Erie Municipal Airport

Erie, Colorado

Airport Master Plan

AIRPORT MASTER PLAN UPDATE

Erie Municipal Airport (EIK)

April 2016

Prepared for the:

Town Board of Trustees
Town of Erie, Colorado

And for the:
State of Colorado
Department of Transportation
Division of Aeronautics

And for the:
US Department of Transportation
Federal Aviation Administration
Denver Airports District Office

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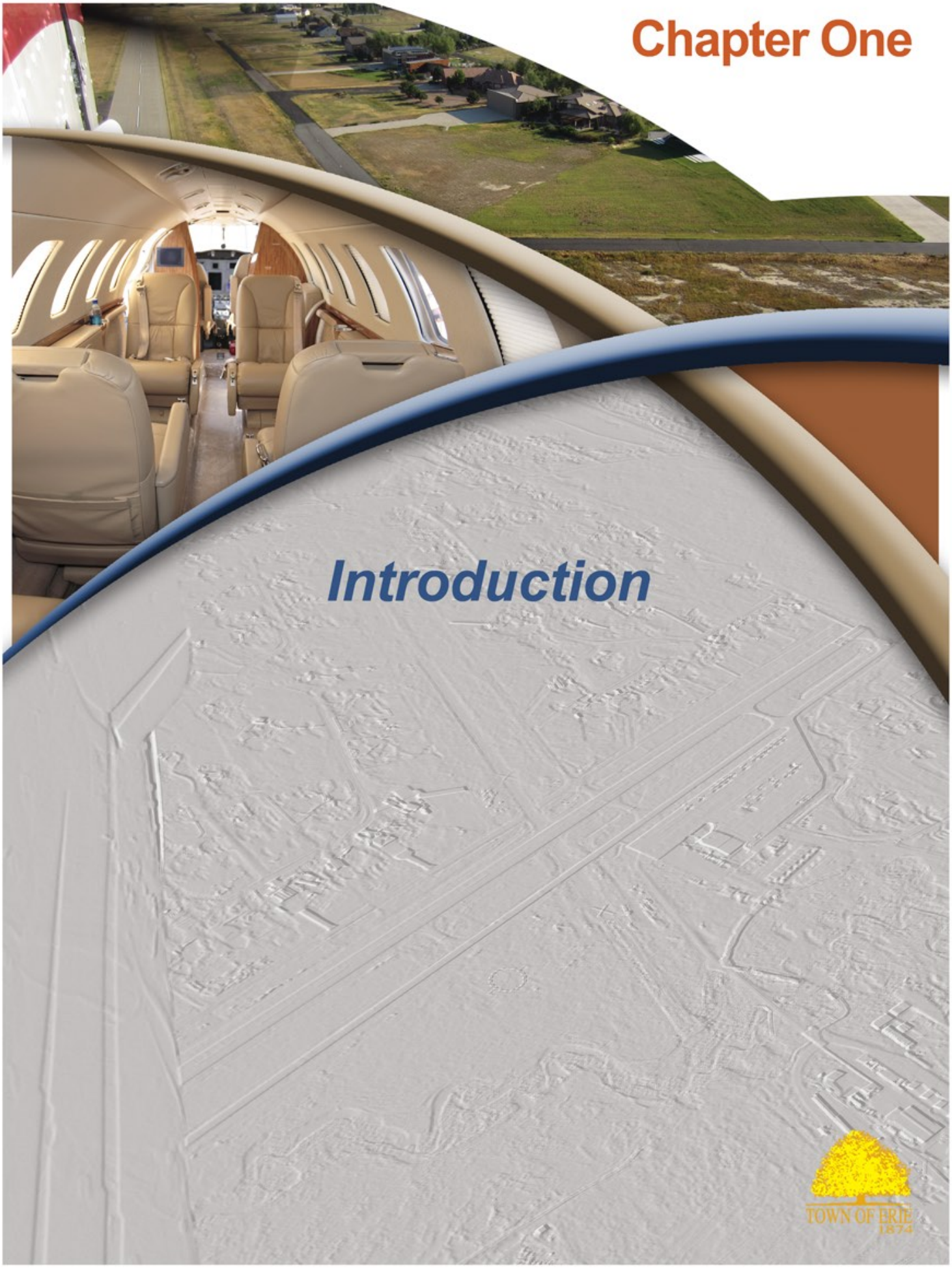
Chapter One



Introduction

TOWN OF ERIE
1874

Chapter One – Introduction to the Plan

1.0 Introduction

The Town of Erie as owner, operator and sponsor of the Erie Municipal Airport has initiated this update of its Airport Master Plan to assess the Airport's existing and future role and to provide direction and guidance related to short- and long-term development. This study will find a course of action over a period of 20 years and beyond. This course of action will be advanced pursuant to Town Board of Trustees prerogative and provide compliance with current Federal Aviation Administration (FAA) airport design standards. This project and its process will be shepherded through the Airport Manager's Advisory Group (AMAG) and Town staff.

This planning is created to be a both a forward-looking and flexible document. Resolutions and solutions are proposed well in advance of the likely need; and the plan is flexible enough to change with the need. Federal and state agencies are then similarly able to effectively program funding and be responsive to financing needs, should that be necessary.

The remainder of this chapter describes plan purpose, objectives and issues and identifies the four-phase planning process created for this planning effort.

1.1 Purpose

The purpose of the planning effort is to use developed methods to objectively evaluate and assess the needs of the Erie Municipal Airport from an aviation use, development, and implementation perspective. Further, the planning will assist Town leadership to sort through the difficult questions and then, use that information to guide local decisions regarding airport infrastructure investment.

Development at the Erie Municipal Airport has plateaued in past years, but this may not continue. The potential need for infrastructure and additional facilities will be analyzed while looking to the future to determine how the airport may participate in the local and regional economy.

The product of this effort will provide the Town with a development program to meet aviation needs in the short- intermediate- and long-range planning periods. Aviation demand associated with the Airport makes it important to plan for aviation safety, capacity, proper facilities and land use compatibility. It is anticipated that benefits derived from the plan will positively affect the airport, its users, Town and the various County residents and the surrounding area.

1.2 Objectives and Issues

Assessing airport needs and filing a new plan is often a complex and difficult, but beneficial task. Some basic questions are:

1. Which airport services are the most attractive to new business and existing users and why?
2. What will it cost to get additional airport infrastructure in place?
3. What kinds of visitors or companies are likely to be interested in the airport?
4. What will the basic needs for the airport be, now and in the future?
5. How might the airport benefit its community by attracting businesses that provide higher income jobs and quality goods and services?

Answers to the above questions will help guide the community to establishing an airport plan and program that contributes to achieving community goals. It often boils down to economic development efforts, and how a community or region uses its resources, including the airport, to achieve its community and economic development goals.

A primary aim of this effort is to evaluate and develop concepts and overall recommendations for the Erie Municipal Airport that will facilitate implementation and are workable.

1.2.1 Objectives

This airport master planning process is intended to be an integral part of the community's overall plan. Coordinated planning that enhances the Airport, the Town, and all three counties is an overall aim. Specifically, the objectives of this study are as follows:

Objective Number One:

Comply with FAA design standards.

Objective Number Two:

Maximize development opportunities.

Objective Number Three:

Be environmentally-responsive.

Objective Number Four:

The Master Plan for EIK and surrounding properties should be integral to the existing operations and facilities.

Objective Number Five:

Future development of the airport should contribute to the image and commercial activity of the airport.

Objective Number Six:

The development of the airport and associated properties should occur in a coordinated and comprehensive manner, to take maximum advantage of the assets of the Town and associated Counties.

Objective Number Seven:

The planning and development of the airport should be oriented to achieve the *highest and best* use of the site. Specific users and uses should be evaluated on a case-by-case basis. *Highest and best use* should be interpreted in terms of the following factors: use of physical site assets, economic benefit, jobs created and salaries, fiscal impact and contribution to the overall objectives of the Town.

Objective Number Eight:

The Airport Master Plan should be flexible to accommodate a range of potential aviation uses and non-aviation users.

Objective Number Nine:

Regional economic goals should be an important consideration in preparing a development strategy for the airport.

Objective Number Ten:

Airport development should be evaluated relative to both long and short-term costs and benefits.

Objective Number Eleven:

The Airport Master Plan should minimize off-site impacts, particularly those affecting surrounding, neighboring areas.

1.2.2 Issues

The Town completed a formal Airport Master Plan process in 2003. The Federal Aviation Administration (FAA) and the Colorado Department of Transportation (CDOT) determined that an update to the plan would be beneficial given current activity and economic conditions. The Town of Erie consulted with FAA, CDOT and the airport master plan consultant to consider

current potential issues and craft a work plan which addresses resolution. Some of those issues are described as follows and will be given particular attention through the planning process.

Issue Number One:
Identify/Address TTF issues

Both residential and commercial through-the-fence are important to the future of the Erie Municipal Airport. Through-the-fence (TTF) is simply accessing the airfield-proper via privately-owned property. The Town of Erie has accepted federal government grant assurances which instruct the conduct of airport business and operations. Existing and future TTF access/ procedures needs to be coordinated with FAA and CDOT to ensure grant assurance compliance.

Issue Number Two:
Protect Airspace/Dispose of Obstructions to Navigable Airspace

The grant assurances discussed above also relate to maintenance of sufficiently clear airspace for unobstructed aircraft operations at the Erie Municipal Airport. Clearance for existing airspace will be addressed along with and potential future airspace needs. Future airport improvements may expand the airport's airspace and require coordination with various constituencies.

Issue Number Three:
Ensure Runway 15-33 Length Adequacy

This issue, and issues number four and five, are somewhat related and have the potential to change the aviation dynamics at the Erie Municipal Airport. In general, and as discussed in the next chapter, airports and runway lengths are designed around the airplanes that use them. Now and/or in the future, a sufficient quantity of runway length demanding aircraft may use the airport in a quantity to suggest an increase in runway length.

Issue Number Four:
Identify Runway 15-33 Design Standards/ Ensure Adequacy

Similar to the runway length adequacy concern of the previous issue, a sufficient number of aircraft may now, or in the future use the airport to suggest a modification of the airport's design standards, including pavement strength, widths and other physical, on-the-ground features.

Issue Number Five:
Ensure Runway 15-33 Instrument Approach Capability Adequacy

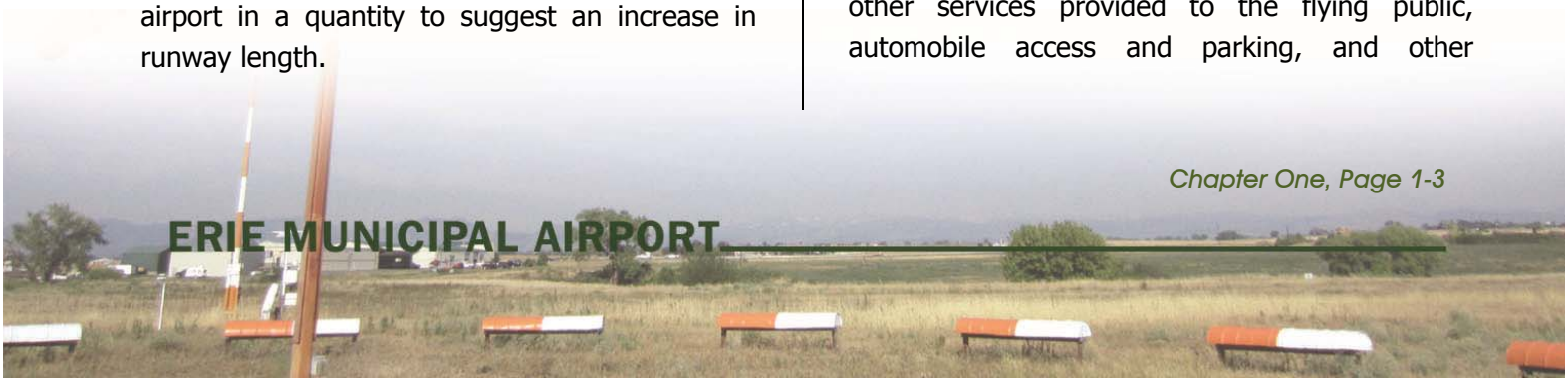
An instrument approach procedure is an FAA-defined three-dimensional path in the sky which allows safe aircraft operation to the airport during some periods of inclement weather. The airport master plan process will consider improved and or additional instrument approach procedures at the Erie Municipal Airport. The primary consequence of improved instrument approach procedures is realization of a more all-weather airport.

Issue Number Six:
Identify/Address Crosswind Runway 9-27 Needs/Issues

Historical Runway 9-27 was decommissioned a number of years ago by the Town due to design standards inadequacies and poor pavement conditions. FAA design standards suggest that if winds favor an east-west runway alignment then planning should be done.

Issue Number Seven:
Identify/Address Landside Needs

This final issue is somewhat of a catch-all for other issues. Landside in this context relates to portions of airport ramp/aprons, the terminal building function/location, aircraft fueling and other services provided to the flying public, automobile access and parking, and other



important features which serve to support the airside of the Erie Municipal Airport.

1.3 Planning Process

A planning process is primary and accompanies this narrative. This planning process and participation through the process from those with interests in the overall aviation community is important to creation of this narrative.

The planning process begins with preparation of the necessary data and mapping to be used in the study to prepare this narrative along with its Airport Layout Plan (ALP) drawings for the Erie Municipal Airport.

The narrative and ALP drawings will be prepared in accordance with FAA guidelines, policies and procedures and applicable federal and state laws and standards. Previous reports and associated work will be reviewed, as necessary.

The project process will be engaged in full coordination with the AMAG, federal, state and local planning agencies, the representatives of which will be consulted for input and invited to attend progress meetings, public meetings or other meetings associated with the process. The end result will provide a planning document that recommends a responsive course of action and a scheduled plan, complete with current cost estimates for facility improvements.

Prior to initiation of this project, the prerequisite project scope of services, budget and schedule were approved. The planning process and its project workflow consist of four project phases, described as below and as depicted on the project workflow exhibit within Appendix A.

1.3.1 Project Participants

The Town Board of Trustees will make final decisions about the future of the Erie Municipal Airport through the course of the master planning process.

Various airport constituencies, including the general public, and the nearby home and business owners will be consulted through the public participation process.

Mr. Jason Hurd, Airport Manager, is the primary information conduit for the master plan consultant. Town of Erie staff, not limited to those professionals in Public Works, Planning and Zoning, Community Development and Economic Development will advise and consult at key project points.

FAA will approve master plan forecasts and internally circulate the master plan for integration in the national airspace system. FAA and CDOT will advise on project progress and documents at key project points.

The airport master plan consultant, Airport Development Group, Inc., will prepare project documentation, guide project progress, solicit guidance, and work to build consensus from plan participants at key project points.

1.3.2 Project Phase One

The master planning process benefits from public participation and as such, a project initiation meeting for the general public, per **Meeting Series No. 1,** is a first step. This public meeting was held on November 28, 2012 at the Erie Community Center. Prior to this meeting the AMAG, Town Staff and Town Board of Trustees were briefed on the project work scope.

Phase One project activities then continue with the drafting of **Chapter Two**, Inventory and **Chapter Three**, Forecasts of Aviation Demand. Efforts associated with Chapter One involve

information acquisition not limited to; facilities and improvements, survey, land uses, airspace and navigational aids, along with socioeconomic, environmental and financial data. Efforts associated with Chapter Two include formulation economic and activity projections culminating in various aviation forecasts specific to the first five-year period; 2014-2018, the second five-year period 2019-2023, and the final 10-year period; 2024-2033, of the 20-year planning horizon.

FAA and CDOT will review these chapters and provide comment, resulting in **Working Paper No. 1**, and the initiation of **Meeting Series No. 2.** Comments will be solicited and addressed from the AMAG and Town staff prior to a second working session with the Town Board of Trustees to discuss the first Working Paper and conclude the second meeting series.

Select Phase One documentation for Meeting Series No. 1 and 2 is found in Appendix A and B, respectively.

1.3.3 Project Phase Two

The planning process then moves to Phase Two with FAA approval of the Forecasts of Aviation Demand.

Facility Requirements and Capacity Analysis, **Chapter Four**, can then be created based upon previous work. Efforts associated with Chapter Four involve determination of the Erie Municipal Airport's role and service capabilities along with airside and landside requirements and an appraisal of grant assurance compliance and airport security requirements. **Chapter Five**, Alternatives Analysis will consider various airfield and landside alternatives which may suit demand over the three planning periods for Trustee consideration.

FAA and CDOT will review Chapters Four and Five and provide comment, resulting in **Working Paper No. 2**, the second project milestone. Comments will be solicited and addressed from the AMAG and Town staff, including Planning and Zoning, prior a second session with the Town Board of Trustees to discuss the second Working Paper. These consultations constitute initiation of **Meeting Series No. 3**. This meeting series concludes with an open house to be conducted at the Erie Community Center followed by a Town Board of Trustees working session.

Town Board of Trustees selection of alternative(s) is the most crucial and important step in the creation of this the master plan and execution of its process, and its third milestone.

Select Phase Two documentation for Meeting Series No. 3 will be found in Appendix C.

1.3.4 Project Phase Three

The airport master plan process then moves to Phase Three with Town Board of Trustees selection of the preferred alternative(s) or modification thereof.

Phase Three work includes creation of **Chapter Six**, Phased Development and Cost Estimates which sequences and provides cost estimates for airport improvements pursuant to the preferred alternative(s) and **Chapter Seven**, Airport Layout Plan and Drawings which depict existing and future airport features per FAA's Airport Layout Plan checklist.

FAA and CDOT will review these chapters and provide comment, resulting in the **Pre-Draft Airport Master Plan**, and the initiation of **Meeting Series No. 4.** The pre-draft narrative will describe and illustrate the recommended

course of action, over the next 20 years, per Town of Board Trustees direction. Comments will be solicited and addressed from the AMAG and Town staff, including Planning and Zoning, prior a pre-draft master plan session with the Town Board of Trustees to discuss the pre-draft master plan.

When FAA, CDOT, AMAG, Town Staff and Town Board of Trustees comments and prerogatives have been sufficiently addressed, Phase Three will conclude, with a **Draft Airport Master Plan**, the fourth project milestone.

Select Phase Three documentation for Meeting Series No. 3 will be found in Appendix D.

1.3.5 Project Phase Four

The airport master plan process then moves to its final phase with Town Board of Trustees approval of the Draft Master Plan.

From there, the master plan narrative and drawings are somewhat turned over to FAA for coordination. Coordination or 'airspacing', is an FAA internal, multi-jurisdictional, 3-month process consisting of an internal review process wherein deliverables are reviewed for continuity and conformity to FAA standards and specifications, and principal changes to the airport are included in the national airspace system.

The fifth and final project milestone is Trustee concurrence with the **Final Airport Master Plan.**

Upon coordination completion, a number of final documents will be printed signed by all parties and the project finalized.

1.4 Consultant Agreement and Study Documentation

The Town of Erie entered into an agreement with Airport Development Group, Inc. in August 2012 to conduct the master planning effort and to prepare this document.

1.4.1 Reference Documents

This study is prepared in accordance with these FAA advisory documents:

Previous Airport Documents (Various Years)
CDOT Airport System Plan

150/5060-5	*Airport Capacity and Delay*
150/5190-4	*A Model Zoning Ordinance to Limit Height of Objects around Airports*
150/5070-6	*Airport Master Plans*
150/5190-5	*Exclusive Rights and Minimum Standards for Commercial Aeronautical Activities*
150/5300-13	*Airport Design*
150/5340-1	*Standards for Airport Markings*
150/5340-18	*Airport Sign System Standards*
150/5300-16	*General Guidance and Specifications for Aeronautical Surveys*
150/5300-17	*General Guidance and Specifications for Aeronautical Survey Airport Imagery Acquisition and Submission to NGS*
150/5300-18	*General Guidance and Specifications for Submission of Aeronautical Surveys to NGS; Field Data and Collection and GIS Standards*
150/5360-9	*Planning and Design Guidelines for Airport Terminal Facilities at Non-Hubs*
150/5360-13	*Planning and Design Guidelines for Airport Terminal Facilities*
150/5020-1	*Noise Control and Compatibility Planning for Airports*
150/5320-5	*Airport Drainage*
150/5050-4	*Citizen Participation in Airport Planning*
150/5230-4	*Aircraft Fuel Storage, Handling and Dispensing on Airports*

5100.38C	*Airport Improvement Program Handbook*
5050.4B	*NEPA Implementing Instruction for Airport Actions*
1050.1E	*Environmental Impacts; Policies and Procedures*

Environmental Desk Reference for Airport Actions

1.4.2 Narrative Report Content

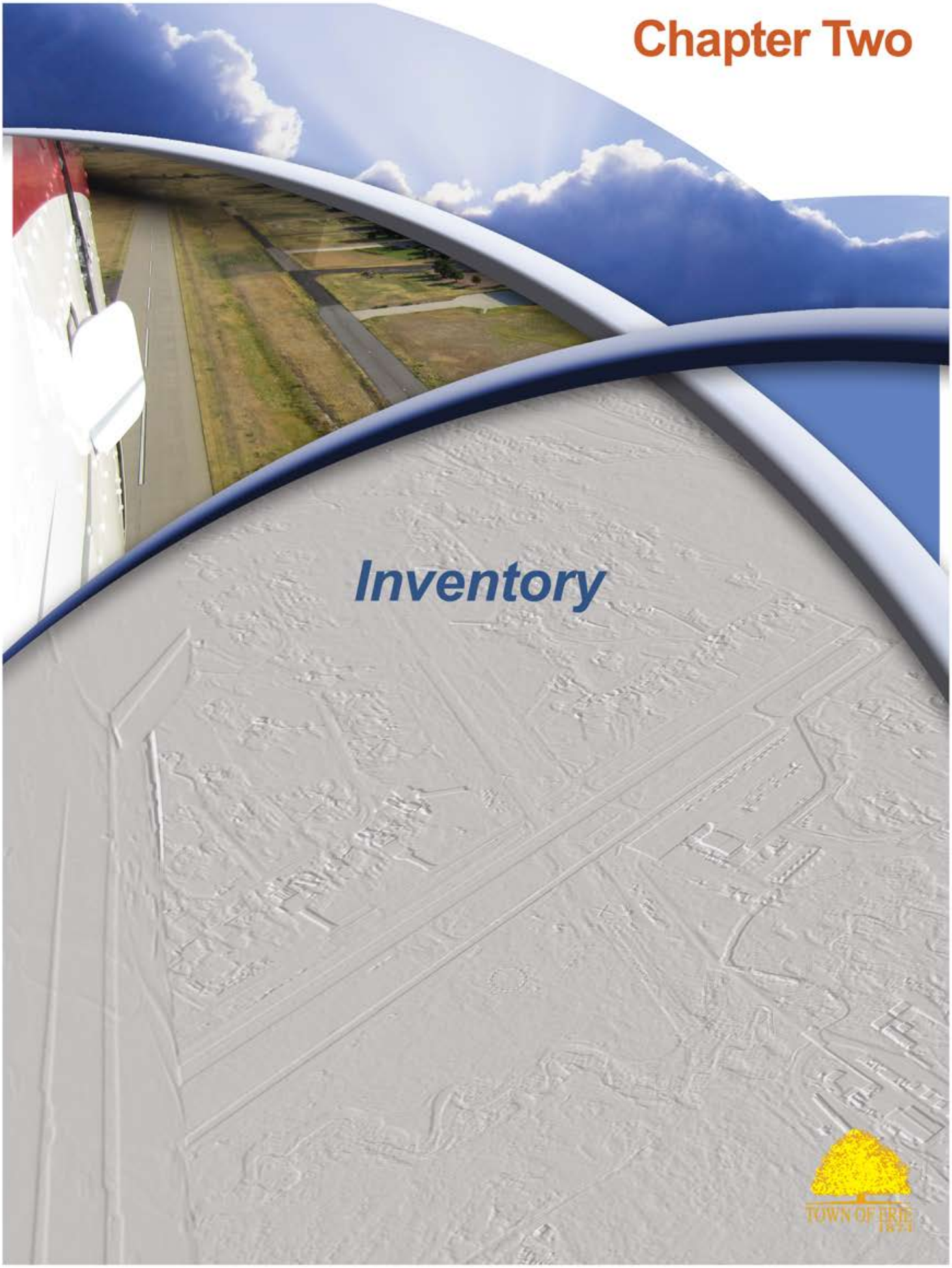
This narrative report presents these chapters:

Chapter 1	Introduction
Chapter 2	Inventory
Chapter 3	Forecasts of Aviation Demand
Chapter 4	Facility Requirements and Capacity Analysis
Chapter 5	Alternatives Analysis
Chapter 6	Phased Development and Cost Estimates
Chapter 7	Airport Layout Plan and Drawings

These ALP Drawings are found in Chapter Seven:

	Cover and Index
Exhibit I	Airport Layout Plan
Exhibit II	Terminal Area Plan
Exhibit III	Airport Airspace Plan (Part 77)
Exhibit IV	Runway 15-33 Approach Surface Plan and Profile
Exhibit V	Runway 15 Inner Portion of Approach Surface Plan and Profile
Exhibit VI	Runway 33 Inner Portion of Approach Surface Plan and Profile
Exhibit VII	Off-Airport Land Use Plan
Exhibit VIII	On-Airport Land Use Plan
Exhibit IX	Airport Property Map (Exhibit A)

Chapter Two



Inventory

Chapter Two – Inventory

2.0 Introduction

This chapter is intended to provide background information and an inventory of the Erie Municipal Airport and its environs. Quality, relevant baseline information in this regard is necessary for plan integrity.

Data herein was obtained from investigation and interviews, consulting firm experience with the airport and its projects along with Town staff guidance, FAA input, CDOT consultation, along with various other governmental agencies and websites.

The Erie Municipal Airport (EIK) is owned, operated, and sponsored by the Town of Erie, Colorado and managed and guided by Mr. Jason Hurd, Airport Manager.

2.1 Brief Area History

Prior to the 1870's and the development of the northern coal fields, settlers living along Coal Creek scratched out their living as farmers or merchants. The few communities existing along the Front Range were miles apart by stagecoach or horseback.

Throughout the 1860's, stagecoach companies delivered freight, mail and passengers to destinations along the foothills. The Overland Stage traveled from Denver to Laramie each day, following much the same route as the present US Highway 287. Contact with distant friends and relatives improved with the coming of the railroad to Erie in 1871. Even after its arrival, however, travelers heading to Longmont had to continue on by stagecoach or spring wagon. Those bound for Boulder detrained at the Erie terminal and boarded a stage for the final destination.

Social interaction among early settlers was limited, and families traveled great distances to attend church, school or grange meetings. Many relied on circuit-riding preachers to bring them the gospel once or twice a month. Such a man was Reverend Richard Van Valkenburg, civic leader and a founder of Erie, Colorado. Having spent many years as a Methodist preacher in the coal towns near Erie, Pennsylvania, the Reverend thought it fitting to bestow that name on its western counterpart.

The original plat for Erie was filed in 1871, following establishment of the Briggs Mine, the first commercial coal mine in Weld County. Until that time, surface coal had been delivered to its customers by horse and wagon.

It was also in 1871 that the Union Pacific Railroad extended a spur westward from Brighton on its main line between Denver and Cheyenne. Coal from the Erie deposits was needed to fuel their huge steam locomotives. The Boulder Valley Railroad, as it was called then, opened up the northern coal fields for development. Soon coal from Erie mines was being shipped by rail to markets in Denver and as far east as Kansas City.

The Town of Erie was incorporated in 1874. This brief area history is via the Town of Erie.

2.2 Brief Airport History

Around 1976, land for the Erie Municipal Airport was purchased and developed by Mr. Tom Pierce and his business partners. They envisioned a private airport and wanted to sub-divide and sell a few lots to help pay for the project. The

property was annexed into the Town of Erie, and properties began selling in 1977.

As these activities began, Pierce and his business partners saw a need to open the airport to the

public to gain support for the maintenance shop, fuel sales and flight school that soon became a major part of the operation. A main hangar with offices, a maintenance shop, a flight school and a fuel island were in place by 1978, the Fixed Base Operator (FBO) origins. A grand opening was well advertised.

The building of homes began in 1977 and 1978. Several lots had sold, and residents began planning and building their airpark homes. But, in the late 70's home mortgage interest rates hit a high range of 16 to 18 percent and building came to a halt. Before rates again became reasonable, Erie had to put a moratorium on water taps, since they didn't have enough water to service this new community.

In 1980, before the water moratorium, Pierce and partners bought a Convair 990, moved it to the airport and perched it on tall pillars. At least 14 vehicles were required to move the parted-out Convair from Stapleton Airport. It took all day for the transport. Pierce built a structure underneath the aircraft and leased the building as a restaurant operation. The restaurant opened as *BJ Strawberries at the Convair*. In March 1981, Pierce and his mechanic friend perished in a plane crash just two months after the Convair's grand opening. Ownership and management of the airport then passed to his wife, Carolee, and

then his son Tom, Jr.

After interest rates returned to reasonable levels, Erie further developed the water treatment plant and home building began again. By 1987 the subdivision began taking shape.

AirPark residents had paid into a maintenance fund since 1979, but it wasn't enough money to fully maintain the blacktop runways. Pierce, Jr. and others convinced the FAA that the airport should become a reliever, and FAA concurred and made the designation. This status gave the airport the ability to obtain FAA and CDOT grant money for the first runway rehabilitation. As a privately-owned airport, property taxes were assessed, representing a huge bill every year, and the owner was not able to generate sufficient funds to pay the matching costs for the runway rehabilitation. In 1991, the airport fell into bankruptcy.

After several years, the Convair was empty and deteriorating. In 1996, cranes lifted it off its pillars so it could be hauled away for scrap. The building was later remodeled into an office building, still in use today.

In 1994, the Town of Erie purchased the airport. The Town contracted for an FBO manager who paid rent to the Town for the FBO building. In four years, the Town had the bankruptcy court paid in full with proceeds from the rent, and the town named the airport the Erie Municipal/Tri-County Airport.

The Erie Airpark Homeowner's Association (HOA) was formed in 1979 to enable a dialogue to develop between the residents, the then airport owner, and the Town of Erie. Original membership in the HOA was optional, dues were $20.00 per year per family, and meetings were held once a month.

Several business have come and gone at EIK over the years, but Rocky Mountain Propeller remains stalwart with a 20-plus year history at EIK. Historical Fixed Base Operations have come and gone as have former Airport Managers. Vector Air, the current FBO and Management company employs administrative and airframe and powerplant professionals and provide the full suite of FBO service for the flying public.

The Tri-County Pilot's Association was formed in 1993, and is still active, with a new name; the *Friends of Erie Airport* (FOEA). FOEA formed in order to support and represent the airport while working with the FAA, the Town of Erie and the surrounding neighbors. An Erie Airport Economic Development Committee was formed in 2008 to encourage businesses to develop on or near airport property. In 2010, businesses on or near, with access to the airport numbered approximately 30 to 35, with 150 to 160 employees. These businesses support the airport and add to the economy of the Town of Erie with jobs, payrolls, sales and property taxes, and airport access fees.

The *Spirit of Flight Museum* opened in 2005. This facility offers a truly unique environment that combines vintage and corporate aviation while promoting the love of flight. Hundreds of rare aviation items and artifacts are on display in the Spirit of Flight Hall of Honor representing the past, present and future of flight. The Spirit of Flight mission is to save and display aircraft and

flight memorabilia to honor all veterans, and to educate the general public on the significance of aviation and aviation history. The Spirit of Flight Museum sponsors an open house annually with other events throughout the year.

Aero Systems is near the Museum and has been doing contract work across the nation for a number of years.

Community Involvement

Every May the airport, with the help of select airport groups participates in *Erie Air Fair Days*. For a number of years, this event's balloon launch was from the airport until it was relocated to a nearby location. FOEA and HOA provides a pancake breakfast and lunches, static airplane displays and participates in the Erie down town fair with a booth and displays. In conjunction with the Experimental Aircraft Association (EAA, Chapter 43), pilots give *Young Eagle Rides* at the *Air Fair*, plus every few weeks all year long.

Various airport businesses sponsor safety seminars as well as open house days for nearby residents of Erie and surrounding communities. The current FBO sponsors pilot safety seminars throughout the year with speakers who provide safety programs for area pilots.

Economic Impact

The Colorado Department of Transportation, Division of Aeronautics publishes their findings of airport specific economic impact. In 1998, CDOT's report indicated Erie had a positive economic impact of $3,395,200, with total earnings of $936,000, along with 42 total jobs. By 2008, the report indicated Erie Municipal Airport's total impact of $12,224,700, total earnings of $4,345,300, and a total of 160 jobs.

The platted Erie Air Park has 140+ homes along with some vacant lots. Property taxes and fees provide support for the Town of Erie, Weld County and St. Vrain Valley School District, the Library District, Water and Sewer Districts, bond repayments for the Erie Community Center, as well as aviation fuel taxes and airport access fees to help support EIK's enterprise fund.

Note that the preceding description of select history and images are courtesy of the Colorado Airport History Preservation Project as administered by Dr. Penny Hamilton, and as described by longtime EIK pilot and homeowner, Ms. Beverly Cameron.

2.3 Airport Role

This planning effort is intended to instruct and supplement state and federal airport planning efforts. This plan is a more detailed look at EIK, while national and state planning step back somewhat and generally consider the role EIK plays in the overall system of federal and state airports.

Table 2-1
Colorado State System Plan (2011)
Performance Benchmarks for Erie Municipal Airport

Performance Measure	Compliance	Description
Activity	Yes	Within 38% of forecast ultimate airspace capacity
Expansion Potential; Planning	No	Master Plan desirable
Expansion Potential; Part 77	No	Zoning in place for FAR Part 77 surface protection
Economic Support; IAPs	Yes	IAP established (Circling)
Economic Support; Fuel	Yes	Jet A and 100 LL fuels available
Economic Support; Autos	Yes	Courtesy, taxi/shuttle, car rental available
Economic Support; $	Yes	economic impact greater than $1 million
Access/Emergency; AWOS	Yes	AWOS on-field
Access /Emergency; Emergency	No	Sufficient emergency runway length available (4,800')
Access /Emergency; Length	Yes	Sufficient minimum runway length available
Investment; Runway Length	Yes	4,630 feet minimum (75% of small aircraft)
Investment; Runway Width	No	75 feet wide minimum
Investment; Runway Strength	Yes	12,500 pounds single-wheel minimum
Investment; Taxiway	Yes	Full/partial-parallel, connectors or turn-arounds
Investment; IAP	Yes	Non Precision IAP available
Investment; Visual Aids	Yes	Beacon, Windcones, PAPI, REIL, Segmented Circle
Investment; Runway Lighting	Yes	MIRL installed
Investment; Apron Lighting	Yes	Apron lighting in place
Investment; AWOS	Yes	AWOS on-site
Investment; Service	Yes	Phone, restroom, car and fuel on-site
Investment; Equipment	Yes	Tractor, mower, snow removal, electrical vault, paint machine, airfield maintenance vehicle
Investment; Airfield Pavements	Yes	Runway, Taxiway and Apron rated 84, 99, 86 out of 100, respectively (as of 2/15/2011)
Security	No	Signage, documented security procedures, positive ID, aircraft secured, community watch program, contact list, formal law enforcement support, security committee, transient pilot sign-in/out, access control, lighting system, personnel ID system, vehicle ID system, challenge procedures

2.3.1 Federal Planning

EIK is part of the US national transportation system, and part of the Federal Aviation Administration's National Plan of Integrated Airport Systems (NPIAS). Of the nation's nearly 5,200 public-use airports, the NPIAS comprises nearly 3,400 airports which are considered, by FAA, significant to the capacity and integrity of the national airspace system.

Because of NPIAS participation, the Town of Erie, as sponsor is eligible, and has received federal funding for airport improvements under the Airport Improvement Program (AIP). Funds to pay for NPIAS improvements originate with the AIP program. AIP is a user-fee based program, funded through the Airport and Airways Trust Fund as originated through the Airport and Airway Improvement Act of 1982, as amended. This grant-in-aid program provides the funding to execute most federal, state and local airport

planning. This planning effort, along with planning done by CDOT may be used to consider the quality and quantity of EIK's participation in the NPIAS.

The current NPIAS (2013-2017) identifies the airport as a public use, local (as opposed to *basic* service, *regional* service or an airport of *national* importance), with 173 based aircraft and $2,131,579 of anticipated development needs for eligible improvements. The NPIAS no longer designates EIK as a reliever to Denver International Airport.

2.3.2 State Planning

EIK is eligible to receive funding through CDOT and other state agencies. The *Colorado Airport System Plan Update* (revised 2011) identifies EIK as an *intermediate* (as opposed to *minor* or *major*) airport in the Colorado system. Table 2-1 notes system plan performance objectives for EIK per that document. In addition, the *Plan* notes that 160 aircraft based at EIK in 2008, and $4,345,300 of wages, and $12,224,700 of economic activity were generated in that same year. The *Plan* notes that 179 aircraft based at EIK in 2010, along 67,500 general aviation operations that same year, ranking number 6 and 9 in the state, respectively.

Figure 2-1 depicts the *Colorado Airport System Plan Update* map of airports.

CDOT occasionally performs inventories of airfield pavement conditions at various airports, including EIK. CDOT's 2011 pavement management system effort identifies the following numerical reference index ranges:

- Ongoing Maintenance (100-62±)
- Major Rehabilitation Needed (±62-41)
- Major Reconstruction Needed (40-0)

And 2010 EIK conditions:

- Runway 15/33 (84)
- Taxiway A (99)
- Apron (86)
- Connector Taxiway A1 (95)
- Connector Taxiway A2 (100)
- Connector Taxiway A3 (100)
- Connector Taxiway A4 (100)
- Connector Taxiway A5 (97)

Along with a 2015 forecast of conditions, assuming that no improvements will be made:

- Runway 15/33 (76)
- Taxiway A (92)
- Apron (82)
- Connector Taxiway A1 (90)
- Connector Taxiway A2 (93)
- Connector Taxiway A3 (97)
- Connector Taxiway A4 (97)
- Connector Taxiway A5 (91)

CDOT occasionally performs an analysis to estimate the economic impacts of Colorado airports. The 2008 effort in this regard indicated that EIK supported 160 jobs, $4,345,300 of total payroll, and $12,224,700 of total output. Findings indicated that five percent (6,335) of EIK's 73,660 general aviation operations are transient, resulting in an average of 3.44 visitors per aircraft arrival. $178.41 in per person/trip expenditures were estimated, resulting in an annual total visitor expenditure value of $1,130,185. This study is expected to be updated in the near future and this chapter will be updated when those data become available.

2.3.3 Previous Airport Planning

The most recent airport planning document on file is an Airport Master Plan update dated February 7, 2002. That narrative and its Airport Layout Plan (ALP) drawing provided the matter-of-course planning analyses including identifying a number of non-standards conditions and obstructions to navigable airspace, development alternatives and a recommended course of action per a series of phased improvements. Table 2-2 identifies historical FAA and CDOT grant-in-aid.

Table 2-2
Historic EIK Grants

(Source: FAA/CDOT)

CDOT Grants	Description	Local Share	Federal/ Other	State	Total
1995-EIK-001	Acquire Truck	$ 4,200	$ 0	$ 20,000	$ 24,200
1997-EIK-001	Upgrade Fuel Farm	$ 3,800	$ 0	$ 34,200	$ 38,000
1999-EIK-001	Taxiway Reflectors/Remark/Master Plan Match	$ 7,700	$ 66,600	$ 19,700	$ 94,000
2000-EIK-001	Pavement Maintenance/Fuel Project	$ 25,000	$ 0	$ 17,600	$ 42,600
2002-EIK-001	Construct Access Road and Parking	$ 16,666	$ 300,000	$ 16,666	$ 333,332
2003-EIK-001	Taxiway Construction Match	$ 9,585	$ 172,537	$ 7,668	$ 189,790
2005-EIK-001	Taxiway Construction Sponsor Match/Install AWOS	$ 43,737	$ 750,000	$ 115,737	$ 909,474
2006-EIK-001	Terminal and Hangar Repair Sponsor Match	$ 7,895	$ 300,000	$ 7,895	$ 315,790
2007-EIK-001	Terminal Repair Sponsor Match, Remark Airfield	$ 17,500	$ 300,000	$ 17,895	$ 335,395
2008S-EIK-001	New Beacon/Pavement Maintenance on Ramp	$ 6,400	$ 0	$ 25,600	$ 32,000
2009-EIK-002	FAA Lighting Project Match	$ 3,948	$ 150,000	$ 3,948	$ 157,896
2009-EIK-001	Pavement Maintenance	$ 30,000	$ 0	$ 120,000	$ 150,000
2009-EIK-00s	Supplemental	$ 0	$ 0	$ 7,895	$ 7,895
2010-EIK-001	Fuel System Upgrade and Pavement Maintenance	$ 56,288	$ 237,236	$ 206,604	$ 500,128
2011-EIK-001	Connector Taxiway Match	$ 45,064	$ 150,000	$ 372,800	$ 567,864
2011-EIK-00s	Supplemental	$ 0	$ 0	$ 27,200	$ 27,200
2012-EIK-001	Master Plan Update Match/Runway Repair, Signage	$ 47,952	$ 150,000	$ 400,000	$ 597,952

FAA Grants	Description	Entitlement	Discretionary	Total
001-1990	Rehabilitate Runway	$ 0	$ 886,927	$ 886,927
001-1990	Rehabilitate Taxiway	$ 0	$ 350,000	$ 350,000
001-1990	Install Apron Lighting	$ 0	$ 35,000	$ 35,000
001-1990	Acquire Land for Development	$ 0	$ 68,720	$ 68,720
002-1993	Construct New Airport	$ 0	$ 793,298	$ 793,298
002-1993	Conduct Airport Master Plan Study	$ 49,999	$ 0	$ 49,999
003-1997	Rehabilitate Apron	$ 814,813	$ 55,709	$ 870,522
004-1999	Conduct Airport Master Plan Study	$ 98,737	$ 0	$ 98,737
005-2000	Acquire Land for Approaches	$ 129,032	$ 0	$ 129,032
005-2000	Install Airfield Guidance Signs	$ 60,000	$ 0	$ 60,000
006-2002	Conduct Miscellaneous Study	$ 10,000	$ 0	$ 10,000
006-2002	Improve Airport Drainage	$ 269,915	$ 0	$ 269,915
007-2003	Rehabilitate Apron	$ 59,020	$ 0	$ 59,020
007-2003	Rehabilitate Taxiway	$ 75,000	$ 0	$ 75,000
008-2005	Construct Access Road	$ 190,154	$ 0	$ 190,154
008-2005	Install Perimeter Fencing	$ 86,065	$ 0	$ 86,065
008-2005	Construct Taxiway	$ 338,935	$ 0	$ 338,935
009-2009	Rehabilitate Runway Lighting	$ 173,693	$ 0	$ 173,693
009-2009	Construct Taxiway	$ 175,000	$ 0	$ 175,000
010-2009	Rehabilitate Runway Lighting	$ 150,000	$ 0	$ 150,000
010-2009	Construct Taxiway	$ 159,778	$ 0	$ 159,778
011-2010	Rehabilitate Apron	$ 50,000	$ 0	$ 50,000
011-2010	Construct Taxiway	$ 109,721	$ 0	$ 109,721
012-2011	Rehabilitate Apron	$ 100,884	$ 0	$ 100,884
012-2011	Construct Taxiway	$ 130,924	$ 0	$ 130,924
013-2012	Conduct Airport Master Plan Study	$ 150,000	$ 0	$ 150,000

2.4 Airport Inventory

EIK is located within the limits of the Town of Erie, Weld County, along the Front Range in the Denver Metropolitan area. The Airport is found close to the intersection of US Highway 7 and County Line Road near the confluence of Weld, Broomfield, and Boulder counties. EIK is approximately 5, 13 and 25 miles from downtown Erie, Boulder, and Denver, Colorado, respectively. Figures 2-1 and 2-2 provide depictions.

Residential-airpark homeownership is found east of the runway and due west of the runway's southern end. The terminal area is found west of midfield and auto access to the terminal area is via US Highway 7 on Airport Road to auto parking. EIK does not have the typical terminal area configuration with a terminal building and auto parking fronting an apron. Auto parking and the terminal building are separated. Vacant land is currently found northwest of midfield.

EIK is located near 40°00'37" North, 105°02' 53" West. EIK properties currently approximate 115 acres, in Sections 30 and 31. Exhibit E on Page 2-13 provides a depiction of the airport.

EIK is equipped with a rotating beacon atop the main hangar. The rotating beacon alternates green and white, indicating nighttime availability of a public-use, civilian airport. EIK is equipped with an Automated Weather Observing System (AWOS). An AWOS provides real-time local weather information for the flying public. The airport has a segmented circle located near the AWOS, both near midfield on the west side of the runway. The segmented circle indicates traffic pattern, and found within the circle is a lighted windcone displaying wind vector information. A supplemental windcone is found near the south runway end.

2.4.1 Runway 15-33

Runway 15-33 is 4,700 feet long and 60 feet wide. It is constructed of concrete with a 12,500 single-wheel gear (SWG) pavement strength. The wheel (single, double, dual-double) nomenclature refers to a pavement design methodology which produces a pavement strength referenced to the number of wheels on a given aircraft strut. Design inputs in this regard include soil type and other soil characteristics, sub grade/base soil improvements, loading, frequency and mix of aircraft which are expected to use the pavement, pavement type and composition, planned pavement life, and other design criteria. In short, pavements were designed to accommodate a limited number of aircraft operations, over time without substantial surface rehabilitation. It is worth noting that the design allows for a limited number of aircraft operations with weights greater than 12,500 pounds.

The effective runway longitudinal gradient is 0.9 percent. The Runway 15 elevation is 5072.0 feet above mean sea level (msl) and Runway 33 is 5116.0 msl. FAA design standards require that the effective and the maximum runway longitudinal gradients not exceed certain limits to ensure a runway is not too steep overall or within a shorter distance. Runway longitudinal line of sight is met. Line of sight provides that any two points five feet above runway centerline shall be mutually visible along any one-half of runway length.

Right traffic is established for Runway 15 operations and left traffic to Runway 33. Aircraft generally use all or portions of a rectangular flight pattern, of which the runway constitutes a portion of one side.

Figure 2-1
Colorado State System Plan

(Source: CDOT)

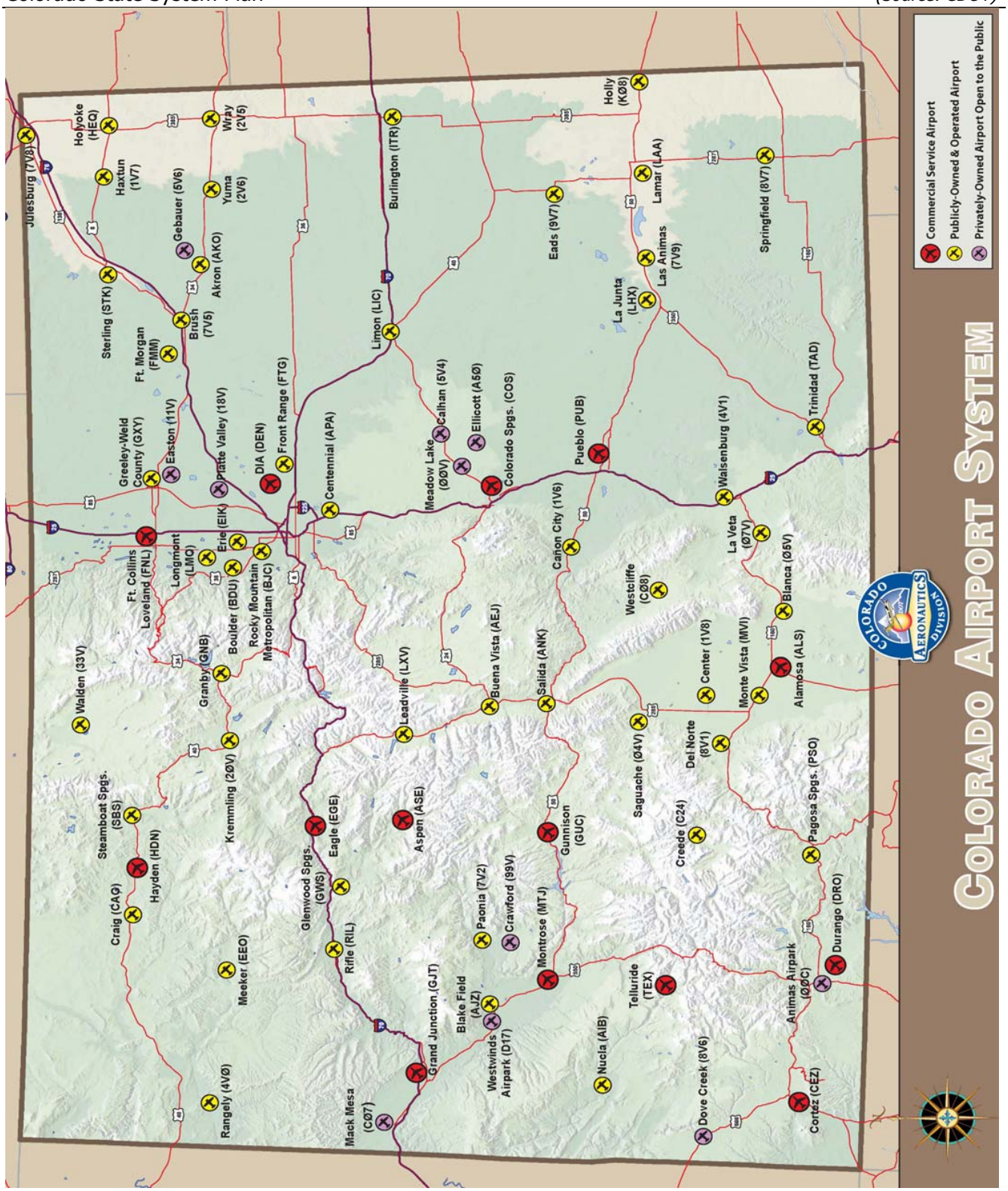
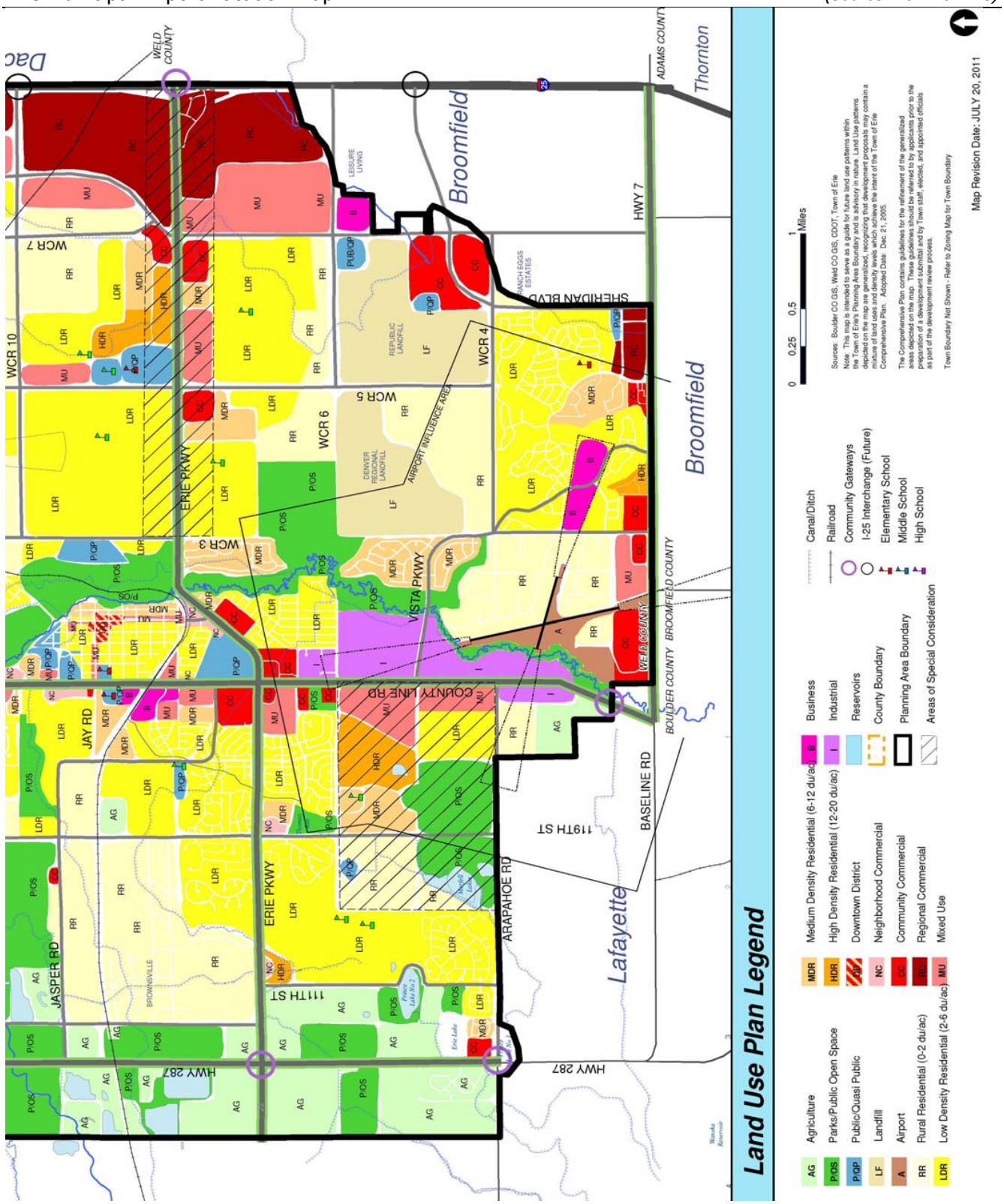


Figure 2-2
Erie Municipal Airport Location Map

(Source: Town of Erie)



Lights are frangibly-mounted (breakable) at the base to avoid substantial damage to the aircraft in the event of a deviation from the runway. The last 2,000 feet in either direction are directionally-lighted amber to indicate runway limits. Runway threshold lights are part of MIRL and are directionally lighted red and green to indicate runway limits.

Both runway ends are equipped with VGSI (Visual Glide Slope Indicator) lighting. The two-light Precision Approach Path Indicator (PAPI-2) is a type of VGSI used to provide lighted, visual information to the pilot as descent toward a runway end is made. The PAPI indicates a red and a white light when on the correct glideslope to either runway end, two red lights when below the glideslope and two white lights when above. The Runway 15 end is equipped with Runway End Identifier Lighting Systems (REILs). REILs are frangibly-mounted flashing lights situated near each runway end. This lighting system facilitates day or night runway end identification, in clear or semi-obscured weather conditions.

Both runway ends are marked with elements appropriate for non precision aircraft operation excluding aiming points. Runway marking elements at EIK include designation (the numbers), centerline, and touchdown zone. Runway markings are generally white.

A wind analysis was conducted as part of this planning. Results indicated that Runway 15-33 does not meet FAA's recommended 95 percent coverage of wind in an all-weather, VFR or IFR conditions. Additional information in this regard is found in Section 2.5.

An Instrument Approach Procedure (IAP) is available for pilots operating at EIK. An IAP is an FAA-designed and prescribed three-dimensional path in the sky for safe aircraft landing. These paths necessarily avoid terrain, tall towers and other obstructions to allow safe aircraft operation during some periods of inclement weather. Figure 2-3 depicts the IAP.

2.4.2 Taxiways and Apron

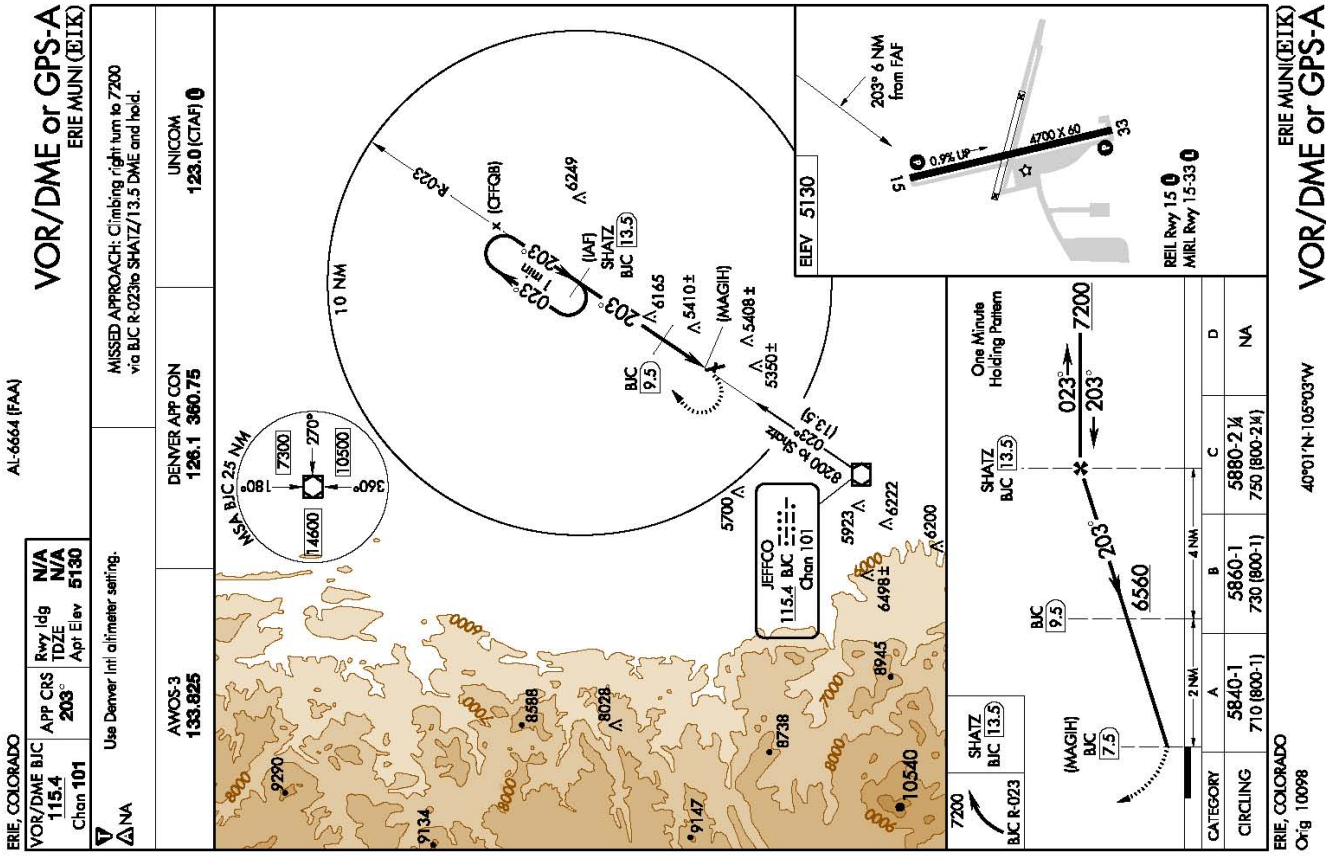
Parallel Taxiway A is Runway 15-33's primary taxiway. It is constructed of concrete at 12,500 SWG. It is 25 feet wide and with a 200 foot taxiway to runway centerline separation. Connecting Taxiways A1, A2, and A5 are constructed of concrete (A3, A4 are asphalt) at 12,500 SWG, are 25 feet wide at their narrowest width, marked with holdlines and equipped with signage 125 feet from Runway 15-33 centerline. Aircraft departure staging area is provided at A1 and A5. Taxiway markings are yellow with blue edge markers. A year 2013 taxiway lighting project is planned.

The main apron is constructed of concrete to 12,500 SWG. The apron approximates 31,000 square yards with 48 tiedown positions. The main hangar abuts this apron. Adjacent to and surrounding the main hangar is additional asphalt apron of 27,568 square yards. A portion of this apron at its northwestern extents (4,400 square yards) was recently reconstructed to 12,500 SWG, while the remainder is of unknown pavement strength and in substantially poorer condition. Aircraft parking is no closer than 250 feet to runway centerline. Apron markings are generally yellow with blue edge markers.

2.4.3 Historical Crosswind Runway

The original airport accommodated a second runway, then Runway 9-27. In 2009, the Town of Erie formally notified the FAA of the permanent closure of this runway. This was in response to FAA recommendations that the runway be repaired or closed due to poor pavement and

Figure 2-3
EIK Instrument Approach Procedure (Visual/Circling) *(Source: FAA)*



other nonstandard conditions. These conditions exist today and the former runway is closed.

The, then, runway approximated 3,825 feet long, 60 wide with an unknown pavement strength and non-standard longitudinal grade on the eastern end. A partial-parallel taxiway had a approximate 200-foot runway to taxiway centerline separation, with connecting taxiways at runway extents and midfield. Taxiway widths approximated 22 feet with unknown pavement strengths. Originating pavements remain on the airport, in a mostly-compromised condition with continuing design standards non-compliance. The former runway is marked with an X.

2.4.4 Airport Services and Access

EIK originated as a residential airpark prior to Town of Erie acquisition and sponsorship. The airport is somewhat unique in that it is a publicly-owned, public use facility that is primarily used by individuals that live adjacent the airport and access the runway via private property.

The eastern side of the runway was platted, and continues to be entirely residential. Several hangar homes exist along the flight line and farther east within the Erie Airpark. Access via US Highway 7 to Bonanza Drive to Piper Drive serves those residents southeast of midfield. Access via US Highway 7 to Bonanza Drive to both Cessna and Commander Drive serves those residents northeast of midfield. Access via US Highway 7 to Airport Road to Baron Court serves those residents due west of the south runway end. These areas constitute the *Airpark* as it will be referenced in this planning document.

Several taxiways exist in various states of repair, material composition and widths, nearer to obligated property for east-side airpark residents. Centerline of an east-side nearly full-parallel taxiway is located approximately 150 feet from runway centerline. Hangar homes along the flight line and farther within the airpark access this parallel taxiway. An extension of this taxiway encircles the northern extents of Cessna Drive. Holdlines are found approximately 115 feet from runway centerline on connecting taxiways near the Runway 15 and 33 ends, and at midfield.

Access to those select airpark residents along Baron Court is somewhat different in that a few, but not all lots currently have access to Taxiway A or the apron, individually.

US Highway 7 to Airport Road also accesses EIK's terminal area. The terminal area features the FBO hangar, fueling facilities and the apron along with 20 movable T-hangars and auto parking.

The FBO hangar is original to the airport and approximates 100 feet by 100 feet along with a co-located two-story office space (approximately 3,000 square feet per level), all under one roof. The hangar is approximately 435 feet from runway centerline. Fueling facilities consist of two 12,000 gallon tanks located near the middle of the apron, with 100LL and Jet-A fuels.

Auto parking area approximates 4,200 graveled square yards. These facilities are fenced and gated in the immediate area and constitute on-airport facilities. Airport customers and patrons must park and walk across a taxiway to access the FBO hangar/offices. Vector Air Employees park vehicles behind (north of) the existing FBO hangar.

Vector Air, EIK's FBO provides a full suite of small and larger aircraft general aviation services to the flying public from terminal area facilities.

Other terminal area aviation-related businesses are located adjacent the airport and access the airport via a taxiway that originates on off-airport property. Rocky Mountain Propellers and two hangar complexes are found due west of the terminal area along this taxiway.

Other businesses and the *Spirit of Flight Museum* north of the terminal area, on the west side of Coal Creek, access the terminal area in a similar fashion. These businesses and the museum are located on South Main Street via County Line Road. Aircraft Access is via a newly constructed/aligned taxiway bridge across Coal Creek. Not all businesses are aviation-related.

Under contract with the Town, Vector Air manages the airport, providing routine airfield safety, security and maintenance.

The Town of Erie Police and Mountain View Fire Rescue provide law enforcement and fire/emergency medical services for the EIK and its environs. Xcel Energy provides power.

Aside from the chain-link perimeter fencing partially surrounding the terminal area, no other fencing exists.

Legend

(E)	Existing
	Existing Property Line
	Building Restriction Line (BRL)
	Runway Protection Zone (RPZ)
	Approach Surface
	Object Free Area (OFA)
	Runway Safety Area (RSA)
	Obstacle Free Zone (OFZ)
	Section Line
	Dirt Road
	Existing Paved Roads
	Existing Pavement
	Existing Avigation Easement
	Threshold Lights
	Precision Approach Path Indicators (PAPI-2)
	Segmented Circle With Lighted Wind Cone
	Rotating Beacon

Airport Data

	Existing
Airport Elevation	5130.0'
Airport Reference Point (ARP) Coordinates (NAD 83)	North Latitude 40°00'18" West Longitude 105°02'37"
Mean Daily Max Temperature - Hottest Month	88.4° - July
Magnetic Variation (November, 2012)	8°46' East
Airport And Terminal Electronic Navigational Aids	Beacon, VOR/DME, Lighted Wind Cone, Segmented Circle
Percent Wind Coverage (10.5 / 13 / 16 / 20 Knots)	85.71 / 89.8 / 94.05 / 97.31
Airport Approach Category And Design Group	Visual - Utility
NPIAS Service Role	GA
Taxiway Lighting	A - Reflectors
Taxiway Marking	Basic

Structures List

No.	Description
1	FBO Hangar
2	Movable Hangars
3	Rocky Mountain Propellers - Off Airport
4	Hangar Complex - Off Airport
5	Vacant
6	Schofield Hangar Complex - Off Airport
7	Waste Connection of Colorado - Off Airport
8	Gaptor Septic Systems - Off Airport
9	LTS Glass Doors - Off Airport
10	Spirit of Flight Museum - Off Airport
11	Aero Systems - Off Airport
12	Turf Cuts, Trail Ridge Construction - Off Airport
13	Tri-County Heliport - Off Airport
14	?

Runway Data

	Runway 15 / 33
	Existing
Effective Gradient (In Percent)	0.95
Percent Wind Coverage (10.5 / 13 / 16 / 20 Knots)	85.71 / 89.8 / 94.05 / 97.31
FAR Part 77 Approach Surfaces (Slope)	(1.5) 20:1 / (.33) 20:1
Instrument Runway	No
Touchdown Zone Elevation (TDZE)	(1.5) 5095.2' / (.33) 5116.67'
Runway Lighting	MIRL
Runway Marking	Non-Precision
Electronic Navigational Aids	Beacon, VOR/DME
Visual Approach Aids	(1.5) PAPI, REIL, MIRL / (.33) PAPI
Runway Length	4,700'
Runway Width	60'
Pavement Type	Concrete
Pavement Design Strength (1,000 lbs)	12,500 SWG
Runway Safety Area Length / Width	5,180' / 120'
Runway Object Free Area Length / Width	5,180' / 250'
Runway Obstacle Free Zone Length / Width	5,100' / 250'
Approach Category And Design Group	A - 1.0mi (Only)
Critical Aircraft	Cessna 150
Approach Speed (Approach Category)	Less than 91 Knots (A)
Wingspan (Design Group)	< 49.0' (I)
Weight	12,050 lbs
Length Of Haul (Aircraft Over 60,000 lbs)	500 Miles
Taxiway Width	A - 25'
Taxiway Lighting	A - Reflectors
Approach Visibility Minimums	Circling
Runway Maximum Grade (In Percent)	.93
FAA Line of Sight (Longitudinal)	Met
Runway End Elevation	(1.5) 5072.2' / (.33) 5116.7'
Runway High / Low Point Elevation	5116.67 / 5072.2'

No.	Revision	Chkd	Date

Erie Municipal Airport
Town of Erie, CO

ADG AIRPORT DEVELOPMENT GROUP, Inc.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2502
303.329.8448 / 303.329.8755
www.ADGAirports.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No:	EIK13598M
Designed By:	SMP
Drawn By:	MTP
Approved By:	SPM
Date:	November 2012

Existing Airport Layout

Exhibit:

E

2.5 Environmental

The Town of Erie has made the following environmental stewardship commitment: "In Erie, we have a relentless commitment to maintaining our Town as a great place to live, work and play. That's why sustainability is more than an option here, it's part of daily life. As a result, we're well on our way to becoming a model for eco-friendly civic development with environmentally sound "green" practices."

2.5.1 Airport Area Zoning and Land Use

The Town of Erie has established *Airport (AP)* zoning, per 10-2-5 of the Town Code. Areas near the Runway 15 and historical Runway 9 and 27 ends are designated *Rural Preservation (RP-2).* Figure 2-1 depicts this zoning per the Town Zoning Map. *Light Industrial (LI)* is found due north of the field, *Rural Residential (RR)* associated with the Airpark, and *Business (B)* southwest of the airfield, along Highway 7. Planned development is found east and northeast associated with the residential Vista Ridge and Vista Pointe planned developments.

The *Airport Overlay (APO)* District overlays all other districts/uses within the area, per Section 10-2-7, as depicted on the next page.

The Town of Erie has accepted Federal funds, and as such, is obligated to comply with certain conditions, known as grant assurances. These assurances, among others, require the Town to enforce compatible land use adjacent the airport and restrict the height of nearby objects. The APO is intended to ensure compliance with these grant assurances. Per APO Section 10-2-7, "the purpose of the airport overlay district is to minimize exposure of residential and other sensitive land uses to aircraft and their potential impacts, including noise, to minimize risks to public safety from aircraft accidents, and to discourage traffic congestion and incompatible land uses proximate to and within airport influence areas." The district provides for the following within the Airport Influence Area (AIA):

- Disposition of non-conforming uses,
- Height and land use limitations,

And, for the following in the event of application for a change in land use within the *APO* district:

- Review and FAA determination for Part 77
- Imposition of avigation easement
- Disclosure to prospective buyers of AIA

AIA limits, as the Town defines them on the zoning map, extend beyond Town jurisdiction into unincorporated Broomfield County, the City of Lafayette, and unincorporated Boulder County.

A *Floodplain Overlay District (FPO)* associated with Coal Creek is of consequence. Section 10-2-7 states the district's purpose is to "promote the public health, safety, and general welfare, to minimize flood losses in areas subject to flood hazards, and to promote wise use of the floodplain". A primary consequence of this district is exclusion of planned, residential development, and promoting other more compatible uses.

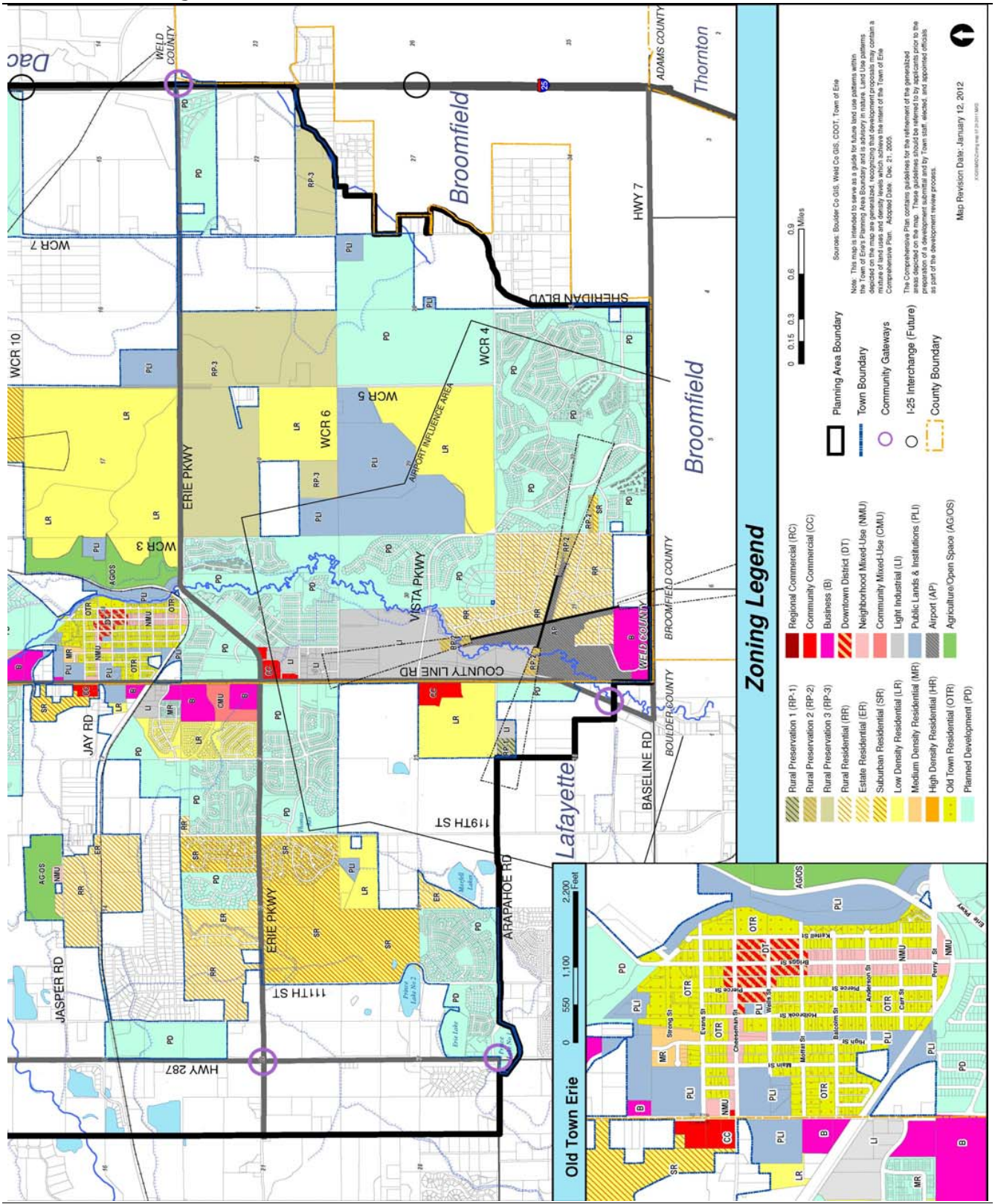
Town Comprehensive Planning

The Town adopted a comprehensive plan in 2005. This document "outlines the community's vision and goals for the future and provides guidance", as an advisory document. EIK, itself, is not substantially addressed within; however, off-airport land uses within the AIA are noteworthy as depicted on Figure 2-4, a depiction of a portion of the Town's future land use map.

Pursuant to and following on from comprehensive planning, the *2008 Erie Transportation Master Plan,* the *2010 Erie Parks, Recreation, Open Space Master Plan* and the 2008 *Natural Area Inventory* exist, but do not markedly address EIK.

Figure 2-4
Town of Erie Zoning

(Source: Town of Erie)



The latter informs habitat as it exists on/near EIK, noting several prairie dog towns, a Swainson's Hawk nest, Burrowing Owl and Tiger Salamander, characterized as *wildlife sites*, along with a rating system for five portions of the Coal Creek Right-of-Way (CCROW) near EIK, characterized as *natural areas*.

The *Open Space Master Plan* specifies that unobstructed, continuous open space, such as the CCROW is identified as high-value for preservation: "The current width and shape and other features of a naturally occurring corridor should be preserved in order to maintain its environmental integrity and avoid creating an engineered appearance."

Notable Portions of Town Code

The Town has spent significant time and effort to accommodate residential and commercial through-the-fence in accordance with FAA grant assurances. Section 2.7.1 specifies (1) An annually-renewable permit and fee for residential access, (2) A multi-year commercial business or commercial non-business access license and fee, (3) Compliance with airport rules and regulations, Airmen regulations and FAA Order 5190.6B (or current at time of license/permit issuance) and other applicable regulations, (4) that the Town may unilaterally modify any provision of or terminate an existing license/permit to maintain FAA grant assurance compliance.

Section 10.6.2B3 specifies that no hangars or buildings should be located within 150 feet of the Coal Creek water course centerline. Section 6.11.4 specifies that aircraft shall use existing easements to access EIK and other *Airpark* properties only if (1) the engine is off and the aircraft is being towed, (2) signage is installed at approved at Town-approved locations, and (3) liability insurance, per the Code, is in force.

City and County of Broomfield

City and County of Broomfield jurisdiction is found south of US Highway 7 in the vicinity of EIK. Zoning in this area is Planned Unit Development, and current land use is a mix of neighborhood residential and open area. Figure 2-5 shows this area, known as Anthem (nearby in green/brown), via a portion of Broomfield's 2005 comprehensive plan land use map. These uses underlay the AIA, as the Town of Erie defines the AIA, *were it* to extend south of Highway 7. Historical Anthem filings seemingly specified no residential land uses underlying Runway 33's historical visual approach surface.

City and County of Broomfield code addresses general aviation airport zoning in Chapter 17-35-030 (F) indicating that wireless facilities/towers shall "meet or exceed current standards and regulations of the FAA". No other substantial or meaningful airport-related code exists.

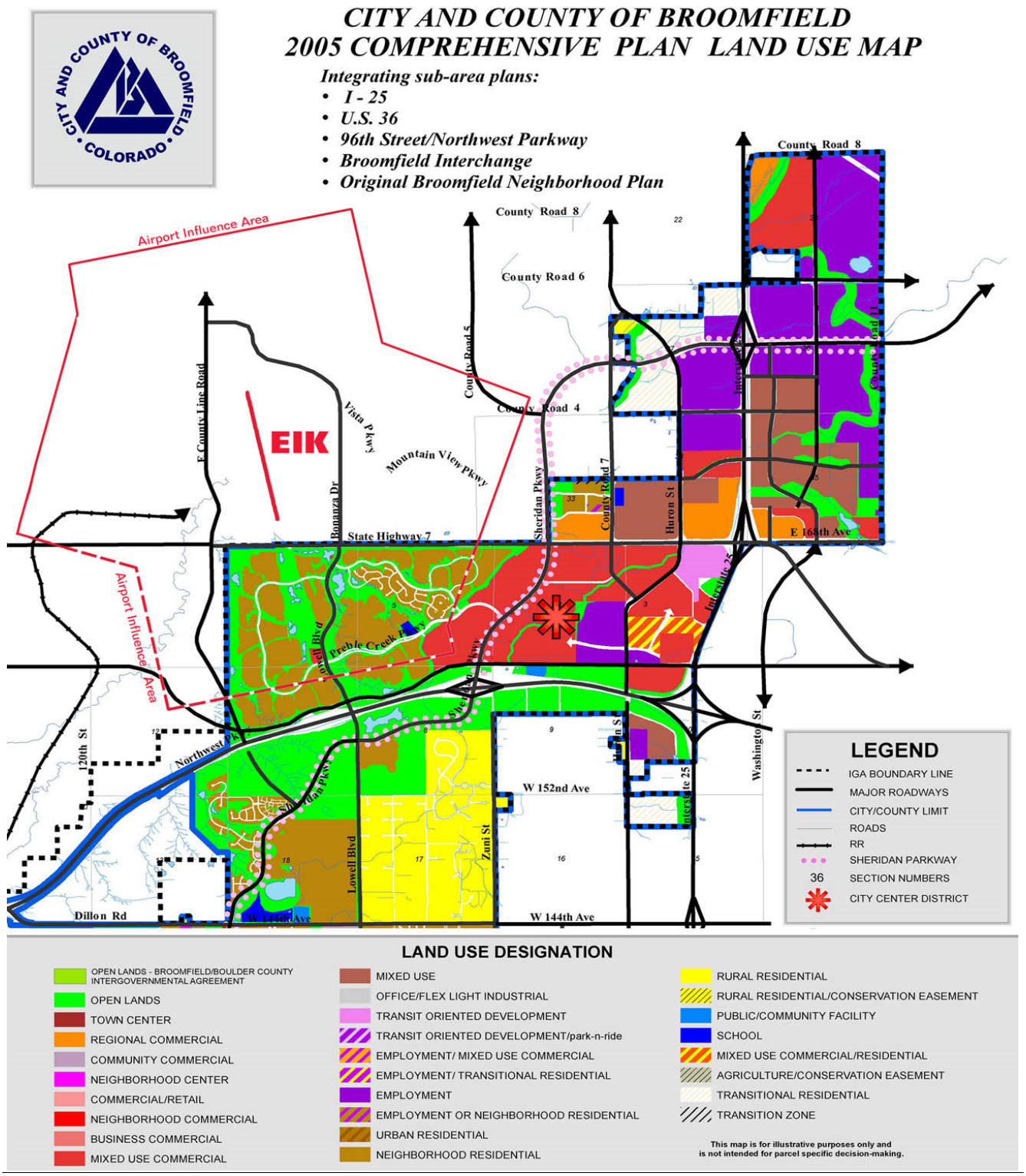
Boulder County

Unincorporated Boulder County is found west of County Line Road and agriculturally-zoned properties underlay the AIA, as the Town of Erie defines the AIA. The Boulder County code within Article 18-107 specifies height restriction based upon 14 CFR Part 77 protection surfaces. No other substantial or meaningful airport-related code exists.

City of Lafayette

The City of Lafayette annexed a triangular piece of property near the intersection of Highway 7 and County Line Road. The City has identified *Public District (P)* zoning to this property, a non-residential zoning. Primary use is currently water treatment and public services. Other City jurisdictional areas are at distance and do not underlay the AIA, as the Town defines it. The City of Lafayette's code does not address airports.

Figure 2-5
City of County of Broomfield Land Uses *(Source: City and County of Broomfield, select additions in red by ADG)*



2.5.2 Climate

Table 2-3 summarizes temperature and precipitation data from Longmont, Colorado, the location of the nearest weather reporting station disseminating detailed information. The Colorado Climate Center at Colorado State University characterizes area weather:

- Dry winters with an occasional wind-blown snow. Some very cold temperatures alternating with some surprisingly warm days.
- Windy springs with highly changeable weather, an occasional blizzard, large temperature changes and an occasional gentle soaking rain or wet snow to help nurture the grasslands.
- Low-humidity summers with hot days and comfortable nights. The threat of big thunderstorms is always there, and the Plains see some of the most ferocious hail storms of the entire continent.
- Pleasant falls, often dry.

Wind

Historical airport planning used winds atop the NOAA weather tower due northeast of EIK. Based upon this location and its data, Runway 15-33 did not meet FAA's recommended 95 percent coverage of wind in all-weather conditions.

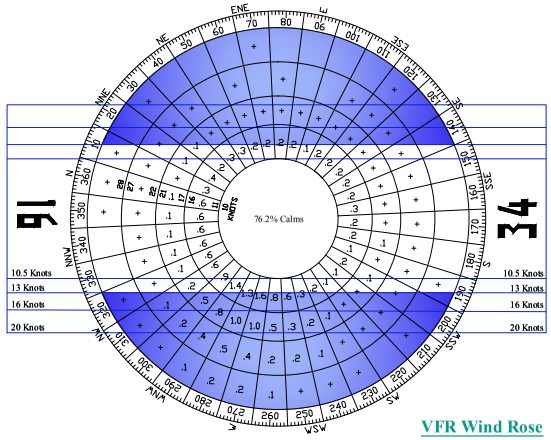
FAA details the objectives of wind analysis noting that the desirable wind coverage is 95 percent. That is; a runway, or runways, at a given alignment should have a crosswind component less than a given threshold 95 percent of the time. These thresholds are: 10.5 knots for small aircraft, 13 knots for larger general aviation aircraft, and 16 knots for larger turbo-prop and some jet aircraft and 20 knots for the largest turbine commercial and general aviation turbine aircraft. The underlying notion is that larger aircraft are better able to accommodate crosswind, without regard to pilot skill, but simply because of size.

Two sources of wind data were gathered for this planning. Rocky Mountain Metropolitan Airport (BJC) is the location of the nearest weather reporting station with a sufficient record to meet FAA guidelines for wind adequacy. In addition, approximately three years' worth of wind data has been withdrawn on a monthly basis from the EIK AWOS. These data were used to create the wind roses found on Exhibit W, on the following page.

Table 2-3
Climate (Average Temperatures; Total Precipitation/Snowfall) *(Source: Western Regional Climate Center)*

Degrees Fahrenheit/Inches	Maximum	Minimum	Precipitation	Snowfall
January	42.6	11.6	0.35	4.8
February	46.0	15.9	0.45	5.5
March	52.8	22.8	0.99	7.1
April	62.3	32.0	1.74	4.9
May	71.6	41.7	2.45	0.7
June	82.1	49.6	1.70	0.0
July	88.4	54.7	1.38	0.0
August	86.6	53.0	1.21	0.0
September	78.3	43.7	1.21	0.5
October	66.6	32.7	0.96	1.8
November	52.3	21.6	0.63	5.3
December	44.1	13.6	0.46	5.3
Annual	64.5	32.7	13.53	35.9

BJC

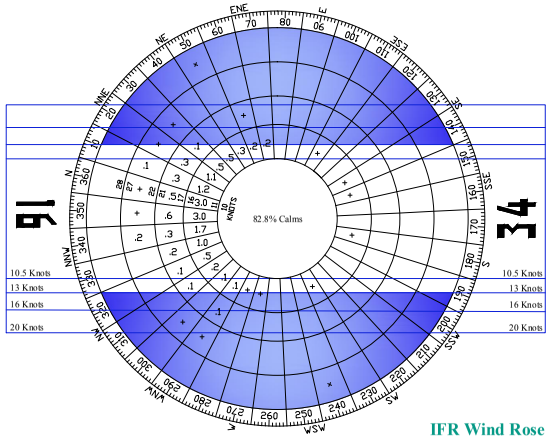


VFR Wind Rose

Source: National Climatic Data Center
Location: Broomfield, Colorado 72469 (BJC)
Period: January 1, 2000 to December 31, 2009
Number of Observations: 46,280
VFR Sky Conditions:
Cloud Ceiling: 1,000 Feet or Greater and Visibility: 3 Statute Miles or Greater

VFR Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
16-34	84.81%	89.13%	93.65%	97.13%

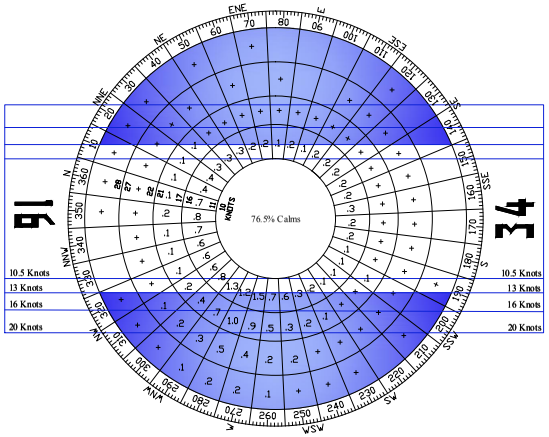


IFR Wind Rose

Source: National Climatic Data Center
Location: Broomfield, Colorado 72469 (BJC)
Period: January 1, 2000 to December 31, 2009
Number of Observations: 2,592
IFR Sky Conditions:
Cloud Ceiling: 200 to 1,000 Feet; and Visibility: 1/2 to 3 Statute Miles

IFR Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
16-34	97.91%	98.89%	99.57%	99.73%



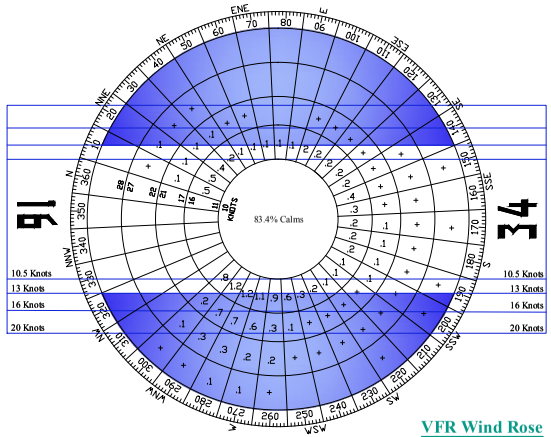
All-Weather Wind Rose

Source: National Climatic Data Center
Location: Broomfield, Colorado 72469 (BJC)
Period: January 1, 2000 to December 31, 2009
Number of Observations: 49,753

All-Weather Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
16-34	85.71%	89.8%	94.05%	97.31%

EIK

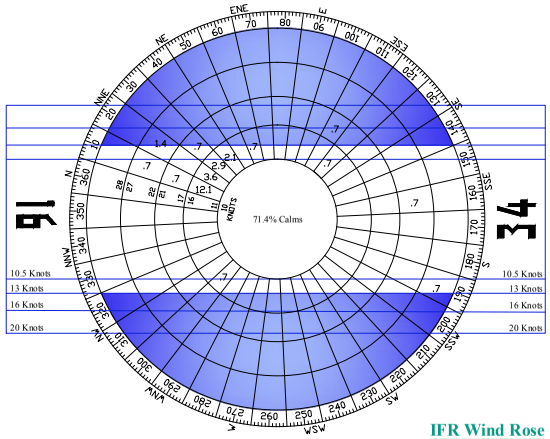


VFR Wind Rose

Source: Erie AWOS
Location: Erie, Colorado (EIK)
Period: July 26, 2010 to October 24, 2012
Number of Observations: 34,257
VFR Sky Conditions:
Cloud Ceiling: 1,000 Feet or Greater and Visibility: 3 Statute Miles or Greater

VFR Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
16-34	88.96%	92.64%	96.27%	98.53%

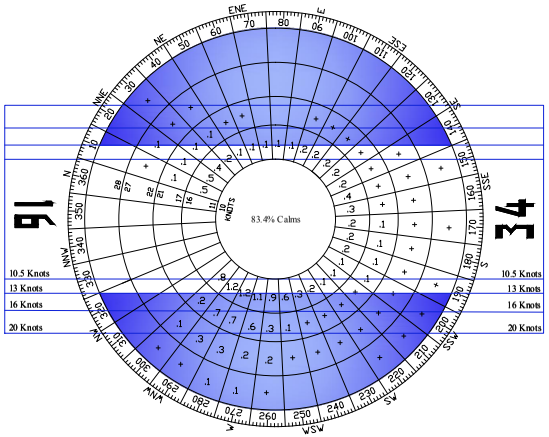


IFR Wind Rose

Source: Erie AWOS
Location: Erie, Colorado (EIK)
Period: July 26, 2010 to October 24, 2012
Number of Observations: 401
IFR Sky Conditions:
Cloud Ceiling: 200 to 1,000 Feet; and Visibility: 1/2 to 3 Statute Miles

IFR Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
16-34	93.31%	97.38%	99.59%	100%



All-Weather Wind Rose

Source: Erie AWOS
Location: Erie, Colorado (EIK)
Period: July 26, 2010 to October 24, 2012
Number of Observations: 34,607

All-Weather Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
16-34	88.99%	92.66%	96.29%	98.54%

Exhibit:
W

Wind Data

Project No: EIK13989M
Designed By: SMP
Drawn By: MTP
Approved By: SPM
Date: November 2012

ADG AIRPORT DEVELOPMENT GROUP, Inc.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-3852
303.758.6094 / 303.758.6095 Fax
www.ADGAirports.com

A.I.P. Project Number: 3-08-0090-13-2012

Erie Municipal Airport
Town of Erie, CO

No.	Revision	Chd	Date

With respect to the BJC data, Runway 15-33 does not meet FAA's recommended 95 percent coverage of wind in all-weather and VFR conditions in the 10.5, 13 and 16-knot speed classifications, and the 10.5 knot speed classification in IFR conditions. With respect to the KEIK data, Runway 15-33 does not meet FAA's recommended 95 percent coverage of wind in all-weather and VFR conditions in the 10.5 and 13-knot speed classifications.

Note that the runway alignment identified on Exhibit W is Runway 16-34, rather than the current Runway 15-33. As a matter of explanation, the runway numerals are to be modified based upon the existing runway alignment of 167.7° minus a current (November 2012) declination of 8.75° East, resulting in a magnetic runway bearing of 158.95°, this within a 155°-165° range, indicating 16 and necessarily, 34.

2.5.3 NEPA

The 1969 National Environmental Policy Act (NEPA) established a US National environmental policy and the Council on Environmental Quality (CEQ). The primary result of this legislation as it relates to the Town as Sponsor, is the requirement to prepare for FAA, as lead agency, environmental clearance documents for an AIP project, generally termed the: *Proposed Federal Action*.

FAA promulgated the *Environmental Desk Reference for Airport* Actions along with other guidance documents to ensure conformity with NEPA. Implementation conformity in this regard results in an FAA-generated environmental finding through one or more of these processes and documents: (1) a Categorical Exclusion (CE), (2) an Environmental Assessment (EA) or (3) an Environmental Impact Statement (EIS).

Twenty-three environmental impact categories are subject to analysis based upon the specific proposed project's stated purpose and need, along with reasonable project alternatives. Impact category significance is characterized in terms of threshold impacts; that is, a record of decision or a finding of a no significant impact is given if the quality or quantity of impacts does not reach identified thresholds.

Because the Town is obligated to comply with FAA grant assurances, federal and state environmental agencies have jurisdiction, and compliance mandates conformity to NEPA in this regard on a project-specific basis.

A review and description of each environmental impact category along with a limited baseline data gathering effort constitutes the remainder of this section.

The first impact category is Air Quality.

1. Air Quality

Pursuant to the Clean Air Act (CAA), the US Environmental Protection Agency (EPA) established six criteria pollutants into the National Ambient Air Quality Standards (NAAQS):

1. Carbon Monoxide (CO)
2. Lead (Pb)
3. Nitrogen Dioxide (NO_2)
4. Ozone (O_3)
5. Particulate Matter (PM_{10}, $PM_{2.5}$)
6. Sulfur Dioxide (SO_2)

Sampling and monitoring for these criteria pollutants is occasionally performed statewide, and any quantity of pollutant which exceeds the threshold specified per CAA and its derivatives, results in a geographic area being placed into non-attainment, with CAA. Non-attainment areas are managed by the state of Colorado through their State Implementation Plan (SIP). The SIP is essentially an EPA-approved remediation plan, which specifies actions that the state will take to reach future attainment with CAA. CAA mandates

that no federal agency will participate in a project that does not conform to the SIP, within a non-attainment area.

Air quality in the EIK area is generally good (poorer during seasonal inversions) with ambient concentrations of NAAQS pollutants below established thresholds, with the notable exception of 8-Hour Ozone, characterized as marginal; ozone is a derivative of the NO_2 NAAQS pollutant. In accordance with FAA Order 5050.4A *Airport Environmental Handbook*, no air quality analysis is required for general aviation or small commercial service airports with less than 180,000 annual forecast operations; however, analysis pursuant to other federal requirements is noteworthy.

FAA's Emission and Dispersion Modeling System (EDMS) is the air quality modeling software of choice for depiction of the geographic distribution and quantity of NAAQS pollutants.

Based on the above it is assumed that there will be a project–specific EDMS analysis necessary if *de minimus* thresholds are exceeded.

2. Biotic Resources

For NEPA environmental analysis purposes, biotic resources refer to area flora and fauna, including their habitat. This impact category instructs reference to state-listed threatened, endangered or other species of special concern and their habitats. Should consultation reveal potential for impact, species-specific mitigation may be required.

Current query to the Colorado Parks and Wildlife revealed species, but not those specific to Weld County. Regardless, seven amphibian, 19 birds, 23 fish, 13 mammals, 10 reptiles and two mollusks were state-specified. These species are found throughout Colorado, and may or may not be found within the area of project-specific concern. Field visits by a qualified biologist, possibly through a biological or ecological assessment or other investigation may be required to make positive identification of reference species and/or habitat and/or find a biological opinion.

3. Coastal Barriers

Barrier islands and landforms often provide protection from wind-driven weather and surf and effectively protect coastal areas from damage. As a result the Coastal Barrier Act of 1982 provided protections for the Coastal Barrier Resource System. Given that the Airport is at a distance from any coastal areas, no analysis in this regard has been completed, nor is any anticipated.

4. Coastal Zone Management

Coastal areas consist of waters and land which are: nationally designated as important resources, effectively protected via the Coastal Zone Management Act of 1972, and are provided protections by the Coastal Zone Management Program. Given that the Airport is at a distance from coastal areas, no analysis in this regard has been completed, nor is any anticipated.

5. Compatible Land Use

The compatible land use impact category primarily relates to aviation noise; and, if the determining analysis for noise not does not rise to the threshold level to substantiate mitigation, then category impacts for compatible land use will likely reach similar conclusions. Also important to the determining impacts are:

1. Community disruption
2. Business relocations
3. Induced socioeconomic impacts
4. Wetland or floodplain impacts
5. Critical habitat alterations

As discussed in the upcoming noise impact category portion of this section, existing or proposed noise sensitive land uses surrounding airports is generally a sub-optimal condition, without mitigation.

Noise impacts notwithstanding, other land use concerns are important. Given that the federal government is not provided the constitutional authority to make local or regional land use decisions, FAA relies upon Sponsors to provide reasonable protections. FAA provides advisory guidance and mandates grant assurance compliance. Grant assurances specify that the Town will take reasonable steps to protect EIK from incompatible land uses. As described earlier, these steps usually involve development of land use plans and zoning which keep incompatible land uses, like some kinds of residential use, at a distance. This coupled with height restriction zoning to protect an airport's airspace are the two relevant issues in this regard.

Also, potential wildlife attractants such as landfills, sewage treatment facilities and such, should be located more than 10,000 feet from airfield pavements.

This document and its process will provide land use compatibility recommendations as derived through the planning process.

6. Construction

Airport construction impacts may consist of dust, aircraft and equipment emissions, modified storm water discharges, spills and noise.

A National Pollution Discharge Elimination System (NPDES) permit is generally required based upon the amount of area (no more than one, or five acres) disturbed. The permit specifies actions taken to manage quantities and rates of storm water runoff and sediment control measures.

In addition to the NPDES permit, the state may require a general permit for discharges, pursuant to an overall Storm Water Pollution and Prevention Pan (SWPPP). Not all state requirements above apply and a determination may be solicited upon specific project identification.

7. Section 4(f) Resources

Section 4(f) refers to that section within the Department of Transportation Act of 1966, and its derivatives, stating that if a given project requires use of a publicly-owned park, recreational area or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance, is approvable if (1) there is no other prudent or feasible alternative which would avoid use, and (2) project planning includes all possible mitigation to minimize harm.

Consultation with the US Environmental Protection Agency (EPA), the US National Park Service (NPS), the US Fish and Wildlife Service (FWS), and the Colorado State Historic Preservation Officer (SHPO) may be necessary to determine appropriateness and proximity of any Section 4(f) lands and potential project impact as they may substantiate threshold impacts.

St. Vrain State Park, the nearest state park is some 8 miles due northeast east of EIK. At its closest point, the nearest federal lands of subject, Rocky Flats National Wildlife Refuge is southwest of EIK. Flagg Open Space Park is due southwest of EIK at, and south of the County Line Road and Baseline Road intersection. Several Boulder County and Lafayette Open Space and Regional Parks are found 1½ miles due west of EIK along with a neighborhood park in nearby residential developments.

8. Federal Endangered/Threatened Species

While the Biotic Resources portion of this section identified the relevant state species, this portion deals exclusively with Federal endangered, threatened or candidate species along with critical habitat, all pursuant to the Endangered Species Act. Table 2-4 identifies these species in Weld County.

Field visits by a qualified biologist, through a biological or ecological assessment or other investigation, may be required to make positive identification of the reference species and/or habitat. Consultation with FWS is prerequisite to project impact category threshold determination.

9. Environmental Justice

Analysis to determine potential disproportionate and/or adverse effects on low-income or minority populations is prerequisite to project impact category threshold determination per (US) Executive Order 12898 and DOT Order 5610.2. Demographic, Census or state and local population, ethnicity and employment data, along with public outreach are used to determine threshold impact significance.

Given that the airport has relatively low activity, baseline category impacts may not reach thresholds of significance, providing that there is no comment of relevance during a project public consultation process.

10. Farmlands

Farmlands of prime, unique or of state or local importance, so designated through scoring via Farmland Conversion Impact Rating Form (AD1006) with the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) may require mitigation. Project specific threshold category impacts should be considered through NRCS consultation.

11. Floodplains

Executive Order (US) 11988 and DOT Order 5650.2 specifies that sensitive development should remain outside the base, 100-year floodplain. Zones A, AE and/or V on a Flood Insurance Rate Map (FIRM) produced the Federal Emergency Management Agency (FEMA) generally depicts these areas. FEMA recommends municipal adoption of ordinance to ensure compliance with the Order.

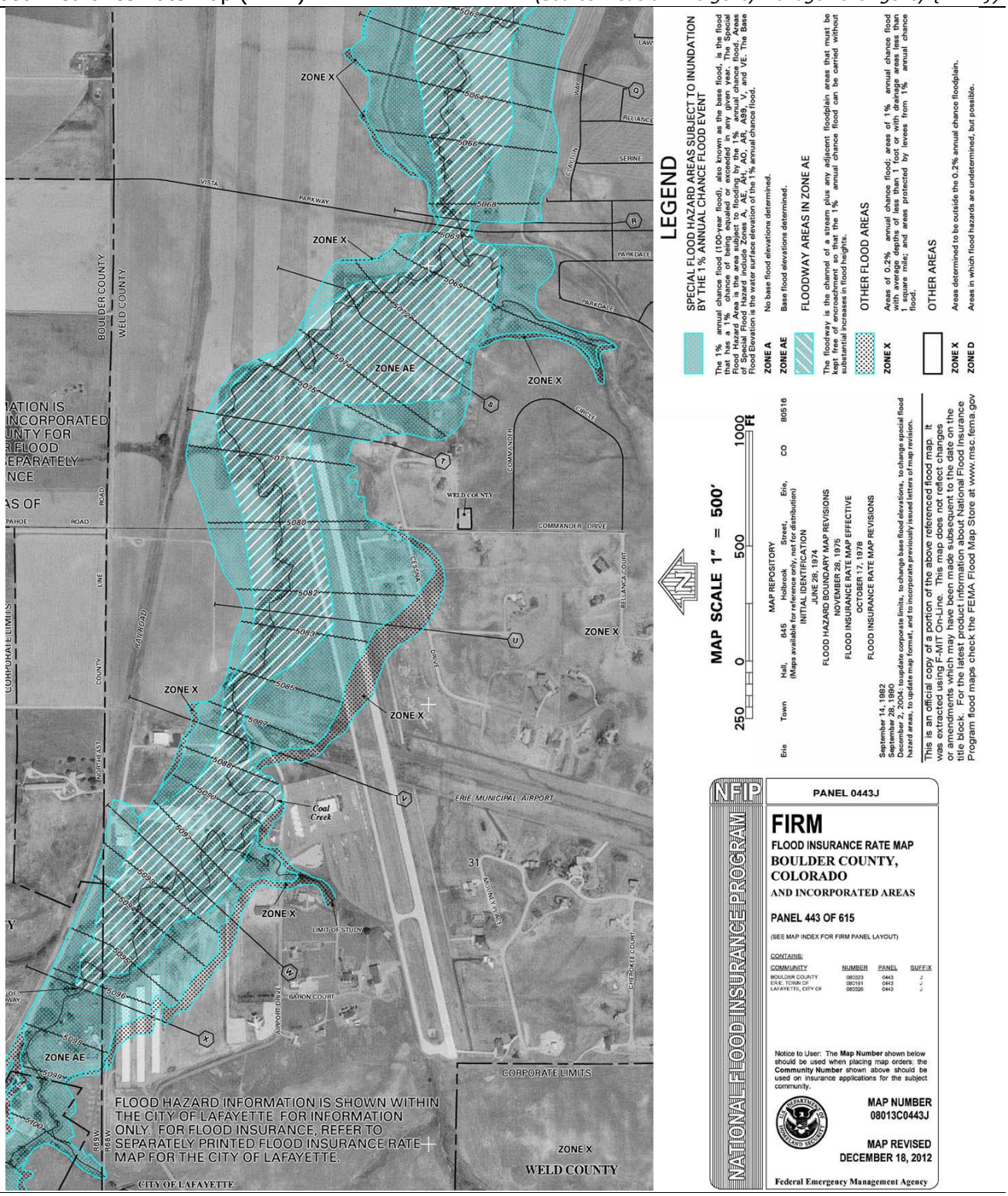
The Town has promulgated its *Floodplain Overlay District (FPO)* (Code Section 10-2-7) associated with Coal Creek, and other waterways to this end. Figure 2-6 shows the FIRM of the airport area.

Table 2-4
US Threatened or Endangered Species in Weld County *(Source: US Fish and Wildlife Service)*

Species (Common Name)	**Taxon**	**Status**
Colorado Butterfly plant	Plants	Threatened
Least Tern	Bird	Endangered
Whooping crane	Bird	Endangered
Mexican Spotted owl	Bird	Threatened
Pallid sturgeon	Fishes	Endangered
Black-Footed ferret	Mammals	Threatened (Experimental)
Preble's meadow jumping mouse	Mammals	Threatened
Piping Plover	Bird	Threatened
Ute ladies'-tresses	Plants	Threatened
Western Prairie Fringed Orchid	Plants	Threatened

Figure 2-6
Flood Insurance Rate Map (FIRM)

(Source: Federal Emergency Management Agency {FEMA})



Note that the floodway is found in white crosshatching and the floodplain (or Floodway Fringe, as the Town Code identifies it) extents are blue. Notably, with respect to floodway (Section 10-2-7-C-6):

1. A regulatory floodway is adopted,
2. New construction of any type is precluded,
3. No filling or excavating is permitted,
4. Flammable/hazardous materials storage is not permitted,
5. EIK is permitted by right, but not if: "structures, fill, excavation" is required.

It is noteworthy that the northern half of the runway is currently within the 100-year floodplain and the northern parallel taxiway extents within the floodway.

12. Hazardous Materials

Hazardous, for purposes herein, refers to industrial wastes, petroleum products, dangerous goods and other contaminants. EPA maintains online databases to search known contaminated sites in accordance with the following legislation:

1. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
2. Resource Conservation and Recover Act (RCRA)
3. Toxic Substances Control Act
4. Oil Pollution Act
5. Community Environmental Response Facilitation Act (CERFA)

Impact category significance relates primarily to the number of hazardous materials, substances and wastes storage, handling and spills and the quantity of subject material. Should investigation reveal sufficient hazardous materials, substance or wastes, permitted remediation or mitigation may be necessary.

Project specific consultation with the state may be necessary to determine threshold impact significance. EPA's *Enviromapper* revealed several instances of air-related reporting associated with the various oil and gas natural resources extraction sites around EIK. Nearby water-related reporting included Lafayette's water treatment facility, the recent replacement of the taxiway bridge crossing Coal Creek. Waste and Land-related reporting includes Aerosystems, Rocky Mountain Propellers, EIK (Town) and a location near Bonanza and Highway 7.

An Environmental Site Assessment (Phase I) should precede purchase of land with AIP funds. This effort provides field reconnaissance, inventories environmental data with limited assurance that the site is free of hazardous materials. Should a recognized environmental condition be noted, progression to Phases II or III may be necessary.

13. Historic Properties

An historic property for purposes herein is defined as any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Places (NHRP). Section 106 of the National Historic Preservation Act (NHPA) provides for a process with the Colorado State Historic Preservation Officer (SHPO) to determine effect and impact category significance. Also, analysis pursuant to the Archaeological Resources Protection Act (ARPA), Archaeological and Historic Preservation Act and the Native American Graves Repatriation Act may be necessary.

Potential for a historic site may require execution of a phased (classed) Cultural Resource Survey or other archaeological/historic investigation to I: Identify, II: Evaluate, and III: Mitigate cultural, historical or archaeological sites of significance.

The nearest register site, the Lincoln School, home to Town administrative offices in *old town* Erie is 2-3 miles north of EIK, and several houses

within Lafayette and Louisville are also in the register, a farther distance.

14. Induced Socioeconomic Impacts

A given project's potential to cause induced or secondary socioeconomic impacts on the community via these factors should be identified:

1. Shifts in patterns of population movement or growth
2. Public service demands
3. Changes in business and economic activities
4. Other factors identified by the public

Baseline category impacts are not expected to reach thresholds of significance, provided that there is no public comment of relevance during project specific consultation.

15. Light Emissions and Visual Effects

Disturbance of area sensitive land uses due to airport lights or activities is of primary concern for this impact category. Given that the airport has relatively low activity, baseline category impacts are not expected to reach thresholds of significance, providing that there is no public comment of relevance during project specific consultation.

16. Noise

Aircraft noise is often one of the most concerning or objectionable environmental impact for a given project or airport environ. Existing and future noise impacts should be evaluated based upon industry standards, as related to the human environment and potentially sensitive species and historic properties; with mitigation provided as appropriate.

FAA has adopted and prescribes use of the Day-Night average sound Level (DNL) noise metric as the cumulative metric of choice for baseline analysis and/or for a given proposed federal action. The DNL noise metric uses the amount of aircraft noise, measured in decibels (db) over a 24-hour period, with an increase of 10 db for each aircraft operation occurring between the hours of 10:00 p.m. to 7:00 a.m.

FAA's Integrated Noise Model (INM) is the noise modeling software of choice for depiction of the geographic distribution of aircraft noise. INM is designed to show the geographic distribution of an average day's aircraft noise about the landing area or runway. Noise, in this regard, is louder and more intense closer to the landing area or runway and diminished with distance. Db value increments typically produced for simple analysis by INM are 75, 65 and 55 db.

Using INM, the area around the runway within which 65 db modeled noise occurs using the DNL methodology can be depicted in plan view. The limits of this 65 db area are inscribed with a line noted as 65 DNL.

FAA has selected 65 DNL as the threshold impact category value of noise significance for most general aviation airports, including EIK. Noise sensitive land uses within the modeled 65 DNL are potentially of environmental consequence.

FAA environmental guidance notes that a noise modeling effort is generally not required when the 65 DNL is not expected to extend past airport property limits. And, the 65 DNL generally does not extend past airport property limits when no more than 90,000 average yearly operations and/or 700 annual jet-powered operations occur.

700 annual jet-powered operations may occur now or well within the 20-year time frame of this planning process; and, noise contours will be produced for this planning. Given that the airport has relatively spirited aircraft activity, baseline category impacts are expected to reach thresholds of significance, and any noise sensitive

land uses surround the airport will be addressed with mitigation measures and techniques recommended, as necessary. Of importance in this regard is airpark residences likely within the 65 DNL; these residence will not be considered sensitive or reaching impact category threshold.

17. Social Impacts

Health and safety risks to children and other socioeconomic impacts including residential relocation, division or disruption of established communities, change of surface transportation patterns, disrupting orderly and planned development along with creation of a notable change in employment levels all related to social impact analysis to the human environment.

Baseline category impacts in this regard are not expected to reach thresholds of significance, providing that there is no public comment of relevance during project specific consultation.

18. Solid Waste

The Solid Waste Disposal Act of 1965 defines solid waste as garbage, refuse or sludge from a waste treatment facility, water supply treatment facility, or an air pollution control facility including solid, liquid, semisolid or contained gaseous material resulting from industrial, commercial, mining, and agricultural or community activities.

Airport construction activities produce solid wastes and consultation with appropriate area agencies should reveal the ability of local disposal or transfer facilities to accommodate expected loads and load types. Project specific analysis, pursuant to the proposed federal action, should be undertaken to ensure that solid wastes related to airport construction activities can be locally accommodated and should describe transport, containment and control to the final destination.

19. Water Quality

Point source discharges of water into the environment, such as from sanitary sewer systems or collection basin drainage along with non-point discharges such as storm water runoff from airfield surfaces may drain pollutants such as oils and pesticides into the natural environment and be cause for consequential water quality impacts. US EPA, FWS and state agencies should be consulted on a project-specific basis in accordance with the following legislation:

1. Federal Water Pollution Control Act as amended by the Clean Water Act (CWA)
2. Clean Water Act (CWA)
3. Safe Drinking Water Act (SDWA)
4. Fish and Wildlife Coordination Act

A Water Quality Certificate from EPA, and NPDES Permit from the State may be necessary on a project-specific basis along with an EPA determination for any drinking water impacts. Documentation related to an airport-specific spill response plan, often maintained through airport certification may by necessary.

Water quality analysis in this regard may require supplemental analysis related to wetlands, floodplains, aquatic species impacts and other NEPA impact categories along with ground water protection.

20. Wetlands

A wetland is defined by a qualified wetland delineation specialist as having all three of the necessary components, (1) hydrology (2) vegetation and (3) soil type. A wetland system may be defined as jurisdictional or non jurisdictional by the US Army Corps of Engineers (USACE) depending upon whether it is connected or adjacent to US navigable waters.

In the event impacts to jurisdictional wetland by a proposed federal action are apparent, USACE

may issue a Section 404 permit pursuant to CWA. This permit, along with other necessary environmental clearances allows construction activities to proceed. Wetland banking is often a suitable compensatory mitigation technique, involving purchase and protection of nearby, suitable wetlands as replacement.

EPA, FWS, the National Marine Fisheries Service (NMFS) and equivalent state and local agencies should also be consulted regarding wetland habitat and species impacts.

The CCROW may feature wetlands of concern for NEPA analysis and consequence.

21. Wild and Scenic Rivers

Rivers or sections thereof, designated Wild and Scenic per the Wild and Scenic Rivers Act of 1968 are those designed by the Department's of Interior or Agriculture, which exhibit remarkable scenic, recreational, geologic, fish, wildlife, historic or cultural value. A portion of the Cache La Poudre in Larimer County is the only river in the state of Colorado so designated.

22. Cumulative Effects

Any resource-specific impacts from a proposed federal action (as individually described in the previous 21 impact categories) added to the past, present and other reasonably foreseeable actions within a defined time period and geographic area for that resource should be described in a cumulative impacts analysis. These analyses should include federal and non-federal participation and be specific to each of the impact categories, as appropriate.

2.5.4 Sustainability

Although the topic of sustainability, as it applies to general aviation airports like EIK, does not necessarily fall under the banner of *environmental* per this chapter's subsection, the

historical consequence of sustainability practices are environmentally-related, and it is for this reason the following discussion is found at this location in the narrative. The above graphic is an FAA-provided depiction.

The first graphic on FAA's website under Airport Sustainability is above and the first works are: "Sustainable actions- reduce environmental impacts help maintain high, stable levels of economic growth, and help achieve "social progress", a broad set of actions that ensures organizational goals are achieved in a way that's consistent with the needs and values of the local community".

The Town Board of Trustee indicate a "relentless commitment to maintaining our Town as a great place to live, work and play. Further, sustainability is more than an option; it is part of daily life. The Town is on the way to becoming a model for eco-friendly civic development with environmentally sound 'green' practices."

Potential sustainability topics for planning consideration include, but are not limited to:

1. LEED certification for future buildings,
2. Town Board of Trustee advocacy to state and federal delegations for strengthening of aircraft emissions standards, utilization of alternative aircraft fuels and energy sources,
3. Voluntary-based noise mitigation measures/policies, with pilot/resident outreach program,
4. Establishment of/adherence to best management practices for water retention and irrigation,
5. Identification and mitigation, as necessary, of any on-airport hazardous materials,
6. Establishment of airport-wide waste reduction/recycling goals,
7. Guidance of occasional public outreach to articulate sustainability goals and progress. Establishment of EIK sustainability constituent group/sub-group dedicated to contemporaneous environmental stewardship and economic development, guided by Town sustainability guidelines and precepts.
8. Working with area utilities to consider a solar site, or other renewable arrangement, on/near EIK. *(Note: siting of a solar facility will require close coordination with FAA)*
9. Limiting the use of diesel engines.
10. And, LED fixtures installation as appropriate.

The Sustainable Aviation Guidance Alliance (SAGA) was formed in 2008 by professional aviation industry groups to assist airports and their sponsor in creating sustainability predispositions and programs. The SAGA database contains nearly 1,000 general practices segregated into the below subject areas:

- Administrative
- Stormwater Management
- Water Efficiency
- Ground Transportation
- Landscape and Exterior Design
- Energy Efficiency and Atmosphere
- Indoor Environmental Quality
- Facility Operations
- Materials and Resources
- Construction Practices

With reference and applicability to various airport areas:

- Terminal Buildings and Interior Areas
- Landside Service Areas
- Landside Airport-Related Development
- Landside Transportation
- Airside

Relating to overall sustainability goals:

- Economic Viability
- Operational Efficiency
- Natural Resources Conservation
- Social Responsibility

For example, database practice number 706 is "use high post-consumer, recycled content paper" and it falls under the materials and resources subject area. The database says that this practice applies to the terminal building and interior areas, landside services areas and landside airport-related development, while meeting the natural resources overall goal.

This rather comprehensive database may be used as baseline for sponsor and tenants in the creation of a sustainability plan and execution of its policies and intent.

On a somewhat related note, a limited number of airport sustainability master plans have been created in recent years at airport of all sizes. This planning was completed as pilot projects with sustainability as a defining priority. CDOT is currently crafting statewide general aviation sustainability guidance to assist the sponsors of the 60 Colorado general aviation airports. This planning and its reporting will invariably be useful to the

Town should it choose to adopt guidance therefrom or craft a stand-alone plan.

2.6 Area Airspace, Airports and Navigational Aids

The operating airspace environment surrounding EIK is important given that the EIK is part of the state and national transportation system. A description of the local airspace surrounding EIK along with nearby public-use airports and navigational aids follows.

2.6.1 Airspace

FAA is charged with oversight of the nation's civil navigable airspace and has established various regulatory and non-regulatory airspace classes and areas, endeavoring to create a safe operating environment for all types of aviation users.

US airspace classifications are conceptualized on Figure 2-7. Regional airspace surrounding the airport is shown on Figure 2-8.

Several classes of airspace are relevant to flight operations in the near vicinity. EIK and most other Denver/Front Range publicly-owned airports underlay Class E airspace.

Class E airspace's horizontal limits are shown in a shaded violet on Figure 2-9 and exist from 700 feet up to 17,999 above ground level (agl). Pilots operating within Class E airspace must be certificated or in training.

Rocky Mountain Metropolitan Airport's Class D airspace limits exist approximately two miles due south of EIK with vertical limits at 7,999 feet above mean sea level (msl). Within this airspace (when effective) a pilot must (1) be certificated, and (2) establish and maintain two way radio contact with ATC prior to entrance. This Class D airspace is shown a singular blue-dashed circle on Figure 2-9.

Denver International's Class B airspace exists directly above EIK from 10,000 to 12,000 feet msl with a southerly horizontal limit at US Highway 7. South of Highway 7 the lower limit drops to 8,000 feet msl. Within this airspace a pilot must (1) be certificated, (2) establish and maintain two way radio contact with air traffic control (ATC), (3) obtain ATC clearance to enter (and be prepared to be denied that entrance), and (4) transmit an assigned transponder code. Class B airspace is shown as somewhat concentric circles, in a lighter blue on Figure 2-9. Finally, a solid red circle depicts the limits of Denver International's 30 nautical mile diameter 'Mode C' veil, containing an area within which an assigned transponder code must be transmitted.

Victor Airway 85 originates from a nearby navigational facility and nearly overflies EIK. This and other similar airways constitute FAA pre-established paths between navigational aids for ease of aircraft operation at altitudes between 1,200 and 17,999 feet agl. No Military Operations Areas (MOAs), or Alert, Warning, Restricted, or Prohibited airspace exists in the near EIK vicinity.

Pilots may remotely control EIK airfield lighting via the Common Traffic Advisory Frequency (CTAF) of 123.0 MHz. This frequency is assigned to EIK and select other nearby airports by FAA as the frequency from which pilots may elect to announce location and intentions. Pilots may contact the EIK AWOS at (303) 604-4339 or 133.825 MHz, along with Denver Approach/ Departure Control at 126.1 MHz.

Figure 2-7
US National Airspace Classifications *(Conceptualization: ADG)*

2.6.2 Area Airports & Navigational Aids

EIK is near a number of general aviation and commercial service airports along with enroute and local navigational facilities. These facilities are identified in blue and blue-green within Figure 2-8, briefly described within Table 2-5.

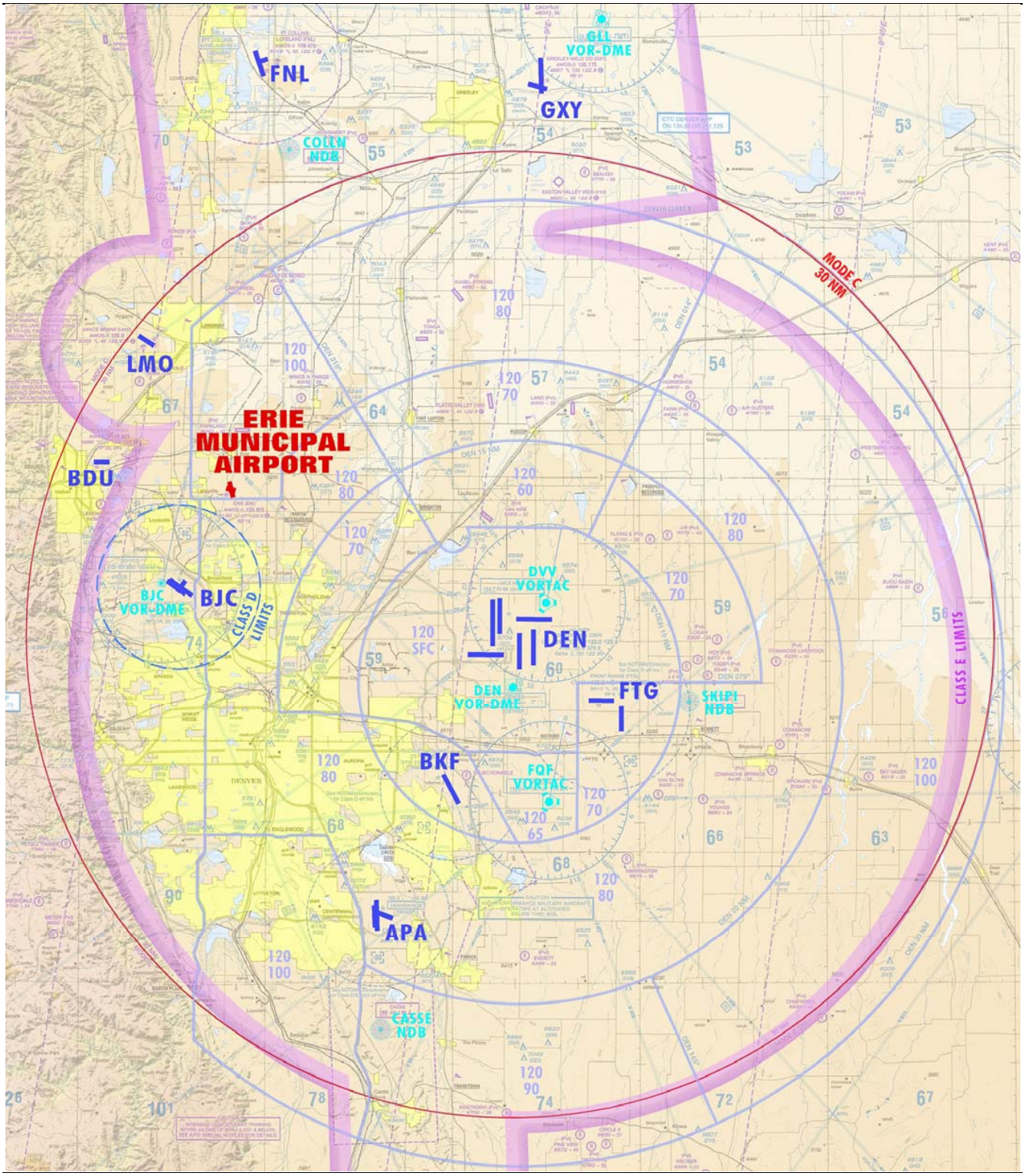
Denver International Airport (DEN) is the fifth busiest airport in the nation, in terms of passenger boardings, the largest airport in terms of area, and is currently the only commercial service airport serving the Denver market. KDEN provides domestic and international service via a variety of carriers.

Rocky Mountain Metropolitan Airport (BJC) is a NPIAS reliever to DEN is home to Denver Air Center, a full-service Fixed Base Operator (FBO) along with 12 aviation maintenance and four aircraft charter businesses, two car rental agencies, five on-site government offices and 21 other businesses. BJC is frequented by corporate aircraft and has approximately 120,000 annual aircraft operations the past few years along with the following numbers of based aircraft: 249 single-engine, 64 multi-engine, 29 jet and 16 helicopters. BJC is sponsored by Jefferson County.

Centennial Airport (APA) is a NPIAS reliever to DEN and always ranks as one of the busiest national general airports, in terms of operations. APA is home to five FBOs along with numerous aviation maintenance/avionics, management and flying clubs, sales, detailing, charter/air ambulance, car rental agencies, and other aviation and non-aviation businesses. APA is frequented by larger corporate aircraft and has approximately 300,000 annual aircraft operations in past years along with the following numbers of based aircraft: 575 single-engine, 133 multi-engine, 121 jet and 20 helicopters. APA is sponsored by the Arapahoe County Public Airport Authority.

Figure 2-8
VFR Terminal Area Chart

(Source: FAA, with highlighting by ADG)



Fort Collins-Loveland Airport (FNL) is a certificated, formerly commercial service airport. FNL is home to a full-service FBO along with three aviation maintenance, three flight training, and two aircraft charter businesses. FNL is frequented by corporate aircraft and had approximately 106,700 recent annual aircraft operations along with the following numbers of based aircraft: 210 single-engine, six multi-engine, eight jet and 12 helicopters. FNL is jointly-sponsored by the Cities of Fort Collins and Loveland.

Buckley Air Force Base (BKF) is a military installation housing the 460th Space Wing, 460th medical group, and the Colorado National Guard's 140th Wing, known for its F-16 Fighting Falcons.

Greeley-Weld County Airport (GXY) is a general aviation airport home to a full-service FBO along with three aviation maintenance, three flight training, and two aircraft charter businesses. GXY accommodates large and small aircraft and had approximately 143,000 recent annual aircraft operations along with the following numbers of based aircraft: 161 single-engine, 26 multi-engine, four jet and four helicopters. GXY is sponsored by the City of Greeley/Weld County.

Vance Brand Airport (LMO) is a general aviation airport home to two full-service FBOs along with several aviation maintenance businesses, and some specializing in skydiving, soaring and gliding. LMO is frequented by general aviation and smaller corporate aircraft with approximately 62,000 annual aircraft operations in a recent year, along with the following numbers of based aircraft: 234 single-engine, 18 multi-engine, two jet and seven helicopters. LMO is sponsored by the City of Longmont.

Boulder Municipal Airport (BDU) is a general aviation home to a full-service FBO along with several specialty aviation businesses and interest groups, some specializing in soaring/gliding. BDU is frequented by general aviation and glider aircraft with approximately 50,582 annual aircraft operations in a recent year, along with the following numbers of based aircraft: 94 single-engine, 12 multi-engine, 45 gliders and one helicopter. BDU is sponsored by the City of Boulder.

The Falcon (FQF) and Mile High (DVV) Very-High Frequency Omni-Directional Range with Tactical Aircraft Control (VORTAC) navigational facilities are near BKF and DEN, respectively. The Denver (DVV), Jeffco (BJC) and Gill (GLL) Very-High Frequency Omni-Directional Range with Distance Measuring Equipment (VOR-DME) navigational facilities are near DEN and GXY, respectively. These navigational facilities provide 360-degree radio-interrogation capabilities for aircraft navigation and are shown as lightly blue-shaded compass roses on the following page.

The Skipi, Casse and Calln NDBs primarily serve IAPs for FTG, APA and FNL, respectively. These ground-based navigational radio facilities enable properly-equipped aircraft to 'home' to a location.

Table 2-5
Area Publicly-Owned Airports and Navigational Aids *(Source: AirNav, FAA Master Records, Websites)*

Airport	**Runway(s) Description** ***Best Approach Procedure***	**Services**	**Distance Direction**
Denver International (KDEN), Denver, CO	All Runways Except 16R/34L: 12,000′ x 150′, *ILS Precision* Runway 16R/34L; 16,000′ x 150′ *ILS Precision*	All Fuel, All Repair Certificated Field Towered Field	19 Miles Due Southeast
Rocky Mountain Metropolitan Broomfield, CO (BJC)	Runway 11L/29R; 9,000′ x 100′ *ILS Precision* Runway 11R/29L; 7,002′ x 75′ Runway 2/20; 3,600′ x 75′	All Fuel, All Repair Certificated Field Towered Field	7 Miles Due South
Centennial (APA) Englewood, CO	Runway 17L/35R; 10,001′ x 100′ *ILS Precision* Runway 17R/35L; 7,000′ x 77′ Runway 10/28; 4,800′ x 75′ *GPS/RNAV Non Precision*	All Fuel, All Repair GA/Towered Field	28 Miles Due South
Fort Collins-Loveland (FNL) Loveland, CO	Runway 15/33; 8,500′ x 100′ *ILS Precision* Runway 6/24 2,273′ x 40′	Fuel, Major Repair Certificated Field Towered Field	26 Miles Due North
Buckley Air Force Base Aurora, CO (BKF)	Runway 14/32; 11,006′ x 150′ *ILS Precision*	Military Towered Field	23 Miles Due Southeast
Greeley-Weld County (GXY) Greeley, CO	Runway 16/34; 10,000′ x 100′ *ILS Precision* Runway 9/27; 5,801′ x 100′ *GPS/RNAV Non Precision*	All Fuel, Major Repair GA/Non-Towered Field	32 Miles Due Northeast
Vance Brand (LMO) Longmont, CO	Runway 11/29; 4,800′ x 75′ *GPS/RNAV Non Precision*	All Fuel, Major Repair GA/Non-Towered Field	11 Miles Due North
Boulder Municipal (BDU) Boulder, CO	Runway 8/26; 4,100′ x 75′ Runway 8G/26G; 4,100′ x 20′	All Fuel, Major Repair GA/Non-Towered Field	8 Miles Due West

Navigational Aid	**Facility Frequency**	**Distance**	**Direction**
Falcon VORTAC (FQF)	116.3 MHz	27 Miles	Due Southeast
Mile High VORTAC (DVV)	114.7 MHz	21 Miles	Due Southeast
Denver VOR-DME (DEN)	117.9 MHz	21 Miles	Due Southeast
Jeffco VOR-DME (BJC)	115.4 MHz	7 Miles	Due South
Gill VOR-DME (GLL)	113.3 MHz	37 Miles	Due Northeast
Skipi NDB	321 KHz	30 Miles	Due Southeast
Casse NDB	260 KHz	33 Miles	Due South
Colln NDB	400 kHz	22 Miles	Due North

2.7 Based Aircraft and Operations

CDOT staff inspects EIK on an annual basis to assess facilities and activity. Data from the annual inspection for the year ended December 31, 2011 indicates that the airport accommodates 95,000 total annual aircraft operations, including 37,500 itinerant and 57,500 local general aviation operations. The inspection notes and Airport Management confirms that approximately 60 percent of aircraft operations are locally-executed and 40 percent are itinerant. The inspection notes a based aircraft number: 165 single-engine, nine multi-engine, one jet and seven helicopters, along with one glider and five ultralight craft, totaling 182 aircraft. This is the current, official FAA record.

CDOT's *2011 Colorado Airport System Plan Update* identified 67,500 annual aircraft operations in the year 2010 (4.2 percent of state total), along with 179 based aircraft (3.4 percent of state total), again for the year 2010. The *Plan* forecast 68,800, 70,400, and 73,940 total annual operations for the years 2015, 2020 and 2030, respectively. Similarly, the *Plan* forecast 183, 187, and 196 total based aircraft for the same respective years.

FAA maintains and administers its own internal historical activity record and forecasting effort, the 2012 Terminal Area Forecast (TAF). With respect to EIK, the TAF notes:

- 28,660 annual itinerant general aviation operations and 45,000 annual local general aviation operations, totaling 73,660 annual operations during the 2005, 2006 and 2007 years.
- 35,000 annual itinerant general aviation operations and 55,000 annual local general aviation operations, totaling 90,000 operations from the year 2009 to the year 2040.

And:

- 227 based aircraft during the 2005, 2006 and 2007 years
- 36 based aircraft during the 2008 and 2009 years.
- 173 based aircraft from the year 2009 to the year 2040.

FAA maintains a database of based aircraft for official record keeping purposes. This database currently indicates 180 based, validated aircraft at EIK. Consultation with Airport Management revealed that an additional 11 aircraft are based at EIK for most of the year, including a newly relocated Eclipse 550 jet aircraft, bringing total based aircraft to 191 for purposes of this planning, distributed as follows: 173 single-engine, nine multi-engine, two jet and seven helicopters.

A general rule-of-thumb for estimating aircraft operations at uncontrolled airports is contained in FAA guidance, recommending: 250 operations per based aircraft for rural general aviation airports, 350 for more urban, busier general aviation airports and 450 for reliever airports in metropolitan areas, resulting in 47,750, 66,850 and 85,950, operations respectively.

Prescription for this planning document included consultation with staff at DEN to inventory radar-based operational activity. EIK is suitably proximate to FAA's radar facilities, and a log of aircraft operations with radar contact was accessed. This consultation revealed that EIK accommodated approximately 7,400, 6,900, and 7,300 general aviation operations in 2008, 2009, and 2010 respectively. Data for these years was the most recent available from FAA via DEN.

Given that these activity levels were below that previously identified in previous years, effort was made to seek resolution. Data from FAA's radar

facilities for LMO was inventoried in the same fashion, revealing approximately 9,150, 9,720 and 9,613 operations in 2008, 2009, and 2010 respectively. Expressed as a percentage, LMO operations exceeded EIK operations by 19.1, 29.0 and 24.0 for the respective years, averaging 24 percent over the three year period.

Using LMO's 2010 FAA-approved baseline aircraft operations estimate of 61,211 from the recently completed *Airport Master Plan*, along with a 24 percent discount, an estimated 46,520 operations for the year 2010 is derived. This value was selected by the master plan consultant and approved by FAA as a reasonable estimate of recent aircraft operations at EIK.

Historical operations counts derived from the *FAA Airport Master Record* and carried through to other databases are sometimes found to overstate the volume of activity through no fault. This lack of accurate operational activity counts is not limited to EIK as aviation activity at non-towered airports has historically been difficult to inventory. Table 2-7 identified baseline activity for this planning.

2.8 Airfield Design Standards

FAA specifies a coding scheme for airport design that relates airfield design criteria to the operational and physical characteristics of aircraft using an airport in a meaningful quantity, along with IAP visibility. This scheme, and standards compliance thereto, relates to individual runways and runway ends at certificated and/or obligated airports. EIK is an obligated airport, because the Town has accepted federal grant-in-aid funds from FAA. The scheme relates to runways, along with their associated IAPs and taxiways/aprons.

2.8.1 Design Standards Criterion

The first portion of the overall scheme relates to a given runway, and runway end, and has three criterion. Table 2-6 shows the criterion collectively, the Runway Design Code (RDC).

Table 2-6
Runway Design Code (RDC) Criterion *(Source: FAA)*

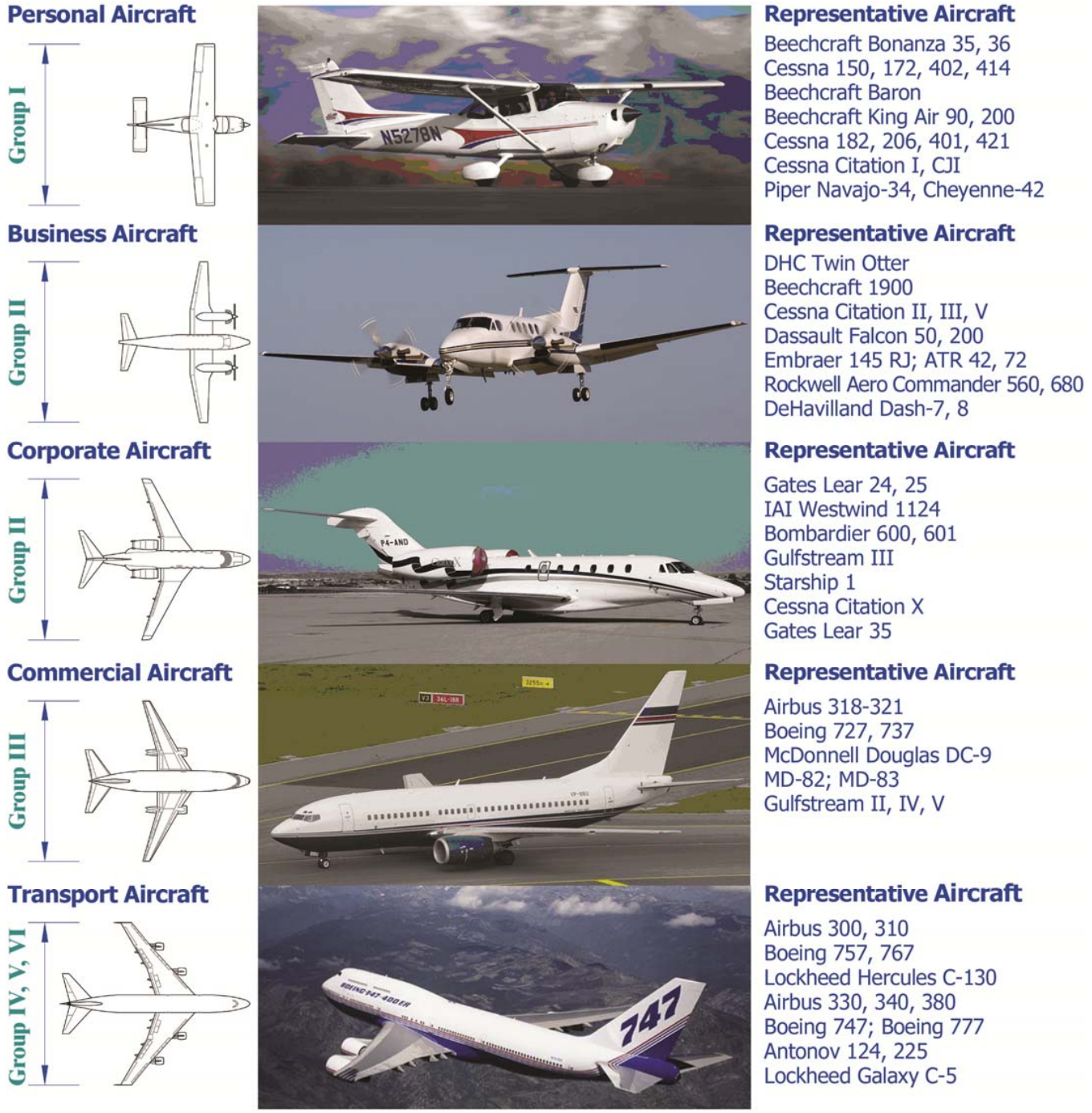
Aircraft Approach Category (AAC)	Aircraft Speed Range (Knots)
A	Less than 91
B	More than 91, but less than 121
C	More than 121, but less than 141
D	More than 141, but less than 166
E	More than 166

Airplane Design Group (ADG)	Aircraft Wingspan Range	Aircraft Tail Height Range
I	Up to but not including 49′	Up to but not including 20′
II	49′ up to but not including 79′	20′, up to but not including 30′
III	79′ up to but not including 118′	30′, up to but not including 45′
IV	118′ up to but not including 171′	45′, up to but not including 60′
V	171′ up to but not including 214′	57′, up to but not including 60′
VI	214′ up to but not including 262′	66′, up to but not including 80′

IAP Capability in Terms of Visibility (Statute Mile)	
RVR 4000	Lower than one mile but greater than ¾ mile
RVR 2400	Lower than ¾ Mile but not lower than ½ mile
RVR 1600	Lower than ½ Mile but not lower than ¼ mile
RVR 1200	Lower than ¼ Mile

The first, represented by a letter, is the Aircraft Approach Category (AAC). It relates to aircraft approach speed, an aircraft operational characteristic (1.3 x Vso/Vref {the speed of an aircraft in the landing configuration}). The second designator, Airplane Design Group (ADG), is represented by a roman numeral. It is related to aircraft wingspan and aircraft tail height; physical

Figure 2-9
Representative Aircraft by Wingspan *(Visualization: ADG)*



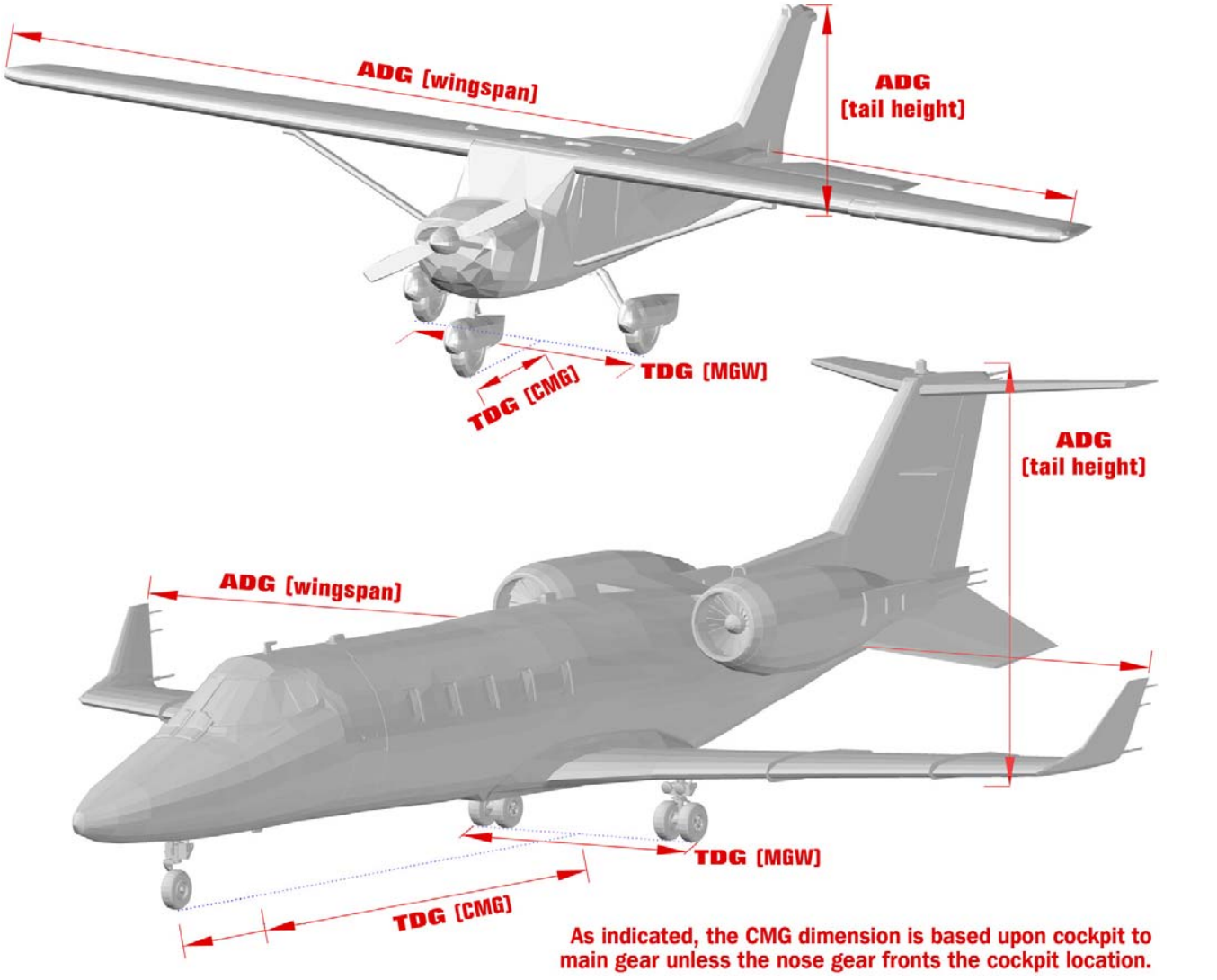
characteristics. Figure 2-9 on the prior page shows representative aircraft grouped only by Airplane Design Group (ADG), for reference.

A given runway end may accommodate an IAP with various FAA-approved visibilities. These visibilities are segregated and expressed in terms of Runway Visual Range (RVR). RVR is a real-time meteorological measurement noted feet and related to ¼ mile visibility increments. RVR measurements are made at the runway location.

These criterion, the AAC speed, ADG wingspan and tail height, along with IAP capability, combine to identify each runway's RDC and classify design standards, primarily related to runway and runway protection. A RDC is associated with a particular runway end. A field with multiple runways may have multiple RDCs.

Beyond RDC, Taxiway Design Group (TDG) is an

Figure 2-10
Select Airport Design Criterion *(Visualization: ADG)*



additional criteria; it is based upon the dimensions of aircraft undercarriage, specifically the distance between the outer edge of the main gear, termed the Main Gear Width (MGW) with the distance between the Cockpit to Main Gear, termed CMG. Note that if the nose wheel fronts the cockpit, the CMG distance increases. Various MGW and CMG ranges combine to make TDG's 1 through 7, with 7 accommodating the largest ranges, and aircraft.

The visualization on the following page, as Figure 2-10, shows the physical aircraft characteristics associated with ADG and TDG.

In many instances ADG and TDG for individual airplanes will be within the same grouping; for example, ADG-I with TDG-1, ADG-II with TDG-2, and AGD-III with TDG-3. Notable exceptions generally include aircraft with a relatively long fuselage.

Note that neither runway end at EIK accommodates a so-called, straight-in IAP (Figure 2-3 depicts IAP-*circling* minima, meaning that the IAP is not authorized for a runway end), indicating greater than RVR4000 visibility (>RVR4000).

Finally, aircraft weight is an additional criterion to be able to determine suitable application of all airport planning and design at EIK. Aircraft which weigh less than 12,500 pounds (maximum certificated gross), regardless of wheel configuration, are termed utility or small aircraft. Those which weight more are termed non-utility or large aircraft. Note that the runway, taxiway and the main apron pavement strengths are currently 12,500 pounds SWG.

The most demanding aircraft or group of aircraft with alike physical and operational characteristics that use the airport regularly; generally conducting at least 500 annual takeoffs or landings, is termed the design aircraft. Therefore, a further refining estimate of aircraft operations made in the previous section is needed. This refining estimate is found in Table 2-7, on the following page.

Thus, the current criterion for Runway 15-33 are:

A&B-I; TDG-1, Small Aircraft; >RVR4000,

And, the current criterion for Taxiway A, its connectors and aprons is:

TDG-1, Small Aircraft.

The current design aircraft is the **Beechcraft Baron (BE55); a B-I, TDG-1, small aircraft.**

It is noteworthy that the FAA's Denver Airports District Office maintains a preference, functionally tied to funding for AIP-assisted projects, that future EIK improvements accommodate B-II-2-large design criteria.

Table 2-7
Estimated Operations by RDC, TDG, Weight, and Runway End/IAP Capability *(Source: ADG Estimate)*

Estimated 2012	**Visual 15**	**Visual 33**	**Circling 15**	**Circling 33**	**Total**
A&B-I, TDG-1, Small	22,000	19,000	3,110	2,400	46,510
A&B-I, TDG-1, Large	10	10	15	15	50
A&B-I, TDG-2, Large	10	10	25	25	70
A&B-II, TDG-1, Small	80	80	70	70	300
A&B-II, TDG-1, Large	4	4	8	8	20
A&B-II, TDG-2, Large	14	12	12	12	50
2012 Total	**22,116**	**19,118**	**3,240**	**2,530**	**47,000**

2.8.2 Design Standards

Design standards encompass various areas, zones, surface gradients and separations standards; select standards are described and tabulated within Table 2-8, based upon Table 2-7 and the current design aircraft:

1. A Runway Protection Zone (RPZ) is a trapezoidal area off each runway end, established to enhance protection of people and property by clearing incompatible land uses. EIK's RPZ's are currently owned partially in fee and wholly in fee and 20:1 avigation easement.
2. The Runway Safety Area (RSA) and Taxiway Safety Area (TSA) are established to ensure that the ground surface adjacent to runways and taxiways is suitably prepared to reduce the risk of damage in the event of an aircraft deviation from paved surfaces. Safety area specifications are dimensional, grade-specific and material-specific.
3. The Runway Object Free Area (ROFA) and Taxiway Object Free Area (TOFA) are established to ensure the safety of aircraft operations by having an area free of objects, except those frangibly-mounted objects, necessary for air navigation or ground maneuvering purposes.
4. The Obstacle Free Zone (OFZ) is a volume of airspace up to 150 feet above airport elevation, centered on runway centerline, primarily established to preclude taxiing and parked aircraft. The runway holdline is sometimes located to coincide with limits of the OFZ.
5. The purpose of the Approach and Departure Clearance Surfaces (AOCS/ DOCS) is to provide obstacle clearance for visual approaches and instrument approach procedures. These surfaces are generally three-dimensional trapezoids with 20:1 or 34:1 surfaces extending upward and outward away from each end of runway.

Note that these are the minimum specifications and exceeding the specifications, for an individual project is generally acceptable, but may not be eligible for federal or state funds.

2.8.3 FAR Part 77

Title 14 of the Code of Federal Regulations, Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace* specifies various imaginary surfaces considered to protect the airspace around the EIK from objects of natural growth or man-made features, termed obstructions. These surfaces are the primary, approach, transitional, horizontal and conical as described in Section 77.25 and as follows:

1. The primary surface is longitudinally centered on the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on centerline. The width of the primary surface is based on the type of approach available or planned for each runway.
2. The approach surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach available or planned for that runway end.
3. The transitional surfaces extend outward and upward at right angles to the runway centerline and runway centerline extended at a slope of 7:1 (±8.13 degrees) from the sides of the primary surface and from the sides of the approach surfaces.
4. The horizontal surface is a level horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of either 5,000 or 10,000 feet from the center of each end of the primary surface of each runway and connecting the adjacent arcs with lines of tangency.

Table 2-8
Select Current EIK Airport Design Standards *(Source: FAA/ADG)*

Standard/Specification	Standard	Existing
Runway Width	60 Feet	60 Feet
Effective Runway Longitudinal Grade	Within ±2% Maximum	Within ±2% Maximum
Runway Pavement Strength (Pounds)	Recommended 12,500 SWG	12,500 SWG
Runway Protection Zones	250'x450'x1,000'	250'x450'x1,000'
Runway Safety Area Width/Beyond End	120'/240'	120'/240'
Runway Object Free Area Width/Beyond End	250'/240'	250'/240'
Taxiway Safety Area Width	49'	49'
Taxiway/Taxilane Object Free Area Width	89'/79'	89'/79'
Runway to Parallel Taxiway A	150'	200'
Runway to Aircraft Holdline on Taxiway A	125'	125'
Runway to Aircraft Parking	>125'	>125'
Obstacle Free Zone Width/Beyond End	250'/200'	250'/200'
Approach Surface (20:1)	400'x3,800'x10,000'	400'x3,800'x10,000
Part 77 Primary Surface Width/Beyond End	250'/200'	250'/200'
Part 77 Approach Surfaces Dimension/Slope	250'x1,250x5,000'; 20:1	250'x1,250x5,000' 20:1

5. The conical surface extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 (±2.86 degrees) for a horizontal distance of 4,000 feet.

Upcoming chapters contain a depiction of these surfaces and Table 2-8 above contains dimensional information for the primary and approach surfaces.

In addition to these surfaces, Section 77.23 provides for additional obstruction identification guidance; A determination in this regard is made by FAA via proponent filing of FAA Form 7460 *Notice of Proposed Construction or Alteration*.

2.9 Financial/Economic Development

The Town of Erie for accounting purposes, classifies EIK as an enterprise fund. Functionally, this means that EIK is to be operated as a stand-alone financial unit with the Town's umbrella of services. Loans and other short-term means to affect a yearly break-even financial condition are permissible, provided they are approved by the Town Board of Trustees. Section 2.1.3 of the Town Code specifies that the Town shall establish fees/charges sufficient to recover operating expenditures of the airport fund. Table 2-9 on the following page provides recent financial information.

Economic development is a defining propensity of the Town of Erie. The Town of Erie Economic Development Department is charged with forming a strong and viable partnership between business, government and education. It is as an on-going process that requires foresight and commitment to economic development. The Town's Economic Development Coordinator leads the Town's Economic Development Department and effort.

The Town's Economic Development Department solicits input from myriad of individuals as well as committees and groups to work toward the mutual goals and continued future of the Town and its citizens and businesses.

Table 2-9 *(Source: Town of Erie)*

EIK Financial Information	2010$	2011$	2012$	2013$ Budget
Airport Fund Revenue				
Aviation Gas Taxes –Colorado	5,125	8,002	5,100	5,100
Crossing License	-	2,800	-	-
Lease / Rental Buildings	720	168	-	-
Lease of Tie Downs and Hangars	9,198	3,430	-	-
FBO Fees	44,813	41,500	36,000	36,000
Fuel Flowing Fees	-	-	5,400	5,400
Access Through-the-Fence Fees	41,365	15,107	-	-
Late Fees on Past Due Accounts	19	(118)	-	-
FAA Airport Grant	216,901	252,113	150,000	150,000
CDOA Airport Matching Grant	-	580,004	404,400	400,000
Interest Income	2,753	1,222	-	-
Unrealized Gain on Investments	(789)	-	-	-
Miscellaneous Income	8,891	9,064	-	-
Airport Fund Revenue				
Benefit Transfer from General Transfer	701	1,427	-	500
Salaries – Regular	3,560	3,225	50	1,500
Aprons / Runway Maintenance Services	1,100	-	-	-
Building / Grounds Maintenance Services	4,563	-	-	-
Maintenance Contracts	3,978	2,205	1,110	-
Consultation Services	3,978	2,205	1,100	-
Legal Services	70,871	31,094	10,000	5,000
Utilities – Electric Service	16,807	12,128		-
Utilities – Gas Service	2,760	2,424	-	-
Utilities – Waste Disp Service	1,631	1,337	-	-
Utilities – Water Service	1,094	484	-	-
Aprons / Runway Maintenance Supplies	173	477	-	
Building / Grounds Maintenance Supplies	20	-	-	-
Courier Services	20	-	-	-
Membership Dues	178	95	-	-
Permits, Licenses, Other Fees	290	35	100	-
Bad Debt Expense	2,228	-	-	-
Vector Control	13,873	350	-	-
Property Insurance	10,983	12,566	12,600	13,700
Transfer to Storm Drainage Operating Fund	19,813	8,816	-	-
Airport Capital Outlay				
Coal Creek Crossing Replacement	2,201	(2,201)	-	-
Construct East Taxiway Connector	8,461	-	-	-
Repair Mid-field Connector Taxiway	12,779	-	-	-
Replace Runway Lighting System	6,560	-	-	-
Joint Crackseal Concrete Apron	122,261	10,484	-	-
Fuel System Upgrade	67,216	317,400	-	-
Taxiway A4 Connector	35,349	260,764	-	-
PAPI Replacement	32,500	-	-	-
Repave Asphalt Ramp	-	203,338	-	-
Master Plan Update	-	-	250,000	-
Runway 33 Improvements	-	-	340,500	-
Realign Runway 33 Sign / Hold Sign	-	-	7,500	-
Taxiway Lighting System and Guidance Signs	-	-	-	601,900

Offering business site assistance through the entire development and permitting process, resources for programs workshops and services as well as offering incentive programs to real estate professionals

In October 2011, the Town of Erie Urban Renewal Authority was established, empowering the Town to encourage economic vitality and improve public safety. An Airport Area Urban Renewal Plan was produced in December 2012 addressing historical airpark and airport properties along with properties either side of Bonanza Drive and US Highway 7. The purpose of the plan is to "reduce, eliminate, and prevent the spread of blight… while advancing the vision and priorities of the comprehensive plan". Noteworthy plan objectives include:

- Provide public infrastructure and make more efficient use of existing land,
- Advance uses that leverage public investment in planned improvements,
- Provide a range of financing mechanisms,
- Facilitate public-private partnerships.

Appended the plan is a *conditions survey* finding numerous isolated insufficiencies within and around EIK and the Airpark. These insufficiencies relate to maintenance and landscaping, upkeep, building and facilities condition, older lot and driveway problems, access road needs, and floodplain and drainage issues.

Economic Development Plan

Upstate Colorado Economic Development (UCED) focuses on supporting primary employers in all sectors. Governed by a Board of Directors via a public/private partnership with members from government and business, UCED's goal is to assist employers with bringing new equity into each community's local economy.

UCED worked with the Town to create its November 2007 *Economic Development Plan*.

This plan was intended to dovetail with the *2005 Comprehensive Plan* and provide reasonable, workable guidance pursuant to that document:

- A coordinated and efficient pattern of growth
- Quality design and development
- Overall economic vitality
- Balanced land use mix
- Stable, cohesive neighborhoods offering a variety of housing types

The plan notes as salient:

"…the attractiveness of the north metro Denver market will likely attract significant investment over the foreseeable future. The amount of that investment which finds its way to the Town of Erie will depend in part upon the aggressiveness of the community to accommodate retailers and employers."

"The Town faces both an opportunity and a threat of over the next few years. It can do much to assure its long-term economic viability by securing desirable retail and employment opportunities or it can assume a more vulnerable position by allowing those investment opportunities to locate in the region, but outside its boundaries, thus restricting revenues that are needed to provide services to its residents. "

The plan infers the Town's historical and somewhat current position as a bedroom community for the Denver/Boulder Metro area.

A primary result of this plan as it relates to EIK is a recommendation to adopt a master plan which "outlines opportunities for business development and employment opportunities".

Airport Economic Development Study

The Town adopted the *Airport Economic Development Study* in October 2009. The purpose of the study was to:

- Assess EIK and its surrounds to identify economic development opportunities
- Identify potential sources of funding for physical improvements, pursuant to Town economic development objectives

- Develop a plan for EIK self-sustainability

Important points/conclusions within the study's recommended development portion include:

- Future activity at EIK will be smaller-aircraft general aviation activity, and to a lesser degree, 'entry-level' business aviation activity,
- The historical airpark provides a solid tax base, but it will not likely contribute meaningfully to future economic development,
- The closed crosswind runway will not reopen primarily due to lack of FAA/CDOT funding,
- Given that the closed crosswind runway would, in fact be closed, areas north and west of midfield should be redeveloped for apron, hangar and ancillary uses and areas east of midfield are valuable for "commercial development",
- The Town should not invest in a new terminal building at an alternative location.
- The Town should formalize, but not own or manage, a through-the-fence Airport Business Park, with a new service road, on currently undeveloped properties west of the Coal Creek floodplain and north of the existing through-the-fence properties on South Main Street.
- The business park should target aviation maintenance, mixed-use executive aviation office suites, aviation training (potentially including an aviation high school), along with other non-aviation uses including light industrial, professional and mixed-use commercial/retail.
- Vacant properties near/adjacent to EIK, fronting US Highway 7 should be developed for non-aviation uses.
- No improvement to the Airport Road/US Highway 7 intersection other than turning lanes installation.
- The Town should see that EIK accommodates an airport restaurant, hotel, rental car service, fly-in turf tiedown area for golf events along Bonanza Drive and extended closed runway centerline, welcoming signage, a general public airport viewing area, and increased interaction with the community.

Effective October 2009, EIK was designed by the Colorado Office of Economic Development and International Trade (OEDIT) as an Aviation Development Zone. This designation may qualify an aircraft manufacturer for a state $1,200 tax credit per new full-time employee.

EIK Economic Development Participants

Representing and supporting Erie's businesses for 17 years, the Erie Chamber of Commerce continues in its goal of improving the quality of life for the residents of Erie. Working with its members, committees, and volunteers, the Chamber offers various benefits and services and support to its members.

The Erie Economic Development Council (EEDC) has evolved into an organization whose members include participants from the Chamber, Town of Erie Board of Trustees, Town Staff as well as members of the public. EEDC promotes the Town to real estate professionals through a variety of venues and its goal is to augment area economic well-being.

The mission of the Erie Airport Economic Development Council (EAEDC) is to maximize the value of EIK for its users and the citizens of Erie. The EAEDC's vision is to promote the creation of high-paying aviation-related jobs that generate real estate and sales tax revenues for the Town of Erie on and adjacent to the airport. The EAEDC is responsible for Erie Economic Development Council activities relating to EIK and its surrounds. The EAEDC is working with companies from around the United States who are looking to make Erie their next home.

EAEDC works to leverage the value of EIK for businesses, educate others as to the value EIK provides to the Town, supports advertising and events that promotes economic development in and around EIK, meet with businesses and developers to leverage relationships and solutions that will help them to be successful, and monitor policy that may affect economic development.

The Metro Denver Aviation Coalition (MDAC) is dedicated to the continued growth and development of Metro Denver's aviation industry, specifically including EIK. The Coalition promotes public policy conducive to economic development, and informs decision makers and the public about the importance of maximizing the economic potential of metro Denver's airports and aviation industry.

The Colorado Aviation Business Association and the Colorado Airport Operators Association advocate for airports and the aviation industry.

General Aviation Appreciation Month

Colorado Governor John Hickenlooper joined 22 other states in issuing a proclamation declaring June 2011 as *General Aviation Appreciation Month,* recognizing the vital contribution all of general aviation, including business aviation, provides to our economy. The proclamation cites a number of indicators that show how general aviation positively impacts the state.

2.10 Opportunities For and Constraints to Aviation Growth

A review, description and depiction of the some of the existing physical site constraints and known, potential opportunities for growth at EIK during this early period of plan development is important to effecting an overall inventory. The Opportunities and Constraints Exhibit is found at the conclusion of this chapter. Note that items thereon are not meant to be a comprehensive listing of all opportunities and constraints.

Constraints

The dominating, but perhaps not the most important feature of the exhibit is the flood way/floodplain associated with Coal Creek. EIK is not in the most ideal site, given the rising terrain around it and the need to protect/preclude development from an occasional flood. As previously discussed the Town Code specifies that building and facilities should generally not be located within a floodway or floodplain, thus limiting the scope and extent of aviation and non-aviation development. Note that the Town owns and maintains a right-of-way around and along Coal Creek, the limits of which are generally within the floodway/plain. Also note that a floodplain, and steeper grades, exists south of and along the current apron/auto parking area.

A similar development constraint exists with respect to the existing land envelope, and with respect to the AWOS critical area. The AWOS 500-foot radius circle is found near midfield indicating the limits of the critical area. Generally speaking, and with notable exceptions, no buildings or facilities should be located within, thus currently limiting the scope and extent of aviation development.

Buildings on properties on the east side of and adjacent to the runway are sited closer to the runway than may be desirable.

Steep grades south of Runway 33, but north of US Highway 7 along and around extended runway centerline functionally limit potential aviation and non-aviation development.

Several instances of noise impact/concern are noteworthy around EIK. EIK's original airfield configuration and the Airpark predated the Vista

Ridge, Vista Pointe and Anthem developments. Noise complaints have been received from residents within these neighborhoods. An area free of residences, underlying the, then, approach zone, as a derivative of the, then town comprehensive plan was historically planned for Vista Ridge and Anthem, and continues to exist. Anthem is found south of US Highway 7 and Vista Ridge is found at the top, left portion of the exhibit. Anthem residents have often perceived low-flying aircraft on a northerly approach to EIK in the green area off extended centerline, south of US Highway 7. This perception is perhaps due to rising terrain, given that US Highway 7 is approximately 30' higher than the southern runway end elevation, and the ambient terrain is somewhat unchanged through the open area.

Other noise impact/concerns are also noteworthy around EIK. The Town recently annexed vacant property southeast of EIK along US Highway 7. Planned mixed-use development thereon, currently termed Sierra Vista, includes low- and medium-density residential near and east of the southern-most airport properties. This residential use is currently proposed to be separated by open space adjacent to current EIK property.

The Airport Road/US Highway 7 intersection is problematic for vehicle movement, particularly Airport Road to eastbound Highway 7. Faster speeds along Highway 7 combined with limited sight distance due to the rising terrain east of the intersection creates challenges for safe merging at peaking movement periods.

Other airport environs-wide environment and land use constraints are not yet well-defined and may only become so upon specific project investigation, clearance and permitting.

Finally, FAA airport design guidance specifies that a future RPZ should not overlap a public road, thus constraining a future northerly runway extension without road relocation. Similarly, the potential length of a reactivated crosswind runway, should the Town leadership wish that course of action, would be constrained.

Opportunities

One of the most noteworthy aspects of EIK's current configuration, with respect to opportunities, is its lack of developable, revenue-producing property.

An area south of the current apron, currently airpark residential, may be a good fit for future apron, hangar and other aviation-related, revenue-producing facilities. Easy-to-understand sensitivities exist for current property owners who may not want to move and acquisition considered in this planning may entail voluntary acquisition.

Due west of this area is additional land currently available for TTF hangars and other aviation-related development.

Due south of these properties and north of US Highway 7 is property with non-aviation potential. This property is well-suited for a hotel or other commercial industrial use, if US Highway 7 can be configured to accommodate the expected traffic. The original Airpark plat indicated that the majority of the area was subject to subsidence.

While the newly annexed property along Highway 7 southeast of EIK, termed Sierra Vista, represents a source of potential noise impact, its revenue and tax-generating capabilities are an opportunity for EIK overall, with respect to area economics.

An inter-governmental planning effort was underway for a time now to generate a preferred realignment for US Highway 7 around and farther north of Lafayette. This effort has ceased. Regardless, a potential realignment remains a

topic and a potential alignment is depicted near and north of the Airport Road and County Line Road intersection. Funding and construction of a preferred alignment will likely be a mid to long-term consideration. A new alignment may (1) preclude the existing Airport Road and US Highway 7 intersection, (2) provide an opportunity for a new 'front door' to EIK, and (3) more fully utilize/integrate properties in relatively poor (according to the *conditions survey* noted in Section 2.9) condition along the corridor.

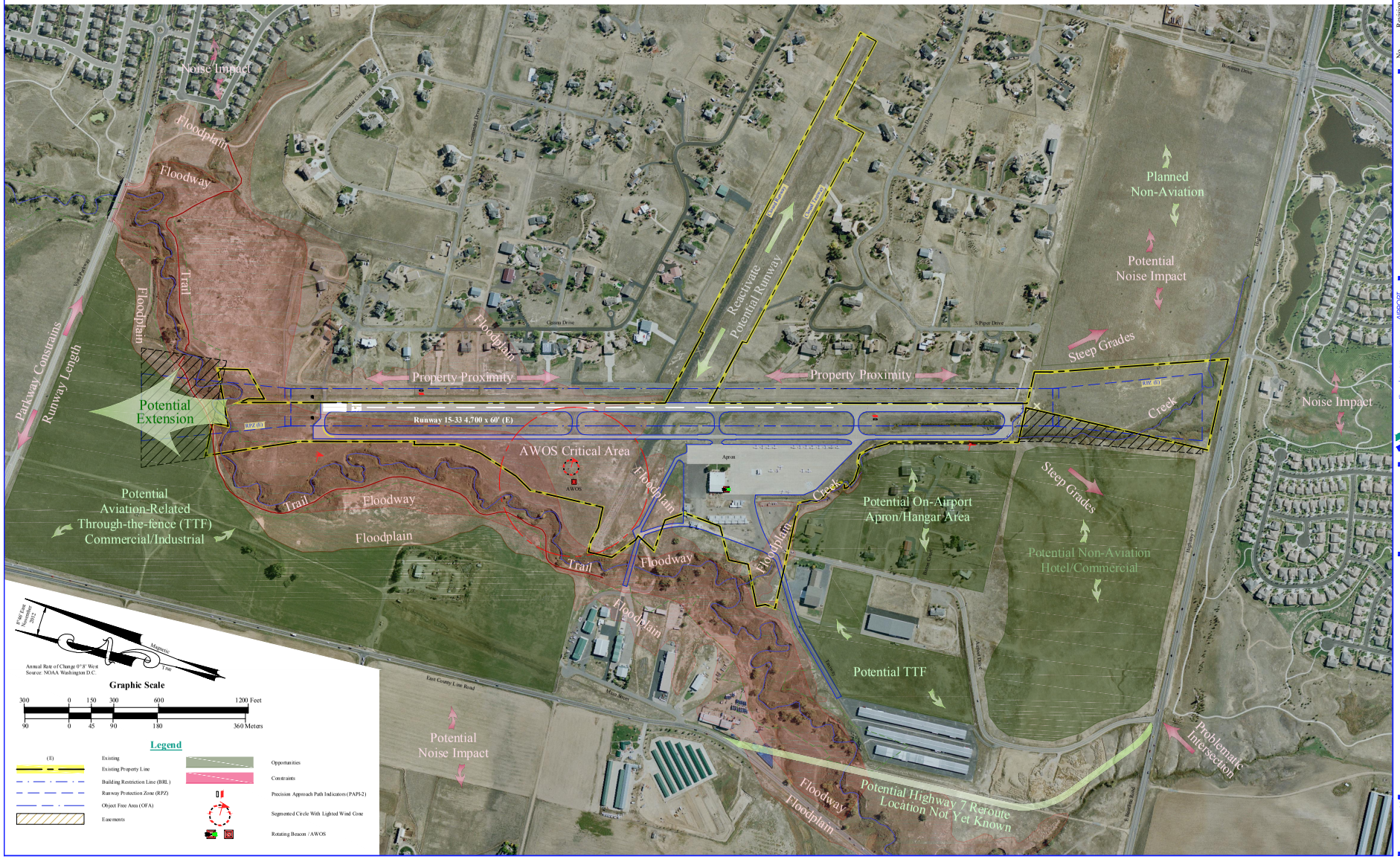
Reactivation of the former crosswind runway is shown as opportunity, but from some constituent perspectives it could very well be a constraint. There is much ground to cover on this issue and the upcoming alternatives analysis will cover it.

Perhaps the two most important opportunities are a northerly runway extension and additional commercial/industrial TTF on properties between the floodplain and County Line Road, north of the existing terminal area.

Rising terrain, as briefly discussed in the previous subsection, functionally prohibits a southerly runway extension, but a northerly runway extension could be accomplished. Coal Creek and its floodway/plain and trail are considerations. Environmental coordination and consultation, the necessary land acquisition for FAA standards compliance and land use and zoning changes are also of consequence. Perhaps the defining constraint to a substantial runway extension, as previously noted, is Vista Parkway.

Finally, TTF aviation-related and non-aviation development is perhaps an important consideration of this planning. A large congruent set of parcel due northwest of midfield is relatively undeveloped and is (1) the last larger-scale contiguous property of its kind with potential airport access (2) must be closely coordinated with FAA for and development, (3) is relatively free of development constraints and already zoned light industrial with County Line Road frontage, (4) will not require acquisition/condemnation for development, only landowner cooperation, (5) represents an minimal opportunity for EIK's enterprise fund, given that the property is envisioned for TTF access, but represents substantial opportunity for Town job growth and tax revenue.

Opportunities for and Constraints to Aviation Growth



No.	Revision	Ckd.	Date

Erie Municipal Airport
Town of Erie, CO

ADG AIRPORT DEVELOPMENT GROUP, Inc.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2832
303.788.1136 / 303.788.1678
www.ADGAirports.com

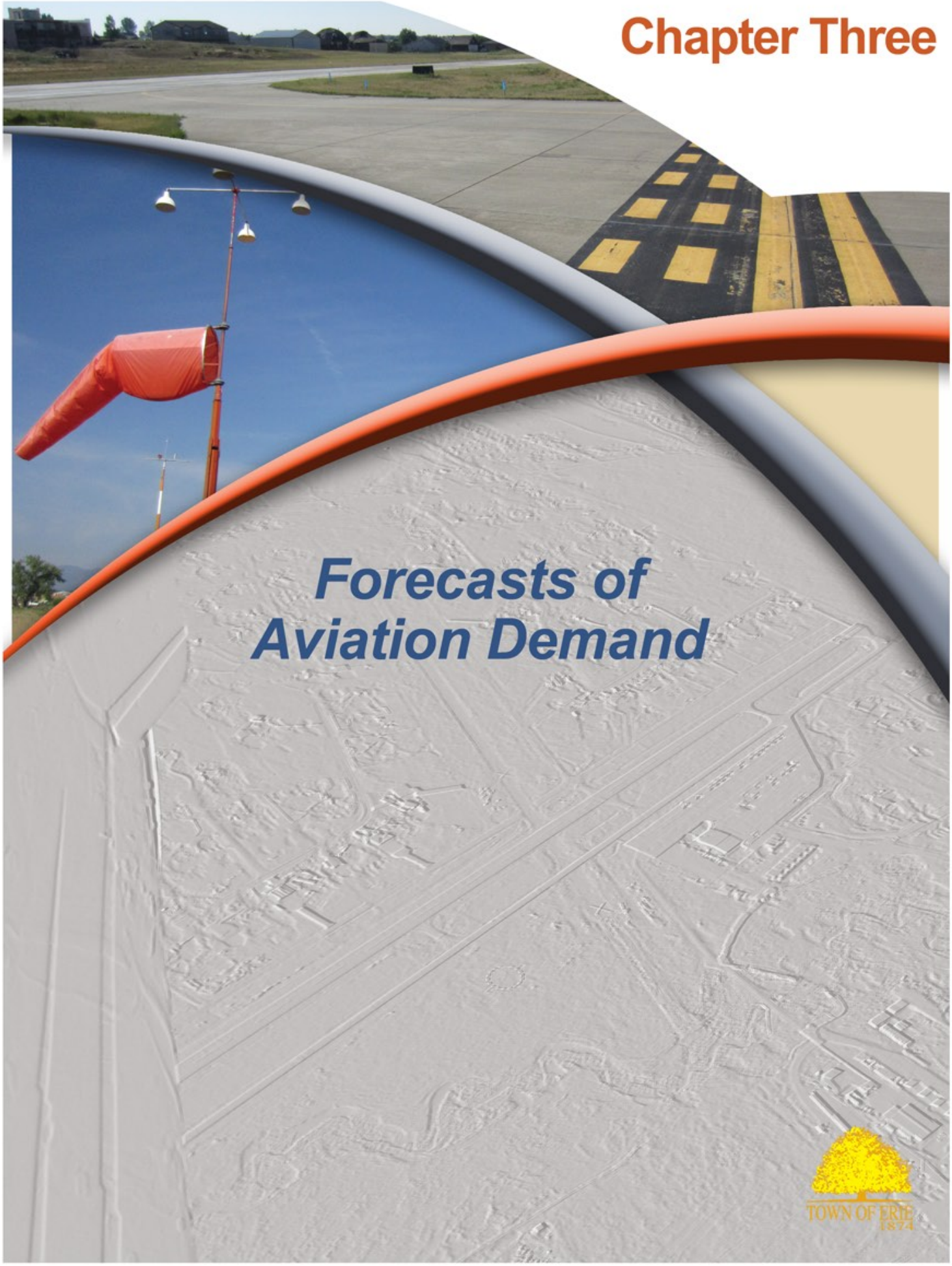
A.I.P. Project Number: 3-08-0090-13-2012

Project No:	EIK13598M
Designed By:	SMP
Drawn By:	MTP
Approved By:	SPM
Date:	November 2012

Opportunities Constraints

Exhibit:
OC

Chapter Three



Forecasts of Aviation Demand

TOWN OF ERIE
1874

Chapter Three – Forecasts of Aviation Demand

3.0 Introduction

The Forecasts of Aviation Demand are the basis for determining airport facility requirements. These requirements are then used to plan airport development such as runways and taxiways, apron area, hangar space and the selection of the specific airfield design standards.

Forecasts estimate the nature and magnitude of aeronautical activity and the associated need for airport development for the 20-year planning period. Due to the highly elastic nature of the aviation industry, most aviation forecasts tend to follow longer-term trends rather than fluctuations in any given year or two.

History has repeatedly demonstrated that general aviation airport utilization will be maximized depending upon the level of service provided to the flying and general public, along with local, regional and national economic conditions.

3.1 Forecast Methodologies

Projections of aviation activity may be prepared considering these and other data. Various projections are then considered in the formulation of a forecast. Forecast formulation is a subjective process concerning the extent to which one projection, or a combination of several projections or prevailing or anticipated conditions, represents a reasonable estimate of future aviation activity.

Several statistical projection techniques are available for forecasting demand at EIK. These include regression, trend and market share.

Regression involves the use of historical data to identify a relationship between the selected dependent variable, such as based aircraft, and an independent variable. This relationship is then applied to projections of the independent variable to produce future values for the dependent variable.

Trend projection provides estimates of future values for aviation demand by determining an historic pattern of change and projecting that pattern into the future. The primary assumption of this methodology is that the same factors that have influenced the past will affect the future.

Market share projections involve a review of past activity as a percentage of activity in a larger regional, statewide, or national market or environment. These percentages, or market shares, are then applied to activity forecasts for the aviation demand to produce a market share projection.

Application of these statistical projection techniques require strong, correlative relationships with historical activity levels of aircraft operations and based aircraft. Strong relationships in this regard may not be particularly valuable for this forecasting effort because of a lack of good, yearly historical aviation activity data.

Because of this, these analyses will somewhat be de-emphasized, and in the final analysis, a more subjective judgment of anticipated future aviation activity is necessary, will be employed, the results of which will be approved by FAA.

The Forecasts of Aviation Demand are provided in increments of 5, 10, and 20 years over the 20-year planning period. These periods are also classified in phases; Phase I is the first five years, Phase II is the second five years, and Phase III is the last 10 years. Year 2014 is the base forecast year, while 2033 is the final forecast year.

Efforts are made to report data and projections as percent change for easy reference.

Aeronautical forecasts necessary to determine airport facility requirements for EIK include:

1. Based Aircraft
2. Based Aircraft by Type
3. General Aviation Operations
4. General Aviation Operations by Type
5. Aircraft Operations Mix
6. Peak Period Aircraft Operations
7. Instrument Aircraft Operations
8. Summary and Design Aircraft

3.2 Brief Economic Review

The previous chapter provided an inventory of aviation activity and conditions salient to an analysis of future aviation activity, but additional information is noted here as background and supplemental.

The U.S. economy began a decline in the summer of 2000 when manufacturing production dropped after numerous interest rate increases by the Federal Reserve Bank in an effort to combat inflation. Despite negative growth in other sectors of the economy, consumer spending kept the gross domestic product in positive territory. It was predicted that the country would not enter a recession and 2002 would bring positive growth. Contrary to the predictions the nation entered a recession in March 2001. The economy recovered only to enter another at the end of 2007.

2008 brought many challenges for the nation's economy. Among these were rising interest rates and tightening credit conditions which caused a sharp decline in the housing market. The fourth quarter saw a dramatic decline in lending activity largely due to turmoil in the financial markets. Energy prices also rose substantially throughout the first half of the year. With the number of lost jobs on the rise, consumer spending began to decline. The automotive industry suffered as sales fell to the lowest numbers in 16 years. The housing sector was also hit hard, as both housing starts and residential investment experienced substantial declines throughout the year.

The economic growth forecast for 2009 was weak. Inflation was expected to decline and the unemployment rate to rise. 2008 and 2009 were predicted to be the slowest two-year growth period since the early 1980's. As predicted, 2009 proved to be another challenging year as unemployment numbers continued to climb reaching as high as 10 percent. Consumer confidence declined and spending reached a very low 0.7 percent for the first half of 2009. The housing sector continued to be very weak for the remainder of 2009. Vehicle sales were once again weak as they reached the lowest rate since the 1960's.

The national economy began to show positive growth in 2010 as the Gross Domestic Product increased in 48 states and the District of Columbia. This growth continued in the third and fourth quarters of 2011 at a rate of 1.8 percent and 3 percent respectively. The fourth quarter of 2011 saw the fastest growth since the second quarter of 2010. The national unemployment rate began a slow decline in 2011, and has yet reached pre-recession levels. Personal incomes

rose slightly in the fourth quarter of 2011 and consumer spending increased.

Economic consensus predicts moderate growth in 2012 and 2013.

3.2.1 Aviation

The aviation industry's growth significantly slowed following the terrorist attack of September 11, 2001, and again more recently with the 'great recession', spiking oil prices and the weak economy. After the terrorist attacks, air travel dropped as much as 50 percent but rebounded in a few years to about 75 percent of normal.

Current (late 2012) growth in the global economy is resulting in an increased demand for air travel. Industry growth over the next five years is expected to average 3.7 percent per year. As the economy continues to recover, the aviation industry predicts meaningful growth with passenger miles more than doubling over the next 20 years.

Prior to the 2008 recession, the National Business Aircraft Association (NBAA) reported that general aviation directly or indirectly employed over 1.26 million people nationwide, generated $150 billion in economic activity. NBAA reported that the industry started feeling the effects of the downturn and has since laid-off over 12,155 employees, adjusting to the new economic realities. Thousands of additional jobs among suppliers and ancillary businesses and were also lost. Some general aviation manufacturers, including Adam Aircraft and Eclipse Aviation, have declared bankruptcy and ceased production.

FAA data indicated that overall general aviation traffic volumes in January 2009 were down 23% compared to January 2008. The same data reports a change in business jet operations of 28.3 percent for January 2009 compared to the same month within 2008, year-over-year. Aircraft manufactures held a record backlog of $83 billion at the end of the third quarter 2008, shrinking by $6 to 7 billion each quarter.

At the same time, the used aircraft market was saturated with inventory levels for business jets reaching over 17 percent.

NBAA notes that fuel costs adversely impact local pilots, organizations and small businesses using general aviation. Historically, the general aviation community has paid nearly twice the price for fuel, than that paid by the commercial airlines. Reports from major fuel providers and aircraft charter companies have shown that when fuel prices increase, consumption and use decline significantly. A survey of aircraft operators from across the country has found that when fuel costs rise significantly, the purchase of turbine fuels falls by 10% to 20% and purchase of aviation gasoline (100LL) drops by 30% to 40%.

The impact of continuing price increases on the industry is visible in all parts of the country, and businesses continue to struggle with fuel prices uncertainty.

High fuel costs change operational behaviors.

3.3 General Economic Indications

Limited research was made for this planning to describe state and regional economic conditions, as these conditions are appropriate to consider in this chapter. The intent of this section is to identify recent and short-term economic trends which may inform aviation forecasting.

The State of Colorado, Office of Economic Development and Trade identifies the business climate indictors (data sources in parens):

- Colorado is ranked first for growth in the startup job sector (StartUpHire, 2012)
- Colorado is ranked the third best state for economic competitiveness (Beacon Hill Institute, 2012)

- Ft. Collins is ranked the third best place for business and careers (Forbes, 2012)
- Colorado ranks in the second tier of bioscience states (Battelle/BIO, 2012)
- Colorado is ranked fifth in entrepreneurial activity (2011 Kauffman Index of Entrepreneurial Activity)
- Colorado ranked third for state technology and science index (Milken Institute, 2011)
- Colorado ranked fifth on the clean energy leadership index (Clean Edge Inc.'s U.S. Clean Energy Leadership Index, 2012)
- Colorado ranked sixth for lowest state sales tax rates (Tax Foundation, 2012)
- Colorado is ranked the second best state for entrepreneurship and innovation (U.S. Chamber, 2012)
- Colorado is the second top state for high-tech business (TechAmerica 2012)
- Third most economically competitive state (Beacon Hill Institute, 2012)
- Third top state for business (CNBC, 2012)
- Fifth best state for business (Forbes, 2012)
- Best state for labor supply (Forbes, 2012)

3.3.1 Colorado-Based Business and Economic Research

A January 7, 2013 review of Colorado's economic and business climate and prospects was fielded by Colorado-based Business and Economic Research (CBER). CBER sources and draws conclusions from publicly-available data.

CBER notes "the Colorado economy mirrors the U.S. economy, experiencing five false starts (since the great recession) and has failed to show the sustained strong growth needed to significantly lower the unemployment rate.

It is questionable whether Colorado is performing better than the nation. BLS Wage and Salary Employment data suggests that Colorado is recovering faster than the nation. Colorado has added government jobs throughout the recovery while the U.S. has experienced declines." CBER notes that government employment data sources, namely local area unemployment and current employment are seemingly telling different stories about the short-term employment picture."

CBER continues, "In 2012, there was good and bad news…trends that will carry into 2013:

- Colorado's population will continue to grow faster than employment. The population will increase by 77,500 people in 2013
- The Colorado housing market is outperforming the nation
- For the time being, gasoline prices have dipped
- The State's General Fund is on the rise again, with revenue projected to increase by 6.4% in the fiscal year ending June 2013, along with and projected gains of 4.2% and 4.1% in the upcoming two years
- At the end of 2012, more than 200,000 Coloradans will be out of work"

CBER expects that 2012 employment numbers will show the addition of 49,600 jobs, followed by an increase of 45,000 to 55,000 jobs in 2013.

3.3.2 State of Colorado Governor's Office of Planning and Budgeting

The State of Colorado Governor's Office of State Planning and Budgeting (OSPB) forecasts:

- "Non-Farm payroll jobs will increase 2.1 percent in 2012, but growth will slow to 1.2 percent in 2013 as the economy is expected to continue on its uneven growth path while it continues to rebuild. Outside forces, such as the federal government's fiscal issues and the European recession will temper hiring. Nationally, job growth will follow a similar pattern but will be slower."
- "Unemployment rates of 8.0 percent and 7.8 percent are forecast for Colorado in 2012 and 2013, respectively. The national unemployment rate will be 8.1 percent and 7.9 percent in 2012 and 2013."

- "Personal income will grow in Colorado at a rate of 4.3 percent in 2012 and 3.9 percent in 2013. Personal income for the nation will grow by 4.2 percent in 2012. The national growth rate will slow to 3.4 percent in 2013."
- "Total wages and salaries paid to all workers will grow in Colorado at a rate of 4.4 percent in 2012 and 3.3 percent in 2013 as job growth slows from the relatively strong pace in 2012. Similarly, total wages to workers nationwide will grow 4.2 percent in 2012. The national growth rate will slow to 3.1 percent in 2013."
- "Retail trade sales in Colorado will grow 5.6 percent in 2012 after increasing 7.3 percent in 2011. Growth will slow further in 2013 to 3.8 percent. Nationwide retail trade will grow at similar rates of 5.0 percent in 2012 and 3.4 percent in 2013."
- "The Denver-Boulder-Greeley Consumer Price Index is forecast to increase 2.1 percent in 2012 and 2.9 percent in 2012; nationally, consumer prices will increase 2.0 percent in 2012 and 2.6 percent in 2013."

3.3.3 Metro Denver Economic Development Corporation

The Metro Denver Economic Development Corporation (MDEDC) expects that its region will achieve full economic recovery in 2013, meaning that all jobs lost during the recent recession will be regained, and Metro Denver will begin a new growth path. MDECD notes that "job growth in Metro Denver accelerated during 2012, and the year finished with stronger than expected employment, adding 34,500 jobs.

MDECD notes that new residents, through migration, support important aspects of the economy, specifically residential real estate. The combination of high demand and low inventory may lead to a supply imbalance in Metro Denver's residential real estate market. MDECD expects that existing home sales are forecast to continue to grow, but at a slower 4.8 percent rate in 2013, compared to 17.5 percent in 2012.

MDECD notes that "the United States endured a challenging political year, with elections and policy decisions overshadowing much of 2012. "Consumer confidence noticeably dipped, and businesses put off hiring and investment. While political leaders did reach a partial fiscal cliff deal, many decisions remain. Tax cuts for most Americans were reinstated, helping to boost optimism and assuage some economic worries of consumers. Analysts believe the worst of the foreclosure crisis is behind us, and the residential real estate market has been improving. Sales of homes are increasing, as are prices. While growth in the job market is expected, it will not be enough to decrease unemployment significantly."

MDECD notes, "Economists believe that Colorado will remain a top-10 performing economy in 2013. Employment gains in 2012 outpaced the nation and should do the same in 2013. Colorado was the seventh-fastest growing state in terms of population between July 2011 and July 2012. Colorado's growing population will help keep the residential real estate market healthy, as demand increases for houses and apartments."

MDECD expects that "the Metro Denver residential real estate market will continue to outperform the nation with decreasing foreclosures, increasing home prices, and strong new construction activity.

3.4 Socioeconomic Indications

A review of historical and projected socio-economic activity can provide insights into the future use of EIK. The following information summarizes population, employment, income, sales and other appropriate, aviation-correlative data important to providing reasonable guidance to estimate the future utilization of EIK.

A profile of the Town, by the Town, follows:

- Town Services: Police, Water, Sewer, Streets, Storm Drainage, Airport, Parks, Recreation, Open Space
- Form of Government: Board of Trustees/ Town Administrator
- Governing Body: Mayor elected at-large to a two-year term; six Trustees elected at-large to four-year terms
- 2011 Households: 6,758
- Median Household Income: *$99,804*
- Median Age: 32.5
- Planning Area: 48 Square Miles
- Incorporated Area: 18 Square Miles
- Parks and Open Space: 346 Acres
- 2012 Operating Budget: $28,975,841
- Town Employees: 258
- 2011 Total Town Mill Levy: 7.288
- 2011 Town Sales/Use Tax Rate: 3.5
- 802 Building Permits in 2011
- 33 Land Use Change Applications in 2011
- 371 Business Licenses Issued in 2011

A Town-website community profile notes the following:

Year	Population	*5-Year Gain*	Number of Households	*5-Year Gain*
2000	6,985	--	2,494	--
2005	14,044	*101%*	5,016	*101%*
2010	18,500	*32%*	6,485	*29%*
2015	25,650	*39%*	9,161	*41%*
2020	33,670	*31%*	12,025	*31%*
2025	40,680	*31%*	14,580	*21%*

Woods and Poole Economics, Inc. (WPE) is nationally-recognized firm specializing in long-term economic and demographic projections. Their data are widely-used by governments and business alike.

The majority of existing airport users reside in Boulder, Weld and Broomfield counties, the airport service area for purposes herein. Note that WPE does not maintain Broomfield data, but the Weld and Boulder data taken both separately and together provides a basis for forecasting, while State of Colorado data is used for reference. WPE identifies their data sources and projection methodologies. Historical population, household and sales data (and projections therefrom) is sourced from the U.S. Census Bureau. Historical employment, earnings, income data (and projections therefrom) is sourced from the U.S. Bureau of Economic Analysis (BEA).

WPE notes that it formulates its proprietary county-based projections as the result of an integrated process. WPE makes county-based projections based upon US personal income, earnings by industry, employment by industry, population, inflation and other variables. Adjustments are made based upon lingering effects from the 2008/2009 recession. WPE then segregates the U.S. into 179 economic areas as identified by the US BEA. WPE employs an *export-base* approach which is used to project employment, and a subsequent earnings projection. The employment and earnings projections are then used to estimate population and households. Final steps involve proprietary reconciliation with population and county-level modifications to the projections.

Select WPE socioeconomic indicators are inventoried for historical and future years of consequence for this planning, as identified on Tables 3-1 and 3-2 and as depicted within Figure 3-1 and 3-2 on upcoming pages.

Complete data sources and methodologies are found within WPE's *2012 State of Colorado Profile; Technical Description.*

3.4.1 CU Medical Development

While specific planned developments may not always be stand-alone drivers of aviation activity, CU Health Sciences' recent acquisition of 66 anchoring acres within a planned 935 acres some 1.5 miles due east of EIK is noteworthy for its potential.

Table 3-1
Area Socioeconomics (Historic) *(Data Source: Woods and Poole Economics)*

Population	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	**2012**
Weld County	182,843	222,951	*21.9 (4.05)*	254,357	*39.1 (3.91)*	266,357
Boulder County	294,270	306,732	*4.2 (0.85)*	327,275	*11.2 (1.12)*	335,581
Colorado	4,326,921	4,631,888	*7.0 (1.41)*	5,049,071	*16.7 (1.67)*	5,207,349
Employment	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	**2012**
Weld County	96,005	109,276	*13.8 (2.76)*	112,304	*17.0 (1.70)*	115,363
Boulder County	237,973	241,409	*1.4 (0.29)*	247,913	*4.2 (0.42)*	252,780
Colorado	2,926,408	3,031,017	3.6 *(0.71)*	3,083,142	*5.4 (0.54)*	3,128,857
Unemployed (%)	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	
Weld County	3.47	5.57	*60.5 (12.10)*	10.18	*193.4 (19.34)*	
Boulder County	3.7	4.51	*21.9 (4.38)*	7.15	*93.2 (9.32)*	
Colorado	3.83	5.12	*33.7 (6.74)*	8.92	*132.9 (13.29)*	
Earnings ($)**	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	**2012**
Weld County (000)	3,551,187	4,377,452	*23.3 (4.65)*	4,348,958	*22.5 (2.25)*	4,646,429
Boulder County (000)	12,464,310	12,285,270	*-1.4 (-0.29)*	12,136,240	*-2.6 (-0.26)*	1,280,625
Colorado (000)	132,997,100	146,436,700	*10.1 (2.02)*	149,795,200	*12.6 (1.26)*	157,808,200
Personal Income ($)**	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	**2012**
Weld County (000)	5,204,621	6,006,771	*15.4 (3.08)*	6,510,584	*25.1 (2.51)*	6,965,964
Boulder County (000)	13,421,510	14,199,160	*5.8 (1.16)*	14,667,996	*9.3 (.93)*	15,233,790
Colorado (000)	163,801,200	179,695,600	*9.7 (1.94)*	196,576,612	*20.0 (2.00)*	207,224,100
Per Capita ($) Personal Income**	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	**2012**
Weld County	28,465	26,942	*-5.4 (-1.07)*	25,596	*-10.1 (*-1.01)	26,153
Boulder County	45,609	46,292	*1.5 (0.30)*	44,819	*-1.7 (-0.17)*	45,395
Colorado (000)	37,856	38,795	*2.5 (0.50)*	38,933	*2.8 (0.28)*	39,795
Households	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	**2012**
Weld County	64,006	80,559	*25.9 (5.17)*	89,899	*40.5 (4.05)*	95,097
Boulder County	115,943	125,234	*8.0 (1.60)*	131,857	*13.7 (1.37)*	136,501
Colorado	1,669,444	1,842,746	*10.4 (2.08)*	1,980,771	*18.6 (1.86)*	2,058,768
Retail Sales($)**	**2000**	**2005**	*5 Year % Change**	**2010**	*10 Year % Change**	**2012**
Weld County (000)	1,802,899	2,314,153	*28.4 (5.67)*	2,408,422	*33.6 (3.36)*	2,669,878
Boulder County (000)	4,585,336	4,998,869	*9.0 (1.80)*	4,865,549	*6.1 (0.61)*	5,281,471
Colorado (000)	618,738,300	692,632,900	*11.9 (2.39)*	689,875,900	*11.5 (1.15)*	751,778,900

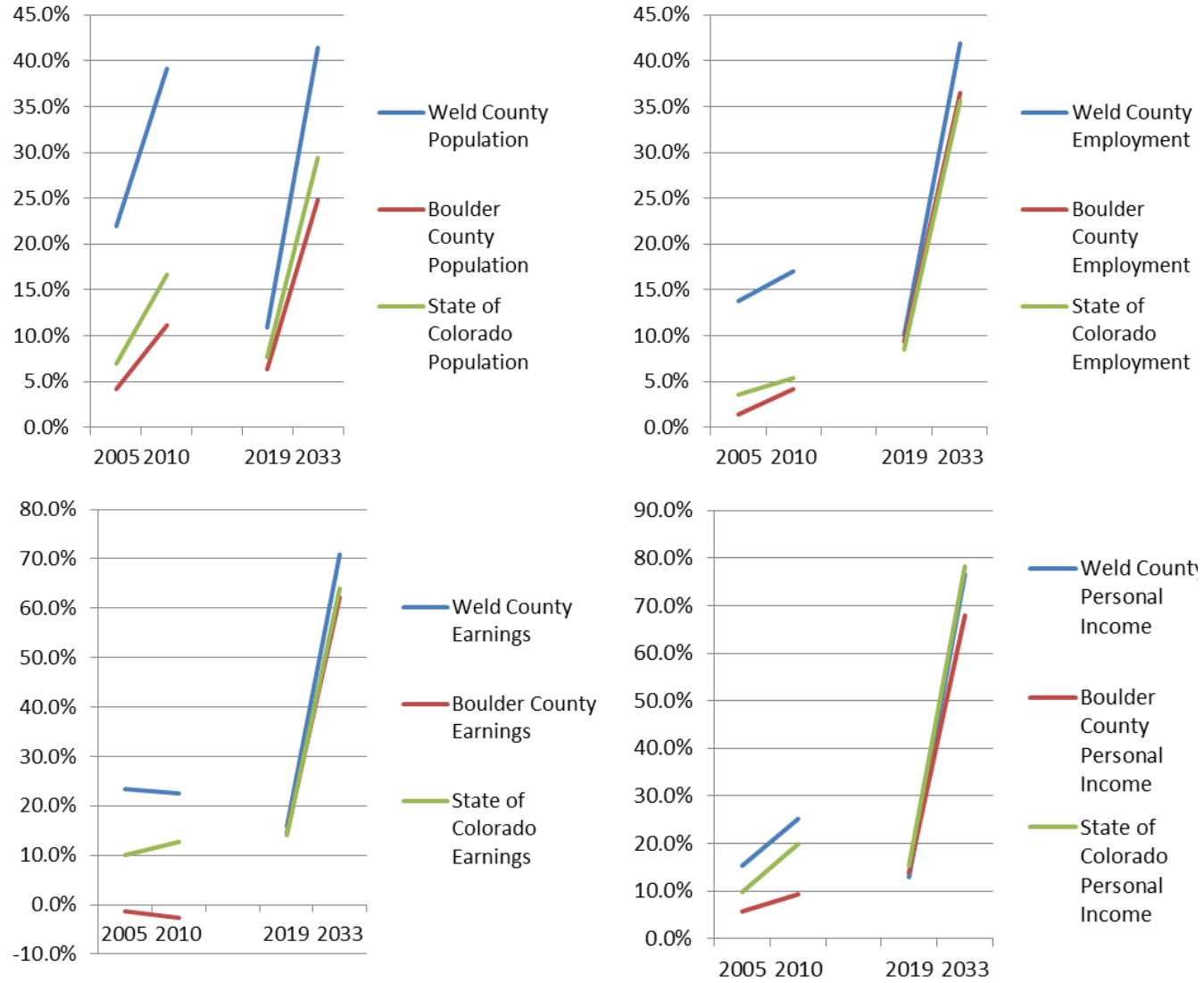
**Overall 5 and 10-year percentage change from 2000 baseline; average annual percentage change in parens; ** 2005 dollars.*

Table 3-2
Area Socioeconomics (Projected) *(Data Source: Woods and Poole Economics)*

Population	**2014**	**2019**	*5 Year % Change**	**2033**	*20 Year % Change**
Weld County	278,494	308,958	*10.9 (2.19)*	393,820	*41.4 (2.07)*
Boulder County	344,180	366,233	*6.4 (1.28)*	429,463	*24.8 (1.24)*
Colorado (000)	5,369,555	5,781,582	*7.7 (1.53)*	6,947,815	*29.4 (1.47)*
Employment	**2014**	**2019**	*5 Year % Change**	**2033**	*20 Year % Change**
Weld County	119,990	132,137	*10.1 (2.02)*	170,311	*41.9 (2.10)*
Boulder County	262,348	286,891	*9.4 (1.87)*	358,193	*36.5 (1.83)*
Colorado	3,234,117	3,510,218	*8.5 (1.71)*	4,389,851	*35.7 (1.79)*
Earnings ($)**	**2014**	**2019**	*5 Year % Change**	**2033**	*20 Year % Change**
Weld County (000)	4,933,249	5,714,783	*15.8 (3.17)*	8,428,946	*70.9 (3.54)*
Boulder County (000)	13,545,230	15,521,630	*14.6 (2.92)*	21,954,970	*62.1 (3.10)*
Colorado (000)	166,443,950	189,952,400	*14.1 (2.82)*	272,859,200	*63.9 (3.20)*
Personal Income ($)**	**2014**	**2019**	*5 Year % Change**	**2033**	*20 Year % Change**
Weld County (000)	7,631,616	8,626,285	*13.0 (2.61)*	13,475,370	*76.6 (3.83)*
Boulder County (000)	15,824,835	18,041,485	*14.0 (2.80)*	26,564,910	*67.9 (3.39)*
Colorado (000)	216,955,700	250,443,800	*15.4 (3.09)*	386,911,300	*78.3 (3.92)*
Per Capita ($) Personal Income**	**2014**	**2019**	*5 Year % Change**	**2033**	*20 Year % Change**
Weld County	26,434	27,921	*5.6 (1.13)*	34,219	*29.5 (1.47)*
Boulder County	45,978	49,262	*7.1 (1.43)*	61,856	*34.5 (1.73)*
Colorado	40,405	43,318	*7.2 (1.44)*	55,688	*37.8 (1.89)*
Households	**2014**	**2019**	*5 Year % Change**	**2033**	*20 Year % Change**
Weld County	100,537	113,537	*12.9 (2.59)*	143,269	*42.5 (2.13)*
Boulder County	141,519	153,209	*8.3 (1.65)*	177,724	*25.6 (1.28)*
Colorado	2,142,052	2,337,166	*9.1 (1.82)*	2,754,685	*28.6 (1.43)*
Retail Sales($)**	**2014**	**2019**	*5 Year % Change**	**2033**	*20 Year % Change**
Weld County (000)	2,850,780	3,332,810	*16.9* (3.38)	4,953,243	*73.8 (3.69)*
Boulder County (000)	5,553,763	6,202,931	*11.7* (2.34)	8,480,880	*52.7 (2.64)*
Colorado (000)	790,266,500	893,281,900	*13.0 (2.61)*	1,241,970,000	*57.2 (2.86)*

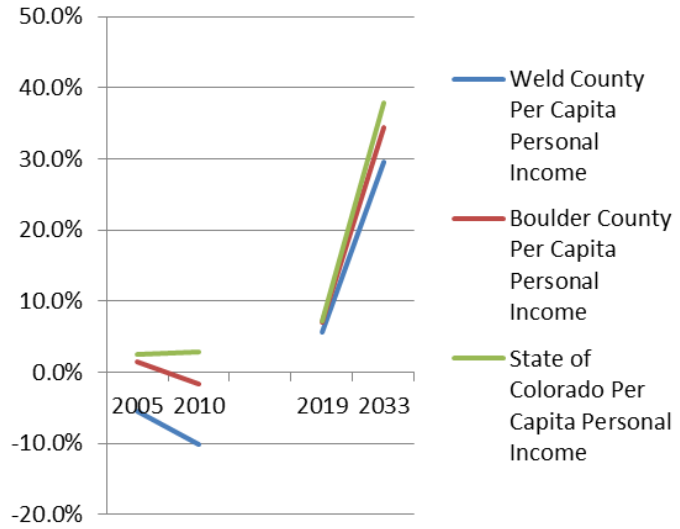
**Overall 5 and 20-year percentage change from 2014 baseline; average annual percentage change in parens; ** 2005 dollars.*

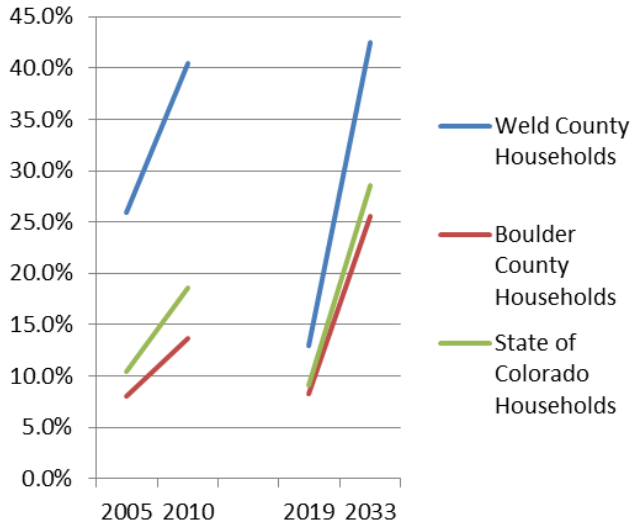
Figure 3-1
Area Socioeconomics (Population, Employment, Earnings, Personal Income) *(Visualization: ADG)*

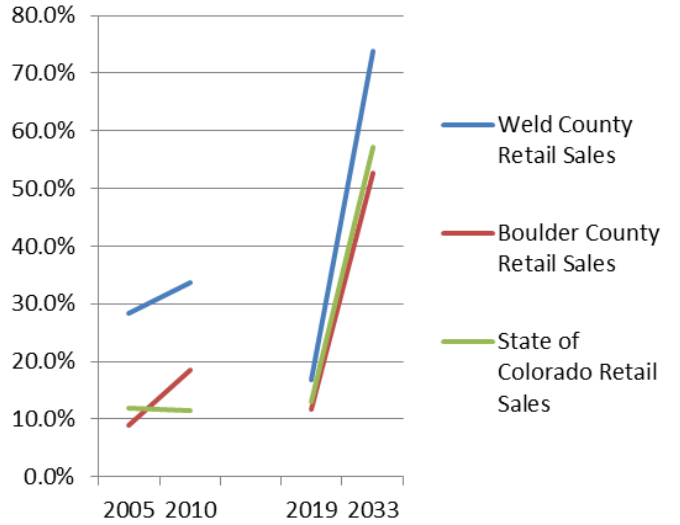


Note: Historic from 2000 baseline, Projected from 2014 baseline

Figure 3-2
Area Socioeconomics (Per Capita Personal Income, Households, Retail Sales *(Visualization: ADG)*







Note: Historic from 2000 baseline, Projected from 2014 baseline

3.5 Aviation-Related Indications

Although area socioeconomic data often closely correlates aviation activity, more direct measures of aviation industry activity are germane.

3.5.1 EIK Fuel Sales

Fuel dispensed at EIK was inventoried from available data, as shown in Table 3-3 and Figure 3-3, and a simple linear regression for planning forecast years of consequence was made. Q1 data was incomplete so an estimate based upon future year's Q1 take of the yearly total was made. Note that the percentage change data used this 2008 derived estimate as baseline.

Table 3-4 and Figure 3-4 in the following page identify and depict the forecast percentage changes in the number of based aircraft and general aviation operations from previous master planning work at select other area airports.

Table 3-3
Fuel Dispensed and Projection *(Data Source: Vector Air)*

Fuel Inventory	**2008***	**2009**	**2010**	**2011**	**2012**
Jet-A	29,643	35,732	28,054	36,075	30,485
100LL	53,811	66,720	71,147	65,915	62,977
Total	83,454	102,452	99,201	101,990	93,462
Fuel Projection	**2014**	**2019**	*5-Year % Change*	**2033**	*20-Year % Change*
Jet-A	32,809	30,925	*-3.5*	29,220	*-10.9*
100LL	55,600	75,516	*19.9*	122,586	*120.5*
Total	88,408	106,440	*13.9*	151,805	*71.7*

**Q1 2008 data incomplete; estimated based upon subsequent years' data. Overall 5 and 20-year change from 2014 baseline.*

Figure 3-3
Fuel Dispensed and Projection *(Visualization: ADG)*

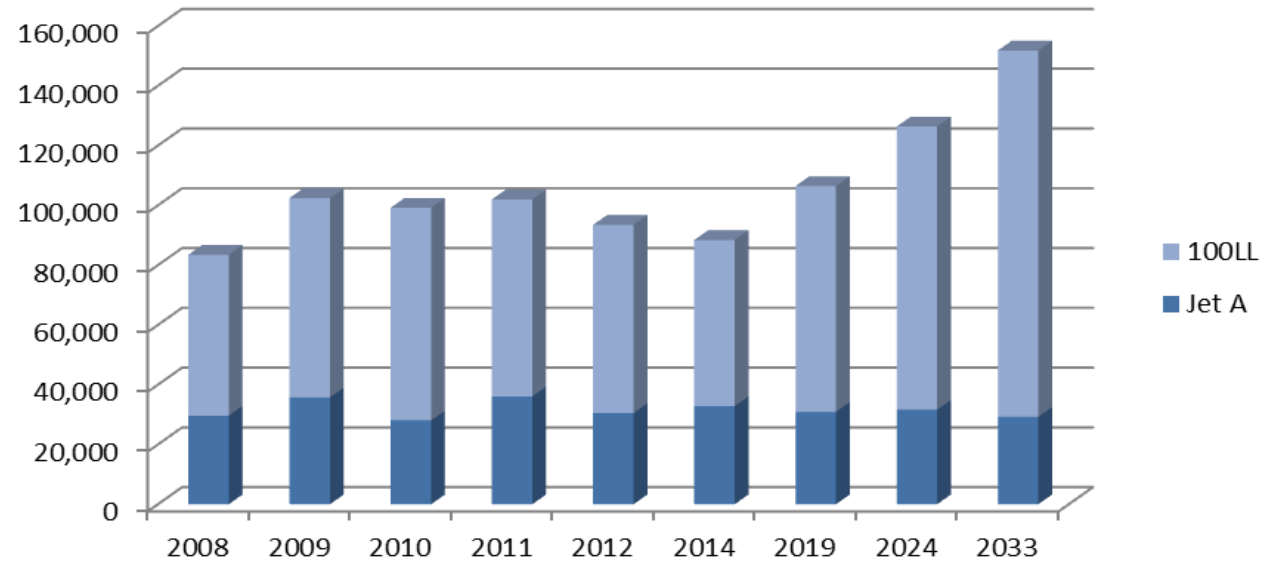
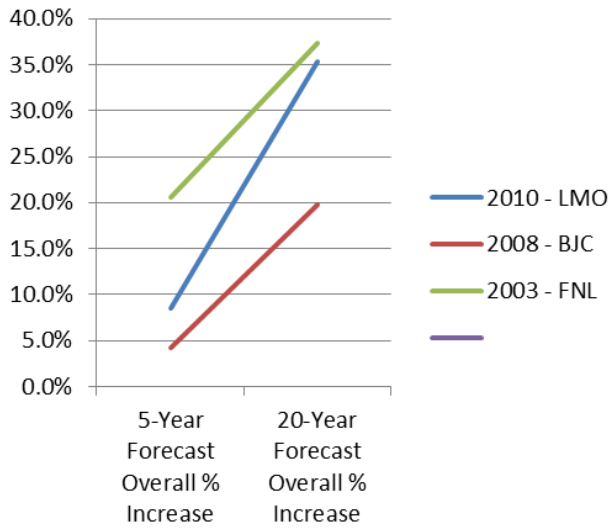
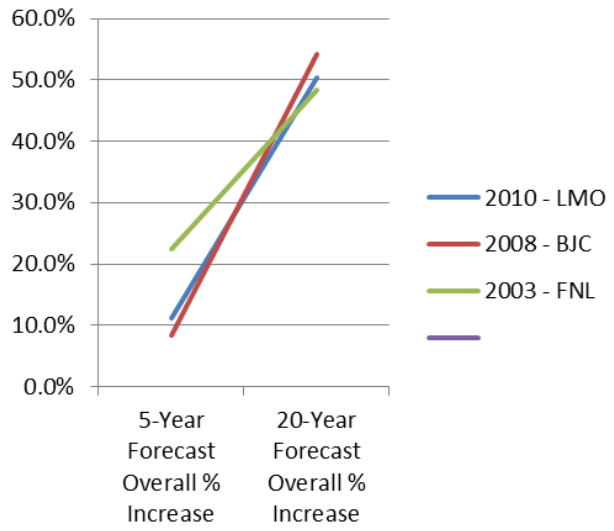


Table 3-4/Figure 3-4
Area Airports Based Aircraft and Aircraft Operations Forecasts *(Source: ADG)*

Based Aircraft Forecast; Year and Airport	*5-Year Forecast Overall % Increase*	*20-Year Forecast Overall % Increase*
2010 - LMO	*8.5%*	*35.3%*
2008 - BJC	*4.2%*	*19.8%*
2003 - FNL	*20.6%*	*37.3%*

Aircraft Operations Forecast; Year and Airport	*5-Year Forecast Overall % Increase*	*20-Year Forecast Overall % Increase*
2010 - LMO	*11.1%*	*50.4%*
2008 - BJC	*8.3%*	*54.1%*
2003 - FNL	*22.5%*	*48.4%*





3.5.2 CDOT Aviation System Plan

CDOT's *2011 Aviation System Plan* forecasted based aircraft for EIK (from 2014 as baseline; interpolated and rounded):

EIK Based Aircraft From State Plan	Forecast New Based Aircraft	*Percent Change from 2014 baseline*
2019	3	*1.57%*
2033	17	*8.90%*

CDOT's *2011 Aviation System Plan* forecast aircraft operations for EIK (from 2014 as baseline; interpolated and rounded):

EIK Aircraft Operations From State Plan	Forecast New Aircraft Operations	*Percent Change from 2014 baseline*
2019	1,540	*3.2%*
2033	6,462	*13.7%*

Note that the *System Plan* employed forecast methodologies for based aircraft and aircraft operations based upon FAA's *FAA Aerospace Forecasts for Fiscal Years 2011-2031*, which the *System Plan* characterizes as 'pessimistic' for the majority of aircraft operating at EIK. More specifically, the *System Plan* primarily based its forecasts upon these FAA-derived average annual growth rates (AAGRs):

Aircraft Class	*AAGR*
Single-Engine Piston	*0.2%*
Multi-Engine Piston	*-0.9%*
Jet	*3.1%*
Helicopter	*2.6%*
Glider	*-0.1%*
Sport	*3.4%*
Experimental	*1.4%*

The *System Plan* notes:

- EIK forecast general aviation operations were adjusted downward from the system-wide projections based upon 'overall trends at towered airports',
- The expected growth rate of based aircraft at EIK is among the top 9 airports growth rates in the state.
- In 2010, EIK accommodated 4.2 percent of all state general aviation operations, the sixth busiest airport in the state, in terms of this metric.
- In 2010, EIK accommodated 3.4 percent of all Colorado-based aircraft, the ninth busiest airport in the state, in terms of this metric.

3.5.3 FAA Forecasts

FAA Aerospace Forecasts Fiscal Years 2013-2033 is the recent edition of this annually updated forecasting document. This document notes:

"As the economy {national} recovers from the most serious economic downturn and slow recovery in recent history, aviation will continue to grow of the long run. Fundamentally, demand for aviation is driven by economic activity."

Its review of the year 2012 notes:

"The general aviation market showed an improvement…single engine piston shipments recovered from their negative trend to a 0.9 percent increase over the previous year…while total poison aircraft shipments were relatively flat, with a 0.3 percent increase. Turbine aircraft shipments by U.S. manufacturers increased by 6.2 percent {year over year}. Turboprop shipments, which increased by 16.2 percent {year over year} accounted for the growth in turbine shipments, as there was a 4.7 percent decline in business jet shipments. General aviation activity at FAA and contract towers increased 0.6 percent {year over year) driven by local operations."

This document indicates that general aviation manufacturing declined significantly following the year 2008 economic challenges and recovery has been tenuous:

- U.S general aviation aircraft shipments decreased from 3,079 units in 2008 to 1,334 units in 2010, and the estimated year 2012 quantity is 1,514.
- U.S general aviation aircraft billings decreased from $13.3± billion in 2008 to $7.9± billion in 2010 and the estimated year 2012 quantity is $8.0± billion.

FAA Aerospace Forecasts indicates the U.S Gross Domestic Product (GDP) Year-Over-Year (YOY) increases (*from IHS Global Insight*):

U.S Projected GDP	*% YOY Increase*
2013	*1.7%*
2014	*2.6%*
2015	*3.4%*
2016	*3.0%*
Years 2017 through 2033	*2.5%*

And, U.S Real Disposable Income (RDI) Year-Over-Year (YOY) increases (*from IHS Global Insight*):

U.S Projected RDI	*% YOY Increase*
2013	*2.0%*
2014	*3.0%*
2015	*3.1%*
2016	*2.9%*
Years 2017 through 2033	*2.4%*

FAA Aerospace Forecasts forecast a 20-year AAGR of 0.5 percent in the aggregate general aviation fleet, with a 2.8 percent 20-year AAGR in turboprop and rotorcraft. An average annual percent decrease of 0.2 and 0.6 percent in the active single-engine piston and multi-engine fleet respectively, is forecast through the year 2033. FAA defines active in this context as "an aircraft which flies at least one hour during the year."

FAA Aerospace Forecasts indicates an AAGR of 3.2 percent through 2013 and 2.0 percent through the 20-year period for active light-sport aircraft.

FAA Aerospace Forecasts indicates that the number of general aviation hours flown is projected to increase by an AAGR of 1.6 percent over the forecast period. Also indicated is that the number of turbine general aviation hours flown is projected to increase by an AAGR of 3.3 percent over the forecast period.

FAA Aerospace Forecasts indicates commercial pilot certification issuance at an AAGR of 0.6 percent, while the number of student pilots are forecast to decreased at an AAGR of 0.1 percent and the number of private pilots is expected at an AAGR of 0.2 percent.

FAA Aerospace Forecasts indicates that FAA's general aviation-related workload increased by 0.6 percent, the first increase since the year 2008. *FAA Aerospace Forecasts* indicates that FAA's general aviation-related workload is forecast at an AAGR of 0.4 percent through the 20-year period.

Finally, FAA's Report to Congress National Plan of Integrated Airport Systems (NPIAS) 2013-2017 is the recent edition of this annually updated document. This document, in Chapter Three, identifies forecast general aviation fleet and hours flown via *FAA Aerospace Forecasts.*

3.6 Based Aircraft Forecasting

The FAA-Approved number of based aircraft at EIK, for purposes of this planning totals 191, distributed as follows:

- 173 single-engine
- 9 multi-engine
- 2 jet
- 7 helicopter

EIK has many positive features and services its local pilot and business communities well. National economic circumstances have slowed the growth of general aviation and the industry continues, like national economy, to await a more substantial rebound. Most local and regional indications point to more robust projections of future based aircraft as probable.

This based aircraft count per FAA's TAF is dissimilar to the count derived for this planning; current counts on the field were verified.

3.6.1 Based Aircraft Projections

Indicators with statistical correlations to aviation activity are used to project the number of based aircraft as shown in Table 3-5, Figure 3-5 and Figure 3-6.

The Population, Earnings, Per Capital Personal Income (PCPI) and Retail Sales Projections are the average of the Weld and Boulder County WPE figures found within Table 3-2. The EIK Fuel Sales Projection is a repeat of figures within Table 3-3. The Area Airports Projection is the average of the forecasting done for other planning for LMO, BJC and FNL. The CDOT Projection is via the newly updated *System Plan*, and the FAA Projection is from *FAA Aerospace Forecasts* for single-engine aircraft. Finally, the Average Projection is the simple mean of the previous projections.

The projections group nicely in terms of large, intermediate and low values. The projections which produce large values are regionally-currency related: Earnings, Retail Sales and EIK Fuel. The projections which produce intermediate values are somewhat regional, being people and aviation-related: PCPI, Population, Area Airports and the Average Projection. The projections which produce low values are somewhat nationally aviation-related: CDOT and FAA.

These projections seemingly suggest:

- Regional local aviation demand could surpass national expectations
- The national and regional aviation industry has yet to see a full recovery

Table 3-5
Based Aircraft Projections *(Data Source: Various)*

Projection	5-Year Forecast Overall Increase	**Projected Number of Based Aircraft**	20-Year Forecast Overall Increase	**Projected Number of Based Aircraft**
Population	8.6%	**208**	33.1%	**254**
Earnings	15.2%	**220**	66.5%	**318**
PCPI	6.3%	**203**	32.0%	**252**
Retail Sales	14.3%	**218**	63.2%	**312**
EIK Fuel	13.9%	**218**	71.7%	**328**
Area Airports	11.1%	**212**	30.8%	**250**
CDOT	1.02%	**193**	8.9%	**208**
FAA	-1.05%	**189**	-4.2%	**183**
Average	8.7%	**208**	37.8%	**263**

Figure 3-5
Based Aircraft Projections *(Visualization: ADG)*

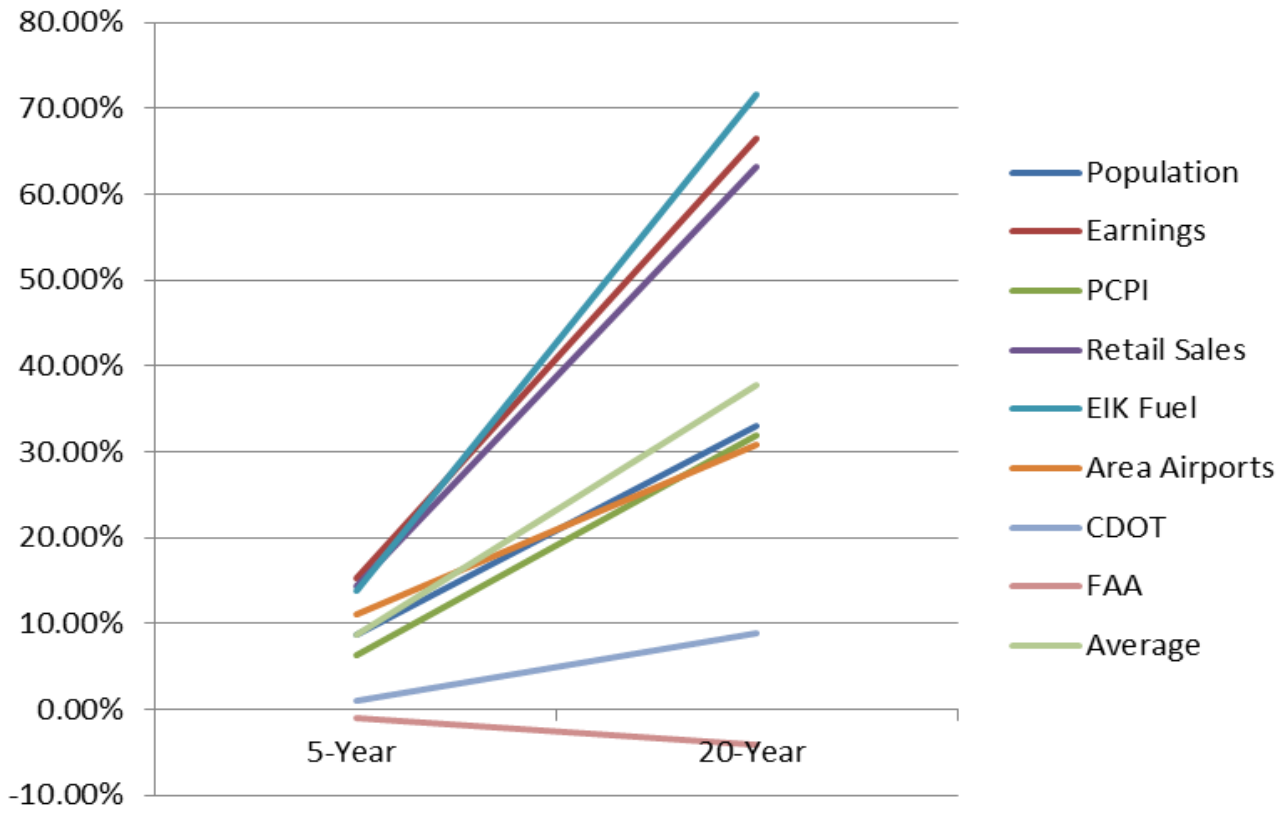


Figure 3-6
Based Aircraft Resulting from Projections *(Visualization: ADG)*

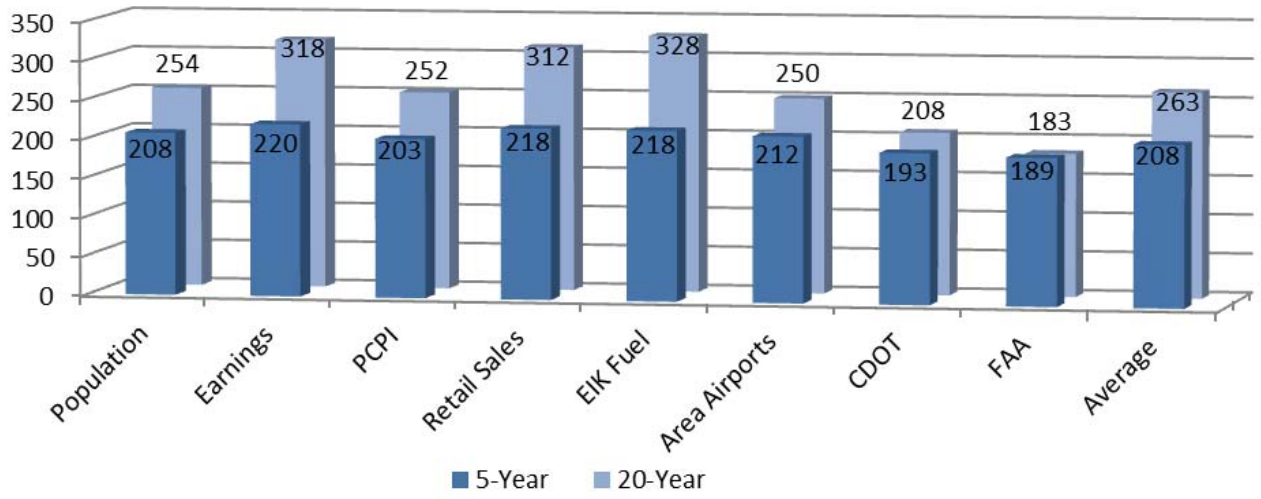


Figure 3-6 above shows the resulting number of based aircraft derived as a consequence of the projections.

3.6.2 Based Aircraft Forecast

A forecast of based aircraft can be taken from one of the above, or a combination of projections. In the consultant's opinion there is no need for extravagant statistical efforts given the nature and scope of EIK's aviation activity.

A bit of optimism is in order:

- EIK fuel sales, and other regional economic measures, have been robust in the face of strong national economic headwinds in recent years.
- The Town and surrounding municipalities have several large multi-use developments which may stimulate participation in the aviation marketplace.
- EIK hangar space is at capacity as is space at some other area airports, with a strong preference to enclose aircraft storage
- The aviation industry, just very recently has shown signs of renewal.

These are perhaps quantified within the larger-value projections.

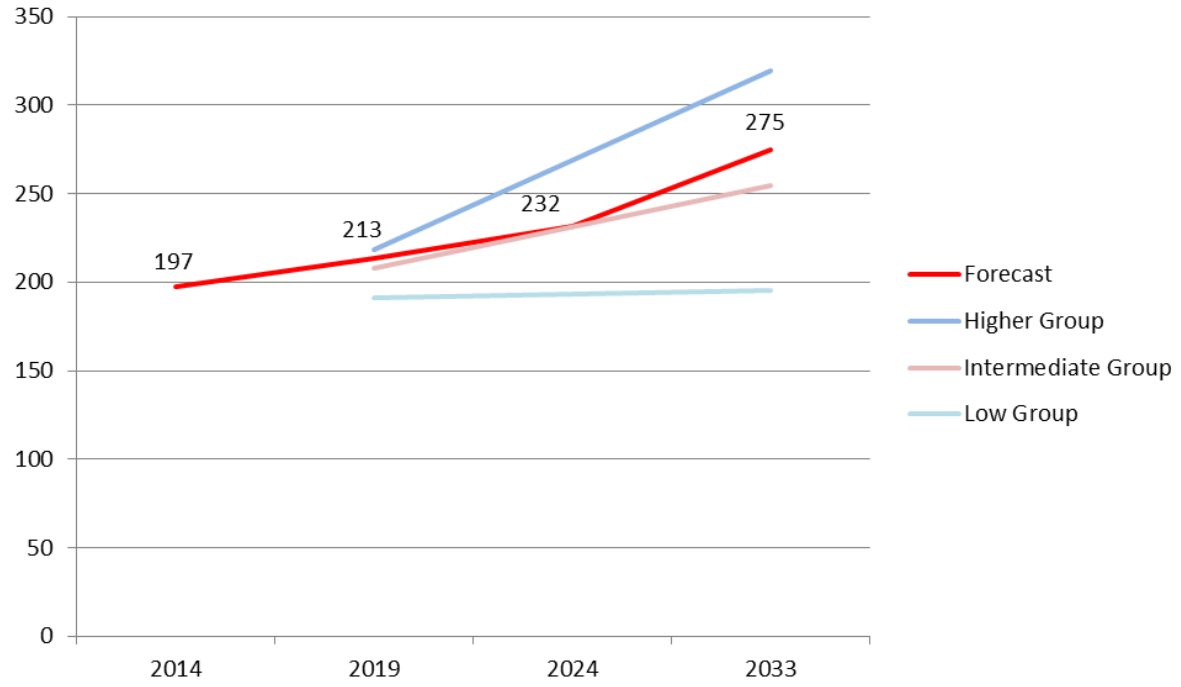
However, a bit of trepidation is also in order:

- Rising fuel and aircraft acquisition costs serve to decrease aviation activity
- Economic uncertainties persist at the national level and will likely remain of concern for the aviation industry. Examples include potential terrorism, and seemingly unforeseeable financial and monetary events

These are perhaps quantified within the lower-value projections.

On balance, reason exists for a bit of optimism, but likely within a standard statistical dispersion. The Average Projection is a 'middle of the road' compromise between the lower CDOT and FAA Projections and the more robust Earnings and EIK Fuel Projections. Optimism is quantified for purposes herein by finding a based aircraft

Figure 3-7
Forecast of Based Aircraft *(Visualization: ADG)*



forecast within the 'high sides' of Average Projection's standard deviation of 5.7 for the 5-year forecast period and 25.8 for the 20-year forecast period.

The Forecast of Based Aircraft is shown on Figure 3-7 in red. This forecast is a simply 1.6 percent annual growth each year, beginning with the 2012 count of 191 aircraft, until 2024 and then 1.9 percent to the final forecast year. Summarily:

Period	AAGR	Overall
2014-2018	1.6%	8.3%
2019-2023	1.6%	8.6%
2024-2033	1.9%	18.4%
2014-2033	*1.7%*	*39.2%*

The higher grouping is the simple mean of the Earnings, Retail Sales and EIK Fuel projections. The intermediate grouping is the simple mean of the PCPI, Population, Area Airports and the Average Projection. The low grouping is the simple mean of the CDOT and FAA Projections. These projections were not selected because other regional-correlative economic conditions are noteworthy.

New based aircraft will likely come to EIK when new hangar capacity is built. And, new hangars may be built, be they T- or box- types, by either the Town or a tenant when demand is likely sufficient to fill space at a given price. The result of this, for example, is that the based aircraft count will jump 10 percent when a new T-hangar is built and occupied.

3.6.3 Based Aircraft Forecast by Type

A further segregation of based aircraft by type is necessary to meaningfully complete this section. This subsection relies on information contained in CDOT and FAA forecasting materials previously discussed. These materials suggest that future aviation activity in general, is likely more robust for in the multi-engine, jet and helicopter types, as opposed to the single-engine type. Figures on the following page repeat earlier data.

Aircraft Type	CDOT AAGR	FAA AAGR
Single-engine	0.2%	-0.2%
Multi-engine	-0.9%	-0.6%
Turboprop	--	2.8%
Jet	3.1%	3.3%
Rotor	2.6%	2.8%
Sport	3.4%	2.0%

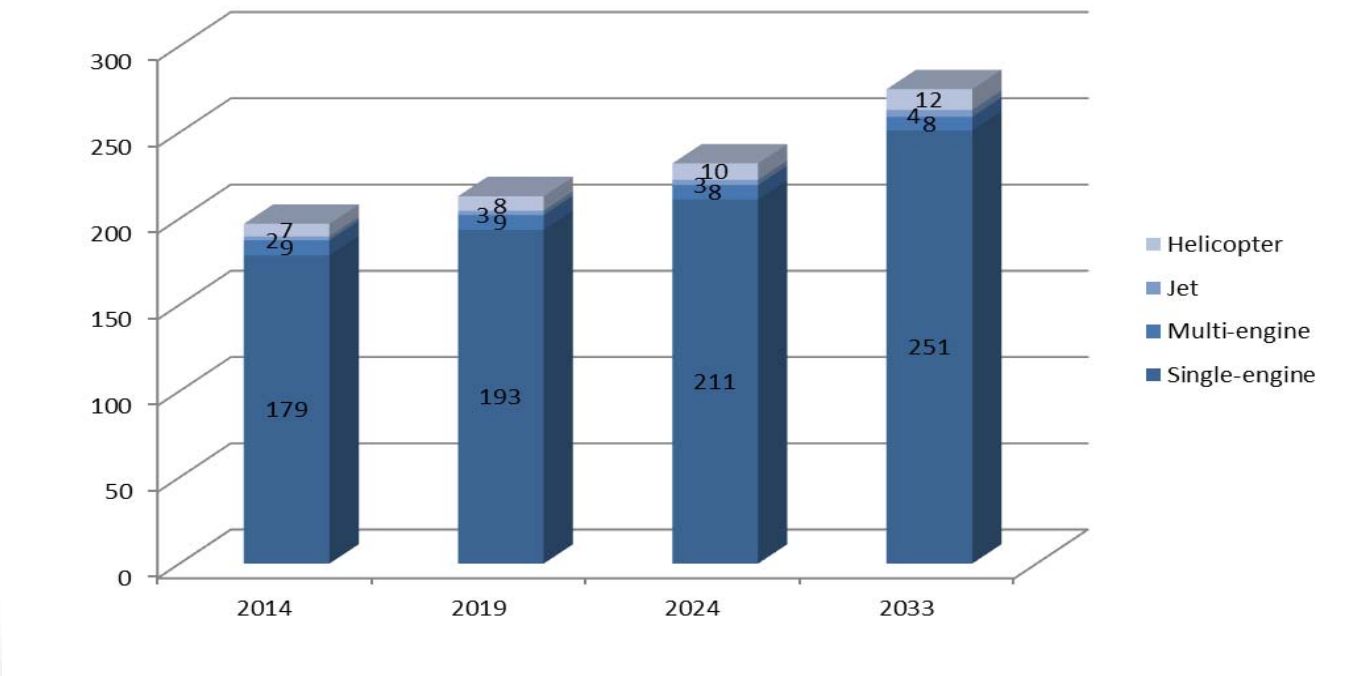
Generally speaking, FAA and CDOT data expect that more sophisticated, expensive aircraft will outnumber less expensive aircraft in the future, with the notable exception of the Sport aircraft category. Based upon these data, use of EIK by larger, faster and more expensive aircraft is expected to increase over the next 20 years, especially relative to use by smaller piston-driven aircraft. Private/business ownership of these larger aircraft is also noteworthy due to the significant decrease in acquisition costs. These factors are considered in the formulation of the based aircraft forecast by type. The following annual growth rates are used and are reflected in Table 3-6 and Figure 3-8.

Aircraft Type	Rate
Single-engine	0.2%
Multi-engine	-0.6%
Jet	3.3%
Helicopter	2.6%

Table 3-6
Forecast of Based Aircraft by Type *(Estimate Source: ADG)*

Aircraft Type	**2014**	**2019**	**2024**	**2033**
Single-engine	179	193	211	251
Multi-engine	9	9	8	8
Jet	2	3	3	4
Helicopter	7	8	10	12
Total Based Aircraft	**197**	**213**	**232**	**275**

Figure 3-8
Forecast of Based Aircraft by Type *(Visualization: ADG)*



Lastly, the single-engine based aircraft count was then increased to conform to the based aircraft forecast shown in Figure 3-7, generating an annual growth rate of 2.2%. For purposes of the forecast, sport is grouped with single-engine and turboprop is grouped with jet.

3.7 Aircraft Operations Forecasting

EIK is an uncontrolled facility and good counts of aircraft operational activity are not available. The number of aircraft operations has been stable, but likely decreasing in the past five years, as most Denver metro area airports, according to FAA.

As previously detailed, general aviation as an industry has struggled over the past few years with the economic headwinds and aircraft production and sales have declined in most categories of aircraft manufacture, including executive aircraft. Larger business and charter general aviation aircraft are expected to fly only slightly more hours on a national basis. However, it is anticipated that itinerant general aviation operations will continue to increase and that local operations will, as well.

The FAA-approved, estimated number of year 2012 aircraft operations, for purposes of this panning, total 47,000, estimated to be distributed as follows; Single-engine: ±84% (39,500), Multi-engine: ±6% (2,800), Jet: ±3% (1,400), Helicopter: ±7% (3,300). It is noteworthy that these baseline counts are substantially less than those identified in FAA's TAF or CDOT estimates. Section 2.7 describes existing count inadequacies from multiple sources and defines the proposed count modification for baseline purposes.

3.7.1 Aircraft Operations Projections

Indicators with statistical correlations to aviation activity are used to project the number of based aircraft as shown in Table 3-7, Figure 3-9 and Figure 3-10. Many of the same indicators used to the number of based aircraft are also relevant to aircraft operations projections as statistical correlations continue to exist.

The Earnings, Per Capital Personal Income (PCPI) and Retail Sales Projections are the average of the Weld and Boulder County WPE figures found within Table 3-2. The Earnings and PCPI Projections become more correlative, while the Retail Sales Projection becomes less so. The EIK Fuel Sales Projection is a repeat of figures within Table 3-3. Modifications are made for aircraft operations projections in two instances:

- The Area Airports Projection is modified with aircraft operations projections
- The FAA Projection is modified to include general aviation hours flown as opposed to the number of ambient aircraft.

The visual results of the modifications are somewhat similar to Figure 3-5; however, the projections no longer group nicely in terms of large, intermediate and low values. The projections which produce high values are regionally-currency related: Earnings, Retail Sales and EIK Fuel, Area Airports and the Average. The projections which produce low values are somewhat nationally aviation-related: CDOT, PCPI, and FAA.

These projections seemingly suggest:

- Regional local aviation demand could surpass national expectations
- The national and regional aviation industry has yet to see a full recovery
- Future aircraft operations activity is expected to be more robust than basing activity, given that the Average Projection's values have increased.

Figure 3-10 shows the resulting number of based aircraft derived as a consequence of the projections.

Table 3-7
Aircraft Operations Projections *(Data Source: Various)*

Projection	5-Year Forecast Overall Increase	**Projected Number of Aircraft Operations**	20-Year Forecast Overall Increase	**Projected Number of Aircraft Operations**
Earnings	15.2%	**54,144**	66.5%	**78,255**
PCPI	6.3%	**49,985**	32.0%	**62,040**
Retail Sales	14.3%	**53,721**	63.2%	**76,728**
EIK Fuel	13.9%	**53,533**	71.7%	**80,699**
Area Airports	30.8%	**61,476**	50.9%	**70,951**
CDOT	3.2%	**48,504**	13.7%	**53,439**
FAA	8.0%	**50,760**	32.0%	**62,040**
Average	13.1%	**53,160**	47.2%	**69,165**

Figure 3-9
Aircraft Operations Projections *(Visualization: ADG)*

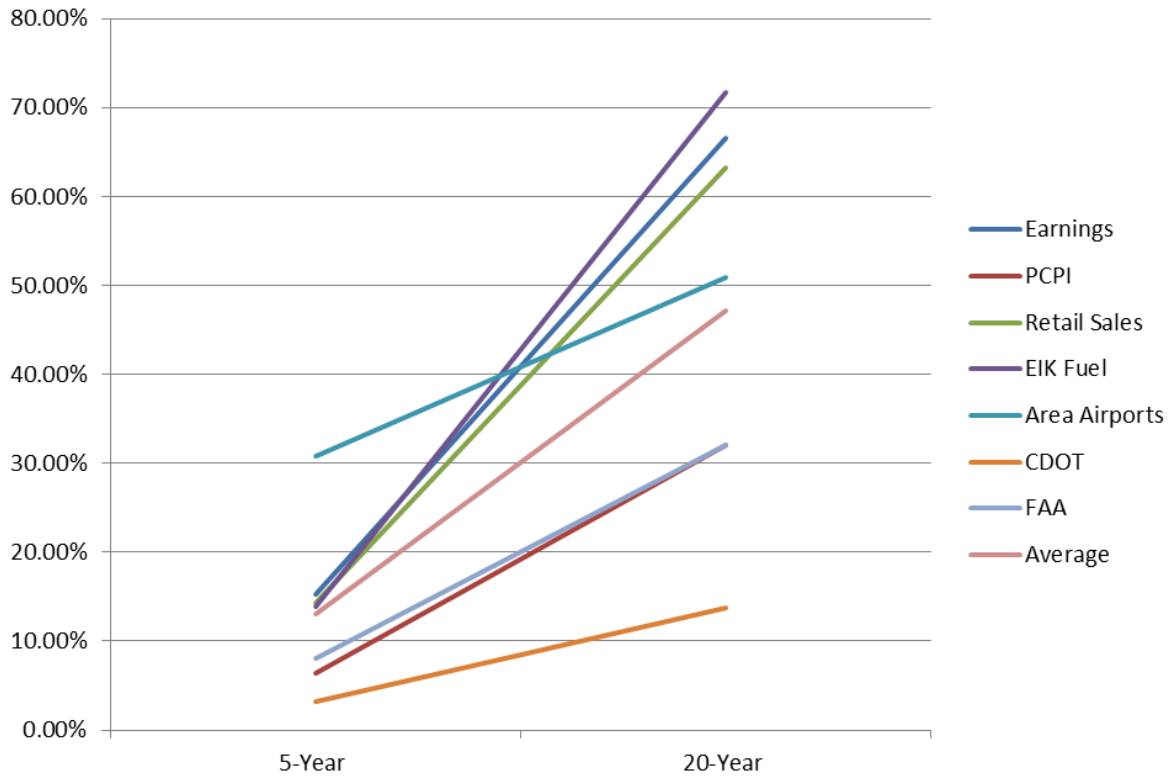
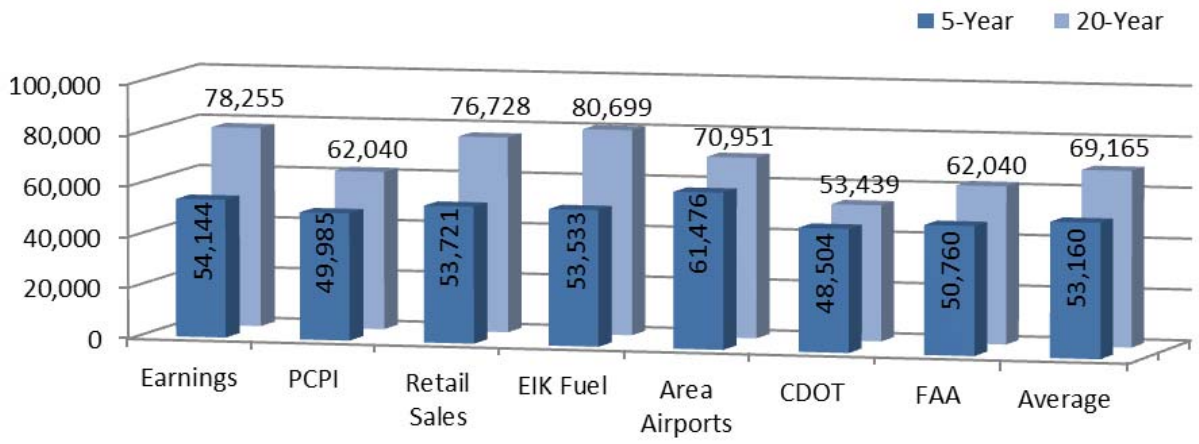


Figure 3-10
Aircraft Operations Resulting from Projections *(Visualization: ADG)*



3.7.2 Aircraft Operations Forecast

A forecast of aircraft operations can be taken from one of the above, or a combination of projections. In the consultant's opinion there is no need for extravagant statistical efforts given the nature and scope of EIK's aviation activity.

A bit of long-term optimism, may be in order:

- EIK fuel sales, and other regional economic measures, have been robust in the face of strong national economic headwinds in recent years.
- The Town and surrounding municipalities have several large multi-use developments which may stimulate participation in the aviation marketplace.
- The aviation industry, just very recently has shown signs of renewal.

These are perhaps quantified within the higher value projections.

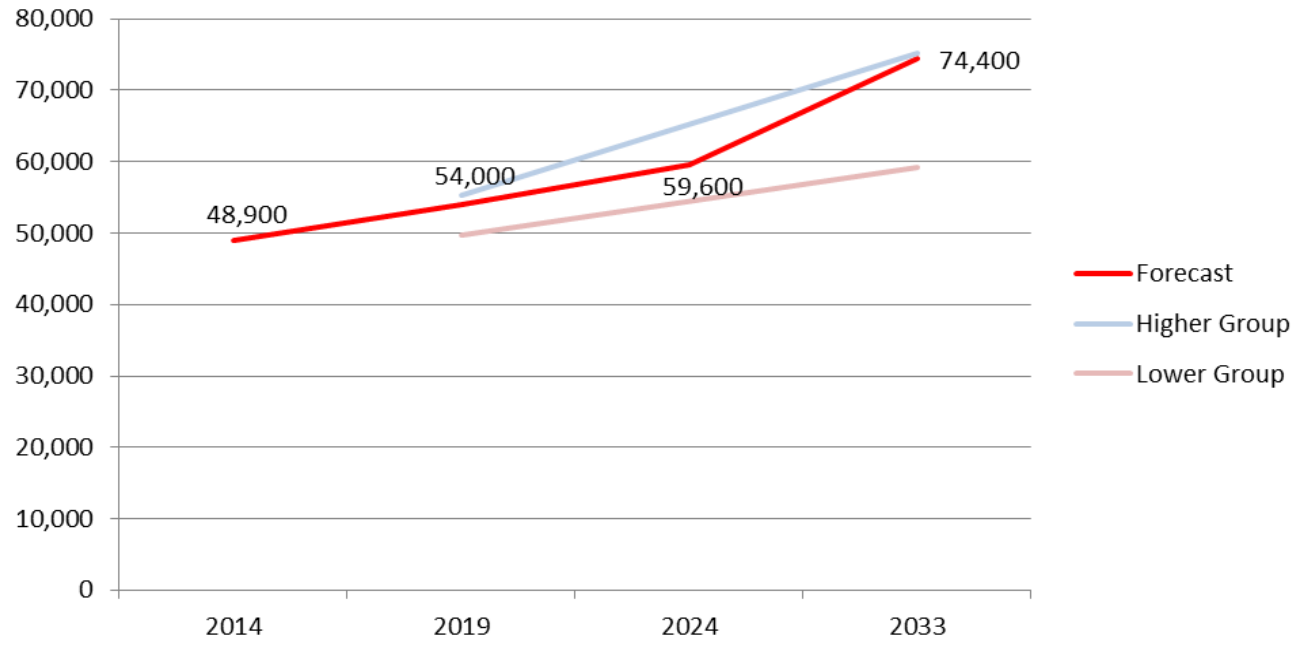
And, a bit of trepidation may also be in order in the short-term:

- Rising fuel and aircraft acquisition costs serve to decrease aviation activity
- Economic uncertainties persist at the national level and will likely remain of concern for the aviation industry. Examples include potential terrorism, and seemingly unforeseeable financial and monetary events

These are perhaps quantified within the lower-value projections.

On balance, reason exists for a bit of optimism, but likely within a standard statistical dispersion. The Average Projection is a 'middle of the road' compromise between the lower PCPI, CDOT and FAA Projections and the other more robust projections. Optimism is quantified for purposes herein by finding an aircraft operations forecast within the 'high side' of the Average Projection's standard deviation of 3,929 for the 5-year forecast period and within the 'high side' of the projections standard deviation of 9,448 for the 20-year forecast period. FAA and CDOT projections were not selected because other regional-correlative economic conditions are noteworthy.

Figure 3-11
Aircraft Operations Forecast *(Visualization: ADG)*



The Forecast of Aircraft Operations is shown on Figure 3-11. This forecast is a simply 2.0 percent annual growth each year, beginning with the 2012 FAA-approved aircraft operations estimate of 47,000 aircraft until 2024, and then 2.5 percent annually to the final forecast year. The marginal increase operations in the final planning period is suggested in *FAA Aerospace Forecasts,* wherein it is noted that (Section 3.5.3) "As the economy {national} recovers from the most serious economic downturn and slow recovery in recent history, aviation will continue to grow of the long run." Each value is rounded to the nearest 100. Summarily:

Period	AAGR	Overall
2014-2018	2.0%	10.4%
2019-2023	2.0%	10.4%
2024-2033	2.5%	24.8%
2014-2033	*2.2%*	*52.1%*

The lower grouping is the simple mean of the FAA, CDOT and PCPI projections. The low grouping is the simple mean of the remaining projections.

3.7.3 Forecast Aircraft Operations by Type

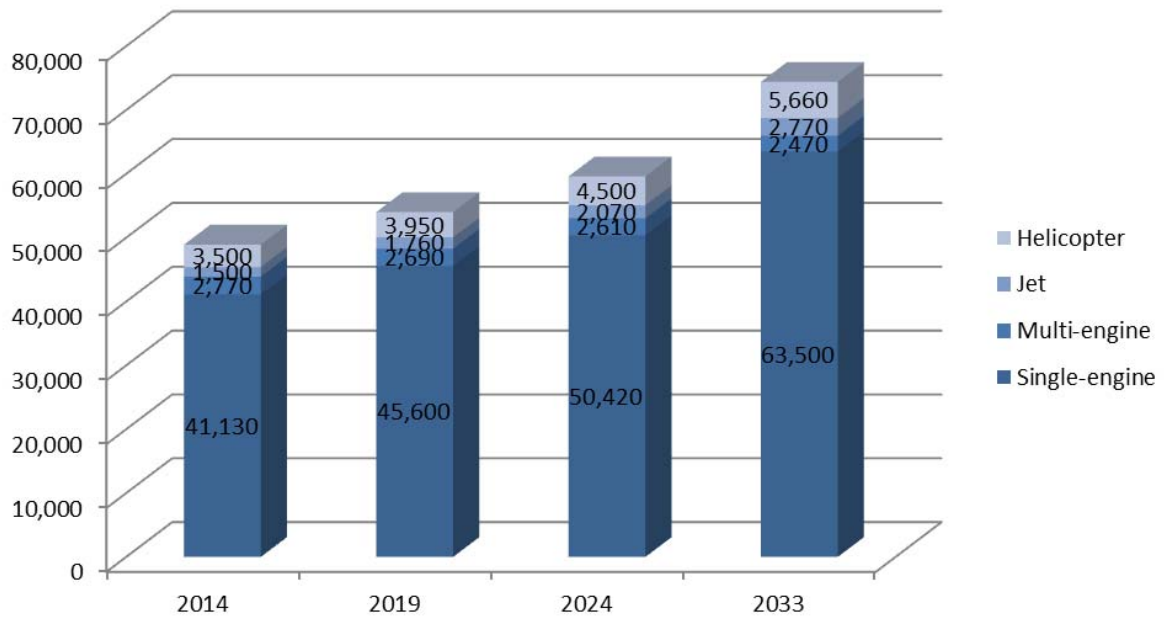
A further segregation of forecast aircraft operations by type is necessary to meaningfully complete this section. This subsection relies heavily on information contained in CDOT and FAA forecasting materials previously discussed. These materials suggest that future aviation activity, in general, is likely more robust in the multi-engine, jet and helicopter types, as opposed to the single-engine type. Figures below repeat earlier data.

Based upon these data, use of EIK by larger, faster and more expensive aircraft is expected to somewhat increase over the next 20 years, especially relative to use by smaller piston-driven aircraft. Private/business ownership of these larger aircraft is also noteworthy due to the significant decrease in acquisition costs. These

Table 3-8
Forecast of Based Aircraft by Type *(Estimate Source: ADG)*

Aircraft Type	**2014**	**2019**	**2024**	**2033**
Single-engine	41,130	45,600	50,420	63,500
Multi-engine	2,770	2,690	2,610	2,470
Jet	1,500	1,760	2,070	2,770
Helicopter	3,500	3,950	4,500	5,660
Total Aircraft Operations	**48,900**	**54,000**	**59,600**	**74,400**

Figure 3-12
Forecast of Aircraft Operations by Type *(Visualization: ADG)*



factors are considered in the formulation of the aircraft operations forecast by type.

Aircraft Type	CDOT AAGR	FAA AAGR
Single-engine	0.2%	-0.2%
Multi-engine	-0.9%	-0.6%
Turboprop	--	2.8%
Jet	3.1%	3.3%
Rotor	2.6%	2.8%
Sport	3.4%	2.0%

The following annual growth rates are used and are reflected in Table 3-8 and Figure 3-12.

Aircraft Type	Rate
Single-engine	0.2%
Multi-engine	-0.6%
Jet	3.3%
Helicopter	2.6%

Results within the multi-engine, jet and helicopter categories were rounded up to the nearest 10 and single-engine based aircraft were then adjusted to conform to the aircraft operations forecast shown in Figure 3-11, generating an annual growth rate of 2.2 percent for the single engine category. For purposes of the forecast, sport is grouped with single-engine and turboprop is grouped with jet.

3.7.4 Aircraft Mix Forecast

An itinerant operation is defined as any aircraft operation other than a local operation. A local

Table 3-9
Forecast Mix of Aircraft Operations

Year	Local Operations	*% Local Operations*	Itinerant Operations	*% Itinerant Operations*	Total Operations
2014	29,340	*60*	19,560	*40*	48,900
2019	32,400	*60*	21,660	*40*	54,000
2024	35,760	*60*	23,840	*40*	59,600
2033	44,640	*60*	29,760	*40*	74,400

Table 3-10
Peak Period Operations Forecast

Year	Total Operations	Peak Month Operations	Peak Day Operations	Peak Hour Operations
2014	48,900	4,890	163	24
2019	54,000	5,400	180	27
2024	59,600	5,960	199	30
2033	74,400	7,440	248	37

operation includes operations within the traffic pattern in sight of the field, low approach and or simulated instrument approaches and transitions to a practice area.

EIK's approximate 60/40 percent local to itinerant mix is dissimilar to the national average local to itinerant mix, averaging 48 percent local and 52 percent. This is primarily because EIK is well utilized for flight training purposes. FAA's existing 5010 *Airport Master Record* for EIK identifies this operational activity split.

It is considered that flight training will continue and will likely increase as the planning period progresses. Simultaneously, itinerant operations via larger, faster and heavier itinerant aircraft are expected to continue increase, proportionally perhaps. As future basing and operations occurs, future traffic will likely follow these trends and the current proportions are forecast are to remain as-is for the planning period. The forecast mix of operations is presented in Table 3-9.

3.7.5 Peak Period Operations Forecast

Existing and future airport facilities should be designed and constructed not for an average day's aircraft activity and not for the busiest day, but for activity somewhere in between.

FAA guidance for estimating peaking activity is reflected in Table 3-10. Peak day is defined as the average number of operations per day during the most active month. In FAA's Northwest Mountain Region and EIK, the most active month normally accounts for approximately 10 percent of total annual operations and approximately 15 percent of the peak day operations occur during the peak hour.

These operational activity estimates will be useful for analyses in upcoming chapters for estimating the necessary, for example, hangars and apron area to accommodate future activity.

3.7.6 Instrument Operations Forecast

Data collected for this planning indicates that 5 percent of the meterological observations occurred during IFR conditions. Were EIK aircraft operations contemporaneous with observations, 2012 instrument aircraft operations could be estimated at 2,350 (47,000 at 5 percent).

Table 3-11
Instrument Operations Forecast

	2014	2019	2024	2033
Instrument Operations	2,445	2,700	2,980	3,720

In the absence of historical flight plan counts, this is a reasonable available source of estimated instrument operations data for this planning, per Table 3-11.

3.7.7 Forecast Summary of Aircraft Operations by AAC, ADG, Weight Runway End and Planning Year

The final forecast of this chapter is a forecast of aircraft operations with the following of subject:

1. Planning Years:
   - ✓ 2014, 2019, 2024, 2033
2. Runway Ends:
   - ✓ Runway 15 and 33
3. Airport Approach Category (AAC; A,B,C), Airport Design Group (ADG; I,II) and Aircraft Weight (Small/Large):
   - ✓ A&B-I Small Aircraft
   - ✓ A&B-II Small Aircraft
   - ✓ A&B-II Large Aircraft
   - ✓ C&D-II Large Aircraft

With respect the second grouping, aircraft operations were segregated approximately 70/30 percent based upon observational evidence and the fact that Runway 33 (northerly operation) is the designated 'calm-wind' runway.

With respect to the third grouping, note that:

A&B-I Small forecasts all aircraft types weighing less than 12,500 pounds, with approach speeds up to 121 knots, and wingspans up to 49 feet, inclusive. Example aircraft include:

- ✓ Cessna 152,172, 210, 206, 414
- ✓ Piper Cub, Arrow, Comanche, Saratoga
- ✓ Beechcraft Bonanza, Duke
- ✓ Cirrus, Mooney, Diamond, Glasair
- ✓ Ultralights, Gliders
- ✓ Citation Mustang, Eclipse 500,
- ✓ Embraer Phenom, Beechcraft Premier 1
- ✓ All Helicopters

A&B-II Small forecasts all aircraft types weighing less than 12,500 pounds, with approach speeds up to 121 knots and wingspans up to 79 feet, inclusive. Example aircraft include:

- ✓ Cessna 441 Conquest
- ✓ Pilatus PC-12
- ✓ Beechcraft King Air 90/100

A&B-II Large forecasts all aircraft types weighting greater than 12,500 pounds, with approach speeds up to 121 knots and wingspans up to 79 feet, inclusive. Example aircraft include:

- ✓ Cessna Citation 550, 650, Sovereign
- ✓ Dassault Falcon 20,50,200
- ✓ Hawker 400, 850XP

C&D-II Large forecasts all aircraft types weighting up to 60,000 pounds, with approach speeds up to 166 knots and wingspans up to 79 feet, inclusive. Example aircraft include:

- ✓ Cessna Citation X
- ✓ Bombardier Challenger 300, 605
- ✓ Dassault Falcon 900, 2000
- ✓ Gulfstream 350, 450

Much like the basis for other baseline and forecast data herein, this forecast is subjective and no solid data exists to substantiate; only anecdotal, observational evidence was used as the basis for much of this forecast.

A design/critical aircraft may be derived from Table 3-12. The design/critical aircraft is an aircraft or more frequently a group of aircraft with similar design or performance characteristics with completes 500 annual operations at EIK. 500 annual aircraft operations is FAA's design guideline threshold for planning purposes.

Table 3-12
Forecast Summary of Aircraft Operations by AAC/ADG/Weight, Runway End and Planning Year

	2014	**2019**	**2024**	**2033**
A&B-I Small; Runway 15	14,604	16,092	17,736	22,065
A&B-I Small; Runway 33	34,076	37,548	41,384	51,485
Sub-Total; A&B-I Small	48,680	53,640	59,120	73,550
A&B-II Small; Runway 15	40	60	80	120
A&B-II Small; Runway 33	80	140	170	280
Sub-Total; A&B-II Small	120	200	250	400
A&B-II Large; Runway 15	30	50	60	100
A&B-II Large; Runway 33	70	100	140	250
Sub-Total; A&B-II Large	100	150	200	350
C&D-II Large; Runway 15	0	4	12	30
C&D-II Large; Runway 33	0	6	18	70
Sub-Total; C&D-II Large	0	10	30	100
Totals	**48,900**	**54,000**	**59,600**	**74,400**

Table 3-13
Critical/Design Aircraft Determination

	2014	**2019**	**2024**	**2033**
Aircraft Approach Category (AAC)	Category A/B	Category A/B	Category A/B	Category A/B
Airplane Design Group (ADG)	Group I	Group I	Group I	Group II
Aircraft Weight (<, >12,500 SWG)	Small	Small	Small	Small
Taxiway Design Group (TDG)	Group I	Group I	Group I	Group II

Chapter Four

Facility Requirements

Chapter Four – Facility Requirements

4.0 Introduction

Given that future aviation activity levels are determined, the ability of existing facilities to satisfy this demand is evaluated herein. Deficiencies determine airport needs throughout the 20-year planning period. This chapter examines impacts to the airport due to the forecasts of aviation demand, focusing on four distinct elements:

- ⇨ Airport Role and Service Level
- ⇨ Airside Requirements
- ⇨ Landside Requirements
- ⇨ Security, Compliance, and Sustainability

Any shortcomings in the ability to serve existing and future demand are highlighted, and recommendations are made regarding physical improvements that might be needed to correct identified shortcomings.

4.1 Airport Role and Service Level

EIK is currently classified in the FAA's National Plan of Integrated Airport Systems (NPIAS) and functions as a general aviation facility within the national system of airports. EIK is currently classified in the State of Colorado's State Aviation System Plan (SASP) as an intermediate general aviation airport within the state system of airports. No change in role over the 20-year planning period is expected or planned by either.

For purposes of this narrative, this type of airport accommodates mostly category small aircraft with approach speeds limited to 121 knots or B category speeds. As described in the previous chapter, EIK is not currently accommodating, nor is expected to accommodate any meaningful number of aircraft operations which exceed these speed thresholds.

4.1.1 Short and Intermediate-Term Role and Design Standards

FAA guidance notes that the most demanding aircraft or group of aircraft with similar characteristics that use the airport on a regular basis, conducting at least 500 annual takeoffs and landings, is termed the critical/design aircraft. This aircraft determines design standards such as runway width, pavement strength and runway to taxiway separation criteria. Previous chapters of this narrative established that the airport should be designed to comply with small aircraft B-I standards at minimum.

The critical/design aircraft within the short (0-5 years hence) and intermediate (5-10 years hence) development periods are characterized by the various aircraft which have:

- ✓ Approach speeds not exceeding 121 knots, or up to Category B aircraft
- ✓ Wingspans not exceeding 49 feet, or up to Group I
- ✓ Maximum certificated weights not exceeding 12,500 pounds (Small aircraft).
- ✓ Undercarriage design within TDG1 limits

The types of aircraft in this classification include the smaller personal and recreational aircraft such as some of the Beechcraft, Cessna, and Cirrus Models; along with most helicopters and ultralight and light-sport aircraft.

This classification also includes many of light jets, such as the Phenom and Eclipse.

Note that not all parts of the field require design based upon this aircraft grouping. For example, T-hangar design and construction for smaller general aviation aircraft could be made for smaller aircraft wingspans, given that many T-hangar doors are narrower than 49 feet.

In summary, the following design standards are anticipated for these portions of the field in the short and intermediate terms:

- ✓ Runway 15-33: B-I, TDG1, Small
- ✓ Taxiway A/Connectors: B-I, TDG1, Small
- ✓ Main Apron: B-I, TDG1, Small
- ✓ Other On-Airport Taxiways and Taxilanes: B-I, TDG1, Small

It is again worth noting that FAA's Denver Airport's District Office has a relatively long-standing policy that funding for airport improvements will be made only for design and construction that complies with B-II standards.

4.1.2 Longer-Term Role and Design Standards

The previous chapters also established that the airport may see increasing numbers of two engine and jet aircraft, along with other aircraft which are larger, faster, heavier and more expensive. This narrative expects that EIK will continue in its role as a general aviation airport for the next 20 years, and no accommodation for more than 500 aircraft operations weighing more than 60,000 pounds or scheduled airline service is expected or planned.

Following the short and intermediate development period, and perhaps near end of this planning effort's 20-year horizon, it is anticipated that larger (with respect to wingspan and undercarriage configuration) aircraft may frequent the airport in sufficient numbers to substantiate a change in classification from B-I to B-II.

The critical/design aircraft within the longer-term (10-20 years hence) development period is characterized by the various aircraft which have:

- ✓ Approach speeds not exceeding 121 knots, or up to Category B aircraft
- ✓ Wingspans not exceeding 79 feet, or up to Group II
- ✓ Maximum certificated weights not exceeding 12,500 pounds (Small aircraft).
- ✓ Undercarriage design within TDG2 limits

The types of aircraft in this classification include the recreational and business aircraft such as a Cessna 441, the Pilatus PC-12 and some of the Beechcraft King Air models. Also included are some smaller business jet aircraft such as the Cessna Citation models, and some Dassault Falcon models. Limited (less than 500 annual operations) visits via these aircraft are expected.

Design for airport facilities to accommodate this classification should proceed and future airside and landside facilities should be designed to accommodate these types of aircraft in the long-term. Given the above, no change in role is anticipated and EIK will likely continue to operate as an intermediate general aviation airport in the State of Colorado's system of airports.

In summary, the following design standards are anticipated for these portions of the field in the longer term:

- ✓ Runway 15-33: B-II, TDG2, Small
- ✓ Taxiway A/Connectors: B-II, TDG2, Small
- ✓ A Portion of Main Apron: B-II, TDG2, Small
- ✓ Remaining Portions of Main Apron: B-II, TDG2, Small
- ✓ Select On-Airport Taxiways and Taxilanes: A/B-I, TDG1, Small

4.2 Airside Recommendations

An analysis of the airfield requirements generated from the previous chapter includes an analysis of wind data, instrument approach capability, navigable airspace, runway, taxiway and apron dimensions, pavement strengths and airfield design standards. Landing and navigational aids are also discussed as follows. Further analysis of alternatives to address airfield requirements will be addressed in the next chapter.

4.2.1 Wind Analysis

FAA details the objectives of a wind analysis noting that the desirable wind coverage is 95 percent. That is, a runway, or runways, at a given alignment(s) should have a crosswind component less than a given threshold 95 percent of the time to meet FAA standards.

Analysis to ensure adequacy was performed in the inventory portion of this narrative as depicted on Exhibit W. Three wind roses for two sites (KBJC and EIK) were created. These three wind roses are (1) All-Weather (all cloud ceiling heights and all visibilities), (2) VFR (occurrence of cloud ceiling heights greater than 1,000 feet above ground level and visibilities greater than three statute miles visibility), and (3) IFR (occurrence of cloud ceiling heights less than 1,000 feet but greater than 200 feet above ground level and visibilities less than three statute miles but greater than one-half mile).

As previously noted the current runway alignment is insufficient under certain wind conditions at the official station of record (KBJC) for purposes of this planning:

- ✓ All-Weather: 10.5, 13 and 16 knots
- ✓ VFR: 10.5, 13 and 16 knots
- ✓ IFR: 10.5 knots

One of two actions may be taken to meet the standard:

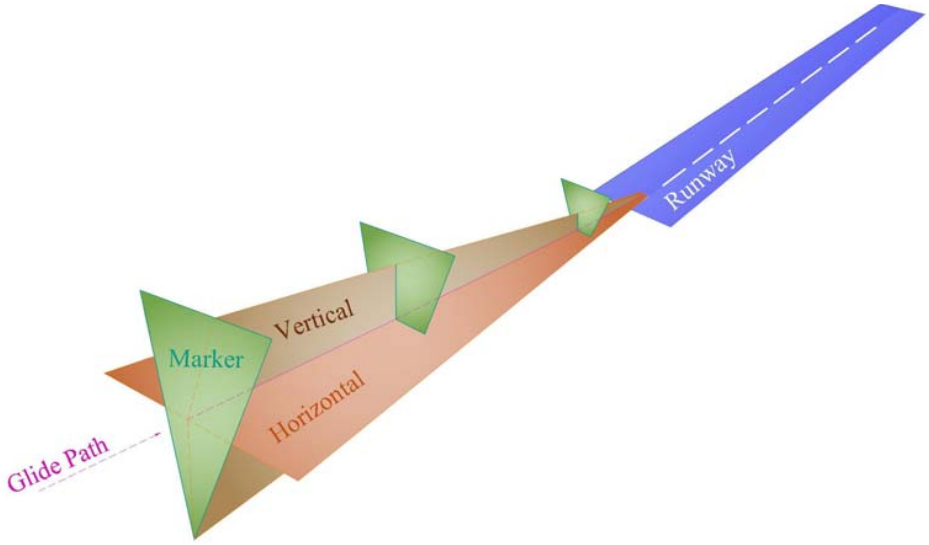
(1) Provide a suitably aligned crosswind runway, or (2) Widen the current runway

4.2.2 Instrument Approach Capability

Instrument approach capability is defined based upon the ability of the airport's navigational equipment and/or GPS technology to safely accommodate aircraft operations during periods of inclement weather. FAA categorizes three types of instrument approach capability: precision, non precision and visual. A runway end with precision instrument approach capability is equipped with either ground-based navigational equipment or satellite-based technology that provides vertical and horizontal guidance to a runway end. A runway end with non precision instrument approach capability is equipped with either ground-based navigational equipment or satellite-based technology that provides only horizontal guidance to a runway end. Horizontal guidance allows the aircraft to be piloted in poorer weather conditions, and horizontal and vertical guidance allows the aircraft to be piloted in poorer conditions still. A runway end with visual instrument approach capability is equipped with no navigation technology and requires relatively clear weather for aircraft operation.

The traditional equipment that provides precision instrument approach capability is an Instrument Landing System (ILS). This system generally consists of a glideslope, a localizer, an approach lighting system along with a series of markers to indicate distance from the runway end along a glide path. The glideslope emits a radio signal which allows an aircraft to follow a pre-specified vertical path to a runway end. The localizer emits a radio signal that allows an aircraft to follow a specific horizontal path to a runway end. The approach lighting system allows close-in visual guidance for day and night. An ILS can provide the precision instrument approach capability

necessary for safe aircraft operation during periods of inclement weather.



Weather, in this regard, comes in two measures, (1) local visibility in statue miles and (2) substantial height of a cloud ceiling above airport elevation.

These two measures are termed 'minimums'. An ILS, for purposes herein, allows a properly equipped aircraft, a properly certified pilot and properly equipped airfield to safely accommodate a landing with cloud ceilings as low as 200 feet with visibilities as low as ½-mile.

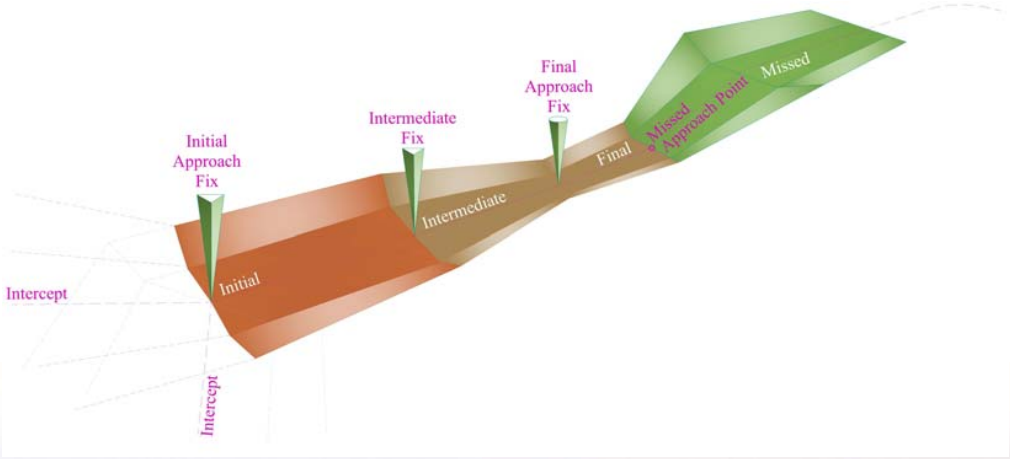
FAA is charged with creating paths in the nation's airspace which allow for safe aircraft operation and landing. These paths nearer to the ground at the nation's airports are termed Instrument Approach Procedures (IAPs). IAPs are instructions for aircraft operators to avoid terrain and obstacles on the way to land on a given runway end. An IAP can be based upon or written for ILS equipment or GPS technology.

GPS-Based Navigation

FAA has participated in establishing the Wide Area Augmentation System (WAAS) program for aviation, using regionally-corrected satellite signals from the Global Navigation Satellite System (GNSS; more commonly known as GPS). Precision instrument approach procedures with ILS-type minima are employed at select airports across the country and do not necessitate the expense of ground-based navigational equipment.

GPS-based IAPs are now formally termed RNAV (aRea NAVigation) Approaches. These approaches are built based upon newer aviation terminology: waypoints, segments, fixes and points. These combine to create a path in the space above and surrounding the airport which the pilot must follow to ensure a safe landing.

A series of geometric shapes surround the procedures. These typical surfaces and their dimensions are prescribed in FAA Order 8260.3B *US Terminal Instrument Approach Procedures* (*TERPS)*, and related orders. The elevation of these surfaces and the course upon which they are based is produced by the controlling obstacle height. If no obstacles exist the height of the



Final Approach Fix, and hence cloud ceiling minima, would theoretically be zero feet above ground level. The controlling obstacle is the tallest object which penetrates any of the surfaces. Generally, the higher the controlling obstacle, the higher the cloud ceiling minima.

In order to maximize the utility of the airport for the flying public, the Town could seek an improved instrument approach procedure to either runway end. This procedure will be based upon the controlling obstacle and FAA will assign minima for the IAP. IAP's currently exists with 'circling' minima; for practical purposes, the current IAPs function as a visual approach.

RNAV Approach Procedure Design Criteria

FAA has requirements prerequisite to IAP creation for IAPs based upon GPS technology, including application of the appropriate airport design standards, airfield survey and identification and potential mitigation of area obstructions to navigable airspace. Once appropriate design standards have been implemented, survey completed and obstructions mitigated, FAA could proceed to IAP creation. FAA has established airport and airspace design guidelines for new RNAV IAPs. Publication of all RNAV procedures is subject to compliance with various design criteria associated with the desired minima and approach capability. *Airport Design* identifies the best-case minima requirements for new Non Precision RNAV IAPs, with visibilities greater than ¾ statue mile. These requirements are noted in Table 4-1 on the following page.

Information describing the various standards and specifications (within Table 4-1) follows:

- ✓ Height Above Touchdown (HAT) is a calculation that is generally made to consider the desired cloud ceiling minima. HAT is the height of the Minimum Descent Altitude (MDA) above the highest elevation within the runway end environment. Minimum Descent Altitude is an altitude prescribed by an approach procedure below which a pilot should not descend unless able to visualize the airfield environment during inclement weather on a given glide path. Generally, a glide path angle greater than three percent will increase the HAT and the cloud ceiling minimum established for a given approach.
- ✓ Although a complete analysis of *TERPS* surfaces for future or ultimate airfield configurations is beyond the scope of this planning, FAA has identified specific guidance

Table 4-1
RNAV Instrument Approach Procedure Design Criteria *(Source: FAA/ADG)*

Standard/Specification	
Height Above Touchdown (HAT)	450 Feet
20:1 TERPS Surface	Clear/Night Lighted
Airport Layout Plan	Approved
Minimum Runway Length	3,200 Feet
Runway Markings	Non Precision
Holdlines and Airfield Signage from Runway Centerline	200'
Runway Edge Lighting	Medium Intensity
Parallel Taxiway	Recommended
Approach Lighting	Recommended
Airfield Design Standards	≥3/4 Mile
Threshold Siting Criteria (Table 3-2 in *Airport Design*)	20:1/Clear
Approach Survey	Non-Vertical

for inclusion into FAA AC 150/5300-13A, *Airport Design*. Guidance therein relates to clear 20:1 surfaces. These surfaces emanate from the end of each runway and protect its final approach.

- ✓ The Airport Layout Plan should show design standards compliance for the desired instrument approach procedures and be approved.
- ✓ Runways ends should be marked non precision with aiming points. Non-precision runway pavement markings include the runway designation, centerline, threshold marking and aiming point.
- ✓ Connector taxiways should have holdlines and airfield signage located 200 feet from runway centerline.
- ✓ Medium-intensity runway lighting and taxiway extensions are recommended to accompany the runway.
- ✓ Compliance with ≥¾-mile design standards should be maintained (these standards are described in the upcoming Table 3-2).
- ✓ FAA guidance prescribes vertical and/or non-vertical survey instructions for airfield and obstacle location based upon *TERPS* airspace surfaces and potential obstructions for a proposed approach procedure.

An IAP with improved minima (specifically the current 800' cloud to ground) currently prescribed is desirable. Specifically, it more clearly indicates to aviation businesses and the flying public that EIK is ready to accommodate business and the aviation user in a more all-weather environment, thereby making EIK more reliable and open for business during period of inclement weather.

4.2.3 Runway 15-33 Length

Runway length requirements can be developed based FAA guidance. Recommended runway lengths are a function of airport elevation (noted in feet above mean sea level), mean maximum temperature of the hottest month, (degrees Fahrenheit), aircraft weight (in pounds, maximum gross certificated weight), number of passenger seats, aircraft engine performance, wet/dry condition of the runway and the maximum difference in runway elevation on centerline. Runway lengths, calculated using FAA's design software, are identified in Table 4-3 based upon the airport's 5,072-foot elevation, 88.4 degree (Fahrenheit) temperature along with the current maximum runway centerline elevation difference of 44 feet. The lengths shown in Table 4-2 include this information.

FAA has an automated runway design standards matrix. This matrix segregates aircraft of all types and sizes into four groups:

1. Aircraft which weigh less than 12,500 pounds with less than 10 passenger seats,
2. Aircraft which weigh less than 12,500 pounds with more than 10 passenger seats,
3. Aircraft which weigh between 12,500 and 60,000 pounds, and
4. Aircraft which weigh more than 60,000 pounds.

The first group of aircraft is split into three sub-sets based upon aircraft performance. One aircraft within the group may perform more poorly than another, solely due to aircraft design and performance characteristics; this aircraft will require a longer take-off run. Aircraft are thus arranged from best to poorest performing and expressed in a percentage of the whole group, with breaks at 75, 95 and 100 percent. FAA's Runway Design Standards Matrix generates a runway length based upon the aggregated performance of the top 75, 95 and 100 percent of all aircraft. For example, runway length generated for 75 percent of airplanes would represent the length required by the top 75 percent of the best performing aircraft.

While the second group of aircraft are not divided, the third group is divided into two categories, 75 and 95 percent of the whole, again based upon performance. These two categories are then split in two sub-categories, based upon useful load of the aircraft operation. Useful load includes the weight of fuel, passengers and cargo. The useful load split, either 60 or 90 percent is predicated upon the notion that a heavier aircraft with more of a load will require a longer take-off run.

Finally, runway length requirements for the fourth group are handled in a slightly different manner. FAA's runway matrix generates a runway length based upon a given distance from EIK to a destination airport for a given non-stop aircraft operation. The presumption is that the farther the travel distance, the greater the useful load (fuel) required, and the longer the required take-off run. For purposes of reporting, distances are noted in 500-foot intervals.

Given that the Forecasts of Aviation Demand suggest that Runway 15-33 is to accommodate small aircraft only (no more than 500 operations with weights greater than 12,500 pounds) for the duration of the planning period, the minimum runway length necessary is 4,630 feet, while 6,390 feet may better accommodate the larger and faster aircraft expected within the group (still small aircraft).

Note that the 75 Percent of Small Aircraft (within the first grouping) length is no longer found in current FAA runway length guidance, but perhaps remains important for evaluation and will be considered in the next chapter.

No appreciable aircraft operations; that is, more than 500, are identified per the Forecasts of Aviation Demand relative to the runway lengths identified for groups 2, 3 or 4, within Table 4-2.

As can be seen from the above discussion, there is no FAA methodology to determine a *specific standard* runway length, only a range of lengths which accommodate certain aircraft types, with certain loads, under certain atmospheric and operational conditions.

Table 4-2
FAA Runway Lengths *(Source: FAA/ADG)*

Recommended Runway Lengths	**Length**
1. Small Airplanes with Less than 10 passenger seats:	
-75 Percent of these Small Aircraft	4,630
-95 Percent of these Small Aircraft	6,230
-100 Percent of these Small Aircraft	6,390
2. Small Airplanes with 10 or More Passenger Seats:	6,390
3. Large Airplanes of 60,000 Pounds or Less:	
-75 Percent of These Large Airplanes at 60 Percent Useful Load	7,080
-75 Percent of These Large Airplanes at 90 Percent Useful Load	9,040
-100 Percent of These Large Airplanes at 60 Percent Useful Load	10,930
-100 Percent of These Large Airplanes at 90 Percent Useful Load	11,140
4. Airplanes of More Than 60,000 Pounds:	
-Traveling no more than 500 non-stop miles to destination	6,790
-Traveling no more than 1,000 non-stop miles to destination	8,060
-Traveling no more than 1,500 non-stop miles to destination	9,230
-Traveling no more than 2,000 non-stop miles to destination	10,300

Ideally, sponsors would have sufficient length for the most demanding aircraft. Yet, runway length also is dependent on the availability of land, funds and environmental concerns. FAA doesn't fund runway extensions just because pilots send letters. Rather, we build what we can justify and fund and then pilots determine if the runway length is adequate for their aircraft. Unfortunately, runways cannot be built for every aircraft type that might potentially use the field. Rather, sponsors build what they can and it is at the pilot's discretion to use the runway based upon the aircraft operations requirements and weather conditions

It is noteworthy that the Colorado State Aviation System Plan (SASP) finds, per Table 2-1, that 100 feet additional runway length is desirable.

Anecdotally, a 5,000-foot runway length may be a minimum threshold for some business aircraft operators due to insurance requirements. While this requirement has not been verified, EIK Airport Management has received similar inquiries and operations have been turned away as a consequence of inadequate runway length. It is estimated that 10 business jet operations annually are lost due to inadequate runway length.

4.2.4 Airfield Design Standards

Select airfield design standards (B-I, Small Aircraft, Visual; Greater Than ¾ Mile) along with future design standards (B-II, Small Aircraft, Visual; Greater Than ¾ Mile) for Runway 15-33 are noted in Table 4-3. The Forecasts of Aviation Demand indicate a potential for B-II aircraft operational activity at EIK in the longer–term planning period, given that activity is expected to reach the FAA guideline of 500 annual operations. The future column identifies these potential longer-term standards.

It worth again noting that (1) FAA Denver Airport's District Office (ADO) has a long-standing policy of funding improvements designed and construct in compliance with B-II standards if funds are available, and (2) that Table 4-3 does not accommodate an improved IAP or better capabilities thereto.

Table 4-3
Select Current and Future EIK Airport Design Standards *(Source: FAA/ADG)*

Standard/Specification	Existing	Future
Runway/Taxiway Width	60/25 Feet	75/35 Feet
Effective Runway Longitudinal Grade	Within ±2% Maximum	Within ±2% Maximum
Runway Pavement Strength (Pounds)	12,500 SWG	12,500 SWG
Runway Protection Zones	250'x450'x1,000'	500'x700'x1,000'
Runway Safety Area Width/Beyond End	120'/240'	150'/300'
Runway Object Free Area Width/Beyond End	250'/240'	300'/500'
Taxiway Safety Area Width	49'	79'
Taxiway/Taxilane Object Free Area Width	89'/79'	115'/131'
Runway to Parallel Taxiway A	150'	240'
Runway to Aircraft Holdline on Taxiway A	125'	200'
Runway to Aircraft Parking	>125'	>250'
Obstacle Free Zone Width/Beyond End	250'/200'	250'/200'
Approach Surfaces (20:1)	250'x700'x5,000'	250'x700'x5,000'
Part 77 Primary Surface Width/Beyond End	250'/200'	250'/200'
Part 77 Approach Surfaces Dimension/Slope	250'x1,250x5,000'; 20:1	250'x1,250x5,000' 20:1

4.2.5 Other Runway 15-33 Needs

Although the current published runway strength is adequate for the planning period, occasional rehabilitation will be necessary. Rehabilitation in this context relates to routing and crack sealing and the occasional slab replacement or concrete pavements. A rejuvenating seal and/or crack seal may be on order for asphalt pavements. No major near-term rehabilitation is planned as pavements are identified for on-going maintenance by CDOT Aeronautics.

The current Visual Glideslope Indicating Systems (VGSI), both two-light Precision Approach Path Indicators (PAPIs) on each runway end may need refurbishment in the intermediate term. Runway End Identifier Indicator Lighting (REILs) units installed on the Runway 15 end may need similar attention. A REIL unit could also be installed on the Runway 33 end. Although the PAPI and REIL units are adequate for the planning period, they should be relocated with any runway extension. Similarly, the Medium-Intensity Runway Lighting System (MIRL) should be extended. The medium-intensity of the system is adequate for the planning period and may need refurbishment in the longer-term.

A review of the Exhibit E within the Inventory suggests that the entirety of the current and future Object Free Area (OFA) and Taxiway Object Free Area (TOFA) should be acquired by the Town of Erie. Federal grant assurances require an airport sponsor to hold title to landing areas of the airport and to maintain the rights and powers over airfield necessary to comply with grant assurances, including maintaining the airport in a safe and serviceable manner (see Federal AIP Grant Assurance No. 4, Good Title, and No. 5, Preserving Rights and Powers).

The Runway Safety Area enlarges from 240 feet beyond end each runway end and from 120 to 150 feet wide. This future enlargement also suggests additional acquisition along the east side of Runway 15-33.

4.2.6 Taxiways

Full-parallel Taxiway A and its connectors serve as the primary taxiway system for EIK. Taxiway A is 25 feet wide with a 200' separation from Runway 17-35. A full-length parallel taxiway to serve the primary runway is a fundamental item of development for airfield safety and efficiency. In the event of a runway extension the full-parallel configuration should be retained, particularly if an IAP is desired.

FAA guidance provides general design precepts for planned taxiway improvements not limited to:

- ✓ Taxiways should be designed for *cockpit-over-centerline* taxiing, as opposed to the previously permitted *judgemental oversteer*.
- ✓ Taxiway intersection design should be made so that no steering angle exceeds 50 degrees.
- ✓ Taxiway intersection design should be such that no more than three turns options exist.
- ✓ Taxiway intersection angles should be regular intervals
- ✓ Taxiway design should be made to discourage runway incursions, increase pilot situational awareness, remove hot spots, limit runway crossings, increase pilot visibility and permit indirect access only to an apron or runway

Longer-term B-II design standards compliance indicate that any future parallel or connecting taxiways should be 35 feet wide, with a minimum 12,500 pound single-wheel gear pavement strength. Any parallel taxiway centerline should be sited with a minimum separation from runway centerline of 240 feet. Holdlines and signage now 125 feet or less perpendicular from runway centerline should be moved to 200 feet perpendicular. All taxiways should be equipped with either edge reflectors or medium-intensity taxiway lighting.

Although the current Taxiway A strength is adequate for the planning period, occasional rehabilitation may be necessary. Rehabilitation in this context relates to routing and crack sealing and the occasional slab replacement. A rejuvenating seal and/or crack seal may be on order for asphalt pavements. No major near-term rehabilitation is planned as pavements are identified for on-going maintenance by CDOT Aeronautics.

FAA-established thresholds of operational demand with respect to holding bays (30 operations per hour) are, per the Forecasts of Aviation Demand, reached in the long-term. The current holding bays near each runway end should be reconfigured for standards compliance. This situation applies to Taxiway A, only. Siting new bays may be somewhat challenging given field site constraints, at least for cost-effectiveness.

Others taxiways are important to the current airfield configuration. Taxiway separation (the east-side parallel taxiway) is approximately 150 feet. This taxiway is off-airport and FAA design standards compliance is not mandatory, but recommended for liability purposes. In accordance with FAA standards, Taxiway centerline must be no closer than 150 feet in the near and intermediate-term and 200 feet in the long-term. Connecting taxiways which access EIK property should be a minimum 25 feet wide. A private taxiway (providing access across Coal Creek) and C (providing access passing Rocky Mountain Propeller) similarly access off-airport aviation and non-aviation uses and the minimum 25-foot width should be retained in these instances.

Taxiways associated with the closed crosswind runway should be similarly designed to FAA standards, particularly if the runway is reactivated.

4.2.7 Navigable Airspace

Navigable airspace for purposes herein relates to 14 CFR Part 77 surfaces and these surfaces are described in the Inventory and Table 4-3.

While FAA does not have the statutory authority to regulate local land and airspace use, FAA encourages airport sponsors like the Town and its adjoining jurisdictions to maintain local airspace clear of obstructions. Airport sponsors that have accepted Federal funds are obligated under Federal grant assurances to take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft (see Grant Assurance 21, Compatible Land Use).

An obstruction to navigable airspace is any object with penetrates a surface meaningful to aircraft operations. Not all obstructions are consequential to maintenance of compatible land use. For example, an obstruction that is property lit and marked in compliance with FAA guidance and is not considered incompatible.

A controlling obstacle and other obstructions to navigable airspace with proposed dispositions and other objects in the vicinity of the airport, for both the existing and future airfield are identified on the various drawings in Chapter Seven.

Given that the community has grown, and will likely continue to grow around the field, compatible land use is, and will always be a concern. The Town currently specifies that permitting is required for development proponents on or near the airport as noted in the Inventory. Future applications for changes in land use or other sensitive development activities around the airport should continue to be received

by the Town, and potential incompatibilities shall be sited/moved to avoid airspace conflicts.

A compatible land use analysis is recommended as a follow-on effort to this master planning, particularly for land uses outside the jurisdictions of the Town of Erie. Aviation operations influence existing and future sensitive land uses south of Highway 7 in the City and County of Broomfield, west in unincorporated Boulder County and other jurisdictions and properties per the *Airport Overlay (APO)* District, Section 2.5.1.

4.2.8 Airspace Capacity

Airspace capacity for purposes herein relates to the ability of the airfield to accommodate the existing and forecast number of aviation operations.

FAA guidance specifies three measures in this regard, Annual Service Volume (ASV), hourly Visual Flight Rule (VFR) and Instrument Flight Rule (IFR) capacities. The first, ASV, is the overall ability of the field to accommodate a modeled number of aviation operations. This value is 230,000 for EIK in its current configuration. The VFR and IFR modeled values are 98 and 59 hourly aviation operations, respectively. FAA guidance as it applies to forecast EIK operational activity suggests no improvements as a consequence of these capacity guidelines.

Given the somewhat local role EIK currently plays in the Colorado and metro Denver system of airports, an air traffic control tower is not an improvement that FAA would likely recommend based upon its cost-benefit analysis. Demonstration of a benefit as it relates to cost is a prerequisite for siting of a tower at EIK. Thus, EIK will remain an uncontrolled field. As a consequence, the current airspace classification, per Section 2.6.1, is unlikely to change.

4.3 Landside Recommendations

Landside area requirements are generated based upon the Forecasts of Aviation Demand. These relate to apron/ramp aircraft parking and circulation area, terminal building and aircraft hangar area, aircraft fueling and fueling area, automobile access and parking area.

Landside facilities are those portions of the airfield which are not directly related to the landing and take-off of aircraft but support it.

The state of affairs on a given general aviation airport is that apron, hangars and other typical landside improvements exist on on-airport; that is, on property owned by the airport sponsor and perhaps leased to a tenant. EIK is unique in that some, perhaps most demand is accommodated off-airport. The extent to which this demand is accommodated creates uniqueness and a complication in crafting a landside requirements section.

More to the point, it is possible that all aviation demand could be accommodated off-airport via through-the-fence (TTF) arrangements. Or perhaps alternatively, all demand could be accommodated on-airport with future on-airport improvements and land acquisition. These are perhaps extremes; however, in order to make meaningful analysis out of this circumstance, a mix will be used. This mix will be identified only in the summary table, Table 4-9.

4.3.1 Based Aircraft Apron Area

Based aircraft apron area is and will continue to be required. Based aircraft parking area is foremost for aircraft rental, transient aircraft and charter activity. Also, a given aircraft owner will likely choose to hangar their aircraft due to personal choice and weather.

Table 4-4
Based Aircraft Apron Requirements *(Source: FAA/ADG)*

	2014	2019	2024	2033
Forecast Single-Engine Based Aircraft	179	193	211	251
Single-Engine Based Aircraft not Hangared	23	25	27	32
Based Aircraft Apron (Single-Engine) (Sq. Yards)	22,080	24,000	25,950	30,720
Forecast Multi-Engine Based Aircraft	9	9	8	8
Multi-Engine Based Aircraft not Hangared	1	1	1	1
Based Aircraft Apron (Multi-Engine) (Sq. Yards)	1,385	1,385	1,385	1,385
Total Based Aircraft Apron recommendations (Sq. Yards)	23,465	25,385	27,335	32,105

EIK's apron and aircraft parking area (including but not limited to based aircraft parking) approximates 33,600 square yards. This area currently accommodates 51 single-engine aircraft tie-downs and 22 single-engine aircraft. No multi-engine aircraft tie-downs are marked. No based jet or helicopter aircraft are to be accommodated given that they will likely be hangared. Future-year single and multi-engine based aircraft values are inflated in proportion to their respective forecasted demand.

Table 4-4 shows the requirements for based aircraft apron using a FAA guideline 960 square yards per each single-engine and 1,385 for each multi-engine aircraft, per this subsections discussion.

4.3.2 Itinerant Aircraft Apron Area

Area recommendations for itinerant aircraft activity are estimated a bit differently, as described below and shown in Table 4-5. Predicated upon the Forecasts of Aviation Demand, approximately 10 percent of aircraft are expected be in larger aircraft category corresponding to the 1,385 area standard, while 90 percent of aircraft are expected be in smaller aircraft category corresponding to the 960 square yard area standard. Note that the larger aircraft category includes multi-engine, jet and helicopter.

A basis for itinerant apron required can then be calculated: 90 percent (for smaller aircraft) times 960 square yards per smaller aircraft plus the quantity of 10 percent (for larger aircraft) times 1,385 square yards per larger aircraft is equal to 10,025 square yards per aircraft {(960 x 90%)+(1,385 x 10%)=1,002.5}. The following is assumed for the calculations in Table 4-5 per FAA estimating guidelines: (1) Peak day itinerant activity constitutes 43 per cent of peak day operations, (2) half of these aircraft will require apron parking at some point during the peak day, and (3) approximately 75 percent of peak day transient aircraft must be simultaneously accommodated. Peak day operations were forecast in Chapter Two. These guidelines originate via FAA

Table 4-5
Itinerant Aircraft Parking Area Requirements *(Source: FAA/ADG)*

	2014	2019	2024	2033
Peak Day Operations	163	180	199	248
Peak Day Itinerant Operations	70	77	86	107
Itinerant Aircraft Positions Required	35	38	43	53
Simultaneous Itinerant Aircraft Positions Required	26	29	32	40
Total Itinerant Aircraft Parking Area Required (Square Yards)	26,065	29,097	32,169	40,090

Central Region Airports Division's, *Apron Size Calculations for Transient Aircraft.*

For example, the year 2014 calculation is as follows: 163 peak day operations times 43 percent (peak day itinerant operations) equals 70, divided by 2 (for those that require parking area) is equal to 35. The product of 35 and 75 percent (aircraft that are expected to be simultaneously accommodated) is equal to 26, and 26 times 10,025 square yards per aircraft is equal to 26,065 square yards. Note that only the final number in this calculation sequence is not rounded.

4.3.3 Terminal Building Area

A basic general aviation terminal building should ideally provide office space, a waiting room for pilots and passengers, an area for food and beverage vending, a public telephone and restrooms. Building area recommendations are shown in Table 4-6. These recommendations are from older FAA guidance, yet remain valuable if considered in the context of FBO perspective and overall airport lease area needs.

Terminal area requirements are a function of the anticipated number of peak hour operations and airport users. Table 3-10 specifies peak hour operations. Peak hour users are computed as 1.5 passengers per each local aircraft arrival and 2.5 passengers per itinerant arrival. Table 3-9 specifies 60/40 percent mix of local/itinerant activity. Typical floor space requirements, expressed in square feet per user are as follows for general aviation terminal facilities: Waiting Lounge; 15, Office Space; 3, Public Conveniences; 1.5, Concession/Vending; 5, Storage, Circulation, HVAC; 24.5.

EIK does not have a formal, dedicated terminal building and space in this regard is collocated with FBO leased area. FAA very rarely provides funding for terminal-related improvements at local general aviation airports like EIK. While EIK's 3,000 square foot terminal area may be adequate for purposes herein, refurbishment could be considered in the near-term as the current facility at or very near the end of its useful life without.

4.3.4 Aircraft Hangar Area

EIK currently accommodates a conventional hangar totaling approximately 10,000 square feet of aircraft storage area along with 20 Port-A-Port T-Hangars totaling 15,700 square feet (±785 square feet each). It is presumed that 95 percent of future based aircraft wish hangar space given current owner preferences.

Hangar area recommendations found within Table 4-7 are based upon: 1,200 square feet for single-engine piston aircraft, 2,200 square feet for multi-engine piston and twin-turbo prop aircraft, 4,000 square feet for smaller jet aircraft,

Table 4-6
Terminal Building Requirements *(Source: FAA/ADG)*

	2014	**2019**	**2024**	**2033**
Peak Hour Operations	*24*	*27*	*30*	*37*
Peak Hour Users	*46*	*51*	*57*	*70*
Waiting Lounge	684	770	855	1,055
Office Space	137	154	171	211
Public Conveniences	68	77	86	105
Vending/Concession	228	257	285	352
Storage, Circulation, HVAC	1,117	1,257	1,397	1,722
Total Terminal Building Area Required (Square Feet)	2,234	2,514	2,793	3,445

12,000 square feet for larger jet aircraft, and 1,500 square feet for helicopter. The small/large jet aircraft category is created by estimating 80/20 segregation from the Forecasts of Aviation Demand for the Jet category. Aircraft accounted for within Table 4-4 are not included for analysis within Table 4-7.

Note that aircraft may be located in T-hangar units, in more conventional small box hangars, or collocated with other aircraft in a larger hangar. A single aircraft, perhaps only requiring 1,200 square feet, may be located in a 6,400 square foot hangar. Summarily, it is not meaningful to infer from the table that a given quantity of future hangars is recommended, only a minimum hangar area.

4.3.5 Support Facilities and Infrastructure

As the airport is developed and improvements take place, extensions to existing utility systems should be considered. The Town is currently planning water/sanitary utility installation on the west side of the field. Future airport users, including individual aircraft owners and corporate interests, should to the extent reasonable be required to participate in the cost of extending utilities to their building and should be charged a connection fee to any system. The fee may be levied directly or through user fees and leases. Utility extensions should be maintained underground to the maximum extent feasible. Larger-scale and corporate development is a potential for EIK.

4.3.6 Aircraft Fueling

Approximately 8,000 gallons of fuels are sold on a monthly basis and the existing tank capacities of 12,000 gallons of piston fuels and 12,000 gallons of turbine fuels roughly equates to a deliver every couple of months. Future operations as a consequence of the Forecasts of Aviation Demand, may suggest monthly deliveries.

Turbine fuel is often dispensed from a fuel truck and additional capacity may be needed to better meet customer expectations. This may require additional storage capacity than is currently provided by the existing fuel farm.

4.3.7 Automobile Parking and Access

Approximately 40 unpaved automobile parking spaces (3,100 square yards) are west the main apron. Although an expansive formal parking lot

Table 4-7
Hangar Area Recommendations *(Source: FAA/ADG)*

	2014	**2019**	**2024**	**2033**
Single-Engine Based Aircraft (Not On Ramp)	*156*	*168*	*184*	*219*
-Single-Engine Hangar Area	187,200	201,600	220,800	262,800
Multi-Engine/Twin Turbo Prop Based Aircraft (Not On Ramp)	*8*	*8*	*7*	*7*
-Multi-Engine/Twin-Turbo Prop Hangar Area	17,600	17,600	15,400	15,400
Jet (Small) Based Aircraft	*2*	*3*	*3*	*4*
-Jet (Small) Hangar Area	8,000	12,000	12,000	16,000
Jet (Large) Based Aircraft	*0*	*0*	*1*	*1*
-Jet (Large) Hangar Area	0	0	12,000	12,000
Helicopter/Other Based Aircraft	*7*	*8*	*10*	*12*
-Helicopter/Other Hangar Area	10,500	12,000	15,000	18,000
Total Hangar Area Recommended (Square Feet)	223,300	243,200	275,200	324,200

is not necessary, adequate space should be planned and protected, in accordance with Table 4-8. These recommendations are from older FAA guidance, yet remain valuable if considered in the context of FBO perspective and overall airport auto parking needs.

The Airport Road intersection with Highway 7 is a sub-optimal access point as discussed in Section 2.10. Planning to accommodate a future, perhaps new airport access point and analysis thereto, is left to the next chapter.

The recommended number of automobile parking spaces required is a function of peak hour users and tenant/employee demand. The peak hour user count was previously derived for the terminal building analysis. The number of tenants and employees at an airport like EIK is estimated to be one person per five based aircraft. A standard 35 square yards per automobile is used to complete Table 4-8. Note that this includes parking area only and not lanes. Paved parking may be more customer service friendly.

4.3.8 Snow Removal and Airfield Maintenance Equipment

Snow removal equipment (SRE) and airfield maintenance equipment are occasionally federally-funded at local general aviation airports. EIK SRE and maintenance equipment has historically been funded by the Town. An opportunity exists via CDOT Aeronautics funding or perhaps CDOT surplus equipment program to acquire equipment dedicated to EIK. Such equipment might include: two plows, a dedicated mower and one or two multi-use vehicles (perhaps including sweeper, snowblower, front loader and backhoe attachments).

SRE buildings facilities are eligible for federal funding and are operationally needed to protect and extend the useful life of equipment. These facilities may be co-located with administration, FBO facilities, or perhaps space could be made to service in an existing hangar.

4.4 Security

General aviation security requirements do not currently specify access procedures. Aviation industry groups have endorsed various airport watch security programs to protect the airport and its aircraft from terrorist incidents. These programs focus on informal surveillance procedures and airport user monitoring of airport activities, not necessarily security-related capital improvements.

Formal, daily airfield and security inspections are completed. Such inspection procedures should be formalized and airport emergency and security plans should be drafted as necessary.

The Transportation Security Administration (TSA) is charged with security at commercial service and general aviation airports. TSA has no requirements of EIK, but has created recommendations based upon threat and the local and regional aviation environment.

Table 4-8
Automobile Parking Area Recommendations *(Source: FAA/ADG)*

	2014	2019	2024	2033
Peak Hour Users	46	51	57	70
Tenants/Employees	39	43	46	55
Automobile Parking Positions Required	85	94	103	125
Total Automobile Parking Area Recommended (Square Yards)	2,975	3,290	3,605	4,375

Per TSA's 2004 *Security Guidelines for General Aviation Airports*, CDOT recommends a *medium* security level and that the following actions be considered:

- ✓ Install strategically located security-related signage
- ✓ Formalize and document security procedures;
- ✓ Provide for positive passenger baggage and cargo identification
- ✓ Established procedures to ensure all aircraft are secured
- ✓ Formalize community watch program,
- ✓ Create security-related contact list
- ✓ Formalize law enforcement support
- ✓ Formalize a security committee
- ✓ Formalize transient pilot sign-in/out procedures
- ✓ Install access control infrastructure and formalize procedures
- ✓ Install lighting system, perhaps building interior and exterior and apron floodlighting
- ✓ Formalize personnel identification system
- ✓ Establish vehicle identification protocol for airfield access
- ✓ Establish and reinforce challenge procedures

Many of these steps have already been taken, some remain to be considered, while others are in process.

TSA and CDOT stop short of recommending security-related fencing; yet FAA specifically included direction to consider this improvement within the context of this planning effort. FAA's recommendation is not necessarily for security purposes, but rather for public protection. A fence is needed to prevent inadvertent access to airfield, which is in close proximity to homes, walking paths and other areas used by the public. Federal Grant Assurance No. 19, Operation and Maintenance, requires the Town to provide for a safe operating environment.

TSA has worked extensively to ensure that a meaningful security apparatus is provided for the general aviation community while being responsive to its constituents. It would be appropriate to occasionally, perhaps every year, to coordinate with TSA representatives. In the event of a threat or perhaps resulting from a commercial or general aviation incident, TSA may elect to regulate rather than recommend various security infrastructure or procedures.

A security plan addressing these and other issues is recommended. Planning to accommodate a future perimeter fence for public safety, and analysis thereto is left to the next chapter.

4.5 Compliance

As discussed throughout this document, EIK has been the recipient of FAA Airport Improvement Program (AIP) grant funds. FAA is required to protect the Federal investment in nation's airports and does so through various means, primarily: grant agreements issued under AIP and its predecessor programs; Airport Aid Development Program (ADAP) and Federal Aid to Airports Program (FAAP), surplus airport property transfers and deed conveyance verbiage.

Upon property acquisition, and each time the Town accepts a grant offer under the AIP program, it accepts a series of obligations. These obligations are termed grant assurances. FAA explanation of the various assurances is formalized in FAA Order 5190.6B, *Airport Compliance Handbook*. Those grant assurances perhaps most relevant to EIK are summarized as follows:

- ⇨ Grant Assurance No. 5; Preserving Rights and Powers: Airport Sponsor will not take or permit any action which would deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions of these grant assurances. Attention should be paid to tenant leases or sub-leases to ensure airport sponsor rights or responsibilities are not inadvertently granted.

- Grant Assurance No. 19; Operations and Maintenance: Airport shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies. Airport Sponsor will ensure that it will not cause or permit any activity or action thereon which would interfere with its airport purposes only use. Airport Sponsor will promptly mark or light hazards resulting from airport conditions, including temporary conditions and notify airmen of conditions affecting use of the airport. FAA may conduct airfield compliance inspections to check safety area grades, airfield pavement markings, frangibility and on-airport land uses.
- Grant Assurance No. 20; Hazard Removal and Mitigation: Airport Sponsor will take appropriate actions to assure that terminal airspace required to protect instrument and visual aircraft operation will be adequately cleared and protected via the removal, lowering, relocation, marking, lighting or other mitigation of existing airport hazards and preventing the establishment or creation of future airport hazards. A hazard is an object that has been determined to have an adverse aeronautical effect upon terminal airspace. A hazard determination is a derivative of an FAA obstruction analysis process. An obstruction is an object which penetrates an FAR Part 77 surface. FAA does not necessarily have the authority to preclude creation of an obstruction. This authority rests with the local zoning jurisdiction; a height-restriction zoning ordinance is a compliance measure.
- Grant Assurance No. 21; Compatible Land Use: Airport Sponsor will take appropriate action, to the extent reasonable, including adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations.
- Grant Assurance No. 22; Economic Nondiscrimination: Airport Sponsor will make the airport available for public use on reasonable terms with unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities. Each Fixed Base Operator (FBO) and Airport Sponsor should it elect to assume such duties, shall be subject to the same rates, fees, rentals and other charges as are uniformly applicable to all other substantially similar FBOs. Airport tenants under appropriate contractual agreements with the Airport Sponsor will not discriminate with respect to services and materials pricing. To affect these, Airport Sponsor may elect to establish minimum standards for the conduct of activities at the airport. Airport sponsor may prohibit or limit any given type or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the public's civil aviation needs.
- Grant Assurance No. 23; Exclusive Rights: Airport Sponsor will permit no exclusive rights to use of the airport by any person providing or intending to provide aeronautical services to the public generally limited to activities directly and closely indirectly related to aeronautical activities.
- Grant Assurance No. 24; Fee and Rental Structure: Airport Sponsor will maintain a financial fee and rental structure which will make the airport as self-sustaining as possible.
- Grant Assurance No. 31; Disposal of Land: Airport Sponsor will ensure that FAA approval, with any reservation interests, is gained before releasing airport properties encumbered via federal grant assurances or other lands depicted on the recent Exhibit A.

Comprehensive information may be found at FAA's website dedicated to the subject: http://www.faa.gov/airports/aip/grant_assurances/

4.5.1 Through-the-Fence (TTF) Access

Given that many airport users access Federally-obligated airport property from an adjacent property, TTF is perhaps EIK's defining feature

and makes is among the few airports in the country with extensive off-airport access.

Residential TTF (RTTF) access has sometimes resulted in airport sponsor challenges in meeting select grant assurances. FAA discourages the practice and notes that airport sponsors are not obligated to execute future airfield access agreements. FAA, over the course of the past few years, has addressed this circumstance on a regulatory basis. Consultations with industry have resulted in requirements for general aviation airport sponsors like the Town with residential TTF access.

FAA instructs airport sponsors with RTTF to ensure that existing and future access should be:

1. Consistent with current and future airport planning
2. Compliant with federal law and FAA recommendation,
3. Does not impede sponsor's ability to comply with grant assurances.

To those ends, FAA requires:

1. An Airport Layout Plan depict existing and proposed access points,
2. FAA review and approval of RTTF access plan, agreement(s), and a summary thereto.

FAA access agreement template guidance specifies:

1. Compliance with, and subordination to, related federal law and grant assurances
2. Accessing property legal description
3. Identification of a 5-year initial term, limited to three 5-year extension options
4. Prohibition of aviation fuel sale from accessing property
5. Prohibition of commercial aeronautical use from accessing property
6. Prohibition of additional access through accessing property
7. Payment of an access fee with an annual escalator and penalties for tardiness, all of which is economically-consistent with that charged to on-airport users
8. An understanding that the accessing property owner solely, will pay for accessing property improvements, and that such improvements as may be required, will be approved 90 days prior to construction/installation.
9. An understanding that airport rules and regulations compliance is compulsory
10. Indemnification pursuant to typical avigation easement instrument language and an understanding an obstruction or hazard to navigable airspace will be disposed of at the accessing property owner's sole expense
11. Provisions for termination and notice of default

FAA RTTF access plan template guidance further specifies that RTTF agreements will include provisions for:

1. Compliance with, and subordination to, related federal law and grant assurances
2. Sanction of any RTTF accessing property/owner non-compliance
3. Execution of an access agreement for each accessing property, as previously described
4. Airport rules and regulations
5. Establishment of a safety education program hereto
6. Provisions to ensure that wildlife hazards are not created and management thereto is enforced
7. A visualization of RTTF access points, taxiways and RTTF-related land uses for FAA use
8. Provision for visitor (visiting RTTF accessing property) compliance hereto

Additional RTTF is not recommended at EIK for purposes herein. Note that the above discussion aims to define FAA-specified RTTF requirements of the Town, as opposed to commercial through-the-fence requirements. Commercial through the fence, such as an off-airport manufacturing business, is perhaps a more suitable off-airport partner and can meaningfully extended an aviation-related economic benefit for the Town.

Although FAA does not specify an access plan or agreement language for commercial TTF, grant

assurance remain in force for this type of access. FAA's RTTF template guidance is valuable as it relates to grant assurance compliance for existing and potential commercial TTF access.

Site planning to accommodate future commercial TTF and analysis thereto, is left to the next chapter.

4.5.2 Airport User and Tenant Guidance

Guidance in this context relates to documents and procedures established to manage grant assurance compliance for current and future business operating on obligated airport property. Three documents are perhaps meaningful in this regard:

1. Airport Rules and Regulations
2. Minimum Standards for the Conduct of Commercial Aeronautical Activities
3. Airport Development Standards
4. Rates and Charges

EIK has informal (not codified) rules and regulations which are somewhat out of date and may not adequately address the current needs of the Town in providing for a safe airfield with easy-to-understand direction for users.

Minimum Standards serve to inform potential and current airport users of the minimum levels of service and protections afforded to the Town, to be provided by a given on-airport business.

Development standards will servce to standardize the appearance and architectural standards for on-airport buildings and facilities in a similar fashion to that provided by a covenant-restricted homeowner association.

A rates and charges analysis will inventory this information for aviation purposes. This data could then be used to establish a basis for enterprise fund financial planning.

Adoption of any or all of these documents is not compulsory for grant assurance compliance will help ensure equable treatment of airport tenants and airport users and aid the Town in complying with Federal grant assurances. These documents/efforts needs not be exhaustive. Templates are found at many other airports and rates and charges studies are regularly performed across the country.

4.6 Sustainability

Sustainability as discussed and defined in Section 2.5.4, and is defining for FAA and the Town and is a relatively new subject. Creation of an airport sustainability plan is recommended. This effort needs not be especially exhaustive, but would perhaps be meaningful to constituents. A public-outreach effort within and informing the plan would be meaningful. Potential topics for consideration could include the prioritization of the SAGA database noted in Section 2.5.4 or other guidance, such as the Airport Cooperative Research Program (ACRP) exploration of the subject. Also perhaps valuable would be CDOT Aeronautics' upcoming statewide Sustainability Management Plan for general aviation airports.

Is it possible that the next Airport Master Plan Update will more sustainability-oriented and may be termed an Airport Sustainability Master Plan.

4.7 Summary

A summary of recommended improvements and actions follow as Table 4-9.

Table 4-9
Summary of Recommendations *(Source: ADG)*

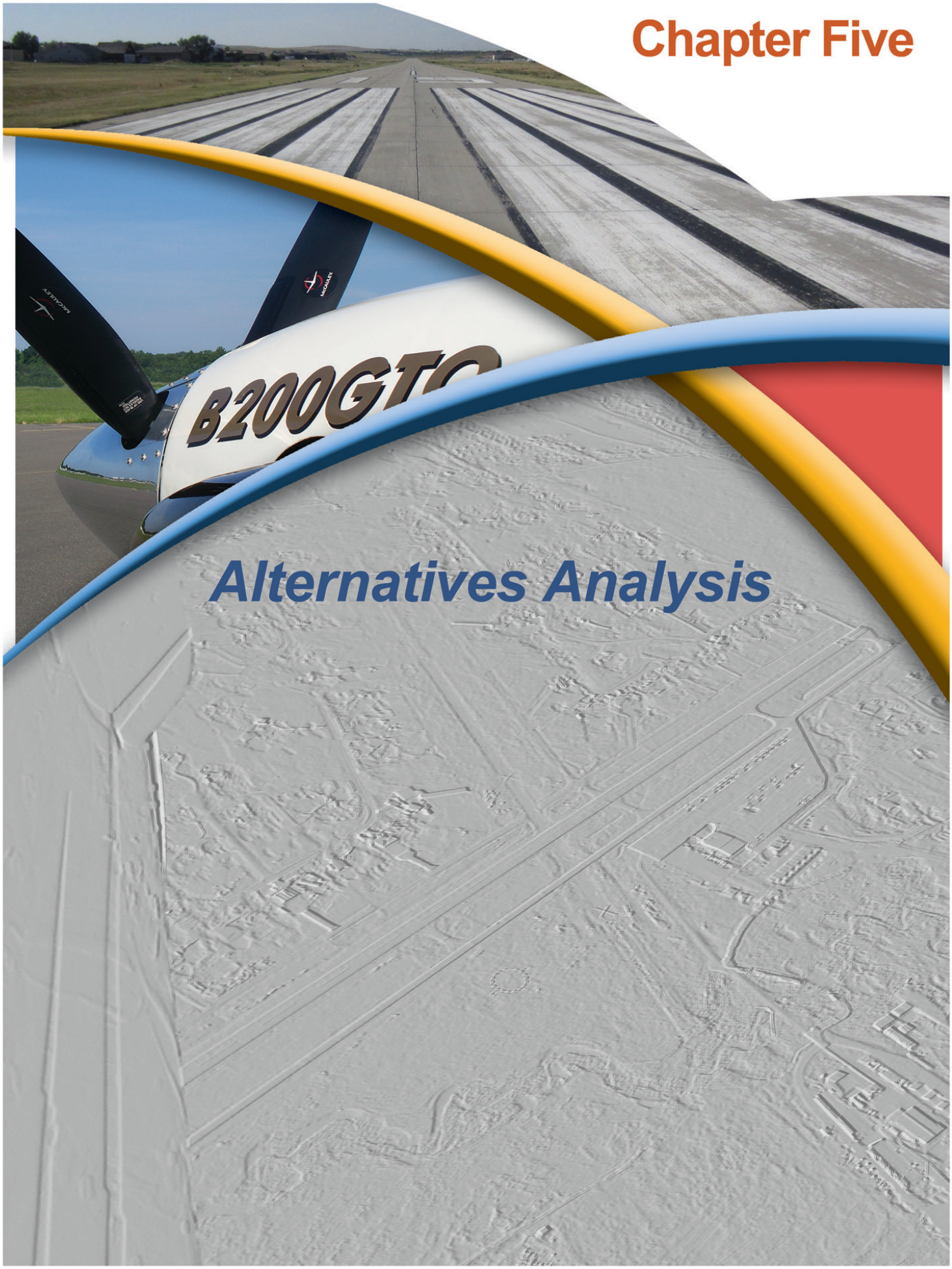
Airport Role	**Recommendation**
Airport Role	General Aviation
Short and Intermediate-Term Design Standards	B-I, TDG1, Small, ≥3/4 Mile
Longer-Term Design Standards and FAA ADO Suggested	B-II, TDG2, Small, ≥3/4 Mile
Airside	**Recommendation**
Wind Coverage (Crosswind Runway or Widen Runway 15-33)	See Next Chapter
Instrument Approach Capability (Perhaps GPS Instrument Approach Procedure{s})	See Next Chapter
Runway 15-33 Length (6,390 Feet)	See Next Chapter
Runway Width (Current is 60')	75 Feet
Taxiway Width (Current is 25')	35 Feet
Runway Protection Zones (Current is 250'x500'x1,000')	500'x700'x1,000'
Runway Safety Area (Current is 120' wide, 240' beyond runway end)	150' wide/300' beyond end
Runway Object Free Area (Current is 250' wide, 240' beyond runway end)	500' wide/300' beyond end
Runway Object Free Area (Current is 250' wide, 240' beyond runway end)	500' wide/300' beyond end
Taxiway Safety Area Width (Current is 49' Wide)	79' Wide
Taxiway/Taxilane Object Free Area Width (Current is 79'/89' Wide)	115'/131' Wide
Distance From Runway 15-33 to Taxiway A (Current is 200')	240'
Distance From Runway 15-33 to Holdline (Current is 125')	200'
Distance From Runway 15-33 to Aircraft Parking (Current is 250')	250'
Runway and Taxiway Pavements	Occasional Rehabilitation
Runway Lighting (MIRL, PAPI, REIL)	Occasional Rehabilitation
Runway End Hold Bays	Reconfigure
Navigable Airspace	Clear/Mitigate Obstructions

Landside	**Existing**	**2014**	**2019**	**2024**	**2033**
On-Airport Based Aircraft Apron Area (SY.)	±25,000	23,465	25,385	27,335	32,105
[3]Recommended Additional Area (SY.)		*0*	*385*	*2,335*	*7,105*
[1]Itinerant Aircraft Apron Area (SY.)	±8,600	13,032	14,548	16,084	20,045
[3]Recommended Additional Area (SY.)		*4,432*	*5,948*	*7,484*	*11,445*
Terminal Building Area (SF.)	±3,000	2,234	2,514	2,793	3,445
[3]Recommended Additional Area (SF.)		*0*	*0*	*0*	*445*
[2]On-Airport Hangar Area (SF.)	±15,700	22,300	24,320	27,520	32,200
[3]Recommended Additional Area (SF.)		*6,600*	*8,620*	*11,820*	*16,500*
Automobile Parking Area (SY.)	±3,100	2,975	3,290	3,605	4,375
[3]Recommended Additional Paved Area (SY.)		*0*	*190*	*505*	*1,275*
Automobile Access Point					See Next Chapter
Airfield Snow Removal and Maintenance Equipment					Occasional Purchase
Security, Compliance and Sustainability					
Security					Create Security Plan
Compliance; Through-the-Fence					On-Going
Compliance; Update Overlay District Zoning/Comprehensive Plan					Update Land Use Plan
Compliance; Airport Rules and Regulations					Perhaps Update
Compliance; Minimum Standards					Consider
Compliance; Development Standards					Consider
Sustainability					Create Sustainability Plan

Notes

[1]Reflects Table 4-5 values discounted 70% based upon the estimated number of off-airport itinerant operations
[2]Reflects Table 4-7 values discounted 90% based upon the estimated number of off-airport based aircraft
[3]The recommended additional area is the difference between baseline existing and horizon year values

Chapter Five



Alternatives Analysis

Chapter Five – Alternatives Analysis

5.0 Introduction

This chapter describes various development options which should be considered to accommodate the facility requirements analysis and recommendations thereto. Several issues are at hand and are carried forward from Table 4-9.

1. Accommodate FAA Design Standards and Clear/Mitigate Obstructions
2. Perhaps Enhance Instrument Approach Capability
3. Accommodate Wind Coverage
4. Consider Runway 15-33 Length
5. Locate Hangars, Apron and Taxiways and consider New Airport Access Point/Configuration

These roughly correspond to the issues to be addressed as described in the Introduction to this planning. Although apparently separate and distinct, the above are related and one impacts another in obvious and in more subtle ways.

5.1 Alternatives Introduction

A sequence of alternatives is created, followed by a series of scenarios to provide meaning to a relatively complex situation.

Alternative No. 1: As-Is
This alternative specifies no future improvements other than accommodation of select FAA design standards and clearance or mitigation of obstructions. This alternative is described within Section 5.2.

The next potential improvement to be considered is a potential enhancement to EIK's instrument approach capability.

Alternative No. 2:
Improved All-Weather Capability
This alternative specifies establishment of a straight-in instrument approach procedure to both runway ends. This alternative is described within Section 5.3.

Wind accommodation to standard is handled slightly differently in that one of two actions, either Alternative No. 3A or 3B will satisfy the FAA wind coverage standard.

Alternative No. 3A:
Accommodate Winds with Crosswind Runway
This alternative specifies a new crosswind runway to meet the standard. This alternative specifies compliance of select FAA design standards and clearance or mitigation of obstructions. This alternative is described within Section 5.4.1.

Alternative No. 3B:
Accommodate Winds with a Runway Widening
This alternative specifies a widened Runway 15-33 to meet the standard. This alternative is described within Section 5.4.2.

Next up for consideration are northerly runway extensions of varying lengths. Three alternatives, 4A, 4B and 4C are considered:

Alternative No. 4A:
Extend 220 feet for 4,920-Foot Runway
This alternative specifies a northerly 220 foot extension for a total runway length of 7,920 feet. This alternative specifies compliance of select FAA design standards and clearance or mitigation of obstructions. This alternative is described within Section 5.5.1.

Alternative No. 4B:
Extend 300 feet for 5,000-Foot Runway
This alternative specifies a northerly 300 foot extension for a total runway length of 5,000 feet. This alternative specifies compliance of select FAA design standards and clearance or mitigation of obstructions. This alternative is described within Section 5.5.2

Alternative No. 4C:
Extend 1,700 feet for 6,400-Foot Runway
This alternative specifies a northerly 1,700 foot extension for a total runway length of 5,200 feet. This alternative specifies compliance of select FAA design standards and clearance or mitigation of obstructions. This alternative is described within Section 5.5.3.

Finally, three landside development alternatives will consider accommodation of potential on- and off-airport apron, hangars, taxiways and aviation business. The previous chapter demonstrated the need for additional landside aviation facilities and alternatives show increasing levels of demand accommodation. A mix of on and off-airport demand accommodation is perhaps valuable.

Alternative No. 5A:
Minimal Landside Development
This alternative specifies minimal on-airport development. No development is proposed northwest of the airfield. This alternative is described within Section 5.6.1

Alternative No. 5B:
Moderate Landside Development
This alternative specifies moderate on-airport development including land acquisition. Light-industrial aircraft manufacturing is proposed northwest of the airfield, off-airport. A new airport entrance, from County Line Road, is proposed. This alternative is described within Section 5.6.2.

Alternative No. 5C:
Robust Landside Development
This alternative specifies robust on-airport development including land acquisition. Light-industrial aircraft manufacturing is proposed for northwest of the airfield, off-airport. A new airport entrance, from County Line Road, is proposed. This alternative is described within Section 5.6.3.

5.2 Alternative No. 1: Current FAA Standards

It is important for grant assurance compliance that this overall planning effort is done pursuant to FAA design standards. This includes the long-standing local FAA policy that future improvements should be B-II compliant.

There is an ever-increasing distance between aviation infrastructure needs and federal and state funding at a local, regional and national level, particularly for general aviation airports. A result of this, at least for EIK, is that an improvement or series of improvements necessary for FAA design standards compliance may not be funded in the short-term or perhaps even in the longer-term if the improvements are substantial. Although substantial is a somewhat subjective term, a case can be made that this alternative specifies substantial improvements, particularly relative to a local, regional and national need. In short, improvements for this alternative are likely to occur over a 20-year period.

This alternative shows improvements for design standards compliance without any additional demand accommodation, or somewhat "As-Is":

1) Acquire ±36 Acres for Runway Object Free Area (OFA) and Runway Protection Zone (RPZ) from approximately 25 property owners.
   a) Relocate a portion of Coal Creek floodplain/way to accommodate relocated Taxiway A near north runway end.
   b) Fence the new perimeter to clear FAR Part 77 surfaces.
2) Ensure no parallel taxiway centerline is closer than 240 feet to runway centerline

3) Ensure that connecting taxiways have holdlines and signage no closer than 200 feet from runway centerline.
4) Widen runway from 60 feet to 75 Feet and relocate runway edge lighting
5) Relocate Taxiway A 40 Feet to the West
   a) Relocate Taxiway A holdlines signage from 125 feet to 200 feet from runway centerline.
   b) Relocate taxiway edge lighting
6) Widen Taxiway A and Connecting Taxiways from 25 Feet to 35 Feet and relocate edge lighting.
7) Loss of ±22 tiedowns on the eastern apron edge, consider replacement area.
8) Enlarged Runway and Taxiway Safety Area (RSA/TSA) and likely including new drainage (3) structures at each of Taxiway A.
9) Lower select trees in Coal Creek right-of-way and monitor tree height around runway.

Note that this alternative is shown as baseline for inclusion in all scenarios, per Section 5.8.

5.3 Alternative No. 2: All-Weather Capability

Alternative No. 2A visualizes improvements associated with an improved Instrument Approach Procedure (IAP) to either runway end. The IAP is a three-dimensional, FAA-created and approved path in the sky for aircraft operation, allowing EIK to function as a more all-weather capable airport. A more capable all-weather airport informs the flying public and aviation businesses that EIK is open for business in a meaningful way as it relates to operations in inclement weather.

In addition to Alternative No. 1's improvements, this alternative specifies that terrain underlying the Runway 33 approach surface will either need to be removed/lowered or red-lit for obstruction disposition. This alternative has other meaningful off-airport on-the-ground consequences and will require substantial cooperation for easy implementation from through-the-fence residences adjoining EIK property:

1) Most every residential structure will need to be equipped with at least two red-lit solar-based lights for obstruction disposition.
2) Many off-airport trees should be immediately lowered without compensation and access agreement provisions should prevail to ensure perpetuity in this regard.
3) A given 7-foot tall perimeter fence should be located no closer than 320 feet from runway centerline. This is particularly problematic on the east side of the runway as structure encroachment is apparent.

5.4 Alternative No. 3: Accommodate Winds

Section 4.2.1 notes that an application of FAA wind coverage standards as they apply to EIK suggests that one of two improvements are in order. The first, a new crosswind runway as discussed Section 5.4.1 followed by the second, a runway widening as discussed in Section 5.4.2.

5.4.1 Alternative No. 3A: Accommodate Winds with a Crosswind Runway

This alternative describes the first option for disposition of FAA standards for wind coverage non-compliance; a 2,200-foot long by 60-foot wide crosswind runway is shown with roughly the same alignment as the historical crosswind runway. Runway end location and length for this alternative are cost-compromises:

1) One reason this runway length was selected is because it is a useful length useful for some smaller aircraft operations. An experienced pilot familiar with EIK may not need this entire length on a given day but an unfamiliar, inexperienced pilot may. It is important to note that this length is insufficient for many aircraft operations.
2) Also considered was the FAA longitudinal runway light of sight standard. This standard specifies, among other things, that the centerline grade should not exceed 2 percent.

Ambient ground elevation increases from midfield along the historic runway grade up toward the east. This grade exceeds 2 percent as the ground rises, and the proposed Runway 27 end location is functionally a compromise between additional runway length and significant terrain removal costs for approach surface clearance.

3) Lastly, proximity to the Coal Creek right-of-way and floodplain/way was considered; the Runway 9 end was located for minimal interaction and standards compliance.

A summary of improvements and actions for standards compliance follows:

1) Acquire ±13 Acres for ROFA and RPZ standards from approximately 16 property owners.
2) Ensure no parallel taxiway centerline is closer than 150 feet to runway centerline.
3) Ensure that connecting taxiways have holdlines and signage no closer than 125 feet from runway centerline.
4) Fence to clear FAR Part 77 surfaces.
5) Grade improved RSA, terrain to clear FAR Part 77 surfaces.
6) Lower select trees in Coal Creek right-of-way, around select residences and monitor tree height around runway. Install red-lit obstruction lighting on select structures.
7) Ensure RPZ's are clear of future taxiways and taxilanes.

While the design associated with this alternative would generate a standards-compliant crosswind runway environment, operational challenges perhaps remain. In furtherance of minimizing operational challenges, a recommendation is made that pilots should be briefed by the Airport Manager, or assigns, prior to runway use. Subjects could include:

1) Insufficient runway length for some aircraft operations regardless of density altitude.
2) The visual environmental on a westerly approach would perhaps invite an uninformed pilot to land long; and other grade changes are noteworthy along with structure proximity.
3) Proximity of Coal Creek and existence of off-airport traffic near the Runway 9 end.
4) Awareness of the aircraft operating envelope during strong wind conditions, regardless of direction operations, but specifically for operations to the west with gusts.
5) Awareness of the airfield environment with a crossing runway and taxiway configuration. Note that creation of a FAA-designated hot spot or a runway incursion would be a reason to immediate close the runway until a resolution can be ensured.
6) Sensitivity for and awareness of noise in the vicinity, and perhaps specific informal noise abatement procedures for runway use.
7) County Line Road overhead utility line proximity.

Although the crosswind runway in this alternative is proposed to be asphalt-paved, a turf-runway is an option. The primary difference between paved and turf would be that both approach surfaces on either end would begin at the runway end instead of 200-feet beyond. The functional result of this would be minimally decreased acquisition and terrain clearance costs. Note that a turf runway is the preferred landing surface for some aviation constituent groups.

It is also important to note that neither FAA nor CDOT is supportive of this alternative and will not be financially participating in its furtherance.

5.4.2 Alternative No. 3B: Accommodate Winds with Runway Widening

This alternative describes the second option for disposition of FAA standards for wind coverage non-compliance, a widening of Runway 15-33 to 100 feet. The theory and practice of this improvement is that a given pilot, regardless of experience, will have more lateral room to maneuver upon touchdown in the event of strong crossing or quartering winds and gusts. The inference is that the additional width provides a

sufficient margin of safety to meet the standard in lieu of a crosswind runway.

5.5 Alternative No. 4: Extend Runway to the North

Section 4.2.3 notes that an application of FAA runway length standards, as they apply to EIK, suggests that a runway extension to 6,400 feet is appropriate. Three alternatives to this end are visualized and described. The first, an extension to 5,200 feet, the second, an extension to 5,700 feet, and finally the 6,390-foot specified distance. Details and discussion hereto are found in Sections 5.6.1, 5.6.2 and 5.6.3, respectively.

A few items are of note for this analysis:

1) CDOT Aeronautics, via its State Airport System Plan (SASP), recommends only an additional 100 feet of runway length.
2) Any meaningful length; that is, beyond 220 feet will require disturbance to Coal Creek, an action which the Town's Comprehensive Plan, Code and supporting documents seem to discourage.
3) Any meaningful length; that is, beyond 500 feet will be demanding on area non-aviation land uses and may be difficult to site.
4) A 6,400-foot runway is the most economically-responsive length from an aviation demand-accommodation perspective.
5) Regional FAA guidance suggests participation with federal funding hereto requires documentation of penalized operations (given that the model inputs used to establish 6,390 feet are perhaps outdated).
6) Regional FAA guidance suggests that no public roads are to exist or be planned within a future RPZ. Should it be desired to have any road remain in place in given circumstance, additional study could be made pursuant to waiving this regional requirement.
7) An estimated Year 2033 65 DNL noise contour is depicted on each alternative:
   a) Contour location is *estimated* based upon the ultimate level (20-year forecast) of aircraft operations per FAA guidance.
   b) A longer runway will generally accommodate larger and faster, but not necessarily noisier aircraft. This fact is not considered or functionally accommodated within the noise contour analysis because the noise contour is based upon the forecast of aircraft operations, and does not by design accommodate a range of runway lengths.
   c) The (Day-Night Average Sound {db} Level) DNL metric is the FAA-specified metric for grant assurance purposes. More to the point, it is not a single-even metric, and single events (an aircraft taking off) exceed these noise average thresholds.

5.5.1 Alternative No. 4A: Extend Runway 220 Feet for 4,920 Total Feet

This alternative describes a first option for a northerly runway extension. The first potential runway extension is 220 feet because this is farthest a given extension can go without interacting with the Coal Creek streambed. For this reason, this alternatives analysis will consider 220 feet to be the minimum extension to be considered.

A summary of improvements and actions for standards compliance follows:

1) Acquire ±9.0 Acres for RPZ and 35' Building Restriction Line (BRL) standards from several property owners. BRL acquisition is not standards-compulsory but recommended.
2) Extension of runway edge lighting and relocation of PAPI landing aids.
3) The 300' beyond end RSA will not require interaction with Coal Creek streambed
4) Extension of Taxiway A to full-parallel along with taxiway edge lighting.
5) Fence to clear FAR Part 77 surfaces.

5.5.2 Alternative No. 4B: Extend Runway 300 Feet for 5,000 Total Feet

This alternative describes a second option for a northerly runway extension. This length meets some charter companies requirements for a

5,000-foot runway. A summary of improvements and actions for standards compliance follows:

1) Acquire ±10.0 Acres for RPZ and 35' Building Restriction Line (BRL) standards from several property owners. BRL acquisition is not standards-compulsory but recommended.
2) Extension of runway edge lighting and relocation of PAPI landing aids.
3) The 300' beyond end RSA will require a drainage structure for Coal Creek.
4) Extension of Taxiway A to full-parallel along with taxiway edge lighting.
5) Fence to clear FAR Part 77 surfaces.

5.5.3 Alternative No. 4C: Extend Runway 1,700 Feet for 6,400 Total Feet

This alternative describes the third and final runway extension option herein. This is the FAA 'from the book' runway standard length. A summary of improvements and actions for standards compliance follows:

1) Acquire ±31.8 Acres for RPZ and 35' Building Restriction Line (BRL) standards from approximately 4 property owners. BRL acquisition is not standards-compulsory but recommended.
2) Extension of runway edge lighting and relocation of PAPI landing aids.
3) The 300' beyond end RSA will require a drainage structure for Coal Creek.
4) Extension of Taxiway A to full-parallel along with taxiway edge lighting.
5) Fence to clear FAR Part 77 surfaces.
6) Relocation of Vista Ridge Parkway. The turn-radius required to fit the road around the RPZ is estimated.

5.6 Alternative No. 5: Landside Development

The alternatives analysis now shifts to accommodation of future hangars, apron, aviation businesses while also considering auto access and future generalized landside configuration.

Both on-airport and off-airport development is considered. Prerequisite to future off-airport development with airfield access is Trustee acceptance of future commercial through-the-fence access and perhaps access agreements thereto.

Near-term, long-term and reserve development areas for aviation and non-aviation purposes are planned for this each alternative.

Examples of compatible on–airport and off-airport aviation-related land uses include:

1. General Aviation Terminal/Ramp
2. Corporate Aviation Terminal/Ramp
3. Air Cargo
4. Aircraft Maintenance and Support
5. Aircraft Rescue and Structural Firefighting
6. On-Field Agricultural/Agricultural Lease
7. Aviation-Related Light Industrial
   a. Parts Manufacturing and Assembly
   b. Flight Simulator
   c. Defense Contractor
   d. Aerial Photography/Photogrammetry
   e. Aerial Spray
8. Fixed Base Operation (FBO)
   a. Aircraft Charter, Storage, Sales
   b. Aircraft Repair and Wash
   c. Pilot Supplies
   d. Pilot Lounge, Flight Planning
   e. Flight Training
   f. Food Services/Catering
   g. Office/Overnight Accommodations
   h. Restrooms
9. Aircraft Storage
   a. T-Hangar
   b. Executive Hangar
   c. Mixed-Use Hangar
   d. T-Shade
10. US Government
   a. Military
   b. Air Traffic Control
   c. Navigational Aids
   d. Homeland Security
   e. Public Safety and Emergency Facilities
   f. Weather Collection and Dissemination
   g. Satellite Communications

Examples of non-aviation related land uses which are generally compatible off-airport and within the airport vicinity include:

1. Postal Annex
2. Telecommunications Facilities
3. Greenhouses
4. Auto Mall/Large-Scale Retail
5. Rental Car Ready Return/Storage
6. Auto/Boat Storage and Mini-Storage
7. Light and Heavy Manufacturing
8. Warehousing/Storage
9. Data Storage
10. Recreational; Fields and Golf Course
11. Hotel/Motel
12. Support/Regional Businesses including Bank, Convenience, Restaurant, Coffee/Snack

Two development areas are considered. The first is within and nearby the existing apron. It includes off-airport aviation uses south of Coal Creek and west of Runway 15-33. The second is area is due west and north of the Runway 15 end on the west side of Coal Creek. For purposes herein these will be termed:

- ✓ Terminal Area
- ✓ North Development Area

Again, both areas could accommodate on-airport and off-airport development in the form of hangar, apron, taxiways/taxilanes and aviation businesses. Trustee prerogative, perhaps as a consequence of consideration hereto, will inform the nature and extent of off-airport development, given that aviation-related development may require an access agreement(s).

It is important to note that the current Town code functionally prohibits establishment of a given off-airport type of aeronautical business if that same type of business currently operates on-airport. For this reason the only types of off-airport aeronautical uses considered herein are hangars and aircraft manufacturing. For purposes herein, both on-airport and off-airport development is visualized within the Terminal Area and only off-airport development is visualized within the North Development Area.

Given that EIK is expected to continue to accommodate larger and faster aircraft, a transition from a personal-class (B-I) kind of airport to a more business (B-II) class facility could be considered. More that point, Section 3.7.7 suggests that B-II is the longer-term design standard and FAA prefers to fund improvements for these types of aircraft.

Specific aims for landside development in this series of alternatives could perhaps include:

1) Plan land uses and propose facilities which will meet anticipated demand, and which will also allow for continued demand accommodation in case regional economic activity is more robust than anticipated.
2) Plan land uses and propose facility locations which will allow the Airport to continue its financial self-sufficiency.

An important constraint for these analyses is the Coal Creek Floodway and its overlay district. The Town code currently notes that no development is permitted with a floodway and only permitted buildings, facilities and pavements are permitted within the floodplain (floodway fringe).

Features important for analysis and shown on the following three landside alternatives include Alternative No. 1 and the approximate limits of the 100-year floodplain (Floodway per Town Code) per Figure 2-6.

5.6.1 Alternative No. 5A: Minimal Landside Development

Alternative No. 5A shows the first landside configuration. It shows no development within the North Development Area and includes the following with the Terminal Area:

1) Additional on-airport general aviation apron to accommodate area for the ±22 tie-downs lost

to standards compliance as shown in Alternative No. 1.
2) A signalized intersection at the Highway 7/Airport Road intersection.
3) Hangar development accommodated off-airport via commercial through-the fence agreements and on-airport via T-shades.

5.6.2 Alternative No. 5B: Moderate Landside Development

Alternative No. 5B shows the second landside configuration and includes the following development within the Terminal Area:

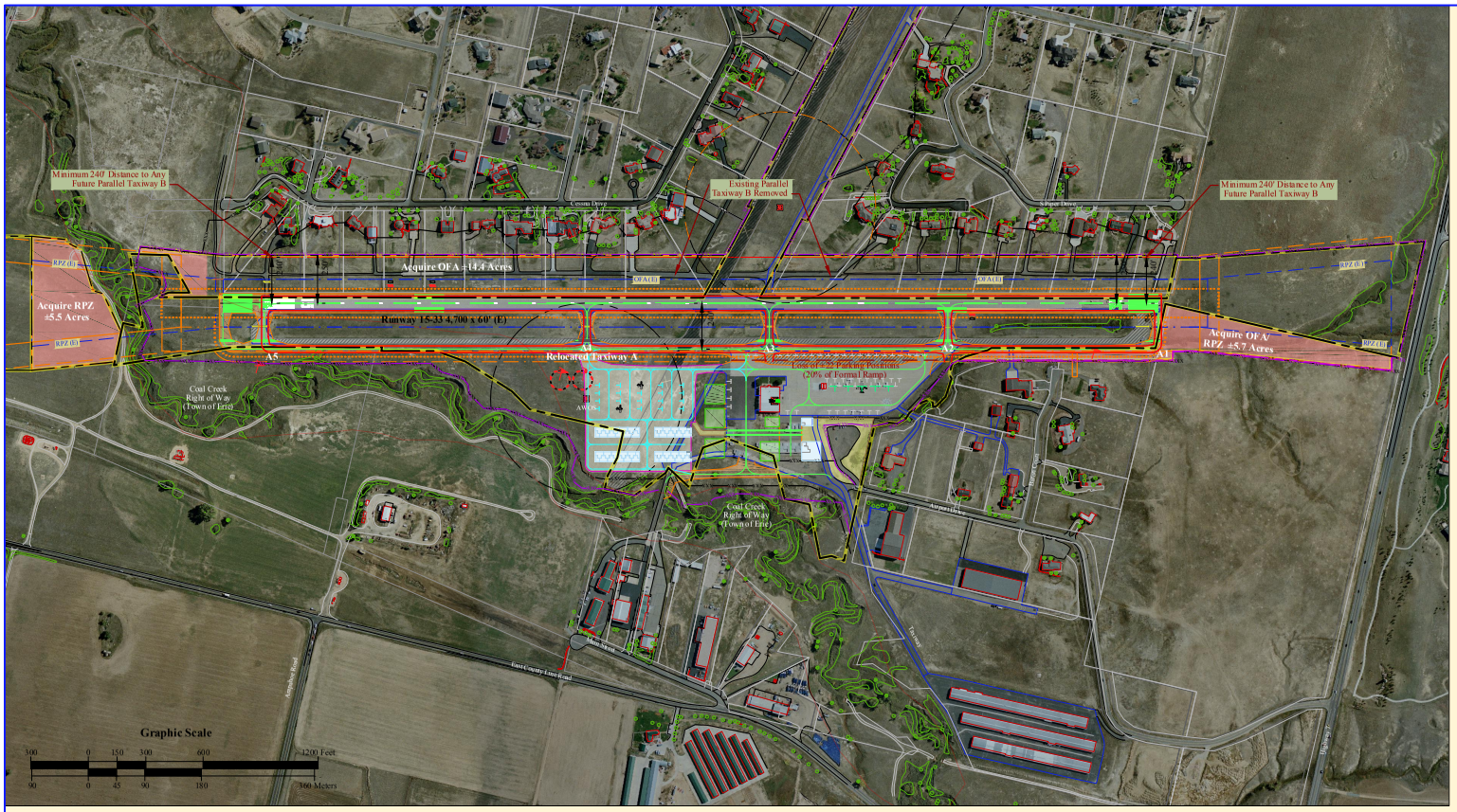
1) Additional on-airport general aviation apron to accommodate area for the ±22 tie-downs lost to standards compliance as shown in Alternative No. 1.
2) Additional on-airport apron, and land acquisition thereto, to accommodate long-term and beyond demand per the Forecasts of Aviation Demand.
3) Hangar development accommodated off-airport via commercial through-the fence agreements and on-airport via T-shades or T-hangars.
4) Hangar development, both airport-funded and ground-leased, accommodated on-airport, with land acquisition thereto.
5) A new primary airport auto access originating from County Line Road.
6) Additional aviation and non-aviation uses along Highway 7 and County Line Road.
7) Off-airport commercial aircraft manufacturing accessing TTF at the Runway 15 end. This would be accomplished via a PUD.

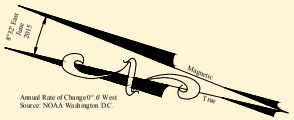
5.6.3 Alternative No. 5C: Robust Landside Development

Alternative No. 5C shows the third landside configuration. This alternative could be seen an "ultimate build-out' if unconstrained aviation development was the preferred course.

1) Additional on-airport general aviation apron to accommodate area for the ±22 tie-downs lost to standards compliance as shown in Alternative No. 1.
2) Additional on-airport apron, and land acquisition thereto, to accommodate longer-term demand, and beyond, per the Forecasts of Aviation Demand.
3) Off-airport hangar development between Rocky Mountain Propeller and Tri-County Hangars and Storage perhaps via commercial through-the fence agreements.
4) Hangar development, both airport-funded and ground-leased, accommodated on-airport, with land acquisition thereto.
5) A new primary airport auto access originating from County Line Road.
6) Additional aviation and non-aviation uses along Highway 7 and County Line Road.
7) Off-airport commercial aircraft manufacturing accessing TTF at the Runway 15 end. This would be accomplished via a PUD.
8) A future economic development area, effected perhaps an mixed-use PUD envisioned to complement EIK.

It is important to note that development for the last all alternatives could perhaps occur in phased manner over a 20-year period.





Legend

(E)	Existing
	Existing Property Line
	Runway Protection Zone (RPZ)
	Object Free Area (OFA)
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Improvements
	Proposed Property Line

Reasons to Say "Yes"

- Standards Compliance

Improvements

- Acquire Land (36 Acres)
- Grade Safety Areas/Structure (Three Locations on South Runway End
- Widen Runway and Taxiway A
- Relocate Runway and Taxiway A Edge Lights
- Relocate Taxiway A, Hold and Signs
- Install Perimeter Fence
- Consider Additional Apron

Total Estimated Cost $12,800,000

Notes

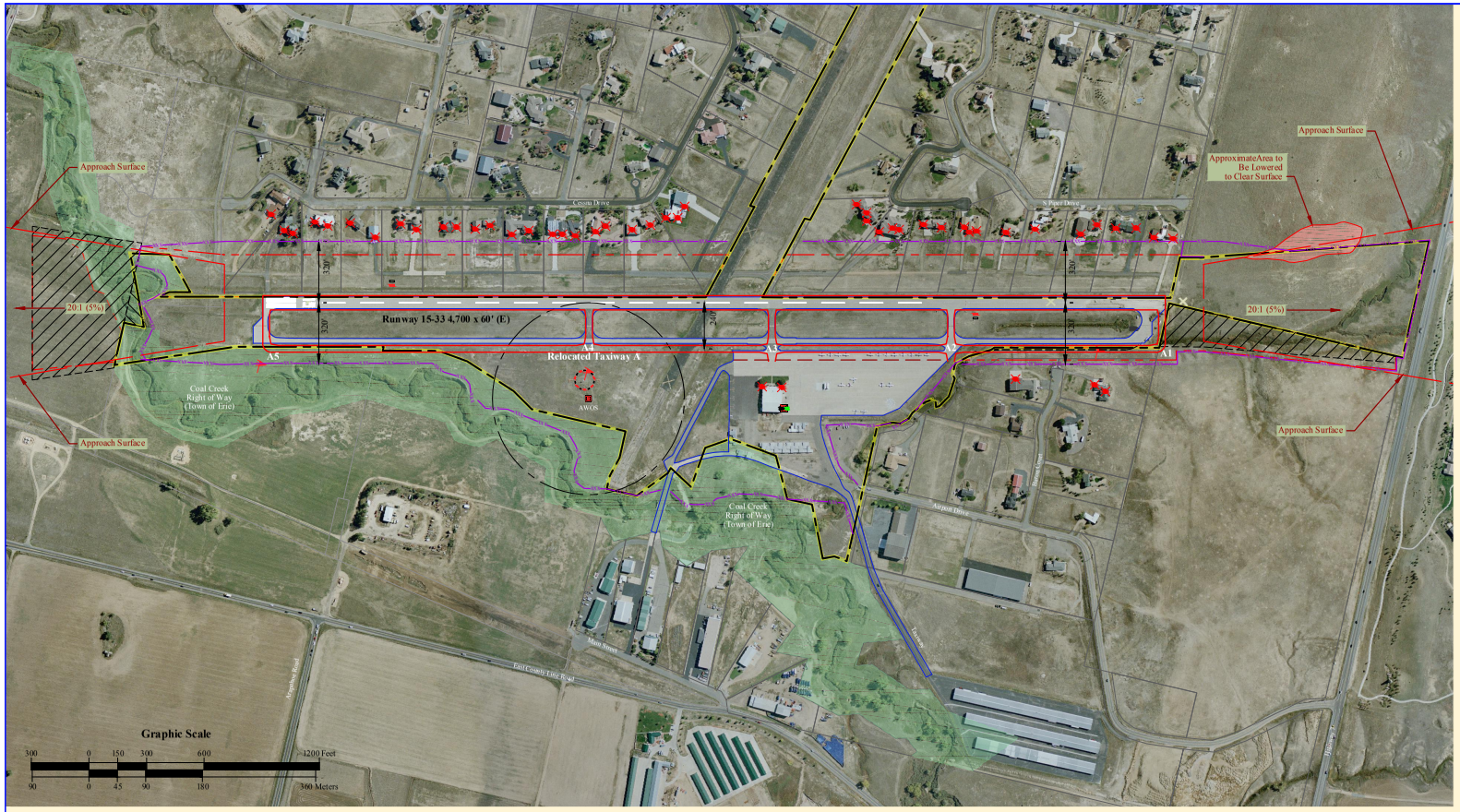
- FAA Pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.
- Visual Runway Only Planned
- Assumes Land Can Be Acquired and Obstructions Mitigated/Lighted
- Assumes Coal Creek Disturbance OK
- Assumes Floodplain Permitting
- Assumes Upstream Floodplain Impacts Can Be Mitigated
- Ensure Off-Airport Taxiways Are No Closer than 240 to Runway Centerline
- Ensure Off-Airport Taxiways Are No Closer than 240 to Runway Centerline
- Additional Apron Should Be Planned To Replace That Lost to Standards
- Safety Area Grading for Taxiway A Only
- Limited Obstruction Mitigation, Mostly Lighting and Tree Lowering
- Assumes Access Agreements in Force

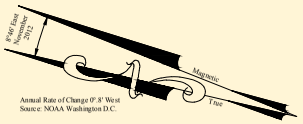
Erie Municipal Airport (EIK)

Alternative No. 1: Current FAA Standards

ADG

Erie Municipal Airport (EIK)





Legend

(E)	Existing
	Existing Property Line
	Runway Protection Zone (RPZ)
	Object Free Area (OFA)
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Improvements
	Proposed Property Line
	Likely Obstruction Light Locations

Some Reasons to Say "Yes"

- More effectively brings dollars and economic development to the Town.
- Responsive to the Aviation Business Community and the local pilot.
- More meaningfully brings EIK into the national airspace system.

Some Reasons to Say "No"

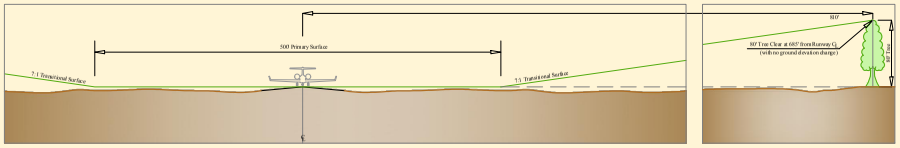
- Potentially much more difficult to site a perimeter fence.
- Requires airpark cooperation.

Improvements

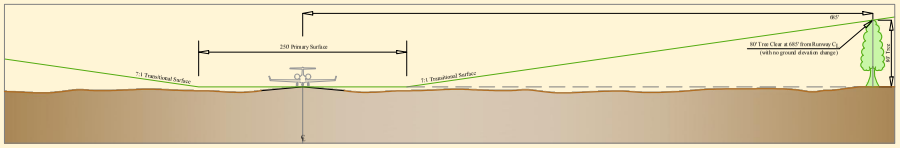
- Install Obstruction Lighting (±50 Units)
- Lower Terrain near Runway 33

Note: One-Mile Visibility Proposed

Total Estimated Cost $500,000

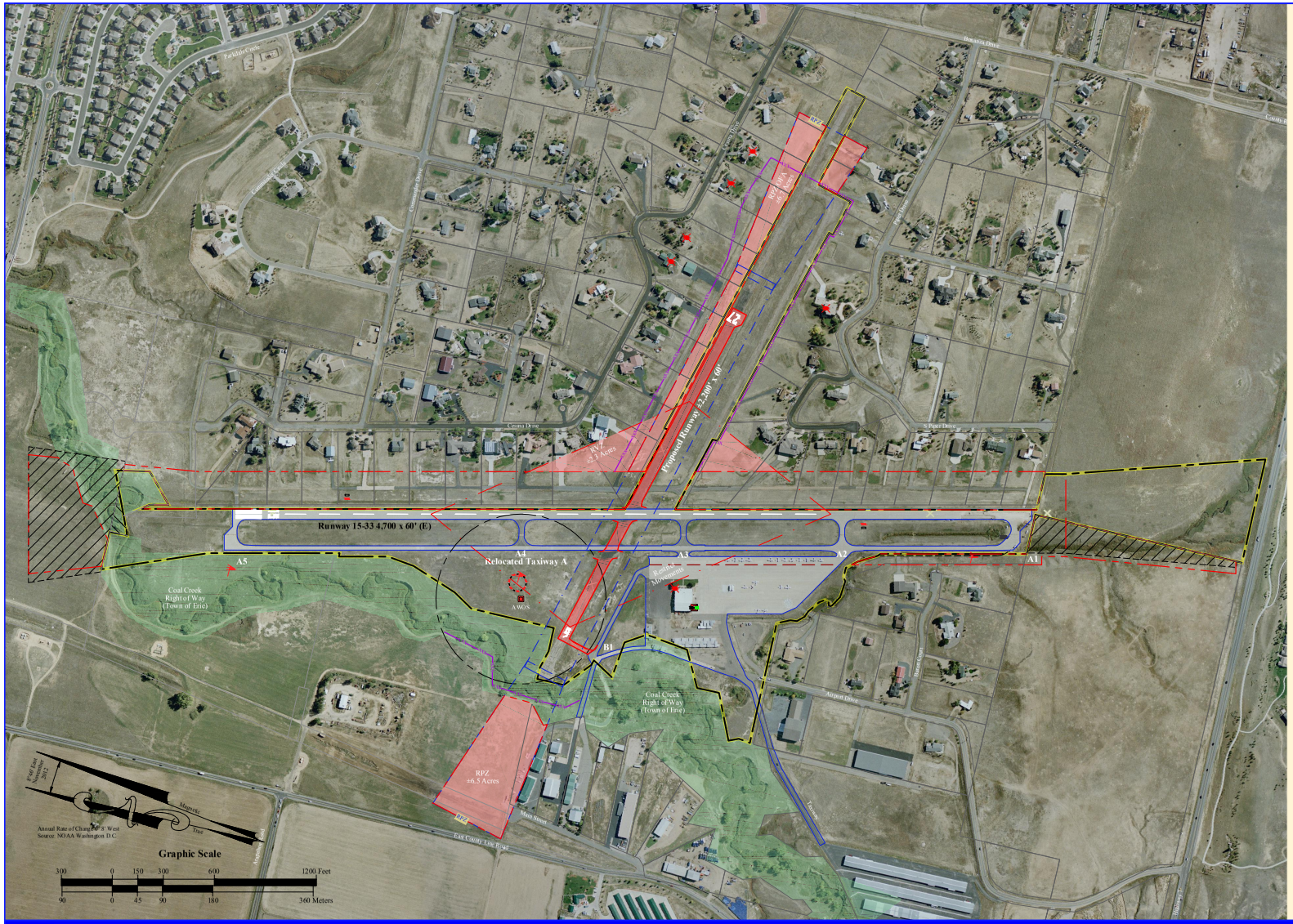


***Proposed* Typical Cross-Section View;Transitional Surface Clearances**



***Existing* Typical Cross-Section View;Transitional Surface Clearances**

Alternative No. 2: Improved All-Weather Capability



Legend

(E)	
	Existing
	Existing Property Line
	Runway Protection Zone (RPZ)
	Object Free Area (OFA)
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Improvements
	Obstruction Light

Some Reasons to Say "Yes"

- Responsive to the the pilot during strong westerly wind conditions.
- One option to meet standards.

Some Reasons to Say "No"

- Runway length insufficient for many aircraft and pilots
- Operating environment creates challenges for unfamiliar pilots, briefing and PPR recommended.
- Necessary land envelope may constrain revenue-producing development areas
- No FAA/CDOT funding.
- Areas not experiencing aircraft operations and noise in the recent past will be exposed.

Improvements

- Acquire Land (13.2 Acres)
- Acquire RVZ Easement (3.6 Acres)
- Grade Safety Area, Grade for Clear Runway 27 Approach Surface
- Install Fence
- Light/Remove Likely Obstructions
- Pave ±2,200' by 60' with one connect and mark with signage

Total Estimated Cost	$1,100,000
Turf Option:	$650,000

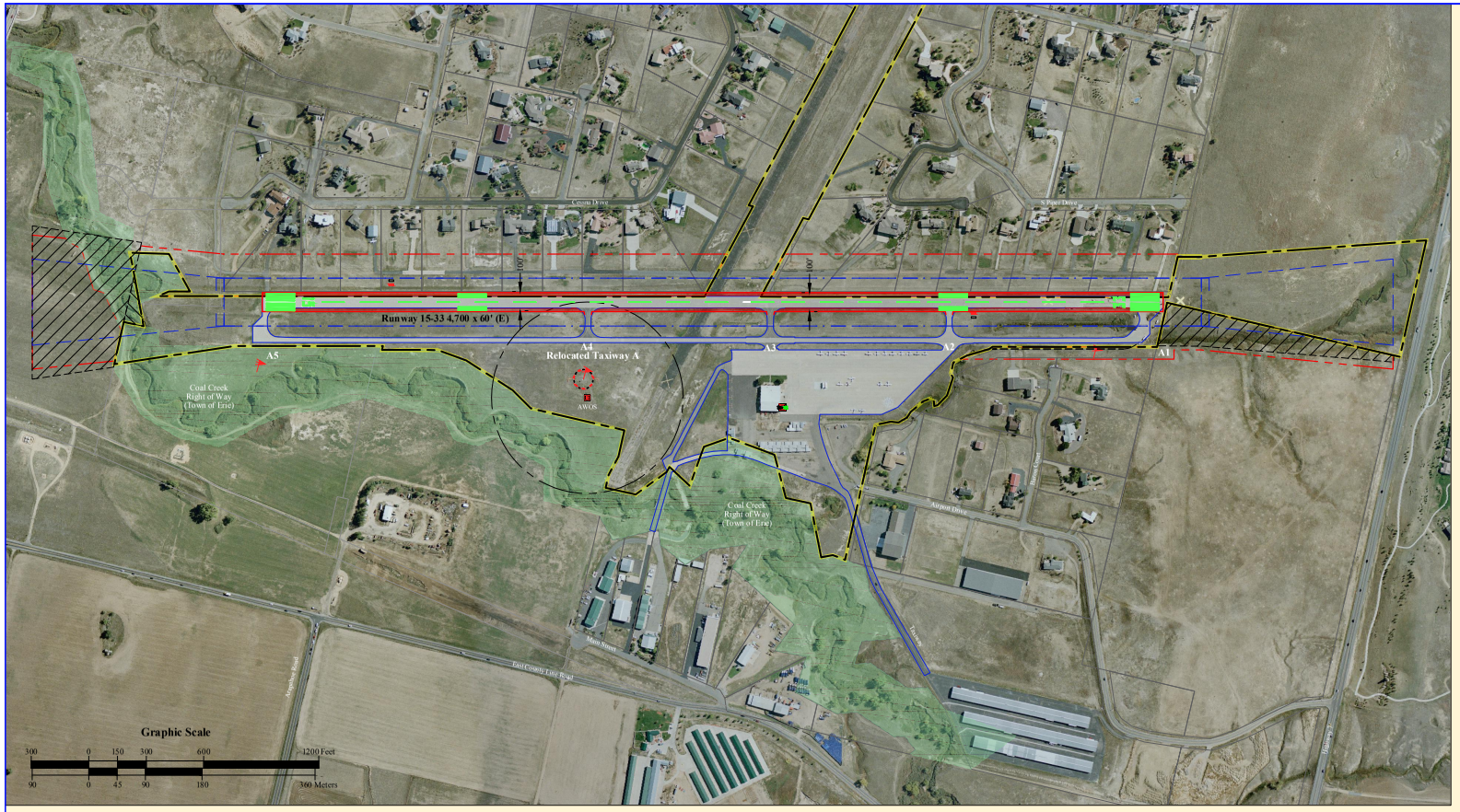
Notes

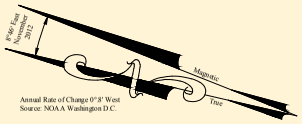
- Airport Fund pays for 100%.
- Visual Runway Only Planned
- Assumes Land Can Be Acquired
- Assumes Associated Taxiways are not Improved
- Powerlines along County Line Road Should Be, Best Case, Lowered
- Some Tiedowns Lost, Apron to be Marked Non-Movement
- Operational Challenges Remain and Cannot be Easily Designed Out.

Erie Municipal Airport (EIK)

Alternative No. 3A: Accommodate Winds with Crosswind Runway

ADG





Legend

(E)	Existing
	Existing Property Line
	Runway Protection Zone (RPZ)
	Object Free Area (OFA)
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Improvements
	Proposed Property Line

Some Reasons to Say "Yes"

-Responsive to the aviation business community and the general economy.
-Perhaps necessary to attract aviation business to the field.
-One method to meet standards.

Improvements

-Widen Runway
-Relocate Runway Edge Lights

Total Estimated Cost $835,000

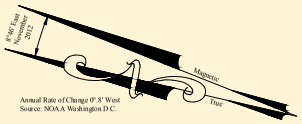
Notes

-FAA Pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.

Erie Municipal Airport (EIK)

Alternative No. 3B: Accommodate Winds with Runway Widening

ADG



Legend

(E)	Existing
	Existing Property Line
	Runway Protection Zone (RPZ)
	Object Free Area (OFA)
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Improvements
	Proposed Property Line

Some Reasons to Say "Yes"

-Responsive to the aviation business community and the general economy.
-Perhaps responsive to attract aviation business to the field, a minimum length.

Some Reasons to Say "No"

-Not supported in state plan.
-Requires justification (operations counts which may not materialize).
-Coal creek environmental impact
-Noise Contour marginally expands
-Cost
-Comprehensive Plan would perhaps require an update

Improvements

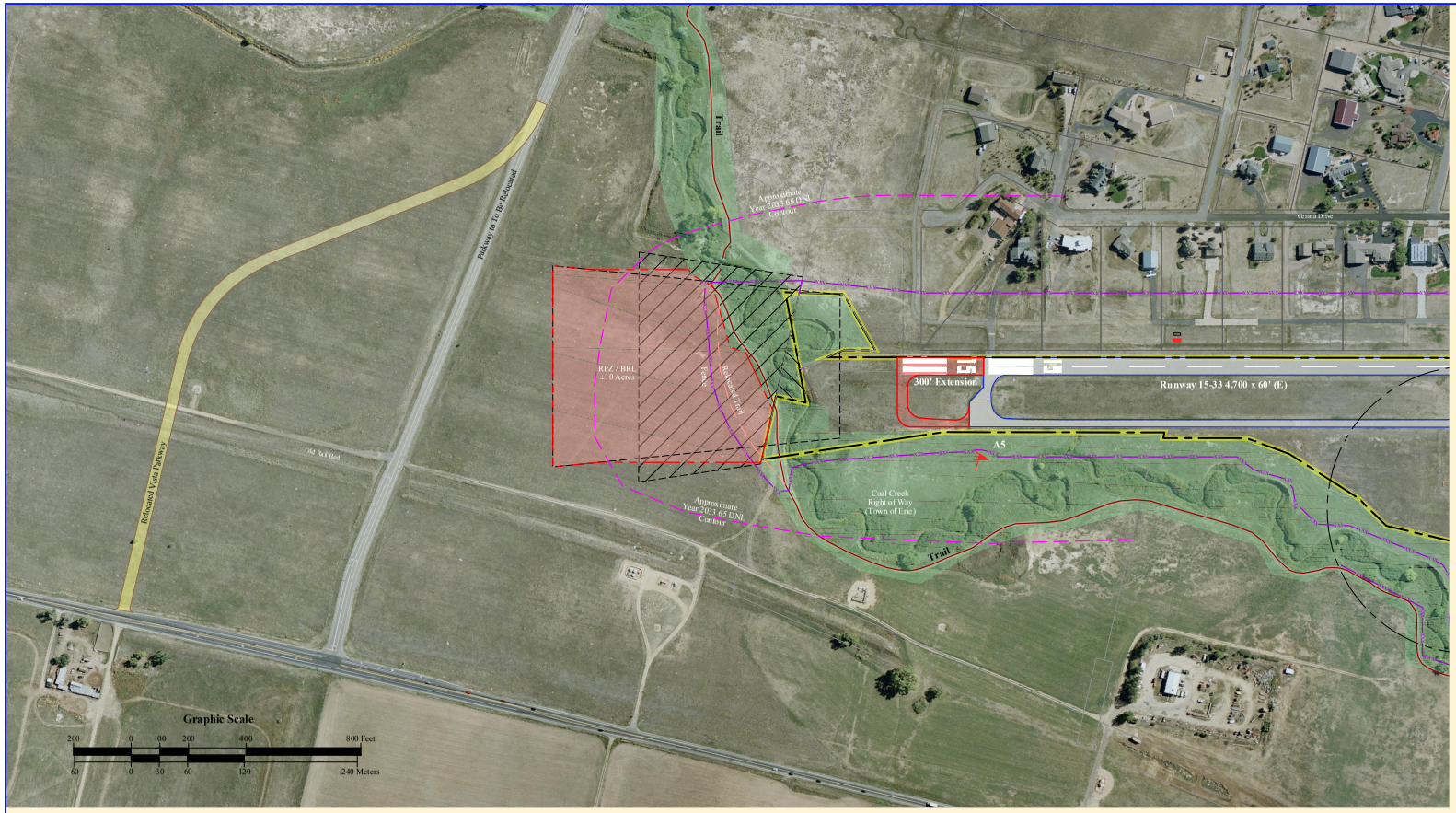
-Acquire Land (9 Acres)
-Extend Runway and Taxiway A
-Relocate Landing Aids
-Install Runway/Taxiway Edge Lights
-Install Perimeter Fence
-Relocate Trail

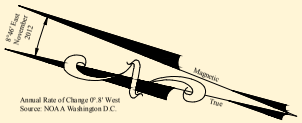
Total Estimated Cost $975,000

Notes

-FAA Pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.
-Assumes Land Can Be Acquired

Alternative No. 4A: Extend Runway 15-33 220 feet to 4,920-Feet





Legend

(E)	Existing
	Existing Property Line
	Runway Protection Zone (RPZ)
	Object Free Area (OFA)
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Improvements
	Proposed Property Line

Some Reasons to Say "Yes"

-Responsive to the aviation business community and the general economy.
-Perhaps responsive to attract aviation business to the field.
-More meaningfully meets FAA *standard* runway length.

Some Reasons to Say "No"

-Not supported in state plan.
-Requires justification (operations counts which may not materialize).
-Coal creek environmental impact
-Noise Contour expands northerly
-Cost
-Comprehensive Plan would perhaps require an update.
-Vista Parkway Relocation Needed; Conceptualized Location, Curve Radii Perhaps Prohibits

Improvements

-Acquire Land (10 Acres)
-Grade RSA/Relocate for Coal Creek
-Extend Runway and Taxiway A
-Relocate Landing Aids
-Install Runway/Taxiway Edge Lights
-Install Perimeter Fence
-Relocate Trail
-Relocate Vista Parkway

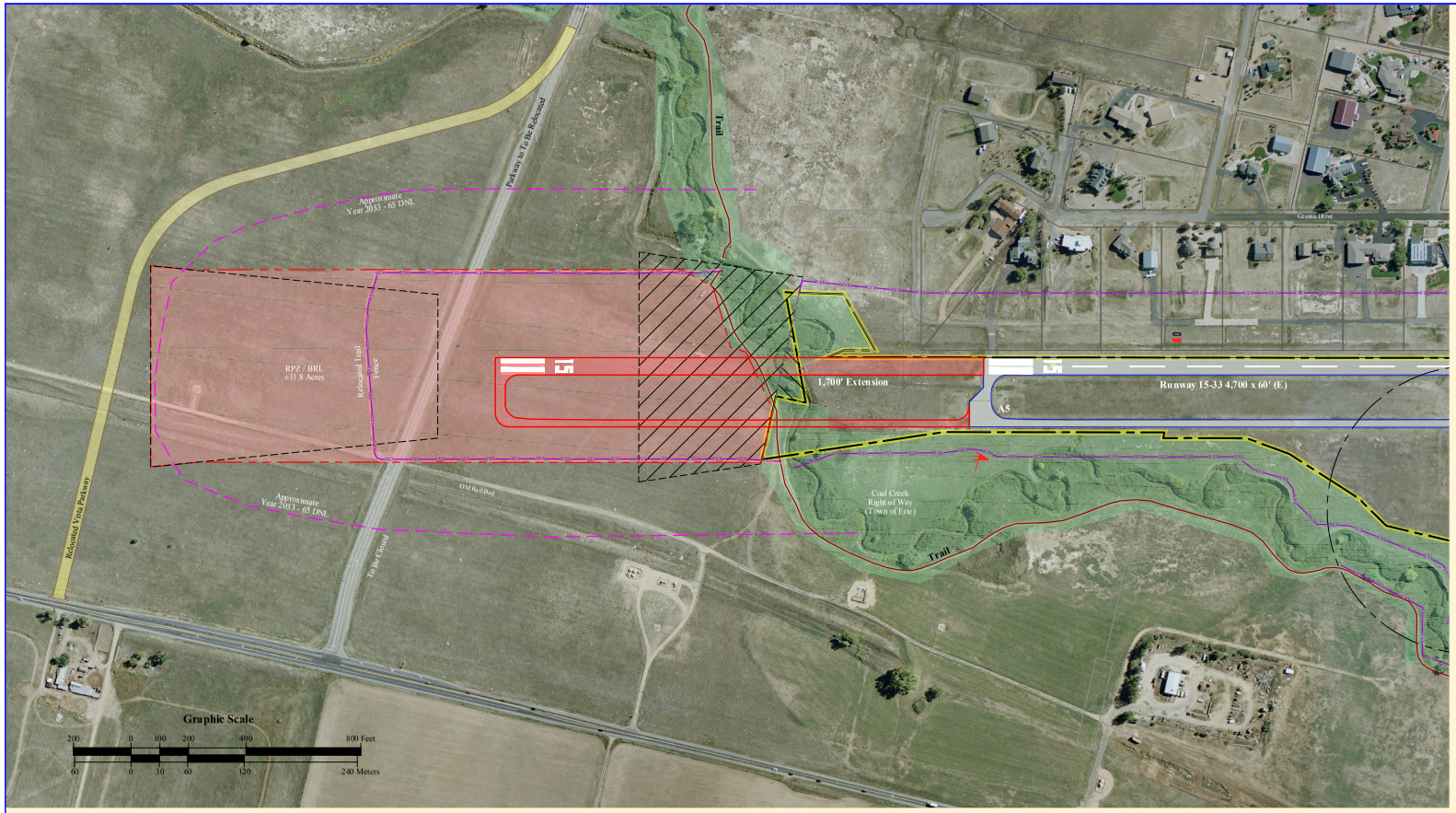
Total Estimated Cost $1,350,000

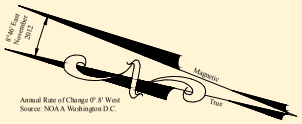
Notes

-FAA Pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.
-Assumes Land Can Be Acquired
-Assumes Coal Creek Disturbance OK
-Assumes Trail Can be Relocated
-Assumes Floodplain Permitting
-Assumes Upstream Floodplain Impacts Can Be Mitigated

Alternative No. 4B: Extend Runway 15-33 300 feet to 5,000-Feet

ADG





Legend

(E)	
	Existing
	Existing Property Line
	Runway Protection Zone (RPZ)
	Object Free Area (OFA)
	Existing Pavement
	Existing Avigation Easement
S.S. S.S. S.S.	Future Fence
	Future Improvements
	Proposed Property Line

Some Reasons to Say "Yes"

- Most responsive to the aviation business community and the general economy.
- Perhaps best to attract aviation business to the field.
- Meets FAA *standard* runway length.

Some Reasons to Say "No"

- Not supported in state plan.
- Requires justification (operations counts which may not materialize).
- Coal creek environmental impact
- Noise Contour expands northerly
- Substantial Cost
- Comprehensive Plan would perhaps require an update.
- Vista Parkway Relocation Needed; Conceptualized Location, Curve Radii Perhaps Prohibits

Improvements

- Acquire Land (32 Acres)
- Grade RSA/Structure for Coal Creek
- Extend Runway and Taxiway A
- Relocate Landing Aids
- Install Runway/Taxiway Edge Lights
- Install Perimeter Fence
- Relocate Trail
- Relocate Vista Parkway

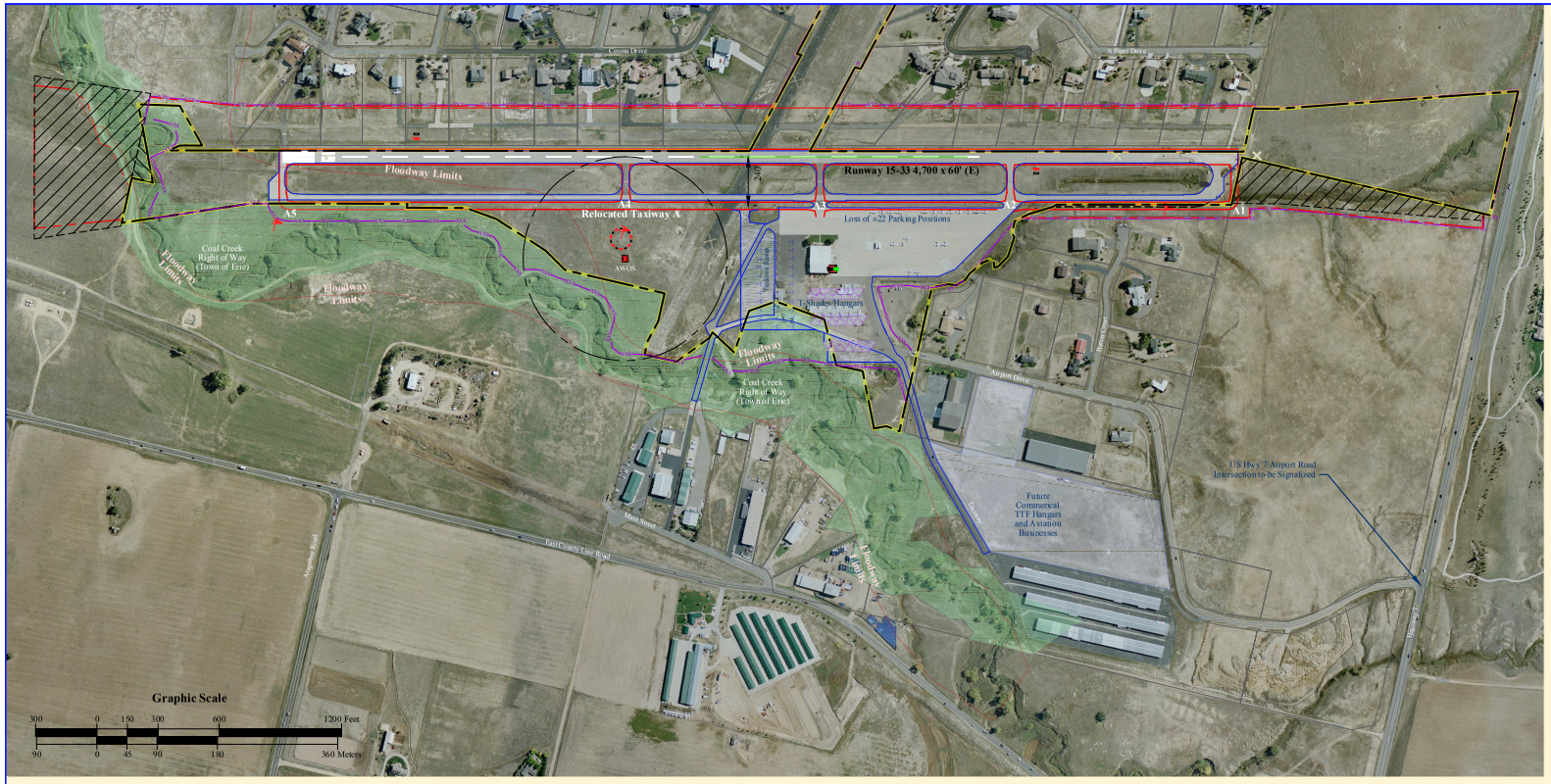
Total Estimated Cost $10,800,000

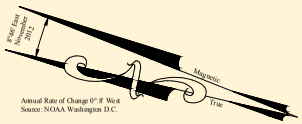
Notes

- FAA Pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.
- Vista Parkway Relocation Needed
- Visual Runway Only Planned
- Assumes Land Can Be Acquired
- Assumes Coal Creek Disturbance OK
- Assumes Trail Can be Relocated
- Assumes Floodplain Permitting
- Assumes Upstream Floodplain Impacts Can Be Mitigated

Alternative No. 4C: Extend Runway 15-33 1,700 feet to 6,400-Foot

ADG





Legend

(E)	Existing
	Existing Property Line
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Aiside Improvements
	Future Landside Improvements

Reasons to Say "Yes"

- Relatively Inexpensive
- Accommodates Near-Term Demand

Reasons to Say "No"

- No Meaningful Long-Term or Aviation Business Demand Accommodation
- Auto Parking Remains Separated from Terminal Area
- Sub-Optimal Airport Automobile Access Remains

Improvements

- Relocate Port-A-Ports and Improve Pavements Around
- Install T-Shades (Aircraft Storage) and improve pavements around
- Construct New Tie-Down Ramp

Total Estimated Cost $1,600,000

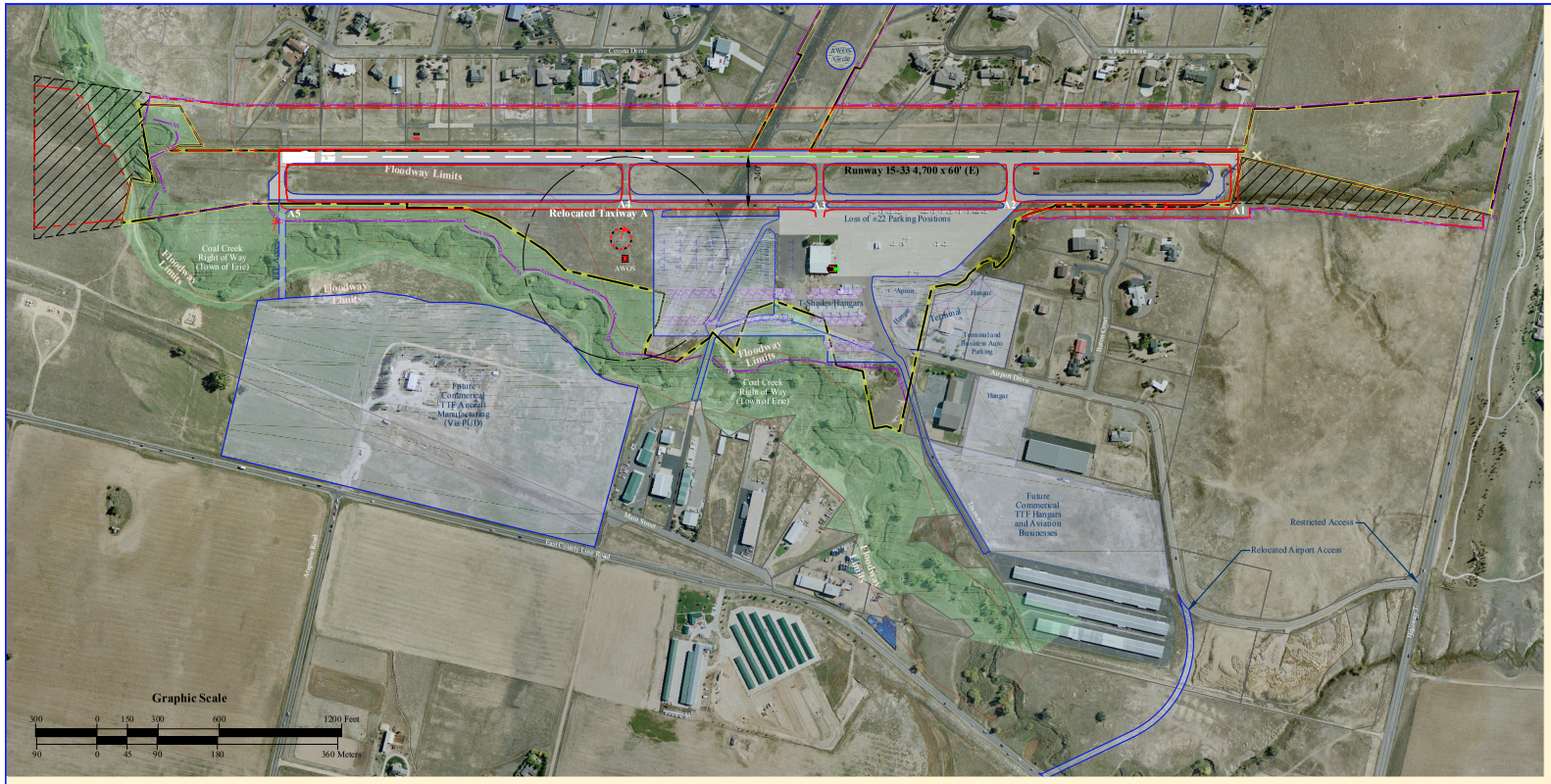
Notes

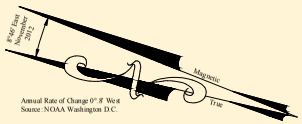
- Alternative No. 1 "As-Is" is shown for for this all other landside alternatives for standards compliance.
- FAA pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.
- Airport Fund pays for hangars.
- Existing apron will be marked to indicate non-movement area for the eastern apron edge tie-down loss.
- Commercial TTF access agreements perhaps necessary.
- Costs for intersection signal not included.

Erie Municipal Airport (EIK)

Alternative No. 5A: Minimal Landside Development

ADG





Legend

(E)	Existing
	Existing Property Line
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Airside Improvements
	Future Landside Improvements

Reasons to Say "Yes"

- More responsive to the aviation business environment, aviation economic development generally.
- Accommodates Longer-Term Demand
- Auto Parking No Longer Separated from Terminal Area
- Airport Automobile Access Relocated

Reasons to Say "No"

- Cost. Improvements are beginning to become unworkable under current financial constraints.
- Requires acquisition and relocation.
- AWOS and Segmented Circle must be moved across the runway and historic crosswind runway must remain closed.

Improvements

- Construct New Terminal Ramp
- Construct New Terminal Building
- Ground Lease New Hangars for Aviation Businesses
- Remove Port-A-Ports
- Install T-Shades (Aircraft Storage) or T-Hangars and improve pavements around
- Construct New Tie-Down Ramp

Total Estimated Cost $6,500,000

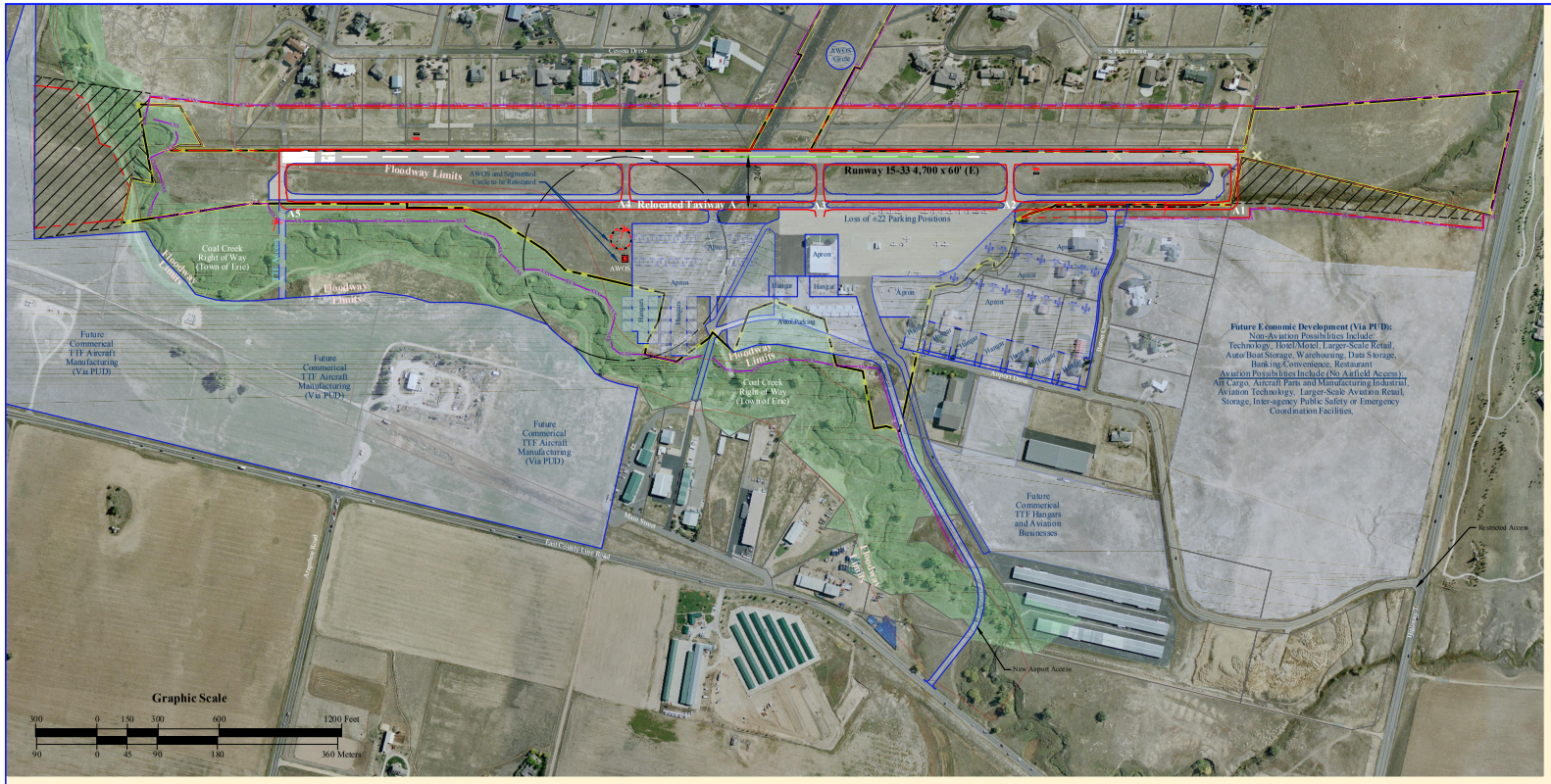
Notes

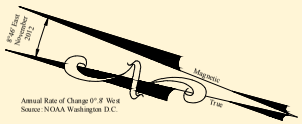
- Alternative No. 1 "As-Is" is shown for for this all other landside alternatives for standards compliance.
- FAA pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.
- Airport Fund pays for hangars.
- Existing apron will be marked to indicate non-movement area for the eastern apron edge tie-down loss.
- Commercial TTF access agreements perhaps necessary.
- Terminal building could be combinded with hangar(s) to make a joint facility.
- Northwest Development Area TTF: Expected to access at County Line/Arapahoe Road and at the end of runway. All improvements and access agreements by others per a PUD.
- Costs for Access Road and ground-leased Executive Hangars not included.

Erie Municipal Airport (EIK)

Alternative No. 5B: Moderate Landside Development

ADG





Legend

(E)	Existing
	Existing Property Line
	Existing Pavement
	Existing Avigation Easement
	Future Fence
	Future Aviside Improvements
	Future Landside Improvements

Reasons to Say "Yes"

- Most responsive to the aviation business environment, leverages and maximizes the airfield for the community and the region
- Accommodates longer-term demand and robust demand beyond.
- Auto parking no longer separated from terminal area
- Airport automobile access relocated

Reasons to Say "No"

- Substantial Cost. Improvements are unworkable under current financial constraints without substantial private sector participation.
- Requires more substantial acquisition and relocation, preferably on a volunteer basis.
- AWOS and Segmented Circle must be moved across the runway and historic crosswind runway must remain closed.

Improvements

- Construct New Terminal Ramps
- Construct New Terminal/Hangar
- Ground Lease New Hangars for Aviation Businesses
- Remove Port-A-Ports
- Construct New Tie-Down Ramp

Total Estimated Cost $14,200,000

Notes

- Alternative No. 1 "As-Is" is shown for for this all other landside alternatives for standards compliance.
- FAA pays for 90% and CDOT 5% if justified, Airport Fund pays for 5%.
- Airport Fund pays for hangars.
- Existing apron will be marked to indicate non-movement area for the eastern apron edge tie-down loss.
- Commercial TTF access agreements perhaps necessary.
- Terminal building could be combined with hangar(s) to make a joined facility.
- Northwest Development Area TTF: Expected to access at County Line/Arapahoe Road intersections at the end of runway. All improvements and access agreements by others per a PUD.
- No airfield access is proposed for economic development area south of Baron Court.
- New Airfield Access crosses Coal Creek and minimally interacts with floodway on the way to the terminal area.
- Costs not included for new access, ground-leased executive hangars.
- Existing FBO Hangar to be Relocated due west of its current site.

Erie Municipal Airport (EIK)

Alternative No. 5C: Robust Landside Development

ADG

5.7 Summary

Overall, a selected course of action for the future represents the formulation of a development policy as much as the process of concept selection. Pursuant to the objectives identified in Section 1.2.1 of this planning, scenarios will be evaluated based upon the following criteria:

1) Safety
2) Cost
3) Operational effectiveness
4) Airspace considerations
5) Land resource utilization
6) Environmental considerations
7) Terminal/landside operational effectiveness
8) Flexibility and expandability
9) Construction/phasing issues
10) Revenue generation
11) Opportunities for private investment

Trustee selection of a scenario or a preferred set of alternatives could be the basis for an updated Airport Layout Plan within the overall master planning context.

Important to note at this point is that selection of an alternative(s) or scenario does not necessarily mean it will happen. The intent is to create, metaphorically, a 20-year 'road' map.

The map then becomes a plan only, and plans may change. The functional result of this type of airport planning, in many instances, is an expectation of change. Or more to the point, a plan which has remained unchanged over a given 10-year period has perhaps not been responsive to 10 years' worth of community or economic growth.

Also important to note is that the Town Trustees may update or change the Airport Layout Plan at any time, but FAA currently funds a more comprehensive Airport Master Plan Update every 10 years or so.

Federal and state funding decisions for improvement at EIK are not made based upon analyses herein or a Trustee decision thereto.

Funding decisions are made during the annual Capital Improvement Plan (CIP) process, primarily through CDOT Aeronautics with FAA as a close, active participant. Generally, for federal-funding participation, a given improvement or series of, must:

1) Be found on the approved Airport Layout Plan; that is, officially sanctioned by the Trustees.
2) Be eligible/justified for federal funds, per FAA advisory circular or supplemental guidance.
3) Be environmentally-cleared
4) Be funded, in an increasingly competitive general aviation funding environment.

More about these prerequisites is covered in the next chapter.

Prior to evaluation, a bit of clarification for, and description of each evaluation criteria is perhaps helpful.

1) Safety in this context refers to design standards compliance and ability to effectively provide obstruction disposition.
2) Cost is referencing estimated costs to construct only.
3) Operational effectiveness relates to the ability of EIK to operate with limitation and constraint.
4) Airspace considerations relates to the ability of EIK to operate without limitation and constraint from an airspace perspective.
5) Land resource utilization refers to the ability of existing and/or planned land acquisition to accommodate anticipated demand.
6) Environmental relates to the extent of EIK's impact of the local environment with respect to NEPA impact categories

7) Terminal/landside operational effectiveness
8) Flexibility and expandability issues
9) Construction/phasing issues.
10) Revenue generation is the ability of the enterprise fund to raise sufficient dollars to remain self-sufficient.
11) Opportunities for private investment is the extent to which aviation businesses find opportunities to conduct business via ground leasing or off-airport accommodation.

Importantly, as can perhaps be seen this evaluation is (1) subjective and (2) not weighted.

The next few subsections discuss each evaluation criteria for the scenarios.

Safety

Each alternative is crafted to be design standards compliant with relative ease of obstruction disposition should Section 4.4 and Section 4.5 recommendations be considered. All alternative and scenarios are weighted equally as 1 as a consequence. The single exception to this, from an unrelated, but important *operations perspective* is Alternative No. 3A Crosswind Runway. Section 5.5.1 identifies potential inadequacies which warrant a 2 rather than a 1, at least from the consultant's perspective.

The remaining Scenarios I-V are assigned a 1-5 evaluation criteria ranking with a 1 being the most responsive and a 5 the least. Similarly, Alternatives are assigned a 1 or 2, or a 1, 2, 3 ranking based upon grouping.

Cost

Scenario and alternatives are simply ranked by the planning-level cost estimate with the least expensive being the most responsive.

Operational Effectiveness

The notion of operational effectiveness focuses on airside but landside interaction is important. Generally, the more demand accommodation afforded, with the prerequisite design standard compliance, the greater operational effectiveness.

Future demand, at least for purposes of forecasted values herein, is constrained with any alternative other than Alternative No. 4. This alternative depicts the recommended runway length and width and the recommended apron area. While constrained demand is not a generally matter for standards compliance, it is perhaps more an issue of economic development accommodation.

Airspace Considerations

Each alternative is crafted to be airspace standards compliant with relative ease of obstruction disposition. It is important to note that obstruction exist and will be created with all of the airside-related alternatives; and these will be disposed of via lowering or lighting per FAA guidance. However, alternative and scenarios are not weighted equally as 1. This is because Alternative No. 2A, more meaningfully allows aircraft operation during periods of inclement weather. Alternatively, off-airport impacts are important. Residences along the eastern flight line will be required to lower trees and light structure for night minima availability. Grading for runway 33 approach surface is also an expense.

Land Resource Utilization

The potential to employ future commercial TTF significantly expands EIK's economic potential. Should future commercial TTF be desired, it may become EIK's defining feature and a reason for the airport potentially signification economic contribution to the region. Other alternatives specify on-airport development with fee acquisition. This is, of course, the traditional method of demand accommodation at a given general aviation airport and is perhaps a reasonable proposal.

The Coal Creek floodway in meaningful ways defines EIK's future. The Town has promulgated prerogative supplemental to its comprehensive plan. See Section 2.5.1 provides more detail in this regard and indicates that Coal Creek should remain as-is as much as possible.

Environmental Considerations

Upon Town staff review of Working Paper No. 2, environmental coordination will be completed. Coordination involves sending this chapter to the various jurisdictional governmental agencies which may wish comment, mot limited to: EPA, USCOE, USDA-NRCS, FWS, NPS, FEMA, SHPO, CDPHE, Boulder County, the City of Louisville, Weld County and the City and County of Broomfield. Known issues for consideration include: Coal Creek flood areas and drainages, various permitting and land ownership issues. Section 2.5, specifically Section 2.5.3 provides additional baseline detail.

This section will be updated and correspondence appended for the additional Trustee consultations following the Open House for this master plan.

Terminal/Landside
Operational Effectiveness

The defining inadequacies for this evaluation category is the need for an airport visitor to cross an active taxiway from auto parking to the terminal area and the inadequacy of the US Highway 7/Airport Road intersection. Though most visitors are familiar with the aviation environment, the inadequacies remain for the parking area. Alternative No. 5B and 5C relocate the access road to mitigate and are superior, but costly options.

Flexibility and Expandability

This section and the next are somewhat related. Alternatives could be phased over time. For example, Alternative No. 5A could be short-term, Alternative 5B could be intermediate-term and Alternative No. 5C could be longer-term. Furthermore, selection of Alternative No. 5C could be made with the instruction to protect for its potential. This instruction could be made with the thought being that the funding and interest to actually build the improvements is not material at this time, but it is desired to reserve and set-aside the property should demand and financial conditions mature or materialize, and that the alternative land uses are perhaps not desired.

Alternatives are somewhat created so that they may build upon each other; that is, for example, Alternative No. 5B can build upon Alternative No. 5A, and Alternative No. 5C can build upon Alternative No. 5B. However, the nature of the field and it potential suggests that this works to a up to a point. It is for this reason that scenarios were created.

Construction and Phasing

Following on and corresponding with the above flexibility discussion, phased construction of the improvements is a bit different. Phasing and meaningful project sequence per Trustee prerogative is the subject of the next chapter.

Revenue Generation

Financial self-sufficiency is a matter for grant assurance compliance and is foundational to this planning effort. It is for this reason that demand accommodation is made for the long-term.

Hangar ground lease revenue is often a large component of revenue for a given general aviation airport. Future hangar can either be funded via from the Airport Fund or by ground leasing. Alternative No. 5B shows T-hangar or T-shade development funded the Airport Fund, while Alternative N. 5C almost exclusively shows hangar area for future ground leasing. Somewhat obviously, upfront costs for ground leasing are

relatively small while the long-term return is less. And, the reverse is generally true for hangar build via the Airport Fund.

With respect to airside facilitates, revenue will increase with a larger, more business aircraft capable airfield.

Opportunities for Private Investment

On-Airport ground leasing is not a common practice at EIK and may be an important part of its future. The reason why it is perhaps not commonplace is due to lack of currently available property within which to lease. Additional land acquisition suggested by the last two landside alternative will create a more traditional leasing environment with less TTF.

However, future Commercial TTF may be an important part of EIK's future. This arrangement allows all of the off-airport benefit (jobs, increased taxes and overall economic growth) without being on-airport property.

With respect to airside improvements, revenue will increase with a larger, more business aircraft capable airfield.

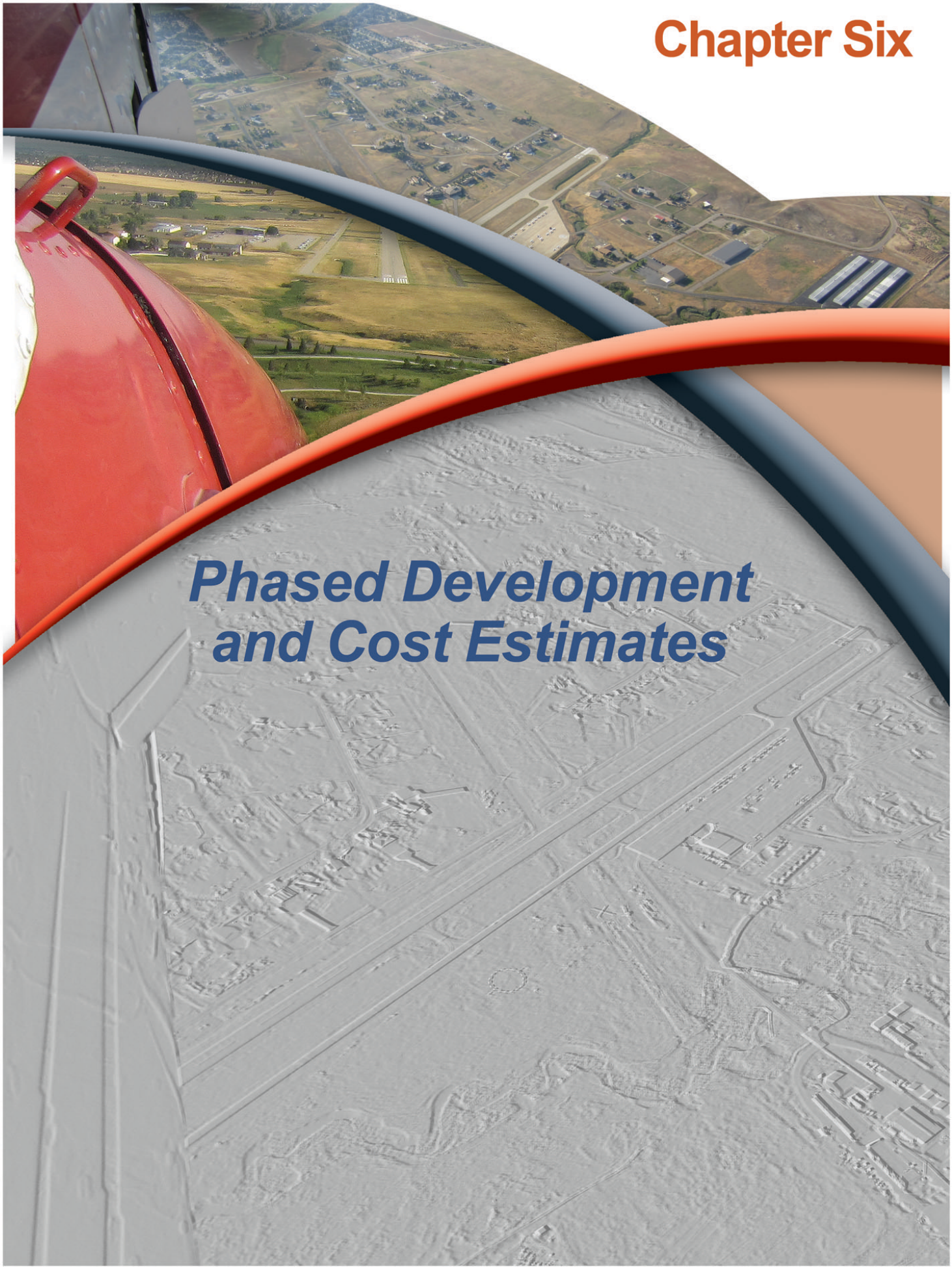
New Apron

5.8 Trustee Prerogative

Information in this chapter was coordinated with Town staff and presented to the Town Trustees. Following these consultations, an open house was held for constituent consideration; then, a second meeting with the Town Trustees was held to solicit direction. This meeting included constituent feedback from the open house and environmental coordination pursuant to Section 5.9.6.

In addition to committing to keep the airport complaint with FAA standards (Alternative 1), the Trustees opted to improve all weather capability by pursuing an instrument approach (Alternative 2). For improved crosswind capability, the Trustees selected runway widening (Alternative 3B). The runway length preferred by the Trustees was Alternative 4A, lengthening the runway by 220 feet.. Additionally, the Trustees chose to prepare for moderate development on and off-airport (Alternative 5B). These decisions were used to prepare the final Airport Layout Plan drawing set.

Chapter Six



Phased Development and Cost Estimates

Chapter Six – Phased Development

6.0 Introduction

Capital improvements and preventive maintenance at the Erie Municipal Airport are scheduled for three successive time periods: Phase I; 2016–2020, Phase II; 2021–2025, and Phase III; 2026–2035. The following sections describe and depict the various improvements, by phase, along with an estimated cost for each item. Development items are shown on three exhibits within the text. The recommended phasing is not set in stone and changes in aviation demand, Town perspective, grant funding or area economics may alter proposed improvement timing.

Estimates were developed using historical year (2014) costs. Each figure represents an estimate of the total project cost. Estimates include construction, engineering, administration, testing, surveying, and legal expenses. It should be noted that these estimates are order of magnitude accurate for planning purposes, based upon area bid tabulations. A contingency amount was generally added to anticipate unforeseen circumstances. This approach reduces the chance of budget surprises when a more detailed investigation and design is initiated. Cost estimates should be reviewed and updated as necessary to account for technological improvements, changes in the economy, future construction innovations, and/or changes in local conditions.

The proposed improvement items are based on unsubstantiated need and not availability of funding; these costs constitute an constrained estimate of future airport needs. The timing of these improvements may vary due to funding constraints. The tables identify FAA, State and Town participation. Town participation may be revenues from the operation of the airport or less likely, from general funds. This could also include general aviation or corporate hangar developers, aviation business owners, aerospace companies or similar companies or individuals that wish to make an investment in the airport. These types of developments are generally not eligible for FAA funding, but sometimes compete for CDOT funds.

6.1 Short-Term Improvements

During this phase, several minor development and improvement items are planned to provide for safe and efficient airport operations and to allow for planned development. The Short Term Improvements, Exhibit ST is meaningfully synonymous with the current Airport Capital Improvement Plan (ACIP). No changes were made to historical CIP except for additions in the Year 2020. The following descriptions accompany the exhibit on upcoming pages.

1. 2016; Construct SRE Building

Enclosure and housing for Snow Removal Equipment is the first project on the current Airport Capital Improvement Program. This facility will have roll-up doors and access the main apron. Design should allow for ease of add-ons as terminal building uses are often complementary to this building.

2/3. 2017; Pavement maintenance;
Runway, Taxiway A and Apron

Select slab replacement and repair is in order for runway and taxiway concrete pavement to extend useful life and prevent spalling and debris destructive to aircraft on movement areas. Select area joint rehabilitation is also planned.

4. 2018; Modify Apron West of FBO Hangar

Apron due west of the main hangar at EIK has deteriorated long past its useful life. This area of the field is prime, relatively inexpensive on-airport area for hangar development. Portable hangars will either be relocated or removed to make way for fixed aircraft storage. It is important that hangar siting consider the 65.5-foot Taxiway OFA clearance to fixed objects for the relocated Taxiway C.

5. 2020; Airport Documents Update

A description of these documents and their use is found in Chapter One. Not all of these are federally eligible for grant-in-aid funding. CDOT may participate in those activities which are not eligible. There are some good examples from other smaller general aviation airports which are suitable for template, and retention of a consultant is perhaps not prerequisite, and funding is not identified for meaningful document creation, in most cases.

6. Acquire Land and Perimeter Fence Project

6.1. 2020; Environmental Assessment

Every federal action involving AIP grant-in-aid funding should have an environmental determination from the Denver ADO. Given the proposed improvements, the level of study will likely be an Environmental Assessment.

7. 2020; Construct T-Hangar Apron (Phase I)

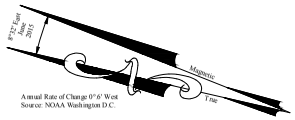
In order to maximize the allowable land envelope for hangar development west of the main hangar, a small portion of paved area needs to be constructed for T-Hangars. Note that costs to construct these hangars are not included in the estimates below.

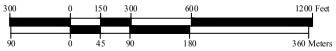
Exhibit ST following this page depicts these items numerically tabulated and referenced in plan view, totaling:

FAA Non Primary Entitlement:	$894,692
FAA Discretionary:	$00
CDOT Aeronautics	$274,705
Town:	$74,705
Others:	$00
Unfunded:	$470,278
Totals	**$1,714,380**

Short-Term Improvements (2016 - 2020)

Date	Number	Recommended Improvements	FAA NPE	FAA Disc.	CDOT	Town	Others	Unfunded	Totals
2016	1	SRE Building	$444,692	$0	$24,705	$24,705	$0	$0	$494,102
2017	2	Pavement Maintenance: Runway/Taxiway A	$0	$0	$0	$0	$0	$138,890	$138,890
2017	3	Pavement Maintenance: Select Apron Rehab	$0	$0	$0	$0	$0	$163,888	$163,888
2018	4	Modifiy Apron West of FBO Hangar	$450,000	$0	$250,000	$50,000	$0	$0	$750,000
2019		Carry Over (Not Shown)	$0	$0	$0	$0	$0	$0	$0
2020	5	Airport Documents Update (Not Shown) 5.1 Update Airport Rules and Regulations 5.2 Update Airport Minimum Standards 5.3 Update Airport Development Standards 5.4 Update Access Agreements (As Necessary) 5.5 Update Land Use Planning/Overlay/Comp Plan 5.6 Create Airport Sustainability Plan 5.7 Create Airport Security Plan 5.8 Update Rates and Charges (As Necessary)	$0	$0	$0	$0	$0	$17,500	$17,500
2020	6	Acquire Land and Perimeter Fence Project 6.1 Environmental Assessment; Acquire Land (Not Shown)	$0	$0	$0	$0	$0	$150,000	$150,000
2020	7	Construct Hangars	$0	$0	$0	$0	$0	$0	$0
		Totals:	$894,692	$0	$274,705	$74,705	$0	$470,278	$1,714,380





Erie Municipal Airport
Town of Erie, CO

No.	Revision	Ckd	Date

ADG AIRPORT DEVELOPMENT GROUP, Inc.
1776 South Jackson Street | Suite 205
Denver, Colorado 80210-3822
303.782.0660 / 303.782.0442 fax
www.airportdevelopment.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No.:	EIK1398M
Designed By:	SMP
Drawn By:	KG
Approved By:	SPM
Date:	August 2015

Short-Term Improvements Years 2016-2020

Exhibit:
ST
of VII Exhibits

6.2 Intermediate-Term Improvements

During this intermediate phase the focus shifts to substantial capital improvements for standards compliance. B-II/TDG-2 airfield improvements to accommodate FAA standards, along with apron/hangar expansion pursuant to anticipated demand accommodation.

The following descriptions accompany the tables and the exhibits on upcoming pages. Years are not assigned to specific projects as timing and necessity are not as clearly defined as in the previous section.

Funding for improvements beyond the runway rehabilitation project (project number eight) is identified as unfunded.

6. Acquire Land and Perimeter Fence Project

6.2. 2021; Environmental Mitigation

Mitigation in this sense likely relates exclusively to the filing and execution of a Clean Water Act Section 404 permit for wetlands pursuant to an Environmental Assessment finding the previous year. Banking is the likely preferred disposition.

6. Acquire Land and Perimeter Fence Project

6.3. 2021; Runway 16 and 34 Partial RPZ and Taxiway A OFA Fee/Easements

In order to accommodate the anticipated Taxiway A Relocation Project, new area will need to be graded near the northern and southern taxiway extents associated with coal creek. Areas of disturbance within will require fee acquisition, while the remainder could be fee or easement.

6. Acquire Land and Perimeter Fence Project

6.4. 2021; East-Side Lots Partial Easements

In order to accommodate Runway OFA standards, portion of every lot along the east-side and adjacent to the runway will need to be acquired. Consultation with FAA headquarters has revealed that an easement is sufficient form of title and grant assurance control for this purpose. While not yet knowable, appraiser-assigned damages to property owners could include taxiway loss of use, wastewater/septic field impacts and consideration for the location of the future fence.

8. Runway Rehabilitation Project

8.1. 2021; Environmental Assessment

Environmental clearance will be prerequisite to project initiation.

9. 2021; Construct T-Hangars (2)

It is expected that additional demand may materialize and a waitlist may become sufficiently long enough for the Town or a private developer to invest additional dollars at the airport in the form of more than one T-Hangar. The second hangar is planned after the access taxiway (project number 13) is operational.

6. Acquire Land and Perimeter Fence Project

6.5. 2022; Obstruction Mitigation

Trees an structure are penetrations to the 20:1 and 7:1 surfaces exist and vegetation will undoubtedly grow there and around the field. These are to be mitigated with solar lighting, via an updated TTF access agreement where appropriate.

8. Runway Rehabilitation Project

8.2. 2022; Group II RSA Grading

Grading surrounding airfield paved surfaces, particularly beyond runway ends, currently accommodates Group I aircraft (less than 49 feet in wingspan) and current standards should accommodate Group II. The functional result is that surface grading area enlarges and is more shallow than current.

8. Runway Rehabilitation Project

8.3. 2022; Reconstruct Runway to 12,500 pounds

The runway is continuing to experience concrete panel fails and is nearing the end of its useful life.

This project envisions reconstruction of the section to restart the life-cycle to its current strength.

8. Runway Rehabilitation Project

8.4. 2022; 220-Foot Northerly Runway Extension to 4,920 Feet

Additional runway length to accommodate users during hot summer days and for those operators currently penalized by the current runway length is planned. The additional 220 feet of runway will extend to the maximum length without the RSA interacting with the Coal Creek streambed.

8. Runway Rehabilitation Project

8.5. 2022; Widen Runway from 60 to 75 feet

100 feet of runway width is prescribed in order for EIK to meet the FAA wind coverage standard, and 75 feet is planned at this point.

8. Runway Rehabilitation Project

8.6. 2022; Modify Taxiway Connector Radii

FAA recently updated taxiway construction design standards and these standards serve to enlarge connecting pavements to the runway.

8. Runway Rehabilitation Project

8.7. 2022; New Airfield Signage and Runway Lighting

Improvement numbers 8.5 and 8.6 will require relocation of the current edge lighting, and signage at connector taxiways. Given the age of this equipment, new should be considered.

6. Acquire Land and Perimeter Fence Project

6.7. 2023; Construct Perimeter Fencing

Conceptual design, done prior to improvement number 6.1 should reveal a fence location to encircle EIK and provide some protection from larger mammals. Final design should consider many factors including FAA standards and airspace clearance homeowner perspectives and rights, environmental permitting, surface grading at steep locations including the Coal Creek vicinity, and perhaps most importantly access points and means of traversing (location, nature and size of gates).

6. Acquire Land and Perimeter Fence Project

6.8. 2023; Relocate AWOS

The current AWOS location is suboptimal with respect to future development. Given that the former crosswind runway will remain closed, this instrument can be relocated to the east side of the field. Preliminary coordination with the equipment manufacturer reveals that an increase in the wind sensor height of 10 feet or so will clear the 7:1 and meet the sensor height clearance requirements found in the FAA siting guidance.

10. Taxiway A Relocation Project

10.1. 2023; Environmental Assessment

Every federal action involving AIP grant-in-aid funding should have an environmental determination from the Denver ADO. Given the proposed improvements, the level of study will likely be an Environmental Assessment.

10. Taxiway A Relocation Project

10.2. 2024; Environmental Mitigation

Mitigation in this sense likely relates exclusively to the filing and execution of a Clean Water Act Section 404 permit for wetlands pursuant to an Environmental Assessment finding from the previous year. Again, banking is the likely preferred disposition or compensatory technique.

11. 2024; FBO Hangar Refurbish

The hangar is not original to the airport, but nearly so. Although project scope is not created, potential improvement could include select: reskinning and paint, lean-to office space modification or refurbishment, and utilities updating.

12. 2024; Vault Replacement, New Generator

The electrical vault is not original to the airport, but nearly so. An entirely new vault housing and component updating is on order along with a complementary back-up generator.

10. Taxiway A Relocation Project

10.3. 2024; TDG Group II Safety Area Grading

The standard runway centerline to parallel taxiway separation of 240 feet and holdine distance of 200 feet in some ways could be thought of as an entirely new taxiway. Site preparation and grading for this new taxiway is planned for this improvement. This improvement is site preparation only and not section construction. Current Taxiway A should remain operational and intact until phased improvement begins in the upcoming year. Temporary closures should be expected during construction.

13. 2025; Construct Taxiway

New, Group II taxiway access from off-airport will be required given the a new hangars are planned for project number nine, starting the year 2021. This new taxiway will connect Taxiway C at the newer 90 degree turn built in the short-term.

14. 2025; Update Airport Master/Sustainability Plan

FAA recommends and generally funds a formal update to the EIK Master Plan every 10 years or so. This update may more closely center on a sustainability concept, more thoroughly discussed in Section 4.6.

15. 2025; PAPI, REIL and Beacon Replacement.

These electrical navigation and landing aids will be nearing the end of their useful lives at this point in time and a refurbishment may be in order. A Four-light PAPI may be desirable.

16. 2025; Acquire SRE; Plow/Multi-Tractor

A period of time will have passed since the last equipment acquisition and new airfield maintenance equipment will assist airfield operations and maintenance. A smaller multi-unit piece of equipment is considered.

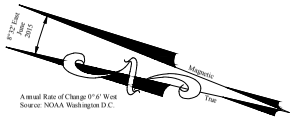
Exhibit IT on the following page depicts these items numerically-tabulated and referenced in plan view, totaling:

FAA Non Primary Entitlement:	$625,000
FAA Discretionary:	$5,908,500
CDOT Aeronautics	$328,250
Town:	$328,250
Others:	$00
Unfunded:	$1,990,000
Totals	**$9,180,000**

Intermediate-Term Improvements (2021 - 2025)

Date	Number	Recommended Improvements	FAA NPE	FAA Disc.	CDOT	Town	Others	Unfunded	Totals
2021	*6	Acquire Land and Perimeter Fence Project 6.2 Environmental Mitigation (Not Shown) 6.3 Runway 16 and 34 Partial RPZ & Taxiway A OFA Fee		$45,000 $585,000	$2,500 $32,500	$2,500 $32,500	$0 $0		$50,000 $650,000
2021	8	Runway Rehabilitation Project 8.1 Runway Rehabilitation; Environmental Assessment (Not Shown)							$0
2021	9	Construct Hangars (2)						$0	$0
2022	6	Acquire Land and Perimeter Fence Project 6.5 Obstruction Mitigation; Lighting (Not Shown)	$150,000	$40,500	$2,250	$2,250	$0		$195,000
2022	8	Runway Rehabilitation Project 8.2 Group II Runway Safety Area Grading 8.3 Reconstruct to 12,500 Pounds (Not Shown) 8.4 Lengthen to 4,920 Feet with 220 foot Northerly Extension 8.5 Widen Runway 16-34 from 60 to 75 feet 8.6 Modify Taxiway Connector Radii 8.7 New Airfield Signage and Runway Edge Lighting		$990,000 $1,080,000 $225,000 $648,000 $279,000 $585,000	$55,000 $60,000 $12,500 $36,000 $15,500 $32,500	$55,000 $60,000 $12,500 $36,000 $15,500 $32,500	$0 $0 $0 $0 $0 $0		$1,100,000 $1,200,000 $250,000 $720,000 $310,000 $650,000
2023	6	Acquire Land and Perimeter Fence Project 6.7 Construct Perimeter Fencing 6.8 Relocate Automated Weather Observing System	$150,000	$720,000 $238,500	$40,000 $13,250	$40,000 $13,250	$0 $0		$950,000 $265,000
2023	10	Taxiway A Relocation Project 10.1 Taxiway A Relocation; Environmental Assessment (Not Shown)							$0
2024	10	Taxiway A Relocation Project 10.2 Environmental Mitigation (Not Shown)						$230,000	$230,000
2024	11	FBO Hangar Refurbish						$125,000	$125,000
2024	12	Vault Replacement, New Generator (Not Shown)						$250,000	$250,000
2025	10	Taxiway A Relocation Project 10.3 Group II Taxiway A/Connector Safety Area Grading						$1,400,000	$1,400,000
2025	13	Construct Taxiway						$185,000	$185,000
2025	14	Update Airport Master/Sustainability Plan (Not Shown)						$350,000	$350,000
2025	15	PAPI/REIL and Beacon Replacement						$170,000	$170,000
2025	16	Acquire SRE; Plow and Multi-Tractor (Not Shown)						$130,000	$130,000
		Totals:	$300,000	$5,436,000	$302,000	$302,000	$0	$2,840,000	$9,180,000

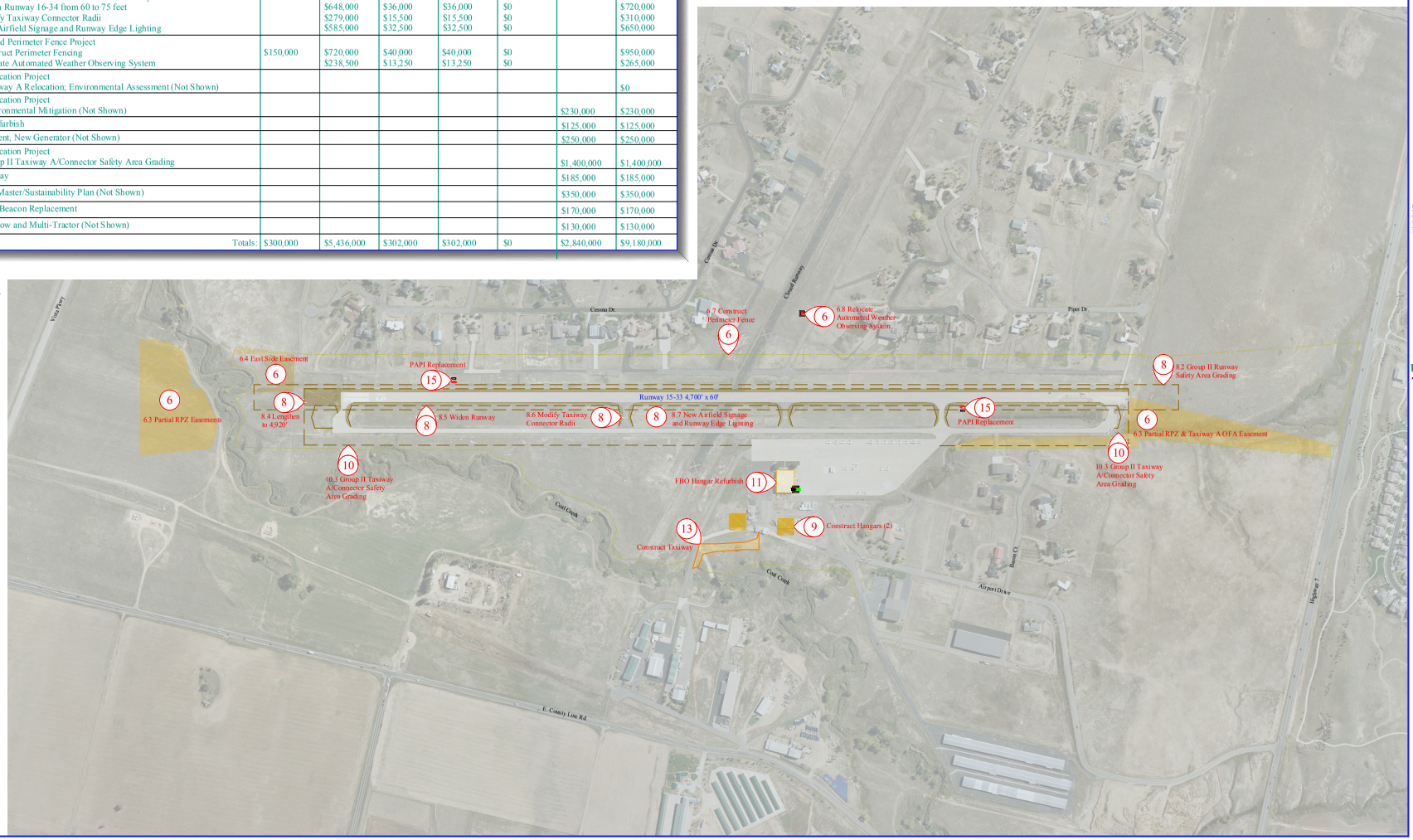
*Federal involvement in land acquisition limits purchase price to fair market value, in accordance with 49 CFR Part 24.



Graphic Scale

300 0 150 300 600 1200 Feet

90 0 45 90 180 360 Meters



No.	Revision	Ckd	Date

Erie Municipal Airport
Town of Erie, CO

ADG AIRPORT DEVELOPMENT GROUP, Inc.
1776 Mount Vernon Street / Suite 200
Denver, Colorado 80205-3530
303.782.0882 / 303.782.0842 fax
www.ADGdenver.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No:	EIK130834
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Intermediate-Term Improvements Years 2021-2025

Exhibit:

IT

of VIII Exhibits

6.3 Long-Term Improvements

During this long-term phase the focus is initially focused on the Taxiway A relocation project and then shift to landside concerns including more on-airport hangars and a smaller general aviation terminal building. Preventive maintenance is wound through the final 10 years of the plan.

The following descriptions accompany the tables and the exhibits on upcoming pages. Years are assigned to specific projects, but timing and necessity are not as clearly defined as in the previous sections. An *Unfunded* status is identified for all improvements.

10. Taxiway A Relocation Project

10.5. 2026; Relocate Taxiway A to 240 Separation (Phase I of II)

The southern half (from connector fronting FBO) of Taxiway A is to be reconstructed with this improvement. Site preparation was completed the previous year. This improvement formalizes the section, including pavements, marking/signage.

17. Terminal Building Project

17.1. 2026; Environmental Assessment

Every federal action involving AIP grant-in-aid funding should have an environmental determination from the Denver ADO. Given the proposed improvements, the level of study will likely be an Environmental Assessment.

10. Taxiway A Relocation Project

10.6. 2027; Relocate Taxiway A to 240 Separation (Phase II of II)

The northern half (from connector fronting FBO) of Taxiway A is to be reconstructed with this improvement. Site preparation was completed the previous year. This improvement formalizes the section, including pavements and marking.

10. Taxiway A Relocation Project

10.7. 2027; Construct Small Aircraft Apron (Phase I)

Phase I of a new Apron (due north of FBO hangar) for smaller (Group I, >49' wingspan) is planned given that the relocation of Taxiway A removed 22 tiedowns from use. This apron should be constructed to 12,500 single-wheel gear with a non-nested tiedown configuration.

17. Terminal Building Project

17.2. 2027; Environmental Mitigation

Mitigation in this sense likely relates exclusively to the filing and execution of a Clean Water Act Section 404 permit for wetlands pursuant to an Environmental Assessment finding from the previous year. Again, banking is the likely preferred disposition or compensatory technique.

10. Taxiway A Relocation Project

10.8. 2028; Construct Small Aircraft Apron (Phase II)

Phase II of a the Small Aircraft Apron will bring total square yardage for aircraft parking up to that recommended by the summary within the Facility Requirements Chapter. This apron should be constructed to 12,500 single-wheel gear with a non-nested tiedown configuration.

10. Taxiway A Relocation Project

10.9. 2028; Reconfigure Existing Apron to Standard

This improvement is primarily a marking and pavements removal effort. The need exists at EIK to accommodate transient parking for larger (Group II; 49 feet >79 feet wingspans). These aircraft, per current FAA standards, require more apron area than smaller aircraft. The current apron will function much like the front porch for larger visiting aircraft.

17. Terminal Building Project

17.3. 2028; Construct Terminal Building

Given that the current apron might best serve as the front door to visiting larger business/ corporate aircraft, a smaller general aviation terminal building near or collocated with the SRE building might provide best community access from EIK. 2,200 to 2,800 square feet of office, restroom and conference is considered. Some area within could be leased.

17. Terminal Building Project

17.4. 2028; Construct Terminal Auto Parking

Paved auto parking area should complement the terminal building and nearby executive hangars.

17. Terminal Building Project

17.5. 2028; Construct Access Taxiway

An access taxiway to service the three northern-most hangars within this new development area (for those planned within the current auto parking area) is perhaps prerequisite for ground leasing.

18. 2030; Construct T-Hangar Apron (Phase I)

This apron is intended to serve as access for continuing T-hangar development. EIK's T-hangar development area is planned for a stretch between the FBO hangar and Coal Creek. This would be Phase I of II for T-Hangar development.

19. 2030; Runway Seal, Crack and Mark

This improvement is preventive maintenance to extend pavement's life for the runway rehabilitation, widening and lengthening from improvement number eight.

20. 2031; Construct T-Hangars (Phase I)

It is expected that additional demand may materialize and a waitlist may become sufficiently long enough for the Town or a private developer to invest additional dollars at the airport in the form of more than one T-Hangar.

21. 2032; Construct T-Hangar Apron (Phase II)

This apron is intended to serve as access for continuing T-hangar development. EIK's T-hangar development area is planned for a stretch between the FBO hangar and Coal Creek. This would be Phase II of II for T-Hangar development. Phase I occurred in 2030.

22. 2033; Taxiway Rehabilitation

Preventive maintenance is planned for the on the access taxiway to off-airport residences. FAA has indicated that this improvement will not be eligible for grant-in-aid.

23. 2033; Taxiway A Seal, Crack and Mark

This improvement is preventive maintenance to extend pavement's life for the runway rehabilitation, widening and lengthening from improvement number 10.

24. 2034; Construct T-Hangars (Phase II)

It is expected that additional demand may materialize and a waitlist may become sufficiently long enough for the Town or a private developer to invest additional dollars at the airport in the form of more than one T-Hangar.

25. 2034; T-Hangar Apron Surface and Crackseal

This improvement is preventive maintenance to extend pavement's life for the apron rehabilitation from improvement number 3.

26. 2034; Terminal Apron Crackseal and Rout (Large Aircraft Apron)

This improvement is preventive maintenance to extend pavement's life for the apron slab and rehabilitation from improvement number 13.

27. 2035; Terminal Apron Crackseal and Mark (Large Aircraft Apron)

This improvement is preventive maintenance to extend pavement's life for the apron slab and rehabilitation from improvement number 13.

28. 2035; Terminal Apron Crackseal and Mark (Small Aircraft Apron)
This improvement is preventive maintenance to extend pavement's life for the new small aircraft apron from improvement number 10.

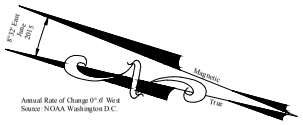
29. 2035; Acquire SRE; Broom/Plow
A period of time (±10 years) will have passed since the last equipment acquisition and new airfield maintenance equipment will assist airfield operations and maintenance. A large combo multi-unit piece of equipment is considered.

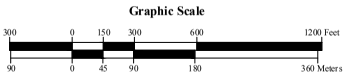
Exhibit LT on the following page depicts these items numerically-tabulated and referenced in plan view, totaling:

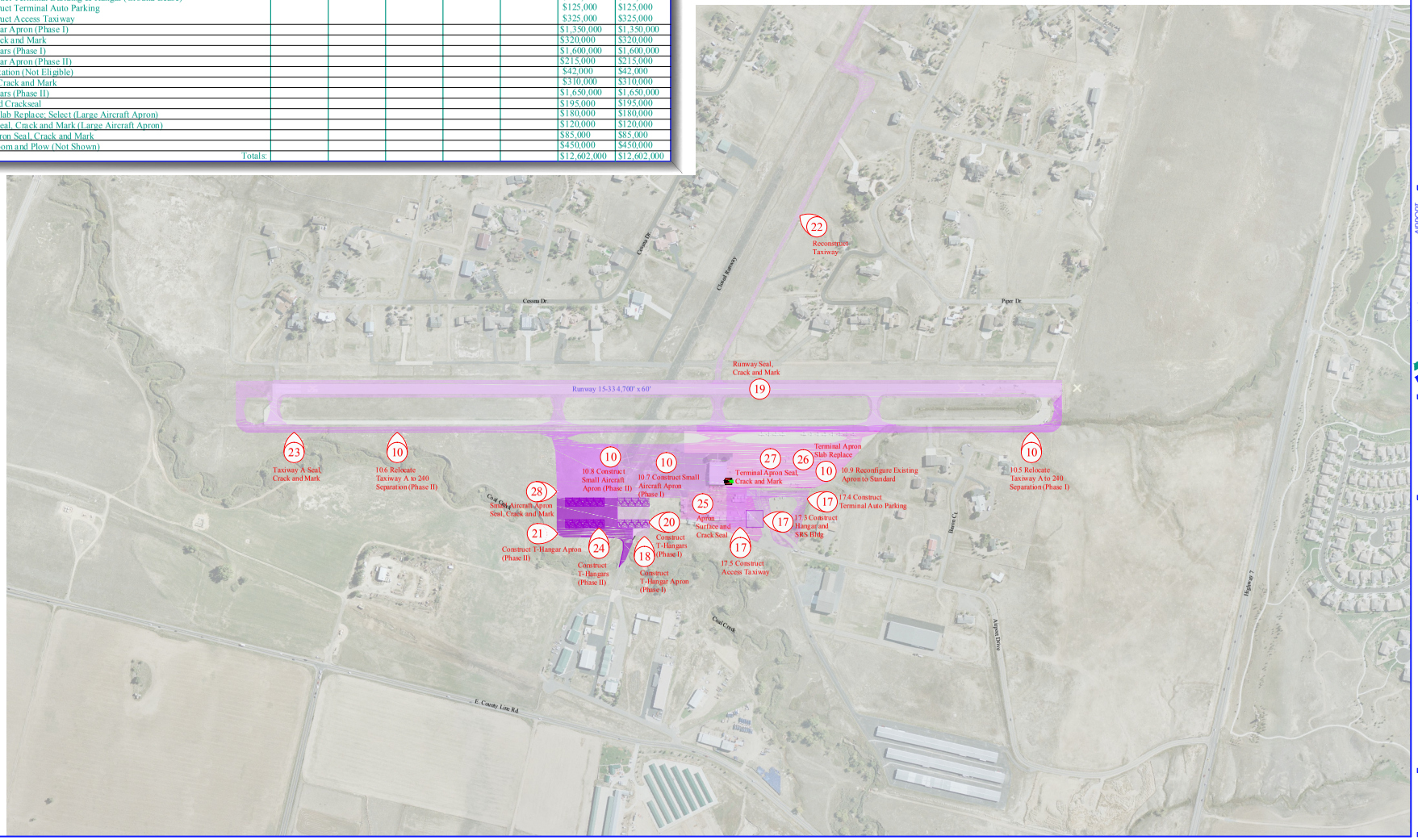
FAA Non Primary Entitlement:	$00
FAA Discretionary:	$00
CDOT Aeronautics	$00
Town:	$00
Others:	$00
Unfunded:	$12,602,000
Totals	**$12,602,000**

Long-Term Improvements (2026 - 2035)

Date	Number	Recommended Improvements	FAA NPE	FAA Disc.	CDOT	Town	Others	Unfunded	Totals
2026	10	Taxiway A Relocation Project 10.5 Relocate Taxiway A to 240 Separation (Phase I of II)						$1,350,000	$1,350,000
2026		Terminal Building Project 17.1 Environmental Assessment (Not Shown)						$65,000	$65,000
2027	10	Taxiway A Relocation Project 10.6 Relocate Taxiway A to 240 Separation (Phase II of II) 10.7 Construct Small Aircraft Apron North of FBO Hangar (Phase I)						$1,550,000 $870,000	$1,550,000 $870,000
2027	17	Terminal Building Project 17.2 Environmental Mitigation (Not Shown)						$55,000	$55,000
2028	10	Taxiway A Relocation Project 10.8 Construct Small Aircraft Apron North of FBO Hangar (Phase II) & Connector 10.9 Reconfigure Existing Apron to Standard (including pavements removal)						$910,000 $185,000	$910,000 $185,000
2028	17	Terminal Building Project 17.3 Construct Terminal Building & Hangar (Ground Lease) 17.4 Construct Terminal Auto Parking 17.5 Construct Access Taxiway						$650,000 $125,000 $325,000	$650,000 $125,000 $325,000
2030	18	Construct T-Hangar Apron (Phase I)						$1,350,000	$1,350,000
2030	19	Runway Seal, Crack and Mark						$320,000	$320,000
2031	20	Construct T-Hangars (Phase I)						$1,600,000	$1,600,000
2032	21	Construct T-Hangar Apron (Phase II)						$215,000	$215,000
2033	22	Taxiway Rehabilitation (Not Eligible)						$42,000	$42,000
2033	23	Taxiway A Seal, Crack and Mark						$310,000	$310,000
2034	24	Construct T-Hangars (Phase II)						$1,650,000	$1,650,000
2034	25	Apron Surface and Cracksealed						$195,000	$195,000
2034	26	Terminal Apron Slab Replace; Select (Large Aircraft Apron)						$180,000	$180,000
2035	27	Terminal Apron Seal, Crack and Mark (Large Aircraft Apron)						$120,000	$120,000
2035	28	Small Aircraft Apron Seal, Crack and Mark						$85,000	$85,000
2035	29	Acquire SRE; Broom and Plow (Not Shown)						$450,000	$450,000
		Totals:						$12,602,000	$12,602,000







No.	Revision	Ckd	Date

Erie Municipal Airport
Town of Erie, CO

ADG AIRPORT DEVELOPMENT GROUP, INC.
1775 South Jackson Street / Suite 150
Denver, Colorado 80210-2000
303.782.0882 / 303.782.0842 fax
www.ADGairport.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No.	EIK13968M
Designed By:	SMP
Drawn By:	KG
Approved By:	SPM
Date:	August 2015

Long-Term Improvements Years 2026-2035

Exhibit:
LT
of VII Exhibits

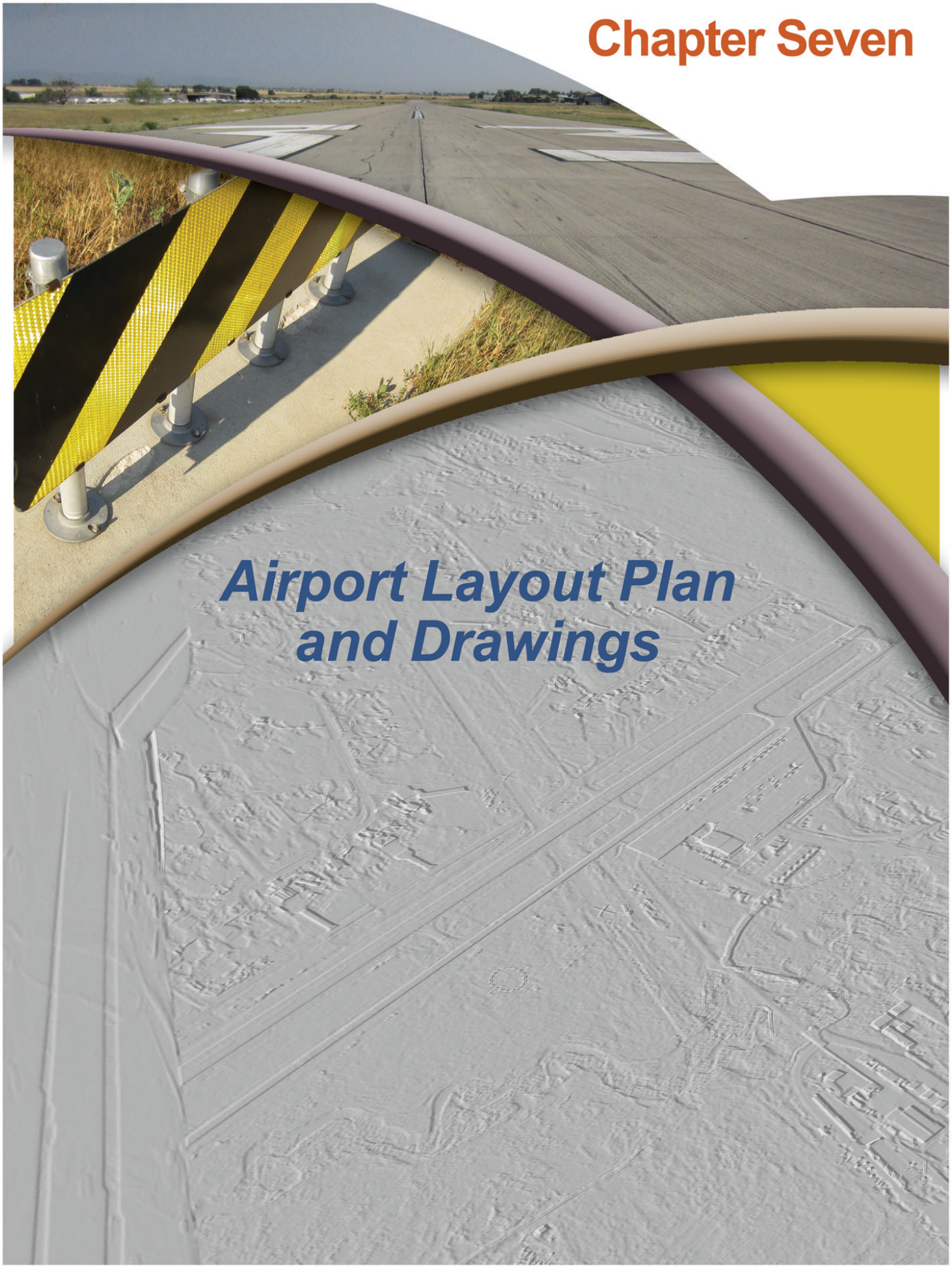
6.4 Summary

Dollars planned for the 20-year term of this effort total:

FAA Non Primary Entitlement:	$1,519,692
FAA Discretionary:	$5,908,500
CDOT Aeronautics	$602,955
Town:	$402,955
Others:	$00
Unfunded:	$15,062,278
Totals	**$23,496,380**

As can be seen the majority of funds for improvements are currently identified as *Unfunded*. The reason for this identification is that financial plans must, per FAA remains financially constrained until such time as funding is programmed via the annual ACIP process.

Chapter Seven



Airport Layout Plan and Drawings

Chapter Seven – ALP and Drawings

7.0 Introduction

This chapter describes and depicts the necessary improvements and Trustee prerogatives derived from previous chapters and shows airport features, not limited to: existing airfield and landside configurations, future developments, airport airspace, land uses and property ownership.

While the single-sheet ALP drawing shows most airport-related features, other depictions, such as airspace limits and off-airport land uses are shown on separate drawings.

These drawings constitute the ALP drawing set:

	Cover and Index
Exhibit II	Airport Data Sheet
Exhibit III	Airport Layout Plan
Exhibit IV	Terminal Area Plan
Exhibit V	Airport Airspace Plan (Part 77)
Exhibit VI	Runway 15/16-32/33 Approach Surface Plan and Profiles
Exhibit VII	Runway 15/16-33/34 Inner Portion of Approach Surface Plan and Profile
Exhibit VIII	Land Use Plan
Exhibit IX	Airport Property Map (Exhibit A)

The ALP is a legal document and represents an agreement between the town of Erie and the Federal Aviation Administration, along with the State of Colorado, Department of Transportation.

This agreement primarily concerns design standards compliance, future development locations and obstruction disposition. On-airport development must be depicted on the ALP and it should be kept reasonably current. A reduced-size ALP along with and other drawings are be found at the end of this chapter.

7.1 Cover and Index

The Cover and Index Exhibit provides information regarding responsible parties along with maps.

7.2 Airport Data Sheet

The Aproprt data Sheet includes tables of existing and future airport standards, wind roses and othe rinformation. Wind information is derived from the airport weather equipment at KBJC, per FAA guidance.

7.3 Airport Layout Plan

The Airport Layout Plan (ALP) is a scaled graphic representation of existing and proposed airport development including pertinent clearance and dimensional information required to show conformance with design standards.

The ALP depicts the recommended location of facilities proposed to accommodate the 20-year demand (and beyond in some cases) as discussed in the facility requirements chapter and synthesized through the alternatives and planning process.

Short-term improvements primarily relate to preventive maintenance while proposed intermediate and longer-term improvements are geared more toward standards compliance and meeting potential demand.

Other notable improvements shown on the ALP include a short runway extension, taxiway relocation, new aprons and hangar and a complete pavements maintenance program, therein built. Other improvements include land acquisitions, AWOS relocation, obstruction (tree) removal.

The Airport Data Table provides basic information concerning airport elevation, airport reference point location, airport land ownership, etc. The Runway Data tables provide information such as airport role, approach surface information and end coordinates/elevations. A scale, legend, and north arrow orient the reader.

7.4 Terminal Area Plan

A number of changes are depicted on the Terminal Area Plan for EIK. This drawing represents a closer-in view of the proposed landside improvements shown on the ALP. Town and potential private hangar developments are planned for the intermediate and long-term, as well as a phased expansion of the existing and a secondary hangar area. This general aviation area includes phased development for apron, hangar and other aviation facilities.

Phased facility construction, utility extension, landscaping, auto access and parking area are expected. These improvements should be constructed as funding and demand allows and are planned to accommodate the expected activity. The proposed size and location in this regard are for planning purposes only and specific plans should be evaluated on a case-by-case basis for general conformance to the ALP.

7.5 Airport Airspace Plan (Part 77)

FAR Part 77 specifies various imaginary surfaces designed to protect the airspace around EIK from objects of natural growth or man-made features, termed obstructions. These surfaces are the primary, approach, transitional, horizontal and conical as shown on the Airport Airspace Plan in their ultimate configuration.

- The primary surface is longitudinally centered on the runways. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is based on the type of approach available or planned for each runway. The primary surface is 250 feet wide and extends 200 feet beyond each runway end.
- The approach surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach available or planned for that runway end.
- The transitional surfaces extend outward and upward at right angles to the runway centerline and runway centerline extended at a slope of 7:1 (±8.13 degrees) from the sides of the primary surface and from the sides of the approach surfaces.
- The horizontal surface is a level horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of 5,000 feet from the center of each end of the primary surface of each runway and connecting the adjacent arcs with lines of tangency.
- The conical surface extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 (±2.86 degrees) for a horizontal distance of 4,000 feet.

Parts of Section 77.23 specify additional surfaces. A surface at a height of 500 feet exists along with another surface a 200-foot height above the

ground surface within 3 nautical miles of the airport. These surfaces are not shown.

7.6 Runway Plan and Profiles

The Approach Surface and Inner-Approach Surface Plan and Profile drawings show the existing, future and ultimate approach surface configurations and their interaction with the airport and off-airport environs. The extended runway centerline ground profile and the critical point profiles are shown for terrain clearance purposes. Notable objects in this regard are shown in each plan and profile and tabulated with heights and disposition, as appropriate. These drawings are supplemental to the Airport Airspace Plan.

7.7 Land Use Plan

The Land Use Plan identifies areas within and adjacent to airport property by zone and/or land use. Review for any residential development near the airport should consider the airport's proximity. The Off-Airport Land Use Plan shows areas associated with ultimate FAR Part 77 surfaces. These areas are and should continue to be protected by ordinance or code to ensure compatible land use. Area off the end of the runway ends are generally the most noise sensitive. The 65 DNL noise contour line encircles and area which is recognized as sensitive to aircraft noise. The area within this contour is almost exclusively owned by the Town or planned to be acquired in fee or easement. The Town's code as it relates to EIK is found on this exhibit.

7.8 Airport Property Map (Exhibit A)

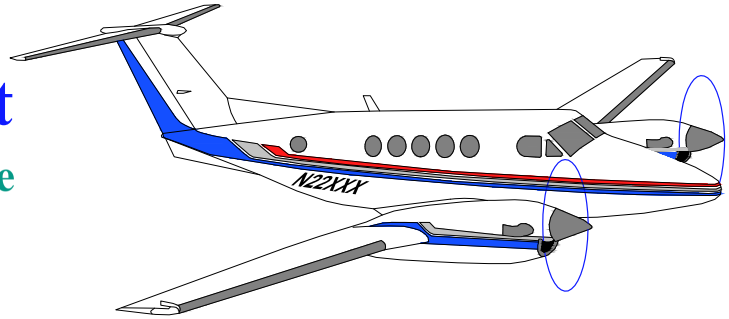
The Airport Property Map shows areas of existing airport sponsor ownership and area proposed for ownership or release. The map also shows easements, buildings, apron, fences, roads and other features of concern. Tracts are shown for depiction purposes only and this map is not to be used for survey or land acquisition. Property information includes ownership, location, purpose, book and page/reception and Federal involvement

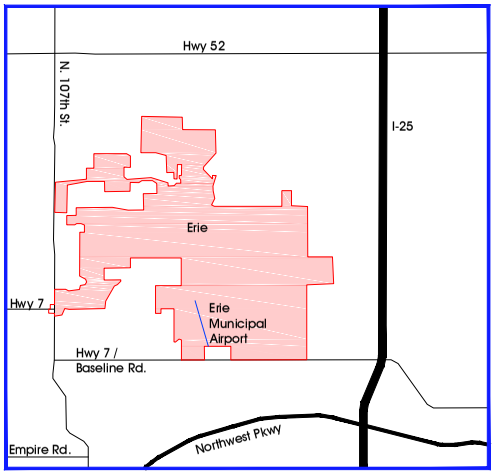
Erie Municipal Airport

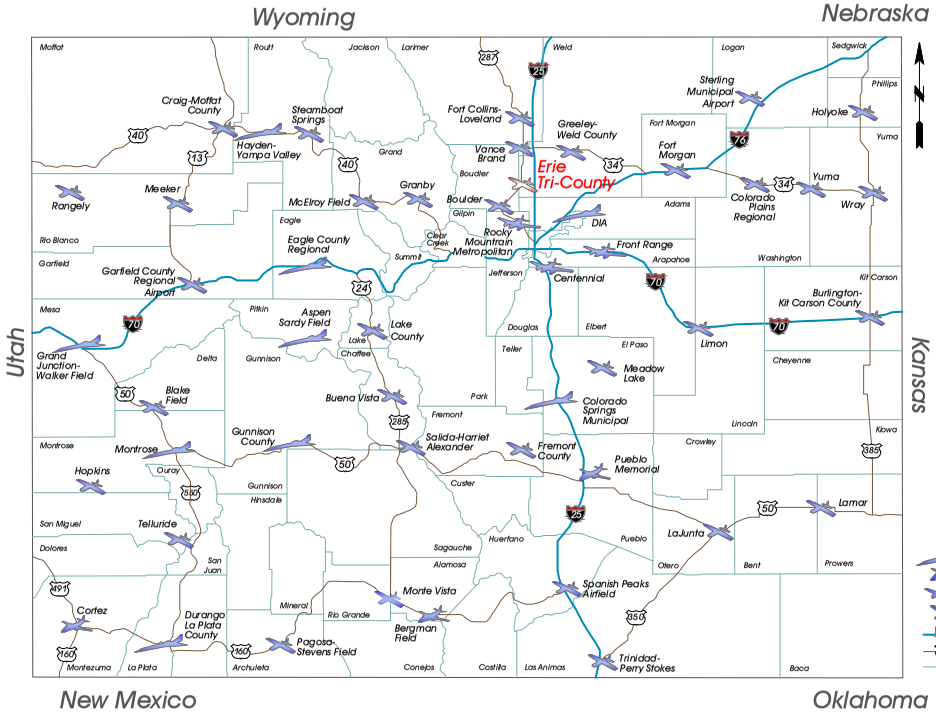
Airport Master Plan Update
Town of Erie, Colorado

AIP Project No. 3-08-0090-13-2012

April 2016







Airport Layout Plan Exhibits

I Cover
II Airport Data Sheet
III Airport Layout Plan
IV Terminal Area Plan
V Airport Airspace Drawing (Part 77)
VI Runway 15/33 Approach Surface Plan And Profiles
VII Runway 15/33 Inner Portion Of Approach Plan And Profiles
VIII Land Use Plan
IX Exhibit 'A' Airport Property Inventory Map

Approvals

CONDITIONALLY APPROVED

Subject to Letter Dated: _____

FEDERAL AVIATION ADMINISTRATION

DENVER AIRPORTS DISTRICT OFFICE

Date: _____

Case No.: _____

No.	Revision	Chd.	Date

Erie Municipal Airport
Town of Erie, CO

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2507
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No:	EIK13980M
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Cover

Exhibit: I of IX Exhibits

Runway Data

	Existing Runway 15/33		Future Runway 15/33	
	15 Existing	33 Existing	15 Future	33 Future
Runway Length and Width (Feet)	4,300 x 60		4,920 x 100	
Runway Pavement Strength (SWG/DWG/DTWG)(x1,000 lbs.), PCN	12.5 SWG/5.4 PCN		12.5 SWG, 5.4 PCN	
Runway Lighting	MIRL, REIL		MIRL, REIL	
Runway Marking (V, NP, PI)	V		NP	
Crosswind Component and Percent Coverage	10.5 Knots/85.71%		10.5 Knots/85.71%	
Blast Pad Width/Length	N/A	N/A	N/A	N/A
Surface Treatment	None		None	
Approach Type (V, NP, PI)	V		NP	
Visibility Minimums	Visual >1 Mile		Visual >1 Mile	
Aeronautical Survey	Not Vertically Guided		Not Vertically Guided	
Runway Development/Reference Code(RDC/RRC)	A/B-I (Small Only)		A/B-II (Small Only)	
Critical Design Aircraft	Cessna 210		Citation CJ2	
-Approach Speed, Wingspan, Weight, Haul	75 kts., 36.7', 4,012 lbs. <500 mi.		115 kts., 49.8', 12,500 lbs. <500 mi.	
Associated Taxiway Design Group (TDG), Width, Lighting	1a, 25', Partial MITL		2, 35', MITL	
Approach Surface	20:1	20:1	20:1	20:1
Departure Surface	N/A	N/A	N/A	N/A
14 CFR Part 77 Approach Surface	20:1 V: 250'x 1,250' x 5,000'	20:1 V: 250'x 1,250' x 5,000'	20:1 V: 500'x 2,000' x 5,000'	20:1 NP: 500'x 2,000' x 5,000'
Threshold Siting Surface	Penetrations		No TSS Penetrations	
Landing/Navigational Aids	PAPI-2		PAPI-2	
Highest Rwy Elevation in first 3,000 feet from landing threshold	5100.5'	5119.4	5100.7	5119.4
Runway End Elevation	5075.5'	5119.4	5073.7	5119.4
Highest/Lowest Runway Elevation	5075.5' / 5119.4'		5073.3' / 5119.4'	
Runway Touchdown Zone Elevation (TDZ)	5100.5'	5119.4	5100.7	5119.4
Runway Intersection Elevation	N/A		N/A	
Displaced Threshold Elevation	N/A	N/A	N/A	N/A
Effective Longitudinal Runway Gradient	<0.1%		<0.1%	
Maximum Longitudinal Runway Gradient	<0.1%		<0.1%	
Line of Sight Standards Met (Longitudinal/RVZ)	Yes/N-A		Yes/N/A	
Runway Safety Area (RSA) Beyond End/Prior To	240'/240'	240'/240'	300'/300'	300'/300'
Runway Safety Area (RSA) Width	120'		150'	
Runway Object Free Area (ROFA) Beyond End/Prior To	240'/240'	240'/240'	300'/300'	300'/300'
Runway Object Area (ROFA) Width	250'		500'	
Obstacle Free Zone (ROFZ) Length Beyond End/Width	200'/250'		200'/250'	
Precision Obstacle Free Zone (POFZ) Length/Width	N/A		N/A	
Runway Protection Zone (RPZ) AAC, Visibility, Dimensions Accommodated, Dimensions and Nature of Ownership	A-II, Vis., 250' 450'x1,000' Fee / Easement	A-II, Vis., 250' 450'x1,000' Fee / Easement	A-II, Vis., 500' 750'x1,000' Fee / Easement	A-II, Vis., 500' 750'x1,000' Fee / Easement
Runway Centerline Separations, Taxiway, Hold and Parking	150', 125', 125'		240', 200', 250'	

Declared Distances

	Existing Runway 15/33		Future Runway 15/33	
	15 Existing	33 Existing	15 Future	33 Future
Takeoff Runway Available(TORA)	4,700'	4,700'	4,920'	4,920'
Takeoff Distance Available (TODA)	4,700'	4,700'	4,920'	4,920'
Accelerate Stop Distance Available (ASDA)	4,700'	4,700'	4,920'	4,920'
Landing Distance Available (LDA)	4,700'	4,700'	4,920'	4,920'

Taxiway Data

	Existing Runway 15/33		Future Runway 15/33	
	15 Existing	33 Existing	15 Future	33 Future
Taxiway and Taxilane Width (E/F)	A: (25'), B: (25')		A: (35'), B: (25'), C: (35')	
Taxiway and Taxilane Safety Area (E/F)	A: (49'), B: (49')		A: (79'), B: (49'), C: (79')	
Taxiway and Taxilane Object Free Area (E/F)	A: (89'), B: (89')		A: (131'), B: (89'), C: (131')	
Taxiway and Taxilane Separation (E/F)	A: (44.5'), B: (44.5')		A: (65.5'), B: (44.5'), C: (65.5')	
Taxiway/Taxilane Lighting (E/F)	MITL		MITL	

Airport Data

	Existing	Future
Airport Elevation	5119.4'	5119.4'
Airport Reference Code	A/B-I (Small Only)	A/B-II (Small Only)
Airport Reference Point (ARP)	North Latitude 40°00'36.8" West Longitude 105°02'53.06"	North Latitude 40°00'37.90" West Longitude 105°02'53.36"
Airport Navigational Aids (Airport Owned)	Beacon, wind cone, seg. circle	Beacon, wind cone, seg. circle
Mean Maximum Temperature of Hottest Month	88.4° Fahrenheit (August)	
Most Demanding Runway Design Code	B-I, Visual	A/B-II, Visual
NPIAS/State Role	General Aviation	General Aviation
Most Demanding Critical/Design Aircraft	Cessna 210	Citation CJ2
Miscellaneous Facilities	AWOS, taxiway lighting, lighted wind cones	

Runway End Coordinates

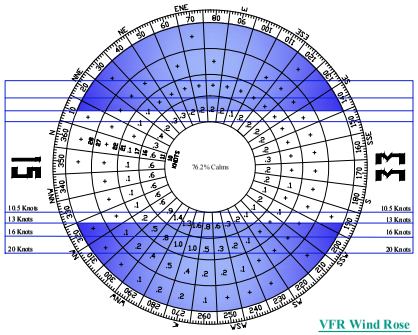
	Runway 15	Runway 33
Existing	North Latitude 40°00'39.51" West Longitude 105°02'59.70"	North Latitude 40°00'14.20" West Longitude 105°02'46.45"
Future	North Latitude 40°00'01.71" West Longitude 105°03'00.35"	North Latitude 40°00'14.20" West Longitude 105°02'46.45"

Note: All latitude/longitude coordinates are in North American Datum of 1983 (NAD 83) and NAVD88 vertical control datum was used.

Modification To Design Standards

Runway	Item	Standard	Comments
None Required			

Approval Date: _____ Airspace Case No. _____

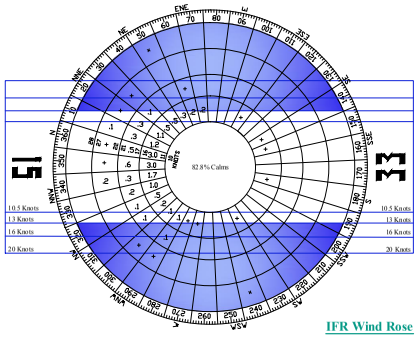


VFR Wind Rose

Source: National Climatic Data Center
Location: Broomfield, Colorado 72469 (BIC)
Period: January 1, 2000 to December 31, 2009
Number of Observations: 46,280
VFR Sky Conditions:
Cloud Ceiling: 1,000 Feet or Greater and Visibility: 3 Statute Miles or Greater

VFR Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
15-33	84.81%	89.13%	93.65%	97.13%

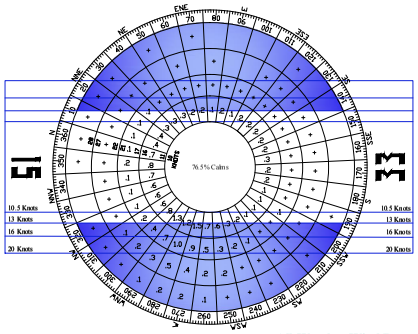


IFR Wind Rose

Source: National Climatic Data Center
Location: Broomfield, Colorado 72469 (BIC)
Period: January 1, 2000 to December 31, 2009
Number of Observations: 2,592
IFR Sky Conditions:
Cloud Ceiling: 200 to 1,000 Feet; and Visibility: 1/2 to 3 Statute Miles

IFR Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
15-33	97.91%	98.88%	99.57%	99.73%



All-Weather Wind Rose

Source: National Climatic Data Center
Location: Broomfield, Colorado 72469 (BIC)
Period: January 1, 2000 to December 31, 2009
Number of Observations: 49,753

All-Weather Wind Coverage

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
15-33	85.71%	89.8%	94.05%	97.31%

Airport Data Sheet

Exhibit:
II
of IX Exhibits

No.	Revision	Chkd	Date

Erie Municipal Airport
Town of Erie, CO

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2507
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No.:	EIK13988M
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Existing Structures List

No.	Description	Occupants	Size (Sqr. Ft.)	Elevation	Estimated Height
1	Hangar	FBO Hangar	±2,900	5,138'	28'
2	Hangar	Movable Hangars	±8,000	5,107'	12'
3	Hangar	Movable Hangars	±8,000	5,107'	12'
4	Office	Rocky Mountain Propeller - Off Airport	±8,000		12'
5	Hangar	Hangar Complex - Off Airport	±17,550		12'
6	Vacant	Office Complex - Off Airport	±6,400		12'
7	Hangar	Schofield Hangar Complex - Off Airport	±6,400		12'
8	Office	Waste Connection of CO - Off Airport	±3,600		12'
9	Office	Gapter Septic Systems - Off Airport	±1,575		12'
10	Office	LTS Glass Doors - Off Airport	±3,000		12'
11	Office	Spirit of Flight Museum - Off Airport	±15,500		12'
12	Office	Aero Systems - Off Airport	±8,800		12'
13	Office	Tar Cats, Trail Ridge Const. - Off Airport	±5,200		12'
14	Office	Tri-County Heliport - Off Airport	±8,000		12'
15	AWOS	AWOS		5,107'	37'

Future Structures List

No.	Description	Occupant	Size	Elevation	Estimated Height
F1	Ground Lease Hangar	- -	10,000'	5,100'	28'
F2	Ground Lease Hangar	- -	10,000'	5,100'	28'
F3	Ground Lease Hangar	- -	10,000'	5,100'	28'
F4	SRE Building	- -	3,750'	5,122'	30'
F5	Ground Lease Hangar	- -	10,000'	5,100'	28'
F6	GA Terminal	- -	10,000'	5,122'	35'
F7	Ground Lease Hangar	- -	2,400'	5,100'	28'
F8	T-Hangar	- -	9,450'	5,104'	16'
F9	T-Hangar	- -	9,450'	5,104'	16'
F10	T-Hangar	- -	11,550'	5,104'	16'
F11	T-Hangar	- -	11,550'	5,104'	16'

Runway End Coordinates

	Runway 15	Runway 33
Existing	North Latitude 40°00'59.51" West Longitude 105°02'59.70"	North Latitude 40°00'14.20" West Longitude 105°02'46.45"
Future	North Latitude 40°01'01.71" West Longitude 105°02'00.35"	North Latitude 40°00'14.20" West Longitude 105°02'46.45"

Note: All latitude/longitude coordinates are in North American Datum of 1983 (NAD 83) and NAVD88 vertical control datum was used.

Approvals

CONDITIONALLY APPROVED

Subject to Letter Dated:_____

FEDERAL AVIATION ADMINISTRATION

DENVER AIRPORTS DISTRICT OFFICE

Date:_____

Case No.:_____

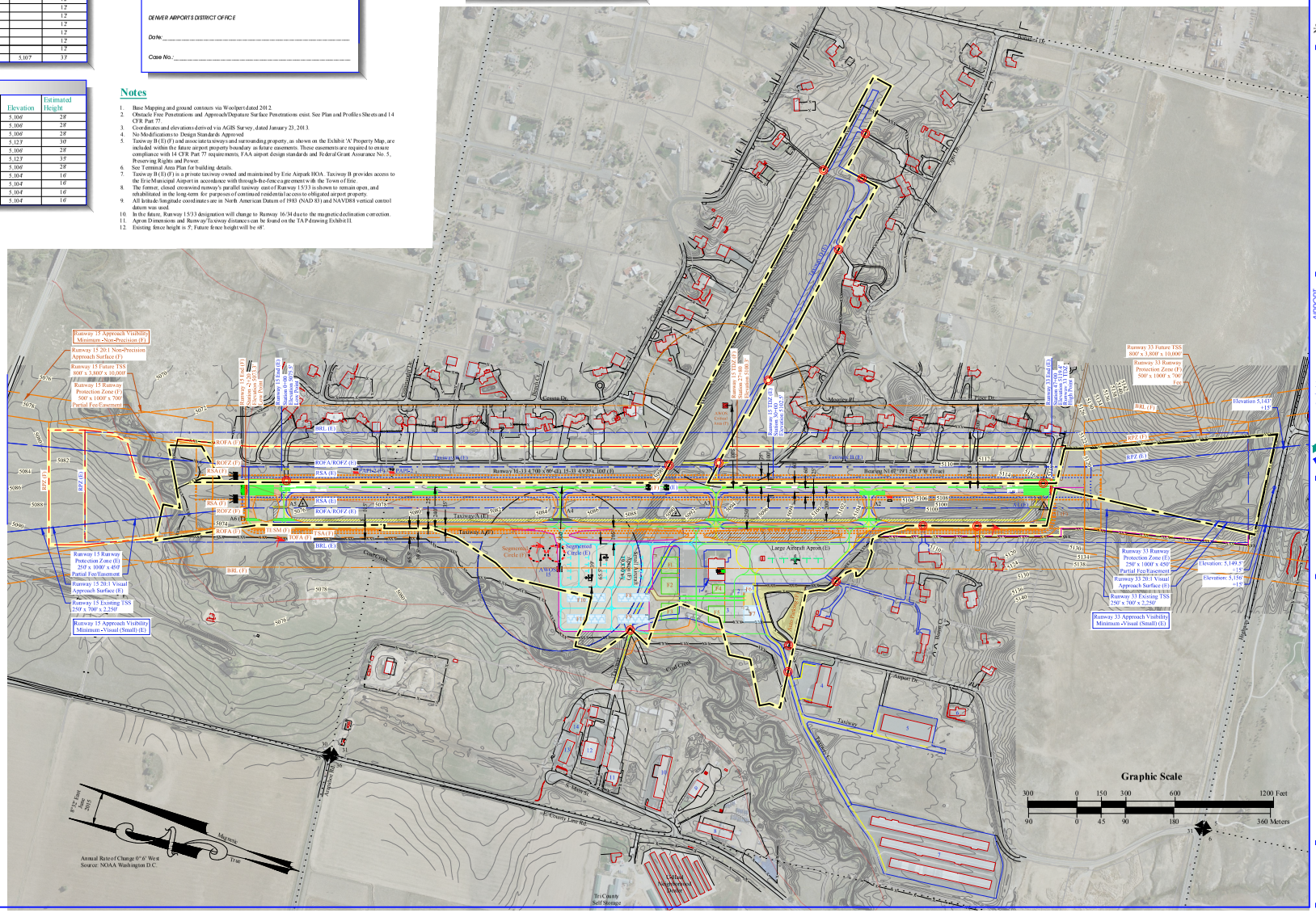
Notes

1. Base Mapping and ground contours via Woolpert dated 2012.
2. Obstacle Free Penetrations and Approach/Departure Surface Penetrations exist. See Plan and Profiles Sheets and 14 CFR Part 77.
3. Coordinates and elevations derived via AGIS Survey, dated January 23, 2013.
4. No Modifications to Design Standards Approved.
5. Taxiway B (E) (F) and associate taxiways and surrounding property, as shown on the Exhibit 'A' Property Map, are included within the future airport property boundary as future easements. These easements are required to ensure compliance with 14 CFR Part 77 requirements, FAA airport design standards and Federal Grant Assurance No. 5, Preserving Rights and Power.
6. See Terminal Area Plan for building details.
7. Taxiway B (E) (F) is a private taxiway owned and maintained by Erie Airpark HOA. Taxiway B provides access to the Erie Municipal Airport in accordance with through-the-fence agreement with the Town of Erie.
8. The former, closed crosswind runway's parallel taxiway east of Runway 15/33 is shown to remain open, and rehabilitated in the long-term for purposes of continued residential access to obligated airport property.
9. All latitude/longitude coordinates are in North American Datum of 1983 (NAD 83) and NAVD88 vertical control datum was used.
10. In the future, Runway 15/33 designation will change to Runway 16/34 due to the magnetic declination correction.
11. Apron Dimensions and Runway/Taxiway distances can be found on the TAP drawing Exhibit 11.
12. Existing fence height is 5', Future fence height will be 8'.

PACS/SACS

	Identification	Coordinates
1	ARVA, PID AI5916 1546.76m NAD88 USGS QUAD: ERIE	40°00'58.03880" N 105°03'00.62846" W
2	TRCO, PID LL1444 1551.43m NAD88 USGS QUAD: ERIE	40°00'53.97310" N 105°02'54.93672" W
3	ERIE AIR PARK, PID AI5917 1559.90 m NAD88 USGS QUAD: ERIE	40°00'14.41166" N 105°02'48.11732" W

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (AIP No. 3-08-0090-013-2012) as provided under Title 49 U.S.C., Section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this Airport Layout Plan 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 or would have justification in accordance with appropriate public laws.



Legend

(E), (F)	Existing, Future
	Existing Property Line
	Future Limits of Easement
	Future Property Line
	Building Restriction Line (BRL)
	Runway Protection Zone (RPZ)
	14 CFR Part 77 Approach Surface
	Object Free Area (OFA)
	Runway Safety Area (RSA)
	Obstacle Free Zone (OFZ)
X X X	Existing Fence (5')
XXX XXX XXX	Future Fence (+8')
	Section Line
	Dirt Road
	Existing Paved Roads
	Future Paved Roads
	Existing Pavement
	Future Pavement
	Pavements To Be Removed/Abandoned
	Existing Buildings
	Future Buildings
	Buildings To Be Removed
	Drainage Line
	Contour Line
	REILs
	Runway End Identifier Lights (REIL)
	Section Corner
	Precision Approach Path Indicators (PAPI-2)
	Airport Reference Point (ARP)
	Segmented Circle With Lighted Wind Cone
	Rotating Beacon
	Through-the-Fence Access Points

No.	Revision	Ckd.	Date

Erie Municipal Airport
Town of Erie, CO

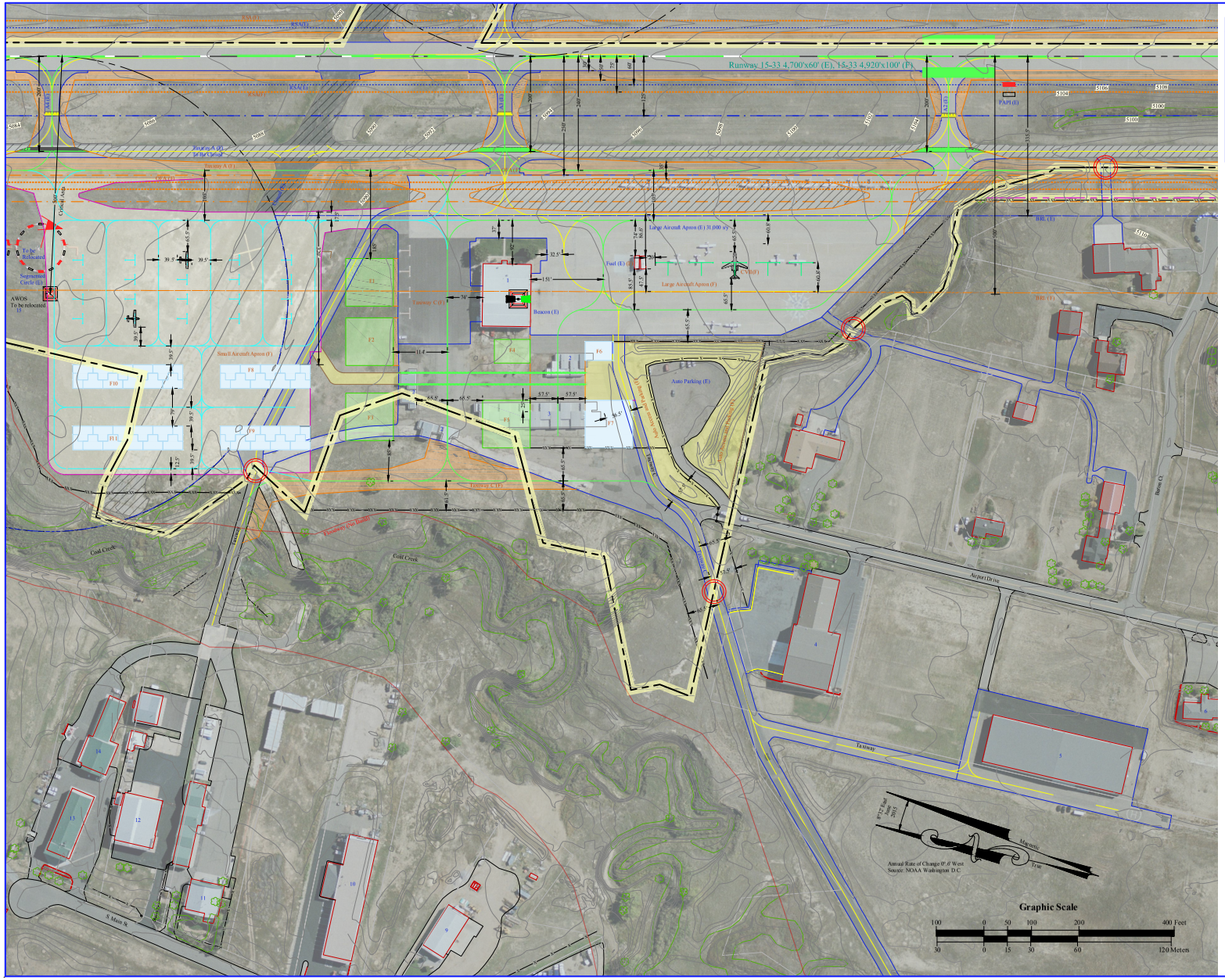
AIRPORT DEVELOPMENT GROUP
1775 South Jackson Street / Suite 950
Denver, Colorado 80210-2502
303.782.0800 / 303.782.0842 fax
www.ADGairports.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No:	EIK13908M
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Airport Layout Plan

Exhibit:
III
of IX Exhibits



Existing Structures List

No.	Description	Occupants	Size (Sqr. Ft.)	Elevation
1	Hangar	FBO Hangar	±15,000	5,123'
2	Hangar	Movable Hangars	±8,000	5,107'
3	Hangar	Movable Hangars	±13,000	5,107'
4	Office	Rocky Mountain Propeller - Off Airport	±8,000	
5	Hangar	Hangar Complex - Off Airport	±17,550	
6	Vacant	--	±6,400	
7	Hangar	Schofield Hangar Complex - Off Airport	±6,400	
8	Office	Waste Connection of CO - Off Airport	±3,000	
9	Office	Captor Septic Systems - Off Airport	±1,575	
10	Office	LTS Glass Doors - Off Airport	±3,000	
11	Office	Spirit of Flight Museum - Off Airport	±15,500	
12	Office	Aero Systems - Off Airport	±8,800	
13	Office	Turf Cuts, Trail Ridge Const.-Off Airport	±5,200	
14	Office	Tri-County Heliport - Off Airport	±8,000	
15	AWOS	AWOS	--	

Future Structures List

No.	Description	Occupant	Size	Elevation
F1	Ground Lease Hangar	- -	10,000'	5,106'
F2	Ground Lease Hangar	- -	10,000'	5,106'
F3	Ground Lease Hangar	- -	10,000'	5,106'
F4	SRE Building	- -	3,750'	5,123'
F5	Ground Lease Hangar	- -	10,000'	5,106'
F6	GA Terminal	- -	10,000'	5,123'
F7	Ground Lease Hangar	- -	2,400'	5,106'
F8	T-Hangar	- -	9,450'	5,104'
F9	T-Hangar	- -	9,450'	5,104'
F10	T-Hangar	- -	11,550'	5,104'
F11	T-Hangar	- -	11,550'	5,104'

Notes:
1. Existing and Future Runway 15/33 primary surface is 250' wide.

Legend

(E), (F) Existing, Future
Existing Property Line
Future Limits of Easement
Future Property Line
Building Restriction Line (BRL)
Object Free Area (OFA)
Runway Safety Area (RSA)
Obstacle Free Zone (OFZ)
Existing Fence
Future Fence
Dirt Road
Existing Paved Roads
Future Paved Roads
Existing Pavement
Future Pavement
Ultimate Pvement
Pavements To Be Removed/Abandoned
Existing Buildings
Future Buildings
Ultimate Buildings
Existing Buildings To Be Removed
Drainage Line
Contour Line
Through-the-Fence Access Points
Segmented Circle With Lighted Wind Cone
Rotating Beacon
Security Gates

Runway to Taxiway Separation Standards (E)

Standard Item	Separation
Runway Centerline To Parallel Taxiway/Taxilane Centerline	150'
Runway Centerline To Edge Of Aircraft Parking	125'
Runway Centerline To Fixed Or Movable Object	125'
Runway Centerline To Holdline	125'
Taxiway Centerline To Parallel Taxiway/Taxilane Centerline	69'
Taxiway Centerline To To Fixed Or Movable Object	44.5'
Taxilane Centerline To To Parallel Taxilane Centerline	64'
Taxilane Centerline To Fixed Or Movable Object	39.5'

*Taxiway Design Group I

Runway to Taxiway Separation Standards (F)

Standard Item	Separation
Runway Centerline To Parallel Taxiway/Taxilane Centerline	240'
Runway Centerline To Edge Of Aircraft Parking	400'
Runway Centerline To Fixed Or Movable Object	400'
Runway Centerline To Holdline	250'
Taxiway Centerline To Parallel Taxiway/Taxilane Centerline	105'
Taxiway Centerline To To Fixed Or Movable Object	65.5'
Taxilane Centerline To To Parallel Taxilane Centerline	97'
Taxilane Centerline To Fixed Or Movable Object	57.5'

*Taxiway Design Group II

No.	Revision	Chk'd	Date

Erie Municipal Airport
Town of Erie, CO

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303.782.0892 | 303.782.0842 fax
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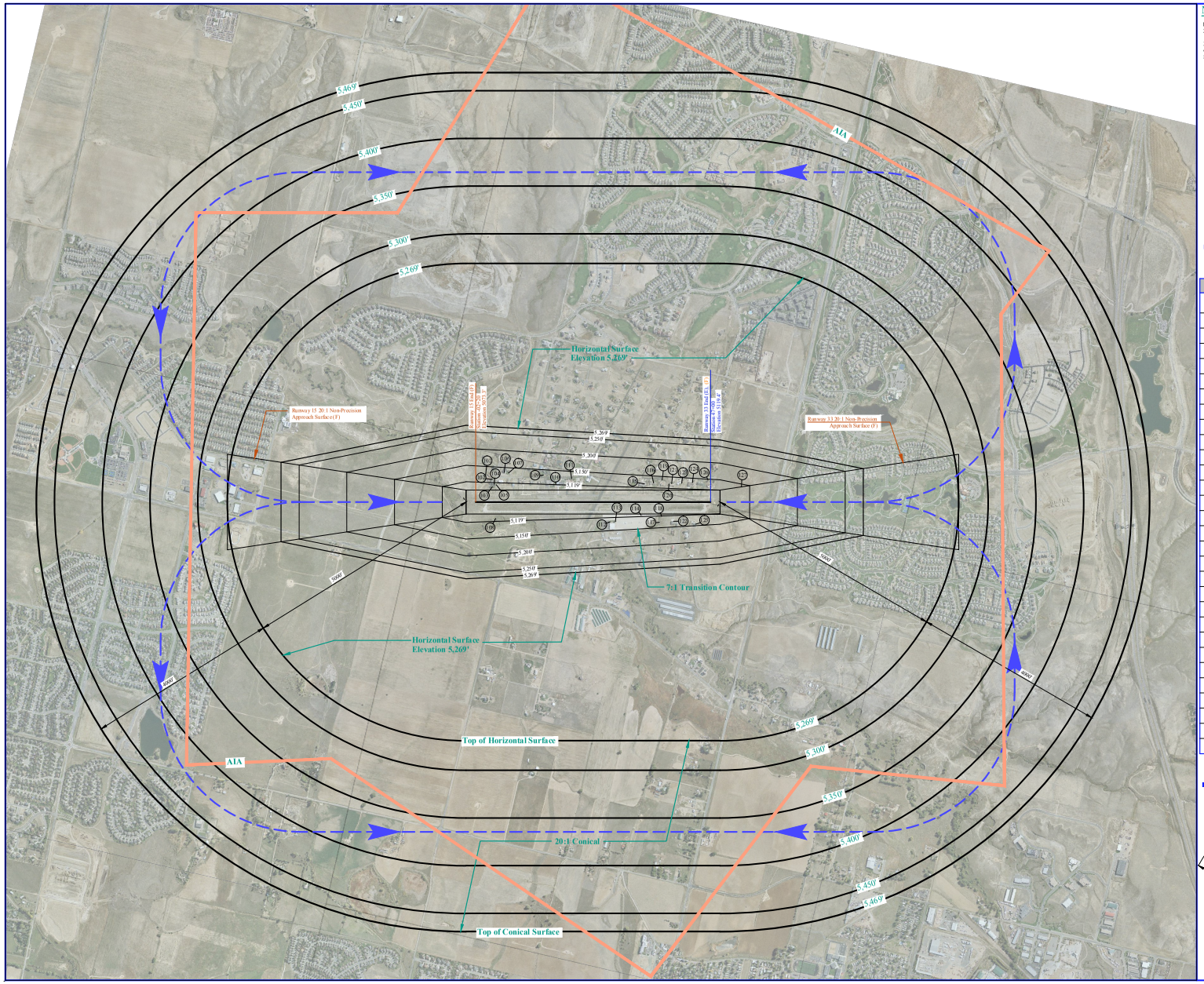
A.I.P. Project Number: 3-08-0090-13-2012

Project No.:	EIK13980M
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Terminal Area Plan

Exhibit:
IV
of IX Exhibits



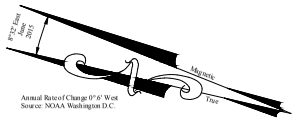
Notes

1. Primary Runway 15-33 is 60 feet wide by 4,700 feet in length existing, 75 feet wide by 4,920 feet in length ultimate.
2. Primary surface for Runway 15-33 is 250 feet wide by 5,100 feet in length. Ultimate primary surface is 500 feet wide by 5,320 feet in length
3. See the Land Use Plan Sheet for information on the zones.
4. See Sheets VI and VII for obstructions within approach surface.
5. Date of obstruction survey 12-4-14. Other object heights were estimated.

Graphic Scale

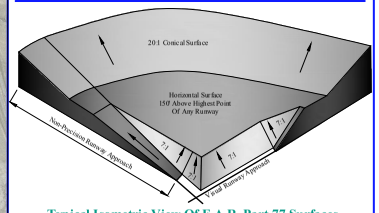
1000 0 500 1000 2000 4000 Feet

300 0 150 300 600 1200 Meters



Obstruction Table

No.	Object	Top Elevation	Part 77 Penetration	Disposition	Estimated Ground Elevation
101	Tree	5123'	0.5' (Before Ext.)	None	5088'
102	Tree	5124'	17.0'	Lower	5081'
103	Tree	5125'	38.1'	Lower	5084'
104	Private Residence	5128'	16.3'	Obstruction Light	5088'
105	Tree	5125'	11.0'	Lower	5090'
106	Private Residence	5142'	10.3'	Obstruction Light	5108'
107	Tree	5135'	4.3'	Lower	5098'
108	Tree	5096'	5.7'	Lower	5079'
109	Tree	5131'	3.5'	Lower	5083'
110	Tree	5133'	7'	Lower	5094'
111	Tree	5128'	0.5'	Lower	5096'
112	Tree	5125'	7.2'	Lower	5094'
113	Tree	5126'	1'	Lower	5080'
114	Aircraft Parking Apron	5106'	2'	Relocate	5100'
115	Private Residence	5134'	7.2'	Obstruction Light	5109'
116	Private Residence	5132'	0.3'	Obstruction Light	5116'
117	Tree	5135'	4.0'	Lower	5095'
118	Tree	5123'	7.0'	Lower	5095'
119	Tree	5145'	1.2'	Lower	5131'
120	Tree	5144'	17.2'	Lower	5115'
121	Private Residence	5140'	5.5'	Obstruction Light	5122'
122	Private Residence	5133'	0.2'	Obstruction Light	5110'
123	Tree	5146'	11.5'	Lower	5117'
124	Private Residence	5148'	5.2'	Obstruction Light	5126'
125	Private Residence	5149'	1.0'	Obstruction Light	5122'
126	Tree	5156'	8.0'	Lower	5120'
127	Nat. High Pnt.	5156'	11'	Lower	5156'



Typical Isometric View Of F.A.R. Part 77 Surfaces

(Cut On Runway Centerlines)

No.	Revision	Chd.	Date

Erie Municipal Airport

Town of Erie, CO

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A.I.P. Project Number: 3-08-0090-13-2012

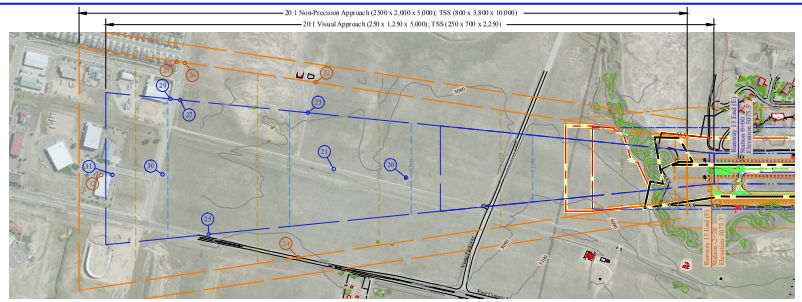
Project No.: EIK13980M
Designed By: SMP
Drawn By: KG
Approved By: DPH
Date: April 2016

Airport Airspace Drawing

Exhibit:

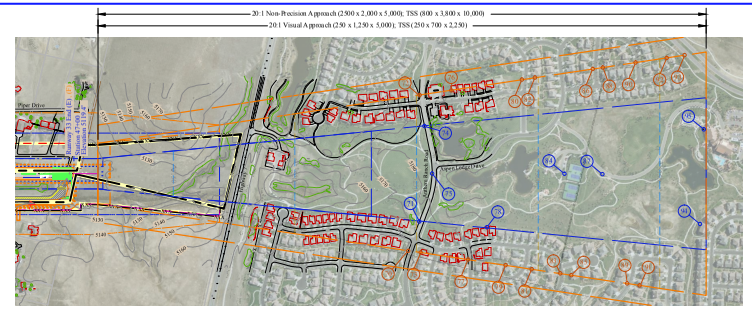
V

of IX Exhibits

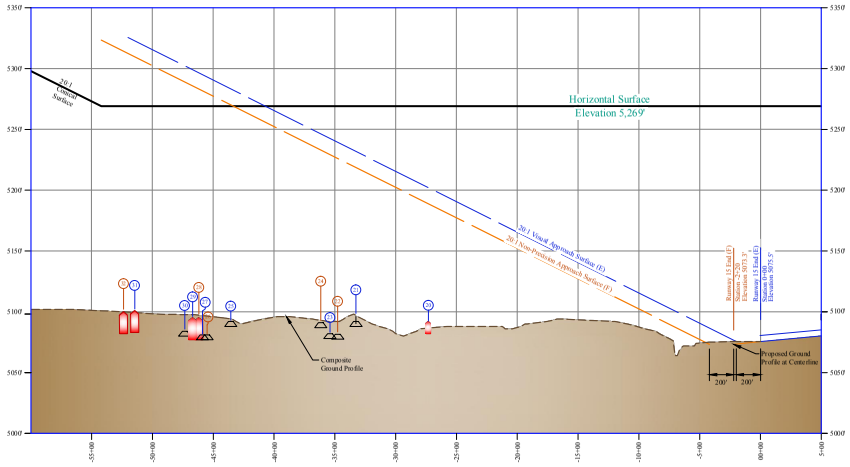


Plan View

Scale 1" = 500'



Runway 15 Plan

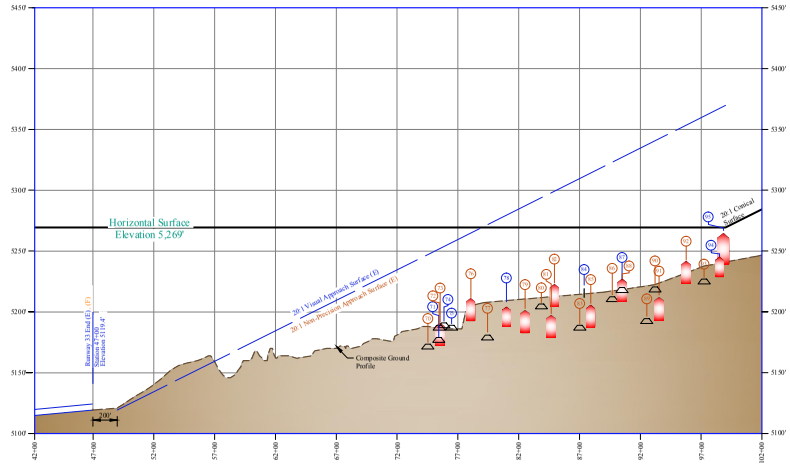


Runway 15 Profile

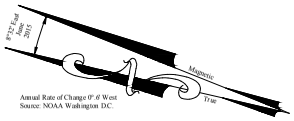
Profile View

Scale 1" = 500'
Vertical Scale 1" = 50'

Runway 33 Plan



Runway 33 Profile



Notes:

1. 14 CFR Part 77 clearance/penetrations determined by adding the following obstacle heights:

   15 ft. - Public Road

2. Close in obstructions as contained within the inner portion of the approach surface are also depicted on Exhibit V, Runway 15/33 Inner Portion Of Approach Surface Plan and Profile.
3. Airport Elevation and high point is 5,119.4'

Legend

(E), (F), (U)	Existing, Future, Ultimate
	Existing Property Line
	Future Property Line
	Building Restriction Line (BRL)
	Runway Protection Zone (RPZ)
	Approach Surface
	Object Free Area (OFA)
	Runway Safety Area (RSA)
	Obstacle Free Zone (OFZ)
X X X	Existing Fence
XX XX XX	Future Fence
	Dirt Road
	Existing Paved Roads
	Future Paved Roads
	Future Pavement
	Existing Buildings
	Drainage Line
5100	Contour Line
	Public Road At Centerline
	Public Road At Edge of Approach Surface
	Private Road At Centerline
	Private Road At Edge of Approach Surface
	Tree/Brush At Edge of Approach Surface
	Building At Edge of Approach Surface

Existing Runway 15 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
20	Building at Centerline	5092'	--		5082'
21	Dirt Road at Centerline	5098'	--		5088'
23	Dirt Road at Edge of Approach Surface	5088'	--		5078'
25	County Line Road at Edge of Approach Surface	5103'	Horizontal Surface 166.0'		5088'
27	Bonnell Avenue at Edge of Approach Surface	5092'	Horizontal Surface 177.0'		5077'
29	Building at Edge of Approach Surface	5095'	Horizontal Surface 174.0'		5077'
30	Bonnell Avenue at Centerline	5095'	Horizontal Surface 174.0'		5080'
31	Building at Centerline (Conical)	5101'	Horizontal Surface 168.0'		5083'

Future Runway 15 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
22	Dirt Road at Edge of Approach Surface	5087.5'	--		5078'
24	County Line Road at Edge of Approach Surface	5102'	Horizontal Surface 167.0'		5087'
26	Bonnell Avenue at Edge of Approach Surface	5092'	Horizontal Surface 177.0'		5077'
28	Building at Edge of Approach Surface	5095'	Horizontal Surface 174.0'		5077'
32	Building at Centerline	5100'	Horizontal Surface 169.0'		5082'

Existing Runway 33 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
71	Anthem Ranch Road at Edge of Approach Surface	5190'	--		5175.0'
74	Anthem Ranch Road at Centerline	5202'	--		5187.0'
75	Anthem Ranch Road at Edge of Approach Surface	5200'	--		5185.0'
78	Building at Edge of Approach Surface	5204'	Horizontal Surface 65.0'		5188.0'
84	Tennis Courts at Centerline	5219'	Horizontal Surface 50.0'		5212.0'
87	Aspen Lodge Road at Centerline	5231'	Horizontal Surface 38.0'		5216.0'
94	Building	5245'	Horizontal Surface 24.0'		5229.0'
95	Building	5271'	Horizontal Surface -2.0'		5240.0'

Future Runway 33 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
70	Anthem Ranch Road at Edge of Approach Surface	5179.5'	--		5169.5'
72	Anthem Ranch Road at Edge of Approach Surface	5195.0'	--		5185.0'
73	Building at Edge of Approach Surface	5190.5'	--		5172.5'
76	Building at Edge of Approach Surface	5210.8'	--		5192.8'
77	Shravano Drive at Edge of Approach Surface	5187.0'	Horizontal Surface 82.0'		5177.0'
79	Building at Edge of Approach Surface	5201.0'	Horizontal Surface 68.0'		5183.0'
80	Chesapeake Drive at Edge of Approach Surface	5212.5'	Horizontal Surface 56.5'		5202.5'
81	Building at Edge of Approach Surface	5197.0'	Horizontal Surface 72.0'		5179.0'
82	Building at Edge of Approach Surface	5222.5'	Horizontal Surface 46.5'		5204.5'
83	Antero Circle at Edge of Approach Surface	5195.0'	Horizontal Surface 74.0'		5185.0'
85	Building at Edge of Approach Surface	5205.5'	Horizontal Surface 63.5'		5187.5'
86	Sonora Drive at Edge of Approach Surface	5218.5'	Horizontal Surface 50.5'		5208.5'
88	Building at Edge of Approach Surface	5227.0'	Horizontal Surface 42.0'		5209.0'
89	Silver Mountain Loop at Edge of Approach Surface	5200.5'	Horizontal Surface 68.5'		5190.5'
90	Alisanto Drive at Edge of Approach Surface	5226.5'	Horizontal Surface 42.5'		5216.5'
91	Building at Edge of Approach Surface	5211.5'	Horizontal Surface 57.5'		5193.5'
92	Building at Edge of Approach Surface	5241.5'	Horizontal Surface 27.5'		5223.5'
93	Lowell Blvd. at Edge of Approach Surface	5238.0'	Horizontal Surface 31.0'		5223.0'

No.	Revision	Chd	Date

Erie Municipal Airport
Town of Erie, CO

AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-2000
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

A.I.P. Project Number: 3-08-0090-13-2012

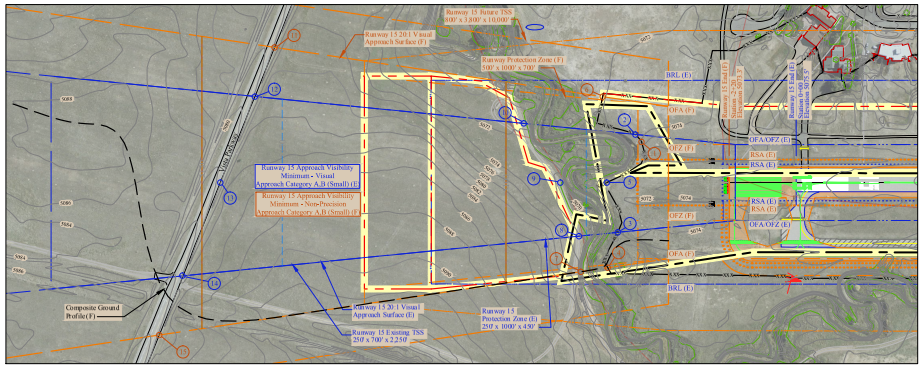
Project No:	EIK 1398M
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Runway 15/33 Approach Surface Plan and Profile

Exhibit:

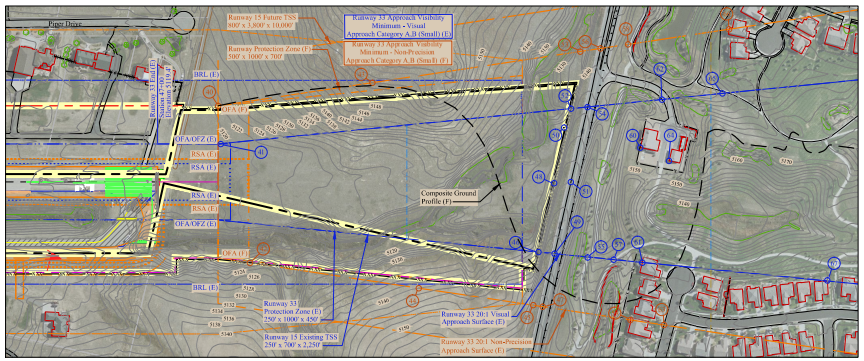
VI

of IX Exhibits



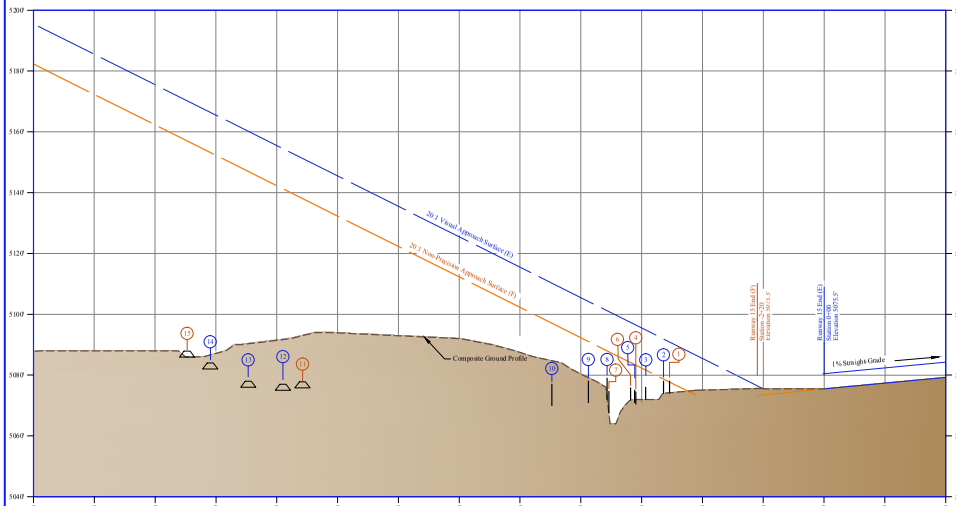
Runway 15 Plan

Scale 1"=200'



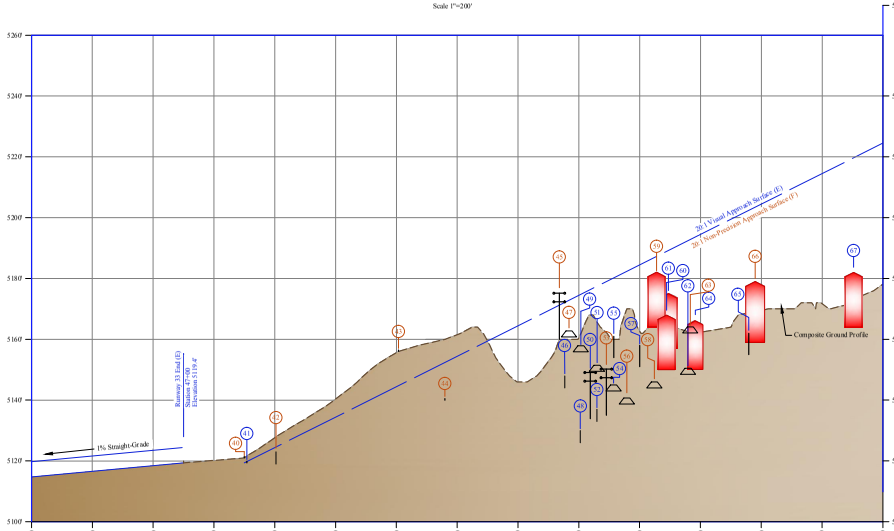
Runway 33 Plan

Scale 1"=200'



Runway 15 Profile

Scale
Horizontal 1"=200'
Vertical 1"=20'



Runway 33 Profile

Scale
Horizontal 1"=200'
Vertical 1"=20'

Legend

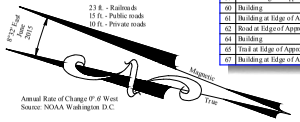
(E), (F), (U)

- Existing, Future, Ultimate
- Existing Property Line
- Future Property Line
- Building Restriction Line (BRL)
- Runway Protection Zone (RPZ)
- Approach Surface
- Object Free Area (OFA)
- Runway Safety Area (RSA)
- Obstacle Free Zone (OFZ)
- Existing Fence
- Future Fence
- Dirt Road
- Existing Paved Roads
- Future Paved Roads
- Future Pavement
- Existing Buildings
- Drainage Line
- Contour Line
- Road
- Tree/Brush At Edge of Approach Surface
- Building At Edge of Approach Surface

Notes:

1. 14 CFR Part 77 clearances/penetrations determined by adding the following obstacle heights:

23 ft. - Railroads
15 ft. - Public roads
10 ft. - Private roads



Annual Rate of Change 0° 6' West
Source: NOAA Washington D.C.

Existing Runway 15 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
2	Fence at Edge of Approach Surface	5081'	--		5074'
3	Fence at Edge of Approach Surface	5079'	--		5072'
5	Fence at Centerline	5078'	--		5071'
8	Trail at Edge of Approach Surface	5079'	--		5072'
9	Trail at Centerline	5078'	--		5071'
10	Trail at Centerline	5077'	--		5070'
12	Vista Parkway At Edge of Approach Surface	5090'	--		5075'
13	Vista Parkway At Centerline	5091'	--		5076'
14	Vista Parkway At Edge of Approach Surface	5097'	--		5082'

Future Runway 16 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
1	Future Fence at Edge of Approach Surface	5081.1'	Approach Surface 3.4'		5074.1'
4	Future Fence at Edge of Approach Surface	5077.5'	--		5070.5'
6	Future Fence at Edge of Approach Surface	5078.8'	--		5071.8'
7	Trail at Edge of Approach Surface	5077.7'	--		5067.7'
11	Vista Parkway At Edge of Approach Surface	5085.8'	--		5075.8'
15	Vista Parkway At Edge of Approach Surface	5095.9'	--		5085.9'

Existing Runway 33 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
41	Ground at Edge of Approach Surface	5120.4'	Approach Surface 0.6'		5120'
46	Fence at Edge of Approach Surface	5151'	--		5140'
48	Highway 7 At Edge of Approach Surface	5147'	--		5140'
49	Fence at Centerline	5171'	--		5156'
50	Power Pole at Edge of Approach Surface	5172'	--		5134'
51	Fence at Edge of Approach Surface	5140'	--		5133'
52	Highway 7 At Centerline	5164.5'	--		5149.5'
54	Highway 7 At Edge of Approach Surface	5158'	--		5143'
55	Trail at Edge of Approach Surface	5161'	--		5154'
57	Trail at Edge of Approach Surface	5158'	--		5151'
60	Building	5168'	--		5150'
61	Building at Edge of Approach Surface	5175'	--		5157'
62	Road at Edge of Approach Surface	5163.5'	--		5148.5'
64	Building	5160'	--		5150'
65	Trail at Edge of Approach Surface	5162'	--		5155'
67	Building at Edge of Approach Surface	5182'	--		5164'

Future Runway 33 Obstruction Table (20:1)

No.	Object	Top Elevation	Surface Penetration	Disposition	Estimated Ground Elevation
40	Ground at Edge of Approach Surface	5121.5	Approach Surface 2.1'		5121'
42	Future Fence at Edge of Approach Surface	5120'	Approach Surface 1.4'		5119'
43	Ground at Edge of Approach Surface	5156.5'	Approach Surface 11.8'		5156'
44	Ground at Edge of Approach Surface	5140.5'	--		5140'
45	Power Pole at Edge of Approach Surface	5158.5'	Approach Surface 13.8'		5160'
47	Highway 7 at Edge of Approach Surface	5175.8'	Approach Surface 3'		5160.8'
53	Power Pole at Edge of Approach Surface	5160'	--		5135'
56	Highway 7 At Edge of Approach Surface	5153.7'	--		5138.7'
58	Road at Edge of Approach Surface	5154'	--		5144'
59	Building at Edge of Approach Surface	5184.1	--		5164.1'
63	Street at Edge of Approach Surface	5172.1'	--		5162.1'
66	Building at Edge of Approach Surface	5179'	--		5159'

No.	Revision	Chd.	Date

Erie Municipal Airport

Town of Erie, CO

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www.ADGAirports.com

A.I.P. Project Number: 3-08-0090-13-2012

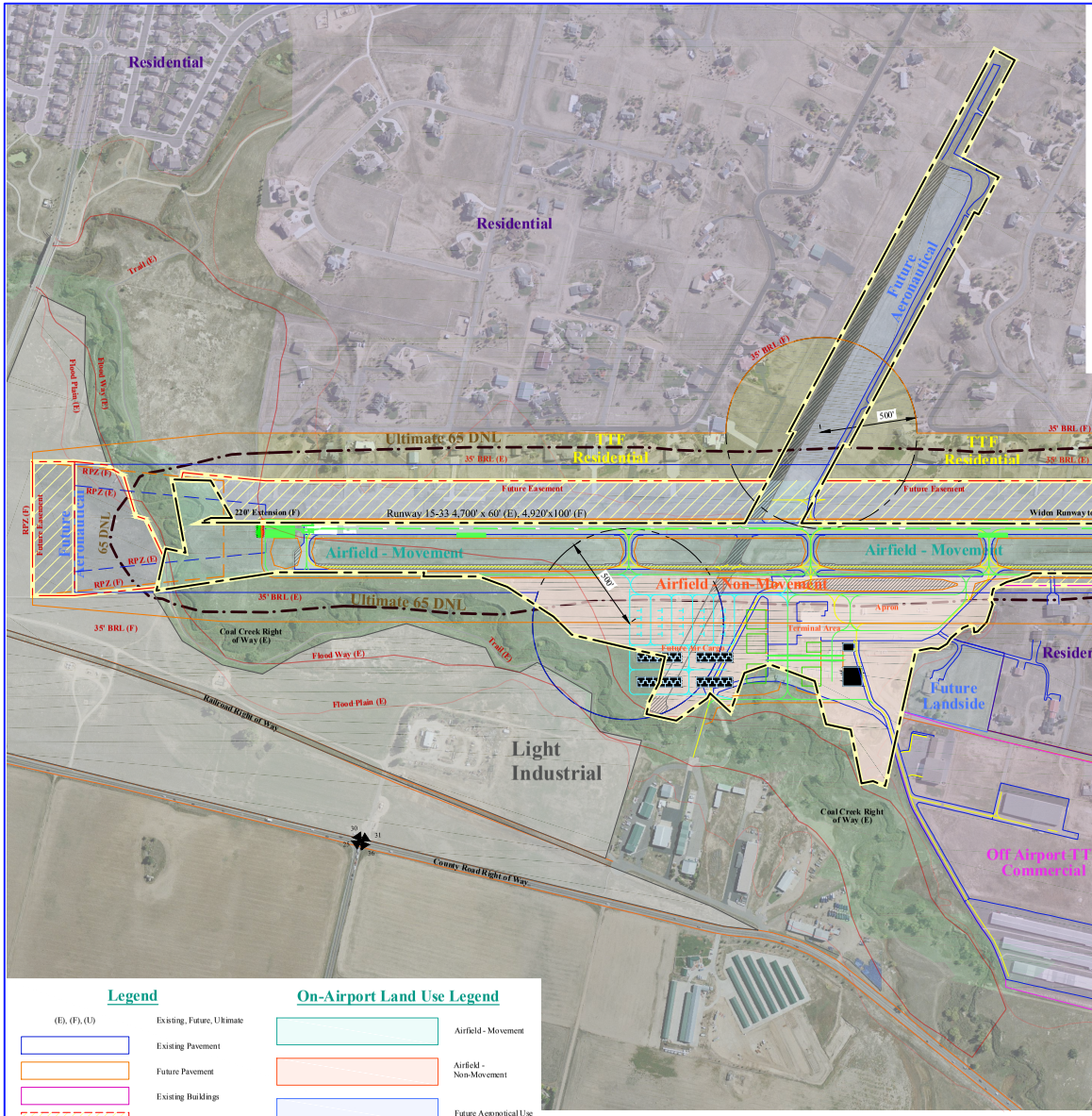
Project No:	EIK13988M
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Runway 15/33-16/34 Inner Portion of Approach Surface Plan and Profile

Exhibit:

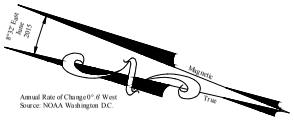
VII

of IX Exhibits



Off Airport (Area) Land Use Legend

- Off Airport TTF Commercial
- Commercial
- Residential
- TTF Residential
- Planned Unit Development (Allows variety of land uses within single development/subdivision)
- Light Industrial
- Highway Right of Way
- BRL Future



Graphic Scale

300 0 150 300 600 1200 Feet

90 0 45 90 180 360 Meters

Noise Contour Legend

Year 2033 65 DNL Noise Countour

Legend

(E), (F), (U)	Existing, Future, Ultimate
	Existing Pavement
	Future Pavement
	Existing Buildings
	Easement
	RPZ/RPZ Pro
	AWOS Critical Area

On-Airport Land Use Legend

	Airfield - Movement
	Airfield - Non-Movement
	Future Aeronotical Use

* Note: There are no large public gathering spaces near the airport (ie. churches, schools, hospitals, etc.

A. General Purpose - Overlay zoning is typically used when there is special public interest that does not coincide with a specific zoning district. Overlay zones contain restrictions in addition to or less than those in the underlying zone district.

B. Airport Overlay District (APO) - Per the Town of Erie Zoning Coded 10-2-5, the following zoning pertains to development on and adjacent to the Erie Municipal Airport.

1. Purpose - The purpose of the Airport Overlay district is to minimize exposure of residential and other sensitive land uses to aircraft and their potential impacts, including noise, to minimize risks to public safety from aircraft accidents, and to discourage traffic congestion and incompatible land uses proximate to, and within, airport influence areas.

2. Warning and Disclaimer of Liability - The degree of protection provided by this Section is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study and does not imply that areas outside the airport influence will be totally free from potential safety issues associated with aircraft activity. This Section shall not create a liability on the part of, or cause an action against, the Town or any officer or employee thereof, for any damages that may result directly or indirectly from the reliance on this Section.

3. Nonconforming Structures or Uses

a. These regulations shall not require any change in the construction, alteration, or intended use of any structure, the construction or alteration of which began prior to the effective date of this Section and is diligently prosecuted; provided, however, that when the nonconforming structure is destroyed or damaged to the extent of more than 50 percent of the appraised value of the nonconforming structure, any reuse, reconstruction or replacement shall be deemed a new use and shall be subject to the applicable provisions of the UDC.

b. The owner of any nonconforming structure or object of natural growth is hereby required to permit the installation, operation and maintenance thereon of such markers and lights as required by the Federal Aviation Regulations ("FAR") Part 77, to indicate to the operators of aircraft in the vicinity of the airport the presence of such nonconforming structures or objects of natural growth. Such markers and lights shall be installed, operated, and maintained at the expense of the owner of such nonconforming structure or object of natural growth.

4. Development Standards

a. Noise contours and 14 CFR Part 77 shall be used when reviewing land use proposals.

b. Noise attenuation in building design should be included in development proposals.

c. An avigation easement is required for all areas within the designated Airport Influence Area.

5. Height Limitations

a. Height limitations within the Airport Influence Area, except as otherwise provided in this Section, are subject to the limitation of the district within which the property is located, recommendations of the Erie Airport Manager, and other appropriate referral agencies. No structure or object of natural growth shall be constructed, erected, altered or permitted to grow or to be maintained in excess of height limits and zones herein established. Chapter 2: Zoning Districts Section 10.2.7 Overlay Districts Title 10 - Unified Development Code NOVEMBER 2013 Erie, Colorado Page 14

b. The specific height zone and limitations for each airport/heliport shall be the designated elevation as shown on the approved airport plan or as calculated using the procedure stipulated on the airport plan.

c. Notice to the Federal Aviation Administration ("FAA") shall be required for the construction or alteration of any structure 200 feet or higher located within 20,000 feet of any Erie Municipal Airport runway.

6. Land Use Limitations - No use may be made of land within the designated Airport Influence Area in such a manner as to:

a. Create electrical interference with radio communication between the airport and aircraft;

b. Make it difficult for pilots to distinguish between airport lights and other lights;

c. Cause glare in the eyes of pilots using the airport;

d. Impair visibility in the vicinity of the airport;

e. Attract birds; or

f. Otherwise endanger the landing, taking off, or maneuvering of aircraft at the airport or in the vicinity of the airport.

7. Airport Influence Area - An application for Initial Zoning, Rezoning, PD or PUD approval for land within the Airport Influence Area shall include, in addition to any other submittal requirements herein, the following:

a. An avigation easement signed by the landowner that acknowledges flight operations above the land, recorded in the office of the county clerk and recorder. The book and page of the recorded easement shall be noted on subsequent approved plans and plats involving the land.

b. A study which shows compliance with the FAA, 14 CFR Part 77, and a plat note on the Final Plat stating that the plat is in compliance with 14 CFR Part 77.

c. Referral to the Erie Airport Manager for review and comment.

d. A copy of the public disclosure statement to be provided to prospective buyers, disclosing the airport activity.

e. A land use compatibility map depicting the 55, 60 and 65 Ldn noise contours overlaid on the property.

8. Airport Influence Area Requirements - Within the following specific portions of the Airport Influence Area, the following shall be required:

a. Approach Surface: Structure height shall be restricted to a maximum of 100 feet or as provided in 14 CFR Part 77, whichever is less.

b. Runway Protection Zone: i. Non-aeronautical structures are prohibited. ii. Structure height shall be restricted to a maximum of 100 feet or as provided in 14 CFR Part 77, whichever is less. Chapter 2: Zoning Districts Section 10.2.7 Overlay Districts Title 10 - Unified Development Code NOVEMBER 2013 Erie, Colorado Page 15 c. 65 Ldn Noise Zone: Residential and other noise sensitive development shall be discouraged. To the extent development is permitted, noise attenuation shall be required.

No.	Revision	Chkd	Date

Erie Municipal Airport

Town of Erie, CO

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A.I.P. Project Number: 3-08-0090-13-2012

Project No:	EIK13980M
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Land Use Plan

Exhibit:

VIII

of IX Exhibits

Airport Property Interest

Tract	Acres	Location	Grantor	Grantee	Type Of Interest	Book & Page	Date of Recording	Usage	Federal Project No.
Parcel 1	20.61	Part of Section 31	Skies Unlimited, Inc.	Town of Erie	Warranty Deed	Book 1435, Page 968	April 6, 1994	Airport Development	AIP No. 03-08-0090-01
Parcel 2	8.5	Part of Section 31	Skies Unlimited, Inc.	Town of Erie	Warranty Deed	Book 1435, Page 968	April 6, 1994	Airport Development	AIP No. 03-08-0090-01
Parcel 3	1.08	Part of Section 31	Skies Unlimited, Inc.	Town of Erie	Warranty Deed	Book 1435, Page 968	April 6, 1994	Airport Development	AIP No. 03-08-0090-01
2	8.3	Part of Section 30	J. Feuer and H.S. Cerousky	Town of Erie	Easement	Book 1280, Page 946	October 24, 1990	RPZ Protection	AIP No. 03-08-0090-01
3	3.12	Part of Section 31	J.D. Feuer	Town of Erie	Warranty Deed	Reception 3639803	July 21, 2009	RPZ Protection	AIP No. 03-08-0090-01
4	1.15	Part of Section 31	C.M. and M.R. Phillips	Town of Erie	Warranty Deed	Reception 2778149	June 30, 2000	RPZ Protection	AIP No. 03-08-0090-01
5	1.21	Part of Section 31	J.D. Feuer	Town of Erie	Correction Quit Claim Deed	Reception 3639803	July 21, 2009	RPZ Protection	AIP No. 03-08-0090-01
8	6.44	Part of Section 31	Weld County Colorado	Town of Erie	Treasurers Deed	Reception 2702613	June 30, 1999	RPZ Protection	AIP No. 02
9	3.5	Part of Section 31	J. Feuer and H.S. Cerousky	Town of Erie	Easement	Book 1280, Page 949	October 25, 1990	RPZ Protection	AIP No. 03-08-0090-01
15	±6	Various	Various	Town of Erie	Easement			Airport Development	AIP No. 02
16	5.84	Part of Section 31	J.T. Hazelwood Trust	Town of Erie	Warranty Deed	Reception 3194268	June 30, 2004	RPZ Protection	
17	±13.47	Part of Section 31	Various	Town of Erie	Notice of Lis Pendens	Reception 3327912	September 30, 2005		
Future									
F1	±0.61	Part of Section 31	Marc Demers	Town of Erie	Fee		--	Future Airport Development	
F2	±0.8	Part of Section 31	Jennifer M. Fitzgerald	Town of Erie	Fee		--	Future Airport Development	
F3	±0.14	Part of Section 31	Feuer Trust	Town of Erie	Fee		--	Future Airport Development	
F4	±2.41	Part of Section 31	Town of Erie	Town of Erie	Fee		--	Future Airport Development	
F5	±2.11	Part of Section 31	Town of Erie	Town of Erie	Fee		--	Future Airport Development	
F6	±3.54	Part of Section 31	Feuer Trust	Town of Erie	Easement		--	Approach Protection	
F7	±1.75	Part of Section 31	Town of Erie	Town of Erie	Fee		--	RPZ Protection	

Notes:

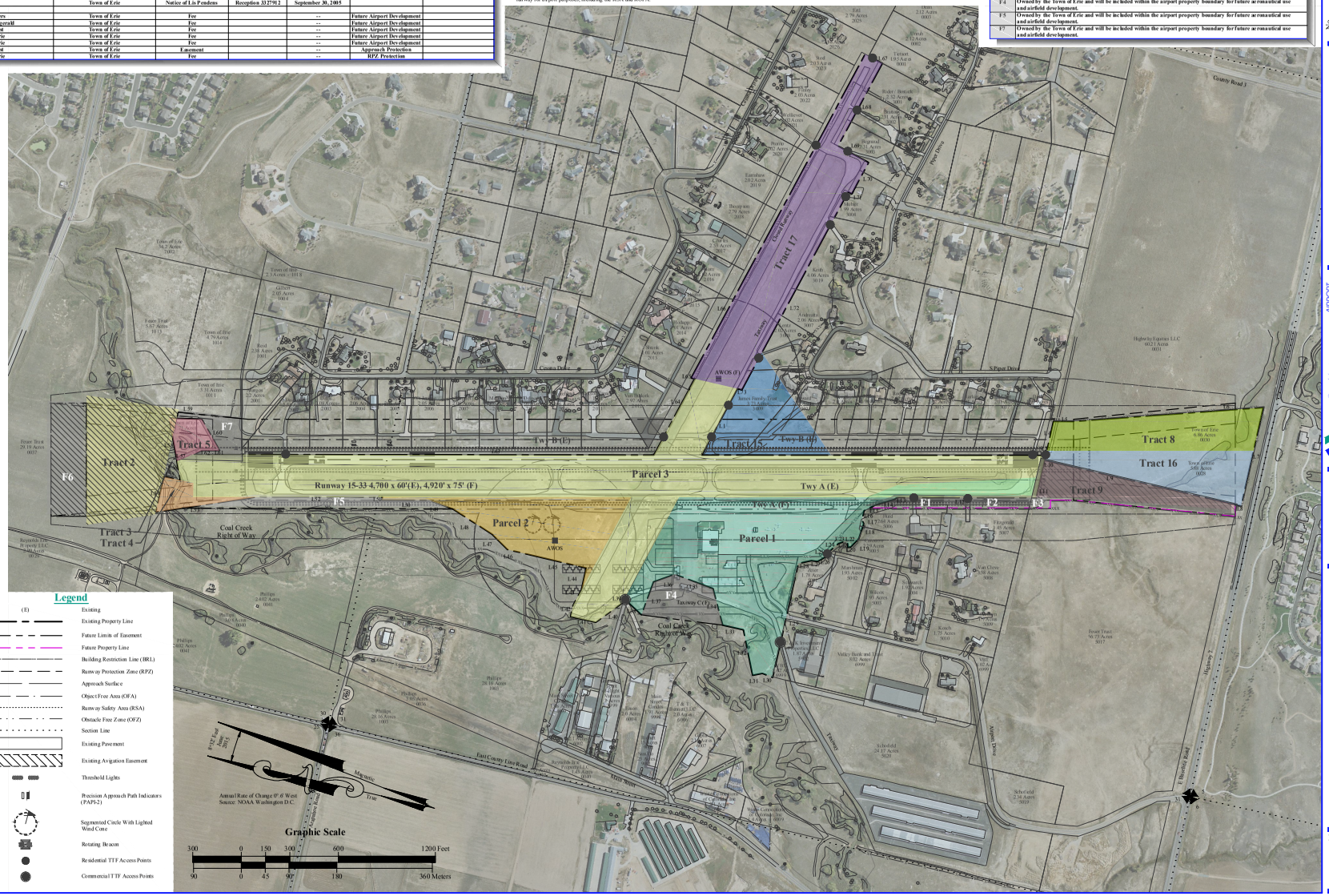
1. All Airport Property situated in Sections 30 and 31, Township 1 North, Range 68 West, 6th Prime Meridian, Town of Erie, Weld County, Colorado.
2. The Erie Municipal Tri-County is located in parts of sections 30 and 31, Township 1 North, Range 68 West of the 6th Prime Meridian, Town of Erie, County of Weld, State of Colorado.
3. Information on this sheet was obtained from Exhibit A (Dated September 2001) and deed research provided by Town of Erie Airport staff. This information is depicted without the benefit of a boundary survey or verification of ownership.
4. Prior to 1339, the Erie Municipal Airport was a private, public-use airport known as the Tri-County Airport. The sponsor of the Tri-County Airport was Skies Unlimited, which received Federal funds under AIP No. 01 for airport improvements, including land acquisition. Subsequently, Skies Unlimited declared bankruptcy and the Town of Erie acquired the airport, including associated leases and easements.
5. Platted easements for the homes just east of the runway reserves the use of land adjacent the runway for airport purposes, including the RSA and ROFA.

Airport Property Notes

Tract	Notes
Parcel 1	Acquired under AIP Project No. 2. These parcels were originally parts of tract H.
Parcel 2	Acquired under AIP Project No. 2. These parcels were originally parts of tract H.
Parcel 3	Acquired under AIP Project No. 2. These parcels were originally parts of tract H.
2	Easement originally acquired by Skies Unlimited but transferred to the Town of Erie.
3 & 5	Same as Coal Creek Right of Way; Tract 3 (CEZ6 No. 1733844) and Tract 5 acquired under AIP project No. 1. Tracts 3 & 5 are recorded as one.
6, 7, 10-14	Reserved for future projects
15	Three parcels acquired in AIP-01. Release from aeronautical use to be requested.
17	Grantors listed at Weld County Recorder.
F1-F3	To be acquired for future taxiways.
F4	Owned by the Town of Erie and will be included within the airport property boundary for future aeronautical use and airfield development.
F5	Owned by the Town of Erie and will be included within the airport property boundary for future aeronautical use and airfield development.
F7	Owned by the Town of Erie and will be included within the airport property boundary for future aeronautical use and airfield development.

Metes and Bounds

No.	Bearing	Distance
L1	N74°43'18.56"W	466.19'
L2	S12°54'51.56"E	2125.80'
L3	S87°07'32.76"E	30.67'
L4	N89°45'15.76"E	185.92'
L5	S12°53'22.2"E	123.38'
L6	S17°00'43.24"E	1136.23'
L7	S89°45'58.76"W	62.13'
L8	N0°06'23.76"E	39.87'
L9	N0°08'13.41"E	1207.07'
L10	S89°46'19.44"W	0.01'
L11	S89°46'24.44"W	236.53'
L12	N12°54'51.56"W	858.27'
L13	N46°43'38.2"W	20.55'
L14	N29°1'80.2"W	120.86'
L15	N40°08'28.2"W	80.41'
L16	N89°28'33.2"W	28.19'
L17	S51°33'45.78"W	25.81'
L18	N84°42'56.2"W	97.92'
L19	S44°17'21.67"W	69.95'
L20	S75°38'06.67"W	18.20'
L21	N3°48'41.33"W	26.26'
L22	N52°40'15.13"W	22.46'
L23	S68°07'44.67"W	42.72'
L24	S49°24'56.67"W	83.20'
L25	S33°36'01.67"W	35.56'
L26	S59°40'10.67"W	52.59'
L27	N82°45'02.13"W	38.94'
L28	S78°15'46.67"W	82.13'
L29	S12°40'56.67"W	72.23'
L30	N68°38'17.13"W	68.71'
L31	S79°05'34.67"W	61.78'
L32	N11°18'46.33"W	28.76'
L33	N77°43'42.33"W	131.47'
L34	N14°44'08.33"W	234.00'
L35	N60°35'54.13"W	252.82'
L36	S70°26'38.67"W	138.51'
L37	S19°57'29.67"W	217.48'
L38	N46°50'01.33"W	145.00'
L39	S28°15'36.16"W	30.39'
L40	S54°00'42.16"W	200.32'
L41	N77°27'21.64"W	160.00'
L42	N12°23'38.16"E	69.37'
L43	N28°1'36.16"E	108.27'
L44	N12°3'45.16"E	140.87'
L45	N76°48'47.64"W	900.00'
L46	N76°48'47.6"	0.01'
L47	N45°17'45.64"W	135.36'
L48	N57°1'70.7.64"W	287.92'
L49	N60°5'900.64"W	158.17'
L50	N89°5'956.64"W	289.91'
L51	N12°2'29.36"E	20.46'
L52	N89°5'956.64"W	770.11'
L53	S81°25'27.71"W	638.48'
L54	N12°38'11.36"E	223.54'
L55	S77°49'51.06"E	105.75'
L56	N10°38'40.64"W	120.00'
L57	N67°16'35.16"E	0.77'
L58	N10°37'39.89"W	270.15'
L59	S88°10'22.58"E	202.90'
L60	S29°33'13.3"E	224.47'
L61	S89°59'58.67"W	110.00'
L62	S67°15'37.67"W	62.58'
L63	S89°55'56.64"E	2851.36'
L64	N28°1'36.16"E	535.10'
L65	N76°5'49.00"E	210.7'
L66	N28°1'440.00"E	2772.19'
L67	S61°45'20.00"E	120.00'
L68	S28°14'40.00"E	579.96'
L69	S61°45'20.00"E	215.00'
L70	S28°14'40.00"E	220.00'
L71	N61°45'20.00"W	25.00'
L72	S28°14'40.00"E	1388.47'
L73	N76°5'49.00"W	28.71'



Legend

(E)	Existing
	Existing Property Line
	Future Limits of Easement
	Future Property Line
	Building Restriction Line (BRL)
	Runway Protection Zone (RPZ)
	Approach Surface
	Object Free Area (OFA)
	Runway Safety Area (RSA)
	Obstacle Free Zone (OFZ)
	Section Line
	Existing Pavement
	Existing Avigation Easement
	Threshold Lights
	Precision Approach Path Indicators (PAPI-2)
	Segmented Circle With Lighted Wind Cone
	Rotating Beacon
	Residential TTF Access Points
	Commercial TTF Access Points

No.	Revision	Ckd	Date

Erie Municipal Airport
Town of Erie, CO

ADG AIRPORT DEVELOPMENT GROUP INC.
1775 South Quebec Street / Suite 300
Denver, Colorado 80210-3302
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www.ADGdesigns.com

A.I.P. Project Number: 3-08-0090-13-2012

Project No:	EIK13984
Designed By:	SMP
Drawn By:	KG
Approved By:	DPH
Date:	April 2016

Exhibit 'A' Airport Property Inventory Map

Exhibit **IX** of IX Exhibits

Airport Development Group, Inc.

Professionals in Aviation Development

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