbs)	80,000	–	–
Runway Approach Category/Design Group	B-II	B-I	A-1
Source: Airport Master Record, ALP			

Runway 16/34 is oriented in a north-south direction and is 2,640 feet long and 75 feet wide. It has an effective gradient of 0.26 percent. The runway is asphalt paved, in good condition[1], painted with basic (runway and centerline) runway markings, and has a medium intensity runway edge lighting system. Runway 16 is equipped with a

[1] The Airport Master Record lists the pavement for Runway 16/34 in fair condition. In 2010, the runway pavement was rehabilitated so the current condition is likely to be good or excellent.

visual approach slope indicators (VASI), and Runway 34 is equipped with a Precision Approach Path Indicator (PAPI). Runway 16/34 has runway end identifier lights (REIL) at both ends. On Runway 16, the threshold crossing height of the visual glideslope indicator equipment is 22 feet; on Runway 34, it is 21 feet. Runway 16/34 has a runway safety area (RSA[2]) that is 3,043 feet long by 120 feet wide. The runway object free area (ROFA[3]) identified on the latest ALP for Runway 16/34 is 3,120 feet long and 250 feet wide.

Runway 5/23 is 2,000 feet long by 60 feet wide and oriented in a northeast-southwest direction. It has an effective gradient of 0.26 percent. It has a gravel surface that is in good condition with reflective threshold and edge markers. The RSA is 2,480 feet long and 120 feet wide. The ROFA is 2,480 feet long and 250 feet wide. Both ends have 60-foot-wide x 50-foot-long paved areas to demark runway ends. Non-standard size numbers will be painted in spring 2014.

2.2.3 Taxiways

MRI has an extensive taxiway system that provides access to all runway ends, aircraft parking aprons, airport facilities, businesses, and developed hangar areas. Taxiways A and N function as dual parallel taxiways for the north and south sides of Runway 7/25. A single parallel taxiway (Taxiway C) serves Runway 16/34 on the east side of the runway. Taxiway R provides partial access to the west side of Runway 16/34. Taxiway W, parallel to Runway 5/23, provides access to the Whiskey Apron and transient parking south of the runway. Taxiway G provides access from the north.

Taxiway Q extends from Runway 16/34 east across the field to the Alaska Regional Hospital helipad. Taxiway G extends from Runway 05/23 north,

Table 2-2 Taxiway Widths

Taxiway Designation	Width (feet)	Taxiway Object Free Area (TOFA) Width	Taxiway Safety Area (TSA) width
A	75	131+	79+
B	35	89+	49+
C	60	89+	49+
D	75/65	131+	79+
E	35	131+	79+
F	35	131+	79+
G	75	131+	79+
H	35	131+	79+
J	75/50	131+	79+
K	340/230	n/a	n/a
L	35	131+	79+
M	50	89+	46+
N	75	131+	79+
Q	65	131+	79+
R	50	89+	79+
S	200	n/a	n/a
T	35	131+	79+
W	35	131+	79+

Source: ALP

[2] A runway safety area (RSA) is a "defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway." (FAA 2012:8)

[3] The runway object free area (ROFA) is centered about the runway centerline; objects non-essential for air navigation or aircraft ground maneuvering purposes must not be placed in the ROFA. (FAA 2012:89)

crossing Taxiway Q and terminates at Taxiway N. Runway 7/25 is served by eight exit Taxiways (Taxiways B, C, D, E, F, H, J, and K); Runway 16/34 is served by five exit taxiways (Taxiways M, N, Q, R, and S); and Runway 5/23 is served by three exit taxiways (Taxiways T, G, and L). Taxiway B serves hangar areas on the west side of the airport. Table 2-2 shows the widths of each taxiway on MRI.

2.2.4 Helipads/Helicopter Parking

According to the ALP, there is one helipad on MRI that is located on Taxiway Q near Alaska Regional Hospital. There is a helipad on the north side of Alpha Transient with two spaces. Several other locations on MRI are used as helicopter parking areas including Erikson, Inc.; Alyeska Helicopters; JayHawk Air; Tanalian Aviation; the intersection of Quebec Transient and Golf East Apron; Alpha Apron; and the eastern end of Golf East Apron. Private helicopters are also parked on other aprons on MRI. The parking areas are asphalt and typically vary in size from 50 feet by 50 feet up to 250 feet by 200 feet. These areas are used for landing and takeoff, as well as for loading and overnight parking.

2.2.5 Pavement Conditions

Merrill Field manages approximately 2.5 million square feet of runway, taxiway, and apron asphalt concrete pavement. Pavement management inspections by the Alaska DOT&PF occur approximately every 3 to 4 years. The inspections, conducted using MicroPAVER software and methodology, involve visual assessments of representative sample units and quantifying the extent and severity of various distresses. The system generates Pavement Condition Index (PCI) values which are used to predict the future conditions of airfield pavements, assuming no maintenance action is taken. The inspection also identifies the preventive maintenance or rehabilitative measures needed to extend the useful life of the pavement.

The results of the 2015 Merrill Field Municipal Airport Pavement Inspection Report produced by the Alaska DOT&PF are shown in Figure 2-2.

The target PCI range for runways is 70–100; the target PCI for taxiways is 60–100. All of the pavement evaluated was within the target PCI range.

Runway 7/25 pavement was rehabilitated in 2005. Other than an approximately 75-foot by 15-foot area of pavement along the south edge of Runway 7/25, between Taxiways C and D which contains multiple 1-inch divots, the runway pavement is in good condition and no signs of pavement heave or rutting were visible.

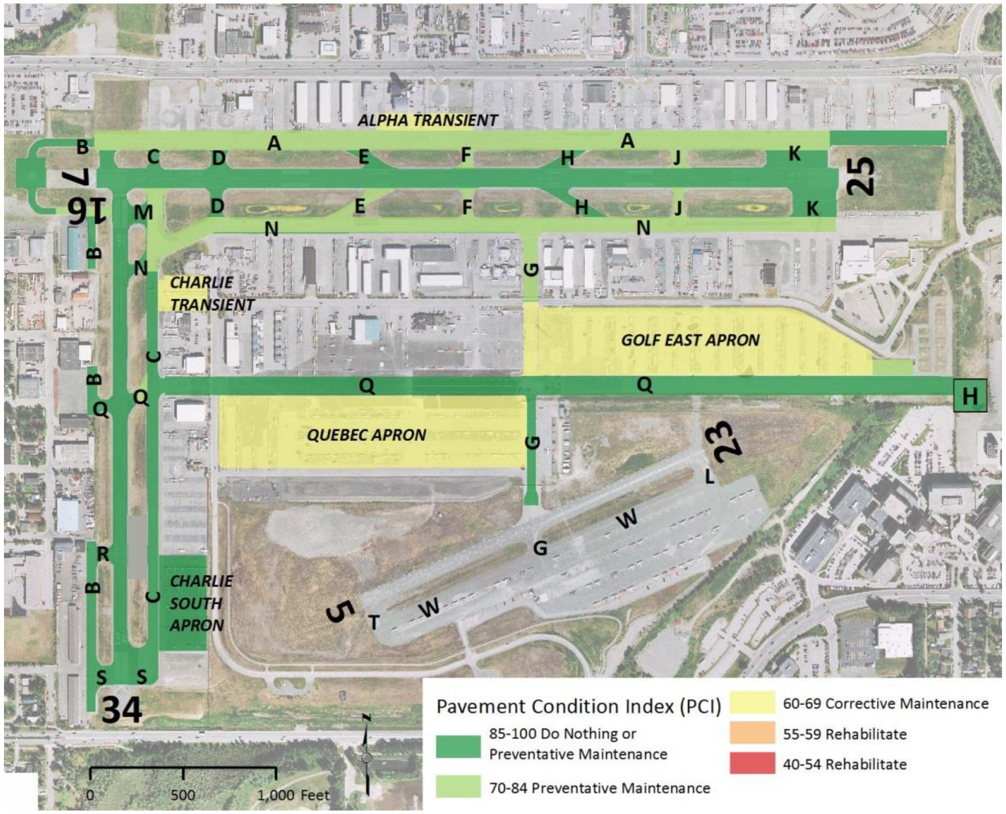
The pavement on Runway 16/34 and associated taxiways was rehabilitated in 2010. The runway pavement is in good condition and no signs of pavement heave or rutting have been reported since the rehabilitation.

Other recent projects have resulted in new pavement in the following locations:

- Aero-Metric Apron
- JayHawk Air Apron
- Charlie South Apron
- Intersection of Taxiway G and Merrill Field Drive
- Intersection of Taxiway Q and Merrill Field
- Erikson Helicopters Apron
- Taxiway Q Station 101+32 to 112+10
- Patches on Taxiways A, C, K, & N
- Taxiway Q Station 111+80 to 117+25
- Western portion of the Golf East Apron

For more information on pavement, please see Appendix B, the *2012 Updated Airfield Inspection Report,* or Appendix C, the *2015 Pavement Inspection Report*.

Figure 2-2 Pavement Conditions, 2015



Source: 2015 Pavement Inspection Report

2.2.6 Runway Utilization

Based on discussions with representatives of the FAA Air Traffic Control Tower, Runway 7/25 is the most heavily used runway at MRI. This runway is used for approximately 80–85 percent of the operations. This is also the primary runway used for touch-and-go training. Runway 16/34 is used primarily by air taxi operators and accounts for approximately 10–15 percent of the operations. Runway 16/34 is often used for arrivals and departures when there is heavy traffic on Runway 7/25. Runway 5/23 is not heavily used and only has approximately 2 percent of the operations. Runway 5/23 is used as a gravel strip during the summer months to accommodate big tundra tires (which are common in rural Alaska) and as a ski strip during the winter months.

2.2.7 Signage

MRI airfield signs are sized in accordance with Category 1 sign criteria listed in Table 1 of AC 150/5340-18F. Category 1 signs have maximum height of 30 inches above finish grade. In general, the signs on MRI have 12-inch lettering and were between 28 and 30 inches high. The signs were installed 10 to 20 feet from the runway or taxiway edge. Raising the height of existing signs would cause the signs to exceed the Category 1 sign criteria standards. Signs that exceed these standards require larger sign panels, larger lettering, and should be installed farther from the runway or taxiway edge to avoid contact with low-wing aircraft. The existing sign size and location meet the needs of a general aviation airport.

Runway Hold Position Signs on Runway 16/34 and Runway 5/23 are located approximately 100 feet from the runway centerlines. Runway Hold Position Signs are supposed to be 125 feet from Runway centerline. Moving the hold position signs to 125 feet from the runway centerline would position holding aircraft within the traveled ways of Taxiway C and Taxiway K. As a result, the FAA has approved the non-standard hold position in a Modification to Standards letter dated February 10, 2009.

MRI also has a compass rose (located 339 feet west of the of the west end of Runway 7/25 and 24 feet north of the runway centerline extended). MRI management anticipates relocating the compass rose in 2014 to near the south east corner of Runway 34 onto or just off Taxiway S intersection.

For more information on signage, please see Appendix B.

2.2.8 Airport Access, Circulation, Parking, Security, and Safety

This section describes existing airport access, parking, security facilities, and safety (accidents/incidents).

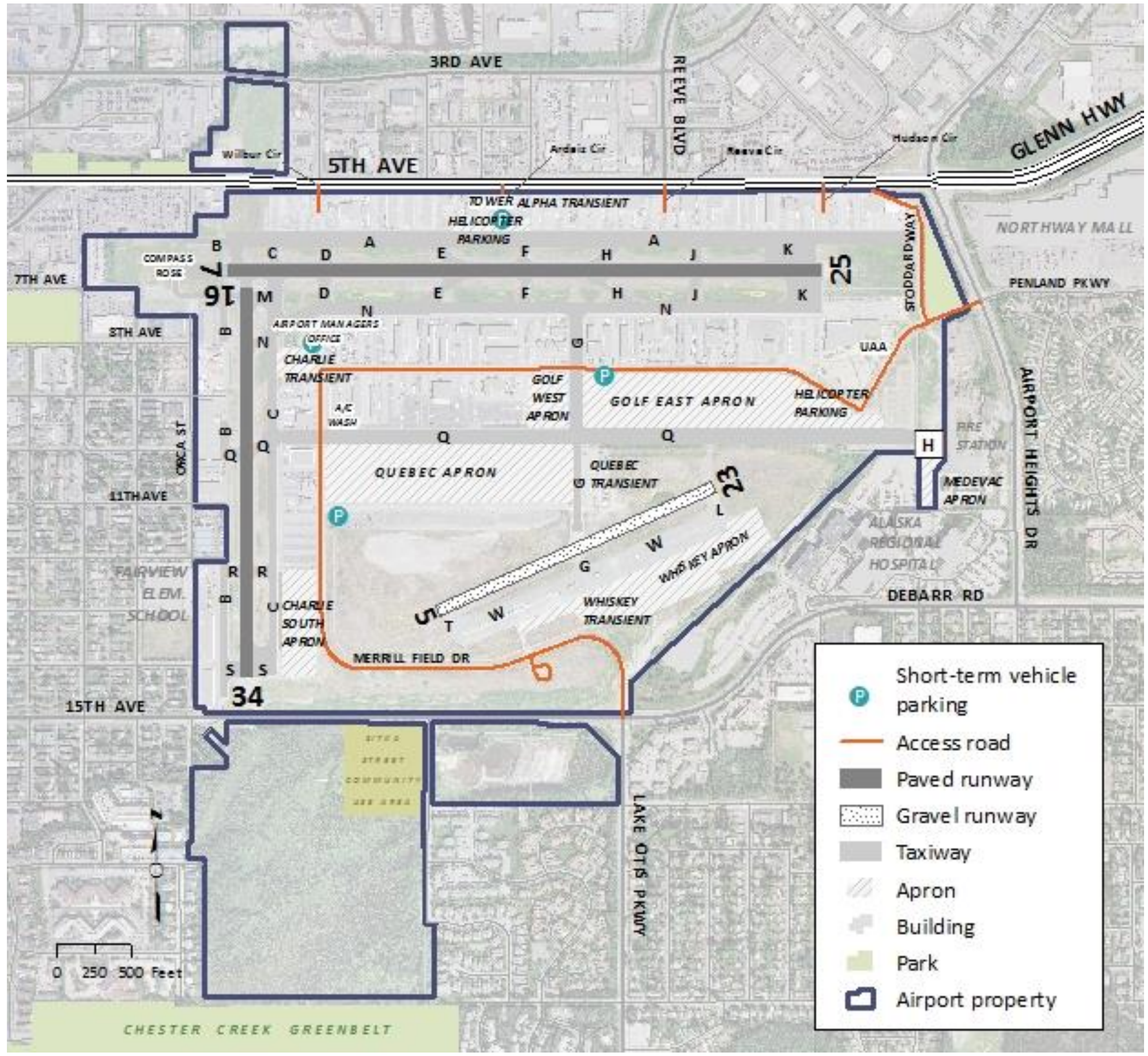
2.2.9 Airport Access Roads

There are four points of cul-de-sac access to MRI from 5th Avenue: Wilbur Circle, Ardaiz Circle, Reeve Circle, and Hudson Circle (Figure 2-3). These cul-de-sacs provide access to businesses on the north side of the airfield. This access from 5th Avenue changed in 2009 as a result of the expansion of 5th Avenue to six lanes. In 2013, traffic on 5th Avenue in front of MRI was approximately 49,500 vehicles per day.

2.2.10 Airport Service Roads

Merrill Field Drive is the airport's internal access service road (see Figure 2-3). This road enters MRI from the east side corridor, Airport Heights Drive, approximately 900 feet south of 5th Avenue, and also on the south end of the airfield at the intersection of

Figure 2-3 Vehicle Access, Circulation, and Parking



Source: Revised ALP 2010 and MRI

15th Avenue/Debarr Road and Lake Otis Parkway. This service road provides mid-field access to UAA, businesses, airport maintenance and administration facilities, and transient and long-term aircraft parking.

Stoddard Way turns north off of Merrill Field Drive approximately 400 feet west of the Airport Heights Drive entrance to MRI. This road provides access to Stoddard's Aero Service, Inc.

2.2.11 Vehicle Parking Areas

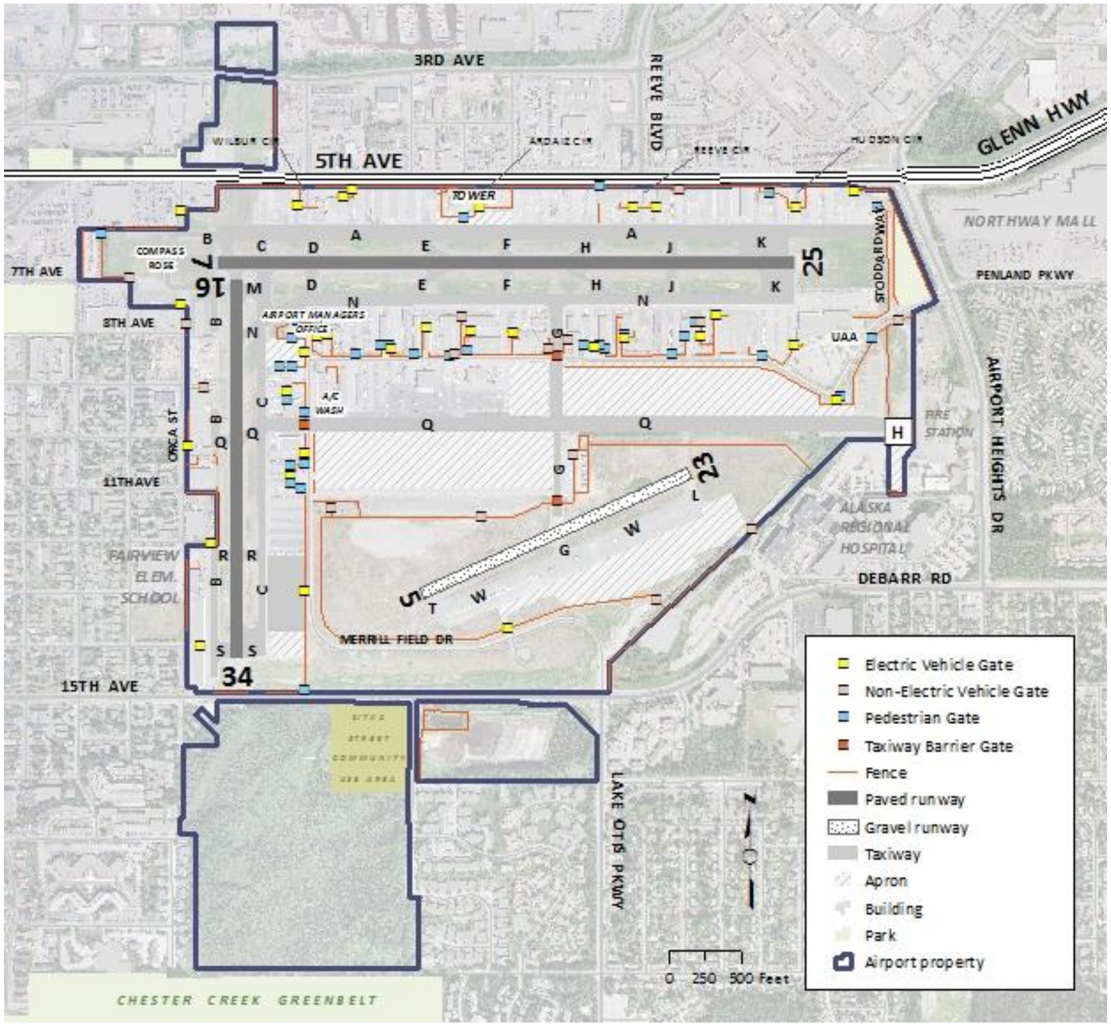
Short-term vehicle parking is available at four locations:

- **Airport Manager's Office** located in the parking area just east of the Manager's Office.
- **Alpha Vehicle Parking** located near Alpha transient at the base of the Air Traffic Control Tower (ATCT).
- **Central Parking** located on the south side of Merrill Field Drive just east of Taxiway Golf.
- **South Parking** located south of the Quebec Taxiway on the east side of Merrill Field Drive (across from Aero Tech).

2.2.12 Security Fencing and Gates

To prevent unauthorized vehicle/pedestrian access to the airport, MRI operates and maintains approximately 28,200 lineal feet of airport perimeter and internal security fencing. The north, east, and south perimeter fencing is typically 7 feet high. The west perimeter fencing, parallel to Orca Street and the Fairview community, includes sections of 7-foot- and 8-foot-high fence. The perimeter fencing on the west side of the fence consists of either galvanized chain link or vinyl-coated fence meeting FAA material specifications.

Figure 2-4 Security Fence and Gates



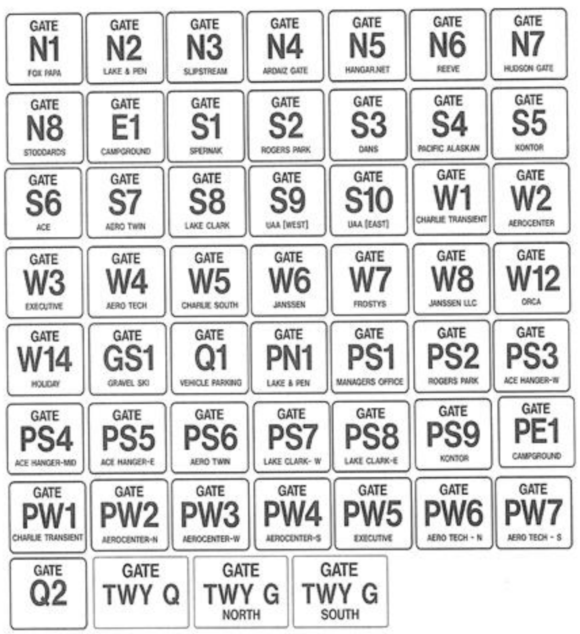
Source: Revised ALP 2010 and MRI

The fencing is in reasonably good condition and no deficiencies were noted.

The security fence has thirty-three (33) electronic vehicle gates, eighteen (18) pedestrian gates, three (3) taxiway barrier gates, and fourteen (14) non-electrical manual vehicle gates (see Figure 2-4). To assist emergency responders and others identify where they are on MRI, signs indicating gate numbers/names have been installed on each gate (Figure 2-5). A map showing the location of each gate sign can be found at the end of Section 3.1 of Appendix B.

Improvements to the security fencing, gates and other measures have contributed to an overall decline historically in runway vehicle/ pedestrian deviations (VPD). Not withstanding that historic decline, there were 13 VPD in 2013.

Figure 2-5 Airport Gate Number/Name



Improvements to the security fencing, gates and other measures have contributed to an overall decline historically in runway vehicle/ pedestrian deviations (VPD). Not withstanding that historic decline, there were 13 VPD in 2013.

Many of the VPD were the result of inadvertent trespass on the taxiway hold lines. The trespass has typically occurred due to inability to see the hold line (i.e. line covered by snow) or the tight geometry between the aprons and the taxiways.

2.2.13 Other Security

MRI has a public address (PA) system that is used by ATCT controllers to communicate directly to unauthorized vehicles or pedestrians who inadvertently access the air operations area. The existing PA system consists of a transceiver located at the FAA ATCT that transmits to six loudspeaker locations. In 2008, the components were repaired/upgraded and the system appears to be functioning properly with no deficiencies at this time.

MRI also has a video surveillance system which was installed in 2005/2006. The system was inspected in 2011 and found to be working, but with an unsatisfactory level of reliability and video camera resolution. The video surveillance system has been upgraded to enhance the image quality and to allow images to be saved as needed for enforcement activities at a later date. Improvements include a complete fiber optic cable local area network, a video surveillance network system, and 17 new high-definition (HD) digital video cameras.

2.2.14 Safety

According to the National Transportation Safety Board (NTSB) Aviation Accident Database, there have been 93 accidents associated with MRI[4] since January 1, 1990. An accident is defined as "an occurrence associated with the operation of an aircraft which takes place between the

[4] The NTSB database was searched for accidents between January 1, 1990 and July 25, 2016 within Alaska and an Airport Name of Merrill. According the NTSB data dictionary, the Airport Name field is used if the event took place within 3 miles of an airport or if the involved aircraft was taking off from, or on approach to, an airport.

time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage" (NTSB no date). Based on the publicly available description of the six accidents involving fatalities, three of them occurred in areas adjacent to MRI and not on airport property.

The FAA Accident/Incident Data System (AIDS) reports 92 incidents associated with MRI during the same time frame. Incidents are defined as "events that do not meet the aircraft damage or personal injury thresholds contained in the NTSB definition of an accident" (FAA, no date). Of these incidents, three involved substantial aircraft damage while the others involved minor or no aircraft damage[5].

2.3 General Aviation

This section provides an overview of general aviation facilities including: transient and permanent aircraft parking apron areas; tiedown positions; hangars; fixed base operators/commercial aviation; flight schools; pilot shops; aircraft parts, sales, maintenance shops and rentals; and the mix of based aircraft.

[5] Seventeen records listed "Null."

2.3.1 Aprons and Tiedowns

There are 6 transient aircraft parking areas on the airfield operated by MRI (Table 2-3). Collectively, within these 6 areas, there are 53 tiedown spaces (49 airplane and 4 helicopter), providing a total of 51 transient tiedown spaces. There are 7 MOA-owned parking aprons providing 477 long-term tiedown spaces In addition, leaseholders operate an additional 497 tiedown spaces.

Table 2-3 Aprons and Tiedowns

MOA Transient Parking	Number of Spaces
Alpha Transient	8
Alpha Transient Helicopter	2
Camping Transient	13
Charlie Transient	17
Quebec Transient	6
Whiskey Transient	5
MOA Permanent Parking	
Charlie South	26
Quebec	187
Golf	143
Golf Helipads	4
MOA Permanent Parking	**Number of Spaces**
Golf West	21
Orca	12
Whiskey	84
Leaseholder Parking	
A&W	31
ACE Flyers	42
ACE	6
Aero Center	17
Aero Twin	21
CAP	6
Charlton	6
Chugach Hangars	7
D&D Airpark	39
Erickson AirCrane	19
Executive Hangars	14
Hiller LLC	28
Kontor	12
Lake & Pen Air	19
North Edge	9
North Star Hangars Owners Association	3
Northland Hangars	32
Pacific Alaskan Airways	10
Rogers Park Hangars	28
SkyTrak Alaska Flight Training	3
Slipstream Hangars Owners Association	6
Spernak's	15
Stoddard's	37
T-Hangar Owners	2
UAA (lot 5)	22
UAA (lots 6 & 7)	23
Quantum Spatial	18
Source: MRI	

**Aero Tech ceased operation in 2012. The business has been sold and hangar development is anticipated.*

2.3.2 Hangars

Table 2-4 Hangars

Location	Number of Hangar Units
A&W Services	1
ACE Hangars	17
Aero Center	2
Aero Twin	1
Chugach Hangars	27
Dan's Hangars	19
Erickson AirCrane	1
Executive Hangars	6
Fox Papa	1
Hiller LLC	1
Janssen Hangars	11
Lake & Pen Air	1
Orca Hangars	10
Northland Hangars	1
North Edge	1
North Star Hangars	14
Pacific Alaskan Airways	11
Rogers Park	8
SkyTrek Alaska	1
Slipstream Hangars	24
Spernak Air	1
Stoddards	1
T-Hangars	20
UAA	2
Source: MRI	

As of April 2016, there were 15 hangar complexes and 9 larger hangars on MRI that have 181 hangar units (Table 2-4). Some hangars are used for maintenance or repair purposes while others are used for aircraft storage.

2.3.3 Fixed Based Operators/ Commercial Aviation

Current commercial aviation operators include seven air taxi operators, four helicopter operators, and two aerial photography and mapping operators on the air field. These businesses include:

Fixed Wing Air Taxi Operators

Alaska Air Transit
Dena'ina Air Taxi
Lake Clark Air Service
Spernak Airways, Inc.
Lake & Pen Air

Helicopter Operators

Alyeska Helicopters
Erickson Air Crane
Group 3 Aviation–Alaska
Jay-Hawk Air
Tanalian Aviation

Aerial Photography and Mapping

Quantum

2.3.4 Flight Instruction

There are currently five flight schools on the field, including Alyeska Helicopters; Land and Sea Aviation; Skytrek, Tanalian Aviation, and the University of Alaska, Anchorage[6].

2.3.5 Avionics/Instrument Shops

Currently, there are two avionics/instrument shops on the field: Northern Lights Avionics and Merrill Field Instruments.

2.3.6 Aircraft Maintenance, Parts, Sales, Supplies and Rentals

Currently, there are seven aircraft maintenance businesses at MRI, including Aero Twin, Alaskan Aircraft Engines, Dan's Aircraft Repair, Chance Aviation, Pratt Aviation Services and T&B Aircraft Repair. Alaska Airframe

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[6] Only UAA matriculated students.

offers both parts and pilot supplies as does Stoddard's Aircraft Parts Center. Aero Twin and Northern Lights Avionics also sell parts and installs and repairs avionics and instruments. Aero Twin engages in aircraft sales. Land and Sea Aviation will rent aircraft. Pilot supplies are sold at Alaska Airframe, Northern Lights Avionics, and Stoddard's Aircraft Parts Center. Chaz Limited offers aircraft painting, as well interior customization and sheet metal fabrication.

2.3.7 Based Aircraft

MRI accommodates a variety of aeronautical activity, including single- and multi-engine aircraft, helicopters, and gliders. The airport serves predominantly general aviation with large numbers of local and itinerate users. According to MRI records, as of 2014, there are approximately 786 aircraft based at MRI. The majority of aircraft based at MRI are single-engine but there are some multi-engine and helicopters.

Design standards for airports are based on the most demanding aircraft or aircraft family that uses the airport on a regular basis (this is often referred to as the design aircraft). FAA Advisory Circular 150/5300-13, *Airport Design*, established an airport reference code (ARC) to identify specific criteria appropriate for the types of aircraft expected to be accommodated at an airport. The ARC has two components. The first is a letter referring to the "aircraft approach category" in terms of approach speed. The second is a Roman numeral referring to the "airplane design group" in terms of wingspan. Aircraft listed in a lower ARC can be accommodated by an airport with an equal or higher ARC. For example, an A-I or B-I aircraft can be accommodated at a B-II airport.

Aircraft equipped with tundra tires or skis such as the Piper PA-12, are categorized in approach category A and design group I. Consequently, Runway 5/23 has an ARC of A-I. Runways 7/25 and 16/34 are used primarily by aircraft that are categorized in approach category A or B and design group I, such as the Cessna 172. Runway 7/25 is sometimes used by aircraft that are in design group II such as the Beechcraft King Air. As a result, Runway 7/25 has a design aircraft of B-II, while Runway 16/34 has a design aircraft of B-I.

2.4 Airport Support Facilities

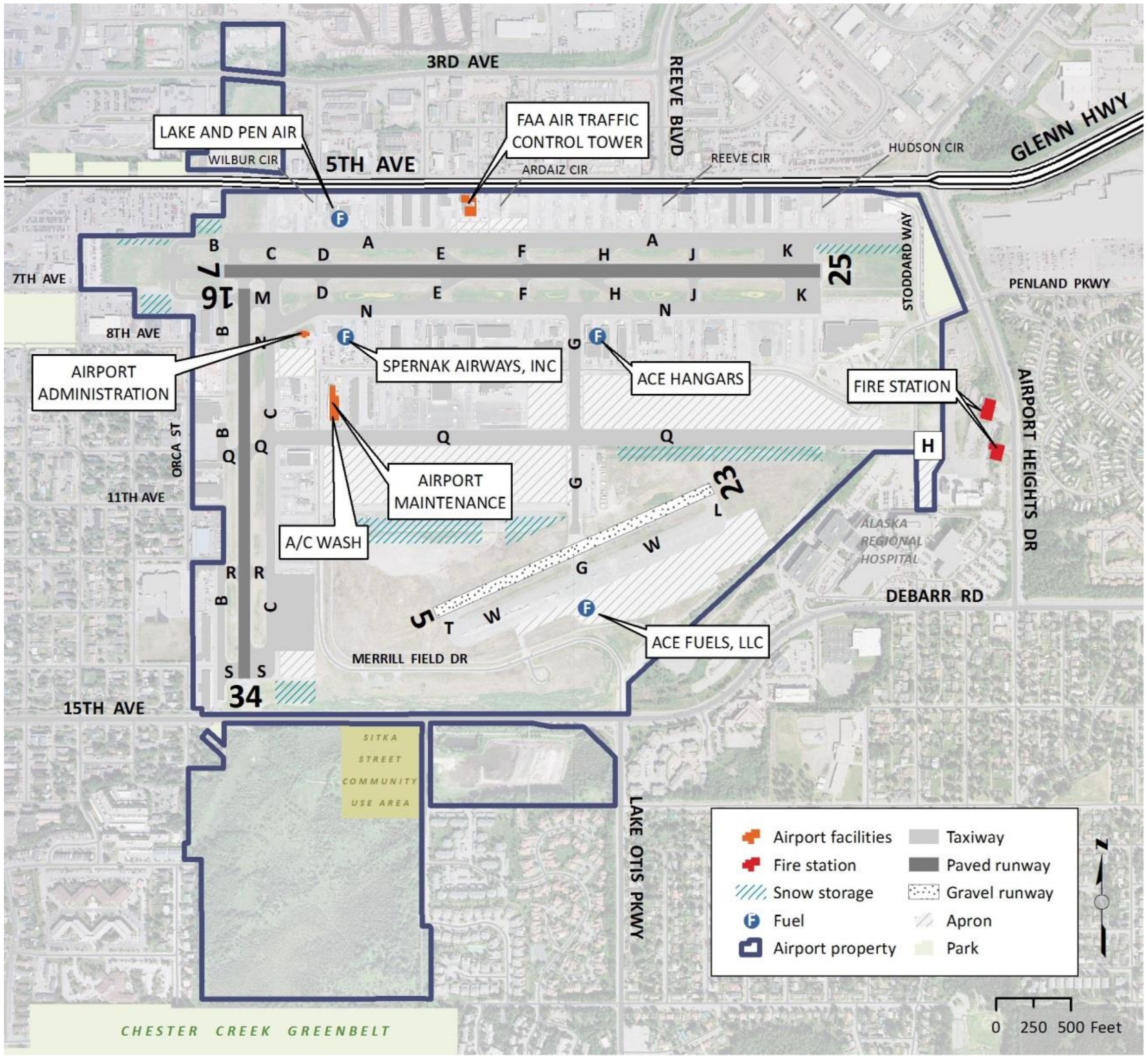
This section provides an overview of MRI's airport support facilities (Figure 2-6).

2.4.1 Fuel

There are three businesses that sell aviation fuel to general aviation traffic: ACE Hangars/ACE Fuels (a Crowley company), Spernak Airways, and Lake and Pen Air. Fuel is supplied from storage tanks maintained by each operator. Aircraft typically have to taxi to one of the fuel islands to refuel. For information on the existing fuel tanks, please see Section 2.8.

Jet A and 100LL are available on MRI but Jet A is not available from all vendors. In 2015, approximately 833,512 gallons of fuel were sold at MRI. A fuel truck does not currently operate at MRI, but has in the past.

Figure 2-6 Airport Support Facilities



Source: Revised ALP 2010 and MRI

2.4.2 Airport Administration and Maintenance

The MRI Administration office (Figure 2-6) is located at 800 Merrill Field Drive. The building housing the administration office used to have the FAA ATCT above it. The ATCT portion of the building was demolished after the new ATCT was constructed on the north side of MRI. Currently, the standby generator and electrical regulator vault are located on the ground level. These are being replaced with a new gas generator supplied by natural gas.

Airport maintenance and snow removal are done by MRI employees. For more information on snow removal, please see Section 2.7.2.

Airport maintenance facilities consist of a 15,000-square-foot building (the blue and gold maintenance building) at the intersection of Merrill Field Drive and Taxiway Q. This building houses general purpose airport equipment as well as the snow removal equipment. Snow is stored in designated snow storage areas (see Figure 2-6). These areas are typically sufficient to meet MRI needs but are not adequate in heavy snowfall seasons such as the winter of 2011/2012.

2.4.3 Aircraft Rescue and Fire Fighting

As MRI does not receive scheduled air carrier service by aircraft with more than 30 passenger seats, it is not subject to Federal Aviation Regulations (FAR) Part 139, *Certification of Airports*. This means MRI does not have to comply with Part 139 requirements for aircraft rescue and firefighting (ARFF) capability. The Anchorage Fire Department (AFD) provides ARFF services. Fire Station 3, which is located on MRI property near the Airport Heights Drive/Merrill Field Drive intersection (Figure 2-6) is the closest fire station. Fire Station 3 has direct access to the airfield operating area along Taxiway Q, which allows for an immediate response in the event of an emergency. Other stations also respond to MRI depending on the availability of Fire Station 3 and the type of incident. There is a letter of agreement between AFD, MRI, and FAA for emergency response.

2.4.4 Federal Aviation Administration

A new FAA ATCT was built on MRI in 1999. The tower is 116 feet high. The hours of operation are May 1–August 31: 7 AM to Midnight; September 1–April 30: 7 AM to 10 PM.

In 1993, the Anchorage FAA Flight Service Station was consolidated with the Kenai facility and the building was demolished.

2.4.5 Other Facilities

MRI operates an aircraft wash during the summer. The wash area provides two bays on the southeast corner of the MRI Maintenance Building The trench drain near the aircraft wash flows water to the sanitary sewer.

2.4.5.1 Medevac Access

A very unique feature of MRI is that Taxiway Q provides direct access to Alaska Regional Hospital which expedites the medical evacuation transportation of sick and injured patients. Without this taxiway, patients would have to be transferred from the medevac plane to an ambulance and then driven to the hospital thus, wasting valuable emergency time.

2.5 Avigation Facilities and Procedures

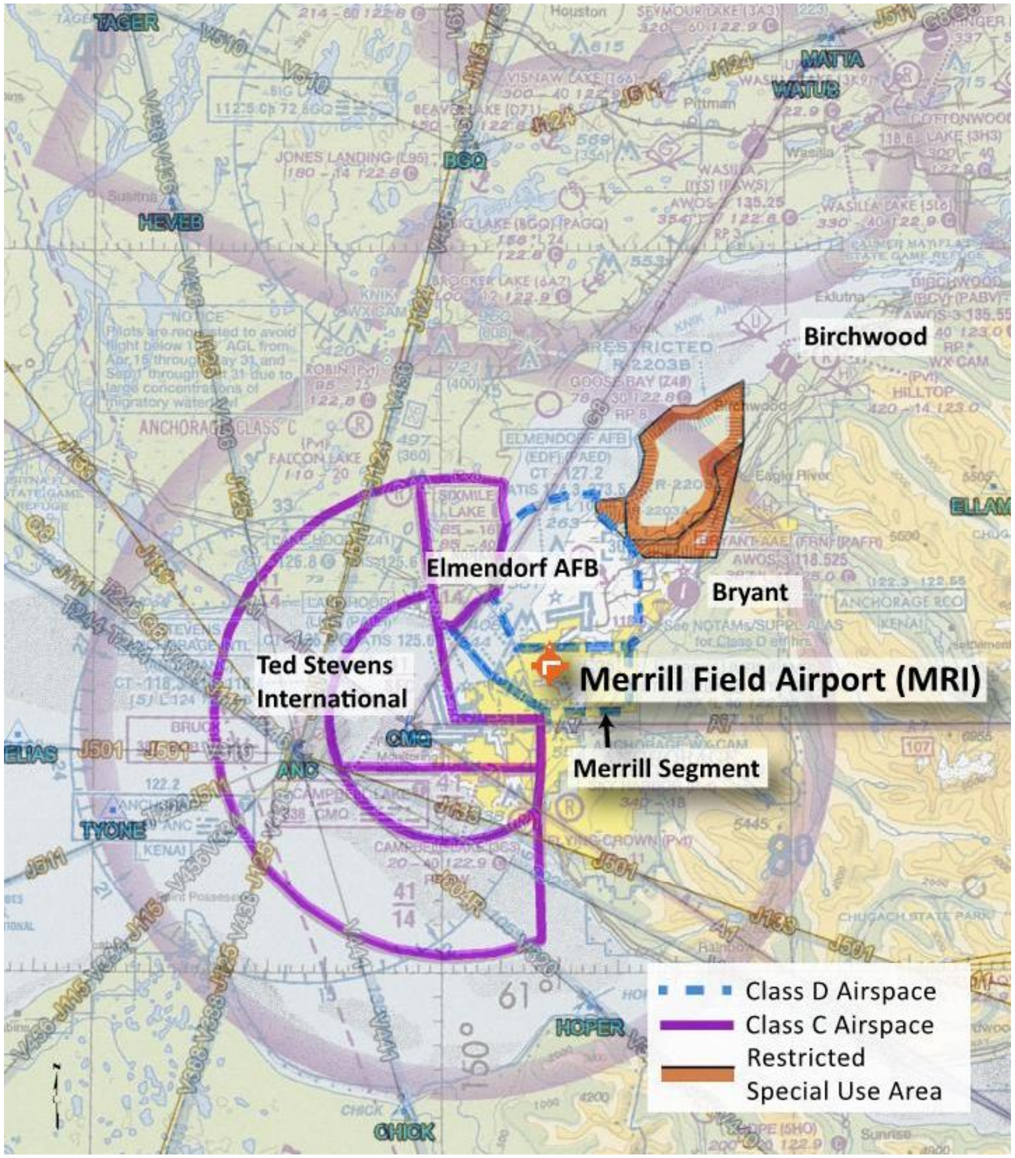
This section summarizes the use of the airspace above and nearby MRI and discusses how air traffic is managed. Also discussed are the operational limitations resulting from traffic interaction with other airports or reserved airspace, obstructions to air navigation, fly friendly noise procedures, and airfield or navigational aid shortcomings.

Avigation (aerial navigation) considerations include airspace and air traffic control, approach areas and obstructions, runway protection zones, and navigational and landing aids.

2.5.1 Airspace and Air Traffic Control

Figure 2-7 depicts the regional airspace. The Merrill Field airspace is designated as Class D when the ATCT is open. When the ATCT is not open the airspace is Class E. The Merrill Field airspace is also defined in 14 CFR 93.63 and is referred to as the Merrill Segment due to the close proximity with other airports in the Anchorage Bowl. A portion of the Merrill Segment has been designated as CARTEE[7] Airspace for use by the military when winds require landings on Runway 34 at Joint Base Elmendorf-Richardson (JBER). The CARTEE airspace is defined as the portion of the Merrill Airspace that is north of Debarr Road and between Muldoon Road and Pine Street.

Figure 2-7 Regional Airspace



Source: FAA ArcGIS Services

[7] CARTEE Airspace was the result of the ATCT Letter to Airmen No. 13-01.

There are several NAVAIDs[8] that provide the basis of the low-altitude airway structure in the area. There are four types of NAVAIDS in the Anchorage area; very high frequency omnidirectional radio range (VOR), distance measuring equipment (DME), military tactical navigational and distance measuring equipment (TACAN), and VORTAC, which is the collocation of a VOR and a TACAN. The closest are listed in Table 2-5 (GlobalAir 2012, AirNav 2012). The Anchorage VOR/DME is now "TED" and has a new frequency 113.15 and new location on ANC near the threshold of runway 25L. Some very high frequency (Victor) airways defined by the TED VOR include V510, V440, V436, V491, V438, V456, V319, V320, V441, V388, V334, and V462.

[8] NAVAIDs are "electronic and visual air navigation aids, lights, signs, and supporting equipment." (FAA 2012:7)

Table 2-5 Nearby NAVAIDS

Name	Location Relative to MRI (NM)
TED VOR/DME	4.3 NM SW
Campbell Lake NDB	6.41 nm SW
Elmendorf TACAN	3.31 nm NE
Big Lake VORTAC	21.66 nm NW
Source: Airnav.com	

2.5.2 Published IFR Procedures

There is one published Standard Instrument Approach Procedure (SIAP) at MRI. This is an Area Navigation (RNAV) global positioning system (GPS) approach (GPS-A). Recently, the development of a second approach was discussed. Due to potential conflicts with JBER and Ted Stevens Anchorage International Airport (ANC), a second approach was not further developed.

The GPS-A begins at an intermediate fix located 6.7 miles west of Point MacKenzie aligned with the flow of traffic to Joint Base Elmendorf-Richardson. The final approach fix is located at Point MacKenzie and the final approach course is aligned from Point MacKenzie over the mouth of Ship Creek to the threshold of Runway 7. The altitude at the final approach fix is 1,600 feet Mean Sea Level (MSL), and aircraft can descend down to 720 feet MSL; the visibility minimums are 1-mile visibility for aircraft in approach categories A and B and with 1.5-mile visibility for aircraft in approach category C. Category D aircraft are not authorized to use this procedure. The missed approach is a climbing left turn to 2,000 feet MSL and fly direct to Big Lake VORTAC and hold for further instructions. The approach procedure is not authorized when local weather is not available.

There are currently nine published Standard Terminal Arrival Routes (STAR) for arrivals to the Anchorage area. These routes are:

- AMOTT SEVEN

- DESKA FOUR
- ELLAM FOUR
- KROTO TWO
- MATSU FIVE
- NEELL TWO
- PTERS ONE
- WITTI ONE
- YESKA FIVE

Pilots destined for MRI can be cleared via one of these STARs and after passing a specific published location can expect radar vector towards MRI; or they can be directed to the initial approach fix for the MRI RNAV procedure. Pilots can expect to descend to the minimum vectoring altitude when in the vicinity of MRI and, if in visual meteorological conditions, they can land. There are also published instrument flight rules (IFR) takeoff minimums and departure procedures (DP) for MRI.

2.5.3 IFR Operations

MRI is within the coverage area of the Anchorage Area Terminal Radar, commonly called Anchorage Approach/Departure. Approach can clear MRI arrivals via one of nine Standard Terminal Arrival Routes. As IFR aircraft near the Anchorage Terminal Area airspace, the enroute controllers at the Anchorage Air Route Traffic Control Center (Center) clears them to descend from en route altitudes and transfers control to approach control who has the responsibility of controlling the aircraft from this point to the Merrill segment of the Anchorage Class D/Part 93 traffic area. If the aircraft is in visual meteorological conditions or special VFR conditions, control is transferred to the Merrill Field Air Traffic Control Tower, commonly known as Merrill Tower, and can be cleared to land. If an aircraft requests an IFR approach during the hours MRI ATCT is closed, an approach can still be authorized but the aircraft would self announce their intentions on the MRI Common Traffic Advisory Frequency (CTAF) instead of receiving a clearance from MRI ATCT.

IFR departures can be cleared for takeoff when released by Anchorage approach/departure control. Immediately after takeoff pilots contact departure control who separates them from other departing and arriving IFR aircraft within the Anchorage Terminal Area. As the aircraft depart or climb above approach/departure control's delegated airspace, control is transferred to Center for en route air traffic control. IFR departures from MRI are problematic for other IFR traffic in the Anchorage area because such a departure from MRI restricts other IFR aircraft flying in the area.

2.5.4 VFR Operations

VFR flights are not controlled outside the various Anchorage Airport Part 93 traffic area segments or the Class C or D airspace. VFR traffic flying to or from these airports are highly encouraged to follow VFR rules that are best operating practices to enhance safety for all users and apply to the airspace surrounding the airport they are operating to or from (see Figure 2-7). Following the rules governing altitude and horizontal route is especially important for approaching or departing the Merrill and Lake Hood segments, particularly when crossing the extended centerline of the JBER runway near Point MacKenzie.

MRI has 10 published VFR procedures designed to provide a way for pilots to comply with the Part 93 airspace requirements and provide procedural "shorthand" for best operating procedures. Without the published procedures, controllers would have to provide full instructions for each aircraft they are controlling. According to the 12 DEC 13 – 6 FEB 14 Alaska Supplement, MRI procedures include:

- Reporting Points Traffic Patterns
- Traffic Pattern Entry Runways 5/23
- Ship Creek Departure
- Shoreline Departure Runway 25
- Inlet Departure Runway 25
- Campbell Arrival/Departure
- Chester Creek Departure Runways 16/23
- City High Departure 16/23
- City High Departure Runways 25/34
- Muldoon SVFR Arrival/Departure
- Common Pattern Entry Runways 7/16
- Common Pattern Entry Runways 25, 34, 5/23
- Providence Helicopter Route
- Helicopter Routes
- Noname SVFR Arrival/Departure

The Merrill segment operates as Class D (controlled) airspace when the Merrill Tower is open and as Class E (limited control) airspace when the tower is closed.

Commercial aircraft operators at MRI expressed a desire to have an increase in IFR opportunities at MRI. Those commenters did not offer any specific forecasts or opinions of potential increases in operations, increases in tons of freight hauled, or increases in enplaned passengers that might result from such a change.

The Merrill Tower frequency 126.00 has been designated by the FAA as the CTAF. The CTAF is used by pilots when the tower is closed to voluntarily announce their position and/or intention of flight activity or ground operation at MRI for the benefit of other pilots.

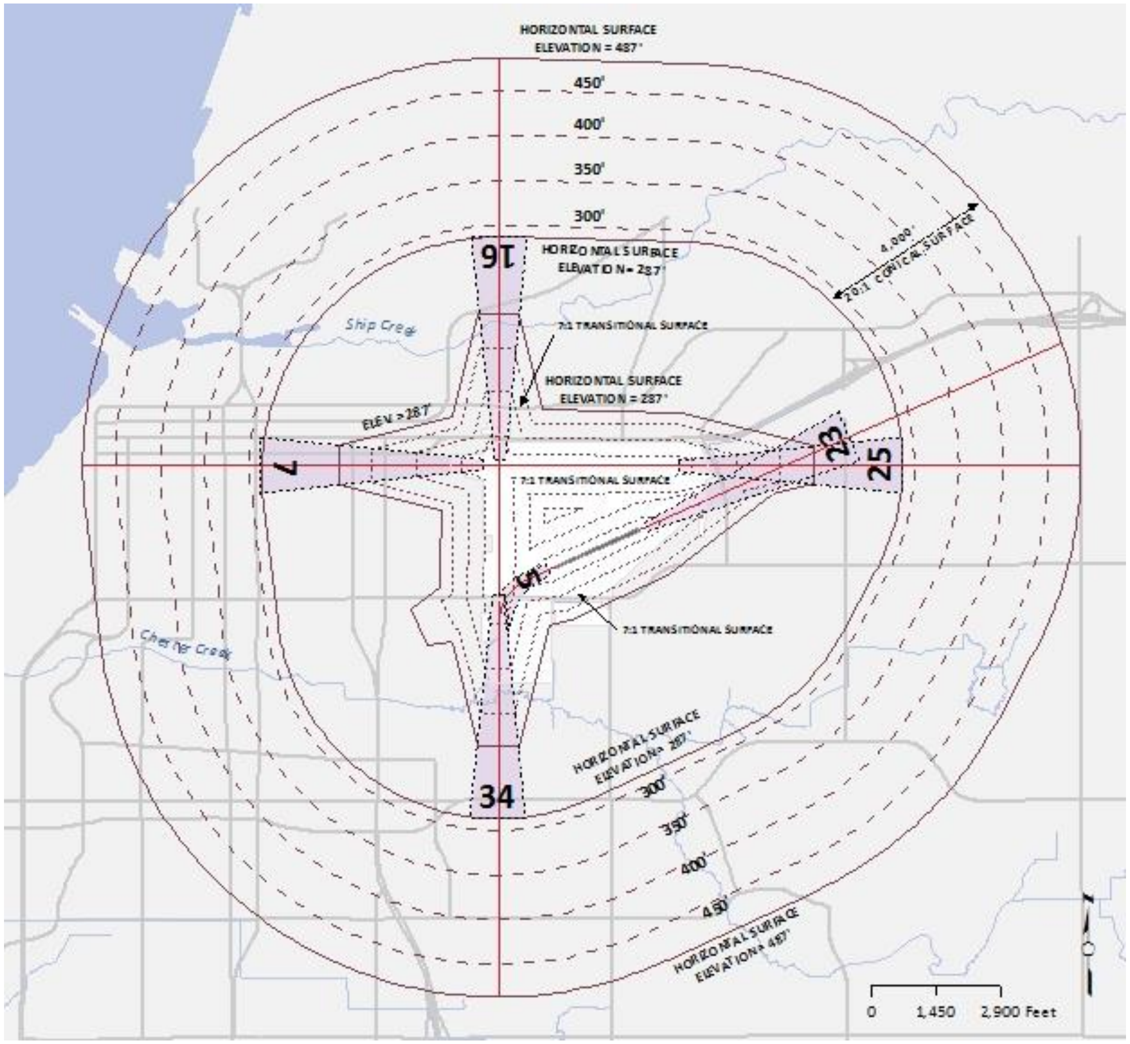
Merrill Field Tower has a second frequency (127.55) that is used only when directed by the ATCT.

Frequency 122.95 has been designated as a shared universal communications (UNICOM) frequency for MRI and ANC which may provide airport information. When in the vicinity of MRI, however, pilots are expected to use the published CTAF.

2.5.5 FAR Part 77 Objects Affecting Navigable Airspace

Airspace consists generally of airways and traffic patterns as well as the designated FAR Part 77 imaginary surfaces, designated approach procedures, and other imaginary

Figure 2-8 MRI FAR Part 77 Surfaces



Source: Revised ALP 2010

surfaces. The purpose of FAR Part 77, *Objects Affecting Navigable Airspace,* is to keep surrounding airspace free and clear of obstructions that may be hazardous to aircraft during approach or departure.

The protected airspace around MRI consists of five imaginary surfaces. Figure 2-8 shows these surfaces (except the approach surface) for MRI and each is described below.

2.5.5.1 Primary Surface

This is an imaginary surface that is longitudinally centered on each runway extending 200 feet beyond the threshold in each direction. The primary surface is 250 feet wide for all three runways at Merrill Field.

2.5.5.2 Approach Surface

The approach surface is an inclined slope going outward and upward from the ends of the primary surfaces. The innermost portion of the approach slope overlaps with the Primary Surface. For the approaches to all three runways, the approach slopes have an inner width of 250 feet and a slope of 20:1 for 5,000 feet widening to 1,250 feet.

2.5.5.3 Horizontal Surface

The horizontal surface is a horizontal plane 150 feet above the established airport elevation. For MRI, the established elevation is 137 feet above MSL resulting in a horizontal surface of 287 feet MSL for MRI. The Horizontal Surface is defined by swinging 5,000 foot arcs around the end of the Primary Airport Surface, which is aligned (longitudinally) with each runway.

2.5.5.4 Transitional Surface

The transitional surface is an inclined plane extending upward and outward at right angles from the runway centerline from the primary surface with a slope of 7:1 terminating at the point where they intersect with the horizontal surface or any other surface with more critical restrictions.

2.5.5.5 Conical Surface

The conical surface is an inclined plane extending upward and outward at a slope of 20:1 from the end of the horizontal surface for a distance of 4,000 feet.

2.5.6 Obstructions

According to the ALP, there are 14 obstructions[9] within the MRI airspace. These are summarized in Table 2-6 and shown on Figure 2-9. There are an additional six close-in obstructions. Runways 7, 34, and 5 are obstructed by trees. Runways 25, 16, and 5 have no close-in obstructions. Since the last AMP, one obstruction (a building that was an obstruction for Runway 16) has been removed. As of February 19,

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[9] An obstruction is an "object of greater height than any of the heights or surfaces presented in Subpart C of Title 14 CFR Part 77, Standards for Determining Obstructions to Air Navigation of Navigational Aids or Facilities." (FAA 2012:7). Any existing or proposed object, whether man-made or of natural growth, that penetrates imaginary surfaces identified in 14 CFR Part 77 is classified as an obstruction (FAA 2012:75).

2014, MRI's Airport Master Record lists four obstructions. Runways 7 and 16 both list a building as an obstruction. Runways 25 and 34 are listed as having a tree or trees as obstructions.

2.5.6.1 Building Restriction Line

The building restriction line[10] (BRL) is a restriction placed on the construction of buildings to protect the airspace surrounding the runways, generally in the area of the Part 77 transition surface and provide space for other improvements such as taxiways. Since building heights vary, often times the setback will vary from runway to runway, and even from each side on the same runway. The existing BRL, as measured from the runway centerline, for Runway 7/25 is at 300 feet on the north side. On the south side, the BRL is 365 feet east of Runway 16/34 and 225 feet west of Runway 16/34. The University of Alaska Anchorage (UAA) Aviation Technology Center building penetrates the BRL just to the east of Runway 25. One penetration of the BRL by the building is approximately 4.5 feet while the other is approximately 21 feet.

For Runway 16/34, the BRL is 200 feet on the west side and 300 feet on the east side. There are 6 penetrations to the BRL on the west side of the runway ranging from approximately 8.5 to 55 feet.

Table 2-6 Airspace Obstructions

ID	Description	Top Elevation (feet)	Part 77 Surface Penetration (feet)
1	Antenna on building	390	+10
2	Antenna on building	237	+46
3	Antenna tower on building	385	+53
4	Antenna on building	187	+51
5	Antenna on building	404	+17
6	Street light	121	+1
7	Street light	122	+2
8	Antenna on building	376	+44
9	Antenna tower on building	410	+37
10	Antenna tower on building	410	+34
11	Tower	298	+11
12	Antenna on building	253	+88
13	High Tower	290	+3
14	High Tower	288	+1

Source: ALP

[10] A building restriction line (BRL) is a "line that identifies suitable and unsuitable locations for building on airports." (FAA 2012:4)

The BRL for Runway 5/23 is 255 feet on each side of the runway center line. There are no penetrations to this BRL.

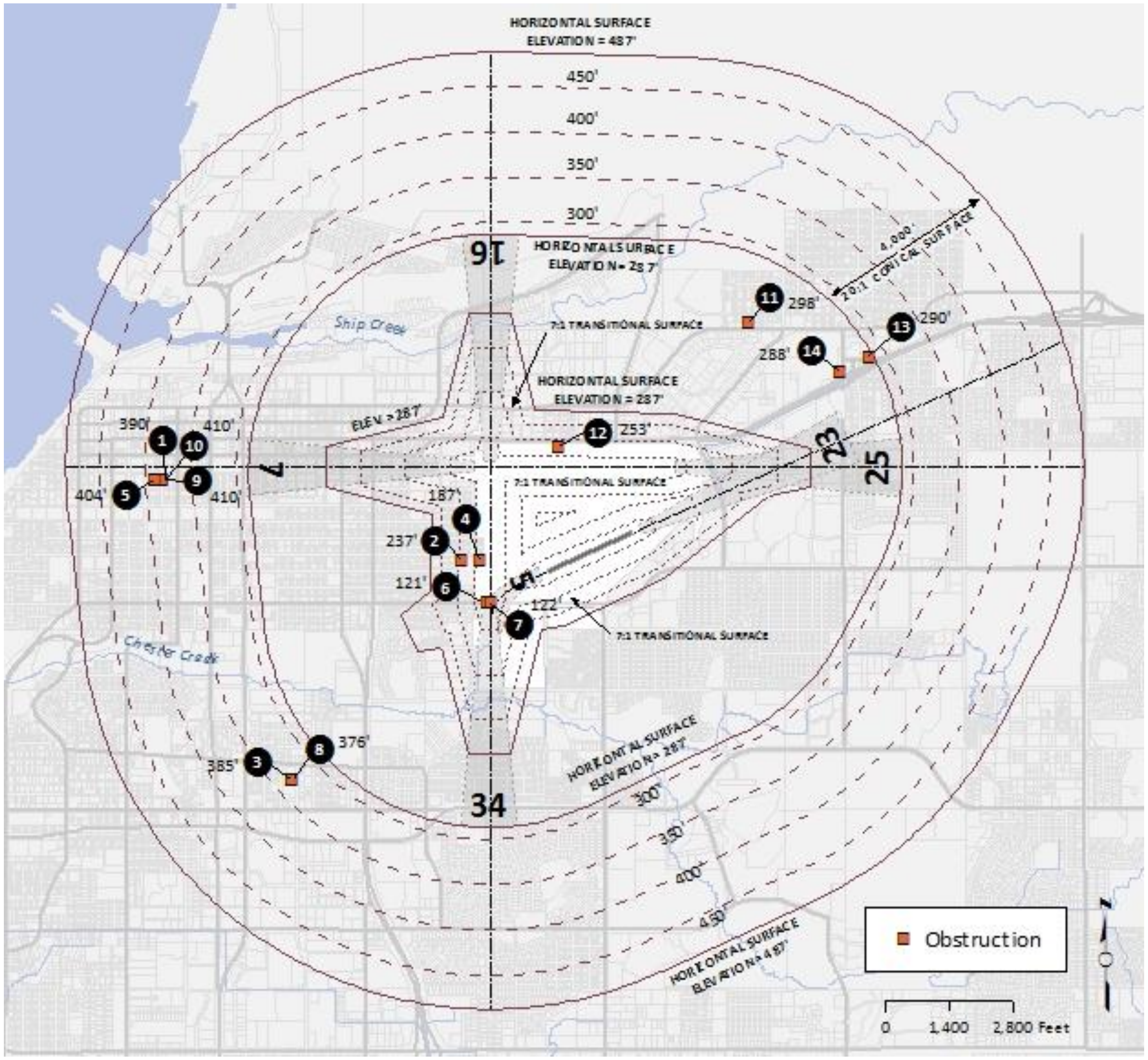
As MRI does not have intersecting runways, a runway visibility zone (RVZ) does not apply. Portions of taxiways C, Q, and G are not visible from the ATCT.

2.5.7 Runway Protection Zones

The existing RPZs[11] for each runway end have been established in accordance with FAA, with a length of 1,000 feet, an inner width of 250 feet, and an outer width of 450 feet.

Portions of all six of the RPZs extend outside of the MRI property lines. The outer portion of the RPZ for Runway 7 is outside the property line to the west and there is a building in the RPZ west of Medfra Street. A trapezoidal area of

Figure 2-9 Obstructions



Source: Revised ALP 2010

[11] An RPZ is an "area at ground level off the runway end to enhance the safety and protection of people and property on the ground." (FAA 2012:8)

the outer portion of the RPZ for Runway 25 with a length that varies between 300 and 450 feet is outside the property line to the east. A portion of the Northway Mall building east of Airport Heights Drive is within the RPZ. There was an avigation easement in this area but it expired in 2013. A small portion in the northwest corner of the RPZ for Runway 16 is outside the property line.

The majority of the RPZ for Runway 5/23 is within the MRI boundary. There are two small sections that are outside the boundary; one is the southwest corner and the other is near Alaska Regional Hospital.

2.5.8 Navigational and Landing Aids

MRI is equipped with the following visual and navigational aids to pilots:

MRI Owned

- Clear-Green Rotating beacon (at intersection of Merrill Field Drive and Taxiway Q) from dusk to dawn
- Lighted Wind Indicator
- PAPI, Runway 34, right
- Reflectors, Runway 5/23

FAA Owned

- VASI, Runway 16, right
- VASI, Runway 7, left
- VASI, Runway 25, left
- Medium intensity Runway Lights, Runway 7/25
- Medium intensity Runway Lights, Runway 16/34
- Precision Instrument runway markings, Runway 7/25
- Basic runway markings, Runway 16/34
- Runway end identifier lights, Runway 7/25
- Runway end identifier lights, Runway 16/34

According to the Airport Master Record, all runway and taxiway lights are non-standard height.

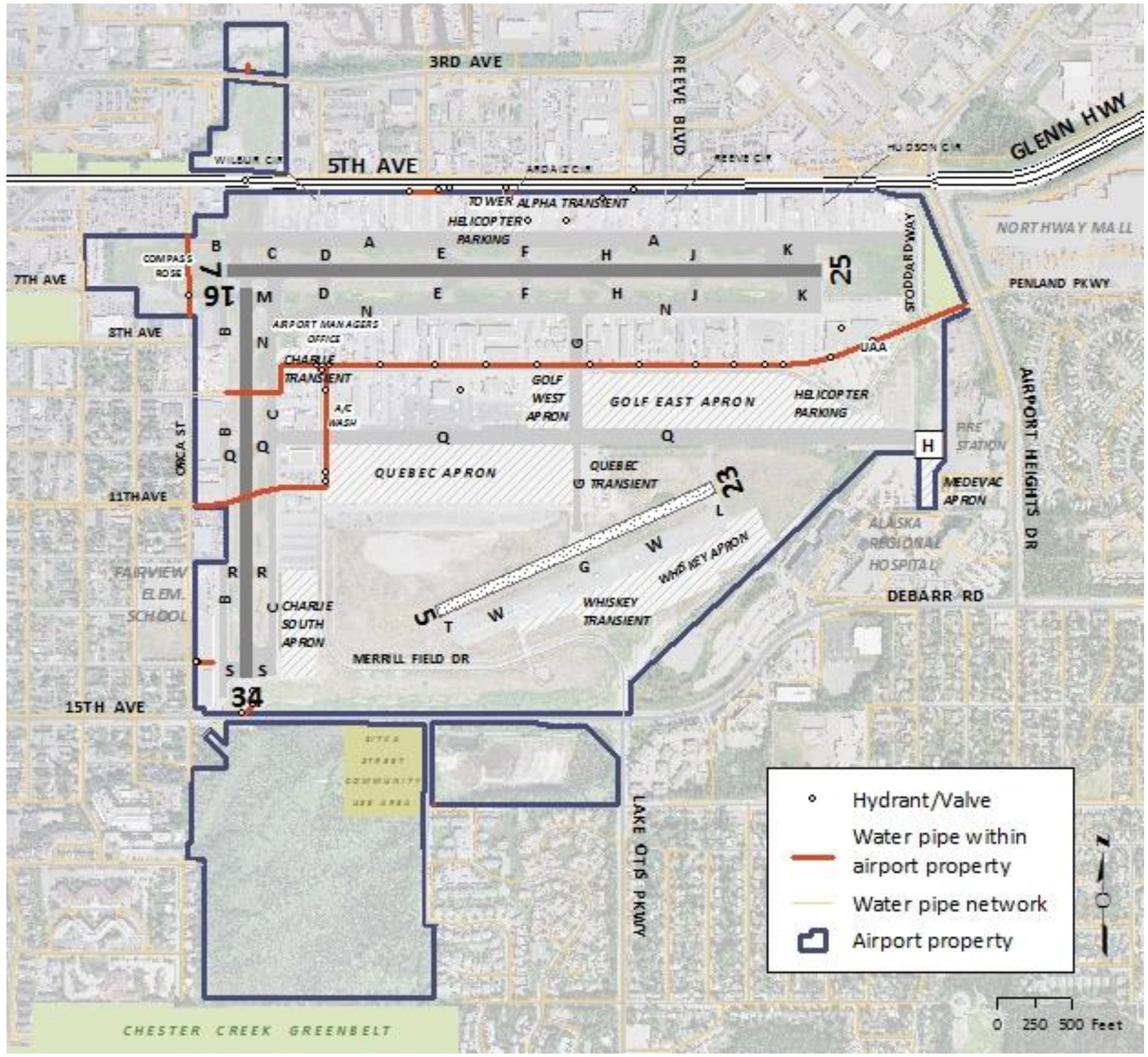
2.6 Utilities

This section describes the utilities serving MRI.

2.6.1.1 Water

Water service for MRI is provided by the Anchorage Water and Wastewater Utility (AWWU), which is owned and operated by the MOA. Water pipes, hydrants, and valves located within MRI are illustrated in red on Figure 2-10. Most of the water pipes on MRI are 24 inches or smaller in diameter. A larger (36-inch) water pipe runs along 5th Avenue. There is one pressure-reducing valve station located on MRI. AWWU noted that any development on MRI will need to use the Private Development or Private System process to extend service to additional lease lots.

Figure 2-10 Water System

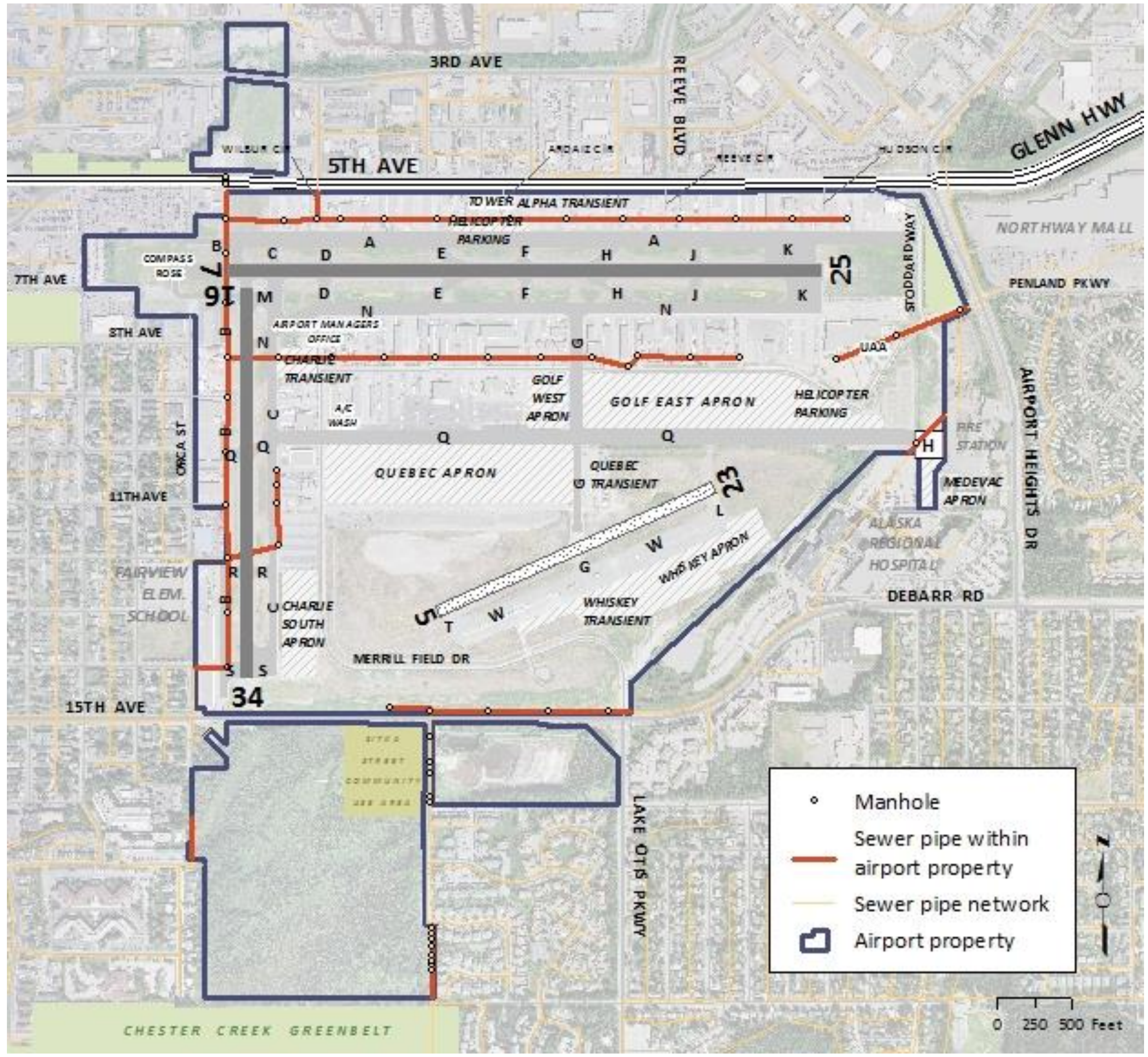


Source: AWWU Production SDE GIS Layer for Business Operations, 2011

2.6.1.2 Wastewater

Wastewater service for MRI is provided by the AWWU, which is owned and operated by the MOA. Sewer pipes and manholes located within MRI are illustrated in red on Figure 2-11. All the pipes on MRI are believed to be 20 inches or smaller in diameter. AWWU noted that any development on MRI will need to use the Private Development or Private System process to extend service to additional lease lots.

Figure 2-11 Wastewater System



Source: AWWU Production SDE GIS Layer for Business Operations, 2011

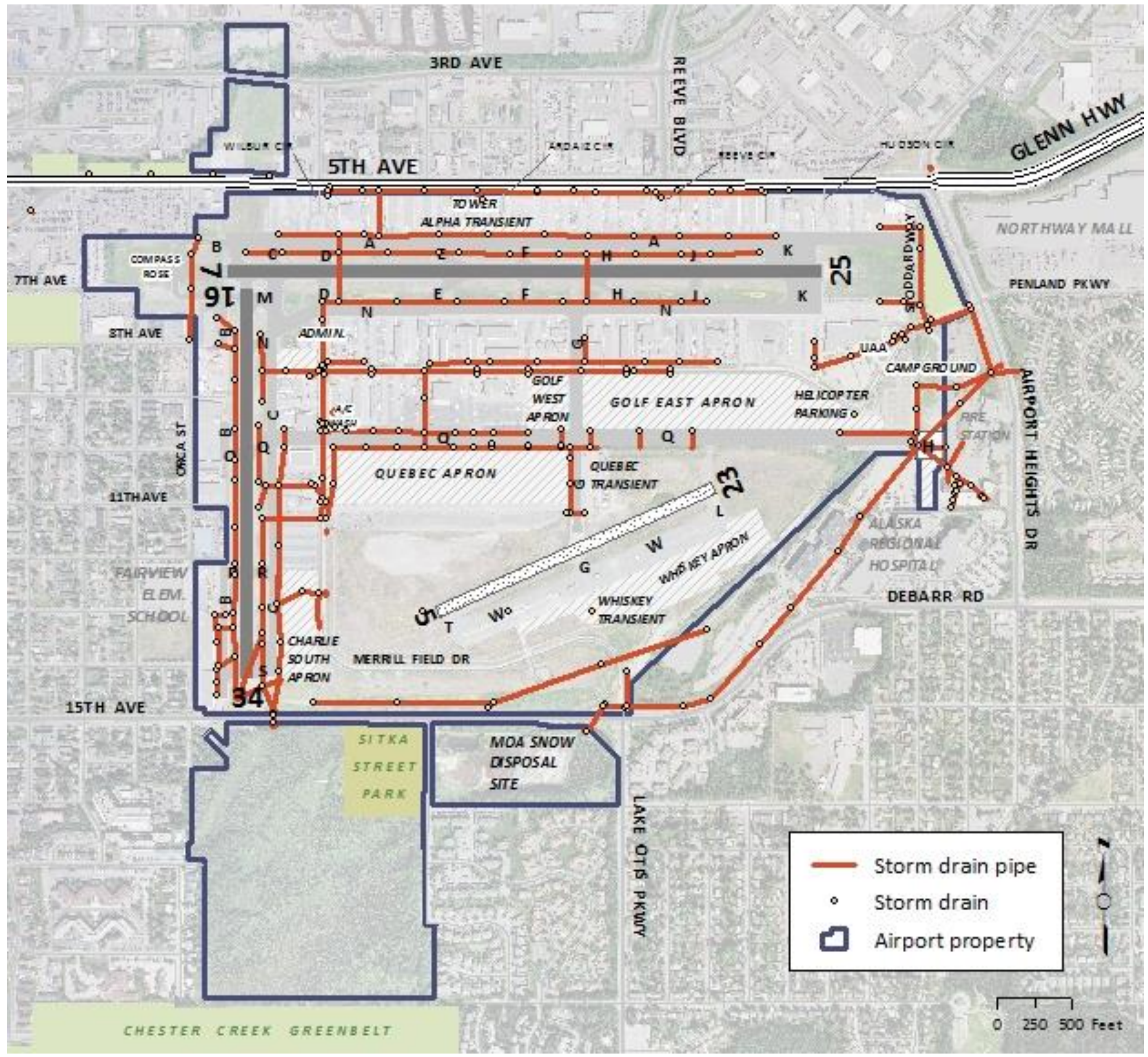
2.6.1.3 Stormwater Drainage

Stormwater discharges at Merrill Field come from a variety of activities including (MOA no date):

- Runway snow removal
- Pavement deicing
- Pavement painting and maintenance
- Waste handling
- Snow collection and storage
- Rain and snow melt

Much of the developed area of MRI is served with an underground drainage system. Stormwater drainage for MRI is maintained by MRI. Storm pipes and drains within MRI are illustrated in red on Figure 2-12.

Figure 2-12 Stormwater Drainage



Source: MOA (Data obtained 2012 from HDL)

The Alaska Department of Environmental Quality (ADEC) under the National Pollutant Discharge Elimination System (NPDES) requires facilities with "storm water discharges associated with industrial activity" to have an industrial storm water permit to discharge storm water.

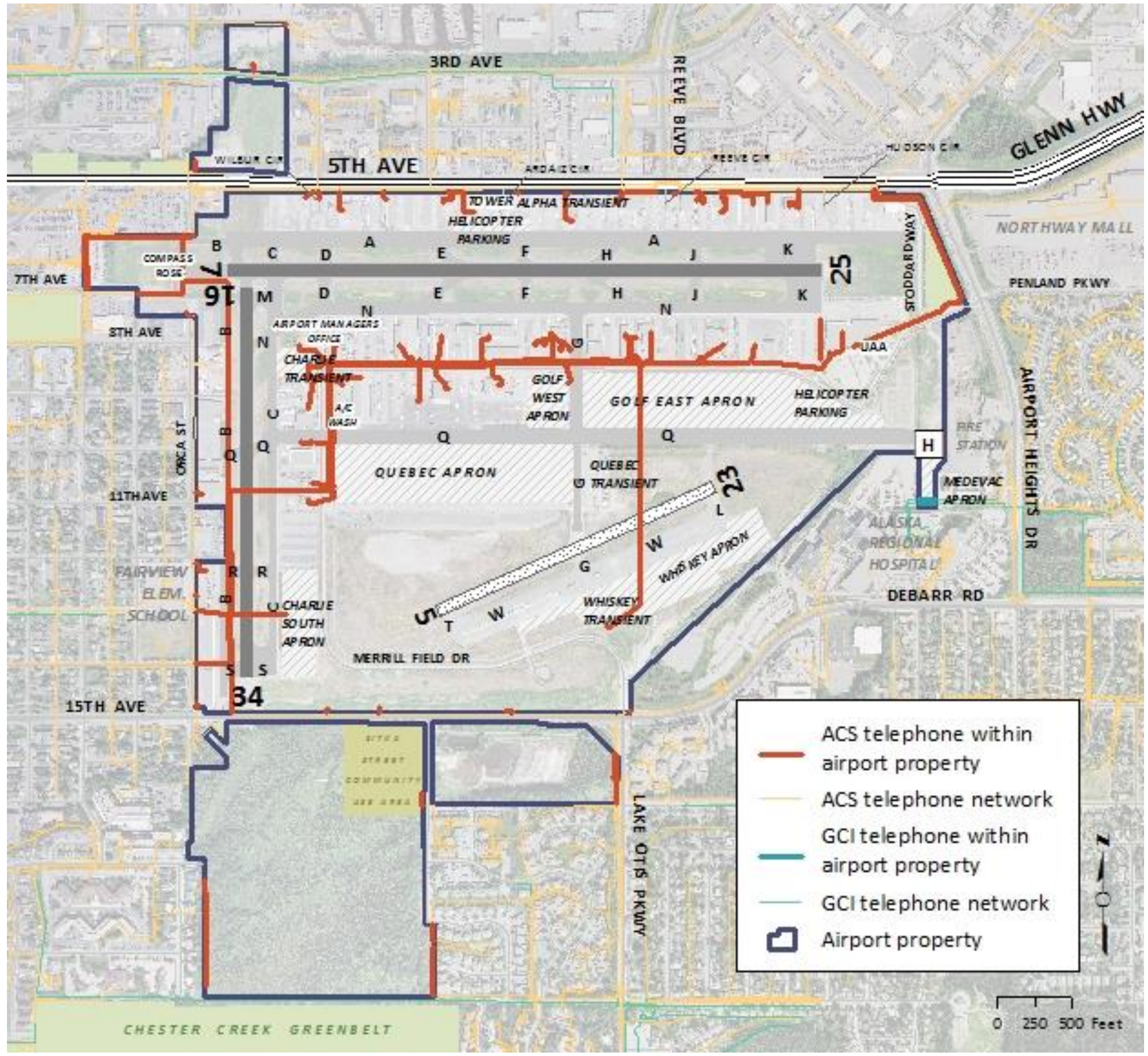
As airports are considered an industrial facility, MRI is required to have a Storm Water Pollution Prevention Plan (SWPPP). MRI is responsible for SWPPP. Individual leaseholders do not have to prepare a separate SWPPP for submittal to ADEC. However, they do have to comply with MRI's SWPPP and submit a SWPPP worksheet to MRI. The SWPPP is available online at http://www.merrillfieldak.com/site.htm

Source: MRI

2.6.1.4 Telephone

Both GCI and ACS provide local telephone service to the MRI area with ACS owning/operating most of the telephone infrastructure on MRI (see Figure 2-13). The entire telephone network on MRI is buried/underground.

Figure 2-13 Telephone

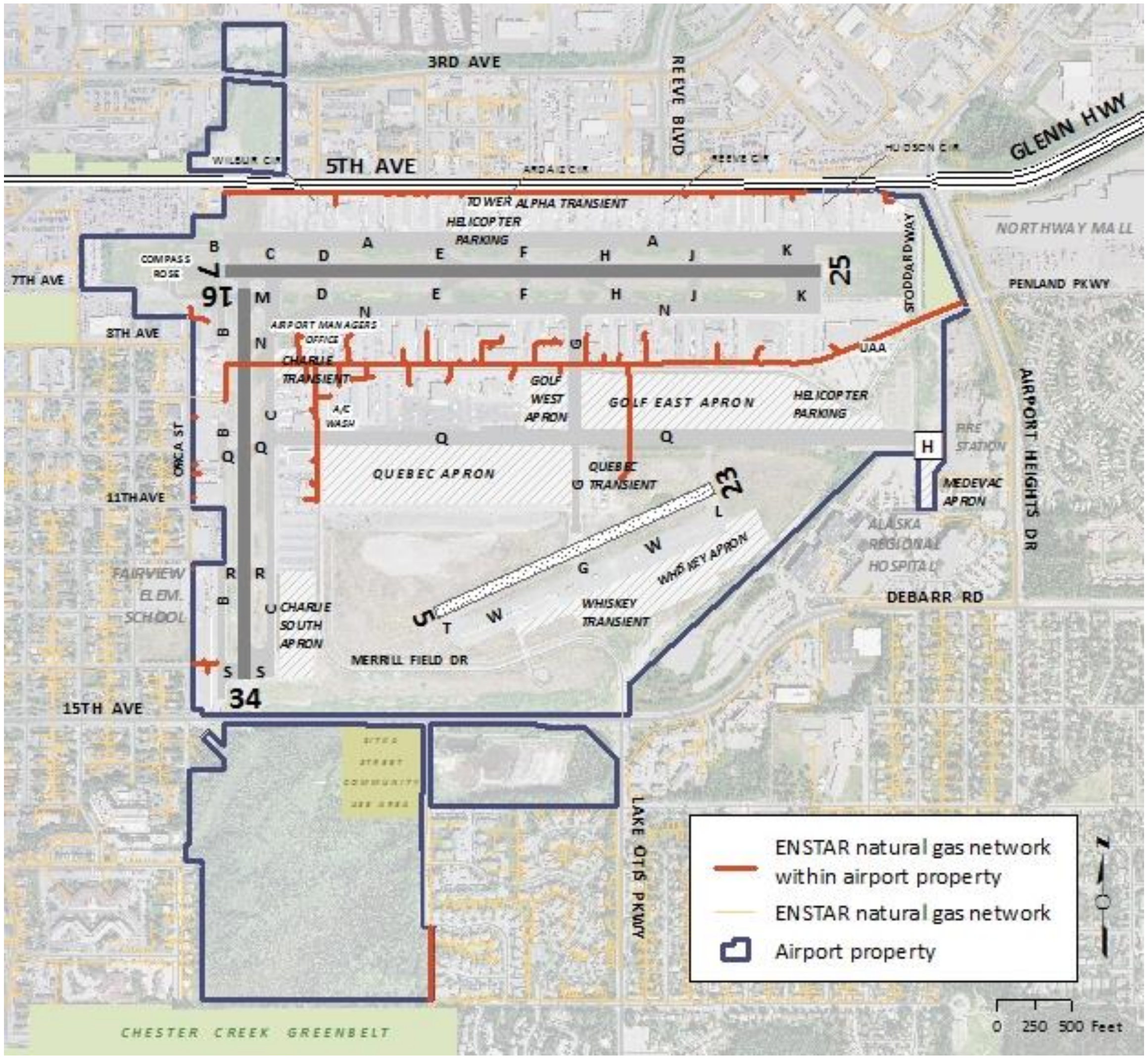


Source: ACS and GCI

2.6.1.5 Natural Gas

Enstar Natural Gas Company provides gas service to MRI. There are no major natural gas transmission lines on MRI but there are service lines (Figure 2-14). Service lines are 4 inches in diameter or smaller. There is a 2-inch pipe that runs east-west across MRI which provides natural gas service to lease lots along Merrill Field Drive. The lease lots along 5th Avenue get natural gas service from pipe running along 5th Avenue.

Figure 2-14 Natural Gas

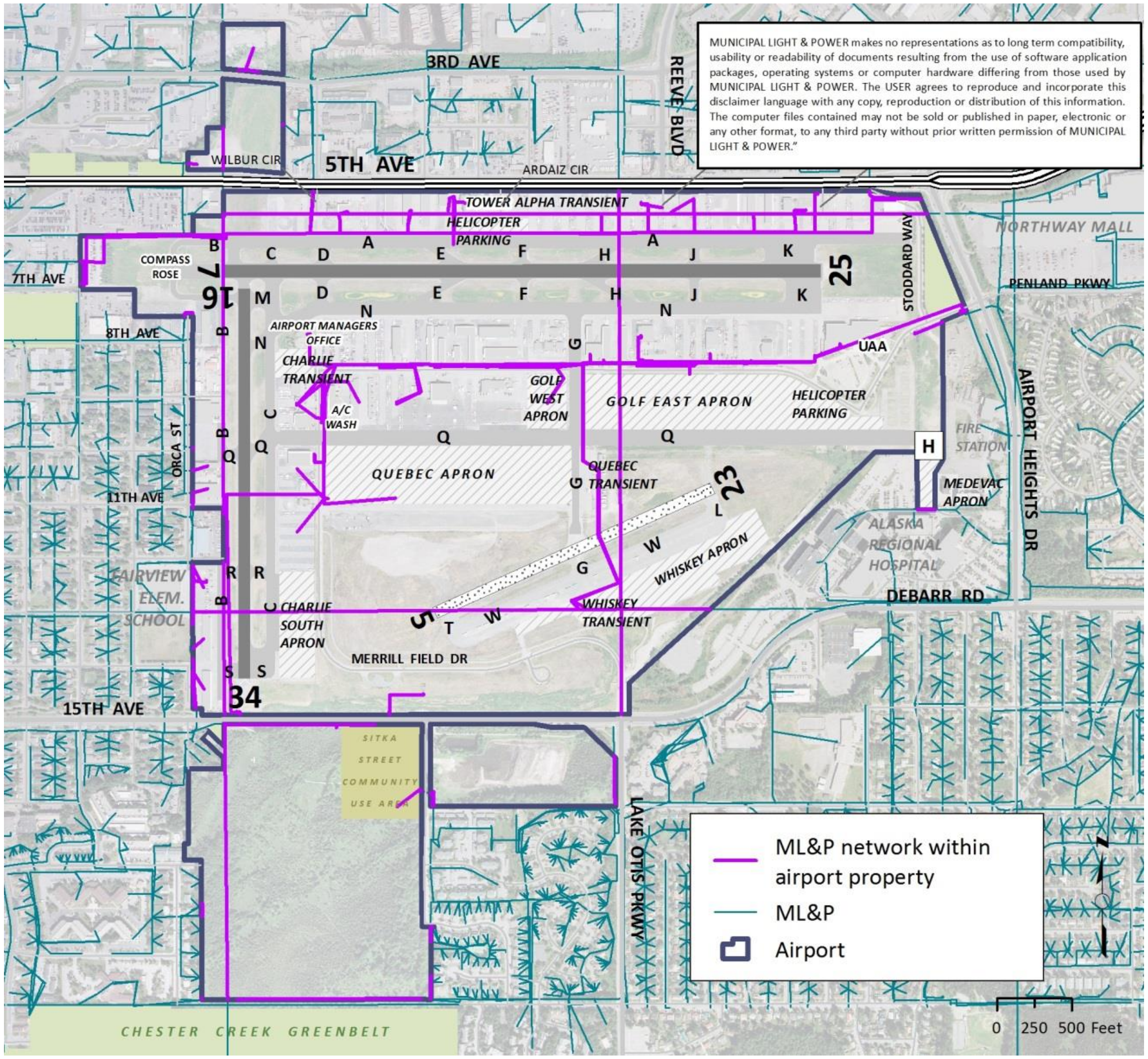


Source: ENSTAR

2.6.1.6 *Electricity*

Municipal Light and Power (ML&P) provides electricity to MRI. ML&P operates two power plants and owns 53.33 percent of the Eklutna Hydroelectric Power Plant. ML&P also belongs to an intertie power system that can be accessed during plant shutdowns or emergency situations. ML&P's electrical network on MRI is shown on Figure 2-15.

Figure 2-15 Electricity



Source: ML&P

2.7 Airport Maintenance and Operations (M&O)

This section summarizes existing airport maintenance and operations facilities and procedures. It is based on interviews with airport personnel, the existing AMP, the MRI ALP, and the airfield inventory update.

2.7.1 Maintenance and Operations Facilities

MRI's maintenance and operations building is located at 835 Merrill Field Drive (near the intersection of Merrill Field Drive and Taxiway Q). The building is approximately 15,000 square feet. The building consists of a two-bay mechanic shop, boiler and electrical room, kitchen, two toilet rooms, break room, office facilities, a multi-bay equipment storage garage, and a sand storage bay. The 2007 Annual Inspection Report listed several corrective actions for the building including defective heater controls and roof de-icing system, mezzanine guardrails needing replacement, and the installation of Ground Fault Circuit Interrupter receptacles in the garage area. Please see the 2007 report for a complete list of deficiencies.

Maintenance equipment on MRI consists of:

- Ice and Snow Equipment
  - 1981 International dump truck
  - 1988 sand sweeper
  - 1997 Oshkosh snowblower
  - 1997 Champion grader
  - 1997 Batts deicing trailer
  - 1999 Ford 1-ton truck w/snowplow
  - 2000 Volvo 16cy dump truck (2)
  - 2000 Sweepster
  - 2006 Volvo wheel loader
  - 2006 Volvo motor grader
  - 2007 International sand truck
  - 2010 Case loader, 921E (2)
  - 2011 Vac/Truck
  - 2014 Oshkosh snowblower
- General Purpose Equipment
  - Tiger triple-gang flail mower
  - 1992 Chevrolet pickup
  - 1995 Chevrolet pickup
  - Pavement crack sealant applicator
  - Pavement crack router
  - 2000 John Deere z-trac mower
  - 2006 Ford Escape (2)
  - Ford van[12]

2.7.2 Snow Removal Procedures

Snow removal is the responsibility of MRI maintenance staff and is done following established snow removal priorities. Priority One areas include:

- Runway 7/25
- Runway 16/34
- Required taxiway access at runway ends

[12] As of February, 2014, this was in the process of being surplused.

- Taxiway N, G, and Q east to hospital and hospital helipad

Priority Two areas include:

- Taxiway A
- Taxiway C
- Taxiway Q (west)
- Taxiway B (north)
- Taxiway B (south)
- Taxiway M
- Taxiway G (South)

Priority Three areas include:

- Cul-de-sacs along 5th Avenue
- Stoddard Way
- Merrill Field Drive
- Access to Whiskey parking
- Walking trail.

Priority Four areas include:

- The remaining taxiways
- Transient parking areas

The priority five areas:

- Golf Apron (east and west)
- Quebec Apron
- Charlie South Apron
- Permanent vehicle parking lot
- Compass rose
- Grooming of snow covered surfaces including Runway 5/23

2.8 Environmental Considerations

This review will be accomplished in accordance with FAA Advisory Circular 150/5070-6B, Airport Master Plans, which states "the principal objective of an environmental overview is to document environmental conditions that should be considered in the identification and analysis of airport development alternatives."

The potential environmental impacts of MRI's Recommended Development Plan will be summarized and addressed in Phase II of the AMP Update.

This section identifies the primary environmental conditions that could affect Master Plan alternatives, recommendations, and implementation of MRI facilities.

2.8.1 Air Quality

The Anchorage area experiences winter temperature inversion conditions that can lead to higher concentrations of carbon monoxide (CO) and particulate matter (PM) as emissions accumulate from vehicles (WRCC 2010).

Anchorage was first identified as experiencing high levels of ambient CO concentrations in the early 1970s, when monitoring programs demonstrated elevated levels of CO throughout the community. Anchorage violated the CO National Ambient Air Quality Standards (NAAQS) every year from 1972 through 1994 and again in 1996, and was designated a nonattainment area. A number of efforts were made to bring Anchorage into compliance (including such initiatives as vehicle inspections, fuel additives, and vehicle plug-in programs). In 1998, Anchorage began a continuous series of years in compliance with the NAAQS. In February 2004, the US Environmental

Protection Agency (EPA) approved a request and maintenance plan to change Anchorage from a nonattainment area to a maintenance area. Under the existing, approved CO maintenance plan for Anchorage, the MOA must follow plan requirements to ensure that the area does not revert to nonattainment for CO. A maintenance area is subject to the same project-level air quality analysis that is required for a nonattainment area. MRI is within the currently designated maintenance area for CO.

The EPA recently decreased its lead standard and is conducting monitoring at 15 airports throughout the country to determine if lead from aviation fuel is a concern. MRI was included in the study which began in October 2011 and continued through October 2012.

A rolling 3-month average of 0.15 micrograms of lead per cubic meter ($\mu g/m^3$) or lower is considered to be in compliance with the NAAQS. The highest 3-month average concentration measured during the Merrill Field study was 0.07 $\mu g/m^3$, or about 47 percent of the Federal standard. Federal regulation would have required sampling to continue at Merrill Field if the highest 3-month rolling average was greater than 50 percent of the NAAQS (0.075 $\mu g/m^3$).

2.8.2 Vegetation

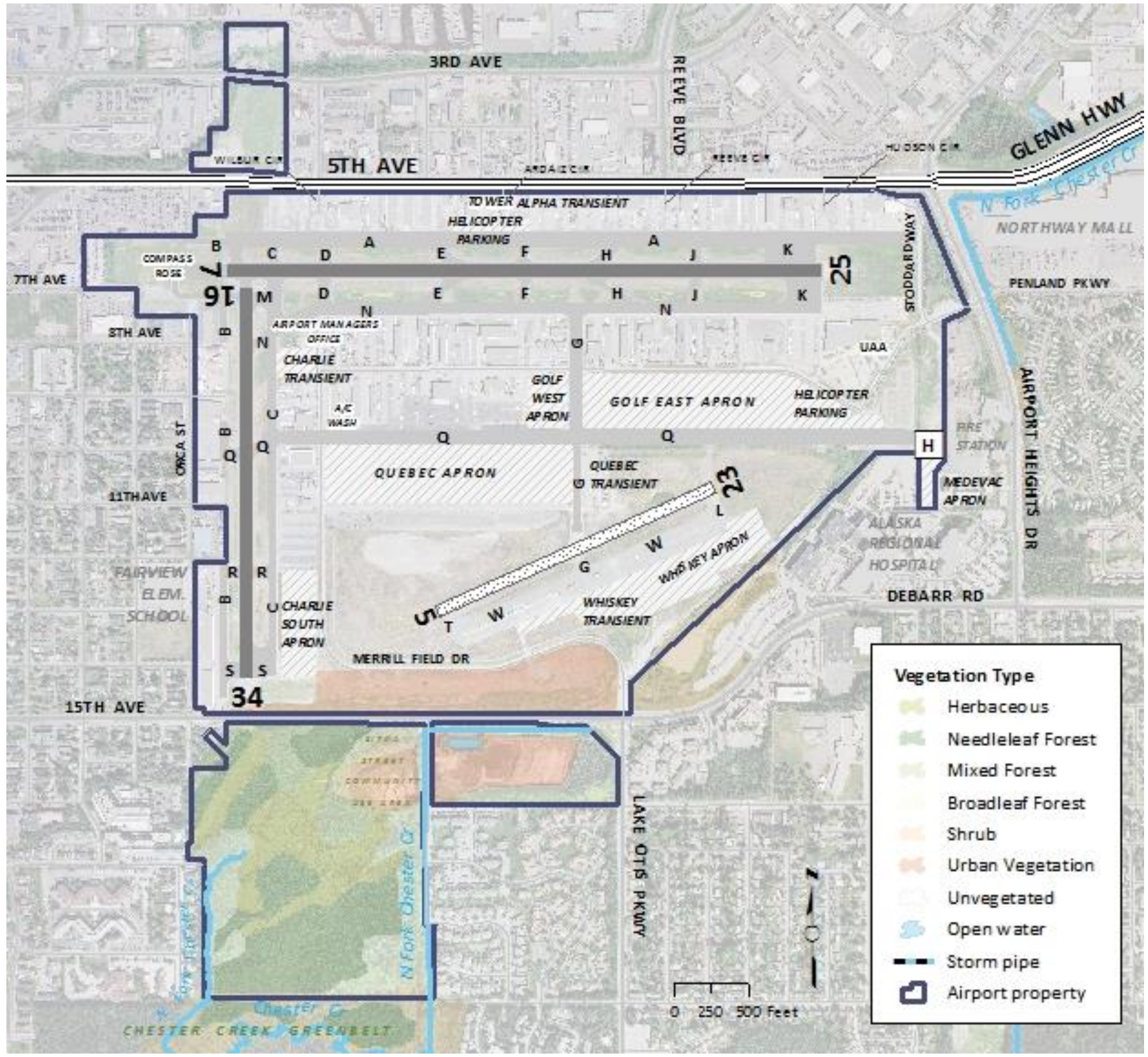
Although MRI is located in an urban environment, several different types of vegetation are present. Four general vegetation types are found within the MRI boundary: forest (needleleaf, broadleaf, and mixed), shrub, herbaceous, and urban vegetation (Figure 2-16). Most of the vegetation is located near the airport boundary or south of 15th Avenue.

Vegetation serves many functions, including providing wildlife habitat, food, shelter, and migration corridors.

Grasshoppers live in vegetated areas on and around MRI. This is a concern because grasshoppers are a wildlife attractant.

2.8.3

Figure 2-16 Vegetation Types



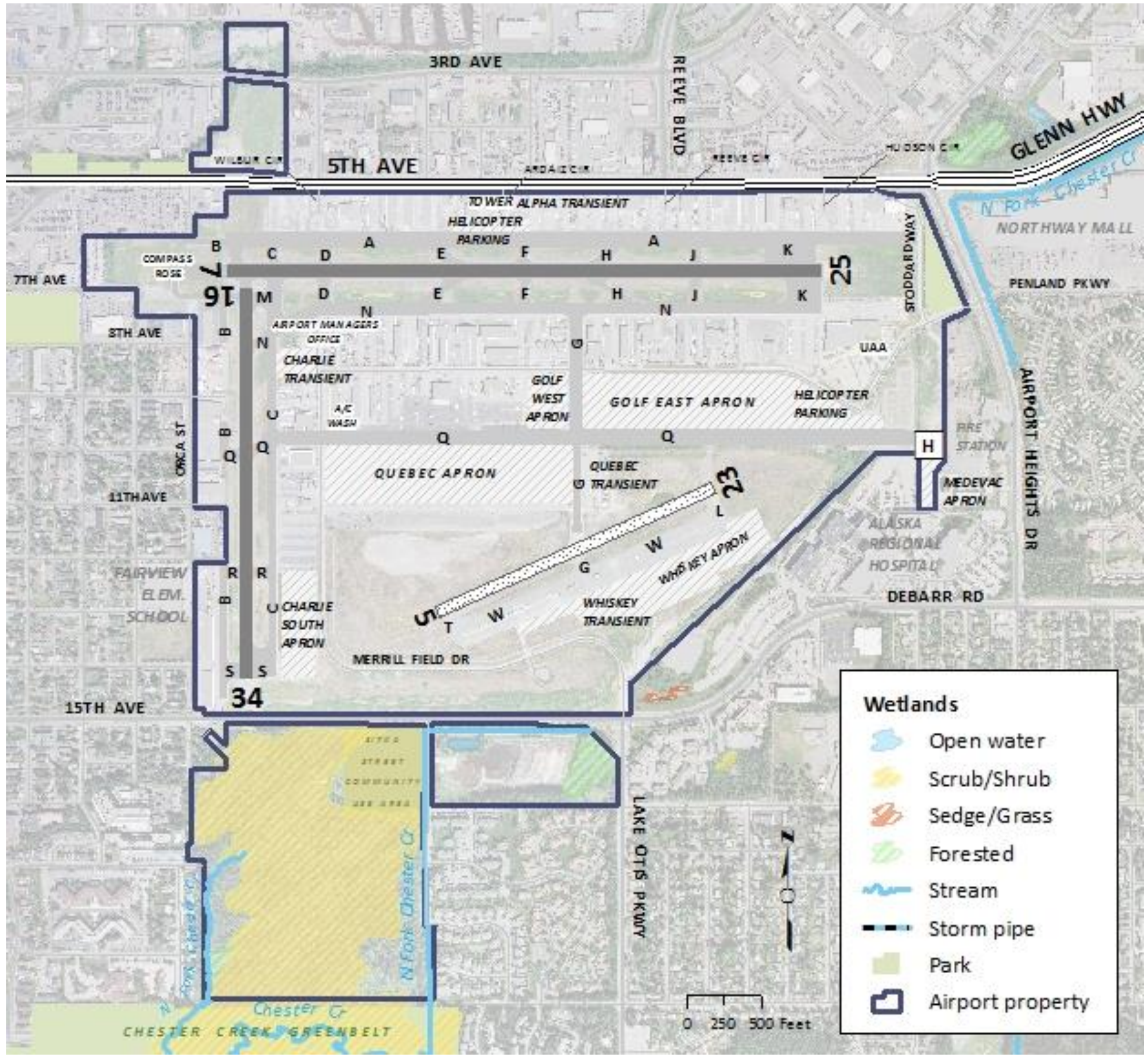
Source: HDR (Vegetation data collected for the Highway to Highway Project, 2010)

2.8.3 Wetlands

The majority of the wetlands on or near MRI are located along Chester Creek. Figure 2-17 shows the location of wetlands in the area based on fieldwork conducted for the Highway to Highway project. Wetlands in this area include forested, scrub and shrub, sedge, and grass. The primary functions of these wetlands are:

- Receive and detain runoff of poor quality from roads, parking lots, snow disposal sites, and MRI.
- Store excess runoff, and release this water over extended dry periods.
- Areas at the toe of slope discharge ground water, which is an important source for the wetlands.
- Isolated small wetlands recharge groundwater.
- Provide wildlife habitat and migration corridor.
- Designated open space for active public use.
- Aesthetic value.

Figure 2-17 Wetlands and Waterbodies



Source: HDR (Wetlands data collected for the Highway to Highway Project, 2010)

2.8.4 Birds, Fish, and Wildlife

A total of 244 bird species have been recorded in the Anchorage area, of which 152 species occur annually (112 breeders and 40 regular migrants) (Myers N.d.). More than 50 of these have been found near MRI (mostly along Chester Creek) during the Alaska Landbird Monitoring Surveys (Handel 2010). Birds are a concern for MRI because of the potential for collisions between birds and aircraft. Flocks of birds, particularly seagulls and ravens, are a concern on MRI. In addition, migratory waterfowl can also be found on MRI during the spring and fall.

Chester Creek provides important habitat for anadromous pink salmon and coho salmon; anadromous and resident Dolly Varden char; and resident rainbow trout, slimy sculpin, and three-spine stickleback. Rainbow trout and Dolly Varden were recently identified as the most abundant species in lower and South Fork Chester Creek. Field studies for the Highway to Highway project found coho salmon, rainbow trout and Dolly Varden in the North Fork of Chester Creek.

Wildlife also frequently uses the Chester Creek Greenbelt, with moose being the most commonly found terrestrial mammal. This is likely because this greenbelt serves as a major link between the University-Medical District and Far North Bicentennial Park on the east side and moose habitat on the west side (including Westchester Lagoon, Earthquake Park, and natural areas/ wetlands along the coast). The greenbelt is only used occasionally by brown bears (Farley 2010). The Chester Creek Aquatic Ecosystem Restoration project at the mouth of Chester Creek resulted in the construction of a new creek channel to provide passage for salmon between Chester Creek and Cook Inlet, which could potentially draw more brown bears to the area (Farley 2010; Sinnott 2010). A variety of furbearers (such as coyote, snowshoe hare, red fox, and least weasel) and other small mammals (such as beaver, porcupine, red squirrel, northern flying squirrel, little brown bat, mice, voles, and shrews) may also be found in the area (ADF&G 2000).

2.8.5 Threatened or Endangered Species

Currently, the USFWS and National Oceanic and Atmospheric Administration (NOAA) Fisheries indicate that there are no threatened or endangered species listed under the Endangered Species Act (ESA) in the MRI area.

2.8.6 Historical, Architectural, Archaeological and Cultural Resources

As part of the Glenn Highway: Gambell to McCarrey Streets Categorical Exclusions, several properties were evaluated to determine if they were eligible for inclusion on the National Register of Historic Properties (NRHP)

(Faith and Yarborough 2005; Faith, Yarborough, and Pendleton 2005).

The Reeve Airmotive Hangar (ANC-1530) was determined eligible for listing on the NRHP. The hangar was found to have historic significance because of its association with the growth of air-related transportation in Alaska from 1944 until the 1970s and with Robert Reeve, an aviation legend who has been inducted into the National Aviation Hall of Fame, and because it was a distinguishable entity representing aviation-related commercial construction in Anchorage during World War II.

The Stoddards Aircraft Parts Center (ANC-1531) was evaluated for NHRP eligibility but it was determined that it was not eligible at that time because the building had undergone substantial remodeling and did not retain enough historical integrity for listing on the NRHP.

The Vernair Hangar (ANC-1423) was also evaluated for NRHP eligibility. It was determined at the time of the evaluation that the hangar was not old enough to meet the eligibility criteria (i.e., less than 50 years old) and was not of exceptional importance to meet criteria considerations for properties less than 50 years old. The hangar was demolished in 2007.

Merrill Field itself (ANC-01946), the east-west runway (ANC-1936), and the North-South Runway (ANC-1937) were also evaluated. It was determined that none of these facilities were eligible for the NRHP at that time. While Merrill Field was determined significant for its association with the air transportation history of Alaska (1930–1950), it did not retain enough integrity to be eligible for listing on the NRHP; only one building from that period (Reeve Airmotive Hangar, ANC-1530) remained and the current runways had little resemblance to the airstrips that were in place during their period of significance.

2.8.7 Streams and Floodplains

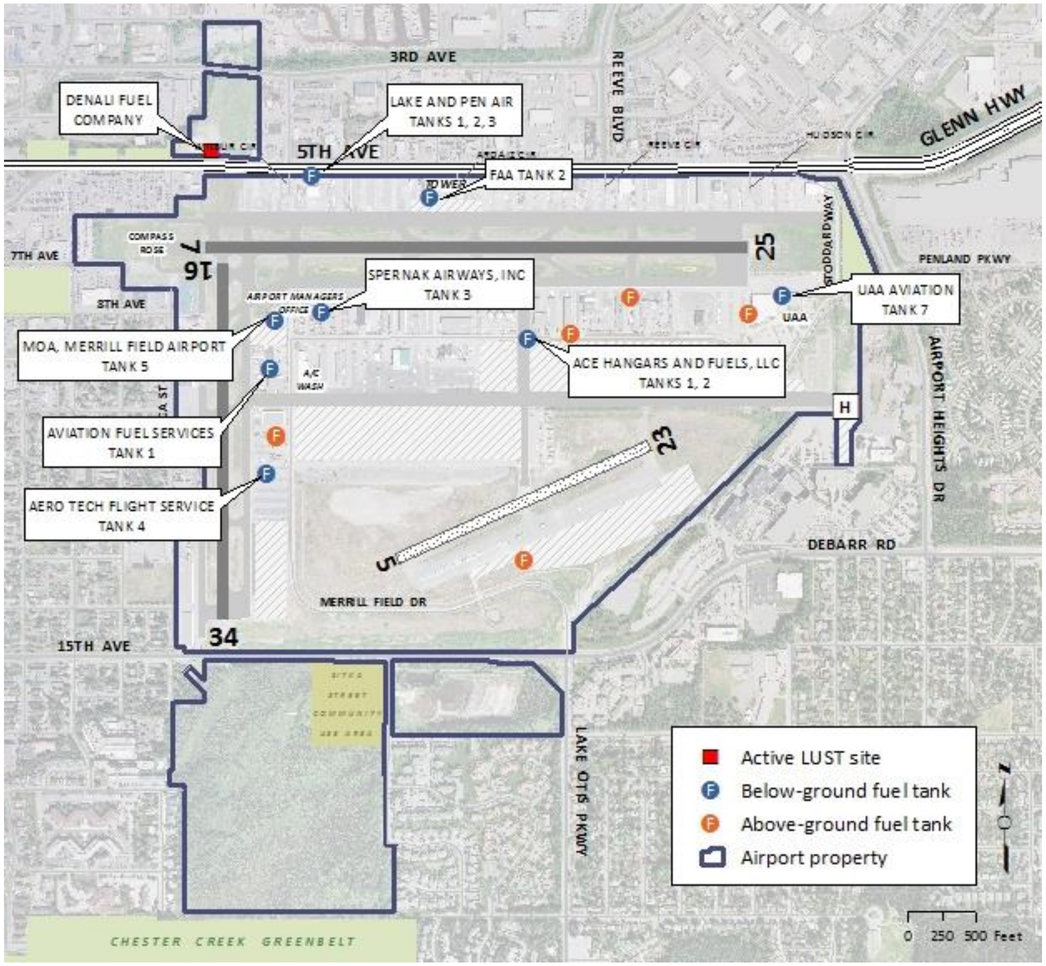
Parts of the North Fork of Chester Creek are located on or near MRI property (Figure 2-17). The entire North Fork channel was rerouted into a ditched channel in the 1960s. The majority of the channel between Debarr Road and Airport Heights Drive is confined to an underground storm pipe and is not visible. There are no identified floodplains on or near MRI.

2.8.8 Hazardous Materials

A search of the ADEC database indicated that as of March 23, 2016, there have been 57 underground storage tanks installed at MRI. The majority of these tanks (49) are permanently out of service. The 8 tanks that are listed as being currently in use or temporarily out of use are listed in Table 2-7 and shown in Figure 2-18 (ADEC 03/23/2016).

The ADEC Leaking Underground Storage Tank (LUST) database indicates there is one active LUST on MRI (see

Figure 2-18 Fuel Tanks and Active Leaking Underground Storage Tanks



Source: ADEC database (February 19, 2014)

Figure 2-18). According to MRI, there are also six aboveground fuel tanks.

Table 2-7 Active and Temporarily Out of Use Underground Storage Tanks on MRI

Location	Name	Facility Type	Tank Size (gallons)	Tank Material	Year Installed	Current Status
1100 Merrill Field Dr	Aero Tech Flight Service (Tank #4)	Commercial	10,000	Cathodically Protected Steel	1997	Currently in use
1707 Merrill Field Dr	Spernak Airways, Inc. (Tank #3)	Air Taxi	10,000	Composite (Steel w/ FRP)	1998	Currently in use
1950 E 5th Ave	FAA (Tank #2)	Federal Non-Military	4,000	Cathodically Protected Steel	1999	Currently in use
2321 Merrill Field Dr	Ace Hangars & Fuels, LLC (Tank #1)	Gas Station	5,000	Fiberglass Reinforced Plastic	2000	Currently in use
2321 Merrill Field Dr	Ace Hangars & Fuels, LLC (Tank #2)	Gas Station	5,000	Fiberglass Reinforced Plastic	2000	Currently in use
2811 Merrill Field Dr	UAA Aviation Facility (Tank #7)	Air Taxi	1,000	Cathodically Protected Steel	1993	Currently in use
900 Merrill Field Dr	Aviation Fuel Services (Tank #1)	Commercial	10,000	Cathodically Protected Steel	1985	Temporarily out of use
900 Merrill Field Dr	Aviation Fuel Services (Tank #2)	Commercial	10,000	Cathodically Protected Steel	1985	Temporarily out of use

Source:* *ADEC Underground Storage Tank Database* *accessed February 19, 2014.

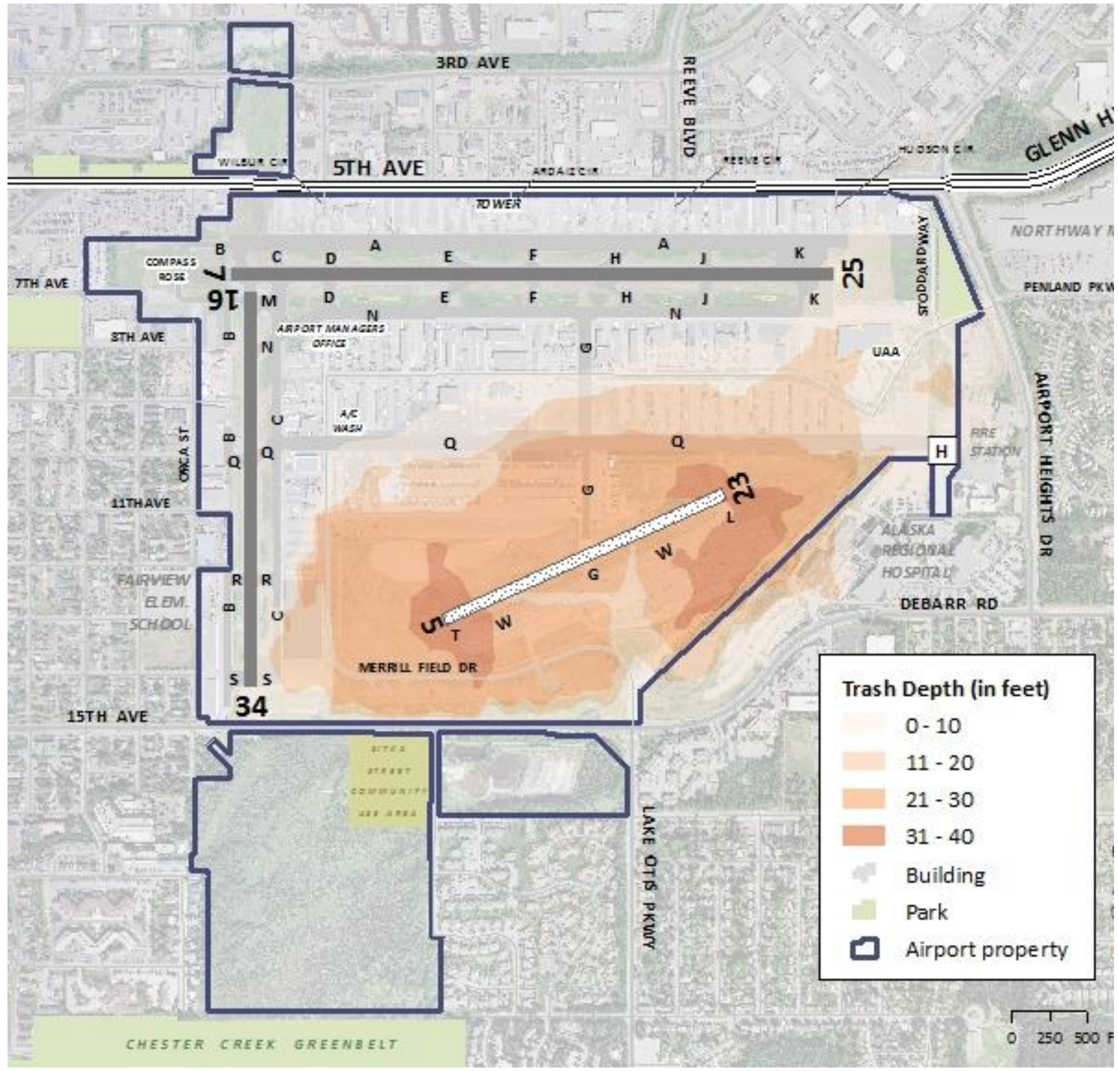
***This MRI Administration Building diesel underground tank is to be removed in the summer of 2014, as part of electrical vault rework project.**

2.8.9 Landfill

Merrill Field Landfill is a closed, unlined landfill located south of East 5th Avenue and north of East 15th Avenue (Debarr Road), between Orca Street (west) and Airport Heights Drive (east) (see Figure 2-19). The landfill covers approximately 200 acres and is filled with soil and refuse to an average depth of 30 feet (Brunett 1990).

Merrill Field Landfill began operation in the late 1930s as an unsupervised garbage dump. It was originally filled by pushing refuse off a bluff near the east end of the current runway. Most of the refuse was burned (if combustible) and bulldozed into the former creek bed north of Chester Creek. After the City of Anchorage took over management of the landfill in 1957, the refuse was typically covered with soil at regular intervals. Frozen stockpiles of soil in the winter made this difficult, and snow was used as a substitute (Hart Crowser 1988).

Figure 2-19 Landfill – Trash Depth



Source: Highway to Highway Project, 2009

Operations continued until 1987, when it was capped and closed. It is estimated that approximately two feet of cover material were added to the landfill at that time. This thickness has likely changed over time as the debris settled. Repairs to the surface likely included adding fill or regrading the existing material to level the site. The current thickness of the cap is therefore likely variable.

It is estimated that the Merrill Field Landfill contains more than 3 million tons of refuse and 1.7 million tons of cover soil, nearly half of which was deposited between 1982 and 1987. Approximately 70 percent of the landfill contents were deposited after 1977 (Hart Crowser 1988). The active development areas within the landfill were initially located near the east end of Merrill Field Drive and, over time, generally moved toward the southwest.

In the early 1970s, the north fork of Chester Creek was diverted through a corrugated pipe that is now buried beneath the landfill, which terminated on the south side of East 15th Avenue, immediately west of Sitka Street. This pipe was later decommissioned and replaced by the current pipe that is located along the southeast perimeter of the landfill mass.

Leachate is the product of water percolating through refuse contained by a landfill. After coming in contact with landfill materials, the contaminated water can potentially impact surface and groundwater, as well as accelerate corrosion of certain construction materials. Because the Merrill Field Landfill was not constructed using a geotextile liner and leachate collection system, leachate is in direct contact with a shallow, unconfined aquifer. The majority of the leachate flows to the southwest.

A comprehensive water quality monitoring program began at the site in 1988.The unconfined aquifer is monitored around the perimeter of the landfill to detect horizontal movement of leachate from the refuse. A cut-off wall and leachate collection system were placed along the north side of East 15th Avenue in 1996. The leachate collected from this system is pumped directly into the municipal sewage system from a lift station and treated at the Point Woronzof water treatment plant. Leachate is sampled semiannually from the lift station.

Seventeen groundwater monitoring wells and one surface water location are monitored annually as required by EPA and ADEC regulations. Although landfill monitoring wells have detected groundwater contaminants in wetlands south of Merrill Field Landfill, concentrations are typically within EPA drinking water standards (Brunett 1990).

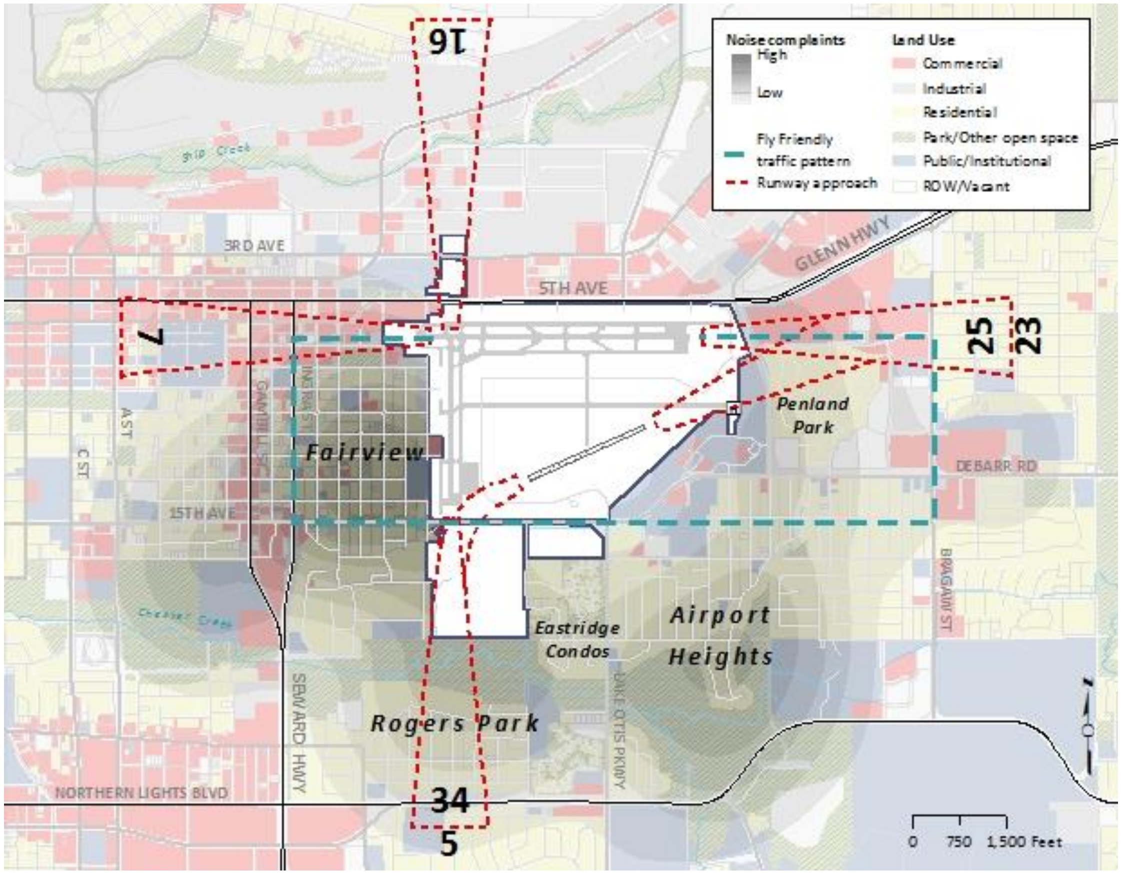
One byproduct of landfill decomposition is methane gas. Explosions caused by indoor methane accumulation are the primary concern for landfill methane production. Long-term exposure to methane can accelerate corrosion of some materials. Although Merrill Field Landfill was closed and capped more than two decades ago, methane production remains relatively high. A methane extraction system was installed in 1991–1992 to intercept methane gas migration into structures along Merrill Field Drive. The methane is drawn by vacuum into a burner house/station near the intersection of taxiways G and Q where it is flared. The MOA Solid Waste Services (SWS) determined the gas was too contaminated to be used effectively for generating power or heat. Gas probes around the perimeter of the landfill mass are monitored quarterly by SWS, and methane gas is also monitored at several buildings adjacent Merrill Field Landfill. Typically the highest concentrations of methane are measured near the northwest edge of the landfill; however, high readings have been measured along its southeast edge. Because Merrill Field Landfill was capped with gravel, methane is passively emitted into the air, thus reducing the amount of methane that would otherwise accumulate and migrate to areas adjacent to the landfill.

2.9 Noise

MRI has a system in place for addressing and documenting aircraft noise complaints that are received. Complaints are recorded on an aircraft noise/activity complaint form that documents the time/date of the complaint as well as the nature of the incident. When the owner of an aircraft associated with a complaint can be identified, the Airport Manager follows up with the pilot. Between 2004, when the noise complaints started being documented, and 2011, approximately 150 complaints have been reported by 71 individuals. This is an average of 18.4 complaints per year. Overall, the number of complaints was at its highest in 2004 and then gradually lessened until 2007 when there were only 6 complaints. Since 2008, the number of complaints has been increasing although they have not reached 2004 levels.

The majority (68%) of the complaints have been associated with aircraft activity with only 32 percent being associated with helicopters. Complaints associated with helicopters were at their highest in 2005 with 19 complaints. Since then, the number of helicopter related complaints had declined dramatically with most years only receiving 1 or 2 complaints. With 22 complaints, fixed-wing related

Figure 2-20 Documented Noise Complaints 2004–2011



Source: Merrill Field 2012 Noise Complaint List complaints were at their highest in 2011.

Overall, Merrill Field receives the most noise complaints in July (24 complaints), followed by May and June with 20 and 18 complaints, respectively. Noise complaints are at their lowest in December (2 complaints) and November (5 complaints).

Approximately half (51%) of the complaints were associated with an aircraft/helicopter flying too low. Figure 2-20 shows the generalized distribution of noise complaints.

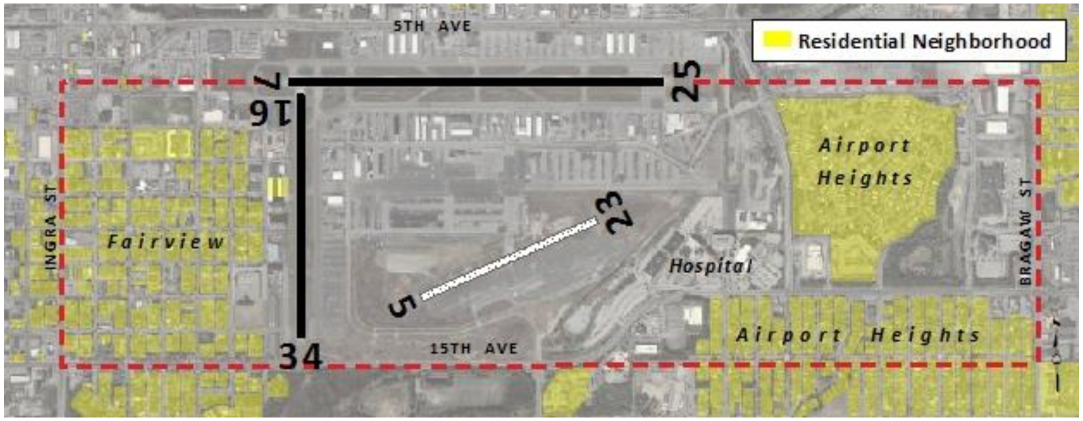
For additional information on noise, please see Appendix D, the *Part 150 Noise Exposure Study*.

2.9.1 "Fly Friendly" Noise Guidelines

Aircraft-generated noise is typically the primary source of incompatibility between an airport and the surrounding land uses. MRI has developed "fly friendly" guidelines as part of their efforts to reduce aircraft noise in adjacent residential areas. The current "fly friendly" guidelines include:

- Utilize the entire length of the runway; do not request intersection departures.
- Follow the established traffic pattern Figure 2-21; do not make an early cross wind turn on departure.
- Maintain the lowest propeller RPM setting necessary for safe flight; do not over power your aircraft.
- Plan training activity during daytime hours; do not conduct training activities (touch-and-goes) during late night hours.
- For helicopters, land long on Runway 7/25, use Runway 16/34 only when wind dictates and/or Runway 7/25 is closed. Land long (between Taxiways R and Q when northbound), follow the greenbelt instead of going straight in. Use steeper ascent and descent angles when practicable.

Figure 2-21 "Fly Friendly" Traffic Pattern



Source: MOA Merrill Field Fly-Friendly Noise Reduction Guidelines. Merrill Field ATCT Letter to Airmen No. 11-01.

2.9.2 Noise Exposure Map Update

Title 14 of the Code of Federal Regulations (CFR) Part 150 "Airport Noise Compatibility Planning" sets forth standards for airport operators to use in documenting noise exposure in their airport environs and for establishing programs to minimize noise-related land use incompatibilities. While participation in this program by an airport is voluntary, over 250 airports, including Merrill Field Airport, have participated in the program. Airport participation provides access to federal funding for implementing any FAA-approved noise compatibility program measure.

Title 14 CFR Part 150 includes two principal elements: (1) a Noise Exposure Map (NEM) and (2) a Noise Compatibility Program (NCP). The MOA is updating the NEM only at this time.

The purpose and goals of this NEM update are to:

- Document aircraft noise exposure that reflects current and forecasted aircraft operations at MRI.
- Collect, analyze, and report information regarding current and forecasted operations as it relates to MRI aircraft noise and land use compatibility.
- Share data and information with the public.

Noise measurements provide important input for understanding the noise environment around an airport. While 14 CFR Part 150 does not require noise monitoring for the development of the NEMs, the Regulation provides specific guidelines for data acquisition and refinement for airports that desire to conduct noise measurements and report the results in the NEM. Ultimately Part 150 requires that the FAA's Integrated Noise Model (INM) be used for obtaining day-night average sound level (DNL) contours.

The FAA has also developed land use guidelines that relate the compatibility of aircraft activity to areas surrounding an airport. Title 14 CFR Part 150 identifies land use activities (i.e., residential, commercial, public use, etc.) that are acceptable within the DNL 65, 70, and 75 decibel (dB) contours. FAA guidance indicates that virtually all land uses below DNL 65 dB are considered to be compatible with the effects of aircraft noise and therefore will not fund mitigation programs below DNL 65 dB.

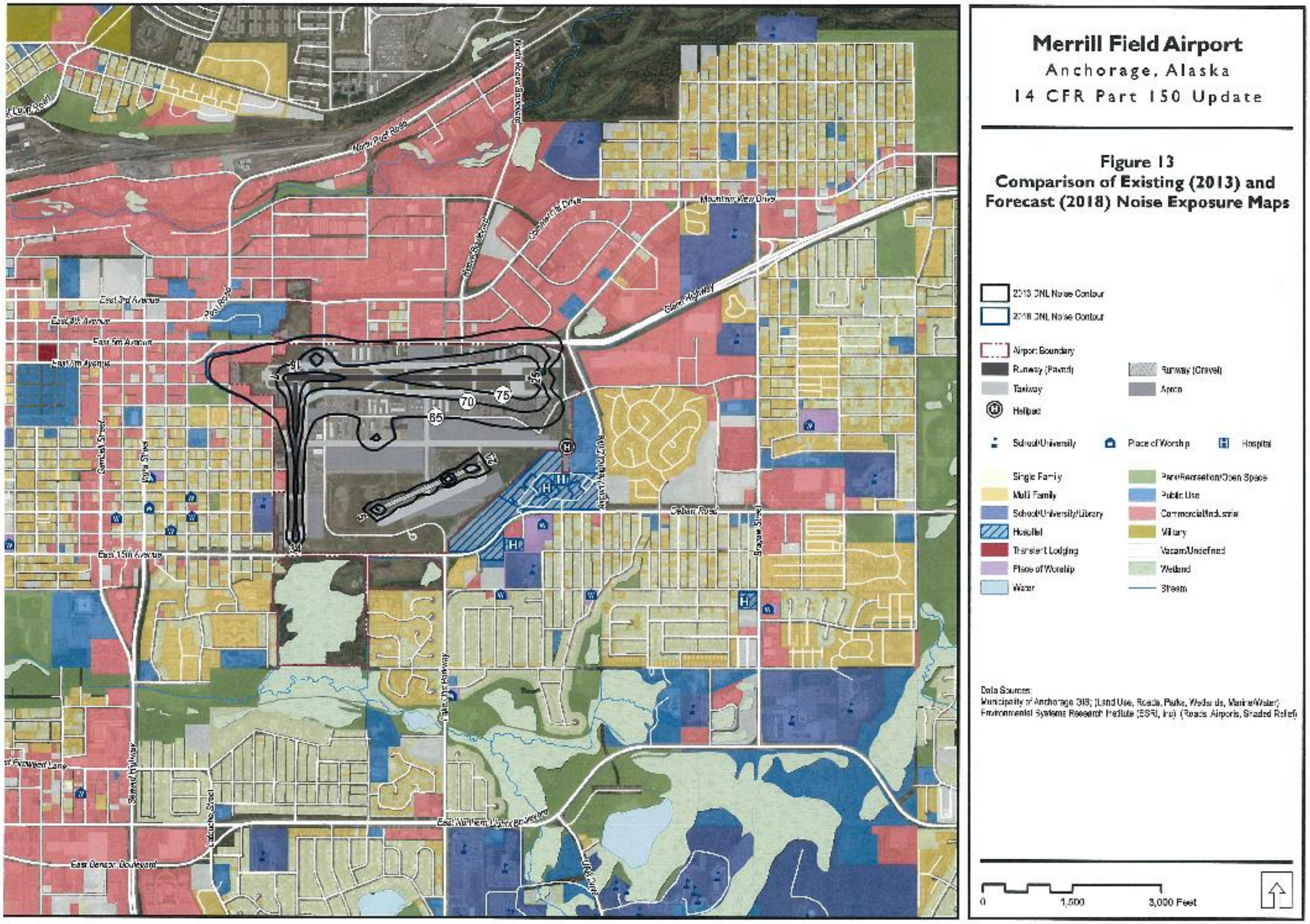
To collect noise measurements, community members volunteered their residences as possible noise measurement site locations. Measurement sites were then selected to provide representative data on a broad range of aircraft operations and geographic areas near the airport.

The NEM Update developed mapped DNL contours for existing and 5-year forecast conditions; i.e., 2013 and 2018. Figure 13 of the Update (see

Appendix D) depicts the existing and forecast conditions contours together for ease of visual comparison (see Figure 2-22). The visual comparison shows little to no change to the noise exposure with the only visible difference to the west of Runway 7/25, which is where the DNL 65 dB contour is slightly larger (less than 2 acres) in 2018 as compared to 2013.

Based on the land use data provided, the existing and forecast conditions DNL contours do not include any identified historic resources or non-residential noise sensitive land uses outside of the airport boundary. One multifamily residential parcel is on the edge and within the DNL 65 dB contour for both the existing and forecast conditions, which results in a total of one housing unit and two persons residing within the DNL 65 dB contour for MRI.

Figure 2-22 Noise Contours



2.10 Meteorological Data

This section presents existing meteorological conditions. According to the National Oceanic and Atmospheric Administration's *2011 Local Climatological Data Annual Summary with Comparative Data,*

"Anchorage is in a broad valley with adjacent narrow bodies of water. Cook Inlet, including Knik Arm and Turnagain Arm, lies approximately 2 miles to the west, north, and south. The terrain rises gradually to the east for about 10 miles, with marshes interspersed with glacial moraines, shallow depressions, small streams, and knolls. Beyond this area, the Chugach Mountains rise abruptly into a range oriented north-northeast to south-southwest, with average elevation 4,000 to 5,000 feet and some peaks to 8,000 or 10,000 feet. The Chugach Range acts as a barrier to the influx of warm, moist air from the Gulf of Alaska, so the average annual precipitation is only 10 to 15 percent of that at stations located on the Gulf of Alaska side of the Chugach Range. The Alaska Mountain Range lies in a long arc from southwest, through northwest, to northeast, approximately 100 miles distant from Anchorage. During the winter, this range is an effective barrier to the influx of very cold air from the north side of the range.

The four seasons are well marked in Anchorage. In the summer, high temperatures average about 60 degrees and low temperatures nearly 50 degrees. Temperatures in the 70s are considered very warm. On summer days, temperatures on the east side of Anchorage may be about 10 degrees warmer than the official airport readings[13]. Rain increases after mid-June. About two-thirds of the days in July and August are cloudy and one-third have rain.

Autumn is brief, beginning in early September and ending by mid-October. Temperatures begin to fall in September with snow becoming more frequent in October. Winter can be considered as mid-October to early April when streams and lakes are frozen. Temperatures steadily decrease into January when the highs are near 20 degrees and lows near 5 degrees. The coldest weather is normally in January, when very cold days have high temperatures below zero. Cold days generally have clear skies and calm wind. Mild days do occur with temperatures in the 30s. On cold winter nights, temperatures on the east side of Anchorage may be 10-20 degrees lower than airport readings on the west side. Most winter precipitation is snow, but rain may occur on a few days.

Annual snowfall varies from about 70 inches on the west side to about 90 inches on the east side of Anchorage at low elevations. Along the Chugach Mountains, snow totals increase

[13] The official airport reading is taken at Ted Stevens Anchorage International Airport. The airport station was located at MRI from 1943 to 1953).

steadily with increasing elevations and winter arrives a month earlier and stays a month longer at the 1,000 to 2,000 foot level. Most snow is light or dry, i.e., low in water content. Freezing rain is extremely rare. Fog, made of water droplets, occurs on about 15 days. In general, ice-fog does not occur in Anchorage.

Spring begins in late April and May when days are warm and sunny, nights are cool, and precipitation is exceedingly small. Foliage turns green by late May. The wind in Anchorage is generally light. However, on several days each winter, strong northerly winds, up to 90 mph, affect the entire Anchorage area. Also during the winter there are about eight occurrences of very strong southeast winds which affect only the east side of Anchorage and the slopes of the Chugach Mountains. These winds occur more often above the 800 feet elevation in the Chugach where winds are funneled thru creek canyons. On the east side of Anchorage, damaging winds of over 100 mph have been recorded.

The average occurrence of the first snow is mid-October, but has occurred as early as mid-September. The average date of the last snow is mid-April, but has occurred as late as early May.

The growing season is about 125 days. Average occurrence of the last temperature of 32 degrees in spring is mid-May and the first in fall is mid-September. Daylight varies from about 19 hours in late June to 6 hours in late December with 12 hours of daylight occurring in late September and late March."

2.11 Land Use

This section summarizes the existing land uses on MRI, adjacent land uses, and leases.

2.11.1 Existing Land Use

The dominant land use on MRI is transportation related. This category includes land used for runways, taxiways, and aprons.

The UAA Aviation Technology Center is located at the east side of MRI. They train pilots, mechanics, and air traffic controllers. They also provide education on airport administration and management.

The Center includes an interactive 360-degree tower simulator, flight simulators, and an experimental weather forecast facility.

MRI has an aircraft campground with picnic area at the east end of Taxiway Q.

A portion of land south of 15th Avenue is used as a park (Sitka Street Community Use Area). Other MRI-owned land in the area is used by the MOA as a snow disposal site during the winter.

2.11.2 FAA Land Compliance Report

As the planning and development of MRI has been financed in part with Airport Development Aid Program (ADAP) and AIP funds administered by the FAA, MRI is required to meet certain grant assurances. Land acquired with federal funds cannot be used for non-airport purposes without the consent of the FAA or without providing fair market value compensation. A recent informal FAA compliance investigation indicated several out-of-compliance concerns at MRI. The biggest concern was the 15 properties considered non-aeronautical uses. Many of these properties are used by other governmental entities and generate revenue for the airport. These properties are considered "airport purposes" because they help MRI remain financially self-sustaining. Other properties, such as the land for Sitka Street Community Use Area, help the airport maintain positive airport-community relations and are considered an "airport purpose."

2.11.3 Existing Leases

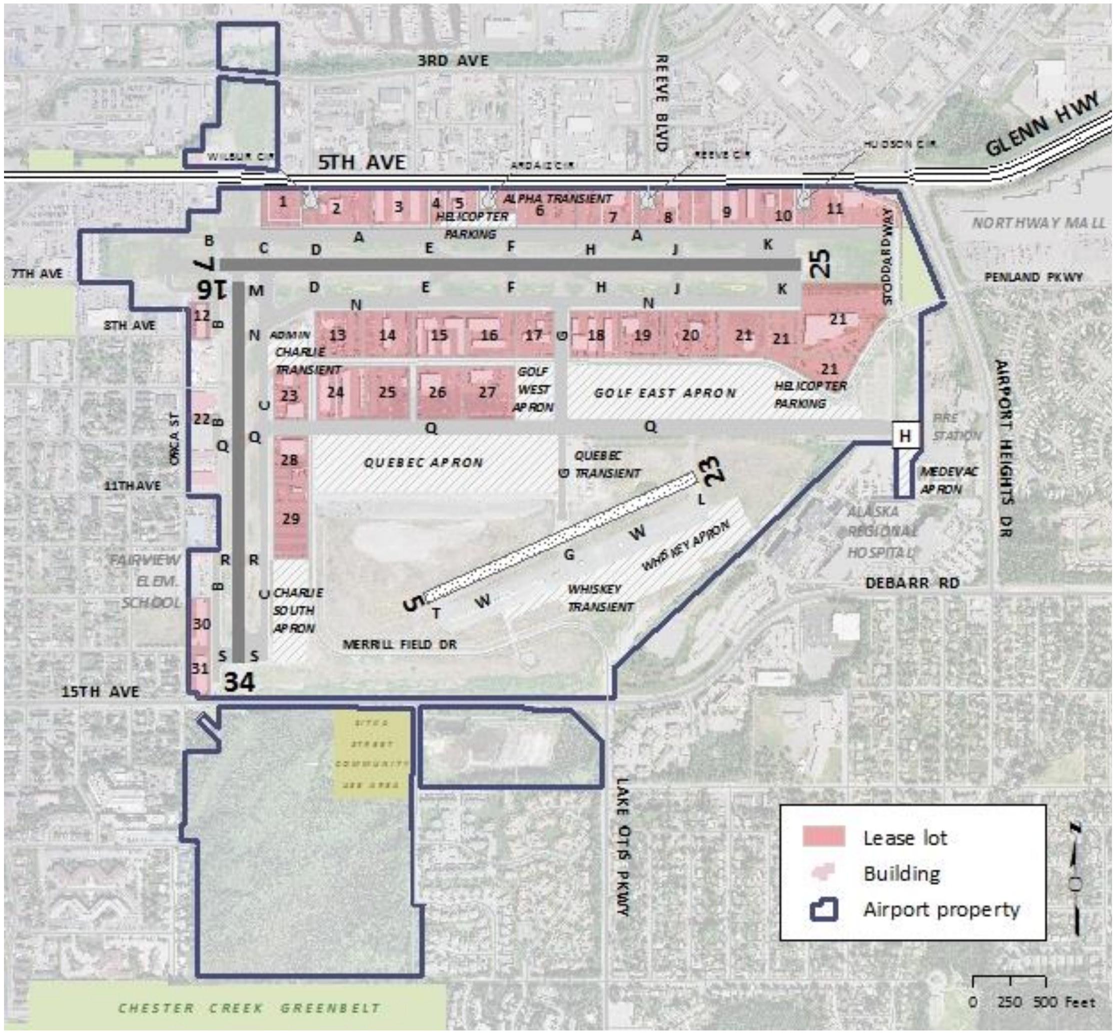
In 2013, approximately 3,377,964 square feet of MRI property was under lease. According to the ALP, there are 28 commercial leaseholds; some sublease part or all of their property. Table 2-8 and Figure 2-23 summarize existing commercial leases on MRI. There are also 20 individual leases for the T-Hangar lots.

Table 2-8 Existing Leaseholders

Map Index	Leaseholder/Business Name (If applicable)
1	Fox Papa/Alyeska Helicopters
2	Wild Country/Lake and Peninsula Airways
3	Slipstream Hangars Condo Association
4	Civil Air Patrol
5	Merrill Field Air Traffic Control Tower
6	Paramount Investments, LLC/Chaz AC Painting
7	Hiller LLC/Wings of Freedom
	Hiller LLC/Land and Sea Aviation
	Hiller LLC/Sky Airparts
	Northland Hangars/Reeve Airmotive
	Northland Hangars/Alsco Aviation
9	Chugach Hangars Owners Assn.
10	North Edge/Tanalian Aviation
11	Stoddard's Aero Service, Inc.
	Aero Star/Northern Lights Avionics
	Aero Star/Merrill Field Instruments
	Aero Star/Pratt Aviation
	Aero Star/ADS-B Technologies
	Aero Star/Aviation Fuel Service
13	Spernak Airways, Inc.
14	Rogers Park Hangars
15	Dan's Hangars Condominium Association Dan's Aircraft Repair
16	Pacific Alaskan Airways LLC
17	Kontor Development LLC
18	ACE Hangar Owners Association/Alaska Air Transit
	ACE Hangar Owners Association/Alaska Air Carriers Association
	ACE Hangar Owners Association/Resolution 3D
	ACE Hangar Owners Association/ACE Fuels
	ACE Hangar Owners Association/Zita Air Service
19	Aero Twin, Inc.
20	A&W Services/Alaskan Aircraft Engines
	A&W Services/Lake Clark Air Service
21	UAA Aviation Technology Division
22	Jayhawk Air
24	T-Hangars (20 individual leases)
25	A.C.E. Flyers, Inc./JayHawk Air
26	Erickson Air Crane
	Quantum Spatial
	Executive Hangars Owners Association/Dena'ina Air Taxi
	D&D Airpark/Clearwater Air
	North Start Hangars Association
	Janssen Hangars Owners Association
	Premier Hangars Owners Association
	SkyTrek Alaska Flight Training
	Orca Hangars Owners Association

*** As of March 2014, this lease was transitioning to a new owner.**

Figure 2-23 Existing MRI Lease Lots



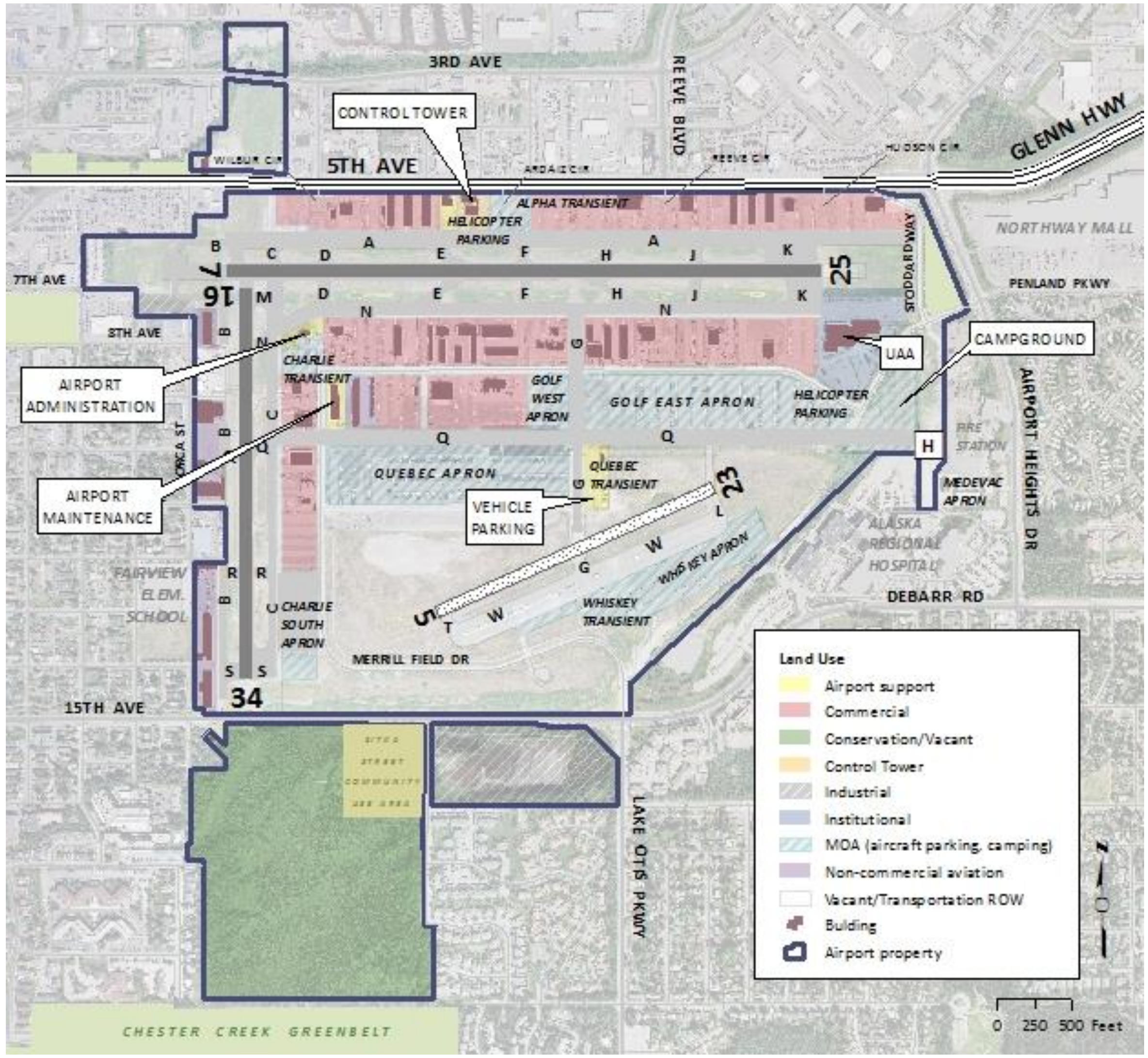
Source: Merrill Field Airport Lease Holders Map, Revised ALP 2010, MRI

2.11.4 Adjacent Land Use

Figure 2-24 shows the land uses adjacent to MRI based on 2010 Geographic Information System (GIS) data obtained from the MOA. MRI is situated between three community councils (Fairview, Airport Heights, and Mountain View).

The area west of MRI is mostly residential except for some commercial development near 5th Avenue and Fairview Elementary School. The area becomes more commercial in nature as it approaches downtown. South of 15th Avenue, the area outside the MRI boundary in Airport Heights is mostly residential. On Debarr Road, between Lake Otis Parkway and Airport Heights Drive, there is some residential and commercial development, but it is primarily public/institutional lands. Institutional uses in the area include Alaska Regional Hospital and North Star Behavioral Health. Between the MRI boundary and Airport Heights,

Figure 2-24 Adjacent Land Uses



Source: MOA Land Use GIS data, 2010

this area is institutional (the Anchorage Fire Department). East of Airport Heights, the area is residential south of Penland Parkway and commercial (Northway Mall) to the north.

The area along and north of 5th Avenue in Mountain View is mostly commercial and industrial with small pockets of residential and public/institutional uses.

2.12 Zoning

Zoning is a type of land use regulation that delineates a community into districts and imposes development requirements within each area (zone). Zoning typically regulates allowable land uses, building and site requirements, and the allowable density of each use. The zoning designation indicates how the MOA intends for the land to be used; it does not necessarily reflect how it is currently being used. Most of MRI is zoned I-1, which is for urban and suburban light manufacturing, processing, storage, wholesaling, and distribution operations. A limited amount of commercial use is allowed in an I-1 district. Residential uses are not permitted except as an accessory use in the same building as the principal use. The rest of MRI is zoned PLI for public lands and institutions.

Airport Height Zones are codified in the zoning regulation – Anchorage Municipal Code (AMC) 21.65. They are used to implement Part 77 of the Federal Airway Regulations to provide safe approach paths to certain airports by limiting development heights (see Figure 2-8). The Airport Height Zone contours for MRI are shown on the MOA's official zoning maps. The contours give the maximum elevation above MSL allowed for structures, including radio antennas. Plot plans for building and land use permits within Airport Height Zones may be required to show elevations referenced to mean sea level to verify that structures don't encroach vertically into the airport approaches or other airport operating areas. The Airport Heights Zoning Map for MRI was prepared by USKH Engineering and is dated January 2004.

2.13 Related Plans, Programs and Projects

This section summarizes existing plans, programs and projects at MRI.

2.13.1 MRI Plans

2.13.1.1 MRI Strategic Plan

The 2012 MRI Business Plan/Updated Strategic Plan describes the airport's mission statement, goals and objectives. The airport's mission statement is "Merrill Field Airport is committed to operating and maintaining a safe and efficient airport that meets the aviation and business needs of the community."

The goals are:

- Enhance the Airport's role as the major general aviation transportation facility serving Anchorage and outlying areas within Alaska by providing services that promote and encourage use of the Airport by the general aviation community.
- Develop an overall Airport strategy, including leasing policies, that attracts aviation support services and related businesses to Merrill Field and encourage long- and short-term private sector investments. This, plus sound fiscal management, will enable Merrill Field to increase its value, both to its customers and to its owner, the Municipality of Anchorage.
- Understand and be responsive to our customers. This will allow us to better meet their needs by providing the services and facilities they desire. Maintain those facilities in a fully functional, efficient and safe condition by continually improving their utility, quality, and appearance.
- Maximize the use of Federal AIP grants to provide facilities that will safely and adequately meet the needs of general aviation.

2.13.1.2 Merrill Field AMP

The most recent MRI AMP was adopted by the MOA in 2000 to guide future development and ensure the airport remains a viable air transportation facility. The objective of the AMP is to provide a long-range perspective to guide development at the airport. The AMP also places priority on supplying aviation services to the surrounding area since it is considered a convenient general aviation facility. The plan identifies the need to acquire property to meet runway design standards, to maintain compatible land uses, and for airport expansion; it also examines needs to improve the airfield, air traffic control facilities, general aviation facilities, and air taxi facilities. Proposed in the plan are improvements to airport access and parking (MOA 2000). A list of projects recommended in the 2000 MRI AMP and their current status is found in Table 2-9. This plan is an update to the 2000 MRI AMP.

Table 2-9 Status of the 2000 Airport Master Plan Recommended Improvements

Phase	Project Description	Status
Phase 1 Improvements (2000–2005)		
Land Acquisition	Acquire land along Orca Street (3 acres and 2 acres) and south of E 15th Ave (1 acre)	In Progress
Airfield	Reverse Taxiways F and H and close Taxiways E and G on both sides of Runway 5-23 (1,000’ x 35’)	Completed
	Add exit taxiway west of Runway 16-34 (100’ x 35’)	In Progress
Airspace and Navigational Aids	Install medium-intensity taxiway lighting (MITL) on new paved taxiways (2,200 l.f.)	Completed
	Relocate Airport beacon	Completed
	Relocate lights on Quebec 2 apron (two lights)	Completed
	Relocate lights on Quebec 3 apron (one light)	Completed
	Relocate lights along Merrill Field Drive (five lights)	Not Yet Undertaken
	Remove or top trees off Runways 5 and 34	In Progress
	Remove upper floors of former FAA ATCT	Completed
Landfill Area Development	Build gravel/ski Runway 5-23 (2,000’ x 100’) and associated taxiways (4,300’ x 35’)	Completed
	Construct groomed snow areas for ski deceleration (300,000 s.f.)	In Progress
	Add connecting taxiway from gravel ski runway to Taxiway Q (200’ x 35’)	Completed
	Provide aircraft parking apron south of gravel/ski runway (500,000 s.f.)	Completed
	Improve gravel perimeter/service road to south (900’ x 16’)	Completed
	Install security fencing (4,300 l.f.)	Completed
	Install two aircraft gates and two vehicular gates	Completed
	Provide gravel access road south of Quebec 3 apron (2,200 l.f.)	Not Yet Undertaken
	Expand long-term vehicular parking (50,000 s.f.)	Completed
Terminal Area	Develop hangars west of Runway 16-34 (32 hangars)	In Progress
	Provide pilots’ shelter (50’ x 40’) and vehicular parking	Not Yet Undertaken

	Develop additional lease lots	Completed
	Remove former FAA Flight Service Station and restore site	Completed
Airport Access and Parking	Add vehicular parking along Merrill Field Drive (250’ x 20’)	Completed
Airport Support and Infrastructure	Replace existing gate operator system (33 gates)	In Progress
	Upgrade public address system	Not Yet Undertaken
	Install barrier gate at Taxiways G and Q	Completed
	Install reader board signage at three locations	Completed
	Increase height of existing fencing from 5 to 8 feet (15,600 l.f.)	Completed
	Provide snow storage areas (grading and drainage)	Completed
	Remove building along North Frontage Road	Completed
	Add aircraft wash facility (60’ x 60’)	Completed
	Acquire equipment for gravel/ski runway	Not Yet Undertaken
	Remove buildings along Orca Street	In Progress
	Extend perimeter security fencing along Orca Street (1,400 l.f.)	Completed
Phase 2 Improvements (2006–2010)		
Land Acquisition	Acquire Anchorage Fire Department land (8 acres) and acquire navigation easements (Runways 7 and 16)	In Progress
Airfield	Widen Taxiway M (100’ x 100’)	Completed
	Extend Taxiway B (800’ x 35’)	In Progress
	Add exit taxiways west of Runway 16-34 (200’ x 35’)	In Progress
Airspace and Navigational Aids	Install MITL on new paved taxiways (1,800 l.f.)	Completed
	Install VASIs on Runway 5-23	Not Yet Undertaken
Terminal Area	Develop hangars west of Runway 16-34 (24 hangars)	In Progress
	Develop aircraft storage shelters on Quebec 3 apron (two 16-unit shelters [400’ x 50’])	Not Yet Undertaken

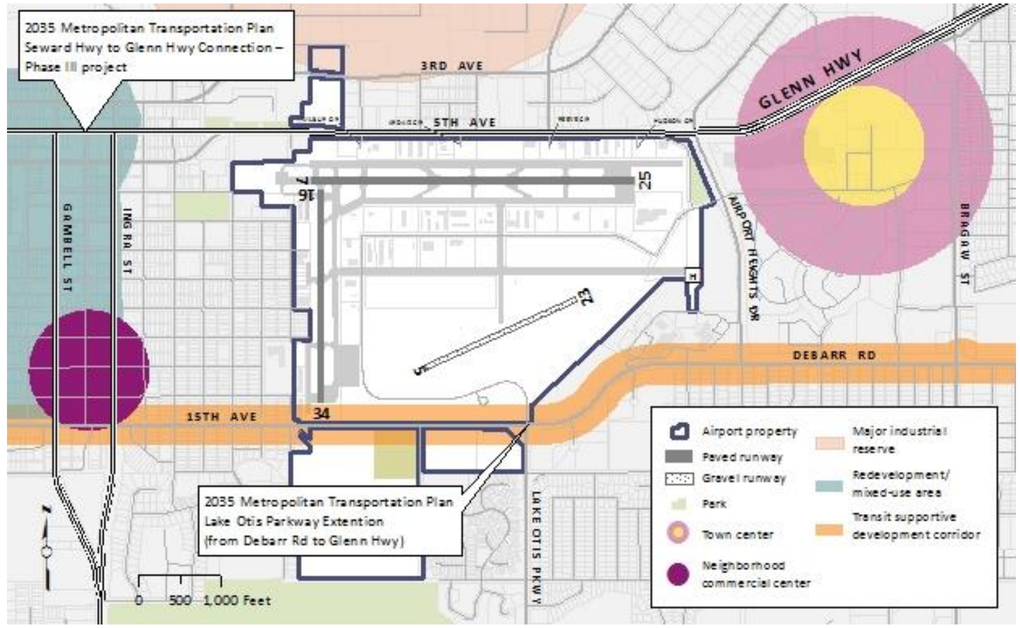
Airport Support and Infrastructure	Install additional tie-down electrical outlets	In Progress
	Remove buildings along Orca Street	In Progress
	Provide paved perimeter/service road to northwest (2,200’ x 16’)	Not Yet Undertaken
	Add aircraft de-icing facility (100’ x 60’)	Not Yet Undertaken
	Expand/remodel Airport Administration offices (4,000 s.f.)	Not Yet Undertaken
Phase 3 Improvements (2011–2020)		
Airfield	Extend Taxiway B (650’ x 35’)	In Progress
	Add exit taxiway on Runway 16-34 (100’ x 35’)	In Progress
Airspace and Navigational Aids	Install MITL on new paved taxiways (1,800 l.f.)	Completed
	Install VASIs on Runway 5-23	Not Yet Undertaken
Terminal Area	Develop public terminal building (12,000 s.f.)	Not Yet Undertaken
	Expand campground aircraft parking (700’ x 200’)	Not Yet Undertaken
	Develop hangars west of Runway 16-34 (24 hangars)	In Progress
	Develop aircraft storage shelters on Quebec 2 apron (three 12-unit shelters [300’ x 50’])	Not Yet Undertaken
Airport Access and Parking	Provide vehicular parking at public terminal (40,000 s.f.)	Not Yet Undertaken
Airport Support and Infrastructure	Remove buildings along Orca Street	In Progress

2.13.2 MOA Plans

2.13.2.1 Anchorage 2020 Comprehensive Plan

"Anchorage 2020" is the Anchorage Bowl Comprehensive Plan, adopted by the Anchorage Assembly in February 2001 and amended in September 2002 to serve as a guideline for future development in the Anchorage Bowl. The Land Use Policy Map (Figure 2-25) summarizes the major land use policies identified in Anchorage 2020. MRI is adjacent to several different policy areas including a transit supportive development corridor and a town center. These policies are summarized in Table 2-10.

Figure 2-25 Anchorage 2020 Land Use Policy Map



Source: 2035 MTP, Anchorage 2020

2.13.2.2 Interim 2035 Metropolitan Transportation Plan

The Anchorage Metropolitan Area Transportation Solutions (AMATS) Metropolitan Transportation Plan (MTP) identifies transportation projects needed in the Anchorage Bowl and Chugiak/Eagle River by the year 2035. The most recent MTP was adopted by the AMATS Policy Committee in 2015. While the MTP does not make recommendations for airspace or operations improvements to MRI, it does recommend improvements to nearby roadway network. The recommended Seward Highway to Glenn Highway Connection – Phase III project has the potential to impact MRI. An extension of Lake Otis Parkway (from Debarr Road to the Glenn Highway) could impact MRI; however, this is an illustrative project, meaning it is not funded in the current MTP and is likely to occur after the year 2035. The Interim 2035 Metropolitan Transportation Plan confirms that the 2035 MTP as a valid document that allows time for documentation and completion of the 2040 MTP.

Table 2-10 Anchorage 2020 Major Policy Areas

Major Policy Area	Description
Midtown and Downtown Major Employment Centers	A major employment center is the most intensely developed portion of the Anchorage Bowl and serves as a focal point for the highest densities of office employment (more than 50 employees per acre), with supporting retail and commercial uses.
Midtown and Downtown Redevelopment/Mixed-Use Areas	A redevelopment/mixed-use area is an area to be developed at medium and high densities to allow people to live closer to work. Redevelopment/mixed-use areas are to be located near major employment centers. District plans that refine Anchorage 2020's vision for these areas have been developed. The Anchorage Downtown Comprehensive Plan was adopted in 2007 and is in the process of being implemented, and a public review draft of the Midtown District Plan has also been developed. Both plans are discussed later in this chapter.
Ship Creek Industrial Reserve	An industrial reserve, as described in the comprehensive plan, contains large vacant areas zoned for industrial use and is strategically located near important transportation facilities such as the Ted Stevens Anchorage International Airport, the Port of Anchorage, the railroad yard, and the highway system. Access to an efficient transportation network is important for the movement of goods around the city and state. The Alaska Railroad Corporation has a master plan for this area and is currently pursuing an intermodal transportation center and associated improvements (pedestrian amenities, transit infrastructure, etc).
Northway Mall Town Center	Town centers are to be the focal points for sub-areas within the Anchorage Bowl. Town centers should have a mix of retail shopping and services, public facilities, and medium- to high-density residential areas. The only town center in the study area is the Northway Mall. Recent nearby retail developments (including Glenn Square Mall and Tikahtnu Commons), however, were not anticipated when this plan was developed; consequently, this area may develop differently than planned.
Mountain View and Fairview Neighborhood Commercial Centers	A neighborhood commercial center is similar to a town center but on a smaller scale. The vision for such a center in Mountain View is refined in the Mountain View Neighborhood Plan, which is discussed later in this chapter. A plan for Fairview is currently being developed and is also discussed later in this chapter.
15th Avenue/Debarr Road Transit-Supportive Development Corridor	A transit-supportive development corridor represents "optimal locations for more intensive commercial and residential land use patterns that will support and encourage higher levels of transit service."

2.13.3 Other Plans

2.13.3.1 Anchorage Area General Aviation System Plan

The purpose of the Anchorage Area General Aviation System Plan was to forecast general aviation activity and identify future aviation system requirements for general aviation facilities and services with the MOA. The plan indicated that based aircraft and operations within the MOA are expected to increase in the future. The plan made several recommendations about needed improvements to the airport system with one of the main recommendations being the need to develop an additional public-use float plane base.

The plan expected the primary role of MRI was to continue serving general aviation activity.

2.13.3.2 JBER Installation Complex Encroachment Management Action Plan

JBER is developing an Installation Complex Encroachment Management Action Plan to address current and future encroachment and sustainment challenges. The plan is to provide a snapshot of current encroachment issues and look at ways to address future concerns. One of the primary purposes of the plan is to identify engagement strategies that JBER could use to discuss potential concerns with other stakeholders. This plan was completed in November 2012.

2.13.3.3 Fairview Community Plan

The Fairview Community Council developed a Fairview Community Plan to provide a community vision that can guide future private and public investment. This plan was approved with amendments by the Anchorage Assembly on September 9, 2014.

2.14 Financial Data

This section will summarize MRI's existing financial resources including its operating revenues and expenses as well as the sources and uses of capital funds.

MRI is both a public service and a business. As a business, MRI has the ability to generate revenue to meet its expenditures. In fact, MRI is expected to operate in a financially self sustaining manner. It is operated by the MOA as an enterprise fund, meaning its income and expenses are accounted for separately from other MOA funds. In 2010, MRI had an operating revenue of $1,325,745 and an operating expense of $3,346,323 ($1,123,707 excluding depreciation). Table 2-11 shows the breakdown of operating revenues and expenditures for 2010. Major sources of revenue for MRI include leases, rents, parking fees, and aircraft tie down fees.

11.60.200 of the AMC establishes the mandatory fees and charges at MRI.

Table 2-11 Operating Revenue and Expenses, 2010

Description	Data
Operating Revenue	
Airport Lease Fees	$527,008
Airport Property Rental	$399,945
Permanent Parking Fees	$257,690
Transient Parking Fees	$12,848
Vehicle Parking	$22,943
MOA Aviation Fuel Fees	$40,761
SOA Aviation Fuel Fees	$15,628
Medevac Taxiway Fees	$47,715
Other Revenue	$1,207
Total Operating Revenue	**$1,325,745**
Operating Expense	
Labor	$995,463
Supplies	$96,744
Charges to Others	($468,587)
Charges from Others	$155,917
Other Services	$79,378
Other Expenses	$227,851
Municipal Enterprise Service Assessment	$36,941
Depreciation*	$2,222,616
Total Operating Expense	**$3,346,323**

***includes all previous capital improvement projects (funded by MRI's contribution and grants received) such as runways, taxiways, and aprons.**

Table 2-12 MRI Fees and Charges

Description	Fee
Parking	
Daily transient (0-6 hours)	No charge
Daily transient (6-24 hours)	$5.00
Tie-down Spaces	
Tail-end	$60/month
Pull-through	$70/month
Impoundment	
Basic	$50.00
24-hour storage	$5.00
Motor vehicle parking	
Daily (0-24 hours)	$5.00
Long-term (20-foot space)	$45/month
Long-term (40-foot space)	$55/month
Fuel flowage fee	$0.08/gallon

These fees were last adjusted on January 1, 2015 (and will be adjusted annually). The current fees are shown in Table 2-12.

Leaseholders pay a monthly fee based on the square footage leased. The 2015 current lease rate is $0.208 per square foot per year.

MRI's capital improvements are funded through FAA's AIP grant program. Table 2-13 shows the most recent FAA AIP grants MRI has received. Appendix E includes a complete listing of AIP grants received by MRI from 1982 to 2013.

MRI also funds some improvements without FAA funds. Recent and planned non-FAA funded improvements include:

- 901 Orca St. Boiler Replacement
- Orca St. building upgrades
- Parallel Taxiway B from Taxiway M to Q

Table 2-13 MRI Airport Improvement Program Projects, 2010 -- 2013

Project Number	Project Description	Obligated	Closed	Entitlement	Discretionary	TOTAL
3-02-0015-049-2010	Acquire Snow Removal Equipment Acquire SRE (part C) (ST EQ SN)	6/7/2010	7/3/2013	$83,896	$569,704	$653,600
3-02-0015-050-2010	Rehabilitate Runway 16/34 Rehab. Runway (RE RW IM)	3/15/2010	8/22/2013	$274,346	$2,861,218	$3,135,564
3-02-015-050-2010	Install Runway Vertical/Visual Guidance System 16/34 Replace Rwy 34 non-fed PLASI with non-fed PAPI (ST RW VI)	3/15/2010	8/22/2013	$250,000	$0	$250,000
3-02-0015-051-2010	Acquire Land for Approaches Acquire Land (ST LA SZ)	7/16/2010		$313,500	$0	$313,500
3-02-0015-052-2010	Remove Obstructions Remove structure and obstructions (ST OT OB)	8/31/2010		$152,000	$0	$152,000
3-02-0015-053-2011	Acquire Snow Removal Equipment Acquire SRE – Replace Sweeper/Vacuum Truck (ST EQ SN)	9/27/2011		$323,000	$0	$323,000
3-02-0015-054-2011	Conduct Airport Master Plan Study Conduct Airport Master Plan Phase I (PL PL MA)	8/26/2011		$608,000	$0	$608,000
3-02-0015-055-2011	Rehabilitate Taxiway Rehabilitate Taxiway Quebec – Phase 2 (RE RW IM)	6/8/2011		$2,253,400	$0	$2,253,400
3-02-0015-056-2011	Acquire Safety Equipment and/or Fencing Fencing, Signage, Lighting (VPD reduction) (SA EQ RF)	9/9/2011		$392,000	$157,100	$549,100

Project Number	Project Description	Obligated	Closed	Entitlement	Discretionary	TOTAL
3-02-0015-057-2012	Rehabilitate Taxiway Rehabilitate Taxiway Quebec – Phase 3 (RE TW IM)	5/17/2012		$1,000,000	$1,437.500	$2,437,500
3-02-0015-058-2012	Acquire Safety Equipment and/or Fencing Fencing, Signage, Lighting (VPD reduction) Phase 2 (SA WQ RF)	8/27/2012		$0	$1,560,000	$1,560,000
3-02-0015-059-2013	Acquire Snow Removal Equipment (ST EQ SN)	8/8/2013		$937,500	$0	$937,500
02-0015-060-2013	Rehabilitate Runway Lighting 16/34 (RE RW LI)	8/27/13		$1,012,500	$0	$1,012,500

Note: A complete list of AIP projects since 1982 is available in Appendix E of this document.

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3.0 AVIATION DEMAND FORECAST

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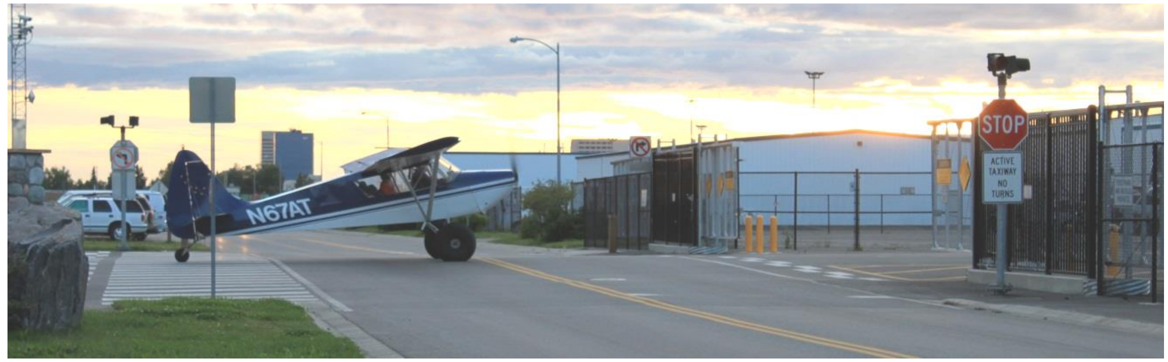


3.1 Introduction

Aviation demand forecasts are a primary master planning tool to help determine that existing MRI facilities are adequate to meet future demand. This chapter presents a 5-, 10-, and 20-year aviation forecast for MRI using 2013 as the base year based on the forecast process described in FAA AC 150/5070-6B.

3.2 Industry Trends

3.2.1 National Trends

National aviation trends often are not directly applicable in Alaska because many communities rely on air travel as their primary mode of transportation. The location of MRI is an urban area in Alaska's largest city and has a variety of users, national trends may be more relevant.

The *FAA Aerospace Forecast Fiscal Years FY 2012– 2032* identifies national aviation trends. The 20-year forecast is relatively optimistic with passenger and operations totals expected to rise as the economy continues to recover. The main aviation sector that affects MRI is general aviation (GA). On the national level, the GA industry struggled in 2010 with the third consecutive year of decline in new aircraft shipments. Operations showed mixed results with traffic at towered airports and consolidated facilities declining while rising at FAA en route centers. Overall, the general aviation segment is expected to increase in the future due largely to increased use of business jets and new products like light sport aircraft.

The forecast indicates that enplanements are expected to grow with regional carriers (similar to those at MRI) growing faster than mainline carriers.

In recent years, cargo activity has been impacted by changes such as security regulations and the increased use of mail substitutes (e.g., emails and faxes). The forecast expects revenue ton miles to increase over the forecast period in response to economic growth.

3.2.2 State Trends

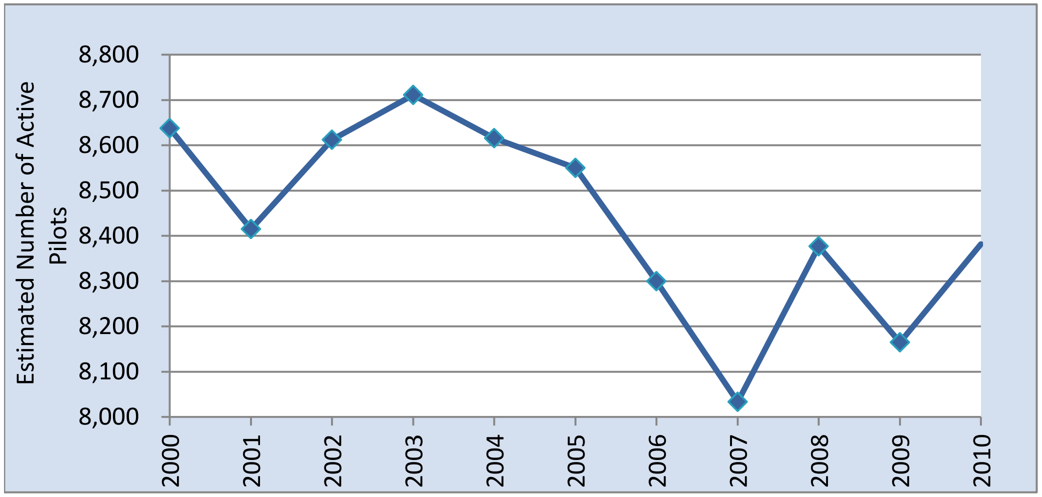
In Alaska, there are 255 airports owned by the DOT&PF and an additional 140 public airports owned by other entities such as the City of Kenai's Kenai Municipal Airport and the City and Borough of Juneau's Juneau International Airport.

While population and income levels have increased over the past decade (see Section 3.6.2), 10-year historic trends in the number of total active pilots in Alaska has decreased. Between 2000 and 2010, the number of total active pilots in Alaska decreased from 8,638 to 8,382 (see Figure 3-1). This is an average annual decline of 0.30 percent.

The historic trend for number of student pilots in Alaska has also declined (Figure 3-2). However, in 2010, the FAA increased the length of time the student pilot certificate was valid from 36 to 60 months. This resulted in more people retaining the student status, which contributed to a substantial increase in the 2010 number. As a result, data for 2010 and later is not directly comparable to previous years because of the difference in reporting.

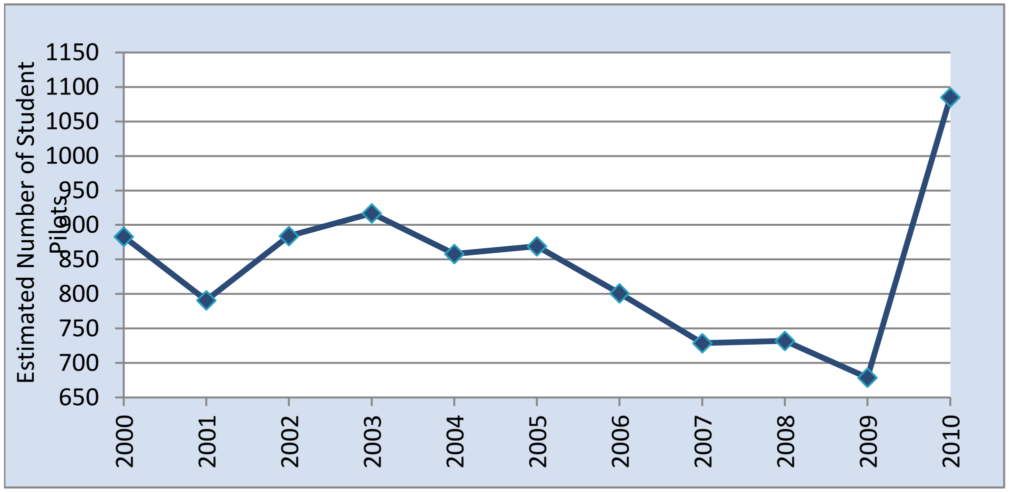
A query of the FAA Airmen Certification Registration Database in March 2012 showed the total number

Figure 3-1 Estimated Number of Active Pilots in Alaska, 2000–2010



Source: FAA U.S. Civil Airmen Statistics. Accessed on March 1, 2012 at http://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics / . Data are from multiple years.

Figure 3-2 Student Pilots in Alaska, 2000–2010



Source: FAA U.S. Civil Airmen Statistics. Accessed on March 1, 2012 at http://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics / . Data are from multiple years.

of registered pilots in Alaska as 9,336[14]. From that number, HDR removed the number of people listed with no medical certification[15] (3,321).

As a result, there are approximately 6,015 registered pilots in Alaska (with current medical certificates). Of this number, 2,777 (approximately 46%) have an MOA address.

3.2.3 Local Trends

MRI serves as the general aviation link between Anchorage and other Southcentral Alaskan communities. It provides many services including aircraft fuel, hangar rental, flightseeing, flight and ground school instruction, rentals, college courses for aviation degree-seeking students at UAA, and a direct taxiway connection to Alaska Regional Hospital.

Activity at Anchorage area airports has been declining over the past 20 years for a variety of reasons including high fuel prices, lack of new pilots, shortage of affordable aircraft, fewer flight schools, and changing economic conditions.

Some local trends that support aviation activity include improved weather reporting, availability of better avionics, more availability of tiedown spaces, gravel/ski strip at MRI that will allow better access by planes with tundra tires/skis, and no increase in the MOA personal tax on aircraft.

[14] The actual number of registered pilots is likely to be higher as people can opt out of having their information included in the database.

[15] Pilots without a valid medical may be considered a sport pilot (which does not require a FAA medical certificate) or are not allowed to fly.

3.3 Forecast Methodology[16]

The proposed methodology for the MRI air traffic forecast update is based on the process recommended in FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans* Chapter 7 (May 2007) and *Forecasting Aviation Activity by Airport* (FAA 2001). These documents provide national guidance for the preparation of AMPs and are recommended for use in preparing individual AMP forecasts. The AC has been the primary guidance in the preparation of master plans since enactment of the Airport and Airways Development Act of 1970. FAA recommends a seven-step process for the development of aviation forecasts. The recommended steps are:

[16] The air traffic forecast was developed in 2012 and early 2013 based on data available at that time. It was approved by the FAA in June 2013. When available, additional information has been added to this section but the forecast was not revised.

Step 1. Identify aviation activity measures

Step 2. Review previous airport forecasts

Step 3. Gather data

Step 4. Select forecast methods

Step 5. Apply forecast methods and evaluate results

Step 6. Compare forecast results with FAA's Terminal Area Forecasts

Step 7. Obtain approval of the forecasts

3.4 Step 1 - Identify Aviation Activity Parameters and Measures to Forecast

The type and level of aviation activity anticipated at an airport identifies the parameters and measures to be forecast. At MRI, the majority of the activity is general aviation.

This forecast focuses on the following parameters:

- Based aircraft
- Aircraft operations – air taxi and general aviation
- Passenger enplanements
- Air cargo – freight and mail

3.5 Step 2 - Collect and Review Previous Airport Forecasts

This step recommends reviewing existing FAA and other related forecasts for MRI and the area as these forecasts can provide insight into aircraft demand in the area. Relevant forecasts to be reviewed are:

- Merrill Field FAA Terminal Area Forecast (2012)
- Merrill Field AMP (2000)
- 2011–2015 NPIAS

3.5.1 Merrill Field FAA Terminal Area Forecast (2012)

The FAA Terminal Area Forecast (TAF) is the official forecast of aviation activity at FAA facilities. The TAF reports passenger enplanements, aircraft operations, and based operations for four major user groups: air carriers, air taxis and commuters, GA, and the military. A further division is made between local and itinerant aircraft operations.

Table 3-1 shows the air traffic forecast for MRI for fiscal years 1990 to 2040.

Table 3-1 2012 FAA Terminal Area Forecast for MRI, 1990–2040

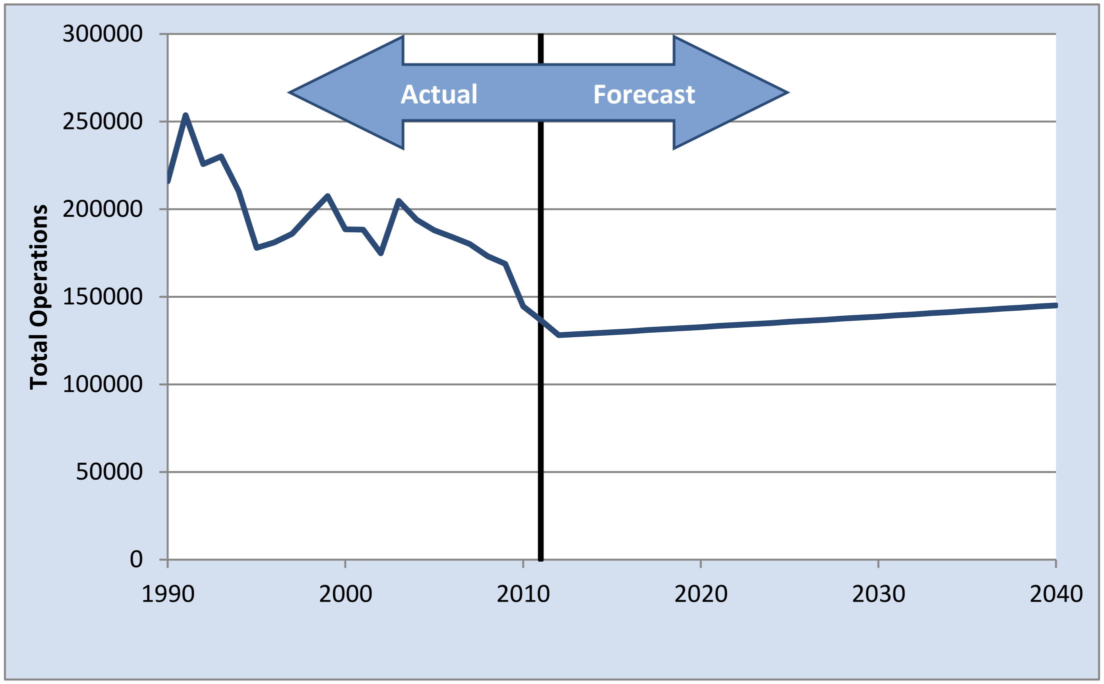
	Passenger Enplanements			Aircraft Operations							
				Itinerant Ops				Local Ops			
Year	Air Carrier	Commuter	Total	Air Carrier	Commuter/Air Taxi	GA	Military	Civil	Military	Total Ops	Based Aircraft
1990	**0**	**734**	**734**	**0**	**9,615**	**79,778**	**0**	**126,424**	**14**	**215,831**	**965**
1991	**0**	**0**	**0**	**0**	**13,139**	**84,363**	**16**	**156,148**	**31**	**253,697**	**965**
1992	0	0	0	0	11,459	79,106	299	134,795	54	225,713	965
1993	0	0	0	0	12,484	80,048	126	137,494	4	230,156	0
1994	0	0	0	0	11,737	78,779	315	117,138	2,288	210,257	965
1995	0	0	0	0	11,053	67,657	560	98,619	70	177,959	965
1996	0	192	192	0	10,248	74,149	413	96,156	45	181,011	965
1997	0	193	193	0	10,342	74,015	23	101,626	0	186,006	966
1998	0	0	0	0	10,607	73,295	17	112,926	10	196,855	966
1999	0	0	0	0	9,090	77,624	19	120,694	4	207,431	966
2000	0	0	0	0	9,387	74,172	4	104,990	2	188,555	966
2001	0	67	67	0	10,517	74,394	171	102,718	473	188,273	966
2002	0	15	15	0	9,929	74,737	34	90,165	2	174,867	966
2003	0	7,470	7,470	0	12,872	80,829	53	110,904	38	204,696	966
2004	0	6,228	6,228	0	14,270	79,992	36	99,676	2	193,976	966
2005	0	5,626	5,626	0	14,756	72,006	97	101,078	4	187,941	966
2006	0	6,896	6,896	0	17,238	70,005	496	96,113	350	184,202	966
2007	0	6,768	6,768	2	16,910	66,892	73	95,505	724	180,106	966
2008	0	6,102	6,102	0	15,744	61,024	845	94,311	1178	173,102	966
2009	0	6,222	6,222	0	15,658	59,840	600	92,341	268	168,707	966
2010	0	5,837	5,837	2	15,100	55,362	128	72,945	924	144,461	965
2011	0	5,983	5,983	1	12,980	58,801	30	64,649	230	136,691	982
2012	0	6,031	6,031	1	13,058	57,516	30	57,186	230	128,021	998
2013	0	6,079	6,079	1	13,136	57,754	30	57,444	230	128,595	1,016
2014	0	6,128	6,128	1	13,215	57,993	30	57,703	230	129,172	1,033
2015	0	6,177	6,177	1	13,294	58,233	30	57,963	230	129,751	1,050

	Passenger Enplanements			Aircraft Operations							
				Itinerant Ops				Local Ops			
Year	Air Carrier	Commuter	Total	Air Carrier	Commuter/Air Taxi	GA	Military	Civil	Military	Total Ops	Based Aircraft
2016	0	6,227	6,227	1	13,374	58,474	30	58,224	230	130,333	1,068
2017	0	6,277	6,277	1	13,455	58,716	30	58,485	230	130,917	1,086
2018	0	6,328	6,328	1	13,536	58,958	30	58,748	230	131,503	1,104
2019	0	**6,379**	**6,379**	**1**	**13,617**	**59,201**	**30**	**59,012**	**230**	**132,091**	**1,124**
2020	0	6,430	6,430	1	13,698	59,445	30	59,277	230	132,681	1,143
2021	0	6,482	6,482	1	13,780	59,690	30	59,544	230	133,275	1,162
2022	0	6,534	6,534	1	13,862	59,936	30	59,812	230	133,871	1,182
2023	0	6,587	6,587	1	13,945	60,183	30	60,081	230	134,470	1,201
2024	0	6,640	6,640	1	14,028	60,431	30	60,351	230	135,071	1,223
2025	0	6,694	6,694	1	14,111	60,681	30	60,623	230	135,676	1,243
2026	0	6,748	6,748	1	14,195	60,932	30	60,896	230	136,284	1,263
2027	0	6,802	6,802	1	14,279	61,184	30	61,170	230	136,894	1,284
2028	0	6,857	6,857	1	14,364	61,437	30	61,446	230	137,508	1,305
2029	0	6,912	6,912	1	14,450	61,691	30	61,722	230	138,124	1,326
2030	0	6,968	6,968	1	14,536	61,946	30	62,000	230	138,743	1,348
2031	0	7,024	7,024	1	14,623	62,202	30	62,279	230	139,365	1,370
2032	0	7,081	7,081	1	14,710	62,459	30	62,559	230	139,989	1,393
2033	0	7,138	7,138	1	14,798	62,717	30	62,840	230	140,616	1,416
2034	0	7,196	7,196	1	14,887	62,976	30	63,123	230	141,247	1,439
2035	0	7,254	7,254	1	14,976	63,237	30	63,407	230	141,881	1,463
2036	0	7,312	7,312	1	15,066	63,499	30	63,693	230	142,519	1,487
2037	0	7,371	7,371	1	15,156	63,762	30	63,980	230	143,159	1,512
2038	0	7,430	7,430	1	15,247	64,026	30	64,269	230	143,803	1,537
2039	0	7,490	7,490	1	15,338	64,291	30	64,558	230	144,448	1,562
2040	0	7,550	7,550	1	15,429	64,557	30	64,849	230	145,096	1,588

Source: FAA TAF

As shown on Figure 3-3, total operations were highest in the early 1990s and have declined since then. The TAF indicates that total operations will be at its lowest in 2012 (128,021). From 2013 to 2040, total operations are expected to gradually increase but will not reach the number of total operations seen in the 1990s and early 2000s.

Figure 3-3 2012 FAA Terminal Area Forecast for MRI Total Operations, 1990–2040



Source: FAA TAF

3.5.2 Merrill Field AMP (2000)

The most recent AMP for MRI was completed in 2000. Table 3-2 shows the aviation demand forecast from the 2000 AMP.

Table 3-2 2000 MRI AMP Aviation Demand Forecast, 1997–2020

	Base Year		Forecast			
	1997	2000	2005	2010	2015	2020
Annual Air Taxi Enplanements	23,000	24,000	29,000	34,000	39,000	44,000
Air Cargo and Mail (tons)	1,850	1,950	2,150	2,400	2,650	2,900
Based Aircraft						
Single-Engine	853	868	900	935	970	1,010
Multiengine	34	36	42	50	58	66
Helicopter	14	16	18	20	22	24
Additional Gravel/Ski	0	0	60	64	68	72
Total Based Aircraft	901	920	1,020	1,069	1,118	1,172
Aircraft Operations						
Air Taxi	10,370	15,700	17,300	19,100	21,100	23,300
General Aviation – Local	103,268	113,500	118,000	128,000	135,800	148,500
General Aviation - Itinerant	73,552	76,200	84,600	89,000	94,300	99,000
Subtotal General Aviation	176,820	189,700	202, 600	217,000	230,100	247,500
Additional Gravel/Ski	0	0	14,600	15,000	16.000	16,000
Total Aircraft Operations	187,190	205,400	233,900	251,100	267,200	286,800
Annual Instrument Operations	1,080	2,500	2,800	3,300	3,900	4,400
Peak Hour Aircraft Operations	90	92	104	112	119	127
Operations per Based Aircraft	218	223	229	235	239	245

Source: 2000 MRI AMP

3.5.3 Birchwood Airport Planning Study Update (2011)

The DOT&PF updated the forecast for Birchwood Airport in December 2011. It was an update of the 2005 AMP. Table 3-3 presents the based aircraft forecast for low-, medium-, and high-growth scenarios.

Table 3-3 Birchwood Airport Based Aircraft Forecast Scenarios (2011–2031)

Year	Low	Medium	High
2011	469	469	469
2016	467	489	497
2021	473	509	526
2031	516	553	590

Source: Birchwood Airport Planning Study Update Forecast Memorandum

3.5.4 Lake Hood and ANC General Aviation Master Plan (2006)

The DOT&PF completed an AMP for Lake Hood and Anchorage International Airport in September 2006. Table 3-4 lists the air traffic forecast from this AMP.

Table 3-4 Forecast of GA Operations at ANC and Lake Hood

Year	Lake Hood Operations Regression Approach	Lake Hood Operations Based Aircraft Approach	ANC GA Operations
2003	58,354	70,723	70,723
2008	63,789	79,242	79,242
2013	65,048	89,173	89,173
2023	67,231	114,442	114,442

Source: Lake Hood and ANC General Aviation Master Plan

3.5.5 2011–2015 National Plan of Integrated Airport Systems (NPIAS)

The NPIAS presents a five-year forecast for enplaned passengers and based aircraft for MRI. Table 3-5 shows the 2011 forecast for the year 2015.

Table 3-5 National Plan of Integrated Airport Systems Passenger Enplanement Forecast for 2015

Passenger Enplanements	15,206
Based Aircraft	965
Hub Type	Non Hub
Role	Commercial Service - Primary

Source: NPIAS

3.5.6 Alaska Aviation System Plan Final Forecasts (2011)

The DOT&PF is developing an Alaska Aviation System Plan. While the plan is still in progress, a forecast was published in June 2011. The purpose of the forecast was to provide updated information for the NPIAS airports. Table 3-6 lists the MRI forecast from this report.

Table 3-6 MRI Alaska Aviation System Plan Forecast (2008–2030)

	2008	2015	2020	2030
Passenger Forecast (enplanements)	6,186	6,908	7,626	9,221
Cargo Forecast (tons)	721	793	890	1,140

Source: Alaska Aviation System Plan Final Forecasts Memo

3.6 Step 3 - Gather Data

3.6.1 Data Requirements

The FAA requires the number of aircraft operations for various categories of aircraft be incorporated into the forecast. Passenger enplanement data, cargo, mail, and freight data are also required data sets, if available. FAA also specifies that population, employment rates, and socioeconomic factors such as personal income be included.

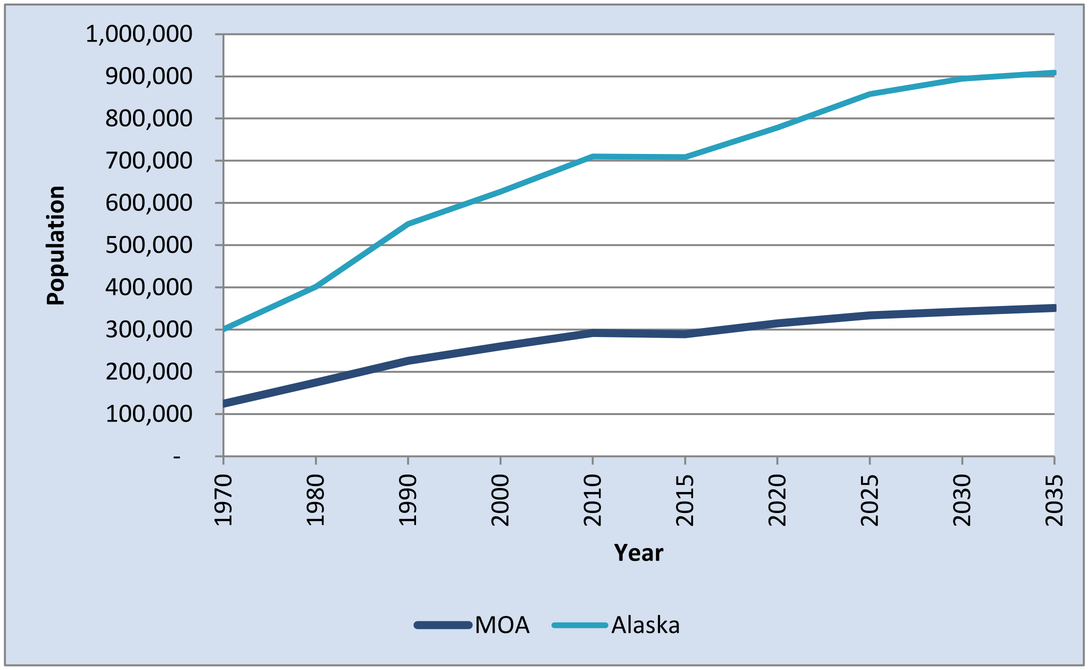
3.6.2 Socioeconomic Trends

The FAA AMP process requires an analysis of socioeconomic factors, as socioeconomics may have a significant impact on the future demand for air travel and air traffic activity. This section presents information on population, employment, per capita income, and a general economic overview for the MOA.

3.6.2.1 Population

Population size and anticipated growth are often key components of forecasting air transportation needs. A community's historic population trends are often helpful in identifying air traffic demand. As shown in Figure 3-4, the population for the State of Alaska and the MOA has grown over the past 40 years and is expected to continue to increase. By 2035, the population of the MOA is expected to be approximately 351,300. The Institute of Social and Economic Research (ISER) expects the State of Alaska's population to grow at a slightly faster rate. Between 2010 and 2035, they expect the State to have an annual average population growth rate of 1.11 percent while the MOA's growth rate was expected to be 0.78 percent.

Figure 3-4 Historical and Projected Population

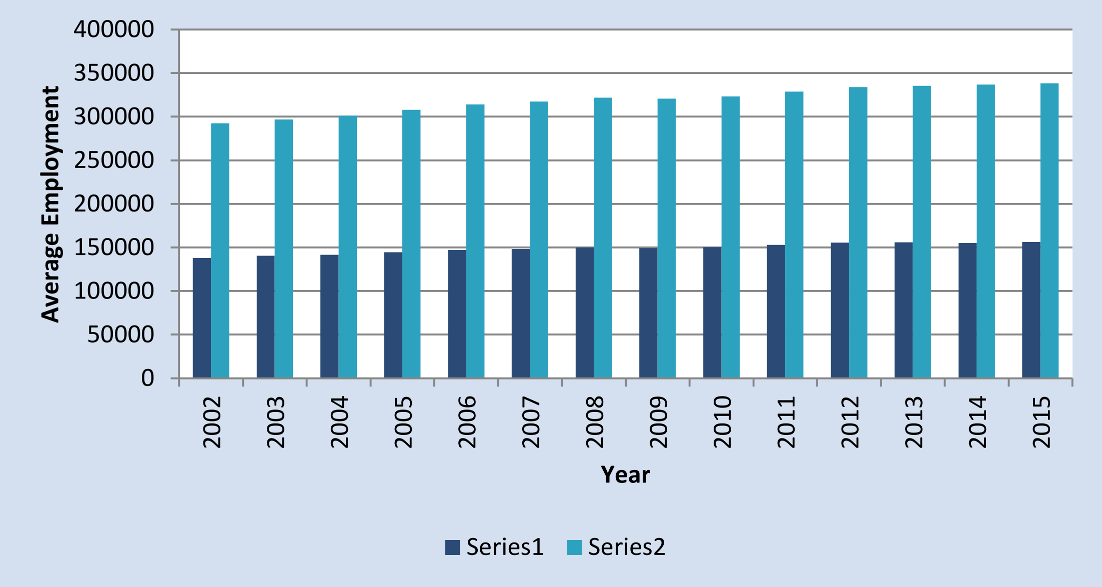


Source: Census, ISER

3.6.2.2 Employment

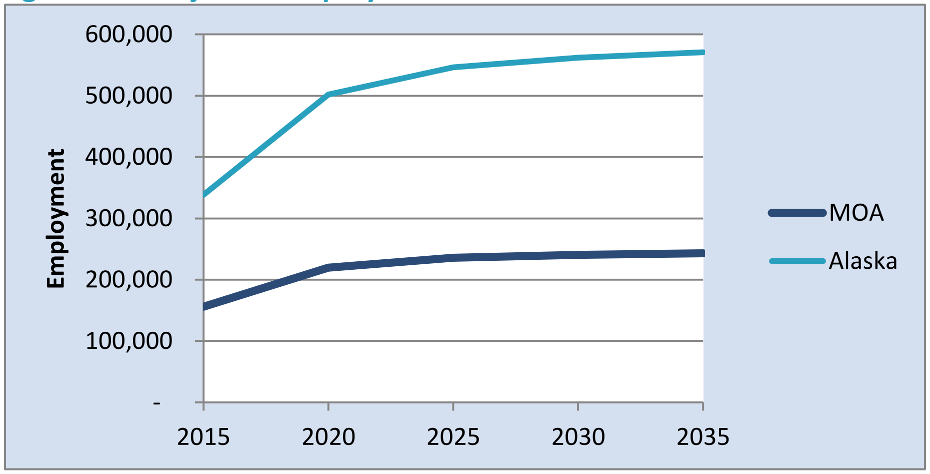
Employment characteristics of an area can be an indicator of its economic development and the area's potential for generating air traffic. Employment in Alaska and the MOA has grown over the past 10 years and is expected to continue to grow. Figure 3-5 shows the average quarterly employment in the MOA and Alaska according to the Census Bureau's Quarterly Workforce Indicators. According to the Department of Labor and Workforce Development (DOL&WD), some of the MOA's biggest employers are the Anchorage School District, the State of Alaska (excluding UAA), Providence Hospital, the MOA, and Safeway (DOL&WD). By 2035, ISER expects total employment[17] in the MOA to be approximately 243,100. Alaska's employment is also expected to increase, but at a slightly faster rate (Figure 3-6).

Figure 3-5 Historical Employment



Source: DOL&WD

Figure 3-6 Projected Employment



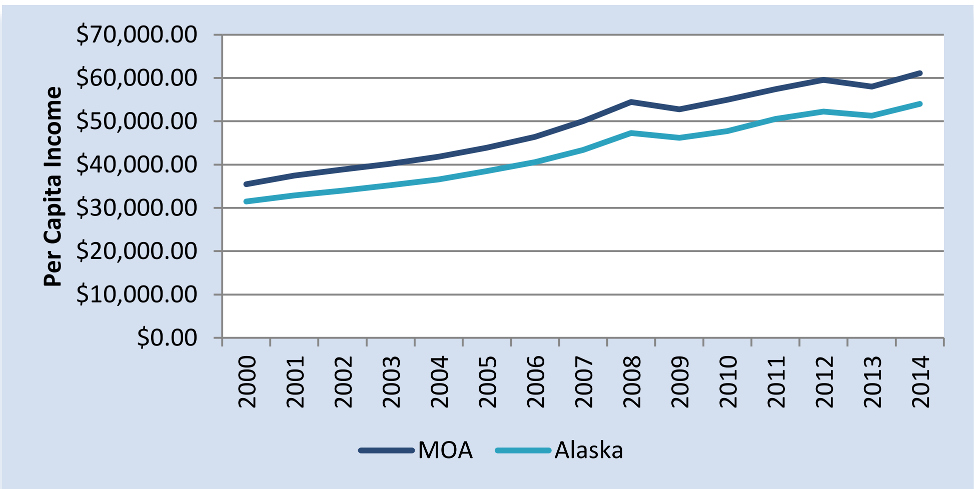
[17] The employment statistics are not directly comparable as the Census Bureau's QWI excludes some categories of worker including self employment and independent contractors

3.6.2.3 Per Capita Income

The personal income available to residents can be an indicator of their financial ability to travel and participate in general aviation activities. Typically, higher income levels are associated with higher than average spending on leisure activities, including aviation activity. Low income levels tend to be associated with lower than average spending.

Since 2000, per capita income in the MOA has been higher than for the state (Figure 3-7). This suggests that MOA residents have more disposable income than people living elsewhere in Alaska. In the MOA, per capita income has risen from $35,502 in 2000 to $61,134 in 2014. This is a 72 percent increase. During the same time frame, per capita income in Alaska has grown by approximately 71 percent.

Figure 3-7 Historic Per Capita Income



Source: Bureau of Economic Analysis

3.6.2.4 Economic Outlook

According to the *Municipality of Anchorage, 2012–2017 Six-Year Fiscal Program*, Anchorage has been partially sheltered from the economic troubles affecting the rest of the country in recent years. One exception to this was 2009 when seven of the eight Anchorage Economic Development Corporation's economic indicators were negative. The economy recovered in 2010, however, with only one indicator remaining negative. This economic growth is expected to continue as long as oil prices remain high. Employment gains are expected, with most of the growth occurring in the health care, professional and business services, and leisure and hospitality fields. Health care and health care-related construction in particular are expected to be growth areas for the MOA. This growth is expected to continue through 2014 as the Baby Boomers enter their senior years and Providence Alaska Medical Center continues its $150 million "Generations" project.

Anchorage has two challenges: the reduction in federal spending and the decline in oil production. While both of these are expected to have a negative impact on the MOA's economy, the timing of these events is uncertain.

3.6.3 Historical Aviation Activity

This section presents a historical overview of air traffic activity at MRI and in the Anchorage area. Topics to be addressed include aircraft registered in the MOA, MRI-based aircraft, and MRI operations.

3.6.3.1 General Aviation

General aviation refers to aviation that is not military aviation, scheduled commercial aviation or air taxi service. General aviation covers a wide range of activities including recreational flying, flight training, medical evacuation, aerial photography, crop dusting, etc.

3.6.3.2 Aircraft Registrations in the MOA

As of May 3, 2012, there were 364,295 aircraft registered in the U.S. according to FAA's Aircraft Registration Master File. Of these, 11,008 (or 3 percent) were registered in Alaska. There were 4,083 aircraft registered in the MOA. Approximately 37 percent of all aircraft registered in Alaska are within the MOA.

3.6.3.3 MRI Based Aircraft

Based aircraft refers to those aircraft that are hangared or on tiedowns at MRI and include those that are based at one of the commercial aviation/fixed base operators or other leaseholder sites. Table 3-7 presents the number of MRI-based aircraft since 1986. Since then, the number of aircraft based at MRI has averaged 926. In 2011, the number of based aircraft (880) was 46 below the average for the time period. In 2012, the number of based aircraft (827) was 99 below the average.

Table 3-7 MRI-Based Aircraft (1986–2016)

Year	Based Aircraft	Year	Based Aircraft
1986	1,079	**2002**	918
1987	1,022	**2003**	913
1988	1,009	**2004**	910
1989	950	**2005**	933
1990	1,003	**2006**	943
1991	1,008	**2007**	910
1992	943	**2008**	892
1993	916	**2009**	902
1994	910	**2010**	887
1995	905	**2011**	880
1996	907	**2012**	827
1997	901	**2013**	833
1998	907	**2014**	786
1999	880	**2015**	786*
2000	884	**2016**	826
2001	869		

**Inventory not completed; using same number as 2014.*
Source: 2000 AMP and MRI Annual Aircraft Inventory

3.6.3.4 Aircraft Operations

An aircraft take-off or landing is counted as one aircraft operation. Historical aircraft operations at MRI from 1980 to 2015 are shown in Table 3-8 and Figure 3-8. The FAA Air Traffic Control Tower records do not include the operations that occur while the tower is closed. Currently, the tower operates between the hours of 7 AM and midnight from May 1 to August 31 and between the hours of 7 AM to 10 PM from September 1 to April 30.

According to FAA Air Traffic Control Tower personnel, the number of aircraft operations that occur when the tower is closed is minimal and will not be accounted for separately in this forecast.

Furthermore, total airport operations at MRI have varied over the past 25 years with a high of 259,632 in 1990 and a low of 127,632 in 2011. This is a decline of approximately 50.8 percent in operations during that time.

Merrill Field has the highest number of aircraft operations between May and August and the fewest number of aircraft operations in December.

Air taxi and general aviation are the two main categories of airport operations at

Table 3-8 Annual Airport Operations (1980–2015)

	Itinerant			Local	Total
Year	Air Taxi	General Aviation	Subtotal	General Aviation	Operations
1980	4,584	101,437	106,021	175,094	281,115
1981	4,874	103,506	112,247	197,980	310,227
1982	8,462	100,811	109,273	193,482	302,755
1983	9,795	113,066	122,861	212,698	335,559
1984	12,015	124,624	136,639	247,675	384,314
1985	12,376	114,454	126,830	195,125	321,955
1986	16,708	104,110	120,830	175,577	296,394
1987	14.946	99,030	113,976	155,591	269,394
1988	10,797	92,458	103,255	143,598	246,853
1989	10,126	85,073	95,199	134,632	229,831
1990	12,436	93,088	105,524	154,086	259,632
1991	12,618	82,233	94,851	156,921	251,817
1992	11,194	77,758	88,952	127,051	216,461
1993	12,682	80,734	93,416	138,891	232,614
1994	11,351	76,851	88,202	113,490	204,029
1995	11,284	72,217	83,501	100,630	184,759
1996	10,117	70,692	80,809	92,464	173,711
1997	10,370	73,529	83,899	103,268	187,190
1998	10,412	77,570	87,982	119,002	207,028
1999	9,236	76,662	85,898	115,151	201,057
2000	9,418	73,544	82,962	106,944	190,527
2001	10,627	73,033	83,660	95,525	179,217
2002	10,381	76,972	87,353	97,284	184,670
2003	12,935	81,132	94,067	108,092	202,278
2004	14,877	77,730	92,607	98,895	191,516

MRI. In addition, there are a small number of military operations each year.

Figure 3-8 Annual Airport Operations (1980–2015)

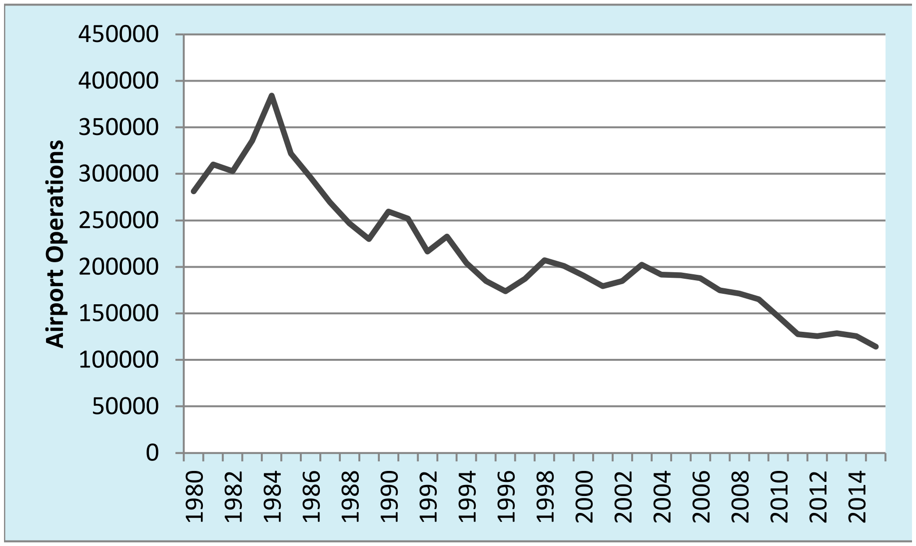


Table 3–8 Annual Airport Operations (1980–2015) cont.

Year	Air Taxi	General Aviation	Subtotal	General Aviation	Operations
2005	15,080	73,762	88,842	101,607	190,816
2006	17,333	69,856	87,189	99,773	187,798
2007	16,617	65,874	82,491	91,785	174,848
2008	15,893	59,380	75,273	93,900	171,396
2009	15,336	59,739	75,075	89,164	165,133
2010	15,119	56,534	71,653	74,089	146,547
2011	12,508	55,746	68,254	59,102	127,632
2012	13,534	54,753	68,287	56,978	125,425
2013	12,319	51,311	63,630	64,738	128,552
2014	12,745	51,832	64,577	60,822	125,588
2015	12,403	50,505	62,908	51,099	114,109

Source: FAA and 2000 AMP

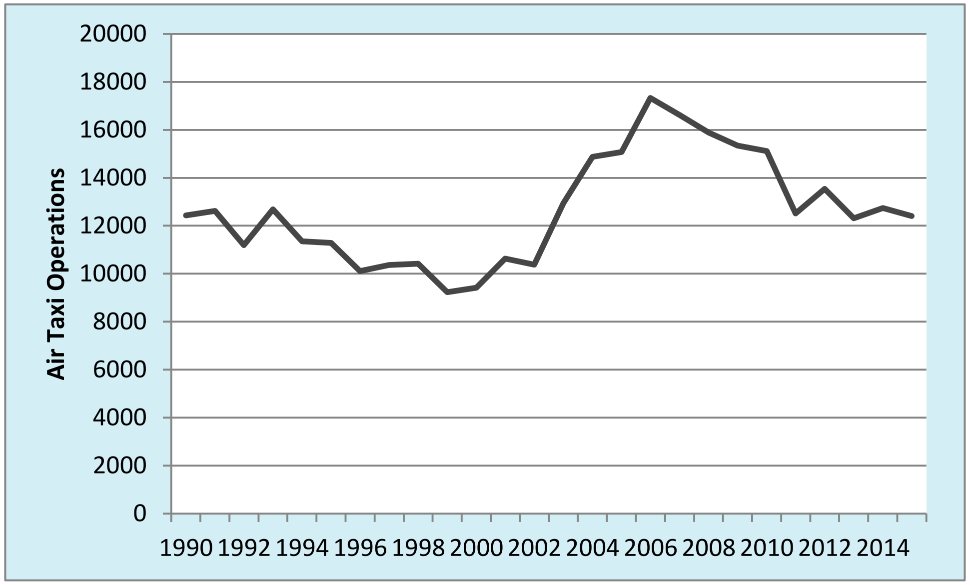
Note: Columns do not sum to total operations because there are a small number of other categories of operations not listed in this table.

3.6.3.5 Air Taxi Operations

An air taxi operation refers to the unscheduled operations of "for hire" air taxis. Over the past 25 years, air taxi operations have ranged from a high of 17,333 in 2006 to a low of 9,236 in 1999 (see Figure 3-9). An operation is recorded as an air taxi operation if it is conducted by a FAR Part 135 operator with an air taxi identifier.

Air taxi operations generally account for between 5 and 10 percent of total operations. Since 2006, air taxi operations have accounted for approximately 9 to 10 percent of the total airport operations.

Figure 3-9 MRI Air Taxi Operations, 1990–2015

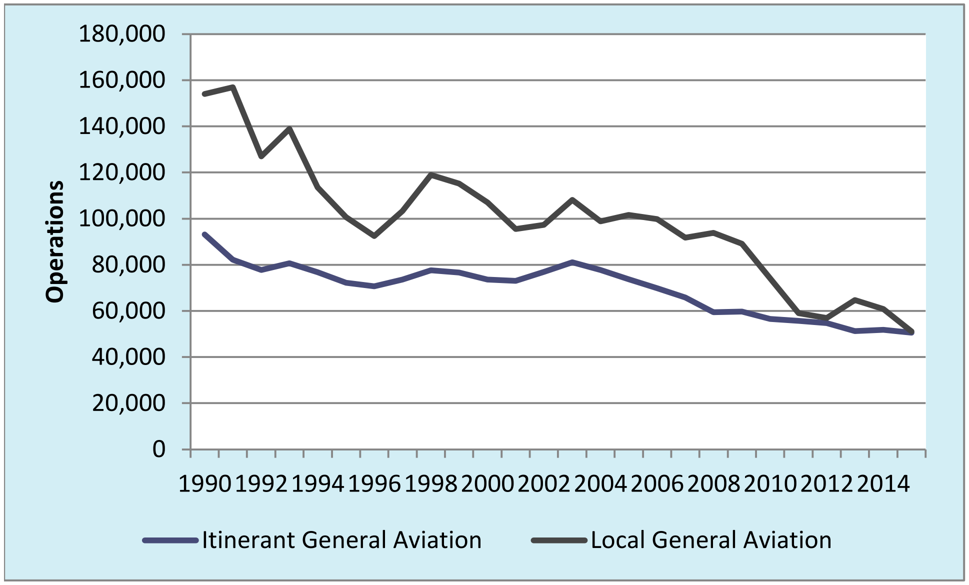


3.6.3.6 General Aviation Operations

General aviation operations refer to all civil aircraft operations that are not categorized as air carrier, air taxi, or military. General aviation operations have generally declined over the past 25 years (see Figure 3-10). According to FAA Tower Count records, in 1990 there were approximately 247,174 general aviation operations compared to only 114,848 in 2011. In 1990, general aviation operations accounted for approximately 95 percent of all airport operations. This has declined to approximately 90 percent in 2011.

General aviation operations can be considered itinerant (the operation arrives from outside the traffic pattern or departs the traffic pattern) or local (the operation stays within the traffic pattern airspace). At Merrill Field, the percentage of operations that are itinerant has been increasing. In 2011, itinerant operations made up approximately 53.5 percent of all aircraft operations. In 1990, itinerant operations made up approximately 40.6 percent of all operations.

Figure 3-10 MRI General Aviation Operations, 1990–2015



3.6.4 Military Operations

Military operations account for a very small percentage of total airport operations at MRI (typically less than 1%). In 2015, there were only 96 military operations. These were primarily training-related.

3.6.5 Enplanements

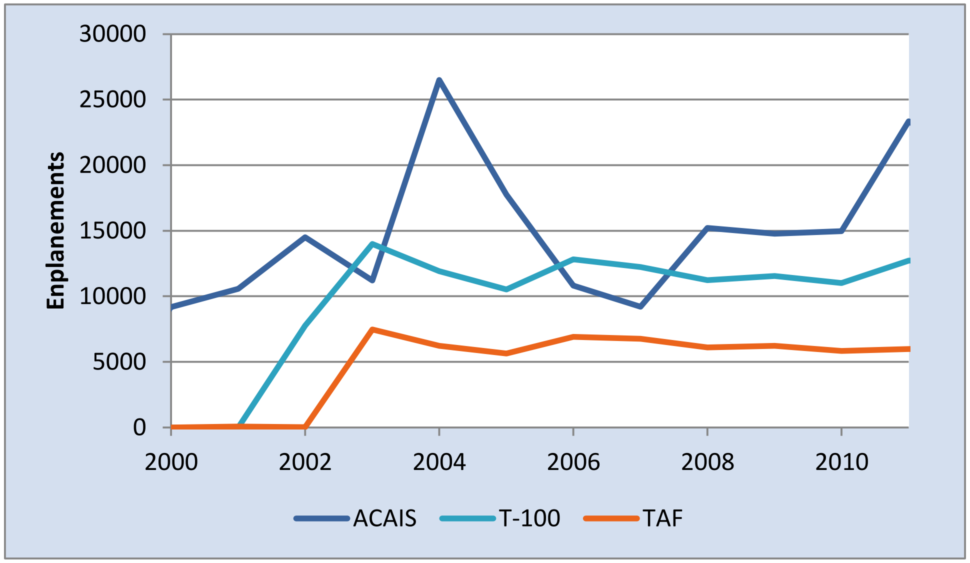
Enplanements reported to the Air Carrier Activity Information System (ACAIS) are used to allocate FAA Airport Improvement Program Funding. Table 3-9 presents passenger enplanements as reported by the FAA ACAIS, the T-100 data from the DOT Bureau of Transportation Statistics, and the FAA TAF (see Figure 3-11). It is important to note that ACAIS and T-100 report enplanements for a calendar year while the TAF reports enplanements for a fiscal year. The T-100 data represent scheduled air carriers only, so the T-100 data for any given year should be lower than the TAF or ACAIS values, as these include non-scheduled flights. In addition, while scheduled air carriers

Table 3-9 MRI Historic Passenger Enplanements

Year	ACAIS	T-100	TAF
1992	N/A	N/A	0
1993	N/A	N/A	0
1994	N/A	N/A	0
1995	202	0	0
1996	143	0	192
1997	193	0	193
1998	N/A	0	0
1999	2,240	0	0
2000	9,173	0	0
2001	10,572	0	67
2002	14,511	7,751	15
2003	11,211	13,988	7,470
2004	26,504	11,899	6,228
2005	17,745	10,508	5,626
2006	10,820	12,816	6,896
2007	9,204	12,235	6,768
2008	15,206	11,236	6,102
2009	14,769	11,551	6,222
2010	14,972	11,013	5,837
2011	23,344	12,708	5,983
2012	20,163	12,824	6,031
2013	N/A	N/A	6,079

Source: FAA

Figure 3-11 MRI Historic Enplanements, 2001–2012



Source: FAA and the US DOT Bureau of Transportation Statistics

are required to report enplanements, non-scheduled air carrier submittals are voluntary. As a result, the ACAIS value likely underreports the number of enplanements.

3.6.6 Cargo and Mail Activity

Air cargo service provides rural communities with a means of importing and exporting goods in a timely manner. The amount of cargo and mail flown in Alaska can be difficult to quantify, but the T-100 reports provide a trend line for this type of service.

The U.S. Postal Service (USPS) provides priority and other classes of mail service to rural Alaska, and in locations where the community is not on the highway system, the mail travels by air. A 1985 special provision in federal law permits and subsidizes the delivery of fourth-class mail at rates that are significantly lower than freight rates. Stores or businesses that ship large quantities of goods such as groceries and other consumer goods palletize their loads and deliver them directly to an air cargo shipper, bypassing the Post Office. Thus the term “bypass mail” is used for these shipments. A postal official at the air carrier facility accepts the pallet on behalf of the Post Office, and bills for the fourth-class postage. The air carrier is responsible for delivery of the goods to the recipient in the destination community. Individuals can also ship goods by fourth-class mail, but those packages must be taken to a Post Office. Approximately 75 percent of the fourth class mail to rural Alaska is transported as bypass mail. Hazardous materials and construction materials are not accepted by the Post Office as fourth-class mail, and must be shipped by air freight. Delivery of mail by air at these favorable rates has facilitated a better flow of goods to rural Alaska.

The Rural Air Service Improvement Act (Public Law 107-206, Sec. 3002, 2002) changed the freight, mail, and passenger service in rural Alaska, including freight and mail reporting requirements for air carriers. Essentially, beginning in 2002, air carriers were required to report all freight and mail on form T-100 to the Federal Bureau of Transportation Statistics (BTS). The BTS implemented a system to facilitate all air carriers to submit their data on a Web-based system. Prior to this 2002 change in the law, only the largest air carriers reported their data. Very little information about the volume of cargo and mail shipped through MRI prior to 2002 is available. Table 3-10 shows historic cargo and mail activity at MRI between 2001 and 2012.

3.7 Step 4 - Select Forecasting Methods

General aviation activity is determined largely by local population and income levels, the cost of flying, and the number of based aircraft at the airport (*Forecasting Aviation Activity by Airport,* FAA 2001*).* Due to the uncertainty associated with developing forecasts, it was decided that three growth scenarios (low, medium, and high) would be calculated. The resulting trends are more important than the actual numbers.

Forecast scenarios were developed for **based aircraft** using the following:

- Trend analysis projecting MRI's based aircraft growth into the future based on a 25-year trend
- Trend analysis projecting MRI's based aircraft growth into the future based on a 10-year trend
- Applying the FAA's Average Annual GA fleet growth rate for 2011–2032 to the MRI-based aircraft

Forecast scenarios were developed for **aircraft operations** using the following methods:

- Trend analysis projecting MRI's operations growth into the future based on a 25-year trend

Table 3-10 Historic Cargo and Mail Activity at MRI, 2002–2015

Year	Freight (Pounds)	Mail (Pounds)
2002	395,428	17,456
2003	788,518	23,799
2004	841,514	20,881
2005	1,335,394	65,895
2006	1,629,081	71,124
2007	1,582,478	77,018
2008	1,445,050	69,131
2009	1,483,854	56,168
2010	1,186,056	51,685
2011	1,737,228	55,759
2012	1,772,184	47,532
2013	1,211,332	43,921
2014	1,093,229	35,824
2015	622,137	29,468

Source: US DOT

- Applying the FAA's national active GA hours flown growth rate (per the FAA Aerospace Forecast) to MRI operations
- Applying the MOA population forecast annual average growth rate to MRI operations

Forecast scenarios were developed for **enplanements** using:

- Trend analysis projecting MRI's operations growth into the future based on a 25-year trend
- Applying MRI's change in operations to enplanements
- Applying the MOA population forecast annual average growth rate to MRI enplanements

Forecast scenarios were developed for **cargo and mail** using:

- Trend analysis projecting MRI's cargo and mail into the future based on an annual average (based on the last five years of data)
- Applying the Rest of Alaska (Alaska excluding the MOA and MSB) population forecast annual average growth rate to MRI cargo and mail
- Trend analysis projecting growth based on change in operations at MRI in the past five years.

3.8 Step 5 – Apply Forecast Methods and Evaluation Results[18]

This section presents three scenarios for based aircraft, aircraft operations, and enplanements for MRI. Table 3-14 at the end of this section summarizes the forecasts and growth rates.

3.8.1 General Assumptions

The following general assumptions were made in the development of this forecast.

- The population and employment estimates are adequate for preparing an aviation demand forecast.
- No policies that constrain aviation activity would be imposed on MRI.
- General aviation activity remain the dominant type of use at MRI.
- Military operations will continue to be approximately 1 percent of total aircraft operations.

[18] In this section, 2013 information has been updated to reflect actual numbers.

3.8.1.1 Based Aircraft

The three based aircraft scenarios use a base year estimate of 827. Each scenario assumes that no substantial changes to the fleet mix will occur. However, based on stakeholder input, it is assumed that helicopters will grow from approximately four percent of the based aircraft to five percent over the next 20 years. The results of each forecast are summarized in Table 3-11 and on Figure 3-12. Each forecast is discussed in more detail below.

Table 3-11 MRI Based Aircraft Forecast Scenarios, 2013–2033

Year	Low Growth (-0.9%)	Medium Growth (0.6%)	High Growth (0.78%)
2013		833	
2018	782	857	866
2023	746	883	901
2028	712	910	936
2033	679	938	974

3.8.1.1.1 Low-Growth Forecast

This forecast scenario assumes the same rate of change in based aircraft between 1986 and 2012 at MRI. Using the number of based aircraft in 1986 (1,079) and 2012 (827), this was an average annual decrease of -0.9 percent.

This scenario represents a continued decline in aviation activity and aircraft being based at airports other than MRI.

Based on this approach, MRI would be expected to have 679 based aircraft in 2033 (148 fewer aircraft than in 2012).

3.8.1.1.2 Medium-Growth Forecast

This forecast scenario assumes the number of based aircraft at MRI would grow similar to the national active GA aircraft growth as forecasted by FAA in the *FAA Aerospace Forecast Fiscal Years 2012–2032* report and detailed in Table 28, Active General Aviation and Air Taxi Aircraft.

Using Table 28, HDR applied the national annual growth rate for the total general aviation fleet over the next 20 years to the MRI based aircraft. The average annual growth for this scenario is 0.6 percent.

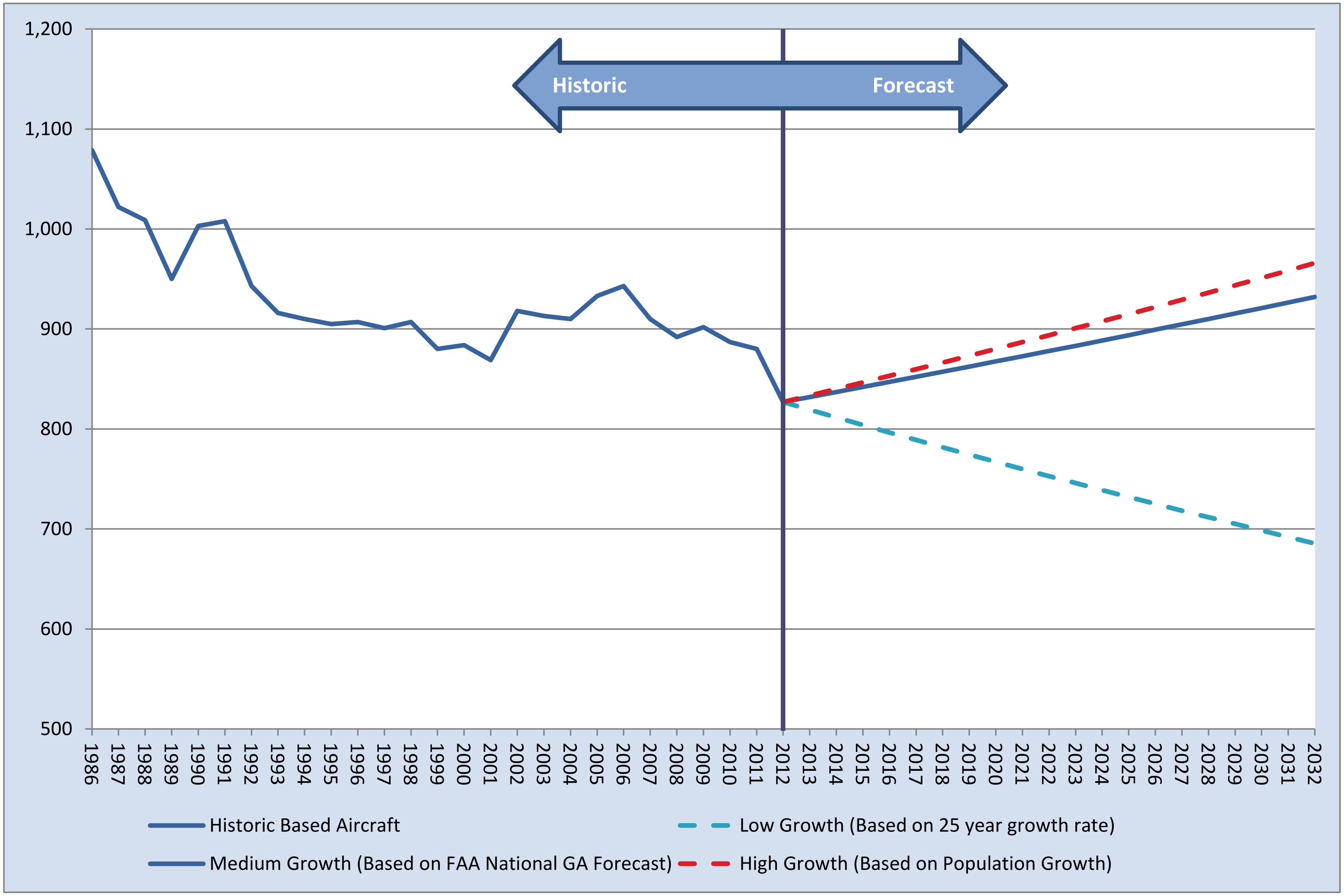
This scenario has the number of based aircraft at MRI increasing to 938 by the year 2033. This is an increase of 111 aircraft in the next 20 years.

3.8.1.1.3 High-Growth Forecast

The high-growth forecast scenario assumes that the number of based aircraft will grow at a rate similar to the population growth rate in MOA. According to ISER, the population in the MOA is expected to grow by 0.78 percent annually between 2010 and 2035.

This scenario assumes aviation activity will occur at similar levels. In this scenario, MRI would be expected to have 974 based aircraft in 2033. This is an increase of 147 aircraft.

Figure 3-12 MRI Based Aircraft Forecast Scenarios, 2013–2033



3.8.1.2 *Aircraft Operations*

The three aircraft operations scenarios use a base year estimate of 128,628[19]. The results of each forecast are summarized in Table 3-12 and on Figure 3-13. Each forecast is discussed in more detail below.

Table 3-12 MRI Operation Forecast Scenarios, 2013–2033

Year	Low Growth (-2.4%)	Medium Growth (0.78%)	High Growth (1.7%)
2013		128,552	
2018	111,038	134,766	142,318
2023	98,232	140,104	154,833
2028	86,903	145,654	168,449
2033	76,881	151,424	183,263

[19] The base year estimate was derived by adjusting the 2011 total operations to 2012 following the medium growth methodology.

3.8.1.2.1 Low-Growth Forecast

The low-growth forecast assumes the same rate of change in the number of total aircraft operations at MRI between 1991 and 2011. Using the numbers of total operations in 1990 (259,632) and 2011 (127,632), this resulted in an annual average growth rate of -2.4 percent. This growth rate is similar to the growth rate between 2001 and 2011 (-2.9%).

In this scenario, total aircraft operations are expected to decrease to 76,881. This is approximately 51,747 fewer operations than in 2012. This is a 41 percent reduction in activity levels.

3.8.1.2.2 Medium-Growth Forecast

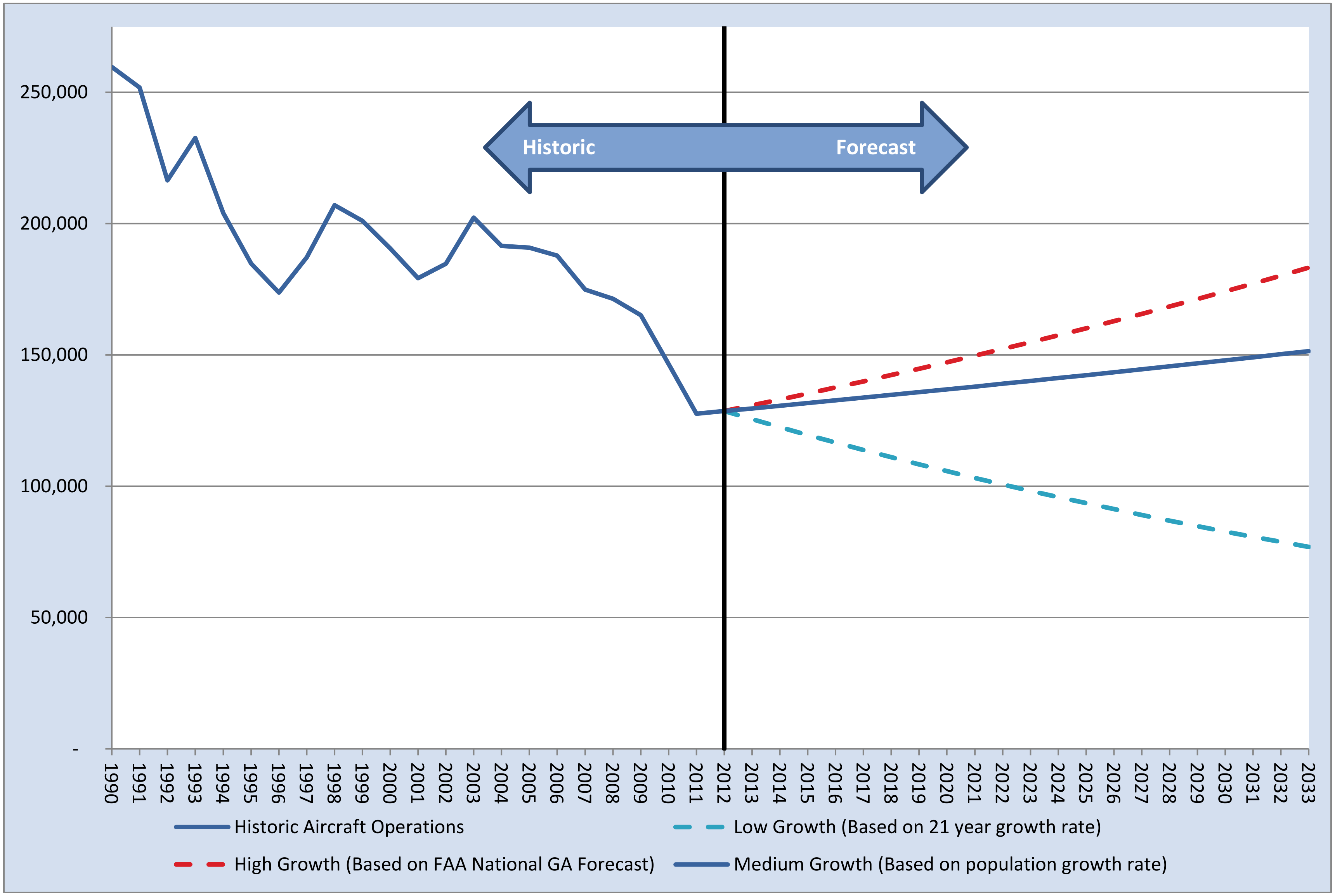
The medium-growth forecast scenario assumes that the number of total operations will grow at a rate similar to the population growth rate in MOA. According to ISER, the population in the MOA is expected to grow by 0.78 percent annually between 2010 and 2035.

In this scenario, total aircraft operations are expected to increase to 151,424 by 2033. This is an increase of 22,797 operations, representing an 18 percent increase over the next 20 years.

3.8.1.2.3 High-Growth Forecast

This forecast scenario assumes the number of annual operations at MRI would grow at a rate equal to the FAA nationwide forecast for GA hours flown (1.7%). The FAA nationwide forecast was obtained from Table 29, Active General Aviation and Air Taxi Hours Flown as part of the FAA publication *Aerospace Forecast Fiscal Years 2012–2032*. The FAA growth rate was taken from Table 29 and is the actual FAA year to year percent change. The average annual growth for this scenario is 1.7 percent.

Figure 3-13 MRI Operations Forecast Scenarios, 2013–2033



In this scenario, operations would increase to 183,263 in 2032. This is an increase of 54,635 operations (43%) from 2012 levels.

3.8.1.3 Enplanements

The three enplanement scenarios use a base year estimate of 14,261.[20] The results of each forecast are summarized in Table 3-13 and **Error! Reference ource not found.**. Each forecast is discussed in more detail below.

Table 3-13 MRI Enplanement Forecast Scenarios, 2013–2033

Year	Low Growth (-2.4%)	Medium Growth (0.78%)	High Growth (3.5%)
2013	13,919	14,372	14,759
2018	12,327	14,942	17,520
2023	10,917	15,533	20,797
2028	9,668	16,149	24,688
2033	8,562	16,789	29,307

[20] The base year estimate was derived by adjusting the preliminary 2011 ACAIS enplanement figure to 2012 following the medium growth methodology.

3.8.1.3.1 Low-Growth Forecast

The low-growth forecast assumes the number of enplanements varies at same rate of change as the number of total aircraft operations at MRI between 1991 and 2011 (an annual average growth rate of -2.4%).

In this scenario, total enplanements are expected to decrease to 8,562 by 2033. This is a decrease of 5,699 enplanements representing a 40 percent decrease over the next 20 years.

3.8.1.3.2 Medium-Growth Forecast

The medium-growth forecast scenario assumes that the number of total enplanements will grow at a rate similar to the population growth rate in MOA. According to ISER, the population in the MOA is expected to grow by 0.78 percent annually between 2010 and 2035.

In this scenario, total enplanements are expected to increase to 16,789 by 2033.This is an increase of 22,797 enplanements representing an 18 percent increase over the next 20 years.

3.8.1.3.3 High-Growth Forecast

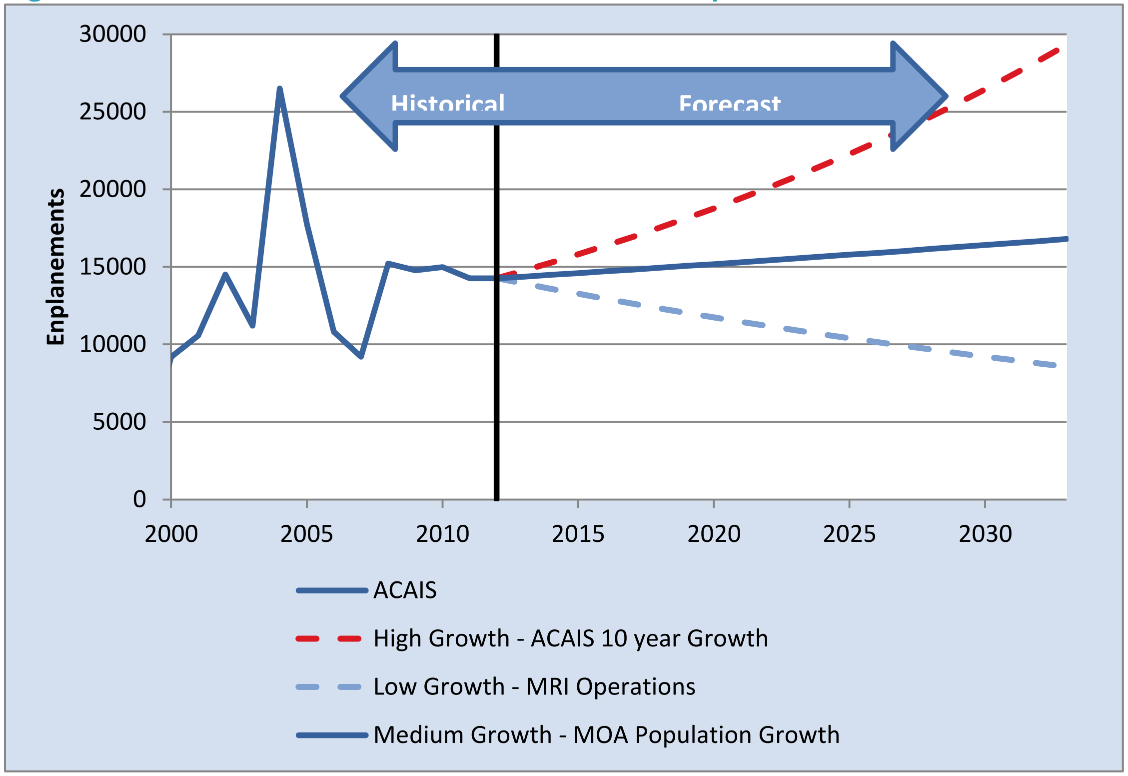
The high-growth forecast scenario assumes that the number of enplanements will change at a rate similar to the change in ACAIS enplanements between 2001 and 2011. Using the numbers of ACAIS enplanements in 2001 (10,572) and 2011 (14,261), this resulted in an annual average growth rate of 3.5 percent.

In this scenario, the number of enplanements is expected to increase to 15,046 by 2033 representing a 106 percent increase over the next 20 years.

3.8.1.4 Air Taxi Activity

Based on the interviews conducted as part of the AMP Update, air taxi activity is likely to remain relatively constant at approximately 10 percent of total operations.

Figure 3-14 Merrill Field Historical and Forecasted Enplanements



3.8.1.5 Local/Itinerant Operations

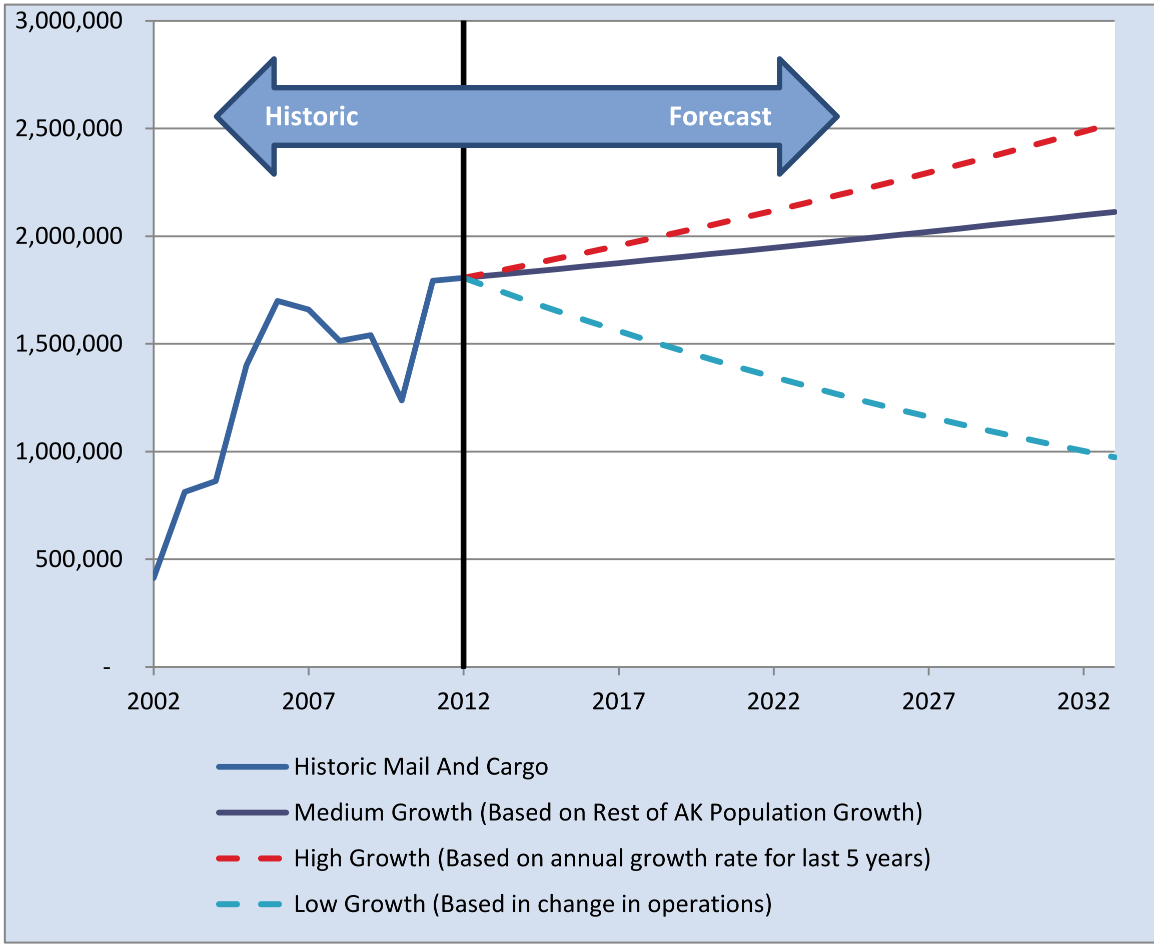
Based on stakeholder interviews, the number of local operations (which are typically associated with flight training) are difficult to forecast. If economic conditions remain the same, stakeholders felt that training activity would increase which would increase the percentage of local operations at MRI. If economic conditions improve, then MRI could see an increase in training related activity.

For this assessment, it was assumed that the percentage of local operations at MRI would remain at approximately 46.5 percent of total operations.

3.8.1.6 Gravel/Ski Runway Operations

Based on the interviews conducted as part of the AMP Update, no significant changes to the fleet mix are anticipated. As a result, usage of the gravel/ski strip is expected to remain at approximately 2 percent of total operations.

Figure 3-15 Merrill Field Historic and Forecast Mail and Cargo



3.8.1.7 Mail/Cargo Operations

Historical records of air cargo and mail activity at MRI are limited. Based on discussions related to mail/cargo, there appears to be a shift from mail to cargo. Over the last 5 years, outgoing cargo has increased by 11 percent, while outgoing mail has decreased by approximately 26 percent. Overall, the amount of mail/cargo going through MRI has increased though. This trend is likely to continue as on-line shopping continues to increase in popularity. Goods ordered on-line are often shipped via FedEx or UPS, which are counted as cargo. In addition, cargo is likely to continue increasing due to oil and gas exploration in the state.

Currently, approximately 83 percent of mail/cargo is enplaned (flown from MRI) and approximately 17 percent is deplaned (flown to MRI).

The total amount of air cargo and mail (both enplaned and deplaned) is forecast to increase from an estimated 1.8 million pounds to 2.1 million pounds in 2033.

3.8.1.8 Helicopter Operations

Helicopter operations are included as part of the general aviation operations and are not recorded separately by the FAA. Published information about the percentage of existing operations that are helicopters was not available for this forecast. However, stakeholders have indicated that helicopter operations have increased over the past few months and sometimes exceed the number of fixed wing aircraft operations. In the future, the number of helicopter operations is expected to vary based on resource exploration activity, private helicopter ownership, the availability of funding for training purposes (such as the G.I. Bill), and interest in civilian training.

3.8.1.9 Annual Airport Instrument Operations

Between 1990 and 2011, approximately 2 percent of all itinerant operations were IFR operations. During that time frame, the percent of IFR operations ranged from a low of 1.2 percent to a high of 8.5 percent. The fleet mix is not expected to change significantly during the next 20 years so IFR operations are likely to be approximately 2 percent of itinerant operations. Another reason the number of IFR operations is also unlikely to change is because pilots have experienced trouble obtaining timely clearances for departure.

3.8.1.10 Peak Hour Aviation Activity

The peak hour forecast is intended for use in the demand-capacity analysis and in determining requirements for future airport facilities. Based on FAA Air Traffic Control Tower records between 2005 and 2011, about 11 percent of the annual aircraft operations occur in June, which is typically the peak month. Peak hour operations are assumed to remain at approximately 11.5 percent of the average daily operations in the peak month. Assuming the same percentages in the future, peak hour operations will increase from 1,640 in 2013 to 1,916 in 2033 (Table 3-14). The number of peak hour operations per day is expected to increase from 4.5 in 2012 to 5.2 in 2033.

3.8.1.11 Operations per Based Aircraft

Operations per based aircraft are expected to increase from 152 operations in 2012 to 161 in 2033, as shown in Figure 3-16.

Figure 3-16 Merrill Field Operations per Based Aircraft

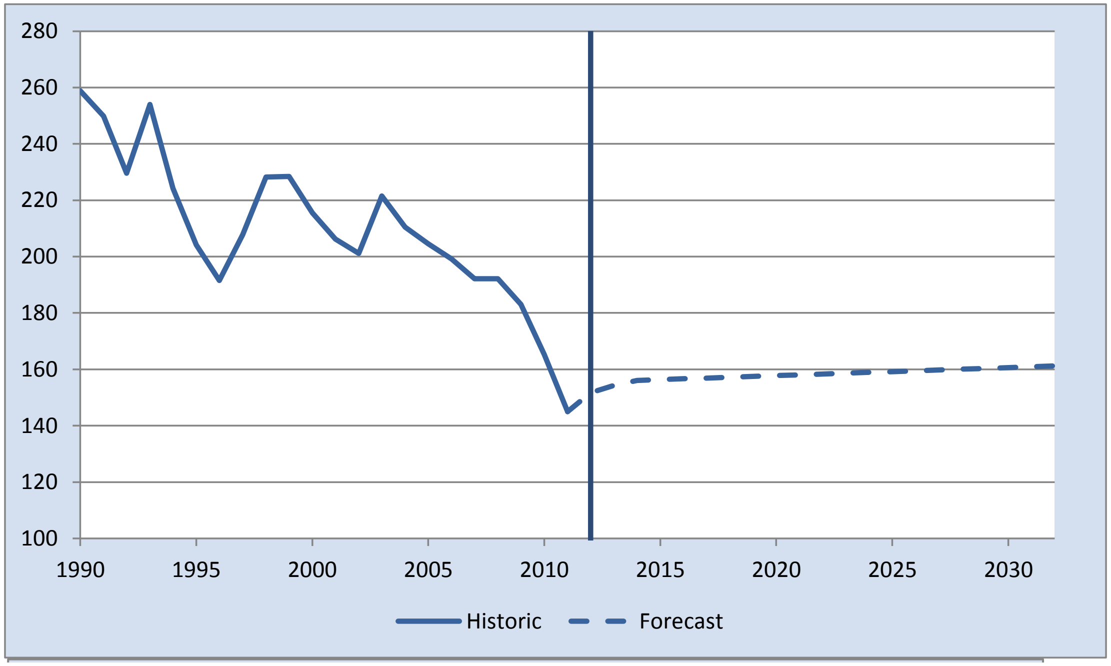


Table 3-14 MRI 20-Year Air Traffic Forecast Levels and Growth Rates

	Base Year	Forecast					Average Annual Compound Growth Rates				
	2012	Base Year +1 (2013)	Base Year +5 (2018)	Base Year +10 (2023)	Base Year +15 (2028)	Base Year +20 (2033)	Base Year +1 (2013)	Base Year +5 (2018)	Base Year +10 (2023)	Base Year +15 (2028)	Base Year +20 (2033)
Annual Enplanements	14,261	14,372	14,942	15,533	16,149	16,789	0.8%	0.9%	0.9%	0.8%	0.8%
Air Cargo and Mail	1,729,987	1,819,983	1,889,253	1,961,182	2,035,837	2,113,335	1.5%	1.1%	0.9%	0.9%	0.8%
Based Aircraft											
Single Engine	744	750	770	790	812	835	0.6%	0.7%	0.6%	0.6%	0.6%
Multi Engine	50	50	51	53	55	56	0.0%	0.4%	0.6%	0.6%	0.6%
Helicopter	33	33	36	40	43	47	0.8%	2.0%	1.9%	1.8%	1.8%
Total Based Aircraft	827	833	857	883	910	938	0.6%	0.7%	0.7%	0.6%	0.6%
Aircraft Operations											
Air Taxi	13,534	12,319	13,477	14,010	14,565	15,142	0.8%	0.9%	0.9%	0.8%	0.8%
Local General Aviation	56,978	64,738	62,666	65,148	67,729	70,412	0.8%	0.9%	0.9%	0.8%	0.8%
Itinerant General Aviation	547,753	54,311	72,100	74,956	77,925	81,012	0.8%	0.9%	0.9%	0.8%	0.8%
Gravel/Ski	2,509	2,593	2,695	2,802	2,913	3,028	0.8%	0.9%	0.9%	0.8%	0.8%
Total Aircraft Operations	125,425	128,552	134,766	140,104	145,654	151,424	0.8%	0.9%	0.9%	0.8%	0.8%
Annual Instrument Operations	2,509	2,571	2,695	2,802	2,913	3,028	0.8%	0.9%	0.9%	0.8%	0.8%
Peak Hour Operations	1,587	1,626	1,705	1,772	1,843	1,916	0.8%	0.9%	0.9%	0.8%	0.8%
Operations per Based Aircraft	152	156	157	159	160	161	0.3%	0.2%	0.2%	0.2%	0.2%

Note: Where possible, data have been updated to reflect actual values.

3.9 Step 6 – Compare Forecast Results with FAA's Terminal Area Forecast

FAA AC 150/5070-6B (May 2007) recommends the forecast results be compared with those contained in the most recent TAF. To facilitate this, FAA recommends using the template found in Appendix C of the document titled *Forecasting Aviation Activity by Airport* (FAA 2001).

The most recent TAF indicates there were 965 based aircraft and 136,691 operations at MRI in 2011 (Table 3-15). Based on actual based aircraft counts and FAA Tower Count Records, the TAF appears to overestimate the number of based aircraft. The TAF appears to slightly underestimate the number of total operations for 2011 but has a similar estimate of operations for 2012. This indicates that the TAF is likely to be similar to the actual conditions at MRI.

3.10 Step 7 – Obtain Forecast Approval

The FAA is responsible for reviewing aviation forecasts that are submitted to the administration in conjunction with airport planning activities including AMPS. FAA reviews these forecasts with the purpose of including them in the TAF and the NPIAS. The forecasts are also an important input in the benefit-cost analysis associated with airport development. FAA reviews the BCA when evaluating funding requests.

The forecasts are to be realistic, based on the latest available information, reflect the existing airport conditions, be supported by information in the study, and provide a reasonable justification for airport planning and development.

While the forecast is a method to develop quantifiable results, forecasters need to use professional judgment to determine what is reasonable as recommended in AC 150/5070-7, *The Airport System Planning Process*, paragraph 506.

Table 3-15 Comparision of Airport Operations Forecast to TAF

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Base year + 1 year	2013	129,631	128,595	0.8%
Base year + 5 years	2018	134,766	131,503	2.5%
Base year + 10 years	2023	140,104	134,470	4.2%
Base year + 15 years	2028	145,654	137,508	5.9%
Base year + 20 years	2033	151,424	140,616	7.7%

As MRI is a non-hub commercial service airport, generally the FAA will find a forecast acceptable if the 5-year forecast is within 10 percent of the TAF and within 15 percent in the 10-year period (AC 150/5070-6B, section 704. If the forecast exceeds the TAF by more than 10 percent and is considered valid by the FAA when they complete their review, the forecast will be incorporated into the TAF and NPIAS.

The project team believes the forecast presented here is a realistic outlook based on the existing information and reflects the existing conditions at MRI. The medium growth scenarios are within 10 percent of the TAF, so additional consultation with FAA to review the results prior to the forecast being submitted was not required. To ensure the accuracy of the forecast, the forecast was reviewed by representatives of MRI and the AMP's advisory committee prior to it being submitted to the FAA for approval. The FAA approved the forecast on June 18, 2013 via email.

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4.0 REQUIREMENT ANALYSIS

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4.1 Introduction

The purpose of this chapter is to determine the facility needs of MRI based on the demand identified in Chapter 3.0 and those needed to meet FAA requirements. This chapter compares existing conditions (Chapter 2.0) at MRI to the latest airport industry standards and FAA design guidance. For the facilities that are inadequate, the AMP will identify required facilities to meet the demand and alternative methods to provide the needed capacity or meet the standards.

Airport facility improvements are needed for several reasons:

- Meet the existing or forecasted demand for the facility,
- Meet FAA design standards or criteria,
- Ensure a well-maintained and safe facility, and
- Enhance operational efficiency.

4.2 Airfield

This section identifies the geometric dimensions to which airfield, landside, and airspace/air traffic control facilities should be developed to meet existing and future demands at MRI.

4.2.1 Airport Classification

MRI is included in the FAA's *National Plan of Integrated Airport Systems* (NPIAS) as a non-hub Commercial Service – Primary airport. Commercial service airports are public airports with scheduled passenger service and have 2,500 or more enplaned passengers annually; since MRI has more than 10,000 annual enplanements, it is categorized as a Primary Airport (NPIAS 2011). MRI is also identified as a nonhub airport, which means it enplanes less than 0.05 percent of all commercial enplanements.

The *Alaska Aviation System Plan* classifies MRI as a Local NPIAS "High Activity" airport. According to the *Plan*, "local airports accommodate mostly general aviation activity. They supplement International, Regional, and Community airports by providing additional general aviation capacity in the more densely populated parts of the state, and they serve low population areas where a Community airport is not warranted. Runway size and landside facilities and services depend on the type and quantity of aircraft using the airport."

4.2.2 Airfield Dimensions

Airfield dimensions are determined by many factors including airport classification, and the design aircraft's type, weight, approach speed, and wingspan. At MRI the Beechcraft King Air 200 has been selected as the design aircraft. This B-II aircraft was selected because it is one of the larger aircraft (54.5 feet wide) to regularly use MRI and is used for critical medevac flights. For Runway 16/34, a specific design aircraft was not selected. This runway was kept as a B-I runway, as it can meet the requirements of approximately 92 percent of the small aircraft fleet. Runway 5/23 is an A-1 runway that can serve approximately 50 percent of the small aircraft fleet.

4.2.3 Airfield Capacity

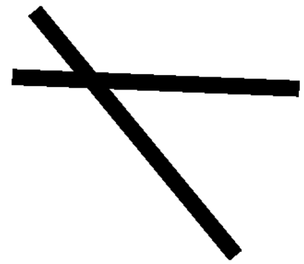
FAA AC 150/5060-5, *Airport Capacity and Delay,* identifies the capacity of an airport based on the number and configuration of its runways. The runway/taxiway configuration at MRI has a theoretical hourly capacity of 98 aircraft operations in VFR and 59 operations per hour in IFR conditions.

According to Figure 2-1 of AC 150/5060-5, MRI has an Annual Service Volume (ASV) of 230,000 operations per year[21] (see Figure 4-1). ASV estimates an airport's annual activity at which the average delay per operation is 4 minutes. The ASV accounts for differences in runway use, aircraft mix, weather conditions, etc. that would be encountered over a year's time.

FAA planning standards indicate that when 60 percent of the ASV is reached, the airport should start planning to increase runway capacity. When 80 percent of the ASV is reached, construction on the runway improvements/expansion should begin. Currently MRI, with 128,628 total operations in 2012, is at 55.9 percent of the annual capacity. MRI is expected to reach 65.8 percent by 2033. Since the operations forecasted are not expected to exceed the ASV during the 20-year planning period, no additional runways or other improvements will be required based on capacity. However, planning to increase capacity should be initiated toward the end of the planning period, when activity reaches 138,000 operations per year.

However, we need to also temper the recommendations from the AC with the fact that MRI recorded more than 350,000 operations in 1984 when operations peaked. Pilots who flew at MRI during this time well remember

Figure 4-1 Capacity and ASV for Long-Range Planning

Runway Use Configuration	Mix Index % (C=3D)	Hourly Capacity Ops/Hr VFR	Hourly Capacity Ops/Hr IFR	Annual Service Volume Ops/YR
	0 to 20	98	59	230,000
	21 to 50	77	57	200,000
	51 to 60	77	56	215,000
	81 to 120	76	59	225,000
	121 to 180	72	60	265,000

Source: Figure 2-1, FAA Advisory Circular 150/5060-5, Airport Capacity and Delay.

[21] Based on runway configuration 9. Only Runways 7/25 and 16/34 were used for this calculation because they are used most often and it provides a more conservative measure. As the two paved runways do not actually cross, the ASV could be as high as 230,000 per runway.

how busy it was, and experienced the resulting delays.

Table 4-1 Runway Design Codes

Approach Category	Approach Speed (knots)	
A	<91	
B	91 - <121	
C	121 - < 141	
D	141 - <166	
E	>166 (greater than 166)	
Design Group	**Tail Height (feet)**	**Wing Span (feet)**
I	<20’	<49’
II	20’ - <30’	49’ - < 79’
III	30’- <45’	79’ - < 118’
IV	45’ - < 60’	118’ - < 171’
V	60’ - < 66’	171’ - <214’
VI	66’ - <80’	214’ - < 262’

Source: FAA AC 150/5300-13A Tables 1-1 and 1-2

4.2.4 Airport Reference Code and Runway Design Code

FAA AC 150/5300-13A, *Airport Design*, establishes an ARC and Runway Design Code (RDC) for the airport, which identify specific design criteria appropriate for the types of aircraft expected to be accommodated at a particular airport (see Table 4-1). The RDC has two components. The first is a letter that refers to the aircraft approach category in terms of an aircraft’s approach speed. The second is a Roman numeral that lists the airplane design group, a classification of aircraft based on wingspan and tail height. Aircraft listed in a lower RDC can be accommodated by a runway with an equal or higher RDC. For example, an A-I aircraft can be accommodated on a B-II runway; but a B-II aircraft cannot use a runway rated for an A-I aircraft except under special circumstances, such as a very lightly loaded aircraft or strong headwinds.

A design aircraft is an aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, taxilane, apron, or other facility. The RDC for a runway is generally selected by reviewing the design aircraft use of a particular runway. According to the RDC definitions contained in FAA 150/5300-13A, the existing dimensions for Runway 7/25 generally meet the criteria for RDC B-II, while those for Runway 16/34 generally meet the criteria for B-I, and the dimensions for Runway 5/23 generally meet the criteria for A-I.

MRI users and airport management indicate there has been an interest in using aircraft at MRI that exceed the current 12,500-pound weight restriction. Eliminating the weight restriction is considered in Chapter 5.0, Concept Development.

4.2.5 Runway Length and Width

Runway length is based on standards presented in FAA AC 150/5300-13A, *Aviation Demand Forecast*, and FAA AC 150/5325-4C, *Runway Length Requirements for Airport Design* (see Table 4-2).

According to Figure 2-2 of AC 150-5325-4C and the FAA Design Program AD42D, Runway 7/25 should have a runway length of at least 3,800 feet (see Table 4-2 and Table 4-3) to safely accommodate B-II small aircraft with 10 or more passenger seats. Runway 7/25 is 4,010 feet long, which is sufficient to accommodate all B-II aircraft, including the design aircraft – the Beechcraft King Air 200.

Runway 16/34 has sufficient length at 2,640 feet to support B-I sized aircraft. It will serve approximately 92 percent of the small aircraft fleet, according to the AC and AD42D software. The runway length needs to be increased by 860 feet to meet FAA standards.

Table 4-2 Runway Design Codes

Airport Elevation (MSL)	136.9
Mean Daily Maximum Temperature in the Hottest Month	68 F (July)
Runway Lengths Recommended for Airport Design (Small Airplanes)	
Small airplanes with approach speeds of less than 30 knots	304
Small airplanes with approach speeds of less than 50 knots	811
Small airplanes with less than 10 passenger seats	
95 percent of these small airplanes	Approx. 2,900
100 percent of these small airplanes	Approx. 3,500
Small airplanes with 10 or more passenger seats	Approx. 3,800
Source: FAA AC 150/5325-4C	

Table 4-3 Comparison of Runway Length and Width to Standards

	7/25	16/34	5/23
Classification	B-II	B-I	A-I
Existing Length	4,010	2,640	2,000
Standard	Varies	Varies	Varies
Meets Standard	Yes	**No**	Yes
Existing Width	100	75	60
Standard	75	60	60
Meets Standard	Yes	Yes	Yes

Runway 5/23 has sufficient length to accommodate ultra light vehicles, ski planes, and tundra-tire-equipped aircraft in the A-I class and should be maintained at 2,000 feet.

FAA recommends a minimum runway width for an RDC of B-II to be 75 feet. For an RDC of A-I and B-I, the recommended width is 60 feet. Based on the forecast air traffic and the anticipated fleet mix, none of the runways at MRI will require additional runway width to accommodate future demand or the design aircraft.

4.2.6 Crosswind Runway

FAA AC 150/5300-13A indicates that a runway should be aligned with the prevailing wind and have at least 95 percent wind coverage. If a runway provides less than 95 percent coverage, a crosswind runway may be required. Wind coverage is calculated using a wind rose (Figure 4-2), which graphically depicts wind data collected from the National Oceanographic and Atmospheric Administration (NOAA).

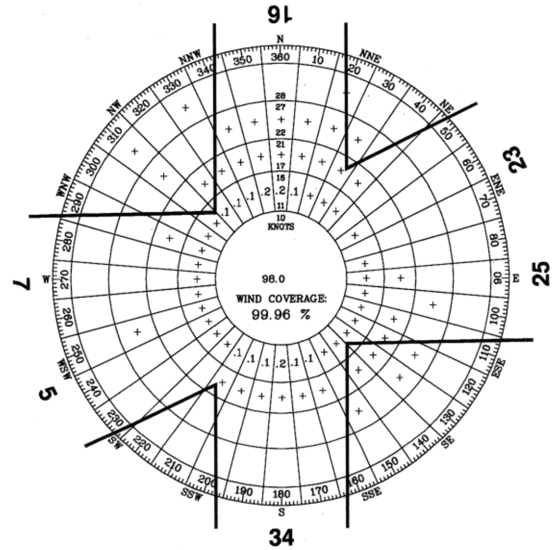
The wind rose is essentially a compass rose with graduated concentric circles representing wind speed. Each box in the wind rose represents a compass direction and, when filled, indicates the percentage of time wind travels in that direction at that speed.

At MRI, each of the runways has greater than 95 percent wind coverage. Combined, the wind coverage at MRI is 99.99 percent (see Figure 4-2). As this is above the FAA's target of 95 percent coverage, no change in runway alignment is needed to accommodate crosswind wind conditions.

4.2.7 Runway Safety Area (RSA)

The RSA is a defined area surrounding a runway that is kept free of obstructions. The purpose of the RSA is to reduce the risk of damage to airplanes that undershoot, overshoot, or have an unplanned excursion from the runway. It also provides greater accessibility for firefighting and rescue

Figure 4-2 Wind Rose from ALP



WIND COVERAGE:	10.5 KNOTS	13 KNOTS
RUNWAY 7-25:	98.39%	99.02%
RUNWAY 16-34:	99.77%	99.90%
RUNWAY 5-23:	98.51%	99.20%
ALL RUNWAYS:	99.96%	99.99%
CALM AND LESS THAN 3 KNOTS = 59.4%		

ALL-WEATHER WIND ROSE
WEATHER DATA FROM MERRILL FIELD AIRPORT
1988-1997

equipment during such incidents. The RSA width is measured from the runway centerline. The RSA length begins at each runway end. As prescribed in FAA AC 150/5300-13A, the RSA shall be:

1. Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
2. Drained by grading or storm sewers to prevent water accumulation;
3. Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and
4. Free of objects, except for objects that need to be located in the RSA because of their function. Objects higher than 3 inches above grade should be constructed on low-impact-resistant supports of the lowest practical height with the frangible point no higher than 3 inches above grade. Other objects, such as manholes, should be constructed at grade. In no case should their heights exceed 3 inches above grade.

All runways at MRI currently have sufficient RSA length and width and meet the above surface standards, with the exception of Runway 34, which is 76 feet short of the desired RSA length where the runway abuts 15th Avenue. Table 4-4 compares the existing RSA to the recommended standards.

4.2.8 Runway Protection Zone (RPZ)

The RPZ is a trapezoidal area located off the end of each runway. Its function is to enhance the safety and protection of people and property on the ground. As recommended by the FAA and where practical, airport sponsors should own the property under the runway approach and departure areas to at least the limits of the RPZ. The FAA also recommends that, where it is practical, to clear the entire RPZ of all above ground objects. When it is impractical, the RPZ should at least be cleared of all facilities that support incompatible activities such as large gatherings of people.

The RPZ dimensions applicable to MRI are dependent on the RDC for aircraft operating under visual approach

Table 4-4 Comparison of Runway Safety Areas to Standards

	7	25	16	34	5	23
Width	150	150	120	120	120	120
Standard	150	150	120	120	120	120
Meets Standard	Yes	Yes	Yes	Yes	Yes	Yes
Distance Beyond Runway End	300	300	240	164	240	240
Standard	300	300	240	240	240	240
Meets Standard	Yes	Yes	Yes	**No**	Yes	Yes

conditions. Table 4-5 presents the applicable standards and compares them to the existing RPZ dimensions at MRI.

The Runway 7/25 RPZ meets the FAA standards for length but not for inner width, outer width, or area. The RPZ no longer meets standards because the standard for B-II small aircraft no longer exists. The RPZs for Runways 16/34 and 5/23 meet the FAA standards. Potential airfield improvements to meet the RPZ design standards for Runway 7/25 are explored in Chapter 5.0, Concept Development.

The FAA issued interim guidance for determining incompatible land uses within the RPZ on September 27, 2012. Public roads and highways have been determined to be an incompatible land use requiring FAA concurrence for any improvements to such. The RPZs for Runways 16, 25, and 34 all cross over public roadways. Any change to these roads will require FAA concurrence that the change does not introduce any new incompatibility.

4.2.9 Runway Obstacle Free Zone (ROFZ)

The ROFZ is a three-dimensional airspace along the runway and extended runway centerline that is required to be free of any obstacles penetrating the surfaces for the protection of aircraft landing and taking off. As shown in Table 4-6, the ROFZs meet applicable standards.

Table 4-5 Comparison of Runway Protection Zone to Standards

	7/25	16/34	5/23
Length	1,000	1,000	1,000
Standard	1,000	1,000	1,000
Meets Standard	Yes	Yes	Yes
Inner Width	250	250	250
Standard	**500**	250	250
Meets Standard	**No**	Yes	Yes
Outer Width	**450**	450	450
Standard	**700**	450	450
Meets Standard	**No**	Yes	Yes
Area (acres)	**8.03**	8.03	8.03
Standard	**13.770**	8.035	8.035
Meets Standard	**No**	Yes	Yes
Presence of Incompatible Land Uses	**Yes (public road)**	**Yes (public road)**	**Yes (public road)**

4.2.10 Runway Object Free Area (ROFA)

The ROFA is an area surrounding runways, taxiways, and taxi lanes that is to remain clear of objects, except for those objects that are fixed by function. As shown in Table 4-7, the ROFAs at MRI meet the applicable standards.

4.2.11 Runway Shoulder Width

Shoulders are defined as an area adjacent to the defined edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft and emergency vehicles' deviation from the full-strength pavement; enhanced drainage; and blast protection. The width of the shoulder is dependent on the RDC for the particular runway.

Runway shoulders also provide blast erosion protection. A stabilized surface, such as turf, normally reduces the possibility of soil erosion and engine ingestion of foreign objects. Paving the shoulders is an alternative to providing turf.

Runway shoulders for both paved runways are currently 10 feet wide and are turf- and gravel-surfaced; thus, they meet the recommended width and surface standards (see Table 4-8). No additional runway shoulder width

Table 4-6 Comparison of Runway Obstacle Free Zone to Standards

	7/25	16/34	5/23
Length	200	200	200
Standard	200	200	200
Meets Standard	Yes	Yes	Yes
Width	250	250	250
Standard	250	250	250
Meets Standard	Yes	Yes	Yes

Table 4-7 Comparison of Runway Object Free Area to Standards

	7/25	16/34	5/23
Length beyond runway end	300	240	240
Standard	300	240	240
Meets Standard	Yes	Yes	Yes
Length prior to threshold	300	240	240
Standard	300	240	240
Meets Standard	Yes	Yes	Yes
Width	500	250	250
Standard	500	250	250
Meets Standard	Yes	Yes	Yes

will be required during the planning period.

4.2.12 Effective Gradient

The effective runway gradient is the maximum distance between the runway centerline elevations divided by the runway length. This value is important because it is used as part of the takeoff calculations. Table 4-9 compares the effective runway gradients at MRI to standards.

4.2.13 Runway Separation

The standard separation between the runway centerline and parallel taxiway centerline for Runway 7/25, a B-II runway, is 240 feet. The centerline of Taxiway A, the only applicable taxiway that does not meet this standard, is only 200 feet from the Runway 7/25 centerline. The standard separation between the runway centerline and parallel taxiway centerline for Runways 16/34 and 5/23, which are A-I and B-I runways, is 150 feet (see Table 4-10). All applicable taxiways meet this standard.

Table 4-8 Comparison of Runway Shoulder Width to Standards

	7/25	16/34	5/23
Width	10	10	N/A
Standard	10	10	N/A
Meets Standard	Yes	Yes	N/A

Table 4-9 Comparison of Effective Gradient to Standards (%)

	7/25	16/34	5/23
Effective Gradient	0.31	0.28	0.26
Standard	0-2	0-2	0-2
Meets Standard	Yes	Yes	Yes

Source: FAA AC 150/5300-13A

The standard separation between the runway centerline and aircraft parking positions for Runway 7/25 is 250 feet and for Runways 16/34 and 5/23 is 125 feet. All applicable aircraft parking areas meet this standard.

4.2.14 Taxiways

MRI has 19 individual taxiways. All aircraft using MRI are in Taxiway Design Group (TDG) 1[22], which is a designation based on the main gear width and the distance from the cockpit to main gear. The minimum taxiway width for TDG 1 aircraft is 25 feet. MRI taxiway widths vary from 35 feet to 340 feet. Many of the taxiways have been constructed so that two aircraft can pass each other on the taxiway. Some of the taxiways are

[22] Note this is a change from AC 150/5300-13 to -13A in the way taxiways are designated.

wider; Taxiway K, for example, is 230 feet wide on one side of the runway and 340 feet wide on the other. This allows various aircraft to do their run-ups and request their takeoff sequence without having to wait for the aircraft in front of them.

Taxiway shoulders must be provided to reduce the possibility of blast erosion and engine ingestion of dust and debris. The width of the shoulders for TDG 1 is 10 feet. Taxiway shoulders at MRI are generally compliant with this standard.

The Taxiway Safety Area (TSA) is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing from the taxiway (AC 150/5300). TSAs on taxiways primarily serving TDG 1 should be at least 49 feet wide. TSAs at MRI are compliant with this standard.

A taxiway/taxilane Object Free Area (OFA) is an area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes (AC 150/5300). The standard width for OFAs on taxiways serving primarily airplane design group I and II aircraft are 89 feet and 131 feet, respectively. The standard width for OFAs on taxiways serving primarily TDG 1 aircraft is 79 feet. OFAs at MRI are compliant with this standard.

Like runway gradients, taxiway system gradients should allow for adequate drainage, but the slopes should be

Table 4-10 Comparison of Runway Separation to Standards

	7/25	16/34	5/23
Holding Positions	125'	100'	100'
Standard	125'	125'	125'
Meets Standard	Yes	No	No
Parallel Taxiway	200/255*	150'	150'
Standard Parallel Taxiway Offset from the Runway Centerline	240'	150'	150'
Meets Standard	No Alpha/Yes November	Yes	Yes
Aircraft Parking	250'N/325'S	225'E/200'W	200'
Standard	250'	200'	125'
Meets Standard	Yes	Yes	Yes

Source: FAA AC 150/5300-13A

*Note: Taxiway A separation = 200 feet, Taxiway N separation = 255 feet slight enough to allow the pilot to maintain positive control and efficient operation of the airplane. The maximum allowable grade change for the fleet of aircraft most common at MRI (i.e., TDG 1 aircraft) is plus or minus 3 percent. All existing taxiways at MRI meet this standard.

Table 4-11 compares the existing taxiway conditions at MRI to the current standards. Most of the taxiways at MRI meet standards and no improvements are needed, except for the following: Taxiway A is too close to Runway 7/25. There is currently 200 feet of separation, but the standard is 240 feet. The hold lines for taxiways B and C are too close to Runway 16/34. The standard is 125 feet; however, the lines are currently at 100 feet. MRI has an approval from FAA of the non-standard hold line distances on taxiways B and C. MRI also has FAA approval for the non-standard hold line distances on all taxiways associated with Runway 5/23. Taxiways A and N that parallel Runway 7/25 were compliant with an old standard that no longer exists. These will be shown in a non-standard conditions table on the ALP.

Aircraft parking at MRI is controlled by three factors: the setback from the runways, the wingtip clearance from the taxiways, and the Taxiway Object Free Area (TOFA). The standard setback from a runway centerline to an aircraft parking area is 250 feet for a B-II, 200 feet for a B-I, and 125 feet for an A-I small. All of the parking at MRI meets this setback standard.

The second factor is the wingtip clearance to an object. The wingtip clearance for TDG 1 aircraft is 20 feet based on the design aircraft being on the taxiway centerline. All taxiways at MRI, including the parallel taxiways designed to let two aircraft pass in opposite directions, are designed for two aircraft to pass each other; applying the wingtip clearance rule means MRI meets this standard.

The third factor is the TOFA. It is somewhat difficult to apply at MRI since the taxiways are wider than the minimum. The formula is one-half the taxiway paved width plus the wingtip clearance of 15 feet, since Taxiways A, B, C, and N are taxilanes on the edge of parking areas. MRI meets the standard of 15 feet for this aircraft parking. The edge of these taxiways has been marked as the edge of the movement area, and automobiles are often observed driving within the TOFA, but outside the movement area. This was raised as a safety issue in the issues identification phase of this study.

4.2.15 Building Restriction Line

The Building Restriction Lines (BRLs) at MRI are shown on the ALP. Normally, a BRL is set to control building penetrations into the Part 77 transitional surfaces of a runway. Airport management can move the BRL farther back from a runway to control the development of the properties alongside of the runway The BRLs at

MRI were likely defined using a combination of these methods as the setbacks from the runways vary. Only one Part 77 penetration, an antenna on a building on the west side of Runway 16/34 was identified on the ALP. The use of the BRL appears to successfully protect the runways and modifications to the BRL will not be studied as part of the concepts development process.

Table 4-11 Comparison of Taxiways to Standards

	A	B	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	T	W
ADG/TDG	II/1	I/1	I/1	II/1	II/1	II/1	II/1	II/1	II/1	II/1	I/1	I/1	II/1	II/1	I/1	I/1	I/1	I/1
Width (ft)	75	75	60	75/65	35	35	75	35	75/50	330/230	35	35/100	35/75	65	50	100/200	35	35
Standard	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Meets Standard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Edge Safety Margin	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+	5+
Standard	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Meets Standard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shoulder Width	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Standard	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Meets Standard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RW Centerline to Parallel Taxiway	200	150	175	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	257	N/A	N/A	N/A	N/A	150
Standard	240	150	150	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	150	N/A	N/A	N/A	N/A	150
Meets Standard	No	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Yes
Object Free Area Width	131	89	89	131	131	131	131	131	131	131	89	89	131	131	89	89	89	89
Standard	131	89	89	131	131	131	131	131	131	131	89	89	131	131	89	89	89	89
Meets Standard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Safety Area Width	79	49	49	79	79	79	79	79	79	79	49	49	79	79	49	49	49	49
Standard	79	49	49	79	79	79	79	79	79	79	79	49	79	79	49	49	49	49
Meet Standards	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: AC 150/5300-13A, Tables 4-1, 4-2, A7-1, A7-2, and A7-3

4.2.16 Helipads/ Helicopter Parking

The helipad at MRI is used primarily for medevac flights to Alaska Regional Hospital. FAA design requirements for hospital heliports are identified in AC 150/5390-2C.

Using the AS 350 A-Star helicopter as the design aircraft for this facility, the minimum dimensions of the MRI hospital helipad should be as follows:

- Touchdown and liftoff area (TLOF): 40 feet by 40 feet
- Final approach and takeoff area (FATO): 64 feet by 64 feet
- Safety area: 76 feet by 76 feet

The facility was originally designed to accommodate a maximum of one helicopter within the FATO and the associated safety area. This is anticipated to be adequate though the planning period.

The standard marking for a hospital helipad is a red H in white cross. The hospital helipad markings should be updated to be consistent with AC 150/5390-2C.

4.2.17 Pavement Strength

MRI manages approximately 2.5 million square feet of pavement included in the runways, taxiways, aprons, roads, and vehicle parking areas. Pavement strength for the runway pavements at MRI have not been calculated or tested as part of the AMP Update. When Runway 16/34 was repaved in 2010, it was designed for 12,500-pound aircraft. When Runway 7/25 was rehabilitated in 2005, it was also designed for 12,500-pound aircraft.

In July 2015, a pavement inspection was conducted by DOT&PF and a Pavement Condition Index (PCI) was developed. The PCI value was determined for each of section of the runways, taxiways, and aircraft parking aprons using standard procedures that combine the different types of distress observed in a specific area of the section. The average PCI value over all of the samples determines the PCI of each section. The average PCI value for Runways 7/25 and 16/34 were 86.00 and 91.00, respectively. PCI values of 70 to 100 are considered serviceable with only preventive maintenance required. Overall, aprons had a weighted average PCI of 74.29 with Tower Apron having the lowest value (61.00) and Taxiway S Apron having the highest value (95.00). Taxiways had a weighted average PCI of 87.05, with Taxiway G having the lowest value (76.29) and Taxiway Q having the highest (100.00). The complete inspection report can be found in Appendix C.

Overall, the pavement is adequate, but it will need regular maintenance and periodic repaving over the next 20 years.

4.2.18 Signage

MRI airfield signs are sized in accordance with Category 1 sign criteria listed in Table 1 of AC 150/5340-18F. The 2012 *Updated*

Airfield Inspection Report examined airport signage to determine if existing signs met requirements and if additional signage was needed. Overall, the inspection indicated that the existing sign size and location meet the needs of a general aviation airport.

A 2007 inspection identified 19 signs that did not meet standard. Since then, 13 signs have been corrected or it was concluded that no changes were necessary because it was impractical, would create safety concerns, or would be confusing. Outstanding signage issues include:

- Repairing two existing signs;
- Constructing two new signs; and
- Relocating an existing sign.

The results are shown in the 2012 Updated Airfield Signs Corrective Action List in Appendix B.

Runway 7/25 is a visual runway with runway markings. The touchdown zone markings and aiming point markings are approximately 20 feet down runway from the preferred located listed in AC 150/5340-1K. Relocation of the markings on Runway 7/25 is studied in Chapter 5.0, Concept Development. The markings on Runway 16/34 are consistent with standards.

Runway 16/34 hold position markings are located 100 feet from runway centerline, which is 25 feet less than the standard distance specified in AC 150/5300-13. The hold lines are installed in this location to keep holding traffic out of the traveled way of the parallel taxiways. The non-standard hold position location is identified on the approved ALP and the Modification to Standards letter dated February 10, 2009, and corrective action is not recommended.

Runway and taxiway markings should be repainted as part of scheduled maintenance.

For additional information, please see Section 1.4 of the 2012 Updated Airfield Inspection Report.

4.3 Airport Access, Parking, and Security

This section looks at airport access, parking, and security to determine if they are adequate to meet future demand.

4.3.1 Airport Access

Public access from the north to MRI is off of 5th Avenue, a four-lane arterial on the north side of the airport, and Merrill Field Drive, a two-lane road that crosses MRI from the east side (at Airport Heights Drive) to the south side (15th Avenue).

The current roads that access the airport are adequate for the current and projected demand at MRI. If planned improvements to adjacent roadways (5th Avenue and Lake Otis Parkway Extension) do not occur, this may change.

Roads that provide access to and from the airport should be monitored by the MOA and DOT&PF to ensure acceptable levels of service.

Planned roadway improvements are considered as part of Chapter 5.0, Concept Development.

4.3.2 Airport Service Roads

The primary airport service road is Merrill Field Drive, bounded by Airport Heights Drive from the east and the intersection of 15th Avenue and Lake Otis Parkway to the south.

Traffic on the airport service road is accommodated on a daily basis and is expected to be adequate for future demand. If traffic volumes on Merrill Field Drive increase substantially, the current practice of accessing parking spaces directly from the roadway may need to be reconsidered.

The segments of Merrill Field Drive from the 15thAvenue/Lake Otis Parkway intersection to Charlie South and from UAA west to Airport Heights Drive need rehabilitation due to the sporadic settlement of the subsurface grade above landfill.

Signage and road markings are reviewed in Chapter 5.0, Concept Development, for clarity and accuracy of directory information.

4.3.3 Vehicle Parking Facilities

Limited short-term vehicle parking is available at the commercial businesses and facilities on MRI for customer and employee use. Short-term vehicle parking is also available at the Airport Manager's Office, Alpha Vehicle Parking (near Alpha transient), Central Parking (near Taxiway G), and South Parking (near Taxiway Q). These parking areas are shown on Figure 2-3. Currently, aircraft owners generally park on the tiedown space or in the hangar vacated by their aircraft when they fly, and this practice is expected to continue.

Sufficient vehicle parking areas should be provided by the lessees in commercial aviation areas. Parking spaces should be provided within the lease lot (as a lease condition) on non-aircraft parking apron areas.

Some of the MRI permitted parking areas are inside the secured perimeter fenced area. The Alpha parking is inside the secured perimeter fence, limited to transient aviation people with a reason to be inside the fence. The new parking area south of Taxiway Q is located in a fenced area with a locked gate where only people with a legitimate need to be inside the area should have access.

Providing additional parking, including long-term secure parking, will be considered as part of the concept development process.

4.3.4 Safety Fencing and Security Fencing

The runways at MRI are surrounded by a safety fence designed to prevent the accidental/unauthorized entry of vehicles and pedestrians onto the airport operations area[23] . Over the past several years, MRI has installed and upgraded fences and gates to reduce the number of vehicle and pedestrian incursions[24]. Not all parts of MRI are fenced, and the potential for conflicts between aircraft and other MRI authorized entry still exists.

The replacement of existing fencing, expansion of the fenced area, and additional fencing improvements are considered in Chapter 5.0, Concepts Development.

4.3.5 Other Security

MRI does not have a 24/7 monitored security program approved by the Transportation Security Administration, nor is one required. However, tenants and users of MRI are covered by the general security provisions of 49 CFR 1540.

[23] An operations area includes runways, taxiways, and aprons.
[24] An incursion is an unauthorized entry into the movement area (controlled area such as runways and taxiway).

Although not a requirement, MRI does have a public address system and a video surveillance system. Improvements to these systems are considered in Chapter 5.0, Concepts Development.

MRI relies on the Anchorage Police Department for enforcement and citation for safety/security (VPD violations).

4.4 General Aviation

This section looks at general aviation facilities and estimates whether future demand can be met with existing facilities.

4.4.1 Aprons and Tiedowns

Based on the aviation forecast presented in Chapter 3.0, Aviation Demand Forecast, it is estimated that MRI will need space for approximately 938 general aviation and commercial aviation aircraft by the year 2033. Currently, most of the general aviation aircraft are parked on tiedowns, as there are a limited number of hangar spaces available.

The number of tiedown spaces at MRI exceeded the number of based planes forecasted for 2033. The number of existing tiedown spaces is believed to be adequate for future demand and no new spaces are needed.

4.4.2 Hangars

All hangars currently in use at MRI are privately owned on land leased from MRI. Many airports have hangars that are owned by the airport and are leased out to users, but MRI does not have any such facilities.

It is assumed that the larger, higher value aircraft are more likely to be stored in a hangar.

Existing hangars are at or near capacity, and there is a need for additional hangars. Alternative hangar development options are explored in Chapter 5.0, Concepts Development.

4.4.3 Helicopter Facilities

There are presently approximately 33 helicopters based at MRI, and the forecast is for an increase to 47 helicopters by 2033. Several of the helicopters based at MRI are used for training purposes. Helicopters follow approach procedures to the runways and then hover-taxi to lease lots. The only helipad provides access to Alaska Regional Hospital.

MRI users have indicated that additional helicopter landing areas, parking areas, and a helicopter terrain park are needed. These will be considered during the Concept Development phase.

4.5 Airport Support Facilities

This section looks at MRI's airport support facilities to determine if they are adequate to meet future demand.

4.5.1 Airport Administration and Maintenance

4.5.1.1 Fuel

At MRI, aircraft fuel is supplied from underground or above-ground storage tanks maintained by individual lease holders. Jet A and Avgas are both available through existing vendors. As of March 2013, there were four fuel vendors on MRI. No automobile fuel is currently dispensed on MRI. Fuel vendors are expected to comply with AMC 11.60.190.

Provided adequate fuel delivery occurs, the existing fuel capacity at MRI should be sufficient for the next 20 years.

MRI users have expressed interest in an additional fuel station on the north side of Runway 7/25. This is considered in Chapter 5.0, Concept Development.

4.5.1.2 Airport Manager's Office

The airport manager's office is in a building that used to be the base of the old four-story ATCT. After the current ATCT was constructed, the old cab and two stories were removed and a roof placed on the structure. Included in this building are offices for the airport manager and staff, public restrooms, and the electrical vault with runway light regulators.

The airport manager's office building is old and is considered marginally functional. Its location is also problematic as it causes line-of-sight problems from the tower.

The airport manager's office is not expected to be sufficient to support the staffing needs of MRI for the next 20 years. A replacement manager's office at a new location is studied in Chapter 5.0, Concept Developments.

MRI also has a maintenance building to store the snow removal equipment and a bay for tonnage for the runway winter sand. Maintenance facilities are likely to be sufficient for the next 20 years.

MRI is likely to need to replace existing and purchase additional snow removal equipment to ensure timely snow removal during the winter months. One of the issues identified is lack of sufficient snow storage during heavy snowfall years.

As part of the concept development process, the project team will investigate additional snow storage locations and snow handling procedures.

4.5.1.3 Aircraft Rescue and Firefighting

MRI does not have an operating certificate issued under 14 CFR Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*, which is required if MRI is to receive services by aircraft with more than 30 passenger seats. The FAA requirement for ARFF capability is one of the Part 139 requirements. The AFD provides emergency response services from nearby fire stations. Fire Station 3, located near the intersection of Airport Heights Drive and Merrill Field Drive, is the closest fire station. It has direct access to the airfield along Taxiway Q, which allows for an immediate response in the event of an accident.

MRI does not anticipate receiving aircraft with more than 30 passenger seats in the next 20 years. As a result, the emergency response capabilities of the AFD should be adequate for MRI's needs. If the AFD closes or relocates Fire Station 3, or makes a dramatic shift in equipment/staffing levels, this issue may have to be revisited.

4.5.1.4 Federal Aviation Administration

The FAA's ATCT was relocated to its current site in 1999. The ATCT has line-of-site concerns due to the location of the airport manager's office and other structures east of Runway 16/34 that block the tower's view of Taxiway C. The ATCT is believed to be adequate to meet future needs.

4.5.1.5 Aircraft Wash Rack

MRI has a unique facility: an area where owners can wash their aircraft. The wash rack is simply an area immediately south of the maintenance equipment shop that has two water hoses on hose reels. Owners supply their own ladders and brushes. Owners are encouraged to not use soaps that could get into the storm sewer or the creeks. Effluent is collected in a trench drain and carried to an oil/water separator before discharging into the municipal sanitary sewer. The concern is that phosphates and other chemicals need to stay out of the creeks. The hoses and reels are put out each spring when the weather is warm enough, and picked up and winterized each fall.

An aircraft wash rack is not a required facility; however, it receives considerable use. Expansion of the aircraft wash has been suggested and will be evaluated during the Concept Development phase. Expansion of the wash rack may also generate additional revenue for MRI.

4.6 Avigation

This section evaluates whether existing avigation facilities are adequate to meet future needs.

4.6.1 Airspace and Air Traffic Control

MRI operates as Class D airspace during the hours when the ATCT is open, and as Class E or G airspace when the tower is closed, depending on the weather. MRI is also covered by the 14 CFR 93 Special Air Traffic Rules regulation that governs all air operations in the Anchorage Bowl. These existing airspace procedures and ATCT provide for safe, orderly, and efficient flow of air traffic. Airspace and ATCT considerations do not limit the amount of VFR aviation activity at MRI and are not expected to do so in the future. IFR operations at MRI are constrained by JBER and ANC. Establishing instrument approaches and departures at MRI has been thoroughly studied. FAA established a GPS-based RNAV approach with 600-foot ceiling and 1-mile visibility minimums, offering a procedure to descend through the clouds to visual conditions and then circle to land at an appropriate runway. Aircraft departing MRI under IFR can do so with clearance from Departure Control and radar vectors upon departure. Sometimes the IFR arrivals flow better if pilots request an instrument approach into JBER with a visual turnout to MRI.

For the purpose of airfield analysis, MRI is assumed to exist in a radar environment. Approach and departure control is, and is expected to be, provided by Anchorage Terminal Radar Approach Control, also known as Anchorage Approach/Departure Control.

Conflict between the Golf Course Approach/Departure for helicopters and fixed-wing aircraft on approach/departure from the gravel strip has been identified as an issue by helicopter operators.

Modifications to existing airspace and air traffic controls to better meet future needs are studied in Chapter 5.0, Concept Development.

4.6.2 Approach Areas and Obstructions

When Runway 5/23 was established, a normal approach and departure would have conflicted with approaches and departures to the other runways, and would have placed aircraft over residential neighborhoods at low altitudes. MRI and the ATCT established procedures where approaches to Runway 5 and departures from Runway 23 would join the approach and departure patterns for Runway 16/34. Departures from Runway 5 and approaches to Runway 23 would join the approach and departure patterns for Runway 7/25. Pilot education of these procedures has been problematic, with reports of low-flying aircraft over the Fairview neighborhood.

The FAA has identified numerous obstructions in the vicinity of MRI, which have been documented in the obstruction database (Part 77) as well as in Section 2.5.6 of this report and on the ALP. As these obstructions have been approved by the FAA, no mitigation action will be studied in the concept development phase.

4.6.3 Navigational and Landing Aids

MRI does not have any radio-type navigational aids. MRI does have VASI and REIL on Runways 7, 25, 16, and 34.

While it is not a current requirement, the replacement of VASI with PAPI is considered in Chapter 5.0, Concept Development. PAPI systems are the new standard for visual approach airports, and VASIs are no longer being installed. However, the VASIs are owned by the FAA and replacement will occur on the FAA's schedule.

A windsock at the Alaska Regional Hospital helipad will be considered as part of the Concept Development phase.

4.7 Lighting

No area lighting standards apply to MRI. Lighting is supplied by the airport owner to support the operations on the airport, and lighting on Runways 7/25 and 16/34 is believed to be adequate.

Lighting on Runway 5/23 is considered in Chapter 5.0, Concept Development.

4.8 Utilities

The expansion of any facilities at MRI is unlikely to require the existing utility systems to be expanded but additional utility lines may be needed. While it is not anticipated that any proposed development at MRI will place a large burden on the existing utility system, some impact may occur. The development, or redevelopment, of any MRI facility will require the developer to coordinate with the utility companies and obtain the necessary permits, reviews, and approvals.

4.8.1 Water

Water service on MRI is provided by AWWU, which is owned and operated by the MOA. The availability of water is considered adequate to meet future airport needs, although additional service lines may be needed.

4.8.2 Wastewater

AWWU collects and treats almost all wastewater produced at MRI. Proposed development of MRI will not require an expansion of the wastewater system, except for service to individual lots. The removal of any building would require the applicable permits. The availability of wastewater services is considered adequate to meet future airport needs, although local service lines may be needed.

4.8.3 Electrical Power

ML&P provides electrical power to MRI. There is sufficient capacity for existing and future demands.

4.8.4 Telephone

Both GCI and ACS provide telephone service to MRI. There is sufficient capacity for existing and future demands. The fiber optic backbone capable of providing high-speed internet is not available to some areas of MRI. As the need for high-speed internet for business purposes increases, the carriers will need to upgrade their systems to provide appropriate service to their customers.

4.8.5 Gas

Enstar Natural Gas provides gas service to MRI. There is sufficient piping capacity for existing and future demands, but service connections to any future lease lots may be needed. The Anchorage Bowl may face natural gas shortages in future years as Cook Inlet gas supplies continue to decline. A decline in the availability of natural gas is of greater concern than the ability to distribute it at MRI.

4.9 Other Facilities

4.9.1 Public Terminal

MRI currently does not have an air taxi terminal, although previous versions of the MRI Airport Master Plan had reserved space and identified the need for a joint-use air taxi terminal. No lessee or developer has stepped forward to fulfill this need. All air taxi operators currently have facilities to serve their passengers, and it could cost more to lease additional space in a joint-use facility. During the replatting of lease lots on the north side of MRI, the reserve for this joint use terminal was removed and the space leased out for normal development.

MRI users not indicated a need for a dedicated public terminal and it is not studied in Chapter 5.0, Concept Development.

4.9.2 Pilots Lounge

Pilot lounges are places that pilots can plan their flights, check weather, file flight plans, rest between flights, and wait for bad weather to improve. Ace and Spernaks provide many of these functions for transient pilots. MRI has also installed some small structures, one on the north side near the Alpha transient, one at the campground, and one at Whisky apron where pilots have a place to get out of the weather. A separate pilot lounge is probably not a practical amenity since they are usually co-located with fuel and other services, and the fuel services at MRI are provided from several locations.

4.10 Land Uses

4.10.1 Airport Land Uses

Uses of land on the airport are governed by Municipal Code and FAA Grant Assurances. Most of the airport property needs to be used for aeronautical purposes. The FAA makes allowance for using airport property for revenue production to support the airport, but these uses are normally reserved for property that could not otherwise be used for aeronautical purposes. Potential development of lands that may be used for non-aeronautical purposes is explored in Chapter 5.0, Concepts Development.

4.10.2 Landfill

The old municipal landfill, which underlays much of the airport property, was permanently closed in 1989 (see Figure 2-19). Methane is a byproduct of decomposing garbage. Due to concerns regarding the accumulation of methane gas, no enclosed buildings should be built on top of the old landfill. SWS still monitors methane gas activity.

As the landfill decomposes, it also causes the area to settle, severely limiting the ability to pave or build structures in this area.

Any improvements above the old landfill considered as part of the Concept Development phase will need to be consistent with methane gas and settlement issues concerns.

4.11 Airport Property/Land Requirements

For airport protection, land acquisition of RPZs is explored in Chapter 5.0, Concept Development.

4.12 Drainage

Drainage at MRI is rather complicated due to the old landfill, as well as the North Fork of Chester Creek that was diverted into a culvert when the landfill was in operation to prevent the creek from being contaminated with landfill runoff. A map showing the direction of surface water drainage is available on line at http://www.merrillfieldak.com/documents/11-003-19_SWPPP-MAP_11x17.pdf. Basically, surface water from paved surfaces is sheet flowed to grassy areas for infiltration, or captured in inlets for carriage by storm drains off the property to the municipal storm drain system. Waters are carried north towards Ship Creek or south to enter the North Fork of Chester Creek. Effluent from special areas, such as the aircraft wash, are captured and run through an oil/water separator before being deposited into the municipal sanitary sewer.

Overall, existing drainage is adequate. MRI users have indicated localized draining concerns at a small number of locations. MRI currently has a SWPPP which complies with DEC's Multi-Sector General Permit for Industrial Activities. The Concepts Development chapter identifies any needed drainage improvements associated with recommended projects.

5.0 CONCEPT DEVELOPMENT

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5.1 Introduction

The purpose of this chapter is to present alternative planning concepts for the long-term development of Merrill Field Airport. The basic purpose of an Airport Master Plan is to set out a plan for future development designed to meet projected needs given community, environmental, and political considerations. The analysis presented in Chapter 4.0 indicates that sufficient capacity exists in the Airport's runway system and apron areas to accommodate anticipated demand through 2033. Therefore, alternative planning concepts were composed to emphasize themes that address the remaining deficiencies and issues but also offer alternative visions for the Airport's future.

For the purpose of facilitating discussion, each alternative vision is presented in this chapter as a grouping of improvements consistent with a theme. These groupings are not mutually exclusive however. Ultimately, improvements from various alternatives could be regrouped to form a preferred alternative as a blend of one or more themes.

The alternatives are:

Safety, Standards, and Asset Preservation – improvements that are required to meet FAA regulations or that should be done regardless of activity levels to ensure safety or to preserve existing airport facilities. This report identifies but does not recommend implementation of all items.

Community Focus – improvements intended to enhance the relationship between the Airport and the surrounding community.

Existing Trends – improvements intended to serve Airport activity at forecasted levels.

Economic Driver – improvements intended to reverse the trend of declining operations and enhance MRI as a source of employment and other economic benefits for the community

Each of these concepts is described in detail below.

5.2 Safety, Standards, and Asset Preservation

As shown in Figure 5-1, this alternative consists of improvements in the following categories:

5.2.1 Airfield and Air Traffic Control Improvements

Expand Runway Blast Pads

- Extend the 75-foot existing length of the Runway 7 blast pad to 150 feet. Extend the 75-foot existing length of the Runway 25 blast pad to 150 feet. Extend the 50-foot existing length of the Runway 7 blast pad to 60 feet and widen the 75-foot-wide pad to 80 feet.

Repair Security Gates and Fencing

- Repair four pedestrian gates and repair non-functional edge sensors, key pads, and manual overrides on electronic vehicle gates; reinstall locking and automatic closure components on the pedestrian gates; repair the damaged aluminum tubing on the Gravel/Ski Runway gate; and drill weep holes at the bottom of all vertical tubing to allow water to escape.

Repair Lighting and Navigation Aids

- Remove and replace the standby generator with a new enclosure outside the airport lighting vault; rearrange the regulator layout and hydronic heat piping in the airport lighting vault to meet code; fix broken or missing lights and junction boxes; replace edge light lamps, upgrade remaining runway and taxiway edge lighting to light-emitting diode (LED) fixtures; improve grounding and bonding of beacon tower; and replace remaining lighted wind cones with LED tilt down fixtures.

Relocate Runway Hold Lines

- Increase separation between Runway 7/25 and Taxiway A hold line by 75 feet
- Increase separation between Runway 7/25 and Taxiway N hold line by 75 feet

Replace VASIs with PAPIs

- **VASI/PAPI Alternative A:** Replace FAA-owned VASIs with MRI-owned PAPIs.
- **VASI/PAPI Alternative B:** Request the FAA replace the VASIs with FAA-owned PAPIs.

Replace Runway Touchdown and Aiming Point Markings

- Remove and re-install the markings, preferably at the same time as the runway is re-surfaced and the PAPIs are installed.

Extend Runway 16/34

- Runway 16/34 length is identified as a deficiency.

Extend Runway 34 RSA

- **Extend RSA Alternative A:** Relocate East 15th Avenue approximately 80 feet to the south and extend the RSA.
- **Extend RSA Alternative B:** Displace the threshold approximately 80 feet north and establish the RSA within existing airport property.
- **Extend RSA Alternative C:** With FAA approval, continue existing non-standard condition.

Replace Airfield Signs

- Fix or replace broken or missing signs, construct new signs, and relocate existing signs to standardize sign layout in the vicinity of the intersecting runways and taxiways.

Increase Runway 7/25 - Taxiway A Separation

- **Runway Separation Alternative A:** Purchase lease lot frontage on Alpha Apron sufficient to move Taxiway A 40 feet north.
- **Runway Separation Alternative B:** Purchase lease lot frontage on Golf Aprons sufficient to move Runway 7/25 and Taxiway N 40 feet south.

- **Runway Separation Alternative C**: Change the Runway 7/25 ARC to B-I.
- **Runway Separation Alternative D**: With FAA approval, continue the existing non-standard condition.

Airfield Pavement Improvements

- Rehabilitate airfield pavement, perform crack sealing and edge repairs, and continue dynamic compaction in selected areas on Taxiway A, Taxiway C, Taxiway E, Taxiway J, Runway 7/25, Runway 16/34, Taxiway N, and apron areas above the closed Merrill Field Landfill.

Improve Visibility of Aircraft Operational Areas from the ATCT

- **Improve ATCT Visibility Alternative A:** Acquire/relocate/demolish obstructing structures.
- **Improve ATCT Visibility Alternative B:** Relocate the ATCT.

Increase Airspace Safety when the ATCT is Closed

- Make arrival and departure announcements a required airport procedure.

Protect MRI Part 77 Airspace

- Acquire control over airspace above the Northway Mall.

Update Special Approach and Departure Procedures

- Request that FAA provide updated special approach and departure procedures to reduce airspace conflicts between fixed wing and helicopter traffic.

5.2.2 Ground Access and Parking

Roadway Signage

- Upgrade, install, and or replace signs in accordance with the MRI 2013 Airport Inspection Report.

Update Gate Access Code System

- Upgrade the gate access code system to improve security.

Additional Vehicle Parking along Merrill Field Drive

- Provide additional vehicle parking along Merrill Field Drive, as existing parking reaches capacity at times.

Rehabilitate Roadway Pavement

- Rehabilitate 3,830 LF of Merrill Field Drive from Taxiway Quebec to the intersection at East 15th Avenue, 1,900 LF of Merrill Field Drive from the intersection at Airport Heights Drive to the limits of the 2000 Airport Access Road Rehabilitation Project, and the remaining 1,450 LF of Merrill Field Drive.

5.2.3 Airport Support

- Construct O&M service road from the east end of Alpha Transient Apron, around the approach end of Runway 7 to the lease area west of Runway 16.
- Replace existing and purchase additional snow removal equipment to ensure timely snow removal during the winter months.

5.2.4 Utilities

- Upgrade the Airport Electrical System (in progress).
- Upgrade the video surveillance system.

5.2.5 Other

- Address issues identified in the FAA Land Use Inspection Report.
- Address new recycling and environmental management requirements.
- Update reader board signage.

Figure 5-1 Safety, Standards, and Asset Preservation

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5.3 Community Focus

As shown in Figure 5-2, this alternative consists of improvements in the following categories:

5.3.1 Airfield and Air Traffic Control

Address Noise Concerns in Adjacent Residential Areas

- Restrict aircraft use to certain runways, time of day/night, types of aircraft, traffic patterns, and operational procedures.
- Establish an ongoing noise monitoring program.
- Ensure that tower staff understand "fly friendly" noise policies and impacts on neighborhoods.

5.3.2 Ground Access and Parking

Improve Access to Trails through MRI from Adjacent Neighborhoods

- Identify appropriate corridors for pedestrian travel and provide signage and channelization.

5.3.3 Airport Support

Potential Closure of ATCT

- Consider the implications of declining operations on the long-term viability of an FAA-funded tower.

5.3.4 Other

Establish Airport Observation Area Where People Could Watch Aircraft

- **Observation Area Alternative A:** Located South of Taxiway T between Merrill Field Drive and East 15th Avenue.
- **Observation Area Alternative B:** Incorporated into the existing Admin Building/Passenger Terminal.

Establish New Community Use Area

- Between Merrill Field Drive and East 15th Avenue.

Establish New Green Space

- **Green Space Alternative A:** Repurpose the existing campground as green space.
- **Green Space Alternative B:** Between Whiskey Apron and hospital property.

Make Sitka Street Community Use Area More Inviting

- Upgrade the trail and bridge.
- Provide connecting trail to the Chester Creek Greenbelt.

Work with Fairview and Airport Heights Community Councils

- Develop a neighborhood interaction plan to identify ways to meet aviation needs while reducing negative impacts to residential areas.

Support Aviation Youth Programs in the Anchorage School District (ASD) and at UAA

Communicate the Impact of MRI on the Local/Regional Economy

Work with Land Developers, Realtors, and Other Municipal Departments to Ensure Potential Property Owners are Aware of the Airport and Potential Noise Prior to Purchasing Property

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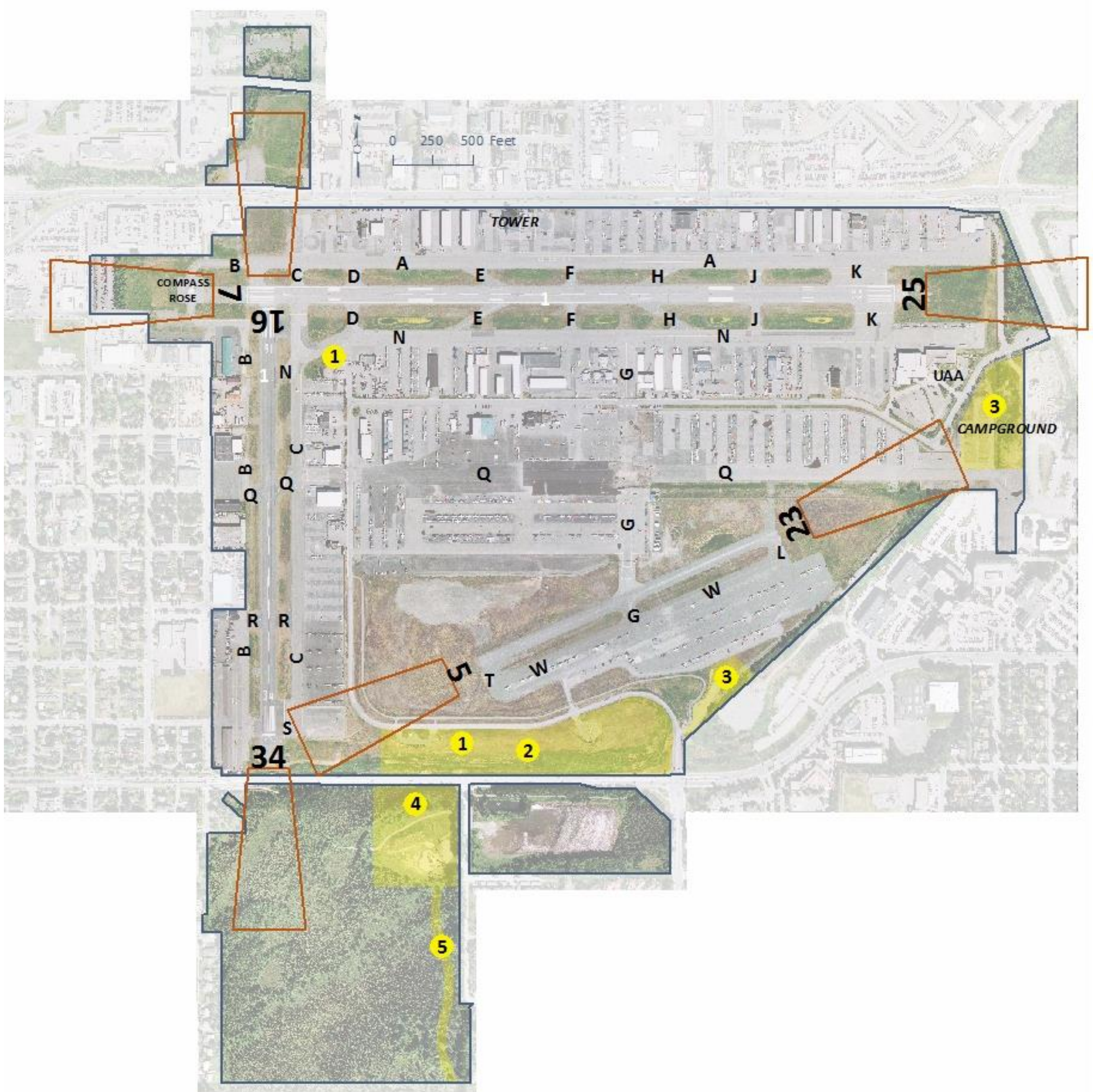
Figure 5-2 Community Focus



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5.4 Existing Trends

As shown in Figure 5-3, this alternative consists of improvements in the following categories:

5.4.1 Airfield and Air Traffic Control

Roads in Runway Protection Zones

- Provide written notification to AK DOT&PF and Municipal Public Works advising them of the requirement for FAA concurrence for changes to roads within the MRI RPZs.

ALP Update

- The ALP should be updated to show all airport property, including helipad and property acquired from AFD as part of the 5th Avenue land exchange.

Property Acquisition and Complete Taxiway B

- Property on Orca Street should be acquired in accordance with the previous MRI Master Plan. Once all the necessary property has been acquired, Taxiway B should be developed to provide a full length taxiway west of Runway 16/34.

Prevent Unauthorized Access to Aircraft Operating Areas (AOAs) by Vehicles, Pedestrians, and their Pets

- Implement signage recommendations of 2013 MRI Inspection Report.
- Evaluate solutions to Taxiway A incursions from Alpha Apron.
- Identify other AOA incursion problem locations. Determine if additional fencing or other measures are required.
- Upgrade the video camera surveillance system and apron lighting to increase reliability, coverage and image resolution.

5.4.2 Airport Support (field maintenance, ARFF, ATCT or airport fuel storage)

Snow Removal and Storage

- Ensure adequate storage areas for snow.
- Review snow storage practices to identify ways to increase efficiency and capacity.
- Consider an additional disposal site on Orca Street (west of Runway 16/34) once this land is acquired by MRI.
- Consider additional snow disposal sites on land acquired from AFD as part of the 5th Avenue land exchange.
- Evaluate potential for melting cleared snow and discharging melt water into the storm drain system.

5.4.3 Other

Compatibility with Other Airports

- Determine how changes in air traffic at Joint Base Elmendorf Richardson would impact MRI. Identify mitigation measures.
- Evaluate potential for MRI to improve its competitive position through sustainability planning and adjustments to fee structures.

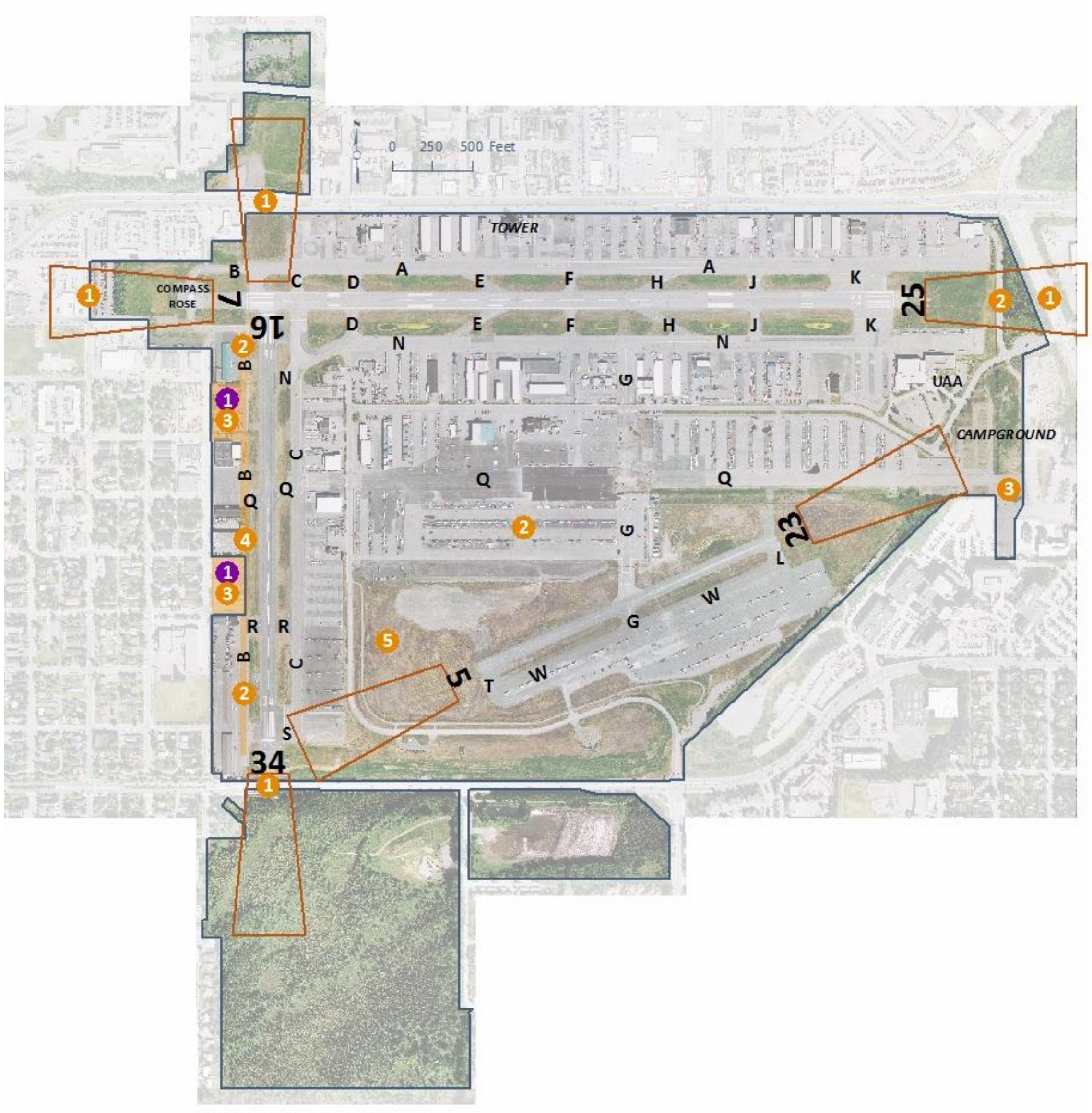
Internet Connection Infrastructure

- Improve internet connectivity for lease holders (project underway)
- Identify ways to reduce wireless broadband interference (project underway).

Long-Term Maintenance of Information and Records

- In accordance with the FAA Next Generation (NextGen) initiative, utilize GIS for the production of Airport Layout Plans, Obstruction Charts, Construction plans, and other airport mapping products.

Figure 5-3 Existing Trends



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5.5 Economic Driver

As shown in Figure 5-4, this alternative consists of improvements in the following categories:

5.5.1 Airfield and Air Traffic Control

Promote Helicopter Training

- Establish a helicopter terrain park – an area where helicopter pilots can train for off-airport operations.

Provide Lighting on Runway 5/23

- Install runway edge and touchdown lighting, REILS, and edge reflector panels.

Increase Area of Airport under ATCT Control

- Add Taxiways Q, G and hospital helipad to ATCT controlled area.
- Fence taxiways.

Lease Areas

- Add covered aircraft parking and hangar facilities.
- Identify and reserve areas appropriate for future tie downs.
- Add a medevac hangar near the hospital helipad.
- Consider aviation support lease lots south of East 15th Avenue.

Promote Airport Use by Larger Aircraft

- Remove 12,500 pound weight limit on Runway 7/25.

IFR Departure and Arrival Procedures

- The FAA is exploring IFR departure concepts wherein an aircraft would navigate to the Big Lake VOR rather than the TED VOR, thus freeing up the potential for more IFR departures. Their recommendations will be reviewed to determine if other changes are needed as a result.

5.5.2 Ground Access and Parking

- Add additional vehicle parking along Merrill Field Drive.

5.5.3 Utility Service

- Identify a site(s) for a de-icing facility.
- Identify a site(s) for a fueling facility on Alpha Transient Apron.
- Identify a site(s) for an additional aircraft wash station.

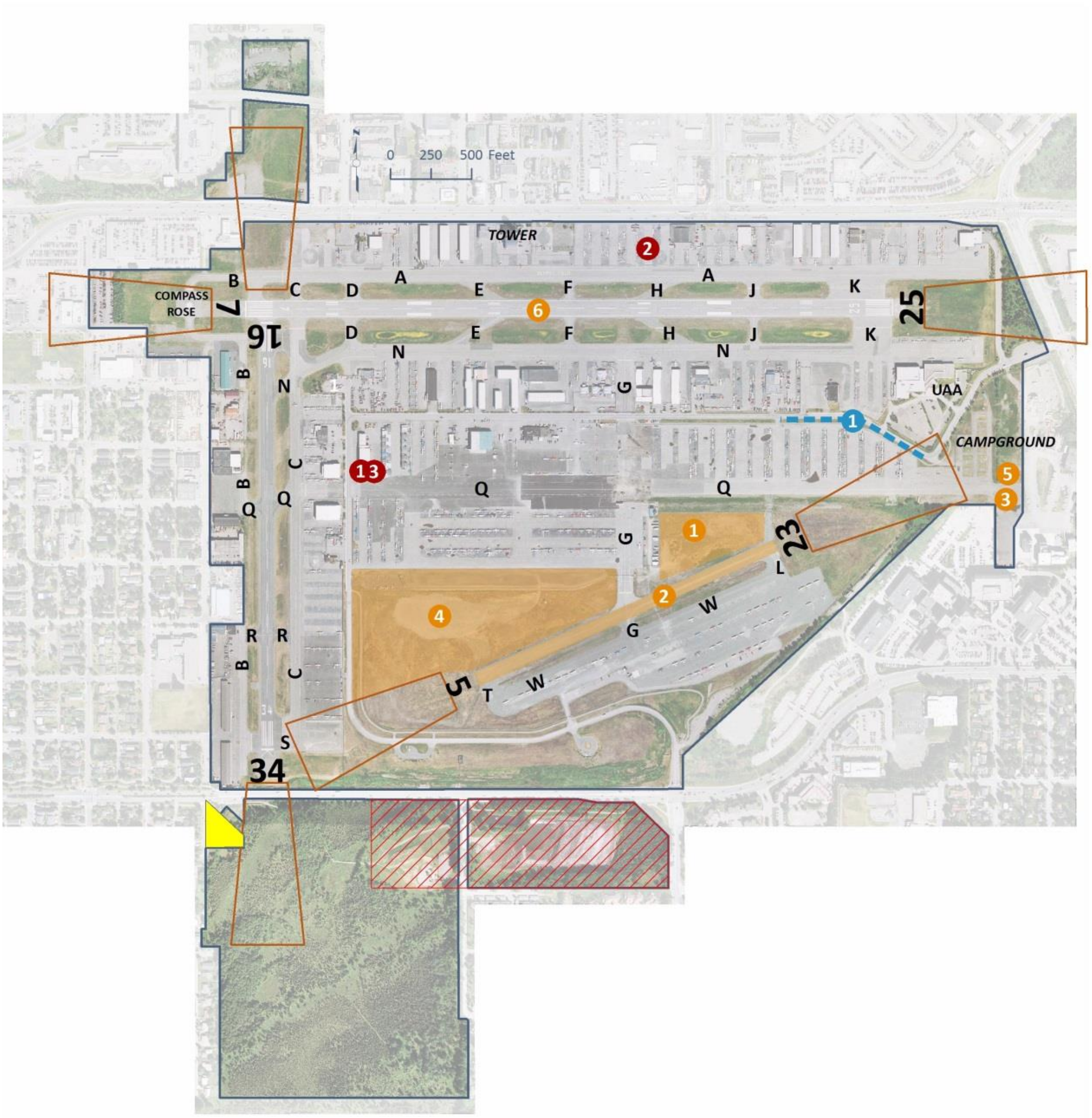
5.5.4 Other

Relocate Managers Office

Business Development

- Encourage business development such as a medical office park. Relocate Sitka Street Community Use Area to a different location within the same parcel. A slight shift south would impact Class A wetlands, or a shift farther south would place the relocation on uplands in the southeast corner of the parcel. The Airport is not opposed to relocating the public use area to either area, subject to permitting and approval. It is highly desirable to include room to restore the North Fork of Campbell Creek back to its original channel within the Class A wetlands and include an open channel next to Sitka Street to route the creek around development. The snow disposal site would no longer operate and would be available for re-development.

Figure 5-4 Economic Driver



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6.0 ALTERNATIVE EVALUATION

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6.1 Introduction

The purpose of this chapter is to evaluate the ability of the alternatives identified in Chapter 5.0, Concept Development, to meet the demands of MRI as well as community objectives for airport development over the 20-year planning horizon. This process will identify projects that can be implemented with a reasonable financial and environmental cost while not constraining development beyond the 20-year planning horizon. The purpose of the evaluation process is to develop a facilities implementation plan, which will be addressed in Chapter 7.0.

As discussed in Chapter 5.0, Concept Development, the potential projects identified through technical analysis and public input were grouped into alternatives based on four general concepts/themes:

1. Safety, Standards, and Asset Preservation
2. Community Focus
3. Existing Trends
4. Economic Driver

The alternatives were presented to stakeholders in September 2013 and refined based on their feedback. Stakeholders indicated their preferences regarding each alternative. As most projects listed in each alternative are not dependent on other improvements, it was decided that the individual projects within each alternative should be evaluated. The recommended development plan will consist of a hybrid of the projects that are found to help MRI fulfill operational needs and community objectives.

6.2 Alternatives Evaluation Process

Each project/element within the four alternatives was evaluated in accordance with the evaluation process outlined in FAA AC 150/5070-6B, *Airport Master Plans*. This chapter presents an evaluation of the elements within each alternative based upon criteria in four broad categories:

1. Operational performance
2. Best planning tenets
3. Environmental factors
4. Fiscal factors

In some cases, the projects listed represent multiple approaches for addressing the same problem. For example, the separation between Runway 7/25 and Taxiway A does not meet FAA standards. There is more than one potential way to deal with this issue, including relocating the taxiway, moving the runway, reclassifying the runway to use a smaller design aircraft, and seeking FAA approval to maintain the existing non-standard condition. Where multiple potential solutions were identified, each was evaluated against the other solutions, and one recommended solution/project was identified for full evaluation.

6.3 Evaluation Criteria

The next step was to evaluate the reasonable elements to determine how well they meet the evaluation criteria and whether they should be included in the implementation plan. The four evaluation criteria (i.e., operational performance, best planning tenets, environmental factors, and financial factors) are described below.

6.3.1 Operational Performance

These criteria evaluate how well the airport functions as a system. The runways, taxiways, aprons, and "leasehold development" tenant improvements all must function as a system for the best operational performance. These criteria look at capacity issues and whether Merrill Field provides users with the right type and an adequate quantity of support services.

6.3.2 Best Planning Tenets

Best planning tenets follow sound planning principles for identifying and selecting projects. The following tenets discussed in FAA AC 150/5070-6B, *Airport Master Plans*, generally apply to the evaluation of master plan development alternatives:

1. Conforms to best practices for safety and security
2. Conforms to the intent of FAA and other appropriate design standards
3. Satisfies user needs
4. Is technically (and financially) feasible
5. Allows for forecast growth throughout the planning period
6. Provides for growth beyond the planning horizon
7. Provides for the "highest and best" land use on and off airport
8. Provides balance between development elements
9. Provides flexibility to adjust to unforeseen changes
10. Conforms to the airport owner's strategic vision
11. Conforms to relevant local, regional, and state transportation plans
12. Is socially and politically feasible

6.3.3 Environmental Factors

Projects must be developed in an environmentally responsible way, and each project would require an environmental clearance as part of the permitting process. This section provides a brief comparative overview of environmental concerns.

Aside from land acquisition along Orca Street, all development is planned to occur on airport property and few adverse impacts are anticipated.

Because a detailed environmental evaluation of the projects contained in the preferred alternative must be carried out in accordance with the National Environmental Policy Act (NEPA) before implementation can begin, environmental factors are only briefly discussed in this chapter. Examples of environmental factors include noise, air quality, water quality, wetlands, wildlife, and endangered species.

6.3.4 Fiscal Factors

Projects must be affordable and fiscally responsible. Applying these criteria may cause some of the potential projects to not be recommended because they are not affordable or there are other ways to solve a problem at a lower cost. Cost estimates are “rough order of magnitude” estimates developed from similar projects recently estimated or completed in the area. To aid in the screening process, projects were placed into one of three cost categories: (1) under $100,000, (2) $100,000 to $500,000, or (3) over $500,000. The categories are to be used only for comparing relative costs and feasibility of alternatives, not for the preparation of grant requests or project plans. The latter would require detailed analysis of each project and would typically be prepared by airport management in cooperation with their consulting engineer.

Fiscal factors include land acquisition costs, construction costs, operating costs, and eligibility for AIP grant funds.

The determination of AIP eligibility is given for each project in this chapter and is based upon a cursory review of Chapter 3.0, Aviation Demand Forecast, and the appendices in the revised *Airport Improvement Program Handbook* (FAA Order 5100.38D). The Airports Division within the Alaska Regional Office of the FAA makes the final determination of eligibility.

The cost estimates for all recommended projects were further refined during the development of the implementation plan. Refer to Chapter 7.0, Facilities Implementation, to review the refined estimates.

6.4 Evaluation

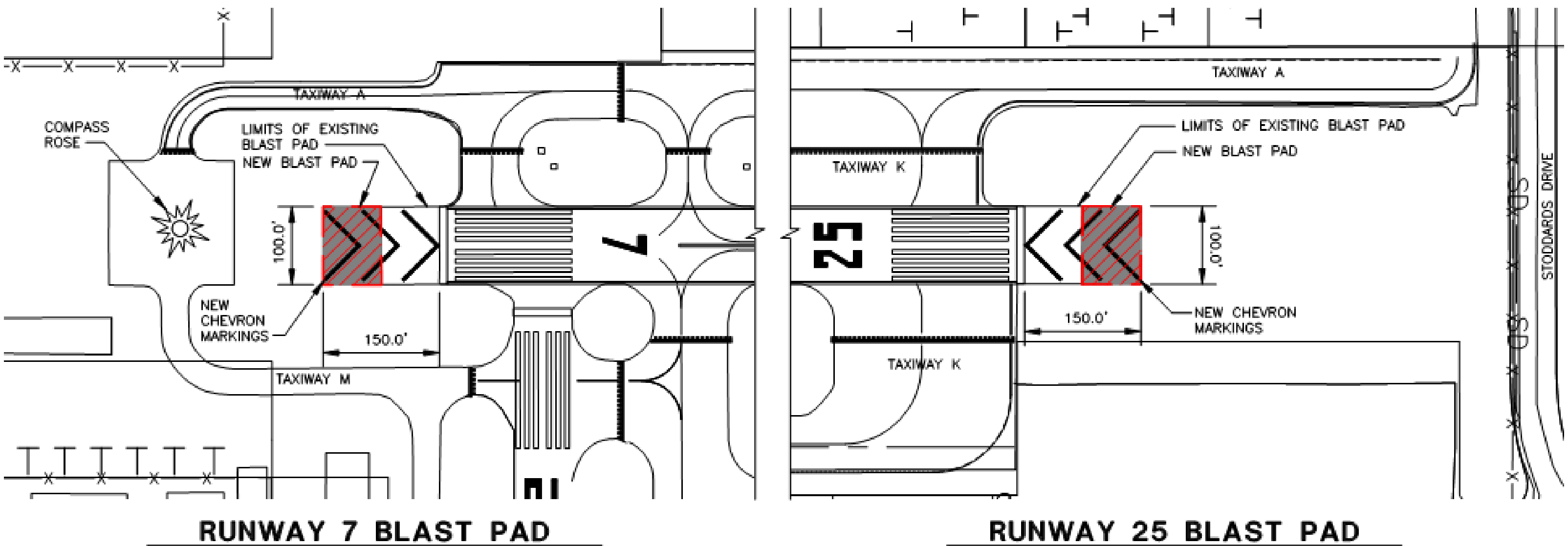
This section describes the evaluation of each alternative.

6.4.1 Safety, Standards, and Asset Preservation

6.4.1.1 Expand Runway Blast Pads

This improvement, seen in Figure 6-1, would increase the current blast pad dimensions on Runway 7/25 to meet FAA standards for a B-II-Small runway. The current dimensions of Runway 7 and Runway 25 blast pads are each approximately 100 feet wide by 75 feet long. Current FAA standards require blast pads to be a minimum of 95 feet wide by 150 feet long. This project would increase the length of each blast pad by 50 feet in the longitudinal direction.

Figure 6-1 Expand Runway Blast Pads



There are no significant environmental concerns associated with this project; however, there would be a slight increase in the paved surface with the resulting minor reduction in storm water absorption. Expanding the runway blast pads is estimated to cost between $100,000 and $500,000. Operational costs would remain about the same and the project would be eligible for AIP grant funds.

Conclusion: To meet standards, MRI has chosen to implement this project.

6.4.1.2 Repair Security Gates and Fencing

This project would address security gate and fencing deficiencies related to vehicle/pedestrian deviations (VPD) that were noted during the 2013 airport inspection. Thirty-three (33) electronic vehicle gates, 18 pedestrian gates, 3 taxiway barrier gates, and 14 non-electrical manual vehicle gates were inspected in July 2013 for general condition and functional performance.

The following deficiencies were noted in the 2013 MRI Inspection Report:

a. **Electronic Vehicle Gate N4:** Miller edge sensor not functional.
b. **Electronic Vehicle Gate N5:** Chain is loose.
c. **Electronic Vehicle Gate S4:** Miller edge sensor not functional.
d. **Electronic Vehicle Gate GS1:** Miller edge sensor not functional.
e. **Electronic Vehicle Gate W2:** Manual override not functional.
f. **Manual Pedestrian Gate PW7:** Missing catch on door latch.
g. **North Pedestrian Gates:** Approximately four north pedestrian gates do not have controls installed (e.g., combo locks, automatic closers, handles). These gates were relocated during the DOT&PF 2008 project; however, the controls were not reinstalled. The gates are locked with chains and padlocks.

As seen in Figure 6-2, this project would perform the following corrective actions:

a. Tighten chains and repair non-functional edge sensors and manual overrides on the electronic vehicle gates.
b. Reinstall locking and automatic closure components on the pedestrian gates.

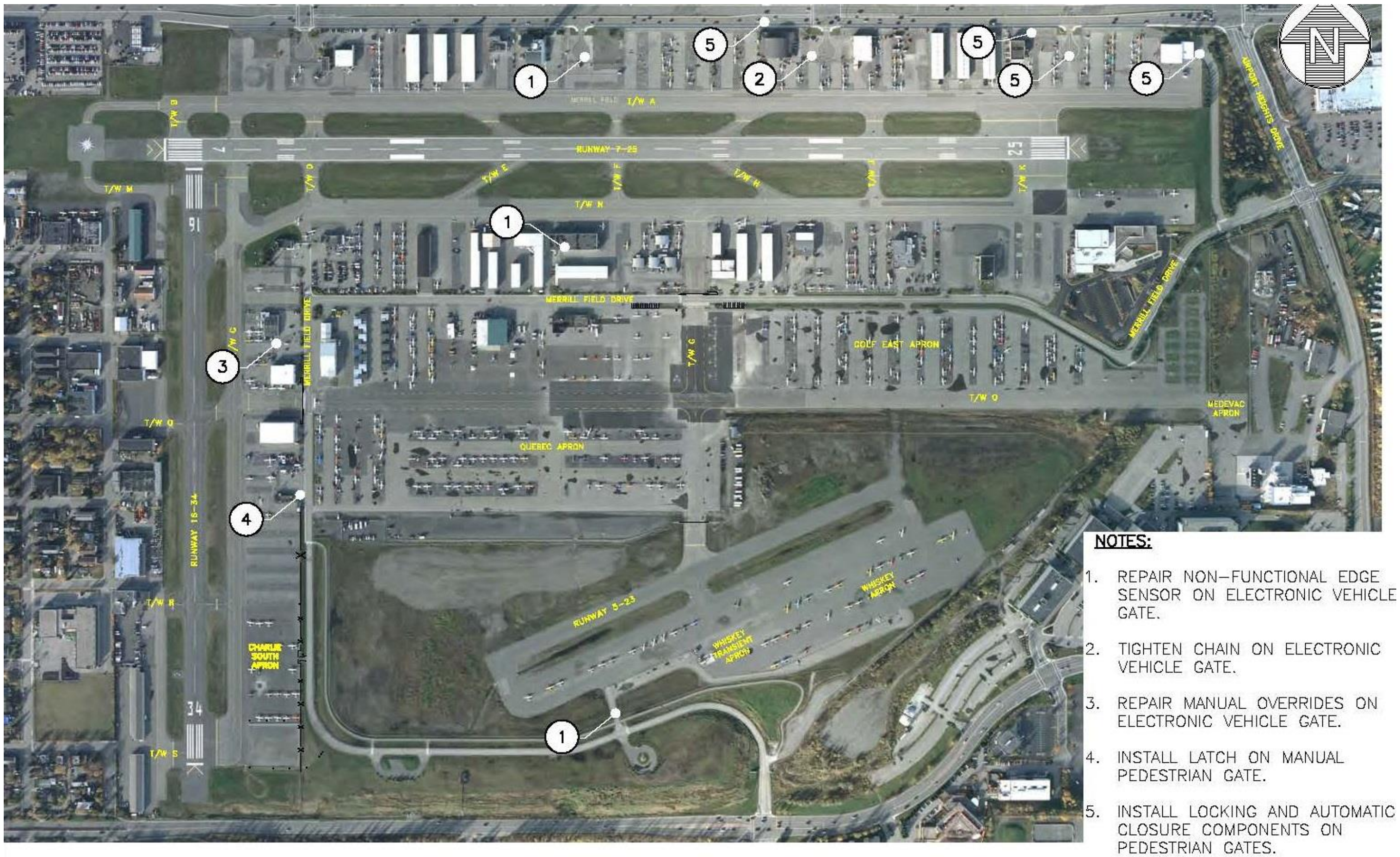
In addition, as an effort to further reduce the VPD statistics/unauthorized entry, especially on the north side, the fencing would be modified to discourage pedestrians circumventing the system and climbing over the fence. Along 5th Avenue, the fence would be raised to reduce the potential for individuals to climb over by standing on the concrete wall. Decorative elements to be incorporated into the fencing will be determined at a later time.

Correcting the noted gate deficiencies and improving fencing would enhance safety and security at the airport. It is consistent with the airport's goal to reduce runway incursions and meets best practices for safety and security.

Repairing the security gates and fencing has minimal environmental concerns or impacts on operating costs. It is estimated that the gate and fencing repairs would cost between $100,000 and $500,000. No land acquisition would be necessary. This type of project is eligible for AIP grant funding.

Conclusion: To enhance security and reduce incursions, MRI has chosen to implement this project.

Figure 6-2 Repair Security Gates and Fencing



6.4.1.3 *Rehabilitate Lighting and Navigation Aids*

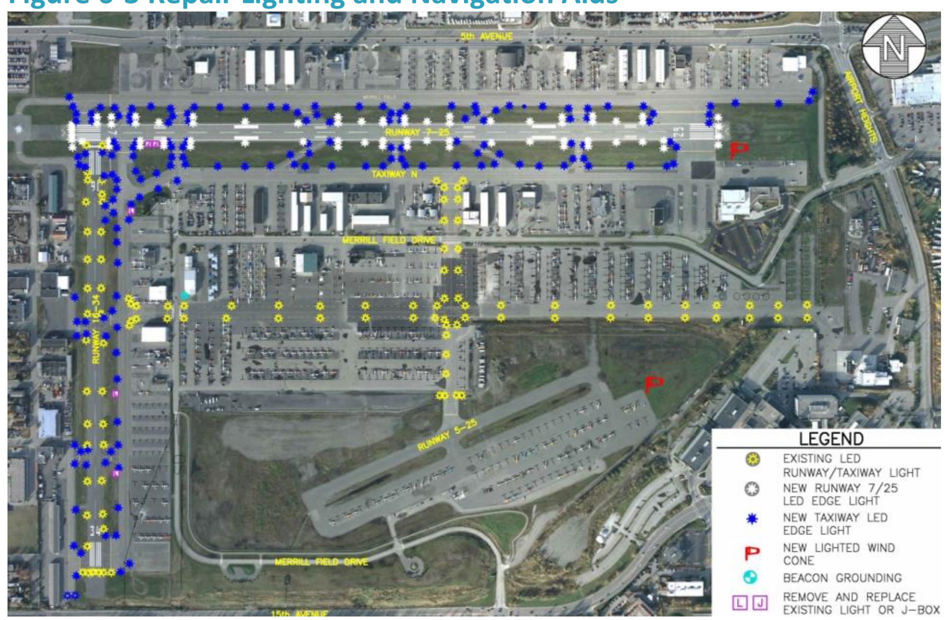
This project would replace approximately 150 incandescent runway and taxiway edge lights on Runway 7/25 and Taxiways A, B, C, N, and interlinks with new LED edge lights (see Figure 6-3). This includes replacement of the secondary wind cones located near the thresholds of Runways 25 and 23 with new tilt-down LED-lighted wind cones. It also includes repairing all lighting cans and junction boxes that were noted as incorrectly located or damaged and correcting airfield beacon grounding deficiencies.

LED edge lights were recently installed on Runway 16/34, and Taxiways G and Q and have proven to be low-maintenance and reliable. The existing Runway 23 and Runway 25 wind cones are old and need replacement. This project would install new LED lights and wind cones and correct noted lighting, junction box, and beacon tower grounding deficiencies.

The improved lighting is expected to enhance airport safety and security and satisfy the request from some airport users for improved lighting. The new lighting is not expected to impact on adjacent neighborhoods or interfere with lighting on nearby roadways.

This project is estimated to cost between $100,000 and $500,000. Operational costs are expected to decrease as electrical consumption and man-hours to change light bulbs decrease. There are no significant environmental concerns associated with this project. The portions of the project that do not involve LED lights are AIP-eligible. The LED portion of the project may be eligible for AIP grant

Figure 6-3 Repair Lighting and Navigation Aids



funds if the existing incandescent fixtures are at the end of their useful life. The systems would consist of all LED or all incandescent fixtures, as the two systems cannot be mixed.

Conclusion: MRI has chosen to implement this project.

6.4.1.4 Relocate Runway Hold Lines

The hold lines for Taxiways A and N are 125 feet from the Runway 7/25 centerline and meet the A/B-II-Small standard. However, they are too close to Runway 7/25 if the runway is reclassified from A/B-II-Small to A/B-II. The standard for A/B-II is 200 feet. The centerline for Taxiway A is 200 feet from the Runway 7/25 centerline, so Taxiway A would have to be moved in order to meet the separation requirement. Moving Taxiway A is not considered reasonable because it would have a negative impact on several lessees. Moving the hold line to the edge of Taxiway A was considered because it would increase the separation to 162 feet and be closer to the standard. With the hold line at the edge of Taxiway A, however, there is not sufficient room on the interlinks for aircraft to queue when crossing or exiting Runway 7/25. This would have a negative impact on airport operations and was not considered acceptable.

Increasing the separation between the Taxiway N hold line and Runway 7/25 centerline to 200 feet would also have a negative impact on airport operations. The relocated hold line would not allow an aircraft to queue on the interlinks and allow passing aircraft on Taxiway N. However, the hold lines could be moved 60 feet to the south without negative impacts on airport operations. The separation would increase to 185 feet, which is only 15 feet short of the FAA standard.

This project is not anticipated to cause environmental concerns. The cost to relocate hold lines is expected to be between $100,000 and $500,000 and would not increase operating costs. It would be eligible for AIP grant funds if conducted as part of a pavement maintenance project.

Conclusion: MRI has decided to keep the existing Taxiway A hold lines. The taxiway hold line configuration has existed for many years and no adverse operational impacts have been noted. Should this become an issue in the future, this will be re-evaluated by MRI. MRI has decided to adopt the recommendation to change to runway category A/B-II (see Section 0) and thus will relocate the Taxiway N hold lines to be 185 feet from the Runway 7/25 centerline. MRI will request a Modification of Standards (MOS) from the FAA documenting both of these hold line non-standard conditions.

6.4.1.5 Replace VASI with PAPI

This project would replace the existing VASI on Runway 7/25 and Runway 16 with a new PAPI.

New four-box PAPI systems would be installed 575 and 424 feet down-runway from the thresholds of Runways 7 and 25, respectively. The PAPIs would be installed to the left of each runway. A new two-box PAPI would be installed approximately 460 feet south of the Runway 16 threshold. This PAPI would be located on the right side of the runway to avoid conflicting with existing interlink Taxiway N, which intersects Runway 16 on the left. The new PAPI would be installed to maintain the existing glide slopes and threshold crossing heights at each runway end. No changes would be made to the existing PAPI installed on Runway 34.

MRI could replace the FAA-owned VASI with MRI-owned PAPI or request that the FAA replace them with FAA-owned PAPI. There is a trade-off. If MRI installs the PAPI, this project could be implemented sooner, but it would result in another project being implemented at MRI expense. If the FAA funds the project, it would take longer to implement. FAA is incentivized to replace the VASI in the near future, as replacement parts for maintaining the equipment are becoming scarce or obsolete. On the negative side, replacing the VASI with PAPI would decrease the area MRI uses for snow storage in the winter because PAPIs are located farther from the runway edge, and snow in front of the equipment cannot block the line of sight from aircraft to the boxes. MRI would be responsible for removing snow in front of the PAPI regardless of ownership.

No significant environmental concerns are anticipated. The project is AIP-eligible, would cost between $100,000 and $500,000, and would not require land acquisition. The project is anticipated to result in increases in operating (system maintenance) costs to MRI even if the capital cost is funded by the FAA.

Conclusion: MRI has decided to keep the existing VASIs, as they are performing adequately, the availability of FAA funding for this purpose is uncertain, and PAPIs would increase MRI operating costs. Over the long term, MRI should request FAA-owned VASIs be installed.

6.4.1.6 Replace Runway Touchdown and Aiming Point Markings

This project would correct Runway 7/25 pavement marking deficiencies by removing the existing touchdown and aiming point runway markings. It would also install new touchdown and aiming point markings in the correct location per FAA AC 150/5340-1L.

The AC requires that the touchdown markings closest to the threshold begin 500 feet down-runway from the beginning of the threshold markings. The existing touchdown markings begin 480 feet down-runway from the beginning of the threshold markings, 20 feet short of where they should begin.

The AC requires the runway aiming point markings to begin 1,000 feet down-runway from the beginning of the threshold markings. The existing aiming point markings begin 980 feet down-runway from the beginning of the threshold markings. The existing aiming point markings are also 50 feet longer than specified in the AC.

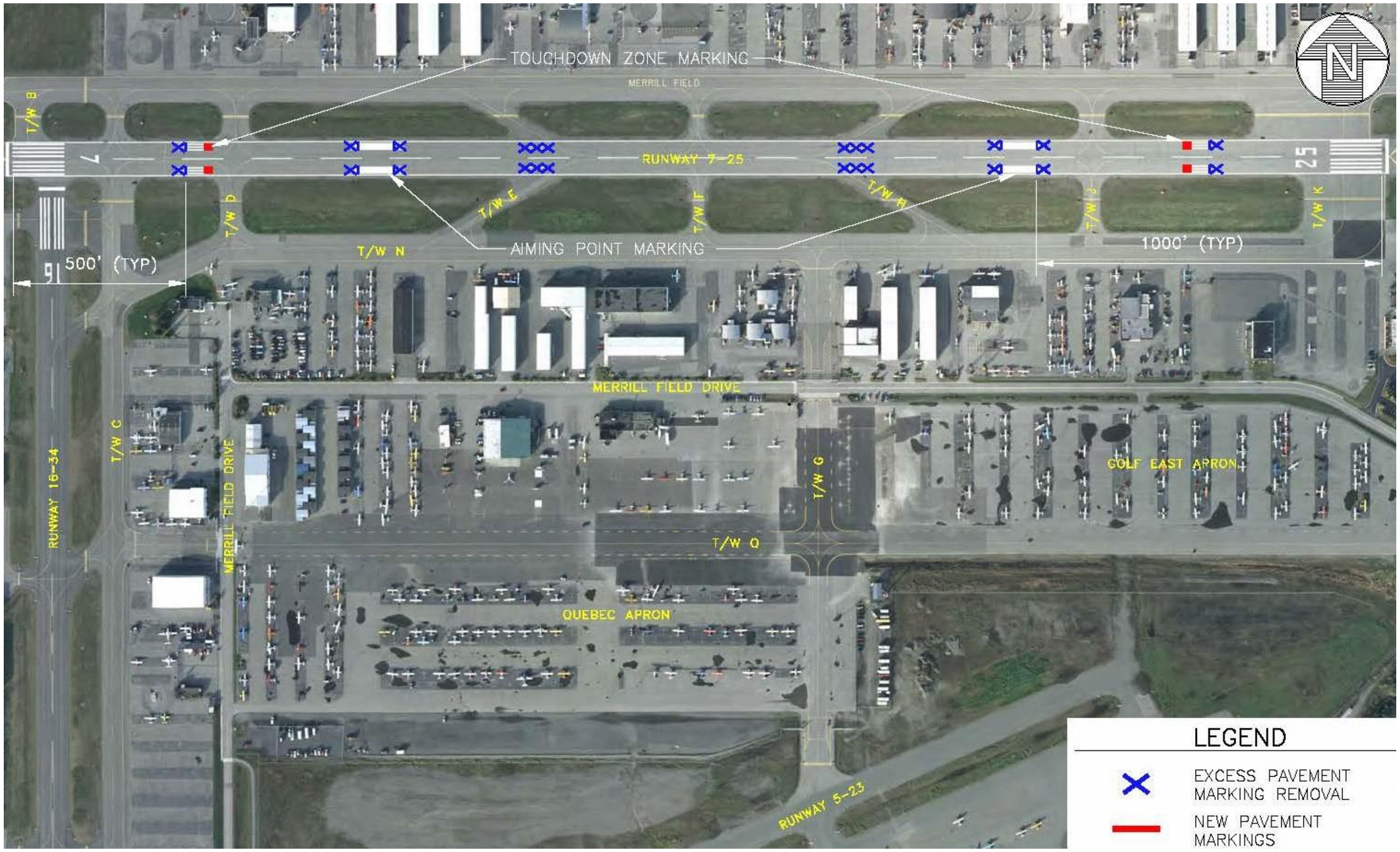
The AC also requires that no touchdown or aiming point markings be installed within 900 feet of the midpoint of the runway to take into account the "no-marking zone" criterion of 1,800 feet centered on the threshold-to-threshold midpoint. Runway 7/25 currently has a second set of runway touchdown markings installed 545 feet on each side of the runway midpoint.

As seen in Figure 6-4, this project would remove the first 20 feet of each of the touchdown markings located closest to the thresholds and extend them 20 feet toward the middle of the runway. Also, the two sets of touchdown markings located in the "no-marking zone" would be removed. The aiming points would be reconfigured such that 20 and 30 feet of pavement marking will be removed from the exterior and interior ends of the existing markings, respectively, leaving aiming points with 100-foot total lengths and beginning 1,000 feet from the threshold markings.

This project would conform to best practices for safety and security. It would also result in conformance with FAA design standards. No significant environmental concerns are associated with these improvements. The project is estimated to cost less than $100,000 and would not increase operational costs. This project is eligible for AIP grant funds if done as part of a pavement maintenance project such as repaving the runway. The recommendation is to wait until the next pavement maintenance project to remark this runway.

Conclusion: MRI has decided this project should be implemented as part of a future repaving project.

Figure 6-4 Replace Touchdown and Aiming Point Markings



6.4.1.7 *Extend Runway 16/34*

Runway 16/34 is designed to accommodate A/B-I-Small aircraft. The current length, 2,640 feet, is 710 feet short of the 3,350-foot standard. The length for Runway 16/34 is physically constrained by 5th Avenue and Runway 7/25 on the north and 15th Avenue on the south. These constraints make it impractical to lengthen Runway 16/34 to meet FAA standards.

Three potential ways to lengthen the runway so it is closer to the standard were identified. One way would be to move the Runway 16 threshold 120 feet north, so the top of a 17-foot vehicle on 5th Avenue would be just under the 20:1 approach slope. This is considered unacceptable since the threshold would be on Runway 7/25.

Another option is to move the threshold north 132 feet so the threshold of Runway 16 is on the north edge of Runway 7/25. This was considered unacceptable because a vehicle on 5th Avenue would penetrate the 20:1 approach slope. Consideration was given to creating a displaced threshold for aircraft landing on Runway 16 so they would have clearance over a vehicle on 5th Avenue. This would require marking and lighting a threshold in the middle of Runway 7/25 and thus was considered not practical.

Extending the runway to the south would be limited by 15th Avenue. Any development to the south would require extensive earthwork and structure, which would be cost-prohibitive.

Conclusion: MRI has decided to retain the existing length of Runway 16/34 as it meets the need of 92 percent of the fleet. Aircraft needing a longer runway can use Runway 7/25. MRI will pursue a MOS from the FAA to formally document the decision to continue the existing condition. If the FAA does not approve a MOS, the alternatives should be revisited.

6.4.1.8 Extend Runway 34 RSA

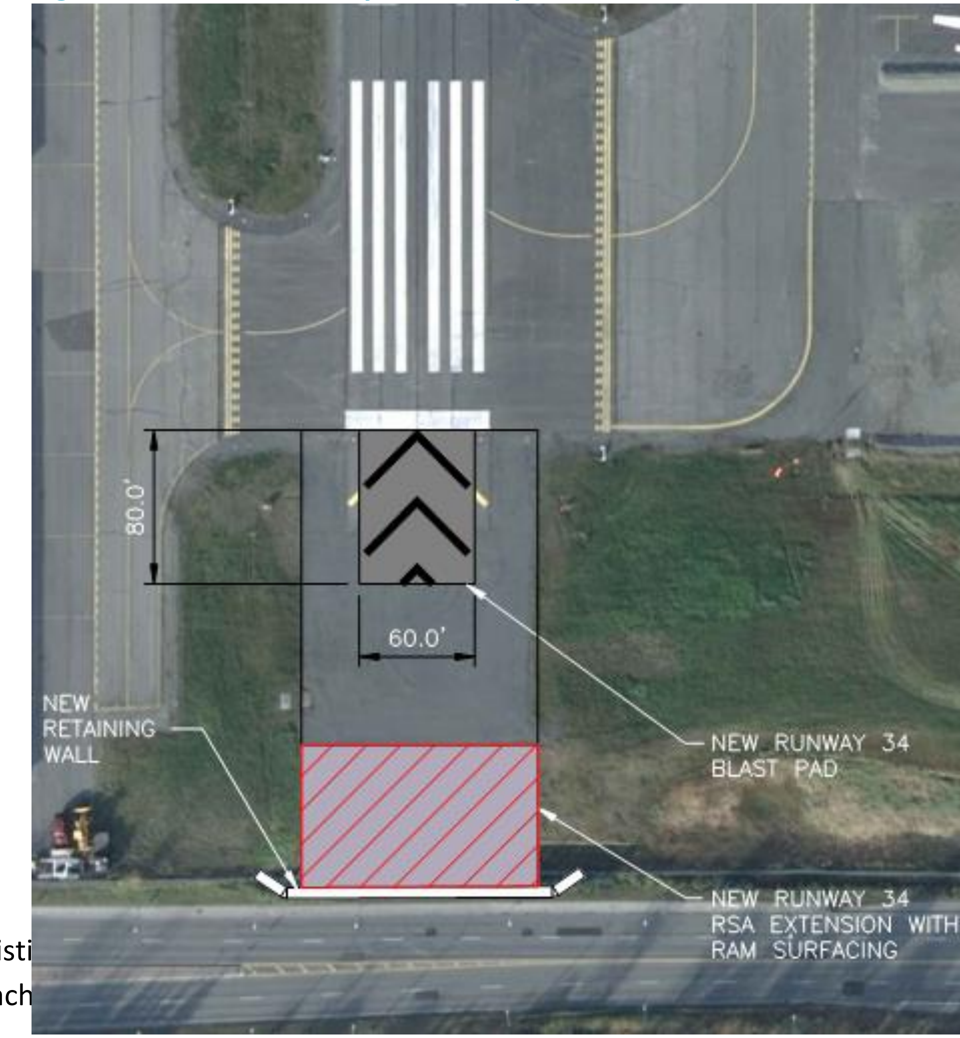
The Runway 34 RSA is 74 feet short of the desired runway length to meet FAA standards. Potential options to address this non-standard condition are discussed below.

Option A

As shown in Figure 6-5, this option would extend the Runway 34 RSA approximately 76 feet to the south for a total RSA length of 240 feet beyond the threshold to meet FAA requirements. The end of the RSA would be approximately 9 feet north of the 15th Avenue sidewalk.

This would require the construction of an embankment and retaining wall. The wall height would be approximately 17 feet above existing grade at its tallest location. Construction of this project would also include relocation of a large ML&P transformer and electrical feeders,

Figure 6-5 Extend Runway 34 RSA, Option A



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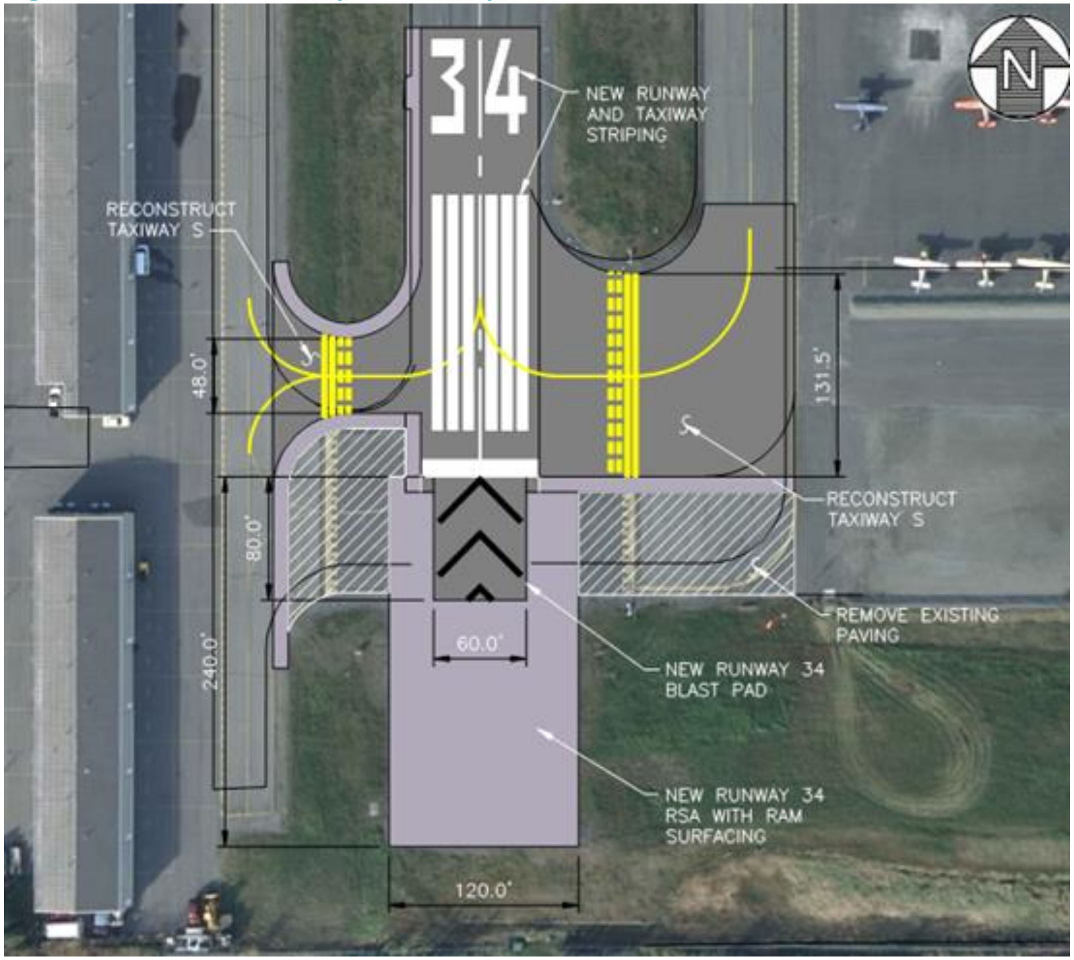
Option B

As shown in Figure 6-6, this option would permanently relocate the Runway 34 threshold 76 feet to the north to provide a total RSA length of 240 feet beyond the threshold in order to meet FAA requirements. The length of Runway 16/34 would be reduced by 76 feet to accommodate the RSA expansion, for a new total runway length of 2,564 feet. The width of interlink Taxiway S would be reduced from 100 feet to 48 feet on the west interlink and from 200 feet to 131.5 feet on the east interlink. Lighting and navigational aids would be modified as necessary.

This option provides a RSA for Runway 16/34 that meets FAA requirements for standard length beyond runway end. However, it reduces the length of Runway 34 and the width of interlink Taxiway S. Reducing the length of Runway 16/34 is considered unacceptable, as it currently does not meet FAA length standards. Taxiway S would also no longer meet FAA standards. This would limit the airport's flexibility to meet future needs and is not consistent with the Airport Manager's vision.

This option is expected to cost over $500,000 and is AIP-eligible.

Figure 6-6 Extend Runway 34 RSA, Option B



Other Options Considered

Shifting the runway to the north to create the RSA on the south end was not considered feasible (see discussion in Section 6.4.1.7 regarding extending the runway).

Another option would be to use declared distances, which is a method for complying with FAA standards on runways where the RSA is too small. The declared distance is a runway length identified by the airport to be used by turbine-powered aircraft in takeoff and landing calculations. The actual runway length is not changed. As MRI does not use a turbine aircraft as the design aircraft, declared distances were not considered.

Conclusion: Airport management has selected to continue the existing non-standard conditions pending FAA approval of a Modification of Standards (MOS). Both reasonable options would cost more than $500,000. Installing a retaining wall at the south end of the RSA may reduce airport safety for aircraft forced to land short and/or overruns. MRI will apply for a MOS to formally document the decision to continue the existing condition. If the FAA does not approve a MOS, the alternatives should be revisited.

6.4.1.9 Replace Airfield Signs

This project would correct airfield sign deficiencies noted during the 2013 MRI Inspection Report. Seventy-two (72) lighted and thirty-five (35) unlighted signs were inspected in July 2013 for general condition and compliance with FAA AC 150/5340-18F. The following four signs were identified as not meeting standards and require corrective action (see Figure 6-7).

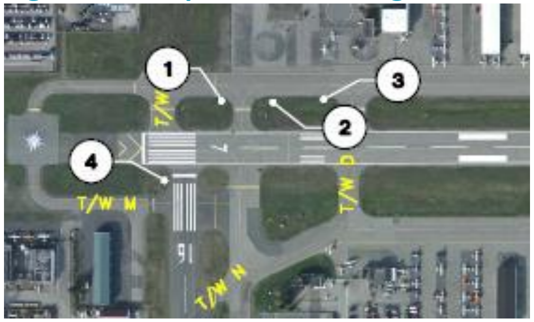
1. **Runway 16 Approach Hold Position Sign:** Sign is located on the north side of the intersection of Taxiway A and Runway 16 approach. Sign cannot be located on the back of another sign and is only 100 feet from runway centerline.

2. **Runway 25 Hold Position Sign:** Taxiway directional sign located at the northeast corner of the intersection of Taxiway C and Runway 25. Sign cannot be located on the back of another sign.

3. **Taxiway Designation Sign:** Damaged face on sign located at the northwest corner of the intersection of Taxiways D and A.

4. **Taxiway Directional Sign:** Sign is located on the west side of the intersection of Taxiway M and Runway 16/34. Sign cannot be located on the back of another sign.

Figure 6-7 Replace Airfield Signs



Damaged sign panels would be repaired and existing signs would be replaced or relocated to meet FAA regulations. This project conforms to best practices and meets FAA standards. It would satisfy the needs of airport users and would be consistent with the Airport Manager's vision for the airport. No significant environmental issues are anticipated as a result of this project. It would cost less than $100,000, does not require land acquisition, is not expected to increase operations costs, and is eligible for AIP grant funding if done as part of a pavement maintenance project.

Conclusion: MRI will pursue replacing the airfield signs as noted in the 2013 MRI Inspection Report and restated in the text above. This project could be combined with another project, bid as a stand-alone small procurement, or constructed by force account using MRI maintenance staff.

6.4.1.10 Increase Runway 7/25 and Taxiway A Separation

The separation between Runway 7/25 and Taxiway A does not meet current FAA standards. The centerline of Taxiway A is currently 200 feet from the centerline of Runway 7/25. FAA standards require 240 feet of separation distance between a B-II-Small runway centerline and the centerline of a parallel taxiway. Three options for increasing the separation distance between Runway 7/25 and parallel Taxiway A to meet current FAA standards were identified and are discussed below.

Option A

As shown in Figure 6-8, this option would relocate Taxiway A 40 feet north of its existing position. Construction would require lease lot acquisition of portions of all the leases along the north side of Taxiway A as well as demolition of the southernmost 40 feet of the three Slip Stream Hangar buildings and the southernmost 40 feet of the three Chugach Hangars located within the new TOFA. The fuel pumps at Lake and Pen Air would also have to be removed.

This option would impact six hangars, resulting in less hangar space. The demand for hangar space is expected to increase over the next 20 years, so a reduction in hangar space would make it more difficult for MRI users to obtain a space. This option would reduce the amount of leasable space at the airport, which currently supports at least 75 tiedown spaces. A public refueling location on the north side of the airport was one of the desirable features for MRI identified during public comments. Eliminating this amenity may make it more difficult to keep aircraft based at MRI, which would lower revenues, thus making it more difficult for the airport to be financially self-sufficient.

This option is expected to cost more than $500,000 and would be eligible for AIP grant funds. Increases in operational costs are expected to be minimal. No expansion of the airport boundary would be required, but land from existing lease lots would be acquired. No significant environmental impacts are anticipated with this option.

Figure 6-8 Increase Separation between Runway 7/25 and Taxiway A, Option A

Option B

As shown in Figure 6-9, this option would increase the separation distance between Runway 7/25 and parallel Taxiway A by relocating Runway 7/25 40 feet south of its current location and Taxiway N 20 feet south of its current location. These relocations would maintain 240 feet separation distance between Runway 7/25 and the north and south parallel taxiways. Extending the threshold of Runway 16 to the new north edge of Runway 7/25 was investigated. Marking Runway 16 would need to be considered.

This option is expected to cost more than $500,000. No substantial environmental impacts are associated with this option, but the eastern end of the runway relocation and the eastern end of the Taxiway N relocation would impact the old landfill.

Option C

Option C would change the Runway Design Code (RDC) for Runway 7/25 from B-II-Small to B-I-Small to meet current FAA standards for separation distance between runways and parallel taxiways included in FAA AC 150/5300-13A. FAA's current standards require a minimum of 240 feet from the centerline of a B-II-Small runway to the centerline of a parallel taxiway. The current FAA standards for B-I-Small runways require a separation distance of 150 feet between runway and parallel taxiway centerlines. Therefore, changing the Runway 7/25 RDC from A/B-II-Small to A/B-I-Small would allow the runway to meet FAA standards without modifying the current runway or taxiway configurations. The existing runway, RSA, ROFA, RPZ, and ROFZ dimensions would meet or exceed the requirements of an A/B-I-Small runway. This option is expected to cost less than $100,000. However, the reduction in RDC would limit the type of aircraft that could use MRI and have other operational impacts to airport users.

Figure 6-9 Shift Runway 7/25, Option B

Conclusion: Airport Management has decided to maintain the existing non-standard conditions and seek a MOS from the FAA. Modifying the current Runway 7/25 and Taxiway A configurations to meet FAA standards for runway and taxiway separation distance is not practical without extreme cost or operational impacts to the airport. Relocating Taxiway A 40 feet to the north would require acquisition of existing lease lot properties, demolition of portions of existing buildings, and reconstruction of Taxiway A and interlinks. Relocation of Runway 7/25 40 feet to the south would require reconstruction of Runway 7/25, acquisition of existing lease lot properties, and relocation of parallel Taxiway N and interlinks. Reducing the Runway 7/25 RDC to B-I Small would have funding and operational impacts on the airport. This option is also not compatible with the King Air 200 design aircraft selected earlier in this master plan.

6.4.1.11 Airfield Pavement Improvements

This project would rehabilitate existing runway, taxiway, and apron pavement areas noted in poor condition and in need of repair in the 2013 MRI Inspection Report. As shown in Figure 6-10, runway pavement repairs would include applying crack sealant to approximately 450 linear feet of cracks on Runways 16/34 and 7/25 and seal coating or some type of pavement rejuvenation on approximately 1,125 square feet of pavement along the southern edge of Runway 7/25, between Taxiways C and D.

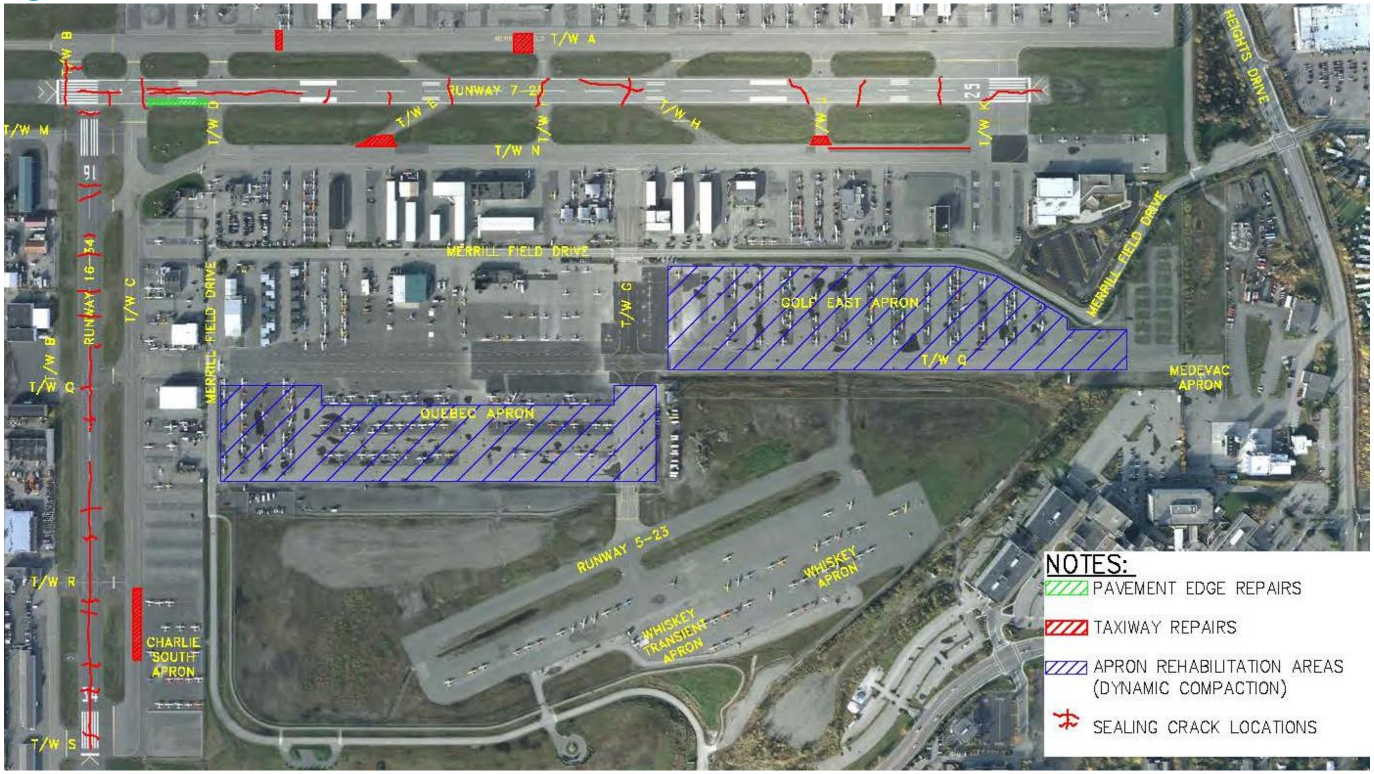
Taxiway rehabilitation is anticipated to include approximately 6,625 square feet of Taxiway A, 6,250 square feet of Taxiway C, 2,500 square feet of Taxiway E, and 1,000 square feet of Taxiway J. This project would also include rehabilitation of approximately 30 acres of existing Golf East and Quebec Aprons constructed above the closed Merrill Field Landfill.

Since 2006, Merrill Field has been systematically rehabilitating taxiways and aprons constructed above landfill refuse using dynamic compaction. Due to the cost, piecemeal rehabilitation would be necessary to continue the apron rehabilitation program to eliminate ponding water and winter icing and provide positive drainage in apron areas.

Each of these dynamic compaction rehabilitation projects would repair damaged pavement areas to provide a smooth, well-drained, and safe drivable surface for aircraft. The pavement rehabilitation would allow the airport to meet existing and future needs. Each project is expected to cost more than $500,000 but is unlikely to have a substantial impact or environmental concerns. Operating costs would decrease as less annual pavement maintenance is required. No land acquisition would be required. The project would be an eligible AIP cost.

Conclusion: MRI has decided to continue to rehabilitate airfield pavement. These projects should be implemented in phases as funding allows.

Figure 6-10 Rehabilitate Airfield Pavement



6.4.1.12 Improve the Visibility of the Airport Operations Area from the ATCT

The relatively new existing ATCT was commissioned in 2003 and the antiquated, historic ATCT at the apex of Runways 7/25 and 16/34 that provided unencumbered line of sight along both runways was demolished. Line of sight onto Runway 16/34 and Taxiway C became an issue only after the ATCT was relocated.

Approximately 566 feet of Taxiway C and 366 feet of Runway 16/34 cannot be seen by ATC personnel in the tower cab due to visual obstruction from the Northern Lights Avionics/Merrill Field Instruments Building and the Executive Hangars Building. These blind spots create safety concerns for aircraft operating on the runway and taxiway. There are three options for improving visibility from the ATCT: relocate the ATCT, remove the obstructions, or install video monitoring of the blind spots. These options are discussed in more detail below.

Option A

As shown in Figure 6-11, this project consists of demolition of the existing ATCT and construction of a new ATCT at a location to increase visibility along Runway 16/34 and Taxiway C from the tower cab. The best location for a new ATCT would be on airport property (Block 2, Tract 2C, Merrill Field Replat) west of the existing tower. This parcel is currently leased to Lake and Pen Air. Construction of the new facility would include lease negotiations with Lake and Pen Air to vacate its current lease; demolition of existing Lake and Pen Air structures; construction of a new tower and supporting infrastructure; and demolition of the existing FAA tower and supporting infrastructure. Relocating the tower to the proposed site would allow ATC personnel to view the entirety of Runways 16/34 and 7/25 and greatly reduce visual obstruction of Taxiway C. Relocating the tower is estimated to cost more than $500,000. A portion of the project cost, up to $2 million, may be AIP-eligible. Relocation of the ATCT could be an initiative of either MRI or the FAA.

Figure 6-11 Improve ATCT Visibility, Option A

Option B

As shown in Figure 6-12, Option B includes demolition of two buildings that currently partially obscure the view of Runway 16/34 and Taxiway C from the cab of the ATCT. The Northern Lights Avionics/Merrill Field Instruments Building is a two-story, 8,200-square-foot building located on the northwestern corner of Taxiway Q and Merrill Field Drive. The Executive Hangars Building is a two-story, 13,000-square-foot building located on the southwest corner of Taxiway Q and Merrill Field Drive. Together these buildings obstruct the view of approximately 566 feet of Taxiway C and 366 feet of Runway 16/34 from the tower cab. Demolition of the two buildings is estimated to cost more than $500,000. AIP-eligibility of this work needs to be determined.

Demolishing these buildings would provide an unobstructed view of Taxiway C and Runway 16/34 from

Figure 6-12 Improve ATCT Visibility, Option B

the tower cab. However, it would eliminate two businesses from MRI. Additional work would be required to determine whether these businesses could be relocated on MRI or if other businesses or tiedowns could be developed on these lease lots without interfering with ATCT visibility. MRI is also in the process of permitting the construction of additional structures south of the Executive Hangars Building that would further reduce ATCT visibility. This is a much-needed leasable area.

Option C

Option C would be to install video cameras for monitoring the blind spots. Kodiak Airport has successfully used this technique to overcome blind spots in a manner more cost-effective than relocating the ATCT or removing structures. The cost to install video cameras and monitoring equipment is anticipated to be less than $100,000. There are no substantial environmental concerns associated with this activity. The FAA is likely to be the project sponsor of this option.

Conclusion: MRI has decided to encourage the FAA to pursue Option C. MRI is also considering changing areas controlled by the ATCT (see 6.5.3.4). If some or all taxiways are removed from the controlled surfaces, they are no longer under ATCT control and visibility on Taxiway C would no longer be an issue. Removing surfaces under ATCT control would also potentially reduce the number of reported incursions. The safety impacts of such re-categorization are still being determined.

6.4.1.13 Roadway Signage

This project would correct roadway sign and marking deficiencies noted on Merrill Field Drive during the 2013 airport inspection. Road signs and pavement markings were inspected along the Merrill Field Drive corridor and at taxiway and apron intersections for conditions and compliance with DOT&PF marking standards and for compliance with the 2003 edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). The existing roadway signage was found to be old and needs to be updated to meet current reflective standards. Also, the following 10 items were identified as needing corrective action:

1. **Crosswalk Sign:** Unnecessary signage on Merrill Field Drive east of the pullout, approximately 100 feet before the intersection with Airport Heights Drive heading northeast.

2. **Crosswalk Sign:** Unnecessary signage on northeast side of Merrill Field Drive, approximately 100 feet west of Starter Way.

3. **Informational Sign:** New signage recommended at Golf Apron entrance on Merrill Field Drive.
4. **Stop Bar Markings:** New markings required on both sides of pathway to entrance at Golf East Apron on Merrill Field Drive.
5. **Street Name:** Unnecessary signage (Airport Heights sign) installed on top of stop sign on the northeast corner of Merrill Field Drive running north-south.
6. **Informational Sign:** New signage recommended at Quebec Apron entrance on Merrill Field Drive.
7. **New Large Signs:** New signs at the entrances to MRI off of Airport Heights Drive and Lake Otis Parkway. This will help inform drivers and pedestrians that they are entering the airport and help reduce vehicle pedestrian deviations.
8. **Crosswalk Sign:** Unnecessary signage on southwest side of Merrill Field Drive at west entrance reader board.
9. **Crosswalk Sign:** Incorrect location of existing sign on southwest corner of intersection of Merrill Field Drive and access point to west Whiskey Apron entrance.
10. **Informational Sign**: New signage recommended approximately 50 feet from the northeast corner of the intersection of Merrill Field Drive and access point to west Whiskey Apron entrance.
11. **Flashing Light Warning Beacon**: Unnecessary light on speed limit sign approximately 80 feet east of intersection of Merrill Field Drive and access point to west Whiskey Apron entrance.

This project would include upgrading existing roadway signs to meet new reflective standards, removing unwarranted and unnecessary signage, adding markings and signs as required to meet standards, and placing informational signs at apron entrances.

This project would upgrade roadway signage to provide clarity and correct the noted sign deficiencies for compliance with DOT&PF and MUTCD standards and regulations. Improving roadway signage is anticipated to cost less than $100,000 and is not expected to increase operational costs. This project should be eligible for AIP grant funding if it is included as part of safety and security of the airport to curtail VPDs. No significant environmental concerns are anticipated.

Conclusion: MRI has elected to correct roadway sign and marking deficiencies as noted above.

6.4.1.14 Mandatory Arrival/ Departure Announcement When ATCT is Closed

The ATCT at MRI does not operate 24 hours per day. To increase airspace safety when the ATCT is closed, it has been suggested that pilots make arrival and departure announcements on the CTAF should be a required airport procedure when the ATCT is closed. This issue is not expected to have substantial environmental concerns or associated costs.

Conclusion: MRI has selected to not supersede FAA authority in this matter. The FAA has not chosen to make such a rule mandatory and the FAA sets communication protocol requirements. In fact, FAA guidance in the Aeronautical Information Manual suggests the communication reverts to using the published ATCT frequency as a Common Traffic Advisory Frequency. They will continue to encourage arrival and departure announcements as part of their best practices when the ATCT is closed. No accidents or safety issues were identified when the issue was researched.

6.4.1.15 Acquire MRI Part 77 Airspace

To protect MRI's Part 77 airspace, acquiring control over the airspace above Northway Mall has been suggested. This would require an easement to be obtained. MRI had an avigation easement that expired January 31, 2013 and was not renewed because of other controls in place. The cost for this work is estimated between $100,000 and $500,000, and there are no environmental concerns.

Conclusion: The airspace is protected by existing MOA zoning regulations (AMC 21.65) and other guidelines. MRI has decided to continue working with the MOA Planning Department and others to ensure airspace is protected from future development.

6.4.1.16 Update Special Approach and Departure Procedures

Airport users have suggested that the FAA provide updated special approach and departure procedures to reduce airspace conflicts between fixed-wing and helicopter traffic.

This action is not expected to have substantial environmental concerns or associated costs to MRI. It is also consistent with best planning tenets for safety. MRI has regular meetings with the ATCT at which this and other topics are discussed.

Conclusion: MRI will continue to work with the FAA ATCT and consider potential changes to approach and departure procedures.

6.4.1.17 Upgrade Security Vehicle Gate Access Control System and Camera Access System

This project would replace the existing card readers and access control cards at 33 existing electronic vehicle gates. New card readers would have the option for long- and short-range card reading. The new access cards would be smaller, with enhanced programming settings to personalize airport access control for each user. Replacing the outdated card readers with new equipment would help ensure the airport's safe operations and reliable airport security and access control.

The existing security camera system was installed in 2006. Subsequently, AIP funding was used to update the system in 2011 (Security Phase-1) and 2012 (Security Phase-2). The system requires constant repair and maintenance due to the short life of electronic components. Future upgrades would require analysis and replacement, as necessary, of the current camera system and its related accessories to include wireless communication, hardware, and software program. The existing camera system's wireless communication system is unreliable, particularly in locations that do not have a clear line of sight. Some camera component parts, hardware, and software programs are obsolete (the standard manufacturer's life is 5 years) and are no longer supported by the manufacturer. Replacement of the wireless system with fiber-optics would increase the reliability of the system. The capability of cameras to capture images is constantly being improved, so the cameras currently being upgraded would be outdated in only a few years.

The camera system upgrade is necessary to maintain the integrity of the VPD program to identify unauthorized entry of vehicles and pedestrians into the AMA for investigation and compliance with law enforcement. The system also provides awareness to the public that their presence at the airport is being monitored, thus preventing VPD.

The cost for the system is estimated to be more than $500,000 and would be an AIP-eligible cost. No environmental concerns are anticipated with this improvement.

Conclusion: MRI is currently replacing the existing card readers and access control cards at electronic vehicle gates by phases. MRI is also upgrading the cameras to a newer digital model to better meet the design objectives.

6.4.1.18 Additional Vehicle Parking along Merrill Field Drive

As shown in Figure 6-13, this project would construct additional parking along Merrill Field Drive to meet current needs for business and tiedown lease holders and improve roadway and apron safety at the Golf East and Quebec aprons. The Golf East Apron parking along Merrill Field Drive would be reconfigured and expanded to provide approximately 117 parking spaces. The existing parking area would be relocated to the south to provide a driving lane between parking stalls and the eastbound lane of Merrill Field Drive to prevent parked vehicles from backing into the roadway. The existing paved sidewalk/bike path and apron perimeter fence would also be relocated.

The new Quebec Apron parking lot would be constructed at the southwestern corner of the Quebec Apron and Merrill Field Drive, adjacent to the existing sidewalk/bike path. The new parking lot would provide 61 parking spaces. The existing security fence would be relocated to maintain security around the perimeter of the new parking lot.

Both parking lots would be located above the closed Merrill Field landfill and dynamic compaction of the subgrade will be needed.

This project is estimated to cost more than $500,000 and is not AIP-eligible. No environmental concerns are anticipated with this improvement, and maintenance costs are anticipated to increase slightly to maintain the additional surface.

Conclusion: MRI has decided to pursue the construction of additional parking along Merrill Field Drive as a gravel-surfaced area as described above. However, since the project is not AIP-eligible, the timeline for construction is many years out.

Figure 6-13 Additional Parking along Merrill Field Drive

6.4.1.19 Rehabilitate Airport Access Road Pavement

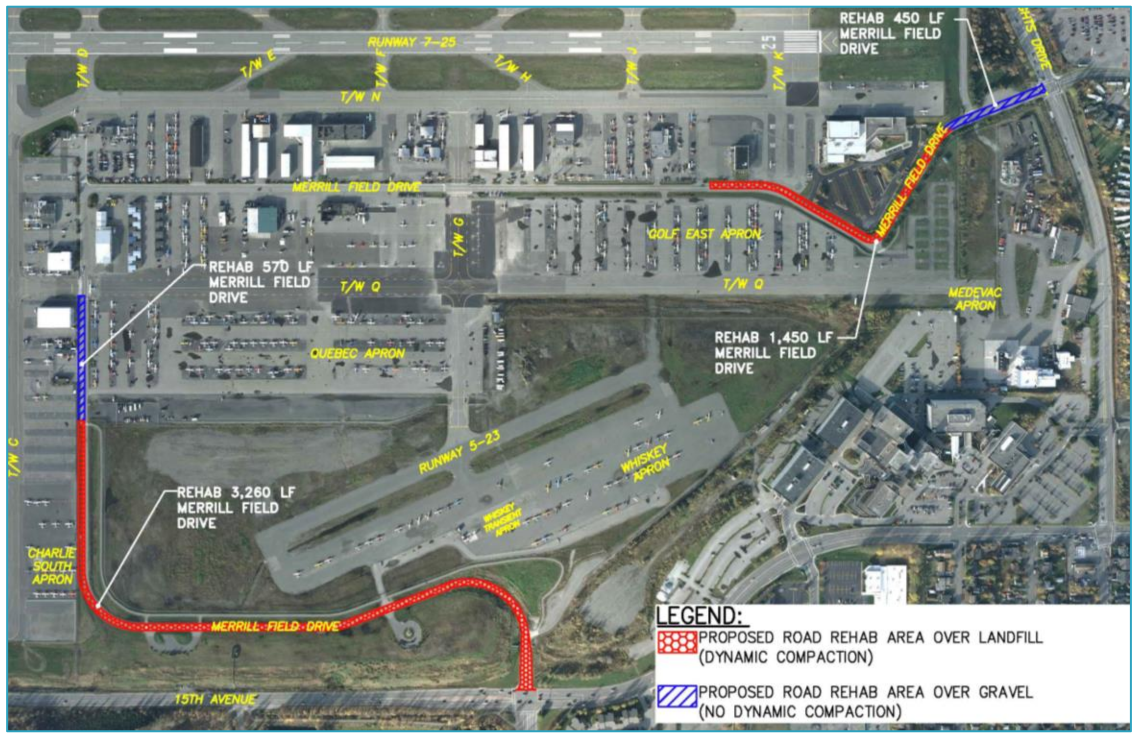
This project would rehabilitate sections of Merrill Field Drive roadway pavement that were noted in poor condition and in need of repair in the 2013 MRI Inspection Report. As shown in Figure 6-14, the project would rehabilitate 3,830 feet of Merrill Field Drive from Taxiway Q to the intersection at 15th Avenue. Approximately 3,260 feet of this segment is located above the closed Merrill Field Landfill and would require dynamic compaction to consolidate underlying landfill refuse.

This project will also rehabilitate 1,900 feet of Merrill Field Drive between the intersection of Airport Heights Drive and the limits of the 2000 Airport Access Road Rehabilitation Project. Approximately 1,450 feet of this segment is located above the closed landfill and would require dynamic compaction.

This project would repair settled and damaged pavement areas to provide a safe access road. It is estimated to cost more than $500,000 and is unlikely to have a substantial impact or environmental concerns. Operating costs would decrease as less annual pavement maintenance is required. No land acquisition would be required. The project would be an AIP-eligible cost.

Conclusion: MRI will pursue rehabilitation of the roadway pavement as described above. This project is likely to be implemented in phases.

Figure 6-14 Rehabilitate Roadway Pavement

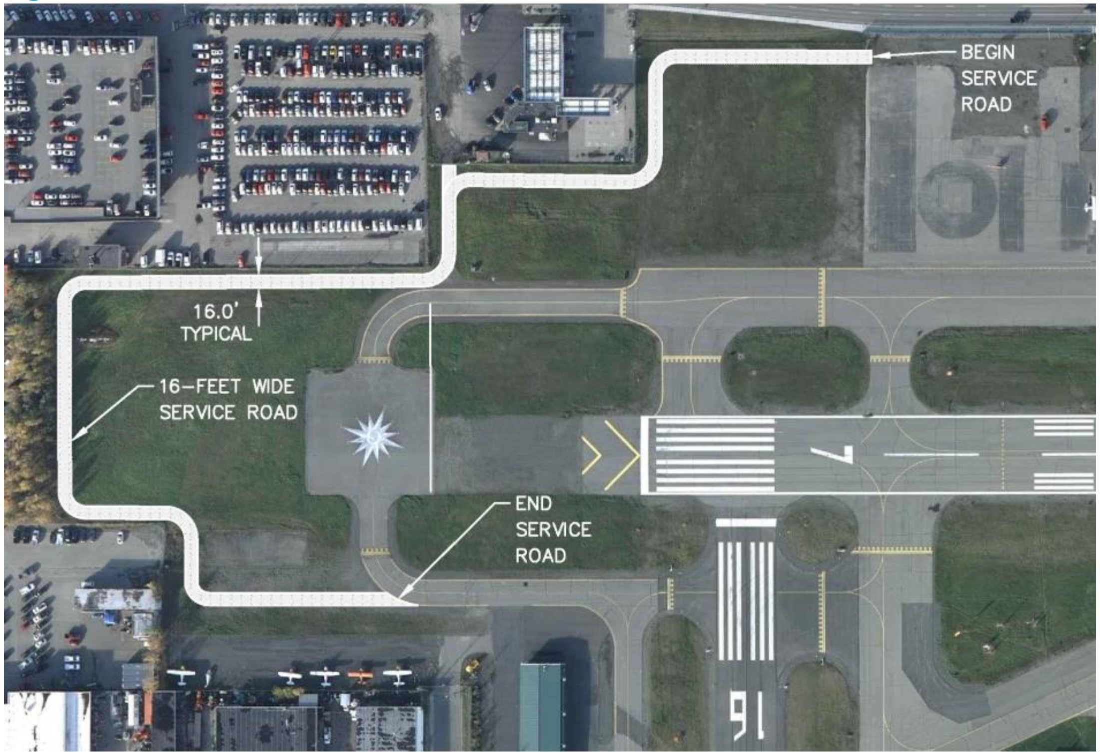


6.4.1.20 O&M Service Road

This project would construct a 16-foot-wide, 1,800-foot-long service road from the north side of Runway 7/25 to the west side of Runway 16/34 without entering an ATCT-controlled runway or taxiway (see Figure 6-15).

The road would begin at the northwest corner of the Alyeska Hangars Lease Lot and follow the airport property perimeter fence along 5th Avenue and around the west end of Runway 7. The road would terminate at Taxiway M, south of the compass rose hold line.

Figure 6-15 Service Road



The project would pave an area that is currently vegetated. Traffic on the road is expected to have minimal impacts due to the low volume of vehicles expected to use the road each day. Installing the road would improve operational efficiency for MRI vehicles to refuel at the Holiday gas station on 5th Avenue.

The cost of the service road is anticipated to be between $100,000 and $500,000 and is AIP-eligible. The road would be built on existing MRI property, so no land acquisition would be needed. The service road would have a small impact on operating costs, as the road would need to be plowed and maintained. If possible, existing vegetated buffer between the proposed road location and airport fence would be preserved.

Conclusion: MRI has decided to pursue the construction of a maintenance service road inside the airport perimeter fence around the west end of Runway 7/25.

6.4.1.21 Replace Existing and Purchase Additional Snow Removal Equipment

This project would purchase new snow-removal equipment (SRE) exclusively for the maintenance of airport surfaces. MRI currently owns and operates a fleet of SRE equipment consisting of two industrial snow blowers, three motor graders, two dump trucks, and three loaders. One of the loaders is a small Volvo model for working in smaller areas but is not efficient for moving and loading large volumes of snow. This project would add a third CAT 921E-size loader to the fleet so that there are three large loaders available to clear and move snow when three maintenance staff are on duty.

Also, the existing 1997 Champion motor grader is prone to breakdowns and in need of replacement. This project would replace this grader with a new Volvo motor grader or similar to match the other existing grader in the fleet. The exact brand of equipment is subject to competitive purchasing rules in order to be AIP-eligible. The maintenance shop needs expansion to house existing snow-removal equipment. Additional equipment would exacerbate this need. A minimum two-bay expansion/addition to the existing shop is warranted and is an AIP-eligible cost. The project cost would exceed $500,000. Equipment that is stored outside typically does not last as long as equipment stored inside.

This project would help ensure there is adequate SRE to meet airport needs, particularly with the demands of removing snow accumulation during winter storms. Keeping the runways and taxiways plowed is essential for safe airport operations. The new equipment may allow faster snow removal, thus reducing the time the runways and taxiways are closed for snow removal operations. This is especially important for medevac flights.

There are minimal environmental concerns associated with this equipment. This project is expected to cost between $100,000 and $500,000. New equipment tends to need less maintenance than older equipment, so operating costs are likely to be reduced. This project is eligible for AIP grant funding.

Conclusion: MRI has decided to replace old and outdated SRE as described above and also expand the shop building that houses equipment.

6.4.1.22 Recycling and Environmental Management Requirements

Public Law 112-95, commonly known as the FAA Modernization and Reform Act of 2012, Section 133, includes the requirement for all airports to evaluate:

- The feasibility of solid waste recycling at the airport;
- Minimizing the generation of solid waste at the airport;

- Operation and maintenance requirements;
- The review of waste management contracts; and
- The potential for cost savings or the generation of revenue.

MRI does not have a public terminal that generates solid waste, so there is no opportunity to minimize generation of waste from such a terminal. Recycling in Anchorage is slowly being developed. SWS currently offers trash pickup at MRI. However, their curbside recycling program is for residential users and does not include MRI. Alaska Waste also offers curbside recycling services, but it is for residential users and their service area does not include MRI.

Disposal of used oil is another issue at airports. Many of the tenants on MRI have installed used oil burners that provide a secondary source of heat for their buildings. Others dispose their used oil at the SWS Central Transfer Station. MRI is encouraged to work with SWS to set up a used oil recycling program so used oil can be collected from tenants in an organized fashion.

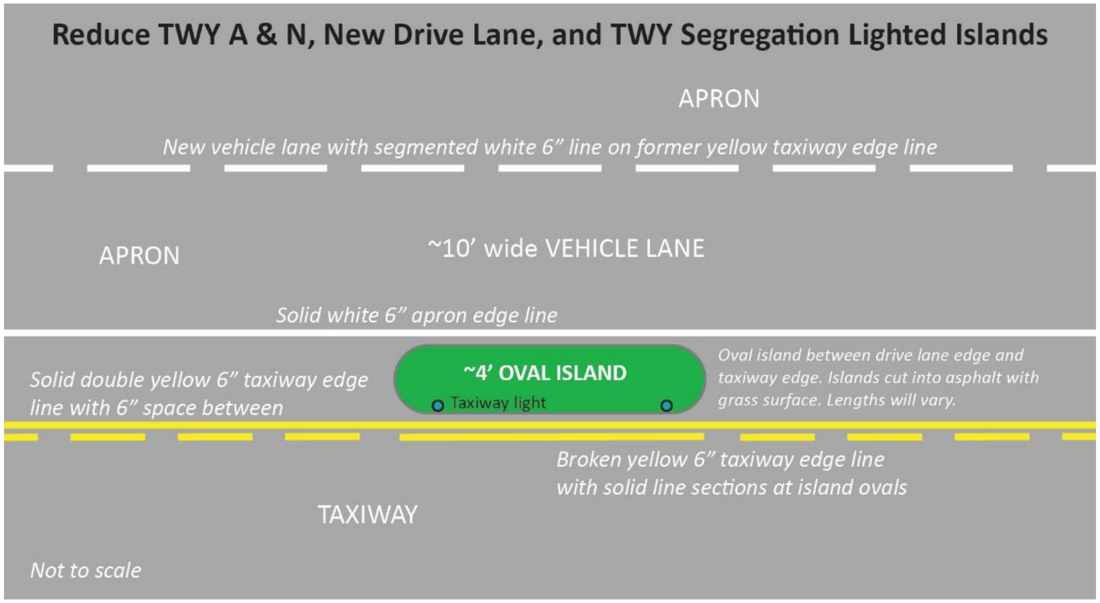
MRI's maintenance group already collects and recycles used motor oil generated by maintenance activities, and the administrative office already recycles solid waste.

Conclusion: MRI will send a letter to all tenants to determine the level of interest, and, if adequate, MRI will explore with SWS the potential of adding MRI to their curbside recycling routes.

6.4.1.23 Taxiway Reconfiguration

MRI has many apron and leasing areas that lead directly to taxiways and runways. This geographic configuration has been identified as one of the contributing factors leading to Vehicle/Pedestrian Deviations from these areas onto the controlled taxiways and runways. Examples are numerous along Taxiways A, N, and C. In order to improve this geographic problem without changing the lease lot configurations, a project will be implemented to relocate the movement area/non-movement area line further onto the existing taxiways. The taxiway widths will all be reduced; but all widths are currently wider than the FAA minimums. This modification will provide space for a vehicle driving lane off of the lease lots and an island that will be strategically located to prevent direct access from the apron/lease lot areas onto the runway interlink without first maneuvering onto the taxiway (see Figure 6-16).

Figure 6-16 Taxilane Reconfiguration for VPD Reduction



6.4.2 Community Focus

6.4.2.1 Address Noise Concerns in Adjacent Residential Areas

It has been suggested that MRI address noise concerns in adjacent neighborhoods by:

- Restricting aircraft use to certain runways, times of day and night, traffic patterns, and operational procedures
- Establishing a noise monitoring program
- Ensuring that FAA ATCT staff understand "fly friendly" noise policies to reduce noise impacts on neighborhoods when communicating with pilots

MRI already encourages best operating practices to reduce noise over the neighborhoods. Restrictions such as limiting runway use or the airport's hours of operation would undermine the airport's ability to financially support itself, conflict with FAA grant assurances, and fail to meet the needs of airport users. An ongoing noise-monitoring program would impose a substantial cost on MRI for equipment and staff that is not AIP-eligible. Updated noise maps for MRI indicate that, by FAA definition, off-airport noise levels are within acceptable limits. MRI implemented "fly friendly" policies that were designed to reduce noise over residential airports. When there are noise complaints and the aircraft can be identified, MRI contacts the pilot regarding the issue. MRI staff has been meeting with community councils and individuals to address noise concerns as well as flight schools and ATCT to implement and practice the operating protocol that was adopted in 2014.

The tasks that ATCT staff members are allowed to perform are specifically identified in the *Aircraft Controllers Handbook* (JO 7110.65). While the staff at the ATCT can be encouraged to understand the "fly friendly" policies, ATCT staff cannot deviate from their handbook in ordering or enforcing controls over pilots. The ATCT controllers can only remind pilots to follow the established "fly friendly" patterns.

Conclusion: MRI will continue working with ATCT staff to reduce noise concerns. MRI will also continue to follow up with pilots who are the subject of noise complaints. MRI will also continue posting information about such efforts and educational materials to increase pilot awareness about noise and community impacts on its website.

6.4.2.2 Improve Access to the Trails through MRI from Adjacent Neighborhoods

It was suggested that MRI improve trail access through MRI from adjacent residential neighborhoods. Residential development is primarily to the west and south of the airport. Developing additional trail connections to the west is not possible because they would have to cross Runway 16/34 and its associated controlled areas. Trail connections to the north are also considered unreasonable because they would have to cross Runway 7/25 and its associated controlled areas.

From the south and east, Merrill Field Drive and associated trails provide access from areas adjacent to the airport. From the south, access to Merrill Field Drive occurs at Lake Otis Parkway, which may discourage Fairview residents from accessing the trail system. A new connection closer to Fairview (but east of Runway 16/34) would provide Fairview residents with better access.

This project would help connect the airport with surrounding neighborhoods. Costs associated with this project are potentially AIP-eligible if the FAA can be convinced that it helps address potential incursion issues by safely conducting pedestrian traffic through the airport outside of AOAs. Non-AIP funding for these improvements could be done by MRI, or another source or department.

The cost for the improvements is estimated to be between $100,000 and $500,000. Minimal environmental concerns are anticipated with this improvement.

Conclusion: MRI has determined that additional trail connections from adjacent neighborhoods are limited due to the location of runways, taxiways, and other controlled areas. MRI will work with the MOA Parks Department to determine if an area south of Runway 16/34 is feasible for any additional trail connections.

6.4.2.3 Potential Closure of ATCT

Airport stakeholders suggested that MRI consider the implications of declining operations on the long-term viability of an FAA-funded tower. However, the FAA-approved updated forecast for aircraft activity anticipates an increase in MRI aircraft operations of approximately 18 percent over the next 20 years. The FAA currently funds tower operations. If operational numbers should drop in the future, MRI could be asked to share in the cost of operating the ATCT. The analysis to determine what these decision points might be is beyond the scope of this AMP. However, MRI users need to be aware of the potential for changes.

Conclusion: MRI has decided that further consideration is not necessary at this time, given the anticipated stability of traffic numbers and continued FAA funding for the tower. Airspace in the Anchorage Bowl is also shared by several public and private airfields including ANC, Lake Hood, JBER, Birchwood, and MRI. The FAA ATCT at MRI is an important component in the management of this airspace to ensure safety, particularly as the MRI ATCT serves as a training facility for new controllers.

6.4.2.4 Establish an Airport Observation Area Where People Could Watch Aircraft

During Phase 1 of the AMP, members of the public suggested that MRI create an additional observation area so people could watch landing and departing aircraft. Two options were considered.

Option A

This option would construct an airport observation area along Merrill Field Drive to provide the public with a designated area for watching aircraft. The new observational area would be constructed on Merrill Field Drive between the existing airport parking/visitor information area and the 11th Air Force Memorial Monument. The observation area as envisioned would consist of parking, a 4-foot-tall observation platform with fixed binocular viewing stations, and an informational kiosk.

This option is estimated to cost more than $500,000 and is not AIP-eligible. Operating costs would include annual pavement maintenance, snow removal, and trash pickup.

Option B

This option would construct an airport observation area at the Merrill Field Airport Manager's Office building.

The observation area as envisioned would consist of a larger visitor parking area, a concrete patio with picnic tables, an informational kiosk, and an observation platform located adjacent to the existing Airport Manager's Office.

This option is estimated to cost between $100,000 and $500,000 and is not AIP-eligible. Operating costs would include annual pavement maintenance, snow removal, and trash pickup.

Conclusion: MRI has concluded that while these are good ideas, there is not sufficient revenue to construct and *maintain additional observation areas. The existing areas will be maintained to allow the public to observe airport activity.*

6.4.2.5 Establish New Community Use Area

Public comment on Phase I of the AMP suggested a new community use area, potentially used as a dog park, just north of the 15th Avenue/Lake Otis Parkway intersection and along Merrill Field Drive at an estimated cost of less than $100,000. This is not an AIP-eligible cost. Operating costs, mainly trash pickup, would be minimal.

Areas on airport property that are not currently needed for other uses could potentially be used for new community use areas. However, costs associated with improvements such as fencing, lighting, and parking would not be AIP-eligible.

Conclusion: MRI already has a community use area south of 15th Avenue (Sitka Street Community Use Area) that is less likely to be needed for future aviation uses. MRI does not intend to develop an additional community use area at this time. However, the airport would be willing to discuss this issue further if another entity is willing to sponsor such as area.

6.4.2.6 Establish New Green Space

Additional green space on MRI was requested during the AMP process. Two options for providing additional green space were considered.

<u>Option A</u>

The existing airfield campground located at the east end of Taxiway Q would be removed and replaced with green space. The existing pavement, tiedowns, and pilot shelter would be removed and the area will be landscaped. This option is estimated to cost less than $100,000, but is not AIP-eligible. Operating costs and environmental impacts are expected to be minimal. No land acquisition is required.

<u>Option B</u>

The existing gravel parking and service road entrance located between the Whiskey Apron and the Alaska Regional Hospital parking lot would be removed and vegetated/landscaped as green space. An access road would be maintained from Merrill Field Drive to the existing service gate located on the east perimeter of the new green space.

This option is estimated to cost less than $100,000; it would not be AIP-eligible. Operating costs and environmental impacts are expected to be minimal. No land acquisition is required.

Conclusion: The campground is used and provides a needed service to airport users, particularly transient pilots during summer months. Campground use also generates revenue for the airport. MRI intends to keep operating the campground. MRI is not currently using the area between the Whiskey Apron and Alaska Regional Hospital and may support this *area being used as green space if a suitable project sponsor is identified. MRI does not have sufficient revenue to implement this project on its own, as it is not AIP-eligible and would prevent MRI from making other aviation-related improvements. Policing/control of the area could be a problem, depending on its usage. This area may be used as a snow dump during the winter.*

6.4.2.7 Make the Sitka Street Community Use Area More Inviting

During the AMP process, there was considerable interest in improving the Sitka Street Community Use Area (also known as Sitka Street Park) to make it more inviting. The Sitka Street Community Use Area is located within 62.66 acres of undeveloped airport property south of 15th Avenue, along the Chester Creek greenbelt. This Sitka Street Community Use Area, immediately west of Sitka Street and south of 15th Avenue, contains trails, lighting, playground, picnic shelter, interpretive kiosk, sledding hill, playing fields, portable toilets, and parking areas. The Sitka Street Community Use Area is maintained by the MOA Parks and Recreation Department.

Three options for improving the Community Use Area were considered. For all options, the MOA Parks Department would be responsible for maintenance of all recreation-related improvements to the Sitka Street Community Use Area.

Option A

Option A would relocate and potentially expand the existing Sitka Street Community Use Area to the area south of the existing location, moving it farther away from 15th Avenue while potentially increasing the area size and scope of the Sitka Street Community Use Area. In addition to the safety and traffic noise reduction aspects of relocating the playground area further from 15th Avenue, the pedestrian trail system in the Chester Creek Greenbelt would be improved to encourage more non-airport-related public use and recreational opportunities, with improved lighting on the existing trail and expansion of the bridge of the north fork of Chester Creek to provide space for sitting and nature viewing. Relocation would include a new paved parking area. This option is estimated to cost exceeding $500,000 and is not AIP-eligible.

Option B

Option B would upgrade the existing pedestrian trail and bridge in the Sitka Street Community Use Area to encourage more non-Airport-related public use and recreational opportunities. This project would install new pavement and lighting in the existing trail and expand the bridge over the north fork of Chester Creek to provide space for sitting and nature viewing. This option is estimated to cost between $100,000 and $500,000 and is not AIP-eligible.

Option C

This option would provide identification and informational signage on the existing Sitka Street Community Use Area pedestrian trail system to encourage more non-airport-related public use and recreational opportunities. This option is estimated to cost less than $100,000 and is not AIP-eligible.

Conclusion: Only Option A potentially provides an economic benefit to Merrill Field by enabling future development opportunities for the land parcels immediately adjacent to the 15th Avenue and Sitka Street. Neither Option B nor Option C provides any economic benefit to Merrill Field. This distinction is significant as the FAA has determined that MRI must not incur revenue diversion in its use of airport property and the existing Sitka Street Community Use Area does not comply with this determination. The best way to accomplish non-revenue diversion of otherwise revenue-producible MRI airport property is to lease out this area as a non-aviation revenue area (see Section 6.4.4.11). To do so, the Sitka Street Community Use Area would need to be relocated and this can be accomplished as an acceptable land use within the parcel.

6.4.2.8 Work with the Fairview and Other Community Councils

During Phase 1 of the AMP Update process, it was suggested that that MRI work with the Fairview and other Community Councils. This work effort would develop a neighborhood interaction plan to identify ways aviation needs can be met while reducing negative impacts to residential areas. It would consist of regularly scheduled meetings between MRI staff and community council members. The work effort would cost less than $100,000 and would not be AIP-eligible.

Currently, MRI interacts with the Fairview, Airport Heights, Rogers Park, and Russian Jack community councils, as well as the public in general through the MOA Mayor's Office and Assembly, the MOA Planning Department, the Municipal Airports Aviation Advisory Commission, and MRI- and FAA-sponsored planning processes, such as this AMP update. The MRI Airport Manager is also available to attend regular community council meetings.

Conclusion: MRI has existing institutional structures and processes in place to coordinate with adjacent community councils. MRI intends to continue using existing mechanisms to coordinate with community councils.

6.4.2.9 Support Aviation Youth Programs in the ASD and at UAA

One comment indicated that MRI should support aviation youth programs in the ASD and at UAA. This work effort consists of ongoing coordination with the ASD and UAA to help provide introductory aviation and flight operations safety instruction in addition to airport and aviation career briefings. One way MRI has supported

UAA in the past is by having interns from the UAA Aviation Technology program work at MRI. Other ways MRI could engage with ASD and UAA students include meeting with students interested in airport management. This is estimated to cost less than $100,000, with most of the cost being staff time. This would not be an AIP-eligible expense.

Conclusion: MRI is willing to and does participate in aviation-related programs when requested by ASD and UAA. MRI currently serves as the landlord for UAA activities on the airport. As such, MRI coordinates on a regular basis with UAA. No capital projects were identified that are within the scope of this master plan that would further benefit these entities.

6.4.2.10 Communicate the Impact of MRI on the Local/Regional Economy

It was suggested that MRI communicate the impact of the airport on the local and regional economy. This work effort consists of economic research, analysis, reporting, and outreach to communicate MRI's importance to the local/regional economy. This would be similar to the analysis conducted by DOT&PF for State-owned airports as part of the Alaska Aviation System Plan. This is estimated to cost less than $100,000 and is AIP-eligible when conducted as part of a larger planning effort.

Conclusion: This activity has been completed as part of the airport master planning effort. The results will be incorporated into the final report.

6.4.2.11 Work with Land Developers, Realtors, and Other Municipal Departments Regarding Airport Proximity and Potential Impacts

Another comment was that MRI should work with developers, realtors, and other Municipal departments to ensure property owners are aware of the airport and the potential for noise prior to purchasing property.

Real estate transactions are governed by other laws and guidelines. Making specific recommendations regarding changes to real estate transactions is beyond the scope of an AMP.

Conclusion: Off-airport real estate transactions are outside the Airport Management's sphere of responsibility. MRI management is willing to speak to professional organizations and other groups regarding the airport and potential off-property airport impacts.

6.4.3 Existing Trends

6.4.3.1 Roads in RPZs

The FAA has determined that roads within RPZs are incompatible land uses. Public roadways cross the RPZs for Runways 5, 23, 16, 34, 7, and 25 (see Figure 6-17). Currently the roads are grandfathered into their existing configurations. However, any changes to these roads would require FAA concurrence that there are no practicable alternatives.

Figure 6-17 Roads in the RPZ

Shortening the runways could potentially mitigate this land use conflict. However, shortening the runways is not a reasonable solution, as the FAA and MRI have made a substantial investment in MRI's infrastructure. FAA standards are for minimum runway length. Longer runways have proven over time to increase safety.

Changing Runway 7/25 from the current A/B-II to category A/B-I is another option. The RPZ for an A/B-I runway has the same length requirement as an A/B-II runway, although the RPZ is narrower; thus the RPZ land use conflict would still exist.

The FAA rules could discourage needed maintenance on these busy roads, and responsible agencies should engage the FAA at the earliest opportunity to ensure needed road improvements can be approved in a timely manner.

Conclusion: MRI will work with the MOA and DOT&PF regarding road maintenance within the MRI RPZs. There are no known plans to modify the road system.

6.4.3.2 ALP Update

The current 2000 MRI Master Plan ALP does not show property recently acquired by MRI from AFD or along Orca Street.

The ALP was last updated in November 2012 to reflect land acquisitions and airport improvements at that time. Consistent with the requirements of the AIP Grant Assurances as well as FAA AC 150/5070-6B Airport Master Plans and best planning tenets, the ALP should be kept current to maximize its utility as a planning tool. Updating the ALP is AIP-eligible, already funded, and will be accomplished as part of the AMP Update. It will also ensure that the airport remains eligible to receive future AIP funds from the FAA.

Conclusion: As part of this AMP update, the ALP will be updated. In the future, MRI will keep the ALP current as funding allows.

6.4.3.3 Acquire Property on Orca Street and Complete Taxiway B

This project would acquire 15 additional parcels along the western airport property boundary, totaling 3.58 acres, and extend the airport property boundary to parallel Orca Street (west of Runway 16/34). This property is needed for future development of a full-length and complete Taxiway B. The project would require removal of existing obstructions, support future development, and ensure compatible land use inside the BRL west of Runway 16/34. Specific properties to be acquired are shown in Figure 6-18 and Table 6-1.

Table 6-1 Property to be Acquired

Merrill Field Subdivisions	
Lot	**Acres**
Block 10	
10	0.23
11	0.23
12	0.23
13	0.23
14	0.16
15	0.16
Subtotal	1.40
Block 22	
1	0.24
2	0.24
3	0.24
4	0.24
5	0.24
6	0.24
Subtotal	1.44
Block 40	
5A	0.46
7	0.28
Subtotal	0.74
Total	**3.58**

This project would enable sufficient property acquisition to complete the construction of Taxiway B as a full-length parallel taxiway for Runway 16/34. The parallel taxiway would help move traffic efficiently, enhance safety, and preserve the capacity of Runway 16/34. Taxiway B would provide airside access for existing airport property to the west. The cost of acquiring the parcels and completing Taxiway B is estimated to exceed $500,000.

This property acquisition project supports best planning tenets by conforming to MRI's strategic vision as the major general aviation transportation facility serving

Anchorage and outlying areas. Project costs are AIP-eligible. Operating costs are expected to increase slightly, as the airport would have to maintain the new taxiway and coordinate additional lease lots. Revenue generated by these lease lots is expected to exceed those costs.

The Fairview Community Council expressed opposition to property acquisition along Orca Street. One reason for their objection was the removal of these properties from the Municipal tax rolls. However, MRI pays a Municipal Enterprise Service Assessment (MESA) in lieu of taxes, so these properties pay a fee equivalent to taxes. The vision for these properties is to develop airport-compatible land uses that minimize noise, respect the residential nature of adjacent property, curtail unauthorized access toward AOAs, and help attract jobs to MRI.

Environmental impacts are expected to be positive as the new aviation-related uses would be designed to act as a noise buffer for residential property to the west. It is anticipated that hangars and other development in this area would create a physical noise barrier, thus reducing noise compared to vacant land.

Conclusion: MRI plans to acquire the remaining Orca Street properties (see Figure 6-18) on a willing seller/willing buyer basis and to ultimately develop a full-length Taxiway B when these acquisitions are completed.

6.4.3.4 Acquire Additional Properties

Occasionally additional properties may become available that would benefit MRI. MRI should evaluate these opportunities to see if such acquisition meets the mission of the airport, helps the airport remain economically viable, and does not adversely affect neighboring properties. One potential property would be the acquisition of the Alaska Sales and Service property along 5th Avenue. This property is already commercial, and offers the opportunity for airport businesses to have airside access.

Figure 6-18 Acquire Property on Orca

6.4.3.5 Prevent Unauthorized Access to AOAs by Vehicles, Pedestrians, and their Pets

MRI had 34 runway incursions in 2014, making MRI the third highest in the country. An analysis of these incursions showed that most were associated with inadvertent entry onto a controlled surface by an aircraft, but some were inadvertent entry by vehicles and pedestrians onto those same controlled surfaces. MRI is geometrically constrained, and some of the setbacks do not meet current dimensional standards, conditions that have existed for many years. While MRI has a history of incursions, the number was as low as 8 in 2005, although there has been a dramatic increase in recent years.

Analysis of the incursions identified several physical improvements that could be made to reduce the number of incursions. The improvements include:

- Revise access protocol to require touch pad entry and/or magnetic card access for AOA ingress and egress (eliminate the existing motion detector/push-button protocol for AOA egress).
- Reduce width of north interlink Taxiway K
- Enhanced hold line markings on north interlink of Taxiway K
- Additional signage on north interlink on Taxiway K
- Upgrade the fencing on 5th Avenue and Stoddards Way
- Enhanced hold line markings on south interlink of Taxiway K
- Additional signage on south interlink of Taxiway K
- Repaint all Taxiway edge markings
- Install Taxiway A edge lighting
- Provide designated vehicle lane north of and parallel to Taxiway A
- Improve signage on Taxiway N
- Install vehicle barriers on Taxiway N
- Install lighting, signage, and navaids on Taxiway 5/23
- Improve the Runway 5/23 perimeter fence
- Informational signs along the fence lines

Non-physical improvements include:

- Additional driver training requirements
- Routinely change gate codes to help ensure only authorized users can enter the gates
- More leaseholder/tenant educational training

Repairing security gates and fencing (described in Section 6.4.1.2) would help reduce incursions, as would upgrading the gate access control system (Section 6.4.1.17).

In addition to the improvements identified above, another option is to change the controlled surfaces under ATCT control. Most of the incursions occurred on taxiways and not on runways. Removing taxiways from ATCT control is likely to reduce the number of incursions. This option would mean that all the taxiways at MRI would be uncontrolled instead of the current situation in which there is a mix of controlled and uncontrolled taxiways. This would be consistent with how other airports such as Lake Hood are controlled. Removing the taxiways from ATCT control would also address the ATCT visibility issue.

This project supports best planning tenets for safety and security, has minimal environmental impacts, and is AIP-eligible. Operational costs are anticipated to be low. Collectively, these improvements would exceed $500,000.

Conclusion: MRI recognizes that incursions are a significant issue and need to be addressed. Airport management has decided to pursue the physical and non-physical improvements to reduce incursions and improve airport operations. MRI will also start discussions with FAA ATCT to remove the taxiways from ATCT control, FAA Runway Safety Office for assistance to update the electronic "driver training program," and FAA Airports Division regarding AIP funding.

6.4.3.6 Review Snow Removal and Storage Sites and Practices

Snow storage during heavy-snowfall years has been identified as a concern. Snow needs to be stored in a manner that is cost-effective but does not create a safety hazard. Transporting large volumes of snow requires the snow to be loaded and trucked to a different location and is not considered a cost-effective approach at MRI.

Since the AMP update process began, MRI changed its snow removal and snow storage procedure. Now, several taxiway connectors are issued a Notice to Airmen (NOTAM) taking them out of service and are not plowed during the winter. This practice appears to help expedite the runway/taxiway snow removal process, plus it enables extra snow storage area where needed. This is a cost-effective means of snow removal and snow storage.

Conclusion: In part, due to limited space at the airport, MRI intends to continue their existing practice of removing snow and storing snow on selected taxiway connector and infield areas. MRI will evaluate snow removal best practices from other airports as they are identified.

6.4.3.7 Compatibility with Other Airports

During the AMP Update process, it was suggested MRI consider its compatibility with other airports in the Anchorage area. Specifically, people were concerned about how changes in air traffic at JBER might impact MRI and how to mitigate any conflicts.

MRI has a responsibility to provide a safe operating environment for its tenants and customers. The military neighbors to the north and east have historically been good neighbors. JBER allows MRI aircraft to penetrate JBER airspace when there are strong southerly winds so that aircraft have a safe base and final for landing on Runway 16. MRI has granted JBER the use of the Cartee Airspace between Pine Street and Boniface Parkway for heavy aircraft landing on Runway 34 at JBER. Concerns center on increases in based aircraft at JBER that could force changes in the VFR corridors into and out of MRI.

Additionally, Bryant Army Airfield on JBER has opened Bryant Airfield for rotorcraft practice during its normal hours of Bryant ATCT operations. This improves noise compatibility of MRI with its adjacent residential neighbors and improves rotorcraft training opportunities.

Conclusion: MRI will continue to work with JBER staff and representatives from other airports to provide a safe operating environment for all users.

6.4.3.8 Competing with Other Airports

Another concern was how MRI can improve its competitive position relative to other airports in Southcentral Alaska. All the airports in the region compete for tiedown and hangar rentals, lease lot tenants, air taxi companies, transient aircraft use, and availability of aircraft maintenance facilities.

Key factors in pilots choosing to base their aircraft at an airport are location and the tiedown/hangar fee structure. MRI is in a highly desirable location near downtown Anchorage. The State-owned airports in the region, operated by DOT&PF, all receive a subsidy from the State legislature to support their fee structure. Other municipally owned airports, such as those in Wasilla and Palmer, offer rates and fees lower than MRI's. These airports are competing within their local economy for customers, and their rates and fees are structured accordingly.

Increasing the number of based aircraft at MRI would benefit the airport because of the revenue generated from tiedown spaces. Increased usage would also have a positive economic benefit on airport businesses from an increased customer base.

Airport users would benefit because the cost of airport operations would be spread among more users and potentially allow fees to be reduced.

MRI should consider ways to attract some of the aircraft that currently tie down at these other airports through economic incentives, introductory tiedown offers, and other marketing efforts.

A review evaluating MRI's rates and fees compared with those of surrounding airports was recently completed by the MAAAC. The study found that the rates and fees at MRI are higher than rates and fees at its competitor airports. Two factors in MRI's favor are service levels and location. None of the other airports, with the possible exception of Lake Hood, are located in such proximity to the population center of Anchorage.

Conclusion: MRI should continue monitoring rates at other airports and implement efforts to increase usage of MRI. The MAAAC has created a tiedown usage committee to identify ways to increase tiedown usage at MRI. Potential ways to increase usage include establishing introductory rates for new lessees and promoting the advantages of being based at MRI.

6.4.3.9 Internet Connection Infrastructure

This project would improve internet connectivity for lease holders and identify ways to reduce wireless broadband interference (project underway). This project would ultimately enable fiber optic cable installation, thereby allowing faster and more reliable internet connectivity by all leaseholders. An improved internet connection is also needed to support the airport's video camera security system as well as future systems such as remote monitoring of the taxiways by the ATCT. This project is coupled with other security improvements and is estimated to cost more than $500,000. It will help address leaseholder complaints regarding internet connectivity at the airport and help attract tenants to the airport.

Conclusion: MRI will continue to improve internet connectivity by working with the service providers.

6.4.3.10 Long-Term Maintenance of Information and Records

Future mapping projects such as ALPs, obstruction charts, and construction plans should produce GIS data that can be incorporated into the FAA's Airports GIS (AGIS) system. The FAA has a long-term plan to use the AGIS system to produce electronic airport documents. Mapping products such as ALPs and obstruction charts that are typically produced by consultants may in the future be custom-produced on demand from GIS data. The GIS data will also be used to help the FAA implement a new satellite-based NextGen National Airport initiative for the modernization of the U.S. air traffic system.

Depending on the project, the development of GIS information may or may not increase the cost of the project. The costs associated with GIS data are typically AIP-eligible. There are no environmental concerns associated with this activity. The production of GIS data also helps MRI comply with best planning practices.

As part of this AMP update is the collection of electronic data, the consultant will submit the GIS following U.S. DOT FAA Guidelines (AC 150/5300-18B). The FIS database (planimetric, geodatabase, metadata) will be submitted to the FAA and National Geodetic Survey (NGS) for inclusion in the AGIS program.

Conclusion: MRI will have consultants use GIS as appropriate on future projects and have the data submitted to the FAA's AGIS.

6.4.4 Economic Driver

6.4.4.1 Helicopter Terrain Park

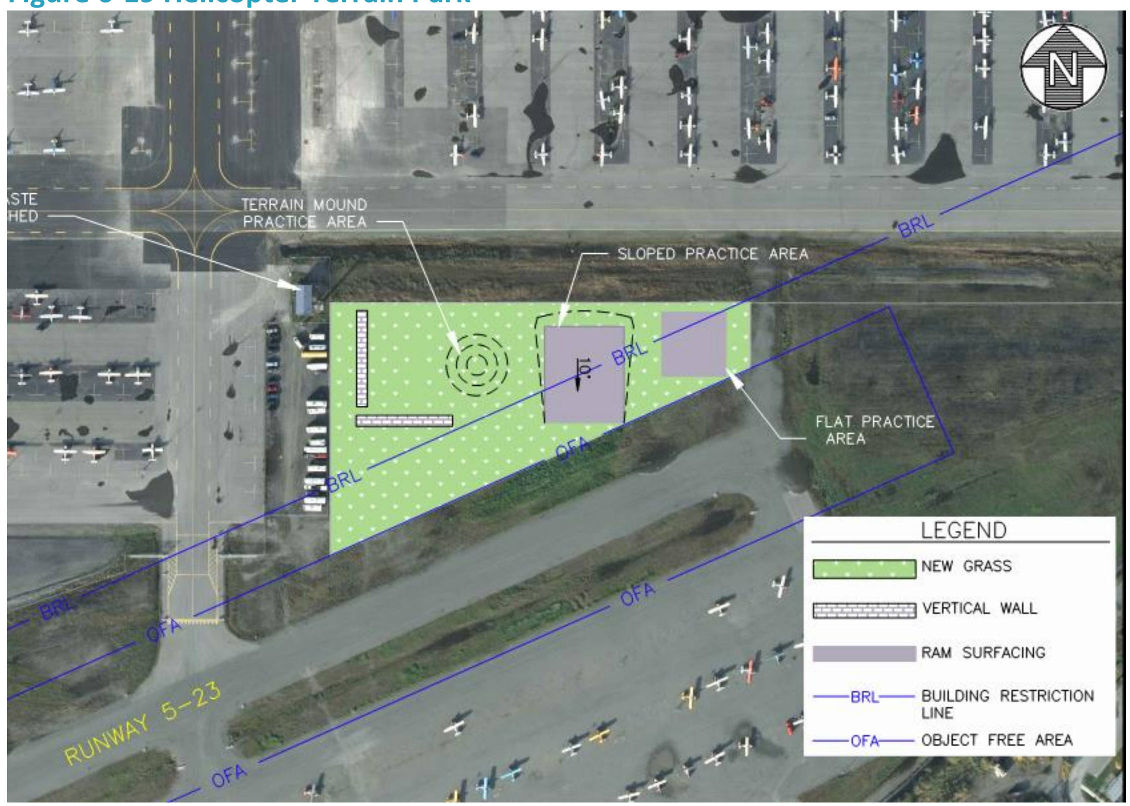
This project would create a helicopter terrain park on Merrill Field to provide a designated helicopter practice area (see Figure 6-19). The terrain park would be located north of Runway 23 and directly east of the SWS flare shed building. The proposed terrain park would be constructed outside of the Runway 23 approach and beyond the runway and taxiway safety areas. The currently unused area northwest of the end of Runway 5 could potentially also be used for this purpose.

The park would include variable terrain features that include slopes, mounds, flat terrain, and ridgelines to provide pilots with a safe environment to practice hovering, landing, hoisting, and picking operations. Structures and 3-D features may also be constructed to simulate confined space operation. The terrain park would be used for private and commercial pilot practice, flight training, and FAA check rides.

Providing a designated helicopter practice area would better serve helicopter flight schools. Concerns have been expressed about the potential for the facility to generate noise, dust, and conflict with nearby aircraft storage and movement areas. Such concerns can be mitigated by distance and ground cover of practice areas. A helicopter terrain park is expected to cost less than $100,000. No additional land would have to be acquired, and it is not likely to increase operating costs. This project is not eligible for AIP grant funding.

Conclusion: Due to potential benefits to flight schools, which have limited training locations elsewhere, MRI has

Figure 6-19 Helicopter Terrain Park



decided to pursue this project on a limited basis. Project supporters will work with MRI management to determine appropriate specific locations and facility features.

6.4.4.2 Provide Lighting on Runway 5/23

This project would install runway edge lighting and navaids on existing gravel/ski Runway 5/23 (see Figure 6-20). It will include installing edge lights, threshold lights, REIL, and a two-box PAPI on each runway end. Edge lighting would be uniformly spaced and symmetrical at 200 feet. The PAPIs would be located approximately 450 and 350 feet down-runway from the thresholds of Runways 23 and 5, respectively. The REIL would be installed 40 feet from runway edge, in line with the runway threshold lights.

Runway 5/23 is a gravel/ski strip, which presents a unique challenge. The lighting is needed most during the winter months, so the ideal is to have lights located in a manner such that they can be seen regardless of the snow depth. One option is to install the tallest standard lights (30 inches) and, should the snow cover them, either they would be declared NOTAM out of service or airfield maintenance could compact or remove the snow. Another option would be to implement over-height lighting, for which height would be determined through a future design effort. MRI needs to work with FAA to determine the suitable lighting height and get approval for a non-standard condition if necessary.

Installing lighting and navaids on Runway 5/23 would better serve airport users and is consistent with best planning tenets and the airport's strategic vision. Lighting may increase the use of Runway 5/23, which in turn may increase noise and air traffic. This area currently does not have lights, and, while such a change in conditions may impact surrounding residential development, impacts should be minimized due to natural topographic screening on Runway 5/23 and the adjacent Whiskey Apron.

This project is estimated to cost more than $500,000. Installing lighting on Runway 5/23 would result in an increase in MRI's operational costs but would be eligible for AIP grant funds to cover capital costs. It is anticipated that installation of runway lighting would also reduce incursions.

Conclusion: MRI has decided that runway lighting should be installed on Runway 5/23.

Figure 6-20 Runway 5/23 Lighting

6.4.4.3 Increase Area of Airport under ATCT Control

This project would increase the aircraft movement areas of the airport under the control of the ATCT to include Taxiways G and Q and the heliport near the hospital. The objective of this project is to increase safety by reducing the potential for collisions and incursions. The cost of this project is estimated at more than $500,000.

This project would require installation of fencing and gates around the area desired, for additional control. In addition, since much of this area is not visible from the ATCT, cameras would be required in order to see the area. Potential suggestions include controlling just Taxiways Q and G, or controlling all of the tiedown areas in addition to the two main taxiways. Controlling just the taxiways is not considered practical. The area is open to the public, with aircraft owners driving their vehicles up to their planes to load and unload cargo and passengers. Fencing would have to be installed alongside the taxiways, with aircraft gates allowing access from each parking area. This would cause maintenance and operational issues, as the aircraft gates are maintenance-intensive. If the entire apron area is fenced, the only gates would be vehicle and pedestrian gates on the perimeter, which require less maintenance. Users would have to stay off the taxiways that are controlled, just as users now stay off Taxiways A and N without ATCT clearance.

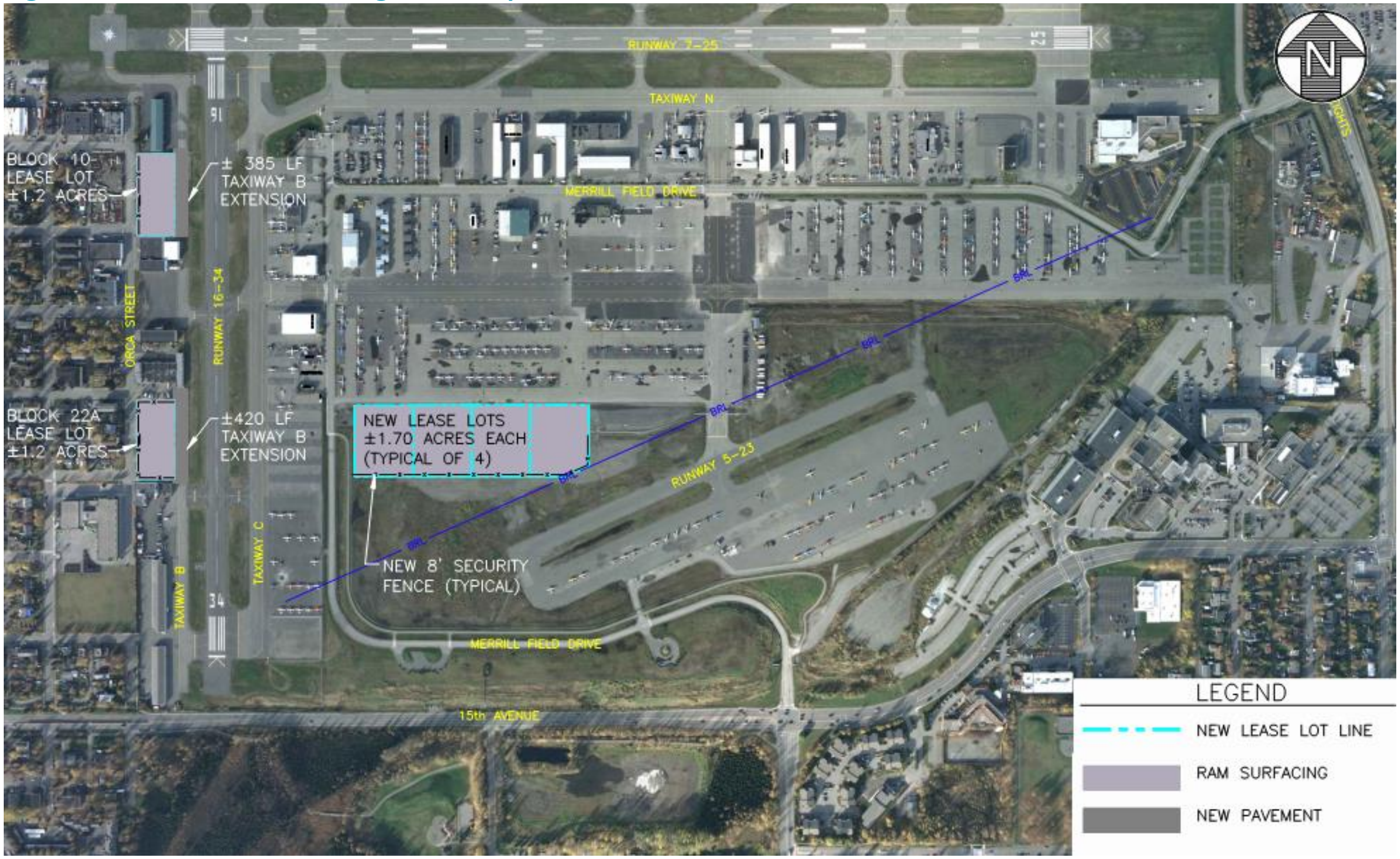
The only known conflicts have occurred when the King Air medevac aircraft is taxiing on Taxiway Q to and from the hospital, and other aircraft are also using the same taxiway. No taxiway collisions or propeller blast damage was documented. Aircraft are moving at relatively slow speed and should be able to avoid conflicts when needed.

Conclusion: MRI has decided to decline increasing the areas of the airport under ATCT control. Contrarily, MRI is considering pursuing the removal of existing controlled Taxiways A, B, C, and N from ATCT control in order to minimize incursions. The most consistent situation would be for all taxiways to be treated the same, whether controlled or uncontrolled.

6.4.4.4 Covered Aircraft Parking and Hangar Facilities

This project would create two new lease lots from property proposed to be acquired on Orca Street and four new lease lots on 6.8 acres of existing airport property south of the Quebec Apron for new covered aircraft parking or hangar development (see Figure 6-21). For the lots near Orca Street, the project would demolish existing structures, and install new perimeter fencing and security gates. For the lease lots near Quebec Apron, a new taxiway would be needed to provide runway access. One negative aspect of this development is this area is currently used for snow storage; an alternate snow storage area would need to be identified.

Figure 6-21 Lease Lots for Hangar Development



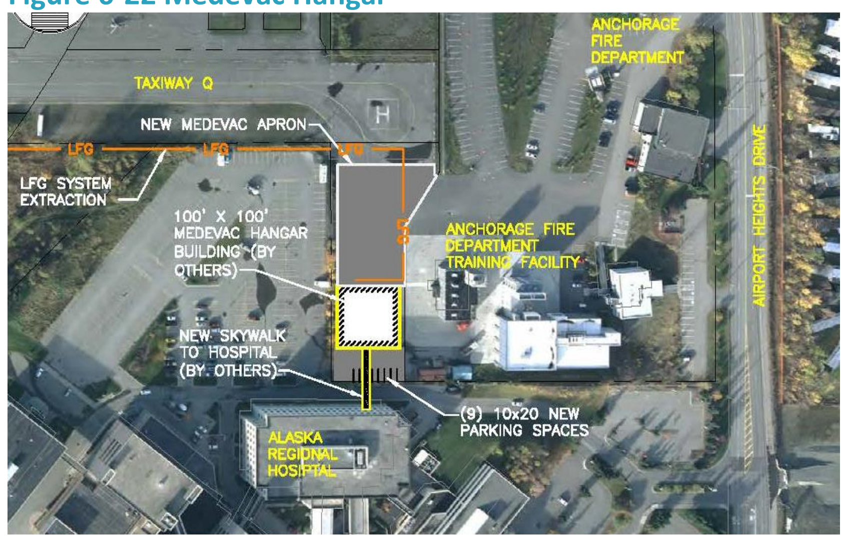
This project would promote economic growth on the airport; however, the cost is projected to be more than $500,000. It supports best planning tenets by conforming to MRI's strategic vision as the major general aviation transportation facility serving Anchorage and outlying areas. The new covered parking/hangar lots and aircraft parking would attract aviation support services and related businesses. The hangars along Orca Street are anticipated to be designed to act as noise buffers for residential property to the west. Project site development capital costs are AIP-eligible. Operating costs are expected to be minimal, but revenue can be expected to increase, as the hangars and aircraft parking are leased. Environmental effects are expected to be positive, as noise impacts would be reduced by the new hangars.

Conclusion: Airport management has decided to pursue additional site development for the new hangar lots and covered aircraft parking lots identified above. Actual development of the structures would be by lessees on leases obtained from the airport.

6.4.4.5 Medevac Hangar

As shown in Figure 6-22, this project would develop a lease lot for medevac hangar construction on the southern portion of the medevac apron parcel. The parcel is paved and used as a medevac apron for Alaska Regional Hospital, which abuts the property to the south. The proposed use is to provide a new 100-foot by 100-foot medevac hangar and vehicle parking area on the southern portion of the apron. The northern portion of the apron would continue to be used as a helipad and aircraft parking area. The existing apron and building pad area was reconstructed in 2013 to a compacted depth of approximately 6 feet. Nonetheless, it is constructed over the closed Merrill Field Landfill, which is settling, and will continue to settle, due to decomposition of the refuse. Extra construction expense may be required to stabilize the site for hangar development.

Figure 6-22 Medevac Hangar



Construction of a medevac hangar would enhance MRI's relationship with the Alaska Regional Hospital. This project is estimated to cost more than $500,000. Environmental impacts would be minimal. No land acquisition would be required. This project could be undertaken by Alaska Regional Hospital or another private party at their own cost on property leased from MRI.

Conclusion: Airport management supports development of a medevac hangar if Alaska Regional Hospital or another project sponsor would like to develop the hangar. There would be no action by MRI. The private sector can develop the hangar if needed.

6.4.4.6 Change the 12,500-Pound Weight Limit on Runway 7/25

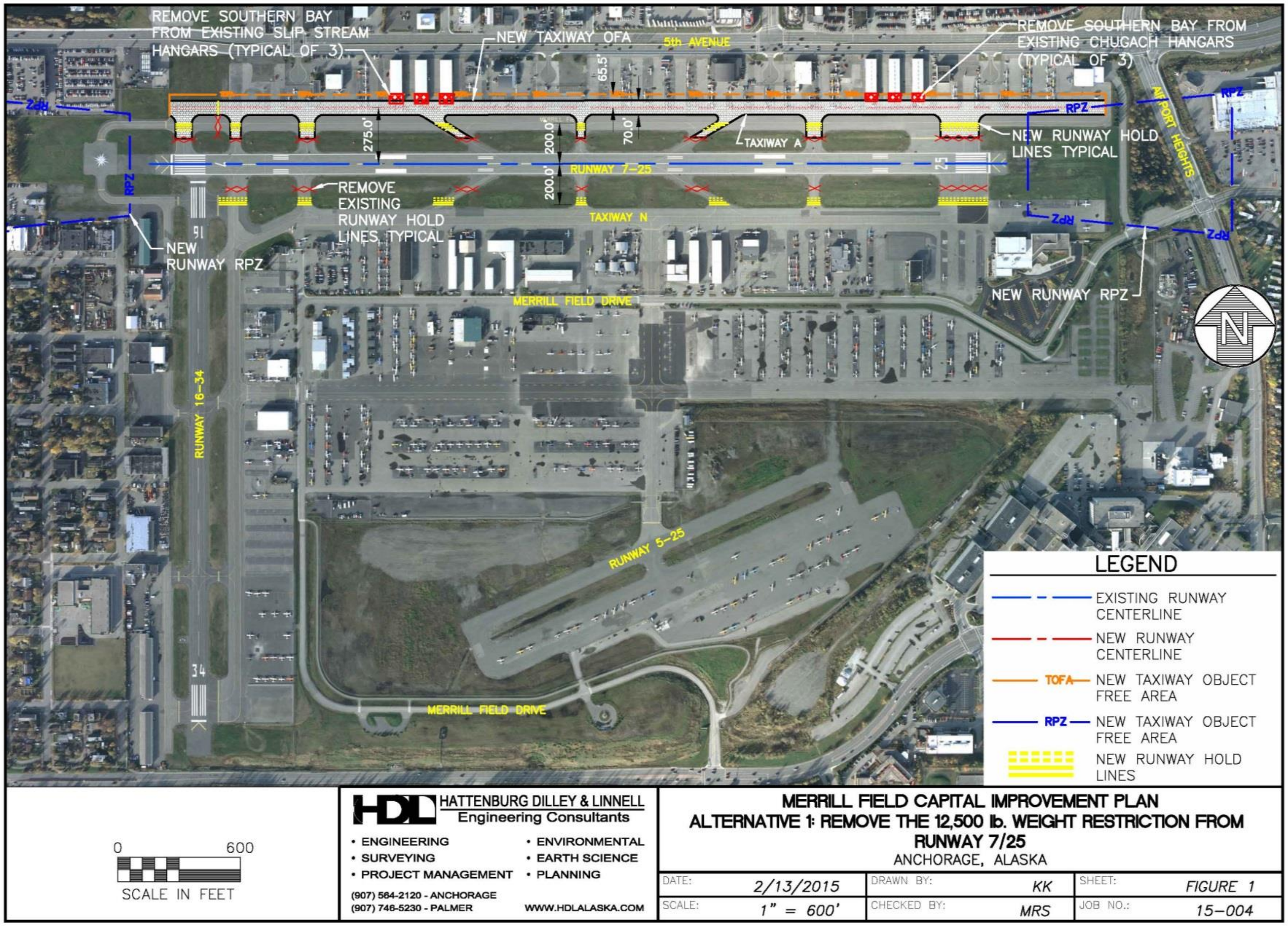
During the AMP development process, a suggestion was made to change the 12,500-pound maximum take-off weight restriction from Runway 7/25 to allow larger aircraft to use the runway and expand commercial opportunities on the airport. If the weight limit is removed, the FAA RDC for existing Runway 7/25 would be changed from B-II-Small to B-II, and any aircraft in the B-II category could use the airport. No improvements would be needed to the runway or structural section to accommodate the change. However, the existing Runway 7/25 RPZ and hold line separation distances should be increased, where possible, to meet current FAA standards for B-II runways. Where the holding position between the runway and Taxiway A cannot be relocated, a MOS will be requested to allow the current positions to remain.

Merrill Field would need to purchase or acquire avigation easements on property off the west end of Runway 7 and off the east end of Runway 25 to control the land uses within the new RPZ where it is not on airport property (see Figure 6-23). Obstructions within the RPZ, including the Alaska Sales and Service and approximately 18,500 square feet of the Carrs-Safeway grocery store off the east end of Runway 25, would be studied for removal or have development controlled. Parking areas within the RPZ could be removed and the perimeter fenced, except for access that would be permitted along public easements and rights-of-way. Airport Heights Drive and other public use roads within the RPZ would continue to be grandfathered in their current position, but any modification would need a practicability study conducted through the FAA Order 7400 process.

Since the weight limit change could require dimensional changes, the airport prefers to keep the B-II-Small dimensional standards and apply for a MOS. The fact that Runway 7/25 does not have low instrument approach minimums, and B-II aircraft over 12,500 pounds are already allowed to operate at MRI for airshows, maintenance flights, and medevac flights is evidence that the weight restriction change would not be significant. The dimensional changes, if enacted, would adversely impact MRI businesses and would create a compelling reason to apply for a MOS.

Another version of this scenario would be to move aircraft hold lines on the interlink taxiways between Runway 7/25 and Taxiway A to the north, and between Runway 7/25 and Taxiway N to the south. They would be relocated from the current 125 feet to 200 feet from Runway 7/25 centerline to meet FAA requirements. To accomplish this, Taxiway A would be relocated 75 feet to the north. Lease lot acquisition and demolition of portions of six existing T-hangars within the new TOFA, which extends 65.5 feet north of the new taxiway centerline, would be necessary. The estimated cost of this project is more than $500,000.

Figure 6-23 Change the 12,500-Pound Weight Restriction on Runway 7/25



Another option would be to allow B-II aircraft that exceed the 12,500-pound weight limit if it can be shown that the aircraft will not increase the noise footprint of the airport or create unacceptable noise levels in adjacent residential areas. The Airport Manager would be able to allow admittance similar to the existing requirements as set forth for maintenance, airshow, or medevac flights in Section 11.60.120 of the Municipal Code.

This project would support MRI's strategic goals by enhancing the airport's ability to perform as the major general aviation transportation facility serving Anchorage and outlying areas. It is also consistent with best planning tenets because it is technically feasible, provides for growth beyond the planning horizon, and promotes flexibility to adjust to unforeseen changes. Operating costs would be minimal, as the runway structural section is adequate and the lighting system and navaids are already in place. Capital costs are potentially AIP-eligible. Land acquisition is required. Environmental impacts would include potential business relocations.

The Fairview Community Council has indicated it is against removing the weight limit because of concerns about increased noise and the fear that an accident from a larger aircraft could be more serious than an accident from a smaller aircraft.

Conclusion: Most large B-II aircraft are quieter than many smaller aircraft (those less than 12,500 pounds). Allowing all B-II aircraft to use MRI will allow the airport to serve a larger number of potential users, which would help the airport be more financially self-sufficient. MRI has decided to pursue obtaining a MOS to allow B-II aircraft and work toward making other airport improvements to meet the B-II standards in the long term. Prior to this taking effect, airport management would have to work with the Municipal Assembly to change Ordinance 11.60, which established the weight restriction.

6.4.4.7 Deicing Facility

Airport users expressed an interest in a deicing facility where they could economically deice their aircraft. Aircraft can be deiced either with chemicals, such as various glycols, or placed into heated hangars and allowed to thaw. Some large airports use an infrared heating system that allows aircraft to taxi into a structure and quickly deice. At MRI, private heated hangar space that pilots can rent to allow their aircraft to thaw out is currently available on an hourly rate or daily basis. Glycols, if used, must comply with MRI's SWPPP rather than be allowed to enter the storm water system untreated. A deicing facility is likely to cost more than $500,000.

Conclusion: MRI has determined that there is not sufficient need for additional de-icing facilities during the AMP's 20-year planning horizon. MRI will re-evaluate this issue in the future if demand increases.

6.4.4.8 New Fueling Site

The scope of this project is to subdivide existing lease lots or renegotiate existing lease agreements in order to replace existing lease lot holders on the north side of Runway 7/25 and provide aircraft fuel service along Taxiway A. This project is not AIP-eligible and is estimated to cost less than $100,000. There are environmental concerns associated with establishing a fueling facility. Lake and Pen Air already has a fueling facility on the north side that is available to sell fuel to people who do not want to taxi to other fuel vendors.

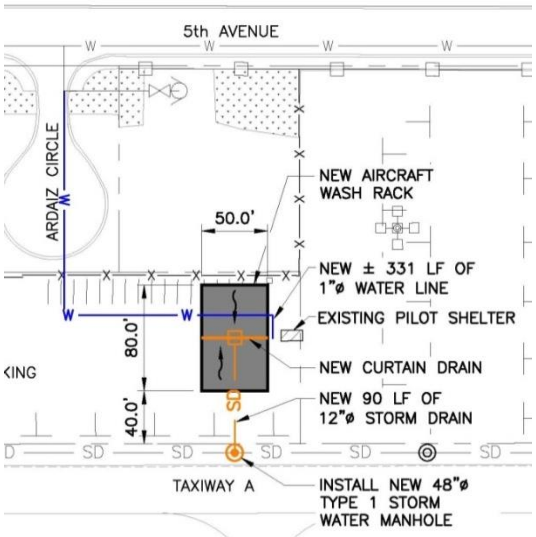
Conclusion: The need for this project no longer exists because Lake and Pen Air recently started selling fuel from their lease lot on the northwest end of Taxiway A. If this fuel vendor stops operating, MRI will re-evaluate this issue.

6.4.4.9 Additional Aircraft Wash Site

As shown in Figure 6-24, this project would construct a second aircraft washing station (wash rack) on Merrill Field, on the north side of Runway 7/25. The existing wash rack is located on the northeastern corner of Taxiway Q and Merrill Field Drive, directly south of and connected to the airport maintenance building.

Merrill Field requires that all aircraft washing activities occur at the wash rack so wash water can be collected and directed to the designated sanitary sewer rather than the storm drain system. Washing aircraft on a lease lot or tiedown is prohibited. The existing wash rack has the capacity for only two aircraft at a time, and a line forms to use the facility during the summer months.

Figure 6-24 Additional Airport Wash Rack



This second location for aircraft washing activities would be more convenient for aircraft parked in the aprons and lease lots along Taxiway A. The wash rack would consist of an approximately 55-foot by 80-foot paved area located on the Alpha Transient Apron, directly west of the existing pilot shelter.

The existing low-pressure wash rack charges users $1.25 for 5 minutes. This rate has been unchanged for many years. An additional wash rack would be expected to operate in the same manner and would increase maintenance costs.

Conclusion: MRI has not determined that there is enough demand to justify an additional wash rack. While people occasionally have to wait to use the existing wash rack, the wash rack is unoccupied most of the time. MRI will monitor usage of the exiting wash rack. If demand increases, this issue will be re-evaluated.

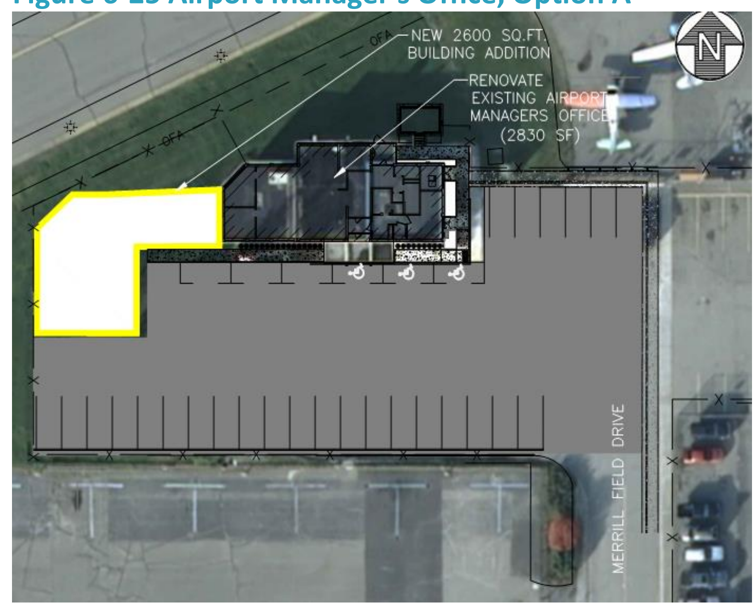
6.4.4.10 Replace/Upgrade Airport Manager's Office

As part of the AMP process, it was suggested that the Airport Manager's Office be upgraded or replaced. One expansion and one relocation option have been considered.

Option A - Expansion

As shown in Figure 6-25, this project would renovate and expand the existing Merrill Field Airport Manager's Office. Construction would include a 1,200-square-foot addition and renovation of the existing office space to provide a modern exterior design and an internal configuration to meet MRI needs. The existing paved parking areas and sidewalks would be relocated approximately 20 feet to the south to accommodate the building expansion. This would impact three aircraft tiedowns on the Charlie-Transient Apron.

Figure 6-25 Airport Manager's Office, Option A



This project is estimated to cost more than $500,000 and is not AIP-eligible. Operating costs may decrease with the design of a more energy-efficient structure. Environmental impacts would be minimal.

Option B - Relocation

This project would relocate Merrill Field's Airport Manager's Office to a new location on or near airport property in concert with AFD's Station #3 (see Figure 6-26).

The existing airport electrical vault, fiber optic/security camera room, and standby generator would remain in their current location. The remaining portion of the existing Airport Manager's Office would be available for lease by airport-related businesses, either singularly or coupled with the corner lot at the apex of Taxiways C and N and Charlie Transient aircraft parking. The Charlie Transient parking area has potential as a lease lot if transient parking is relocated to another area of the airport.

This project is estimated to cost more than $500,000 and is not AIP-eligible. Operating costs may decrease with the design of a more energy-efficient structure. Environmental impacts would be minimal.

Conclusion: MRI acknowledges that, while desirable, relocating the manager's office is a low priority relative to other airfield needs that are also not AIP-eligible. MRI has elected not to pursue this project at this time.

Figure 6-26 Relocation of Airport Manager's Office, Option B

6.4.4.11 Optimize the Use of non-aviation MRI land parcels for Revenue Generation Purposes

This particular project recommends developing two parcels of airport land south of 15th Avenue (the existing MOA snow storage area and Sitka Street Community Use area) for non-aviation-related, office-building-related revenue generation purpose (see Figure 6-27), as it is impractical to use these parcels for direct aviation purpose due to significant terrain elevation differences (30+ feet below the prevailing airfield elevation) and practical non-accessibility to the MRI AOAs. These identified-for-future-lease land parcels when leased would become a revenue-generating cost center when leased, revenues from which would be used to support airport operating costs. The adjacent parcel areas fronting 15th Avenue are proposed for such development: One is an existing snow storage area, presently leased to the MOA (at a reduced, snow storage site rate) and the second is the area presently occupied by the “Sitka Street Community Use Area,” presently permitted to the MOA Parks Department in five year period increments. Both parcel areas front 15th Avenue and are valuable, prime commercial parcels.

The project would develop the property as lease lots for future construction of non-aviation and aviation businesses, and would—considering its proximity to Alaska Regional Hospital property literally abutting MRI—make this area highly desirable for medical-related businesses. The cost of this development is estimated to exceed $500,000 and would be funded by others (not MRI or the FAA). Making airport land available for this non-aviation purpose would require approval from the FAA.

MRI is a public airport, with multiple municipal and federal obligations, including maintenance of financial self-

Figure 6-27 Potential New Lease Lots

reliance (i.e., to be financially self-sufficient and not reliant upon general municipal taxes or support). These federal contractual obligations include use/lease/rental of airport lands without revenue diversion for *airport purposes* and, if not for direct aviation-related airport purpose, use/lease/rental of airport lands at fair market value without revenue diversion, using revenues so derived for airport purpose. Foregoing such obligations and relinquishing such lands would obligate the MOA/MRI to repay any federal assistance received for historic purchase of such property. Non-compliance could also jeopardize funding for future capital projects.

Regarding alternatives for the existing snow storage area, two potential areas for a relocated snow storage site on MRI are identified (see Figure 6-28). Regardless of where such construction would occur – on field or otherwise - any development of a new snow storage site requires specific snow storage site planning, including drainage, traffic and utilities considerations and these conceptual alternative sites may or may not accommodate such actual construction.

The aforementioned second 15th Avenue parcel (see Figure 6-27), presently used as the "Sitka Street Community Use Area," located south of and fronting 15th Avenue, immediately west of and fronting Sitka Street, is within the designated green belt that is south of MRI Runway 16/34 and north of the Chester Creek greenbelt. This Sitka Street Community Use Area – mislabeled a "park" – is not actually a park, per se, but rather this MRI owned land is a "public use area," which area has park-like features of playground equipment and a small hill that is used for sledding. (The distinctive difference is a *Park* is defined as "an area of land set aside for recreation" and a *public use area* is defined as use for "purposes designated as beneficial to the public." Distinctively, the former is *not* airport purpose, whereas the latter *can be* part of airport purpose – as in within a designated runway approach/ departure corridor – and, as long as the land is designated *airport purpose*, no MOA/MRI restitution for land acquisition assistance would be warranted or expected.) This would hold true even though, due to terrain elevation differences and non-accessibility to the MRI Airport Operations Areas, these parcels are not particularly suitable for direct aviation-related lease purposes other than as a physical AOA separation noise buffer area between the AOAs and residential development south of 15th Avenue.

Relocating the renamed "Sitka Street Community Use Area" to airport land due south of its current location and relocation of the existing snow disposal site to a to-be-determined location would enable both of these parcels to be developed as non-aviation related, future office development (likely in concert with the medical complex related corridor that is predominate relative to the nearby – literally abutting MRI – Regional Hospital medical complex). It is anticipated that the redevelopment costs of relocating the existing Sitka Street Community Use Area to the area immediately south and within the approach/departure corridor would be borne as part of the entire leasehold development cost, possibly as a green space corridor in concert with planning such development. Developing both parcels in concert would enable recovery of the relocation cost and return both parcels to market value revenue generation, as required by multiple MRI municipal and federal obligations that include maintenance of financial self-reliance and use/lease/rental of airport lands at fair market value for airport purposes. Regardless of timing, the recommended development of this “beneficial-to-the-public” Sitka Street Community Use Area parcel for revenue generation purposes would only occur *after* an alternate “beneficial-to-the-public” site is developed (see Figure 6-28).

The cost of this development project is estimated to exceed $500,000 and would be funded by others (not MRI or the FAA). Making airport land available for this purpose is consistent with the Transit Supportive Development Corridor policy of the *Anchorage 2020: Anchorage Bowl Comprehensive Plan.* Development should be consistent with other elements of the Anchorage Municipal Comprehensive Plan. This plan is also socially and politically feasible as there is a shortage of developable land in the Anchorage Bowl and such development would also add to the MOA tax base and create both construction as well as long term jobs. Specifics of this development would be closely coordinated with community councils neighboring MRI and will require approval from the FAA, as part of the overall Airport Master Plan approval process.

There is no doubt there will be environmental concerns that will need address as developing these parcels for future office development, including reconstruction of the existing “sledding hill” recreation area, will likely involve or require placing fill in wetlands and removal of vegetation for at least some of this proposed development, plus the current seasonal use snow storage site may have oil, sand, and other contaminants. Notwithstanding any such development – including the relocated Sitka Street Community Use Area – the extensive green belt area south of the Runway 16/34 corridor will remain largely as open space, in concert with the Runway 16/34 corridor. As noted, while the timing for such development is indeterminate, under no circumstances would the existing sledding hill/ Sitka Street Community Use Area be eliminated before a replacement “sledding hill recreation area” is constructed, and any such effort would absolutely be closely coordinated with the adjoining neighborhood community councils.

Development characteristics to ensure consistency with Anchorage Comprehensive Plan elements:

- The land use is consistent with the Land Use Designation provided by the *Anchorage Bowl Land Use Plan Map* update, upon adoption of that plan (2016, anticipated).

Figure 6-28 Possible Alternate Snow Storage Sites

- The development does not preclude restoration of the North Fork of Chester Creek into its original channel in the wetlands west of Sitka Street, provides space for reconstruction of the open creek channel next to Sitka Street up to 15th Avenue, and preserves or enhances the open creek channel east of Sitka Street, in conformance with the *Chester Creek Watershed Plan* (2015; pp 53–54).
- The development incorporates the relocation and enhancement of the "Sitka Street Community Use Area" to replace the current active recreation area.

Possible Alternate Snow Storage Sites

Top location east of and directly in line with Runway 25 approach, approximately 25' below runway grade, situated between Stoddard Way, Merrill Field Drive, and Airport Heights Blvd.

Bottom location is south of Merrill Field Drive, east of MRI aircraft campground, west of AFD Sta#3 Training Area.

Drainage, traffic and utilities considerations for either of these sites have not yet been evaluated.

Conclusion: This AMP amendment identifies parcels of airport land south of 15th Avenue for revenue-generation purposes to support Airport operations while maintaining and/or improving the existing Sitka Street Community Use Area.

7.0 FACILITIES IMPLEMENTATION

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7.1 Introduction

The purpose of this chapter is to present a broad overview of the recommended capital improvements. These improvements will be incorporated into the ALP. Improvements to operations and procedures are not included with this estimate as they were discussed in previous chapters.

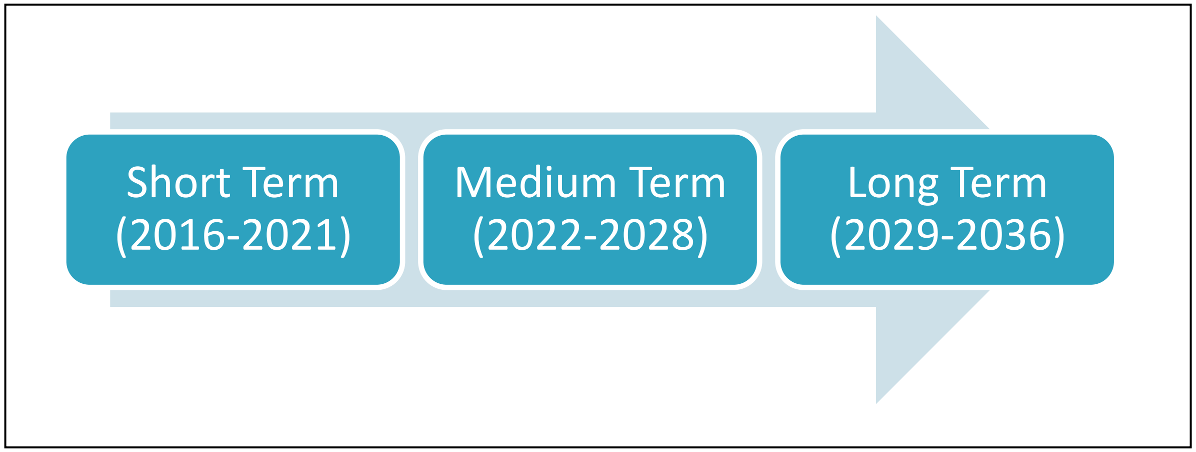
Recommended improvements are listed by three periods: short term (0 to 5 years), medium term (6 to 10 years), and long term (11 to 20 years).

The short-term list includes the projects needed to satisfy existing demand and to correct any safety deficiencies. The medium- and long-term lists identify projects needed to satisfy future demand levels and projects that could not be funded in the short term. It is recommended that facilities in the medium and long terms not be designed or constructed until the anticipated demand level develops.

Medium- and long-term projects may not occur exactly as the schedule shows. Although each period has a designated length, projects identified for one period may overlap with others as they are needed and funding is available. It is important to note that this list is dynamic in nature, meaning the order in which projects appear may change for a number of reasons, including a change in airport demand, funding availability, and political disposition. In other words, MRI management should be prepared to make adjustments as necessary.

The following discussion represents the priority of projects at this time, broken down into the short, medium, and long terms. The order of projects within each group does not necessarily represent the priority within that group, but rather is an aggregation of projects that need to be accomplished in the short-, medium-, and long-term time frames.

For each recommended project, a capital cost estimate has been generated, as well as impacts on maintenance costs and impacts to users.



7.2 Short Term

Figure 7-1 and Table 7-1 show the short-term (0-5 years) capital improvements needed at MRI. These improvements will address some of the safety and standards issues identified in earlier chapters. The work items are not sequential; they can be addressed in any order.

Figure 7-1 Short-term Capital Improvements Needed

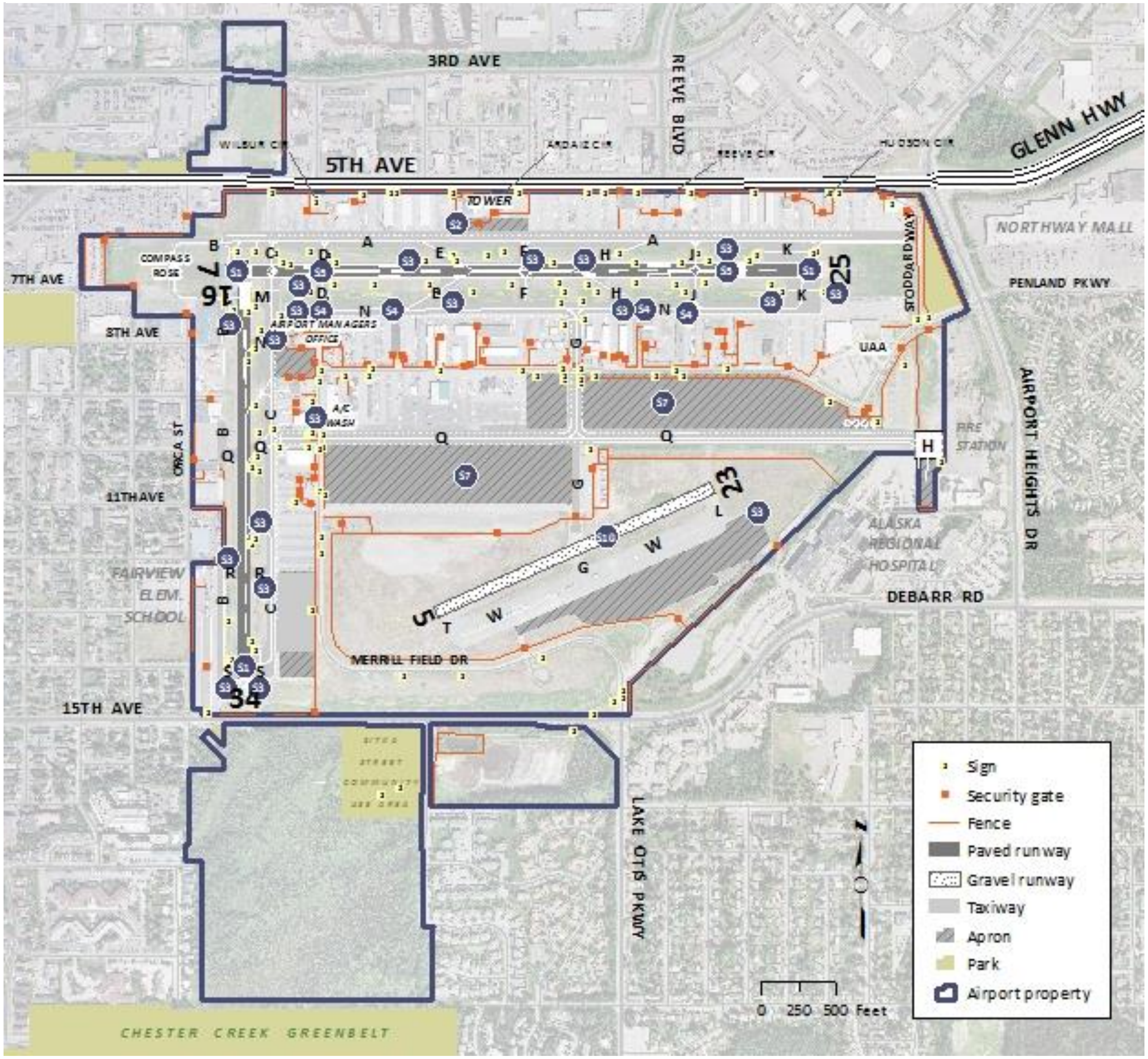


Table 7-1 Short-term Capital Improvements Needed

(Note: items are not listed in sequential order. They should be implemented when funding is available.)

Project ID	Title	Description	Cost Estimate ($)
S1	Expand Runway Blast Pads	Reconstruct the blast pads at the end of the runways to meet FAA standards	325,800
S2	Upgrade Security Vehicle Gate Access Control System and Camera Access System and Fencing	Modify the	5,481,000
S3	Rehabilitate Lighting and Navigation Aids	Upgrade Runway 7/25 lights to LED Upgrade remaining taxiway lights to LED	256,300
S4	Relocate Runway Hold Lines	Relocate the hold lines on the interlinks between Taxiway N and Runway 7/25	62,600
S5	Replace Runway 7/25 Touchdown and Aiming Point Markings	Replace Runway 7/25 touchdown and aiming point markings	159,400
S6	Replace Airfield Signs	Replace airfield signs to correct identified deficiencies	34,700
S7	Airfield and Apron Pavement Improvements	Continue dynamic compaction of old landfill	7,438,900
S8	Roadway Signage		30,800
S9	Replace Existing Snow Removal Equipment and Other Equipment	SRE includes a motor grader, dump truck, deicing trailer, small loader, and sanding truck Non-SRE includes a water tank truck, maintenance truck, 3 pickup trucks, tractor mower, small mower	1,616,000
S10	Provide Lighting on Runway 5/23	Install runway lights and navigation aids on Runway 5/23	800,000

7.3 Medium Term

Figure 7-2 and Table 7-2 show the medium-term (6-10 years) capital improvements needed at MRI. These improvements will be developed primarily after the short-term projects have been completed. The primary purpose of these medium-term projects is to keep the infrastructure at a service level that is functional and maintainable. The airport access road, apron, and runway pavement projects will be necessary to maintain a level of service and safety desired at this airport. Security improvements represent an ongoing effort to upgrade the cameras and electronic controls as technology improves. Many of the electronic components have a fairly limited service life and we expect they will reach the end of that service life within the medium time frame. Similarly, the snow removal equipment will need to be replaced and upgraded as it wears out.

Figure 7-2 Medium-term Capital Improvements Needed

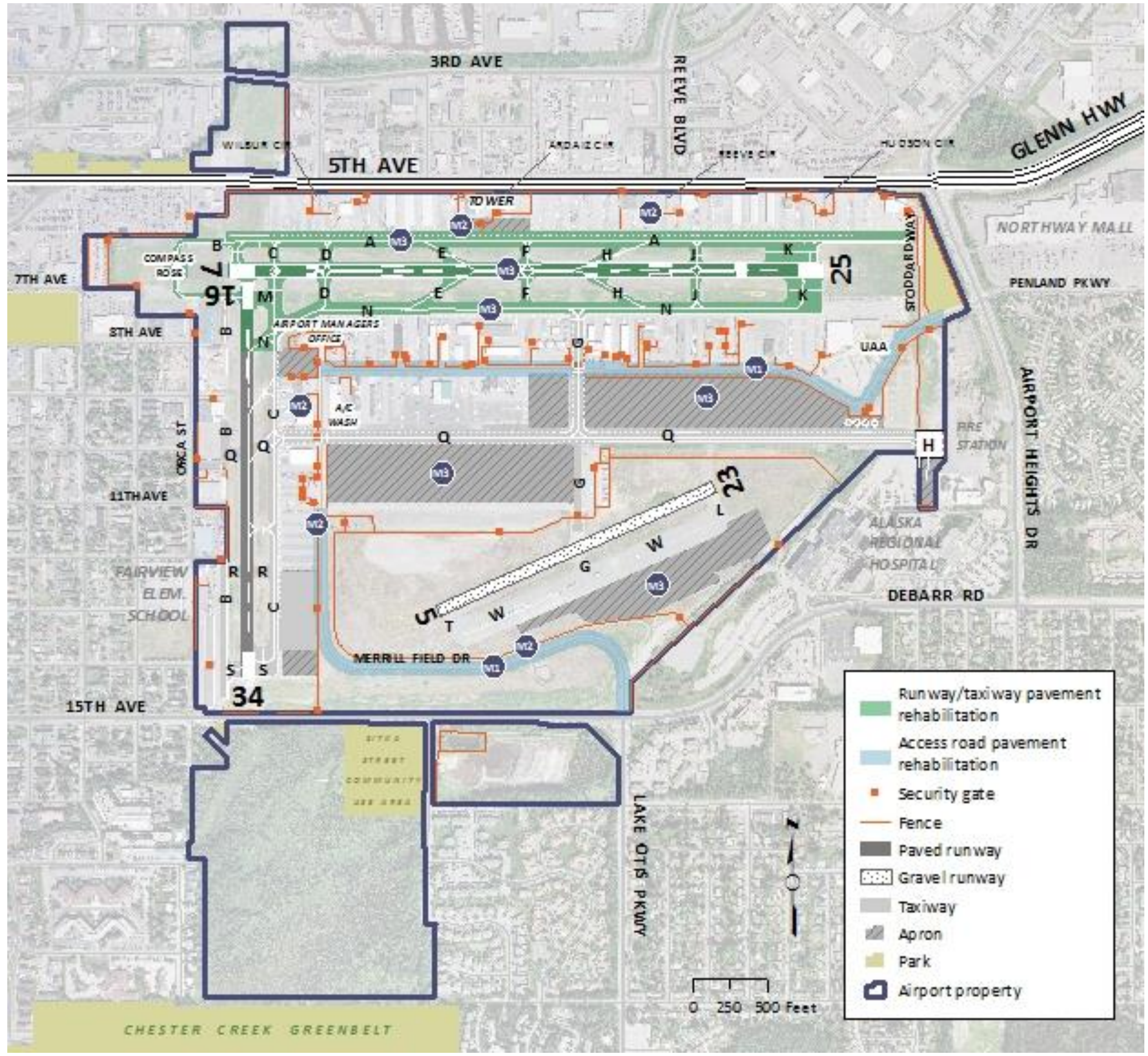


Table 7-2 Medium-term Capital Improvements Needed

(Note: items are not listed in sequential order. They should be implemented when funding is available.)

Project ID	Title	Description	Cost Estimate ($)
M1	Rehabilitate Airport Access Road Pavement	Utilize dynamic compaction to improve the subgrade and repave	7 ,657,000
M2	Upgrade Security Vehicle Gate Access Control System and Camera Access System	Due to changes in technology and aging equipment, access controls will need periodic upgrades. This project is a placeholder for future improvements	829,600
M3	Airfield and Apron Pavement Improvements	Repave Runway 7/25 and Taxiways A and N, and interlinks Continue dynamic compaction of old landfill	24,816,760
M4	Replace Existing Snow Removal Equipment and Other Equipment	SRE includes a motor grader, deicing trailer, large loader, and small loader Non-SRE includes 2 administrative vehicles	1,786, 000
M5	Acquire additional City Electric property	Acquire property north of 9th Ave, south of compass rose area, west of Orca St.	1,500,000

7.4 Long Term

Figure 7-3 and Table 7-3 Long-term Capital Improvements Needed show the long-term (11-20 years) capital improvements needed at MRI. These improvements represent a vision for capital improvements that will allow MRI to succeed on a long-term basis. The list includes projects considered because pavements, lights, and equipment are anticipated to wear out and the airport needs to plan on fixing or replacing as warranted. The list also includes improvements that will enhance the function or service provided to the public. In some cases this will also increase the airport's revenue-generating opportunities, thus ensuring the airport remains economically self-sustaining. An example is increased vehicle parking for airport users and customers.

Acquisition of additional property for airport use has been a long-standing goal of the airport, and this listing provides a placeholder for such acquisition. The goal is to continue the long-standing airport desire to acquire properties only on a willing-seller/willing-buyer situation and not resort to condemnation.

Figure 7-3 Long-term Capital Improvements Needed

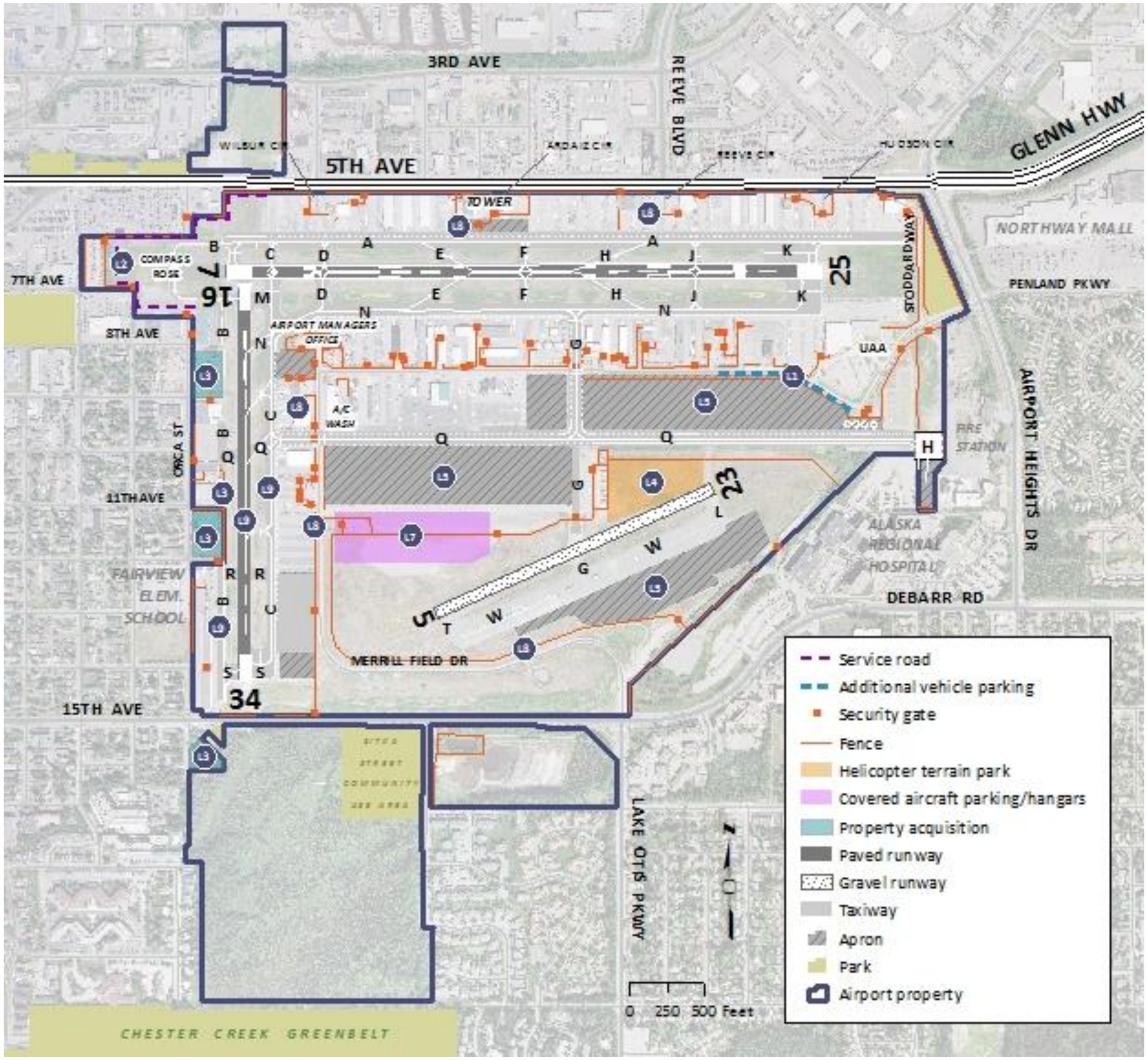


Table 7-3 Long-term Capital Improvements Needed

(Note: items are not listed in sequential order. They should be implemented when funding is available.)

Project ID	Title	Description	Cost Estimate ($)
L1	Additional Vehicle Parking along Merrill Field Drive	Construct additional vehicle parking along Merrill Field Drive	2,095,000
L2	O&M Road	Construct a service road around the west end of Runway 7	252,000
L3	Property Acquisition on Orca Street and Complete Taxiway B	Acquire additional parcels of property on the east side of Orca Street and complete Taxiway B	17,464,000
L4	Helicopter Terrain Park	Construct a helicopter terrain park to aid helicopter training	1,243,000
L5	Apron Improvements	Continue dynamic compaction of old landfill	18,698,000
L6	Replace Existing Snow Removal Equipment and Other Equipment	SRE equipment includes snow blower, 2 motor graders, 2 dump trucks, deicing trailer, small loader, 2 large loaders, and a sanding truck Non-SRE includes a maintenance truck, sweeper, 3 maintenance pickups, and a lawn mower	6,079,000
L7	Covered Aircraft Parking and Hangar Facilities	Site prep only. Development will be by lessee.	6,303, 000

Project ID	Title	Description	Cost Estimate ($)
L8	**Upgrade Security Vehicle Gate Access Control System and Camera Access System**	**Due to changes in technology and aging equipment, access controls will need periodic upgrades** **This project is a placeholder for future improvements**	**954,000**
L9	Airfield and Apron Pavement Improvements	Repave Runway 16/34, Taxiways C and B, and interlinks Continue dynamic compaction of former landfill areas	5,392,000
L10	Relocate Compass Rose	Relocate Compass Rose to a location not yet determined	200,000
L11	MOA Snow Storage Relocation	Develop an alternate snow storage area for the MOS Street Department.	300,000
L12	Relocate Sitka Street Public Use Area	Relocate Sitka Street Public Use Area south of where it is now	150,000
L12	Develop Commercial Non-Aviation Revenue Leases	In the areas south of 15th Ave and east and west of Sitka Street solicit proposals for long term commercial development	100,000

7.5 Environmental/NEPA Considerations

The National Environmental Policy Act (NEPA) of 1969 requires airports operating under the FAA's authority to conduct environmental analyses to address potential environmental effects of major airport actions. Projects included on this list may be subject to environmental review under NEPA and will require an FAA determination prior to implementation.

It is expected that NEPA review of any of the above projects can be accomplished through the completion of an Environmental Assessment (EA) or Categorical Exclusion (CE) rather than a more comprehensive Environmental Impact Statement (EIS). However, it is unknown at this time whether the projects can be assessed under a single comprehensive EA or will require multiple individual EAs. Projects that have independent utility can be assessed separately in an EA.

The decisions on independent versus a "packaged" NEPA review should be made in consultation with FAA and will be influenced by project specificity, implementation timing, funding sources, and funding availability.

Upon completion of the Master Plan Update and approval of the ALP, a proposed short-term environmental strategy would include:

1. Develop an implementation strategy on specific short- and medium-term projects, given sponsorship decisions and funding sources.
2. Conduct coordination meetings with the FAA to discuss the environmental approval process, obtain confirmation that projects can be assessed with an EA or CE rather than a more comprehensive EIS, and determine whether projects should be evaluated in a "packaged" format or evaluated individually.
3. Initiate the NEPA process, including refinement of the scope, purpose and need, alternatives, stakeholder coordination, etc.

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8.0 FINANCIAL IMPLEMENTATION

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8.1 Introduction

The purpose of this chapter is to present options for funding the capital improvements outlined in Chapter 7.0, Facilities Implementation. Improvements to operations and procedures are not included with this financing implementation roadmap; rather, this chapter focuses on options for financing the capital portion identified in earlier chapters of the AMP.

The recommended improvements outlined in Chapter 7.0, Facilities Implementation, are broken down by three time periods: short term (zero to 5 years), medium term (6 to 10 years), and long term (11 to 20 years). This financial overview does not attempt to specifically identify funding for each project in each of the periods, but rather outlines in broader terms the potentially available mechanisms that MRI can utilize to fund the capital program.

MRI operates as an enterprise funded department of the MOA. As such, it is mandated to operate without general MOA or taxpayer subsidy. In fact, MRI pays intra-governmental charges to the MOA for other department services. As a result, MRI must be – and remain – entirely financially self-sufficient.

MRI historically and currently receives most of the capital improvement funding through the FAA Airport Improvement Program (AIP) grants. MRI is required to provide a match for the grants through funds generated by airport operations. In the past, the State of Alaska provided a portion of the grant matching funds, but the current funding climate has eliminated the State portion. MRI-generated operations funds must also pay for non-AIP projects and airport maintenance.

8.2 Airport Improvement Program

The AIP provides grants for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). MRI is a public-use airport and is thus eligible to receive FAA grants.

8.2.1 AIP History

To promote the development of a system of airports to meet the nation's needs, the federal government embarked on a grants-in-aid program to units of State and local governments shortly after the end of World War II. This early program, the Federal-Aid Airport Program, was authorized by the Federal Airport Act of 1946 and drew its funding from the general fund of the U.S. Treasury.

A more comprehensive program was established with the passage of the Airport and Airway Development Act of 1970. This Act provided grants for airport planning under the Planning

Grant Program and for airport development under the Airport Development Aid Program (ADAP). These programs were funded from a newly established Airport and Airway Trust Fund, into which were deposited revenues from several aviation-user taxes on such items as airline fares, air freight, and aviation fuel. The authority to issue grants under these two programs expired on September 30, 1981. During this 11-year period, 8,809 grants totaling $4.5 billion were approved nationwide.

The current program, known as the AIP, was established by the Airport and Airway Improvement Act of 1982 (Public Law 97-248). Since then, the AIP has been amended several times, most recently with the passage of the FAA Modernization and Reform Act of 2012. Funds obligated for the AIP are also drawn from the Airport and Airway Trust Fund.

8.2.2 Projects that Receive AIP Funds

Because the demand for AIP funds exceeds the availability, FAA bases distribution of these funds on present national priorities and objectives. AIP funds are typically first apportioned into major entitlement categories such as primary, cargo, and general aviation. A formula from 49 USC 47114 then allocates entitlements. General aviation airports receive a fixed entitlement. Primary airports receive a higher basic entitlement that increases as the number of passenger entitlements increase. Airports can accumulate 3 years' worth of entitlements to accomplish larger projects. MRI is in the primary category because there are at least 10,000 annual reported commercial operator revenue passenger enplanements. Should the number of enplanements drop below 10,000, MRI would move to the non-primary general aviation category, resulting in a significant decrease in AIP funding.

The remaining funds are distributed to a discretionary fund. Set-aside projects such as airport noise and the Military Airport Program receive first attention from this discretionary distribution. The remaining discretionary funds are distributed according to a national prioritization formula. MRI has been very successful in receiving discretionary funding based on the combination of project needs and lack of funding available through their entitlements.

8.2.3 History of AIP Grants at MRI

Appendix B presents the history of AIP grants at MRI. As shown in this appendix, MRI has been very successful at receiving its entitlements, plus some discretionary funding each year.

8.2.4 Project Eligibility

AIP grants can be obtained for planning projects, capital development projects (including snow removal equipment), and noise compatibility projects. Projects must be at or associated with public-use airports, heliports, and seaplane bases. A public-use airport is an airport open to the public that meets the following criteria:

- Publicly owned, or
- Privately owned but designated by FAA as a reliever, or
- Privately owned but having scheduled service and at least 2,500 annual enplanements.

To be eligible for a grant, an airport must be included in the NPIAS. The NPIAS, which is prepared and published every 2 years, identifies public-use airports that are important to public transportation and contribute to the needs of civil aviation, national defense, and the U.S. Postal service. MRI is listed in the NPIAS.

Recipients of grants are referred to as "sponsors." The description of eligible grant activities is described in the authorizing legislation and relates to capital items serving to develop and improve the airport in areas of safety, capacity, and noise compatibility (see Section 8.2.5 for additional information). In addition to these basic principles, a sponsor must be legally, financially, and otherwise able to carry out the assurances and obligations contained in the project application and grant agreement.

8.2.5 Eligible Projects

Eligible projects include improvements related to enhancing airport safety, capacity, security, and environmental concerns. In general, sponsors can use AIP funds on most airfield capital improvements or repairs and, in some specific cases, for terminals, hangars, and non-aviation development. Any professional services necessary for the design — such as planning, surveying, and design — are also eligible. Aviation demand at the airport must justify the projects, which must also meet federal environmental and procurement requirements.

Projects related to airport operations and revenue-generating improvements are typically not eligible for funding through the AIP. Operational costs — such as salaries, equipment, and supplies — are also not eligible for AIP grants.

Table 8-1 lists typical examples of eligible and ineligible projects; the list is not exhaustive. The FAA can answer specific questions about AIP eligibility.

Table 8-1 Examples of Eligible versus Ineligible AIP Projects

Eligible Projects	Ineligible Projects
Runway construction/rehabilitation	Non-snow removal maintenance equipment and vehicles
Taxiway construction/rehabilitation	Office and office equipment
Apron construction/rehabilitation	Fuel farms*
Airfield lighting	Landscaping
Airfield signage	Artworks
Airfield drainage	Industrial park development
Land acquisition	Marketing plans
Weather observation stations (AWOS)	Training
NAVAIDs such as REILs and PAPIs	Improvements for commercial enterprises
Planning studies	Maintenance or repairs of buildings
Environmental studies	
Safety area improvements	
Airport layout plans (ALPs)	
Access roads only located on airport property	
Snow removal equipment and snow removal equipment facilities	
Removing, lowering, moving, marking, and lighting hazards	
Glycol recovery trucks/Glycol vacuum trucks** (11/29/2007)	

**May be eligible. FAA will make the determination.*
*** To be eligible, the vehicles must be owned and operated by the Airport and meet the Buy American Preference specified in the AIP grant.*

In addition, the following must also apply for FAA to consider a project for AIP funding:

- The project sponsorship requirements have been met.
- The project is reasonably consistent with the plans of planning agencies for the development of the area in which the airport is located.
- Sufficient funds are available for the portion of the project not paid for by the federal government.
- The project will be completed without undue delay.
- The airport location is included in the current version of the NPIAS.
- The project involves more than $25,000 in AIP funds.
- The project is depicted on a current airport layout plan approved by FAA.

8.2.6 Project Coverage

For the MRI airport, AIP grants cover up to 95 percent of eligible costs. The percentage can vary based on statutory requirements and funding allocations.

8.2.7 Sponsor Obligations

Airports sponsors who accept a grant offer are also accepting conditions and obligations associated with the grant assurances. These include obligations to operate and maintain the airport in a safe and serviceable condition, not grant exclusive rights, mitigate hazards to airspace, and use airport revenue properly.

8.3 Passenger Facility Charge

8.3.1 What is a Passenger Facility Charge?

The Passenger Facility Charge (PFC) Program allows the collection of PFC fees up to $4.50 for every enplaned passenger at commercial airports controlled by public agencies. PFCs are capped at $4.50 per flight segment, with a maximum of two PFCs charged on a one-way trip or four PFCs on a round trip, for a maximum of $18 total. Airports use these fees to fund FAA-approved projects that enhance safety, security, or capacity; reduce noise; or increase air carrier competition.

8.3.2 Are PFC charges an option at MRI?

The aircraft operating at MRI are too small to meet the definition of commercial air carriers. So even though MRI has air carriers operating at the airport that charge for their service, because of the small size of the aircraft, none of the passengers could be charged a PFC.

8.4 Revenue Bonds

As a subdivision of the MOA, MRI could potentially sell either general obligation or revenue bonds to fund significant projects. This is analogous to road service bonds or water and sewer bonds that are sold to enable large projects for roads, water, or sewer projects.

General Obligation (GO) Bond sales are approved by a general vote of the residents, and those residents incur an obligation to repay the bonds over time. This is done through a mill rate increase on property taxes or through use fees. Since not all residents of the MOA use the services of the MRI airport, the sale of GO bonds to finance MRI capital improvements is possible, but unlikely.

Revenue Bonds are specifically tied to a single (or multiple) revenue-generating entity that would be constructed from historic revenue generated numbers. While it is possible that a Revenue Bond could be sold for a revenue-generating capital project at MRI, it is unlikely that such a scenario would come to pass as the limited user base at MRI would be obligated to pay back such bonds, backed by the full faith and credit of the MOA, through revenue generated from the specific MRI capital project. This is not practical for the limited user base at MRI.

8.5 State Funding

The DOT&PF rural airport system as a whole receives approximately $27 million annually from the State General Fund[25] to subsidize operation and maintenance of the DOT&PF airports. MRI and other municipally owned and operated airports do not have this option and while, historically, MRI and other non-State airports have received State funding to partially match their AIP grants, even this option is not presently available.

MRI does not anticipate receiving any State funding during the planning period, due to lack of State funding. The State's priority is to fund DOT&PF-owned airport projects.

8.6 Airport Landing Fee

Many airports charge landing fees to generate revenue for airport operations and capital improvements. Airports in Alaska that charge such fees are generally larger and service larger aircraft. For practical efficiency reasons, these airports generally exempt smaller aircraft under a certain weight, such as 6,000 pounds. If MRI were to adopt such a model, the few larger planes operating at MRI would pay a small fee for each landing. The estimated annual revenue is very small, and such revenue would literally not be enough to cover the administrative fees needed to collect the revenue.

MRI could collect landing fees from all aircraft if the N-number tally collected from the ATCT could be used for billing purposes, thus conceivably spreading the administrative cost among all MRI users. However, while this is a potential revenue source for MRI, collection of these fees would very likely have the negative effect of pushing MRI users to other airports, as none of the surrounding airports collect such fees. Thus, landing fees at MRI are not considered a viable option for revenue generation.

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[25] Alaska Aviation System Plan

8.7 Leases of Airport Land and Buildings

One of the primary revenue sources currently used by MRI is the collection of leasing fees for airport property and rental fees from airport-owned buildings on airport property. Both lease fee rates and rental rates are tied to the fair market value of similar property elsewhere in the MOA. By contract, the rates may be adjusted periodically by MRI with adoption by ordinance of the Anchorage Municipal Assembly and are typically adjusted annually based on the Consumer Price Index. The rates are included in the annual capital and operating budget that all municipal departments must submit for approval. As a standard management practice, lease and rental adjustment notices are sent to tenants at least 3 months before the end of the fiscal year.

8.8 Tiedown Fees

Another major revenue source for MRI is the collection of tiedown fees. MRI has more than 800 tiedown spaces on the aprons, not counting tiedown spaces on leased property. People wishing to tie down on one of the MRI spaces must obtain a permit by airport management that includes the rates charged. The rates are different depending on the amenities offered (e.g., paved, gravel, tail in, pull through, and spaces with electrical power). The tiedown rates can be adjusted annually with adoption by ordinance of the Anchorage Municipal Assembly. While there is not a "fair market" price for tiedowns, MRI must compete with Ted Stevens Anchorage International Airport, Lake Hood Seaplane Base, Birchwood Airport, Wasilla Airport, and the Palmer Airport. This competition for very mobile tenant customers directly influences the rates that can be charged.

8.9 Management Staff is Limited

MRI has six office staff members to manage some 800 aircraft tiedown spaces, 55 leaseholds, 45 businesses, and a dozen rentals on the 437-acre airport situated in the middle of the MOA, where residential development since 1930 has occurred on all sides of the airport, and noise impacts on adjoining neighborhoods is an ongoing issue. Additionally, there are four airfield maintenance staff members (plus typically one to three temporary summer helpers) to maintain the three runways, taxiways, and apron areas on this 437-acre airport. MRI is open for use 24/7, 365 days per year (although it is not staffed 24/7).

8.10 Conclusion

Funding capital improvements at any airport is a continuing challenge, and MRI is no exception. In additional to capital improvements, MRI revenues must also cover operational expenses such as salaries for airport employees and utilities, as well as maintenance of airport surfaces such as runways, taxiways, and aprons.

Municipal enterprises such as MRI must collect enough revenue to cover expenses without requesting supplemental funding from the MOA. Because MRI is municipally owned and operated, state funds are not an option. Other traditional airport funding sources include FAA AIP grants, Passenger Facility Charges, revenue bonds, and fees for airport landings, leases, and tiedowns, some of which are not options for MRI.

The FAA bases distribution of AIP grants on national priorities and objectives. AIP grants can be used for most capital improvements or repairs; operating expenses and revenue-generating improvements are not AIP-eligible.

MRI revenues must also cover capital improvements not eligible for AIP funding, as well as funding the required match for AIP grants. MRI strives to prioritize the capital improvement projects to address critical safety issues on the airport and then address other areas such as the need to meet FAA standards, correct environmental deficiencies, and provide services for airport users.

MRI management must also balance the need for revenue generation with the reality that they are competing with surrounding airports for users. MRI must price its services at a rate that does not push users to other nearby airports, and to the degree practical, attract users from other airport facilities.

Based on the potential funding sources described above, the most suitable revenue sources for the MRI airport are tiedown fees, leases, and AIP funding (which currently funds up to 95 percent of all eligible MRI capital costs). The AIP program generates the largest amount of capital funding and is likely to be the funding source for the majority of the capital improvements at MRI. Revenues from tiedown fees and leases could be used to fund prioritized non-AIP capital projects, which include maintenance vehicles such as the water truck, street sweeper, mowers, and administrative vehicles and ongoing building maintenance expenses.

Operating an aged airport with ever-changing needs using limited resources has always been a challenge for MRI management. MRI management must be frugal and efficient to operate the airport and plan for future development while at the same time safely operating the airfield in the middle of Alaska’s largest city.

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