Chapter 4

SUSTAINABILITY PLAN

4.1 INTRODUCTION

This chapter discusses current City and Airport sustainability practices. This includes solid waste and other recycling programs, air emissions, electrical usage, greenhouse gases, water usage, storm water discharges, noise, natural resource management, water disposal, solid waste, cleaning and maintenance programs and administrative procedures. Some of these practices are also discussed later in Chapter 7, Environmental Considerations, as they relate to environmental quality issues.

Airport sustainability encompasses a wide range of practices applicable to the planning, design, building and operating of airport facilities. There are three core principles – protecting the environment, maintaining high and stable levels of economic growth and social progress that recognizes the needs of all stakeholders. The benefits of airport sustainability planning include reduced energy consumption, reduced environmental impacts (e.g., noise and air quality), reduced hazardous and solid waste generation, reduced greenhouse gas emissions, improved water quality, improved community relations and cost savings.

This chapter also includes recommendations for recycling and minimizing the generation of airport solid waste consistent with applicable state and local recycling laws. It should be noted that the cost of performing a waste audit is an allowable cost under the FAA Airport Improvement Program.

4.2 AIRPORT RECYCLING, REUSE AND WASTE REDUCTION PLAN

According to FAA Order 5100.38D *Airport Improvement Program Handbook* on Airport Improvement Program (AIP) grant eligibility, airport recycling, reuse and waste reduction plans, including the cost of a waste audit, are eligible under the FAA Modernization and Reform Act (FMRA) of 2012 (Public Law 112-95). According to Section 132 (b) of FMRA, the purpose of the recycling plan is to develop a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable state and local recycling laws.

There is a need to audit solid waste from Airport-owned and occupied buildings and Airport provided public use areas. At the Soldotna Municipal Airport, this would include airfield (runways and taxiways), aircraft parking aprons and the Airport Maintenance Yard. The only other City/Airport-owned facility is the well house on the north side of Funny River Road.

Recycling refers to any program, practice or opportunity to reduce the amount of waste disposal in a landfill. This includes the recycling, reuse and reduction of municipal solid waste (MSW) and other materials that could be legally disposed of in a 42 U.S.C. 6941-

6949a landfill or equivalent State-permitted facility. This includes construction and demolition (C&D) debris, organic compostable materials, such as food and yard waste, and deplaned waste. This does not include other types of solid waste such as hazardous waste, universal waste (i.e., batteries, fluorescent bulbs, electronics, etc.) or industrial waste.

According to the September 30, 2014 FAA Program Guidance Letter (PGL), *Guidance on Airport Recycling, Reuse and Waste Reduction,* this applies to:

a) Municipal Solid Waste (MSW) at airports, including, but not limited to, aluminum and steel, glass bottles and containers, plastic bottles and containers, packaging, bags, paper products and cardboard.
b) Construction and Demolition (C&D) at airports including any non-hazardous solid waste that results from land clearing, excavation or construction, demolition, renovation, or repair of structures, roads and utilities. This includes, but is not limited to, concrete, wood, metals, soil, bricks and masonry material, asphalt, rock, stone, gravel, sand, roofing materials, drywall, carpet, plastic, pipe, rocks, earthwork, land-clearing debris, cardboard, and salvaged building components. Some C&D debris may require special handling and may be subject to special requirements, e.g., tar-impregnated roofing materials and asbestos-containing building materials.
c) Compostables at airports which are sometimes referred to as green waste and food waste. Green waste consists of tree, shrub and grass clippings, leaves, weeds, small branches, seeds, pods and similar debris generated by landscape maintenance. Food waste is food that is not consumed, or is generated during food preparation activities and discarded.
d) Deplaned Waste at airports is MSW that is removed from passenger aircraft. These materials include bottles and cans, newspaper and mixed paper, plastic cups and utensils, food waste, food-soiled paper, magazines, unconsumed or surplus food and paper towels.

The Airport recycling, reuse and waste reduction plan includes the review and documentation of each of the following five elements listed in Section 133 of the FMRA.

- The feasibility of solid waste recycling at the Airport.
- Minimizing the generation of solid waste at the Airport.
- Operation and maintenance requirements.
- Review of waste management contracts, and
- The potential for cost savings or the generation of revenue.

The Airport recycling, reuse and waste reduction plan includes the following sections.

4.2.1 Facility Description and Background

Information on the number of based aircraft, aircraft operations, air taxis and other operators who serve the Airport, and available passenger and cargo data are presented

earlier in Chapter 2. Information on the Airport location, general aviation classification, governance and facility layout and description are presented earlier in Chapters 1 and 3.

The existing recycling program responsibilities at the Airport include several components as follows:

- The City/Airport has direct control of waste management on the airfield (runways, taxiways and non-leased aircraft parking aprons), airport maintenance yard and water well house, and other non-leased portions of the Airport.
- The City/Airport has no direct control of waste management on tenant-leased spaces and buildings (hangars, apron areas, offices and vehicular parking) and waste generated on aircraft using their facilities. The City/Airport encourages tenants to dispose of solid waste through the Alaska Waste contractor who serves the Airport Maintenance Yard.
- There are no areas of the Airport that the City/Airport does not have either direct control or influence on.

The Airport does not have its own separate active recycling program. The Airport's current waste management program is part of the Kenai Peninsula Borough-wide waste management program. The program is covered by the following State/City/Kenai Peninsula Borough ordinances, requirements, permits, etc. The Central Peninsula Landfill (CPL) is required by the State of Alaska Department of Environmental Conservation (ADEC) regulations to have multiple permits including ADEC Solid Waste Disposal Permit (SW1A006-16), ADEC Solid Waste RD&D Permit (SWRDD002-14) and ADEC Alaska Pollutant Discharge Elimination System Multi-Sector General Permit (AKR050000-11-AAC-110).

The ADEC encourages solid waste source reduction and recycling under *Alaska Statute, Chapter 46.06, Recycling and Reduction of Litter*, but has no restrictive regulations. Waste management practices at the Airport follow City *Code of Ordinances, Chapter 13.04 Municipal Airport, Section 13.04.200, Waste Disposal and Littering* which states that "No person shall litter any part of the Airport but shall dispose of any waste in proper containers."

Solid waste at the Airport Maintenance Yard is collected by the Alaska Waste haulage company on a weekly basis and disposed of at the Kenai Peninsula Borough Central Peninsula Landfill, the public and commercial disposal site located at Mile 98.5 on the Sterling Highway, about 2.5 miles south of Soldotna, and operated by the Kenai Peninsula Borough Solid Waste Department. Commercial haulers and the public deposit solid waste at the landfill.

The current recycling program is based on voluntary public participation and diverts as much material as possible from the landfill. The recyclables are baled and placed in a staging location for transport to market. The Kenai Peninsula Borough contracts with JCM to haul the recyclable bales to West Rock (formerly Rock Tenn) in Anchorage and the Kenai Peninsula Borough is paid for the recyclables received. Scrap metal (e.g.,

copper, iron and junk vehicles) is stored on site and a local scrap and salvage company periodically collects and hauls it away for marketing.

Because it is not practicable, or cost effective, to transport glass for recycling, and because there is a beneficial use locally, the Central Peninsula Landfill has utilized the glass collected for Central Peninsula Landfill road projects as a subbase and drainage material.

Additionally, construction and demolition (C&D), landscaping and wood (L&W), scrap metal and other materials not requiring burial are managed in other areas of the landfill site. Asbestos requires special Kenai Peninsula Borough permitting and is only accepted at the Central Peninsula Landfill where it is buried in a separate cell.

Hazardous waste, e.g., fluorescent bulbs, lead acid and household batteries, used oil and latex paint, refrigerators and freezers, are accepted at the landfill. The Kenai Peninsula Borough hazardous waste management contractor ships the hazardous waste out of Alaska for management.

The estimated annual tonnage at the landfill is 48,000 tons to 58,000 tons. In fiscal year 2014, only 719 tons were recycled primarily cardboard, mixed paper, newspaper and aluminum. In 2014, the Kenai Peninsula Borough received a total of about $34,000 for recycled materials and in 2015 about $40,000 according to the Kenai Peninsula Borough.

Service area property taxes are assessed only for commercial/business waste. Private individuals are not charged any fees except for waste requiring special handling, e.g., household appliances, junk vehicles, asbestos, tires, construction/demolition/land clearing debris, etc.

The infrastructure in place on the Airport that supports airport recycling only includes facilities to collect and transport solid waste to the landfill. At present, solid waste is collected in dumpsters located at the Airport Maintenance Yard, Samaritan's Purse and Talon Air Service that are serviced weekly. Additional dumpsters are provided when there is construction activity. At present there is no solid waste recycling, reuse and waste reduction program at the Airport.

The City has installed "Big Belly" solar trash cans at Rotary Park on the north side of the Airport, north of Funny River Road.

Off-airport infrastructure includes accessible off-site recycling facilities at the Central Peninsula Landfill disposal site on the Sterling Highway and at Peninsula Scrap and Salvage located at Mile Post 18 on Kalifornsky Beach Road. Commodity markets for the reuse of some paper, cardboard, plastics, aluminum, metals, organic material, wood and other MSW exist in the Soldotna and Anchorage areas and some is shipped out of Alaska as noted earlier.

In the past, the Airport construction projects have stockpiled useable gravel and topsoil for use elsewhere on the Airport for development projects. In addition, on asphalt rehabilitation projects, existing asphalt is pulverized for use as a crushed asphalt base course under the new pavement surfaces.

One of the Natural Resources & the Environment goals of the *Envision Soldotna 2030 Comprehensive Plan* states that the City should "Consider conducting a sustainability audit of City operations and identifying sustainability goals for each City department. Examples could include reducing energy use, increasing recycling and use of recycled materials, and adopting Leadership in Energy Efficient Design (LEED) certification requirements for all City facilities."

4.2.2 Waste Audit

A waste audit has not been conducted to identify and document the source, composition and baseline quantity of MSW waste streams generated at the Airport. It is recommended that the City submit an application to FAA for an Airport Improvement Program grant to conduct a waste audit in accordance with FAA Order 5100.38D, *Airport Improvement Program Handbook*. The waste audit would include the following:

- The annual quantity and composition of MSW and C&D debris generated.
- The sources and activities that generate waste.
- The generators (owners and facilities/areas) of the various waste streams.

The Airport Maintenance Yard houses snow removal equipment and a large mower. The City performs general maintenance at this facility such as washing vehicles and placing chains on snow removal equipment, as needed. At present there is one solid waste dumpster at the Airport Maintenance Yard that is emptied once a week by Alaska Waste. The volume of waste generated from the Airport Maintenance Yard consists of office type waste, e.g., mixed paper and cardboard, kitchen waste, plastics (bottles/containers) and office cleaning materials. The waste is collected regularly by Alaska Waste and is deposited at the Central Peninsula Landfill. Detailed maintenance, such as oil changes, takes place offsite at the large City Maintenance Facility located on Arbor Street. All waste oil generated at the Airport Maintenance Yard is taken to the City Maintenance Facility and is recycled in a waste oil burner. Occasionally, scrap metal is collected and stored at the Airport Maintenance Yard and is recycled locally on an as-needed basis.

4.2.3 Feasibility of Solid Waste Recycling at the Airport

A solid waste recycling program has not been established at the Airport.

There is a small local market for some recyclable commodities as noted earlier. However, logistical considerations (e.g., high transportation and labor costs) affect how some solid waste is handled and the associated feasibility. For example, some types of solid waste have to be hauled to Anchorage and others are shipped out of Alaska for recycling.

Alaska Waste currently provides solid waste collection service for Soldotna City Hall, Library, Public Works Department, Police Department, and City parks and campgrounds. Alaska Waste is a regulated utility and certified by the State of Alaska. The solid waste is not sorted out at the landfills.

There are voluntary measures the Airport could adopt to improve the existing waste management and sustainability practices that other airports have successfully adopted, including:

- Implement a recycling program at the Airport Maintenance Yard that promotes proper separation and disposal of waste material.
- Coordinate with airport leaseholders and tenants to implement recycling at their facilities.
- Require sorting of recyclables on airport construction projects.

Opportunities for solid waste recycling Airport-wide include developing and implementing a recycling program. Through their current contract with Alaska Waste, the City could extend current services to include separation of recyclable office materials such as mixed paper, cardboard, newspapers, and plastics from Airport leaseholders and tenants as well as other City facilities. Solid waste recycling options are also available through the following.

Scrap metal recycling is available, should the Airport or leaseholders demolish any existing structures involving large amounts of metal. The scrap metal recycling center is located at the Central Peninsula Landfill. Glass recycling and hazardous waste disposal for airport users are also available at the Central Peninsula Landfill as noted earlier.

Recycling of earthwork and asphalt pavement materials should continue on airport construction projects.

4.2.4 Operation and Maintenance Requirements

There are currently no operation and maintenance requirements for waste handling and recycling responsibilities for solid waste at the Airport.

4.2.5 Review of Waste Management Contracts

At present all solid waste removal at the Airport is contracted to Alaska Waste to transfer all solid waste to the Central Peninsula Landfill 2.5 miles south of Soldotna (about 4 miles from the Airport). Alaska Waste is an optional use utility company regulated by the State of Alaska. At present the City pays $115 per month for weekly service at the Airport Maintenance Yard. This cost is funded out of the City General Fund. The current contract neither encourages nor impedes the use of environmentally-preferred products by the Airport or Airport tenants and leaseholders.

4.2.6 Potential for Cost Savings or Generation of Revenue

The cost for implementing a recycling program at the Airport is estimated to be too much as there is limited potential for cost savings or revenue generation because of the low volume and value of solid waste and other recycling material that is generated. There is minimal revenue generated from recycling versus the high transportation and labor costs as noted earlier. Also, the use of the landfill is free for individual users. There are some charges for businesses.

4.2.7 Plan to Minimize Solid Waste Generation

The City/Airport has already initiated some recycling measures to minimize solid waste generation. These include the following:

- The City/Airport has recycled content requirements.
- The City/Airport reuses airfield pavement and other building materials such as topsoil and sand from excavations which are utilized on projects, old asphalt which is ground up and recycled back into projects as subbase material.
- The City/Airport salvages materials (e.g., signs, pipes, lights) which are stored and sold at auction for reuse in the area.
- The City/Airport recycles gas and oil filters, waste gasoline, motor oil, antifreeze, scrap metal, tires, electrical wiring, electronics, deicing fluids, hazardous materials, batteries, light bulbs, toner cartridges, electronics, etc.
- Infield areas around the runways and taxiways are planted with hay. The hay is harvested during the summer months which eliminate grass clippings and debris otherwise generated by landscape maintenance.

There is no formal recycling program at the Airport. The cost of implementing a formal program with Alaska Waste would not justify a program with the waste hauler. The City/Airport could however establish an informal voluntary recycling program that includes office and shop waste reduction for the Airport Maintenance Yard and work with the Airport Advisory Commission and airport tenants and leaseholders to develop a voluntary program to include the private leaseholders, hangars, offices and other facilities. This could include the following:

- Place recycling containers and additional solid waste dumpsters in strategic locations on the Airport.
- Document the Airport's program to recycle mixed paper, newspaper, cardboard, plastic bottles and cups and aluminum cans at a minimum.
- Establish objectives and develop targets to reduce the amount of waste being disposed of in the landfill.
- Add any required capital improvements to the Airport Master Plan Capital Improvement Program.
- Identify best management practices to address any conflicts with existing plans and programs, e.g., storm water pollution prevention plan.
- Identify how recycling will be implemented as part of new development projects.

- Discuss how the Airport will track and report on the recommendations to improve recycling performance.
- Identify constraints to improving recycling that are outside the Airport's control that could change in the future.
- Work to expand current Kenai Peninsula Borough community recycling events to include the Airport.
- Consider any program enhancements in the future.

4.3 AIR EMISSIONS

Air emissions are also discussed later in Chapter 7, Section 7.2, Air Quality. Sustainability practices relating to air emissions include:

- City/Airport prohibits the burning of landscape waste on the Airport.
- Construction vehicle idling is not permitted for longer than 20 minutes and only above 20 degrees.
- City/Airport requires contractors to provide and implement Stormwater Pollution Prevention Plan (SWPPP) Best Management Practices (BMP) to prevent/minimize adverse exterior air quality emissions and impacts.
- City/Airport requires contractors to provide and implement SWPPP Best Management Practices such as water down loose materials and exposed earth during construction, prohibits the use of chemical soil stabilizers, requires spray down of truck wheel wells and use of rumble strips before exiting the site, regular street sweeping, installation of temporary fencing, dust palliatives or penetration asphalt on haul roads, hydro seed or fast growing vegetation on disturbed areas, silt separation fencing and other soil stabilization features as required.
- City/Airport applies BMPs for dust control.
- City/Airport requires soil stockpiles or areas under construction be covered during rainfall, high wind, and at night, if necessary.
- City/Airport requires haulers to cover truck beds, if necessary.
- City/Airport developed and implements a construction dust control plan.
- City/Airport requires contractors to minimize the time that bare ground is exposed to prevent erosion and air quality impacts.
- City/Airport requires balanced earthwork to minimize off-site hauling.

4.4 ELECTRICAL USAGE

Homer Electric Association (HEA) provides the electrical utility service to the Airport. The Airport Maintenance Yard used $8,567 of electrical power in 2016. The City does not track the usage. Sustainability practices relating to electrical usage include:

- The City receives and utilizes grants for energy-related improvements (e.g., light emitting diode (LED) street lighting and energy upgrades in City buildings.
- The Airport has installed LED taxiway edge lights.
- The Airport has installed LED runway and taxiway guidance signs.

- The City has installed a variable frequency drive (VFD) well pump in the well house located at the Airport.
- The City has initiated a LED street-lighting program.
- The City utilizes low-level lighting to mitigate light pollution. (The City lights are shielded to direct the light downwards and reduce light pollution.)
- City/Airport limits construction at night to minimize lighting impacts to neighbors and improve safety.
- City/Airport requests construction lighting to be focused toward earth to minimize night-sky pollution and pilot interference.

4.5 GREENHOUSE GASES

Greenhouse gases (GHGs) are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and global warming. Most GHGs occur naturally in the atmosphere, but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and other greenhouse (or heat-trapping) gases to the atmosphere.

According to the United Nations Intergovernmental Panel on Climate Change (IPCC), the six main GHGs whose global emissions are human-related are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6). CO_2 emissions represent the largest portion, ranging from 80 to over 90 percent of the total. By comparison, CH_4 and N_2O emissions correspond to approximately two and four percent, respectively. CO_2, CH_4, and N_2O are the predominant GHGs at most airports.

The primary sources of GHG emissions at the Airport include aircraft, auxiliary power units (APU), ground support equipment (GSE), stationary sources and vehicles operating on the access and service roads and vehicular parking facilities. Emissions from these sources arise from the combustion of fossil fuels, e.g., jet fuel (JetA), aviation fuel (100 low-lead), diesel, gasoline and compressed natural gas, and are emitted as by-products contained in the engine exhaust.

The scientific community continues to make an effort to better understand the impact of aviation emissions on the global atmosphere. The FAA, with support from the U.S. Global Change Research Program and participating federal agencies, has developed the Aviation Climate Change Research initiative in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for Air Transportation Noise and Emissions Reduction Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. No data specific to the Soldotna Municipal Airport is available.

4.6 WATER USAGE

The City of Soldotna Utility Department operates a Class A Municipal System that is regulated by the Alaska Department of Environmental Conservation (ADEC). Water service to the Airport is provided by the City of Soldotna Utility Department as discussed earlier in Chapter 3, Section 3.8.5.1 Water. There are 18 structures at the Airport that are connected to the City water system and all have water meters installed. The Airport Maintenance Yard is not connected to the City water system as it is on its own well.

The water used for aircraft fire fighting operations is obtained from nearby lakes or rivers.

To reduce water use, the City would first restrict water use by limiting City Parks and Recreation irrigation of landscaping throughout the City. Then the City would restrict contractors from obtaining water for construction use. Sustainability practices relating to water use include:

- City Utility Department conducts distribution system leakage tests
- City Utility Department has increased use of variable speed motor control systems as well as upgrade monitoring and control equipment.
- Airport water supply and distribution is metered as well as for airport tenant users.
- City/Airport informally requests use of nonpotable or grey water whenever practical and feasible.

4.7 STORM WATER DISCHARGES

The airport storm water drainage system consists of four discrete systems as described earlier in Chapter 3, Section 3.8.5.3 Stormwater. The City/Airport implements and uses several Soil Erosion and Sedimentation Controls and Stormwater Best Management Practices (BMPs) including:

- City/Airport requires all contractors to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) on projects they are working on.
- City/Airport has developed and maintains vegetation and rip rap outfalls for soil stabilization
- City/Airport has developed oil/water separators
- City/Airport has developed detention ponds, e.g, near the southwest corner of the Airport.
- City/Airport has developed vegetated drainage ditches alongside Runway 7-25
- City/Airport has developed sedimentation structures and ditches
- City/Airport conducts icing sand removal in the spring
- Airport tenants have developed and implemented individual SWPPPs.
- Airport tenants use their own deicing systems without collection and treatment.

4.8 NOISE

The noise impacts of aircraft operations are discussed later in Chapter 7, Section 7.12 Noise and Noise-Compatible Land Use.

The City/Airport has developed voluntary noise abatement procedures to minimize the impact of aircraft operations and aircraft noise on residential areas around the Airport and to promote a good neighbor policy between the users of the Airport and nearby residents. The procedures are published in pilot and official aviation publications and could be posted on the Airport website and at other locations on the Airport. The aircraft flight track patterns are to the south of the Airport over the Kenai National Wildlife Refuge. People can call the Airport Maintenance Yard, or City Engineer, and report what they believe to be noisy aircraft.

Sustainability practices relating to noise include:

- City/Airport requires contractors to schedule construction work on the Airport between 7:00 a.m. and 7:00 p.m. (or 8:00 a.m. to 6:00 p.m.) near residential areas, to minimize noise, vibration and other impacts on the Airport neighbors. Exceptions are made for on-airport related projects that do not require traffic to and from the Airport, e.g., in the summer due to longer hours of sunlight.
- City/Airport requires mufflers on all construction equipment.
- City/Airport prohibits the reduction in speed of a truck by the method of running against engine compression, commonly called “jake breaking”.

4.9 NATURAL RESOURCE MANAGEMENT

The City/Airport has implemented several natural resource management sustainability practices including:

- City/Airport uses nontoxic wildlife control methods.
- City/Airport utilizes other methods to control wildlife when the safety of the pilots and passengers and airport users and employees may be at risk.
- City/Airport reuses waste oil from equipment for building heat.
- City/Airport uses ultra-low sulphur diesel (ULSD) fuel in all City/Airport equipment.
- Airport and airport operators/tenants have approved Spill Prevention, Control and Countermeasure (SPCC) Plans and Hazardous Waste Control Plans in place for fuel tanks and products.
- Airport utilizes movement detectors, LED signs, energy upgrades, and after-hours energy reduction when lights are turned off, to reduce energy consumption.
- Metering equipment is installed on electricity and gas distribution systems.
- Hay is harvested eliminating disposal of grass clippings and landscape debris.
- Where practical, disturbed soils are planted and mowed to keep vegetation low.
- City/Airport uses thermally-efficient glass/thermal controls on City buildings.
- Airport has installed LED taxiway edge lights.
- Airport has installed LED runway and taxiway guidance signs.

- City has initiated a LED street lighting program.
- City utilizes low-level lighting to mitigate light pollution. (The lights are shielded to direct light downwards.)
- City/Airport requires all building materials to be certified.

4.10 WATER DISPOSAL

A new combination pressure and gravity sewer main was constructed in 2011 along Funny River Road to the east end of the Airport as described earlier in Chapter 3, Section 3.8.5.2 Sanitary Wastewater. This sewer main connects to the City public sewer system and the Soldotna Wastewater Treatment Plant located on South Kobuk Street in Soldotna. Not all airport buildings are connected to the City public sewer system as some are still on septic systems.

The City/Airport implements the following sustainability practices for water disposal.

- City Utility Department is increasing the use of new technology, i.e., variable speed motor controllers, and implementing monitoring and control equipment upgrades.

4.11 CLEANING AND MAINTENANCE PROGRAMS

The City/Airport implements the following sustainability practices for City facilities, including the Airport.

- Airport uses environmentally-friendly cleaning products.
- Airport performs vehicle and equipment maintenance to avoid adverse impacts, e.g., to storm water systems.
- City/Airport uses nontoxic cleaning supplies, non-absorptive flooring and walls, materials that resist mold, etc.
- City/Airport requires contractors to contain and clean all chemical spills and dispose of clean up supplies properly.
- City/Airport has restrictions on use of certain wood preservatives as regulated by other agencies.

4.12 ADMINISTRATIVE PROCEDURES

The City/Airport is actively involved in community partnering and community outreach programs. These take place in several formats including:

- City Council meetings and workshops on Airport projects or items of interest or concern to the community.
- Airport Commission quarterly meetings.
- Airport meetings in accordance with national and state requirements, e.g., public information meetings on Airport Master Plan and Environmental Assessment documents.

- Community outreach by Airport website, letter, mailings, press releases and advertisements, group and individual meetings on specific projects or items of concern.
- Airport has established voluntary noise abatement procedures to promote a good neighbor policy between users of the Airport and the residents of the City. (Aircraft flight traffic patterns are to the south of the Airport.)
- City/Airport jointly sponsor Kenai Peninsula Annual Air Fair with the City of Kenai for the community to visit the Airport to promote aviation safety and Military Appreciation Day and meet with Airport management, Airport tenants and users and offer Airport tours.
- City/Airport actively works with local conservation groups to implement restoration projects for airport improvements, e.g., the Kenai Watershed Forum.
- Airport actively works with other City departments, Kenai Peninsula Borough and FAA to prevent incompatible land uses and zoning from adversely impacting aircraft and airport operations.
- Airport works with Native American organizations to inform them of proposed airport projects.

Chapter 5

AIRPORT FACILITY REQUIREMENTS

5.1 INTRODUCTION

The major elements of the Airport, which were described in Chapter 3, must be analyzed individually and balanced in relation to one another as part of the airport layout and master planning process for the Soldotna Municipal Airport. These major elements are:

- Airport Property
- Airfield
- Airspace and Navigational Aids
- General Aviation
- Air Taxi/Terminal Area
- Airport Access and Parking
- Airport Support
- Nonaviation Uses
- Off-Airport Land Uses

The existing facilities must be evaluated and their ability to satisfy aviation demand throughout the planning period, as set forth in Chapter 2, must be determined. From these evaluations, the requirements for any additional facilities and improvements can be established. These requirements will, in turn, provide the basis for the recommended Airport Master Plan Update.

A summary of the major requirements for facilities and improvements at the Airport through the year 2035 is presented in Table 5-1. Existing facilities are also listed for purposes of comparison.

5.2 AIRPORT PROPERTY

The Airport property encompasses the airfield, aircraft basing facilities and some undeveloped areas. The Airport is situated on 486 acres of land and is in basically a rectangular shape, except part of the northern boundary that is curved along the Kenai River, as described in Chapter 3.

Recommendations will be made for any land acquisition, or avigation easements, required for both airport protection (including runway protection zones, approach and departure areas) and development and will be discussed in the alternatives in Chapter 6.

Table 5-1
EXISTING FACILITIES AND FUTURE REQUIREMENTS
2015-2035

	Existing	Future			
	2015	2020	2025	2030	2035
AIRFIELD					
Runway 7-25					
Length (feet)	5,000	5,000	5,000	5,000	6,000
Width (feet)	132	132	132	132	132
Pavement strength (pounds)					
-Single-wheel aircraft	75,000	75,000	75,000	75,000	75,000
-Dual-wheel aircraft	155,000	155,000	155,000	155,000	155,000
Runway 7S-25S (Tundra-tire/Ski)					
Length (feet)	2,300	2,300	2,300	2,300	2,300
Width (feet)	60	60	60	60	60
-Single-wheel aircraft (pounds)	12,500	12,500	12,500	12,500	12,500
Taxiways (width-feet)					
A, B, C, F and G	50	50	50	50	50
D and E	25	25	25	25	25
GENERAL AVIATION					
Based aircraft tiedowns	78	75	70	65	60
Itinerant aircraft spaces	15	17	20	22	25
Hangar spaces	70	80	90	100	115

SOURCE: Wince-Corthell-Bryson and Aries Consultants Ltd.

5.3 AIRFIELD

The following analysis of airfield requirements covers airport classification, airfield dimensions, airport reference code, runway and taxiway dimensions, airfield pavement and airfield capacity.

5.3.1 Airport Classification

According to Federal Aviation Administration (FAA) planning criteria, the Airport is classified as a General Aviation Local Airport in the *National Plan of Integrated Airport Systems* (NPIAS). General Aviation Local Airports supplement local communities by providing access to local and regional markets.

The Airport is classified as a Local Airport-NPIAS High Activity Airport in the 2011 *Alaska Aviation System Plan Update*. A Local Airport-NPIAS High Activity Airport is defined as 1) not qualifying for the International, Regional or Community classes; 2) are in the NPIAS; and 3) have at least 20 based aircraft.

5.3.2 Airfield Dimensions

Airfield dimensions are determined by several factors, including airport classification and type, weight, approach speed and wingspan of the most demanding aircraft. Generally speaking, no one aircraft can be expected to be the most demanding in all of these factors. Aircraft that may be the determinant for runway length may not be the most demanding aircraft for considerations of lateral separations of the runways, taxiways and taxilanes. Further, facilities used for small aircraft (12,500 pounds or less maximum gross takeoff weight) will have some different dimensional requirements than those facilities used by large aircraft (more than 12,500 pounds maximum gross takeoff weight).

5.3.3 Runway Design Code and Airport Reference Code

FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*, establishes a runway design code (RDC) to provide information needed to determine certain design standards that apply to a specific runway at a particular airport. The RDC has three components. The first is depicted by a letter referring to the "aircraft approach category" (AAC) in terms of approach speed. The second is a roman numeral referring to the "airplane design group" (ADG) in terms of wingspan or tail height whichever is the most restrictive. The third relates to the lowest visibility minimums approved for the specific runway.

The first two components represent the airport reference code (ARC) that signifies the airport's highest RDC.

According to the RDC definitions contained in FAA AC 150/5300-13A, the existing airfield dimensions for Runway 7-25 generally meet the criteria for RDC B-III. However, the Airport is currently used primarily by small aircraft (12,500 pounds or less maximum gross takeoff weight) in RDC A-I, such as a Cessna 150 or Piper Cub, up to aircraft in RDC B-II, such as the Beech King Air B-200.

Based on the aviation activity forecasts presented in Chapter 2, the largest and highest performing civil aircraft expected to use the Airport in the future, with at least 500 annual operations, are the RDC B-II (e.g., Beech King Air B-200) type aircraft of 12,500 pounds or less. Therefore, on the basis of this analysis and comments from FAA, the ARC for the Soldotna Municipal Airport should be B-II.

According to FAA AC 150/5300-13A, the RDC also includes the approach visibility minimums of a particular runway as expressed by the runway visual range (RVR) values in feet. For Runway 7-25 the RVR is 5,000 feet (i.e., not lower than one mile visibility). For Runway 7S-25S the RVR value is VIS (i.e., runways with visual approach use only).

According to FAA AC150/5300-13A, the existing Approach Reference Code (APRC) and Departure Reference Code (DPRC) for each runway are as follows:

- APRC for Runway 7-25: D/IV/5000 and D/V/5000 and for Runway 7S-25S: B/I(S)/VIS
- DPRC for Runway 7-25: D/IV and D/V and for Runway 7S-25S: B/I(S)

5.3.4 Runway Length

FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides design standards and guidelines for determining recommended runway length. For airplanes of 60,000 pounds or less, runway length curves are provided for families of airplanes. The FAA has derived these curves with data from FAA approved aircraft flight manuals and assumed loading conditions.

According to FAA AC 150/5325-4B, the recommended runway length to accommodate 100 percent of small airplanes (12,500 pounds or less maximum gross takeoff weight) at the Airport, corrected for a mean maximum daily temperature of 66 degrees Fahrenheit and elevation of 113 feet mean sea level (MSL), is as follows:

- Less than ten (10) passenger seats = 3,375 feet
- Ten (10) passenger seats or more = 3,900 feet

The FAA AC 150/5325-4B has recommended runway length curves to accommodate 75, 95 and 100 percent of small airplanes (wheeled aircraft). In addition to using these curves for recommended runway lengths for the main Runway 7-25 at a mean maximum daily temperature, these curves can be used for considerations of the gravel/ski Runway 7S-25S. Wheeled aircraft use the gravel runway during the summer months, so these curves have direct application, for that purpose. However, during the winter months longer runway lengths for ski equipped aircraft operations are required. For these ski operations, the curves can be used for comparative purposes. The recommended runway lengths for small airplanes, corrected for elevation (113 feet MSL) and temperature (66 degrees Fahrenheit for summer and 32 degrees Fahrenheit for winter) are as follows:

	Recommended Runway Length (feet)	
Percent of Small Airplane Fleet	**At 66°F (summer)**	**At 32°F (winter)**
100	3,375	2,875
95	2,875	2,500
75	2,300	2,000

Essentially all tundra (large) tired aircraft are accommodated within the 75 percent of the small airplane fleet (e.g., Piper Cub, Cessna 180 and Champ). A runway length of 2,300 feet is adequate for takeoff of tundra-tired aircraft during the summer months. However, landing of ski-equipped aircraft is more critical than takeoff for wheeled

aircraft. A runway length of 2,300 feet is 300 feet more than the required 2,000 feet for a wheeled aircraft during the winter months. The most critical runway conditions for landing a ski-equipped aircraft are when some snow has melted and the temperature drops to around 32 degrees Fahrenheit, refreezing the melted snow.

When these conditions exist it is difficult to determine the runway length required for a ski-equipped aircraft to decelerate to taxi speed. During the winter months, proper grooming of the snow on the runway would improve this situation. At present this is not being done.

For aircraft between 12,500 and 60,000 pounds maximum allowable gross takeoff weight, FAA AC 150/5325-4B has recommended runway length curves for 75 and 100 percent of the fleet at 60 and 90 percent useful load. Useful load consists of passengers and baggage, cargo and usable fuel. For the Airport, the recommended runway lengths, corrected for elevation (113 feet MSL), temperature (66 degrees Fahrenheit) and runway gradient (0.35 percent) are as follows:

		Runway Length (feet)	
Percent of Fleet	**Percent of Useful Load**	**Dry**	**Wet or Slippery**
75	60	4,760	5,290
75	90	5,990	6,680
100	60	4,910	5,460
100	90	6,970	7,760

The runway gradient corrections for the above recommended runway lengths are for takeoffs, which are generally more demanding than for landings. However, for some turbojet aircraft, landings on a wet or slippery runway are more demanding. A correction of 15 percent, without the runway gradient correction, is required to accommodate these aircraft.

5.3.4.1 Runway 7-25

The existing runway length of 5,000 feet, with a runway gradient of 0.35 percent, is adequate to accommodate 100 percent of the small airplanes of 12,500 pounds or less allowable gross takeoff weight. This runway could also accommodate 75 percent of the fleet of more than 12,500 pounds and up to 60,000 pounds with 60 percent useful load on a dry runway. The runway would have to be extended to at least 5,290 feet to accommodate these aircraft with wet or slippery runway conditions. Consideration should be given to ultimately planning for a runway length of 6,000 feet which would accommodate 75 percent of the fleet with 90 percent useful load on a dry runway.

5.3.4.2 Tundra-tire/Ski Runway 7S-25S

The existing runway length of 2,300 feet is adequate to accommodate all tundra-tired aircraft.

5.3.5 Crosswind Runway

Based on wind data collected by the AWOS-3 located at the Airport, and obtained from the FAA, for the period from January 2006 through April 2015, the wind coverage for a runway orientation of 7-25 is as follows:

Crosswind Component in Knots (MPH)	Wind Coverage in Percentage
10.5 knots (12 mph)	99.6
13.0 knots (15 mph)	99.8
16.0 knots (18 mph)	100.0

Wind coverage means the percentage of time that a given crosswind component is not exceeded. In general, when a runway provides less than 95 percent wind coverage, a crosswind runway should be considered. The percentage for 10.5 knots is essentially 100 percent for Runway 7-25. The 10.5 knots applies to aircraft in RDC A-I (i.e., Beech Bonanza) and B-I (i.e., Cessna 421 Golden Eagle). The 13.0 knots applies to aircraft in RDC A-II (i.e., DeHavilland DHC-6 Twin Otter) and B-II (i.e., Beech King Air). The 16.0 knots applies to aircraft in RDC A-III (i.e., DeHavilland DHC-8) and B-III (i.e., McDonnell Douglas DC-6).

Generally, when wind coverage is less than 95 percent, a crosswind runway is recommended. Therefore the wind coverage is at least 95 percent of the time and a crosswind runway is not required.

5.3.6 Helicopters

There is presently one helicopter based at the Airport and one is forecast through 2035. However, helicopters from other locations use the Airport. At present there is no designated helicopter takeoff and landing pad on the Airport. Any landing and takeoff helipad will be evaluated in relation to the design criteria in FAA AC 150/5390-2C, *Heliport Design*, to determine where one could be located.

FAA AC 150/5390-2C, Chapter 5, *Helicopter Facilities on Airports*, refers to Chapter 2, *General Aviation Airports*, for dimensions and clearances to facilities, including FATO/TLOFs being developed on an airport for helicopter usage. A final approach and takeoff area (FATO) is a defined area over which the final phase of the approach to a hover, or landing, is completed and from which the takeoff is initiated. This area was called the "takeoff and landing area" in previous publications. A touchdown and liftoff area (TLOF) is defined as a load-bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off. The TLOF is

frequently called a helipad according to FAA. Chapter 2 *General Aviation Airports* states that when the entire FATO is load-bearing, an identifiable TLOF may not be required.

A separate landing and takeoff helipad would be located so that helicopters can operate independently of the fixed-wing aircraft activity on the runways and in the surrounding airspace. Protection zones would also need to be provided around the landing and takeoff helipad as discussed in FAA AC 150/5390-2C, *Heliport Design*. Space would be provided near the takeoff and landing helipad for helicopter parking facilities with 60-foot spacing between helipads and an 80-foot wide helicopter taxi route to minimize the amount of hover taxiing required.

The overall minimum dimension of the FATO is 1.5 times the overall length of the design helicopter, or 65 feet by 65 feet for a Bell 206LR and 87 feet by 87 feet for a Bell 212. The main rotors' diameters are 37 feet for a Bell 206LR and 49 feet for a Bell 212. An approach/takeoff area would be provided in two directions and preferably at an angle of 180 degrees to each other. At the Airport, they would be proposed to be aligned with the taxiway on the apron the FATO is marked on if a designated FATO would be provided. These dimensions would also accommodate the Eurocopter AS-350 A Star helicopter used for medevac flights.

The FAR Part 77 imaginary surfaces are as follows. The primary surface coincides with the size of the FATO. The approach surface begins at each end of the primary surface, with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1. The helipad transitional surfaces extend outward and upward from the lateral boundaries of the primary and approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

A protection zone is the area underlying the approach/takeoff surface extending out to where the surface is 35 feet above the highest elevation of the FATO. This area would be 280 feet in length if the surface is level.

5.3.7 Taxiways

The existing taxiway system is basically adequate for the forecast aviation demand. Taxiway B provides a full-length parallel taxiway at 400 feet centerline-to-centerline from Runway 7-25 which meets the criteria for design group III aircraft (i.e., DeHavilland DHC-8). Taxiways C and G provide entry/exit taxiways at the ends of Runway 7-25, with Taxiway F providing an intermediate entry/exit taxiway. All of these taxiways lead to the main aircraft parking apron. In addition, there is a parallel apron Taxiway A extending from Taxiway B to Taxiway G.

The asphalt pavement on Taxiway B is in poor condition and should be repaired to maintain the usability of the primary full-length parallel taxiway.

Taxiways D and E are entry/exit taxiways for the gravel Runway 7S-25S.

5.3.8 Other Airfield Dimensions

Applicable airport dimensional and separation standards for RDC A-I/B-I and A-II/B-II for small airplanes (12,500 pounds or less) exclusively, plus RDC A-II/B-II and A-III/B-III for large airplanes (more than 12,500 pounds) and RDC C-II for small business jets are shown in Table 5-2. The criteria for RDC A-I/B-I apply to the tundra-tire/ski Runway 7S-25S. Because of the mix of aircraft that presently use the Airport, the criteria for at least RDC A-II/B-II should be used for the main Runway 7-25 for planning purposes.

At this time, all the applicable airport and dimensional standards for Runway 7-25 are currently met for RDC A-II/B-II. The dimensions of concern are for the runway safety area (RSA), the runway object free area (ROFA) and the runway obstacle free zone (ROFZ), as well as the Federal Aviation Regulations (FAR) Part 77, *Safe, Efficient Use, and the Preservation of the Navigable Airspace*, primary surface criteria.

At this time, all of the applicable airport and dimensional standards are also currently met for RDC A-III/B-III as shown in Table 5-2. On the south side of Runway 7-25, trees and terrain would have to be removed to meet the FAR Part 77 34:1 approach surfaces and FAA Order 8260.3D, *United States Standard for Terminal Instrument Procedures* (TERPS), 40:1 departure surfaces.

To accommodate RDC C-II aircraft on a regular basis would require a significant increase in airport dimensional and separation standards as presented in Table 5-2. This will be further illustrated in the alternatives described later in Chapter 6.

Existing airport dimensions, in feet, and those required for RDC A-II/B-II, A-III/B-III and C-II are presented below:

	Existing	**RDC A-II/B-II**	**RDC A-III/B-III**	**RDC C-II**
RSA	6,200 x 300	5,600 x 150	6,200 x 300	7,000 x 500
ROFA	6,200 x 800	5,600 x 500	6,200 x 800	7,000 x 800
ROFZ	5,400 x 400	5,400 x 400	5,400 x 400	5,400 x 400

The FAA design criteria requires RSAs, ROFAs and ROFZs to be provided of specified length and width, along and beyond the ends of the runways, based on the existing and expected RDC aircraft that will use the runways. The RSAs, ROFAs and ROFZs are rectangular areas centered about the runway centerline. For Runway 7-25 the existing RSA, ROFA and ROFZ meet the criteria for RDC A-II/B-II and A-III/B-III.

Table 5-2

AIRPORT DIMENSIONAL AND SEPARATION STANDARDS

ITEM	RUNWAY DESIGN CODE (RDC)				
	A-I/B-I[1]	A-II/B-II[1]	A-II/B-II[2]	A-III/B-III[2]	C-II
Runway Width	60	75	75	100	100
Runway Shoulder Width	10	10	10	20	10
Runway Blast Pad Width	80	95	95	140	120
Runway Blast Pad Length	60	150	150	200	150
Runway Safety Area Width	120	150	150	300	500
Runway Safety Area and Object Free Area -Length Beyond Each Runway End	240	300	300	600	1,000
Runway Object Free Area Width	250	500	500	800	800
Obstacle Free Zone Width	250	250	400	400	400
Runway Centerline to Taxiway Centerline	150	240	240	300	300
Runway Centerline to Aircraft Parking Area	125	250	250	400	400
Taxiway Width	25	35	35	50	35
Taxiway Shoulder Width	10	10	10	20	10
Taxiway Safety Area Width	49	79	79	118	79
Taxiway Object Free Area Width	89	131	131	186	131
Taxiway Centerline to Parallel Taxiway Centerline	69	105	105	152	105
Taxiway Centerline to Fixed or Movable Object	44.5	65.5	65.5	93	65.5
Taxilane Centerline to Fixed or Movable Object	39.5	57.5	57.5	81	57.5
Runway Protection Zone					
Not lower than one mile:					
-Length	1,000	1,000	1,000	1,000	1,700
-Inner Width	250	250	500	500	500
-Outer Width	450	450	700	700	1,010
Not lower than ¾ mile:					
-Length	1,700	1,700	1,700	1,700	1,700
-Inner Width	1,000	1,000	1,000	1,000	1,000
-Outer Width	1,510	1,510	1,510	1,510	1,510
Lower than ¾ mile:					
-Length	2,500	2,500	2,500	2,500	2,500
-Inner Width	1,000	1,000	1,000	1,000	1,000
-Outer Width	1,750	1,750	1,750	1,750	1,750

1. For small airplanes (12,500 pounds or less) exclusively.
2. RDC A-II/B-II and A-III/B-III are for large airplanes (over 12,500 pounds)

SOURCE: FAA AC 150/5300-13A, *Airport Design*, for visual runways and runways with not lower than three-quarters (3/4) statute mile approach visibility minimums for runway and taxiway dimensional standards. Runway protection zone dimensional standards are for visual runways and runways with not lower than one (1) statute mile approach visibility minimums.

All of the on-airport buildings are located outside of the established building restriction line (BRL), set at between 605 feet at the west end and 858 feet at the east end, on the north side of Runway 7-25. The Airport property line to the south of Runway 7-25 is at approximately 600 feet from the runway centerline. The possibility of reducing the BRL setbacks in certain areas to meet current FAA design standards and to maximize use of the Airport will be evaluated later in the alternative development concepts for the Airport.

Ideally, if a precision instrument approach, such as an instrument landing system (ILS) or localizer performance with vertical guidance (LPV) global positioning system (GPS) instrument approach, is to be considered for Runway 7-25, the BRL should be located on both sides of the runway, at least 750 feet from the runway centerline. This should be taken into consideration during evaluation of alternative development concepts for the Airport.

Ideally, for a utility runway, the BRL should be located at 370 feet from the runway centerline to allow buildings of 35 feet height. The BRL for Runway 7S-25S varies between 385 feet and 473 feet north of the runway centerline.

The recommended minimum aircraft parking limit line for RDC A-II/B-II is 250 feet, and for RDC A-III/B-III the aircraft parking limit line is 400 feet, from the Runway 7-25 centerline.

Applicable taxiway design and separation standards for RDC A-I/B-I, A-II/B-II, A-III/B-III and C-II are shown in Table 5-2. The FAA design criteria for RDC B-II require taxiway safety areas to be 79 feet wide and for taxiway object free areas to be 131 feet wide, both centered on the taxiways. The FAA design criteria for RDC B-III require taxiway safety areas to be 118 feet wide and for taxiway object-free areas to be 186 feet wide, both centered on the taxiway. With the exception of Taxiways D and E, which provide access to Runway 7S-25S, all existing taxiways meet these criteria.

For exclusive use of aircraft in RDC A-I small (12,500 pounds or less) related to the tundra-tire/ski Runway 7S-25S, the minimum taxiway safety areas are 49 feet wide, and the taxiway object-free areas are 89 feet wide, both centered on the taxiway. Taxiways D and E meet these criteria.

The recommended minimum aircraft parking limit line for RDC B-II is 65.5 feet and for RDC B-III is 93 feet, and for RDC A-I it is 44.5 feet from the taxiway centerline.

5.3.9 Airfield Capacity

The FAA technique for estimating airfield capacity (FAA AC 150/5060-5, *Airport Capacity and Delay*) was used to compute hourly capacity and annual service volumes for both the existing airfield and potential improvements to be evaluated as part of this study.

The hourly capacity of the airfield is defined as a measure of the maximum number of aircraft operations (landings and takeoffs) that can be accommodated on the airfield in an hour. This definition contains no assumptions regarding "acceptable" levels of delay to aircraft; it expresses the maximum physical capability of an airfield or any one of its components under a set of specified conditions.

The hourly capacity of the airfield depends on a number of conditions including ceiling and visibility, runway use, aircraft mix, percent of arrivals, percent touch-and-go and exit taxiway locations. These conditions were analyzed on the basis of available operations data, meteorological records and conversations with Airport management personnel.

The analysis indicates that the hourly capacity of the two existing Runways 7-25 and 7S-25S is about 95 operations during visual flight rule conditions (VFR) and about 25 operations during instrument flight rules (IFR) conditions as they operate as a single runway. The peak hour demand is forecast to increase from 12 operations in 2015 to 16 operations by the year 2035. Therefore, the existing Runways 7-25 and 7S-25S are capable of handling the forecast demand.

Annual service volume (ASV) is a reasonable estimate of an airport's annual capacity in terms of aircraft operations that may be used as a reference in airport planning. The ASV is the annual volume of aircraft operations beyond which the average delay to each aircraft increases rapidly with relatively small increases in aircraft operations (and beyond which the levels of service on the airfield deteriorate).

The ASV of the existing Runways 7-25 and 7S-25S is estimated to be about 200,000 operations. By comparison, according to the aviation activity forecasts presented in Table 2-7, air traffic is expected to reach a level of 27,000 operations by the year 2035.

The tundra-tire/ski Runway 7S-25S does not increase the airfield capacity because aircraft operations to and from the tundra-tire/ski runway are dependent on activity on the main Runway 7-25.

5.3.10 Pavement Strength

The current runway pavement strengths, by aircraft landing gear, as reported in Chapter 3, are as follows:

Aircraft Maximum Gross Weight (pounds)		
Runway	**Single Wheel**	**Dual Wheel**
7-25	75,000	155,000
7S-25S	----	----

All RDC A-II/B-II and A-III/B-III aircraft gross weights that typically and/or occasionally use the Soldotna Municipal Airport are below the maximum gross weights listed above.

The tundra-tire/ski gravel runway is designed to accommodate single-wheel-gear aircraft up to 12,500 pounds.

All of the pavements on the Airport were evaluated using the FAA-developed software program called COMFAA. While this program is utilized to report pavement strengths for pavements serving aircraft over 12,500 pounds and not required for pavements serving small aircraft, the results do provide useful information for planning future pavement maintenance projects as well as guidance with potential future use by heavier aircraft.

For this study aircraft with single- and dual-wheel gear configurations with maximum gross weights from 2,000 to 155,000 pounds were evaluated against the various pavement sections and subgrade conditions at the Airport.

FAA Advisory Circular (AC) 150/5335-5C, *Standardized Method of Reporting Airport Pavement Strength*, provides updated guidance and the COMFAA design software for evaluating existing pavement section performance under known and/or projected aircraft fleet mix annual operations. This FAA Advisory Circular provides for establishing, and reporting, the standardized International Civil Aviation Organization (ICAO) airport runway(s), taxiway(s) and apron pavement strength. The standardized reporting method known as the Aircraft Classification Number – Pavement Classifications Number (ACN-PCN is defined as follows:

> *The ACN is a number that expresses the relative effect of an aircraft, at a given weight, tire pressure, and landing gear geometry on a defined pavement section with a specified subgrade strength. The PCN is a number that expresses the load-carrying capacity of a defined pavement section for unrestricted operations. This methodology is structured so a pavement section with a particular PCN value can support any aircraft that has an ACN value equal to, or less than, the pavements PCN value. Aircraft maximum load can then be determined by direct ratio utilizing the aircraft ACN and the pavement PCN.*

The PCN system uses a coded format to facilitate computerization. A five-part number is used and listed in the following format: Numerical PCN/Pavement type/Subgrade category/Allowable tire pressure/Method used to determine the PCN. For the pavement evaluated at the Soldotna Municipal Airport, the numerical PCN value indicates the load-carrying capacity of a pavement in terms of a standard single-wheel load at a tire pressure of 181 pounds per square inch (psi). The pavement type is listed as "F" which indicates flexible pavement. The subgrade category is listed as "A", "B" or "C" which indicates subgrade California Bearing Ratios (CBRs) of 15, 10 or 6, respectively. The allowable tire pressure is listed as "Y" which indicates pressure limited to 181 psi. The method used to determine the PCN is listed as "T" which indicates a technical evaluation.

Based on the existing pavement sections and estimated subgrade CBRs provided in the 1995 pavement deflection testing for the runway, taxiways and apron, the PCN values generated by the COMFAA program for the applied fleet of aircraft resulted in the following values:

Pavement	PCN
Runway 7-25	37/F/C/Y/T
Taxiway A	21/F/C/Y/T
Taxiway B	21/F/C/Y/T
Taxiway C	59/F/B/Y/T
Taxiway F	44/F/C/Y/T
Taxiway G	61/F/A/Y/T
Apron (old)	21/F/C/Y/T
Apron (new)	39/F/A/Y/T

The PCN results show that all of the pavements on the Airport, with the exception of Taxiways A and B and the older areas of the Apron, can support larger aircraft up to the SW75 and DW155 configured aircraft such as the DC-6 and C-130. Taxiways A and B and the older areas of the Apron display a lower PCN value due to thinner pavement sections and lower subgrade CBR values found during the 1995 deflection testing.

The PCN values are shown earlier on Figure 3-3 with the Pavement Condition values determined by the State of Alaska Department of Transportation and Public Facilities (ADOT&PF) during a 2014 inspection of the Airport pavement sections.

5.3.11 Pavement Conditions

The ADOT&PF completed an Airport Pavement Condition Inspection Report in 2014. The inspection and report provides a numerical condition rating according to the US Army Corps of Engineers Pavement Condition Index (PCI) methods as described in FAA AC 150/5380-6B, *Guidelines and Procedures for Maintenance of Airport Pavements*.

This method provides a value of 100 for new pavements with deductions for measured deterioration down to a value of 0 for failed pavement. Guidelines for determination of recommended corrective action on aging pavement are as follows:

Runways	Taxiway/Aprons	Corrective Action
100-70	100-60	Preventative Maintenance
69-40	59-40	Maintenance/Rehabilitation
39-0	39-0	Reconstruction

The PCI values from the 2014 inspection of the Airport's pavements are shown earlier on Figure 3-3. The reported values show that Runway 7-25 and Taxiways C, F and G require corrective maintenance. Taxiways A and B and the older areas of the Apron require rehabilitation while the newer reconstructed areas of the Apron should receive regular preventative maintenance.

5.3.12 Pavement Requirements

Based on the results of the above pavement evaluations, recent geotechnical information collected during reconstruction of Apron areas and a recent visual inspection of the paved surfaces, Taxiways A and B should be reconstructed as soon as possible. After reconstruction Taxiway B can be utilized as a temporary runway during any closure of the main Runway 7-25 for rehabilitation and/or reconstruction. Areas of the older Apron that are showing signs of accelerated fatigue should be investigated and reconstructed similar to the 2014 apron reconstruction.

5.4 AIRSPACE AND NAVIGATIONAL AIDS

Airspace and air navigational considerations include airspace and air traffic control, approach/departure areas and obstructions, runway protection zones, and navigational and landing aids.

5.4.1 Airspace and Air Traffic Control

Existing airspace procedures and air traffic control (ATC) facilities provide for safe, orderly and expeditious flow of air traffic. Airspace and ATC considerations do not limit the capacity of aviation activity at the Airport, and they are not expected to limit capacity in the future.

The aviation demand forecasts indicate activity levels will remain below the requirements for an air traffic control tower (ATCT) during the planning period to the year 2035. In the vicinity of the Soldotna Municipal Airport, existing procedures stated in the *Aeronautical Information Manual (AIM)*, published by the FAA, in paragraph 4-1-9, *Traffic Advisory Practices at Airports Without Operating Control Towers*, subparagraph g, titled, *Self-Announce Position and/or Intentions,* are adequate for present and forecast traffic levels. This subparagraph provides

procedures for pilots to use over a common traffic advisory frequency (CTAF) to advise other pilots of their position and intentions. These procedures are also covered in FAA AC 90-42F, *Traffic Advisory Practices at Airports Without Operating Control Towers*. The Soldotna Municipal Airport CTAF (122.5) is listed in the *Alaska Supplement* published by the FAA National Aeronautical Charting Office.

5.4.2 Approach/Departure Areas and Obstructions

According to the FAA Form 5010-1, *Airport Master Record*, last inspected in July 2014, other charts and documents, and an obstruction survey conducted during the *2004 Airport Master Plan Update*, there are several penetrations to the FAR Part 77 approach surfaces, transitional surfaces, horizontal surfaces and conical surface.

The controlling obstruction within the 34 to 1 Runway 7 approach surface is a group of trees located approximately 1,440 feet west of the runway end and 280 feet south of the extended runway centerline on airport property. The controlling obstruction within the 34 to 1 Runway 25 approach surface is a group of trees located approximately 2,250 feet east of the runway end and 320 feet south of the extended runway centerline on airport property.

In addition to the approach and transitional surface slopes defined in FAR Part 77, the departure surfaces for designated runways defined in FAA Order 8260.3D, *United States Standard for Terminal Instrument Procedures* (TERPS) were also reviewed. The 40 to 1 departure surface for instrument runways is penetrated by about 610 trees for Runway 25 departures. Some of the trees penetrate the 40 to 1 departure surface by as much as 143 feet. For Runway 7 instrument departures, there are about 328 trees that penetrate the 40 to 1 departure surface. Some of the trees penetrate the 40 to 1 departure surface by as much as 89 feet. The trees are noted in published instrument departure procedures. The City and FAA are in the process of analyzing the extent of this problem that includes trees both on and off airport property, by analyzing the new aerial surveys completed in 2016.

Based on the 2016 aerial surveys, there are approximately 355 trees penetrating the 34 to 1 approach and 7 to 1 transitional surfaces to existing Runway 7 and 257 trees and 13 power poles penetrating the 34 to 1 approach and 7 to 1 transitional surfaces to existing Runway 25. There are about 328 trees and 14 power poles penetrating the 40 to 1 departure surface for existing Runway 7 and 610 trees and 12 power poles penetrating the 40 to 1 departure surface for existing Runway 25. Of the surface penetrations, approximately 50 percent of the trees on the west end and approximately 70 percent of the trees on the east end are located on airport property. None of the power poles are located on airport property. The remainder of the surface penetrations are located within the Kenai National Wildlife Refuge or on private property.

In addition to the trees and power poles, there are also locations where the ground surface penetrates the approach and departure surfaces. These areas are located within the Kenai National Wildlife Refuge and on private property to the south of the Airport and penetrate the approach surface for Runway 7 and the departure surfaces for both Runways 7 and 25.

5.4.3 Runway Protection Zones

Ideally, all of the runway protection zones (RPZ) should be owned in fee title by the Airport. Alternatively, avigation easements with sufficient interest to allow entry and removal of obstructions for both approach and departure RPZs to comply with both FAR Part 77 and TERPS criteria, may be acceptable to meet FAA grant assurance obligations. At the present time, the runway protection zones are entirely within the existing airport boundary.

The following summarizes the RPZ visibilities and dimensions discussed below:

Visibility	Aircraft to be Served	Length in Feet	Inner Width in Feet	Outer Width in Feet
Runway approaches				
-Not lower than 1 mile	A/B-I, II Small	1,000	250	450
-Not lower than 1 mile	A/B-I, II	1,000	500	700
-Not lower than 3/4 mile	All	1,700	1,000	1,510
-Lower than 3/4 mile	All	2,500	1,000	1,750
Runway departures	A/B-II, III	1,000	500	700

The approach RPZs start 200 feet beyond the physical ends of the existing paved Runway 7-25 and gravel Runway 7S-25S. The Runway 7-25 departure RPZs start 200 feet beyond the physical ends of Runway 7-25. However, the FAR Part 77 approach surfaces for non-paved runways, such as the gravel Runway 7S-25S, start at the end of the runway.

The controlling tree obstructions to the Runway 7-25 approach surfaces are outside the existing runway protection zones.

The existing RPZs for Runway 7-25 are adequate in size for large aircraft in approach categories A and B with approach visibility minimums of visual and not lower than one mile. The existing dimensions are 1,000 feet long, 500 feet inner width and 700 feet outer width. However, if approach visibility minimums are to be any lower in the future, the RPZs would have to be enlarged. For visibility lower than one mile, but not lower than ¾ of a mile, the dimensions would be 1,700 feet long, 1,000 feet inner width and 1,510 feet outer width. For visibility lower than ¾ of a mile, the

dimensions would be 2,500 feet long, 1,000 feet inner width and 1,750 feet outer width. Increasing the dimensions of the Runway 7-25 runway protection zones will be considered during the evaluation of the alternatives.

The existing RPZs for Runway 7S-25S are adequate in size for aircraft using the runway. The existing RPZ size is for runways accommodating small aircraft (12,500 pounds or less) exclusively with visibility minimums of visual and not less than one mile with dimensions of 1,000 feet long, 250 feet inner width and 450 feet outer width.

5.4.4 Navigational and Landing Aids

Existing navigational aids are basically adequate through the planning period to the year 2035. However, it would be desirable to establish lower straight-in approach minimums for either Runway 7 or Runway 25, if certain criteria can be met. To accomplish this may require installation of additional navigational and landing aids.

If nonprecision instrument approach procedures with lower minimums were to be established, approach lighting systems would have to be installed to get visibility minimums less than one mile. If an instrument landing system (ILS) precision instrument approach were to be established, a localizer, glide slope and approach lighting system would have to be installed. If a localizer performance with vertical guidance (LPV) nonprecision instrument approach were to be established, additional navigational aids would not be required except for a potential approach light system to further reduce the approach minimums. This could be a medium-intensity approach lighting system (MALS) or a medium-intensity approach lighting system with sequenced flashers (MALSF).

FAA is no longer installing FAA-owned and maintained ILS systems. However, it is possible for the City of Soldotna to install and maintain a non-FAA ILS but FAA would recommend pursuing a LPV nonprecision instrument approach with similar minimums instead.

At present the lowest minimums are 500 feet minimum descent altitude (MDA) and one statute mile visibility for Runway 25 localizer performance (LP) procedure and 700 feet MDA and one statute mile visibility for Runway 7 lateral navigation (LNAV procedure).

An Airport Airspace Analysis would have to be conducted by FAA to determine the feasibility of establishing lower minimums. The airport or procedure sponsor must furnish to FAA certain required information on this subject. The FAA AC 150/5300-13A, Table 3-4, *Standards for Instrument Approach Procedures*, identifies airport landing surface requirements and lists the airport data, provided by the procedure sponsor, that the FAA needs to conduct the airport airspace analysis. Any significant reduction in minimums constitutes a new procedure.

An accurate survey of obstructions centered along the extended runway centerline will be required. (An aerial survey has recently been completed.) The survey will need to cover the primary area of the approach surface out to the final approach fix. Any critical obstructions that are currently keeping the minimums high would have to be avoided or removed. Visibility minimums can be affected by minimum descent altitudes (MDA). With the existing MDAs the visibility minimums cannot be less than one mile. After the obstruction survey is complete, more will be known of what steps will be necessary, such as obstruction removal, to obtain lower MDAs and what additional navigational aids will be required to lower the visibility minimums. These considerations will be addressed in the evaluation of airport development concept alternatives.

In addition, before pursing an improvement to lower approach minimums, FAA recommends a weather (ceiling and visibility) analysis be conducted to determine how often, i.e., number of hours a year, the improved approach minimums are actually needed.

In 2016, the FAA was considering canceling the nondirectional beacon (NDB RWY25) and the very high frequency omnidirectional radio range/distance measuring equipment (VOR/DME-A) approach procedures, discussed in Chapter 3, due to a lack of use and the availability of other approach procedures that provide better performance minimums. However in October 2016 the FAA determined, after reviewing comments received, that the two procedures will remain in effect. Comments mentioned the need for a VOR and/or NDB procedure for IFR training and proficiency. It should be noted that FAA may reevaluate these procedures at a later date.

The NDB/DME is located on Lot 2, Block 2, Beacon Subdivision, containing about 5.74 acres owned by the City of Soldotna. However, if the land ceases to be used for this purpose (i.e., NDB instrument approach system) then ownership of the land reverts to the Kenai Peninsula Borough.

Additional navigational aid issues that need to be addressed include updating airport lighting, including taxiway and apron lighting and signage. The City prefers to keep the existing visual approach slope indicators (VASIs) as they are easier for FAA to maintain rather than replacing them with precision approach path indicators (PAPIs). Obstructions (e.g., vegetation, buildings, etc.) related to automated weather observing system (AWOS) installations within a radius of 500 feet should be at least 15 feet lower than the wind sensor and, within a radius of 1,000 feet, no higher than 10 feet above the wind sensor.

5.5 GENERAL AVIATION

General aviation includes those aviation facilities not required for air carrier or commuter/air taxi activities.

5.5.1 Commercial and Noncommercial Aviation

Commercial aviation activities are defined as those that provide aviation products and services for the benefit of the general public. Several commercial aviation/fixed base operators provide a range of general aviation services at the Airport including tiedowns, repair and maintenance, fueling, flight instruction, parts and supplies, aircraft leasing and rental and aircraft charter.

Sufficient area should be provided for future expansion as well as for potential new operators. There are currently several lease lots available for commercial aviation located in the area to the north of Runway 7-25.

On the northwest side of the Airport, to the north of the West apron, 20 lease lots have recently been developed. Sixteen of the lots are 0.23 acres in size and four are approximately one acre in size. The one-acre lots have space for an aircraft parking apron or hangars, airfield access on the south side via taxilanes, ground access on the north side and vehicular parking space. They are similar in size to those in the Central Apron area. If the need arose, the unplatted area to the west of these lots could have larger lots.

New lease lots could not be developed on the south side of the Airport because of limited space available, lack of utilities and lack of vehicular access.

If the City's Airport reserved lot is relocated, then this area could be redeveloped as a lease site. There are currently undeveloped lease lots at the east end of the Airport north of the end of Runway 25.

5.5.2 Aircraft Parking and Storage

On the basis of the aviation forecasts presented in Chapter 2, it is estimated that space will be required for about 190 based aircraft by the year 2035. Based on the current mix of aircraft, it is estimated that over 95 percent of the aircraft are general aviation and less than 5 percent of the aircraft are air taxis. Therefore, based on the forecasts, space for approximately 180 general aviation and up to 10 air taxi aircraft will be required by 2035.

At present most of the general aviation aircraft are parked on tiedowns as there are limited hangar spaces available. There are 78 City tiedown spaces, as well as tiedowns on private leaseholds, currently available for permanent parking, but as there are 163 based aircraft, many spaces are vacant in the winter but are full in the summer.

There are a ten-unit hangar building and three five-unit hangar buildings used for aircraft storage. Other existing hangars are on individual lease lots and are typically used for the storage and maintenance of the leaseholders' own aircraft.

There has been an increasing demand for hangar space at airports in recent years. In the future it would be desirable to provide space for development of additional storage hangars (either conventional, T-hangar or shelter) at the Airport. Actual demand for hangar space could vary depending on such factors as availability, cost, City policy towards providing such facilities and who develops the hangars (City or private). It is estimated that approximately 60 percent of the general aviation aircraft, or about 115 aircraft, could be accommodated in T-hangars, conventional hangars or shelters by 2035, compared to the present 40 percent. This would require approximately 350,000 square feet (8 acres) of land by 2035. Ideally, the aircraft storage hangars should be consolidated in the same general area.

The City currently maintains 78 permanent long-term tiedown spaces on the center aircraft parking apron to the north of Runway 7-25. Many are unused except during peak summer months. There are also an estimated 25 spaces on the private lease lots. Sufficient City and private tiedown spaces are currently available to serve the aircraft basing demand through the forecast 2035 period especially if more based aircraft are able to relocate to hangars in the future. About 40 percent of the based general aviation aircraft, or 75 aircraft, would be accommodated in tiedown spaces by 2035. This would require approximately 200,000 to 340,000 square feet (5 to 8 acres) of based aircraft tiedown space.

In addition to the based aircraft demand, space should be provided for up to 25 year-round transient aircraft parking spaces. This will require about 70,000 to 110,000 square feet (2 to 2.5 acres) of apron space. Additional transient aircraft parking will be required for the peak summer activity on the Airport. There are currently 15 spaces on the main apron that are signed by the City as itinerant aircraft spaces.

Space for large transient aircraft parking, including busjets or aircraft over 12,500 pounds, should be provided in a separate area and away from the small aircraft, e.g., on the east apron.

5.5.3 Helicopters

Space should be provided near any new helicopter touchdown and lift off (TLOF) area for helicopter parking facilities with 50-foot spacing (1-1/3 RD) between helipads and 74-foot helicopter taxi route (2 RD for a Bell Jet Ranger) to minimize the amount of hover taxiing required for taxi through parking positions. The helicopter parking positions should be located to provide at least 1/3 RD, and a minimum of 10 feet, between the main rotor circle and any object, building, safety area or other parking position and 1/3 RD from the edge of the taxi route width. The size of the parking position should be no less than the RD of the largest helicopter to be accommodated.

The taxiway routes would be the taxilane between aircraft tiedowns where the minimum width is 79 feet for the object free area for a Design Group I aircraft. The minimum clearance for a helicopter taxiway is 10 feet each side of the main rotor for

the taxi route for ground taxiing and 1/3 Rotor Diameter (RD), but not less than 10 feet, for hover taxiing. The taxi route width is 2 RD for hover taxing and 1.5 RD for ground taxiing. For the Eurocopter AS-350 A Star used for medevac operations at the Airport, the taxi route width would be 71 feet for hover taxiing and 53 feet for ground taxiing. The total clearance required between rows of parked aircraft would be 95 feet for hover taxiing and 63 feet for ground taxiing.

5.6 AIR TAXI/TERMINAL AREA

The air taxis operate from their own facilities that typically include space for passengers, office and cargo handling, adjacent aircraft and vehicular parking positions. The air taxi operators are located in the same general areas as the other commercial aviation/fixed base operators at the Airport.

5.6.1 Air Taxi

It is estimated that the number of air taxi aircraft will increase from about 5 at present to about 8 by 2035. They are expected to continue to be primarily single-engine and small twin-engine aircraft with less than 10 seats. The air taxi aircraft are stored in the air taxi operator's hangar/cargo/passenger buildings or on aircraft tiedowns.

There are some vacant and undeveloped lease lots on the Airport, as noted earlier, that could be developed to generate additional building, aircraft parking apron and vehicular parking space for current and potential air taxi operators.

There is no all-cargo air taxi operator on the Airport at present. Several air taxi operators carry small packages and other cargo from their individual facilities, and this practice is expected to continue.

5.6.2 Public Terminal

Air taxi operators were interviewed, including existing tenants on the Airport and transient operators from other locations in the State. Pilots based at the Airport, as well as pilots from outside the Soldotna area (bush and transient pilots) who use the Airport and its facilities (and other airports in the area), were contacted.

The existing air taxi operators at the Airport have made considerable investments in their leased premises to serve their passenger and cargo activity. Relocation of any of these operations to a new facility is not economically feasible. In addition to the existing leased premises and employees, duplicate or additional facilities and employees would be required in a new public terminal facility. Alternatively, transportation costs (e.g., vehicle, aircraft) would increase to coordinate and transfer passengers and cargo to and from the existing air taxi operator facilities and a new terminal.

Several air taxi operators that are not based at the Airport serve passengers and cargo into and out of the Airport. Currently, these passenger and cargo activities are accommodated at one of the existing tenant facilities. In addition, the bush and transient pilots and medevac pilots have a requirement for a pilot lounge or shelter type facility, with good access to and from both the airside and landside of the Airport. A pilot lounge is currently provided by MARC.

Based on the above, the requirement for a public terminal for air taxi operations does not appear to be needed. However, there appears to be a requirement for limited public terminal facilities to serve both some air taxi and general aviation needs. The City should continue to monitor air taxi/pilot/passenger use of the Airport.

A public terminal facility would provide passenger and cargo facilities for air taxi operators not based at the Airport. About 2,000 square feet of terminal space should be planned to potentially accommodate Airport Administration offices, meeting space, pilots' lounge, waiting area and a small snack bar/cafe/coffee shop. Public telephones, restrooms, food and beverage machines, direct-line service to rental car agencies and hotels-motels and a computer for weather data and flight planning would be provided. This area would also include utility systems and heating, ventilating and air conditioning in the building space.

An aircraft-parking apron will be required on the airside of the terminal building and vehicle parking will be required on the landside. Based on input from air taxi operators serving the Airport, they expect to continue operating up to nine-passenger aircraft, primarily single-engine and small twin-engine aircraft. About 10,000 square feet of aircraft parking apron would be required to accommodate transient air taxi operators and allow sufficient space for aircraft parking and the loading and unloading of passengers, baggage and cargo. Vehicle parking and roadway connections will be required on the landside area of the terminal facility.

5.7 AIRPORT ACCESS AND PARKING

This section describes the Airport public access, vehicular parking facility and on-Airport service road requirements.

5.7.1 Access Roads

The primary public Airport access road is Funny River Road, which enters the Airport primarily from the west and, to a minor degree, from the east.

In recent years, a joint FAA and Alaska Department of Transportation and Public Facilities (DOT&PF) project realigned the pavement along Funny River Road around the west end of the Airport. This project significantly enhanced travel through the area and to and from the Airport. In addition, the first 1.2 miles of Funny River Road, from the Sterling Highway to the west end of the Airport property, is scheduled

to be upgraded in 2017, with new asphalt, widened shoulders and drainage improvements.

It is assumed that traffic on Funny River Road will increase at the typical rural growth rate of 3.2 percent per year through the design period. Traffic volumes are expected to increase from 1,690 average daily traffic (ADT) in 2014, as counted at the Kenai River Center immediately north of the Airport, to 3,300 ADT in 2035. The existing two 12-foot paved driving lanes are adequate for Airport, residential and other uses through the design period.

Traffic on Funny River Road is presently at a level that justifies 8-foot wide shoulders along both sides from the Sterling Highway through Airport property.

A realignment of Funny River Road to south of the Airport property has been proposed in the past. This would necessitate substantial acquisition of right-of-way to the west of Airport property through private property. The realignment would be constructed adjacent to the Refuge along the south Airport boundary on airport property, then cross a portion of the Refuge property to realign to Funny River Road in the east.

5.7.2 Vehicular Parking Facilities

There is a gravel service road, south of Runway 7-25, that connects to both ends of the runway, that could be extended if the runway is extended.

Limited short-term vehicular parking is available on the various commercial aviation businesses and lease lot facilities on the Airport for both customers and employees. Aircraft owners generally park on the tiedown spaces, or in the hangars vacated by their aircraft when they fly, and it is expected that this practice will continue in the future. Additionally, space for approximately 36 vehicles is available on the City-owned Lot 4A at the main entrance.

Vehicular parking spaces should continue to be provided within each commercial aviation lease lot (as a condition of the lease) for use by visitors and employees. The development of a public terminal facility (for air taxi and/or general aviation) should also include vehicular parking.

5.7.3 Airport Service Roads

Service roads from Funny River Road provide access for Airport activities from five locations. A central paved access where an automated gate is situated; a second automated gate at approximately Mile Post 2.3 of Funny River Road; a third beyond the east end of the aircraft parking apron where a gravel road with padlocked gate is located; and two new gravel roads with padlocked gates off the realigned Funny River Road at the west end of the Airport.

5.8 AIRPORT SUPPORT

This section describes the support facilities serving the Airport including administration and maintenance, aircraft rescue and fire fighting, Federal Aviation Administration, fuel, utilities and fencing.

5.8.1 Airport Administration and Maintenance

Lot B is a 3.9-acre property presently undeveloped, but under City ownership. The tract is designated for use for facilities serving the Airport public, which may include a terminal and/or pilots' lounge with restrooms, water and telephone.

The Soldotna Municipal Airport Maintenance Yard is located at Mile 2.6 of Funny River Road, north side, near the east end of the Airport area. Maintenance equipment kept at the City Yard is not dedicated exclusively to Airport use except for snow removal equipment purchased with FAA Airport Improvement Program funds. City of Soldotna employees, as a priority part of their regular duties, carry out Airport maintenance and airfield snow removal. City leased tiedown areas are snowplowed on a "workload permitting" basis.

Commercial aviation/fixed based operators are required to provide their own snow removal, or store their own snow, with Airport Field Maintenance crews removing these piles on a "workload permitting" basis.

Most of the City's snow removal equipment is aged and only limited warm storage exists for dedicated airport equipment or sand storage. Future improvements should include the acquisition of new snow removal equipment and facilities to house it as well as dry sand storage.

The Soldotna Municipal Airport Administration Office and Airport Manager are currently located at City Hall. The maintenance facility and lease activity are on Arbor Street. If a terminal or new airport maintenance facility is constructed at the Airport, a new Airport Administration Office should be included.

5.8.2 Aircraft Rescue and Fire Fighting

The City of Soldotna provides aircraft rescue and fire fighting (ARFF) facilities and services through its participation in the Central Emergency Services. The nearest response fire station is located in Soldotna at the intersection of Binkley Street and the Sterling Highway approximately 4.5 miles distant by road.

Soldotna Municipal Airport is not a FAR Part 139, *Certification of Airports*, certificated airport because it does not receive scheduled air carrier service. Therefore, there is no Federal requirement for an ARFF capability. If commercial aviation ever developed on the Airport at a level that would require compliance with FAR Part 139 requirements, an ARFF facility may be required.

5.8.3 Federal Aviation Administration

Weather information and flight services are provided through the Kenai FAA Flight Service Station facility.

An air traffic control tower will not be required based on the aviation activity forecasts presented in Chapter 2.

5.8.4 Fuel

Aviation fuel 100LL (low lead) and Jet A are available to the public through a 24-hour credit card lock system at MARC. MARC also provides Jet A refueling by truck.

Several operators have their own fuel storage tanks. It does not appear that a consolidated fuel storage facility is required.

5.8.5 Aircraft Wash Pad

Space should be provided on the Airport for a permanent aircraft wash pad, at least 60 feet by 60 feet, with appropriate water, drainage and environmental control systems to serve future needs. There may also be a need for an aircraft deicing facility in the winter.

5.8.6 Utilities

Utilities serving Soldotna Municipal Airport include water, sanitary wastewater, stormwater, electrical power, telephone and natural gas.

5.8.6.1 Water

Water service for the Airport is provided by the City of Soldotna Utility Department's public water system. A 10-inch diameter water main ties into the City's water distribution system at the Sterling Highway and extends east to the Airport along Funny River Road, ending at approximate Mile Post 2.5. The water line is a combination of ductile iron and high-density polyethylene (HDPE) with fire hydrants located approximately every 500 feet with adequate volume available for fire fighting flows and fire sprinkler systems.

All of the Airport lots that front along Funny River Road have water service stubouts. In addition, a private developer has extended an 8-inch diameter main to serve ten interior lease lots at the east end of the Airport.

5.8.6.2 Sanitary Wastewater

A combination 6-, 8-, 10- and 12-inch diameter pressure and gravity sewer main serves the Airport. The line ties into the City's sewer collection system at the Sterling Highway and extends east along Funny River Road to approximately Mile Post 2.5. All of the Airport lots that front along Funny River Road have sewer service stubouts. In addition, a private developer extended an 8-inch sewer main to serve ten interior lease lots at the east end of the Airport.

5.8.6.3 Stormwater

The Soldotna Municipal Airport drainage system consists of four discrete systems that either discharge into the Kenai River or to an existing basin in the southwest corner of the Airport property. These systems drain much of the apron areas as well as the infield areas between the runways and taxiways. Minor grading work is still required in some infield areas to improve drainage, however this can be accomplished when adjacent runways and taxiways are undergoing improvements. Three of the drainage systems include oil/water separators prior to their discharges. The remaining system should have an oil/water separator installed in-line prior to its discharge to the Kenai River.

5.8.6.4 Electrical Power

Homer Electric Association (HEA) provides electrical utility service to the Soldotna Municipal Airport. Adequate capacity is available for present and future demands. However, it would be desirable to expand secondary power service and apron lighting. Development to the east would require relocation of about 3,000 feet of primary power and extension of secondary power for proposed lease lots and airport lighting requirements.

5.8.6.5 Telephone

Alaska Communication Systems (ACS) provides telephone service to Soldotna Municipal Airport. There is sufficient line capacity to and through the Airport property. Development of the Airport to the east would require relocation of this utility as well.

5.8.6.6 Natural Gas

Enstar Natural Gas Company provides natural gas service to the Airport. A 2-inch gas main serves the airport property and extends east to River Park Drive. Expansion to the east would require relocation of about 4,000 feet of this gas main.

Adequate gas service is available to provide for existing demands. An expanded network of parallel mains, when required could provide future gas service needs.

5.8.7 Fencing

All areas in which active Airport and aircraft operations take place are fenced. Fencing modifications will be required, depending upon the Airport Master Plan concept selected, varying from minor to major modifications and installations.

Intermediate vehicle fence gates should be added along the south fence line to facilitate removal of moose from Airport property.

5.9 NONAVIATION USES

There are several nonaviation uses occurring at the Airport at various times during the year as described in Chapter 3. Several activities may still continue such as recreational sled dog racing and agricultural operations.

5.10 OFF-AIRPORT LAND USES

The land uses surrounding the Soldotna Municipal Airport are described in Chapter 3 and illustrated on Figure 3-5.

5.10.1 Land Uses Inside Corporate Boundary of City of Soldotna

All lands within the Airport property boundary and City limits are zoned Industrial. Any land acquired by the Airport in the future, and within the City limits, would currently be zoned Industrial.

5.10.2 Land Uses Outside Corporate Boundary of City of Soldotna

Any Airport-acquired lands outside the City limits will remain without a zoning classification unless annexed into the City. The City is considering annexation of existing Airport property that is outside the City corporate boundary to the west and to the northwest on both sides of the relocated Funny River Road.

5.10.3 Comprehensive Plan

The City of Soldotna's Comprehensive Plan, *Envision Soldotna 2030*, was adopted in 2011. As noted in Chapter 3, one of the General Land Use Goals of the Plan is to "Evaluate the need for an airport overlay zone to encourage airport compatible development on or near the Airport." The intent is that land located at the Airport, including lease lots and aircraft tiedown spaces within the secure area, have different requirements and restrictions than lands outside the Airport. General zoning requirements such as landscaping, and access to dedicated rights-of-way may be inappropriate for lots used solely for aviation. The City should consider establishing an airport overlay zone, which governs use of airport lands and is specific to the needs of these aviation-related properties. The City should also evaluate the potential to rezone the riverfront portion of the industrial-zoned lands on the north side of the

Airport, and south of the Kenai River, to a mixed use zone to protect the river from intensive industrial uses.

Chapter 6

ALTERNATIVE AIRPORT DEVELOPMENT CONCEPTS

6.1 INTRODUCTION

In this chapter, alternative airport development concepts to accommodate the major airport facility requirements are described. The alternatives are based on the aviation demand forecasts, presented in Chapter 2, and the additional facilities required to accommodate the anticipated demand, described in Chapter 5.

The alternatives are described in terms of their impact on the major airport functional areas - airfield, avigation, terminal area, air taxi, access and parking, and airport support. The inclusion of individual projects in the alternatives does not necessarily imply that the projects are recommended or that they should be implemented in the near future. The primary purpose is to facilitate the selection of a long-term development concept for the Airport. Individual project and land use recommendations, and the staging of airport improvements over time, will be developed later in the study. In some cases, the projects may not be required within the 20-year time period of this study. In these cases the objective will be to reserve appropriate land areas, consistent with the long-term development concept, so that future development is not precluded.

The airport master planning process is essentially a decision-making process, and each alternative involves tradeoffs among the various factors. The selected airport master plan concept may well involve features from different alternative development concepts described in this chapter.

This chapter presents three alternative concepts for the possible future development of the Soldotna Municipal Airport.

- Alternative Concept 1 reflects the 2004 Airport Master Plan, including a 1,000-foot extension of Runway 7-25, and updated to reflect actual development since 2004.

- Alternative Concept 2 retains the existing airfield facilities and includes refinements to the 2004 Terminal Area Plan.

- Alternative Concept 3 includes a 1,000-foot extension of Runway 7-25 and improved nonprecision instrument approach procedures and associated land acquisition.

Alternatives 1, 2 and 3 present a wide range of potential development concepts varying from Alternative 1, which could be considered an intermediate development; to Alternative 2, which could be considered a minimum development; and Alternative 3, which could be considered a maximum development. Another alternative is the No Action Alternative that would be the same as the Existing Airport Facilities, as shown on Figure 3-1, in Chapter 3.

The alternatives are also intended to illustrate how different areas of the Airport might be developed and where different facilities might be located in the future. The different conceptual elements of the alternatives will be reviewed by the City, Federal Aviation Administration (FAA), Airport Commission, airport users, the public, and other interested parties. Then an airport master plan will be developed combining those conceptual elements from the different alternatives that are preferred by the City into a long-range development plan for the Airport. This plan will be presented later in Chapter 8.

6.2 ALTERNATIVE AIRPORT DEVELOPMENT CONCEPT 1

This alternative accommodates both small airplanes (12,500 pounds or less) and large airplanes (greater than 12,500 pounds) up to a runway design code (RDC) of A-III and B-III. This alternative reflects the recommendations of the 2004 Airport Master Plan, updated to include improvements implemented since 2004, and as shown on the current 2014 Airport Layout Plan. This alternative is illustrated on Figure 6-1.

- Accommodates RDC A-III and B-III aircraft with wingspans up to 119 feet (e.g., DeHavilland DHC-8, McDonnell Douglas DC-6) on Runway 7-25.
- Extends Runway 7-25 to the east to 6,000 feet if required for an operator using larger and/or faster aircraft.
- Retains nonprecision instrument fight rules (IFR) approaches to Runways 7 and 25 with visibilities of not lower than 1 mile.
- Accommodates RDC A-I aircraft with wing spans of up to 49 feet (e.g., Piper Cub, Cessna 180) on tundra-tire/ski Runway 7S-25S.
- Retains visual approaches to Runway 7S and 25S.

6.2.1 Airport Property

- Does not include any land acquisition to the west or east.

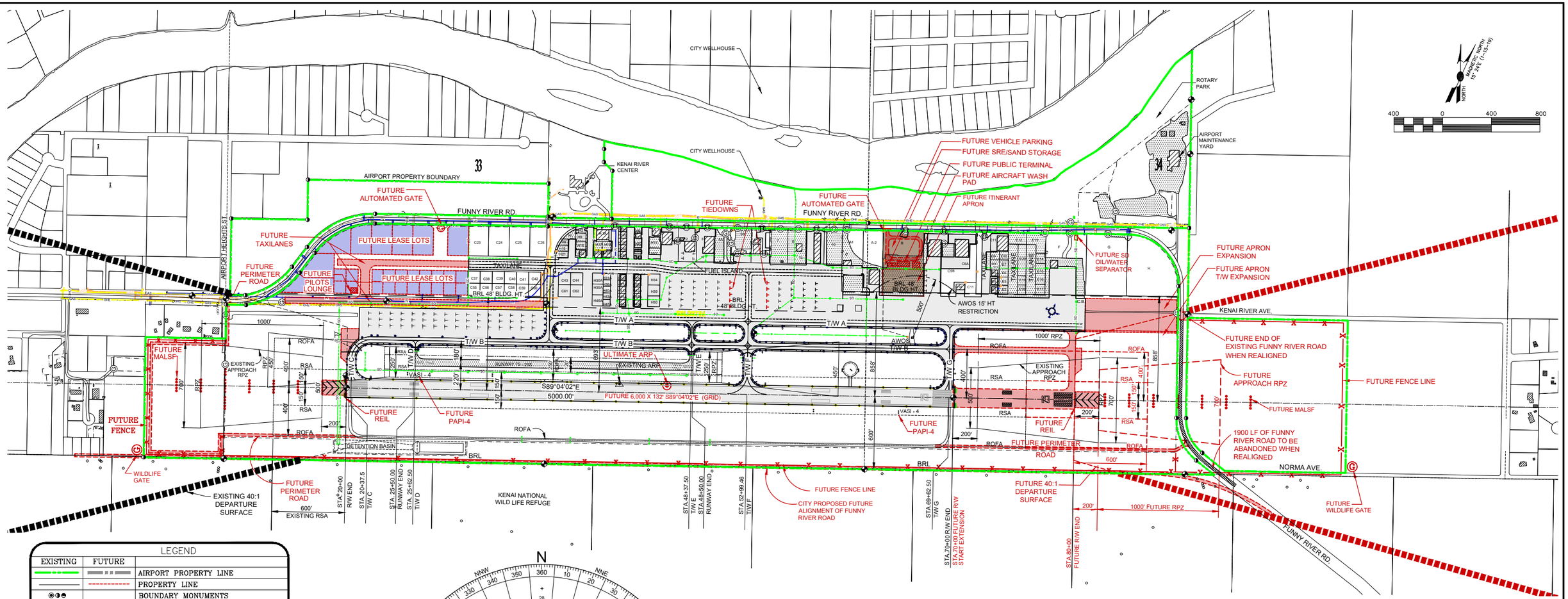
6.2.2 Airfield

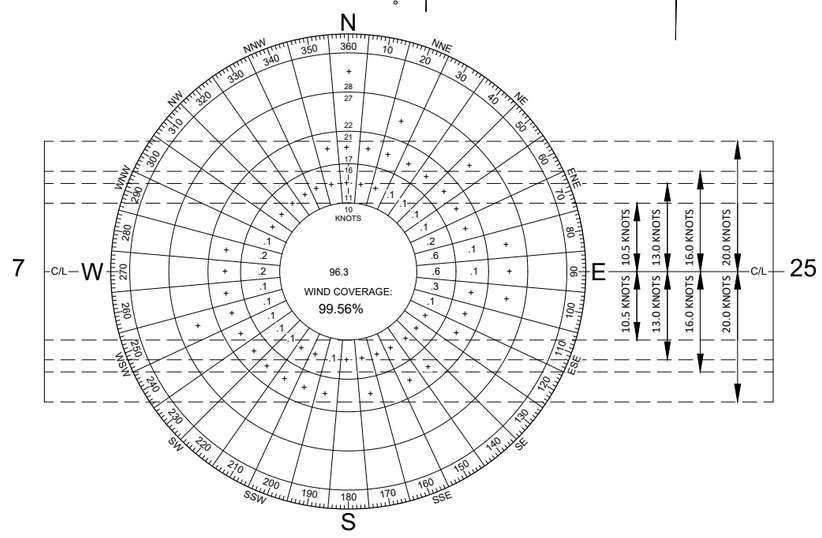
Runway 7-25

- Extends Runway 7-25 to the east to 6,000 feet long and 132 feet wide.
- Retains primary surface at 500 feet wide, centered on the runway.
- Includes runway safety area 300 feet wide, centered on the runway, and extending 600 feet beyond the runway ends.
- Provides runway object free area 800 feet wide, centered on the runway, and extending 600 feet beyond the runway ends.
- Retains existing Taxiway B, from the end of Runway 7 to the east end of extended Runway 25 at a separation of 400 feet from Runway 7-25, centerline-to-centerline.
- Provides new entry/exit taxiway at extended end of Runway 25.
- Provides aircraft holding aprons/runups at both ends of Runway 7-25.
- Provides blast pads 200 feet long and 156 feet wide for AIII/BIII aircraft.

Tundra-tire/Ski Runway 7S-25S

- Retains tundra-tire/ski Runway 7S-25S, at 2,300 feet long and 60 feet wide, located between Runway 7-25 and Taxiway B at 220 feet centerline-to-centerline north of Runway 7-25.
- Retains primary surface at 250 feet wide, centered on the runway.
- Retains runway safety area 120 feet wide, centered on the runway, and extending 240 feet beyond the runway ends.





WIND COVERAGE

WIND INFORMATION TAKEN FROM:
AWOS-3 AT SOLDOTNA MUNICIPAL AIRPORT
JANUARY 2006 TO APRIL 2015

10.5 KNOT CROSSWIND COVERAGE = 99.56%
13.0 KNOT CROSSWIND COVERAGE = 99.81%
16.0 KNOT CROSSWIND COVERAGE = 99.97%
20.0 KNOT CROSSWIND COVERAGE = 100.0%

LEGEND

EXISTING	FUTURE	
		AIRPORT PROPERTY LINE
		PROPERTY LINE
		BOUNDARY MONUMENTS
		1 1/2" CAP
		PRIMARY SURVEY MONUMENTS
		RUNWAY SAFETY AREA (RSA)
		RUNWAY OBJECT FREE AREA (ROFA)
		BUILDING RESTRICTION LINE (BRL)
		SECURITY FENCING
		AIRPORT REFERENCE POINT (ARP)
		SEGMENTED CIRCLE
		COMPASS ROSE
		TAXIWAY IDENTIFIER
		ROADWAYS
		PAVEMENT
		GRAVEL SURFACE
		TIEDOWNS
		BUILDINGS
		RUNWAY, APRON, TAXIWAY LIGHTING
		MEDIUM INTENSITY APPROACH LIGHTING SYSTEMW/FLASHERS (MALSF)
		PAPI-4
		WINDSOCK
		LIGHTPOLE
		POWER POLE
		SURFACE STORM FLOW
	SD	STORM DRAIN
UGE		UNDERGROUND ELECTRIC
W		WATER
		RUNWAY END IDENTIFIER LIGHTS
VASI		VISUAL APPROACH SLOPE INDICATOR
		FENCE GATE
F		FUEL ISLAND
33 | 34		SECTION CORNERS
		RUNWAY PROTECTION ZONE (RPZ)
		FUTURE LEASE LOTS
		TRACT DESIGNATED FOR FACILITIES SERVING AIRPORT PUBLIC

WINCE-CORTHELL-BRYSON
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DRAWN BY: VICKI COLEMAN
CHECKED BY: MARK BLANNING DATE: Mar 13,2019

SOLDOTNA MUNICIPAL AIRPORT
ALTERNATIVE AIRPORT DEVELOPMENT CONCEPT 1
SOLDOTNA, ALASKA

FIGURE 6-1

PLOTTED: Mar 13, 19 – 8:49am
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- Retains runway object free area 250 feet wide, centered on the runway, and extending 240 feet beyond the runway ends.
- Retains entry/exit Taxiways D and E at the ends of Runway 7S-25S to Taxiway B and aircraft parking aprons.

6.2.3 Airspace and Navigational Aids

Airspace and Air Traffic Control

- Retains all five existing nonprecision IFR approaches to Runways 7 and 25 with their existing visibility minimums of not lower than one (1) mile.
- Retains Runway 7S-25S traffic pattern to the south side of the Airport as part of the Runway 7-25 traffic pattern.

Approach/Departure Areas and Obstructions

- Retains approach surfaces at 34:1 for Runway 7-25.
- Retains approach surfaces at 20:1 for the tundra-tire/ski Runway 7S-25S.
- Provides 40:1 instrument departure surfaces for Runways 7 and 25 in accordance with FAA Order 8260.3D, *United States Standards for Terminal Instrument Procedures* (TERPS).
- Requires removal, or other mitigation, of tree, power pole and ground obstruction penetrations to the 34 to 1 approach and 40 to 1 departure surfaces as shown in Table 6-1.
- Provides obstacle free zone 400 feet wide for Runway 7-25 and 250 feet wide for Runway 7S-25S, centered on the runways, with vertical sides extending up to the horizontal surface. There are no penetrations for either Runway 7-25 or tundra-tire/ski Runway 7S-25S.
- Moves the building restriction line for Runway 7-25 on the west apron to 779 feet north of the runway centerline to reflect the location of the new lease lots. Retains the building restriction line on the central and east aprons at 693 feet and 858 feet north, respectively. Retains the building restriction line on the south side of the runway at 600 feet from the runway centerline.
- Moves the building restriction line on the west apron to 559 feet north of Runway 7S-25S and retains the building restriction line on the central apron at 473 feet north of Runway 7S-25S.

Runway Protection Zones

- Retains the existing approach runway protection zones for visibility minimums of not lower than 1 mile at 1,000 feet long by 500 feet inner width by 700 feet outer width for Runway 7-25.
- Retains the existing runway protection zones at 1,000 feet long by 250 inner width by 450 feet outer width for the tundra-tire/ski Runway 7S-25S.
- Provides departure runway protection zones at 1,000 feet long by 500 feet inner width and 700 feet outer width for Runway 7-25.

Table 6-1
PENETRATIONS TO APPROACH AND DEPARTURE SURFACES

		Ground (CY)	Trees Total (On Airport)	Power Poles
CONCEPT 1				
West End:	Approach*	23,874[1]	355 (192)	- 0 -
	Departure	257,719[1]	610 (328)	12
East End:	Approach*	30,788[2]	422 (334)	13
	Departure	208,421[3]	486 (422)	12
CONCEPT 2				
West End:	Approach*	23,874[1]	355 (192)	- 0 -
	Departure	257,719[1]	610 (328)	12
East End:	Approach*	- 0 -	257 (191)	13
	Departure	20,770[4]	328 (221)	14
CONCEPT 3				
West End:	Approach*	372,228[1]	720 (333)	9
	Departure	257,719[1]	610 (328)	12
East End	Approach*	164,541[3]	573 (445)	14
	Departure	208,421[3]	486 (422)	12

*Includes 7:1 Transitional Surface
1. All on Refuge Property
2. All on Airport Property
3. On Airport, Private and Refuge Property
4. On Private and Refuge Property
SOURCES: Wince-Corthell-Bryson and Geopro Consultants, LLC.

Navigational and Landing Aids

- Provides medium-intensity approach lighting system (MALS) or medium-intensity approach lighting system with sequenced flashers (MALSF) for Runways 7 and 25 extending out 1,400 feet from the runway thresholds.
- Extends medium-intensity runway lights (MIRL) for Runway 7-25 to the extended east end and relocates visual approach slope indicator light (VASI-4) system for Runway 25 to the east.
- Replaces existing VASI-4 systems with precision approach path indicators (PAPI-4) at both ends of Runway 7-25.
- Extends medium intensity taxiway lights (MITL) for Runway 7-25 taxiways to the east and for new entry/exist taxiway.
- Installs runway end identifier lights (REIL) at both ends of Runway 7-25.
- Retains runway edge reflectors for tundra-tire/ski Runway 7S-25S.

6.2.4 Terminal Area

- Retains existing lease lots and aircraft parking aprons, except for west apron.
- Expands development of lease lots to the west, south of recently realigned Funny River Road, and south onto the existing west apron.
- Provides space for 28 new lease lots on new northwest aircraft parking apron.
- Extends east apron and lease lot development east to existing Funny River Road.
- Provides additional tiedowns on central apron to replace tiedowns lost on west apron.
- Provides future public terminal on central apron and pilots' lounge on west apron.
- Includes uses for land north of Funny River Road.

6.2.5 Airport Access and Parking

- Incorporates City-proposed future realignment of Funny River Road to the south of Runway 7-25.
- Closes existing Funny River Road at east end by Kenai River Avenue when Funny River road is relocated south of the Airport.
- Installs more access roads and gate access to the new aircraft parking aprons and lease lots. Individual lease lot gating and parking should be provided in the fencing layout.
- Constructs access road and vehicle parking lot for public terminal.

6.2.6 Airport Support

Airport Administration and Maintenance

- Provides space for airport administration and maintenance, future snow removal equipment/sand storage, aircraft wash pad and deicing facility in public terminal area.

Fuel

- Requires some fueling capability to be made available at the expanded east and west apron areas, either by truck or established facilities, because of the separation of aircraft operations. The City prefers to rely on private operators to provide fuel rather than the City providing fuel services.

Utilities

- Provides electrical power to the expanded west and east apron areas. Expansion of the Airport development to the east will require extension of electrical, telephone, and gas service, and extension of secondary service to the lease lot and apron areas.
- Requires an oil/water separator to be installed in-line on the existing east storm water collection system prior to its discharge into the Kenai River.
- Extends water and sewer mains from Funny River Road into the west apron to serve the interior lease lots.

Fencing and Security

- Requires new fencing along the proposed Funny River Road realignment to the south.
- Adds two vehicle gates along the south fence line to drive wildlife outside the fenced area.
- Adds one automated gate to the west apron and one to serve the public terminal with fencing modifications along Funny River Road and the west apron lease lots.
- Requires expansion of existing perimeter road on the south side of the Airport if Funny River Road is realigned to the south.
- Requires new fencing and perimeter road extension around west end of Airport.
- Requires new fencing around east end of Airport.

6.3 ALTERNATIVE AIRPORT DEVELOPMENT CONCEPT 2

This alternative accommodates primarily small airplanes (12,500 pounds or less) and large airplanes (greater than 12,500 pounds) up to a runway design code (RDC) of A-II and B-II. It also allows for the occasional use of the Airport by larger A-III and B-III aircraft (e.g., DeHavilland DHC-8 and McDonnell Douglas DC-6). This alternative is illustrated on Figure 6-2.

- Accommodates RDC A-II/B-II aircraft with wingspans of up to 79 feet (e.g., Beech King Air B-200, Cessna 441 Conquest, DeHavilland DHC-6 Twin Otter) on Runway 7-25.
- Retains Runway 7-25 at 5,000 feet.
- Retains nonprecision instrument flight rules (IFR) approaches to Runways 7 and 25 with visibility minimums of not lower than one (1) mile.
- Accommodates RDC A-I aircraft with wingspans of up to 49 feet (e.g., Piper Cub, Cessna 180) on tundra-tire/ski Runway 7S-25S.
- Retains visual approaches to Runways 7S and 25S.

6.3.1 Airport Property

- Does not include any land acquisition to the west or east.

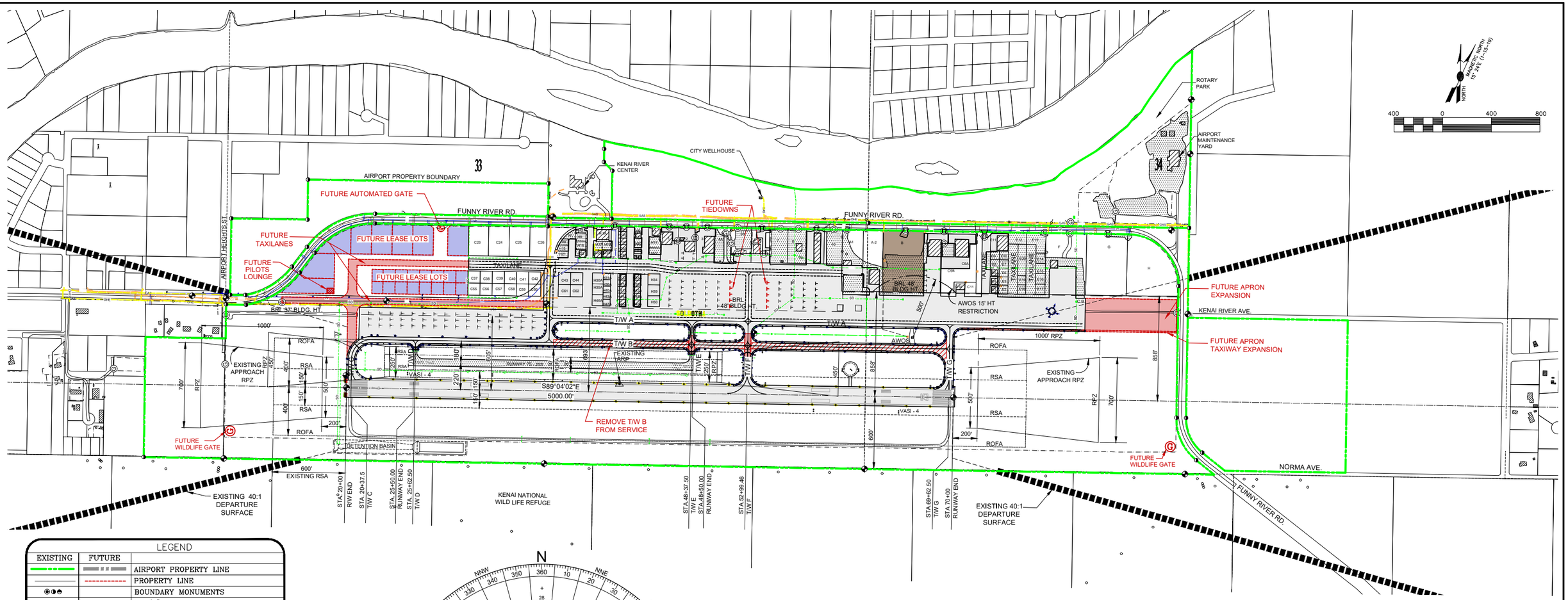
6.3.2 Airfield

Runway 7-25

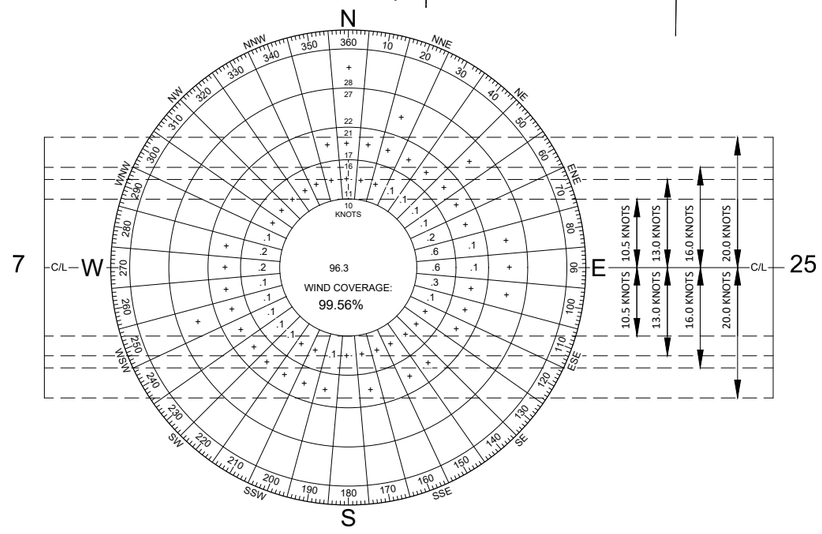
- Retains Runway 7-25 at 5,000 feet long and 132 feet wide.
- Retains primary surface at 500 feet wide, centered on the runway.
- Includes runway safety area 150 feet wide, centered on the runway, and extending 300 feet beyond the runway ends.
- Provides runway object free area 500 feet wide, centered on the runway, and extending 300 feet beyond the runway ends.
- Removes existing Taxiway B from service from the intersection with Taxiway A to Taxiway G.
- Extends Taxiway C to north to serve new northwest aircraft parking apron.
- Does not include blast pads or holding aprons at ends of runway.

Tundra-tire/Ski Runway 7S-25S

- Retains tundra-tire/ski Runway 7S-25S, at 2,300 feet long and 60 feet wide, located between Runway 7-25 and Taxiway B at 220 feet centerline-to-centerline north of Runway 7-25.
- Retains primary surface at 250 feet wide, centered on the runway.
- Retains runway safety area 120 feet wide, centered on the runway, and extending 240 feet beyond the runway ends.



EXISTING	FUTURE	LEGEND
		AIRPORT PROPERTY LINE
		PROPERTY LINE
		BOUNDARY MONUMENTS
		1 1/2" CAP
		PRIMARY SURVEY MONUMENTS
		RUNWAY SAFETY AREA (RSA)
		RUNWAY OBJECT FREE AREA (ROFA)
		BUILDING RESTRICTION LINE (BRL)
		SECURITY FENCING
		AIRPORT REFERENCE POINT (ARP)
		SEGMENTED CIRCLE
		COMPASS ROSE
		TAXIWAY IDENTIFIER
		ROADWAYS
		PAVEMENT
		GRAVEL SURFACE
		TIEDOWNS
		BUILDINGS
		RUNWAY, APRON, TAXIWAY LIGHTING
		MEDIUM INTENSITY APPROACH LIGHTING SYSTEMW/FLASHERS (MALSF)
		WINDSOCK
		LIGHTPOLE
		POWER POLE
		SURFACE STORM FLOW
		STORM DRAIN
		UNDERGROUND ELECTRIC
		WATER
		RUNWAY END IDENTIFIER LIGHTS
		VISUAL APPROACH SLOPE INDICATOR
		FENCE GATE
		PAPI-4
		FUEL ISLAND
		SECTION CORNERS
		RUNWAY PROTECTION ZONE (RPZ)
		FUTURE LEASE LOTS
		TRACT DESIGNATED FOR FACILITIES SERVING AIRPORT PUBLIC



WIND COVERAGE

WIND INFORMATION TAKEN FROM:
AWOS-3 AT SOLDOTNA MUNICIPAL AIRPORT
JANUARY 2006 TO APRIL 2015

10.5 KNOT CROSSWIND COVERAGE = 99.56%
13.0 KNOT CROSSWIND COVERAGE = 99.81%
16.0 KNOT CROSSWIND COVERAGE = 99.97%
20.0 KNOT CROSSWIND COVERAGE = 100.0%

WINCE-CORTHELL-BRYSON
ARIES CONSULTANTS LTD.

DRAWN BY: VICKI COLEMAN
CHECKED BY: MARK BLANNING DATE: Mar 13,2019

SOLDOTNA MUNICIPAL AIRPORT
ALTERNATIVE AIRPORT DEVELOPMENT CONCEPT 2
SOLDOTNA, ALASKA

FIGURE 6-2

PLOTTED: Mar 13, 19 – 8:51am
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- Retains runway object free area 250 feet wide, centered on the runway, and extending 240 feet beyond the runway ends.
- Retains entry/exit Taxiways D and E at the ends of Runway 7S-25S to Taxiway B and aircraft parking aprons.

6.3.3 Airspace and Navigational Aids

Airspace and Air Traffic Control

- Retains all five existing nonprecision IFR approaches to Runways 7 and 25 with their existing visibility minimums of not lower than one (1) mile.
- Retains Runway 7S-25S traffic pattern to the south side of the Airport as part of Runway 7-25 traffic pattern.

Approach/Departure Areas and Obstructions

- Retains approach surfaces at 34:1 for Runway 7-25.
- Retains approach surfaces at 20:1 for tundra-tire/ski Runway 7S-25S.
- Provides 40:1 instrument departure surfaces for Runways 7 and 25 in accordance with FAA Order 8260.3D, *United States Standards for Terminal Instrument Procedures* (TERPS).
- Requires removal, or other mitigation, of tree, power pole and ground obstruction penetrations to the 34 to 1 approach and 40 to 1 departure surfaces as shown in Table 6-1.
- Provides obstacle free zones of 400 feet wide for Runway 7-25 and 250 feet wide for Runway 7S-25S, centered on the runways, with vertical sides extending up to the horizontal surface. There are no penetrations for either Runway 7-25 or the tundra-tire/ski Runway 7S-25S.
- Retains existing building restriction line for Runway 7-25 at between 605 feet and 858 feet to the north of the runway centerline for 37 feet to 48 feet high buildings, respectively, and 600 feet to the south of the runway to the Airport property line.
- Retains existing building restriction line at between 385 feet and 473 feet north of Runway 7S-25S for 37 feet to 48 feet high buildings, respectively.

Runway Protection Zones

- Retains the existing approach runway protection zones for visibility minimums of not lower than one (1) mile at 1,000 feet long by 500 feet inner width by 700 feet outer width for Runway 7-25.
- Retains the existing runway protection zones at 1,000 feet long by 250 inner width by 450 feet outer width for the tundra-tire/ski Runway 7S-25S.
- Provides departure runway protection zones at 1,000 feet long by 500 feet inner width and 700 feet outer width for Runway 7-25.

Navigational and Landing Aids

- Retains medium intensity runway lights (MIRL) and visual approach slope indicator (VASI-4) systems for Runway 7-25.
- Retains runway edge reflectors for tundra-tire/ski Runway 7S-25S.

6.3.4 Terminal Area

- Provides space for 24 new lease lots on new northwest aircraft parking apron.
- Retains existing lease lots and aircraft parking aprons.
- Extends east aircraft parking apron and lease lot development east to existing Funny River Road.
- Restricts use of large commercial lease lots to east apron area.
- Provides additional tiedowns on central apron to replace tiedowns lost on west apron.
- Installs apron lighting on the central aircraft parking apron.
- Provides future pilot lounge at west end.
- Includes uses for land north of Funny River Road.

6.3.5 Airport Access and Parking

- Completes providing separate access road to the end of the west apron and to the proposed lease lots off Funny River Road.

6.3.6 Airport Support

Airport Administration and Maintenance

- Anticipates no change or increase in administration requirements. Assumes some increase in winter maintenance to groom active ski Runway 7S-25S and taxiway areas. In the summer, dust control and/or maintenance of gravel runway/taxiway areas will continue to be required.

Fuel

- Anticipates no change in fueling facilities and services. Ground access to the present fuel facilities must be co-coordinated with snow removal operations across the central apron area.

Utilities

- Provides electrical power to the expanded west and east apron areas. Expansion of the Airport development to the east will require extension of electrical, telephone and gas service, and extension of secondary service to the lease lot and apron areas.

Fencing and Security

- Adds one automated access gate to the west apron. The fencing along Funny River Road and the proposed west apron lease lots should be modified to accommodate off-road parking outside of the airport security area. This would have to be done by the lessee depending on their operations.
- Adds two vehicle gates along the south fence line to drive wildlife outside the fenced area.
- Adds security cameras at entry gates and on aircraft parking aprons.

6.4 ALTERNATIVE AIRPORT DEVELOPMENT CONCEPT 3

This alternative accommodates small airplanes (12,500 pounds or less) up to RDC A-II and B-II. This alternative is illustrated on Figure 6-3.

- Accommodates RDC A-II/B-II aircraft with wingspans up to 79 feet (e.g., Beech King Air B-200, DeHavilland DHC-6 Twin Otter) on Runway 7-25.
- Extends Runway 7-25 to the east to 6,000 feet if required for an operator using larger and/or faster aircraft.
- Provides for nonprecision IFR approaches to Runways 7 and 25 with visibility minimums of not lower than ¾ mile.
- Accommodates RDC A-I aircraft with wing spans of up to 49 feet (e.g., Piper Cub, Cessna 180) on tundra-tire/ski Runway 7S-25S.
- Retains visual approaches to Runways 7S and 25S.

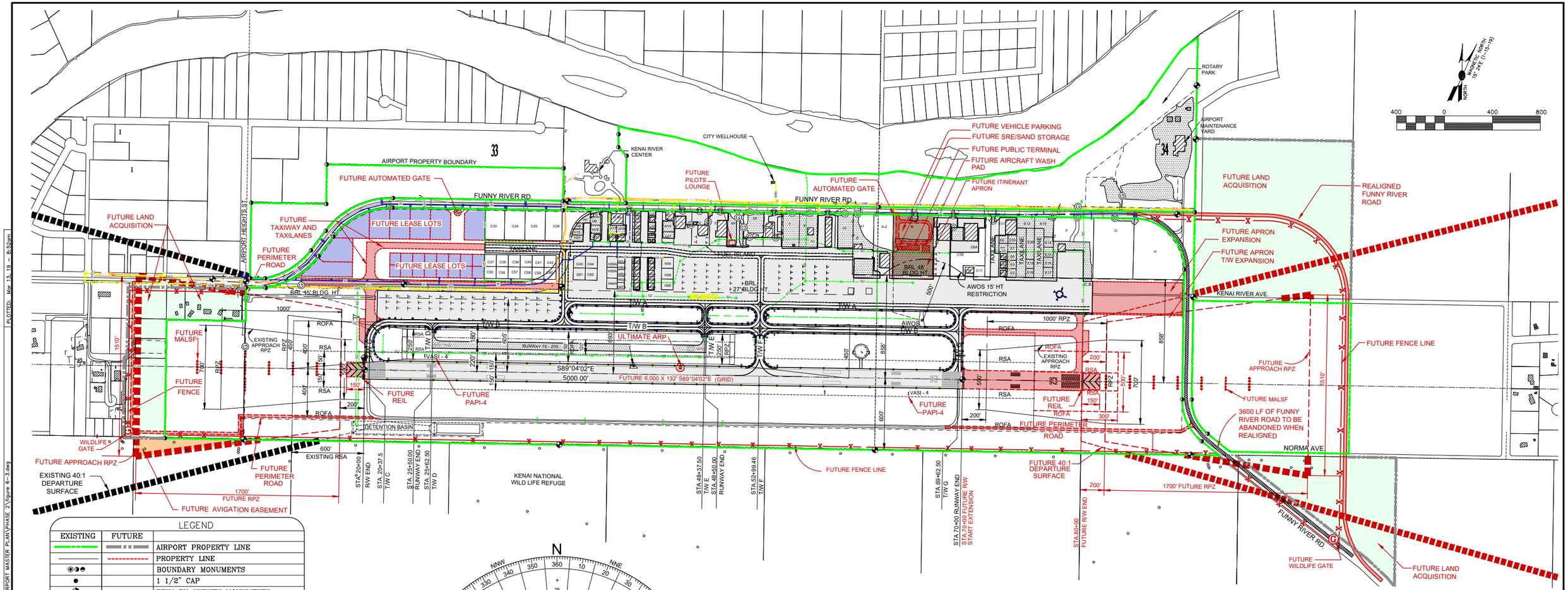
6.4.1 Airport Property

- Requires land acquisition or avigation easements west of Runway 7-25 over 13.2 acres on private property and avigation easements over 1.9 acres to the southwest and on land in the Kenai National Wildlife Refuge for nonprecision approaches with not lower than ¾ mile visibility.
- Includes acquisition of 49 acres of private property that will allow protection for the expanded Runway 25 runway protection zone and the realignment of Funny River Road to the east.

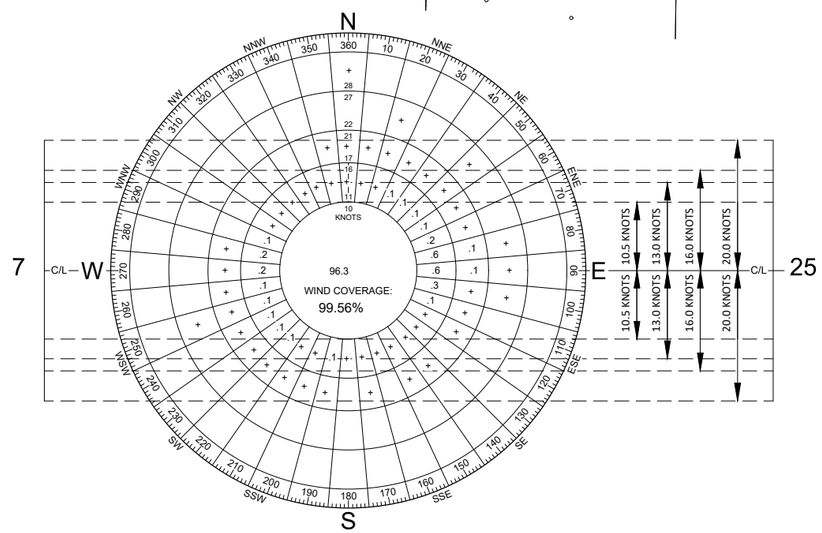
6.4.2 Airfield

Runway 7-25

- Extends Runway 7-25 to the east to 6,000 feet long and 132 feet wide.
- Modifies the profile of Runway 7-25 to improve the line-of-sight along the runway.
- Widens primary surface to 1,000 feet wide, centered on the runway.
- Includes runway safety area 150 feet wide, centered on the runway, and extending 300 feet beyond the runway ends.
- Provides runway object free area 500 feet wide, centered on the runway, and extending 300 feet beyond the runway ends.
- Retains existing Taxiway B, from the end of Runway 7 to the east end of extended Runway 25, at a separation of 400 feet from Runway 7-25 centerline-to-centerline.
- Extends Taxiway C to north to serve new northwest aircraft parking apron.
- Provides new entry/exit taxiway at the extended end of Runway 25.
- Provides aircraft holding aprons/runup areas at both ends of Runway 7-25.
- Provides blast pads 150-feet long and 156-feet wide for A-II/B-II aircraft.



EXISTING	FUTURE	LEGEND
		AIRPORT PROPERTY LINE
		PROPERTY LINE
		BOUNDARY MONUMENTS
		1 1/2" CAP
		PRIMARY SURVEY MONUMENTS
		RUNWAY SAFETY AREA (RSA)
		RUNWAY OBJECT FREE AREA (ROFA)
		BUILDING RESTRICTION LINE (BRL)
		SECURITY FENCING
		AIRPORT REFERENCE POINT (ARP)
		SEGMENTED CIRCLE
		COMPASS ROSE
		TAXIWAY IDENTIFIER
		ROADWAYS
		PAVEMENT
		GRAVEL SURFACE
		TIEDOWNS
		BUILDINGS
		RUNWAY, APRON, TAXIWAY LIGHTING
		MEDIUM INTENSITY APPROACH LIGHTING SYSTEMW/FLASHERS (MALSF)
		PAPI-4
		WINDSOCK
		LIGHTPOLE
		POWER POLE
		SURFACE STORM FLOW
		STORM DRAIN
		UNDERGROUND ELECTRIC
		WATER
		RUNWAY END IDENTIFIER LIGHTS
		VISUAL APPROACH SLOPE INDICATOR
		FENCE GATE
		FUEL ISLAND
		SECTION CORNERS
		RUNWAY PROTECTION ZONE (RPZ)
		FUTURE LAND ACQUISITION
		FUTURE LEASE LOTS
		TRACT DESIGNATED FOR FACILITIES SERVING AIRPORT PUBLIC
		FUTURE AVIGATION EASEMENT



WIND COVERAGE

WIND INFORMATION TAKEN FROM:
AWOS-3 AT SOLDOTNA MUNICIPAL AIRPORT
JANUARY 2006 TO APRIL 2015

10.5 KNOT CROSSWIND COVERAGE = 99.56%
13.0 KNOT CROSSWIND COVERAGE = 99.81%
16.0 KNOT CROSSWIND COVERAGE = 99.97%
20.0 KNOT CROSSWIND COVERAGE = 100.0%

WINCE-CORTHELL-BRYSON
ARIES CONSULTANTS LTD.

DRAWN BY: VICKI COLEMAN
CHECKED BY: MARK BLANNING DATE: Mar 13,2019

SOLDOTNA MUNICIPAL AIRPORT
ALTERNATIVE AIRPORT DEVELOPMENT CONCEPT 3
SOLDOTNA, ALASKA

FIGURE 6-3

PLOTTED: Mar 13, 19 – 8:52am
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Tundra-tire/Ski Runway 7S-25S

- Retains tundra-tire/ski Runway 7S-25S, at 2,300 feet long and 60 feet wide, located between Runway 7-25 and Taxiway B at 220 feet centerline-to-centerline north of Runway 7-25.
- Retains primary surface at 250 feet wide.
- Retains runway safety area 120 feet wide, centered on the runway, and extending 240 feet beyond the runway ends.
- Retains runway object free area 250 feet wide, centered on the runway, and extending 240 feet beyond the runway ends.
- Retains entry/exit Taxiways D and E at the ends of Runway 7S-25S to Taxiway B and aircraft parking aprons.

6.4.3 Airspace and Navigational Aids

Airspace and Air Traffic Control

- Retains all five existing nonprecision IFR approaches with at least one approach to Runway 7 and one approach to Runway 25 having visibility minimums of not lower than ¾ mile.
- Retains Runway 7S-25S traffic pattern to the south side of the Airport as part of Runway 7-25 traffic pattern.

Approach/Departure Areas and Obstructions

- Retains approach surfaces at 34:1 for Runway 7-25.
- Retains approach surfaces at 20:1 for the tundra-tire/ski Runway 7S-25S.
- Provides 40:1 instrument departure surfaces for Runways 7 and 25 in accordance with FAA Order 8260.3D, *United States Standards for Terminal Instrument Procedures* (TERPS).
- Requires removal, or other mitigation, of tree, power pole and ground obstructions to the 34 to 1 approach and 40 to 1 departure surfaces as shown in Table 6-1.
- Provides obstacle free zones, centered on the runway, of 400 feet for Runway 7-25, and 250 feet wide for Runway 7S-25S with vertical sides extending up to the horizontal surface. There are no penetrations for either of the runways.
- Retains existing building restriction line for Runway 7-25 at between 605 feet and 858 feet to the north of the runway centerline for 15 feet to 48 feet high buildings, respectively, and 600 feet to the south of the runway to the Airport property line.
- Retains existing building restriction line at between 385 feet and 473 feet north of Runway 7S-25S for 15 foot to 27 foot high buildings, respectively.

Runway Protection Zones

- Provides runway protection zones for visibility minimums of not lower than ¾ mile at 1,700 feet long by 1,000 feet inner width by 1,510 feet outer width for Runway 7-25.

- Requires acquisition of, or avigation easements over 13.2 acres on private property for expanded Runway 7 runway protection zone to the west. It would also require avigation easements over 1.9 acres of Kenai National Wildlife Refuge land to the southwest.
- Requires acquisition of 49 acres of private property and the relocation of Funny River Road to the east for expanded Runway 25 runway protection zone to the east.
- Retains the existing runway protection zones at 1,000 feet long by 250 inner width by 450 feet outer width for the tundra-tire/ski Runway 7S-25S.
- Provides departure runway protection zones at 1,000 feet long by 500 feet inner width and 700 feet outer wide for Runway 7-25.

Navigational and Landing Aids

- Provides medium-intensity approach lighting system (MALS) or medium-intensity approach lighting system with sequenced flashers (MALSF) for Runways 7 and 25 extending out 1,400 feet from the runway ends.
- Extends medium intensity runway lights (MIRL) for Runway 7-25 to the extended east end and relocates visual approach slope indicator light (VASI-4) system for Runway 25 to the east.
- Replaces existing VASI-4 systems with PAPI-4 at both ends of Runway 7-25.
- Extends medium intensity taxiway lights (MITL) for Runway 7-25 taxiways to the east and for new entry/exit taxiway.
- Installs runway end identifier lights (REIL) at both ends of Runway 7-25.
- Retains runway edge reflectors for tundra tire/ski Runway 7S-25S.

6.4.4 Terminal Area

- Provides space for 24 new lease lots on new northwest aircraft parking apron.
- Expands development of lease lots to the west, south of recently realigned Funny River Road.
- Retains existing lease lots and aircraft parking aprons.
- Restricts use of large commercial lease lots to east apron.
- Extends east apron and lease lot development east to existing Funny River Road.
- Provides future public terminal and pilot lounge on central apron.
- Installs apron lighting on the central aircraft parking apron.
- Includes uses for land north of Funny River Road.

6.4.5 Airport Access and Parking

- Realigns Funny River Road further to the east of Runway 7-25.
- Closes approximately 3,600 linear feet of existing Funny River Road at east end when Funny River Road is relocated further east of the Airport.
- Installs more access roads and gate access to the new aircraft parking aprons and lease lots. Individual lease lot gating and parking should be provided in the fencing layout.
- Constructs access road and vehicle parking lot for public terminal.

6.4.6 Airport Support

Airport Administration and Maintenance

- Requires co-coordinating snow grooming and removal across the central apron to accommodate integrated use by both wheeled and ski equipped aircraft.
- Provides space for airport administration and maintenance, future snow removal equipment/sand storage, aircraft wash pad and deicing facility in public terminal area.

Fuel

- Anticipates no change in fueling facilities and services. Ground access to the present fuel facility must be co-coordinated with snow removal operations across the central apron area.

Utilities

- Provides electrical power to the expanded west and east apron areas. Expansion of the Airport development to the east will require extension of electrical, telephone, and gas service, and extension of secondary service to the lease lot and apron areas.

Fencing and Security

- Requires new fencing along the south boundary of the Airport.
- Adds two vehicle gates along the south fence line to drive wildlife outside the fenced area.
- Adds one automated gate to the west apron and one to serve the public terminal with fencing modifications along Funny River Road and the west apron lease lots.
- Requires expansion of existing perimeter road on the south side of the Airport.
- Requires new fencing and perimeter road extension around west end of Airport.
- Requires new fencing around east end of Airport.

6.5 POTENTIAL ENVIRONMENTAL IMPACTS

The environmental overview is presented in Chapter 7. Potential environmental impacts from improvements included in the alternatives are summarized below.

Obstruction tree clearing to meet FAR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, 34 to 1 approach surface criteria and FAA Order 8260.3D, *United States Standard for Terminal Instrument Procedures* (TERPS), 40 to 1 departure surface criteria could potentially impact the Kenai National Wildlife Refuge.

Airport improvement projects that may need to be evaluated with respect to constructive use of the Kenai National Wildlife Refuge include obstruction tree clearing associated with lower approach and departure surface minimums and the future extension of Runway 7-25 to accommodate larger aircraft.

Reducing the aircraft approach minimums from not lower than one mile visibility to not lower than ¾ mile visibility would require larger runway protection zones. This would result in the need for future land acquisition of, or avigation easements over, private property west and east of the Airport. It would also require future avigation easements over small areas of the Kenai National Wildlife Refuge to the southwest and southeast of the Airport.

Relocating Funny River Road to the south side of the Airport, along the Airport property line, could have potential impacts on the Kenai National Wildlife Refuge.

Based on the forecast aircraft operations, it is expected that the future 65 decibel (dB) Day-Night Level (DNL) noise exposure contour will be contained within the Airport property.

Three wetland areas have been previously identified within the Airport boundary. The wetland area northwest of Runway 7-25 has been noted as a bird attractant by several pilots and they have informally requested that it be filled in for safety reasons. Based on more recent information and discussions, the City and the USACOE need to resolve if the area northwest of the end of Runway 7 is actually wetland or manmade and the USACOE has no jurisdiction. The two wetland areas to the east of Runway 7-25 would potentially be impacted if the runway is extended and if Funny River Road is relocated to the east.

National Environmental Policy Act (NEPA) environmental documentation will be required for any proposed improvement project.

6.6 SUMMARY OF ALTERNATIVE CONCEPT COSTS

The preliminary estimated costs of the alternative concepts are presented in Table 6-2.

Costs are presented in Table 6-2 to extend Runway 7-25 by 1,000 feet to the east at RDC A-II/B-II dimensional standards. The added costs to provide clear approach slopes of 34:1 and departure slopes of 40:1 by removing on-airport obstructions are also listed in Table 6-2.

Table 6-2 also presents the costs of accommodating instrument approach visibilities of not lower than ¾ mile rather than the existing not lower than one (1) mile (e.g., land acquisition and/or avigation easements for increased runway protection zones and related obstruction removal).

Other costs associated with the airport terminal area, access and parking, support and maintenance outside of the alternative airfield and airfield protection area costs are identified in Table 6-2.

The FAA Airport Improvement Program (AIP) typically provides 93.75 percent of the cost of an eligible project. Historically, the State of Alaska provided Legislative grants to airports in the State that are not owned and operated by the State. These grants provided up to 50 percent of an eligible project's local match requirement for FAA AIP grants. These grants provided 50 percent of the City's 6.25 percent matching funds for FAA AIP eligible projects or 3.125 percent of the total project costs.

However, the State notified the City of Soldotna that due to the State's fiscal reality, beginning October 1, 2015, the State DOT&PF will be unable to continue providing a matching share to local sponsors such as the Soldotna Municipal Airport. The State did not specify for how long the matching share funds would not be available. However, it is possible that these funds could be made available sometime in the future when the State's fiscal situation improves. Therefore, for the purposes of the Airport Master Plan, it has been assumed that FAA will fund 93.75 percent of eligible FAA projects listed in Table 6-2 and the City will fund the remaining 6.25 percent.

For non-FAA eligible projects listed in Table 6-2, such as the public terminal, pilots' lounge, hangars and shelters, it is assumed that the City and/or private developers will fund these projects. There may be limited potential for Alaska Department of Environmental Conservation (ADEC) funds for water and sewer extensions to the west apron.

Table 6-2

AIRPORT DEVELOPMENT CONCEPT ALTERNATIVE COSTS

ITEM	CONCEPT 1	CONCEPT 2	CONCEPT 3
LAND ACQUISITION/ AVIGATION EASEMENTS			
West end of Airport	- 0 -	- 0 -	920,000
East end of Airport	- 0 -	- 0 -	160,000
RUNWAY 7-25			
1,000 Foot Extension	3,300,000	- 0 -	3,100,000
Holding Aprons	710,000	- 0 -	540,000
Modify Runway Profile	- 0 -	- 0 -	7,000,000
Increase Width of Primary Surface	- 0 -	- 0 -	1,050,000
Blast Pads	940,000	- 0 -	700,000
Extend Taxiway B	1,100,000	- 0 -	1,100,000
Extend Taxiway C	- 0 -	1,150,000	1,150,000
Remove Taxiway B	- 0 -	525,000	- 0 -
New Entry/Exit Taxiway	500,000	- 0 -	500,000
New West Apron Taxilanes	2,350,000	2,000,000	2,000,000
RUNWAY APPROACHES (34:1) ON-AIRPORT OBSTRUCTION REMOVAL			
Clearing	290,000	275,000	320,000
Excavation	510,000	- 0 -	1,920,000
Landscaping	85,000	- 0 -	200,000
RUNWAY DEPARTURES (40:1) ON-AIRPORT OBSTRUCTION REMOVAL			
Clearing	310,000	275,000	310,000
Excavation	1,520,000	- 0 -	1,520,000
Landscaping	170,000	- 0 -	170,000
NAVIGATION AND LANDING AIDS			
MALSF	1,000,000	- 0 -	1,000,000
VASI-4/PAPI-4	200,000	- 0 -	200,000
REIL	100,000	- 0 -	100,000
TERMINAL AREA			
Extend East Apron and Taxiway A	2,300,000	2,300,000	2,300,000
Expand West Apron Lease Lots	3,800,000	3,800,000	3,800,000
Additional Tiedowns	10,000	10,000	- 0 -
Apron Lights	- 0 -	175,000	175,000
Itinerant Apron	400,000	- 0 -	400,000
Public Terminal (2,000 s.f.)	700,000	- 0 -	700,000
Pilots Lounge (1,000 s.f.)	250,000	250,000	- 0 -
Hangars (10 at 3,000 s.f.)	3,000,000	3,000,000	3,000,000
Shelters (10 at 2,500 s.f.)	750,000	750,000	750,000

Table 6-2 (continued)

ITEM	CONCEPT 1	CONCEPT 2	CONCEPT 3
AIRPORT ACCESS AND PARKING			
Realign Funny River Road to South	8,600,000	- 0 -	- 0 -
Realign Funny River Road to East	- 0 -	- 0 -	3,000,000
Reclaim existing Funny River Road	190,000	- 0 -	360,000
Terminal Access Road and Parking	625,000	- 0 -	625,000
Automated Gates	300,000	150,000	300,000
AIRPORT SUPPORT			
SRE/Sand Storage Building (7,200 s.f)	2,900,000	- 0 -	2,900,000
Aircraft Wash Pad	50,000	- 0 -	50,000
Deicing Facility	1,000,000	- 0 -	1,000,000
Electrical Extensions	120,000	120,000	120,000
Water and Sewer Extensions	750,000	- 0 -	- 0 -
Stormwater Oil/Water Separator	100,000	- 0 -	- 0 -
Realign Perimeter Fencing	715,000	- 0 -	840,000
Extend Perimeter Road	1,125,000	- 0 -	1,125,000
Wildlife Gates	25,000	25,000	25,000
Security Cameras	- 0 -	250,000	- 0 -

SOURCE: Wince-Corthell-Bryson