Mat-Su Regional Aviation System Plan
Land Use Guide

April 2017

DOWL

MATANUSKA SUSITNA BOROUGH
REGIONAL AVIATION SYSTEM PLAN
LAND USE GUIDE

Prepared for:

Matanuska Susitna Borough
350 East Dahlia Avenue
Palmer, Alaska 99645

Prepared by:

DOWL
4041 B Street
Anchorage, Alaska 99503
(907) 562-2000

W.O. 61440

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TABLE OF CONTENTS

Page

TABLE OF CONTENTS (cont.)

Page

FIGURES

TABLES

APPENDICES

LIST OF ACRONYMS

AAC ..... Alaska Administrative Code
AC ..... Advisory Circular
AIP ..... Airport Improvement Program
ALP ..... airport layout plan
AS ..... Alaska Statute
CDP ..... Census-Designated Place
DOT&PF ..... State of Alaska Department of Transportation and Public Facilities
FAA ..... Federal Aviation Administration
FAR ..... Federal Aviation Regulation
IESNA ..... Illuminations Engineering Society of North America
Mat-Su ..... Matanuska Susitna Borough
NPIAS ..... National Plan of Integrated Airport Systems
RASP ..... Regional Aviation System Plan
ROW ..... right-of-way
RPZ ..... Runway Protection Zone

1.0 PURPOSE AND NEED

The purpose of this study is to examine the basics of land use compatibility and suggest best practices for achieving compatible land uses near airports in the Matanuska Susitna Borough (Mat-Su). While a larger area was reviewed around each airport, for the purpose of this land use guide only off-airport land within one-quarter mile of the State of Alaska Department of Transportation and Public Facilities (DOT&PF) airports in the Mat-Su were evaluated for recommendations regarding the non-aeronautical use of land adjacent to each airport. There are eight DOT&PF owned and operated airports within the Mat-Su, as follows: Big Lake, Goose Bay, Lake Louise, Sheep Mountain, Skwentna, Summit, Talkeetna, and Willow (Figure 1). While this study only examined these eight airports, its findings can also be considered at other public and private airports in the Mat-Su.

Figure 1: Airport locations

The following sections summarize the land use compatibility basics and tools that can be implemented at the local level to protect airports and the people who live around them:

- 2.0 Land Use Characteristics
- 3.0 Airport Zones
- 4.0 Land Use in the Matanuska-Susitna Borough
- 5.0 Best Practices
- 6.0 Land Use Considerations
- 7.0 Matanuska-Susitna Borough Airports' Compatibility
- 8.0 Conclusion

2.0 LAND USE CHARACTERISTICS

Five main characteristics of land uses are evaluated for compatibility with airport operations.

1. Height – Tall structures and vegetation can obstruct an aircraft's flight path.
2. Noise – Aircraft noise can impact uses such as homes, schools, and hospitals.
3. Wildlife – Aircraft can collide with birds and mammals in the vicinity of an airport.
4. Density – High concentrations of people near airports may be endangered during an emergency.
5. Visual Obstructions – Glare, dust, and other visual effects can obstruct a pilot's view.

3.0 AIRPORT ZONES

There are four main zones that are considered when evaluating land use compatibility near Mat-Su airports. The zones detailed in the sections below are based on Federal Aviation Regulation (FAR) Part 77 *Objects Affecting Navigable Airspace* which defines a set of imaginary airport surfaces that should be monitored for obstructions to air navigation. The surfaces defined in Part 77 have been simplified for the evaluation of land uses near the eight airports as many of them are located in rural or remote locations that are largely undeveloped. While only a few

examples of land use concerns are discussed below for each zone, all concerns - tall structures, visual obstructions, concentrations of people, wildlife attractants, and noise - should be considered at every airport in each of the airport zones discussed below.

3.1 Runway Protection Zone

The Runway Protection Zone (RPZ) is a trapezoidal area off the end of a runway meant to enhance the protection of people and property on the ground (Figure 2). It is desirable for the land within the RPZs to be owned by the airport owner so that it may be kept clear of incompatible objects, structures, and land uses. The dimensions of each RPZ are a function of the type of aircraft served by the airport and approach visibility. Seven of the eight airports have visual approaches and according to Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A *Airport Design*, their RPZ dimensions are 250 feet x 1,000 feet x 450 feet. Big Lake has a non-precision approach on both runway ends, with an RPZ size of 500 feet x 1,000 feet x 700 feet.

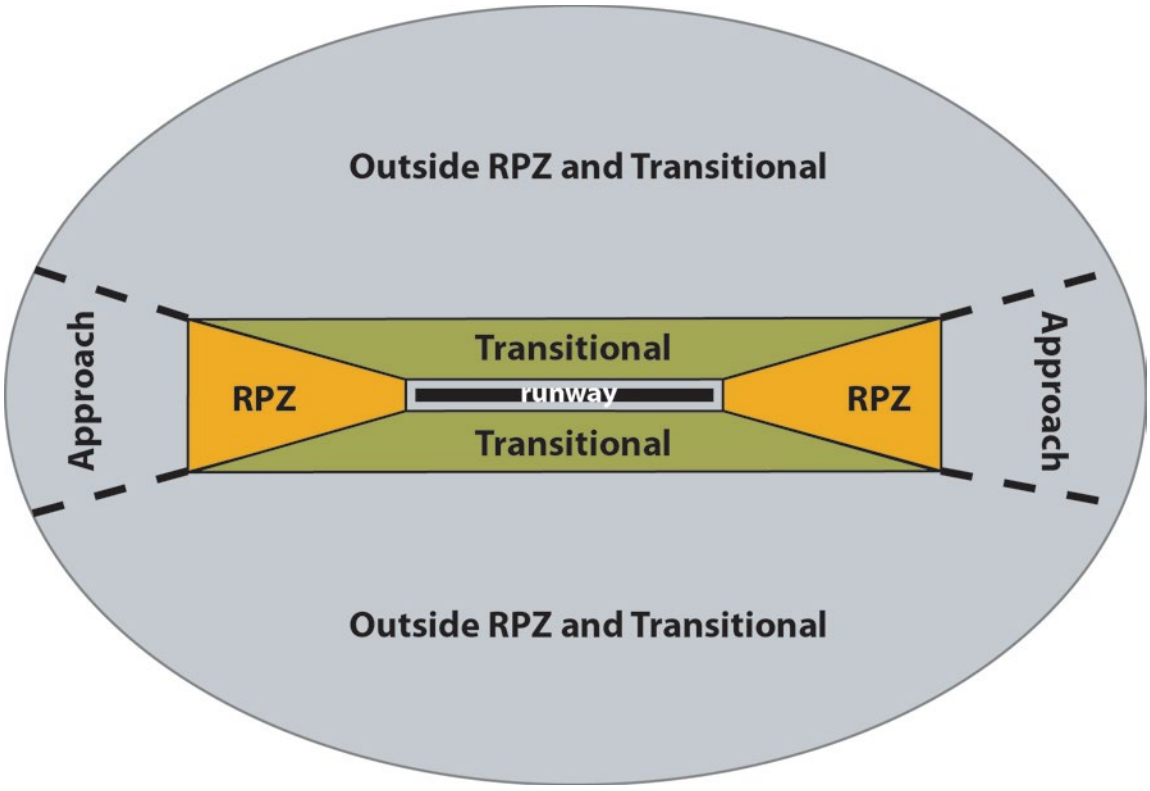


Figure 2: Airport Zones

Since RPZs are located immediately off the ends of runways, this area is most prone to impacts from aircraft overruns and undershoots. Therefore, it is critical for this area to remain clear of incompatible land uses, which is considered any use that constrains the safe and efficient operation of an airport or exposes people living or working nearby to unacceptable levels of noise or hazards.

3.2 Approach Zone

The approach zone or approach surface is designed to protect the use of the runway in all visibility and meteorological conditions. This zone typically has a trapezoidal shape that extends away from the runway along the centerline (similar to the RPZ) but for a longer distance. This zone covers the area where aircraft are typically aligning with the runway prior to landing. The size of a runway's approach surface depends on the visibility minimums and type of approach associated with the runway end according to FAA AC 150/5300-13A *Airport Design*. Seven of the eight airports have visual approaches with approach dimensions of 250 feet x 5,000 feet x 1,250 feet. Big Lake has a larger approach zone due to its non-precision approach, measuring 500 feet x 5,000 feet x 2,000 feet.

Since the approach zone is where the majority of aircraft operate upon takeoff and prior to landing, the land uses in this area may be most impacted by aircraft noise and tall structures within this area can obstruct the flight path. At airports with visual approaches, the flight path should remain clear of penetrations by development, trees, and other obstacles at a slope of 20:1.

3.3 Transitional Zone

The transitional zone extends outward and parallel to the runway centerline on both sides of the runway. This area is in close proximity to the runway and should be evaluated for compatibility, especially as it relates to land uses that are noise sensitive or may attract wildlife that could collide with operating aircraft.

3.4 Outside RPZ and Transitional Zone

The area extending beyond the RPZ, approach and transitional zones is loosely based upon the FAR Part 77 *Conical Surface* which is an elliptical area that covers the locations where aircraft may be turning/maneuvering or performing circling procedures upon landing. Low altitude

flights may occur in this area and, therefore, tall structures can pose obstructions to flight in this zone.

4.0 LAND USE IN THE MATANUSKA-SUSITNA BOROUGH

The Mat-Su Borough is approximately 25,258 square miles in size. Outside of the major urban areas such as Wasilla, Palmer, and Houston, communities within the borough are generally semi-rural or rural in nature. The Mat-Su does not have area-wide zoning, however many communities have Comprehensive Plans with Land Use Plan Maps that provide general guidance for future growth. Much of the land within the communities is vacant and undeveloped.

Published information on existing land uses in the semi-rural and rural communities is found on Mat-Su parcel ownership data. This data indicates a mix of private, borough, state, federal, mental health trust, public university, and native corporation ownership. The ownership data does not provide the type of development or land uses on each parcel.

The Mat-Su Borough is charged by the State of Alaska for the planning of land use, the subdivision of land, and for zoning (Appendix A). The currently adopted borough-wide Comprehensive Plan establishes goals for growth, transportation and placement of public facilities. Other community councils throughout the borough have chosen to adopt community comprehensive plans that more specifically address the concerns of their communities.

The Mat-Su Borough does not have traditional zoning practices, as other Alaska communities have in place, such as Anchorage, Kodiak, Fairbanks, etc. There are, however, minimal borough-wide land use regulations in place such as setbacks, lot sizes, road and driveway requirements, as well as conditional use permit requirements for certain uses, such as tall structures, junk yards, resource extraction, alcoholic beverage facilities and dispensaries. In addition, some unincorporated communities outside of the cities have chosen to implement more stringent land use regulations within their boundaries, which are incorporated into the borough zoning code and enforced as such.

There is currently an effort underway to reformat, streamline and refine the MSB Zoning Code, Title 17, which is anticipated to be complete by Summer 2017. The new format will set the stage

for overlay districts to be added to the menu of available options, including aviation activities as identified in this document.

5.0 BEST PRACTICES

A variety of tools can be used to achieve greater levels of airport land use compatibility. The best one to use for each airport and community depends on a variety of factors (some of which are discussed in Section 6.0 Land Use Considerations). The following seven sections summarize the best practices that may be most useful to airports in the Mat-Su Borough.

5.1 Acquisition

According to FAA AC 150/5300-13A *Airport Design*, off-airport development will have a negative impact on current and future airport operations when it creates obstacles to the safe and efficient use of the airspace surrounding an airport. Acquisition allows the airport owner to control the types and characteristics of land uses present to promote a safe operating environment for aircraft and safety for people on the ground near an airport.

5.2 Land Use Zoning

Various types of land use zoning can be used to encourage compatible development around airports. Local municipal zoning and airport specific zoning regulations should be reasonable and not impose requirements or restrictions that do not reasonably promote the health, safety and welfare of the community. They should also not require the removal, lowering, or other change or alteration of any obstruction not conforming to the regulation at the time of adoption or amendment (known as grandfathering existing uses at the time of zoning adoption/implementation).

Zoning can be an effective tool for guiding the development of compatible uses near airports when other tools (such as acquisition) are not feasible. There are many zoning techniques that allow for property owners and airports to coexist in a safe environment. One technique includes the use of development standards that minimize incompatible features of development that might otherwise be prohibited or considered incompatible).

Sample development standards could include:

1. Proposed site lighting fixtures should be concealed or shielded with an Illuminations Engineering Society of North America (IESNA) full cut-off style fixture with an angle not exceeding 90 degrees to minimize the potential for glare and unnecessary diffusion on adjacent property.

2. Site lighting, including street and parking lot light fixtures should be located on the site in a non-linear pattern to avoid the appearance of runway lighting and to avoid making it difficult for pilots to distinguish between airport lights and other lights.

3. Permanent water bodies (such as ponds) should have wildlife mitigation features such as tall grasses around the perimeter that deter wildlife from using them. Water detention/retention ponds should drain within 24 hours to prevent wildlife from using them.

4. Dust, smoke, or steam emissions, whether generated through activities on the site or through building operations, should be controlled to minimize impact to pilots' visibility.

5. Glare from site activities or building materials which could affect the vision of pilots using the airport should be minimized.

6. Exterior solid waste disposal facilities should be contained and covered to minimize sources of food for wildlife.

An Airport Overlay Zoning District is another zoning mechanism that can effectively mitigate incompatible uses around airports. Airport Overlays are typically composed of specific surface and safety zones. The zones cover a geographic area that is affected by airport activities and are defined on the basis of factors including, but not limited to, aircraft noise, aircraft flight patterns, airport safety zones, local circulation patterns, and area development patterns. The surface and safety zones are overlaid on top of the existing underlying zoning, which remains in full force and effect. Where the requirements imposed by the surface and safety zones conflict with the requirements of the underlying zoning, the more restrictive requirement shall be enforced.

Development standards for height vary. Topography and Part 77 surfaces should be mapped to determine maximum heights. Height standards should be developed on a case by case basis.

Additional information on developing and implementing airport zoning can be found in ACRP Report 27 *Enhancing Airport Land Use Compatibility* at http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_027v1.pdf. A model zoning ordinance is also provided in Appendix C of Report 27.

5.3 Avigation Easement

Avigation Easements are property rights acquired by an airport whenever land use around an airport needs to be controlled or when air rights and/or obstruction removal (for example a tree) is required. Avigation easements are often used to control the growth of trees and other vegetation (through pruning and removal) that is present on private property, but that pose an obstruction to the safe operation of aircraft. They can also be used to restrict or limit uses around airports. Rights and restrictions within an avigation easement typically fall into three general categories. These include the restrictions on the use of the property, the right of pilots using the airport to create incidental effects, such as noise, and the height restrictions of natural and manmade structures.

5.4 Right of First Refusal

This tool allows for the airport owner to be notified first and given the opportunity to purchase property of interest (such as property in the RPZ or approach zone) when the owner decides to sell. This is an agreement between the airport owner and the property owner that is put in place prior to the property hitting the market. The airport owner then has the first right to accept or refuse the purchase of the property when it is put up for sale. This is an effective tool when used proactively and can be a more viable alternative to traditional acquisition efforts.

5.5 Conservation Easement

A conservation easement can be implemented in situations where it is desirable for property to exist as it is today into the future. For example, if property (that is not airport-owned) near the airport is currently open space or forested and undeveloped, a conservation easement could be purchased by the airport to guarantee the property continues to exist as such and not be developed (over the course of the easement lifetime).

5.6 Development/Clearing Agreement

This tool has particular relevance to the Mat-Su airports, as much of the land surrounding the airports is undeveloped but has tall vegetation. In this instance, the airport could enter into a development or clearing agreement with the property owner (which would be the State of Alaska in many instances) that allows for the continued pruning and removal of vegetation that poses an obstruction to aircraft operation.

5.7 Outreach/Education

One of the best tools that can be used to promote compatible land use near airports is to educate the local community and involve the stakeholders that are or can be impacted by incompatibility. Public outreach can bring awareness to the benefits of compatibility which can be realized through development standards and other best practices discussed in this section. DOT&PF, Municipal and airport websites, social media, public open houses, and other events can be used to spread the word.

6.0 LAND USE CONSIDERATIONS

There is no one-size-fits-all approach to solving land use incompatibilities and preventing future impacts. The solution chosen should be based on a variety of factors, including development status, location, land use type, land ownership, and level of control. Additional factors that should be considered are discussed below in no particular order. It is imperative to consider all variables before choosing and implementing a land use solution at an airport.

6.1 State and Federal Requirements

Airports must consider any applicable state or federal requirements when reviewing potential land use solutions. For example, an airport that is included in the National Plan of Integrated Airport Systems (NPIAS) is obligated to fulfill a number of grant assurances as a condition of receiving federal funding through the Airport Improvement Program (AIP). Two of those assurances are directly related to the protection of an airport from incompatible land uses.

6.1.1 Federal Aviation Administration (FAA) Requirements

All the state-operated airports in the borough, except Sheep Mountain and Summit, have been developed using federal AIP grant funds. As a condition of receiving an AIP grant, the airport

operator must agree to a set of Airport Assurances, one of which relates to Compatible Land Use, as follows:

> 21. *Compatible Land Use.* It (airport operator) will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

The FAA expands on this requirement in FAA Order No. 5190-6b, Chapter 20, which states, in part:

> 20.1 - Incompatible land use at or near airports may result in the creation of hazards to air navigation and reductions in airport utility resulting from obstructions to flight paths or noise-related incompatible land use resulting from residential construction too close to the airport.
>
> 20.2.e - Definition of Compatible Land Use. Compatibility of land use is attained when the use of adjacent property neither adversely affects flight operations from the airport nor is itself adversely affected by such flight operations. In most cases, the adverse effect of flight operations on adjacent land results from exposure of noise sensitive development, such as residential areas, to aircraft noise and vibration. Land use that adversely affects flight operations is that which creates or contributes to a flight hazard.
>
> 20.3.a - The general rule on residential use of land on or near airport property is that it is incompatible with airport operations because of the impact of aircraft noise and, in some cases, for reasons of safety, depending on the location of the property.

The FAA Order No. 5190-6b has a great deal more to say about compatible land uses adjacent to airports. However, for the purposes of this study, it is sufficient to summarize that the FAA views incompatible use of land around an airport to be uses that may hinder, or make unsafe, the operation of aircraft (such as towers or smoke) or an use that is adversely impacted by aircraft operations (such as residential housing or a school). From an airport compatibility viewpoint, ideal off-airport land uses include such things as greenbelts, farming, public recreation, retail, commercial, and light industrial (provided no smoke, steam, or bright lights are involved).

Although the FAA requirements described above have legal application only to airports where AIP grants have be used, they have general application to all airports. For the purpose of this study, the FAA compatible land use principles will only be considered at all eight of the DOT&PF airports in the Mat-Su.

6.1.2 State Airport Land Use Zoning

Under Alaska Statutes (AS) 02.25.010 – AS 02.25.050, the state has the authority to adopt land use zoning around any airport to prevent hazards to aircraft operations. Although the state has adopted regulations under 17 Alaska Administrative Code (AAC) 45.145 to implement zoning around airports, no off-airport zoning has been adopted. In general practice, the state has left it up to local governments to zone or otherwise control off-airport land uses.

6.2 State Ownership

Fortunately, several of the eight airports are surrounded by some state-owned land that is left in its natural condition and is undeveloped. Depending on the presence of natural vegetation and topography, two land use solutions may be used. A conservation easement could be used for state-owned land that is open space or has low growing vegetation and is of a similar elevation as the nearby airport. A development/clearing agreement could be used for state-owned land that has tall vegetative growth, existing development, or is at a higher elevation than the nearby airport. This type of agreement would allow for tree clearing and prevention of future plantings and development. This is particularly useful in runway approach zones where obstructions may need to be cleared. If the state does not own the land in critical areas around an airport, a right of first refusal could be pursued by the state or the Mat-Su Borough as a preferred land use solution.

6.3 Funding

Funding for implementing land use solutions may come from a variety of sources, such as the FAA (if the airport is included in the NPIAS), the State of Alaska, and local municipalities. An airport's budget is a key factor in choosing the scope of land use solution chosen. For example, an airport that is federally obligated and receives funding from the FAA, the State, and local matching funds may have a much larger budget to address land use incompatibility and, therefore, may have the opportunity to use acquisition as a tool - whereas an airport with limited funding may only be able to use zoning or avigation easements due to budget constraints.

6.4 Specific Location

The specific location of a use must be considered. For example, the location of a use under the extended runway centerline, or within a runway approach or flight pattern would likely be more incompatible than a location outside of the Transitional Zone.

6.5 Public Consideration

A community's willingness to implement land use solutions such as zoning or accept acquisitions should be considered when choosing a preferred solution.

6.6 Master Plans and Airport Layout Plans

The FAA recommends all airports have an airport master plan study completed every 10-15 years, or as demand warrants, with an updated airport layout plan (ALP). The FAA also requires all current and future development be displayed on an ALP in order to be eligible for AIP funding. Figure 3 demonstrates the typical planning process for an Airport Master Plan. The Mat-Su Regional Aviation Systems Plan (RASP) Phase II evaluated which DOT&PF owned airports have current master plans and ALPs. Table 1 documents the status of these studies at DOT&PF owned airports and approximate costs if an updated study is recommended.

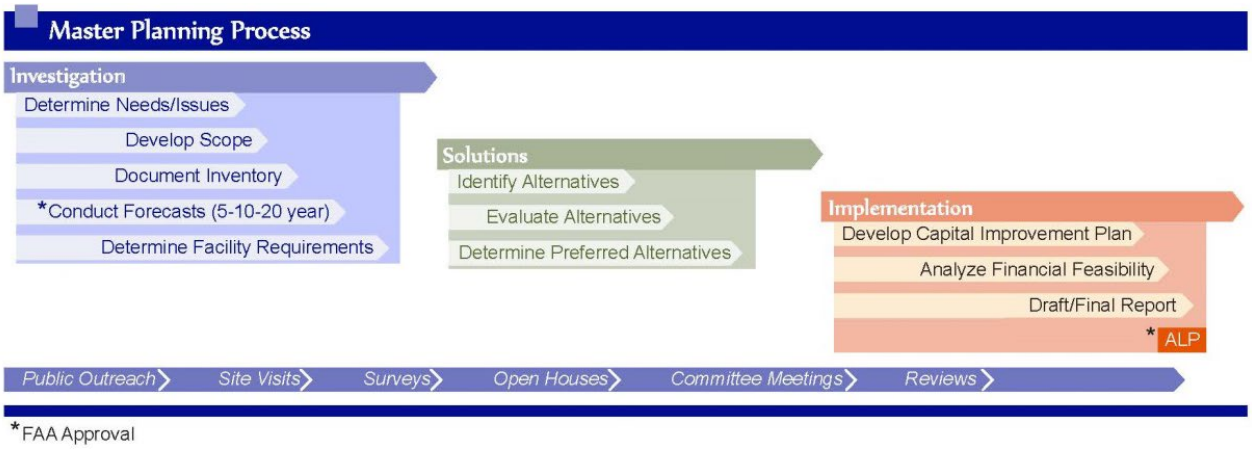


Figure 3: Master Plan Process

Table 1: Summary of MSB Airport Master Plan/Airport Layout Plan Needs

MSB Public Airport/Owner	Existing Master Plan Date	ALP Date	Master Plan/ALP Update Planned or Under Way? Date**	New Master Plan/ALP Cost*
Big Lake/ DOT&PF	None	2003	Yes, Master Plan/ALP to start in 2016	$250,000 - $450,000
Goose Bay/ DOT&PF	None	2007	No	Not needed
Lake Louise/ DOT&PF	None	2002	No	Not needed
Palmer/ City of Palmer	2009	2006	Yes, Master Plan/ALP completed in 2015	Not needed
Sheep Mountain/ DOT&PF	None	2013	No	Not needed
Skwentna/ DOT&PF	None	2007	No	Not needed
Summit/ DOT&PF	None	None	No	$25,000
Wasilla/ City of Wasilla	2003	2009	Yes, Master Plan/ALP to be finished in 2016	Not needed
Willow/ DOT&PF	None	2003	Yes, Master Plan/ALP to be finished in 2016	Not needed

* The cost of a master plan and ALP can be highly variable depending on airport complexity, master plan issues, extent of public involvement, and the amount on non-standard tasks (aeronautical survey, financial planning, and airport site selection).

** An ALP is only needed if the airport wishes to receive FAA Funding.

7.0 AIRPORT COMPATIBILITY

Each of the eight state-owned airports has been evaluated for land use compatibility and possible land use measures that could protect the airport and people on the ground. Appendix B provides a detailed comprehensive plan analysis for each airport. Since many of these airports are not fenced, land uses around them have the potential to generate vehicle traffic that crosses the runways. This type of conflict could be increased by adjacent uses, but can probably not be controlled by anything but fencing, signage, and education. This is a common issue within small rural communities with few roads.

7.1 Big Lake Airport

The Big Lake Airport is a General Aviation facility regularly used by light aircraft and helicopters. The approximately 225-acre airport site is surrounded on the north, west, and most of the south by land in private ownership. Within one-quarter mile of the airport, the private land west and northwest of the airport is subdivided and predominately used for residential purposes. In the area outside of S. Taxiway, Pilot Circle, and Tailwind Circle, these residential uses reach to within 550 feet of the runway centerline. In addition, Big Lake Elementary School is located immediately northwest of the airport. According to the FAA criteria, these are incompatible uses.

The private land to the south of the airport and the remainder of the land on the north are predominately large tracts of undeveloped or sparsely developed property. Lands adjacent to the airport on the east and southeast are owned by the borough or the University of Alaska, and are undeveloped.

Some private land west of the airport falls within the RPZ, notably a church and a motel. The DOT&PF will begin an airport master plan study for the airport in late 2016, in part, to develop a solution for this conflict.

Properties fronting on South Big Lake Road within one-quarter mile of the airport have some retail/commercial potential. The unsubdivided land around the rest of the airport has limited potential for incompatible non-aeronautical development due to the lack of high traffic roads and low demand for development.

7.1.1 Recommendations

Within one-quarter-mile of the Airport boundary:

1. Further subdivision for residential purposes should be discouraged;

2. Retail/commercial use of land fronting on Big Lake Road should be encouraged outside of the RPZ;

3. The borough and University lands to the east and southeast have extremely limited development potential due to limited or non-existent access and distance from South Big Lake Road. Never the less, their subdivision for residential purposes should be discouraged.

7.2 Goose Bay Airport

The Goose Bay Airport is primarily used as a light aircraft training site for touch-and-go practice by students operating from higher traffic airports in the region. There are no permanently based aircraft at the Airport.

Apart from private property adjacent to the extreme north boundary of the Airport, the facility is surrounded by undeveloped state, institutional and Native corporation land. The Airport is literally the dead end of South Knik-Goose Bay Road, an area of sparse development and low vehicular traffic. Even land with frontage on the road and within one-quarter mile of the airport has virtually no retail/commercial potential at the present time.

The large tracts around the airport also have limited development potential at the present time. Gravel mining and timber/firewood harvesting are about the only airport compatible uses for this land (so long as dust and smoke are controlled to prevent hazards to air traffic).

As the south Mat-Su grows, the airport may experience an increase in traffic, as well as the development of hangar space and aircraft parking space. With an eye on the future, the Airport should be protected from incompatible uses adjacent to the facility’s boundaries.

7.2.1 Recommendations

Within one-quarter-mile of the Airport boundary:

1. Discourage subdivision of land for residential purposes;

2. Encourage the use of South Knik-Goose Bay Road frontage property for retail/commercial purposes; and

3. Permit timber harvest and gravel mining, so long as dust and smoke are controlled to prevent hazards to air traffic.

7.3 Lake Louise

This is a low traffic recreational Airport, primarily used for access to cabins, homes, and businesses that have developed at the south end of Lake Louise. With the exception of a few lots in a recreational subdivision west of the Airport, the facility is surrounded by water and vacant state land. Economic growth in the area appears to be very slow and oriented to recreation and tourism. The state-maintained Lake Louise Road ends on the Airport.

The vacant state land southwest of the Airport boundary is of limited development potential due to rough terrain and lack of vehicle access. However, the state land within a quarter-mile of the eastern Airport boundary has developable land along the Lake Louise Road and on the north shore of Lake George. The most likely non-aeronautical uses for this property are recreational cabins, year around homes, and tourist-oriented businesses.

The Airport is in a remote location in an area that's likely to experience little significant growth in the foreseeable future. Aircraft traffic is unlikely to increase to the level of a significant nuisance to adjoining property owners. The Airport has a relatively large property site (the runway centerline is 800 feet from the west boundary) and is bounded by Lake Louise on one side, so the runway is well-protected within its reserve from incompatible uses on nearby land. Therefore, as a practical matter, allowing otherwise an incompatible residential use within one-quarter mile is unlikely to create any future significant land use conflicts.

7.3.1 Recommendations

Within one-quarter-mile of the airport boundary:

1. Encourage the development of tourist-oriented businesses along the Lake Louise Road; and

2. Allow the development of recreation cabins and residential buildings along the Lake Louise Road and on Lake George.

7.4 Sheep Mountain

This is an unmaintained, low traffic airport on a 130-acre site between the north side of the Glenn Highway and the slopes of Sheep Mountain. Although used on rare occasions for air access to nearby private property, the airport's primary purpose is to provide a safety stop for light aircraft transiting the pass between Matanuska Glacier and Tahneta Lake, an area subject to radical weather shifts and sudden visibility reduction. Apart from parcels of federal and private land at the east and southeast end of the Airport, the facility is surrounded to the south by state land and the Glenn Highway right-of-way (ROW).

Current uses of nearby private land consist of tourist oriented businesses, recreational cabins, and private residences. The development potential within one-quarter mile of the north airport boundary is virtually zero due to steep terrain and lack of access. The highest potential for non-aeronautical development within one-quarter mile of the airport would be the land fronting the south side of the Glenn Highway ROW where highway and tourist oriented businesses might be possible.

Similar to the Lake Louise Airport, aircraft traffic at Sheep Mountain is nominal and unlikely to ever increase to the level of a significant nuisance to adjoining property owners. The Airport has a relatively large property site (the runway centerline is 800 feet from the north boundary) and is bounded on the south by the Glenn Highway ROW, so the runway is well-protected within its reserve from incompatible uses on nearby land. The Airport site is long enough, east – west, that the runway could be shifted to the west enough to enclose both RPZ's within the Airport boundary. Therefore, as a practical matter, allowing otherwise incompatible residential uses

within one-quarter mile is unlikely to create any future land use conflicts, so long as the runway approaches are kept clear of hazards to aircraft operations.

7.4.1 Recommendations

Within one-quarter-mile of the Airport boundary:

1. Encourage the development of tourist-oriented businesses along the Glenn Highway ROW; and

2. Allow the development of recreation cabins, excluding structures that would constitute a hazard to aircraft operating within the runway approaches.

7.5 Skwentna

This Airport is a low traffic facility serving a local population of less than 40 people. The Airport serves an annual logistics support function for the Iditarod Sled Dog Race and the Iron Dog Snow Machine Race, and experiences brief spikes in air traffic during these events. The runway and both RPZ's are situated in a narrow 125-acre site. Except for a parcel of federal land (40+/- acres) adjacent to the southwest boundary and a string of small-parcel private tracts about 700 feet northeast of the airport, nearly all the land within one-quarter mile of the airport is Native corporation owned.

The Skwentna Census-Designated Place (CDP) consists of approximately 450 square miles, more or less centered on the airport. The population of the CDP has been in a state of decline, dropping from 111 in 2000 to 37 in 2010. However, the area is an active center for hunting, fishing, and river tourism, with at least one lodge operating year around. Apart from lodging and guiding, land use in the area mostly consists of a few recreational cabins and private residences.

The air traffic at the Airport is relatively low and conflicts with off-airport non-aeronautical uses appear unlikely. However, the Airport site is extremely narrow (less than 450 feet wide at the narrowest point) so residential and recreational cabin uses should not be allowed to develop immediately adjacent to the airport boundary.

With a small local economy and low population, the potential for any significant economic development on land surrounding the airport appears minimal. Commercial guiding and lodging facilities and other tourist oriented uses of adjacent land would be compatible with the Airport.

7.5.1 Recommendations

Within one-quarter-mile of the airport boundary,

1. Allow the development of tourist-oriented businesses; and

2. Discourage the development of recreation cabins and residential buildings immediately adjacent to the Airport boundaries.

7.6 Summit

Similar to the Sheep Mountain Airport, Summit primarily serves as a safety stop for light aircraft transiting Broad Pass, where rapid changes in weather and visibility can occur. It serves no community or local population and is not regularly maintained by DOT&PF. The north one-third of the Airport site is outside the Mat-Su Borough.

Except for the portion of the northeastern RPZ that extends beyond Airport property, the runway is well protected from incompatible land uses inside a site of nearly 1,000 acres.

Apart from a single tract of private land at the southwest end of Mirror Lake and the ROWs of the Alaska Railroad and the Parks Highway, all the land within one-quarter mile of the airport is federally owned. The Airport is isolated from any existing economic activity, so the potential of economic development in the vicinity of the Airport is very limited. That said, if federal land were to be made available for development, the only areas within one-quarter mile of the airport that would be likely to see any use would be those with frontage on the Parks Highway.

7.6.1 Recommendations

Within one-quarter-mile of the Airport boundary:

1. Allow the development of tourist-oriented businesses and recreation cabins, excluding structures that would constitute a hazard to aircraft operating within the runway approaches.

7.7 Talkeetna

With over 30,000 aircraft operations per year, Talkeetna is the busiest of the eight airports in this study. Activity is highest in the summer months when tourist and mountain climbing flights dominate. The 520-acre Airport site would be adequate to protect the runway from many incompatible uses were it not for the fact that the runway is offset toward the northwest, which places it in near proximity to residential property. Most of the land within one-quarter mile of the northwest side of the airport is fully developed, largely with residential structures and, secondarily, with tourist-oriented businesses. In this area, substantial incompatible land use has already occurred and may become an issue of conflict for the Airport in the future. Development of the few undeveloped parcels in this area for incompatible uses should be discouraged.

Most of the land immediately adjacent to the southeast Airport boundary is marsh and/or floodplain and is not practical for non-aeronautical development. Nevertheless, residential uses in this area should not be allowed. Most of the area southeast of this lowland is substantially elevated above the airport. A small portion of this elevated area within one-quarter mile of the Airport boundary has been developed for residential purposes. The rest is undeveloped borough, institutional, and Native corporation land. Because of this property's elevation and its distance from the runway (roughly, one-half mile), its use for residential purposes is unlikely to create conflicts with the airport.

A master plan update is being considered for Talkeetna, land use compatibility should be re-evaluated at that time.

7.7.1 Recommendations

Within one-quarter-mile of the Airport boundary:

1. On the northwest side of the Airport, further subdivision of large parcels for residential purposes should be discouraged and Airport-compatible commercial/retail/public recreation developments should be encouraged.

2. Elsewhere, except in the elevated areas southeast, residential developments should not be allowed.

3. Because of the expansive mountain views, good soils, and distance from the runway, the elevated area southwest of the Airport has good economic development potential for almost any use that doesn't create a hazard for aircraft operations.

7.8 Willow

Primarily an active general aviation airport, Willow does support occasional heavy aircraft operations due to its long runway (4,400 feet) and proximity to mining and other resource development sites in the Western Susitna Valley and the Alaska Range. The Airport has experienced fairly steady growth over the years, a trend which is likely to continue.

The Airport site's relatively large size (400+ acres), together with the ROWs of the Parks Highway on the west and the Alaska Railroad on the east, affords some protection for the runway from incompatible land uses. Aside from the Alaska Railroad and Parks Highway and the exception of a couple of relatively small state, borough, and institutional owned parcels, the airport site is virtually surrounded by private land, most of which has been subdivided for residential purposes. This substantial incompatible land use around the Airport may become an issue of conflict in the future. Indeed, it already has in the Willow Lake area. Development of the few remaining undeveloped parcels adjacent to the Airport for residential uses should not be allowed.

Highway frontage properties within one-quarter mile of the Airport boundaries have economic development potential for commercial, retail and service businesses. Many of these properties have already been developed for these purposes.

7.8.1 Recommendations

Within one-quarter-mile of the Airport boundary:

1. Encourage the use of highway frontage property for commercial, retail, and service business development.

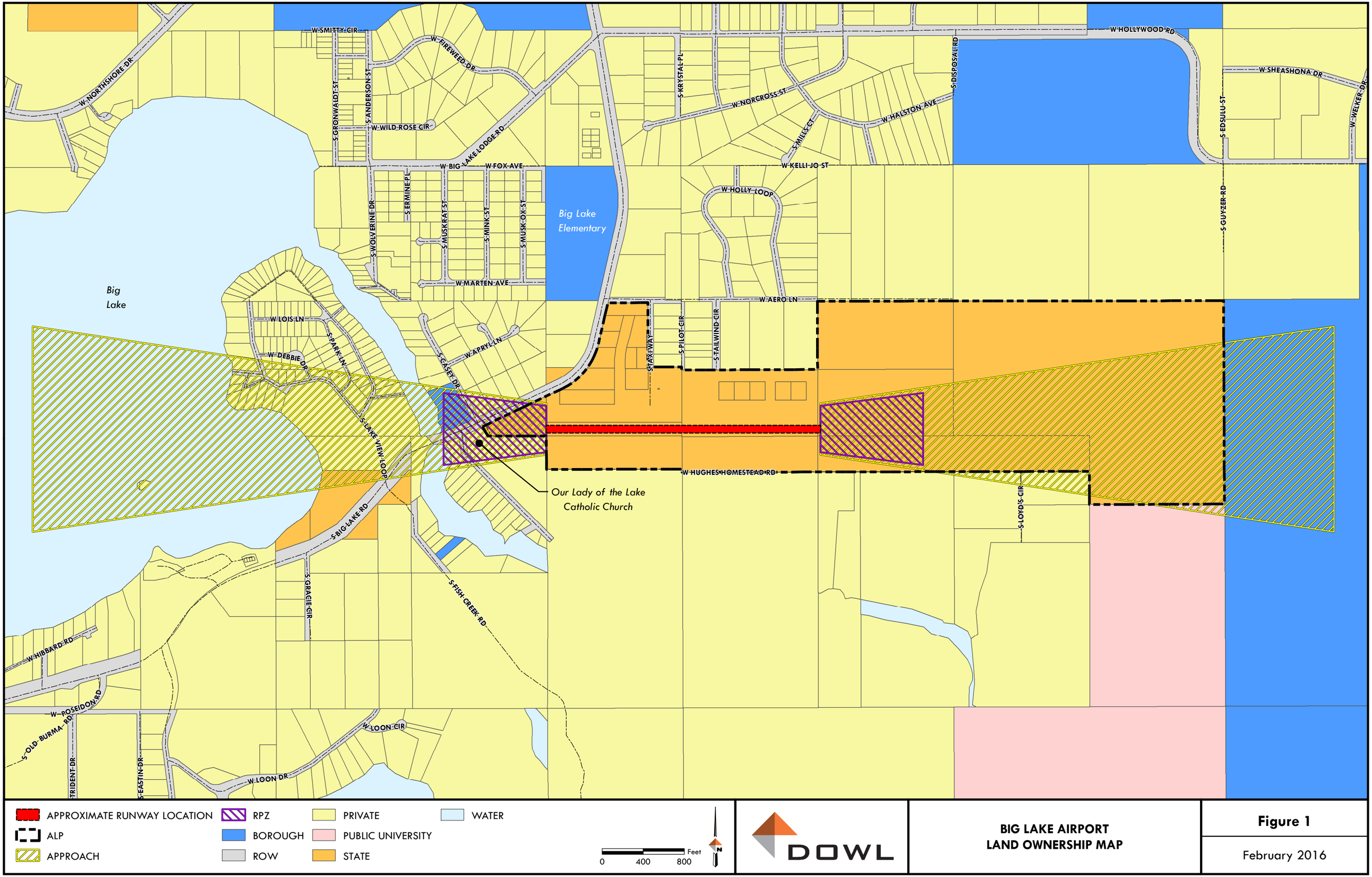
2. Further subdivision of land for residential purposes should not be allowed.

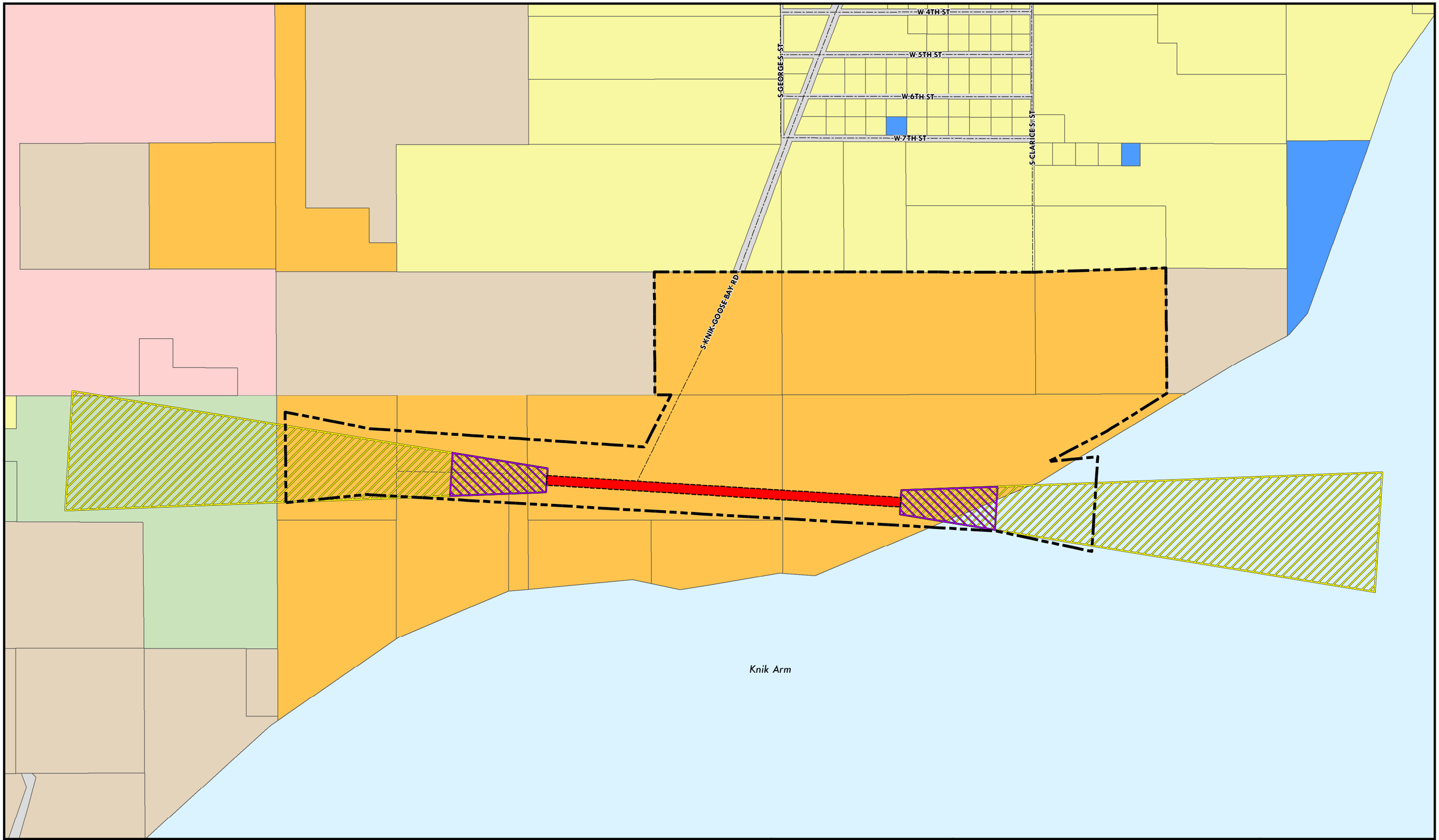
8.0 CONCLUSION

Several of the DOT&PF owned airports within the MSB, including Goose Bay, Lake Louise, Sheep Mountain, Skwentna, and Summit, are surrounded by state-owned, native-owned, and federal- owned lands and are in areas with limited development. A few airports including Big Lake, Talkeetna, and Willow are surrounded by large-lot residential lands that have minimal development. While current conflicts between these airports and the neighboring properties exist, proactive measures need to be taken to promote harmonious development around DOT&PF owned airports to avoid future conflict. All of the methods mentioned in the previous sections — acquisition, avigation easement, right of first refusal, conservation easement, and development/clearing agreement — are ways to protect the health, safety and welfare of communities while preserving the borough's aviation system. Through outreach and education, policy makers and the community can determine which best practices are most suited to their needs. As best practices are implemented and become more widely accepted there may be opportunities to establish zoning regulations that better enhance the long-term protection from incompatible development.

APPENDIX A

Land Use and Ownership Maps


W SMITTY CIR
W FIREWEED DR
W NORTHSHORE DR
S GRONWALDT ST
S ANDERSON ST
W WILD ROSE CIR
W BIG LAKE LODGE RD
W FOX AVE
S ERMINE PL
S WOLVERINE DR
S MUSKRAT ST
S MINK ST
S MUSK OX ST
W MARTEN AVE
Big Lake
Big Lake Elementary
W HOLLYWOOD RD
S KRYSTAL PL
W NORCROSS ST
S DISPOSAL RD
W HALSTON AVE
S MILES CT
W KELLI JO ST
W SHEASHONA DR
W WELKER DR
S EDSULU ST
S GUYZER RD
W HOLLY LOOP
W AERO LN
S TAXI WAY
S PILOT CIR
S TAILWIND CIR
W LOIS LN
S PARK LN
W DEBBIE DR
W APRYL LN
S CASEY DR
S LAKE VIEW LOOP
W HUGHES HOMESTEAD RD
Our Lady of the Lake Catholic Church
S LOYD'S CIR
S BIG LAKE RD
S GRACIE CIR
S FISH CREEK RD
W HIBBARD RD
W POSEIDON RD
S OLD BURMA RD
TRIDENT DR
S EASTIN DR
W LOON CIR
W LOON DR
APPROXIMATE RUNWAY LOCATION
ALP
APPROACH
RPZ
BOROUGH
ROW
PRIVATE
PUBLIC UNIVERSITY
STATE
WATER
0
400
800
Feet
N
DOWL
BIG LAKE AIRPORT
LAND OWNERSHIP MAP
Figure 1
February 2016

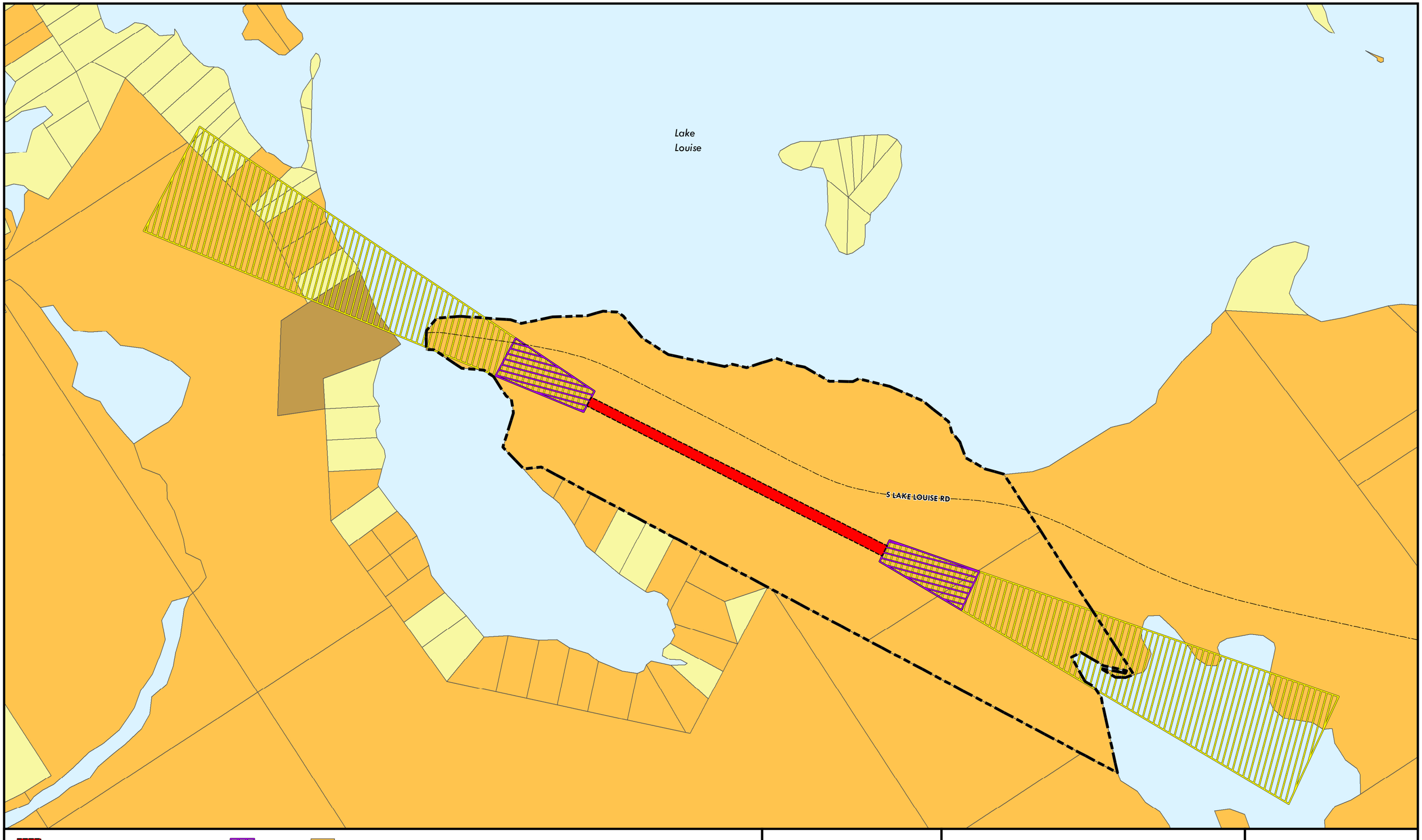


DOWL

GOOSE BAY AIRPORT
LAND OWNERSHIP MAP

Figure 2

February 2016

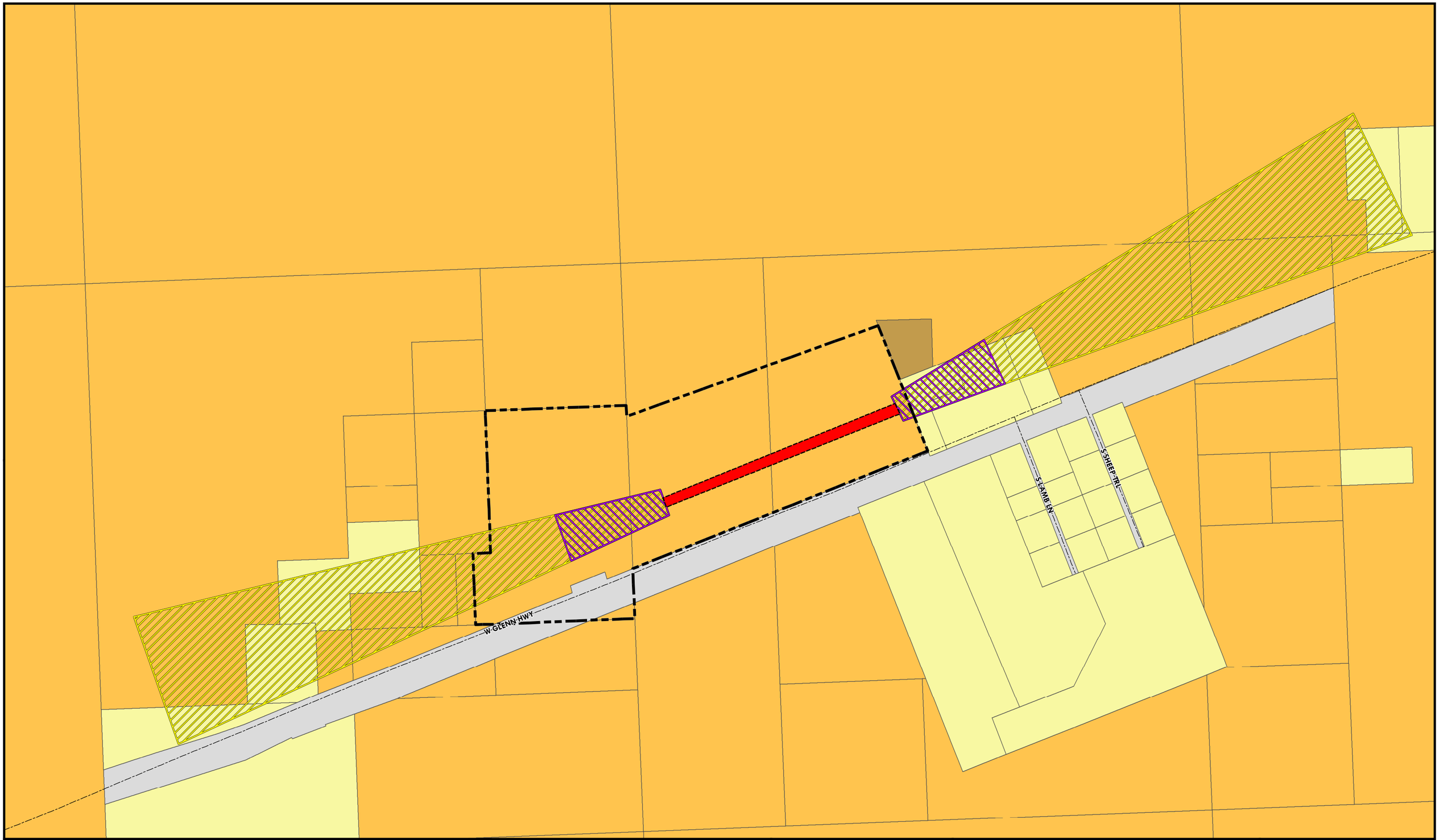


DOWL

LAKE LOUISE AIRPORT
LAND OWNERSHIP MAP

Figure 3

February 2016



APPROXIMATE RUNWAY LOCATION
ALP
APPROACH
RPZ
FEDERAL
ROW
PRIVATE
STATE

Feet
0 400 800

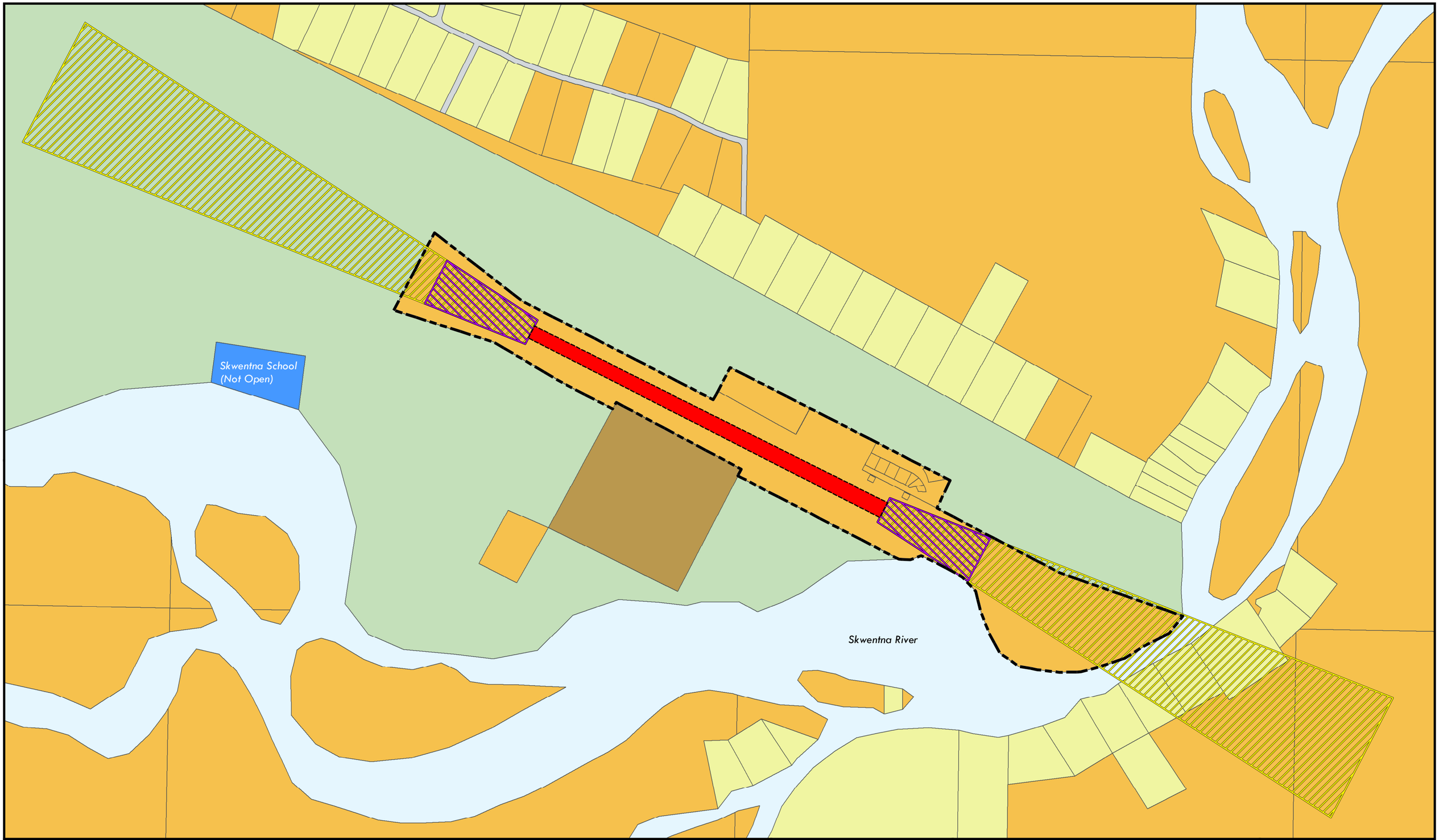
N

DOWL

SHEEP MOUNTAIN AIRPORT
LAND OWNERSHIP MAP

Figure 4

February 2016

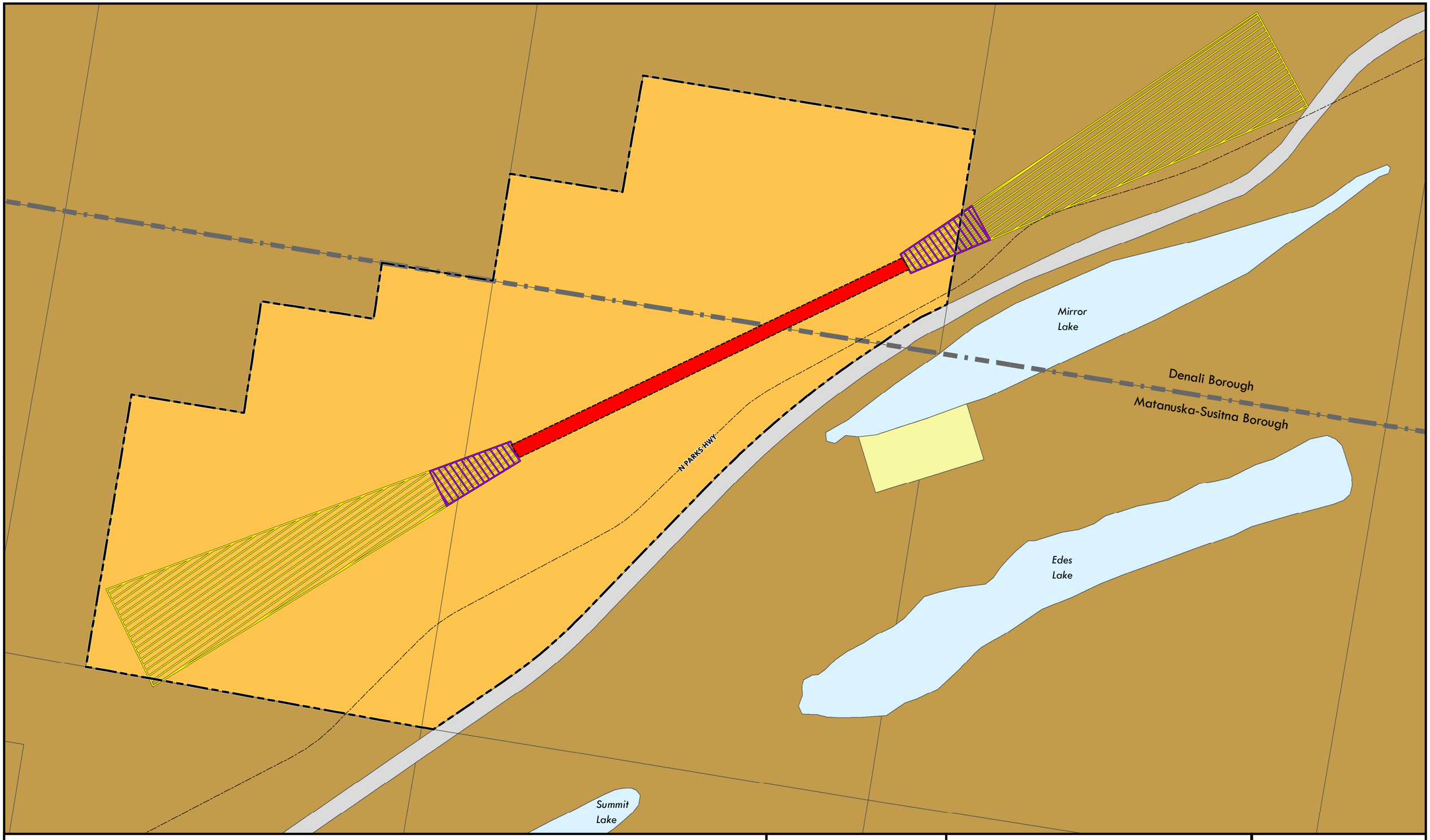


DOWL

SKWENTNA AIRPORT
LAND OWNERSHIP MAP

Figure 5

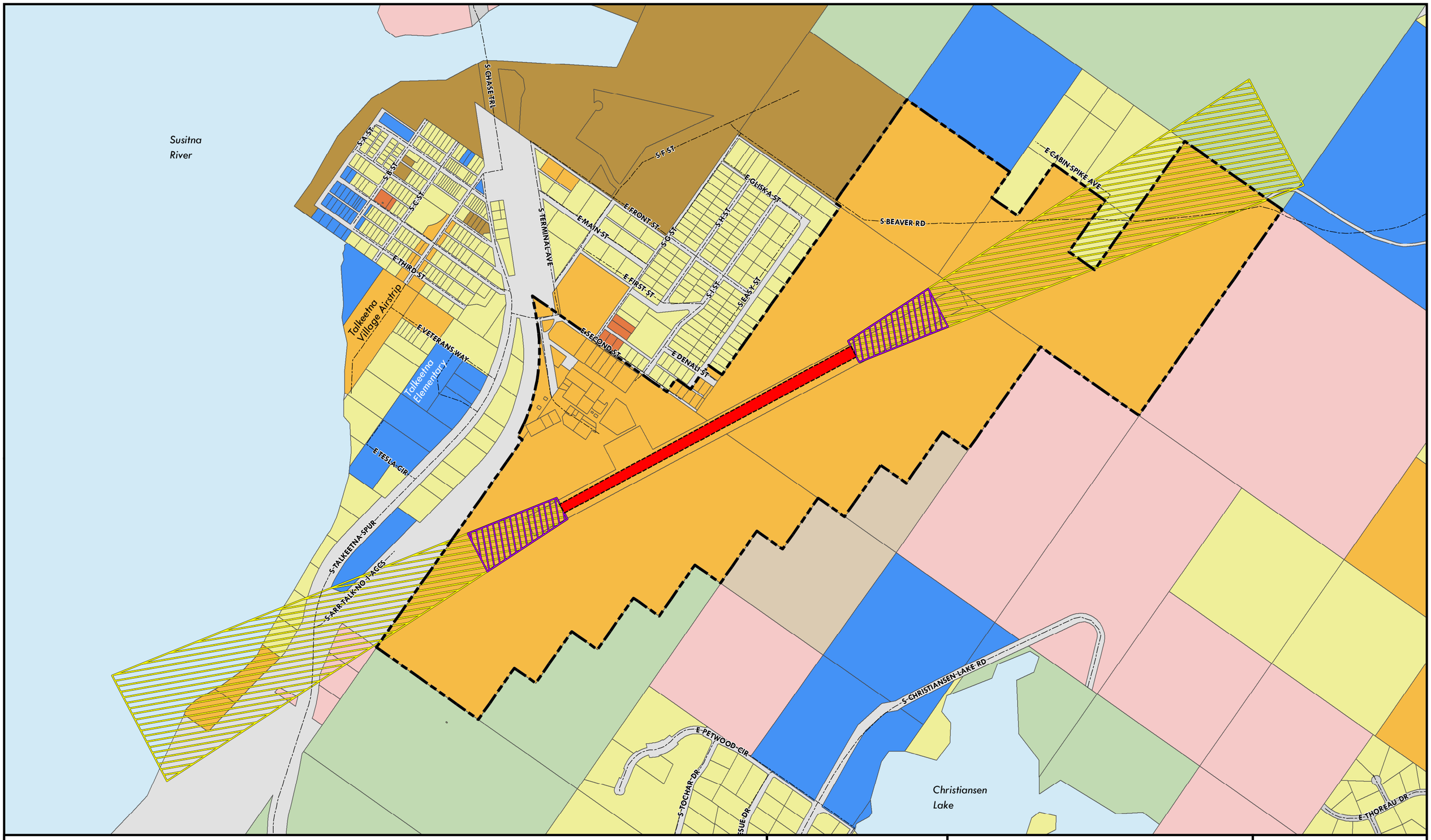
February 2016



SUMMIT AIRPORT
LAND OWNERSHIP MAP

Figure 6

February 2016

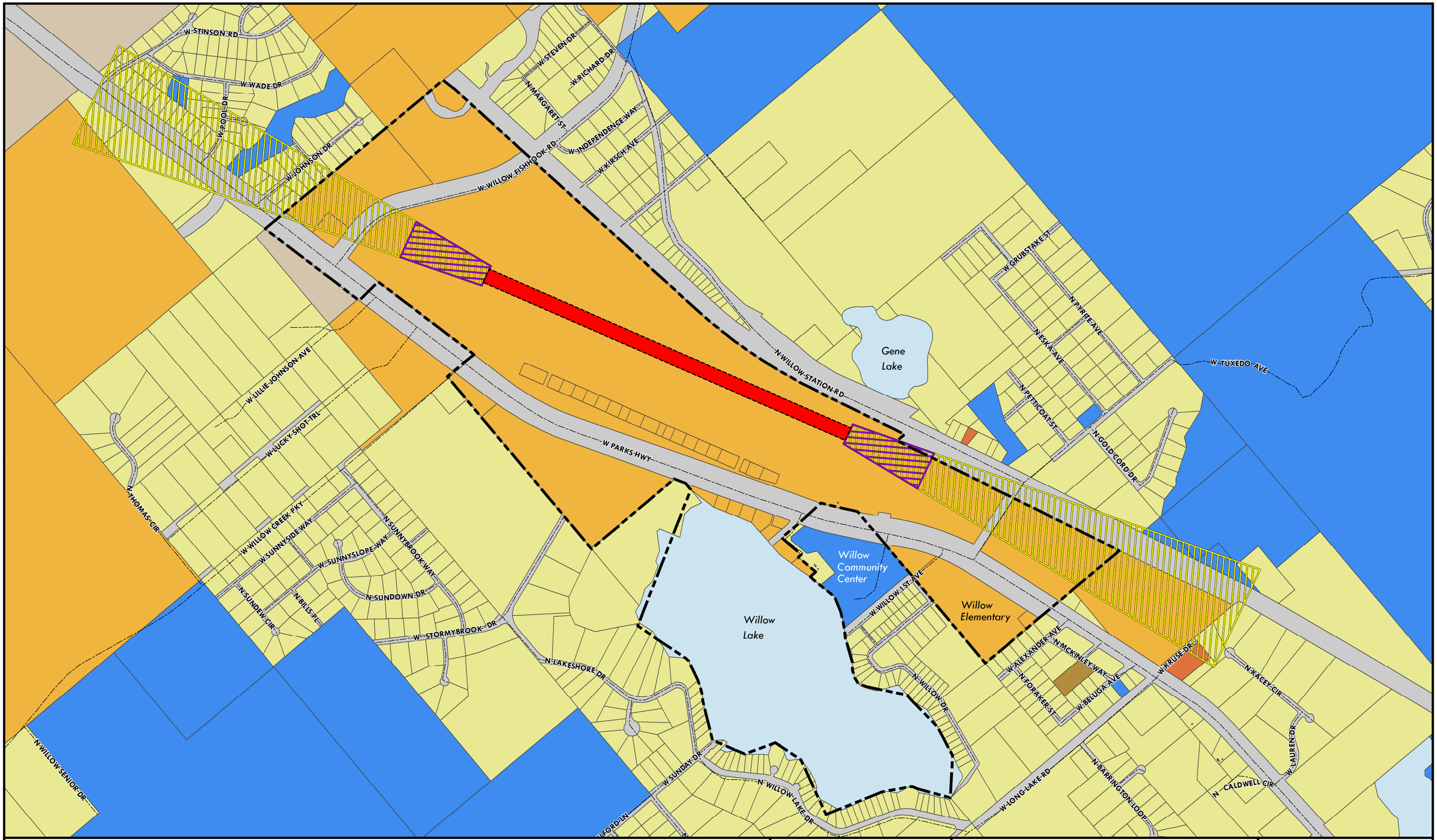


DOWL

TALKEETNA AIRPORT
LAND OWNERSHIP MAP

Figure 7

February 2016



APPROXIMATE RUNWAY LOCATION
ALP
APPROACH
RPZ
BOROUGH
COOPERATIVE
FEDERAL
MENTAL HEALTH
NATIVE CORP
PRIVATE
PUBLIC UNIVERSITY
ROW
STATE
WATER

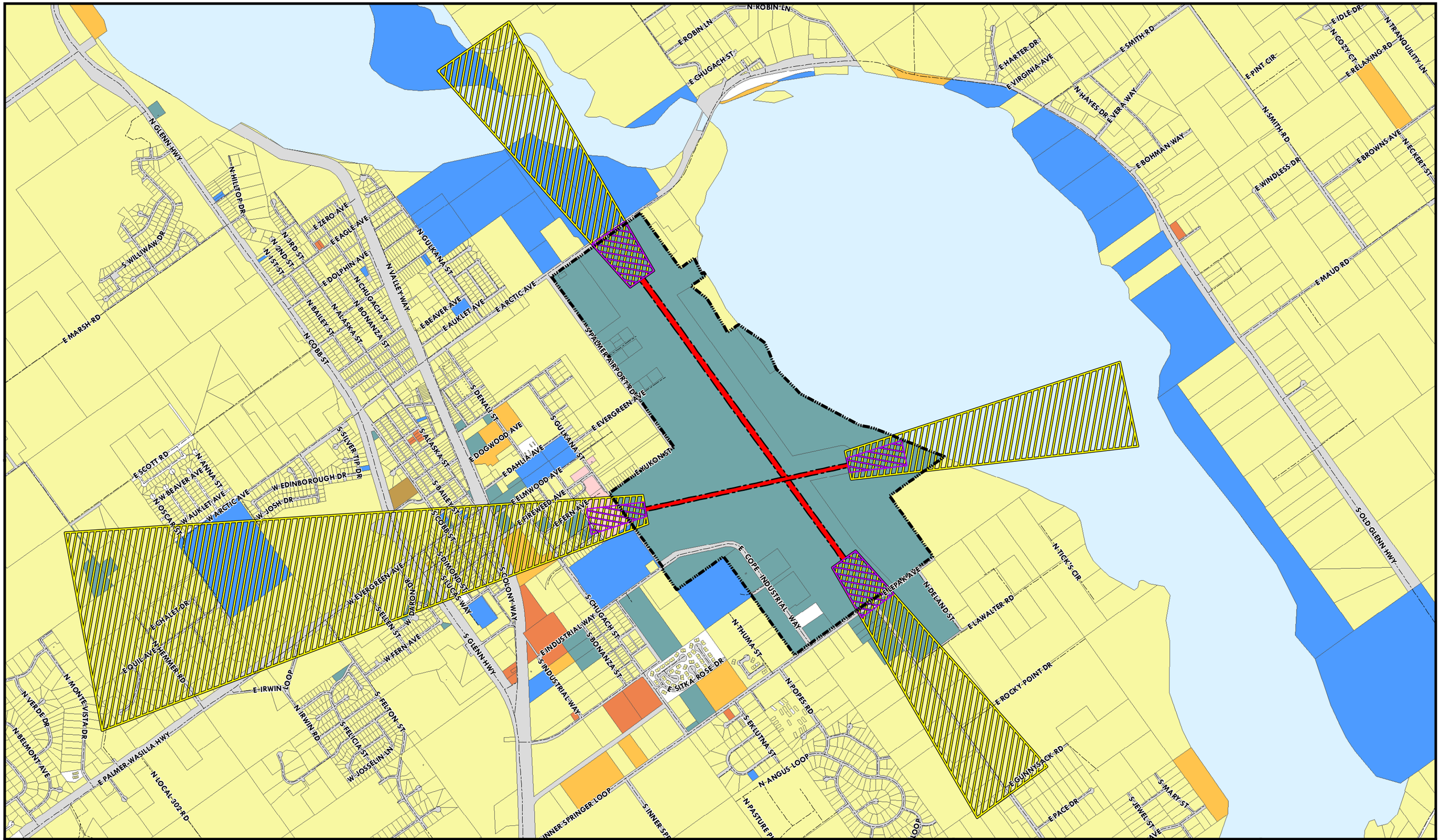
0 500 1,000 Feet

DOWL

WILLOW AIRPORT
LAND OWNERSHIP MAP

Figure 8

February 2016

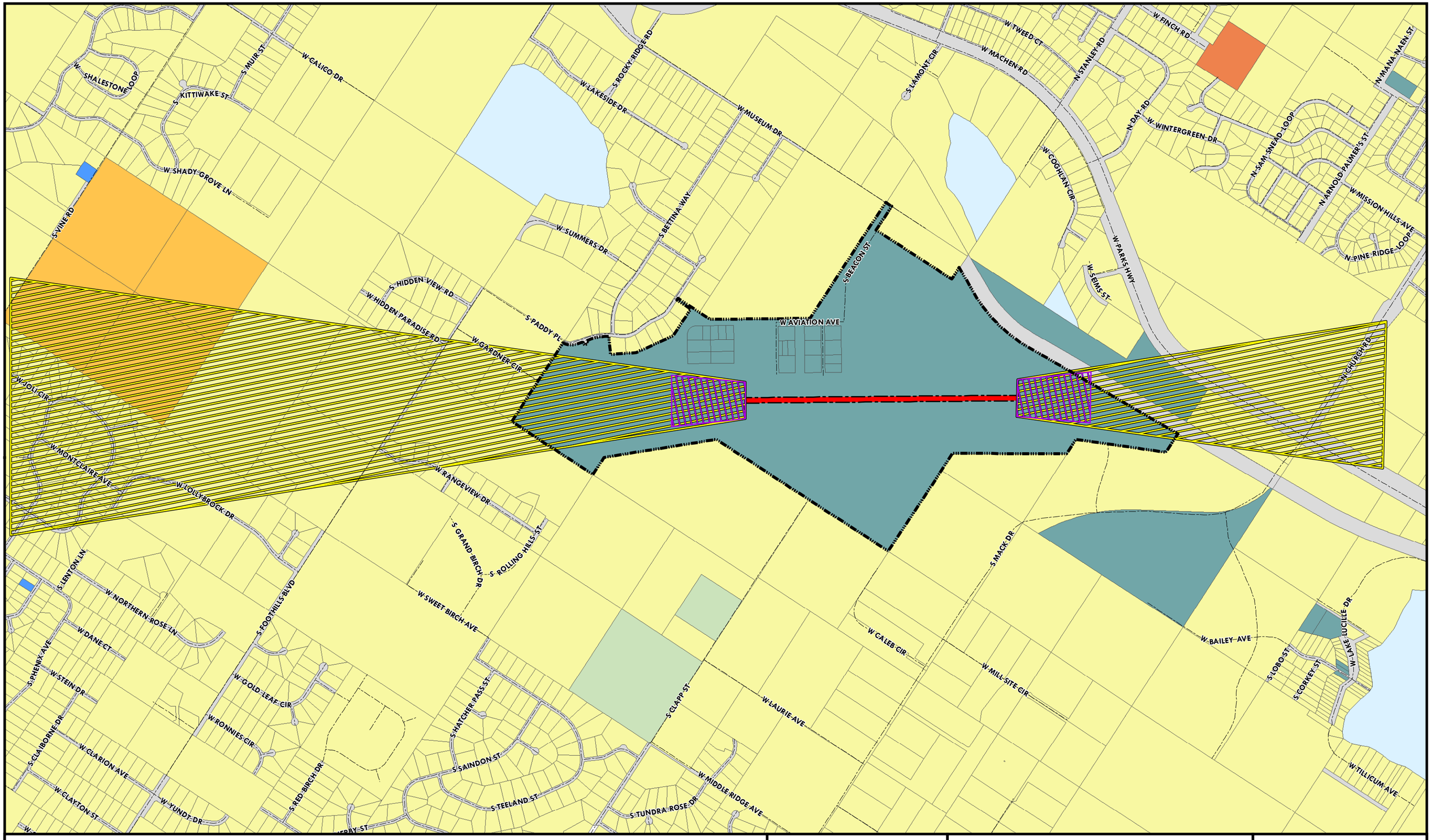


DOWL

PALMER AIRPORT
LAND OWNERSHIP MAP

Figure 9

April 2017


W SHALESTONE LOOP
S KITTIWAKE ST
S MUIR ST
W GALICO DR
W SHADY GROVE LN
S VINE RD
S ROCKY RIDGE RD
W LAKESIDE DR
W MUSEUM DR
S BETTINA WAY
W SUMMERS DR
S LAMONT CIR
W TWEED CT
W MACHEN RD
N STANLEY RD
W FINCH RD
N MANA NAFN ST
N DAY RD
W WINTERGREEN DR
N SAM SNEAD LOOP
N ARNOLD PALMER ST
W MISSION HILLS AVE
N PINE RIDGE LOOP
W COGHLAN CIR
W PARKS HWY
W SIMS ST
S BEACON ST
W AVIATION AVE
N CHURCH RD
S HIDDEN VIEW RD
W HIDDEN PARADISE RD
S PADDY PL
W GARDNER CIR
W JOLI CIR
W MONTCLAIRE AVE
W LOLLYBROCK DR
W RANGEVIEW DR
S GRAND BIRCH DR
S ROLLING HILLS ST
S LENTON LN
W NORTHERN ROSE LN
S FOOTHILLS BLVD
W SWEET BIRCH AVE
S PHENIX AVE
W DANE CT
W STEIN DR
W GOLD LEAF CIR
S CLAIBORNE DR
W CLARION AVE
W RONNIES CIR
W CLAYTON ST
W YUNDT DR
S RED BIRCH DR
S HATCHER PASS ST
S SAINDON ST
S TEELAND ST
S CLAPP ST
W LAURIE AVE
S TUNDRA ROSE DR
W MIDDLE RIDGE AVE
S MACK DR
W CALEB CIR
W MILL SITE CIR
W BAILEY AVE
S LOBO ST
S CORKEY ST
W LAKE LUCILLE DR
W TILLICUM AVE
APPROXIMATE RUNWAY LOCATION
ALP
APPROACH
RPZ
BOROUGH
CITY
COOPERATIVE
ROW
NATIVE CORP
PRIVATE
PUBLIC UNIVERSITY
STATE
WATER
0 400 800
Feet
N
DOWL
WASILLA AIRPORT
LAND OWNERSHIP MAP
Figure 10
April 2017

APPENDIX B

Comprehensive Plan Analysis

Plan/ Document	Existing Conditions, Land Use, Aviation Issues	Goals, Recommendations, Projects	Policy, Codes	OBSERVATIONS	ACTIONS
Matanuska-Susitna Borough					
Matanuska-Susitna Borough Code			■ Per 17.55.020.A: No structure or footing shall be located closer than 75 feet from the high water mark of a watercourse or body of water. ■ Per 17.55.020.B: Docks, piers, marinas, aircraft hangars, and boathouse may be located closer than 75 feet and over the water provided they are not used for habitation and do not contain sanitary or petroleum fuel storage facilities.	Existing Borough Code addresses concerns related to the protection of water bodies; however, no existing code addresses concern of land use near the Borough's eight airports.	Review existing code and explore opportunities to address airport land use at the regional level.
Sheep Mountain					
Glacier View Comprehensive Plan (2006): Sheep Mountain Subdistrict Plan	■ State owned runway located at Sheep Mountain Lodge. Runway is unplowed during winter months for ski plane landing. ■ Private Meekins airstrip adjacent to Majestic Valley Lodge.	■ Maintain current level of maintenance at state runway. ■ Allow for additional aviation industry accommodations if necessary (depending on tourism).		Unfortunately, most of the land ownership data in the immediate vicinity of the airport is unavailable. However, per the limited land ownership data and the fact that the airport is state-owned, it is assumed that much of the area around the airport is also state-owned. A limited area to the southeast of the airport is privately-owned, including the adjacent Sheep Mountain Lodge. A few single-family homes are present in this privately-owned area. The region is mountainous and therefore presents natural obstructions (along with trees). Due to the tourism-related traffic that frequents this airport and surrounding area, there is a potential for additional commercial and residential development nearby to support the increased visitors. It is important that the area around the airport (especially within the RPZs and approaches) be protected from incompatible development which could include multiple-story lodges or hotels or large resort development that attracts large concentrations of people.	Since it appears that much of the land surrounding the airport is owned by the state, it is recommended that the state identify and protect this property with a conservation easement to prevent development on state-owned land. A portion of the Sheep Mountain Lodge appears to fall within the eastern RPZ according to general aerial evaluation. An option to consider may be requesting a right of first refusal to the lodge owners should they ever decide to sell the property off the east end of the runway. Additionally, imposing height restrictions within the Glacier View Special Land Use District: Sheep Mountain Subdistrict would help limit height concerns in the future related to development or natural growth. Overall the airport environment is largely undeveloped and with the exception of tree trimming and clearing as needed, has limited land use concerns.
Chapter 17.19: Glacier View Special Land Use District: Sheep Mountain Subdistrict			■ Per 17.19.045C.13, conditional uses: "Other uses that are generally compatible with the land use district, and that are similar in intensity to the above conditional uses in terms of their traffic, noise, or other off-site impacts, as determined by the director (i.e., air tourism development)."		

Plan/ Document	Existing Conditions, Land Use, Aviation Issues	Goals, Recommendations, Projects	Policy, Codes	OBSERVATIONS	ACTIONS
Talkeetna					
Talkeetna Airport Master Plan (2001)	■ Airspace conflicts with Talkeetna village airstrip, Christianson Lake float planes, and aircraft flying along ARRC. ■ Only access crosses ARRC tracks, trains periodically stopped on tracks. ■ During peak hours, parking demand exceeds capacity .			The airport is located to the east of the Susitna River and to the north west of Christiansen Lake. A general aerial evaluation shows limited development within both RPZs and approaches. The approach to Runway 36 does extend partially over the Susitna River and over a railroad. Two lodges are located near the airport, one on either end of the runway, just outside of the RPZs and approaches. Limited land ownership data is available - and what is available shows partial ownership of the airport land by the state. There are privately-owned parcels within both approaches, but again, limited development is seen. Local planning efforts and zoning indicate a desire to maintain the airport in a way that supports future use and meets the needs of airport users, while respecting the characteristics of the community and the quality of life for residents. Additionally, the development of a floatplane facility at the airport is desired to move traffic away from Christiansen Lake.	With continued use of the airport and promotion of future airport and related growth, it is critical that local land use controls are in place to protect the safety of airport operations while addressing the needs and concerns of the surrounding population. Therefore, it is recommended that the Talkeetna Special Use District expand upon the development regulations to include height and land use components (including wildlife concerns due to location near water body) for the airport specifically, instead of addressing only setbacks of shorelands. If this is not possible, it is recommended that a separate special use district be established for the airport alone that includes these regulations. Similar to the Christensen Lake Special Use District, a new airport special use district should also include considerations for the local population, such as limiting noise from airport operations by restricting hours of operation or implementing a fly-quiet program and/or measures. Due to the limited land ownership data available, it is unknown how much of the land surrounding the airport and within the approaches and RPZs is owned by the state. It is recommended that a conservation easement be established over any of the state-owned airport land, including any owned within the RPZs and approaches. It is also recommended that the state request a right of first refusal for any privately-owned land within the RPZs so that it can come under control of the airport eventually. In the meantime, it is suggested that the airport secure avigation easements over any privately-owned parcels within the RPZs (if applicable) to limit height concerns within these critical areas.
Heliport Relocation Study (2004)		■ Relocate to area that minimizes impacts to adjacent residences.			
Talkeetna Comprehensive Plan (1999) *Talkeetna Comprehensive Plan (1999)continued*	■ Increasing (airport) noise is of concern to the community. Fixed-wing and rotary-powered aircraft should be routed to minimize the impact of noise on the communitv.	■ Maintain Talkeenta's major recreation and ecologically sound tourism economy and avoid conflicting activities. ■ Lands associated with the Talkeetna Airport should be managed for airport-related operations only so that the continued efficiency of this important facility is maintained. ■ Airport should be expanded though the addition of a taxiway and expansion of the apron area when needed to handle air taxi traffic. In the longer term, extension of the State airport runway may be justified. ■ Airplane tiedowns should be provided. ■ A float/ski plane strip parallel to the state airstrip should be considered. It could alleviate the congestion and possible fuel contamination at Christiansen Lake. ■ Talkeetna Village airstrip should remain in public ownership and should continue to be an airstrip and remain open for air traffic.			
Chapter 17.29: Talkeetna Special Land Use District			■ Per 17.25.045.D: Setbacks for shorelands are 75 feet from the mean high water mark.		

Plan/ Document	Existing Conditions, Land Use, Aviation Issues	Goals, Recommendations, Projects	Policy, Codes	OBSERVATIONS	ACTIONS
Chapter 17.29: Talkeetna Special Land Use District: Christiansen Lake District	■ Low density residential development.		■ 17.25.075B.1, The purpose of this district is to maintain the qualities of the district that are key to its attractive, residential and recreational character. These qualities include existing low density residential development, proximity to public recreational opportunities, and pristine lake water quality. ■ 17.20.075C, D, and E. Aviation uses are not specifically addressed as permitted, conditional, or prohibited use.		
2009 Mat-Su Borough Build out Analysis Summary	■ Airport is zoned transportation. Land around Christiansen Lake is zoned conservancy state, undeveloped, park, residential, and MSB land.				
Christiansen Lake Land Management Plan (1999)	■ 21 lots on lake shoreline. MSB owns two lots. ■ Four floatplane permits are available for docking on MSB park lot ■ Main concerns: water quality, lake surface recreation conflicts, creation of noise, and wildlife impacts.	■ Recommendations: use of commercial and recreational aircraft is recognized. However growth of commercial floatplane operations is not compatible with residential and recreational character of the lake. ■ Encourage AK DOT&PF to develop a floatplane facility at Talkeetna airport.			
AK Department of Fish and Game: Fish Resource Monitor	■ Twister Creek (adjacent to airport) is identified as an anadromous waterway. Christiansen Lake is not an identified anadromous waterway.				

Plan/ Document	Existing Conditions, Land Use, Aviation Issues	Goals, Recommendations, Projects	Policy, Codes	OBSERVATIONS	ACTIONS
Summit Lake					
AK Department of Fish and Game: Fish Resource Monitor	■ Summit Lake is not identified as an anadromous waterway.			Very limited land ownership data is available in the vicinity of the Summit Lake Airport, other than a small area of privately-owned land (vacant) to the southeast of the runway. Other than a highway running nearly parallel to the runway on the south side, no other development can be seen within the airport's RPZs and approaches. Several lakes, including Summit Lake are in the vicinity of the airport, and therefore, it is possible that wildlife could be an issue. A river/creek also runs nearly parallel to the airport on the north side.	Since the airport is state-owned, it is recommended that a conservation easement be established for the airport and RPZs to protect it from any future development. Existing topography limits the development that is possible in the airport vicinity, so there is limited concern of development popping up (other than any on the privately-owned parcel). Wildlife concerns are probably the biggest land use issue for this airport.
Lake Louise					
Lake Louise Comprehensive Plan (1998)	■ "The numerous lakes provide excellent access for float planes. There is a state-owned 2,400 foot airstrip located at the end of Lake Louise and two privately-owned airstrips in the area." ■ 56 permanent residents in area. ■ Official Lake Louise airport runway is closed due to poor conditions. ■ Wheeled aircraft land on Lake Louise Road, potential conflicts with increased vehicle traffic in the area.	■ Recommendations: No. 11 - Support and encourage improved air transportation by upgrading the Lake Louise Airport and continue a maintenance program. ■ Implementation: The community council and the borough will work with the AKDOT&PF to upgrade and maintain the Lake Louise Airport.	■ Standard MSB zoning codes. Draft 2015 comprehensive plan discusses creation of a Lake Louise Special Use District in the future.	The airport is located on the southern end of Lake Louise on what appears to be a peninsula between lake Louise and Lake Dinty. A general aerial evaluation shows limited development in the area, other than a road running parallel to the runway on the east side, and some single-family residential homes to the east of the approach to Runway 13. Nearly all of the land around the airport is owned by the state, with the exception of some parcels along the lake that are privately owned. One parcel that is privately-owned sits under the extended runway centerline, but falls outside of the RPZ. Recent aerial imagery shows the airport in operational condition, which contradicts the 1998 Lake Louise Comprehensive Plan note that the runway was closed due to poor conditions. It appears that recommendations of the 1998 plan to maintain the airport were addressed as it is operational today. It is assumed that wheeled aircraft are no longer landing on Lake Louise Road and creating a conflict with vehicular traffic.	The importance of air transportation to the Lake Louise community is demonstrated by the efforts to maintain the local airport. Since the airport is state-owned, it is recommended that a conservation easement be established for the airport and RPZs to prevent development in the future which could negatively impact the utility of the airport. It is also recommended that the 2015 comprehensive plan update include a recommendation to establish height and use guidelines within the proposed Lake Louise Special Use District. These height and use guidelines would apply only to the areas within the extended approaches, and would not prohibit development, but encourage compatible land use types and elements.
Louise, Susitna, and Tyonek Lakes Comprehensive Plan Draft (2016)		■ Plan does not mention any goals for aviation.			
AK Department of Fish and Game: Fish Resource Monitor	■ Lake Louise is not identified as an anadromous waterway.				

Plan/ Document	Existing Conditions, Land Use, Aviation Issues	Goals, Recommendations, Projects	Policy, Codes	OBSERVATIONS	ACTIONS
Willow					
Willow Area Community Comprehensive Plan (2013)	■ Commercial floatplane industry on (Willow) Lake has caused noise controversy with lake residents. ■ Approximately 400 licensed pilots live in Willow, with 112 private aircraft based at Willow airports. ■ Public Seaplane Base at Willow Lake. ■ Private Seaplane bases at Nancy Lake, Kashwitna Lake, Long Lake, Minuteman Lake, and Redshirt Lake. ■ 125 lots within 500 feet of Willow Lake, 58 lots have developed residences. ■ Preserve connection between Willow Airport and Willow Lake.	■ Goal #1. Preserve community's open and relatively unrestricted access to public and private aviation facilities (11 airstrips in area). ■ Recommendation: Discourage government action and restrictions that would limit aircraft access to community lakes and to landing strips. ■ Goal #2. plan effectively to minimize encroachment on airstrips by non-compatible development. ■ Goal #3. Enhance Willow Airport with improved services and facilities. ■ Goal #4. minimize the adverse impacts aviation activities may have on airport neighbors. ■ Recommendation: Encourage aircraft operators to follow noise abatement procedures to minimize noise footprint in takeoff and landing corridors. ■ Goal #5. Develop and pursue strategies that market the Willow airport. ■ Recommendation: Highlight Willow Airport's unique access to nearby services (fuel, groceries, medical facilities, post office, etc.). ■ Recommendation: Develop facilities that will encourage the public to continue using Willow Airport (electricity at tie downs, rental t-hangars, etc.). ■ Goal #6. Develop public access and parking facilities at Kashwitna Lake and designate landing and takeoff approach vectors.	■ MSB zoning codes	Very limited land ownership data is available in the vicinity of the Willow Airport, other than some state-owned parcels to the west of the airport. A general aerial evaluation shows limited development within the runway RPZs and approaches. The Runway 13 approach extends over Willow Creek and the Runway 31 approach extends over some small water bodies, including Ruth Lake. The airport is surrounded by water bodies of various sizes on all sides, and therefore wildlife issues may be present. Surrounding land uses appear to include low density residential, some industrial and some commercial. The recent comprehensive plan illustrates the community's desire to protect the airport and its operation while also addressing local concerns such as noise impacts. Growth is encouraged for this airport, and it is important to maintain the connection between the airport and Willow Lake for seaplane operations.	Many of the goals established in the 2013 comprehensive plan are tailored toward the encouragement of future growth in a way that is compatible with airport operations and limits impact to the surrounding community (such as limiting encroachment by non-compatible development, and encouraging aircraft operators to follow noise abatement procedures). In order to achieve these goals, it is recommended that local zoning reflect height and land use regulations (visual obstructions, density, wildlife attractants, etc.) that are necessary for compatible growth in the future. For the land that is owned by the state, it is recommended that a conservation easement be established over that land to protect it from future development. Additionally, it is recommended that the airport request a right of first refusal for any privately-owned land within both RPZs so that it can come under control of the airport in the future. In the meantime, avigation easements should be pursued to limit height concerns on these privately owned parcels (again, limited land ownership data is available so it is possible that the state already owns this land).

Plan/ Document	Existing Conditions, Land Use, Aviation Issues	Goals, Recommendations, Projects	Policy, Codes	OBSERVATIONS	ACTIONS
Willow Airport Master Plan (2012)	■ Airport improvement project. No narrative	■ 14. Replace buoys (in Willow Lake) ■ 16. Develop safety improvements for aircraft crossing the (Parks) highway (from airport to Willow Lake) ■ 17. Water level maintenance study (Willow Lake)			
2009 Mat-Su Borough Build out Analysis Summary	■ Willow Airport is zoned Transportation. Land surrounding Willow Lake is classified as undeveloped, residential, commercial. Lake access from the airport is constrained as public facility land.				
AK Department of Fish and Game: Fish Resource Monitor	■ Willow Lake is not an anadromous waterway. Long Lake to the west and Gene Lake to the east are identified as anadromous waterways. Kashwitna Lake is identified as an anadromous waterway.				
Goose Bay					
2009 Mat-Su Borough Build out Analysis Summary	■ Goose Bay airport zoned Transportation surrounding land uses are undeveloped and residential			The airport is located along the Knik Arm waterbody. The only development is to the north and west of the airport. A general aerial evaluation shows very limited development near the airport, and none within the RPZs and approaches. The location of the airport along a water body and adjacent to the Goose bay State Game Refuge presents wildlife hazard concerns. Much of the area in the immediate vicinity of the airport is owned by the state. Land to the north is privately owned (where the limited residential development is located), and the land to the far west is university- and native-owned.	Since the airport is state-owned, it is recommended that a conservation easement be established for the airport and area within the approaches to protect it from any future development. Due to the location on the water, development to the east of the airport is not a concern. However, while the native-owned land is to the far west of the airport, it is underneath the extended centerline of the runway and it is suggested that state officials work with the native group to prevent any incompatible uses from being developed on that land. Since the airport is located on the water and adjacent to the state game refuge (a spring and fall resting and feeding area for waterfowl, and a habitat to moose, beavers, muskrat, and mink, in addition to the black and brown bears, coyotes, red fox, and occasional lynx that cross the wetlands in search of food). Wildlife hazards are significant concern for this airport, both birds and mammals alike. The state should monitor this area closely and develop a wildlife mitigation plan and strategies (if not already developed) to protect the operations of the airport and the continued protection of species within the refuge).
Greatland Trust Conservation Prioritization Mat-Su Borough: Knik Arm Area (2010)	■ Airport is adjacent to Goose Bay State Game Refuge. Goose Creek is identified as an anadromous waterway. Area surrounding airport is not identified as critical conservation habitat by this plan.				
Knik Sled Dog and Recreation Special Land Use District			■ Allows all permitted and conditional uses in MSB		

Plan/ Document	Existing Conditions, Land Use, Aviation Issues	Goals, Recommendations, Projects	Policy, Codes	OBSERVATIONS	ACTIONS
Skwentna					
Susitna Matanuska Area Plan (2011)	■ Lands surrounding Skwentna to be considered for legislative designation as State Forest.		■ Guidelines: Building Setback to all waters except anadromous streams: 75 to 150 feet landward of the ordinary highwater mark. Does not apply to structures such as docks, bridges, and culverts ■ Guidelines: Building Setback to anadromous waters: 150 to 200 feet landward of the ordinary highwater mark. Does not apply to structures such as docks, bridges, and culverts	The airport is located on the north side of the Skwentna River, near the convergence of the Yentna and Skwentna Rivers, in a largely uninhabited area. A general aerial evaluation shows the closest development near the airport is a roadhouse to the west of the airport that falls outside of the airport's RPZ and approach to Runway 10. Additionally, sparse single-family residential development can be seen along the river to the southeast of the airport within the approach to Runway 28. Land ownership data indicates the airport and RPZs are owned by the federal government. Land outside of the RPZs in the runway approaches is native-owned to the west and privately-owned to the east (along with a significant area with no land ownership data available). The largest land use concerns likely at this airport include wildlife hazards associated with the nearby river, and tree obstructions.	Since much, if not all airport and RPZ land is already federally-owned, it is recommended that a conservation easement be placed on this land to prohibit any future (non-airport) development. It is noted that the Susitna Matanuska Area Plan from 2011 describes the land surrounding Skwentna to be considered State Forest - it is possible that this designation would achieve the same outcome as a conservation easement in that it would prohibit future development. However, further investigation is needed to determine the development limitations on state forest land. While a significant amount of land to the northwest of the airport is under native-control, it does fall under the extended runway centerline and within the approach to Runway 10. As such, it is recommended that coordination with the native group take place to stay abreast of any future development in the area in order to suggest compatibility measures if needed.

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Big Lake					
Big Lake Lake Management Plan (1998)	■ Conflicts between users (motorized, non-motorized, float planes, water skiing, swimming, and PWC) are increasing.			The airport is located on the east end of Big Lake and is owned by the state. Per a general aerial evaluation, the land within the RPZ (which is owned by the state) and approach to Runway 25 has little if any development. South Big Lake Road and some privately-owned lots are located within the Runway 7 RPZ. Current uses on these lots include single family residential development, along with a church and a motel and lounge (which pose density concerns). The Runway 7 approach lies on top of additional single family residential development and over a portion of Big Lake. Previous planning efforts that the regional and local levels in 2009 recognize the importance of the Big Lake Airport to the community and to the region. A number of goals and strategies are focused on the maintenance and continued operation of the airport in order to promote additional use, attract new business, and improve safety.	In terms of land ownership, it is recommended that the state request a right of first refusal for the privately owned land within the Runway 7 RPZ to gain complete control over this critical area over time. In the meantime, it is recommended that the state purchase avigation easements (if not already in place) over these parcels to limit any height concerns from structures and/or vegetation (trees). In terms of land use, the Big Lake Comprehensive Plan addresses the importance of planning for height-compatible uses, especially within the runway approaches. However, it is unknown if existing zoning aligns with the strategies of the comprehensive plan (i.e. does the zoning limit height in accordance with the airport's location?). It is noted that there is a building height guideline per the capability of local fire equipment to not exceed three stories, however three stories in height within the RPZ or approach can be an issue for safe aircraft operation. Therefore, it is recommended that local zoning include height restrictions that align with the size and type of runway approach. In addition to height restrictions, it is recommended that the type of land uses allowed in proximity to the airport be regulated to prevent incompatible uses from being developed. The 2009 plan recognizes the residential uses in the vicinity of the airport, but does not address the concerns related with such development (noise, density, etc.). Increasing airport-related development is a strategy of the 2009 comprehensive plan. It is important that additional airport development be developed according to FAA regulation, especially if located on airport property. Non-aeronautical uses and unrestricted access to the airport should be carefully monitored. Lastly, the state should establish a conservation easement over the state land that makes up the airport. This will help protect the airport from incompatible development in the future.
2009 Mat-Su Borough Build out Analysis Summary	■ Big Lake Airport is zoned transportation. Land around Big Lake is mainly zoned undeveloped, park, and residential. ■ Other main zoning districts around other water bodies in the area are wetland conservancy, MSB land, park, and residential. ■ Lands surrounding the Big Lake Airport are undeveloped, wetland conservancy, and residential. Adjacent undeveloped lands are classified as buildable lands.				
Big Lake Comprehensive Plan (2009)	■ Big Lake and Fish Creek are identified anadromous waterways. ■ Airport-Industrial - the plan identifies two public airports: the existing facility on the east side of Big Lake, and the area identified for a major future float plane strip at 7-Mile Lake. This area, located in the southern portion of the community council area, was designated for this future use in the Borough's adopted aviation plan.	■ Plan airport use and future residential uses in the vicinity of the airport to minimize conflicts and safety issues. For example identify and maintain safe approach paths for air traffic. ■ Promote small airport and airport-related commercial and industrial activities. ■ For the existing Big Lake Airport, retain options for moving planes safely and conveniently between Big Lake and the airport.	■ Building Height guideline: fire standards locally available equipment argue for not allowing structures over three stories in height.		

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Big Lake Comprehensive Plan (2009)	■ The Big Lake Airport is a public airport owned and maintained by the Alaska Department of Transportation and Public Facilities. The airport is located east of South Big Lake Road and northeast of Fish Creek in the Big Lake core area. The total area of the airport is approximately 230 acres which includes a 2435 ft. by 70 ft. gravel airstrip and nine lease lots. The airport does not have a control tower but does have a runway lighting system via pilot control along with a weather data source which is via weather broadcast. There is no designated runway for planes equipped with skis in the winter time although a snow pack is maintained when possible to allow for planes on skis. Big Lake is not a recognized float plane base but the lake is used regularly by airplanes in both summer and winter. Big Lake Airport has an average of approximately 55 aircraft operations per day.	■ Transportation Priority Goal #2: Improve the big Lake Airport: ensure and enhance the future of air transportation in the Big Lake area by protecting and improving the existing airport.			

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Big Lake Comprehensive Plan (2009)	■ Currently there are several small businesses at the airport including plane maintenance and restoration businesses. However, the relationship between the community and the airport has never been clearly defined and the relationship has been described as occasionally awkward. Over the last few years, there has been more development at the Big Lake Airport than any where else in the community. In the Rural Aviation Safety Plan, there is a big push for a dedicated float plane base in the Mat-Su Borough. During the 1996 comprehensive planning process, community members identified the expansion of the Big Lake Airport into the regional airport a priority. Since then, the borough has looked at other facilities and traffic patterns and has determined that Big Lake is not a desirable location for a regional airport. Additionally, community members no longer see themselves as a central regional supply center, therefore the 1996 goal does not mesh with the community's current goal to diversify its economy. The development of a float plane base at the lake south of Big Lake and the future of other infrastructure projects in the region will affect the impact of the airport on commerce in the community. Community members feel that the airport as it currently exists should be more directly tied to economic activities in Big Lake. In addition to development at the airport, individuals in the community are building personal hangars adjacent to their residences throughout Southcentral Alaska. For example, there are some developments where condominiums on lakes are built with float-plan slips. This is currently not a possibility at Big Lake.	■ Strategy 1: Protect the existing Big Lake Airport by maintaining the approach zones in accordance with Federal Aviation Administration guidelines. This can be accomplished by having the Borough acquire right of way at the east end of the runway for future expansion. ■ Strategy 2: Control the placement and height of buildings within the approach zones of the airport. ■ Strategy 3: Improve the airport by providing water and sewage systems when systems are available in the Big Lake area. ■ Strategy 4: Expand the lease area at the Big Lake Airport to allow for further development ■ Strategy 5: Encourage the Alaska DOT&PF to clean up the existing "junk" aircraft and mow weeds so that additional auto parking is available. ■ Strategy 6: Encourage community support of the continued permitting process for a float plane and emergency service access in Fish Creek Park which provides access for float planes from Big Lake to the Big Lake Airport.			

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Big Lake Comprehensive Plan (2009)		■ Economic Priority Goal #6: Capitalize on airport as a center for economic activity ■ Strategy 1: Inventory airport businesses, services and key contacts • Recruit a business owner, or other representative of the airport to participate in chamber meetings and other gatherings of local businesses. ■ Strategy 2: Inventory community aviation needs (e.g. residential, small and large-scale commercial, tourism) and compare to local aviation capacity. • There is a difference between a 50-float plane airport and 1500-float plane airport. With a larger magnitude, more businesses may be willing to locate near airport. ■ Strategy 3: Improve airport equipment and management. ■ Strategy 4: Lobby for runway improvements ■ Strategy 5: Clean-up airport ground and improve area landscaping; beautify the airport to create a community friendly and attractive site for locals and visitors. • Erect some kind of greeting/"Welcome to Big Lake Sign." ■ Strategy 6: Implement airport shuttle.			

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