# Emmett Municipal Airport

Idaho Airport Development Plan 2017

RIEDESEL Engineering

# EMMETT MUNICIPAL AIRPORT

## IDAHO AIRPORT DEVELOPMENT PLAN 2017

# ACKNOWLEDGEMENTS

The Emmett Municipal Airport Development Plan Update was developed as a cooperative effort with the following groups:

| | |
|---|---|
| Airport Sponsor (Owner): | *City of Emmett*<br>Gordon Petrie, Mayor<br>Bruce Evans, Superintendent of Public Works<br>Randy Nuxoll, Committee Member<br>Mike Zehner, Committee Member<br>Tracy Barrus, Committee Member |
| Project Administrators: | *Idaho Transportation Department, Division of Aeronautics*<br>Melissa Kaplan, Airport Planner<br>Bill Statham, Project Manager |
| Project Consultant: | *Riedesel Engineering, Inc.* |

# CONTENTS

**List of Tables**

**List of Figures**



**Appendices**

# 1 INTRODUCTION & INVENTORY

This Small Airport Planning Study is funded by a grant from the Idaho Transportation Department Division of Aeronautics (ITD) under Idaho Airport Aid Program (IAAP) Key Number NP-04197.A-07. In August 2016, Riedesel Engineering, Inc. was contracted to complete a Narrative Report and ALP Drawings for the Emmett Airport.

The City of Emmett, in cooperation with the Idaho Transportation Department, Division of Aeronautics has undertaken this Planning Study, to complete a Narrative Report with Airport Layout Plan and associated drawings, for the Emmett Municipal Airport. The planning year horizon is 20 years, which will assist the City in maintenance and development of the Emmett Municipal Airport. This project will be conducted in accordance with the Idaho Transportation Department, Division of Aeronautics 2010 Idaho Airport Development Plan.

The Emmett Municipal Airport is a vital part of the Idaho airport system and is an integral component of the transportation infrastructure for the region. It provides access to our nation's air transportation network, provides community benefits, and generates economic activity.

This plan was created in accordance with the Idaho Airport Development Plan guidance provided by the Idaho Transportation Department Division of Aeronautics. This Airport Development Plan addresses the requirements for an Airport Layout Plan (ALP) and is focused on maintaining the existing improvements and infrastructure in addition to the planned growth of the airport facilities to accommodate future demands. The requirements for future facilities will be evaluated not only from the standpoint of aviation needs, but also from the standpoint of the relationship of airport facilities to the surrounding land uses and the community as a whole.

Objectives of this Development Plan include:

- Inventory of existing conditions and infrastructure at the Airport.
- Analyze the existing and future airport facilities and requirements to meet forecast aviation demand over the next 20 years.
- Realistic and workable Capital Improvement Program (CIP) that identifies items necessary to maintain/expand airport facilities.
- Revised Airport Layout Plan (ALP) drawings that graphically depict existing conditions at the airport as well as proposed capital improvements.

The development of this plan included public participation. An Airport Advisory Committee was assembled consisting of a representation from the City, airport users/ hangar owners, and other interested parties.

Three meetings were held, one with the Airport Advisory Board to review the document and give input on the Capital Improvement Plan. At this meeting, the Board helped identify the specific local needs and wants. The proposed projects were then given a priority of the order of when to complete. Potential funding was also taken into consideration. The City is committed to the Airport and to make improvements in a timely manner. A public airport workshop was advertised in the local paper to ask for input from the general public. At this meeting, only City staff and Airport Board attended. The third meeting was when the Plan was presented to the City Council, which was advertised again to the general public. At the City Council meeting, members asked general questions about the Report and the improvements. The main question was what would be required from the City. In addition, one member of the public stated they supported the Airport. The group was supportive of the Plan overall and wanted to contribute to Airport growth.

## 1.1 GENERAL

In order to complete a full assessment of the airport and its future needs, several factors must be studied which may have an effect, either positive or negative, on airport development, operations, and operational costs. The first step in the Airport Development Plan process is the collection of pertinent data relating to the Emmett Municipal Airport and its surrounding environment.

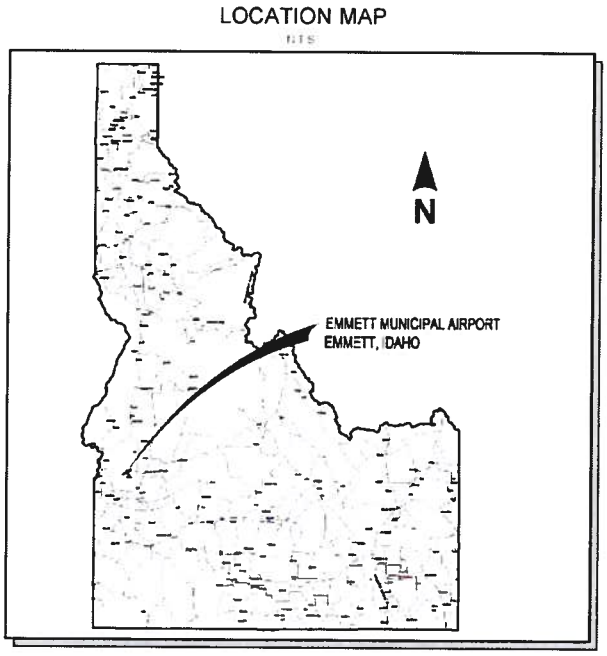



Figure 1-1

The data includes information about the community, the natural and physical environment, and the airport facilities. Information for the existing airport and surrounding area was collected through on-site investigations, review of existing studies, and conversations with City personnel and users knowledgeable about the current and desired airport facilities.

The City of Emmett is located in southwest Idaho south of U.S. Highway 52 in Gem County; refer to Figure 1-1 to the right. It is primarily an agricultural town, with recreational activities for residents and visitors in the surrounding area.

The Emmett Municipal Airport is a Non-NPIAS general aviation airport, located 3 miles southwest of the Emmett City center. It is located one mile south of U.S. Highway 52 on Airport Road. The airport serves businesses and recreational users in Emmett and nearby areas. It also serves as a gateway to Idaho's back country airports. The airport is operated by the City of Emmett and classified as a Local Recreational Airport by the Idaho Airport System Plan 2010.

As a Local Recreational Airport, the Emmett Airport serves a supplemental role in local economies, primarily accommodating recreational, personal flying, and limited local business activities. The Emmett Airport is one of 16 airports in Idaho identified as this type of airport.

The airport minimum facilities and service objectives for Local Recreational Airports as listed in the Idaho Airport System Plan include:

- Runway Length - Meeting Idaho VFR Airport Design Dimensions
- Runway Width - 50 feet as the State standard
- Runway Strength – Single-wheel landing gear – 12,500 pounds
- Taxiway – Turn-a-rounds
- Instrument Approach - Visual, Non-precision Approach desired
- Visual Aids - Rotating Beacon, Wind Cone, REILs, PAPIs, VASIs
- Runway Lighting - Maintain Existing
- Weather Reporting Facilities - On-site ASOS or AWOS as required
- Services - Phone, Restroom, AvGas, Courtesy/Loaner Car
- Facilities - Facility with Public Restrooms and Pilots Lounge; Hangar Storage for 50% of Based Aircraft; Apron (Tie-Downs) for 50% of Based Aircraft and 50% of Transient Aircraft; Auto Parking

## Area Topography

The Emmett Airport has an elevation of 2,354 feet (estimated). The Salmon River Mountains are east of the airport, with smaller hills surrounding Emmett. The City and Airport lie in a small valley with relatively flat farm ground.


Golf Course


Future Hangar area


Existing Private Hangars


Looking North at R/W 10

## Climate

Emmett has a four season climate. Winter low temperatures generally range from 22 to 32 degrees Fahrenheit with the coolest temperatures typically occurring in January. Summer high temperatures generally range from 81 to 90 degrees Fahrenheit with the warmest days occurring in the month of July. Annual precipitation averages about 13.9 inches. December is typically the wettest month of the year.

## Airport History

The Emmett Municipal Airport was initially created with acquisition of approximately 31 acres from Archie C. and Grace M. Tuttle, 10 acres from Lester Yeakel, and 0.5 acres from Aagji Davidson on December 26, 1944. Later on an additional 3.5 acres and 6 acres were acquired from Lester Yeakel and Lester & Nola Yeakel in 1967 and 1968, respectively. In 2000, 7.5 acres of property were acquired from S.S.I. Foods, Incorporated to accommodate a runway extension of Runway 12/30. The airport property totals approximately 80 acres in fee simple, is what the City owns as the current airport property. The airport has an easement on six (6) acres granted from Donald Taylor for the runway.

A Certification of Aviation Use was issued by the Idaho Department of Public Works, Aeronautics Division on October 29th 1945. This was an Operation Permit – Aircraft Landing Facility. At the time of the permit the airport was operated by Webb's Flying Service.

Today the Emmett Municipal Airport is primarily used by single engine aircraft and there are currently eight private hangar owners.

The original runway was gravel and approximately 150 feet in width by 2,900 feet in length. In the 70s the runway was reduced to approximately 55 feet by 2,400 feet. It is assumed that during this period gravel taxiways were added. In 1991 the runway, Runway 10/28, was reconstructed and extended to the present length (3,307 feet). In 2006 and 2009 the partial parallel taxiway and runway was rehabilitated. Both taxiway and apron were crack filled and fog sealed in 2011.

An existing privately owned agricultural air strip is located to the north of the Emmett Airport. The property was owned by the Morris Family in the late 2000s and this was the last time it was used. The use was primarily agricultural spray planes at that time.

The first presentation to the Airport Committee was held on September 8, 2016 at 5 p.m. The presentation consisted of an introduction to the ALP process, delivery of a copy of a draft ALP document, and scope of work, followed with any discussion/input from the Committee on the draft plan.

An airport workshop was advertised in the Emmett Messenger Index inviting the public to attend a meeting on future planning for the airport. No persons showed to the workshop other than Airport Advisory Committee Members.

The Airport Advisory Committee will make a recommendation to the City Council upon completion of the planning document whether to accept the document or not. A public advertisement was published in the Emmett Messenger Index to inform the public of the ALP agenda item and the time and place of the City Council meeting.

## Aircraft Activity

There are two types of aircraft activity data: based aircraft and annual operations. Based aircraft are the number of aircraft that are stored at an airport (either in hangars or in tiedowns). Annual Emmett Airport operations are a reflection of the yearly number of aircraft that perform a takeoff and landing sequence at the Airport. There are currently 21 based aircraft at the Emmett Airport. The fleet mix consists of 21 single-engine aircraft. Current annual aircraft operations at the Airport are estimated to be 12,000. Of that, 6,000 are general itinerant aviation operations, 5,700 general aviation local operations, and 300 which are air taxi. Projected based aircraft and annual operations data will be presented in Chapter Two, Forecasts. No significant Airport Service Area studies have been conducted, but based on discussions with the Airport tenants and users, it is estimated that service area includes the City of Emmett and the surrounding area.

## Critical Aircraft

An airport is designed based on the characteristics of the most demanding aircraft, or critical aircraft, which currently uses an airport or that, is projected to use an airport at some point in the future. The critical aircraft for an airport must have 500 or more annual itinerant operations at that airport. An itinerant operation is defined as an operation involving a trip extending more than 20 miles from and/or to the Airport. Airport records indicate that the critical aircraft for Emmett Airport is the Cessna 182 Skylane. This aircraft has a wingspan of 36 feet, an approach speed of 70 knots, and a maximum takeoff weight of 2,950 pounds.

The airport reference code (ARC) is a criterion that defines the critical airport dimensions based on an airport's critical aircraft. The ARC is defined specifically by the approach category and the design group of the aircraft. The approach category of the aircraft is determined by 1.3 times the stall speed of the aircraft in its landing configuration at its maximum landing weight. The approach category is represented by the letters A, B, C, D and E. The design group of the aircraft is based on the length of the wingspan and is defined by roman numerals I, II, III, IV, V and VI.

The Emmett Airport has an existing ARC meeting the current FAA Standards of A-I (small). Approach category A includes those aircraft that have an approach speed less than 90 knots. This design group includes those aircraft that have a wingspan up to but not including 49 feet. "Small" means that the maximum takeoff weight of the aircraft is 12,500 pounds or less. The Cessna 182 Skylane, identified as the critical aircraft, fits this ARC. The existing facilities at the Emmett Municipal Airport are discussed in the following paragraphs.

## 1.2 Airport Facilities

### Airport Location

The Emmett Municipal Airport is located approximately 3 miles southwest of Emmett and south of State Highway 52 on approximately 80 acres owned by the City, refer to Figure 1-2. The Latitude and Longitude listed in the FAA Digital Airport/Facilities Directory for the Emmett Airport is 43° 51' 09.54" N / 116° 32' 20.65" W. The Emmett Municipal Airport FAA Identifier is S78. The existing airport elevation is 2,354 feet mean sea level (MSL). Access to the airport can be gained from Airport Road to W. Sales Yard Road which is south of and adjacent to the airport.

### Table 1-1 Airport Data

| | |
|---|---|
| **Airport Identifier** | S78 |
| **Airport Elevation** | 2354 msl |
| **CTAF** | 122.9 |

### Runways and Taxiways

The airport has one runway, Runway 10/28, which is 3,307 feet long and 55 feet wide. The airport has one partial parallel taxiway which extends from the southeast Runway 28 end on the south side of the runway approximately 3/4 of the runway length. Three connector taxiways are constructed perpendicular to the partial parallel taxiway to provide access for existing hangars. An aircraft parking apron is located on the east end of the airport and south of the runway. The pavement sections and time line for the construction dates of the airports pavements were taken from the 2016 PCI Report.

The runway is constructed of asphalt pavement with a design strength of 8,000 pounds single wheel gear (SWG). This pavement strength is consistent with the required design weight of most general aviation aircraft utilizing the airport. The existing runway's pavement section consists of approximately 6.5 inches of gravel overlain with approximately 2.5 inches of asphalt. The runway was constructed in 2008. The runway pavement is in very good condition, but will need maintenance in the next few years to increase the life of the pavement and to help prevent distresses.

The existing taxiway pavement section consists of approximately 3 inches of asphalt concrete base overlain with approximately 2 inches of asphalt. The taxiways were constructed in 2006/2008 and are in excellent condition. The pavement will need maintenance in the next few years to increase the life of the pavement and to help prevent distresses.

Table 1-2 represents the existing facilities and service objectives for Local Recreational Airports as listed in the State System Plan.

The Emmett Municipal Airport meets most of the design standards except the pavement strength, visual aids, and no turnaround on Runway 10.

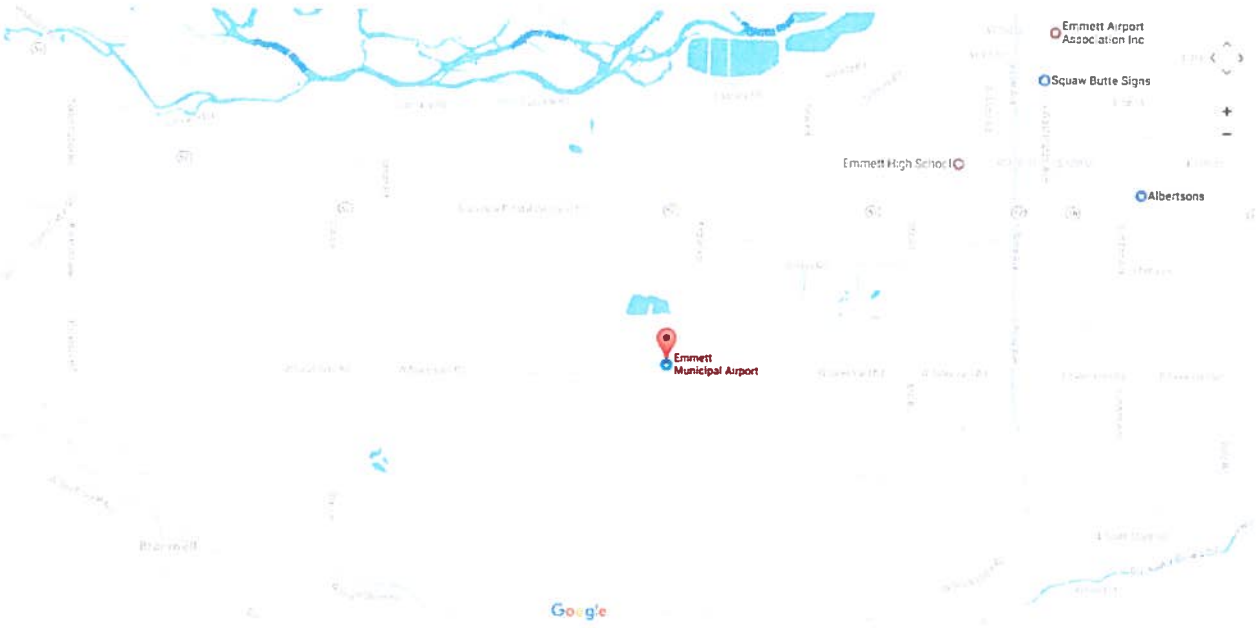



Figure 1-2, Vicinity Map

**Table 1-2 Runway 10/28 Data**

| Design Feature | State Criteria | Existing |
|---|---|---|
| Runway Length | 2705 feet | 3,307 feet |
| Runway Width | 50 feet | 55 feet |
| Runway Surface | Asphalt | Asphalt |
| Runway Strength | Single Wheel 12,500 pounds | Single Wheel 8,000 pounds |
| Approach | Visual, Non-precision desired | Visual |
| Runway Lighting | Medium Intensity | Medium Intensity |
| Visual Aids | Beacon, Wind Cone, REILs, PAPIs, VASIs | Beacon, Lighted Wind Cone |
| Runway Gradient | 0 – 2% | 0.1% |
| Runway Elevation | | R/W 10 2351.0' R/W 28 2354.0' |
| Taxiway | Turnarounds | R/W 10 - none R/W 28 Taxiway |
| Weather Reporting Facilities | On-site ASOS or AWOS as required | None |
| Services | Phone, Restroom, AvGas, Courtesy Car | Phone, Port-a-potty, AvGas |
| Pavement Condition Index of 81 or greater | PCI - 81 | PCI - 83 |
| Terminal | Facility with restrooms | Pilots lounge (no restrooms) |
| Hangar Spaces | 50% of Based Aircraft | Met |
| Apron Spaces | 50% of Based Aircraft 50% of Transient Aircraft | Met |
| Auto Parking | Auto Parking | Met |
| Wind Coverage | | 95% (assumed) |
| Displaced Thresholds | | R/W 10 – 200 feet R/W 28 – 373 feet |
| Traffic Pattern | | Left |

### Building Areas

The current and future building areas are located south of the partial parallel taxiway. Currently there are eight private single hangars, including a hangar that could be used by a fix based operator. In addition there is one hangar owned by the City. There has been interest in additional hangar space that can be accommodated through development to either side of the existing hangars.

A small pilot's lounge (10' X 16'), with power, internet, furniture and heating for the pilots' use. A port-a-potty is located adjacent to the pilot's lounge. There is also a restaurant, golf pro shop, and golf cart storage located at the south eastern corner of the airport. A nine-hole golf course lies to both the south and north of the airport.

### Apron and Tiedown Area

The aircraft parking apron is asphalt pavement including space for tie-downs, maneuvering, and taxiing. A total of 23 tie-downs are provided on the apron. The apron was constructed with the partial parallel taxiway in 2008/2009 and is in excellent condition. The pavement will need maintenance in the next few years to increase the life of the pavement.

Self-service fuel Station

Restaurant

Private Hangars

Potential FBO Hangar

### Fixed Base Operators/ Fuel

Currently there is not a Fixed Base Operator (FBO) at the Emmett Airport. At one time an FBO operated at the airport selling fuel and doing aircraft maintenance. The City would like to have a FBO once again at the airport and does have a possible location for the FBO facility.

100LL av-gas is currently available for public purchase at the airport. The system is comprised of a self-serve fueling station open 24 hours a day.

### Access Roads and Auto Parking

Access to the airport from the City of Emmett is west on Highway 52 for approximately 1.75 miles then south on .75 miles on Airport Road and west on W. Sales Yard Road. W. Sales Yard Road proceeds along the south side of the airport and provides access to the airport including the hangars and tie-downs.

Airport users generally park their vehicles in the vicinity of the existing hangars and buildings. The Airport Layout Plan has designated a public parking area south of the existing hangars.

### Airport Maintenance Equipment

The City of Emmett provides the general airport maintenance and snow removal on an as-needed basis utilizing city owned equipment.

### Approaches, Visual Aids, NAVAIDS, and Airspace

Emmett Airport aircraft operations are conducted under VFR flight rules. Pilots operating in the vicinity of Emmett Airport monitor a common radio frequency of 122.9. This Common Traffic Advisory Frequency (CTAF) is used by pilots to identify other aircraft operating in and around the airport. It is used for communication by users of the airport as needed.

The Emmett Airport has a visual approach to the runway. Runway 10/28 is marked with visual runway markings.

The airport has a lighted wind cone with a segmented circle made up of painted half barrels. An unlit wind cone is located on south end of the airport. There are medium intensity runway edge lights, runway end lights, taxiway lights and rotating beacon that operate sunset to sunrise at the airport. There are no additional NAVAIDS located at the airport.

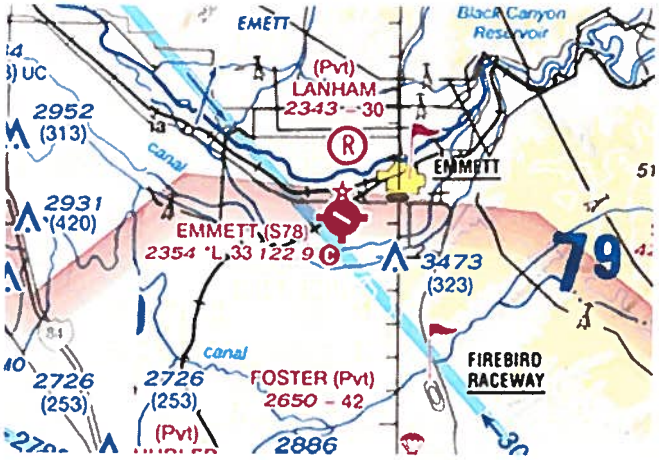



Figure 1-3, Emmett Airport Airspace

The airport traffic pattern is a standard left-hand pattern.

Airspace in the State of Idaho is controlled by two Air Route Traffic Control Centers (ARTCC). The Seattle ARTCC controls northern half of Idaho airspace, and the Salt Lake City ARTCC controls the southern portions of Idaho airspace. Emmett Airport is located within the Salt Lake City ARTCC jurisdiction. Figure 1-3 shows the airspace in the vicinity of the Emmett Airport.

### Automobile Parking

Vehicular access to the airport is from W. Sales Yard Road which is located at the southeast corner of the airport. A barbed wire fence is around the airport and works to keep traffic off of the airport. Currently dedicated automobile parking is located to the south of the apron in addition to between the existing hangars at the airport.

### Utilities

Electricity and telephone are available at the Emmett Airport. Both are provided by local public utility providers. Water is supplied by a single well on site at the airport. No public sewer or natural gas exists at the airport. The golf course office and restaurant is served by an individual septic system. A pressure irrigation line extends under the runway and serves both sides of golf course. A drain pipe extends along the tie down area to the drainage ditches across the road on the north side of the airport. One private hangar has a propane tank to supply a space heater.

### Fencing

The Emmett Municipal Airport is 80% fenced. Fencing materials consist of a combination of three strand barbed wire with posts.

## 1.3 Zoning and Land Use

Development in the general vicinity of the Emmett Airport has been insignificant. Predominate land use to the south and east of the airport consists of agricultural activities including irrigated grazing land. To the north and east of the airport lies the City of Emmett consisting of residential, commercial, and industrial type activities. These activities do not appear to conflict with or interfere with the operational capabilities of the airport. The City of Emmett Zoning Map indicates the zoning control around the airport is agricultural, and the Airport Zoning Ordinances can be found in the City of Emmett Planning and Zoning Sections. Copies of the current City of Emmett Zoning Map should be obtained from the City. A copy of the current Planning and Zoning Ordinances as well as a map can be found in Appendix A.

It is recommended that the City of Emmett review the current airport zoning ordinances and utilize the ITD Airport Land Use Guidelines as guidance to make any modifications necessary to ensure compatible land use planning around the airport.

Runway 28 looking northwest

# 2 FORECASTS

## 2.1 ACTIVITY FORECAST SUMMARY

The purpose of aviation forecasts is to help indicate and determine the relative timing, type, and size of airport improvements. Projections are made in the form of based aircraft and annual operations.

Aviation forecasts were completed in 2009 in the Idaho Airport System Plan published by the Idaho Transportation Department Division of Aeronautics. Those forecasts will be utilized for this plan update, refer to Table 2-1 below for the activity forecast summary for the year 2007 and projected year 2037. The Division of Aeronautics reviewed the following items to develop the aviation forecasts including, 1) historical demand, 2) local socioeconomic indicators, 3) state and national trends, and 4) the airport master plan.

### Table 2-1 Activity Forecast Summary

| Activity Forecast Summary | | | | | |
|---|---|---|---|---|---|
| **Activity** | **2008** | **2015** | **2017** | **2027** | **2037** |
| **Based Aircraft** | 21 | 21 | 21 (actual) | 26 | 31 |
| **Annual Operations** | 5,000* | 6,000** | 6,300* | 7,600 | 8,900 |
| Source: *2009 Idaho Airport System Plan published by Idaho Transportation Department Division of Aeronautics | | | Source: **2015 Federal Aviation Administration TAF published by the FAA | | |

In summary, the Emmett Airport is projected to experience low to moderate growth over the next 20 years. The next step is assessing and planning the needed airport facilities in order to increase the airport usage.

# 3 FACILITY REQUIREMENTS

## 3.1 GENERAL

The Airport Layout Plan (ALP) is a scaled drawing which depicts the layout of the airport's existing and proposed facilities and features. This drawing shows the extent of compliance of these existing and proposed facilities and features to current State of Idaho Transportation Department Division of Aeronautics VFR (Visual Flight Rule) design standards and planning criteria. An ALP which is current and State-approved is a mandatory requirement for the receipt of State financial assistance. The ALP for the Emmett Airport is included in this report as Sheet 2 in Chapter 4, Airport Plans.

This section, Facility Requirements, will examine each of the Airport's functional areas to identify proposed actions that the sponsor is prepared to take to meet the Idaho Transportation Department Division of Aeronautics Standards and planning criteria. This chapter will also identify projects to enhance the function of the airport to ensure that adequate facilities are provided to meet projected demand through the year 2037.

The analysis of facility requirements has been broken into seven sections:

- Section 3.2 identifies the current airport classification for Emmett Airport.
- Section 3.3 summarizes significant State of Idaho Division of Aeronautics Design Standards which should be met for the layout of Emmett Airport.
- Section 3.4 looks at the requirements for the airport under Federal Aviation Regulation (FAR) Part 77 - Objects Affecting Navigable Airspace
- Section 3.5 analyzes present facilities and future needs in relation to existing and projected demands.
- Section 3.6 discusses land use compatibility issues both on and off the airport property.
- Section 3.7 defines a twenty-year, time-phased Capital Improvement Program (CIP) necessary to provide the recommended facility improvements outlined in Section 3.5.
- Section 3.8 outlines environmental issues that need to be addressed.

## 3.2 AIRPORT CLASSIFICATION

Emmett Airport is currently classified as a Local Recreational Airport under the 2010 State of Idaho Aviation System Plan. Local Recreational Airports are publicly owned airports that serve a supplemental role in local economies, primarily accommodating recreational, personal flying, and limited local business activities. Emmett Airport is not included in the National Plan of Integrated Airport System (NPIAS); therefore, it is not eligible for funding by the FAA.

The critical aircraft is the specific type or family of aircraft that is the most demanding of the facility from a size, weight, or speed standpoint. The critical aircraft for the airport is

chosen by selecting the most demanding aircraft, or family of aircraft, using the airfield a minimum of 500 itinerant operations per year at the airport.

The largest regular user of the airport is the type of family of aircraft including the Cessna 182 Skylane with a wingspan of approximately 36', an operating weight of 2,950 lbs. (loaded) and a calculated approach speed of 70 knots (1.3 times stall speed). Over the years, the airport has served various itinerant aircraft.

## 3.3 Design Standards

The design criterion that applies to this type of airport can be found in the publication entitled "Minimum Dimension of VFR Airports," published by the Idaho Transportation Department (ITD), Division of Aeronautics. The State recommends that as a minimum the airport be improved to meet all State VFR requirements.

Table 3-1 presents the dimensional requirements for a VFR airport. One of the key considerations of any airport planning is to determine and evaluate the dimensional standards for the airfield layout.

### Table 3-1 Dimensional Standards

| Design Items | State Stds | Existing |
|---|---|---|
| **Airport Elevation** | | 2,354'msl |
| **Runway Length (2000 + 1/3 elev)** | 2,784' | 3,307' |
| **Runway Width** | 50' | 55' |
| **Runway Shoulder Width** | 10' | 10' |
| **Runway Safety Area (RSA)** | 100' | 100' |
| **Runway Object Free Area (ROFA)** | 200' | 200' |
| **Runway Object Free Area Beyond Runway End** | 200' | 200' |
| **Runway Protection Zone – Width of Inner Surface** | 200' | 200' |
| **Runway Protection Zone – Width of Outer Surface** | 300' | 300' |
| **Runway Protection Zone – Length** | 1,000' | 1,000' |
| **Runway Longitudinal Grade** | 0-2% | 0.1% |
| **Runway Transverse Grade** | 1-2% | OK |
| | | |
| **Taxiway Width** | 20' | 25' |
| **Taxiway Shoulder Width** | 10' | 10' |
| **Taxiway Safety Area (TSA)** | 40' | 40' |
| **Taxiway Object Free Area (TOFA)** | 76' | 76' |
| | | |
| **Runway Centerline To Parallel Taxiway Centerline** | 125' | 180' |
| **Runway Centerline to Edge of Aircraft Parking** | 125' | 220' |
| **Runway Centerline to BRL** | 200' | 240' |
| **Taxiway Centerline to Fixed or Movable Object** | 38' | 50' |

**Idaho Transportation Department (ITD), Division of Aeronautics Source: "Minimum Dimension of VFR Airports,"**

In comparing the existing facility dimensions to the ITD VFR standard, the following criteria are not met.

- Runway End to Property Line less than 200', approximately 650' of runway on leased property

The following discussion outlines the airport criteria listed above:

**Runway Object Free Area (ROFA)** The ROFA is a two-dimensional ground area centered on the runway and extending 200 feet beyond each runway end. The ROFA must be clear of all objects not required for air navigation or aircraft ground maneuvering purposes, i.e., parked aircraft, as well as buildings, fences, roads, trees, etc. The width of the ROFA is dictated by the Aircraft Approach Category and the Airplane Design Group.

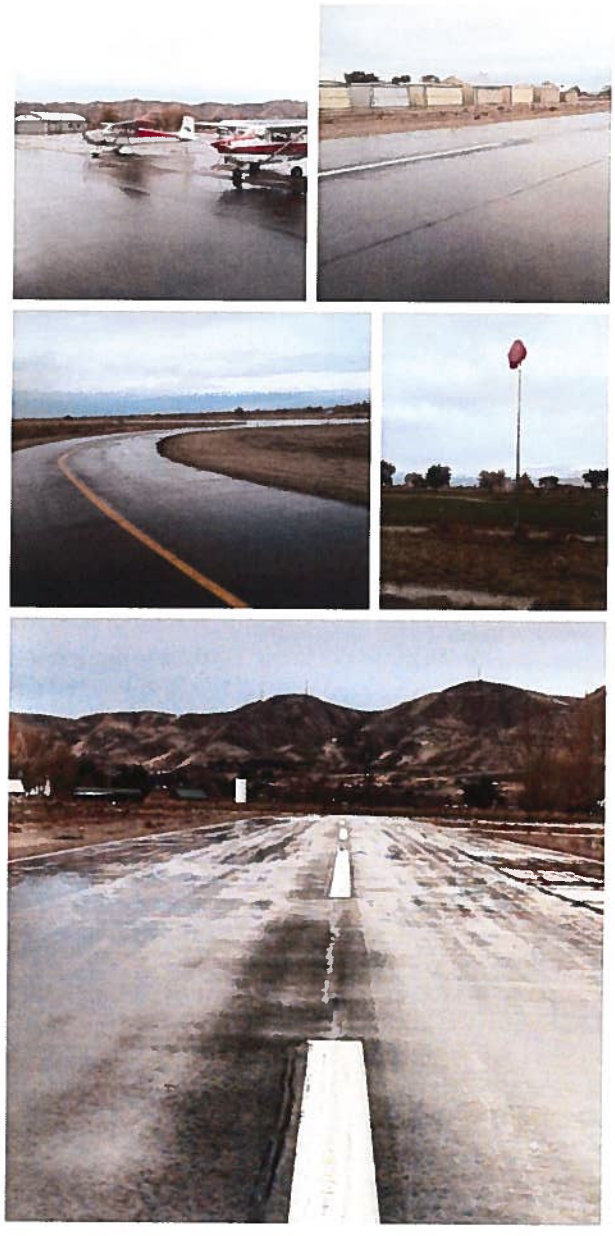
The Emmett Airport ROFA is currently 200 feet beyond the runway end and meets the State standards with the displaced thresholds.

**Runway Safety Area (RSA)** A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an under-shoot, overshoot or excursion from the runway. The RSA should be cleared and graded and have no potentially hazardous ruts, humps, depressions or other surface variations.

The RSA for Emmett is currently 100 feet in width meeting the State standards with the displaced thresholds.

**Runway Obstacle Free Zone (OFZ)** The Runway OFZ is a defined volume of airspace centered above the runway centerline. The runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline.

The standard is 200 feet in width and Emmett Airport currently meets the State Standards.



**Taxiway Object Free Area (TOFA)** A two-dimensional ground area centered on taxiways. The TOFA clearing standard precludes vehicle service roads, parked airplanes and objects except those whose location is fixed by function such as a navigational aid.

The standard is 76 feet centered on the taxiway centerline. This would indicate that parked aircraft need to be at least 38 feet from the centerline of the nearest taxiway.

The Emmett airport meets the minimum safety TOFA standards as the existing hangars are located 56 feet from the taxiway centerline.

**Taxiway Safety Area (TSA)** A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. The standard TSA width for Emmett Airport is 40-feet centered on the taxiway centerline. No current objects would restrict the airport from meeting this criterion.

The Emmett airport meets the minimum TSA standards.

**Runway Protection Zones (RPZ)** Runway Protection Zones are defined areas on the ground beyond the end of the runway that are maintained clear of incompatible objects and activity in order to protect persons and property from collision hazards. The RPZ is trapezoidal in shape and begins 200 feet from the end of each runway. The existing Runway 10/28 RPZ inner dimension is 200 feet centered on the runway, the length is 1,000 feet and the width at the outer end of the trapezoid is 300 feet.

Runway 10/28 RPZ is sized accordingly and meets the State minimum standards.

## 3.4 FAR Part 77 – Objects Affecting Navigable Airspace

**Federal Aviation Regulation (FAR) Part 77** defines imaginary surfaces which are used to evaluate the airspace surrounding the airport for obstructions to air navigation. The imaginary surfaces are defined relative to each runway end, the established airport elevation, the elevation of the approach end of the runway and the most precise approach planned to that runway end. Any object, whether natural or man-made, which penetrates these imaginary surfaces is defined by the FAA to be an obstruction. All natural or man-made obstructions which penetrate the FAA surfaces are generally recommended for removal if obstruction lighting or lowering of the obstruction is not practical.

**Figure 3-1**, Typical FAR Part - 77 Imaginary Surfaces, illustrates the dimensional standards for civil airport imaginary surfaces. Runway 10/28 corresponds to the dimensional standards for a utility runway (designed to serve only small aircraft) with visual approaches. Part 77 relates to the planned airfield configuration for an airport, and therefore, depicts facilities to accommodate aircraft in the A-I small category

Sheet 3 of the ALP drawings depicts the ultimate imaginary surfaces associated with the Emmett Airport.

**Figure 3-1**

## LEGEND

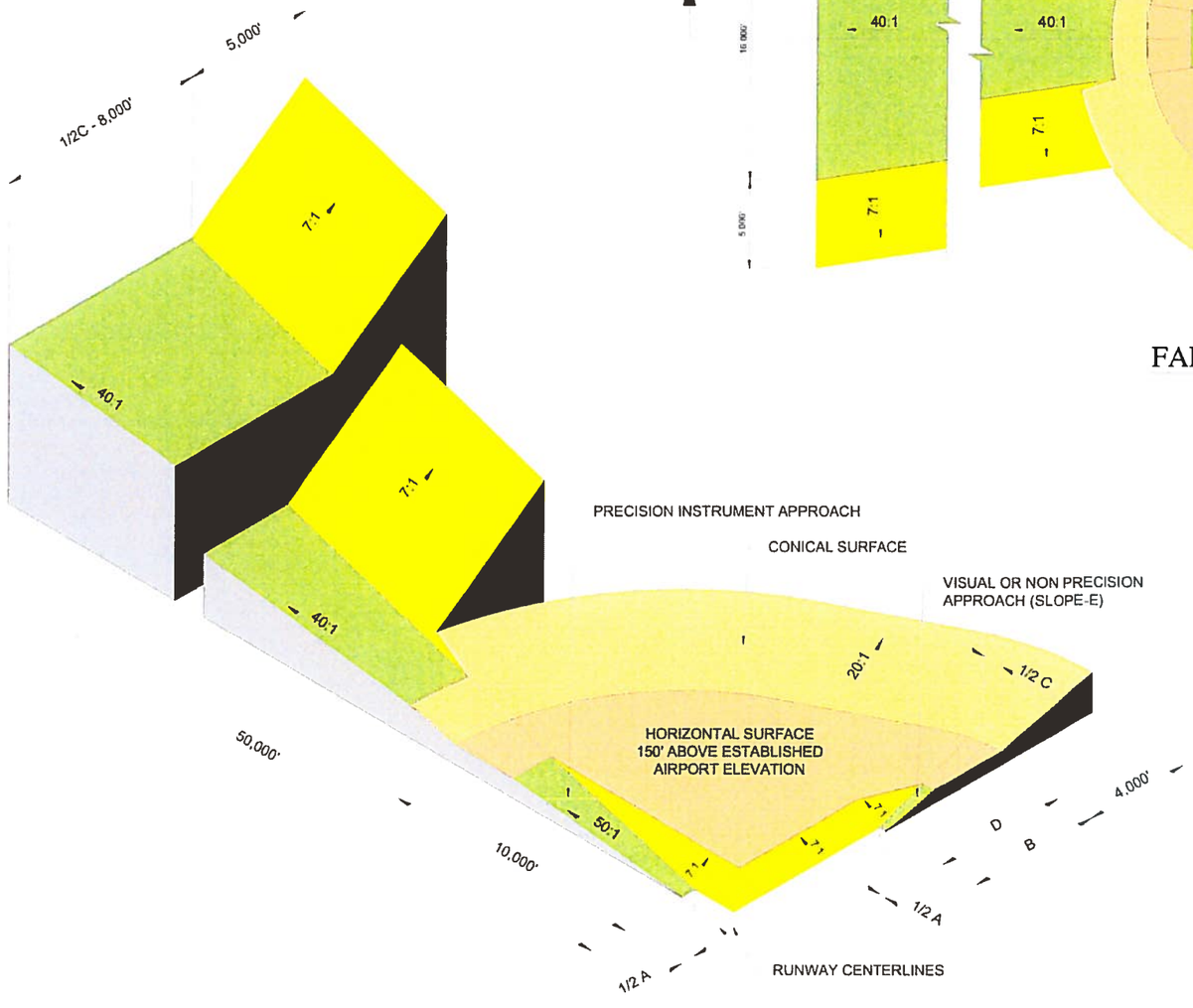
= PRIMARY SURFACE

= CONICAL SURFACE

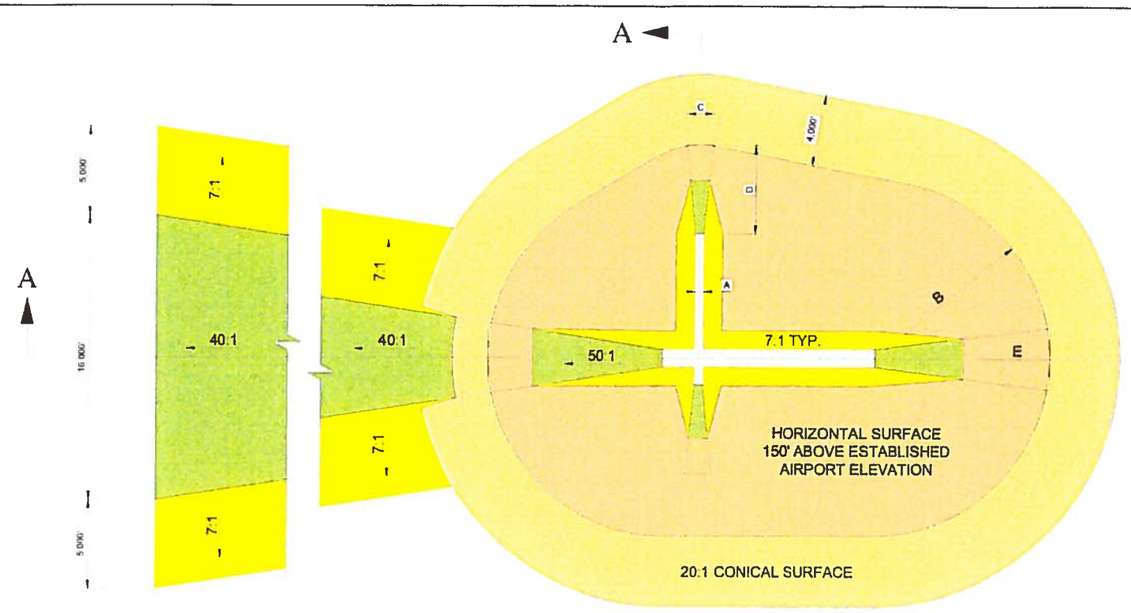
= APPROACH SURFACE

= TRANSITIONAL SURFACE

= HORIZONTAL SURFACE




SECTION A-A




FAR PART-77 PLAN

DIMENSIONAL STANDARDS (FEET)

| DIM | ITEM | VISUAL RUNWAY A | VISUAL RUNWAY B | NON-PRECISION INSTRUMENT RUNWAY A | NON-PRECISION INSTRUMENT RUNWAY B C | NON-PRECISION INSTRUMENT RUNWAY B D | PRECISION INSTRUMENT RUNWAY |
|---|---|---|---|---|---|---|---|
| A | WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END | 250' | 500' | 500' | 500' | 1000' | 1000' |
| B | RADIUS OF HORIZONTAL SURFACE | 5000' | 5000' | 5000' | 10000' | 10000' | 10000' |
| | | VISUAL APPROACH A | VISUAL APPROACH B | NON-PRECISION INSTRUMENT APPROACH A | NON-PRECISION INSTRUMENT APPROACH B C | NON-PRECISION INSTRUMENT APPROACH B D | PRECISION INSTRUMENT APPROACH |
| C | APPROACH SURFACE WIDTH AT END | 1250' | 1500' | 2000' | 3500' | 4000' | 16000' |
| D | APPROACH SURFACE LENGTH | 5000' | 5000' | 5000' | 10000' | 10000' | * |
| E | APPROACH SLOPE | 20:1 | 20:1 | 20:1 | 34:1 | 34:1 | * |

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET


RIEDESEL Engineering
202 Fifth Avenue
Twin Falls, Id. 83301
Phone: (208) 733-3446
Fax: (208) 734-2278




Proj. Number: 2454
Scale: AS SHOWN
Date: 09/06/12
Drawing Path: Z:\2454

FIGURE 3-1

EMMETT MUNICIPAL AIRPORT
2017 AIRPORT LAYOUT PLAN

EMMETT, IDAHO

## 3.5 Recommended Facility Improvements

In order to assist the City of Emmett in the management and safety of its airport, two publications are recommended. The first, Airport Cooperative Research Program Guidebook for Managing Small Airports (ACRP Report 16), is a publication sponsored by the Federal Aviation Administration which presents numerous resources and references relevant to airport issues to help guide readers to solutions, regardless of their level of airport experience or role at the airport. The ACRP provides a forum where airport operators, managers and representatives can cooperatively address common operational problems. Also, it is recommended that the City of Emmett utilize the Idaho Airport Operational Safety Manual to develop an Operational Safety Manual for the Emmett Airport. These two publications will help to structure the airport in preparation for growth.

The following section details and provides justification for the recommended improvements and actions to be accomplished by the City of Emmett in the next 20 years. Most improvements are shown on the Airport Layout Plan, Sheet 1 of 4 of the Airport Plans. Improvements were divided into three phases for construction. These phases are as follows:

Phase I – (2018-2022)

- Construct T- Hangars (City Funding only)
- Rehabilitate Airport Pavements-Crack Fill & Slurry Seal
- Acquire Land (Currently leased, City funding only)

Phase II – (2023-2027)

- Add Fixed Base Operator (City only, no cost)
- Extend Parallel Taxiway & Construction
- Rehabilitate Airport Pavements-Crack Fill & Slurry Seal
- Improve Gravel All-weather Access Road

Phase III—(2028-2037)

- Expand and Improve Apron
- Rehabilitate Airport Pavements-Crack Fill & Slurry Seal
- Install Automated Weather Observation System (AWOS)
- Upgrade Runway Lighting System
- Install NAVAID's, RIEL, PAPI

Future and beyond 2037

- Upgrade Airport Security Fencing
- Land Acquisition
- Lengthen and Widen Runway 10/28
- Extend Parallel Taxiway
- Add RNAV Approach

## Airfield Pavements

### *Runway, Taxiways, and Apron Rehabilitation*

Runway 10/28, partial parallel taxiway, and hangar taxiways pavements were constructed in 2008. The apron was constructed in 1996/2006/2013. Rehabilitation of Runway 10/28 including crack fill and surface seal was completed in 2011. A rehabilitation schedule including crack filling and slurry seal surface treatment is recommended to maintain the condition of the existing airport pavements.

One of the priorities of the City is to maintain the pavements via rehabilitation during the next 2-6 years.

Pavement Rehabilitation is addressed in the Capital Improvement Plan, see **Table 3-2**.

### *Runway 10/28 – Land Procurement*

Currently Runway 10/28 is located on leased land. A high priority project would include the land acquisition for the existing runway. Prior to land acquisition environmental requirements by the City would need to be completed as City funds are to be used to purchase the land. It would be appropriate to review future considerations and if economically feasible purchase all land proposed in the Narrative Report for potential improvement projects.

Land procurement is addressed in the Capital Improvement Plan, see **Table 3-2**.

### *Parallel Taxiway Construction*

The construction of a full parallel taxiway is recommended from Runway 28 to Runway 10 end. The partial parallel taxiway is 30 feet in width and will need to be extended by approximately 650 feet in length. The construction of a full parallel taxiway will allow for more growth to the west along the south side of the airport and reduce runway incursions due to back taxiing aircraft on the runway. Land will need to be procured prior to extension of the parallel taxiway.

The parallel taxiway extension is addressed in the Capital Improvement Plan, see **Table 3-3**.

## Electronic and Visual Navigational Aids

Existing navigational aids at the Emmett Airport include rotating beacon, medium intensity runway edge and threshold lights, a lit wind cone with segmented circle, and an unlit wind cone.

Future navigational aids that are recommended by the 2009 Idaho Airport System Plan are the installation of PAPI's (Precision Approach Path Indicator), REILs (Runway End Identifier Lights) both would be included as a part of the runway lighting upgrade project along with adding pilot control to the MIRL's.

The above mentioned NAVAID's would be included as a part of the Runway Lighting Upgrade project addressed in the Capital Improvement Plan, see **Table 3-3**.

Other improvements to be considered would be the installation of taxiway reflectors and an Automated Weather Observation System (AWOS). AWOS's are being commissioned at many airports in Idaho as well as the rest of the nation. The system can be accessed by phone or radio for current weather information, temperature, cloud cover and visibility. The installation of an AWOS should be considered in planning and when sufficient funding is available.

The Automated Weather Observation System is addressed in the Capital Improvement Plan, see **Table 3-4**.

### Fuel Station/ Fixed Base Operations

Presently there is a self-service AvGas fueling station but, no Fixed Base Operator at the Emmett Airport. A Fixed Base Operator is desirable to provide the airport with additional services potentially including A & P aircraft maintenance or flight training or aircraft rental. The need to provide additional services at the airport is essential to the growth of the Emmett Airport.

### Perimeter Control / Security Fencing

The airport property is currently fenced only with a three strand barb wire fence. Access to W. Sales Yard Road is through an open area and access to the airport cannot be controlled. A new chain fence with lockable gates is desired to be added as a security improvement to the airport.

### Land Acquisition, Lengthen Runway, and Lengthen Parallel Taxiway

In the event of a runway extension project, land acquisition and will be required. A western extension is the only alternative with the land to the west being agricultural it would be anticipated to be reasonable in cost to purchase and should have a minimal impact to existing facilities. If completed an Environmental Assessment would be the first step required of the project. The runway and taxiway would be extended to the west and more than likely would be completed in several phases.

These items were addressed in the Capital Improvement Plan, see **Table 3-4**.

### T-Hangars

The City has a demand for additional hangars and would like to construct T-Hangars to be able to meet the demand as well as increase revenue at the airport.

T-Hangars are addressed in the Capital Improvement Plan, see **Table 3-2**.

### Grass Runway

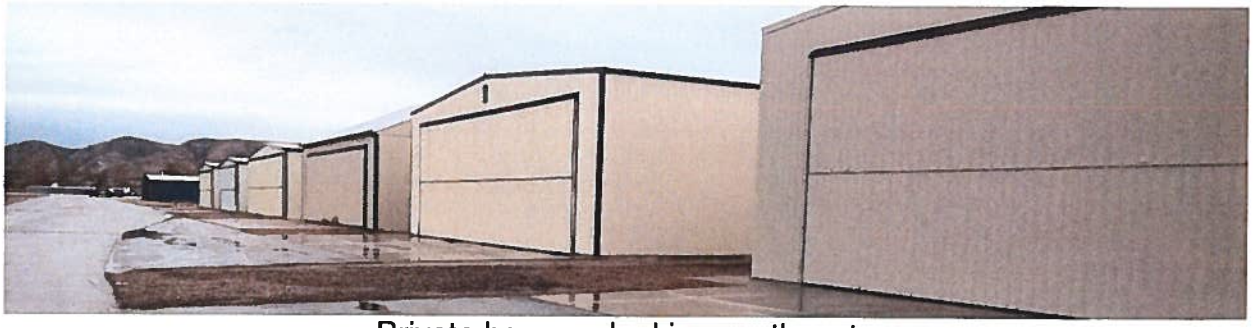
Emmett wants to be able to better serve the large contingency of back country pilots flying in Idaho. If a grass runway was constructed they could increase the users of the airport. Currently back country flying has a great following and Emmett has a unlimited opportunity to serve these users while enhancing economic development in the area.

### Economics and Financing the Development Program

The City of Emmett has an opportunity to greatly improve the usefulness of this community asset by developing the airport facility through sound economic planning and identifying funding sources to meet the requirements of improvement projects. Financing the development of improvement projects does not come from one source. A combination of state and local, and in some cases, private funding, should be considered when planning projects.

The City of Emmett should make an effort to position itself through establishing lease policies, annual budget and other income sources that generate sufficient revenues to meet the matching fund requirements for the State grants. Identifying money that can fund airport projects of a higher priority such as the runway lighting projects and local priority projects is beneficial to the airport and the City. The potential also exists for the City to provide in kind services such as trenching, conduit installation, and/or grading for the project to install runway lighting system in lieu of matching funds. These types of decisions are made by the State on a case by case basis, but should be explored to see if this strategy could be viable.

In our present economic times, funding for projects is becoming increasingly competitive. Funding provided through the State is distributed on a priority basis with the priorities established by the State. The City of Emmett will be competing with other community airports in the State of Idaho. Maintaining contact with the State Division of Aeronautics' representatives is important in keeping them informed of current airport priorities and needs.



Private hangars looking southeast

## 3.6 Land Use

Land use planning for areas on and around the Airport is very important to ensure compatibility with other uses nearby the Airport, but also to ensure that incompatible uses are not allowed to develop near an airport that later could constrain the growth or continued operation of the airport. The City of Emmett is recommended to utilize the Idaho Transportation Department's Land Use Guidelines for the State of Idaho to help establish zoning requirements and land uses near the airport. These guidelines are an available educational tool that can assist the City of Emmett in the implementation of compatible land use zoning. The following section comprises the recommendations relative to land uses in the vicinity of the airport and recommended controls to ensure compatibility with airport operations.

### On-Airport Land Use

The Airport Layout Plan provides the basis for land use on airport property. In addition to the airfield development depicted on this plan, there is proposed development of hangars and airport buildings. These items have been discussed in previous sections.

### Off-Airport Land Use

No evaluation of the land uses and zoning for land surrounding the airport was completed as part of this study. The zoning regulations can be found in Appendix A. However, the City and County need to ensure that developments proposed around the airport and especially in the Runway approach areas, do not interfere with the airspace and/or airport operation.

## 3.7 Capital Improvement Program

The following tables detail the proposed Capital Improvement Program and schedule for the next 20 years. Also included are estimated costs in current year dollars to implement this program. The development schedule has been phased in three development periods. The first phase covers the first five years (2018-2022), the second phase covers the second five years (2023-2027) and the third phase covers the final ten years (2028-2037). The 20 year planning period is to ensure airport preparation for growth in demand of aeronautical facilities.

Before summarizing staged capital costs, one key point needs to be emphasized: the staging of development projects is based upon current and projected activity at the airport. Projections of aviation demand were presented in Chapter 2 of this study. These estimates of future activity are used to determine the need for additional airport facilities and, in many instances, to determine the effects associated with development of these facilities. In the event airport activity varies from projected levels, implementation of projects should occur when demand actually warrants, rather than according to the estimated staging presented herein.

### Table 3-2 Capital Improvement Program Phase I (2018- 2022)

| Capital Improvement Program – Phase I 2018-2022 | | | |
|---|---|---|---|
| **Description** | **Total Cost** | **City Share (50%)** | **State Share (50%)** |
| Construct T- Hangars (Non IAAP Eligible) | $100,000 | $100,000 | $0 |
| Rehabilitate Airport Pavements | $200,000 | $100,000 | $100,000 |
| Land Acquisition (10 Acres) (Non IAAP Eligible) | $50,000 | $50,000 | $0 |
| Subtotal Phase I | $350,000 | $250,000 | $100,000 |

### Table 3-3 Capital Improvement Program Phase II (2023-2027)

| Capital Improvement Program Phase II (2023-2027) | | | |
|---|---|---|---|
| **Description** | **Total Cost** | **City Share** | **State Share** |
| Recruit Fix Based Operator | $0 | $0 | $0 |
| Parallel Taxiway Construction | $200,000 | $100,000 | $100,000 |
| Rehabilitate Airport Pavements | $200,000 | $100,000 | $100,000 |
| Improve Gravel Access Road | $70,000 | $35,000 | $35,000 |
| Subtotal Phase II | $470,000 | $235,000 | $235,000 |

### Table 3-4 Capital Improvement program Phase III (2028-2037)

| Capital improvement program Phase III (2028-2037) | | | |
|---|---|---|---|
| **Description** | **Total Cost** | **City Share** | **State Share** |
| Improve and Expand Apron | $240,000 | $120,000 | $120,000 |
| Rehabilitate Airport Pavements | $200,000 | $100,000 | $100,000 |
| Install AWOS | $150,000 | $75,000 | $75,000 |
| Upgrade R/W Lighting System | $400,000 | $200,000 | $200,000 |
| Subtotal Phase III | $990,000 | $495,000 | $495,000 |

### Table 3-5 Capital Improvement Program Total (2018-2037)

| Capital Improvement Program Total (2018-2037) | | |
|---|---|---|
| **Total Cost** | **Sponsor Share** | **State Share** |
| $1,810,000 | $980,000 | $830,000 |

The cost estimates presented in **Tables 3-2, 3-3 and 3-4** should be viewed as such - an estimate - and subject to subsequent refinement and final design. The cost estimates presented in **Tables 3-2, 3-3 and 3-4** are in 2017 dollars; no escalation for possible inflation has been applied to future years. The cost estimates also are assumed for construction costs of a competitively bid project utilizing the State of Idaho bidding process. No factors for in-kind services by the City or a private venue have been included; however in the initial stages of each Capital Improvement Project receiving

funding consideration for in-kind services to serve as match will be made. A detailed cost analysis can be found in Appendix B.

In addition to the total cost column, there are two columns to the right. These two columns represent the amount the project cost that must be borne by the sponsor of the Airport at an estimated 50 percent of the project costs and by the State Division of Aeronautics, an estimated 50 percent of the project costs. Actual percentages are subject to change based upon population, funding, and designation by the State Division of Aeronautics.

## 3.8 Environmental Issues

There has been no environmental study completed in previous planning studies for the Emmett Airport. An environmental study is not anticipated for future improvements; however, if future improvements deem a runway extension is necessary then it is possible an environmental study will be completed at that time.

Emmett Municipal Airport looking northwest

# 4 AIRPORT PLANS

## 4.1 INTRODUCTION

This section of the report provides the ALP drawing set. This set of drawings consists of the following exhibits included at the end of this report:

- Sheet 1 — Cover Sheet
- Sheet 2 — Airport Layout Plan
- Sheets 3 & 4 — Airport Airspace Drawing
- Sheet 5 — Exhibit "A" Airport Property Map

An ALP approved by the State of Idaho, Division of Aeronautics and the local Airport sponsor is required before any major airport development can be state funded. Standards for preparation of the ALP are provided in the Idaho Transportation Division of Aeronautics' publication, Idaho Airport Development Plan Checklist, Chapter 201, "Minimum Dimensions for VFR Airports".

As described in previous sections of this study, Emmett Airport meets State Visual Flight Rules.

*Copies of this set of drawings in 11" x 17" size are included at the end of this chapter.*

## 4.2 COVER SHEET (SHEET 1)

The Cover Sheet provides a view of the existing airport, Drawing Index, Location and Vicinity Map at the Emmett Municipal Airport.

## 4.3 AIRPORT LAYOUT PLAN (SHEET 2)

The Airport Layout Plan is the key-planning document for the airport. Features, which are included on the ALP, include:

- Identification of Owner and Engineer
- Location and vicinity maps
- Layout of existing and proposed facilities and features
- Basic airport and runway data tables
- Legend and airport facility listings
- Title and revision blocks

The ALP is an important document that should be kept current, reflecting changes in physical features on the airport. Actual airport development may vary from the concepts shown; however, allocations of land for specific purposes are the intent of this exhibit.

## 4.4 Airport Airspace Drawing (Sheets 3 &4)

Sheets 3 & 4 were prepared in accordance with FAR Part 77, Objects Affecting Navigable Airspace. For Runway 10 and 28, the existing approach surface is 20:1 visual approach surface. This exhibit was prepared utilizing the current Airport Airspace Drawing and updating current airport features. The Runway Protection Zone for approach end 10 and the surfaces within 9,200 feet for each end of Runway 10/28 are shown. This exhibit may be used for planning purposes with respect to development around and under the airport traffic pattern airspace.

## 4.5 Exhibit "A" Airport Property Map (Sheet 5)

The Exhibit "A" Property Map indicates presently owned property boundaries.

# APPENDIX A

## Zoning Regulations & Map

# Chapter 7
# TERRITORIAL EXTENT



## 1-7-1: CORPORATE LIMITS:

The corporate boundary lines of the city are defined and established on the official map that is on file in the office of the city clerk, and it is available for public inspection. (Ord. 660, 8-5-1963; amd. 1989 Code)

## 1-7-2: JURISDICTION OF CITY:

The city includes all of the land lying within the corporate boundary lines as herein redefined and established, and the city has corporate jurisdiction and control over the same and over the whole thereof. (Ord. 660, 8-5-1963)

## 1-7-3: AREA OF CITY IMPACT:

## 1-7-3-1: PURPOSE; CONSIDERATION:

A. Purpose: The purpose of establishing an area of city impact for the city is to identify a logical urban fringe area adjoining the city. The urban fringe area is realizing, or will realize, development pressure that must be planned for in an orderly manner. Section 67-6526, Idaho Code, requires that cities and counties negotiate an area of city impact.

B. Consideration: The following factors were considered by the planning and zoning commissions of Gem County and the city, plus the county commissioners and mayor and city council in establishing the area of impact:

1. Trade area,

2. Geographic factors, and

3. Areas that can reasonably be expected to be annexed in the future. (Ord. 898, 2-9-1999)

## 1-7-3-2: EMMETT AREA OF CITY IMPACT BOUNDARY:

A. The Emmett area of city impact is the area designated on the city of Emmett future land use map of the 2007 Gem community joint comprehensive plan attached to the ordinance codified herein. By this reference it is fully incorporated herein. The Emmett area of city impact is generally described as follows:

Beginning at a Point on the eastern slope hillside which is at 2,700 feet above elevation due east of the intersection of Frozen Dog Road and Fuller Road;

then S along the eastern slope hillside, following the 2,700 foot elevation line S to Sand Hollow Road;

then continuing from Sand Hollow Road up to the 2,700 foot elevation line and SW to where the line meets State Highway 16;

then due W of State Highway 16 to alignment with Sales Yard Road;

then W on Sales Yard Road to the intersection of Airport Road;

then N along Airport Road alignment to the south bank of the Payette River;

then E along the south bank of the Payette River to a point near the Last Chance Ditch in alignment with Frozen Dog Road;

then E along said alignment of Frozen Dog Road to a Point on the eastern slope hillside which is at 2,700 feet above elevation;

which is also the Point of Beginning.

B. In case a property under single ownership is divided by the boundary line of the Emmett area of city impact and the line divides such property so that one or both parts has a depth of three hundred feet (300') or less, such part may be included in the jurisdiction within which the remainder and larger portion of the property is located. (Ord. O2007-13, 1-8-2008)

## 1-7-3-3: ORDINANCE AND COMPREHENSIVE PLANNING PROVISIONS GOVERNING THE AREA OF CITY IMPACT:

The city of Emmett, after considering the trade area, geographic factors, and areas that can reasonably be expected to be annexed to the city in the future, hereby adopt the following as the applicable plans and ordinances for the Emmett area of city impact:

A. Zoning: The zoning ordinance of Gem County shall govern land use within the unincorporated areas of the Emmett area of city impact.

B. Subdivision Requirements: The subdivision of land within the Emmett area of city impact shall occur only in conformance with the subdivision ordinance deemed applicable by virtue of provisions of this section and state law.

1. Except as otherwise provided by this section within the area of city impact the subdivision ordinance of Gem County, as such now exists or as later amended, shall apply in accordance with the provisions of this section.

2. Within one mile of the corporate limits of the city of Emmett, but fully within the area of city impact, the subdivision ordinance of the city of Emmett, as such now exists or as later amended, shall apply. Gem County shall apply the city of Emmett subdivision ordinance for said areas. Except as otherwise authorized by the Emmett city council prior to any application being submitted to Gem County, subdivisions required to comply with this section shall install curb, gutter and sidewalk improvements in accordance with the adopted public works standards of the city at the time of subdivision construction (whether the property is able to be annexed or not). City of Emmett stormwater improvements may be waived by the city if an acceptable alternative design to manage stormwater is approved by the city engineer during the subdivision application process. Said alternative must still comply with all other state and federal rules.

3. All subdivision proposals shall be evaluated in accordance with the policies established by the Gem community joint comprehensive plan. The city of Emmett shall be entitled to notice of any subdivision request in the area of city impact comparable to the notice provided to adjoining landowners, but in no case less than thirty (30) days prior to action upon the subdivision request.

4. Any public street right of way dedications accepted by Gem County upon recording of subdivisions in the area of city impact will become the public right of way of the city of Emmett upon annexation, including all maintenance and related responsibilities. If Gem County receives any type of fee or cash contribution in lieu of construction of a public street right of way improvement and said fees are obligated to be spent within the area of city impact yet remain unspent, the county and city shall annually review potential transfers of said unspent revenues from Gem County to the city for any annexed rights of way.

C. Special Use Permits, Variances, Planned Unit Developments, And Other Discretionary Permits: Within the Emmett area of city impact, jurisdiction for issuance of any special use permits, variances, planned unit development, or any other discretionary land use permits or authorizations shall be vested in Gem County. However, where a planned unit development or special use permit for any application that changes the principal use of the property is proposed on property that is eligible to apply for annexation to the city of Emmett, said applicant must apply for annexation prior to any application being filed with Gem County. If the annexation application is denied, Gem County shall process the planned unit development in accordance with city of Emmett ordinances. Gem County shall notify the city of Emmett of receipt of a completed application for any of the aforementioned discretionary permits in the same manner that notice is provided to adjacent landowners, but in no case less than thirty (30) days prior to action upon a permit request.

D. Private Roads: Unless otherwise approved by the Emmett city council, no new private roads will be approved by Gem County for development within the area of city impact, unless a private road is the only legal means of ingress/egress to said property.

E. Special Areas: In addition to the foregoing provisions, any request for permission to build or develop in the area of influence of the Emmett wastewater treatment plant or the Emmett municipal airport shall be referred to the city of Emmett for review and comment at least thirty (30) days prior to issuance of any permit or development authorization. Notwithstanding any provisions of the Gem County zoning ordinance or subdivision ordinance to the contrary, no construction, development or establishment of any use which would impair the usefulness, or materially harm the operating environment, of the Emmett wastewater treatment plant or the Emmett municipal airport shall hereafter be permitted.

F. Comprehensive Plan: Within the Emmett area of city impact all zoning, subdivision review, consideration of discretionary permits, and regulation of development in special areas shall be evaluated in accordance with the Gem community joint comprehensive plan, which is hereby adopted as the comprehensive planning document that shall govern in the Emmett area of city impact.

G. Shared Protection Of Surface Waters: The city of Emmett will review surface water management proposals for land uses and developments within the city limits and to developments to which the city subdivision ordinance is applicable, to require that surface water will not be allowed to infiltrate irrigation facilities which cross the city limits unless design work is implemented to minimize potential adverse effects upon the quality of irrigation waters.

H. Shared Analysis Of Traffic And Other Public Service Impacts: The city of Emmett and the Gem County road department will review all land development proposals to determine impacts to road capacity and traffic service. All other applicable public services will be requested to review the impacts of development on their ability to provide public services. The object of this shared analysis is to make sure that roadways and other public services have sufficient capacity to handle growth and development. (Ord. O2007-15, 12-18-2007)

## 1-7-3-4: ANNEXATION:

The city of Emmett may annex any eligible land parcel within the Emmett area of city impact in accordance with applicable law. (Ord. O2007-15, 12-18-2007)

## 1-7-3-5: ESSENCE OF REVIEW AUTHORITY:

Within the area of city impact, both Gem County and the city shall conduct public hearings to consider the merits of a development request. Approval by each entity will be necessary prior to issuing building permits. (Ord. 898, 2-9-1999)

## 1-7-3-6: PROCEDURES FOR JOINT REVIEW AND TIME LINES FOR ACTION:

Upon receipt of any development request, permit application or discretionary actions provided or submitted to Gem County for development action within the Emmett area of city impact, the county shall mail a copy of the complete application and supporting documents to the city of Emmett at least

thirty (30) days prior to any scheduled county public hearing or public meeting date for county action.

The city of Emmett will then have an opportunity to review, comment and provide a recommendation or opinion on the proposal to the county. If the city of Emmett chooses to submit comments or recommendations to the county, then the city must do so in writing on city letterhead and hand deliver the comments to the county at least seven (7) days prior to the scheduled county hearing or meeting date on the proposed action.

All official communication pertaining to a development proposal within the Emmett area of city impact between the city and county shall be in writing. If the city chooses not to provide written comment on a particular proposal, then the county will consider the absence of written comments from the city as "No comments from the City of Emmett" and this wording will be entered into the official public record for the affected project. (Ord. O2007-15, 12-18-2007)

## 1-7-3-7: MODIFICATION:

The Emmett area of city impact and the applicable plans and ordinances may be modified in accordance with the procedures set forth by law. (Ord. O2007-15, 12-18-2007)

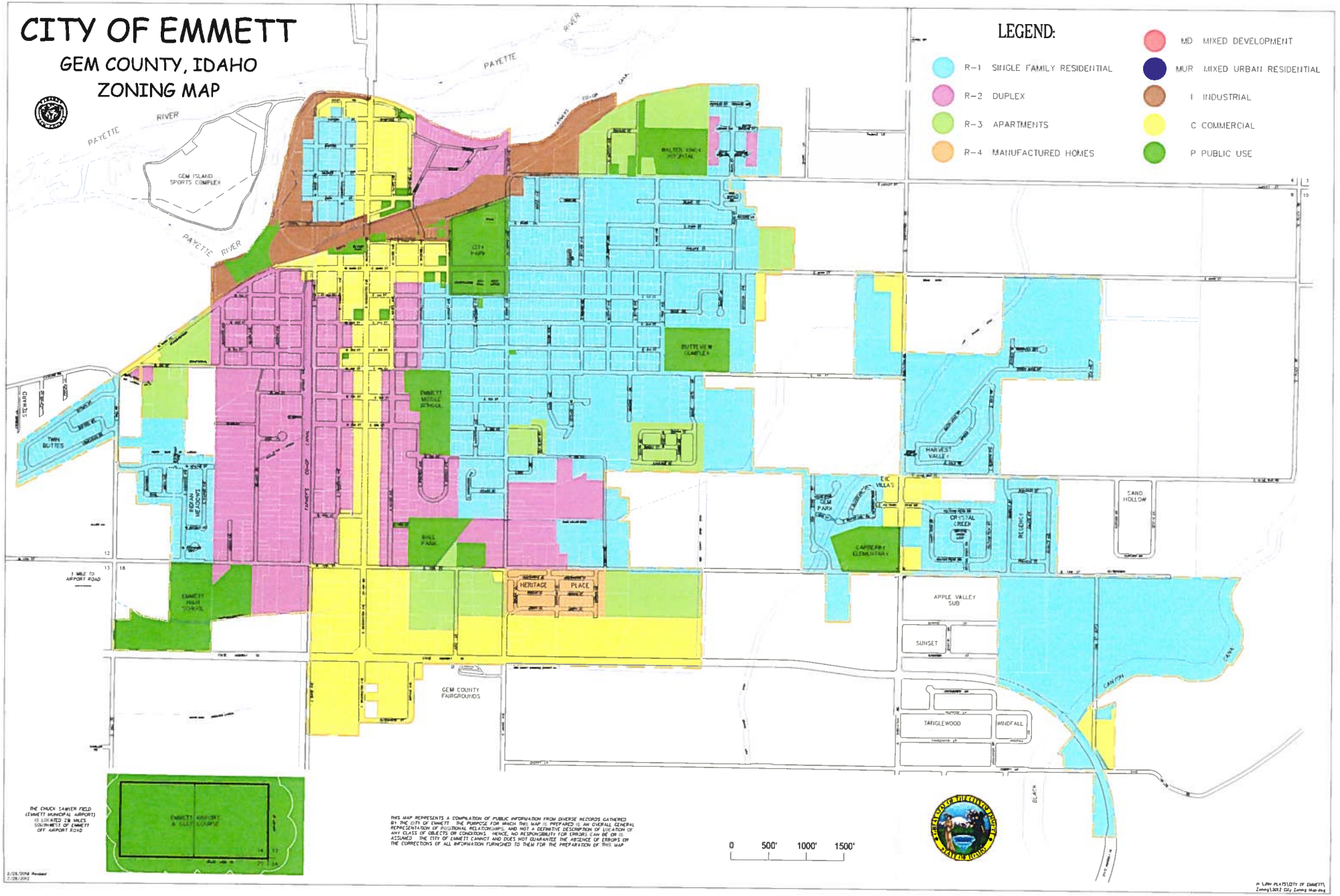
## 1-7-3-8: ENFORCEMENTS:

The provisions of this section 1-7-3 and the agreement to implement it may be enforced by either the city or Gem County through legal action initiated to require specific performance with the terms of this section 1-7-3 or other appropriate legal action. Violation of this section 1-7-3 by one subject to this jurisdiction shall be punishable by the penalties authorized to be imposed upon those found guilty of a misdemeanor crime, including the authorized fine, imprisonment or both. Violators may also be subject to civil legal action intended to compel compliance with the provision of this section 1-7-3. (Ord. 898, 2-9-1999)

# CITY OF EMMETT

## GEM COUNTY, IDAHO

## ZONING MAP



# APPENDIX B

## CIP Cost Breakdown

| Capital Improvement Program - Phase I 2018 – 2022 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Available Funding | | | Project & Project Costs | | | |
| Year | City | State | Total | Project | City | State | Total |
| 2018 | $ 50,000 | $ - | $ 50,000 | Land Acquisition (10 acres by City) | $ 50,000 | $ - | $ 50,000 |
| 2019 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2020 | $ 50,000 | $ 50,000 | $ 100,000 | Pavement Rehabilitation | $ 100,000 | $ 100,000 | $ 200,000 |
| 2021 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2022 | $ 50,000 | $ - | $ 50,000 | Construct T-Hangars (8 by City) | $ 100,000 | $ - | $ 100,000 |
| Total | $ 250,000 | $ 150,000 | $ 400,000 | | $ 250,000 | $ 100,000 | $ 350,000 |

| Capital Improvement Program - Phase II 2023 – 2027 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Available Funding | | | Project & Project Costs | | | |
| Year | City | State | Total | Project | City | State | Total |
| 2023 | $ 50,000 | $ 50,000 | $ 100,000 | Recruit Fix Based Operator | $ - | $ - | $ - |
| 2024 | $ 50,000 | $ 50,000 | $ 100,000 | Extend Parallel Taxiway | $ 100,000 | $ 100,000 | $ 200,000 |
| 2025 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2026 | $ 50,000 | $ 50,000 | $ 100,000 | Pavement Rehabilitation | $ 100,000 | $ 100,000 | $ 200,000 |
| 2027 | $ 50,000 | $ 50,000 | $ 100,000 | Gravel All-weather Access Road | $ 35,000 | $ 35,000 | $ 70,000 |
| Total | $ 250,000 | $ 250,000 | $ 500,000 | | $ 235,000 | $ 235,000 | $ 470,000 |

| Capital Improvement Program - Phase III 2028 – 2037 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Available Funding | | | Project & Project Costs | | | |
| Year | City | State | Total | Project | City | State | Total |
| 2028 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2029 | $ 50,000 | $ 50,000 | $ 100,000 | Expand & Improve Apron | $ 120,000 | $ 120,000 | $ 240,000 |
| 2030 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2031 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2032 | $ 50,000 | $ 50,000 | $ 100,000 | Pavement Rehabilitation | $ 100,000 | $ 100,000 | $ 200,000 |
| 2033 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2034 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2035 | $ 50,000 | $ 50,000 | $ 100,000 | Install AWOS | $ 75,000 | $ 75,000 | $ 150,000 |
| 2036 | $ 50,000 | $ 50,000 | $ 100,000 | None | $ - | $ - | $ - |
| 2037 | $ 50,000 | $ 50,000 | $ 100,000 | R/W Lighting With PAPI & REIL | $ 200,000 | $ 200,000 | $ 400,000 |
| Total | $ 500,000 | $ 500,000 | $ 1,000,000 | | $ 495,000 | $ 495,000 | $ 990,000 |

**ENGINEER'S OPINION OF PROBABLE COST**

Emmett Municipal Airport - Emmett Idaho
Capital Improvement Projects

Riedesel Engineering, Inc.
May 2017

**PHASE I CAPITAL IMPROVEMENT PROJECTS (2018-2022)**

**LAND ACQUISITION (City funds only)**

| Description of Item | Unit | Quantity | *Engineer's Estimate* Unit Price | Amount |
|---|---|---|---|---|
| Land Acquisition | AC | 10 | $ 4,500.00 | $ 45,000.00 |
| Administration Costs ( Aparaiser, survey, ect) | LF | 1 | $ 5,000.00 | $ 5,000.00 |
| | | **Total Land Acqusition Costs** | | $ 50,000.00 |

**PAVEMENT REHABILITATION**

| Description of Item | Unit | Quantity | *Engineer's Estimate* Unit Price | Amount |
|---|---|---|---|---|
| Joint Sealing Filler | TON | 3 | $ 6,000.00 | $ 18,000.00 |
| Emulsified Asphalt Slurry Seal Surface Treatment | SY | 42200 | $ 2.50 | $ 105,500.00 |
| Paint Removal | SF | 5000 | $ 1.00 | $ 5,000.00 |
| Temporary Runway & Taxiway Painting | LS | 1 | $ 6,000.00 | $ 6,000.00 |
| Permanent Runway & Taxiway Painting | LS | 1 | $ 6,000.00 | $ 6,000.00 |
| Project Quality Control | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| Construction Surveying | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| Mobilization | LS | 1 | $ 7,000.00 | $ 7,000.00 |
| | | | Construction Total | $ 157,500.00 |
| | | | Engineering | $ 20,000.00 |
| | | | Construction Observation | $ 15,000.00 |
| | | | Administration | $ 7,500.00 |
| | | | **Total Pavement Rehab. Costs** | $ 200,000.00 |

**EAST PARALLEL TAXIWAY CONSTRUCTION - 800 FT BY 25 FT**

| Description of Item | Unit | Quantity | *Engineer's Estimate* Unit Price | Amount |
|---|---|---|---|---|
| 18" Unclassified Excavation | CY | 1200 | $ 18.00 | $ 21,600.00 |
| 12" Pit run Base Course | CY | 800 | $ 35.00 | $ 28,000.00 |
| 4" Aggregate Base Course | CY | 300 | $ 50.00 | $ 15,000.00 |
| 2.5" Bituminous Surface Course | TON | 350 | $ 120.00 | $ 42,000.00 |
| Pavement Markings | LS | 1 | $ 6,000.00 | $ 6,000.00 |
| Project Quality Control | LS | 1 | $ 10,000.00 | $ 10,000.00 |
| Construction Surveying | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| Mobilization | LS | 1 | $ 15,000.00 | $ 15,000.00 |
| | | | Construction Total | $ 142,600.00 |
| | | | Engineering | $ 24,000.00 |
| | | | Construction Observation | $ 18,000.00 |
| | | | Administration | $ 5,000.00 |
| | | | **Total East Parallel Taxiway Costs** | $ 189,600.00 |

## PHASE II CAPITAL IMPROVEMENT PROJECTS (2023-2027)

**ACCESS ROAD CONSTRUCTION - 800 FT BY 20 FT**

| Item | Unit | Quantity | *Engineer's Estimate* Unit Price | Amount |
|---|---|---|---|---|
| 18" Unclassified Excavation | CY | 1000 | $ 18.00 | $ 18,000.00 |
| 12" Pit run Base Course | CY | 600 | $ 35.00 | $ 21,000.00 |
| 4" Aggregate Base Course | CY | 200 | $ 45.00 | $ 9,000.00 |
| Project Quality Control | LS | 1 | $ 2,000.00 | $ 2,000.00 |
| Construction Surveying | LS | 1 | $ 1,000.00 | $ 1,000.00 |
| Mobilization | LS | 1 | $ 7,000.00 | $ 7,000.00 |
| | | | Construction Total | $ 58,000.00 |
| | | | Engineering | $ 5,000.00 |
| | | | Construction Observation | $ 5,000.00 |
| | | | Administration | $ 2,000.00 |
| | | | **Total Access Road Costs** | $ 70,000.00 |

**PAVEMENT REHABILITATION**

| Description of Item | Unit | Quantity | *Engineer's Estimate* Unit Price | Amount |
|---|---|---|---|---|
| Joint Sealing Filler | TON | 3 | $ 6,000.00 | $ 18,000.00 |
| Emulsified Asphalt Slurry Seal Surface Treatment | SY | 42200 | $ 2.50 | $ 105,500.00 |
| Paint Removal | SF | 5000 | $ 1.00 | $ 5,000.00 |
| Temporary Runway & Taxiway Painting | LS | 1 | $ 6,000.00 | $ 6,000.00 |
| Permanent Runway & Taxiway Painting | LS | 1 | $ 6,000.00 | $ 6,000.00 |
| Project Quality Control | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| Construction Surveying | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| Mobilization | LS | 1 | $ 7,000.00 | $ 7,000.00 |
| | | | Construction Total | $ 157,500.00 |
| | | | Engineering | $ 20,000.00 |
| | | | Construction Observation | $ 15,000.00 |
| | | | Administration | $ 7,500.00 |
| | | | **Total Pavement Rehab. Costs** | $ 200,000.00 |

## PHASE III CAPITAL IMPROVEMENT PROJECTS (2028-2037)

**APRON EXPANSION & IMPROVEMENTS - 300 FT BY 100 FT**

| | | | *Engineer's Estimate* | |
|---|---|---|---|---|
| Description of Item | Unit | Quantity | Unit Price | Amount |
| 18" Unclassified Excavation | CY | 1700 | $ 18.00 | $ 30,600.00 |
| 12" Pit run Base Course | CY | 1200 | $ 35.00 | $ 42,000.00 |
| 4" Aggregate Base Course | CY | 400 | $ 50.00 | $ 20,000.00 |
| 2.5" Bituminous Surface Course | TON | 500 | $ 120.00 | $ 60,000.00 |
| General Grading | LS | 1 | $ 10,000.00 | $ 10,000.00 |
| Pavement Markings | LS | 1 | $ 500.00 | $ 500.00 |
| Project Quality Control | LS | 1 | $ 10,000.00 | $ 10,000.00 |
| Construction Surveying | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| Mobilization | LS | 1 | $ 15,000.00 | $ 15,000.00 |
| | | | Construction Total | $ 193,100.00 |
| | | | Engineering | $ 24,000.00 |
| | | | Construction Observation | $ 18,000.00 |
| | | | Administration | $ 5,000.00 |
| | | | **Apron Costs** | $ 240,100.00 |

**INSTALL LIGHTING SYSTEM/NAVAIDS**

| | | | *Engineer's Estimate* | |
|---|---|---|---|---|
| Description of Item | Unit | Quantity | Unit Price | Amount |
| No. 8 AWG L-824C Cable, in place | LF | 7000 | $ 2.00 | $ 14,000.00 |
| No. 6 Bare Counterpoise Wire | LF | 6500 | $ 2.00 | $ 13,000.00 |
| Electrical Conduit, 1 - 2", in place | LF | 6500 | $ 15.00 | $ 97,500.00 |
| Electrical Junction Structure Size B, Class 1A | EA | 5 | $ 900.00 | $ 4,500.00 |
| Airport Regulator, Vault, & Vault Equipment | LS | 1 | $ 45,000.00 | $ 45,000.00 |
| Medium Intensity Runway Light | EA | 26 | $ 900.00 | $ 23,400.00 |
| Medium Intensity Runway Threshold Light | EA | 12 | $ 930.00 | $ 11,160.00 |
| Mobilization | LS | 1 | $ 12,000.00 | $ 12,000.00 |
| | | | | |
| | | | Construction Total | $ 220,560.00 |
| | | | Engineering | $ 40,000.00 |
| | | | Construction Observation | $ 25,000.00 |
| | | | Administration | $ 5,000.00 |
| | | | **Total Lighting System/NAVAIDS Costs** | $ 290,560.00 |

# APPENDIX C

## Idaho Airport System Plan

# Idaho Airport System Plan

## Emmett Municipal Airport

S78

INDIVIDUAL AIRPORT SUMMARY | 2009

## Understanding the Airport

The city of Emmett is located in southwestern Idaho where the Payette River emerges from the mountains, approximately 25 miles northwest of Boise. It is primarily an agricultural town, with multiple recreational activities for residents and visitors to the Emmett Valley.

Emmett Municipal Airport is a general aviation airport, located approximately 2 miles southwest of Emmett, Idaho off of ID-52. It is located immediately adjacent to the Gem County Golf Course, a small but challenging 9-hole course. The airport serves businesses and recreational users in Emmett and nearby areas.

The airport has recently seen several capital improvements designed at attracting more users and based aircraft. A partial parallel taxiway, several new hangars, freshly resurfaced runway, and a self-serve fuel station have all been added in recent years. A courtesy car and a new pilot's lounge for transient pilots is available for use, and aircraft maintenance facilities are located at the airport. The Hole-in-One Restaurant is also located on airport property, serving both golfers and pilots at the airport.

Each year in April, the airport hosts an open house and fly-in featuring a breakfast, classic cars, aviation-related games and prizes.

In addition to providing recreational access to backcountry fliers and travelers, the airport supports military helicopter training, and provides a location for student pilots to practice their touch-and-go's. The airport is also used periodically for search and rescue and fire fighting activities. The USFS was based here during the fire seasons in 2006 and 2007.

## Airport Roles

The Idaho Airport System Plan (IASP) has identified five functional roles for the 75 public-use airports included in the study. These roles expand on the Federal Aviation Administration's (FAA) role categories of commercial service and general aviation airports. Airports that are included in the FAA's National Plan of Integrated Airport Systems (NPIAS) are eligible for federal funding.

| Role Summary | |
|---|---|
| IASP Role → | Local Recreational |
| Federal Role → | General Aviation |
| NPIAS → | No |

## Forecasts

When planning for new or additional airport facilities, projections in the form of based aircraft and annual operations can be helpful in determining the type and size of necessary improvements. Historical demand and local socioeconomic indicators, as well as state and national trends and the airport's master plan were reviewed in developing the airport's forecast.

The table below highlights the forecast activity for Emmett Municipal Airport.

| Activity Forecast Summary | | |
|---|---|---|
| ACTIVITY | 2007 | 2027 |
| Based Aircraft | 21 | 26 |
| Annual Operations | 5,000 | 6,300 |

## Facilities & Services and Recommended Development Costs

Facility and service objectives were developed for each of the five role categories of the IASP. These objectives provide guidance on the minimum level of facilities and services needed for the airport to fulfill its identified role in the system.

In order to continue to serve the aviation needs of surrounding communities and the State of Idaho, the IASP has identified several important projects for the airport. Many of these projects are eligible for federal and/or state funding. Recommended development costs include projects needed to meet each of the recommendations of the Idaho Airport System Plan as well as projects from the airport's capital improvement plan (CIP). While these projects are included as part of the IASP, it is recognized that execution of these projects is dependent on the local economic environment. Further, if the minimum system objective is exceeded, then maintenance of that objective is recommended.

The following table summarizes current facilities and services, the airport's facility and service objectives, projects recommended to meet the objectives within the context of the system plan, and the estimated development costs to implement the projects. Planning and environmental recommendations serve as guidance related to the development needed for the airport to fulfill its role in the overall statewide system.

Emmett Municipal Airport is an integral component to the State's system of airports. It provides access to our nation's air transportation network, provides community benefits, and generates economic activity. The proposed development improvements will ensure that Emmett

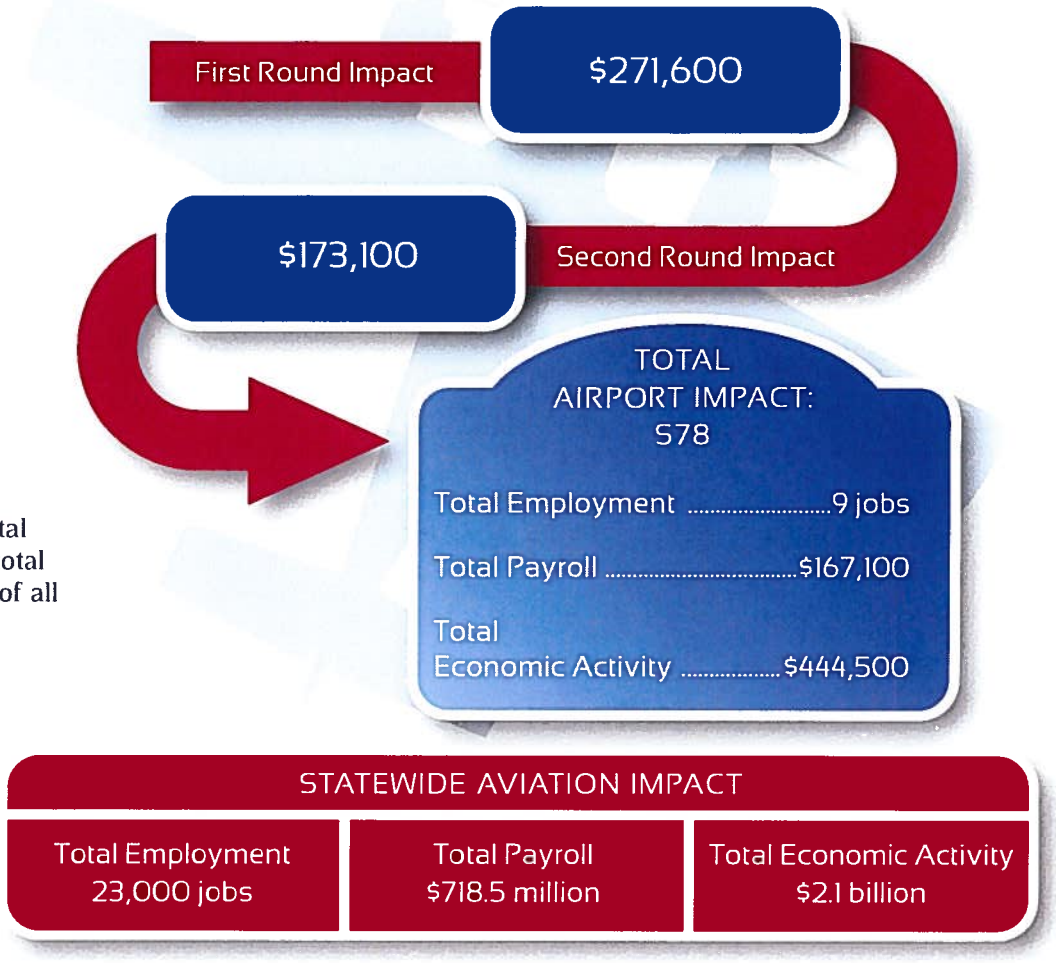
Municipal Airport continues to provide area residents and businesses with the aviation infrastructure necessary for the 21st century.

| | EXISTING | SYSTEM OBJECTIVE | RECOMMENDATION | DEVELOPMENT COST |
|---|---|---|---|---|
| **AIRSIDE FACILITIES** | | | | |
| Primary Runway Length | 3,250 feet | 2,783 feet or greater | None | $0 |
| Runway Width | 50 feet | 50 feet | None | $0 |
| Runway Strength | 12,000 Lbs SW | 12,500 Lbs SW | None | $0 |
| Taxiway Type | Partial Parallel | Turnarounds | None | $0 |
| Instrument Approach | Visual | Non-Precision/Visual | None | $0 |
| Visual Aids | Rotating Beacon | Rotating Beacon | None | $0 |
| | Wind Cone | Wind Cone | None | $0 |
| Runway Lighting/Reflectors | MIRL | Maintain Existing | None | $0 |
| Weather Reporting Facilities | None | None | None | $0 |
| **LANDSIDE FACILITIES** | | | | |
| Terminal with Public Restroom | Yes | None | None | $0 |
| Hangar Storage | 15 Spaces | 11 Spaces | None | $0 |
| Apron Spaces | 14 Spaces | 11 Spaces | None | $0 |
| Auto Parking | 4 Spaces | Parking Spaces | None | $0 |
| **SERVICES** | | | | |
| Phone | Yes | Yes | None | $0 |
| Restroom | Yes | Yes | None | $0 |
| FBO | None | None | None | $0 |
| Maintenance Facilities | None | None | None | $0 |
| Fuel | AvGas Only | AvGas Only | None | $0 |
| Ground Transportation | Courtesy/Loaner Car | Courtesy/Loaner Car | None | $0 |
| **PAVEMENT MAINTENANCE, PLANNING/ENVIRONMENTAL AND MISCELLANEOUS** | | | | |
| Pavement Maintenance | | | | $1,035,200** |
| Master Plan/ALP/Environmental | | | | $30,000** |
| Snow Removal Equipment | | | | $0 |
| Miscellaneous | | | | $10,000* |
| Other CIP Projects | | | | $10,000* |
| TOTAL | | | | $1,085,200 |

*Airport Capital Improvement Plan (CIP) Project | **Idaho Airport System Plan (IASP) Project

## Economic Benefit to Idaho

The system plan quantifies the total economic activity of each airport in the Idaho system. Through a comprehensive survey process, the direct economic benefits related to on-airport business tenants and the indirect benefits associated with visitor related expenditures were determined for each system airport. The multiplier effect of these benefits was then calculated to ascertain the total airport-related impacts. The total economic activity is the sum of all direct (on-airport), indirect (off-airport visitor industry), and multiplier impacts. The study finds that aviation-related businesses located on airports support thousands of jobs and produce billions of dollars of economic impact.




## Compatible Land Use

The development of land uses that are not compatible with airports and aircraft noise is a growing concern across the country. In addition to aircraft noise, there are other issues, such as safety and environmental impacts to land uses around airports which need to be considered when addressing the overall issue of land use compatibility. Although several federal programs include noise standards or guidelines as part of their funding-eligibility and performance criteria, the primary responsibility for integrating airport considerations into the local land use planning process rests with local governments. ITD Division of Aeronautics has long been an advocate for compatible land use planning around airports. Through the IASP, an Airport Land Use Guidebook was developed for use by the airports, local governments, and the Division of Aeronautics. The Idaho Airport Land Use Guidebook not only informs and educates airports, communities, and local governments but it also provides the necessary tools for implementing compatible land use planning.

IDAHO TRANSPORTATION DEPARTMENT AERONAUTICS

## For more information contact:

IDAHO TRANSPORTATION DEPARTMENT | DIVISION OF AERONAUTICS
3483 RICKENBACKER STREET, BOISE, ID 83705 | P.O. BOX 7129, BOISE, ID 83707-1129
PHONE: 1-208-334-8775 | IN-STATE TOLL FREE: 1-800-426-4587 | FAX: 1-208-334-8789
HTTP://ITD.IDAHO.GOV/AERO/

Prepared by: Wilbur Smith Associates and T-O Engineers

# APPENDIX D

## 2016 Pavement Condition Index Report

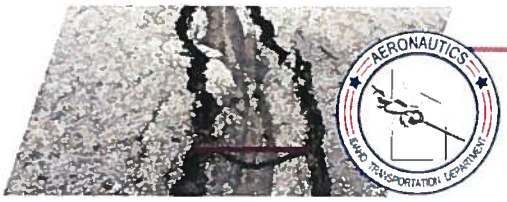
# IDAHO DIVISION OF AERONAUTICS
# NETWORK PAVEMENT MANAGEMENT SYSTEM - PHASE VI

2016 Pavement Condition Index Report for

## *Emmett Municipal Airport (S78)*

Kimley»Horn

Expect More. Experience Better.





# TABLE OF CONTENTS

## *APPENDICES*

# EXECUTIVE SUMMARY

The Division of Aeronautics (AERO), City, and Airport Consultant staff make frequent decisions regarding the timing and type of maintenance and rehabilitation (M&R) activities that should be completed at Emmett Municipal Airport (S78) to maintain an acceptable operational condition of the pavement network. In order to maintain a reasonable M&R schedule and 5-year Capital Improvement Plan (CIP), decision makers must know the relative condition of its pavements to make informed decision.

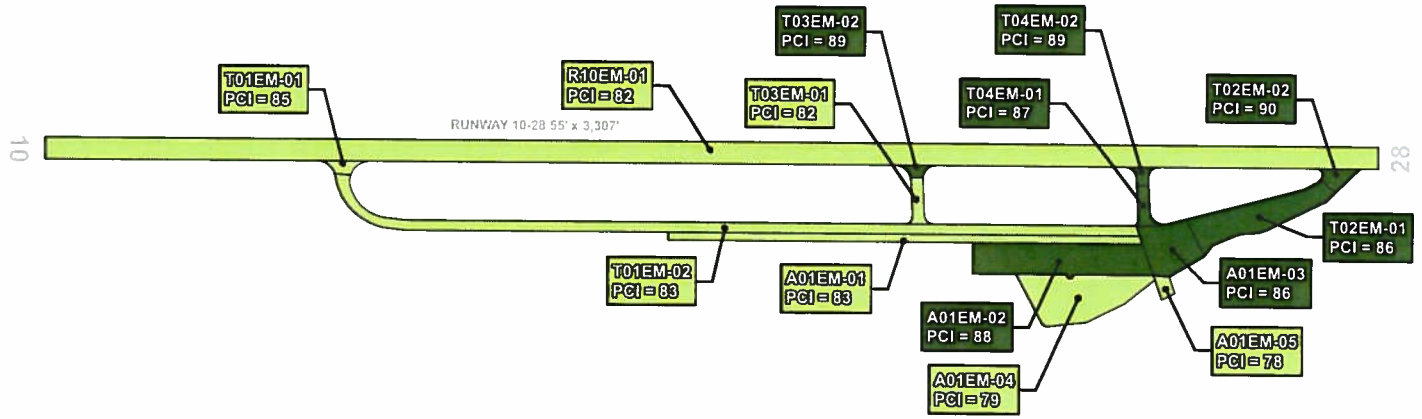
## ES.1 Current Pavement Condition

The Pavement Condition Index (PCI) is a number ranging from 0 to 100 which indicates the apparent structural integrity and surface operational condition of the pavement, with "100" indicating a pavement in new condition and "0" indicating a failed pavement section as graphically depicted in **Figure ES.1-1**.

**Figure ES.1-1**
**PCI Rating**

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

In April 2016, approximately 379 thousand square feet of pavements were identified for the airside pavements at S78. Generally speaking, the airfield pavements at S78 are in *Satisfactory* condition having an area-weighted PCI of 83. The area-weighted PCIs of the aprons, runways, and taxiways are 84, 82, and 84, respectively. **Figure ES.1-2** summarizes the current PCIs for S78.




**Legend**

**Pavement Condition Index**

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

Kimley»Horn

Figure ES.1-2

**2016 Airfield PCI Exhibit**

*Airport ID*

**S78**

*Idaho Transportation Department Division of Aeronautics*

## ES.2 Recommended 5-Year Capital Improvement Plan

The 5-year recommended Capital Improvement Plan (CIP) presented for S78 is for the 2018 – 2022 planning period given that AERO has already established the CIPs for 2016 and 2017.

Decisions related to the timing for M&R, thus the development of the CIP is based on the Critical PCI methodology. A pavement is considered to have reached the end of its functional life when its surface condition, i.e. PCI, has deteriorated to the point where applying preventative maintenance activities are no longer cost effective and major rehabilitation is required to return the pavement safe operational condition. **Table ES.2-1** summarizes the critical PCI values by branch use and airport classification established for the Idaho NPMS.

**Table ES.2-1**
**Critical PCI Values by Branch Use and Airport Classification**

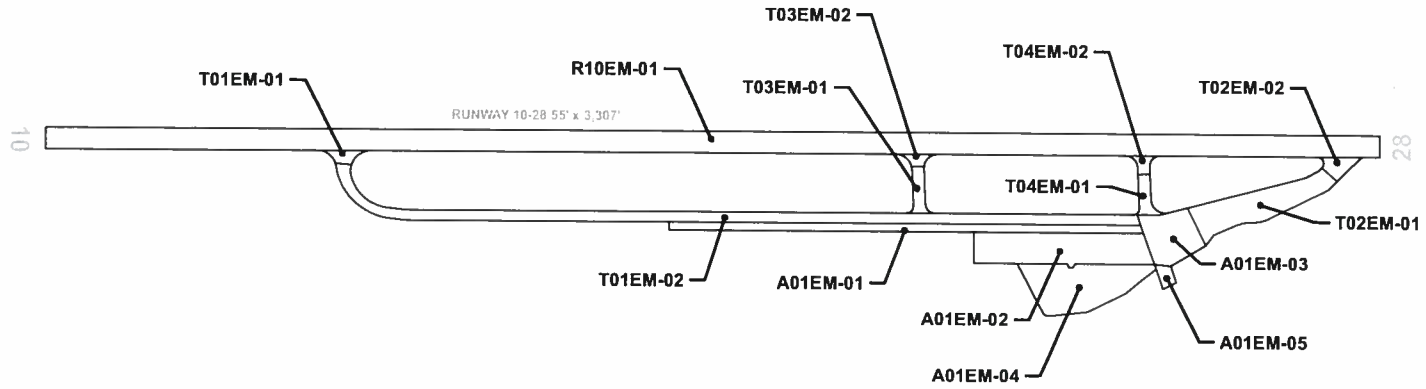
| Airport Classification | Branch Use | | |
|---|---|---|---|
| | Runway | Taxiway | Apron |
| NPIAS | 65 | 60 | 50 |
| Non-NPIAS | 50 | 45 | 40 |

The PAVER pavement management software program was used to analyze the data for S78 and to provide a baseline for the development of a 5-year CIP; however, such a program has limitations. In an effort to provide the most logical CIP recommendations and costs it was necessary to consider other factors such as construction phasing, operational impacts, and currently planned rehabilitation projects when developing the recommended CIP. In order to develop realistic project specific cost estimates that AERO and S78 can trust for future planning purposes realistic cost estimates were developed outside of the PAVER program to include additional construction items and soft costs including items such as airfield electrical improvements / upgrades, costs for unknown utilities, future planned underground drainage improvements, construction costs (including quality control and construction administration), general administration costs, and professional services for design and construction.

The 5-year CIP for S78 is summarized in **Table ES.2-2** and graphically in **Figures ES.2-1** and **ES.2-2** for major rehabilitation and surface treatments, respectively.

**Table ES.2-2**
**S78 Recommended 5-year CIP Summary Table**

| Year | Branch ID | Section ID | Area (SF) | PCI at Treatment | Recommended Treatment | PAVER Output | | Soft Costs | | | | | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Unit Cost | Total Cost | Drainage/ Elec./Misc. | QA/QC Testing | Construction Administration | Admin Costs | Design Fee | |
| 2020 | A01EM | 1 | 23,436 | 74 | Surface Treatment | $0.35 | $8,203 | | | $820 | $90 | $902 | $10,015 |
| 2020 | A01EM | 2 | 33,943 | 81 | Surface Treatment | $0.35 | $11,880 | | | $1,188 | $131 | $1,307 | $14,506 |
| 2020 | A01EM | 3 | 15,810 | 77 | Surface Treatment | $0.35 | $5,534 | | | $553 | $61 | $609 | $6,756 |
| 2020 | A01EM | 4 | 29,709 | 72 | Surface Treatment | $0.35 | $10,398 | | | $1,040 | $114 | $1,144 | $12,696 |
| 2020 | A01EM | 5 | 1,978 | 69 | Surface Treatment | $0.35 | $692 | | | $69 | $8 | $76 | $845 |
| 2020 | R10EM | 1 | 181,885 | 75 | Surface Treatment | $0.35 | $63,660 | | | $6,366 | $700 | $7,003 | $77,729 |
| 2020 | T01EM | 1 | 2,152 | 76 | Surface Treatment | $0.35 | $753 | | | $75 | $8 | $83 | $920 |
| 2020 | T01EM | 2 | 51,361 | 75 | Surface Treatment | $0.35 | $17,977 | | | $1,798 | $198 | $1,977 | $21,949 |
| 2020 | T02EM | 1 | 24,679 | 77 | Surface Treatment | $0.35 | $8,638 | | | $864 | $95 | $950 | $10,547 |
| 2020 | T02EM | 2 | 3,330 | 80 | Surface Treatment | $0.35 | $1,166 | | | $117 | $13 | $128 | $1,423 |
| 2020 | T03EM | 1 | 3,676 | 74 | Surface Treatment | $0.35 | $1,287 | | | $129 | $14 | $142 | $1,571 |
| 2020 | T03EM | 2 | 1,466 | 80 | Surface Treatment | $0.35 | $513 | | | $51 | $6 | $56 | $626 |
| 2020 | T04EM | 1 | 3,457 | 78 | Surface Treatment | $0.35 | $1,210 | | | $121 | $13 | $133 | $1,477 |
| 2020 | T04EM | 2 | 1,673 | 80 | Surface Treatment | $0.35 | $586 | | | $59 | $6 | $64 | $715 |
| | | | | | | | | | | | | *Total for 2020:* | *$161,777* |




**Legend**

- 2018 Major Rehabilitation
- 2019 Major Rehabilitation
- 2020 Major Rehabilitation
- 2021 Major Rehabilitation
- 2022 Major Rehabilitation
- No Rehabilitation

Kimley»Horn

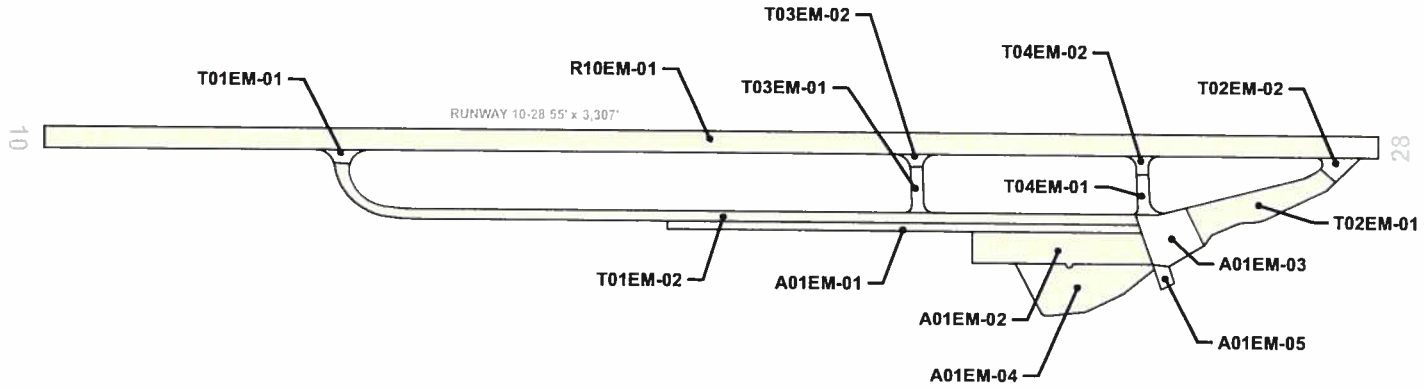
Figure ES.2-1

**Recommended 5-Year Capital Improvement Program**

*Airport ID*

**S78**

*Idaho Transportation Department Division of Aeronautics*




**Legend**

- 2018 Surface Treatment
- 2019 Surface Treatment
- 2020 Surface Treatment
- 2021 Surface Treatment
- 2022 Surface Treatment
- No Rehabilitation

Kimley»Horn

Figure ES.2-2

**Recommended 5-Year Capital Improvement Program**

*Airport ID*

**S78**

*Idaho Transportation Department Division of Aeronautics*

# CHAPTER 1 – INTRODUCTION

## 1.1 Background

The Division of Aeronautics (AERO) is an entity within the Idaho Transportation Department. AERO is responsible for maintaining 30 National Plan of Integrated Airport System (NPIAS) classified airports and 18 Non-NPIAS airports through the use of a Network Pavement Management System (NPMS). The NPMS is intended to serve as a tool in identifying pavement maintenance and rehabilitation needs, aiding in the decision making process related to federal grant funding of capital projects, legislative decision making, and planning needs of local jurisdictions. Federal Aviation Administration (FAA) grant assurances require airports to have a pavement management system in place to address these objectives and AERO assists with achieving these objectives. For over 20 years AERO has actively managed their airfield pavement infrastructure at these 48 airports through the use of the NPMS.

## 1.2 Project Objectives

AERO, City, and Airport Consultant staff make frequent decisions regarding the timing and type of maintenance and rehabilitation activities that should be completed at Emmett Municipal Airport (S78) to maintain an acceptable operational condition of the pavement network. In order to maintain a reasonable maintenance and rehabilitation schedule and 5-year Capital Improvement Plan (CIP), decision makers must know the relative condition of its pavements to be able to knowledgeably determine which pavements are in need of rehabilitation and at what point in time to apply these measures. To further strengthen their understanding of the airfield pavement condition at S78, AERO decided to update their existing NPMS to effectively manage Idaho's pavement network but more specifically, S78's pavement network based on current conditions. The data collected will be used for determining current (2016) as well as 5- and 10-year predicted Pavement Condition Index (PCI) values and to provide recommendations on the timing of future maintenance and rehabilitation activities. This report summarizes the data collection, analysis, program development and implementation of S78's NPMS.

This program can be used by decision makers to make logical and cost effective decisions regarding their pavement network for pavement rehabilitation projects in the future. It is recommended by Kimley-Horn and Associates, Inc. (Kimley-Horn) and the FAA that AERO update their NPMS for each airport on a 3-year basis.

This update was completed using the PAVER computer program for S78. With PAVER, a database will be established that will store pavement inventory and condition information, schedule maintenance activities, and prepare maintenance and rehabilitation budgets. A comprehensive NPMS provides information that assists with the project programming process.

The primary information resulting from a pavement management study includes:

- Functional Pavement Condition Index (PCI) determined from a visual condition survey;
- Remaining life determination (functional);
- PAVER pavement management system customization including unit costs, maintenance and rehabilitation policies, and prioritization;
- Development of a 5-Year CIP based on current and predicted PCIs;
- Functional pavement analysis and report of findings and recommendations; and
- Implementation of computerized NPMS

With maintenance and rehabilitation costs escalating, consequences of poor maintenance can be costly. If maintenance is conducted before significant decline in pavement condition occurs, substantial repair and/or rehabilitation costs may be avoided or delayed.

While a good NPMS does not replace sound engineering judgment, it does provide an excellent tool to assist AERO staff and the individual airports in their decision making processes. Furthermore, it provides information that can be used to support project funding requests and aid in developing work prioritization plans.

## 1.3 General Scope of Work

Kimley-Horn in association with AERO developed a scope of work to meet the project's objectives. The primary tasks undertaken to update the NPMS for S78 include but are not limited to:

- Research available airport construction records for construction projects that have taken place since the most recent update of the NPMS completed in 2011. This data is used to update the pavement inventory, network definition, and existing PAVER database. Additionally, a detailed review of all construction history documentation was conducted to verify the data contained in the existing PAVER database.
- Network definition maps were updated to reflect geometric changes and pavement sectioning since 2011 and the maps were spatially projected into a Geographic Information System (GIS) for use in tablet applications and for data sharing.
- Conducting visual PCI surveys in accordance with American Society of the International Associate for Testing and Material (ASTM) D5340-12.

- Information gathered from field surveys, records research, and network definition tasks were input into the updated PAVER database. PAVER uses this information to create a multi-functional database that can be used for a wide range of maintenance and management efforts, including pavement condition evaluation and data analysis. This powerful program can assist the pavement manager in many ways including serving as a centralized database from which to create reports and graphics.
- PAVER pavement management system customization was completed on the statewide level for the NPMS.
- PAVER data analysis was completed and the findings were used to develop a 5-Year CIP for S78.
- This report and documentation summarizes all evaluation methodologies used during the NPMS update at S78. It incorporates preliminary field reports including visual evaluation results and provides various PAVER analysis results and standard reports.
- Quality control was a key element in this study, and was included in the scope of work to assure that the technical objectives of the NPMS and all contractual obligations were met.

## 1.4 Report Organization

This report is divided into the following chapters:

- **Chapter 1 "Introduction"** - This chapter describes a general overview of the project objectives, general scope of work, study approach, technical references, and a list of project team participants.
- **Chapter 2 "Network Definition Update and Field Investigations"** - This chapter describes the methodology and procedures that were employed to update the pavement network and conduct field investigations, including historical research, and pavement condition surveys. Also included is a discussion of commonly found pavement distresses at the airport.
- **Chapter 3 "Pavement Condition Index"** - This chapter discusses the PAVER program and implementation, describes the procedures to calculate the pavement condition index, and discusses S78's current and future pavement conditions.
- **Chapter 4 "NPMS Customization"** - This chapter describes the development of the NPMS customization including the development of maintenance and rehabilitation policies, unit costs, and prioritization.
- **Chapter 5 "S78's Rehabilitation Recommendations"** - This chapter presents the findings of the PAVER analysis and the recommended 5-Year CIP for S78 based on the current and predicted PCIs.
- **Chapter 6 "Pavement Management Implementation"** - This chapter presents recommendations for implementing the NPMS at S78.

- **Appendix A "Re-Inspection Reports"** - provides a report summarizing all of the visual condition data compiled during the condition surveys at S78. Data is summarized on all levels including the branch, section, and sample unit levels.
- **Appendix B "PAVER Reports"** - lists the pavement management reports from PAVER including: Branch Condition Report, Section Condition Report, Work History Report, and PAVER Prediction Models.
- **Appendix C "Photo Appendix"** – presents general photos of current pavement conditions observed at S78.
- **Appendix D "Detailed 1st Year Maintenance Recommendations"** – Summarizes the recommended preventative maintenance activities (pavement sections with PCIs above critical) for the Year 1 based on pavement distresses observed in 2016.

## 1.5 References

The following FAA Advisory Circulars (ACs) and ASTM Standards are referenced as specific guidelines and procedures for maintaining airport pavements; establishing an effective maintenance program, and identifying specific types of pavement distresses, along with their probable cause, inspection guidelines, and recommended methods of repair.

- AC 150/5380-6C "Guidelines on Procedures for Maintenance of Airport Pavements"
- AC 150/5380-7B "Airport Pavement Management Program (PMP)"
- ASTM 5340-12 "Standard Test Method for Airport Pavement Condition Index Surveys"

## 1.6 Project Team Participants

In support of Kimley-Horn's contract with AERO to update the NPMS at S78, the following associated project team members supported in the field investigations, analysis, and the production of this report.

| | |
|---|---|
| **Kimley-Horn and Associates, Inc.** | *Project Management, Network Definition Update, Visual Condition Surveys, Data Entry, PAVER Customization, PAVER Analysis, CIP Development, and Reporting* |
| **J-U-B Engineers, Inc.** | *Records Research, Assistance with Visual Condition Surveys, PAVER Customization, and CIP Development.* |

# CHAPTER 2 – NETWORK DEFINITION AND FIELD INVESTIGATIONS

To complete the pavement evaluations and to develop an updated NPMS for S78, it was necessary to collect information related to existing airport pavement inventory and conditions. Specialized analysis techniques were used to estimate pavement deterioration rates and determine predicted PCIs. This chapter describes the approaches taken to collect the required information.

## 2.1 Historical Records Research

AERO staff provided the consultant team all available information on existing airport pavement cross-sections and dates of construction contained in the existing NPMS and those sections that have been planned or completed construction since the last update. Historical records for S78 since the previous NPMS update were collected and reviewed. The information collected as part of this effort consisted of existing pavement history, pavement thickness and composition, and construction dates.

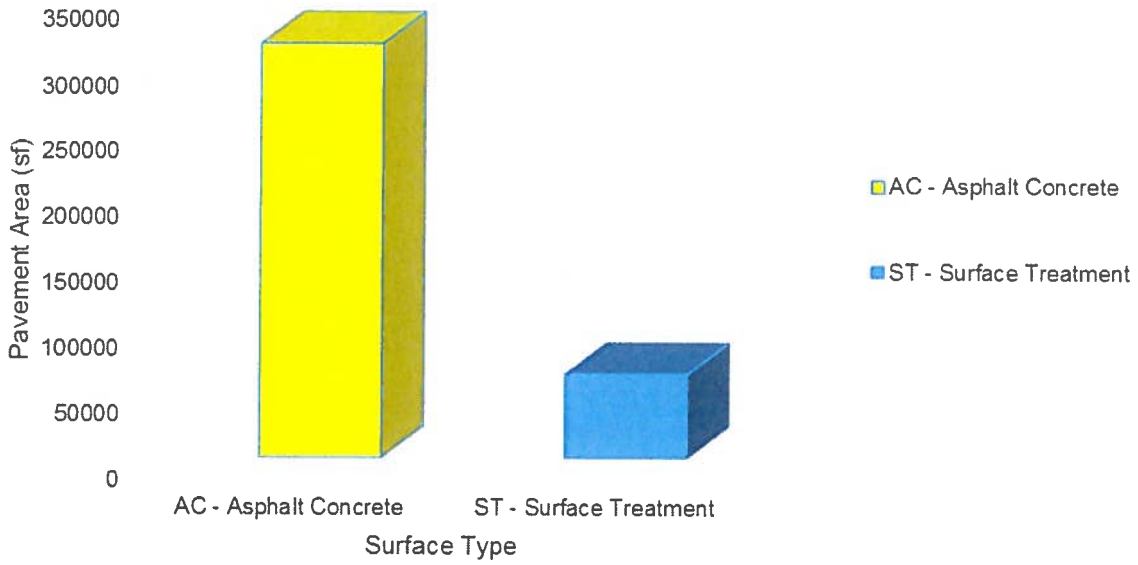
The updated historical data collected during this task was input into the PAVER database. This database includes (for each section): surface type, date of construction or last rehabilitation, section boundaries, areas.

**Figure 2.1-1** illustrates the existing pavement types for the airside pavement network at S78.

## 2.2 Network Definition

To facilitate the update to an existing NPMS, the pavement network must be updated to reflect changes since the previous update was completed. While the Network Definition for S78 was previously setup, modifications were required to adjust for recent or planned construction. This section describes the methodology for defining, describing, and identifying the network for S78.

**Figure 2.1-1**
**Pavement Area vs. Surface Type**




## *Branch and Section Identification*

Airport pavements are typically managed based on primary use an construction history. Airport pavements are divided into branches, sections, and sample units according to the guidelines contained in FAA Advisory Circular 150/5380-6C, "*Guidelines and Procedures for Maintenance of Airport Pavements*." The following are definitions for FAA's pavement division categories:

**Network:** A single pavement network is identified at S78; "EMMETT" that contains all of the airfield pavements including runways, taxiways, and aprons.

**Branch:** A branch is any identifiable part of a pavement network that is a single entity having a distinct function. Airfield pavements such as runways, taxiways, and aprons are each considered to be separate branches.

**Section:** A section is a subdivision of a branch and has consistent characteristics throughout its length or area. These characteristics include: structural composition (pavement layer material type and thickness), construction history, traffic, and pavement condition. A section should also have the same traffic type. A section is the basic management unit of a pavement network, and is that portion of a branch on which a maintenance and repair project is likely to be completed.

**Sample Unit:** A sample unit is an arbitrarily defined portion of a pavement section that is used to perform the visual (functional) pavement condition surveys. It is the smallest subdivision in a pavement network. For flexible pavements, sample units are typically 5,000 square feet ± 2,000 square feet in area and for rigid pavements, sample units typically include approximately 20 slabs ± 8 slabs.

Each pavement division is assigned a unique identification. Each branch number consists of up to five alphanumeric characters. The first character indicates the branch type: "R" for runway, "T" for taxiway, and "A" for apron. The next one to four alphanumeric characters following the branch type identifier specifies the individual runway, taxiway, or apron being referenced. Followed by a two-letter abbreviation of the associated City, for example; "EM" for Emmett.

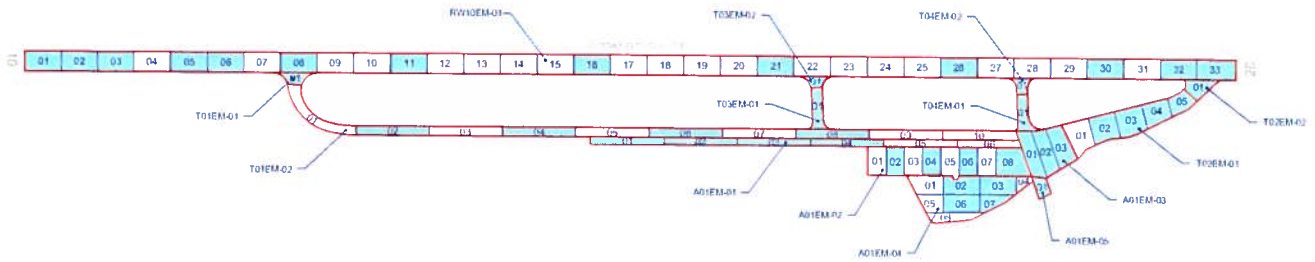
Each branch is assigned as many section numbers as necessary. Up to three alphanumeric characters are assigned and indicate the section number. For example, the identification number for the Branch Runway 10/28, Section 01, would read as follows:

| BRANCH | SECTION |
|---|---|
| R10EM | 01 |

A network definition map including the layout of the branches, sections, and sample units identified for the airside network at S78 is shown in **Figure 2.2-1**. The sections indicated were used as analysis units during the visual condition survey. Pavement analyses were completed for each individual section. The previously established airport network definition for S78 in 2012 was used as a basis and updated accordingly based on changes in construction history since that time.

## Pavement Identifiers

Several pavement identifiers, or characteristics, are used to describe a branch or section's function, importance, and construction. These characteristics are: branch use, pavement rank, and surface type.




IDAHO NETWORK PAVEMENT
MANAGEMENT PHASE IV

PREPARED FOR

Idaho Transportation Department
Division of Aeronautics

**Branch Use:** Branch use identifies the primary use of each distinct pavement area. For each airside pavement included in this program, a branch use of "Runway", Taxiway", or "Apron" was assigned, as appropriate.

**Table 2.2-1** summarizes the branch and section inventory for S78. This report lists the network ID, airport type, branch ID, branch name, branch use, branch area, section ID, pavement surface type, section area, last construction date, last inspection date, and current PCI.

**Pavement Rank:** Pavement rank refers to the relative importance assigned to pavement facilities based on their level or type of use.

**Surface Type:** Each pavement section is assigned a surface type designator based on the surface layer material present. The surface types contained in the Idaho NPMS database include asphalt concrete (AC), asphalt overlaid over existing asphalt concrete (AAC), Portland cement concrete (PCC), surface treatments (ST), and chip seals (X). Two surface types were encountered at S78: AC and ST.

## 2.3 Pavement Condition Index Survey

A pavement condition survey is the primary means of obtaining and recording pavement distress data. The condition survey for both rigid and flexible pavement facilities consists primarily of a visual inspection of the pavement surfaces for signs of distress resulting from traffic (aircraft and vehicular) and environmental influences. A visual pavement condition survey provides an indication of the rate of deterioration of a pavement from a functional (visual) point of view and can be an indicator of structural distress. A visual survey alone will not predict the remaining structural capacity of a pavement.

The condition survey is a visual statistical sampling of pavements which records primary distress types (i.e., cracking and deformation), the quantity of these distresses, and their severity. During a visual condition survey, random samples of a pavement network are taken to provide a statistical reliability as outlined in the FAA Advisory Circular 150/5380-7B "*Airport Pavement Management Program*". **Table 2.3-1** shows the recommended minimum number of sample units to be inspected based on the total number of sample units in a section. In total, a similar sampling rate that was used in 2011 was followed resulting in approximately 20% of the sample units were inspected at S78 on the airside pavement network in 2016.

**Table 2.2-1**
**S78 Pavement Inventory Summary**

| Network ID | Airport Type | Branch ID | Branch Name | Branch Use | Section ID | Surface | True Area (sf) | Construction Date | Inspection Date | 2016 PCI |
|---|---|---|---|---|---|---|---|---|---|---|
| EMMETT | NON-NPIAS | A01EM | Apron 01 Emmett | APRON | 1 | AC | 23,436 | 9/3/2006 | 4/5/2016 | 83 |
| EMMETT | NON-NPIAS | A01EM | Apron 01 Emmett | APRON | 2 | ST | 33,943 | 1/1/2013 | 4/5/2016 | 88 |
| EMMETT | NON-NPIAS | A01EM | Apron 01 Emmett | APRON | 3 | AC | 15,810 | 9/3/2006 | 4/5/2016 | 86 |
| EMMETT | NON-NPIAS | A01EM | Apron 01 Emmett | APRON | 4 | ST | 29,709 | 8/1/1996 | 4/5/2016 | 79 |
| EMMETT | NON-NPIAS | A01EM | Apron 01 Emmett | APRON | 5 | AC | 1,978 | 9/3/2006 | 4/5/2016 | 78 |
| EMMETT | NON-NPIAS | R10EM | Runway 10/28 Emmett | RUNWAY | 1 | AC | 181,885 | 9/3/2008 | 4/5/2016 | 82 |
| EMMETT | NON-NPIAS | T01EM | Taxiway 01 Emmett | TAXIWAY | 1 | AC | 2,152 | 9/2/2008 | 4/5/2016 | 85 |
| EMMETT | NON-NPIAS | T01EM | Taxiway 01 Emmett | TAXIWAY | 2 | AC | 51,361 | 9/3/2006 | 4/5/2016 | 83 |
| EMMETT | NON-NPIAS | T02EM | Taxiway 02 Emmett | TAXIWAY | 1 | AC | 24,679 | 9/3/2006 | 4/5/2016 | 86 |
| EMMETT | NON-NPIAS | T02EM | Taxiway 02 Emmett | TAXIWAY | 2 | AC | 3,330 | 9/2/2008 | 4/5/2016 | 90 |
| EMMETT | NON-NPIAS | T03EM | Taxiway 03 Emmett | TAXIWAY | 1 | AC | 3,676 | 9/3/2006 | 4/5/2016 | 82 |
| EMMETT | NON-NPIAS | T03EM | Taxiway 03 Emmett | TAXIWAY | 2 | AC | 1,466 | 9/2/2008 | 4/5/2016 | 89 |
| EMMETT | NON-NPIAS | T04EM | Taxiway 04 Emmett | TAXIWAY | 1 | AC | 3,457 | 9/3/2006 | 4/5/2016 | 87 |
| EMMETT | NON-NPIAS | T04EM | Taxiway 04 Emmett | TAXIWAY | 2 | AC | 1,673 | 9/2/2008 | 4/5/2016 | 89 |

**Table 2.3-1**
**Network Level Sampling Criteria**

| PCC Pavement | | Asphalt Pavement | |
|---|---|---|---|
| No. of Sample Units in Section (N) | No. of Sample Units to Be Inspected (n) | No. of Sample Units in Section (N) | No. of Sample Units to Be Inspected (n) |
| 1-3 | All | 1-3 | All |
| 4 | 3 | 4 | 3 |
| 5-7 | 4 | 5-9 | 4 |
| 8-10 | 5 | 10-20 | 5 |
| 11-16 | 6 | 21-30 | 6 |
| 17-28 | 7 | 31-70 | 7 |
| 29-64 | 8 | >70 | 10%, but < 17 |
| 65-90 | 9 | | |
| >90 | 10%, but < 32 | | |

The condition survey at S78 was conducted using sample units of 5,000 square feet (±2,000 square feet) for asphalt pavement and 20 contiguous slabs (± 8 slabs) for concrete pavement. Some adjustments were made in the sample unit size in the field, necessitated by the geometry of the sample units.

Approximately 20% of the sample units were randomly selected for survey at S78 for all pavements. The 20% sampling frequency allows for a higher level of confidence evaluating network pavement conditions and is consistent with previous visual pavement inspections that have been completed. Subsequent network inspections should be completed with this same frequency and sample to better predict the future PCI of the pavements. The sampling rate utilized during the 2016 update is sufficient to achieve a 95% confidence level. For the most part sample units in the same representative area compared to previous inspections were inspected for data consistency. Subsequent network inspections should be completed with this same frequency and sample to better predict the future PCI of the pavements.

## Methodology

A visual condition survey was performed at S78 in April 2016. The survey was performed using the PCI methodology developed by the U.S. Army Corps of Engineers, and described in FAA Advisory Circular AC 150/5380-6C, "*Guidance and Procedures for Maintenance of Airport Pavements*" and ASTM D5340-12, "*Standard Test Method for Airport Pavement Condition Index Surveys*". These documents define distress types, severity levels, and methods for measuring and recording distresses.

The PCI procedure was developed to collect data that would provide engineers and managers with numerical value indicating overall pavement condition, and that would reflect both pavement structural integrity and operational surface condition. The procedure was designed to be highly repeatable and was found to be well-correlated with the judgment of experienced pavement engineers.

A PCI survey is performed by measuring the amount and severity of certain distress types, or defects, observed within a sample unit. **Table 2.3-2** lists the AC pavement distress types considered in the PCI method, and also identifies the related cause (load, climate, other) as assigned by the PAVER software for airside pavements. **Table 2.3-3** lists the PCC pavement distress types considered in the PCI method, and also identifies the related causes of the distress for airside pavements. Load-related distresses exist where the pavement is likely insufficient to accommodate the applied aircraft loading. Climate-related distresses arise due to exposure to and extreme variation in climatic conditions. Other related distresses are caused by actions not related to load or climate, such as oil or fuel spills, construction-related issues, and material quality issues.

**Table 2.3-2**
**Pavement Distresses - Asphalt Surfaced Airfields**

| Code | Distress | Mechanism |
|---|---|---|
| 41 | Alligator Cracking | Load |
| 42 | Bleeding | Other |
| 43 | Block Cracking | Climate |
| 44 | Corrugation | Other |
| 45 | Depression | Other |
| 46 | Jet Blast | Other |
| 47 | Joint Reflection – Cracking | Climate |
| 48 | Longitudinal / Transverse Cracking | Climate |
| 49 | Oil Spillage | Other |
| 50 | Patching | Other |
| 51 | Polished Aggregate | Other |
| 52 | Raveling | Climate |
| 53 | Rutting | Load |
| 54 | Shoving | Other |
| 55 | Slippage Cracking | Other |
| 56 | Swelling | Other |
| 57 | Weathering | Climate |

*Source: PAVER 6.5.3*

**Table 2.3-3**
**Pavement Distresses - Concrete Surfaced Airfields**

| Code | Distress | Mechanism |
|---|---|---|
| 61 | Blow-up | Climate |
| 62 | Corner Break | Load |
| 63 | Linear Cracking | Load |
| 64 | Durability Cracking | Climate |
| 65 | Joint Seal Damage | Climate |
| 66 | Small Patch | Other |
| 67 | Large Patch / Utility Cut | Other |
| 68 | Popout | Other |
| 69 | Pumping | Other |
| 70 | Scaling / Crazing | Other |
| 71 | Faulting | Other |
| 72 | Shattered Slab | Load |
| 73 | Shrinkage Cracking | Other |
| 74 | Joint Spalling | Other |
| 75 | Corner Spalling | Other |
| 76 | Akali Silica Reactivity | Other |

*Source: PAVER 6.5.3*

Examination of specific distress types, severities, and quantities provides valuable information that is used to determine the cause of pavement deterioration, its condition, and eventually its M&R needs.

The condition of each pavement will dictate which of the distresses will be placed into each group. Classification by possible cause includes load, climate/durability, moisture/drainage, and other related causes. Classification by possible effect includes roughness, skid/hydroplaning potential, presence of or potential for foreign object debris (FOD), rate of deterioration, and maintenance requirements.

Although each distress is assigned only one cause by the PAVER pavement maintenance management software, the appearance and rate at which the distress occurs may be influenced by other causes. For example, alligator cracking is typically caused by aircraft loads or material deficiencies and is not likely to appear where traffic is minimal. However, its occurrence may be exacerbated by environmental factors such as moisture or drainage issues; when the base material is saturated and the asphalt concrete is placed under higher-induced strains under aircraft loading. As a result, the occurrence of alligator cracking may be accelerated due to the asphalt concrete being further fatigued under each aircraft load due to the base material being inefficient in carrying the design loads.

## 2.4 Airport Pavement Investigation

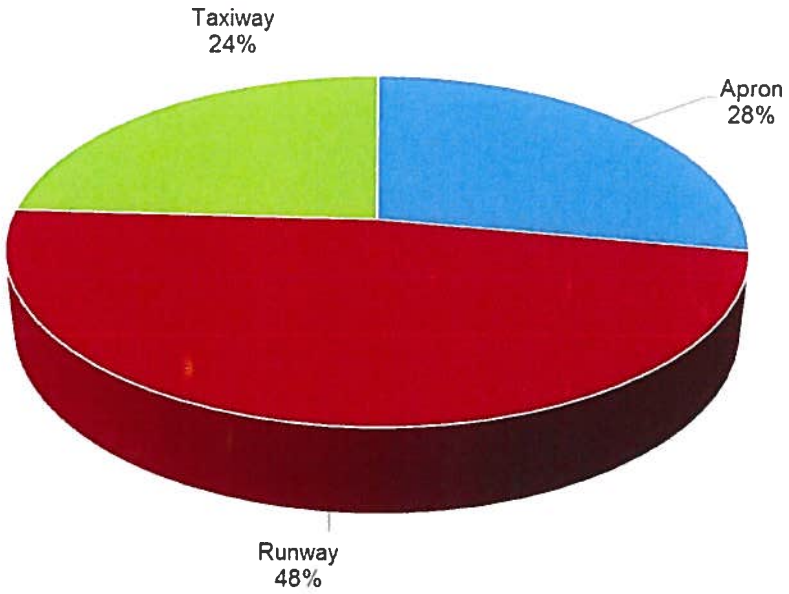
Distress data was collected for each sample unit surveyed and entered into the PAVER computer program, and stored in the database. The program used the data to calculate the PCI for each sample unit and section (refer to Chapter 3).

In April 2016, approximately 379 thousand square feet of pavements were identified for the airside pavements at S78. A total of 14 distinct pavement sections were identified. These areas are summarized in **Table 2.4-1** and are shown graphically in **Figure 2.4-1**.

**Table 2.4-1**
**Pavement Areas and Percent of Areas**

| Airside Network | | |
|---|---|---|
| Branch Use | Area (sf) | Percent of Area |
| Apron | 104,876 | 28 |
| Runway | 181,885 | 48 |
| Taxiway | 91,794 | 24 |
| Totals: | 378,555 | 100 |

**Figure 2.4-1**
**Pavement Percentage versus Pavement Use**



# CHAPTER 3 – PAVEMENT CONDITION INDEX

Visually identifying a specific pavement distress type (load- or climate-related), determining the severity of the distress, determining the quantity of the distress, and the computation of a PCI provides valuable information. This information can also be used to identify possible causes of the pavement deterioration, and eventually help in developing maintenance and rehabilitation recommendations. Load-related distress or pavements exhibiting visual indications of load-related distress can be further evaluated by conducting a structural evaluation consisting of non-destructive testing methods. Visual condition surveys were completed on the airside pavements at S78.

## 3.1 PAVER Computer Program

PAVER was developed by the U.S. Army Construction Engineering Research Laboratory (USA-CERL) and uses the guidelines contained in FAA Advisory Circular 150/5380-6C "*Guidelines and Procedures for Maintenance of Airport Pavements*". PAVER is a Windows-based program that can store information relating to pavements including but not limited to; pavement type (layer and material property data), dates of construction, pavement condition data, traffic data, construction and maintenance history information, and nondestructive testing data to name a few. Using the data stored in the PAVER database provides the user with many capabilities, including: evaluating current condition, predicting future condition, determining maintenance and rehabilitation needs, scheduling future inspections, and identifying budget needs based on various analysis scenarios. The existing PAVER database was updated to the current version, Version 6.5.6, as part of this update and was used to assist in updating the NPMS for S78.

## 3.2 PAVER Update

The following steps were completed to update the existing airside PAVER database and for S78:

- Update the existing PAVER database to Version 6.5.6
- Data collection and entry;
- Data integrity and error checking;
- Determination of current PCIs;
- Development of updated prediction models;
- Determination of 5- and 10-Year predicted PCIs; and
- PAVER report generation and interpretation.

## Data Collection and Entry

To update the PAVER software, data must first be collected and entered into the program. Existing pavement branches and sections defined during the last update in 2011 were evaluated and updated accordingly using the inventory module. The inventory items updated included section naming, last construction date, section areas, and if appropriate, surface types. After these tasks were completed, the visual condition survey data was entered into the PAVER database.

Based on the visual condition data gathered and the likely causes associated with these distresses (load- and/or climate/environment-related), the engineer has some understanding of the cause of deterioration over the life of the pavement. Analyzing the potential causes of deterioration being exhibited helps the user identify proper maintenance and rehabilitation strategies.

**Figure 3.2-1**, "Section vs Age," is one of many graphs that can be obtained through the use of PAVER that demonstrates the age of the pavements within the network. It shows the number of sections versus the age at the time of inspection for the areas that were inspected as part of this update. As shown in this illustration, the airside pavements vary in age from approximately 3-years to 20-years with the majority of the pavement being between 6- and 10-years of age.

**Figure 3.2-1**
**Summary of Sections vs. Age**

### Data Integrity and Error Checking

Because the usefulness of the PAVER database outputs are dependent on the accuracy of the data contained in it, it is essential that all data be carefully checked for errors. Once all of the information obtained was entered into the PAVER database, printouts were generated and checked for errors against the original field data sheets and corrections were made as needed.

### PAVER Reports

PAVER Version 6.5.6 is capable of producing a variety of reports using the data contained in the database. The report generation capability is almost unlimited once data is exported to a spreadsheet for further formatting. The following PAVER reports were generated for S78 and are provided in Appendix B:

- PAVER Work History Report;
- PAVER Branch Condition Report;
- PAVER Section Condition Report;
- PAVER Prediction Models.

## 3.3 Calculating the Pavement Condition Index

Visual condition data collected during the PCI inspections was entered into the PAVER database. PAVER was then used to calculate the current PCI for each sample unit and section. The PCI is a number ranging from 0 to 100 which indicates the apparent structural integrity and surface operational condition of the pavement, with "100" indicating a pavement in new condition and "0" indicating a failed pavement section. Pavement Condition Ratings (PCRs) are associated with PCI ranges and these ratings vary from "failed" to "excellent." PCRs are discussed in more detail in **Section 3.4**.

To calculate a PCI for a given sample unit, each distress type observed is assigned a deduct value based on its density (frequency of occurrence) and severity within that sample area. All deducts are summed and subsequently adjusted (or corrected) for the number of different distresses found. This corrected deduct value is subtracted from 100, to arrive at the PCI for that particular sample unit. The PCI for a pavement section is the mean PCI value of all sample units evaluated within that section. PCRs are associated with ranges of PCI values. **Figure 3.3-1** shows the condition ratings and the range of PCI values to which each descriptive rating corresponds.

**Figure 3.3-1**
**PCI Rating**

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

## 3.4 Pavement Condition Rating

**Table 2.2-1** on page 2-6 provided an inventory summary for each pavement section as well as the 2016 individual section PCIs. Detailed individual distress' that were observed in the field can be found in **Appendix A**, "Pavement Re-Inspection Reports."

## 3.5 Current Pavement Condition

A variety of condition indices will be presented in the remaining chapters of the report including PCIs discussed in this chapter. **Table 3.5-1** summarizes the measured criteria, index ranges, and critical PCI thresholds based on airport type to provide the reader a basis for understanding the data being presented for the functional (visual) evaluation that is further discussed in this chapter. The critical PCI is the condition at which maintenance may no longer be cost effective and major rehabilitation should be considered.

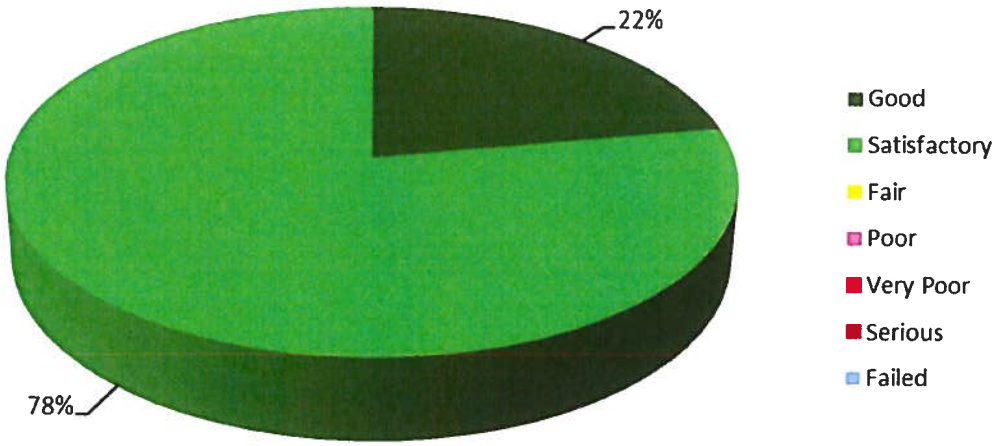
**Figure 3.5-1** summarizes the current pavement condition inspected under the study limits at S78. As illustrated in this figure, 100 percent of the airside pavement area is in *satisfactory* to *good* condition.

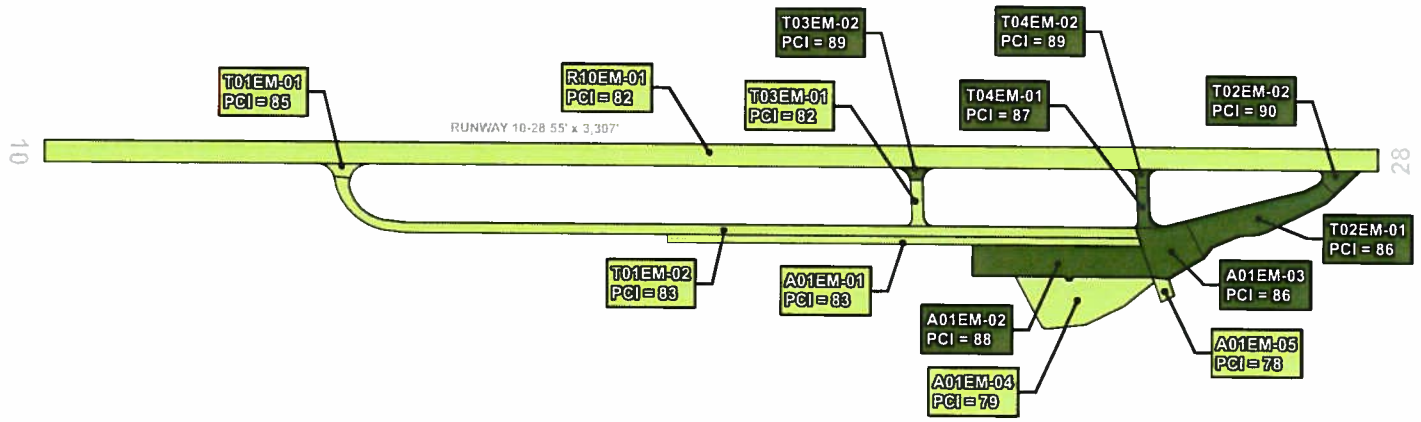
**Figure 3.5-2** illustrates the existing PCIs (2016) for all of S78's pavement sections included in this NPMS update based on the visual condition survey results. This figure is color-coded to easily illustrate overall pavement condition. The pavement sections that are displayed in yellow (fair), magenta (poor), reds (very poor to serious), and grey (failed) should be considered for rehabilitation.

**Table 3.5-1**
**Measured Condition Indices, Numerical Ranges, and Critical PCI**

| Index | Numerical Range | | Critical PCI Based on Airport Type | |
|---|---|---|---|---|
| | Minimum | Maximum | NPIAS Airports | Non-NPIAS Airports |
| Pavement Condition Index (PCI) | 0 | 100 | 65 for Runways<br>60 for Taxiways<br>50 for Aprons | 50 for Runways<br>45 for Taxiways<br>40 for Aprons |

**Figure 3.5-1**
**Summary of Current (2016) Pavement Condition by Percent Pavement Area**






**Legend**

**Pavement Condition Index**

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

Kimley»Horn

Figure 3.5-2

**2016 Airfield PCI Exhibit**

*Airport ID*

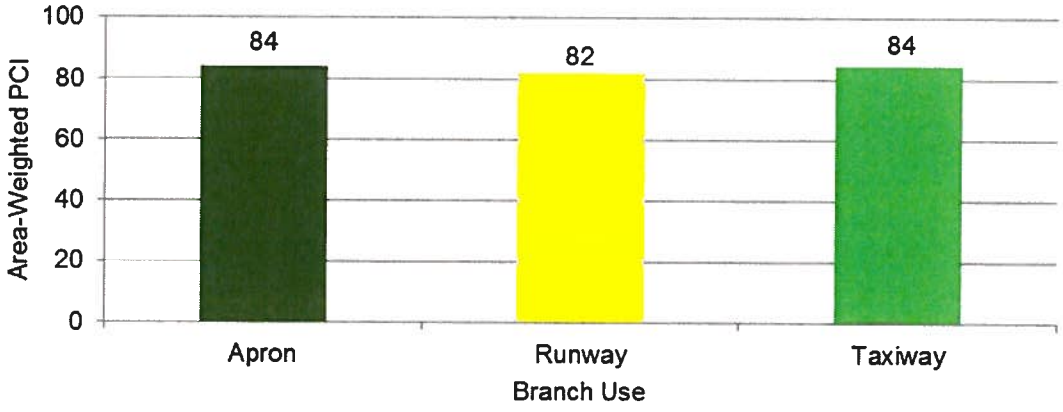
**S78**

*Idaho Transportation Department Division of Aeronautics*

## Network Level Pavement Condition Index Discussion

A total of approximately 379 thousand square feet of airfield pavement including runways, taxiways, and aprons were inspected at S78 in April 2016 using the procedure outlined in ASTM D5340-12 "*Standard Test Method for Airport Pavement Condition Index Surveys*." A total of 14 pavement sections were identified based on the previous NPMS update and recent construction records resulting in minor changes to the sections identified in 2011. The existing network has an area-weighted age at the time of inspection of approximately 9 years. Generally speaking, the airfield pavements at S78 are in *Satisfactory* condition having an area-weighted PCI of 83. The area-weighted PCIs of the aprons, runways, and taxiways are 84, 82, and 84, respectively. **Figure 3.5-3** summarizes the area-weighted PCIs by branch use for S78.

**Figure 3.5-3**
**Area-weighted PCI by Branch Use**




**Appendix C** provides a variety of photographs taken during the visual condition surveys which document the overall condition of each branch and common distresses observed at the time of inspection.

# 3.6 Predicted Pavement Condition

The key of any NPMS is accurately estimating the future condition of each individual pavement section. Data collected during this study was used in the development of performance models and predicting future pavement condition. PAVER was used to develop prediction curves used to determine typical deterioration rates.

To develop these curves, all airside pavements for every airport included in this phase of the NPMS update were first divided into "groups or families" with similar pavement type, traffic, use,

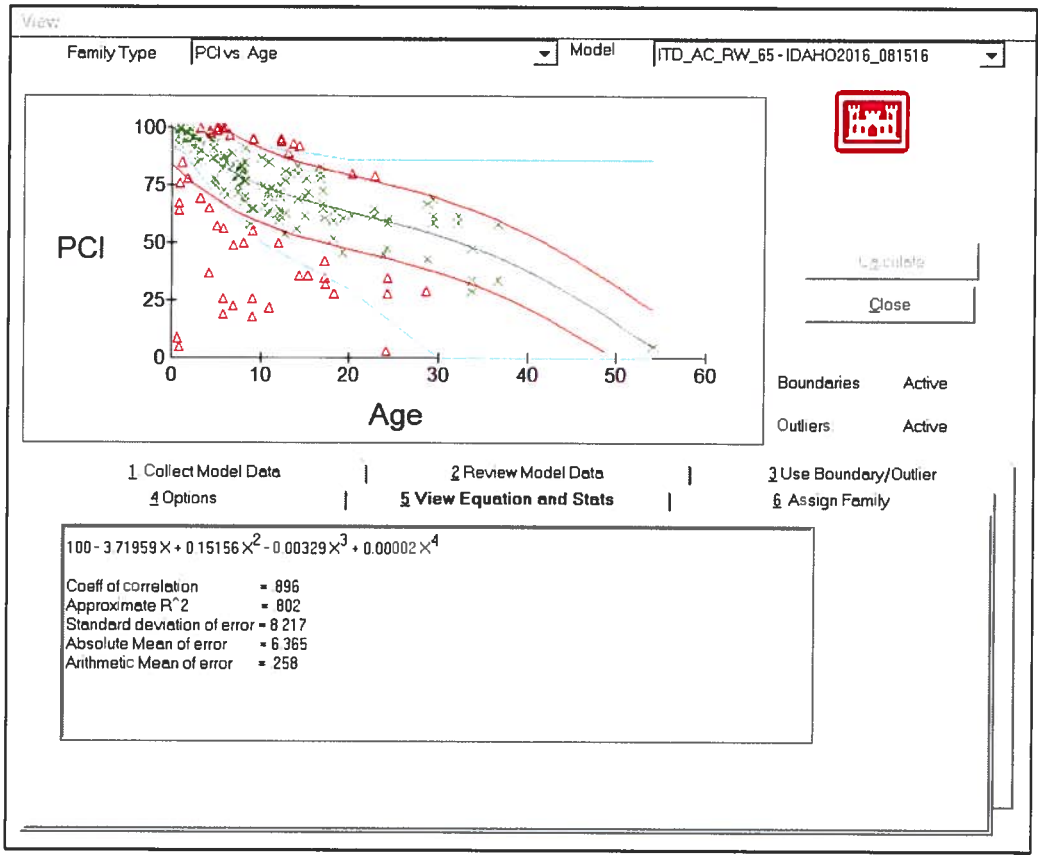
and rank. For example, all asphalt-surfaced runway, taxiway, and apron pavements were grouped together, etc. and constituted a family then PAVER establishes a best-fit curve through the visual condition data collected during the study to determine the PCI versus time for each family group. Research has demonstrated that pavement condition prediction is performed by assuming that there is a high probability that the behavior of one section will be similar to the behavior of other sections in the same family. These curves were used to determine when a pavement section would reach the critical PCI value determined acceptable for its surface type and usage, and to determine the proper timing of maintenance and rehabilitation activities.

The development of family curves for the NPMS is a very powerful and useful technique in predicting pavement condition even when historical condition data is limited. Multiple prediction curves were developed and evaluated for Idaho's NPMS; ultimately eight prediction curves were used for the functional analysis. The eight curves are listed below:

- ITD_AC_AP – Asphalt-surfaced Apron Pavements
- ITD_AC_RW – Asphalt-surfaced Runway Pavements
- ITD_AC_TW – Asphalt-surfaced Taxiway Pavements
- ITD_PCC – All PCC-surfaced Pavements
- ITD_ST_AP – All Surface-Treated Apron Pavements
- ITD_ST_RW – All Surface-Treated Runway Pavements
- ITD_ST_TW – All Surface-Treated Apron Pavements
- ITD_X – All Chip Sealed Pavements

An example of a family curve generated is shown in **Figure 3.7-1**, which shows the actual data points used to generate the prediction model. The remaining prediction curves are summarized in **Appendix B**. These curves will need to be further defined and developed as more inspection data is gathered during subsequent NPMS updates in future years.

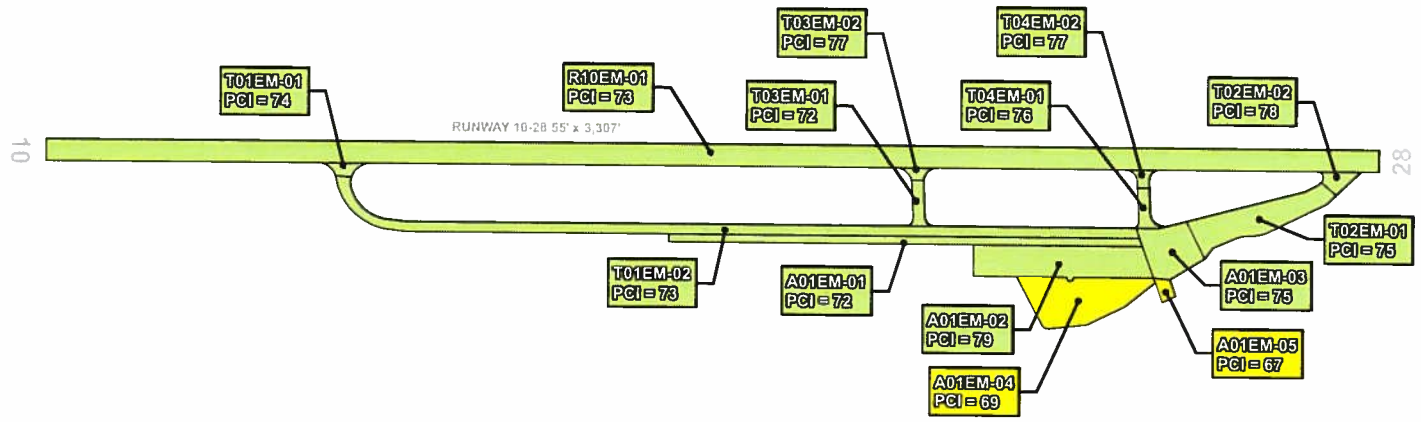
**Figure 3.7-1**
**ITD Prediction Curve (AC-surfaced Runway Pavements)**



## *Predicted Pavement Condition in 5 and 10 Years with No Major Work*

This section describes the pavement condition which is expected to result if only routine maintenance is applied. Routine maintenance consists of those activities normally performed on a regular basis, including crack sealing, joint seal repair, spall repair, minor patching, etc.

**Figures 3.7-2 and 3.7-3** illustrate the predicted pavement condition in five years (2021) and ten years (2026) if no major rehabilitation (zero budget) is completed on the airfield pavements during a five-year and ten-year period, respectively, from the time of inspection.




**Legend**

**Pavement Condition Index**

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

Kimley»Horn

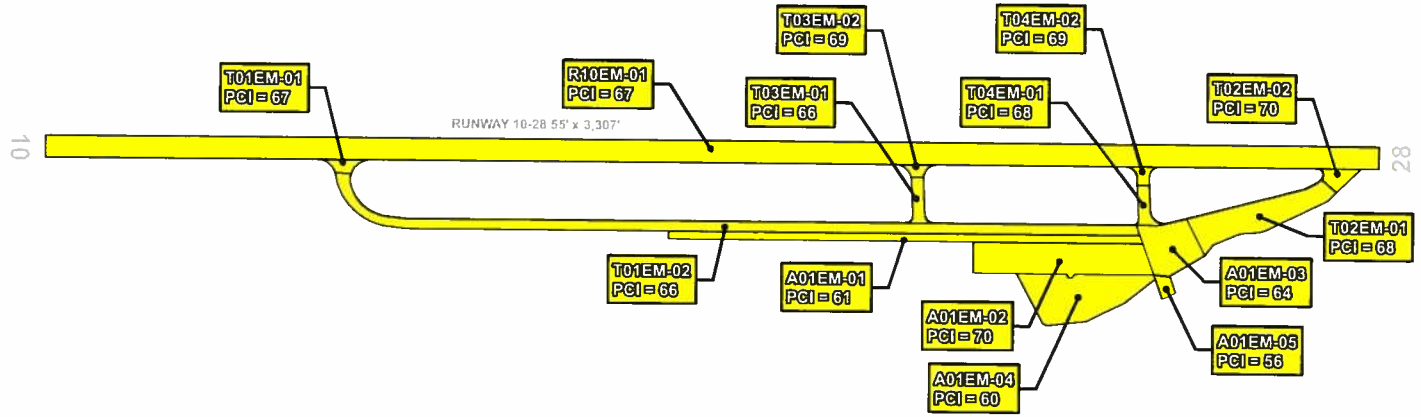
Figure 3.7-2

**2021 Airfield Predicted PCI Exhibit**

*Airport ID*

**S78**

*Idaho Transportation Department Division of Aeronautics*




**Legend**

**Pavement Condition Index**

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

Kimley»Horn

Figure 3.7-3

**2026 Airfield Predicted PCI Exhibit**

*Airport ID*

**S78**

*Idaho Transportation Department Division of Aeronautics*

# CHAPTER 4 – NPMS CUSTOMIZATION

As part of the Phase VI update to the NPMS AERO requested a greater level of customization be completed to the PAVER software compared to previous updates in an effort to provide more realistic M&R recommendations to its airport sponsors. That being said, Kimley-Horn and J-U-B utilized the existing NPMS customization information, where available, as a starting point and further defined that information to consider actual conditions including airport type, geographic location, use, priority, and typical maintenance procedures to name a few.

## 4.1 Determination of Airport Type

In order to customize the NPMS to reflect items including typical pavement sections, traffic, geographic location, and typical approach to M&R activities that impact unit costing and ultimately CIP recommendations each individual airport was assigned a specific airport type. The airport types were first broken down by NPIAS or Non-NPIAS classification. The NPIAS airports were further subdivided into four additional airport types including NPIAS Large (NPIAS-L), NPIAS Medium (NPIAS-M), NPIAS Medium Cold Weather (NPIAS-M_C), and NPIAS Small (NPIAS-S) based on airport type, geographic location, and typical pavement section. A single airport type (NON-NPIAS) was assigned to all Non-NPIAS airports. **Table 4.1-1** summarizes the airport type identification for the 33 airports included in this phase of the NPMS update.

**Table 4.1-1**
**Summary of Airports by Airport Type**

| Airport Name | Network ID | Airport Type |
|---|---|---|
| ABERDEEN MUNICIPAL AIRPORT | ABERDEEN | NPIAS-S |
| AMERICAN FALLS AIRPORT | AMER FALLS | NON-NPIAS |
| ARCO - BUTTE COUNTY AIRPORT | ARCO | NPIAS-M_C |
| BEAR LAKE COUNTY AIRPORT (PARIS) | BEAR LAKE | NPIAS-M_C |
| BLACKFOOT AIRPORT (MCCARLEY FIELD) | BLACKFOOT | NPIAS-M_C |
| BUHL MUNICIPAL AIRPORT | BUHL | NPIAS-M |
| BURLEY MUNICIPAL AIRPORT | BURLEY | NPIAS-M |
| CALDWELL INDUSTRIAL AIRPORT | CALDWELL | NPIAS-L |
| COTTONWOOD MUNICIPAL AIRPORT | COTTON | NON-NPIAS |
| DOWNEY AIRPORT (HYDE MEMORIAL) | DOWNEY | NON-NPIAS |
| DRIGGS MUNICIPAL AIRPORT (TETON PEAKS) | DRIGGS | NPIAS-L |
| EMMETT MUNICIPAL AIRPORT | EMMETT | NON-NPIAS |
| GLENNS FERRY MUNICIPAL AIRPORT | GLENNS | NON-NPIAS |
| GOODING MUNICIPAL AIRPORT | GOODING | NPIAS-M |

**Table 4.1-1 (cont.)**
**Summary of Airports by Airport Type**

| Airport Name | Network ID | Airport Type |
|---|---|---|
| HAZELTON MUNICIPAL AIRPORT | HAZELTON | NON-NPIAS |
| HOMEDALE MUNICIPAL AIRPORT | HOMEDALE | NPIAS-S |
| JEFFERSON COUNTY AIRPORT | RIGBY | NON-NPIAS |
| JEROME COUNTY AIRPORT | JEROME | NPIAS-M |
| LEE WILLIAMS MEMORIAL AIRPORT | MIDVALE | NON-NPIAS |
| MACKAY AIRPORT | MACKAY | NON-NPIAS |
| MALAD CITY AIRPORT | MALAD | NON-NPIAS |
| MOUNTAIN HOME MUNICIPAL AIRPORT | MTN HOME | NPIAS-M |
| MUD LAKE-JEFFERSON COUNTY AIRPORT | MUD LAKE | NON-NPIAS |
| MURPHY AIRSTRIP | MURPHY | NON-NPIAS |
| NAMPA MUNICIPAL AIRPORT | NAMPA | NPIAS-L |
| NEZ PERCE MUNICIPAL AIRPORT | NEZPERCE | NON-NPIAS |
| PARMA AIRPORT | PARMA | NON-NPIAS |
| PAYETTE MUNICIPAL AIRPORT | PAYETTE | NON-NPIAS |
| PRESTON AIRPORT | PRESTON | NPIAS-S |
| REXBURG AIRPORT | REXBURG | NPIAS-M_C |
| ROCKFORD MUNICIPAL AIRPORT | ROCKFORD | NON-NPIAS |
| SODA SPRINGS AIRPORT (ALLEN H. TIGERT FIELD) | SODA | NON-NPIAS |
| ST. ANTHONY MUNICIPAL AIRPORT | ST ANTHONY | NON-NPIAS |

## *Typical Pavement Cross Sections*

The following typical pavement cross sections were considered in the development of the per square foot unit costs for major rehabilitation activities based on various airport types identified.

- NPIAS Large – 4" Asphalt / 5" Aggregate Base / 12" Aggregate Subbase
- NPIAS Medium – 3" Asphalt / 4" Aggregate Base / 9" Aggregate Subbase
- NPIAS Medium (Cold) – 3" Asphalt / 4" Aggregate Base / 13" Aggregate Subbase
- NPIAS Small – 2" Asphalt / 4" Aggregate Base / 10" Aggregate Subbase
- Non-NPIAS – 2" Asphalt / 6" Aggregate Base

The standard sections are intended for planning purposes and are not intended to be a design level section and each "airport" is advised to develop a specific pavement section in accordance with the procedures set forth in AC 150/5320-6E during project level design.

## 4.2 Preventative Maintenance Policies

Preventative maintenance policies are applied in PAVER when a pavement section is above the critical PCI identified. The intention is to continually maintain a pavement section above the critical PCI through preventative maintenance activities to extend its pavement life. **Table 4.2-1** outlines the preventative maintenance policies developed for this update to the NPMS. It should be noted that the application of these treatments is most valid in year 1 of the analysis as it utilizes actual distresses observed at the time of inspection. For this update to the NPMS the analysis years considered were 2018 – 2022, therefore the maintenance recommendation presented in **Appendix D,** "Applied Policy Details – Detailed 1st Year Maintenance Recommendations", should only be considered for 2017.

**Table 4.2-1**
**ITD Preventative Maintenance by Airport Classification**

| Distress | Distress Severity | Description | 2016 Policies | |
|---|---|---|---|---|
| | | | NPIAS | Non-NPIAS |
| | | | Work Type | Work Type |
| 41 | Low | Alligator Cracking | Do Nothing | Do Nothing |
| 41 | Medium | Alligator Cracking | Patching - AC Deep | Patching - AC Deep |
| 41 | High | Alligator Cracking | Patching - AC Deep | Patching - AC Deep |
| 42 | N/A | Bleeding | Do Nothing | Do Nothing |
| 43 | Low | Block Cracking | Do Nothing | Do Nothing |
| 43 | Medium | Block Cracking | Crack Sealing - AC | Crack Sealing - AC |
| 43 | High | Block Cracking | Crack Sealing - AC | Crack Sealing - AC |
| 44 | Low | Corrugation | Do Nothing | Do Nothing |
| 44 | Medium | Corrugation | Do Nothing | Do Nothing |
| 44 | High | Corrugation | Patching - AC Shallow | Patching - AC Shallow |
| 45 | Low | Depression | Do Nothing | Do Nothing |
| 45 | Medium | Depression | Patching - AC Shallow | Do Nothing |
| 45 | High | Depression | Patching - AC Shallow | Patching - AC Shallow |
| 47 | Low | Joint Reflection Cracking | Do Nothing | Do Nothing |
| 47 | Medium | Joint Reflection Cracking | Crack Sealing - AC | Crack Sealing - AC |
| 47 | High | Joint Reflection Cracking | Crack Sealing - AC | Crack Sealing - AC |
| 48 | Low | L&T Cracking | Do Nothing | Do Nothing |
| 48 | Medium | L&T Cracking | Crack Sealing - AC | Crack Sealing - AC |
| 48 | High | L&T Cracking | Crack Sealing - AC | Crack Sealing - AC |
| 49 | N/A | Oil Spillage | Do Nothing | Do Nothing |
| 50 | Low | Patching | Do Nothing | Do Nothing |
| 50 | Medium | Patching | Do Nothing | Do Nothing |

**Table 4.2-1 (cont.)**
**ITD Preventative Maintenance by Airport Classification**

| Distress | Distress Severity | Description | 2016 Policies | |
|---|---|---|---|---|
| | | | NPIAS | Non-NPIAS |
| | | | Work Type | Work Type |
| 50 | High | Patching | Patching - AC Deep | Patching - AC Deep |
| 51 | N/A | Polished Aggregate | Do Nothing | Do Nothing |
| 52 | Low | Raveling | Do Nothing | Do Nothing |
| 52 | Medium | Raveling | Patching - AC Shallow | Do Nothing |
| 52 | High | Raveling | Patching - AC Shallow | Patching - AC Shallow |
| 53 | Low | Rutting | Do Nothing | Do Nothing |
| 53 | Medium | Rutting | Patching - AC Shallow | Do Nothing |
| 53 | High | Rutting | Patching - AC Deep | Patching - AC Deep |
| 54 | Low | Shoving | Do Nothing | Do Nothing |
| 54 | Medium | Shoving | Do Nothing | Do Nothing |
| 54 | High | Shoving | Patching - AC Shallow | Patching - AC Shallow |
| 55 | N/A | Slippage Cracking | Patching - AC Deep | Patching - AC Deep |
| 56 | Low | Swelling | Do Nothing | Do Nothing |
| 56 | Medium | Swelling | Do Nothing | Do Nothing |
| 56 | High | Swelling | Patching - AC Shallow | Patching - AC Shallow |
| 57 | Low | Weathering | Do Nothing | Do Nothing |
| 57 | Medium | Weathering | Do Nothing | Do Nothing |
| 57 | High | Weathering | Patching - AC Shallow | Patching - AC Shallow |
| 61 | Low | Blow-Up | Do Nothing | Do Nothing |
| 61 | Medium | Blow-Up | Patching - PCC Full Depth | Patching - PCC Full Depth |
| 61 | High | Blow-Up | Patching - PCC Full Depth | Patching - PCC Full Depth |
| 62 | Low | Corner Break | Do Nothing | Do Nothing |
| 62 | Medium | Corner Break | Crack Sealing - PCC | Crack Sealing - PCC |
| 62 | High | Corner Break | Patching - PCC Full Depth | Patching - PCC Full Depth |
| 63 | Low | Linear Crack | Do Nothing | Do Nothing |
| 63 | Medium | Linear Crack | Crack Sealing - PCC | Crack Sealing - PCC |
| 63 | High | Linear Crack | Patching - PCC Full Depth | Patching - PCC Full Depth |
| 64 | Low | Durability Cracking | Do Nothing | Do Nothing |
| 64 | Medium | Durability Cracking | Patching - PCC Partial Depth | Patching - PCC Partial Depth |
| 64 | High | Durability Cracking | Patching - PCC Full Depth | Patching - PCC Full Depth |
| 65 | Low | Joint Seal Damage | Do Nothing | Do Nothing |
| 65 | Medium | Joint Seal Damage | Joint Seal (Localized) | Do Nothing |
| 65 | High | Joint Seal Damage | Joint Seal (Localized) | Joint Seal (Localized) |
| 66 | Low | Small Patch | Do Nothing | Do Nothing |

**Table 4.2-1 (cont.)**
**ITD Preventative Maintenance by Airport Classification**

| Distress | Distress Severity | Description | 2016 Policies | |
|---|---|---|---|---|
| | | | NPIAS | Non-NPIAS |
| | | | Work Type | Work Type |
| 66 | Medium | Small Patch | Patching - PCC Partial Depth | Do Nothing |
| 66 | High | Small Patch | Patching - PCC Partial Depth | Patching - PCC Partial Depth |
| 67 | Low | Large Patch | Do Nothing | Do Nothing |
| 67 | Medium | Large Patch | Patching - PCC Partial Depth | Do Nothing |
| 67 | High | Large Patch | Patching - PCC Full Depth | Patching - PCC Full Depth |
| 70 | Low | Scaling | Do Nothing | Do Nothing |
| 70 | Medium | Scaling | Do Nothing | Do Nothing |
| 70 | High | Scaling | Grinding (Localized) | Grinding (Localized) |
| 71 | Low | Faulting | Do Nothing | Do Nothing |
| 71 | Medium | Faulting | Do Nothing | Do Nothing |
| 71 | High | Faulting | Grinding (Localized) | Grinding (Localized) |
| 72 | Low | Shattered Slab | Do Nothing | Do Nothing |
| 72 | Medium | Shattered Slab | Crack Sealing - PCC | Crack Sealing - PCC |
| 72 | High | Shattered Slab | Slab Replacement - PCC | Slab Replacement - PCC |
| 73 | N/A | Shrinkage Cracking | Do Nothing | Do Nothing |
| 74 | Low | Joint Spall | Do Nothing | Do Nothing |
| 74 | Medium | Joint Spall | Patching - PCC Partial Depth | Do Nothing |
| 74 | High | Joint Spall | Patching - PCC Partial Depth | Patching - PCC Partial Depth |
| 75 | Low | Corner Spall | Do Nothing | Do Nothing |
| 75 | Medium | Corner Spall | Patching - PCC Partial Depth | Do Nothing |
| 75 | High | Corner Spall | Patching - PCC Partial Depth | Patching - PCC Partial Depth |
| 76 | Low | ASR | Do Nothing | Do Nothing |
| 76 | Medium | ASR | Patching - PCC Partial Depth | Do Nothing |
| 76 | High | ASR | Slab Replacement - PCC | Slab Replacement - PCC |

## 4.3 Global Maintenance

Global maintenance activities include treatments that are applied over the entire pavement section and are intended to extend the life of the pavement section. Global maintenance treatments such as slurry seals, fog seals, and chip seals are used frequently on airports throughout Idaho. In order to be effective it is important to apply these various global maintenance treatments at the right time and to pavements that are in good condition (i.e. above the critical PCI and exhibiting only age- or climate-related distresses). However, given funding constraints these types of treatments are often applied as a band-aid to address deteriorated pavement sections.

For the purpose of this analysis a generalized global maintenance treatment referred to as "Surface Treatment" is considered. It is recommended that a crack seal is completed prior to applying the recommended global treatment. Additionally, it is the responsibility of the airport engineer(s) to determine the appropriate surface treatment to be applied based on an evaluation during project level design in addition to the functional condition identified in this report.

Based on discussions with AERO staff the following parameters were applied in the analysis:

- Surface treatments to be applied on pavements with PCIs above critical and exhibiting climate- and age-related distress (i.e. L&T cracking, weathering, and raveling)
- 7-year application interval with a 2-year increase in life
- First surface treatment to be applied at Year 3 (or as close to given other project phasing constraints) following new surface construction

## 4.4 Critical PCI Values

A pavement is considered to have reached the end of its functional life when its rideability, skid characteristics, or surface condition have deteriorated to the point where action is required to correct the deficiency. Determination of when functional failure has occurred is usually based on the results of the visual condition survey.

To estimate functional remaining life, minimum allowable levels of PCI were set for all pavements within the airport (i.e. critical PCI values). These minimum values (threshold values) were established by evaluating current pavement conditions at S78 and estimating at what condition the pavements should be rehabilitated. The available condition data, combined with the team's pavement evaluation experience at other airports, were used to establish the threshold PCI values.

**Table 4.4-1** summarizes the critical PCI values by branch use and airport classification established for the Idaho NPMS.

**Table 4.4-1**
**Critical PCI Values by Branch Use and Airport Classification**

| Airport Classification | Branch Use | | |
|---|---|---|---|
| | Runway | Taxiway | Apron |
| NPIAS | 65 | 60 | 50 |
| Non-NPIAS | 50 | 45 | 40 |

## 4.5 Unit Costs

J-U-B conducted a detailed review of recent bid tabulations from across the State of Idaho that encompassed a variety of airport construction projects in an effort to develop representative planning level unit costs for M&R activities.

### Preventative and Global Maintenance Costs

**Table 4.5-1** summarizes the unit costs applied for the preventative and global maintenance activities based on airport type.

**Table 4.5-1**
**Unit Costs for Preventative and Global Maintenance by Airport Type**

| Work Type | Units | Unit Cost | | | | |
|---|---|---|---|---|---|---|
| | | NPIAS | | | | |
| | | Large | Medium | Medium_Cold | Small | Non-NPIAS |
| Crak Sealing - AC | LF | $1.20 | $1.20 | $1.20 | $1.20 | $1.20 |
| Patching - AC Shallow | SF | $1.78 | $1.68 | $1.78 | $1.78 | $1.59 |
| Patching - AC Deep | SF | $3.37 | $2.43 | $2.57 | $1.78 | $1.59 |
| Joint Seal (Localized) | LF | $2.25 | $2.25 | $2.25 | $2.25 | $2.25 |
| Crack Sealing - PCC | LF | $2.25 | $2.25 | $2.25 | $2.25 | $2.25 |
| Grinding (Localized) | SF | $0.75 | $0.75 | $0.75 | $0.75 | $0.75 |
| Patching - PCC Partial Depth | SF | $8.00 | $8.00 | $8.00 | $8.00 | $8.00 |
| Patching - PCC Full Depth | SF | $15.00 | $15.00 | $15.00 | $15.00 | $15.00 |
| Slab Replacement - PCC | SF | $24.00 | $24.00 | $24.00 | $24.00 | $24.00 |
| Crack Seal - Surface Treatment | SF | $0.35 | $0.35 | $0.35 | $0.35 | $0.35 |

### Major Rehabilitation Costs

The PAVER software utilizes a cost by PCI relationship when determining the anticipated costs for major rehabilitation activities. The costs per square foot for major rehabilitation presented in **Table 4.5-2** were developed using the typical pavement sections outlined in **Section 4.1** and the notes presented at the bottom of the table.

**Table 4.5-2**
**Unit Costs for Major Rehabilitation by Airport Type**

| | Unit Cost ($/SF) | | | | |
|---|---|---|---|---|---|
| | NPIAS | | | | |
| PCI | Large | Medium | Medium_Cold | Small | Non-NPIAS |
| 100 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |
| 90 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |
| 80 | $1.00 | $0.75 | $0.75 | $0.50 | $0.00 |
| 70 | $1.40 | $1.15 | $1.15 | $0.90 | $0.25 |
| 60 | $1.40 | $1.15 | $1.15 | $0.90 | $0.50 |
| 50 | $1.40 | $1.15 | $1.15 | $0.90 | $0.90 |
| 40 | $11.19 | $7.46 | $9.24 | $7.44 | $3.96 |
| 30 | $11.19 | $7.46 | $9.24 | $7.44 | $3.96 |
| 20 | $11.19 | $7.46 | $9.24 | $7.44 | $3.96 |
| 10 | $11.19 | $7.46 | $9.24 | $7.44 | $3.96 |
| 0 | $11.19 | $7.46 | $9.24 | $7.44 | $3.96 |

Notes:
NPIAS Large – Critical PCI to 40: 2" AC Mill and Replace
NPIAS Medium – Critical PCI to 40: 1.5" AC Mill and Replace
NPIAS Small/Non-NPIAS – Critical PCI to 40: 1" AC Mill and Replace
Less than 40 – Full-depth Reconstruction
PCC Reconstruction Assumed to be $15.00/SF

# CHAPTER 5 – REHABILITATION RECOMMENDATIONS

This chapter will address typical maintenance and rehabilitation (M&R) questions: how much money is needed in the coming years to maintain the pavements, within an unlimited budget; which pavements will be maintained each year; and what type of M&R should be applied.

Decision makers need to understand the impact on budgetary needs based on current and predicted conditions. Annual budgetary needs can be established within PAVER to maintain the pavements in an acceptable condition. The needs are estimated on the section level by projecting the year at which each individual section will deteriorate below the critical PCIs and multiplying the section area by the unit M&R cost relationship (refer to **Table 4.5-2** shown in the previous Chapter).

The assumption that the PCI will return to 100 after an overlay or reconstruction activity is completed and that the PCI will only slightly increase after a preventive or global maintenance activity is applied.

PAVER utilizes the preventive maintenance policies presented in Chapter 4 to estimate budget requirements for maintenance activities in the first year of the work plan. The budget for subsequent years is based on the unit M&R cost relationship as described in Chapter 4.

This chapter presents the results of the PAVER analysis for S78 as well as the recommended 5-year CIP.

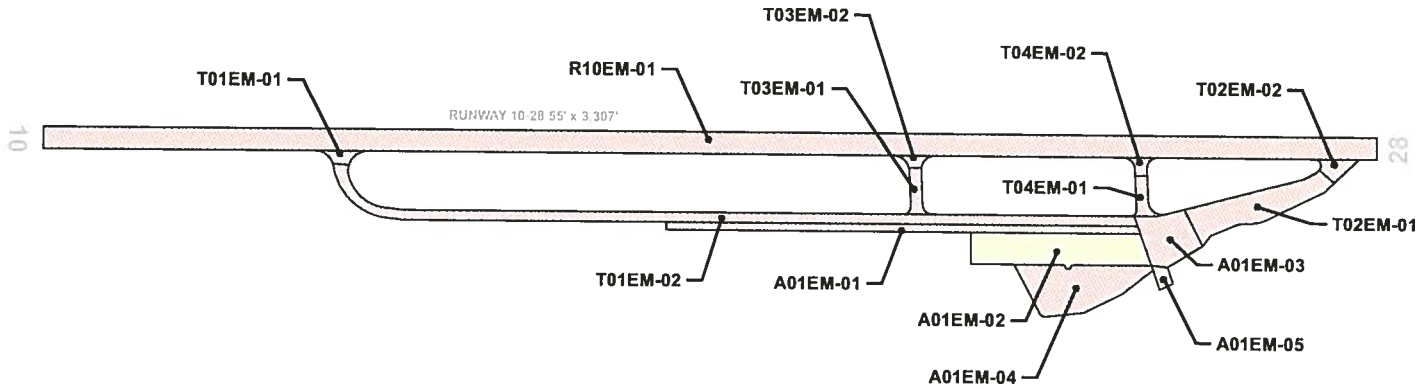
## 5.1 PAVER Unlimited Budget Analysis

Given the uncertainty in the availability of funding an unlimited budget analysis was completed to evaluate the worst case scenario and identify all pavement related needs. AERO did provide Kimley-Horn with their currently planned statewide CIP for 2016 and 2017 so that data was utilized when developing the recommended 5-year CIP. A 5-year planning period (2018-2022) was utilized for the analysis at S78.

**Table 5.1-1** and **Figure 5.1-1** summarize the results of the unlimited budget analysis for S78. The fluctuation in the M&R costs is due to M&R being applied primarily in year one due to the unlimited funding nature of the analysis scenario. The results of the PAVER analysis will be used as the basis for developing the recommended 5-year CIP presented in Section 5.2.

**Table 5.1-1**
**Summary of 5-year M&R Needs Identified by PAVER Unlimited Budget Analysis**

| Year | Branch ID | Section ID | Area (SF) | PCI at Treatment | Recommended Treatment | Unit Cost | Total Cost |
|---|---|---|---|---|---|---|---|
| 2018 | A01EM | 1 | 23,436 | 78 | Surface Treatment | $0.35 | $8,203 |
| 2018 | A01EM | 3 | 15,810 | 81 | Surface Treatment | $0.35 | $5,534 |
| 2018 | A01EM | 4 | 29,709 | 75 | Surface Treatment | $0.35 | $10,398 |
| 2018 | A01EM | 5 | 1,978 | 73 | Surface Treatment | $0.35 | $692 |
| 2018 | R10EM | 1 | 181,885 | 78 | Surface Treatment | $0.35 | $63,660 |
| 2018 | T01EM | 1 | 2,152 | 80 | Surface Treatment | $0.35 | $753 |
| 2018 | T01EM | 2 | 51,361 | 78 | Surface Treatment | $0.35 | $17,977 |
| 2018 | T02EM | 1 | 24,679 | 81 | Surface Treatment | $0.35 | $8,638 |
| 2018 | T02EM | 2 | 3,330 | 84 | Surface Treatment | $0.35 | $1,166 |
| 2018 | T03EM | 1 | 3,676 | 77 | Surface Treatment | $0.35 | $1,287 |
| 2018 | T03EM | 2 | 1,466 | 83 | Surface Treatment | $0.35 | $513 |
| 2018 | T04EM | 1 | 3,457 | 82 | Surface Treatment | $0.35 | $1,210 |
| 2018 | T04EM | 2 | 1,673 | 83 | Surface Treatment | $0.35 | $586 |
| | | | | | | *2018 Total:* | *$120,615* |
| 2020 | A01EM | 2 | 33,943 | 81 | Surface Treatment | $0.35 | $11,880 |
| | | | | | | *2020 Total:* | *$11,880* |
| | | | | | | *5-Year Total:* | *$132,495* |




**Legend**

| | |
|---|---|
| 2018 Surface Treatment | 2018 Major Rehabilitation |
| 2019 Surface Treatment | 2019 Major Rehabilitation |
| 2020 Surface Treatment | 2020 Major Rehabilitation |
| 2021 Surface Treatment | 2021 Major Rehabilitation |
| 2022 Surface Treatment | 2022 Major Rehabilitation |

Kimley»Horn

Figure 5.1-1

PAVER 5-Year Capital Improvement Program

*Idaho Transportation Department Division of Aeronautics*

*Airport ID*

S78

## 5.2 Recommended 5-Year CIP

This section is a culmination of what has been evaluated and used in the development of the recommended CIP plan for S78. The results as presented in this section will vary from what is presented in the previous section based on other considerations including AERO's currently programmed CIP for 2016 and 2017, additional costs necessary to account for total project costs, as well as project packaging to optimize funding dollars, overall operations, and construction logistics throughout the airport. The recommended CIP, as outlined, should enable the airport to maintain the existing airport infrastructure at an acceptable condition, properly allocate funding, and apply M&R activities in a timely manner in the upcoming years.

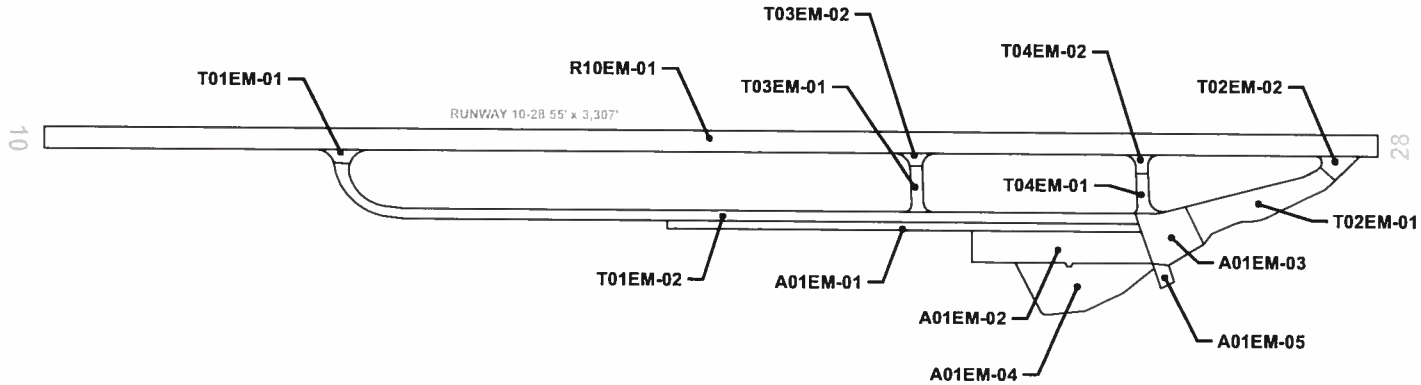
### Project Packaging and CIP Development Considerations

The PAVER analysis results presented previously provide a good baseline for the development of a 5-year CIP; however, such a program has limitations. For example, rehabilitation projects are recommended based only on functional pavement condition under an unlimited budget scenario and oftentimes this results in adjacent pavement sections being recommended for rehabilitation in different years requiring multiple mobilizations to remote locations in Idaho and multiple operational disruptions. In addition, PAVER only takes into account the cost of the pavements and not the overall projects. In an effort to provide the most logical CIP recommendations and costs it is necessary to consider other factors such as construction phasing, operational impacts, and currently planned rehabilitation projects when developing the recommended CIP.

In order to develop a realistic 5-year CIP for S78 the following items were considered using the PAVER recommendations presented in Section 5.1 as the basis:

- Adjacent pavement sections recommended for M&R were grouped into logical construction projects.
- Prioritization was based on condition and distress types present.
- Pavement sections that were "granted" in the Idaho Statewide Capital Improvement Program (ISCIP) for 2016 or 2017 were manually removed from the recommended CIP.
- Recently rehabilitated pavement sections had a surface treatment manually applied as near to year three as possible assuming alignment with another recommended project.
- All sections recommended for complete reconstruction or an asphalt mill and replace in the 5-year CIP have a crack seal and surface treatment recommended at year three (or as near as possible), i.e. a pavement section recommended for a mill and replace in 2018 will have a planned surface treatment in 2021.

S78's recommended 5-year CIP is simplified and graphically presented in **Figures 5.2-1** and **5.2-2** for major rehabilitation and surface treatments, respectively.




**Legend**

- 2018 Major Rehabilitation
- 2019 Major Rehabilitation
- 2020 Major Rehabilitation
- 2021 Major Rehabilitation
- 2022 Major Rehabilitation
- No Rehabilitation

Kimley»Horn

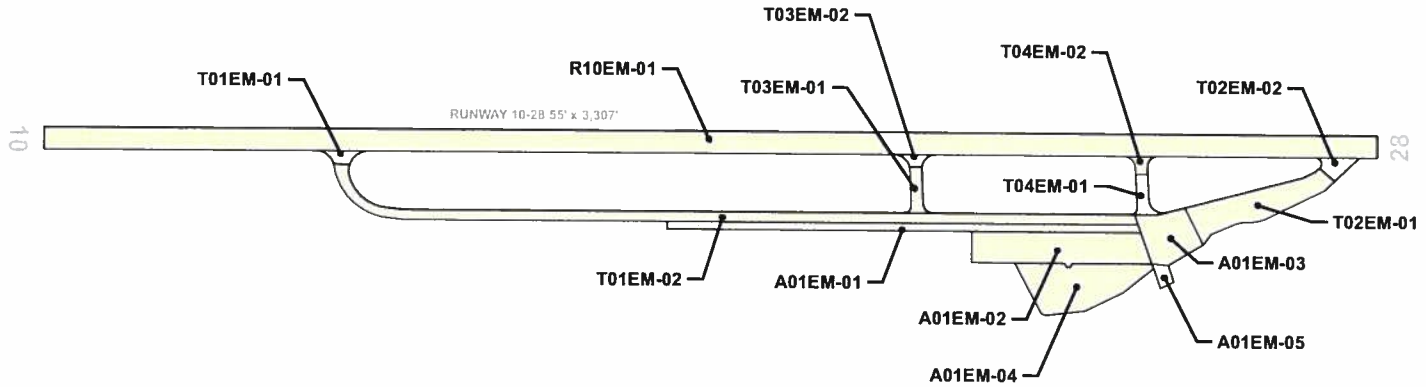
Figure 5.2-1

**Recommended 5-Year Capital Improvement Program**

*Airport ID*

**S78**

***Idaho Transportation Department Division of Aeronautics***




**Legend**

- 2018 Surface Treatment
- 2019 Surface Treatment
- 2020 Surface Treatment
- 2021 Surface Treatment
- 2022 Surface Treatment
- No Rehabilitation

Kimley»Horn

Figure 5.2-2

**Recommended 5-Year Capital Improvement Program**

*Airport ID*

**S78**

*Idaho Transportation Department Division of Aeronautics*

## Development of Project Specific Cost Estimates

The PAVER software produces cost estimates based on a unit cost per square foot for pavement related (hard costs) costs only as presented in Chapter 4. In an effort to develop realistic project specific cost estimates that AERO can trust for future planning purposes our team developed realistic cost estimates outside of the PAVER program to include additional construction items and soft costs including items such as airfield electrical improvements / upgrades, costs for unknown utilities, future planned underground drainage improvements, construction costs (including quality control and construction administration), general administration costs, and professional services for design and construction. The raw costs for the pavement materials were the basis for developing the cost estimates and those costs were increased based on applied percentages related to these items. A discussion of each of these items is presented below.

- Drainage/Electrical/Misc. Improvements – 8% of raw pavement costs (only considered for complete reconstruction)
- QA/QC Testing – 3% of raw pavement costs plus drainage/electrical/misc. improvements (only considered for complete reconstruction and mill/replace)
- Construction Administration – 10% of raw pavement costs plus drainage/electrical/misc. improvements plus construction administration
- General Project Administration - 1% of total construction costs
- Professional Design Fee – 10% of total construction costs

**Table 5.2-1** summarizes the project specific cost estimates based on the recommended 5-year CIP for S78.

## Detailed 1st Year Maintenance Needs

This analysis was performed to estimate the amount of preventative maintenance activities that are recommended based on the preventative maintenance policies to maintain the pavements that have a PCI value above the critical PCI value at a high level. PAVER develops specific (type and quantity of repair) maintenance recommendations for year 1 of the analysis using the extrapolated distresses developed based on actual field data collected during the PCI surveys. The analytical process for year 1 of the analysis develops a more accurate plan for identifying maintenance needs as compared to future years. Given that specific distress types and severity present are unknown for future years, 2 through 5, of the analysis PAVER applies a unit cost ($/sf) based on PCI for each individual pavement section having a PCI greater than the critical.

In order to determine the budget needs for preventative maintenance activities in year 1 of the analysis a "Consequence of Localized Distress Maintenance" scenario was simulated. Applying the recommended preventative maintenance activities will increase the area-weighed PCI value of the network only slightly; however, it is expected that applying such maintenance on an annual

basis will extend the life of the pavements that have PCI values greater than the critical PCI values identified. It should be noted that applying preventative maintenance to pavements below the critical PCI value is not a cost-effective way to manage your pavement infrastructure. The detailed year 1 recommended preventative maintenance recommendations are presented in **Appendix D**.

**Table 5.2-1**
**S78 Recommended 5-year CIP Summary Table**

| | | | | | | PAVER Output | | | | Soft Costs | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Branch ID | Section ID | Area (SF) | PCI at Treatment | Recommended Treatment | Unit Cost | Total Cost | Drainage/ Elec./Misc. | QA/QC Testing | Construction Administration | Admin Costs | Design Fee | Total Cost |
| 2020 | A01EM | 1 | 23,436 | 74 | Surface Treatment | $0.35 | $8,203 | | | $820 | $90 | $902 | $10,015 |
| 2020 | A01EM | 2 | 33,943 | 81 | Surface Treatment | $0.35 | $11,880 | | | $1,188 | $131 | $1,307 | $14,506 |
| 2020 | A01EM | 3 | 15,810 | 77 | Surface Treatment | $0.35 | $5,534 | | | $553 | $61 | $609 | $6,756 |
| 2020 | A01EM | 4 | 29,709 | 72 | Surface Treatment | $0.35 | $10,398 | | | $1,040 | $114 | $1,144 | $12,696 |
| 2020 | A01EM | 5 | 1,978 | 69 | Surface Treatment | $0.35 | $692 | | | $69 | $8 | $76 | $845 |
| 2020 | R10EM | 1 | 181,885 | 75 | Surface Treatment | $0.35 | $63,660 | | | $6,366 | $700 | $7,003 | $77,729 |
| 2020 | T01EM | 1 | 2,152 | 76 | Surface Treatment | $0.35 | $753 | | | $75 | $8 | $83 | $920 |
| 2020 | T01EM | 2 | 51,361 | 75 | Surface Treatment | $0.35 | $17,977 | | | $1,798 | $198 | $1,977 | $21,949 |
| 2020 | T02EM | 1 | 24,679 | 77 | Surface Treatment | $0.35 | $8,638 | | | $864 | $95 | $950 | $10,547 |
| 2020 | T02EM | 2 | 3,330 | 80 | Surface Treatment | $0.35 | $1,166 | | | $117 | $13 | $128 | $1,423 |
| 2020 | T03EM | 1 | 3,676 | 74 | Surface Treatment | $0.35 | $1,287 | | | $129 | $14 | $142 | $1,571 |
| 2020 | T03EM | 2 | 1,466 | 80 | Surface Treatment | $0.35 | $513 | | | $51 | $6 | $56 | $626 |
| 2020 | T04EM | 1 | 3,457 | 78 | Surface Treatment | $0.35 | $1,210 | | | $121 | $13 | $133 | $1,477 |
| 2020 | T04EM | 2 | 1,673 | 80 | Surface Treatment | $0.35 | $586 | | | $59 | $6 | $64 | $715 |
| | | | | | | | | | | | | *Total for 2020:* | *$161,777* |

# CHAPTER 6 – PAVEMENT MANAGEMENT IMPLEMENTATION

It is recommended that the NPMS be updated every 3-years in order to accurately plan for M&R needs.

## 6.1 Project Level Rehabilitation Projects (Design Level)

Prior to implementing major rehabilitation projects, it is recommended that S78 and their consultant perform a full project level evaluation of the specific section(s) of pavements during the design process. Specific pavement rehabilitation alternatives can then be developed based on specific conditions at the time of rehabilitation and a recommended alternative can then be selected after a life-cycle cost analysis is performed.

## 6.2 Re-Inspection of Pavements

A high priority should be given for continuous maintenance and re-inspection of all of S78's pavements to ensure continued safe aircraft operations. While deterioration of the pavements due to usage and exposure to the environment cannot be completely prevented, applying timely and effective maintenance strategies can slow the anticipated rate of deterioration. Lack of adequate and timely maintenance is the greatest single cause of pavement deterioration.

### Re-Inspection Schedules

A series of scheduled periodic inspections must be carried out for an effective maintenance program. Re-inspection of pavements should be scheduled to ensure that all areas, particularly those that may not come under day-to-day observation, are thoroughly evaluated and reported. Thorough inspections of all paved areas should be scheduled accordingly.

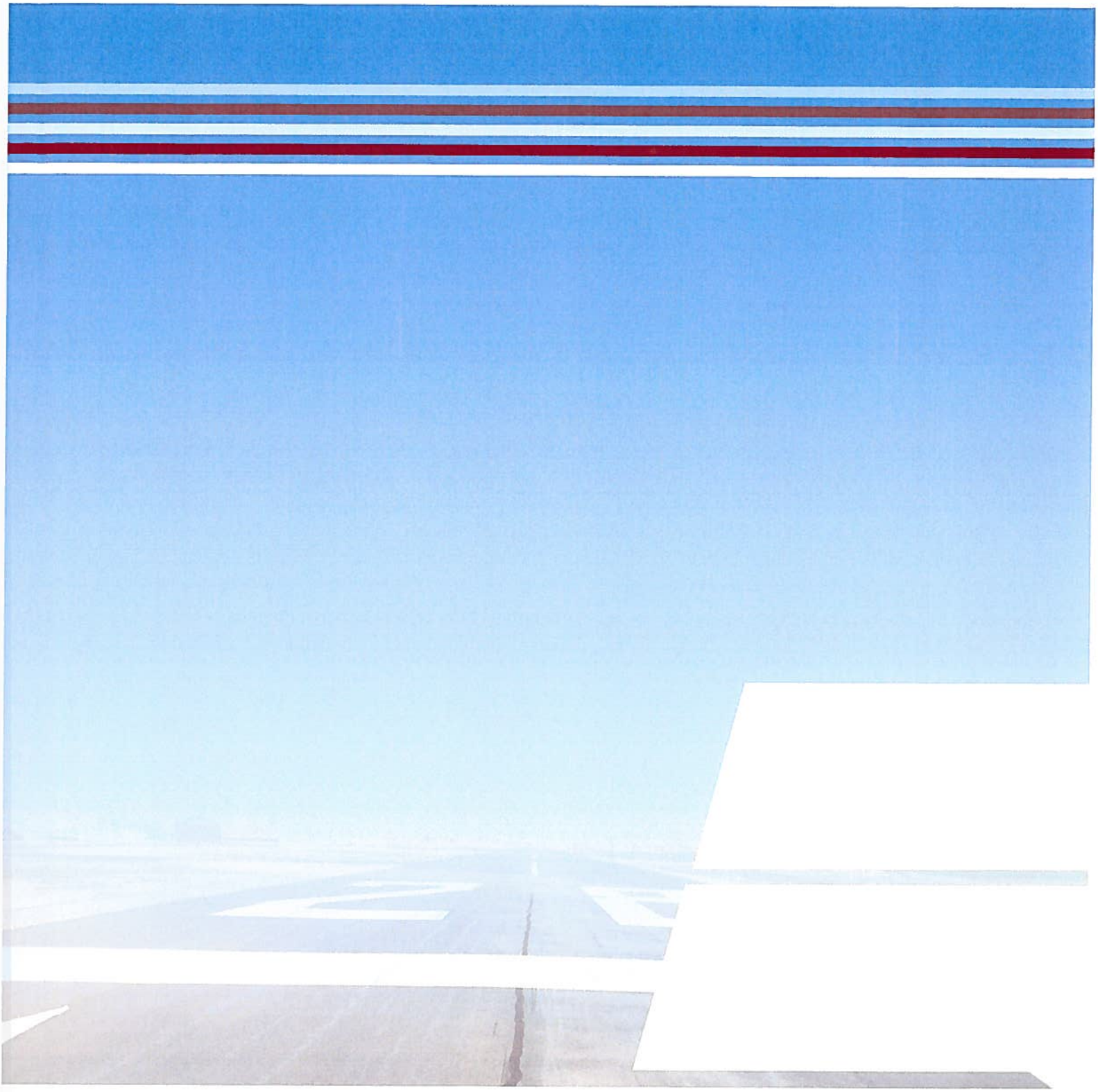
It is recommended that a PCI survey be performed and the PAVER database be updated on a three-year basis for each pavement section of the network.

## 6.3 Recommendations

The following recommendations are made to fully implement a pavement management program for S78.

### Recommendations

- Develop a detailed preventative maintenance program for S78.
- Further refine and implement the updated recommended rehabilitation program for S78.
- Maintain the PAVER program either through a consultant or trained in-house staff.
- Routinely update PAVER with new construction and maintenance cost data.
- Update the NPMS on a three-year cycle to see the greatest benefit.
- Develop a Statewide Pavement Design Criteria Report with design guidelines for each subsequent design project(s) that will take into consideration the recommendations of this report.




Kimley»Horn

111 West Jackson Boulevard
Suite 700
Chicago IL 60604

**CRAIG WEST, P.E.**
craig.west@kimley-horn.com
312.924.7429


# APPENDIX E

## Land Agreement and Easement Conveyance

# AGREEMENT

AGREEMENT MADE, effective as of October 11, 1989, by and between JAY L. MORRIS and JUDY MORRIS, husband and wife, of 316 Wilson Avenue, Emmett, Idaho, hereinafter referred to as Owners, and THE CITY OF EMMETT, GEM COUNTY, IDAHO, hereinafter called City.

FOR GOOD AND VALUABLE CONSIDERATION, the receipt of which is hereby acknowledged, the parties agree as follows:

## SECTION ONE
## CONVEYANCE OF EASEMENT

Owners hereby grant and convey to City an easement for use as an airport runway safety overrun over and across the property owned by Owners and described as follows:

An easement 200.00 feet in width lying within the NE1/4 SW1/4, SE1/4 SW1/4, and NW1/4 SE1/4 all in Section 14, T. 6 N., R. 2 W., B.M., Gem County, Idaho, more particularly described as follows:

Commencing at the Northeast corner of the SE1/4 SW1/4, Section 14, T. 6 N., R. 2 W., B.M., said point beint the TRUE POINT OF BEGINNING.

thence South 0°18'50" West 79.36 feet along the Easterly boundary of the said SE1/4 SW1/4, Section 14 to a point;

thence North 63°17'02" West 697.55 feet along a line parallel to and 100.00 feet Southwesterly from the extended centerline of the Emmett Municipal Airport runway to a point;

thence North 54°20'15" East 225.71 feet along a line parallel to and 110.00 feet Southeasterly from the centerline of the Idaho Northern Railroad to a point;

thence South 63°17'02" East 815.58 feet along a line parallel to and 100.00 feet Northeasterly from the said extended centerline of the Emmett Municipal Airport runway to a point on the Southerly boundary of the NW1/4 SE1/4, said Section 14;

thence North 89°50'03" West 288.38 feet along said Southerly boundary of the NW1/4 SE1/4, Section 14 to the point of beginning;

SECTION TWO
CONSTRUCTION AND MAINTENANCE

The airport runway safety overrun described above shall be constructed and maintained in good repair by City at its sole cost and expense.

SECTION THREE
DURATION OF EASEMENT

This easement shall continue as long as the City continues to operate an airport on property adjacent to the property which is the subject of this easement. In the event the City discontinues the operation of this airport, this easement shall cease and be of no further force or effect.

SECTION FOUR
USE OF OWNERS' PROPERTY

Owners shall not make any use of their property which is inconsistent or interferes with the easement described hereinabove.

SECTION FIVE
SUCCESSORS AND ASSIGNS

This agreement shall be binding upon the heirs, personal representatives, successors, and assigns of the parties to this agreement.

IN WITNESS WHEREOF, each party to this agreement has caused it to be executed in Emmett, Idaho, on the day indicated below.

OWNER:

JAY L. MORRIS

JUDY MORRIS

CITY OF EMMETT, GEM COUNTY, IDAHO

By: MARILYN LORENZEN
Mayor

Attest: CECILE JENSEN
City Clerk

STATE OF IDAHO )
) ss.
County of Gem )

On this 11 day of October, 1989, before me, the undersigned, a Notary Public for Idaho, personally appeared JAY L. MORRIS and JUDY MORRIS, husband and wife, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I hereunto set my hand and affixed my official seal the day and year in this certificate first bove written.

Cecile L. Lorenzen

Notary Public for Idaho
Residing at Emmett, Idaho
My Commission Expires 1992

STATE OF IDAHO )
) ss.
County of Gem )

On this 11 day of October, 1989, before me, the undersigned, a Notary Public for Idaho, personally appeared MARILYN LORENZEN, known to me to be the Mayor of the City of Emmett, Gem County, Idaho, that executed said instrument, and acknowledged to me that such City of Emmett, Gem County, Idaho, executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Cecile L. Lorenzen

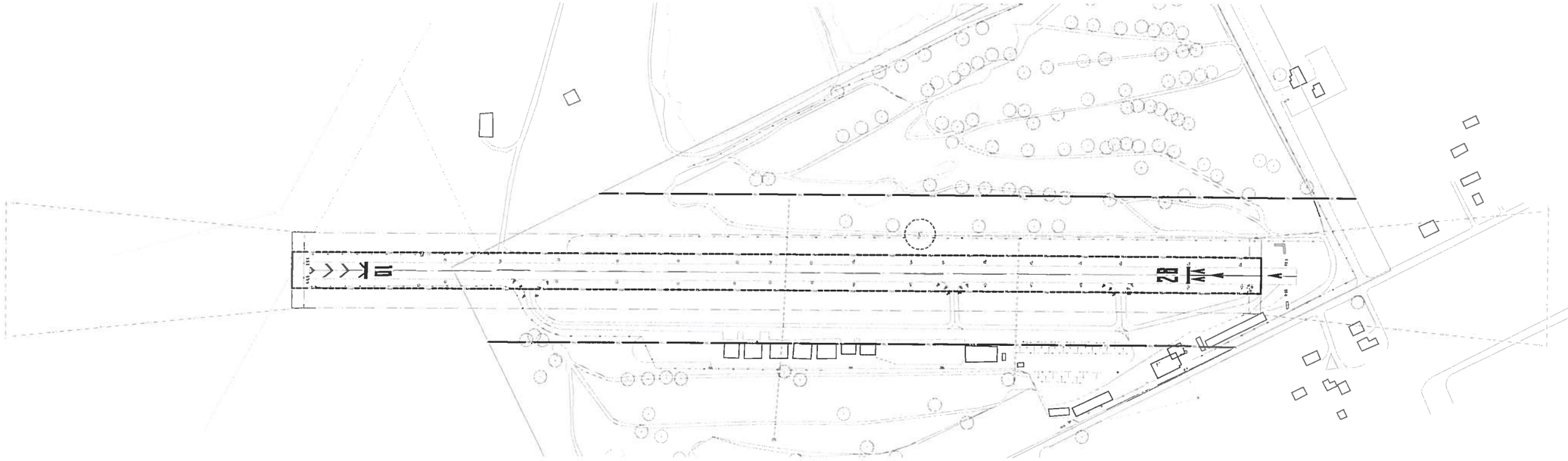
Notary Public for Idaho
Residing at Emmett, Idaho
My Commission Expires 1992

# APPENDIX F

## Drawings

# EMMETT MUNICIPAL AIRPORT

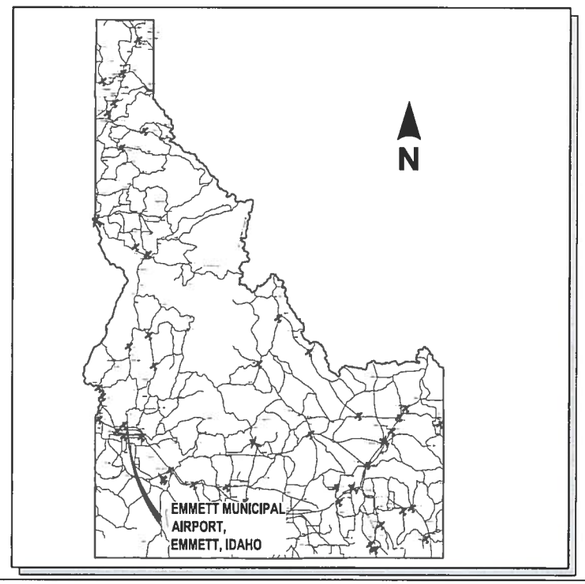
## MAY, 2017




| DRAWING INDEX | |
|---|---|
| SHEET | TITLE |
| 1 | COVER SHEET |
| 2 | AIRPORT LAYOUT PLAN |
| 3-4 | AIRPORT AIRSPACE DRAWING |
| 5 | AIRPORT PROPERTY MAP - EXIBIT A |

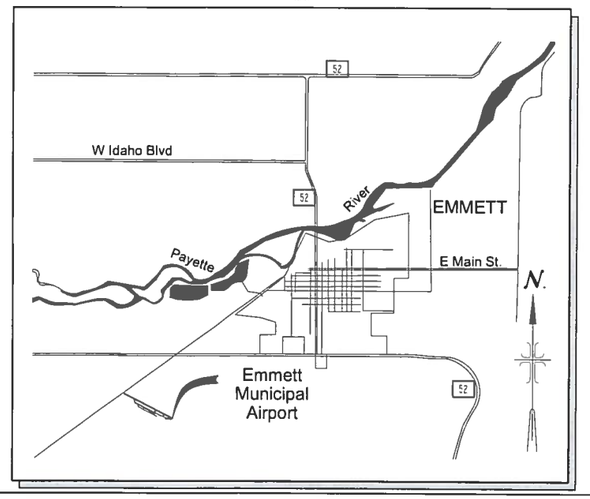
LOCATION MAP

N.T.S.




VICINITY MAP

N.T.S.




**GENERAL NOTES**

1. "THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION (AIP _-_-____-___) AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DRAWINGS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

**OWNER:**

CITY OF EMMETT
MAYOR: GORDON PETRIE

AIRPORT MANAGER: BRUCE EVANS
PHONE: (208)-365-9569

RIEDESEL Engineering
850 East Franklin Road, Suite #408A
Meridian, Id. 83642
Phone: (208) 898-9165
Fax: (208) 734-2748



REVISIONS

| NO | DATE | BY | DESCRIPTION |
|---|---|---|---|
| 1 | --- | --- | --- |
| 2 | --- | --- | --- |
| 3 | --- | --- | --- |
| 4 | --- | --- | --- |
| 5 | --- | --- | --- |
| 6 | --- | --- | --- |

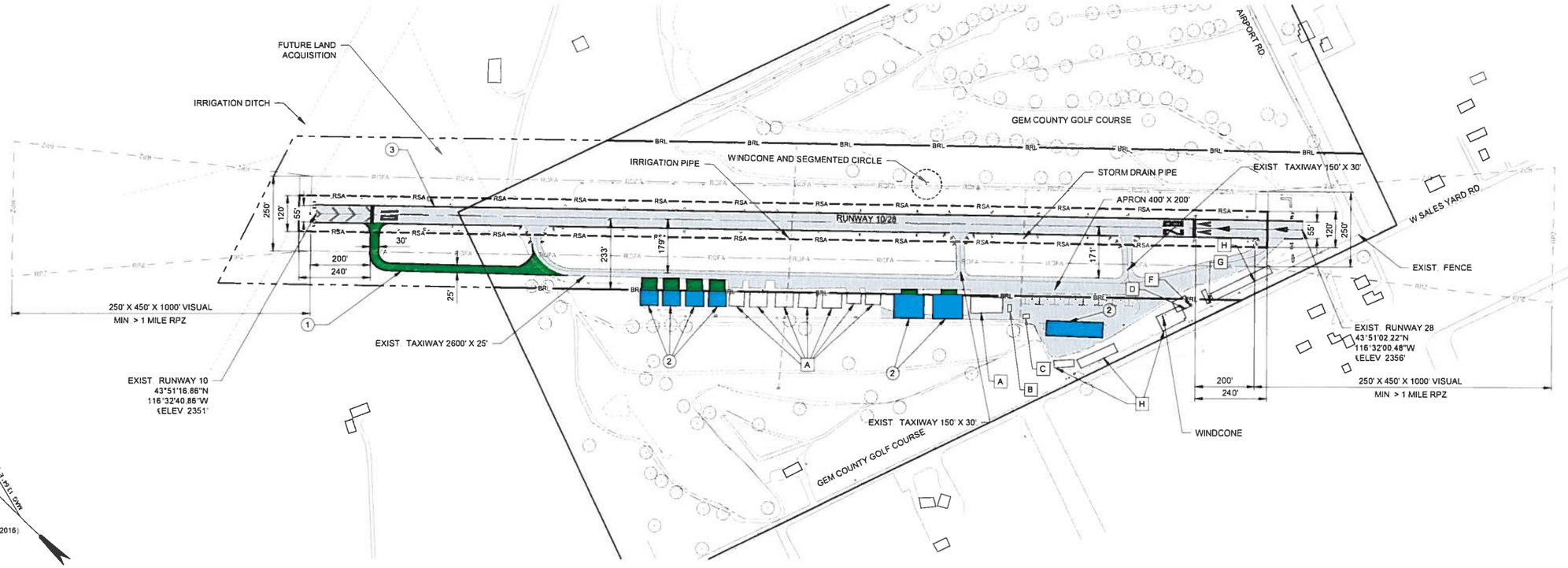
EMMETT MUNICIPAL AIRPORT
CITY OF ENNETTM, IDAHO
KEY NO. NP83711

COVER SHEET

PRELIMINARY NOT FOR CONSTRUCTION

| | |
|---|---|
| DESIGNED | EW |
| DESIGN CHECKED | MMG |
| DETAILED | EW |
| DRAWING CHECKED | MMG |
| FILE NAME | 2654-COVER dwg |
| DRAWING DATE | 5/18/17 |
| DRAWING SCALE | AS SHOWN |
| SHEET | 1 OF 5 |

LOT DATE: 5/22/2017
\2654 EMMETT MUNICIPAL AIRPORT\CADD\CIVIL 3D\DRAWINGS\2654-COVER.DWG




## ULTIMATE AIRPORT IMPROVEMENTS

| # | IMPROVEMENT |
|---|---|
| 1 | PROPOSED TAXIWAY |
| 2 | FUTURE HANGARS |
| 3 | RUNWAY 10/28 WIDENING AND EXTENSION |
| 4 | RUNWAY LIGHTING/ELECTRICAL VAULT |
| 5 | FUTURE FBO/ PILOT'S LOUNGE AND RESTROOM AREA |
| 6 | FUTURE PUBLIC PARKING AREA |

## AIRPORT DATA TABLE

| | EXISTING | ULTIMATE (U) |
|---|---|---|
| Airport Classification | Arc A-1 small | Arc B-1 small |
| Airport Elevation (NAVD 88) | 3307' | Same |
| Airport Reference Point (ARP) Coordinates (NAD 27) Lat / Long | ? | ? |
| Normal Maximum Temperature, Hottest Month | 90° F | Same |
| Airport Functional Role | General Aviation | Same |
| Visual & Electronic Navaids | Lighted Windcone Segmented Circle Rotating Beacon | PAPI |
| Base Aircraft | 21 | ? |
| Hangars | 7 - Private | ? |
| Pilot/Visitor Servics | Restroom, Cafe, Telephone | Picnicking, etc. |

## RUNWAY 12/30 DATA TABLE

| | RUNWAY 12/30 | |
|---|---|---|
| | EXISTING (E) | ULTIMATE (U) |
| RUNWAY DIMENSIONS | | |
| - Length | 3307' | Same |
| - Width | 55' | 60' |
| Runway 10 Elevation (NAVD 88) | 2351' | Same |
| Runway 28 Elevation (NAVD 88) | 2356' | Same |
| Runway 10 End Coordinates Lat (WGS84) | N 43° 51' 16" | Same |
| Long (WGS84) | W 116° 32' 40" | Same |
| Runway 28 End Coordinates Lat (WGS84) | N 43° 51' 02" | Same |
| Long (WGS84) | W 116° 32' 00" | Same |
| Effective Runway Gradient (In %) | 0.1% | Same |
| Runway Operational Surfaces | Asphalt | Same |
| Pavement Strength (Single Wheel) | 8,000 lbs | Same |
| Approach Category | Visual | Same |
| Approach Visibility Minimums | Vis. Min ≥ 1 Mi. | Same |
| Runway Line-of-Sight | Does Meet Criteria | Same |
| Part 77 Approach Slope-Runway 10 | Visual 20:1 | Same |
| Part 77 Approach Slope-Runway 28 | Visual 20:1 | Same |
| Runway Lighting | MIRL | PAPI/REIL |
| Runway Marking | Visual | Same |
| RUNWAY SAFETY AREA (RSA) DIMENSIONS | | |
| - Width | 120' | Same |
| - Length Beyond Ends | 240' | Same |
| OBJECT FREE AREA (OFA) DIMENSIONS | | |
| - Width | 250' | Same |
| - Length Beyond Ends | 240' | Same |
| Visual Approach Aids | None | None |

## BUILDING & USE TABLE

| # | DESCRIPTION | OWNER |
|---|---|---|
| A | PRIVATE HANGAR | N/A |
| B | FUEL STATION | STEVE & NADINE BURAK |
| C | PILOT RESTROOM | STEVE & NADINE BURAK |
| D | RESTAURANT | GEM COUNTY GOLF ASSOCIATION |
| E | PUBLIC HANGAR | CITY OF EMMETT |
| F | WELL HOUSE | N/A |
| G | GOLF CART SHED | GEM COUNTY GOLF ASSOCIATION |
| H | PUBLIC HANGAR | CITY OF EMMETT |

APPROVAL OF
ITD DIVISION OF AERONAUTICS

APPROVAL BLOCK

BILL STATHAM PROJECT MANAGER — DATE

SUBMITTED TO ITD DIVISION OF AERONAUTICS BY RIEDESEL ENGINEERING, INC.
DATE:

APPROVAL BLOCK

CITY OF EMMETT MAYOR — DATE

## LEGEND

| Existing | Ultimate (U) | |
|---|---|---|
| | | Barbed Wire Fence |
| | | Airport Property Line |
| | | Easement |
| | | Wind Cone |
| | | Buildings |
| | | Power Poles - Overhead |
| | | Overhead Power Line |
| | | Precision Approach Path Indicator (PAPI) |
| | | Light Pole |
| | | Wind Cone & Segmented Circle |
| | | Drop Inlet |
| | | Pavement |
| | | Gravel |
| | | Tree |
| | | Ditch |
| | | Runway Object Free Area (OFA) |
| | | Runway Safety Area (RSA) |
| | | Runway Protection Zone (RPZ) |
| | | Building Restriction Line (BRL) |
| | | Power Distribution Block |
| | | Runway Threshold Light |
| | | Runway Edge Light |
| | | Taxiway Edge Light |
| | | Power Box |
| | | Chain Link Fence |

RIEDESEL Engineering
850 East Franklin Road
Suite #408A
Meridian, Id. 83642
Phone: (208) 898-9165
Fax: (208) 744-2748



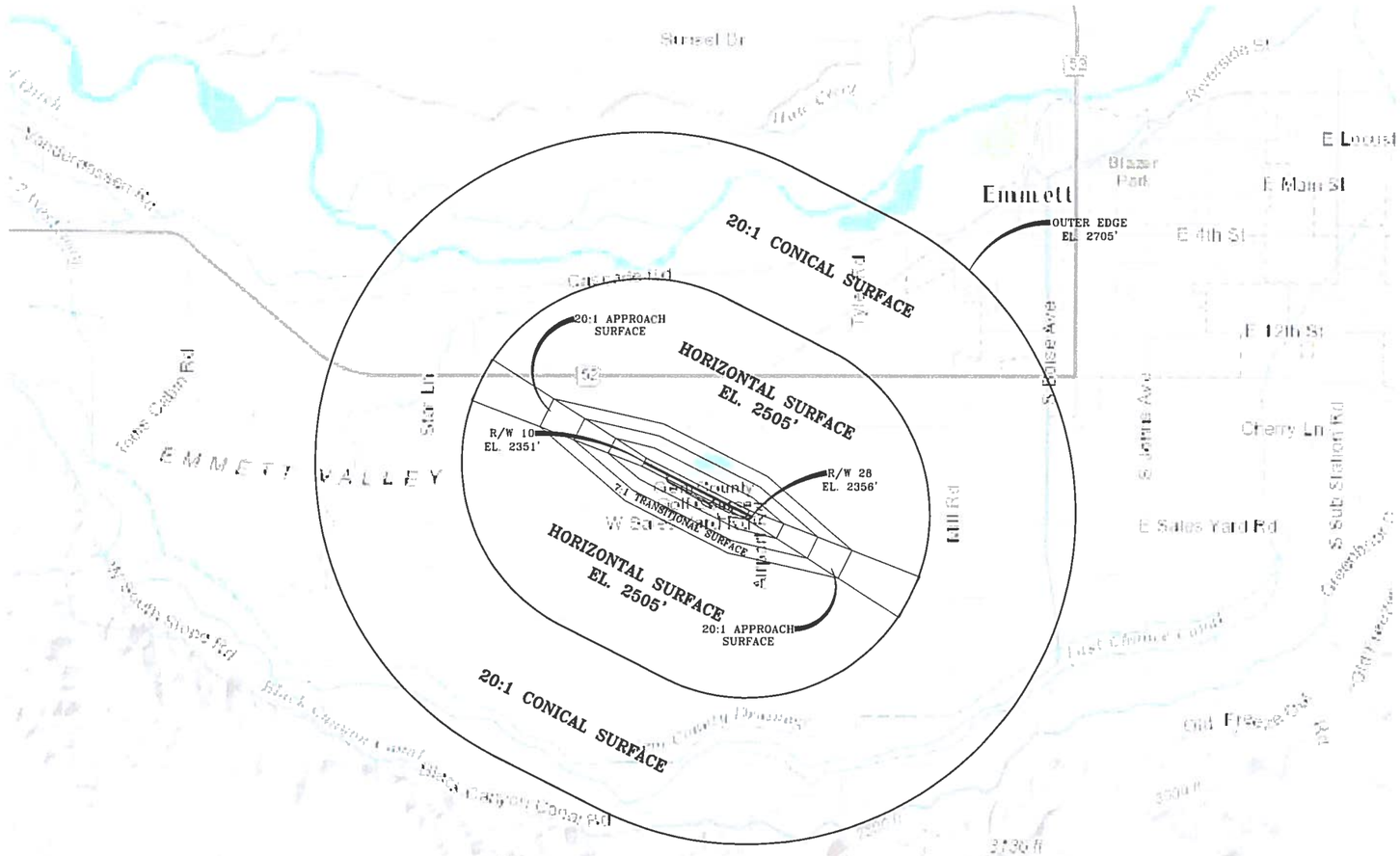
| NO | DATE | BY | REVISIONS DESCRIPTION |
|---|---|---|---|
| 1 | --- | --- | --- |
| 2 | --- | --- | --- |
| 3 | --- | --- | --- |
| 4 | --- | --- | --- |
| 5 | --- | --- | --- |
| 6 | --- | --- | --- |

# EMMETT MUNICIPAL AIRPORT
CITY OF EMMETT, IDAHO
KEY NO. NP83711

## AIRPORT LAYOUT PLAN

| | |
|---|---|
| DESIGNED | EW |
| DESIGN CHECKED | MGG |
| DETAILED | EW |
| DRAWING CHECKED | MGG |
| FILE NAME | 2654-ALP-1 dwg |
| DRAWING DATE | 5/18/17 |
| DRAWING SCALE | AS SHOWN |
| SHEET | 2 OF 5 |

PLOT DATE: 5/22/2017
Z:\2654 EMMETT MUNICIPAL AIRPORT\CADD\CIVIL 3D\DRAWINGS\2654-ALP-1.DWG




2000 1000 0 2000 4000 6000

SCALE IN FEET

SOURCE
N.O.A.A. (2016)

MAG 13.6°E (2016)

0 1000 2000 4000

HORIZONTAL (FT)
HORIZ. DATUM: NAD 83
VERT. DATUM: NAVD 88

GENERAL NOTES
THIS AIRPORT AIRSPACE DRAWING IS BASED FROM THE OCTOBER 1998 AIRPORT LAYOUT PLAN UPDATE. NO FURTHER OBSTRUCTION SURVEY WAS COMPLETED AS PART OF THE 2010 UPDATE

RIEDESEL Engineering
850 East Franklin Road, Suite #408A
Meridian, Id. 83642
Phone: (208) 898-9165
Fax: (208) 734-2748



REVISIONS

| NO | DATE | BY | DESCRIPTION |
|---|---|---|---|
| 1 | --- | --- | --- |
| 2 | --- | --- | --- |
| 3 | --- | --- | --- |
| 4 | --- | --- | --- |
| 5 | --- | --- | --- |
| 6 | --- | --- | --- |

# EMMETT MUNICIPAL AIRPORT

CITY OF EMMETT, IDAHO
KEY NO. NP83711

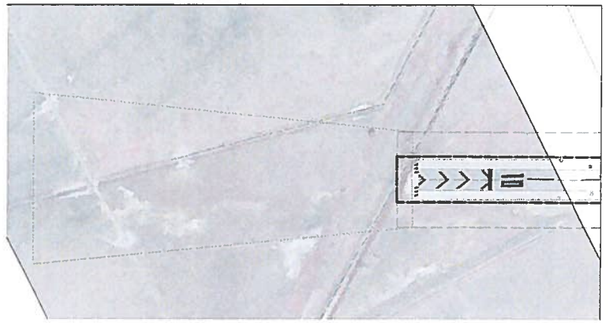
AIRPORT AIRSPACE DRAWING

PRELIMINARY NOT FOR CONSTRUCTION

| | |
|---|---|
| DESIGNED | EW |
| DESIGN CHECKED | MGG |
| DETAILED | EW |
| DRAWING CHECKED | MGG |
| FILE NAME | 2654-CLR1 dwg |
| DRAWING DATE | 5/18/17 |
| DRAWING SCALE | AS SHOWN |



PLOT DATE: 5/22/2017
Z:\2654 EMMETT MUNICIPAL AIRPORT\CADD\CIVIL 3D\DRAWINGS\2654-CLR1.DWG



APPROACH END 10 PLAN VIEW

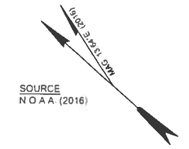
200 100 0 200

HORIZONTAL SCALE IN FEET

APPROACH END 28 PLAN VIEW

200 100 0 200

HORIZONTAL SCALE IN FEET




SOURCE
N O A A (2016)

0 1000 2000 4000

HORIZONTAL (FT)
HORIZ. DATUM: NAD 83
VERT. DATUM: NAVD 88

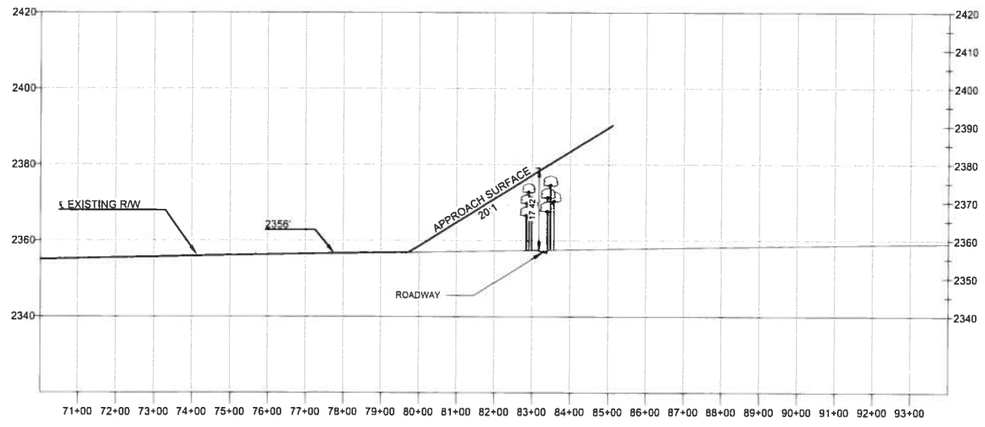



RUNWAY CL CENTERLINE PROFILE STA: 39+00 - 57+00

APPROACH END 10 PROFILE

200 100 0 200

HORIZONTAL SCALE IN FEET
VERTICAL SCALE 1"=40'




RUNWAY CL CENTERLINE PROFILE STA: 70+00 - 94+00

APPROACH END 28 PROFILE

200 100 0 200

HORIZONTAL SCALE IN FEET
VERTICAL SCALE 1"=40'

RIEDESEL Engineering
850 East Franklin Road, Suite #408A
Meridian, Id. 83642
Phone: (208) 898-9165
Fax: (208) 734-2748



REVISIONS

| NO | DATE | BY | DESCRIPTION |
|---|---|---|---|
| 1 | --- | --- | --- |
| 2 | --- | --- | --- |
| 3 | --- | --- | --- |
| 4 | --- | --- | --- |
| 5 | --- | --- | --- |
| 6 | --- | --- | --- |

EMMETT MUNICIPAL AIRPORT
CITY OF EMMETT, IDAHO
KEY NO. NP83711

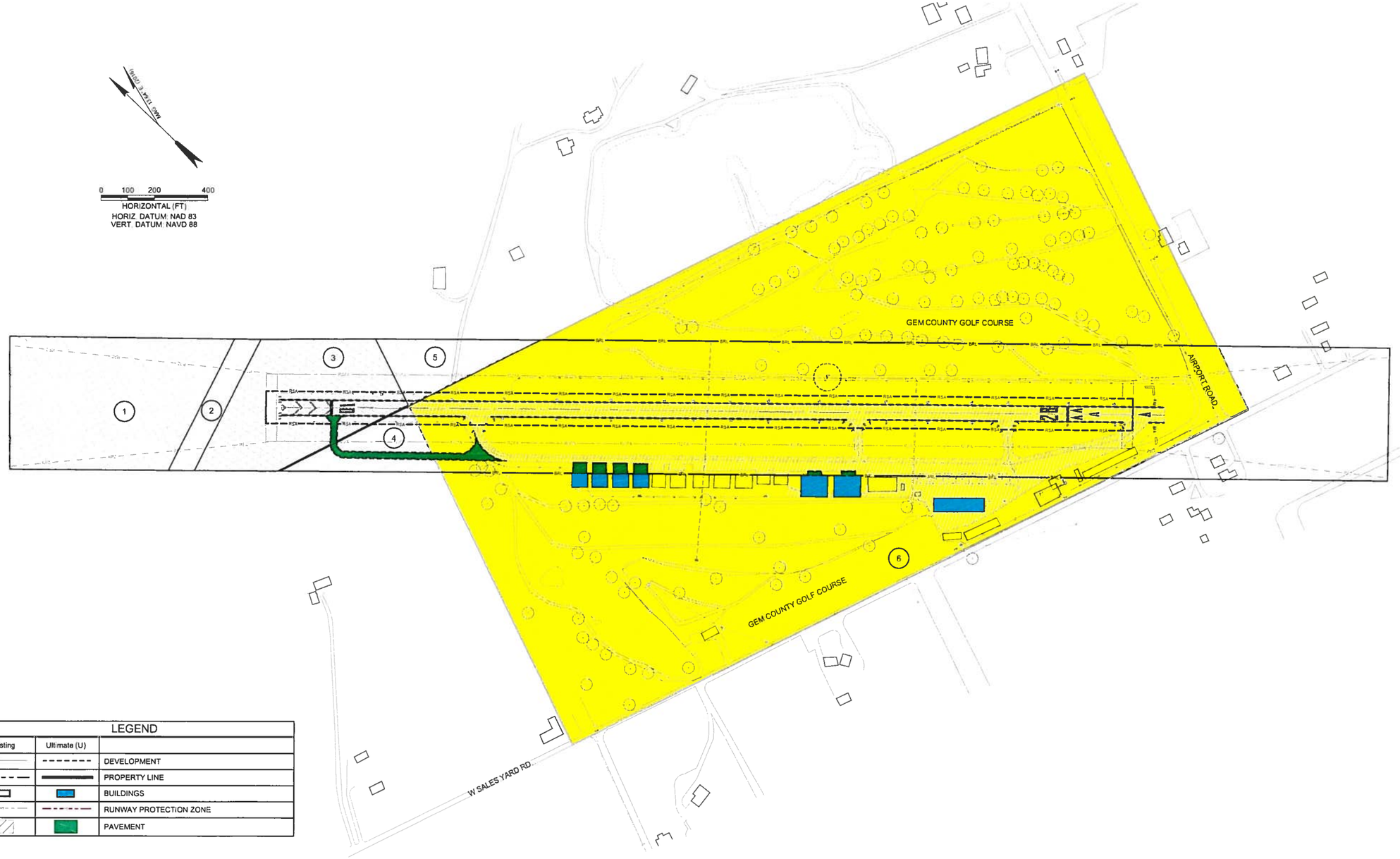
AIRPORT AIRSPACE DRAWING

PRELIMINARY NOT FOR CONSTRUCTION

| | |
|---|---|
| DESIGNED | EW |
| DESIGN CHECKED | MGG |
| DETAILED | EW |
| DRAWING CHECKED | MGG |
| FILE NAME | 2654-CLR1 dwg |
| DRAWING DATE | 5/18/17 |
| DRAWING SCALE | AS SHOWN |



PLOT DATE: 5/22/2017
Z:\2654 EMMETT MUNICIPAL AIRPORT\CADD\CIVIL 3D\DRAWINGS\2654-CLR1.DWG




| LEGEND | | |
|---|---|---|
| Existing | Ultimate (U) | |
| | | DEVELOPMENT |
| | | PROPERTY LINE |
| | | BUILDINGS |
| | | RUNWAY PROTECTION ZONE |
| | | PAVEMENT |

| LAND PARCEL DATA | | | | | |
|---|---|---|---|---|---|
| PARCEL | GRANTOR | INSTRUMENT # | INTEREST | ACRES | STATE AGREEMENT |
| 1 | FUTURE PROPERTY PURCHASE | 143600 | N/A | 8 62 | N/A |
| 2 | FUTURE PROPERTY PURCHASE | 145255 | N/A | 1 17 | N/A |
| 3 | FUTURE PROPERTY PURCHASE | 141785 | N/A | 6 12 | N/A |
| 4 | FUTURE PROPERTY PURCHASE | 146600 | N/A | 2 12 | N/A |
| 5 | FUTURE PROPERTY PURCHASE | 148055 | N/A | 1 86 | N/A |
| 6 | CITY OF EMMETT | 149000 | FEE SIMPLE | 80 | N/A |

## NOTES:

1) NO BOUNDARY SURVEY WAS PERFORMED PARCEL BOUNDARIES DERIVED FROM THE DEEDS PROVIDED BY THE CITY OF EMMETT
2) AIRPORT PROPERTY BOUNDARY SHOWN AMOUNTS TO 80 00 ACRES MORE OR LESS
3) DESCRIBED PARCELS IN DEEDS OVERLAP ACREAGE IN TABLE CORRESPONDS TO DEED

RIEDESEL Engineering
850 East Franklin Road
Suite #408A
Meridian, Id. 83642
Phone: (208) 898-9165
Fax: (208) 734-2748



| REVISIONS | | | |
|---|---|---|---|
| NO | DATE | BY | DESCRIPTION |
| 1 | --- | --- | --- |
| 2 | --- | --- | --- |
| 3 | --- | --- | --- |
| 4 | --- | --- | --- |
| 5 | --- | --- | --- |
| 6 | --- | --- | --- |

# EMMETT MUNICIPAL AIRPORT

CITY OF EMMETT, IDAHO
KEY NO. NP83711

AIRPORT PROPERTY MAP - EXHIBIT A

PRELIMINARY NOT FOR CONSTRUCTION

| | |
|---|---|
| DESIGNED | EW |
| DESIGN CHECKED | MGG |
| DETAILED | EW |
| DRAWING CHECKED | MGG |
| FILE NAME | 2654-EXA dwg |
| DRAWING DATE | 5/18/17 |
| DRAWING SCALE | AS SHOWN |
| SHEET | 5 OF 5 |

PLOT DATE: 5/22/2017
Z:\2654 EMMETT MUNICIPAL AIRPORT\CADD\CIVIL 3D\DRAWINGS\2654-EXA DWG


MERIDIAN OFFICE
850 E. Franklin Road, Ste. 408A
Meridian, ID 83642
(208) 898-9165

TWIN FALLS OFFICE
526C Shoup Ave West
Twin Falls, ID 83301
(208) 733-2446

LEWISTON OFFICE
77 Southway Avenue, Ste. C
Lewiston, ID 83501
(208) 743-3818

RICHLAND OFFICE
1845 Terminal Drive, Ste. 150
Richland, WA 99354
(509) 946-3559