

6.0 RECOMMENDED PLAN

This chapter presents the Airport Capital Improvement Plan (ACIP) and Airport Layout Plan (ALP) that is associated with the recommended developments at Danielson Airport. The ACIP provides a financial plan for the recommended projects for the 20-year planning period. The ALP illustrates the recommended future airport layout, and serves as the official development plan for the Airport.

6.1 Summary of the Recommended Plan

Chapter 4 presented the overall recommended airport development plan for Danielson Airport. The plan contains recommendations for airfield and landside development, which have been organized into three implementation phases. The recommendations include the following:

Phase I (0 to 5 years)

- 1A* - Tree obstruction removal from runway approach surfaces
- 1B* - Airport perimeter fencing and emergency access gate through high school
- 1C* - Paved airfield service road and reconfigured roadway to T-hangars
- 1D* - Fuel farm/fuel truck parking pad
- 1E* - Runway End Identifier Lights (beyond Runway 13) and Precision Approach Path Indicators (both runway ends)
- 1F* - GPS instrument approach (for Runway 13) and non-precision runway markings
- 1G* - Exit taxiway development near existing T-hangars
- 1H* - Tree clearing/grubbing for skydiving drop zone
- 1I* - T-hangar development east of existing T-hangars
- 1J* - Rehabilitation of existing Airport Road and parking areas

Phase II (6 to 10 years)

- 2A* - Rehabilitation of existing paved Tiedown Apron
- 2B* - Paved tiedown apron development adjacent to existing paved Tiedown Apron
- 2C* - Conventional hangar development west of the FBO hangar

Phase III (11 to 20 years)

- 3A* - Rehabilitation of existing runway
- 3B* - Rehabilitation of existing taxiway
- 3C* - Airport Road reconfiguration
- 3D* - T-hangar development west of existing T-hangars
- 3E* - Conventional hangar development north of the FBO hangar

6.2 Airport Capital Improvement Plan

The ACIP lists the recommended projects and associated cost estimates for the 20-year planning period. Grant-eligible projects at Danielson Airport may receive 95 percent federal funding, with ConnDOT responsible for the remaining 5 percent share.¹ Grant-eligible capital projects include planning and environmental studies, runway and taxiway development and rehabilitation, airport lighting, security enhancements, aircraft parking aprons, access roads, obstruction removal, land acquisition, and navigational aids.

Projects that are ineligible for funding include those that generate revenue and do not directly benefit the general public, such as hangars, fuel farms, and office buildings. A private entity or developer, such as a fixed base operator (FBO) or other corporation, may fund and construct grant-ineligible projects under a lease agreement with ConnDOT. In some cases, ConnDOT may fund the total cost of an ineligible project, or an eligible project with a lower FAA priority (e.g., new airport access road).

In addition to the potential new airport developments, the Airport must also continually rehabilitate existing airfield facilities (e.g., pavement rehabilitation typically occurs every 20 years). As such, the ACIP includes these additional items. Although these items are not considered new capital developments, the associated costs can comprise the majority of an airport's annual capital investment.

Note that the ACIP does not constitute a commitment on behalf of the FAA or ConnDOT to fund any of the projects. In addition, the ACIP does not imply that the projects would receive environmental approvals. Thus, the ACIP serves as a planning document that must remain flexible. The ACIP should undergo regular updates as project priorities and demands indicate.

Table 6-1 provides the 20-year ACIP for Danielson Airport, organized into the following three phases:

- Phase I (0 to 5 years)
- Phase II (6 to 10 years)
- Phase III (11 to 20 years)

¹ FAA funding participation has ranged between 90 to 95% of the total project cost in recent years. The FAA's future funding participation is anticipated to be either 90 or 95%.

TABLE 6-1 – AIRPORT CAPITAL IMPROVEMENT PLAN				
Project	Total Estimated Cost	Anticipated Funding Source		
		FAA	State	Private
Phase I (0 to 5 years)				
1A - Tree obstruction removal	\$250,000	\$237,500	\$12,500	
1B - Airport fencing and emergency gate	\$300,000	\$285,000	\$15,000	
1C - Paved airfield service road	\$125,000	\$118,750	\$6,250	
1D - Fuel farm/fuel truck parking pad	Undetermined	Undetermined		
1E - REILs and PAPIs	\$150,000	\$142,500	\$7,500	
1F - GPS approach, upgrade runway markings	\$75,000	\$71,250	\$3,750	
1G - Exit taxiway development	\$100,000	\$95,000	\$5,000	
1H - Tree clearing for skydiving drop zone	\$50,000			\$50,000
1J - T-hangar development (east)	\$1,100,000			\$1,100,000
1K - Rehab Airport Road and parking areas	\$150,000	\$142,500	\$7,500	
Phase I Subtotal	\$2,300,000	\$1,092,500	\$57,500	\$1,150,000
Phase II (6 to 10 years)				
2A - Rehab existing Paved Tiedown Apron	\$250,000	\$237,500	\$12,500	
2B - Paved tiedown apron development	\$1,400,000	\$1,330,000	\$70,000	
2C - Conventional hangar development (west)	\$750,000			\$750,000
Phase II Subtotal	\$2,400,000	\$1,567,500	\$82,500	\$750,000
Phase III (11 to 20 years)				
3A - Rehabilitation of existing runway	\$1,000,000	\$950,000	\$50,000	
3B - Rehabilitation of existing taxiway	\$500,000	\$475,000	\$25,000	
3C - Airport Road reconfiguration	\$275,000	\$475,000	\$25,000	
3D - T-hangar development (west)	\$2,200,000			\$2,200,000
3E - Conventional hangar development (north)	\$800,000			\$800,000
Phase II Subtotal	\$4,775,000	\$1,686,250	\$88,750	\$3,000,000
GRAND TOTAL	\$9,475,000	\$4,346,250	\$228,750	\$4,900,000

6.3 Airport Layout Plan

The ALP drawings illustrate all development projects identified for Danielson Airport throughout the 20-year planning horizon. Upon approval by ConnDOT and the FAA, the ALP becomes the official development document for the Airport. The FAA requires that all new airport facilities be consistent with the ALP. As such, keeping the drawings accurate and up to date is a high priority. FAA policy now requires that the ALP be updated at least every five years.

Although the ALP is the only drawing that is signed by the FAA, it is part of a larger drawing set that includes the sheets listed below. These ALP drawings can be found in Appendix D.

DRAWING INDEX		
Sheet No.	Sheet Title	Drawing No.
	Cover Sheet & Drawing Index	---
1	Existing Airport Layout	ALP-1
2	Airport Layout Plan	ALP-2
3	Inner Approach Surface Drawing - Runway 18-36	ALP-3
4	Airport Airspace Plan	ALP-4
5	Land Use Plan	ALP-5
6	Property Plan	ALP-6

6.3.1 Existing and Proposed Airport Layout Plan

The first sheet of the drawing set (ALP-1) illustrates the existing airport layout. This sheet depicts the Airport as it exists today. The drawing identifies key FAA airfield design standards (e.g., Runway Safety Areas, Object Free Areas, Runway Protection Zones) and illustrates existing landside facilities. Key information, such as runway end elevations and runway-taxiway offsets, is also illustrated on ALP-1.

The proposed ALP (ALP-2) includes all features of ALP-1, and illustrates each recommended facility for Danielson Airport. Several offices within the FAA review this drawing for consistency with airport design standards, flight procedures, surrounding airspace, and environmental requirements. Approval of ALP-2 represents the acceptance of the general location of future facilities. However, prior to the development phase of each project, ConnDOT is required to submit the final locations, heights, and exterior finish of each proposed structure for approval. ALP approval does not represent environmental clearance under the National Environmental Policy Act (NEPA) or Connecticut Environmental Policy Act (CEPA), or compliance with permit requirements. Such approvals must be obtained prior to development, and are not part of the ALP process.

It is also noted that ALP approval does not represent a commitment on behalf of ConnDOT, the FAA, or others to fund or pursue the projects depicted. Rather, the Master Plan and associated ALP represent the first products of the planning and development process, and are intended to depict a broad and long-range view of the potential improvements to the Airport.

The ALP drawings were prepared in accordance with FAA design standards for Airport Reference Code (ARC) B-I. Aircraft within ARC B-I include the Piper Saratoga and Cessna Skyhawk.

The following publications were used during the drawing preparation:

- FAA Advisory Circular 150/5300-13, *Airport Design*
- FAA Advisory Circular 150/5070-6B, *Airport Master Plans*
- Federal Aviation Regulations, Part 77, *Objects Affecting Navigable Airspace*

The major proposed facilities on the ALP include tree obstruction removal, a service road, fencing improvements, lighting and instrumentation upgrades, and apron and hangar development. Rehabilitation and maintenance of existing paved areas is also incorporated into the ACIP. No extension of the paved runway is included on the ALP.

Runway End Identifier Lights (REILs) are currently installed on the Runway 31 end. REILs are recommended for Runway 13 to provide enhanced visibility of the runway end. Danielson Airport does not currently provide vertical guidance equipment for either Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) conditions. Precision Approach Path Indicators (PAPIs) are recommended for each runway end to provide vertical approach guidance during VFR conditions. For improved approach capability during IFR conditions, a GPS non-precision instrument approach (IAP) is recommended for Runway end 13.² This would require an upgrade of the runway markings from visual to non-precision, as illustrated on ALP-2. Overall, with the implementation of the recommendations above, the approach capabilities of Danielson Airport would be substantially improved.

The Runway Protection Zone (RPZ) is a ground area that provides land use protections beneath the inner portion of each runway approach, thereby enhancing the protection of people and property on the ground. Since the design aircraft is forecast to remain under 12,500 pounds, the dimensions and locations of the RPZs at Danielson Airport will not change during the 20 year planning period, as listed in Table 6-2.

² According to weather data from Windham Airport, Runway 13 at Danielson Airport provides the best wind coverage for approaches during IFR conditions.

TABLE 6-2 – RUNWAY PROTECTION ZONE DIMENSIONS				
Runway End – Current	Visibility Minimum	Inner Width	Outer Width	Length
Runway 13 (Visual)	1-mile	250'	450'	1,000'
Runway 31 (Visual)	1-mile	250'	450'	1,000'
Runway End – Proposed	Visibility Minimum	Inner Width	Outer Width	Length
Runway 13 (GPS IAP)	1-mile	250'	450'	1,000'
Runway 31 (Visual)	1-mile	250'	450'	1,000'

6.3.2 Airport Airspace Plan

The next two sheets of the ALP Drawing Set (ALP-3 and 4) illustrate the airspace requirements associated with Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*. Part 77.23 identifies a series of geometric planes (i.e., imaginary surfaces) that extend outward and upward from an airport's runways to define obstruction clearing requirements. These surfaces identify the maximum acceptable height of objects by defining three dimensional surfaces surrounding all sides of the airfield. When an object penetrates an imaginary surface, it is considered an airspace obstruction and may present a hazard to air navigation.

The height and dimensions of the imaginary surfaces are determined by the airfield elevation, design aircraft, and the type of approach to each runway end. The specific surfaces for OXC are described below.

Primary Surface: A surface longitudinally centered at the runway elevation extending 200 feet beyond each runway end. The width of the primary surface is 250 feet for the existing visual Runway 13-31 at Danielson Airport. The recommended non-precision GPS IAP to Runway 13 would increase the entire width of the primary surface to 500 feet. This is because the primary surface is defined as the largest width required by either runway end.

Horizontal Surface: A horizontal plane 150 feet above the airport elevation. As the elevation of Danielson Airport is 238 feet above mean sea level (AMSL), the horizontal surface is situated at 388 feet AMSL. The shape of the surface is created using radial arcs of 5,000 feet, from the ends of the primary surface, connected by lines tangent to the arcs.

Conical Surface: A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1, for a horizontal distance of 4,000 feet. The elevation of the outer edge of the conical surface at Danielson Airport is 588 feet AMSL.

Approach Surface: Surfaces longitudinally centered on the extended runway centerlines, extending outward and upward from the ends of the primary surface. For Danielson Airport, the dimensions and slopes of the approach surfaces are listed in Table 6-3.

TABLE 6-3 – APPROACH SURFACE DIMENSIONS				
Runway End – Current	Inner Width	Outer Width	Length	Slope
Runway 13 (Visual)	250'	1,250'	5,000'	20:1
Runway 31 (Visual)	250'	1,250'	5,000'	20:1
Runway End – Proposed	Inner Width	Outer Width	Length	Slope
Runway 13 (GPS IAP)	500'	2,000'	5,000'	20:1
Runway 31 (Visual)	500'	2,000'	5,000'	20:1

Transitional Surface: Surfaces extending outward and upward at right angles from the sides of the primary and approach surfaces at a slope of 7 to 1. The transitional surfaces terminate at the overlying horizontal surface.

Objects that penetrate the runway imaginary surfaces are depicted on ALP-3 and ALP-4.

ALP-3, the Inner Approach Surface Plan and Profile Drawing, provides greater detail regarding the close-in airspace obstructions, particularly to the inner portions of each approach surface (also see Figure 5-4). For each obstruction, the height, penetration, ownership, and proposed action/disposition are indicated in the associated tables.

Several close-in trees penetrate the primary and transitional surfaces to the south of the runway. Removal of these trees, which are located on airport property, is recommended, as illustrated on ALP-3. Several trees also penetrate the recommended non-precision approach surface to Runway 13, most of which are located in a wetland area on the airport property. Sporadic groups of trees also penetrate the recommended approach surface to Runway 31. Removal of all tree obstructions is recommended. Any tree removal located off the airport property, such as those in the residential area along Maryland Street and in the adjacent cemetery, would require ConnDOT to obtain avigation easements from the property owner.

In addition to tree penetrations, there are also building and light pole penetrations in the recommended approach surface to Runway 31. To improve the safety of the approach, the buildings should be equipped with obstruction lighting and the light poles should be lowered or redesigned. Overall, all of the obstruction issues above should be addressed before a non-precision GPS instrument approach is pursued. As illustrated on ALP-3, the existing approaches to Runway 13-31 contain obstructions, and on and off airport tree removal is necessary.

ALP-4, Airport Airspace Plan, illustrates the overall dimensions of the Part 77 surfaces, and highlights penetrations to the outer surfaces. As shown, there are some limited penetrations to the outer portions of the imaginary surfaces.

6.3.3 Land Use Plan

Danielson Airport is located in the Town of Killingly, Windham County, Connecticut. As depicted on ALP-5, the Land Use Plan, the area surrounding Danielson Airport primarily

consists of open, wooded, residential, and institutional areas. A summary of nearby features is provided below.

- The Quinebaug River creates the western and southern borders of the airport property.
- Residential development is located immediately northwest and southeast of the airport property.
- The Harvard H. Ellis Technical High School is located immediately east of the airport property.
- Cemeteries, light industrial, and senior housing developments are located along Maple Road to the east.
- Large open and wooded areas provide a buffer between the airport property and surrounding areas (except to the east).

Danielson Airport is located on the eastern side of the Town of Killingly, along the border of the Town of Brooklyn. ALP-5 depicts the zoning districts in the adjacent towns, as well as the general land uses. ALP-5 also illustrates all of the property owned by ConnDOT.

As described in Chapter 4, the FAA recommends controlling the land immediately beyond the runway ends, within the RPZs, through easement or acquisition of the property. The existing RPZ beyond Runway 31 contains one home. Voluntary acquisition of the home should be considered for land use compatibility purposes. There are no homes located in the existing RPZ beyond Runway 13.

Land use compatibility is also related to airport noise exposure. The FAA uses a Day-Night Average Noise Level (DNL) of 65 dB as a threshold to determine if incompatible activities exist in the vicinity of an airport. DNL levels for existing and future conditions indicate a maximum noise level of DNL 60 dB at Danielson Airport. Thus, no incompatible land use impacts would be anticipated as a result of aircraft noise in the Town of Killingly. Since the existing and future airport noise levels are less than DNL 65 dB, the noise contours are not illustrated on ALP-5.

ALP-6 provides a more detailed Airport Property Map, including acquisition history. The primary purpose of this sheet is to provide information indicating how various tracts of airport property were acquired (i.e., federal programs, local funds only, etc.). The map identifies for the FAA the aeronautical use of properties acquired with federal funds.