# Environmental Assessment

# Taxiway and Drainage Improvement Project

Hoyle, Tanner Project Number: 063221

January 2020

Prepared for:

Tweed-New Haven Airport Authority
Tweed-New Haven Regional Airport
New Haven and East Haven, CT

Prepared by:

Hoyle, Tanner & Associates, Inc.
150 Dow Street, Manchester, New Hampshire 03101
Phone: 603.669.5555 Fax: 603.669.4168
Web: www.hoyletanner.com

This Environmental Assessment becomes a Federal document when evaluated and signed by the responsible federal official.

Responsible Federal Official: R. Doucette Date: January 3, 2020

Richard P. Doucette, Environmental Program Manager

# Tweed-New Haven Regional Airport

## Environmental Assessment

## Taxiway and Drainage Improvement Project

Hoyle, Tanner Project Number: 063221

January, 2020

# Table of Contents



## List of Figures

**List of Tables**



**APPENDICES**

# 1. INTRODUCTION

## 1.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 is a key piece of federal legislation designed to raise environmental awareness. It requires major federal actions to fully consider the impacts a project would have on the natural and social environment before capital improvement projects are funded. It requires coordination with federal agencies and calls for public involvement in the planning and environmental review process. The Federal Aviation Administration (FAA) complies with and supports both the policies and procedures of NEPA.

Any project involving action by the federal government that could significantly affect the environment requires a federal environmental determination. To address NEPA in airport development, FAA developed and issued *Order 1050.1F: Environmental Impacts: Policies and Procedures, and Order 5050.4B: Implementing Instructions for Airport Actions*. These documents identify three project categories:

- Actions which are Categorically Excluded (Cat Ex);
- Actions requiring an Environmental Assessment (EA); and
- Actions requiring an Environmental Impact Statement (EIS).

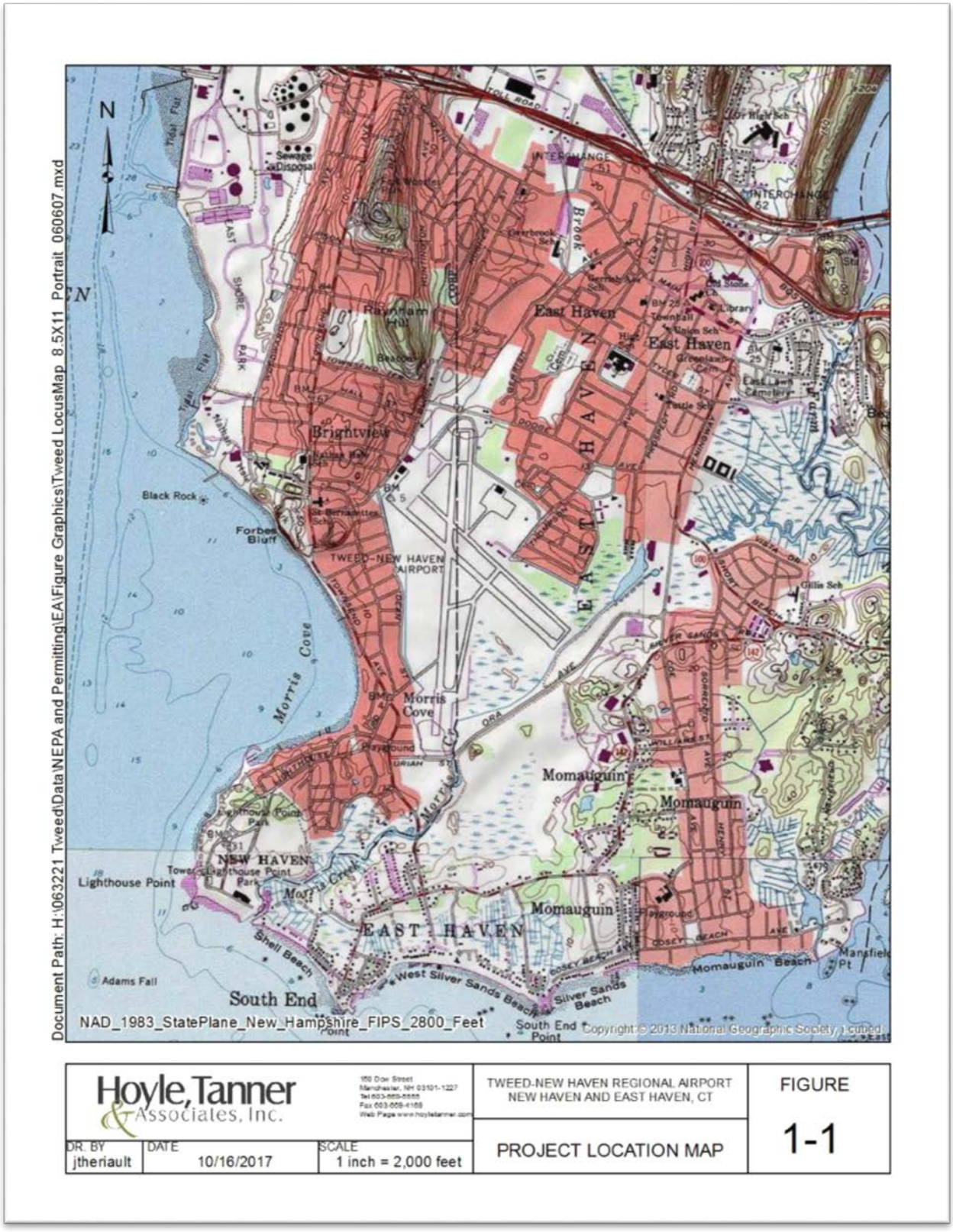
As defined in the FAA's Order 1050.1F, "A Cat Ex refers to a category of actions that do not individually or cumulatively have a significant effect on the human environment, and for which neither an EA nor an EIS is required." Actions requiring an Environmental Assessment (EA) may or may not have significant environmental impacts but due to the unknown, further analysis is required. Actions with known significant impacts require an Environmental Impact Statement (EIS).

## 1.2 Environmental Assessment Requirement

The Tweed New-New Haven Airport Authority (TNHAA), owner and operator of Tweed-New Haven Regional Airport (Tweed Airport; Figure 1-1), is proposing improvements to the Taxiways and drainage on the airport in order to improve the overall safety of Tweed Airport and to alleviate flooding in certain areas of the airport. The proposed *federal action* includes approval of the revised Airport Layout Plan (ALP) and potential federal funding for elements of the proposed project.

The proposed actions may be categorically excluded from additional analysis via an EA or EIS, per FAA Order 1050.1F; however, the proposed Project exceeds the minimal expansion intent for actions eligible for Cat Ex due to the need to acquire off-airport properties or easements. Therefore, further environmental impact analysis is required and will be fulfilled via development of this EA.

**Figure 1-1: USGS Location Map, Tweed-New Haven Regional Airport**



## 1.3 Federal, State and Local Agency Jurisdiction

The proposed project would require state and local permitting as listed in Table 1.

**Table 1: State and Local Permitting, Tweed-New Haven Regional Airport, Taxiway and Drainage Improvement Project**

| Resource | Agency | Permit |
|---|---|---|
| Wetlands | CTDEEP<br>USACE | Inland Wetlands and Watercourses Permit<br>Section 404 CT General Permit<br>401 Water Quality Certification |
| Stormwater Discharge | CTDEEP/NPDES | Construction General Permit |

## 1.4 Purpose and Need

There is a *need* to ensure the overall safety of the general public and airport employees at Tweed Airport. Compliance with current FAA requirements and standards is the primary path to meeting this need.

The current configuration of Taxiway (TW) infrastructure at Tweed Airport is not compliant with the geometric design standards of the recently issued FAA Advisory Circulars (150/5300-13A, change 1). The primary *purpose* of the proposed project is to bring the airport into compliance with this standard to the greatest extent practicable, which would allow for safer and more efficient movement of aircraft.

TW A is parallel to Runway (RW) 2-20, which is the primary runway for the airport. The separation between the taxiway and the runway centerlines is currently 275' while the FAA required separation distance is 400' to maintain a safe distance for aircraft simultaneously using the runway and taxiway.

To remedy the lack of separation on the north end of the airfield it is proposed to shift TW A away from the runway to meet the 400' separation requirement. In addition, the associated connected portions of TWs C, F and G would be reconstructed and reconfigured to meet new geometric design requirements of the recently issued FAA Advisory Circulars. The existing service road around the north end of TW A must be shifted as well to keep it out of the 118-foot-wide TW A Safety Area (TSA) while recognizing that it will remain within the TW Object Free Area (TOFA) defined as within 93 feet of the TW centerline.

The project also includes maintenance of the drainage ditch system that runs along the east side of the airport boundary and encircles RW 32 in order to improve water flow and reduce the potential for wildlife interactions on the airport. The ditch has become filled with sediment and vegetation, causing water to remain in the ditch in certain sections rather than flowing off-site.

Sediment and vegetation would be removed to restore the ditches to their original contours and carrying capacities. The Tweed Airport Wildlife Hazard Management Plan identified standing fresh water as the primary wildlife attractant that should be addressed in order to reduce the potential for wildlife-aircraft interactions; maintaining this ditch would reduce this potential and provide for improved safety at the airport. Culverts within the drainage system and within the project area would be evaluated for functionality; culverts identified as undersized may be replaced with larger sized pipes to improve water flow during storm events.

## 1.5 Public Involvement and Comment

The Draft EA was made available for public review and comment for 55 days. A Notice of the Availability of the Draft EA (Appendix B), including instructions on how comments could be submitted, was posted in local newspapers and on the Airport's website, http://www.flytweed.com, and mailed to identified stakeholders. A public informational meeting was initially advertised for November 26th. However, this meeting was canceled and rescheduled to take place in conjunction with the public comment meetings for the Airport's Master Plan Update; those meetings occurred on December 11 and 12th.

The FAA received a single comment on the Draft EA from Timothy Timmermann, Director, Office of Environmental Review, US Environmental Protection Agency (EPA; Appendix K). No other agency stakeholders or members of the public submitted comments. Chapters 4, 5 and 6 were modified in partial response to these comments. Of particular note, completion of the wetland permitting process, including final development of a compensatory mitigation package, if required by CTDEEP or USACE, and a stormwater management plan, should satisfy the remaining concerns of EPA.

A Finding of No Significant Impact (FONSI) was developed for the project by the FAA on January 3, 2020 (Appendix L).

# 2. PROPOSED ACTION AND ALTERNATIVES

Federal guidelines require that alternatives to the proposed action be identified and reviewed to determine the alternative that best meets the evaluation criteria with the fewest overall impacts to the ecological and human environment. It is imperative that these alternatives be reasonable, feasible, and meet the project purpose and need to be eligible for detailed analysis.

Table 2, following this section, outlines the Proposed Action and alternatives, associated potential impacts, and cost, and functions as a decision matrix.

## 2.1 No Action Alternative

The existing conditions do not conform to current standards in FAA Advisory Circular 150/5300-13A and potentially create hazardous conditions for aircraft passengers and staff during approach, departure, and ground transport. The current parallel separation configuration of TW A results in unnecessary delays because taxiing aircraft must wait to proceed until RW 20 is clear. The layouts of TWs C, F and G at their junctions with TW A and RW 20 do not comply with the current FAA standards.

Inadequate drainage poses a significant safety hazard by allowing standing water that can become a wildlife attractant.

*This Alternative, by its very definition, would not meet the purpose and need for the project***.**

To address the purpose and need detailed in Section 1.4, action alternatives have been developed that would address the non-compliant situations regarding the offset between Taxiway A and Runway 2-20, correct the geometry of Taxiways C, F and G, and address the drainage concerns.

## 2.2 Proposed Action Alternatives

The Proposed Action has been designed to meet the purpose and need by providing a fully compliant TW A and RW 20 separation of 400 feet and a service road that complies with FAA design standards prohibiting objects, including service roads, within the 118-foot wide TW Safety Area (Figure 2-1). This separation distance is necessary to prevent interactions between drivers of service vehicles on the road and aircraft using the Taxiway. However, these actions can only be completed if work can occur on two off-site parcels. TNHAA would need to either purchase part or all of the two parcels directly or purchase easements to allow for the service road to cross the parcels. These efforts are currently underway.

Due to the uncertainty of acquiring these parcels or easements, the Proposed Action has been divided into phases as detailed below.

### Phase 1- Preliminary Taxiway and Service Road Reconfiguration

Phase 1 would be constructed completely within the existing airport boundary, would be completed before land or easement acquisition is completed as a preliminary step towards meeting the FAA standards, and would include the following components as shown on Figures 2-2 and 2-3:

*Taxiways A, C, F and G Reconfiguration*

The FAA issued Advisory Circular AC 150/5300-13A, change 1, in 2014 that includes revised design standards for the geometry of runways and taxiways that are mandatory for all projects funded with federal grant monies through the Airport Improvement Program (AIP) and/or with revenue from the Passenger Facility Charges (PFC) Program. Areas of Tweed Airport that currently do not meet these standards and require realignment and/or reconstruction include TWs A, F and G.

TW A is a parallel taxiway to RW 2-20, which is Tweed Airport's primary RW. The FAA required separation distance between a RW and a parallel TW is 400' to maintain a safe distance for aircraft simultaneously using the RW and TW. The separation between TW A and the RW 2-20 centerline is currently 275'. In order to create this 400' separation, TW A must shift eastward from its existing location. Because TWs C, F and G connect TW A to the apron, these TWs would need to be reconstructed when TW A shifts. In doing so, TWs F and G would be realigned to meet the new design standards. The existing service road around the north end of TW A must be shifted as well to keep it out of the 118-foot-wide TW A Safety Area (TSA) in order to provide a safe distance between vehicles using the service road and aircraft using the taxiway.

*Drainage Improvements*

The existing drainage ditch that runs along the eastern airport boundary and encircles RW 32 would be maintained to remove excessive silt build-up and vegetation, which are currently preventing proper function. An existing undersized culvert under the taxi lane to the privately owned off-site T-hangars would be replaced with a larger culvert to reduce ponding in the immediate area that allows water to flood across the service road and onto TW A. Other culverts within the ditch system would be evaluated for replacement if necessary to improve flow during storm events. The ditch maintenance would allow for this additional flow to be contained within the ditch and conveyed downstream and offsite through the existing ditch alignment.

**Figure 2-1: Proposed Action Phases 1 and 2,**
**Tweed-New Haven Regional Airport, Taxiway and Drainage Improvement Project**

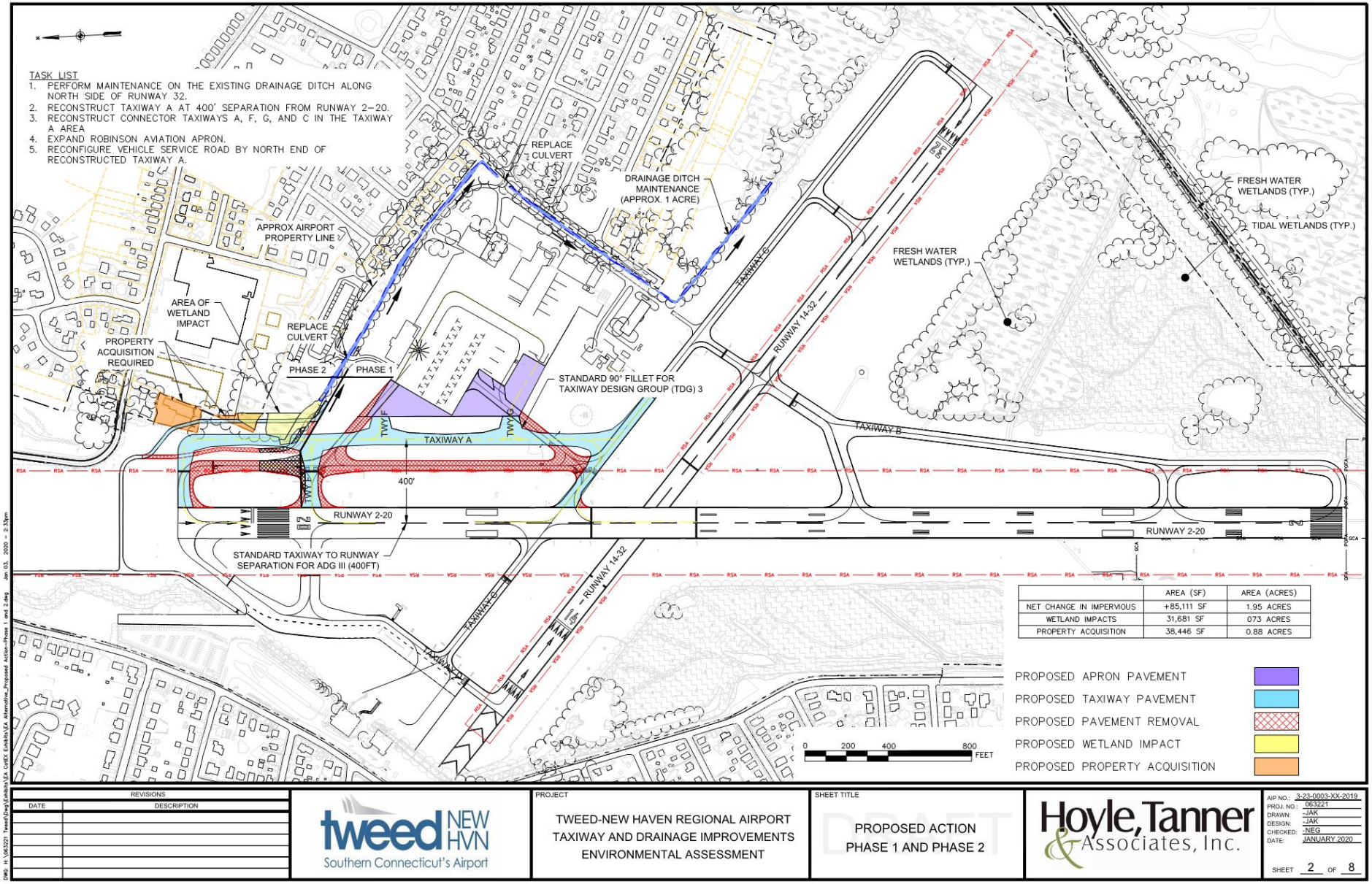


**Figure 2-2: Proposed Action Phase 1, Taxiway and Service Road Details,
Tweed New Haven Regional Airport, Taxiway and Drainage Improvement Project**

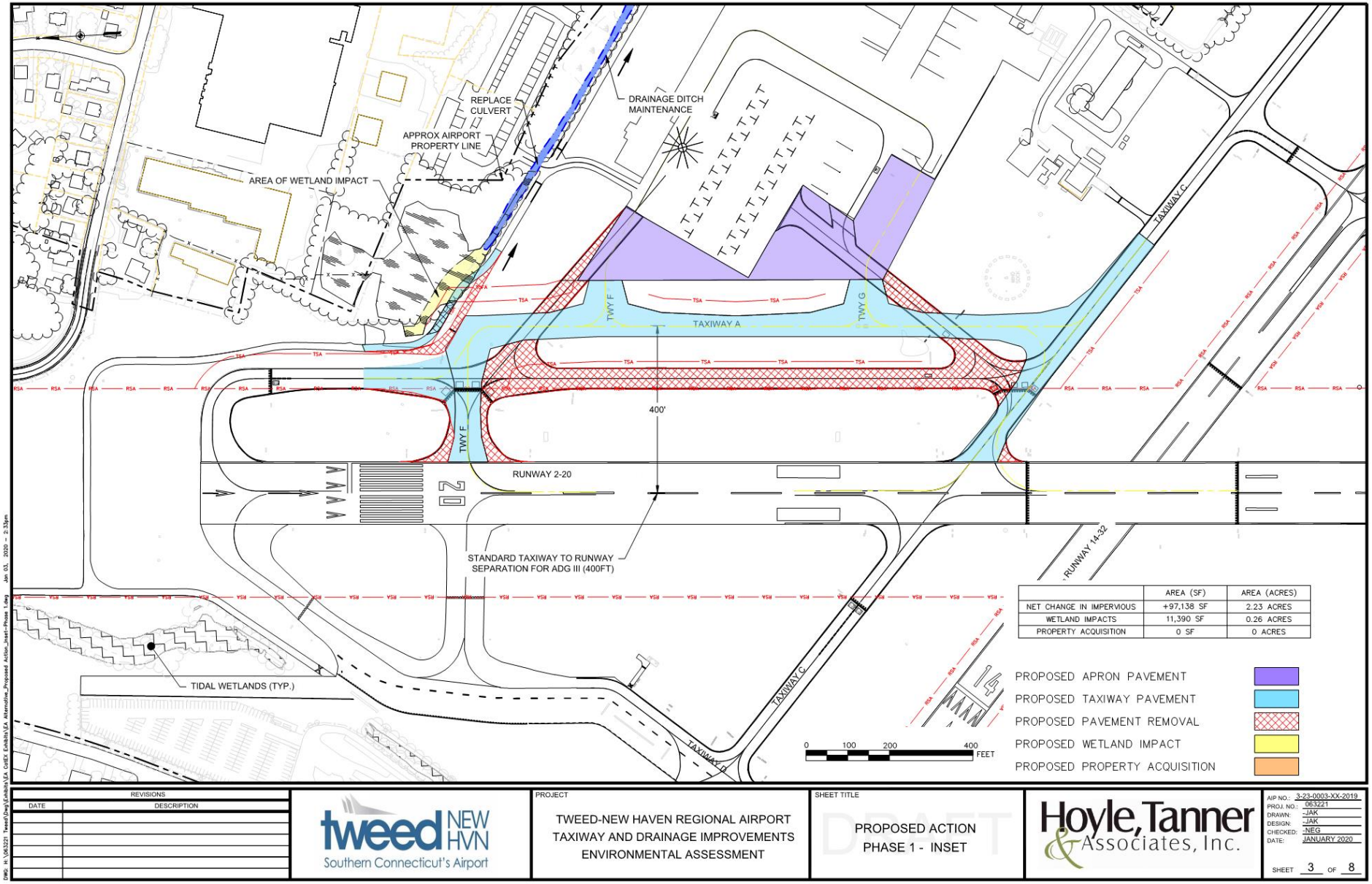
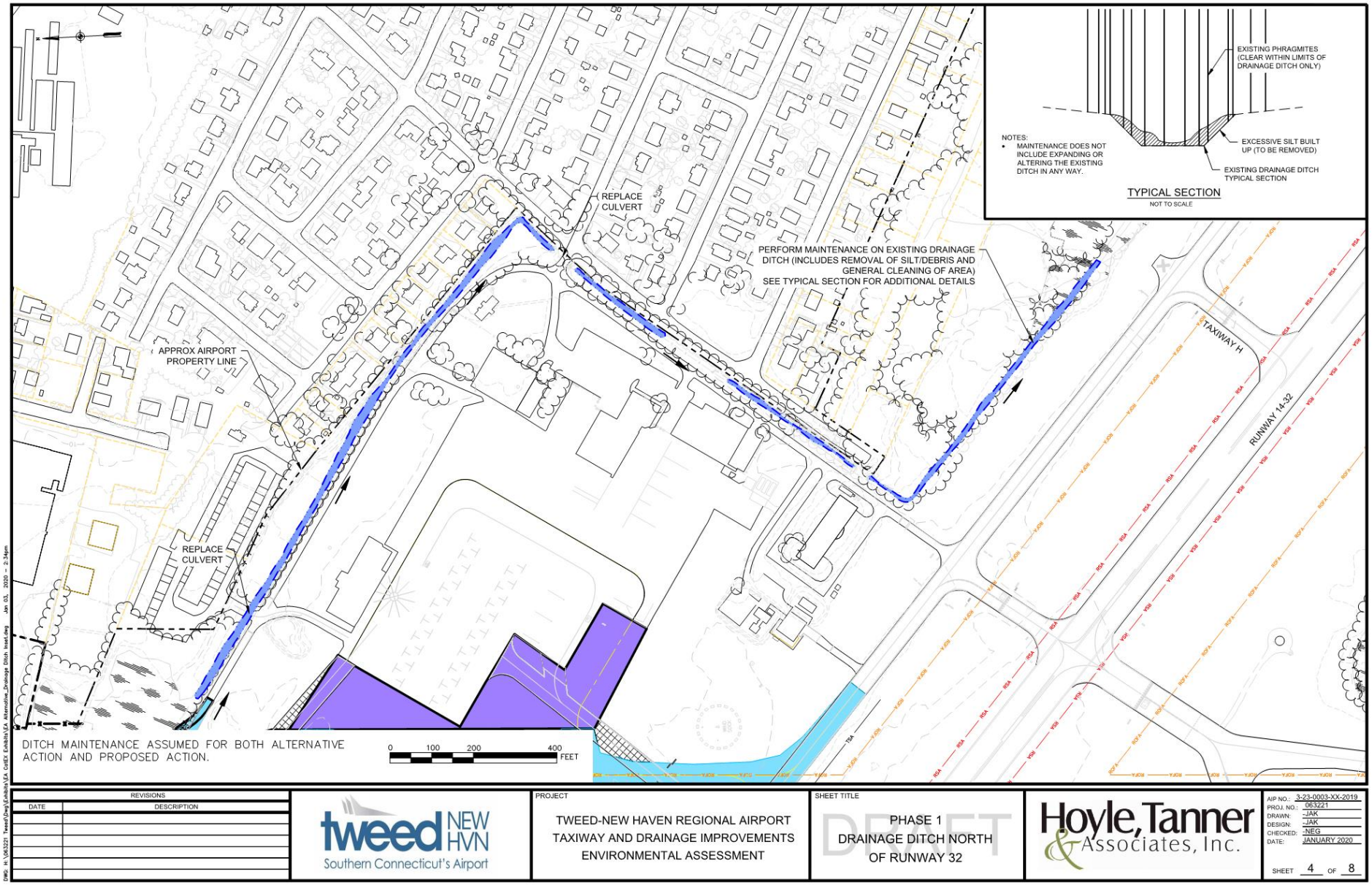


**Figure 2-3: Proposed Action Phase 1, Drainage Ditch,
Tweed New Haven Regional Airport, Taxiway and Drainage Improvement Project**



## Phase 2- Final Taxiway and Surface Road Reconfiguration Alternatives

Completion of Phase 2 would be dependent on completion of efforts to purchase off-site parcels or easements. As a continuation of the work completed during Phase 1, Phase 2 would include relocating the northern end of TW A and its associated service road away from RW 20. The extent of this shift would vary, as shown on Figure 2-4, 2-5 and 2-6, based on the following factors:

*Proposed Action*
The Phase 2 Proposed Action shown on Figure 2-4 would extend TW A such that the service road would be located outside of the existing airport boundary. This could only occur if off-site land or easements are successfully acquired.

*Action Alternative A*
Phase 2 Alternative A alignment is shown in Figure 2-5 that would keep all proposed work within the existing airport boundary and would minimize the impact to the small pocket wetland on the northeast side of TW A. The separation distance between TW A and RW 2-20 would be as wide as possible and an improvement over the existing conditions but would not be fully compliant with the FAA Advisory Circular (AC)150/5300-13A. This alternative would allow for an aircraft to fully complete the turn towards RW 20 so that while holding at the hold line the aircraft would almost be perpendicular to the runway; however, this location of the hold line would require a Modification of Standards because it would not meet the FAA AC, thus it is not the safest option for holding aircraft. While the pilot can see both ways on the runway to see if there is approaching traffic, the visual sightline is awkward and requires the pilot to turn their body to obtain a complete view.

In addition, in order to reduce wetland impacts and place the service road outside of the TSA, the service road makes a sharp jog to the left, causing vehicles entering this section of the service road to navigate an “s” curve that is atypical of service road design. This condition would increase the need for driver vigilance and decreases the overall safety of the road in this location.

The FAA has indicated their approval of this Alternative based on the safety improvement over existing conditions should efforts to obtain the use the off-site land be unsuccessful. While this alternative presents the least amount of wetland impact, it results in the highest amount of safety concerns for pilots and vehicle drivers, would not meet the FAA AC and would require a Modification to Standard.

*Action Alternative B*
The Phase 2 Alternative B alignment was also developed to keep all work within the existing airport boundary. Shortly after the TW A and TW F junction, TW A would angle to the northwest, making room for the vehicle service road to be placed outside the TW A safety area and remain on airport property. This alignment is shown on Figure 2-6.

This alignment is presented as a way to keep all work within the existing airport boundary and reduce wetland and impervious surface impacts as compared to the proposed action, however, the proposed Alternative B centerline would not be parallel to RW 20 and would not meet the runway/taxiway separation standards. There is a slight improvement in aircraft visibility over the existing condition since holding aircraft are at 30 degrees to the runway instead of 0 degrees, but it is not enough of an improvement for aircraft to be able to see approaching traffic from the south. Ideally holding aircraft hold at 90 degrees (perpendicular) to the runway so that the pilot can see traffic approaching from both directions. In addition, the service road, which is shown as

located outside of the TSA as required, would include an angled shift to align with the taxiway, and then a shift again when it connects to the existing service road. The shifts in the road alignment result in the need for increased driver vigilance and decreases the overall safety of the road in this location when compared to the proposed action.

While this alternative presents an option with wetland impacts in between Alternative A and the Proposed Action, the safety concerns presented by the angular hold line and curved service road alignment are such that this alternative may not be approved by the FAA.

## 2.3 Alternatives Matrix

The No Action and Phase 2 Action Alternatives were analyzed and compared to define the issues and provide a clear basis for the most reasonable choice among the options. Table 2 outlines the alternatives, the associated impacts, and the cost. Phase 1 is assumed to be constructed and included in each of the alternatives as presented.

**Table 2: Alternatives Matrix, Tweed-New Haven Regional Airport, Taxiway and Drainage Improvement Project**

| Alternative | Description | Wetland Impacts (square feet/acres) | Change in Impervious Surface (square feet/acres) | Estimated Project Costs | Meets Purpose and Need |
|---|---|---|---|---|---|
| No Action | No improvements | None | 0 | $0 | No |
| Proposed Action | TW A centerline 400' from RW 20 for its entire length turning 90°, off-site parcel use or acquisition necessary. | 31,681/0.73 | 85,079/1.95 | $7.29M | Fully |
| Action Alternative A | TW A centerline mostly compliant, hold line perpendicular, work contained on-site. | 20,910/0.48 | 85,306/1.95 | $7.14M | Partially |
| Action Alternative B | TW A centerline mostly compliant, hold line non-perpendicular, work contained on-site. | 24,860/0.57 | 74,326/1.70 | $6.87M | Partially |

**Figure 2-4: Phase 2, Proposed Action,**
**Tweed New Haven Regional Airport, Taxiway and Drainage Improvement Project**

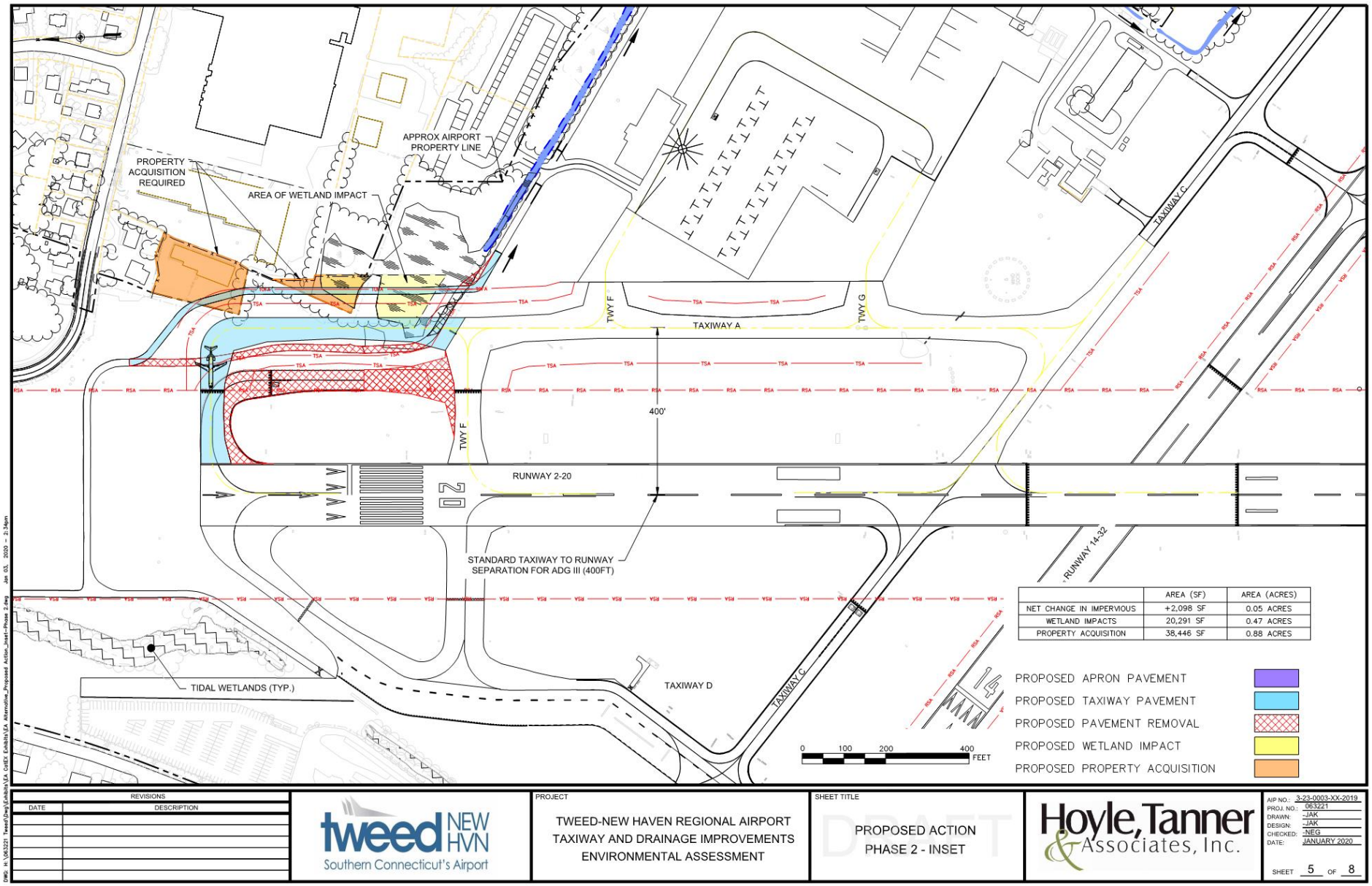


**Figure 2-5: Phase 2, Action Alternative A,**
**Tweed New Haven Regional Airport, Taxiway and Drainage Improvement Project**

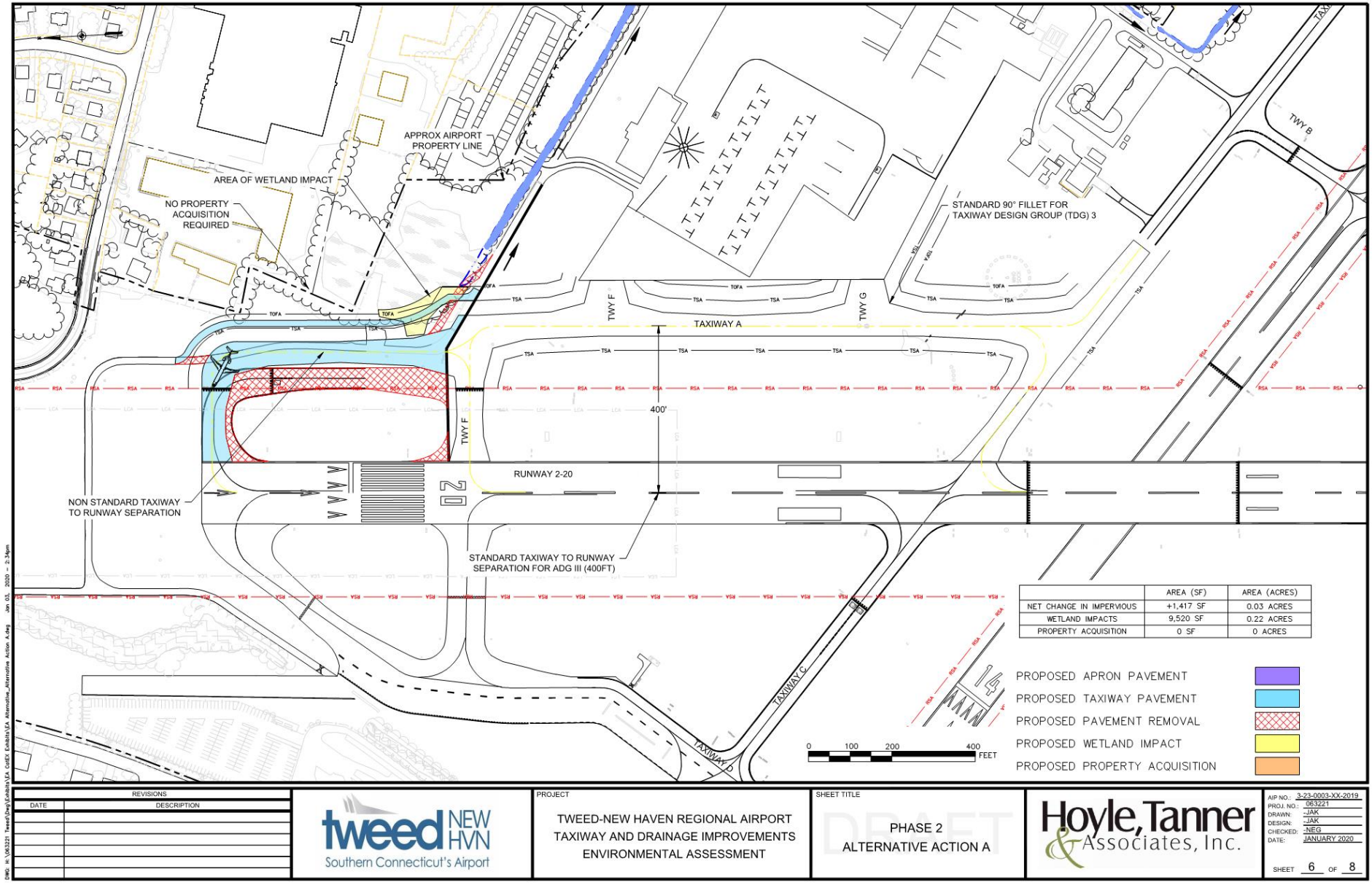
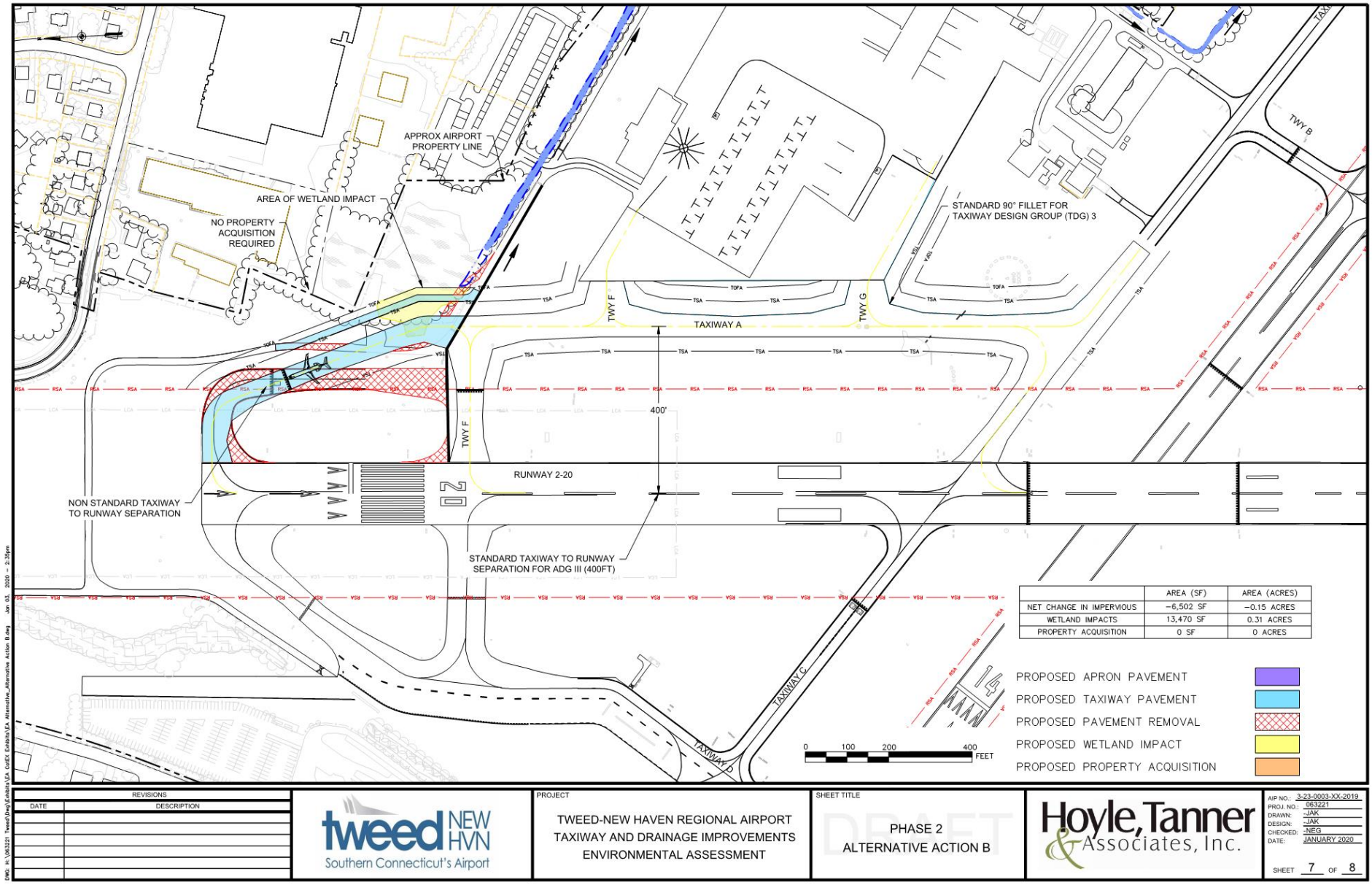


**Figure 2-6: Phase 2, Action Alternative B,**
**Tweed New Haven Regional Airport, Taxiway and Drainage Improvement Project**



# 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.1 Project Location and Introduction

Tweed-New Haven Regional Airport is located primarily in New Haven but extends partially into East Haven, CT. It lies to the east of Morris Cove and the East Shore area of New Haven. The Momauguin area of East Haven and the mouth of the Farm River are southwest of Tweed Airport, and Burr Street and Dodge Avenue encircle Tweed Airport's north end.

There are 14 possible environmental impact categories identified by FAA Order 1050.1F, Paragraph 4-1. As stated in Paragraph of 4-2.c, "...if an environmental impact category is not relevant to the proposed action or any of the reasonable alternatives identified (i.e., the resources included in the category are not present or the category is not otherwise applicable to the proposed action and alternative(s)), this should be briefly noted and no further analysis is required." The following resources are either not present within the project boundary, or no alternative discussed in this document would affect them:

- Climate
- Department of Transportation Act, Section 4(F)
- Farmlands
- Hazardous materials, solid waste, and pollution prevention
- Natural resources and energy supply
- Socioeconomics, environmental justice, and children's environmental health and safety risks
- Visual effects (light emissions, visual resources/visual character)

Only those areas where there may be impact caused by the proposed action, or where there are uncertainties requiring evaluation, contain analysis in this document.

Implementation of the Proposed Action or Action Alternatives at Tweed Airport may impact the following categories:

## 3.2 Air Quality

Per the Clean Air Act, the EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants that are considered harmful to public health and the environment. When a state has been designated as "attainment" for a pollutant, all regions of the state are in compliance. According to the EPA, the entire state of CT meets these standards for the following: CO, $NO_2$, Pb, $SO_2$, $PM_{2.5,}$ and $PM_{10}$. New Haven and East Haven, CT are currently in non-attainment for Ozone. Refer to Appendix A for the letter from the State of Connecticut dated October 1, 2016 discussing the State's inability to meet the 2015 Ozone Standards due to the magnitude of the out of state transport problems and the State's lack of ability to regulate these air quality degradations.

Neither the Proposed Action or Action Alternatives would increase air traffic or impact the type of aircraft using Tweed Airport. Therefore, no permanent change in emissions from airport use is expected. However, construction related activites are expected to result in short-term and negligible impacts associated with vehicle emissions from material delivery trucks and construction equipment operation.

## 3.3 Biological Resources

Biological resources refer to the various types of flora (plant life) and fauna (animal life) in the vicinity of the Project. The term also refers to vegetative communities, both upland and wetland, supporting the nearby fauna, including state-listed endangered/threatened or species of special concern.

### Fisheries

No fisheries resources would be impacted by the Proposed Action or Action Alternatives at Tweed Airport. The drainage ditch does not contain sufficient fish habitat, and strict adherence to required erosion and sediment controls would prevent sedimentation form being transported off-site.

### Upland Vegetation

Upland vegetative communities within and near Tweed Airport primarily consist of maintained grounds, old fields/successional lands, and wooded knolls. All of the upland areas have been highly influenced by human activity.

The maintained areas include Tweed Airport runways, taxiways, structures, asphalt roads, and neighboring residential and industrial lots. Most of the developed lands are vegetated with lawns and landscaped with trees and shrubs. Old field conditions exist generally adjacent to the maintained grounds portions of Tweed Airport. These fields are dominated by herbaceous vegetation that is cut on a seasonal basis. An existing Grassland Management Plan is implemented for the grassland and old field areas on Airport property, and is included as Appendix D.

### Aquatic and Wetland Vegetation

Wetlands on and adjacent to Tweed Airport include tidal and freshwater wetlands and are described in detail in Section 3.7 and as shown on the figures in Appendix C. A large contiguous freshwater and tidal wetland system that borders on or drains into Morris Creek and Tuttle Brook occurs on the site.

Wetland vegetation on airport property includes freshwater emergent marsh, shrub-scrub and wooded swamp plant assemblages and tidal marsh wetland communities. The majority of tidal marsh habitat is dominated by the invasive Common reed [*(Phragmites australis)*, a.k.a. *Phragmites*], extremely dense in some locations, which limits available light and space for other plant species and decreases plant diversity. Over the past five years, the Morris Creek tide gate has been operating in a manner that allows tidal flows to wetlands landward of the tide gate. To date, this has allowed for the partial conversion of lands dominated by *Phragmites* to lands dominated by typical salt marsh species, e.g. saltwater cordgrass (*Spartina alterniflora)* and salt meadow cordgrass (*S. patens)*.

### Wildlife Habitat

Terrestrial, aquatic and wetland plant communities were surveyed at Tweed Airport as part of the Wildlife Deterrent Fence Project in 2013. The results of this study can be found in the Tweed-New Haven Regional Airport Wildlife Evaluation (Appendix E).

Developed portions of Tweed Airport make up an area of approximately 200 acres along the RWs and TWs, while adjacent undeveloped wildlife habitat encompasses an area of approximately 550 acres. Plant communities in and around Tweed Airport provide habitat for a relatively diverse assemblage of wildlife species, particularly given the extent to which development exists in the

Morris Cove/Lighthouse Point section of New Haven and the Momauguin section of southern East Haven.

Collectively, the vegetative resources provide some or all the life-sustaining requirements for numerous wildlife species, particularly since many of these species utilize multiple habitats during their life cycles. Species for which suitable habitat is available on and proximate to Tweed Airport include a wide range of large and small mammals, birds of prey [e.g. osprey (*Pandion haliaetus*) and Northern harrier (*Circus cyaneus*)], shorebirds [e.g. killdeer (*Charadrius vociferous*) and sandpipers], wading birds [e.g. great egret (*Ardea albus*) and snowy egret (*Egretta thula*)], Canada geese and various species of ducks and gulls, songbirds (resident and migratory), reptiles associated with upland habitats (e.g. Eastern garter snake (*Thamnophis s. sirtalis*), and reptiles and amphibians associated with freshwater wetlands [e.g. snapping turtle (*Chelydra serpentina*) and green frog (*Rana clamitans*). Finfish, such as mummichogs (*Fundulus heteroclitus*) and shellfish [e.g. oysters (*Crassostrea virginica*)] also occur in tidal waters on and offsite.

**Federally and State-Listed Threatened or Endangered Species**

State-listed endangered/threatened species and species of special concern also utilize Tweed Airport and surrounding habitats. According to the March 15, 2019 letter from the Connecticut Department of Energy and Environmental Protection (CTDEEP; Appendix A), the Natural Diversity Data Base (NDDB) contains documentation of five grassland bird species occurring near or within the project area (Table 3). In order to avoid impacts to these state-listed species, the following conditions would be met during and after construction:

- Land disturbance activities would be conducted outside of grassland bird breeding season. Work can be safely performed between August 16 and April 14 to avoid impacts to these species.
- Any upland grassed areas that are disturbed during the course of the project would be re-seeded using an FAA-approved mix of warm season grass species.

In addition, the state-endangered yellow thistle (*Cirsium horridulum*) has been documented in the area of Morris Cove from a historic specimen. There are no records of surveys having been conducted within the project work areas. The potential habitat for this plant, sandy fields at or near the edges of salt marsh, is outside of the project limits, as shown on the figure included in Appendix A, thus, this species is not anticipated to be affected by the project. In addition, grassed areas that may be potential habitat within the project footprint are included within the Runway and Taxiway safety areas that, per FAA approved Grassland Management Plan, must be continually mowed to remain between 6-12 inches in height (Appendix A). Even if there were thistle in these areas, they cannot be managed differently than they already are without creating unacceptable safety impacts to the airport's operations.

Identification information would be included in the contractor plans, and if such plants are found during construction, CTDEEP would be contacted to determine the best way to avoid or minimize impacts to this plant.

An official species list was also issued by the U.S. Fish and Wildlife Service (USFWS) IPAC system for the project footprint indicating the presence of the federally threatened Northern long-eared bat (*Myotis septentrionalis;* Appendix A). Although some tree clearing would be necessary as part of the relocation of TW A in the Proposed Action and Action Alternatives, it would not occur near a known hibernaculum, maternity roost, or during the June 1 – July 31 pupping season. Using the 4(d) Rule Streamlined Consultation Form, FAA has made the determination that the Proposed

Action may affect but is not likely to adversely affect the Northern long-eared bat (Appendix A). USFWS did not respond during the 30-day review period, which denotes concurrence with the determination.

Neither the Proposed Action nor Action Alternatives are expected to have a significant impact on biological resources in the project area.

**Table 3: State Threatened, Endangered, and Special Concern Species, Tweed-New Haven Regional Airport, Taxiway and Drainage Improvement Project**

| Species | Classification |
|---|---|
| Yellow Thistle (*Cirsium horridulum*) | Endangered |
| Grasshopper Sparrow (*Ammodramus savannarum*) | Endangered |
| Horned Lark (*Eremophila alpestris*) | Endangered |
| Bobolink (*Dolichonyx oryzivorus*) | Special Concern |
| Eastern Meadowlark (*Sturnella magna*) | Special Concern |
| Savannah Sparrow (*Passerculus sandwichensis*) | Special Concern |

## 3.4 Coastal Resources

The state agency responsible for compliance with the requirements of the Coastal Zone Management Act (CZMA) of 1972, as amended, is Connecticut's Coastal Management Program administered by CTDEEP and approved by National Oceanic and Atmospheric Administration (NOAA) through the Office of Long Island Sound Program (OLISP). The entire Airport property is located within the Coastal Boundary as established by CGS Section 22a-94, with the exception of the extreme northwestern portion of property. This portion of Tweed Airport lies east of Burr Street between the airport entrance road and Holmes Street, west of Morris Creek/Tuttle Brook. Within the Coastal Boundary, CTDEEP maps indicate the occurrence of a variety of coastal resources on Tweed Airport property (Appendix F). The 2002 Tweed-New Haven Regional Airport Master Plan Update documents and details these resources, which are described here briefly:

- Coastal Land Resources - modified bluffs and escarpments along the faces of Morris Cove and Morgan Point; and beaches and dunes, on the shores of New Haven Harbor and Long Island Sound
- Coastal Flood Hazard Areas - most of the site is contained within the 11-foot National Geodetic Vertical Datum (NGVD) floodplain elevation, as defined by FEMA, see Section 3.7 below
- Shorelands - uplands higher than the 11-foot NGVD elevation occur to the west, south and east of Tweed Airport
- Regulated Tidal Wetlands - these wetlands are described in Section 3.7.
- Undesignated Tidal Wetlands – these inland wetlands occur on and off Tweed Airport
- Intertidal Flats - occur on most of the shoreline surrounding Tweed Airport

- Coastal Waters - offshore, nearshore waters and estuarine embayments exist within the Long Island Sound just off Airport property

None of the above-listed coastal resources would be directly impacted by the Proposed Action or Action Alternatives. All proposed wetland impacts occur above the Coastal Jurisdiction Line (CJL; See Section 3.7).

## 3.5 Historical, Architectural, Archeological, and Cultural Resources

Procedures in Section 106 of the National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974 are used to evaluate impacts to Archaeological, Architectural, and Cultural resources.

Previous CT State Historic Preservation Office (SHPO) review covered the areas of proposed work in the Proposed Action and Action Alternative scenarios. Correspondence on March 18, 1996, and a March 28, 1996 response from the Deputy Historic Preservation Officer of the Connecticut Historical Commission show that the project areas do not possess archaeological integrity or sensitivity, and that SHPO expects projects in the area to have no effect on historic, architectural or archaeological resources listed on or eligible for the National Register of Historic Places. FAA corresponded with Todd Levine of CT SHPO on May 4, 2017 requesting concurrence with the FAA's determination that the undertaking would have no adverse effect on historic or architectural resources (Appendix G). No response has been received as of the issuance of this EA.

## 3.6 Noise and Noise-compatible Land Use

Airport development actions that change aircraft operations and/or movements and aircraft types using the airport, may affect existing and future noise levels. A noise analysis primarily focuses on how proposed airport actions would change the cumulative noise exposure of individuals to aircraft noise in areas surrounding the airport. Besides using noise levels to determine compatible land use, airport noise may be a concern when determining potential effects on several other environmental resources as well. These resources may include, but are not limited to, Section 4(f)-protected resources and historic and cultural sites.

### Noise Analysis

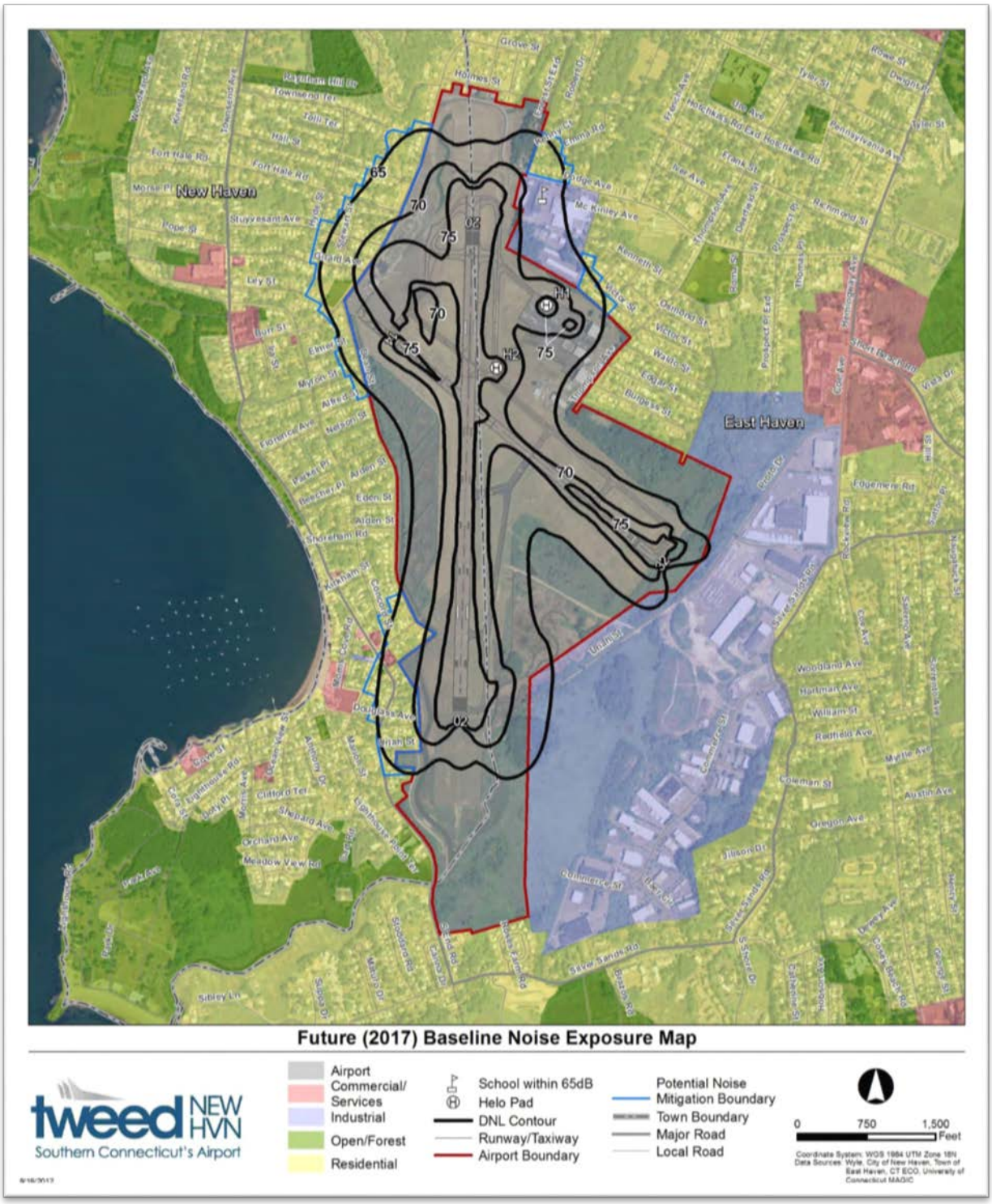
A 2012 CFR Part 150 Noise Compatibility Study was completed in order to identify and mitigate for areas of significant noise exposure in the vicinity of Tweed Airport. Excerpts from this report are included as Appendix J; a copy of the entire report is available from the FAA New England Region. As part of this study, projected noise contours were modeled for 2017 based on forecasted growth in air traffic on RW 2-20, ground operations associated with potential new commercial service, and the federally-mandated phase-out of Noise Stage 2 aircraft below 75,000 lbs. These modeled noise exposure contours would be used as the baseline condition for the purposes of this project and are shown on Figure 3-1.

Tweed Airport has installed sound insulation within 71 residences, and an additional 102 buildings are anticipated to be insulated in the Summer of 2020.

The noise study conducted in 2012 provided important data relative to Tweed Airport's noise impacts on neighboring communities. Tweed Airport's 65 dB noise contour as modeled in 2012 for the future (2017) baseline condition encompassed approximately 304 acres of varying land use, with 90% of the area inside the modeled DNL 65 dB contour located on airport property and 94% of this area identified as compatible land uses, with the remaining 6% impacting residential

land uses. As a result of this study, several recommendations for noise mitigation measures were implemented, including a voluntary sound insulation program for qualifying residential units.

**Figure 3-1: 2017 Projected Noise Contours at Tweed-New Haven Regional Airport, Tweed Taxiway and Drainage Improvement Project**



In May 2016, the FAA Air Traffic Organization also completed an updated initial noise analysis screening using the FAA-approved noise screening tool, Terminal Area Route Generation, Evaluation, and Traffic Simulation (TARGETS) Aviation Environmental Design Tool (AEDT) Environmental Plug-In (Appendix J). The 2016 noise modeling analysis was completed to screen for potential increases in noise resulting from implementation of a new instrument arrival procedure named RNAV (GPS) RWY 20, which has been implemented. The 2016 noise analysis indicated that RNAV (GPS) RWY 20 instrument approach procedure would result in no new noise impacts.

**Taxiway A, C, F & G Realignment**

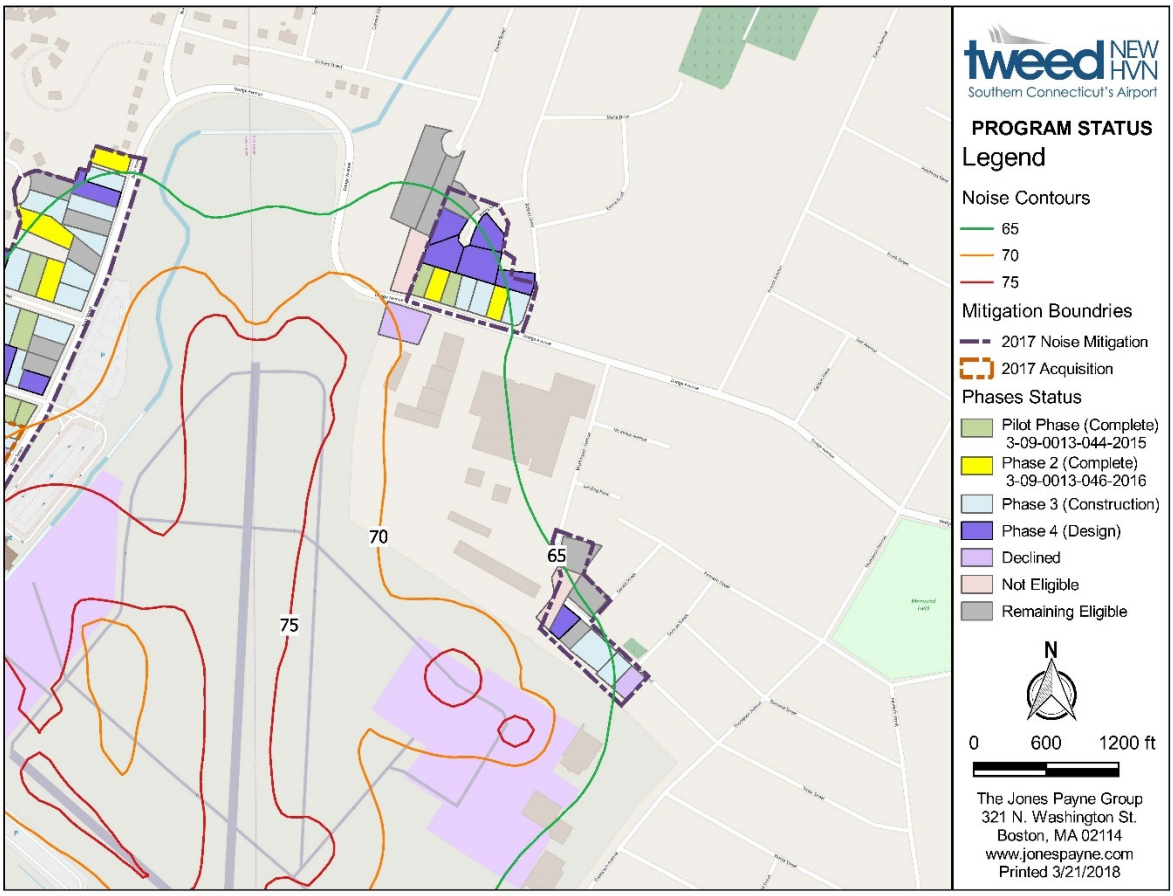
Because of the proximity of current and proposed airport ground operations to the businesses and residences on Washington Avenue and Dodge Avenue, it is relevant to discuss potential ground operation noise impacts from the TW realignments in the Proposed Action and Action Alternatives.

Ground operations modeling is based on the impacts of maintenance aircraft run-ups and pre-takeoff aircraft run-ups, which are the most significant sources of noise originating from the ground. Maintenance run-ups occur at designated locations on the airport property, none of which would change because of the Proposed Action or Action Alternatives. Pre-flight engine run-ups occur prior to take-off, generally at the hold line on the taxiway prior to entering the end of the RW as detailed in figure 3-23 of the 2012 Part 150 Study. Aircraft taking off from Runway 20 would queue and perform run-ups on TW A prior to the hold line, which would shift approximately 125 feet to the east because of the Proposed Action and Action Alternative A, but would remain the same as existing if Alternative B were constructed.

Although shifting pre-takeoff engine run-ups closer to the abutting industrial/residential neighborhood, neither the Proposed Action nor the Action Alternative A are expected to significantly shift the existing modeled DNL 65 dB noise contour. This is because pre-takeoff engine run-ups typically take less than 30 seconds at 60-70% power and are usually performed only once daily by each aircraft. Aircraft at takeoff power and during departure at low altitude produce more noise than the level produced from any run-up or ground operation. Takeoff noise levels are modeled in the 2012 Noise Study (Appendix J).

An independent analysis of the Proposed Action and Alternatives compared to the data provided in the 2012 Noise Study was conducted by HMMH for use in this EA. That analysis concluded that shifting the Runway 20 aircraft holding position approximately 50 feet to the east of the existing position would result in the 65 DNL contour moving less than 50 feet to the east near the relocated hold position (Appendix J). HMMH specified that the shift would be more evident within the commercial area on the south side of Dodge Avenue rather than extending into the residential area on the north side of Dodge Avenue. Given the scale of Figure 3-1, this shift would still be encompassed by the potential noise mitigation boundary (shown in blue). As shown on Figure 3-2: Noise Mitigation Program Status, these areas are currently targeted for noise mitigation efforts, some of which has already been completed. Based on this mitigation in response to the minimal to negligible shift in the 65 DNL, noise impacts from the project are not expected to be significant.

**Figure 3-2: Noise Mitigation Program Status, March 2018, Tweed-New Haven Regional Airport, Taxiway and Drainage Improvement Project**




## 3.7 Water Resources

### Wetlands and Surface Water

Wetland jurisdictional boundaries within the project area were field delineated on November 2, 2016 to identify both inland and tidal wetlands as defined by the Connecticut General Statutes (CGS) as well as federal wetlands and navigable waters as defined by the U.S. Army Corp of Engineers (ACOE) under Section 10 of the Rivers and Harbors Act of 1899. Delineation was conducted in accordance with the 1987 Corps of Engineers Wetland delineation manual and the Regional Supplement to the Corps of Engineers Wetland delineation manual: Northcentral and Northeast Region (Version 2.0; January 2012). Wetlands within or adjacent to Tweed Airport have been identified for almost two decades for a variety of permitting efforts from a combination of aerial photography, topographical elevational modeling, and site-specific field review.

In 2012, the Connecticut General Assembly passed PA 12-101 which included a revision to the State's regulatory jurisdiction under Connecticut General Statutes (CGS) Section 22a-359, changing the upper regulatory jurisdiction limit for tidal wetlands from the "high tide line" to the area up to and including the elevation of the "coastal jurisdiction line" (CJL) as determined for the State's major tidal waterbodies. The CJL for the wetland within Tweed Airport boundary above the tide gate on Morris Creek is 3.5' NGVD. All wetlands below this elevation for the purpose of the project are considered tidal, and they are therefore under the jurisdiction of OLISP. Wetlands

above this elevation are considered freshwater wetlands under the regulatory jurisdiction of the CTDEEP Inland Waters.

One large contiguous wetland system that borders on or drains into Morris Creek occurs on the site. This wetland has a long history of disturbance, having historically been a deposition site for dredge spoils from New Haven harbor. More recently the wetland has been transected by numerous roads, filled and channelized to accommodate development and its streams piped and re-aligned resulting in restriction of tidal flows.

Wetland habitats at the airport include tidal and freshwater marshes, freshwater scrub/shrub, and wooded swamp plant communities. The majority of wetland areas in this system consist of tidal marsh habitat dominated by Common Reed [*(Phragmites australis)*, a.k.a. *Phragmites*]. In all areas of marsh observed, the *Phragmites* growth is extremely dense, limiting available light and space for other plant species. As a result, plant diversity in these habitats is low.

### Wetland Impacts

Although the majority of construction would occur in currently maintained upland grassland, the Proposed Action would require impacts to a disturbed forested wetland located in the northeast side of the airport and continuing on the parcels intended for acquisition. This wetland has been altered by an earthen/gravel rail and appears to be a remnant wetland with a drainage ditch created to convey runoff from the northeast into the drainage ditch system; due to its size, isolated nature and lack of connectivity, it does not provide significant wetland habitat functions.

The Proposed Action, including Phase 1 and 2, which would meet the purpose and need of the project, includes impacts of 31,681 sq. ft. (0.73 acres) to this wetland.

In Phase 1, impacts of 11,390 sq. ft. (0.26 acres) would occur due to the shift in the service road alignment, while Phase 2 Proposed Action impacts of 20,291 sq. ft. (0.47 acres) would result from extension of TW A and shifting the service road alignment.

Phase 2 Action Alternatives A and B would minimize wetland impacts when compared to the Proposed Action, but neither alternative would allow for full compliance with FAA Advisory Circular 150/5300-13A's 400' separation standard between TWs and RWs.

Although Phase 2 Action Alternatives A and B both reduce the amount of direct wetland impacts, they do so at a reduction in safety for drivers of vehicles on the service road and pilots using the taxiway and do not fully meet the FAA Advisory Circular regarding the offset between RW 20 and TW A. Alternative B may not be considered enough of a safety improvement that it would be approved by the FAA given the angled hold line for aircraft waiting on TW A.

**Table 4: Wetland Impacts, Tweed-New Haven Regional Airport, Taxiway and Drainage Improvement Project**

| Alternative | Wetland Impact (square feet/acre) |
|---|---|
| No Action | 0 |
| Proposed Action | 31,681/0.73 |
| Action Alternative A | 20,910/0.48 |
| Action Alternative B | 24,860/0.57 |

Because the proposed wetland impacts total less than one acre, the project would require a US Army Corps of Engineers (USACE) General Permit (GP) and a CTDEEP Inland Water Resources Division (IWRD) Inland Wetland Permit.

**Surface Water Impacts**

The existing drainage system would accommodate the proposed new impervious area of pavement after the proposed maintenance activities have been completed. Detailed discharge calculations would be provided in a Stormwater Pollution Control Plan (SWPCP) as the project registers for a General Permit (GP) for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities with CTDEEP. A CTDEEP General Permit would be required for maintenance of the existing man-made drainage ditches.

In the Proposed Action and Phase 2 Alternative A, 1.95 acres of new pavement (approximately 1% of the 200-acre developed portion of Tweed Airport) would be added in currently maintained lawn areas. Phase 2 Alternative B would result in 1.75 acres of new pavement. Additional stormwater run-off resulting from the increase in impervious surface is anticipated to be accommodated by the existing drainage system and would discharge into the existing drainage ditch system as it currently does; should drainage improvements or treatment measures be necessary upon final analysis of design during permitting, those structures would be located within the areas along TWs A and G that are maintained grass areas.

**Floodplains**

The FEMA 100-year floodplain map is shown in Figure 3-3. Morris Creek is the primary drainage channel in the watershed. This watercourse is tidally influenced from Morris Cove to the airport property, a distance of over 9,000 linear feet. A tide gate, 3,000 feet upstream from the mouth of Morris Creek, restricts tidal flows within Morris Creek. The watershed above the tide gate is approximately 2 square miles in area.

Tweed Airport falls within the 100-year floodplain of both New Haven and East Haven. Flood insurance studies for New Haven (FEMA Flood Insurance Administration, 1980) and East Haven (FEMA Flood Insurance Administration, 2010) indicate that the 100-year flood would inundate all areas of the airport at or below 11 ft National Geodetic Vertical Datum (NGVD). With the exception of some land north of Dodge Ave., all airport property is at elevations at or below 11 ft NGVD. The airport filed for and received a Conditional Letter of Map Revision (CLOMR) in 2005 and a Letter of Map Revision (LOMR) in 2011 for activities within the 100-year flood plain.

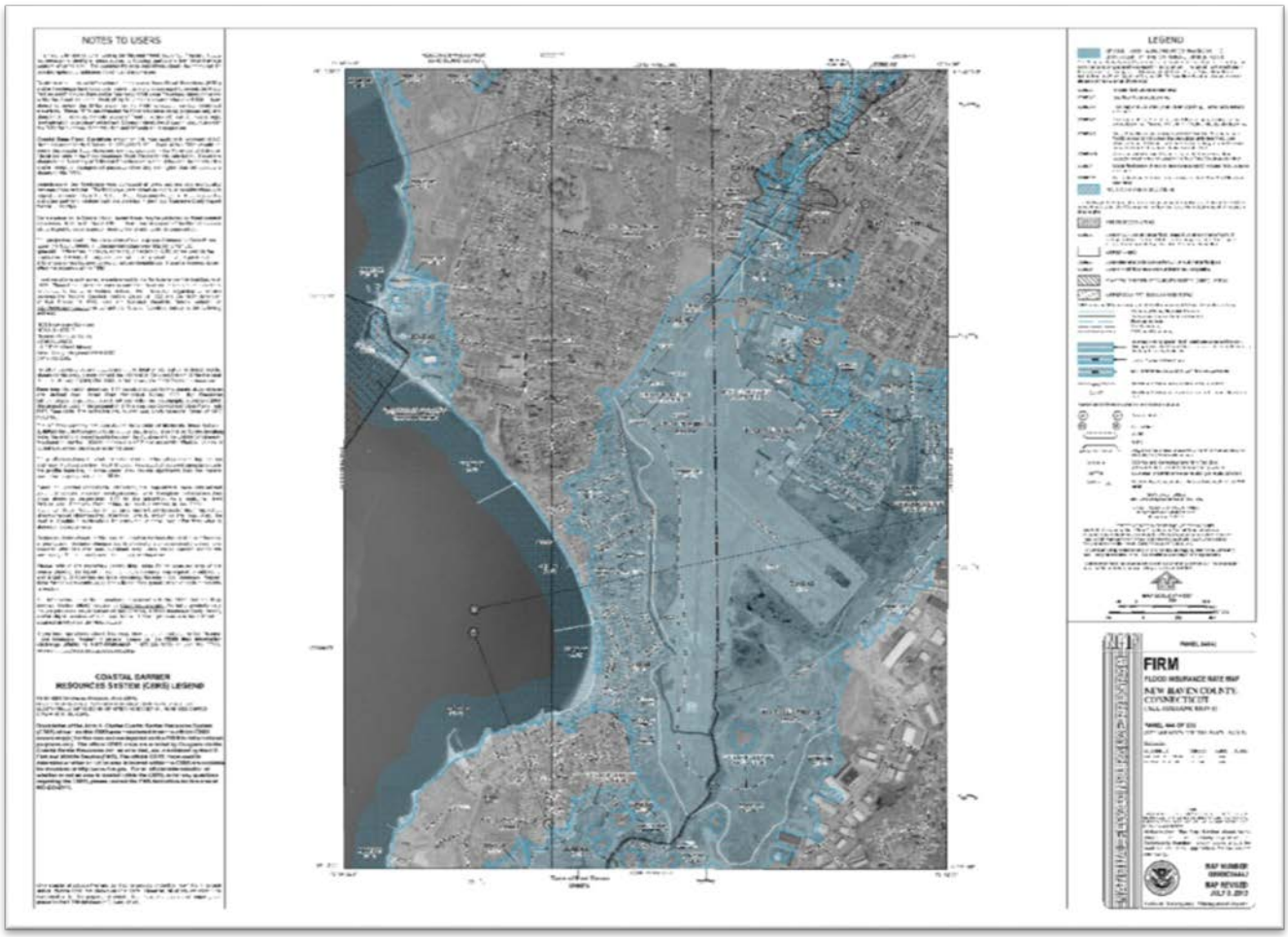
FAA Order 1050.1F Exhibit 4-1. Significance Determinations for FAA Actions for Floodplains states the significance threshold as:

"The action would cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of DOT Order 5650.2, Floodplain Management and Protection."

Impacts to the 100-year floodplains within the Airport property would be minimal and mitigated via use of Best Management Practices (BMPs) and Connecticut Guidelines for Erosion and Sediment Control. The proposed drainage improvements have the potential to change the hydraulic characteristics of the floodplain in smaller inland and tidal events. This can be avoided by designing the new drainage system with proper culvert design and profile grades that mimic the natural environment and the use of BMPs where necessary and prudent.

The proposed wetland fill would be within the FEMA 100-yr floodplain, however, this amount of fill is not extensive enough to require a CLOMR and would not substantially change the elevation within the floodplain. The adverse impacts on the natural and beneficial floodplain values and would be permitted via the USACE 401 Water Quality Certification and the CTDEEP Inland Water Resource Permit. Mitigation is not anticipated for this fill outside of the potential mitigation to be developed for the wetland impacts, but, should it be deemed necessary, the Airport would meet the requirements of these agencies.

**Figure 3-3: FEMA Flood Insurance Rate Map, Tweed-New Haven Regional Airport Taxiway and Drainage Improvement Project**




## Mitigation

The mitigation process began during design by modifying the alternative designs to avoid or minimize impacts to water resources the greatest extent practicable. Impacts that are remaining and unavoidable are acceptable and consistent with applicable statutory standards. Wetland avoidance and minimization measures have guided the design of the proposed TW and service road. However, if additional mitigation is required by CTDEEP or USACE, a mitigation plan would be designed and discussed during those permitting processes.

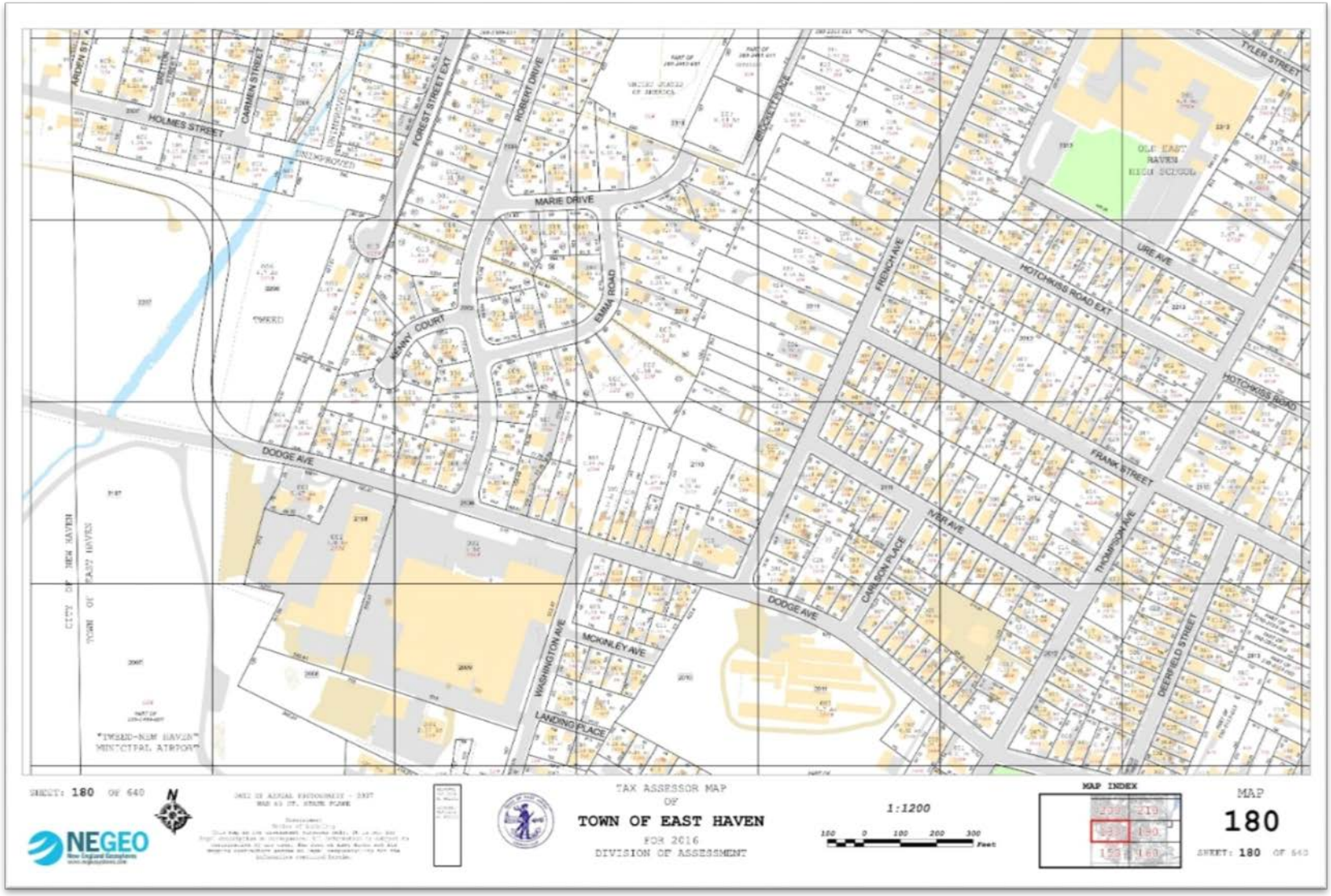
## 3.8 Land Use

FAA Order 1050.1F does not list a significance threshold for Land Use, and notes "The determination that significant impacts exist in the Land Use impact category is normally dependent on the significance of other impacts." The Proposed Action includes either the purchase of two parcels adjacent to Tweed Airport's boundary on the northeast corner of the property on Tax Map 180 in the Town of East Haven (Figure 3-4) or purchase of easements across these parcels. Tax cards for these parcels are included in Appendix H.

Map 180 Lot 2108-002 is a 3.8-acre parcel zoned LI-3 (light industrial) with two buildings on it: Building 1 is a one-story building approximately 35,591 sq ft currently used for administrative offices; Building 2 is a one-story building approximately 6,770 sq ft currently used as a commercial garage. Map 180 Lot 2009-004 is a 2.67-acre parcel zoned LI-3 (light industrial) with a building approximately 3,600 sq ft currently used as an automotive maintenance building.

The conversion of these parcels and their associated buildings to airport ownership would not have a negative impact on the Town of East Haven.

**Figure 3-4: Tax Map 180**
**Town of East Haven, Tweed-New Haven Regional Airport Taxiway and Drainage Improvement Project**



## 4. SUMMARY

Implementation of the Proposed Action or Alternatives would improve the overall safety of the general public and airport employees at Tweed Airport. The proposed configurations of runways, taxiways and service roads would fully or partially comply with current FAA requirements and standards, and maintenance of the drainage system would reduce standing water that has become an attractant for wildlife.

The Proposed Action includes purchase of easements or land from abutting properties for completion of Phase 2. The Tweed-New Haven Airport Authority is currently in negotiations with these land-owners. The Action Alternatives have been designed to provide alternatives that would keep the northern section of Taxiway A and the service road located on property currently owned by the Airport Authority.

The environmental analysis detailed in Chapter 3 describes the impacts resulting from the Proposed Action and the Action Alternatives. Impacts would be similar in size and scope for four out of the seven resource categories analyzed. Wetland impacts would be minimized under Action Alternative A when compared to the Proposed Action. The area of new impervious pavement and noise impacts would be minimized under Action Alternative B when compared to the Proposed Action.

Although Phase 2 Action Alternatives A and B both reduce the amount of direct wetland impacts, they do so at a reduction in safety for drivers of vehicles on the service road and pilots using the taxiway and do not fully meet the FAA Advisory Circular regarding the offset between RW 20 and TW A. Alternative B may not be considered enough of a safety improvement that it would be approved by the FAA given the angled hold line for aircraft waiting on TW A.

The project need is to ensure the overall safety of the general public and airport employees at Tweed Airport by bringing the airport into compliance with current FAA requirements and standards; implementation of the Proposed Action is the preferred alternative. The impacts to a disturbed, low value wetland are a reasonable trade-off in order to increase safety at the airport to the maximum extent practicable.

## 5. AGENCIES CONTACTED AND PERSON CONSULTED, EA PREPARERS

The following were contacted during the environmental analysis process and provided materials, comments or information that was incorporated into the EA:

| AGENCY/ORGANIZATION | CONTACT |
|---|---|
| CTDEEP Natural Diversity Database | Ms. Shannon B. Kearney |
| US Fish and Wildlife Service (USFWS) | IPAC Electronic System<br>Ms. Suzi VonOettingen |
| Hoyle, Tanner & Associates, Inc. | Mr. Robert Furey, P.E.<br>Mr. Nils Gonzalez, P.E.<br>Ms. Kimberly R. Peace<br>Ms. Joanne Theriault<br>Ms. Deb Coon |
| Wyle Environmental and Energy Research & Consulting | Mr. Jawad Rachami |
| HMMH | Mr. Gene Reindel |
| Federal Aviation Administration (FAA) – Environmental Policy Team Office | Mr. Richard Doucette |
| ESS Group | Mr. Craig Wood |

# Appendix A
# Agency Coordination

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: February 06, 2019
Consultation Code: 05E1NE00-2019-SLI-0817
Event Code: 05E1NE00-2019-E-01881
Project Name: Tweed-New Haven Airport Runway and Taxiway Rehabilitation Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**New England Ecological Services Field Office**
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

# Project Summary

Consultation Code: 05E1NE00-2019-SLI-0817

Event Code: 05E1NE00-2019-E-01881

Project Name: Tweed-New Haven Airport Runway and Taxiway Rehabilitation Project

Project Type: RECREATION CONSTRUCTION / MAINTENANCE

Project Description: Tweed-New Haven Airport Runway and Taxiway Rehabilitation Project

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.26588810644266N72.88628994949742W


Counties: New Haven, CT

# Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Mammals

| NAME | STATUS |
|---|---|
| Northern Long-eared Bat *Myotis septentrionalis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9045 | Threatened |

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

# Critical habitats that lie within your project area

There are no critical habitats within your project area.

# Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

| **Information to Determine 4(d) Rule Compliance:** | **YES** | **NO** |
|---|---|---|
| 1. Does the project occur wholly outside of the WNS Zone[1]? | ☐ | ☒ |
| 2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees? | ☒ | ☐ |
| 3. Could the project disturb hibernating NLEBs in a known hibernaculum? | ☐ | ☒ |
| 4. Could the project alter the entrance or interior environment of a known hibernaculum? | ☐ | ☒ |
| 5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year? | ☐ | ☒ |
| 6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31. | ☐ | ☒ |

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

**Agency and Applicant**[3] (Name, Email, Phone No.):

This project will be funded by the Federal Aviation Administration (FAA).

Applicant:
Tweed-New Haven Airport Authority
155 Burr St
New Haven, CT 06512
(203) 468-8833
Contact: Diane Jackson, Airport Manager
djackson@avports.com

[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf
[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html
[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

Consultant:
Joanne Theriault
Hoyle, Tanner & Associates, Inc.
150 Dow Street
Manchester, NH 03101
(603) 669-5555 x160
jtheriault@hoyletanner.com

**Project Name**: Tweed-New Haven Airport Runway and Taxiway Rehabilitation Project

**Project Location** (include coordinates if known):

Tweed-New Haven Airport
155 Burr Street
New Haven, CT 06512

Lat: 41.265349
Long: -72.887591

**Basic Project Description** (provide narrative below or attach additional information):

The Federal Aviation Administration (FAA), in cooperation with the Tweed-New Haven Airport Authority and their consultants Hoyle, Tanner & Associates, is preparing an Environmental Assessment for proposed changes to improve the overall safety of Tweed-New Haven airport (the Airport). The project includes reconstruction of Runway 14-32, realignment of Taxiways A, C, F and G, and drainage improvements to alleviate flooding during heavy rain events. The airport is located at 155 Burr Street, New Haven, CT. The Federal Aviation Administration (FAA) is acting as the lead federal agency for the U.S. Department of Transportation for this project.

*Construction will be performed between August 16 and April 14 to avoid impacts to grassland bird breeding.

| **General Project Information** | **YES** | **NO** |
|---|---|---|
| Does the project occur within 0.25 miles of a known hibernaculum? | ☐ | ☒ |
| Does the project occur within 150 feet of a known maternity roost tree? | ☐ | ☒ |
| Does the project include forest conversion[4]? (if yes, report acreage below) | ☒ | ☐ |
| Estimated total acres of forest conversion | 1.16 acres | |
| If known, estimated acres[5] of forest conversion from April 1 to October 31 | unknown | |
| If known, estimated acres of forest conversion from June 1 to July 31[6] | 0* | |
| Does the project include timber harvest? (if yes, report acreage below) | ☐ | ☒ |
| Estimated total acres of timber harvest | | |
| If known, estimated acres of timber harvest from April 1 to October 31 | | |
| If known, estimated acres of timber harvest from June 1 to July 31 | | |
| Does the project include prescribed fire? (if yes, report acreage below) | ☐ | ☒ |
| Estimated total acres of prescribed fire | | |
| If known, estimated acres of prescribed fire from April 1 to October 31 | | |
| If known, estimated acres of prescribed fire from June 1 to July 31 | | |

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).
[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.
[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

| | | |
|---|---|---|
| Does the project install new wind turbines? (if yes, report capacity in MW below) | ☐ | ☒ |
| Estimated wind capacity (MW) | | |

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature:  Date Submitted: May 9, 2017

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

March 15, 2019

Kimberly Peace
Hoyle, Tanner &Associates Inc
150 Dow St
Manchester, NH 03101
kpeace@hoyletanner.com

**NDDB DETERMINATION NUMBER:** 201903537, formerly 201614882

**Project:** Safety and Drainage Improvements to Tweed New Haven Regional Airport Located at 155 Burr Street in New Haven and East Haven, CT

**Expiration**: March 15, 2021

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding this project. According to our records, there are State-listed species (RCSA Sec. 26-306) documented within the proposed project area.

**Plants**
Yellow thistle (*Cirsium horridulum*), a State Endangered plant species, has been documented from the vicinity of Morris Cove through a historic herbarium specimen. This species typically grows as a biennial or short-loved perennial and can be found in fields, open shrublands, or along the borders of coastal salt marshes. Yellow thistle generally blooms in June and July, though its distinctive rosettes can be observed through much of the growing season.

Your updated application did not indicate if this plant was found in the work area. If Yellow thistle is observed within the proposed areas of disturbance at Tweed New Haven Regional Airport, contact Matthew Shannon (matthew.shannon@ct.gov) for further guidance to avoid impacting this State-listed species.

**Grassland Birds**
State endangered birds horned lark (*Eremophila alpestris*) and grasshopper sparrow (*Ammodramus savannarum*), state species of special concern Savannah sparrow (*Passerculus sandwichensis*), bobolink (*Dolichonyx oryzivorus*), and eastern meadowlark (*Sturnella magna*) occur within Tweed-New Haven Airport.

The horned lark, grasshopper sparrow, Savannah sparrow, bobolink and eastern meadowlark are considered to be grassland-obligate birds. They require open fields to breed, nest and forage in. Habitats preferred by these species include large grasslands, agricultural fields, and airports. The breeding season for these birds is approximately from late April through August. It is during this period that they are most susceptible to disturbances in their feeding and nesting habitat.

To avoid impact to these species:

- Land disturbance activities including digging, ground clearing, heavy machinery driving staging, or ground trampling that will occur more than 100 feet into a grassland parcel or cut across parcels of grassland in a way that fragments grassland habitat patches should be done when

grassland birds are not breeding. Breeding primarily takes place between April 15- August 15. Conducting land disturbance activities outside of the breeding season will avoid impact to the individuals.

  - **Conduct project work between August 16- April 14.***

- Any upland grassed areas that may be disturbed during the course of the project, should be reseeded using an FAA-approved mix of warm season grass species including:
  - Little bluestem (*Schizachyrium scoparium*)- "Aldous" or "Cimarron"
  - Big bluestem (*Andropogon gerardii*)- "Niagra"
  - Indiangrass (*Sorghastrum nutans*)- "Rumsey"
  - Switchgrass (*Panicum virgatum*) -"Blackwell", "Shelter", or "Cave in Rock"
  - Bermudagrass (*Cynodon dactylon*) -"Quickstand"
    - Seed mix ratios are variable, however for Connecticut a minimum of 60% little bluestem is preferred. Big bluestem is an acceptable alternative to little bluestem for the dominant species in the chosen mix. When one of the bluestems is the dominant species the other grass species listed may be mixed in any ratio desired. Of these species, Burmudagrass is the least favored and should be used in the lowest percentage.

***Your application indicates that you plan to conduct work during the recommended time period, but if work cannot occur between months of August 16-April 14**:

- The proposed construction staging area and associated vehicles and equipment should be restricted to existing paved areas as much as possible.
- Beginning April 1- through duration of project: All grassy areas within a 50 foot buffer of planned work remain continuously mowed as short as possible to avoid attracting nesting birds into work zones.
- If vehicle access is required to cross grassy areas outside of work zones, designated paths and areas should be marked and kept mowed beginning April 1. Do not drive outside of designated work areas into grassy habitat, nesting birds will be crushed.
- Identify locations on the property where grassland habitat will remain unmowed between April 15- August 30 to mitigate for lost habitat during construction. These areas must provide adequate conditions for upland grassland habitat. Provide a map detailing these grassland mitigation areas to Shannon Kearney (Shannon.kearney@ct.gov).
- Any upland grassed areas that may be disturbed during the course of the project, should be reseeded using an FAA-approved mix of warm season grass species as described above.

This is determination is valid for two years.

---

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Bureau of Natural Resources and cooperating units of DEEP, independent conservation groups, and the scientific community. This

information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated in the NDDB as it becomes available.

Please contact me if you have any questions (shannon.kearney@ct.gov). Thank you for consulting with the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

Sincerely,

/s/ Shannon B. Kearney
Wildlife Biologist

**From:** Peace, Kimberly R.
**Sent:** Friday, March 15, 2019 1:46 PM
**To:** Kearney, Shannon <Shannon.Kearney@ct.gov>; matthew.shannon@ct.gov
**Cc:** Coon, Deb <dcoon@hoyletanner.com>; Gonzalez, Nils <ngonzalez@hoyletanner.com>; 063221 Tweed RW and TW Revision <063221TweedRWandTWRevision@hoyletanner.onmicrosoft.com>
**Subject:** RE: NDDB DETERMINATION NUMBER: 201903537, formerly 201614882 Safety and Drainage improvements to Tweed New Haven Regional Airport

Thank you Shannon, we really appreciate your response in such a timely manner on this important project.

I have attached a site plan of the airport from a prior project identifying the tidal wetlands and freshwater inland wetlands, with the proposed work areas indicated. It is our understanding that Yellow thistle was documented from the Morris Cover area and is often associated with grassed plains that are adjacent to tidal areas. A majority of the project area would not be within potential habitat for this species, as shown, with the exception of the work to be completed around Taxiways C and D.

The tidal wetlands adjacent to the upland areas around Taxiways C and D are channelized and located at a slightly lower elevation than the grassed uplands. In addition, these grassed areas are within the Runway and Taxiway safety areas that per FAA approved Grassland Management Plan, must be continually mowed to remain between 6-12 inches in height. Even if there were thistle in these areas, they cannot be managed differently than they already are without creating unacceptable safety impacts to the airport's operations.

Because of this, we do not intend to conduct a Yellow thistle survey for this project. We will include identification information in the contractor plans, and if such pants are found while they are working, we will contact Matthew.

Thank you.

**Kimberly R. Peace**

Senior Environmental Coordinator
Hoyle, Tanner & Associates, Inc.
(603) 669-5555, ext 151 | Cell: (603) 716-3343

**From:** Kearney, Shannon [mailto:Shannon.Kearney@ct.gov]
**Sent:** Friday, March 15, 2019 11:27 AM
**To:** Peace, Kimberly R. <kpeace@hoyletanner.com>
**Subject:** NDDB DETERMINATION NUMBER: 201903537, formerly 201614882 Safety and Drainage improvements to Tweed New Haven Regional Airport

Hello, Please see attached:
**NDDB DETERMINATION NUMBER:** 201903537, formerly 201614882

**Project:** Safety and Drainage Improvements to Tweed New Haven Regional Airport Located at 155 Burr Street in New Haven and East Haven, CT

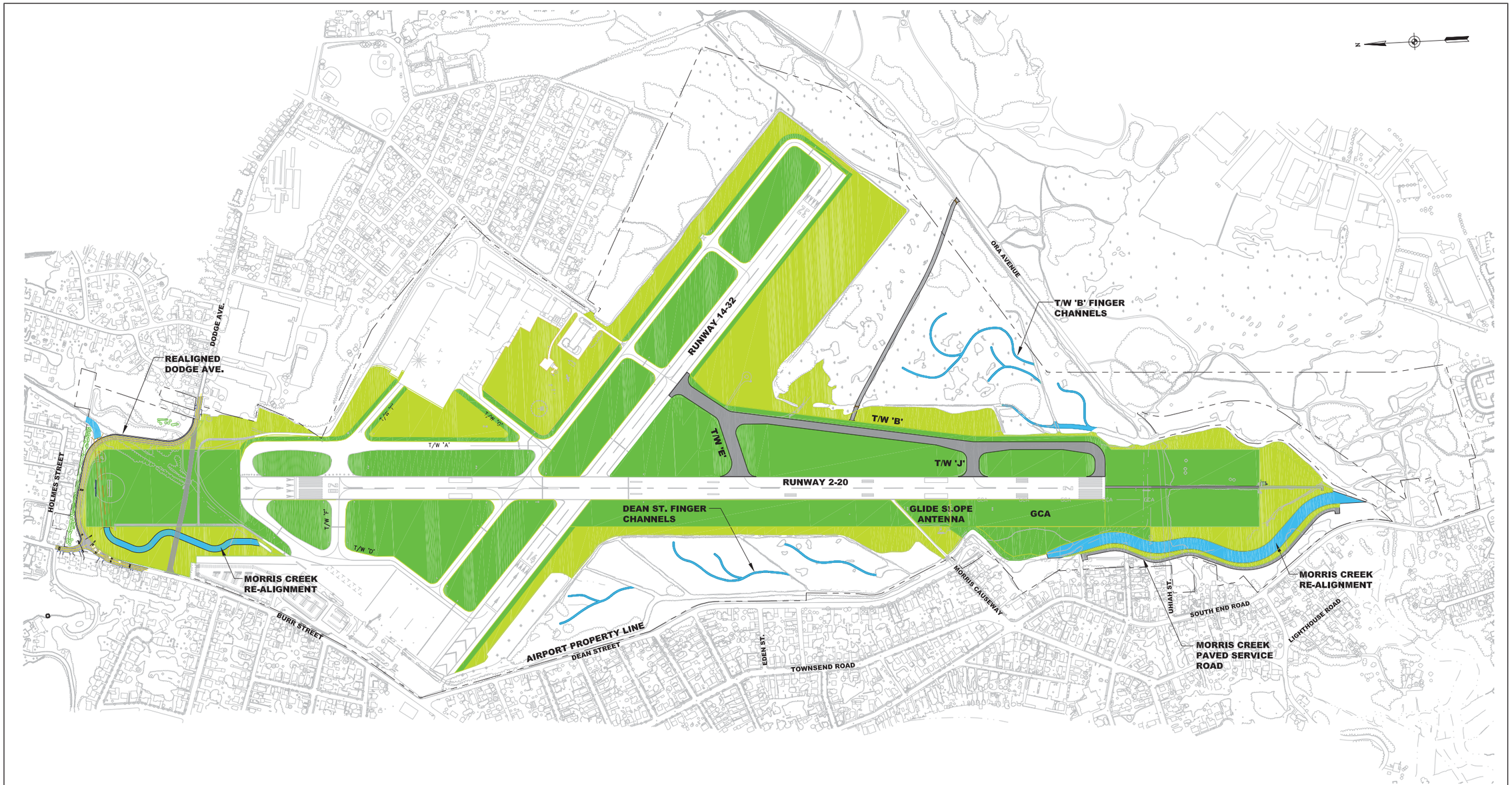
Thank you,

Shannon B. Kearney
Wildlife Division
Connecticut Department of Energy and Environmental Protection
PO Box 1550, Burlington, CT 06013
P: 860.424.3170 | E: shannon.kearney@ct.gov

Connecticut Department of ENERGY & ENVIRONMENTAL PROTECTION

www.ct.gov/deep

***Conserving, improving and protecting our natural resources and environment;***
***Ensuring a clean, affordable, reliable, and sustainable energy supply.***




**LEGEND**

AIRFIELD SAFETY AREA & GLIDESLOPE CRITICAL AREA

AIRFIELD NON-SAFETY/NON CRITICAL AREAS

MORRIS CREEK FINGER CHANNELS

# TWEED / NEW HAVEN REGIONAL AIRPORT
# GRASSLAND MANAGEMENT PLAN
# DECEMBER, 2010

**DRAWING NO. 1**

Hoyle, Tanner & Associates, Inc.
150 Dow Street
Manchester, NH 03101-1227
Tel 603-669-5555
Fax 603-669-4168
Web Page: www.hoyletanner.com


TIDAL WETLANDS DELINEATED PER CTDEEP TIDAL WETLANDS ACT AND FEDERAL JURISDICTION

INLAND WETLANDS PER CTDEEP JURISDICTION

APPROXIMATE AIRPORT PROPERTY LINE

Tidal Wetlands associated with Morris Cove

**TWEED NEW HAVEN REGIONAL AIRPORT**
**EXISTING WETLANDS**

**FIGURE 6**

Hoyle, Tanner & Associates, Inc.
150 Dow Street
Manchester, NH 03101-1227
Tel 603-669-5555
Fax 603-669-4168
Web Page: www.hoyletanner.com


Drawing name: H:\063218\dwg\EXHIBITS\FENCE\tweed-2012-FENCE-EA-FIG6.dwg Jun 20, 2013 - 3:19pm

**Dannel P. Malloy**
GOVERNOR
STATE OF CONNECTICUT

October 1, 2016

Mr. H. Curtis Spalding, Regional Administrator
United States Environmental Protection Agency Region 1
EPA New England
5 Post Office Square, Suite 100
Boston, MA 02109-3912

***Re: 2015 8-Hour Ozone National Ambient Air Quality Standards***
***Recommended Attainment Area Designation for Connecticut***

Dear Administrator Spalding:

Pursuant to section 107(d) of the Clean Air Act (CAA), the State of Connecticut is required to submit designation recommendations to the Environmental Protection Agency (EPA) for the 2015 8-Hour Ozone National Ambient Air Quality Standards. Based on the nature of ozone formation and transport, Connecticut would like to recommend the entire northeast region of the country be included in a single nonattainment area as identified in the attached map (Attachment 1). This map, which includes data from EPA's contribution modeling for the Cross State Air Pollution Rule (CSAPR) Update, identifies the contribution of each state to ozone levels in Connecticut.

The CSAPR Update was only finalized this past month – not soon enough to assist Connecticut in attaining the 2008 ozone standards on the original schedule anticipated by EPA. Unfortunately, while Connecticut continues to adopt every reasonable measure to attain the standards as expeditiously as possible, the magnitude of the transport problem has hindered and delayed our attainment of the 2008 ozone standards. Without significantly increased effort on the part of upwind states, ozone transport will prevent us from attaining the more stringent 2015 ozone standards.

While the region described in Attachment 1 includes all the states that contribute significantly to ozone levels in Connecticut that exceed the 2015 ozone NAAQS, we recognize that you are constrained in accepting our recommendation by a court ruling[1] that took a narrow interpretation of the CAA with respect to the impact of ***nearby*** areas on ozone nonattainment designations. Given EPA's decision to narrowly constrain the definition of the term "nearby" under the CAA, a logical alternative is to merge the Philadelphia and New York metropolitan areas into a single nonattainment region. This smaller region, which includes highly interconnected urban areas lying along a

[1] *Mississippi Commission on Environmental Quality v. EPA*, 790 F.3d 138, 160 (D.C. Cir. 2015).

OFFICE OF THE GOVERNOR • STATE CAPITOL
210 CAPITOL AVENUE, HARTFORD, CONNECTICUT 06106
TEL (860)566-4840 • FAX (860)524-7396 • www.governor.ct.gov
Governor.Malloy@ct.gov

congested interstate highway system, confines the nonattainment area to the states which are the greatest contributors to ozone transport into Connecticut. This option is shown in Attachment 2.

The transport of ozone and its precursor pollutants from upwind states has resulted in unacceptable air quality in Connecticut for too long. Our businesses and citizens continue to bear an unreasonable share of the financial and public health consequences of ozone transport.

The CAA was amended in 1990 with the intent of addressing the ozone transport problem. Unfortunately it has not fulfilled expectations in this regard. This is the fourth time since 1990 that Connecticut has gone through a nonattainment designation largely caused by transported ozone and precursors from upwind states. Connecticut lacks the regulatory authority to prevent upwind states from degrading our air quality and must rely on federal action to force upwind states to remedy ozone transport. We hope that EPA will accept an expanded nonattainment area to help address this as yet intractable transport problem.

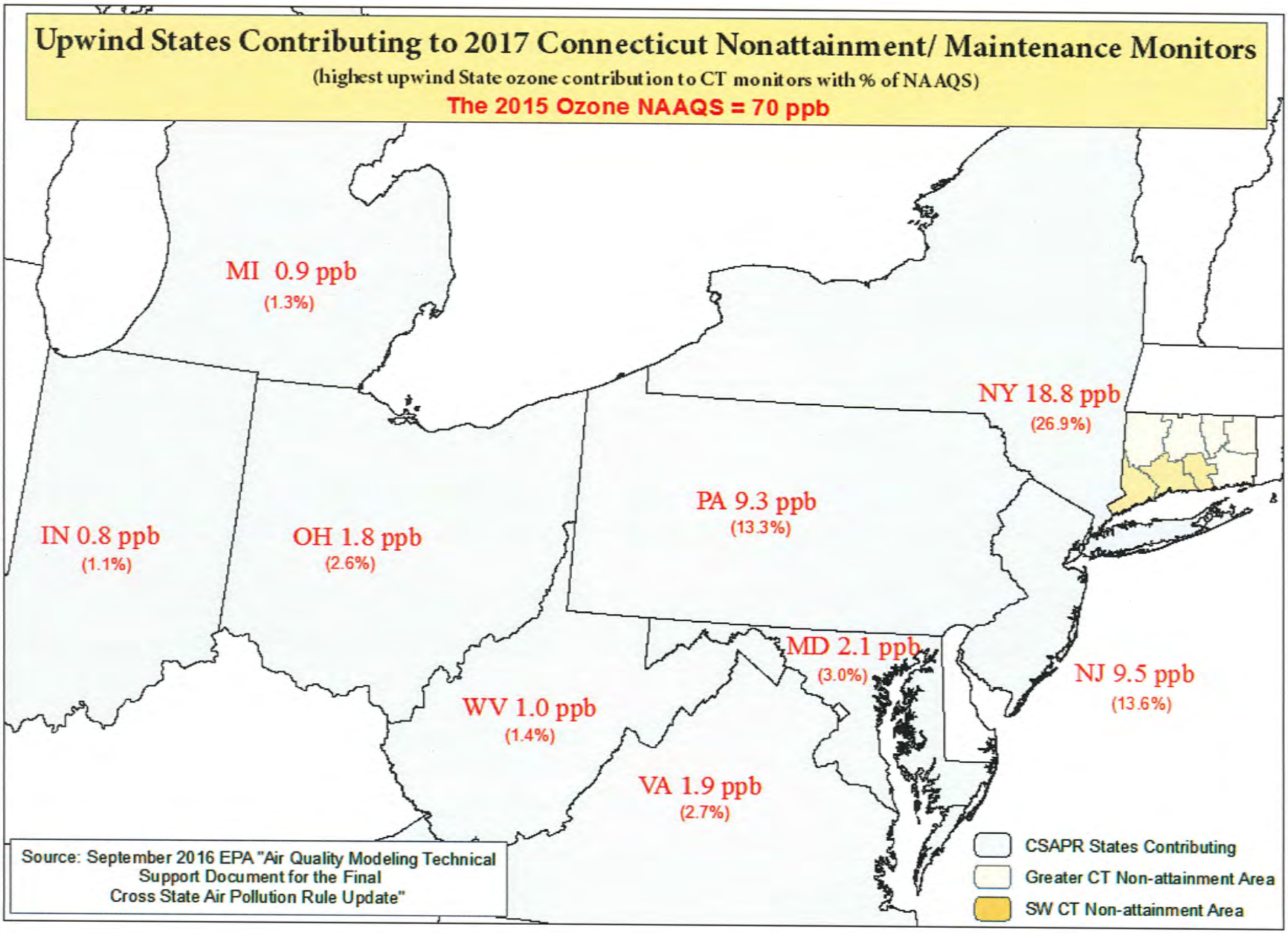
Should EPA conclude no change in the process is warranted, we have attached the requisite documentation which, following EPA guidance[2], preserves the status quo (Attachment 3).

Sincerely,

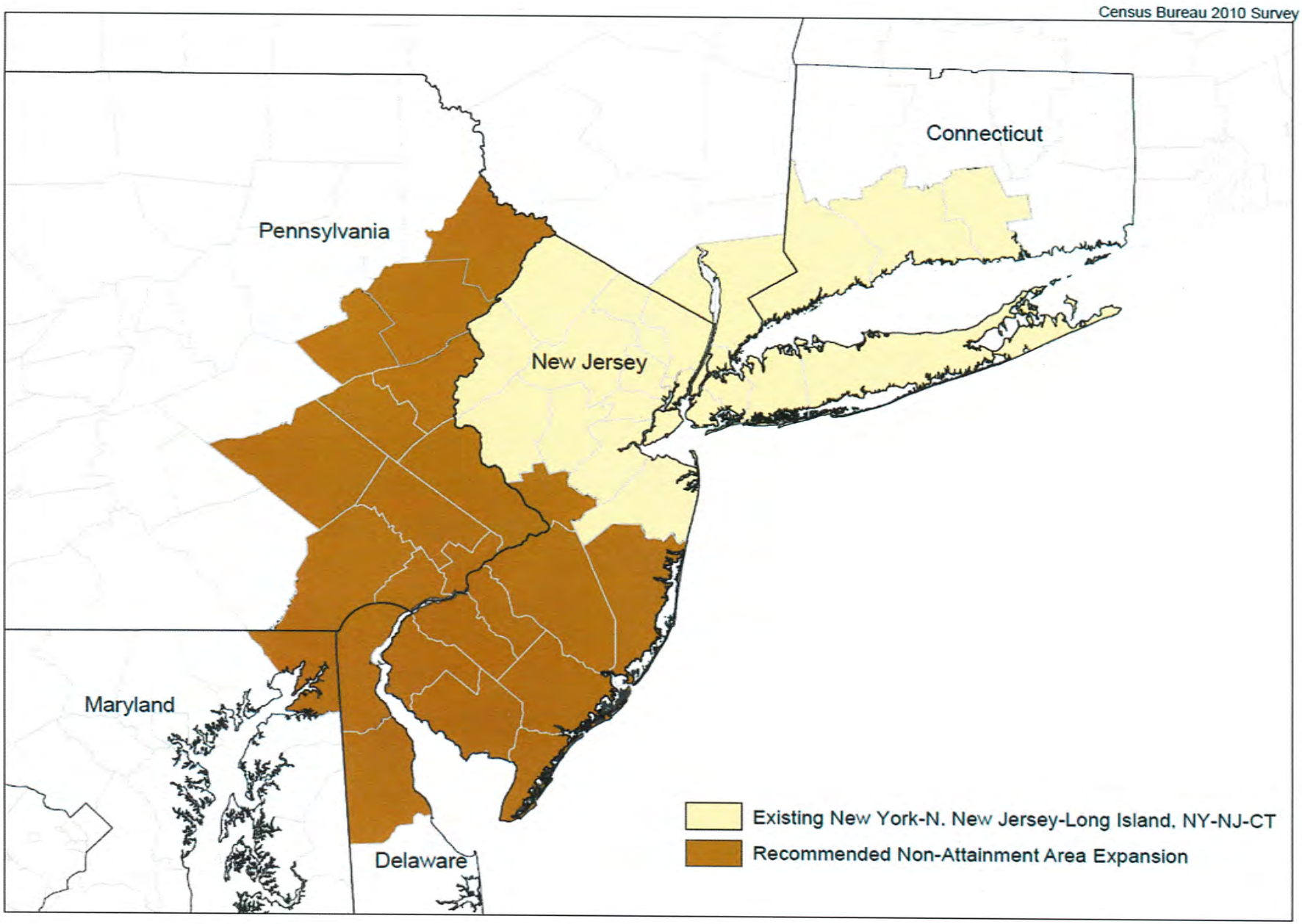
Dannel P. Malloy
Governor

[2] *Area Designations for the 2015 Ozone National Ambient Air Quality Standards*, EPA Office of Air and Radiation, February 25, 2016.

Attachment 1



Attachment 2



Attachment 3

# Ozone Designation Recommendations For the 2015 Ozone National Ambient Air Quality Standards

# TECHNICAL SUPPORT DOCUMENT

Connecticut Department of Energy and Environmental Protection
Bureau of Air Management

October, 2016

# Appendix B
# Notice of Availability

**Public Notice**

# Notice of Environmental Assessment

## Tweed-New Haven Regional Airport
## New Haven and East Haven, CT
## Taxiway and Drainage Improvement Project

The Tweed-New Haven Airport Authority, owner and operator of Tweed-New Haven Regional Airport, is proposing improvements to the Taxiways and drainage system on the airport to bring the airport into compliance with Federal Aviation Administration (FAA) standards and ensure safer and more efficient movement of aircraft. Taxiway A will be shifted away from the runway and the associated connected portions of Taxiways F, G and C will be reconstructed and reconfigured, and the existing service road around the north end of Taxiway A will be shifted. The project also includes maintenance of the existing drainage ditch system around the east end of Runway 32.

Because the (FAA) is providing funding, and an approval to the Airport Layout Plan, the Authority is required to prepare an Environmental Assessment (EA) for the FAA to review. This is a written document that explains the potential environmental and human effects of what is proposed at the Airport. The EA is available for review at the following locations:

- Tweed New Haven Airport, 155 Burr Street, New Haven, CT 06512
- FAA New England Region, 1200 District Avenue, Burlington, MA 01803
- Town Hall, Town of East Haven, 250 Main Street, East Haven, CT 06512
- City Hall, City of New Haven, 165 Church Street, New Haven, CT 06510
- The Hagaman Memorial Library 227 Main St, East Haven, CT 06512

and can be viewed or downloaded from the Tweed Airport website at http://www.flytweed.com.

You may ask for a digital copy of the EA or have a paper copy mailed to you by contacting Kimberly Peace at (603)669-5555 x151 or via email at kpeace@hoyletanner.com.

You are invited to read and comment on the EA to the Authority and FAA. An Open House will be held on Tuesday, November 26th, 2019 from 4:30 to 7 pm at the East Haven Senior Center, 91 Taylor Ave, East Haven, CT. You are invited to attend to learn more about this project.

You will be able to provide comment on the project at the Open House, or you may provide comments via phone, fax, mail or email. Please send comments to:

- Kimberly Peace, Hoyle, Tanner & Associates, Inc., 150 Dow Street, Manchester, NH 03101, (603)669-5555 x151, or kpeace@hoyletanner.com or
- Richard Doucette, Federal Aviation Administration, 1200 District Ave, Burlington MA 01803, or richard.doucette@faa.gov.

Your comments should be received no later than December 6, 2019. Please make your comments as specific as possible, and include your name and address.

**FOR IMMEDIATE RELEASE**

**CONTACT:** Mr. Sean Scanlon, Executive Director
**Phone:** 203-466-4880
**Email address:** sscanlon@flytweed.com

**Tweed-New Haven Airport to Host Public Information Meetings for Airport Master Plan Update**

**New Haven and East Haven, CT**

Tweed New Haven Airport (Tweed) is initiating an Airport Master Plan Update and has announced that it will have two public information meetings: **Wednesday, December 11, 2019 from 6:30 to 8:30 p.m. at the Nathan Hale School, 480 Townsend Avenue, New Haven and Thursday, December 12, 2019 from 6:30 to 8:30 p.m. at the East Haven Senior Center, 91 Taylor Avenue, East Haven**. These meetings will provide background information on the Airport Master Plan Update as well as allow the public to participate in the planning process.

The meetings will begin with a brief presentation summarizing major accomplishments since the last Master Plan Update, ongoing airport projects, Master Plan Update goals and objectives, process, schedule, and outline the project's outreach program. Following the presentation, attendees can provide a comment and interface with the project team.

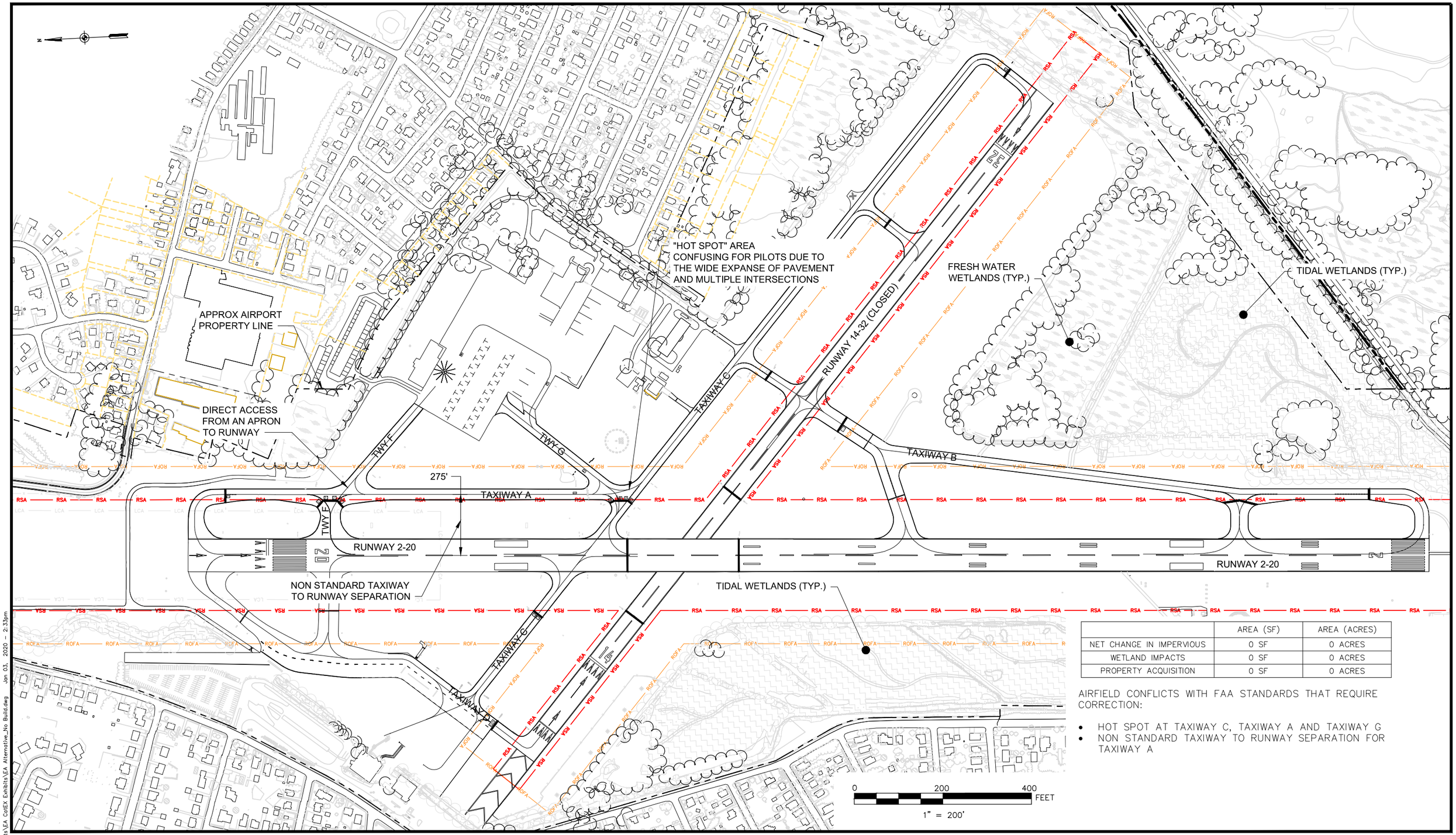
These public information meetings are a way for local residents, airport users, business owners, and any other interested parties to learn about and receive updates on the Tweed Airport Master Plan Update and potential subsequent efforts. This is a key opportunity to interact with the project team, as well as to provide input at the outset of the Master Plan Update.

The final products of the Master Plan Update project are the official planning documents for the airport: an Airport Master Plan Update and Airport Layout Plan, which guide the future development at the airport. The Master Plan Update will include the current and proposed layout, financial plans, schedules for planned work, the assessment of alternatives on technical, environmental, and economic grounds, and ultimately establishes a framework for the future of the airport.

Engagement with the community will be an important component of ensuring that the Master Plan Update is a transparent process. Tweed has also established Technical and Community Advisory Committees, comprised of a wide range of stakeholders, that will guide the Master Plan Update process.

For more information about the Master Plan Update, please contact Mr. Sean Scanlon, Executive Director of Tweed - New Haven Airport Authority at 203-466-4880.

# Appendix C
# Alternative Graphics




| | AREA (SF) | AREA (ACRES) |
|---|---|---|
| NET CHANGE IN IMPERVIOUS | 0 SF | 0 ACRES |
| WETLAND IMPACTS | 0 SF | 0 ACRES |
| PROPERTY ACQUISITION | 0 SF | 0 ACRES |

AIRFIELD CONFLICTS WITH FAA STANDARDS THAT REQUIRE CORRECTION:

- HOT SPOT AT TAXIWAY C, TAXIWAY A AND TAXIWAY G
- NON STANDARD TAXIWAY TO RUNWAY SEPARATION FOR TAXIWAY A

| REVISIONS | |
|---|---|
| DATE | DESCRIPTION |
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

NO BUILD ALTERNATIVE
(EXISTING CONDITIONS)

DRAFT

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 063221
DRAWN: -JAK
DESIGN: -JAK
CHECKED: -NEG
DATE: JANUARY 2020

SHEET 1 OF 8

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_No Build.dwg Jan 03, 2020 - 2:33pm

TASK LIST

1. PERFORM MAINTENANCE ON THE EXISTING DRAINAGE DITCH ALONG NORTH SIDE OF RUNWAY 32.
2. RECONSTRUCT TAXIWAY A AT 400' SEPARATION FROM RUNWAY 2–20.
3. RECONSTRUCT CONNECTOR TAXIWAYS A, F, G, AND C IN THE TAXIWAY A AREA
4. EXPAND ROBINSON AVIATION APRON.
5. RECONFIGURE VEHICLE SERVICE ROAD BY NORTH END OF RECONSTRUCTED TAXIWAY A.

REPLACE CULVERT

DRAINAGE DITCH MAINTENANCE (APPROX. 1 ACRE)

APPROX AIRPORT PROPERTY LINE

AREA OF WETLAND IMPACT

PROPERTY ACQUISITION REQUIRED

REPLACE CULVERT

PHASE 2

PHASE 1

STANDARD 90° FILLET FOR TAXIWAY DESIGN GROUP (TDG) 3

TAXIWAY C

RUNWAY 14-32

FRESH WATER WETLANDS (TYP.)

TIDAL WETLANDS (TYP.)

FRESH WATER WETLANDS (TYP.)

TAXIWAY B

TWY E

TAXIWAY A

TWY C

400'

RUNWAY 2-20

STANDARD TAXIWAY TO RUNWAY SEPARATION FOR ADG III (400FT)

TAXIWAY G

TAXIWAY D

RUNWAY 14-32

RUNWAY 2-20

RSA

POFA

GCA

| | AREA (SF) | AREA (ACRES) |
|---|---|---|
| NET CHANGE IN IMPERVIOUS | +85,111 SF | 1.95 ACRES |
| WETLAND IMPACTS | 31,681 SF | 073 ACRES |
| PROPERTY ACQUISITION | 38,446 SF | 0.88 ACRES |

PROPOSED APRON PAVEMENT

PROPOSED TAXIWAY PAVEMENT

PROPOSED PAVEMENT REMOVAL

PROPOSED WETLAND IMPACT

PROPOSED PROPERTY ACQUISITION

0 200 400 800 FEET

| REVISIONS | |
|---|---|
| DATE | DESCRIPTION |
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

PROPOSED ACTION
PHASE 1 AND PHASE 2

DRAFT

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 063221
DRAWN: -JAK
DESIGN: -JAK
CHECKED: -NEG
DATE: JANUARY 2020

SHEET 2 OF 8

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_Proposed Action-Phase 1 and 2.dwg Jan 03, 2020 - 2:33pm

REPLACE CULVERT

DRAINAGE DITCH MAINTENANCE

APPROX AIRPORT PROPERTY LINE

AREA OF WETLAND IMPACT

TAXIWAY C

TWY F

TAXIWAY A

TWY G

TSA

RSA

400'

TWY F

RUNWAY 2-20

02

20

STANDARD TAXIWAY TO RUNWAY SEPARATION FOR ADG III (400FT)

RUNWAY 14-32

14

TIDAL WETLANDS (TYP.)

TAXIWAY D

TAXIWAY C

| | AREA (SF) | AREA (ACRES) |
|---|---|---|
| NET CHANGE IN IMPERVIOUS | +97,138 SF | 2.23 ACRES |
| WETLAND IMPACTS | 11,390 SF | 0.26 ACRES |
| PROPERTY ACQUISITION | 0 SF | 0 ACRES |

PROPOSED APRON PAVEMENT

PROPOSED TAXIWAY PAVEMENT

PROPOSED PAVEMENT REMOVAL

PROPOSED WETLAND IMPACT

PROPOSED PROPERTY ACQUISITION

0 100 200 400 FEET

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_Proposed Action_Inset-Phase 1.dwg Jan 03, 2020 - 2:33pm

REVISIONS

| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

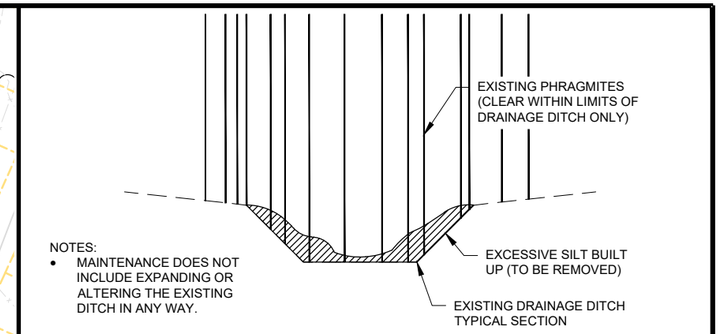
PROPOSED ACTION
PHASE 1 - INSET

DRAFT

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 063221
DRAWN: -JAK
DESIGN: -JAK
CHECKED: -NEG
DATE: JANUARY 2020

SHEET 3 OF 8




NOTES:

- MAINTENANCE DOES NOT INCLUDE EXPANDING OR ALTERING THE EXISTING DITCH IN ANY WAY.

TYPICAL SECTION

NOT TO SCALE

REPLACE CULVERT

PERFORM MAINTENANCE ON EXISTING DRAINAGE DITCH (INCLUDES REMOVAL OF SILT/DEBRIS AND GENERAL CLEANING OF AREA) SEE TYPICAL SECTION FOR ADDITIONAL DETAILS

APPROX AIRPORT PROPERTY LINE

REPLACE CULVERT

TAXIWAY H

RUNWAY 14-32

DITCH MAINTENANCE ASSUMED FOR BOTH ALTERNATIVE ACTION AND PROPOSED ACTION.

0 100 200 400 FEET

| REVISIONS | |
|---|---|
| DATE | DESCRIPTION |
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

DRAFT

PHASE 1
DRAINAGE DITCH NORTH
OF RUNWAY 32

Hoyle, Tanner & Associates, Inc.

| | |
|---|---|
| AIP NO.: | 3-23-0003-XX-2019 |
| PROJ. NO.: | 063221 |
| DRAWN: | -JAK |
| DESIGN: | -JAK |
| CHECKED: | -NEG |
| DATE: | JANUARY 2020 |

SHEET 4 OF 8

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_Drainage Ditch Inset.dwg Jan 03, 2020 - 2:34pm

PROPERTY ACQUISITION REQUIRED

AREA OF WETLAND IMPACT

APPROX AIRPORT PROPERTY LINE

TAXIWAY C

TWY F

TAXIWAY A

TWY G

TSA

RSA

400'

TWY F

RUNWAY 2-20

02

20

STANDARD TAXIWAY TO RUNWAY SEPARATION FOR ADG III (400FT)

RUNWAY 14-32

14

32

TIDAL WETLANDS (TYP.)

TAXIWAY D

TAXIWAY C

| | AREA (SF) | AREA (ACRES) |
|---|---|---|
| NET CHANGE IN IMPERVIOUS | +2,098 SF | 0.05 ACRES |
| WETLAND IMPACTS | 20,291 SF | 0.47 ACRES |
| PROPERTY ACQUISITION | 38,446 SF | 0.88 ACRES |

PROPOSED APRON PAVEMENT

PROPOSED TAXIWAY PAVEMENT

PROPOSED PAVEMENT REMOVAL

PROPOSED WETLAND IMPACT

PROPOSED PROPERTY ACQUISITION

0 100 200 400 FEET

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_Proposed Action_Inset-Phase 2.dwg Jan 03, 2020 - 2:34pm

REVISIONS

| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

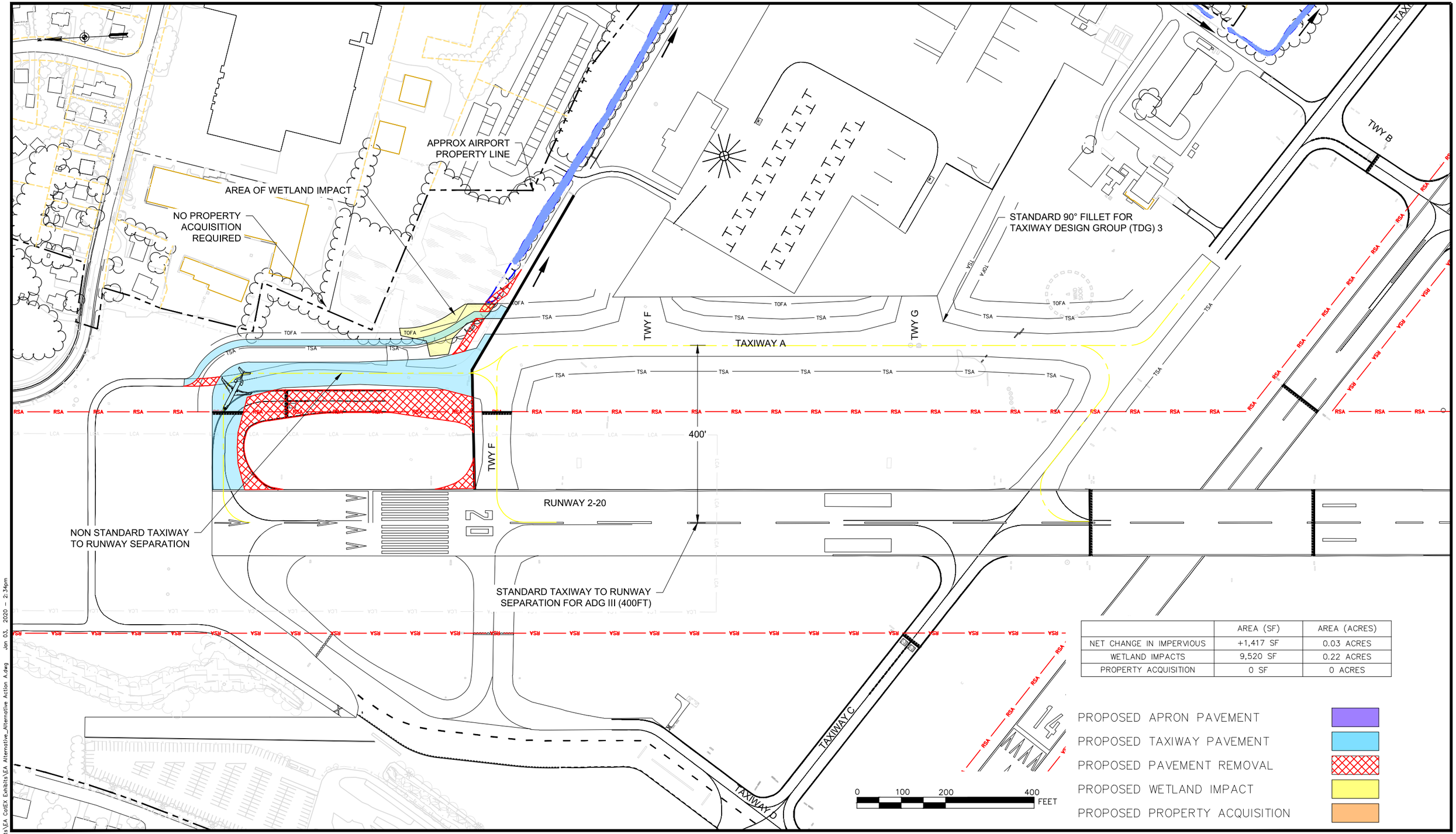
PROPOSED ACTION
PHASE 2 - INSET

DRAFT

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 063221
DRAWN: -JAK
DESIGN: -JAK
CHECKED: -NEG
DATE: JANUARY 2020

SHEET 5 OF 8




| | AREA (SF) | AREA (ACRES) |
|---|---|---|
| NET CHANGE IN IMPERVIOUS | +1,417 SF | 0.03 ACRES |
| WETLAND IMPACTS | 9,520 SF | 0.22 ACRES |
| PROPERTY ACQUISITION | 0 SF | 0 ACRES |

REVISIONS

| DATE | DESCRIPTION |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

PHASE 2
ALTERNATIVE ACTION A

DRAFT

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 063221
DRAWN: -JAK
DESIGN: -JAK
CHECKED: -NEG
DATE: JANUARY 2020

SHEET 6 OF 8

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_Alternative Action A.dwg Jan 03, 2020 - 2:34pm

APPROX AIRPORT PROPERTY LINE

AREA OF WETLAND IMPACT

NO PROPERTY ACQUISITION REQUIRED

STANDARD 90° FILLET FOR TAXIWAY DESIGN GROUP (TDG) 3

TWY B

TWY F

TAXIWAY A

TWY G

400'

TWY F

RUNWAY 2-20

NON STANDARD TAXIWAY TO RUNWAY SEPARATION

STANDARD TAXIWAY TO RUNWAY SEPARATION FOR ADG III (400FT)

TAXIWAY C

TAXIWAY D

| | AREA (SF) | AREA (ACRES) |
|---|---|---|
| NET CHANGE IN IMPERVIOUS | −6,502 SF | −0.15 ACRES |
| WETLAND IMPACTS | 13,470 SF | 0.31 ACRES |
| PROPERTY ACQUISITION | 0 SF | 0 ACRES |

PROPOSED APRON PAVEMENT

PROPOSED TAXIWAY PAVEMENT

PROPOSED PAVEMENT REMOVAL

PROPOSED WETLAND IMPACT

PROPOSED PROPERTY ACQUISITION

0 100 200 400 FEET

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_Alternative Action B.dwg Jan 03, 2020 - 2:35pm

REVISIONS

| DATE | DESCRIPTION |
|---|---|
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

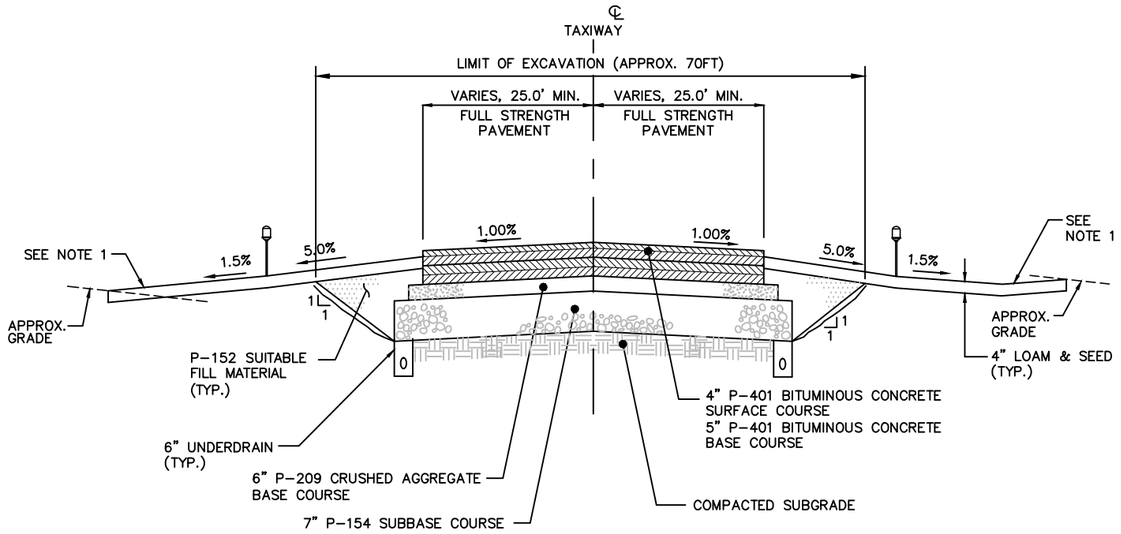
PHASE 2
ALTERNATIVE ACTION B

DRAFT

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 063221
DRAWN: -JAK
DESIGN: -JAK
CHECKED: -NEG
DATE: JANUARY 2020

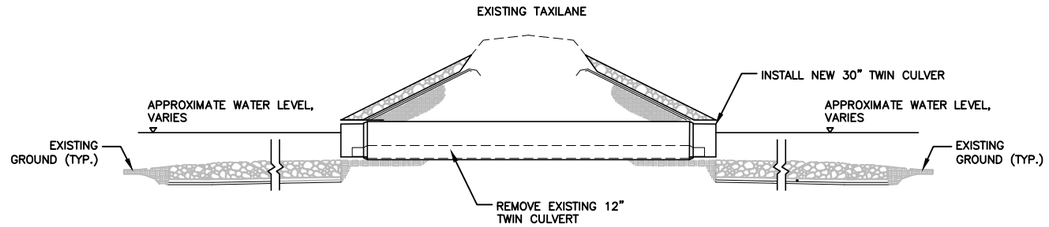
SHEET 7 OF 8




TYPICAL PAVEMENT SECTION 1 – TAXIWAY A, F, G, & C (RWY 14 END)

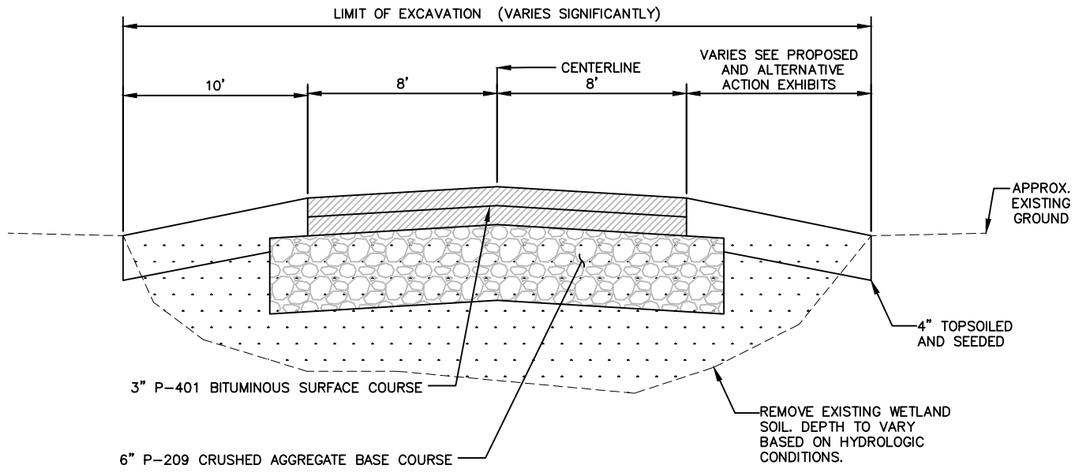
NOT TO SCALE

NOTES:
1. MAX. SLOPE OF 12:1 BEYOND THE TAXIWAY SAFETY AREA.
2. PAVEMENT TYPICAL SECTION 1 IS MEANT TO ACCOMMODATE THE LARGER AIRCRAFT SEEN AT THE AIRPORT AND HAS MORE BITUMINOUS PAVEMENT THAN TYPICAL SECTION 2. HOWEVER BOTH ARE 22 INCHES DEEP.




CULVERT REPLACEMENT DETAIL

NOT TO SCALE




VEHICLE SERVICE ROAD TYPICAL SECTION

NOT TO SCALE

DWG: H:\063221 Tweed\Dwg\Exhibits\EA CatEX Exhibits\EA Alternative_Typical Sections.dwg Jan 03, 2020 - 2:35pm

| REVISIONS | |
|---|---|
| DATE | DESCRIPTION |
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

TWEED-NEW HAVEN REGIONAL AIRPORT
TAXIWAY AND DRAINAGE IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

SHEET TITLE

DRAFT

TYPICAL SECTIONS

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 063221
DRAWN: -JAK
DESIGN: -JAK
CHECKED: -NEG
DATE: JANUARY 2020

SHEET 8 OF 8

# Appendix D

# Tweed-New Haven Regional Airport Grassland Management Plan

155 Burr Street
Administration Building
New Haven, CT 06512
Phone: (203) 466-8833
Fax: (203) 466-1199

April 13, 2011

Mr. Kevin Zawoy
Environmental Analyst III
CT DEP
Office of Long Island Sound Programs
79 Elm Street
Hartford, CT 06106-5127
United States of America

RE: PERMIT # IW-2000-116, DIV-200003052, WQC-200003051
Grassland Management Plan (Original February, 2008)
**UPDATE, November 2010**

Dear Mr. Zawoy:

Thank you for taking the time to visit our airport on September 14th, 2010. During your visit and discussions with Mr. Marshall Dennis and Mr. Charles Kurtz, you expressed interest in the airport's current mowing procedures in both the airfield safety and non-safety/non-critical areas. The following discussion (as related to our February 2008 Grassland Management Plan) is intended to address your concerns.

As stated in the original February, 2008 Grassland Management Plan, filed with DEP in February 2008, certain procedures can and should be updated based on the observations of Airport staff as related to the the safety of the Airport. The 2008 plan outlines mowing procedures for the safety critical areas of the airport, reference Drawing No. 1 of the plan. The following discussion summarizes wildlife activities at the airport from April 2009 to present, or since the completion of runway safety area improvements at the south end of the airport.

The airport monitors wildlife on and near the airfield in accordance with 14 CFR Part 139 Section §139.337 Wildlife Hazard Management, and has developed and maintains their own specific Wildlife Hazard Management Plan. The plan places a particular emphasis on identification and abatement of wildlife hazards within the airfield environment. The plan ensures that the Airport will take immediate measures to identify and mitigate wildlife hazards whenever they are detected or whenever airport management has been advised that hazardous conditions exist. The plan outlines steps for monitoring, documenting, and reporting potential wildlife hazards and strikes at the Airport. Protocols for responding to hazardous wildlife situations are presented, including roles and responsibilities of airport personnel.

Pursuant to the plan, the Airport has encountered steady levels of wildlife hazard incidents which have been successfully mitigated through implementation of the plan. One of the most common hazards to airfield safety has been bird strikes. The airport finds it is necessary to maintain mowing procedures within safety critical areas, as shown on Drawing No.1 of the 2008 Grassland Management Plan. Within non-safety critical areas, Airport maintenance staff limits

mowing as much as practicable without allowing wildlife attractants to increase the frequency of potential bird strikes. However, in the event an increase in wildlife attractants (insects, vectors, herbivores, small and large mammals) is observed by airport staff, non-critical safety areas that abut critical areas are mowed. This further reduces the risk of wildlife hazards within both safety and non-safety critical areas. Conversely, when wildlife attractants are deemed to be at an acceptable and safe level, non-critical safety areas are mowed in accordance with the Grassland Management Plan.

This update is intended to supplement the 2008 plan for two reasons:

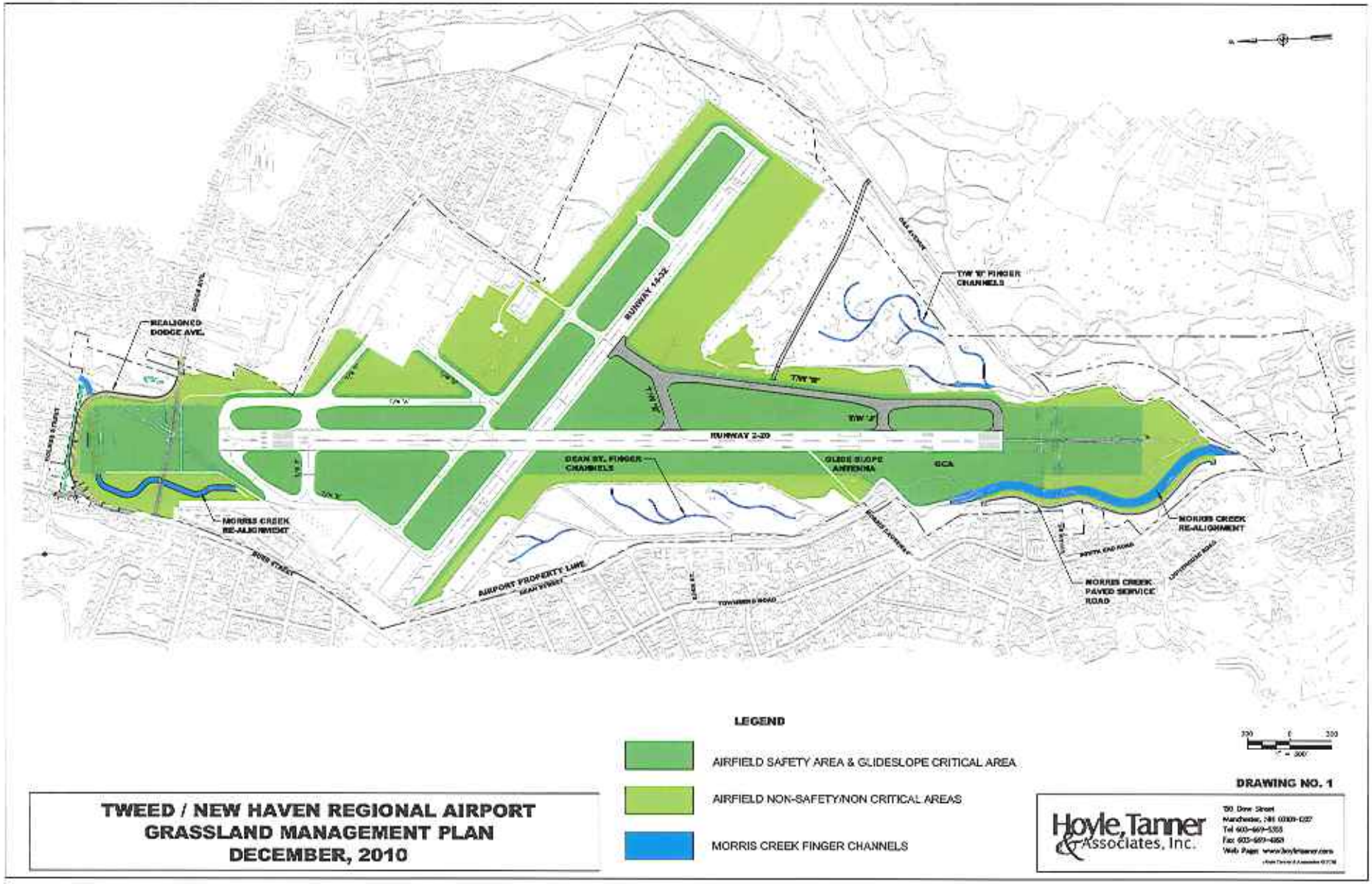
1) Inform CT DEP that the airport maintains the 2008 Grassland Management Plan through standard wildlife management procedures and standard grounds maintenance procedures. The plan illustrates the intended mowing areas and delineates these areas according to a purposeful balance between wildlife management and airport safety. These procedures are briefed at the airport on a quarterly basis and are made a part of standard training procedures for all airport staff.

2) Report that as much as practicable, the Airport is limiting mowing of non-safety critical areas in accordance with the 2008 plan. However, CT DEP should be aware that the plan was intended to serve as a set of guidelines and to be amendable, as needed, to ensure overall Airport safety. Therefore, the airport wishes to inform CT DEP that minor deviations the 2008 plan (mowing procedures in non-safety critical areas) have been deemed necessary in the past 18 months to maintain safe airfield operations. These occasions have been dealt with as exceptions to the plan, and have not permanently altered standard operating procedures. Further and potential future deviations will be handled on a case by case basis and will be managed with sensitivity towards the goals and objectives of the 2008 Grassland Management Plan.

Respectfully,

Lori Hoffman-Soares
Airport Manager

cc: M. Dennis, Wetlands & Wildlife Inc.
R. Furey, Hoyle Tanner & Associates, Inc.
D. Wilda, USDA




# TWEED / NEW HAVEN REGIONAL AIRPORT
# GRASSLAND MANAGEMENT PLAN
# DECEMBER, 2010

**DRAWING NO. 1**

Hoyle, Tanner & Associates, Inc.
Manchester, NH 03101-1127
Tel 603-669-5555
Fax 603-669-4555
Web Page: www.hoyletanner.com

# Appendix E

# 2013 Wildlife Evaluation

233 Russell Hill Road
Ashburnham, MA 01430
978-827-5800
FAX: 978-827-5802
Email: mwdennis@verizon.net

**Wetlands & Wildlife, Inc.**
Environmental Consulting and Permitting

# Memorandum

**To:** Robert Furey, P.E. **From:** Marshall W. Dennis

**Date:** January 23, 2013

**Re:** Proposed Wildlife Hazard Deterrent Fence @Tweed-New Haven Airport **CC:** File #1208

☐ **Urgent** X **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **FYI**



## 1.0 BACKGROUND

The following discussion addresses the potential impacts to wildlife populations associated with the proposed installation of a perimeter fence surrounding the Tweed-New Haven Airport (the 'Airport') located in New Haven and East Haven (see Figure 1). The proposed fence, up to ten (10) feet in height with three (3) strands of out-facing barbed wire, will totally enclose the Airport and is designed to preclude non-avian wildlife from accessing the Airport proper. Wherever possible, a four (4) foot fabric skirt will be buried on the exterior (landside) to discourage burrowing underneath the vertical fence.

As described in Airport's *Wildlife Hazard Assessment/Management Plan* (2012) prepared by U.S. Department of Agriculture (USDA) Wildlife Services staff, "Any species of wildlife that is capable of crossing the runway or flying in conflicted airspace can be a threat to aircraft and human safety". On 20 September 2012, for example, two white-tailed deer (*Odocoileus virginianus*) entered the runway as a jet was taking off. The aircraft struck one of animals, causing damage to the wing and landing gear. The collision was fatal for the deer. The aircraft was able to abort the takeoff, however, and no injuries were reported as a result of this incident.

Past occurrence of bird strikes also have been documented at the Airport. There have been numerous observations of large mammals, including white-tailed deer and coyote (*Canis latrans*) on the airfield, as well. In fact, due to the number of deer sightings, both the U.S. Fish & Wildlife Service (FWS) and the CT Department of Energy and Environmental Protection (CT DEEP) have issued wildlife depredation permits to the Airport.

# 2.0 EXISTING VEGETATION AND WILDLIFE RESOURCES

## 2.1 VEGETATION

Existing biotic resources have been addressed in Section 5.2 of the Environmental Assessment (EA). In summary, both upland and wetland (i.e. tidal and freshwater) habitat are located on and adjacent to the Airport.

### 2.1.1 Upland Plant Communities

Upland vegetative communities within and near the Airport primarily consist of maintained grounds, old fields/successional lands and wooded knolls.

*Maintained Grounds @Runway 2 Safety Area*

The maintained grounds areas include the airport runways and structures, asphalt roads, and neighboring residential and industrial lots. Most of the developed lands are vegetated with lawns, and landscaped with trees and shrubs. Old field conditions exist generally adjacent to the maintained grounds portions of the airport. These fields are dominated by herbaceous vegetation that is cut on a seasonal basis. Some areas both north and south of Morris Creek, however, are in somewhat more advanced stages of succession. In these areas, woody plant species also are present, such as black cherry (*Prunus serotina*), red oak (*Quercus rubra*), staghorn sumac (*Rhus typhina*), Autumn Olive (*Elaeagnus umbellata*) honeysuckle (*Lonicera morrowi*) and multifora rose (*Rosa multiflora*).


*Wooded Knoll @Ora Avenue Tidal Wetland Restoration Area*

Several wooded knolls occur on and off the Airport east of Runway 2/20, south of Runway End 2 and northeast of Ora Avenue. These knolls range up to approximately 25 feet above the surrounding landscape. Bedrock is close to, and often exposed above, the ground surface. The majority of the knolls are dominated by red oak, scarlet oak (*Quercus coccinea*) and gray birch (*Betula populifolia*), with other plant species consisting of sassafras (*Sassafras albidum*), white oak (*Quercus alba*), tree-of-heaven (*Ailanthus altissima*), staghorn sumac, highbush blueberry (*Vaccinium corymbosum*), lowbush blueberry (*Vaccinium angustifolium*), maple-leaf viburnum (*Viburnum acerifolium*) and cat-brier (*Smilax glauca*).

## 2.1.2 WETLANDS

Wetlands on and adjacent to the Airport include tidal and freshwater wetlands. Seaward of the Morris Creek tide gate where salinities generally approach 30 parts per thousand, tidal wetlands are dominated by saltwater cordgrass (*Spartina alterniflora*) and salt meadow cordgrass (*Spartina patens*). Landward of the tide gate where salinities generally are lower, the most abundant plant species consist not only of saltwater cordgrass and salt meadow cordgrass, but vast expanses of the invasive common reed (*Phragmites australis*), especially south of Morris Creek.

In this regard, it should be noted that over the past five (5) years, the Morris Creek tide gate has been operating in a manner that allows tidal flows to wetlands landward of the tide gate. To date, this has allowed for the partial conversion of lands dominated by *Phragmites* to lands dominated by typical salt marsh species, e.g. saltwater cordgrass and salt meadow cordgrass (see photographs below).

*Saltwater Cordgrass Bordering Relocated Morris Creek*

*Restored Saltwater Cordgrass @Ora Avenue Tidal Wetland Restoration Area (in foreground at right)*

*Forested Freshwater Wetland @Proto Drive*

Generally between Runway 14/32 and the haul road, as well as north and east of the haul road, forested freshwater wetlands are most prevalent. Dominated by red maple (*Acer rubrum*) in the overstory, while silky dogwood (*Cornus amomum*), arrowwood (*Viburnum dentatum*) and tussock sedge (*Carex stricta*) constitute prevalent understory species.

Freshwater wetlands also occur west of the Runway 20 safety area. This narrow primarily emergent wetland is associated with relocated Tuttle Brook. Plant species associated with this wetland include pickerel weed (*Pontederia cordata*), arrow-arrum (*Peltandra virginica*),

halberd-leaved tearthumb (*Polygonum arifolium*), jewelweed (*Impatiens capensis*), Joe-pye-weed (*Eupatorium maculatum*), soft-stemmed bulrush (*Scirpus validus*), lurid sedge (*Carex lurida)* and rice-cutgrass (*Leerzia oryzoides*), among others.

*Emergent Freshwater Wetland @Runway Safety Area 20*

## 2.2 WILDLIFE RESOURCES

Plant communities in and around the Airport provide habitat for a relatively diverse assemblage of wildlife species, particularly given the extent to which development exists in the Morris Cove/Lighthouse Point section of New Haven and the Momauguin section of southern East Haven. Overall, USDA/Wildlife Services staff has observed ten (10) species of mammals, 100 species of birds, and two (2) species of reptiles on Airport property.

*Osprey*

Collectively, the relatively diverse vegetative resources provide some or all of the life-sustaining requirements for numerous wildlife species, particularly since many of these species utilize multiple habitats during their life cycles. Species for which suitable habitat is available on and proximate to the Airport include a wide range of large and small mammals, birds of prey [e.g. osprey (*Pandion haliaetus*) and Northern harrier (*Circus cyaneus*)], shorebirds [e.g. killdeer (*Charadrius vociferous*) and sandpipers], wading birds [e.g. great egret (*Ardea albus*) and snowy egret (*Egretta thula*)], Canada geese and various species of ducks and gulls, songbirds (resident and migratory), reptiles associated with upland habitats (e.g. Eastern garter snake (*Thamnophis s. sirtalis*), and reptiles and amphibians associated with freshwater wetlands [e.g. snapping turtle (*Chelydra serpentina*) and green frog (*Rana clamitans*). Finfish, such as mummichogs (*Fundulus heteroclitus*) and shellfish [e.g. oysters (*Crassostrea virginica*)] also occur in tidal waters on and offsite.

State-listed endangered/threatened species and species of special concern also utilize the Airport and surrounding habitats. These include the above-referenced Northern harrier (Endangered), great egret (Threatened), snowy egret (Threatened) and other State-listed species.

*Great Egret (Threatened)*

Further, recent correspondence (31 October 2012) received from the CT DEEP/Wildlife Division relative to State-listed endangered/threatened species and species of special concern also noted that diamond back terrapins (*Malaclemys t. terrapin*) may use areas along the haul road for nesting. To date, however, no evidence of this occurrence has been observed along or proximate to the haul road or anywhere else on or proximate to the Airport. This likely is due to the blockage of turtle movements upstream by the Morris Creek tide gate located downstream and west of South End Road.

# 3.0 WILDLIFE IMPACT EVALUATION

## 3.1 Future Habitat Availability

Besides the maintained grounds and seasonally maintained old field communities associated with the runways and taxiways, existing wildlife habitats for non-avian species that utilize the Airport proper and surrounding lands are anticipated to consist of the undeveloped lands primarily west of Coe Avenue (see Figure 2). These lands generally may be described as follows:

- South of the residential neighborhoods along Dodge Avenue;
- West of the development along Coe Avenue, Proto Drive, Uriah Street and Commerce Street;
- North and south of the residential areas along Silver Sands Road (Route 337);
- South of the residences along lower South End Road;
- East and west of the residences along South Street;
- East of the residences along upper South End Road and Dean Street; and
- West of South End Road along Morris Creek, including Lighthouse Point.

It is acknowledged that such species as white-tailed deer and coyote may venture outside this area, such as to undeveloped lands within the Farm River watershed east of Coe Avenue. It is anticipated, however, that the highly developed Coe Avenue corridor functions as a significant deterrent to non-avian wildlife movements, thus limiting wildlife access between the undeveloped lands associated with Morris Creek and the Farm River.

As shown on Figure 2, developed portions of the Airport contain an area of approximately 200 acres of wildlife habitat along the runways and taxiways, while adjacent undeveloped habitat encompasses an area of approximately 550 acres, for a collective total of ~750 acres of viable wildlife habitat. As previously noted, the vegetative resources within this overall area of wildlife habitat provide some or all of the life-sustaining requirements for numerous wildlife species.

For many migrating bird species, for instance, the Airport represents a temporary stopover or wintering area along the Atlantic Flyway. Further, while such permanent residents as

*White-Tailed Deer on Airport Property*

white-tailed deer and cottontail rabbits (*Sylvilagus floridanus*) may feed on the herbaceous vegetation along the runways and taxiways, these areas do not provide the cover and breeding habitat required by these species.

Regardless, with the potential exception of shrews, voles, moles, mice and rats that are small enough to enter the site via gates and/or other similar structures, the installation of the proposed perimeter fence will effectively preclude access by non-avian wildlife to approximately 325 acres of land primarily consisting of maintained ground (~200 acres), and a ~125-acre mixture of more naturally occurring uplands and freshwater wetlands, as well as tidal habitats associated with the Ora Avenue and Dean Street wetland restoration areas. Thus, of the 750 acres of land presently serving as wildlife habitat, approximately 425 acres will remain as available habitat to non-avian species following fence installation, an overall reduction of approximately 43%.

## 3.2 Population Effects and Wildlife/Human Interactions

For the notably smaller mammals (e.g. shrews, voles, moles, mice and rats), as well as reptiles, amphibians and fish populations, activity patterns and population dynamics are not likely to be disrupted due to the relatively small home ranges characteristic of these species.

*Mummichog @Tidal Creeks*

With respect to larger mammals, however, the effects associated with fence installation will be more pronounced. It is anticipated that individuals of various species will become 'trapped' inside Airport property subsequent to fence construction, thereby precluding their access to traditional/pre-fence home range habitats and altering current predator/prey dynamics. The proposed action also will decrease the diversity of habitats available to non-avian wildlife inside the fence. With the exception of the maintained grounds associated with runways and taxiways, for example, the vast majority of the area inside the fence will consist of freshwater and tidal wetlands, i.e. unsuitable long-term habitats for most mammalian species.

Accordingly, isolation and habitat exclusion ultimately will result in the mortality of many isolated individuals, primarily due to the lack of suitable food sources, vegetative cover and breeding sites. Fencing and the lack of suitable habitat also may result in the temporary increased frequency of such species as white-tailed deer, coyote and cottontails within the Airport's maintained grounds in search of food. Omnivores, such as striped skunk (*Mephitis*

*mephitis*), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*) may fare better in the short term, particularly since the latter two species may be able to climb over the fence to escape isolation. However, the paucity of habitat characteristics associated with larger mammalian species, coupled with the probable absence of available mates, eventually will lead to the elimination of most, if not all of these species inside the fence. FWS- and CT DEEP-approved depredation also is expected to play a key role in eliminating individual wildlife species inside the fence.

For wildlife individuals whose habitats inside the fence are no longer available, opportunities in securing requisite life-sustaining requirements outside the fence, similarly, will become more limiting. Again, it is acknowledged that such species as opossum and raccoon may climb over and inside the fence in search of supplemental habitat, just as they may climb over and outside the fence. The habitual 'fence climbing' behavior of these species to access otherwise non-accessible lands, however, is dubious. As noted above, lands inside the fence mostly will consist of freshwater and tidal wetlands. While opossums and raccoons frequent such habitats, other habitats are required, as well.

The fact that existing wildlife populations will occur within a reduced area also will affect, as with the animals inside the fence, predator/prey dynamics and, eventually, species population levels. Clearly, available wildlife habitat following the loss of approximately 325 acres of formally available habitat will not be able to sustain the same or similar number of individuals, especially since the home ranges of small (e.g. cottontail rabbits) and large mammals (e.g. coyotes) may extend from 100 acres to multiple square miles, as well as the fact that many of these species will be competing for the same available food sources. Consequently, the present population of these animals will decrease until sustainable population levels once again are attained.

The exclusion of previously available habitat also is expected to increase wildlife/human interactions. For example, whereas deer once fed on woody and herbaceous plant species in Airport woodlands, as well as along the runways and taxiways, it's probable that the exclusion of these food sources and the limited abundance of food outside the fence will necessitate deer to seek residential plantings as a source of nourishment. Such interactions, primarily with respect to the storage of organic solid waste, also are expected to increase with respect to other mammals, including the omnivorous opossum, striped skunk and raccoon. In addition, fencing may result in residential areas in the vicinity of South End, Silver Sands, Minor and Roses Farm Roads being used as wildlife travel corridors, particularly since this area represents the shortest distance between available habitats north, south and west of these residences.

## 4.0 SUMMARY

The Tweed-New Haven Airport Authority is proposing to install a perimeter fence around the Tweed-New Haven Airport. With the primary exception of very small mammals, this fence will effectively serve to preclude non-avian wildlife access to the Airport.

As described above, project implementation will result in a reduction in the quantity and diversity of available wildlife habitats within the geographic area presumed to constitute the home range of affected wildlife species. Thus, existing non-avian wildlife populations will be confined to a markedly smaller and modified landscape of undeveloped lands surrounded primarily by residential and industrial land uses.

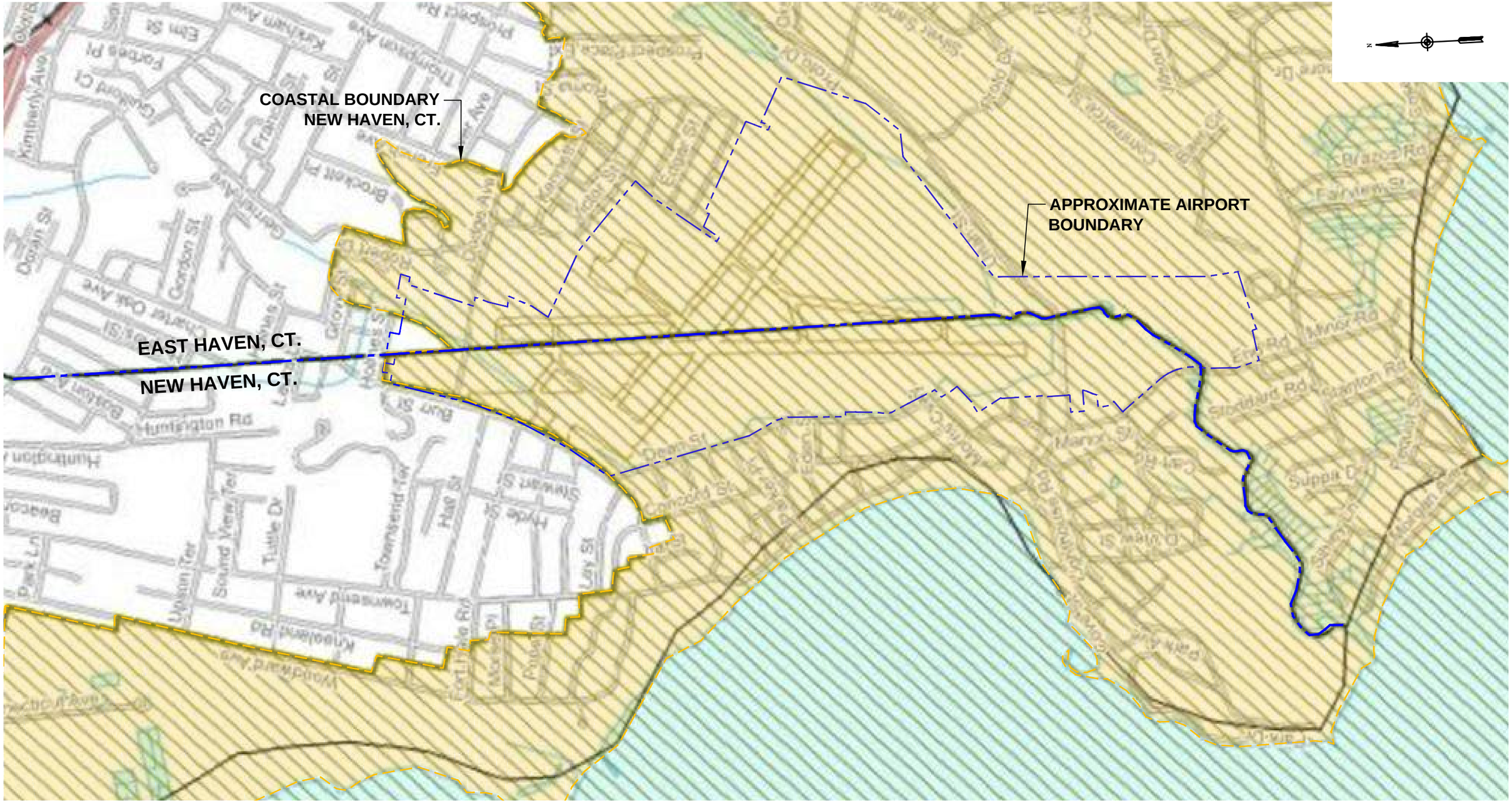
In this regard, it is important to note that not only will the size of remaining undeveloped lands play an important role in future individual, population and community dynamics, but landscape composition, as well. Remaining undeveloped lands, for instance, will not simply be a proportionate reduction of presently available habitats that theoretically would lead to a proportionate decrease in the number of individuals of each species. As noted above, between 100 – 125 acres of relatively high quality freshwater and tidal wetlands will be fenced off and no longer be available to non-avian wildlife. Consequently, the habitats actually remaining for use by wildlife, for the most part, will consist of vast expanses of degraded wetlands dominated by invasive common reed (*Phragmites australis*), especially south of Morris Creek. The availability of woodland habitat also will be notably reduced.

These habitat conditions will not be able to sustain the same or similar number of individuals. Instead, the diminished extent of available habitat will result in the carrying capacity of these lands for wildlife to be exceeded, leading to wildlife mortality due to such decimating factors as starvation, predation, accidents (e.g. animal/vehicle collisions) and stress. In response to the limited available habitat, some individual white-tailed deer and coyotes, for example, may attempt to seek more suitable habitat elsewhere, such as within the Farm River watershed. It is probable, however, that the carrying capacity for such species in this area already has been attained, thereby leading to the mortality of migrating individuals. Further, changes in landscape composition, as noted above, also are anticipated to contribute to wildlife mortality, emigration and alterations to the composition of wildlife populations in the subject area.

Lastly, the exclusion of previously available habitat also is expected to increase wildlife/human interactions, including but not necessarily limited to wildlife consumption of vegetation within residential areas. The disturbance of outdoor refuse containers by wildlife in search of food also is expected to increase, as is pet predation primarily by coyotes. In addition, fencing may result in residential areas in the vicinity of South End, Silver Sands, Minor and Roses Farm Roads being used as wildlife travel corridors, particularly since this area represents the shortest distance between available habitats north, south and west of these residences.

# Appendix F

# Coastal Resources Map




| REVISIONS | |
|---|---|
| DATE | DESCRIPTION |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

tweed NEW HVN
Southern Connecticut's Airport

PROJECT

**TWEED-NEW HAVEN REGIONAL AIRPORT**
**RUNWAY AND TAXIWAY REHABILITATION**
**PROJECT**
**ENVIRONMENTAL ASSESSMENT**

SHEET TITLE

**NEW HAVEN CONNECTICUT**
**COAST BOUNDARY**
**CT DEEP**

DRAFT

Hoyle, Tanner & Associates, Inc.

AIP NO.: 3-23-0003-XX-2019
PROJ. NO.: 0632
DRAWN: -JLC
DESIGN: -DEC
CHECKED: -KRP
DATE: FEBRUARY 2019

SHEET 1 OF 1

DWG: H:\0632000 GEN\Exhibit\HVN-NEW-HAVEN-CT-COASTAL-BOUNDARY.dwg Feb. 12, 2019 - 11:10am

# Appendix G

# SHPO Correspondence

U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
New England Region

12 New England Executive Park
Burlington, MA 01803

May 4, 2017

Todd Levine
State Historic Preservation Office
One Constitution Plaza
Hartford, CT 06103

Dear Mr. Levine:

The Federal Aviation Administration (FAA), in cooperation with the Tweed-New Haven Airport Authority and their consultants Hoyle, Tanner & Associates, is preparing an Environmental Assessment for proposed changes to improve the overall safety of Tweed-New Haven airport (the Airport). The project includes reconstruction of Runway 14-32, realignment of Taxiways A, C, F and G, and drainage improvements to alleviate flooding during heavy rain events. The airport is located at 155 Burr Street, New Haven, CT. The Federal Aviation Administration (FAA) is acting as the lead federal agency for the U.S. Department of Transportation for this project.

The FAA has consulted with the CT State Historic Preservation Office (SHPO) on previous projects at the Airport. Hoyle, Tanner & Associates, Inc. has records of two consultations with CTSHPO regarding projects at the Airport that concluded with determinations of "No Effect" for their areas of potential effect (APE), which overlap with the APE for the current undertaking. In a letter dated March 28, 1996, SHPO determined that the "existing structures and adjacent neighborhood lack historical and architectural importance" when the Airport sought approval to extend the Runway 2-20 safety areas and reconstruct Taxiways B and E. Additionally, SHPO declined to comment when the Airport constructed a Wildlife Hazard Deterrent Fence around the perimeter of the property.

The FAA finds this undertaking will have no adverse effect on historic or architectural resources. We have provided the attached supporting documents and request your concurrence with this finding. I appreciate your time and attention to this very important matter.

Sincerely,

R. Doucette

Richard P. Doucette
Manager of Environmental Programs
FAA New England Region

Enclosures

# Appendix H

# Property Tax Cards

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2011.

# TOWN of EAST HAVEN
# ASSESSOR

Information on the Property Records for the Municipality of East Haven was last updated on 12/6/2016.

## Parcel Information

| | | | | | |
|---|---|---|---|---|---|
| Location: | 12 WASHINGTON AVE | Property Use: | Industrial | Primary Use: | Warehouse |
| Unique ID: | C0294400 | Map Block Lot: | 180 2009 004 | Acres: | 2.67 |
| 490 Acres: | 0.00 | Zone: | LI-3 | Volume / Page: | 0322/1074 |
| Developers Map / Lot: | 14 | Census: | 1802000 | | |

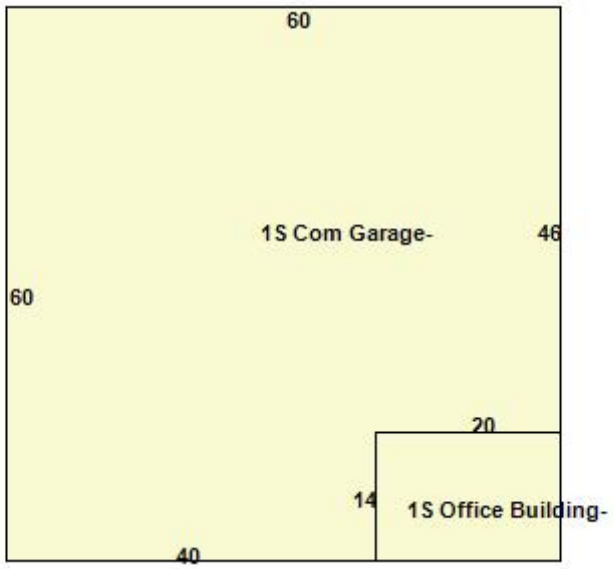
## Value Information

| | Appraised Value | 70% Assessed Value |
|---|---|---|
| Land | 205,600 | 143,920 |
| Buildings | 163,588 | 114,510 |
| Detached Outbuildings | 7,170 | 5,020 |
| Total | 376,358 | 263,450 |

## Owner's Information

| Owner's Data |
| --- |
| CELENTANO ROBERT<br>12 WASHINGTON AVE<br>EAST HAVEN, CT 06512 |

## Building 1

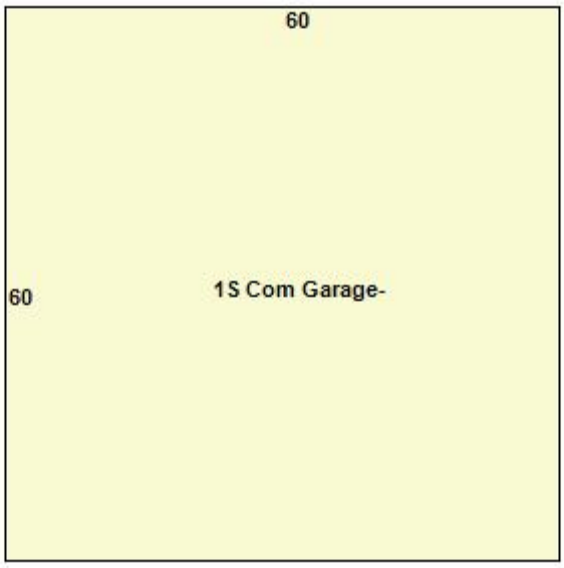



| | | | | | |
| --- | --- | --- | --- | --- | --- |
| Category: | Automotive | Use: | Maintenance Building | GLA: | 3,600 |
| Stories: | 1.00 | Construction: | Low Cost | Year Built: | 1980 |
| Heating: | FHA | Fuel: | Oil | Cooling Percent: | 0% |
| Siding: | Metal | Roof Material: | | Beds/Units: | 0 |

## Special Features

## Attached Components

## Building 2




| | | | | | |
|---|---|---|---|---|---|
| Category: | Automotive | Use: | Maintenance Building | GLA: | 3,600 |
| Stories: | 1.00 | Construction: | Low Cost | Year Built: | 1980 |
| Heating: | FHA | Fuel: | Oil | Cooling Percent: | 0% |
| Siding: | Metal | Roof Material: | | Beds/Units: | 0 |

## Special Features

## Attached Components

## Detached Outbuildings

| Type: | Year Built: | Length: | Width: | Area: |
|---|---|---|---|---|
| Fencing | 1980 | | | 200 |
| Paving | 1980 | | | 2,300 |
| Paving | 1980 | | | 2,300 |

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2011.

# TOWN of EAST HAVEN
# ASSESSOR

Information on the Property Records for the Municipality of East Haven was last updated on 12/6/2016.

## Parcel Information

| | | | | | |
|---|---|---|---|---|---|
| Location: | 290 DODGE AVE | Property Use: | Retail | Primary Use: | Mixed Use - Retail / Office |
| Unique ID: | P0418900 | Map Block Lot: | 180 2108 002 | Acres: | 3.80 |
| 490 Acres: | 0.00 | Zone: | LI-3 | Volume / Page: | 0926/0190 |
| Developers Map / Lot: | | Census: | 1802000 | | |

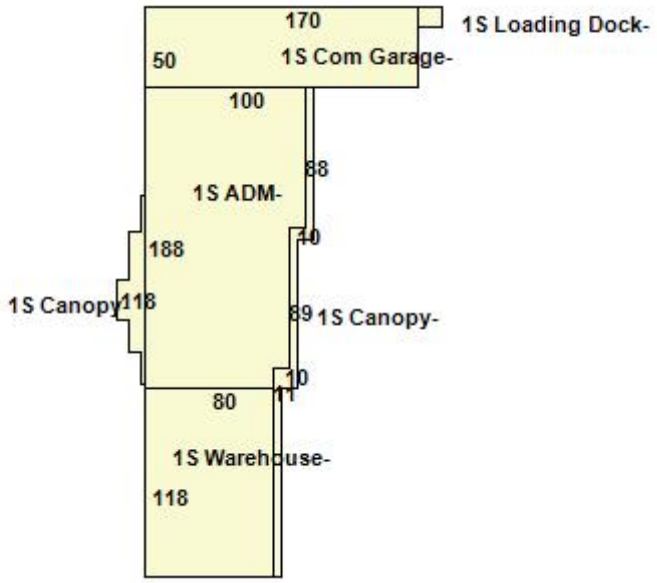
## Value Information

| | Appraised Value | 70% Assessed Value |
|---|---|---|
| Land | 290,400 | 203,280 |
| Buildings | 2,250,799 | 1,575,560 |
| Detached Outbuildings | 521,200 | 364,840 |
| Total | 3,062,399 | 2,143,680 |

## Owner's Information

| Owner's Data |
| --- |
| PISCITELLI GIUSEPPE FAMILY LIMITED<br>PARTNERSHIP<br>331 SILVER SANDS RD<br>EAST HAVEN, CT 06512 |

## Building 1




| | | | | | |
| --- | --- | --- | --- | --- | --- |
| Category: | School | Use: | Administration Office | GLA: | 35,591 |
| Stories: | 1.00 | Construction: | Average | Year Built: | 1983 |
| Heating: | FHA | Fuel: | Gas | Cooling Percent: | 52% |
| Siding: | Concrete Block | Roof Material: | | Beds/Units: | 0 |

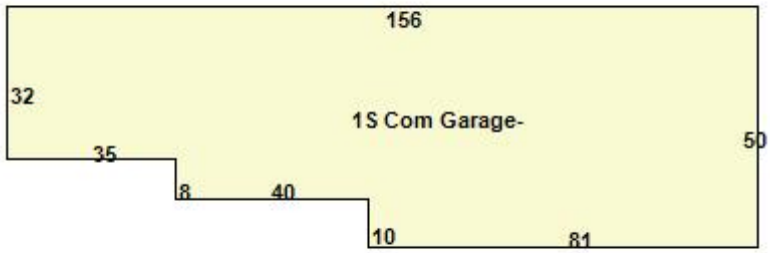
## Special Features

| | |
| --- | --- |
| Wet Sprinklers | 35630 |

## Attached Components

| Type: | Year Built: | Area: |
|---|---|---|
| Canopy | 1983 | 1,720 |
| Canopy | 2002 | 1,108 |
| Cov Loading Dock | 1983 | 195 |
| Fin Mezz | 1983 | 1,584 |

## Building 2




| Category: | Automotive | Use: | Commercial Garage | GLA: | 6,770 |
|---|---|---|---|---|---|
| Stories: | 1.00 | Construction: | Average | Year Built: | 1983 |
| Heating: | Susp. Space | Fuel: | Gas | Cooling Percent: | 0% |
| Siding: | Concrete Block | Roof Material: | | Beds/Units: | 0 |

## Special Features

## Attached Components

# Appendix I

# Tribal Coordination

U.S. Department
of Transportation
**Federal Aviation
Administration**

New England Region
Office of the Regional Administrator

12 New England Executive Park
Burlington, MA 01803

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

MAY 15 2017

Ms. Melissa Tantaquidgeon Zobel
Tribal Historic Preservation Officer
Mohegan Indian Tribe of Connecticut
5 Crow Hill Road
Uncasville, CT 06382

Dear Ms. Zobel:

**Government-to-Government Consultation Invitation**
**Airport Project at Tweed New Haven Airport, New Haven, Connecticut**

The Federal Aviation Administration (FAA), in cooperation with airport owners and operators, is proposing a project at Tweed New Haven Airport, New Haven, Connecticut, as outlined herein.

**Purpose of Government-to-Government Consultation**

The purpose of Government-to-Government consultation as described in the National Historic Preservation Act, Section 106, Federal Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments," and FAA's Order 1210.20, "American Indian and Alaska Native Tribal Consultation Policy and Procedures," is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA undertakings that uniquely or significantly affect Tribes.

**Consultation Initiation**

With this letter, the FAA is inviting the Mohegan Indian Tribe of Connecticut to consult on concerns that may significantly affect your Tribe related to the proposed airport improvements. Early identification of Tribal concerns will allow the FAA and the airport owner and operator to consider ways to avoid, mitigate, or minimize potential impact to Tribal resources and practices as project alternatives are developed and refined.

**Project Information**

The Tweed New Haven Airport proposes to construct taxiways adjacent to the existing runways. Enclosed is a plan showing the location of the proposed taxiways.

**Confidentiality**

We understand that you may have concerns regarding the confidentiality of the information on areas or resources of religious, traditional, and cultural importance to the tribe. We would be happy to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response will assist us in incorporating your concerns into project planning. For that reason, we respectfully request that you contact FAA within thirty days of your receipt of this correspondence as to your interest in Government-to-Government Consultation regarding these projects.

You may contact FAA's Regional Tribal Consultation Official, Todd Friedenberg by telephone at 781-238-7022, or by email at Todd.D.Friedenberg@faa.gov. At that time, the consultation request will be provided to the FAA, Airports Division.

Sincerely,

Amy L Corbett

Amy L. Corbett
Regional Administrator

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

New England Region
Office of the Regional Administrator

12 New England Executive Park
Burlington, MA 01803

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

MAY 15 2017

Marissa Turnbull
Tribal Historic Preservation Officer
Mashantucket Pequot Tribal Nation
2 Matts Path
Mashantucket CT 06338

Dear Ms. Turnbull:

**Government-to-Government Consultation Invitation**
**Airport Project at Tweed New Haven Airport, New Haven, Connecticut**

The Federal Aviation Administration (FAA), in cooperation with airport owners and operators, is proposing a project at Tweed New Haven Airport, New Haven, Connecticut, as outlined herein.

**Purpose of Government-to-Government Consultation**

The purpose of Government-to-Government consultation as described in the National Historic Preservation Act, Section 106, Federal Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments," and FAA's Order 1210.20, "American Indian and Alaska Native Tribal Consultation Policy and Procedures," is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA undertakings that uniquely or significantly affect Tribes.

**Consultation Initiation**

With this letter, the FAA is inviting the Mashantucket Pequot Tribal Nation to consult on concerns that may significantly affect your Tribe related to the proposed airport improvements. Early identification of Tribal concerns will allow the FAA and the airport owner and operator to consider ways to avoid, mitigate, or minimize potential impact to Tribal resources and practices as project alternatives are developed and refined.

**Project Information**

The Tweed New Haven Airport proposes to construct taxiways adjacent to the existing runways. Enclosed is a plan showing the location of the proposed taxiways.

**Confidentiality**

We understand that you may have concerns regarding the confidentiality of the information on areas or resources of religious, traditional, and cultural importance to the tribe. We would be happy to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response will assist us in incorporating your concerns into project planning. For that reason, we respectfully request that you contact FAA within thirty days of your receipt of this correspondence as to your interest in Government-to-Government Consultation regarding these projects.

You may contact FAA's Regional Tribal Consultation Official, Todd Friedenberg by telephone at 781-238-7022, or by email at Todd.D.Friedenberg@faa.gov. At that time, the consultation request will be provided to the FAA, Airports Division.

Sincerely,

Amy L Corbett

Amy L. Corbett
Regional Administrator

Enclosure

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms. Melissa TantaQuidgeon Zobel
Tribal Historic Preservation Officer
Mohegan Indian Tribe of Connecticut
5 Crow Hill Road
Uncasville, CT 06382

9590 9402 1319 5285 2093 22

2. Article Number (Transfer from service label)
7015 1520 0002 8286 7558

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature
X Colleen R. Talley ☐ Agent ☐ Addressee

B. Received by (Printed Name) Colleen R Talley
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ nsured Mail
☐ nsured Mail Restricted Delivery
over $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☒ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

MAY 16 2017

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Marissa Turnbull
Tribal Historic Preservation Officer
Mashantucket Pequot Tribal Nation
2 Matts Path
Mashantucket, CT 06338

9590 9402 1319 5285 2092 92

2. Article Number (Transfer from service label)
7015 1520 0002 8286 7527

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature
X AGENT OF FOXWOODS RESORT CASINC ☐ Agent ☐ Addressee

B. Received by (Printed Name)
C. Date of Delivery 5/18/17

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ ıured Mail
☐ ıured Mail Restricted Delivery
ver $500)
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☒ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

MAY 16 2017

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

# Appendix J

# 2012, 2016 Noise Analyses

# FAR Part 150 Noise Compatibility Study for Tweed New Haven Regional Airport

November 2012

This version of the Study has been shortened to be include as an Appendix to the Tweed Runaway and Taxiway Rehabilitation Project EA: Chapters 5-7 and the Appendices have been removed. A complete copy of this Study can be received from the FAA New England Region.

Prepared for:

tweed NEW HVN
Southern Connecticut's Airport

Prepared by:

wyle

*Intentionally left blank*

**Tweed New Haven Regional Airport**

**FAR Part 150 Noise Compatibility Program**

November 2012

tweed NEW HVN
Southern Connecticut's Airport

*Prepared by:*

wyle

Environmental and Energy
Research & Consulting (EERC)

200 12TH Street, Suite 900
Arlington, VA 22202
703.413.4700

Statement of Certification and Public Notification

In accordance with Title 14 CFR Part 150, these maps and accompanying documentation are submitted as the Existing and Future Baseline Noise Exposure Maps for Tweed New Haven Regional Airport. To the best of my knowledge and belief, these maps were prepared with the best available information and on the basis of reasonable assumptions, are hereby certified as true, complete, and representative of future aircraft noise levels.

I also hereby certify that interested persons have been afforded adequate opportunity to submit their views, data, and comments concerning the Noise Exposure Maps and the accompanying description of aircraft operations. A copy of all written comments received during development of the maps is included in this document.

Signed

11-13-12

Date

Tim Larson
Executive Director
Tweed New Haven Regional Airport

*Intentionally left blank*

# FAR Part 150 Noise Compatibility Study for Tweed-New Haven Regional Airport

# FINAL

Wyle Report WR 12-17
Job No. T58186 (580.10.037)

November 2012

*Prepared for:*

Tweed - New Haven Regional Airport
155 Burr Street
New Haven, CT 06512

*Prepared by:*

Wyle
Environmental and Energy
Research & Consulting (EERC)

200 12TH Street, Suite 900
Arlington, VA 22202
703.413.4700

# Table of Contents



## Sections

## Table of Contents – *continued*

## Table of Contents – *continued*



## Figures

## Table of Contents – *continued*

## Table of Contents – *concluded*



## Tables

*Intentionally left blank*

## FAR Part 150 Study Noise Exposure Map Checklist

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **I. Submitting and Identifying the NEM:** | | | |
| **A.** Submission is properly identified: | | | |
| **1.** 14 C.F.R. Part 150 NEM | Yes | | Statement of Certification |
| **2.** NEM and NCP together? | Yes | | Letter of Submittal, Statement of Certification |
| **3.** Revision to NEMs FAA previously determined to be in compliance with Part 150? | | No | No Previous NEMs |
| **B.** Airport and Airport Operator's name are identified? | Yes | | Letter of Submittal; Section 1.0 |
| **C.** NCP is transmitted by airport operator's dated cover letter, describing it as a Part 150 submittal and requesting appropriate FAA determination? | Yes | | Letter of Submittal |
| **II. CONSULTATION: [150.21(b), A150.105(a)]** | | | |
| **A.** Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development? | Yes | | Section 1.3.2; Appendix D, Appendix E |
| **B.** Identification of consulted parties: | | | |
| **1.** Are the consulted parties identified? | Yes | | Section 1.3.2 |
| **2.** Do they include all those required by 150.21(b) and A150.105(a)? | Yes | | Section 1.3.2 |
| **C.** Does the documentation include the airport operator's certification, and evidence to support it, that interested persons have been afforded adequate opportunity to submit their views, data, and comments during map development and in accordance with 150.21(b)? | Yes | | Statement of Certification; Appendix D, Appendix E |
| **D.** Does the document indicate whether written comments were received during consultation and, if there were comments, that they are on file with the FAA regional airports division manager? | Yes | | Section 1.3.2; Appendix E |
| **III. GENERAL REQUIREMENTS: [150.21]** | | | |
| **A.** Are there two maps, each clearly labeled on the face with year (existing condition year and one that is at least 5 years into the future)? | Yes | | Figure 1, Figure 2 |
| **B.** Map currency: | | | |
| **1.** Does the year on the face of the existing condition map graphic match the year on the airport operator's NEM submittal letter? | Yes | | Figure 1 |
| **2.** Is the forecast year map based on reasonable forecasts and other planning assumptions and is it for at least the fifth calendar year after the year of submission? | Yes | | Figure 2 |
| **3**. If the answer to 1 and 2 above is no, the airport operator must verify in writing that data in the documentation are representative of existing condition and at least 5 years' forecast conditions as of the date of submission? | Yes | | Statement of Certification |

**FAR Part 150 Study Noise Exposure Map Checklist – *continued***

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **C.** If the NEM and NCP are submitted together: | | | |
| **1.** Has the airport operator indicated whether the forecast year map is based on either forecast conditions without the program or forecast conditions if the program is implemented? | Yes | | Statement of Certification; Section 4.2 |
| **2.** If the forecast year map is based on program implementation: | | | |
| **a.** Are the specific program measures that are reflected on the map identified? | Yes | | Figure 2, Section 5 |
| **b.** Does the documentation specifically describe how these measures affect land use compatibilities depicted on the map? | Yes | | Section 5 |
| **3.** If the forecast year NEM does not model program implementation, the airport operator must either submit a revised forecast NEM showing program implementation conditions [B150.3(b), 150.35(f)] or the sponsor must demonstrate the adopted forecast year NEM with approved NCP measures would not change by plus/minus 1.5 DNL? (150.21(d)) | Yes | | Forecast year NEM includes program implementation |
| **IV. MAP SCALE, GRAPHICS, AND DATA REQUIREMENTS: [A150.101, A150.103, A150.105, A150.21(a)]** | | | |
| **A.** Are the maps of sufficient scale to be clear and readable (they must not be less than 1" to 2,000'), and is the scale indicated on the maps?<br>*(Note (1) if the submittal uses separate graphics to depict flight tracks and/or noise monitoring sites, these must be of the same scale, because they are part of the documentation required for NEMs.)*<br>*(Note (2) supplemental graphics that are not required by the regulation do not need to be at the 1" to 2,000' scale)* | Yes | | Figure 1, Figure 2, Figure 3-4, Figure 3-5, Figure 3-6 |
| **B.** Is the quality of the graphics such that required information is clear and readable? *(Refer to C. through G., below, for specific graphic depictions that must be clear and readable)* | Yes | | Figure 1, Figure 2, Figure 3-4, Figure 3-5, Figure 3-6 |
| **C.** Depiction of the airport and its environs: | | | |
| **1.** Is the following graphically depicted to scale on both the existing condition and forecast year maps? | | | |
| **a.** Airport boundaries | Yes | | Figure 1, Figure 2 |
| **b.** Runway configurations with runway end numbers | Yes | | Figure 1, Figure 2 |
| **2.** Does the depiction of the off-airport data include? | | | |
| **a.** A land use base map depicting streets and other identifiable geographic features | Yes | | Figure 1, Figure 2 |
| **b.** The area within the DNL 65 dB (or beyond, at local discretion) | Yes | | Figure 1, Figure 2 |
| **c.** Clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the DNL 65 dB (or beyond, at local discretion) | Yes | | Figure 1, Figure 2 |

**FAR Part 150 Study Noise Exposure Map Checklist – *continued***

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **D. 1**. Continuous contours for at least the DNL 65, 70, and 75 dB | Yes | | Figure 1, Figure 2 |
| **2.** Has the local land use jurisdiction(s) adopted a lower local standard and if so, has the sponsor depicted this on the NEMs? | | No | No local standards have been adopted |
| **3**. Based on current airport and operational data for the existing condition year NEM, and forecast data representative of the selected year for the forecast NEM? | Yes | | Figure 1, Figure 2 |
| **E.** Flight tracks for the existing condition and forecast year timeframes (these may be on supplemental graphics which must use the same land use base map and scale as the existing condition and forecast year NEM), which are numbered to correspond to accompanying narrative? | Yes | | Figure 3-4, Figure 3-5, Figure 3-6 |
| **F.** Locations of any noise monitoring sites (these may be on supplemental graphics which must use the same land use base map and scale as the official NEMs) | Yes | | Figure 7-1 |
| **G.** Noncompatible land use identification: | | | |
| **1.** Are noncompatible land uses within at least the DNL 65 dB noise contour depicted on the map graphics? | Yes | | Figure 1, Figure 2 |
| **2.** Are noise sensitive public buildings and historic properties identified? *(Note: If none are within the depicted NEM noise contours, this should be stated in the accompanying narrative text.)* | Yes | | Section 2.1; Figure 1, Figure 2, Figure 2-1, Figure 5-5 |
| **3.** Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend? | Yes | | Section 2.1; Figure 2-1 |
| **4.** Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative? | | No | No normally noncompatible land uses are considered compatible |
| **V. NARRATIVE SUPPORT OF MAP DATA: [150.21(a), A150.1; A150.101, A150.103]** | | | |
| **A.** 1. Are the technical data and data sources on which the NEMs are based adequately described in the narrative? | Yes | | Section 3, Section 4 |
| **A.** 2. Are the underlying technical data and planning assumptions reasonable? | Yes | | Section 3, Section 4 |
| **B.** Calculation of Noise Contours: | | | |
| **1.** Is the methodology indicated? | Yes | | Section 3.1 |
| **a.** Is it FAA approved? | Yes | | Section 3.1 |
| **b.** Was the same model used for both maps? *(Note: The same model also must be used for NCP submittals associated with NEM determinations already issued by FAA where the NCP is submitted later, unless the airport sponsor submits a combined NEM/NCP submittal as a replacement, in which case the model used must be the most recent version at the time the update was started.)* | Yes | | Section 3.1, Section 4.1 |

**FAR Part 150 Study Noise Exposure Map Checklist – *continued***

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **c.** Has AEE approval been obtained for use of a model other than those that have previous blanket FAA approval? | | No | No other model was used besides the FAA approved INM version 7.0c |
| **2.** Correct use of noise models: | | | |
| **a.** Does the documentation indicate, or is there evidence, the airport operator (or its consultant) has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another that was not included on the FAA's pre-approved list of aircraft substitutions? | | No | No model adjustments or substitutions were made to the FAA-approved noise model |
| **b.** If so, does this have written approval from AEE, and is that written approval included in the submitted document? | | No | No model adjustments or substitutions were made to the FAA-approved noise model |
| **3.** If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed? | Yes | | Section 7.1 |
| **4.** For noise contours below DNL 65 dB, does the supporting documentation include an explanation of local reasons? *(Note: A narrative explanation, including evidence the local jurisdiction(s) have adopted a noise level less than DNL 65 dB as sensitive for the local community(ies), and including a table or other depiction of the differences from the Federal table, is highly desirable but not specifically required by the rule. However, if the airport sponsor submits NCP measures within the locally significant noise contour, an explanation must be included if it wants the FAA to consider the measure(s) for approval for purposes of eligibility for Federal aid.)* | | No | Noise contours are shown for DNL 65 dB and above. |
| **C.** Noncompatible Land Use Information: | | | |
| **1.** Does the narrative (or map graphics) give estimates of the number of people residing in each of the contours (DNL 65, 70 and 75, at a minimum) for both the existing condition and forecast year maps? | Yes | | Sections 3.2 and 4.2, Tables 3-5 and 4-2 |
| **2.** Does the documentation indicate whether the airport operator used Table 1 of Part 150? | Yes | | Section 1.1.3 |
| **a.** If a local variation to table 1 was used: | | | |
| **(1)** Does the narrative clearly indicate which adjustments were made and the local reasons for doing so? | | No | Table 1 was used in the determination of compatible land uses |
| **(2)** Does the narrative include the airport operator's complete substitution for Table 1? | | No | Table 1 was used in the determination of compatible land uses |
| **3.** Does the narrative include information on self-generated or ambient noise where compatible or noncompatible land use identifications consider non-airport and non-aircraft noise sources? | | No | No self-generated or ambient noise sources were considered |
| **4.** Where normally noncompatible land uses are not depicted as such on the NEMs, does the narrative satisfactorily explain why, with reference to the specific geographic areas? | | No | All noncompatible land uses are correctly depicted on the NEMs |
| **5.** Does the narrative describe how forecast aircraft operations, forecast airport layout changes, and forecast land use changes will affect land use compatibility in the future? | Yes | | Section 4.2 |

**FAR Part 150 Study Noise Exposure Map Checklist – *concluded***

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **VI. MAP CERTIFICATIONS: [150.21(b), 150.21(e)]** | | | |
| **A.** Has the operator certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts? | Yes | | Statement of Certification; Section 1.1 |
| **B.** Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete under penalty of 18 U.S.C. § 1001? | Yes | | Statement of Certification |

## FAR Part 150 Study Noise Compatibility Program Checklist

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **I. IDENTIFICATION AND SUBMISSION OF PROGRAM:** | | | |
| **A.** Submission is properly identified: | | | |
| **1.** 14 C.F.R. Part 150 NCP? | | | |
| **2.** NEM and NCP together? | Yes | | Letter of Submittal, Statement of Certification |
| **3.** Program revision? (To what extent has it been revised?) | Yes | | Letter of Submittal, Statement of Certification |
| **B.** Airport and Airport sponsor's name are identified? | Yes | | Letter of Submittal; Section 1.0 |
| **C.** NCP is transmitted by airport sponsor's cover letter? | Yes | | Letter of Submittal |
| **II. CONSULTATION: [150.23]** | | | |
| **A.** Documentation includes narrative of public participation and consultation process? | Yes | | Section 1.3.2; Appendix D, Appendix E |
| **B.** Identification of consulted parties: | | | |
| **1.** All parties in 150.23c consulted? | Yes | | Section 1.3.2 |
| **2.** Public and planning agencies identified? | Yes | | Section 5; Appendix D |
| **3.** Agencies in 2., above, correspond to those affected by the NEM noise contours? | Yes | | Figure 1, Section 5 |
| **C.** Satisfies 150.23(d) requirements: | | | |
| **1.** Documentation shows active and direct participation of parties in B., above? | Yes | | Section 5; Appendix D |
| **2.** Active and direct participation of general public and opportunity to submit their views, data, and comments on the formulation and adequacy of the NCP? | Yes | | Appendix D, Appendix E |
| **3.** Participation was prior to and during development of NCP and prior to submittal to FAA? | Yes | | Appendix D, Appendix E |
| **4.** Indicates adequate opportunity afforded to all consulted parties to submit views, data, etc.? | Yes | | Appendix D, Appendix E |
| **D.** Evidence included of notice and opportunity for a public hearing on NCP? | Yes | | Section 1.3.2, Appendix D, Appendix E |
| **E.** Documentation of comments: | | | |
| **1.** Includes summary of public hearing comments, if hearing was held? | Yes | | Section 1.3.2, Appendix E |
| **2.** Includes copy of all written material submitted to operator? | Yes | | Appendix E |
| **3.** Includes operator's responses/disposition of written and verbal comments? | Yes | | Appendix E |
| **F.** Is there written evidence from the appropriate office within the FAA that the sponsor received informal agreement to carry out proposed flight procedures? | | No | No new proposed flight procedures were recommended in the NCP |

**FAR Part 150 Study Noise Compatibility Program Checklist - *continued***

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **III. NOISE EXPOSURE MAPS: [150.23, B150.3; 150.35(f)]** | | | |
| **A.** Inclusion of NEMs and supporting documentation: | | | |
| **1.** Map documentation either included or incorporated by reference? | Yes | | Letter of Submittal, Section 4.2 |
| **2.** Maps previously found in compliance by FAA? | Yes | | |
| **3.** Compliance determination still valid? | | | |
| (a) Existing condition NEM represents conditions at the airport at the time of submittal of the NCP for FAA approval? | Yes | | Statement of Certification |
| (b) Forecast condition NEM represents conditions at the airport at least 5 years into the future from the date of submittal of the NCP to the FAA for approval? | Yes | | Statement of Certification, Section 4.2 |
| (c) Sponsor letter confirming elements (a) and (b), above, if date of submission is either different than the year of submittal of the previously approved NEMs or over 12 months from the date shown on the face of the NEM? | Yes | | Letter of Submittal |
| (d) If (a) through (c) cannot be validated, the NEMs must be redone and resubmitted as per 150.21. | | | |
| **4.** Does 180-day period have to wait for map compliance finding? | Yes | | |
| **B.** Revised NEMs submitted with program: (Review using NEM checklist if map revisions included in NCP submittal. Report the applicable findings in the spaces below after a full review using the NEM checklist and narrative.) | Yes | | |
| **1.** Revised NEMs included with program? | Yes | | |
| **2.** Has airport sponsor requested in writing that FAA make a determination on the NEM(s), showing NCP measures in place, when NCP approval is made? | Yes | | Letter of Submittal |
| **C.** If program analysis uses noise modeling: | | | |
| **1.** INM, HNM, or FAA-approved equivalent? | Yes | | |
| **2.** Monitoring in accordance with A150.5? | Yes | | Section 7.1 |
| **D.** One existing condition and one forecast-year map clearly identified as the official NEMs? | Yes | | Figure 1, Figure 2 |
| **IV. CONSIDERATION OF ALTERNATIVES: [B150.7, 150.23(e)]** | | | |
| **A.** At a minimum, were the alternatives below considered, or if they were rejected was the reason for rejection reasonable and based on accurate technical information and local circumstances? | | | |
| **1.** Land acquisition and interests therein, including air rights, easements, and development rights? | Yes | | Appendix D, Section 5 |
| **2.** Barriers, acoustical shielding, public building soundproofing | Yes | | Appendix D, Section 5 |

## FAR Part 150 Study Noise Compatibility Program Checklist - *continued*

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **I. IDENTIFICATION AND SUBMISSION OF PROGRAM:** | | | |
| **3.** Preferential runway system | Yes | | Appendix D, Section 5 |
| **4.** Flight procedures | Yes | | Appendix D, Section 5 |
| **5.** Restrictions described in B150.7 (taking into account Part 161 requirements) | Yes | | Appendix D, Section 5 |
| **6.** Other actions with beneficial impact not listed in the regulation | Yes | | Appendix D, Section 5 |
| **7.** Other FAA recommendations (see D, below) | Yes | | Appendix D, Section 5 |
| **B.** Responsible implementing authority identified for each considered alternative? | Yes | | Section 5 |
| **C.** Analysis of alternative measures: | | | |
| **1.** Measures clearly described? | Yes | | Appendix D, Section 5 |
| **2.** Measures adequately analyzed? | Yes | | Appendix D, Section 5 |
| **3.** Adequate reasoning for rejecting alternatives? | Yes | | Appendix D, Section 5 |
| **D.** with the local airport circumstances, determine whether other actions should be added? | | | No additional actions have been identified |
| **V. ALTERNATIVES RECOMMENDED FOR IMPLEMENTATION: [150.23(e), B150.7(c); 150.35(b), B150.5]** | | | |
| **A.** Document clearly indicates: | | | |
| **1.** Alternatives that are recommended for implementation? | Yes | | Section 5 |
| **2.** Final recommendations are airport sponsor's, not those of consultant or third party? | Yes | | Letter of Submittal |
| **B.** Do all program recommendations: | | | |
| **1.** Relate directly or indirectly to reduction of noise and noncompatible land uses? *(Note: All program recommendations, regardless of whether previously approved by the FAA in an earlier Part 150 study, must demonstrate a noise benefit if the airport sponsor wants FAA to consider the measure for approval in a program update. See E., below.)* | Yes | | Section 5 |
| **2.** Contain description of each measure's relative contribution to overall effectiveness of program? | Yes | | Section 5 |
| **3.** Noise/land use benefits quantified to extent possible to be quantified? *(Note: some program management measures cannot be readily quantified and should be described in other terms to show their implementation contributes to overall effectiveness of the program.)* | Yes | | Section 5 |
| **4.** Does each alternative include actual/anticipated effect on reducing noise exposure within noncompatible area shown on NEM? | Yes | | Section 5 |

**FAR Part 150 Study Noise Compatibility Program Checklist – *continued***

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **5.** Effects based on relevant and reasonable expressed assumptions? | Yes | | Section 5 |
| **6.** Does the document have adequate supporting data that the measure contributes to noise/land use compatibility? | Yes | | Section 5 |
| **C.** Analysis appears to support program standards set forth in 150.35(b) and B150.5? | Yes | | Section 5 |
| **D.** When use restrictions are recommended for approval by the FAA: | | | |
| **1.** Does (or could) the restriction affect Stage 2 or Stage 3 aircraft operations (regardless of whether they presently operate at the airport)? (If the restriction affects Stage 2 helicopters, Part 161 also applies.) | | No | No access or use restrictions are included in the recommended NCP |
| **2.** If the answer to D.1 is yes, has the airport sponsor completed the Part 161 process and received FAA Part 161 approval for a restriction affecting Stage 3 aircraft? Is the FAA's approval documented? For restrictions affecting only Stage 2 aircraft, has the airport sponsor successfully completed the Stage 2 analysis and consultation process required by Part 161 and met the regulatory requirements, and is there evidenced by letter from FAA stating this fact? | | No | No access or use restrictions are included in the recommended NCP |
| **3.** Are non-restrictive alternatives with potentially significant noise/compatible land use benefits thoroughly analyzed so that appropriate comparisons and conclusions among all alternatives can be made? | | No | No access or use restrictions are included in the recommended NCP |
| **4.** Did the FAA regional or ADO reviewer coordinate the use restriction with APP-400 prior to making determination on start of 180-days? | | No | No access or use restrictions are included in the recommended NCP |
| **E.** Do the following also meet Part 150 analytical standards: | | | |
| **1.** Recommendations that continue existing practices and that are submitted for FAA re-approval? *(Note: An airport sponsor does not have to request FAA re-approval if noise compatibility measures are in place from previously approved Part 150 studies. If the airport has implemented the measures as approved in the previous NCP, the measures may be reported and modeled as baseline conditions at the airport.)* | Yes | | Section 5 |
| **2.** New recommendations or changes proposed at the end of the Part 150 process? | | No | No additional recommendations or changes have been suggested |
| **F.** Documentation indicates how recommendations may change previously adopted noise compatibility plans, programs, or measures? | Yes | | Section 5 |

**FAR Part 150 Study Noise Compatibility Program Checklist – *concluded***

| Program Requirement | Yes | No | Supporting Pages/Review Comments |
|---|---|---|---|
| **G.** Documentation also: | | | |
| **1.** Identifies agencies that are responsible for implementing each recommendation? | Yes | | Section 5 |
| **2.** Indicates whether those agencies have agreed to implement? | Yes | | Section 5 |
| **3.** Indicates essential government actions necessary to implement recommendations? | Yes | | Section 5 |
| **H.** Timeframe: | | | |
| **1.** Includes agreed-upon schedule to implement alternatives? | Yes | | Section 6 |
| **2.** Indicates period covered by the program? | Yes | | Section 6 |
| **I.** Funding/Costs: | | | |
| **1.** Includes costs to implement alternatives? | Yes | | Section 6 |
| **2.** Includes anticipated funding sources? | Yes | | Section 6 |
| **VI. PROGRAM REVISION: [150.23(e)(9)]** | | | |
| Supporting documentation includes provision for revision? (Note: Revision should occur when it is likely a change has taken place at the airport that will cause a significant increase or decrease in the DNL noise contour of 1.5 dB or greater over noncompatible land uses. See §150.21(d)) | Yes | | Section 5 |

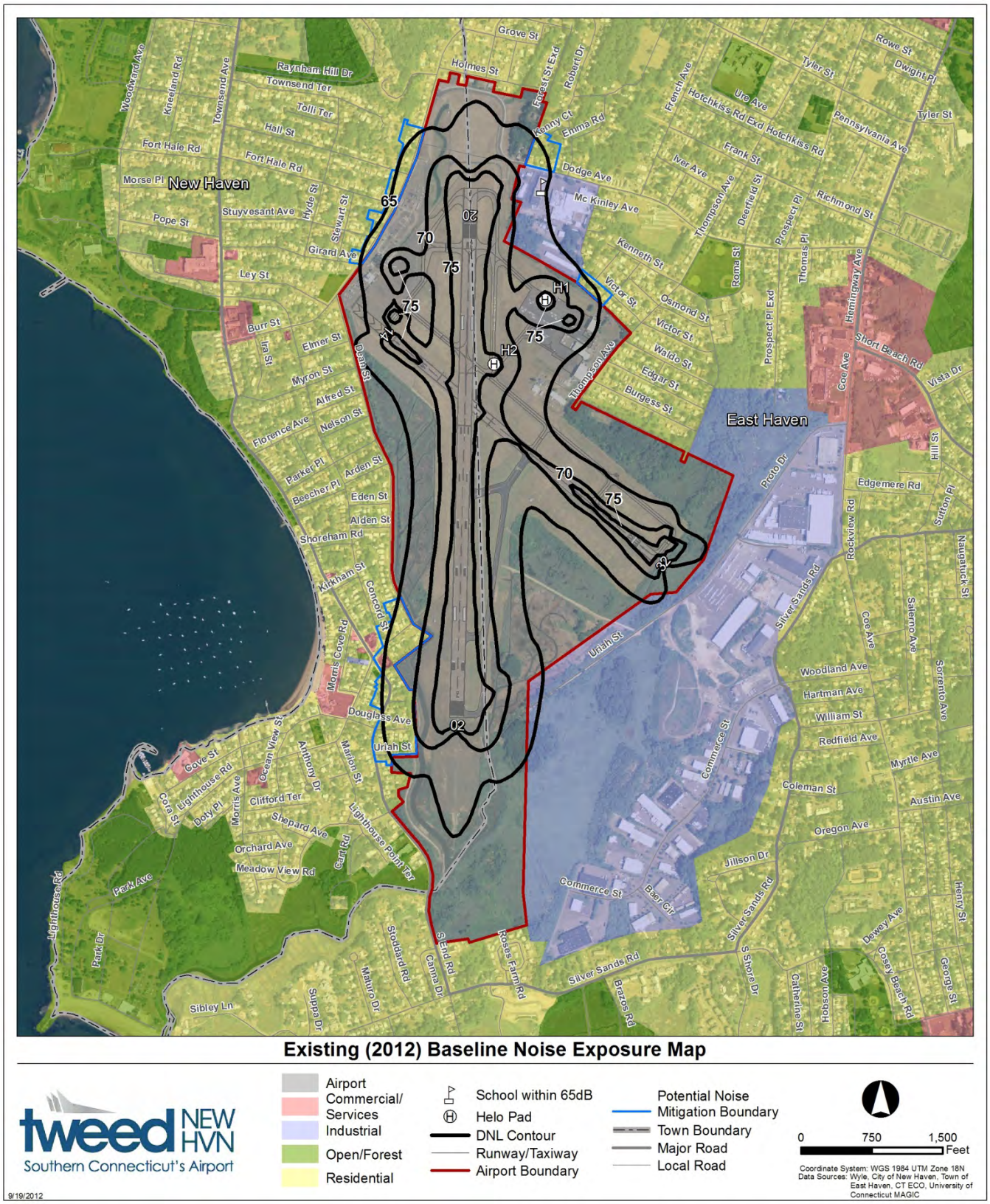



**Figure 1: Existing (2012) Baseline Noise Exposure Map**

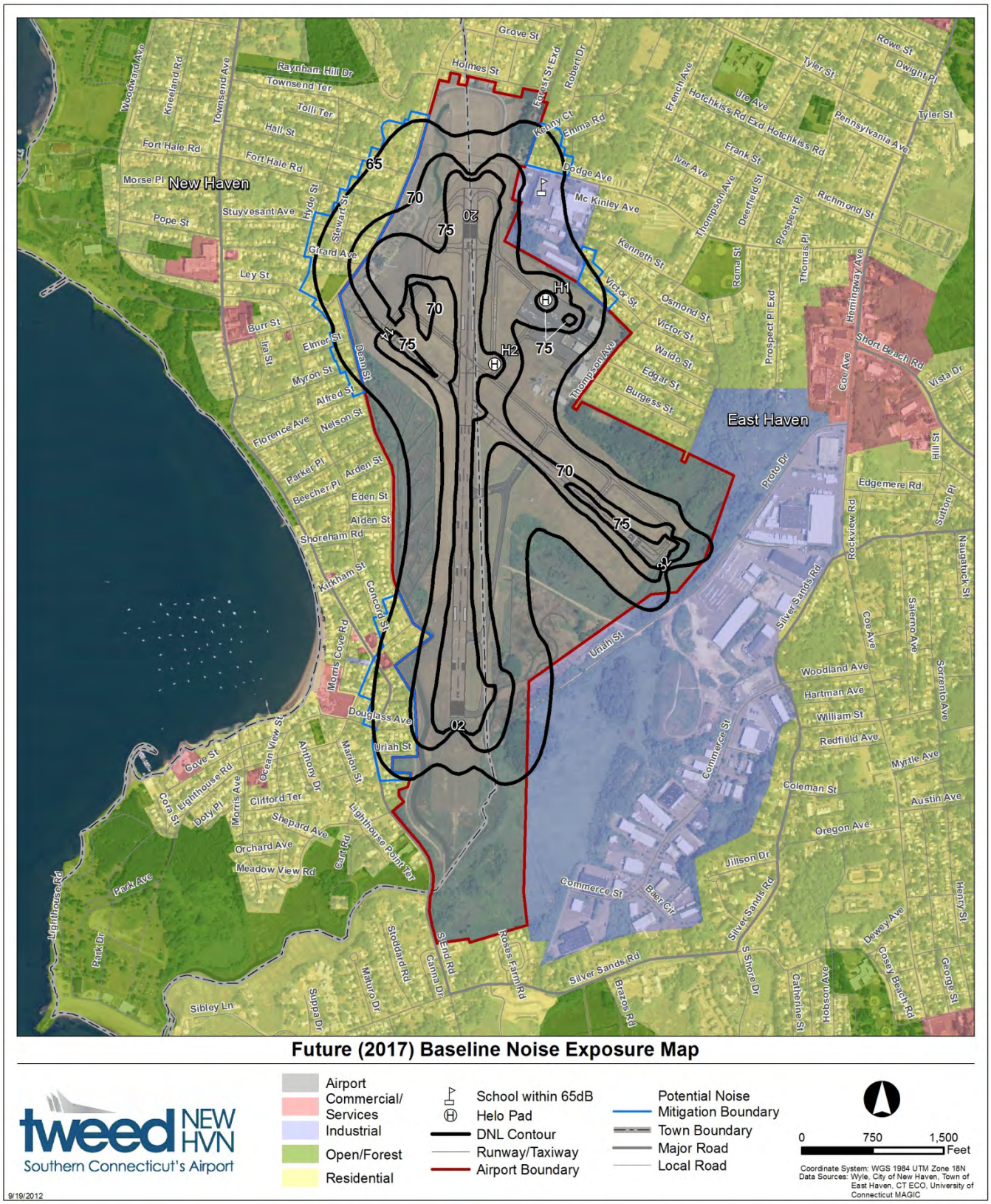



**Figure 2: Future (2017) Baseline Noise Exposure Map**

SECTION 1

# Introduction and Background

This FAR Part 150 Noise Compatibility Study was sponsored by and conducted for the Tweed–New Haven Regional Airport (HVN) in New Haven, CT, pursuant to current federal guidelines, standards and regulations and with the input and participation of the general public and the following agencies and organizations:

- The Federal Aviation Administration (FAA);
- The Tweed-New Haven Air Traffic Control Tower;
- Airport tenants, including the Robinson Aviation Fixed Base Operator (FBO);
- Elected officials from the State and local government; and
- Representatives from local planning and zoning departments.

The intent of this study is to identify areas of significant noise exposure in the vicinity of Tweed–New Haven Regional Airport, and to design a framework for the reduction of those impacts and the mitigation of incompatible land-uses around the airport. FAR Part 150 planning requires the evaluation of existing conditions at an airport, which include the existing airfield configuration, the type and frequency of operations, and an analysis of surrounding land uses. It also typically calls for a 5-year projection of operations and airport conditions as a basis for noise compatibility determination and the need for mitigation. This study includes a community noise measurement program, together with supplemental noise analyses and dynamic single event simulations to enhance community understanding of noise exposure in the vicinity of the Tweed-New Haven Regional Airport.

## 1.1 FAR Part 150 Noise Compatibility Program

### 1.1.1 History of FAR

#### *Part 150*

The FAR Part 150 Noise Compatibility Program originated from the Aviation Safety and Noise Abatement Act of 1979. This Act, codified in the U.S. Code of Federal Regulations (CFR) as Title 49, Subtitle VII, Part B, Chapter 475, Subchapter 1, provides the regulatory guidance used to develop Noise Exposure Maps (NEM) and a Noise Compatibility Program (NCP). FAR Part 150 guidelines prescribe the methodologies to assess noise exposure in the vicinity of airports that provides a "highly reliable relationship between projected noise exposure and surveyed reaction of people to noise" and determines individual noise exposure as a result of those aircraft operations. Most importantly, FAR Part 150 guidelines outline the types of land uses that are typically considered compatible or incompatible with specific levels of aircraft noise.

Through fiscal year 2011, 256 airports have received Airport Improvement Program (AIP) grants for FAR Part 150 studies. Approximately $103 million in AIP funds were granted to aid airports in the preparation of FAR Part 150 studies while over $5.7 billion were expended to implement approved NCP measures. In addition, approximately $12.5 million of Passenger Facility Charges (PFC) were authorized to perform

FAR Part 150 studies while approximately $3.4 billion in PFC funds were expended to implement approved NCP measures[1].

### *Program Guidance Letter*

In August 2012, the FAA's Airports Financial Assistance Division, APP-500 released a Program Guidance Letter (PGL) 12-09 on AIP Eligibility and Justification Requirements for NCP implementation measures involving noise insulation projects. The PGL clarifies the two-step procedure for defining eligibility as described in the AIP Handbook, namely that: a) structures must be located within the current modeled DNL 65 noise contour, and (b) current interior noise levels must be DNL 45 or greater. Early communication with all residents regarding the two-step eligibility requirements is essential. Sponsors shall also notify residents that eligibility is subject to change in the event there are changes to the approved Noise Exposure Map.

*Sampling Program*

The initial step to implement a Noise Insulation Program is to conduct a windshield survey of the affected community to identify the diversity of the residences in the noise contour. Information to be collected includes construction type, size, age, number of levels and housing type (single or multi-family). Sponsors must submit an Acoustical Testing Plan which outlines the proposed acoustical testing procedures, protocols and test phasing plan. The Plan must be in accordance with the FAA's 1992 adopted guidance on testing, sampling and statistical measures.

*Special Circumstances*

The FAA has outlined special circumstances for the treatment of residences that do not meet the two-step eligibility requirements.

a. Block Rounding (Residences located in areas beyond the modeled DNL 65 noise contour): The FAA allows for the determination of a reasonable and logical end point (e.g. neighborhood boundary, street, river or other physical or natural barrier or feature). Sponsors must provide the ADO with the list of addresses proposed to be included in the Program and noted as "Included due to block rounding". The ADO must review and either approve or disapprove of the proposed residences. Once a residence is approved for block rounding, its interior noise levels will determine whether the home is eligible for treatment.

b. Neighborhood Equity (Residences within the modeled DNL 65 contour, but interior noise level is below DNL 45): Where there are a few residences within a neighborhood that do not meet the interior noise level requirements, the FAA will allow for a modified design package (Neighborhood Equity package) which may include improvements such as caulking, weather stripping, installation of storm doors or ventilation packages. The Sponsor must submit the list of proposed properties to receive the Neighborhood Equity package and provide cost estimates of the design compared to the standard design package. Sponsors may not have more 20 residences receiving the Neighborhood Equity package per phase.

c. Ventilation Only (Residences that do not have an existing Positive Ventilation System but interior noise level is below DNL 45): Residences that rely on open windows for air circulation are eligible for a Continuous Positive Ventilation System package. Sponsors may provide air conditioning in lieu of ventilation only. The ADO must receive detailed information about the Ventilation Only package costs compared to the costs of a standard noise insulation package.

[1] Information and statistics about AIP and PFC Funding for Noise Compatibility Projects is available on the FAA website at: http://www.faa.gov/airports/environmental/airport_noise/part_150/funding/.

Upon completion of the survey, and with ADO acceptance, the Sponsor shall select a representative sample of each type of housing to conduct acoustical testing, typically between 10-30% of the surveyed properties. Based upon the test data, the Sponsor shall develop a design package for each housing type (e.g. brick vs. sided homes) which will outline the necessary modifications to achieve a Noise Level Reduction (NLR) of at least 5 dB. The Sponsor shall submit the proposed design packages along with the windshield survey and testing results to the ADO for review and approval.

With ADO approval, sound insulation of residences may begin. The Sponsor is expected to test 10-30% for each phase of the Program to validate design assumptions and obtain pre- and post-modification noise levels.

### 1.1.2 FAR Part 150 Planning Process Overview

The FAR Part 150 planning process is designed to facilitate airport user and community input throughout the study. As a voluntary study undertaken by an airport sponsor (in this case, the sponsor is the airport), the goals of the study include increasing public awareness of airport operations, as well as taking steps to reduce the impact of aircraft noise impacts on noise-sensitive development around an airport. An airport sponsor may elect to start a FAR Part 150 study at any point in time, although most usually update the study when conditions at an airport change or are expected to change noise exposure around the airport.

The FAR Part 150 process typically begins with an introductory meeting concurrent with the initiation of a data collection effort. The NEM representing existing conditions over a 12-month period is developed and overlaid on a land-use map which identifies noise-sensitive development (such as residences, places of worship, libraries, and schools), major roadways, airport facilities, and other readily identifiable geographic references. The noise exposure contours are developed using the FAA's Integrated Noise Model (INM), described in Section 1.2.2. The noise model utilizes input data including flight operations, runway orientation, aircraft types, flight trajectories, and temporal distribution of operations to model noise exposure contours for existing and future baseline conditions.

A five-year forecast condition is typically modeled taking into account projected changes at the airport, such as number of operations and fleet mix, as well as planned facility development that has been evaluated under a separate study. This projected noise exposure contour serves as the baseline for the Noise Compatibility Program (NCP), and is used to evaluate the potential benefits of various noise abatement and mitigation alternatives..

During the course of the FAR Part 150 study, each of the strategies evaluated is referred to as an alternative. Once an alternative passes the various screening criteria, it is referenced as a recommended measure. After optimum noise abatement alternatives are identified, appropriate noise mitigation measures, such as zoning changes, sound insulation programs, and other land-use measures are prescribed by the study in the form of recommendations. Programmatic measures, such as pilot awareness programs, installation of noise monitors, and provisions to update the noise environment can also be evaluated based on their feasibility, practicality, safety, and ability to reduce the impacts of noise from aircraft operations.

Once an airport sponsor (in this case, the airport) has determined, in coordination with its stakeholders, the set of abatement, mitigation and programmatic measures that would result in meeting compatibility goals that are practical for implementation, the NEM and NCP are presented at a public meeting for comments, questions, or concerns, then submitted to the FAA for review and approval. The FAA evaluates whether the methodology used to create each NEM is compliant with its guidelines. Upon acceptance of the NEMs, the FAA evaluates the merits of the recommended NCP. An overview of the noise compatibility planning process is shown in **Figure 1-1**.

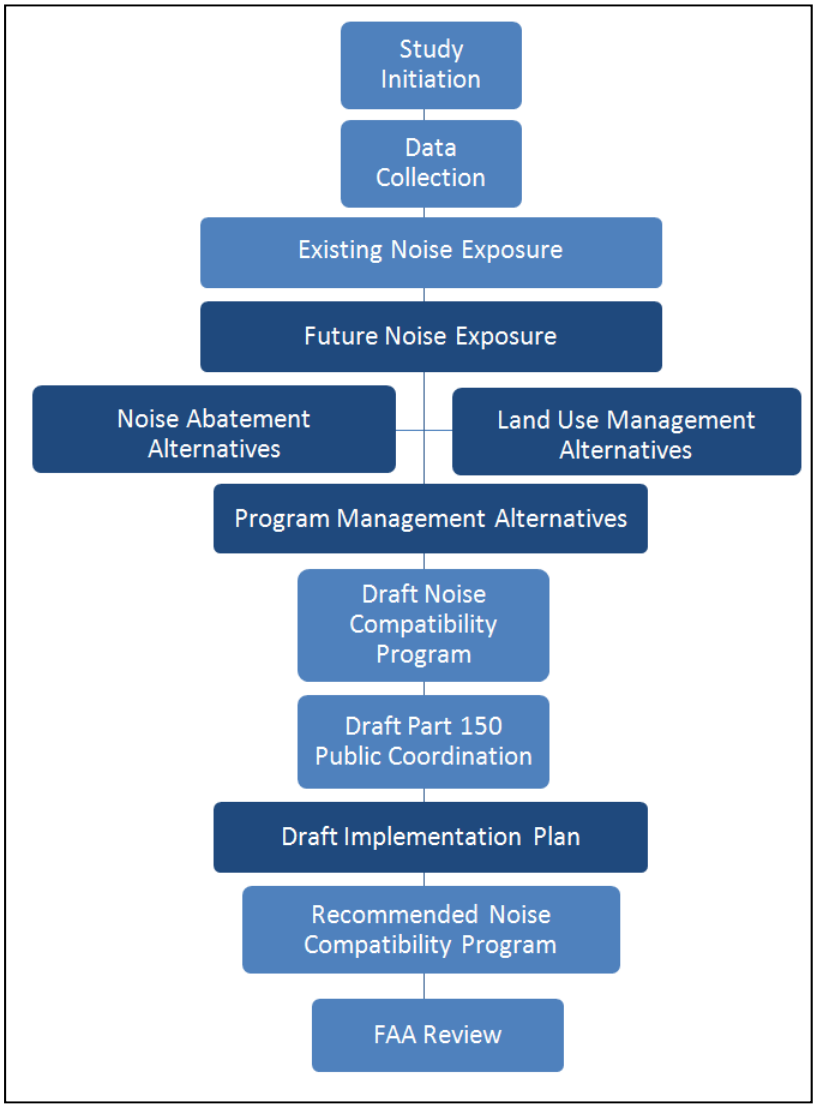



**Figure 1-1: Part 150 Planning Process**

### 1.1.3 Land Use Compatibility

Suggested land use compatibility guidelines for evaluating land use in areas surrounding public-use airports were developed by the FAA when FAR Part 150 regulations were promulgated. These guidelines, reproduced in **Table 1-1**, outline the recommended compatibility for common land uses in the vicinity of airports. Based on these federal guidelines, all land uses, including residential and noise-sensitive developments, are considered compatible at levels lower than modeled DNL 65 dB. At levels at or above DNL 65 dB, different land uses are either permitted outright, permitted with recommended sound attenuation materials incorporated into the construction, or not recommended. The Federal government does not have jurisdiction in local land use decisions; thus, the land-use compatibility guidelines are recommendations for use by local planning jurisdictions, and form the basis for defining areas that may be eligible for federal funding assistance through the Airport Improvement Program. However, this does not preclude local jurisdictions from implementing local noise standards that are more stringent than those recommended by federal guidance.

The designations contained in Table 1-1 do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining acceptable and permissible land uses rests with local authorities.

**Table 1-1: Land Use Compatibility with Yearly Day-Night Average Sound Levels**

| Land Use | Below 65 | 65 - 70 | 70 - 75 | 75 - 80 | 80 - 85 | Over 85 |
|---|---|---|---|---|---|---|
| **Residential** | | | | | | |
| Residential (other than mobile homes and transient lodgings) | Y | N[1] | N[1] | N | N | N |
| Mobile Home Parks | Y | N | N | N | N | N |
| Transient Lodgings | Y | N[1] | N[1] | N[1] | N | N |
| **Public Use** | | | | | | |
| Schools | Y | N[1] | N[1] | N | N | N |
| Hospitals and Nursing Homes | Y | 25 | 30 | N | N | N |
| Churches, Auditoriums, and Concert Halls | Y | 25 | 30 | N | N | N |
| Government Services | Y | Y | 25 | 30 | N | N |
| Transportation | Y | Y | Y[2] | Y[3] | Y[4] | Y[4] |
| Parking | Y | Y | Y[2] | Y[3] | Y[4] | N |
| **Commercial Use** | | | | | | |
| Offices, business and Professional | Y | Y | 25 | 30 | N | N |
| Wholesale and retail building materials, hardware, and farm equipment | Y | Y | Y[2] | Y[3] | Y[4] | N |
| Retail trade - General | Y | Y | 25 | 30 | N | N |
| Utilities | Y | Y | Y[2] | Y[3] | Y[4] | N |
| Communication | Y | Y | 25 | 30 | N | N |
| **Manufacturing and Production** | | | | | | |
| Manufacturing, general | Y | Y | Y[2] | Y[3] | Y[4] | N |
| Photographic and optical | Y | Y | 25 | 30 | N | N |
| Agriculture (except livestock) and forestry | Y | Y[6] | Y[7] | Y[8] | Y[8] | Y[8] |
| Livestock farming and breeding | Y | Y[6] | Y[7] | N | N | N |
| Mining and Fishing, resource production and extraction | Y | Y | Y | Y | Y | Y |

| Land Use | Below 65 | 65 - 70 | 70 - 75 | 75 - 80 | 80 - 85 | Over 85 |
|---|---|---|---|---|---|---|
| **Recreational** | | | | | | |
| Outdoor sports arenas and spectator sports | Y | Y[5] | Y[5] | N | N | N |
| Outdoor music shells, amphitheaters | Y | N | N | N | N | N |
| Nature exhibits and zoos | Y | Y | N | N | N | N |
| Amusements, parks, resorts, and camps | Y | Y | Y | N | N | N |
| Golf courses, riding stables, and water recreation | Y | Y | 25 | 30 | N | N |

Key:

- Y (Yes) - Land Use and related structures compatible without restrictions.
- N (No) - Land Use and related structures are not compatible and should be prohibited.
- NLR - Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
- 25, 30, or 35 - Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes:

1 - Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

2 - Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

3 - Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

4 - Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

5 - Land use compatible provided special sound reinforcement systems are installed.

6 - Residential buildings require an NLR of 25.

7 - Residential buildings require an NLR of 30.

8 - Residential buildings not permitted.

Source: *FAR Part 150 Airport Noise Compatibility Planning*, Appendix A, Table 1.

## 1.2 Aircraft Noise Modeling

### 1.2.1 Aircraft Noise Metrics

Noise represents one of the most contentious environmental issues associated with aircraft operations. Although many other sources of noise are present in communities, aircraft noise is readily identified by individuals as a source of annoyance. An assessment of aircraft noise requires a general understanding of how sound affects people and the natural environment and how it is measured. **Appendix A** provides a detailed discussion of noise and its effects on people and the environment. This section describes the measures of noise, i.e. noise metrics, used in the assessment of noise and in communicating noise exposure to the public.

During an aircraft overflight, the noise level heard by a listener initially is below the ambient or background noise level, but rises to its maximum level as the aircraft flies closest to the observer, and then returns to the background level as the aircraft recedes into the distance. The variation in sound level with time is shown by the curve in **Figure 1-2**. Acoustical scientists have devised different ways of describing this noise history in terms of noise metrics that relate to the impact that the noise has on individuals. The most common of these metrics are presented below.

#### *1.2.1.1 Maximum Sound Level ($L_{max}$)*

The Maximum Sound Level, abbreviated as $L_{max}$, is the highest instantaneous A-weighted sound level measured at a given location during an aircraft overflight. This maximum sound level will only be experienced for a short period of time, but is important in judging the interference caused on conversation, TV or radio listening, and other common activities. Although it provides some measure of the intrusiveness of the event, it does not completely describe the total event, because it does not include the period of time over which the sound is heard.

#### *1.2.1.2 Sound Exposure Level (SEL)*

Individual time-varying noise events, such as aircraft overflights have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. The Sound Exposure Level, abbreviated as SEL, is a composite metric that represents both the level of the sound and its duration. SEL provides a measure of the net impact of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft overflight, SEL includes contributions from both the maximum noise level and the lower noise levels produced during onset and recess periods of the overflight.

The SEL is a logarithmic measure of the total acoustic energy received by the listener during the overflight. Mathematically, it represents the level of a constant sound that would, in one second, generate the same acoustic energy as the actual time-varying noise event. For aircraft overflights which typically last several seconds, the numerical value of the SEL is 5 to 10 dB greater than the $L_{max}$.

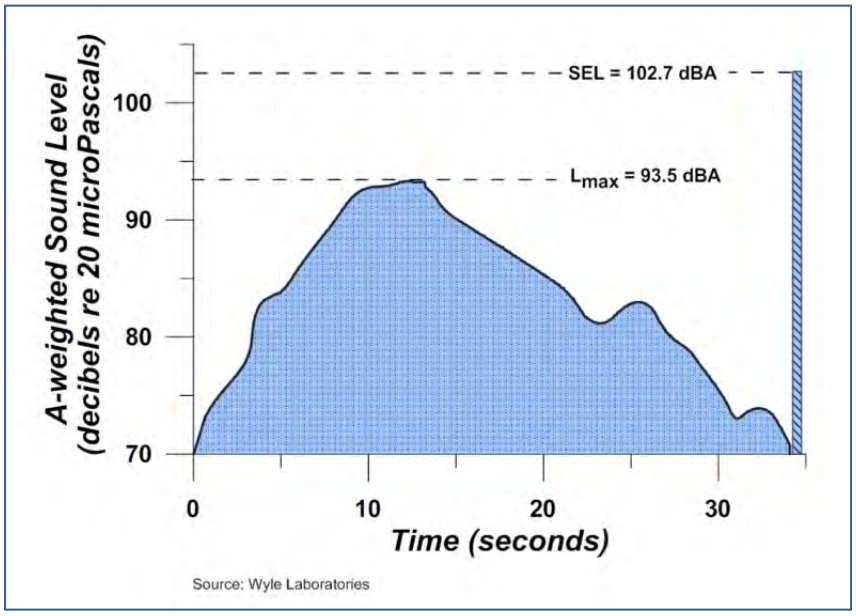



**Figure 1-2: Example of Maximum Sound Level and Sound Exposure Level from an Individual Event**

#### *1.2.1.3 Day-Night Average Sound Level (DNL)*

Long-term noise exposure around an airport is described in terms of the time average sound level generated by aircraft operating at that facility on the basis of an average annual day (AAD). The measure of noise specified in FAR Part 150 for assessing aircraft noise exposure in communities in the vicinity of airfields is the Day-Night Average Sound Level (DNL), in units of the decibel (dB). DNL is an average sound level generated by all aviation-related operations during a 24 hour period with sound levels of nighttime noise events adjusted by adding a 10 dB weighting factor. Daytime is defined as the period from 7:00 a.m. to 10:00 p.m., and nighttime from 10:00 p.m. to 7:00 a.m. The 10 dB weighting factor accounts for the generally lower background sound levels and greater community sensitivity to noise during nighttime hours.

DNL is an average quantity, mathematically representing the continuous A weighted sound level that would be present if all of the variations in sound level that occur over a 24-hour period were smoothed out so as to contain the same total sound energy. This composite metric accounts for the maximum noise levels, the duration of the events (sorties or operations), and the number of events that occur over a 24-hour period. DNL does not represent the sound level heard at any particular time, but quantifies the total sound energy received from multiple events during a 24-hour period. While it is normalized as an average, it represents all of the sound energy, and is therefore a cumulative measure.

### 1.2.2 Integrated Noise Model (INM)

The required model for evaluation of noise exposure around an airport for a FAR Part 150 Study is the FAA's Integrated Noise Model (INM). The INM is designed to estimate long-term noise exposure using the annual average number of operations of each aircraft type, using a given runway, and flying on a given three-dimensional (3D) trajectory. The model accepts individual aircraft operations, and includes a directional distribution of operations based on the proportion of aircraft flying in different directions throughout the year. This is the standard and accepted model for all aircraft noise modeling projects of this type, including those completed under NEPA and FAA FAR Part 150. INM version 7.0c (FAA 2007) was used to model noise exposure at Tweed-New Haven. All aircraft operations and input data used to derive the noise exposure contours were modeled in accordance with FAA standards established in Order 1050.1E and Order 5050.4B.

The INM program contains three elements which process the input data in the following order:

- Flight Module: Definition of three-dimensional (3D) flight trajectories with associated aircraft performance characteristics.
- Noise-Power-Distance (NPD) Database: Noise-Power-Distance values based on measurements conducted according to Federal Aviation Regulation (FAR) Part 36 certification procedures.
- Acoustic Module: Sound propagation algorithms approved for use by the scientific community (e.g., Society of Automotive Engineers).

Aircraft are modeled on 3D flight trajectories with the appropriate altitude, flight speed and thrust setting at defined points along the trajectory. Modeling requires placing aircraft at the correct three-dimensional location in the air, and appropriately matching the aircraft speed and thrust values to extract the correct sound level value from the NPD database. Finally, once the appropriate aircraft sound level is selected from the NPD, the INM estimates the sound level at receiver points on the ground using the sound propagation algorithms in the acoustic module.

The model includes flight characteristics for a wide variety of aircraft in both the commercial and military fleets, and works by computing the noise from each flight at a large number of grid points on the ground.

Once all operations have been modeled and the sound levels summed for the grid points, noise contours are generated by connecting grid points representing equal levels of noise exposure.

The noise contours generated by INM are overlaid on land use, zoning and other types of maps. The program includes built-in tools for comparing contours and utilities that facilitate easy export to commercial Geographic Information Systems. The model also calculates predicted noise at specific sites such as hospitals, schools or other sensitive locations. For these specific locations, the model reports detailed information for the analyst to determine which aircraft events contribute most significantly to the overall noise level..

## 1.3 Tweed-New Haven Part 150 Study

### 1.3.1 Goals and Objectives

Tweed New Haven Regional Airport is committed to a proactive planning process to address noise compatibility issues resulting from airport operations. The FAR Part 150 program is a voluntary program undertaken by the airport, under FAA sponsorship, to identify potential community impacts from aircraft noise and to develop appropriate mitigation measures for affected land uses around the airport according to established federal standards and guidelines.

The goals of this study are as follows:

- Determine the existing aircraft noise levels and define a baseline noise exposure contour representative of aircraft operations in the year 2012;
- Forecast and analyze the potential impact of airport operations within a five-year planning horizon;
- Identify measures and strategies to reduce adverse noise impacts within the study area according to established FAA standards and guidelines; and
- Promote compatible land use practices in the vicinity of the airport, in coordination with airport stakeholders, community members, and local jurisdictions, through comprehensive land use strategies including rezoning, comprehensive planning, building code revisions applicable to new development, sound insulation of existing incompatible structures, and other appropriate strategies.

### 1.3.2 Consultation and Public Involvement

Public coordination and stakeholder consultation is a key part of Noise Compatibility Planning and requires a concerted communication effort for the purposes of both collecting important input for the study and providing information about the noise analysis, the FAR Part 150 process, and the recommended noise compatibility measures.

The study included a public outreach component consisting of public workshops, a public hearing, information newsletters, and a public study website. Facebook and Twitter were also used to inform the public about study public meetings. The public outreach process allowed for the dissemination and presentation of information about current FAR Part 150 guidelines, aircraft noise models and metrics, and noise compatibility measures, as well as supplemental noise exposure information. It also allowed the study to receive important input from the community about perceived noise exposure issues relating to aircraft operations at HVN.

In addition, the study relied on two study committees, a Technical Advisory Committee (TAC) and Community Advisory Committee (CAC) to discuss study input in order to ensure its completeness, comprehensiveness and compliance with FAR Part 150 guidelines.

**Appendix D** contains information and input shared and derived through the public coordination and stakeholder consultation process used in the study. **Appendix E** contains the public comments and responses to the comments.

#### 1.3.2.1 Technical Advisory Committee (TAC)

The Tweed New Haven noise study Technical Advisory Committee, comprised of key airport users and stakeholders with first-hand knowledge of airport operations, federal and state regulations, and local airport planning issues, played a key role in reviewing and validating input data for noise modeling and land-use compatibility analysis.

#### 1.3.2.2 Community Advisory Committee (CAC)

The Tweed New Haven noise study was guided by a Community Advisory Committee (CAC), comprised of community members from both the City of New Haven and the Town of East Haven. These community members attended regular meetings with the study team including a kick-off meeting and they followed closely the progress of the analysis and its resulting recommendations. The CAC played an important role in reviewing input data for noise modeling, planning supplemental noise monitoring program, as well as providing input on the land-use compatibility analysis.

#### 1.3.2.3 Study Database

A database of over 800 residents and businesses in close proximity to the airport was developed early in the study process. Community Advisory Committee members, Technical Advisory Committee members, and elected officials were added to the database. The database was also regularly updated as people requested to be added to the study mailing list via the study website. Furthermore, people who signed-in at public meetings were also added to the mailing list database. Newsletter editions were mailed to members of the public at various milestones during the project.

#### 1.3.2.4 Newsletters

Three newsletters were published to periodically update the public on the study's progress and distributed by USPS mail to over 800 individuals in the project database, primarily resident and business neighbors of the airport. The first newsletter explained the purpose of the noise study, its methodology, schedule and public participation program. The second newsletter shared information about the supplemental noise monitoring program, and the third newsletter summarized the draft Noise Compatibility Program and the Existing (2012) and Forecast (2017) Noise Exposure Maps.

#### 1.3.2.5 Website

A website was developed and regularly updated to provide the most current information and progress on the noise study. The website explains the purpose and background of the study, alerts people to upcoming meeting dates, presents study findings, and serves as a vehicle for people to add themselves to the project mailing list and submit comments. Documents, such as study newsletters, technical documents, video noise simulations, the draft Noise Compatibility Program and draft Noise Exposure Maps are posted on the website. A glossary of technical terms is also provided on the website.

#### 1.3.2.6 Public Workshops and Hearing

*Public Meeting 1:* The first public workshop was held on July 13, 2011. The community was notified in advance about the workshop through a variety of communication and outreach tools, including:

- Direct mailing of the study newsletter to over 800 residential and commercial addresses in the vicinity of the airport included announcement of public meetings;

- Announcement of public meetings on the HVN public website;
- Direct notification of CAC members and elected officials in the City of New Haven and the Town of East Haven;
- Press releases to *New Haven Register* and *East Haven Courier;* and
- Posting on the airport's Facebook page and announcements through the airport's Twitter account.

The objective of the first public workshop was to inform the community about the core objectives of the FAR Part 150 study and provide an interactive platform for addressing community inquiries about aircraft noise at Tweed-New Haven and the process for recommending and addressing potential noise mitigation strategies should adverse impacts be identified. Workshop participants viewed display boards set up at stations or tables devoted to specific topics and were able to talk one-on-one with the study team. One station showed video simulations of aircraft noise events. Attendees were asked for comment about community noise issues and the FAR Part 150 study process and were provided comment forms.

*Public Workshop 2:* The second public workshop was held on January 12, 2012. The community was notified in advance about the workshop through the same outreach methods and tools utilized to publicize the first workshop. The objective of the second public workshop was to share the Noise Exposure Map (NEM) for existing (2012) baseline conditions results with the community and provide an interactive platform for addressing community concerns and questions about the study The community was invited to visit information stations where they were provided with an overview of the FAR Part 150 study, its purpose, scope, and methodology, as well as visualizations and explanations of the Noise Exposure Maps (NEM) for Existing (2012) baseline. Information about the supplemental noise monitoring program and its results, as well as noise simulations of single-event aircraft operations at HVN were provided.. Workshop participants were provided with large displays of the existing (2012) NEM, video simulations of aircraft noise events, and other study input. Attendees were asked for comment about the FAR Part 150 study, both in writing and in open forum. In addition to community members, several state and local officials attended the workshop and provided input on the study.

*Public Hearing:* The public hearing was held on October 16, 2012. The community was notified in advance about the hearing through the same outreach methods and tools utilized for the previous workshops (see Workshop 1), as well as a legal notice and display advertisement published in the *New Haven Register* Furthermore, a postcard was direct mailed to over 800 addresses notifying neighbors of the airport of the public hearing.

The objective of the hearing was to provide a formal record of public comment on the noise study as well as to share proposed NEM results and Noise Compatibility Program measures with the community and to provide an interactive platform for addressing community concerns and questions about the study. Before the formal presentation and hearing began, attendees were able to browse display boards and talk with study team members about the purpose, scope, and methodology of a FAR Part 150 study view noise exposure visualizations and receive information on the Noise Exposure Maps (NEM) for Existing (2012) baseline and Future (2017) baseline. Attendees were also shown the individual measures in the Noise Compatibility Plan (NCP), and were invited to provide their addresses to see where their homes are located in relation to the mitigation boundaries of land use mitigation measures using Google Earth software. Attendees were invited to comment about the FAR Part 150 study, both verbally or in writing for the public transcript. Approximately 50 people attended the public hearing. Eleven people offered verbal formal testimony. Two people submitted written comments at the hearing.

### 1.3.3 Study Methodology

This study has been conducted in conformity with FAR Part 150 regulations and guidelines. It applies the latest scientific and technical standards, tools, and metrics required by the Federal Aviation Administration for the performance of noise compatibility planning at U.S. airports.

A comprehensive methodology for data collection, reduction and analysis of Tweed-New Haven Regional Airport (HVN) operational data was developed to derive input for noise modeling of airport conditions in compliance with FAR Part 150 Noise compatibility requirements. The study team leveraged extensive operational databases from the Federal Aviation Administration (FAA) and conducted extensive data collection interviews with HVN Air traffic Control Staff and airport tenants. The data sources leveraged for this study include:

- FAA Enhanced Traffic Management System (ETMS);
- FAA Air Traffic Activity Database System (ATADS);
- HVN Regional Airport Landing Fee Reports;
- New York Terminal Approach Control (TRACON) Radar data; and
- DOT Bureau of Transportation Statistics (BTS).

The nature of HVN aircraft operations requires an active and multi-sourced effort to define total operations performed at the airport by GA and air carrier aircraft, including those performed during times when the ATCT is closed. As such, a detailed and comprehensive framework for using all available data sources was created to ensure the completeness and accuracy of the operational data to be modeled in the study. **Figure 1-3** summarizes the data integration and flow process used in the study. Primary sources were used to derive operational volumes by aircraft category and secondary sources were used to fill in gaps where needed as well as for redundancy and quality control purposes. The result is a comprehensive accounting for annual aircraft operations at HVN.

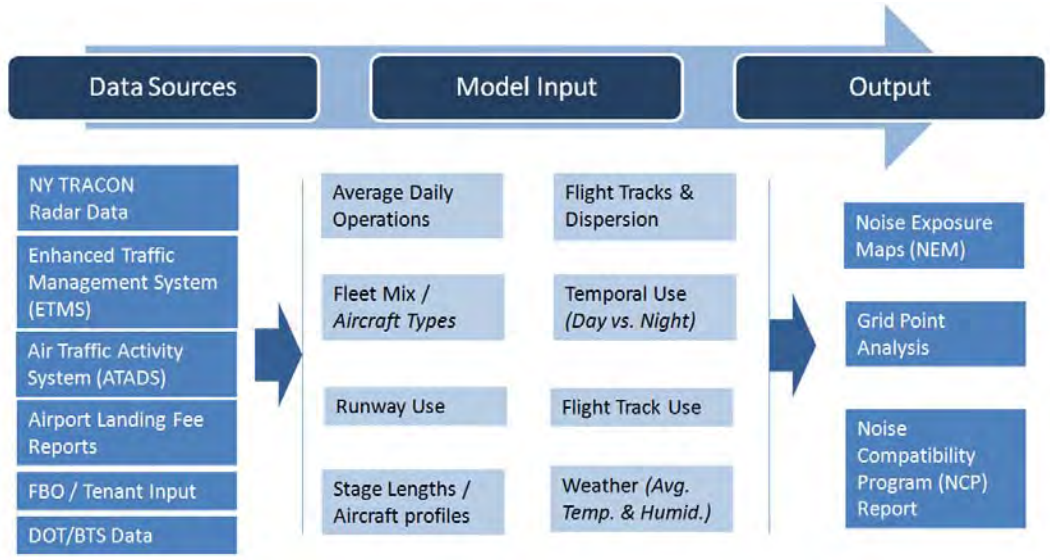



**Figure 1-3: HVN Data Integration and Flow Process for the Part 150 Study**

The study Technical Advisory Committee (TAC), which includes representatives from the ATCT and FBO, was active in providing data and enhancing the accuracy of the study input including flight trajectories and temporal distribution of traffic activity. Furthermore, radar data from the New York (NY) Terminal Approach Control (TRACON) was collected and analyzed for a sample 45-day period in the summer of 2011. The radar data sample was processed and analyzed for the purposes of deriving statistical input for the noise study, including nominal and dispersed flight tracks for both jet traffic and propeller-driven traffic. Given the distance between HVN and the Airport Surveillance Radar (ASR) operated by the NY TRACON, the radar data is constrained by the ASR's inherent line of sight limitations, requiring further coordination with ATC on flight patterns at and around the airport.

As stated and further described in section 1.2.2, the required model for FAR Part 150 analysis is the FAA's Integrated Noise Model (INM). The INM predicts the cumulative long-term noise exposure from the average annual operations of each aircraft type, on each runway, and on each three-dimensional (3D) trajectory. The latest version of the INM, version 7.0c (FAA 2007), was used to model noise exposure at Tweed-New Haven. The detailed data derived from the aforementioned collection and analysis effort was compiled into INM input consisting of airfield configuration, average temperature and humidity, flight track locations, aircraft fleet mix, aircraft climb and descent profiles, runway utilization, and number of daily operations (day/night). FAR Part 150 regulations require the use of an average annual day (AAD) condition, meaning that the analysis input has to take into account all aircraft that operate at the airport in a 365-day period, the runways and flight paths utilized, the profiles flown, and the time of day of the operations to predict average daily noise exposure. The latter is assessed using the Day-Night Average Sound Level (DNL) metric as described in Section 1.2.1.3.

*Intentionally left blank*

SECTION 2

# Tweed-New Haven Facilities and Activity

This section discusses the airport and its vicinity and provides information about Tweed-New Haven facilities, aviation users, and procedures. Section 2.1 provides geographical context for the study area, Section 2.2 describes the airport tenants, Section 2.3 provides details regarding airport airside facilities, Section 2.4 describes airspace procedures, and Section 2.5 provides a summary of aviation activity at the airport.

## 2.1 Airport Location and Vicinity

The detailed study area identified for the purpose of this Part 150 is shown in **Figure 2-1**. This study area concentrates on areas surrounding the airport experiencing aircraft noise exposure and includes New Haven to the west of the airfield and East Haven to the east of the airfield. The detailed study area characterizes the land uses and facilities surrounding the airport for the purpose of identifying significant noise impacts from aircraft operations. Land use data, as well as other data including roads, building footprints, and parcel boundaries were received from both the Connecticut GIS database and the City of New Haven Planning Department.

Land uses surrounding the airport are varied. Directly to the north, west, and south of the airfield, areas in New Haven are comprised of mostly of residential development with a few small areas of commercial areas. Lighthouse Park is located to the southwest of the airport and Fort Hale Park is to the west. On the East Haven side of the airport, there is a large industrial area directly off the airport boundary to the southeast of the airfield, west of Silver Sands Road. There is a smaller industrial complex northeast of the airport boundary and south of Dodge Avenue. There are residential communities located directly off the airport property between the two industrial areas.

Only one noise-sensitive facility exists within the airport noise environs. There are two schools that rent out a facility within the industrial complex northeast of the airport boundary on Dodge Avenue. The address of the facility is 290 Dodge Avenue in East Haven and the two schools are East Haven Adult Education and Shoreline Clinical Day School.

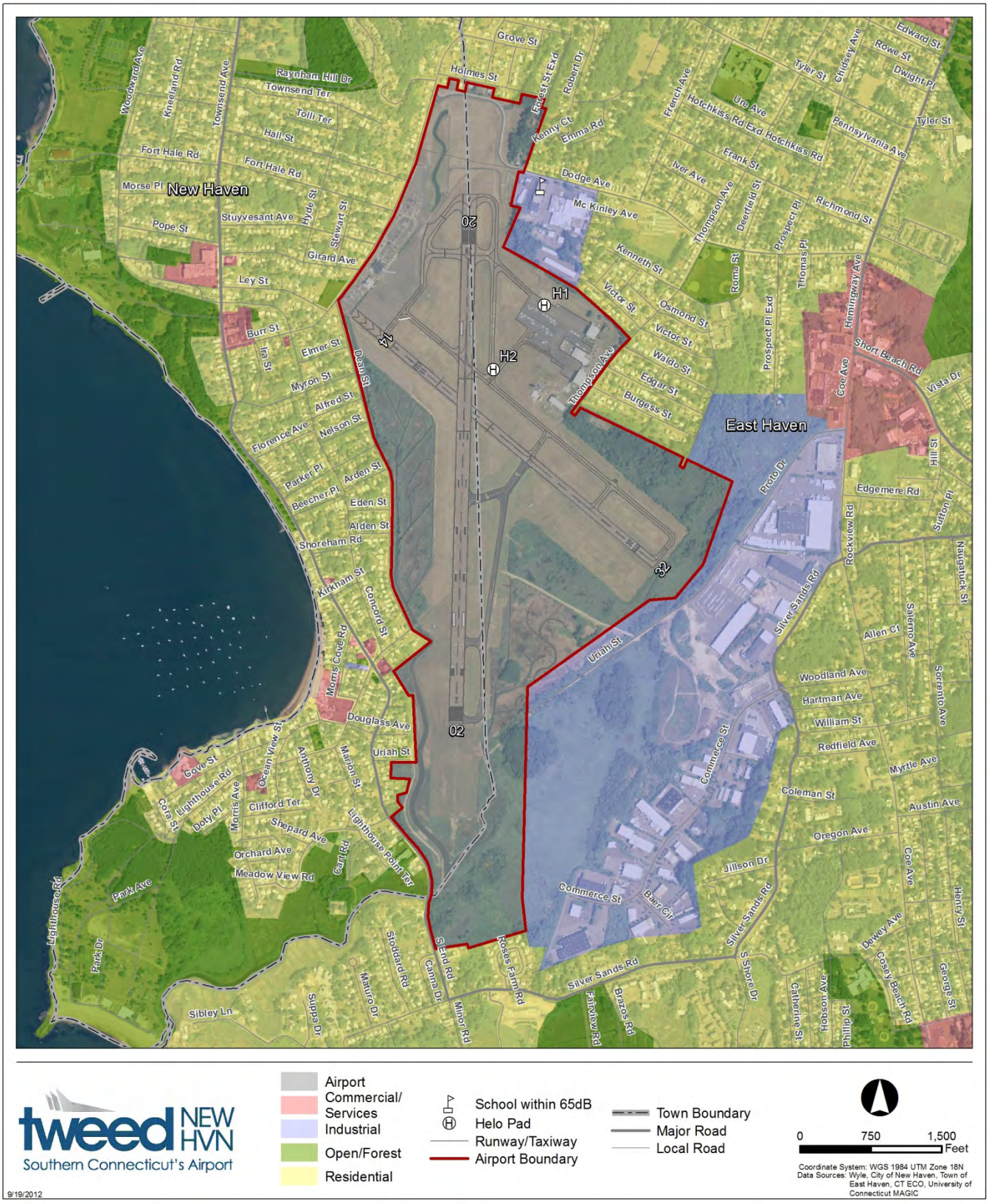



**Figure 2-1: HVN Part 150 Detailed Study Area depicting Land Use Areas**

## 2.2 Airport Users and Tenants

Tweed-New Haven Regional Airport is classified by the FAA National Plan of Integrated Airport Systems (NPIAS) as a non-hub primary airport. HVN serves General Aviation (GA) aircraft consisting of small single and twin engine propeller-driven aircraft and business jets. Various GA operators use the airport in a transient mode for refueling, aircraft maintenance, flight instruction, and private charter operations.

The airport is home to scheduled air carrier operations conducted by U.S. Airways using a Dash 8-100 aircraft that provides commercial service to and from Philadelphia International Airport four times a day (four departures and four arrivals on average per day).

The Fixed-Based operator (FBO) at the airport is Robinson Aviation LLC, which has been providing aviation services there since 1987. Robinson Aviation is a full-service FBO offering various aviation services including flight instruction, aircraft maintenance, aircraft fueling, aircraft rentals, and aircraft charters. The FBO maintains several Piper PA-28 aircraft, including Piper Warrior II and Piper Arrow II aircraft, for both rental and flight instruction. The Piper PA-28 aircraft is a single-engine propeller-driven aircraft designed and built by Piper Aircraft for General Aviation activity including flight training, air taxi, and personal use. Robinson Aviation also maintains a Flight Simulator used for flight instruction and Pilot Certification

## 2.3 Airport Facilities

### 2.3.1 Air Traffic Control Tower (ATCT)

The airport Air Traffic Control Tower (ATCT) is an FAA contract facility which is staffed daily between the hours of 6:00 a.m. and 10:00 p.m. The air traffic control tower, located at 155 Burr Street, south of the terminal building and shown on **Figure 2-2**, is responsible for the movement of aircraft on and around the immediate airport. The HVN air traffic control tower is operated by a private contractor that adheres to all rules and regulations set forth by the Federal government. There are currently 250 towers in the FAA Contract Tower Program across 46 States and four U.S. Territories. The U.S. Inspector General testified on 18 July 2012 before the Committee on Transportation and Infrastructure, Subcommittee on Aviation, of the U.S. House of Representatives that "contract towers continue to provide safe air traffic services and are strongly supported by users."[2]

### 2.3.2 Navigation Aids

A navigation aid is generally described as any ground-based facility with the primary purpose of providing navigational guidance to aircraft. This includes facilities associated with radio direction finding and signaling. The FAA operates and maintains air navigation facilities under statutory authority and also prescribes standards for their operation by pilots and aviation users. HVN has, and is in range of, several systems to aid aircraft flying in and out of the airport, as well as in its vicinity, during different weather conditions.

*Very-High Frequency Omni-directional Range (VOR)*

A Very-High Frequency Omni-directional Range, or VOR, provides omni-directional information to a suitably equipped aircraft. A VOR can be collocated with distance measuring equipment, or DME, as is the case at HVN. While the VOR provides a radial from which a pilot can determine a heading as the aircraft is flown toward or away from the VOR, the DME provides a means of measuring the distance between the VOR/DME and the aircraft. The VOR/DME at HVN is located on the airfield.

[2] Department of Transportation (2012). Inspector General: Update on the Safety and Cost Aspects of the Federal Aviation Administration's Contract Tower Program.

### *Nondirectional Radio Beacon (NDB)*

A Nondirectional Radio Beacon, or NDB, is a low to medium frequency radio beacon which transmits non-directional signals from a fixed point on the ground. With suitable navigation equipment, an aircraft can tune in to a specific frequency within range of the NDB to receive bearing, or 'homing', information to the reference station. The closest NDB facility is located approximately 12 miles northwest of HVN.

### *Instrument Landing System*

An Instrument Landing System (ILS) assists in a precision instrument approach procedure by providing both vertical and horizontal guidance to an aircraft. An ILS consists of a localizer transmitter, a glideslope indicator, an outer marker, and an approach lighting system. An aircraft must be equipped with suitable equipment to utilize the ILS. ILS approaches are rated by category, from I to III, denoting the systems navigation precision and fidelity. The varied categories reference the capabilities of the ground equipment, with CAT I being the least accurate. Runway 02 is equipped with a CAT I ILS, which allows equipped aircraft to utilize the runway for precision approaches.

### 2.3.3 Runways

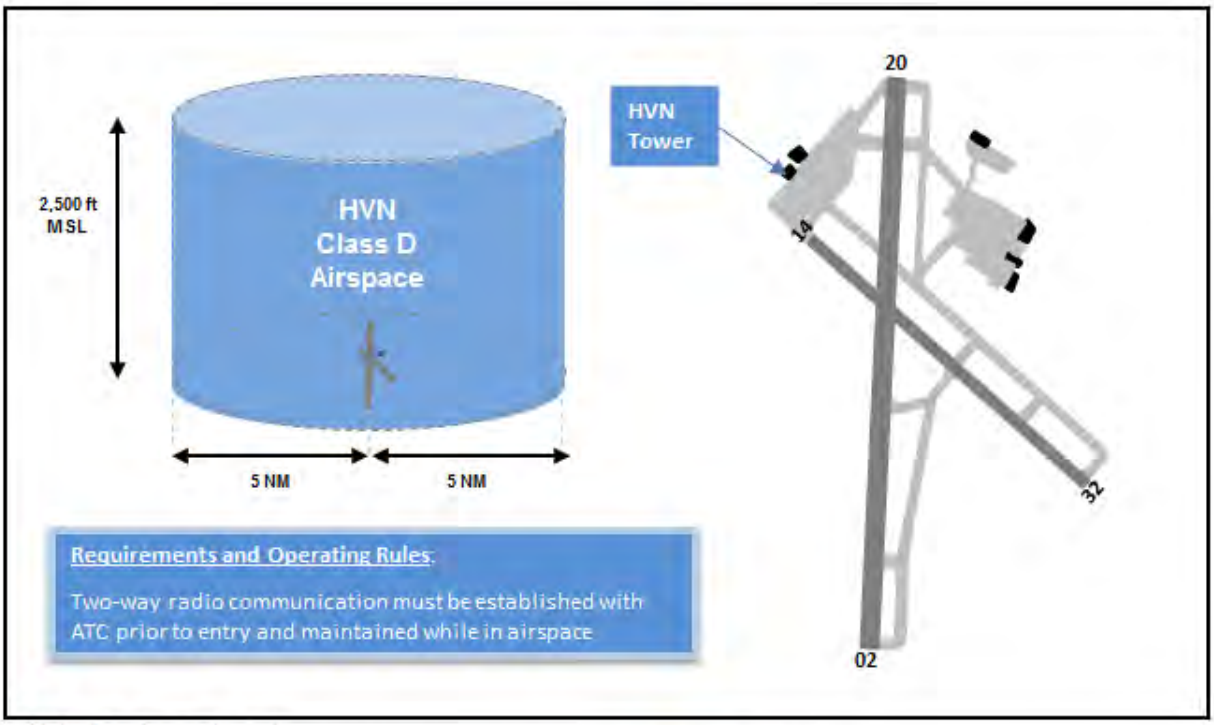
HVN has two runways, Runway 02-20 and Runway 14-32. Runway 02-20, which serves as the primary runway at the airport, is 5,600 feet long and 150 feet wide. Runway 14-32, is 3,626 feet long and has a width of 100 feet. Runway 20 end has a displaced threshold of 352 feet, while the displaced threshold of runway 14 is 361 feet and that of runway 32 is 300 feet. A displaced threshold is a limited area on the runway that can be used for take-off, but not for landing. At HVN, displaced thresholds allow aircraft clearance over trees and obstructions on landing. They also bring aircraft on a higher descent slope outside the boundary of the airport. **Figure 2-1** shows the locations of the runways in relation to the surrounding areas of New Haven and East Haven.

As previously mentioned, Runway 02 is equipped with ILS, which allows pilots to perform precision instrument approaches with vertical guidance at the airport. Runway 02 is also equipped with a Medium Intensity Approach lighting system (MALSF) with runway alignment indicator lights, consisting of a series of light bars extending from the centerline of the runway. Runway 20 is equipped with a Visual Approach Slope Indicator (VASI), which is a system of lights that provides visual descent guidance to pilots on approach to the runway.

The ability of aircraft to use specific runways is dictated primarily by wind direction, but also by such factors as runway capabilities (i.e., length, approach aids, etc.), aircraft performance capabilities, and ATC traffic management constraints.

## 2.4 Airspace

Airspace within the control of the United States is classified as either controlled (classes A, B, C, D, and E) or uncontrolled (Class G), each of which has specific restrictions, requirements, and guidelines. Tweed-New Haven terminal airspace is designated as Class D airspace, which is positively controlled by an Air Traffic Control Tower (ATCT). HVN Class D airspace extends to 2,500 feet Above Mean Sea Level (MSL) and extends over a radius of 5 Nautical Miles (see **Figure 2-2**). FAA operating rules require aircraft to maintain positive radio contact with the ATCT within Class D airspace. The HVN Class D airspace is in the proximity of several airports along the Connecticut coast and across the waters into New York State. Therefore, traffic in the vicinity of HVN consists of both transient traffic enroute to/from other neighboring airports, as well as traffic to and from HVN.




*Note: Drawing not to scale*
*Source: Wyle Laboratories, 2012; FAA Aeronautical Information Manual, 2012*

**Figure 2-2: Depiction of the Airspace Surrounding HVN Airport**

### 2.4.1 General Operating Procedures

An aircraft assignment to a runway for departure or arrival depends on a number of primary factors including wind direction, runway specifications, aircraft performance limitations, and air traffic management constraints. Pilots follow instructions issued to them by air traffic controllers within controlled airspace and respond to ATC instructions for arrival and departure operations at HVN while the ATCT remains open. When the ATCT is closed pilots use radio communication to advise local traffic of their position and intentions and see and avoid other aircraft under visual flight rules. As mentioned in section 2.3.2, HVN has ground-based navigation aids that provide pilots with precision and non-precision navigational and spatial information to safely operate at HVN. Approach lighting systems, radio communication frequencies and navigation aids at HVN operate at all times at HVN.

Tweed New-Haven Regional Airport maintains several operating procedures that are published for pilot advisory in the Airport Facility Directory (AFD)[3] to promote safety and noise abatement at the airport. Pilots are advised that:

- Runway 14 is closed to jet operations and night landings.
- Runway 32 is closed to jet departures except by prior permission.
- Touch and Go operations are only permitted between 7am and 10pm Monday through Saturday and 8am to 10pm on Sunday.

[3] Airport Facility Directory (AFD) is published by the U.S. DOT and updated every 56 days. AFD information for HVN is available at http://aeronav.faa.gov/pdfs/ne_28_26JUL2012.pdf.

- Departing aircraft on runway 20 should begin turn after passing shoreline.
- Arriving aircraft should avoid close–in base legs and short approaches on Runways 14 and 20.

### 2.4.2 Instrument Departure and Arrival Procedures

Aircraft perform arrival and departure operations under both visual and instrument conditions based on weather conditions, aircraft capabilities, ground-based equipment, and air traffic control procedures in effect at the airport. HVN has one precision instrument approach to Runway 02 using ILS and three non-precision instrument approaches using the VOR and Area Navigation (RNAV). These instrument procedures along with standard departure procedures are published by the FAA in the U.S. Terminal Procedures Publication. These publications are available online, as well in print at the local FBO.

Instrument departure and arrival operations require that pilots maintain FAA certification and that aircraft are properly equipped to receive navigational guidance from ground- or satellite-based systems. They also require that pilots maintain two-way radio communication with Air Traffic Control. Precision instrument approaches provide both horizontal and vertical guidance using glide slope navigation, whereas non-precision approaches provide only horizontal or homing guidance and require pilots to cross various fixes along the approach path at specific altitudes.

## 2.5 Airport Activity

Airport operations for HVN were compiled by performing an analysis of several data sources including key FAA operational databases. The Air Traffic Activity System (ATADS) provided annual operations data by operation category; hence, identifying total annual flights performed by commercial, air taxi, GA, and military operators at HVN. The Enhanced Traffic Management System (ETMS) and HVN Landing Fee reports provided further detail on the fleet composition and temporal distribution of air traffic at HVN.

**Table 2-1** provides a summary of total annual operations at HVN by operational category (Commercial/Air Taxi, GA, and Military) from 1990 through 2011. The historical information is also further categorized in terms of itinerant and local operations. Commercial and Air Taxi operations consist of scheduled airline operations as well as unscheduled operations performed by commercial air taxi operators. Itinerant and local GA activity consists of business, recreational, and training operations including touch-and-go patterns. Finally, military operations consist of transient helicopter and fixed-wing operations.

Air traffic at HVN has experienced a steady decline over the past 20 years—a trend that is also true for other regional airports. Recent economic conditions have generally exacerbated that overall trend in recent years. Today, total air traffic at HVN is less than half the level it was in the early 1990s with the decline driven by a steady decrease in local GA operations as seen in **Figure 2-3**. HVN has also experienced a decrease in scheduled commercial air traffic with the cancellation of air service by two airlines in the last 10 years.

However, recent operations data at Tweed-New Haven shows a slight upward trend with a 6-percent increase in overall traffic in 2011 relative to the previous year, driven mainly by an increase in local General Aviation operations—a likely indication of improving demand enablers for General Aviation at the airport and overall economic conditions in the region.

**Table 2-1: Historical Operations at HVN from 1990 through 2011**

| Year | Itinerant | | | Local | | Total |
|---|---|---|---|---|---|---|
| | Air Carrier & Air Taxi | General Aviation | Military | General Aviation | Military | |
| 1990 | 8034 | 32,627 | 146 | 52,812 | 467 | **95,115** |
| 1991 | 11,206 | 31,513 | 163 | 45,503 | 912 | **90,326** |
| 1992 | 12,243 | 28,699 | 164 | 28,334 | 817 | **71,286** |
| 1993 | 11,018 | 29,852 | 186 | 30,056 | 209 | **72,350** |
| 1994 | 10,326 | 26,889 | 199 | 23,822 | 110 | **62,375** |
| 1995 | 11,819 | 29,163 | 431 | 22,375 | 112 | **64,929** |
| 1996 | 11807 | 28,484 | 303 | 28,634 | 124 | **70,381** |
| 1997 | 10132 | 30,195 | 179 | 29,272 | 170 | **70,977** |
| 1998 | 5152 | 31,753 | 180 | 24,285 | 277 | **62,676** |
| 1999 | 4769 | 27,273 | 96 | 26,582 | 298 | **60,047** |
| 2000 | 5260 | 26,874 | 72 | 29,050 | 256 | **62,541** |
| 2001 | 4581 | 24,624 | 111 | 31,420 | 326 | **62,091** |
| 2002 | 3508 | 25,850 | 231 | 34,668 | 428 | **65,714** |
| 2003 | 3705 | 22,781 | 209 | 31,443 | 567 | **59,734** |
| 2004 | 4501 | 22,752 | 192 | 36,129 | 800 | **65,403** |
| 2005 | 6137 | 22,653 | 244 | 38,240 | 819 | **69,122** |
| 2006 | 4639 | 24,172 | 706 | 27,706 | 383 | **58,635** |
| 2007 | 4483 | 24,374 | 647 | 23,048 | 137 | **53,718** |
| 2008 | 3905 | 20,268 | 155 | 22,648 | 49 | **48,054** |
| 2009 | 3096 | 18,229 | 140 | 19,493 | 346 | **42,333** |
| 2010 | 3201 | 17,831 | 265 | 14,053 | 116 | **36,487** |
| 2011 | 3367 | 17,614 | 229 | 16,305 | 81 | **38,658** |

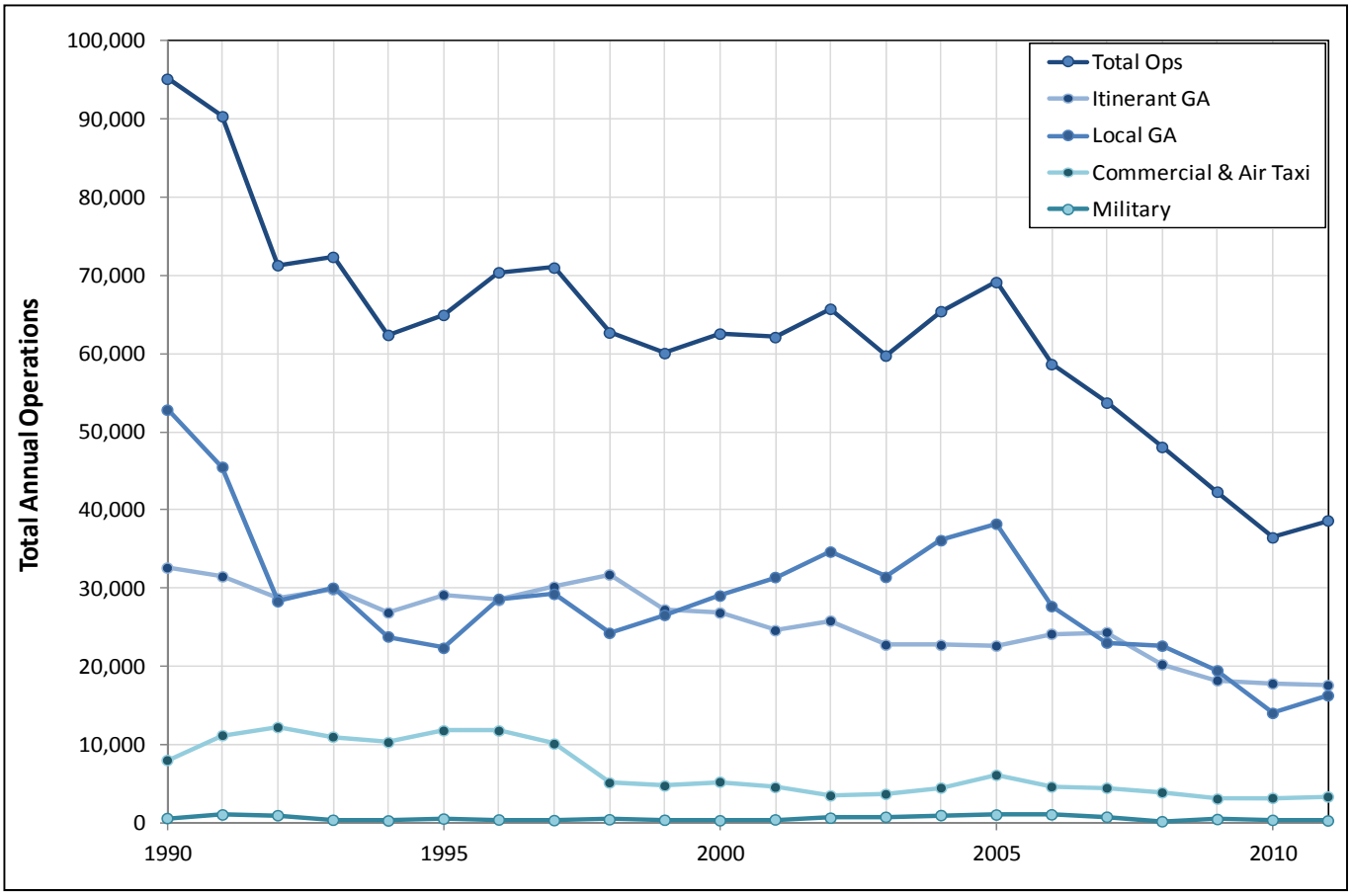



**Figure 2-3: Historical Air Traffic Activity at HVN by Operation Category**

SECTION 3

# Existing (2012) Baseline Conditions

FAR Part 150 requires the evaluation of existing conditions at an airport, which includes the existing airfield configuration, the type and frequency of operations, and an analysis of land uses surrounding the airport. At the onset of the Noise Compatibility Program Study, airport operations from the most recently available 12-month period were collected and evaluated from a variety of sources as described in the section 1.3.3.

This section documents the existing conditions noise exposure contour at Tweed-New Haven Regional Airport. Section 3.1 summarizes the modeled data representing existing CY2012 average annual conditions at HVN, whereas Section 3.2 summarizes the noise exposure results and impact analysis associated with Existing (2012) Baseline conditions. All aircraft operations and input data used to derive the noise exposure contours were modeled in accordance with FAA standards established in Order 1050.1E, Policies and Procedures for Considering Environmental Impacts (FAA, 2004); Order 5050.4B, Airport Environmental Handbook (FAA, 2006); and FAR Part 150, Airport Noise Compatibility Planning (FAR, 2012).

## 3.1 Modeled Existing Conditions

### 3.1.1 Aircraft Operations

FAA noise modeling regulations require that noise exposure be presented for an average annual day (AAD) condition. The AAD condition takes into account all aircraft that operate at the airport in a 365-day period, the runways and flight paths utilized, the profiles flown by the aircraft, and the time of day of operations to create a 'typical' average daily noise exposure.

The modeled airport operations for HVN were based on a thorough analysis of operational databases in order to derive a complete dataset of traffic at HVN representing an entire year of fleet and airport utilization data. The primary source for this process was the 2010 ETMS database, which contains air traffic data used by FAA and other agencies to assess national, regional, and local traffic volumes and trends for a variety of planning, regulatory, and decision-support analyses. Local aircraft activity not captured by ETMS was obtained from information contained in HVN Landing Fee Reports and ATADS air traffic counts obtained from active FAA databases and verified by the HVN ATCT.

The analysis process produced airport operational information by operations type, aircraft type, and time of day (Day: 7am to 10pm and Night: 10pm to 7am local time) for three primary categories of operation: Commercial/Air Taxi, General Aviation (GA), and Military. Within the GA category the data were further categorized in terms of itinerant and local operations. Commercial and Air Taxi operations were derived from ETMS data and verified using public databases available from Department of Transportation Bureau of Statistics (DOT/BTS). The operational tempo for Itinerant GA activity was derived from a combination of ETMS data, landing fee reports, and ATADS data. GA Local operations, which generally consist of training operations including touch-and-go patterns were primarily derived from ATADS, whereas military operations were derived from a combination of ETMS and ATADS inputs.

**Table 3-1** provides a summary of 2010 annual operations at HVN by operation category, aircraft category, and temporal period. These operations represent seed-year data for the analysis performed to derive Existing (CY2012) Baseline conditions at HVN.

**Table 3-1: CY2010 HVN Regional Airport Annual Operations by Operation and Aircraft Category**

| Operation Category | Aircraft Category | Day | Night | Total |
|---|---|---|---|---|
| Commercial/Air Taxi | Turboprop | 2,480 | 796 | 3,276 |
| | Jet | 870 | 76 | 946 |
| General Aviation | Prop | 26,348 | 468 | 26,816 |
| | Turboprop | 749 | 117 | 866 |
| | Jet | 2,361 | 219 | 2,580 |
| | Helicopter | 1,610 | 2 | 1,622 |
| Military | Prop | 44 | 36 | 80 |
| | Turboprop | 58 | 5 | 63 |
| | Jet | 43 | 33 | 76 |
| | Helicopter | 162 | 0 | 162 |
| TOTAL | | 34,735 | 1,752 | 36,487 |

As shown in **Figure 3-1**, airport operations at HVN are dominated by GA propeller-driven aircraft, consisting of more than 80 percent of all airport operations, while an additional 7 percent are conducted by GA business jets. Furthermore, approximately 9 percent of all operations at the airport are conducted by commercial and Air Taxi operators, including regularly scheduled flights performed by US Airways between HVN and Philadelphia International Airport (PHL) and occasional charter operations, under FAR Part 135, performed by air taxi operators using small jet and turboprop aircraft. Finally, about 1.4 percent of all operations at HVN are conducted by military aircraft including Coast Guard Helicopters and other military jet and propeller-driven aircraft.

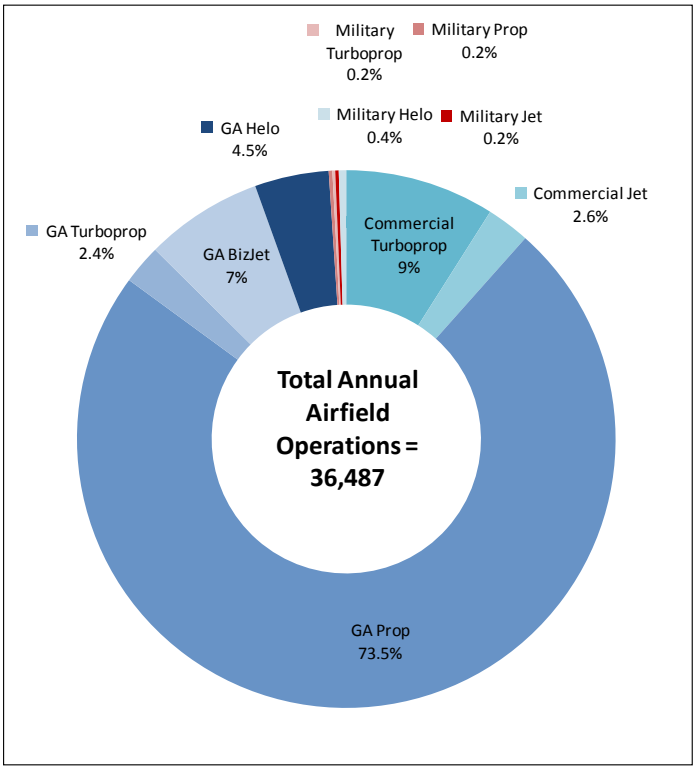



**Figure 3-1: HVN Regional Airport Operations by Operation and Aircraft Category**

The FAA requires that the Existing Baseline scenario for the study reflect annual conditions for the Calendar Year (CY) during which the study and its associated NCP is submitted for review and approval. As such, the Existing Baseline conditions for the HVN FAR Part 150 study reflect Calendar Year (CY) 2012 operational conditions at the airport. In order to develop operational data for Existing (CY2012) Baseline condition, seed data from calendar years 2010 and 2011 were analyzed and projected into CY 2012 conditions by performing a trend analysis. **Table 3-2** provides the total number of airport operations performed at HVN in 2010 and 2011, as well as the total modeled for Existing (2012) Baseline conditions, which is 41,142, of which 36,090, or 88%, are GA aircraft operations.

**Table 3-2: Total Operations for Seed Years (CY2010 and CY2011) and Existing (2012) Baseline**

| Operation Category | 2010 | 2011 | 2012* |
|---|---|---|---|
| Commercial/Air Taxi | 4,222 | 4,429 | 4,646 |
| General Aviation | 31,884 | 33,919 | 36,090 |
| Military | 381 | 310 | 406 |
| **Total** | **36,487** | **38,658** | **41,142** |

* Projected levels

### 3.1.2 Fleet Mix

The aircraft fleet mix refers to the different types of aircraft that operate at an airport. Some aircraft types are common users at an airport, and may be based at the airport, while other aircraft may only utilize an airport for maintenance, refueling, or occasional passenger transport. Aircraft are typically categorized based on type, size and operation. Due to the predominance of GA operations at HVN, a wide variety of small propeller-driven and business jet aircraft operate in and out of the airport. Commercial airline operations are conducted by a single aircraft type, the Dash 8 aircraft[4], operated by Piedmont for US Airways. **Figure 3-2** provides a summary of aircraft operation by type or category.

Development of the fleet mix for modeling in INM relied on the same databases used to develop the airport reference operational input data. Each input database provided different levels of fleet detail and required ad-hoc data development processes. Following the compilation of fleet mix data, study input was matched to INM aircraft databases and FAA-approved substitutions in the INM databases.

[4] US Airways aircraft variants operating at HVN include Dash 8-100 and Dash 8-300.

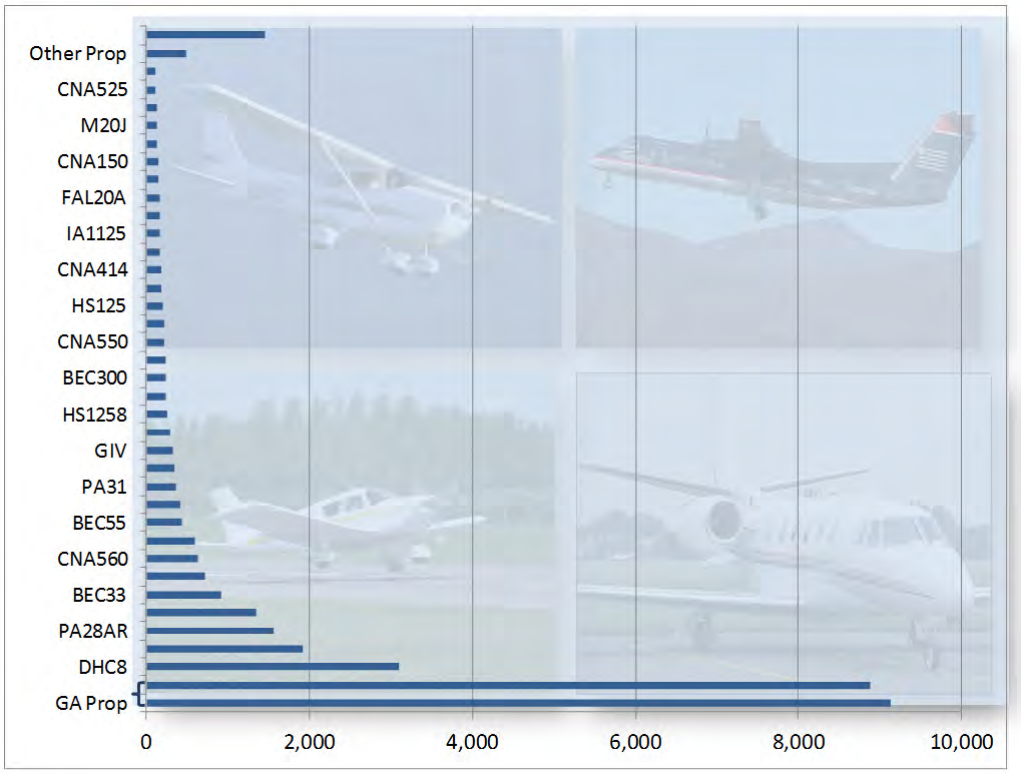



**Figure 3-2: Fleet Mix Distribution of aircraft operations at HVN**

### 3.1.3 Runway Utilization

Airport runway utilization is primarily a factor of wind and weather conditions, but also others factors including aircraft performance capabilities, runway specifications, and air traffic management requirements and constraints. Aircraft land and take off into the wind, which determines runway orientation for the pilot and Air Traffic Control. Runway assignment then can be determined based on various factors including the length of available runway, the types of navigational aids available for guidance, the destination or origin of the flight, the location of ground based facilities including a terminal or parking apron, and any closures or construction on the airfield. Runway utilization is a key input in the analysis and modeling of noise exposure contours at an airport.

To develop a strong basis for defining runways utilization at the airport, an analysis of wind data for the whole year of 2010 was performed and the input coordinated with HVN ATCT to ensure inclusion of operational and air traffic management procedures in the modeled runway use data. A full dataset of weather data was obtained from the National Oceanic and Atmospheric Administration (NOAA)[5]. The annual data provided wind speed and direction every six minutes throughout the year; which was compiled into hourly averages for the analysis. The wind direction data was analyzed by time of day in order to derive input for runway use during day (7:00am – 10:00pm) and night (10:00pm – 7:00am) periods. The annual average wind direction distribution resulting from this analysis is summarized in **Figure 3-3**. As shown, the highest proportion of winds at HVN originates from Northerly headings (bearings of 350 to 050 degrees); hence, generally promoting northbound runway traffic.

The input derived from the wind analysis was correlated to operational data, ATC input and procedural restrictions at the airport, as described in section 2.4. The input for runway utilization was analyzed by aircraft category. Based on airfield procedures, jet aircraft and large turboprop aircraft use Runway 02-20

[5] Data obtained from NOAA Weather Station, NWHC3, in New Haven, CT.

and seldom use Runway 14-32, whereas small propeller-driven aircraft can use either Runway 02-20 or Runway 14-32.

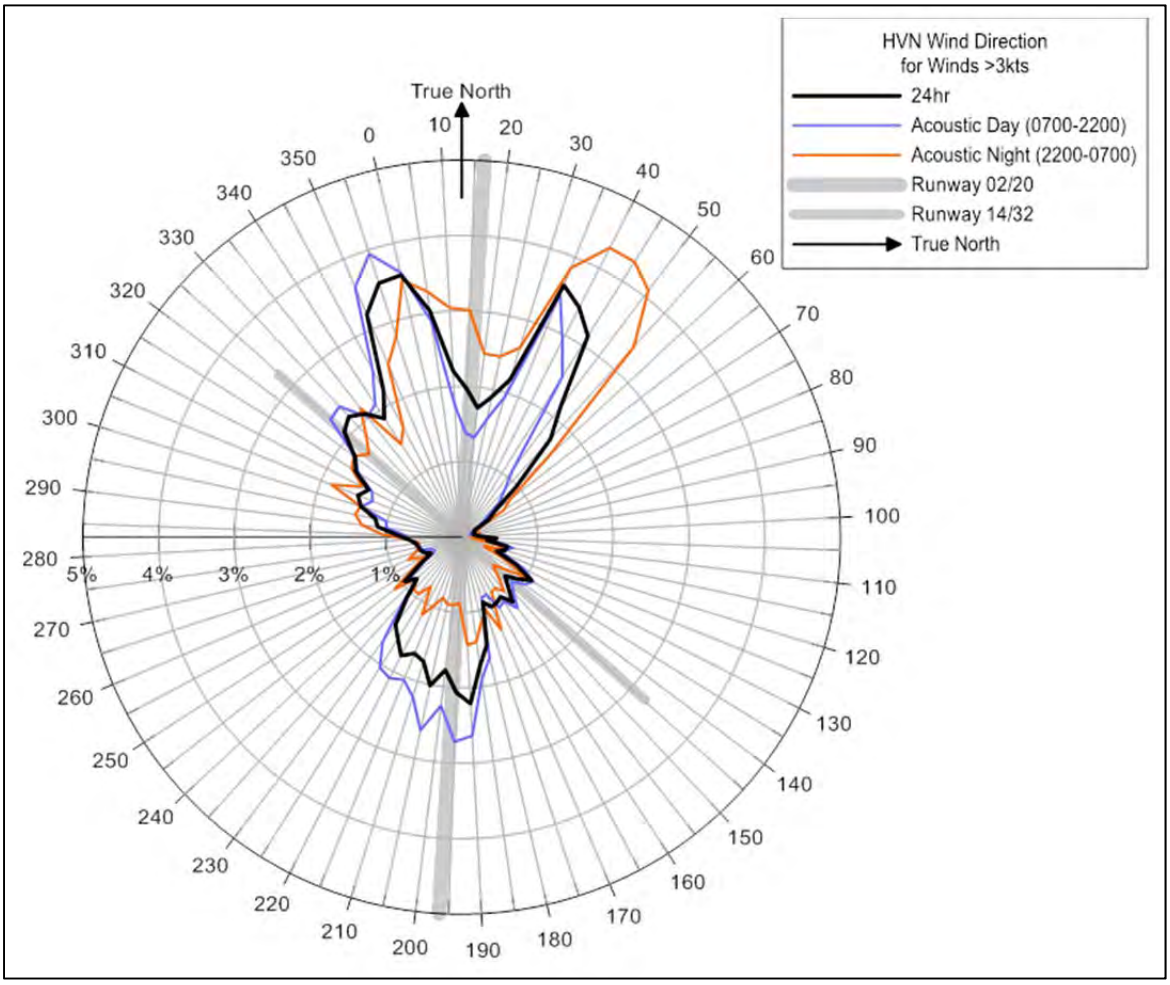



**Figure 3-3: Analysis of Full-Year 2010 Wind-Row Data at HVN**

The study included input from HVN ATCT on preferential runways for various operational conditions and augmented the wind analysis to define the runway use data modeled for the study and presented in **Table 3-3**.

**Table 3-3: Runway Utilization Percentages by Aircraft Category**

| Aircraft Category | Runway | Arrivals | | Departures | | Closed Pattern | |
|---|---|---|---|---|---|---|---|
| | | Day | Night | Day | Night | Day | Night |
| Turboprop | **02** | 44% | 44% | 44% | 44% | 44% | 44% |
| | **20** | 46% | 46% | 46% | 46% | 46% | 46% |
| | **14** | 0% | 0% | 0% | 0% | 0% | 0% |
| | **32** | 10% | 10% | 10% | 10% | 10% | 10% |
| General Aviation Propeller | **02** | 39% | 39% | 39% | 39% | 39% | 39% |
| | **20** | 33% | 33% | 33% | 33% | 33% | 33% |
| | **14** | 9% | 9% | 9% | 9% | 9% | 9% |
| | **32** | 19% | 19% | 19% | 19% | 19% | 19% |
| Jet | **02** | 44% | 44% | 44% | 44% | N/A | N/A |
| | **20** | 56% | 56% | 56% | 56% | N/A | N/A |
| | **14** | 0% | 0% | 0% | 0% | N/A | N/A |
| | **32** | 0% | 0% | 0% | 0% | N/A | N/A |

### 3.1.4 Flight Track Utilization

Flight track utilization refers to how flight paths (also referred to as ground paths) are used by aircraft to operate in and out of the airport. Noise modeling takes into account individual flight tracks flown by different aircraft types when performing arrival, departure and closed pattern operations at HVN. In order to define nominal and dispersed flight tracks for HVN, radar data was collected from the NY TRACON for a sample period of 45 days during the summer of 2011 (July to August). Input on flight trajectories was also received from HVN ATCT and airport tenants to take into account local operating procedures, as well as published Instrument Arrival and Departure Procedures in effect at the airport.

**Figures 3-4 through 3-6** show all the arrival, departure, and closed-pattern (touch and go) tracks at HVN derived from both radar analysis and HVN ATCT data. These figures also show land use data and focus in on the impacted communities closest to the airport. **Figures 3-7** through **3-22** provide more detailed illustrations of the nominal and dispersed flight tracks. They represent the average annual trajectories for both jet and propeller-driven aircraft modeled in INM to produce average annual noise exposure contours resulting from aircraft operations at HVN. The flight track illustrations are presented for arrival, departure, and closed-pattern (touch and go) operations with jet and propeller tracks listed separately. **Figures 3-7** through **3-22** also provide flight track utilization for each runway, operation type, and aircraft category.

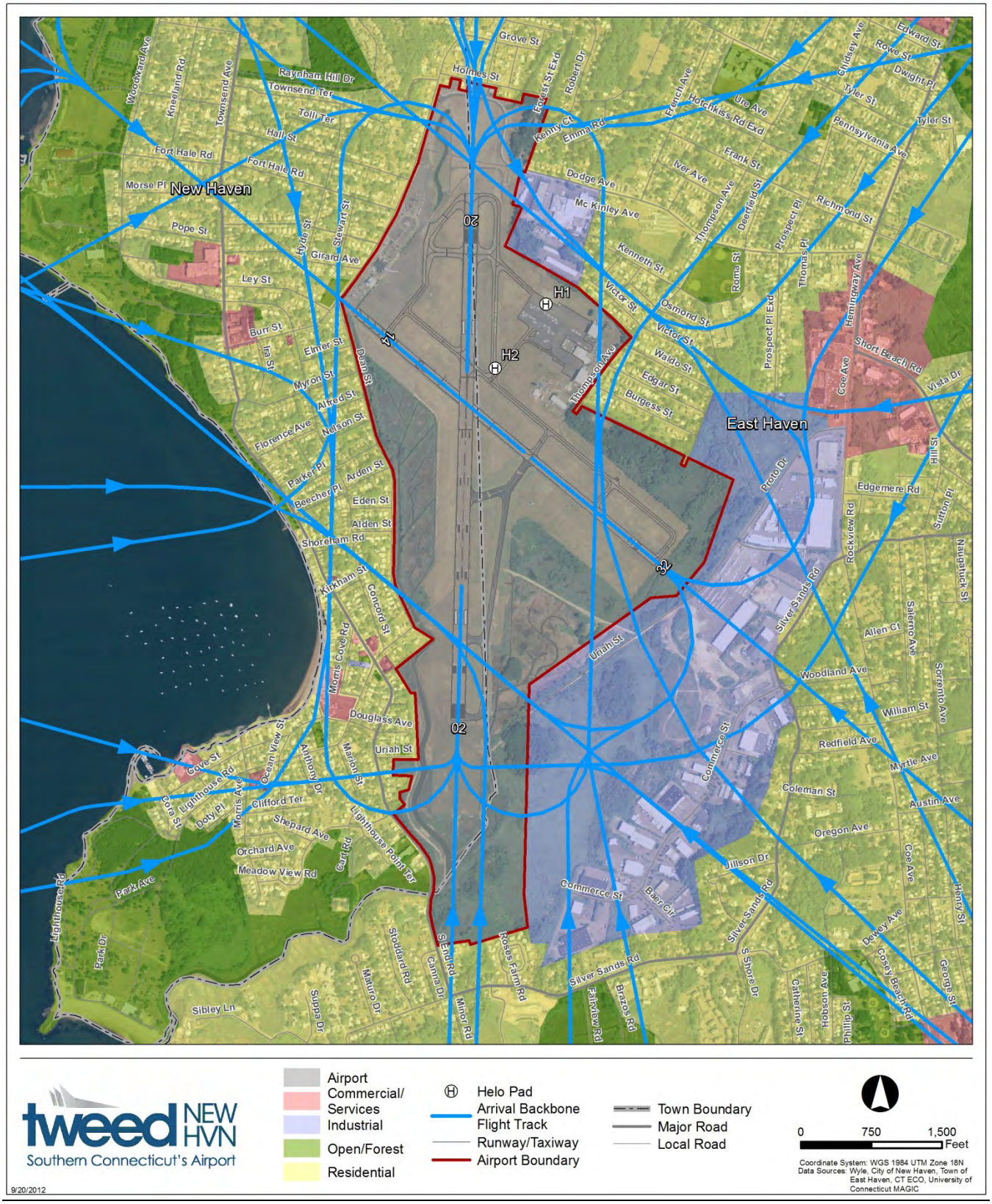



**Figure 3-4: Arrival Flight Tracks of all Aircraft Categories and to all Runways**

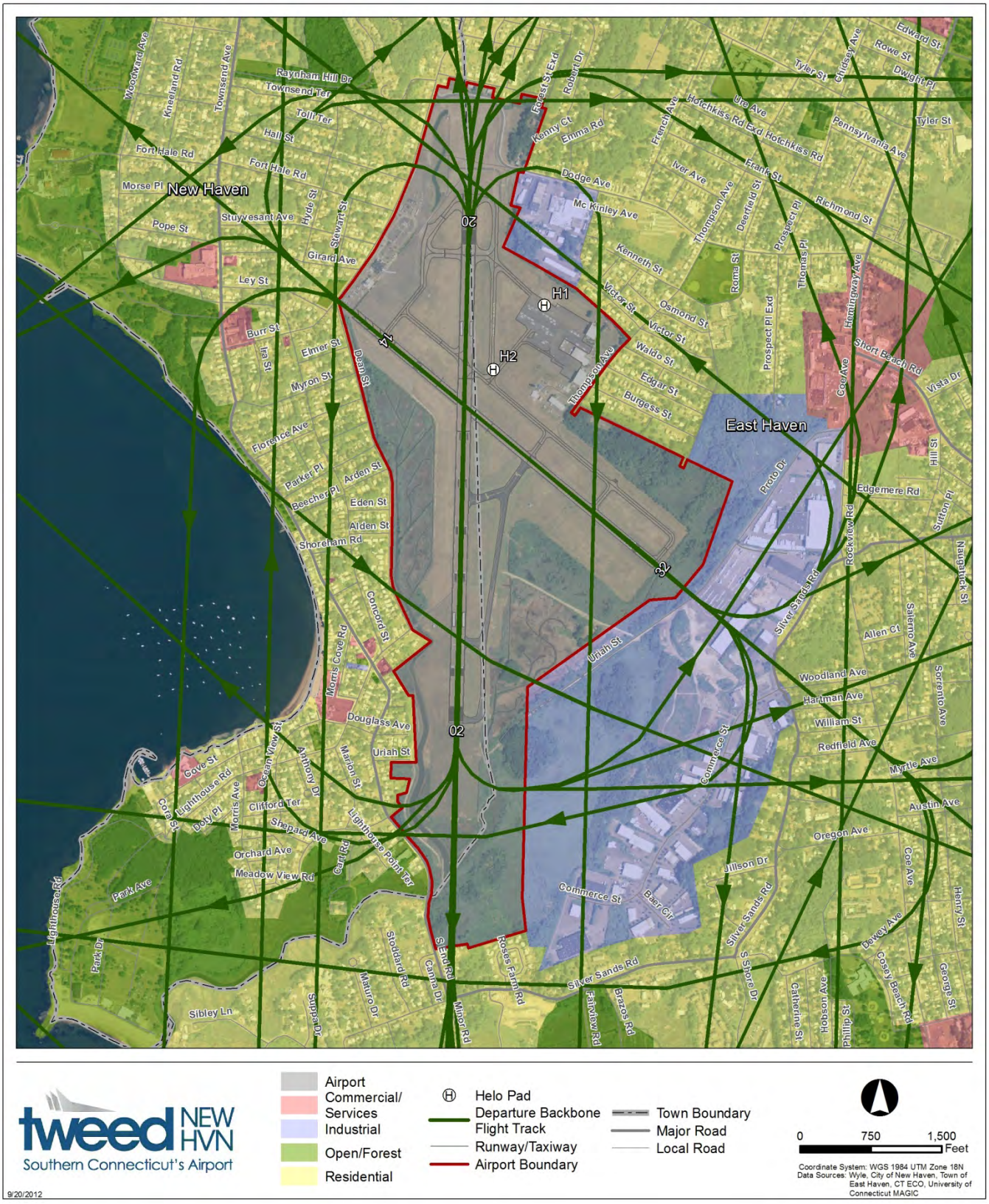



**Figure 3-5: Departure Flight Tracks of all Aircraft Categories and from all Runways**

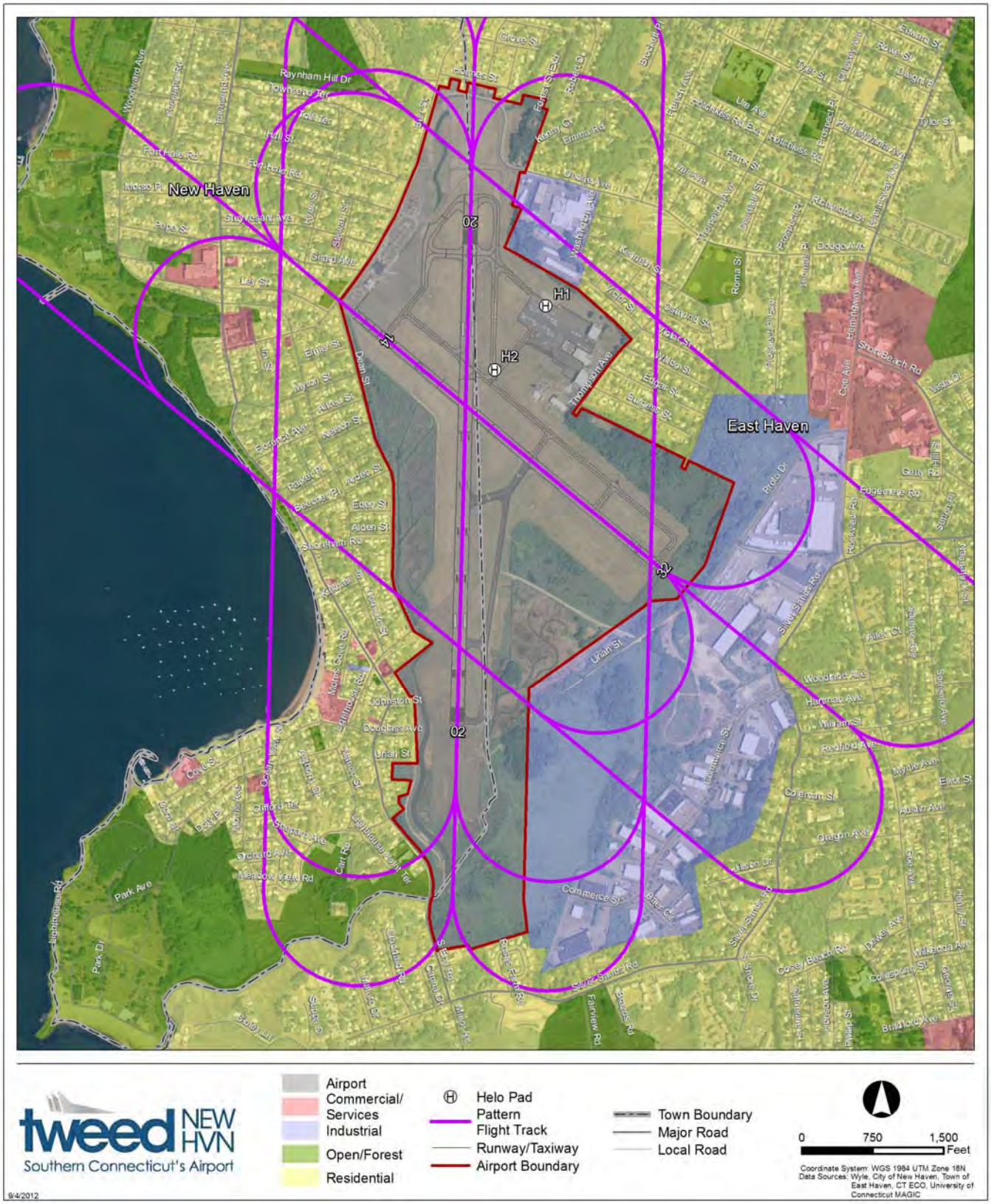



**Figure 3-6: Closed Pattern (Touch and Go) Flight Tracks of all Aircraft Categories and from all Runways**

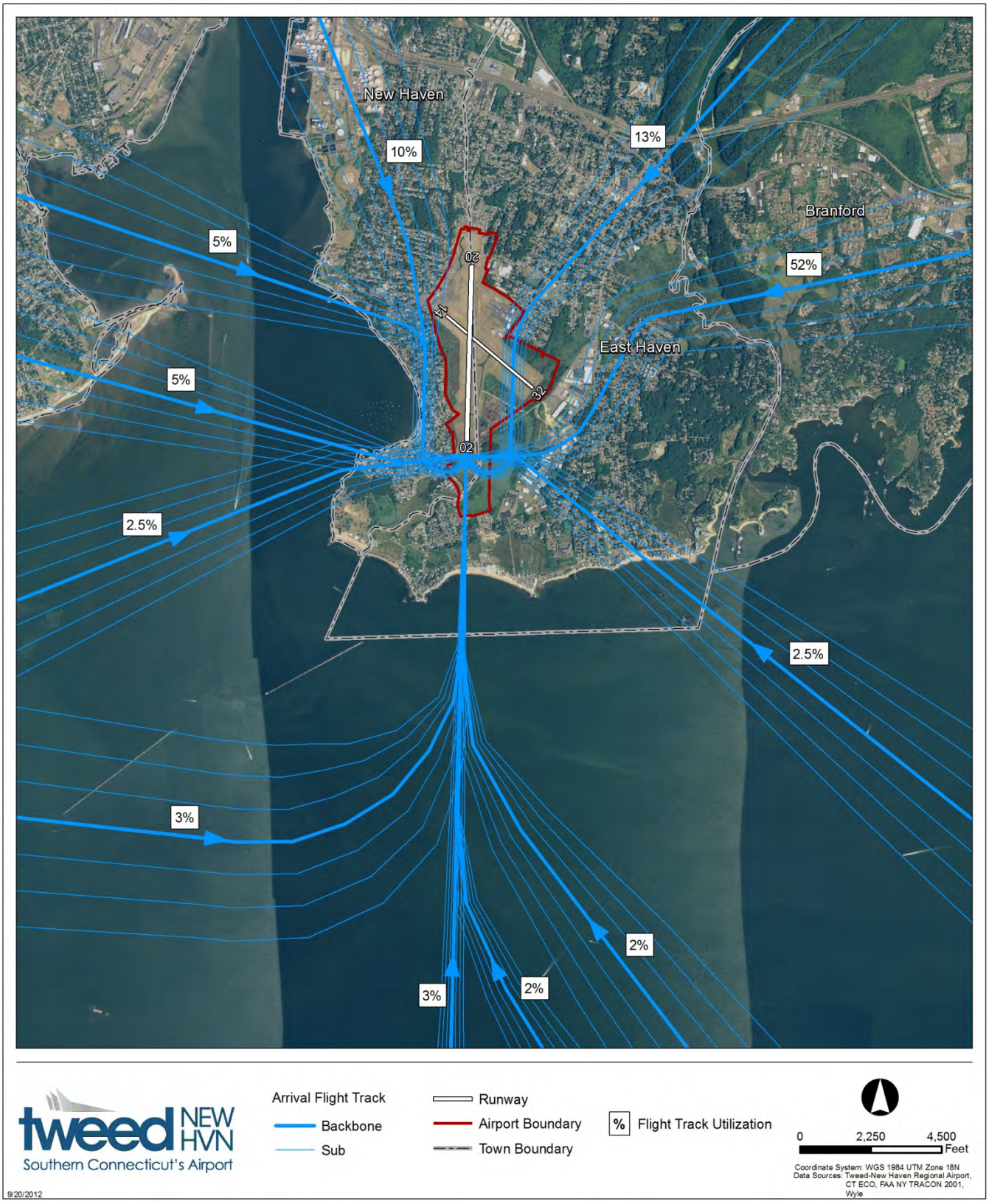



**Figure 3-7: Arrival Flight Tracks for Propeller-Driven Aircraft on HVN Runway 02**


**Figure 3-8: Arrival Flight Tracks for Propeller-Driven Aircraft on HVN Runway 20**


**Figure 3-9: Arrival Flight Tracks for Propeller-Driven Aircraft on HVN Runway 14**


**Figure 3-10: Arrival Flight Tracks for Propeller-Driven Aircraft on HVN Runway 32**


**Figure 3-11: Arrival Flight Tracks for Jet Aircraft on HVN Runway 02**


**Figure 3-12: Arrival Flight Tracks for Jet Aircraft on HVN Runway 20**


**Figure 3-13: Departure Flight Tracks for Propeller-Driven Aircraft on HVN Runway 02**

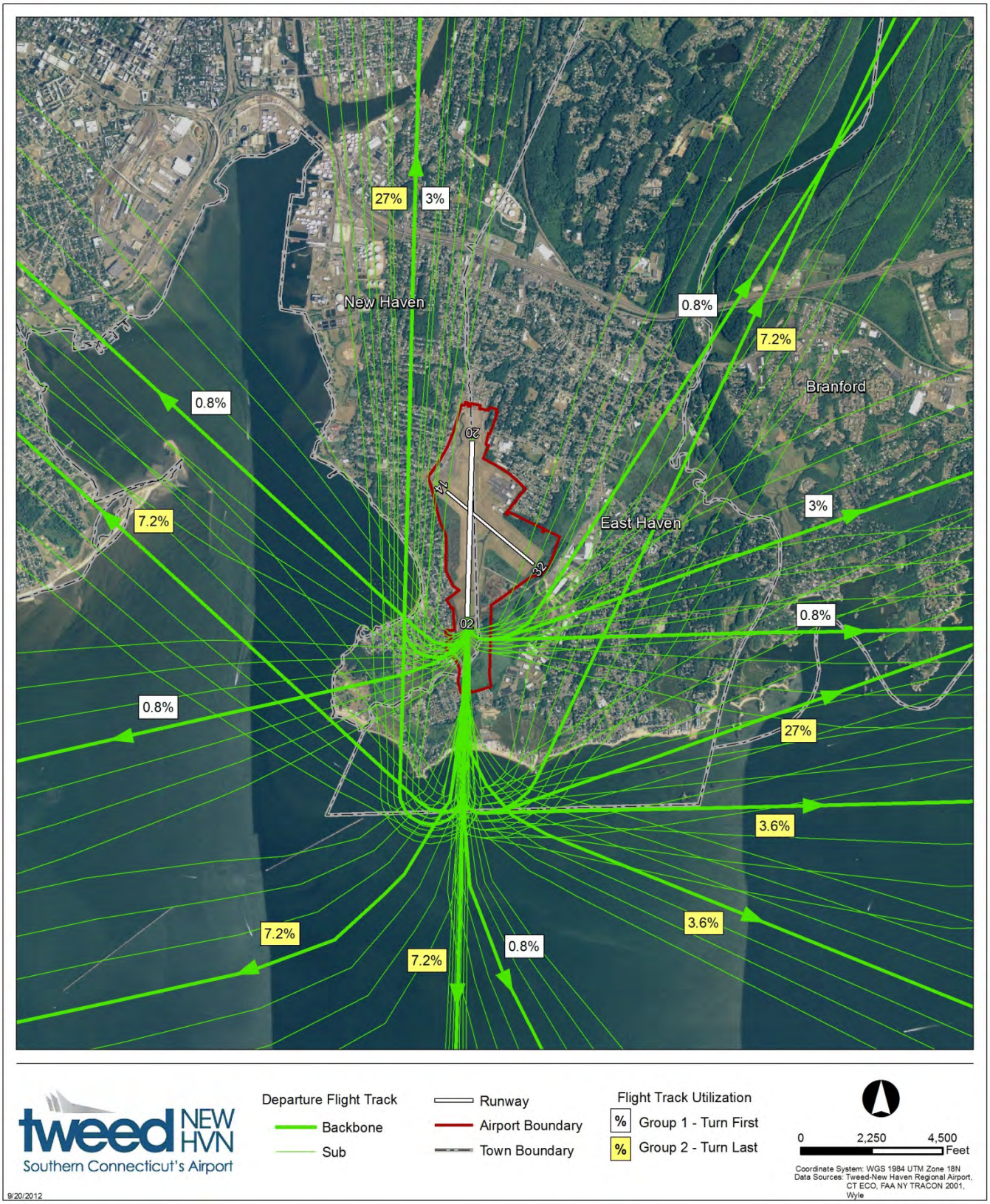



**Figure 3-14: Departure Flight Tracks for Propeller-Driven Aircraft on HVN Runway 20**


**Figure 3-15: Departure Flight Tracks for Propeller-Driven Aircraft on HVN Runway 14**


**Figure 3-16: Departure Flight Tracks for Propeller-Driven Aircraft on HVN Runway 32**


**Figure 3-17: Departure Flight Tracks for Jet Aircraft on HVN Runway 02**


**Figure 3-18: Departure Flight Tracks for Jet Aircraft on HVN Runway 20**

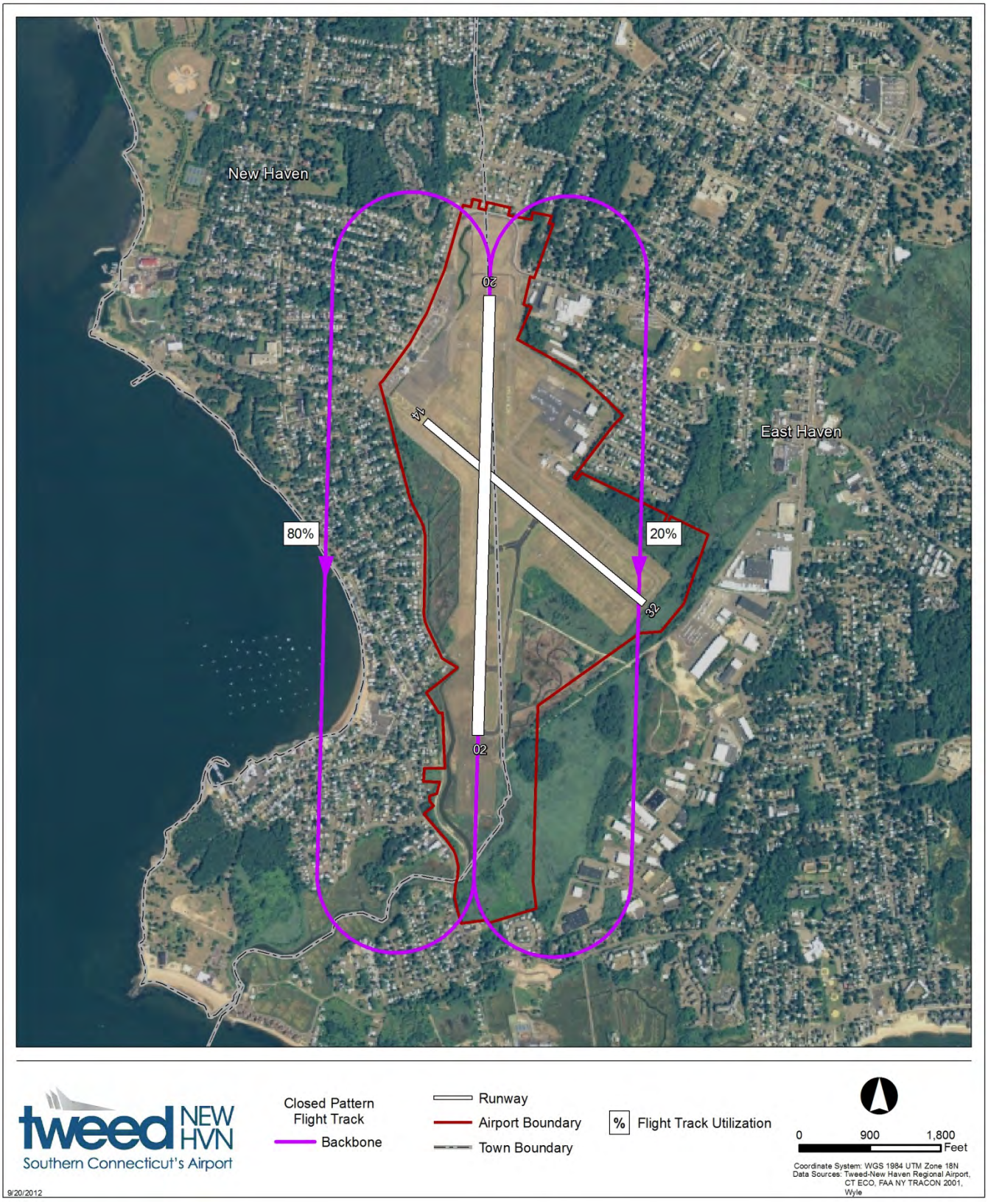



**Figure 3-19: Closed Pattern (Touch & Go) Flight Tracks on HVN Runway 02**


**Figure 3-20: Closed Pattern (Touch & Go) Flight Tracks on HVN Runway 20**


**Figure 3-21: Closed Pattern (Touch & Go) Flight Tracks on HVN Runway 14**


**Figure 3-22: Closed Pattern (Touch & Go) Flight Tracks on HVN Runway 32**

### 3.1.5 Flight Profiles

While a flight track refers to a representation of the aircraft position as projected on the ground, the flight profile is a representation of an aircraft's performance along that flight track, accounting for altitude, thrust, and speed. The INM takes all of these factors into account for each flight trajectory and aircraft type to model noise exposure from individual events and produce the cumulative DNL results for average annual conditions. INM flight profiles for each aircraft type and flight track at HVN were modeled for the Existing (2012) Baseline Condition.

### 3.1.6 Ground Run-Up Operations

Aircraft perform ground operations on airfield ramp areas for pre-flight, shutdown, and maintenance operations. These ground activities, referred in this study as run-up operations, vary in duration and by aircraft type. The modeled run-up operations at HVN consist of:

- Maintenance run-ups conducted by based GA aircraft at the East ramp serving the FBO
- Pre-flight run-ups performed by GA aircraft prior to departure at runway hold-short locations
- Engine start-up and shut-down operations by commercial aircraft at Terminal ramp location.

**Figure 3-23** shows the locations of all the modeled run-up operations. Engine maintenance run-ups are conducted by GA aircraft at a ramp location adjacent to the FBO facility operated by Robinson Aviation LLC. The modeled maintenance run-up operations data, including location, duration, average daily operations, as well as aircraft type, power setting, and heading are summarized in **Table 3-4**.

**Table 3-4: Maintenance Run-ups modeled for CY 2012**

| Aircraft Type | INM Aircraft Type | Run-up Location (Lat/Long) | Heading | Modeled 2012 Annual Operations | Duration | Engine Power Setting (RPM) |
|---|---|---|---|---|---|---|
| PA-34 Piper Seneca II | BEC58P | 41.267571°N, 72.883501°W | 180 degrees | 5 | 5 min | 1700 |
| PA-28-200 Piper Arrow II | GASEPV | | | 15 | 2 min | 2000 |
| PA-28-161 Piper Warrior II | PA28 | | | 75 | 2 min | 2100 |

Pre-flight run-ups are conducted at each of the four runway hold-short locations by single-engine GA aircraft for a short duration prior to departure. The number of pre-flight run-up operations performed by each single-engine GA aircraft at each runway hold-short location corresponds to the number of departures on each runway that those aircraft perform. The modeled duration of pre-flight run-ups is 30 seconds at 2,000 RPM based on user input obtained from the airport FBO.

Finally, the modeled engine start-up and shut-down operations at the terminal ramp location are performed by US Airways using the Dash-8 aircraft. Six (6) daily engine start-up and shut-down operations occur during daytime (7:00am – 10:00pm) and Two (2) during nighttime (10:00pm – 7:00am) on an annual average-day basis. Based on input from US Airway ground personnel at HVN, these ground operations have an average duration of 5 minutes at idle power.


**Figure 3-23: Maintenance, Pre-Flight, and Terminal Run-up Locations at HVN**

## 3.2 Existing Noise Exposure

Noise contours are lines that connect points of equal sound levels values predicted by the INM model and resulting from average annual operations at the airport. For instance, a 65 dB contour connects all points on the ground with a modeled DNL value of 65 dB. Generally, noise contours are depicted at 5 dB intervals starting with the noise compatibility DNL threshold of 65 dB. The FAR Part 150 Land Use Compatibility Guidelines (CFR, 2012) define noise-sensitive land-uses above a modeled DNL of 65 dB to be non-compatible with airports and noise-sensitive uses below modeled DNL of 65 dB are considered to be compatible without restrictions.

### 3.2.1 Existing Noise Exposure Contours

Following the collection, verification, and modeling of operational input data for the Existing (2012) Baseline condition, noise exposure was calculated and overlaid on a detailed land use map. Noise contours for the study area are overlaid on land use layers and aerial imagery at 5 dB contour intervals and shown on **Figures 3-24 and 3-25.**

The modeled DNL 65 dB noise exposure contour encompasses approximately 304 acres of various land use areas, or 0.475 square miles. The shape of the noise exposure contours reflect the predominant use of Runway 02/20, as the contour extends furthest from the runways along the extended centerlines of each. A majority of aircraft operations occur on Runways 02 and 20, while the number and frequency of general aviation operations on Runways 14 and 32 have a much smaller effect on the cumulative noise environment. The highest levels of modeled noise exposure (DNL 75 dB and above) remain on airport property, while the DNL 70 dB level of noise exposure just barely goes past the airport property in only a couple of locations.

Overall, approximately 90% of the area inside the modeled DNL 65 dB noise exposure contour lies on airport property, and 94% of the overall area inside the modeled DNL 65 dB noise exposure contour lies over compatible land uses. The remaining 6% impacts residential land uses. No noise sensitive facilities are located within modeled DNL levels of 70 dB or above. Noise sensitive facilities are schools, places of worship, libraries, hospitals, and care facilities. Levels of DNL 70 dB noise exposure do impact a small noise sensitive area (less than an acre) of incompatible land uses southwest of the airport, affecting only 1 home. The modeled DNL 65 dB noise exposure contour encompasses residential areas surrounding the airport, mostly in the two areas southwest and northwest of the airport, and includes approximately 69 homes. There is a noise sensitive facility located within the modeled DNL 65 dB noise exposure contour. The Shoreline Clinical Day School and East Haven Adult Education both rent out the same facility in a commercial/industrial center at 290 Dodge Ave in East Haven.

### 3.2.2 Impact Analysis for Existing Noise Exposure

Estimated population and housing units information was calculated based on data from the 2010 US Census. The population exposure was computed by proportion, which means that the population in each block was proportionally included in the count based on the percentage of each block area that fell within the noise contour. This approach assumes that the population within each block is evenly distributed over the entire census block area, which is not necessarily indicative of the actual population distribution of the census block. Additionally, the area within the airport boundary was removed from the census data to insure no population was included within the airport property. The housing counts were further refined by using the parcel data on the New Haven side of the airport. The modeled DNL 65 dB noise exposure contour includes an estimated population of approximately 165 people. **Table 3-5** lists the estimated impacts of the modeled Existing (CY2012) Baseline noise contours.

**Table 3-5: Existing (2012) Baseline Condition Land Use Impacts, Population Impacted, and Noise-Sensitive Facilities at HVN**

| Existing (2012) Baseline Noise Exposure Contour | | | | |
|---|---|---|---|---|
| **Category** | **65 - 70 DNL** | **70 - 75 DNL** | **75 + DNL** | **65+ DNL** |
| **Land Use Impacts (Acres)** | | | | |
| On-Airport | 139 | 81 | 54 | 274 |
| Open/Forest | <1 | 0 | 0 | <1 |
| Commercial | <1 | 0 | 0 | <1 |
| Industrial | 11 | <1 | 0 | 11 |
| Residential | 18 | <1 | 0 | 18 |
| Total | 168 | 82 | 54 | 304 |
| **Estimated Population** | | | | |
| Residences | 69 | 1 | 0 | 70 |
| Estimated Population* | 165 | 2 | 0 | 167 |
| **Noise-Sensitive Facilities** | | | | |
| Schools | 2 | 0 | 0 | 3 |
| Places of Worship | 0 | 0 | 0 | 0 |
| Libraries | 0 | 0 | 0 | 0 |
| Hospitals | 0 | 0 | 0 | 0 |
| Care Facilities | 0 | 0 | 0 | 0 |

Note: Population figures are derived from determining the percentage of each census block contained within each contour band.

Source: Wyle, 2012

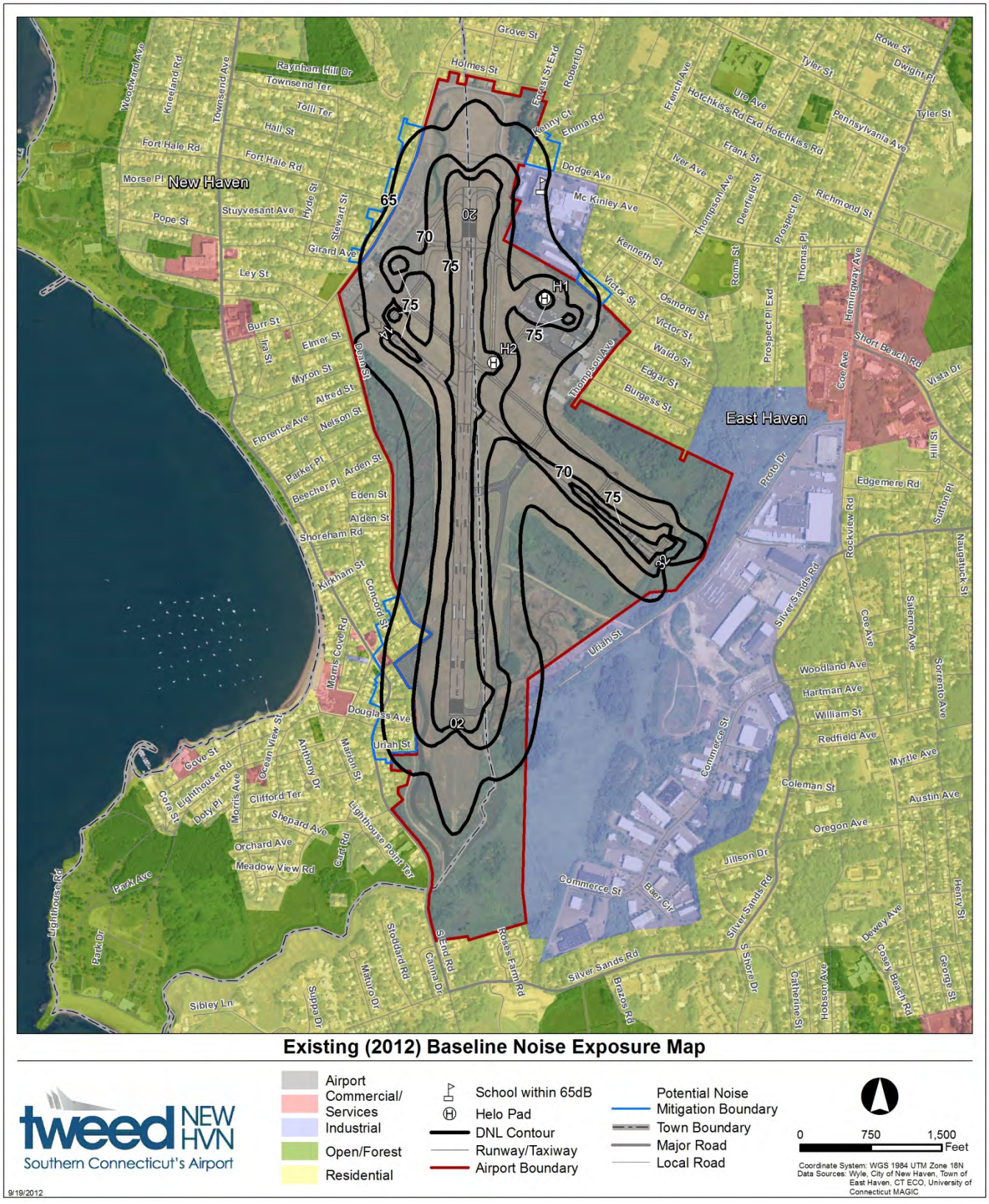



**Figure 3-24: Existing (2012) Baseline Noise Exposure DNL Contours with Land Use Areas**


**Figure 3-25: Existing (2012) Baseline Noise Exposure DNL Contours with Noise Gradients**

*Intentionally left blank*

SECTION 4

# Future (2017) Baseline Conditions

FAR Part 150 Noise compatibility guidelines require the evaluation of a five-year future forecast condition in the analysis of noise exposure at an airport. This section documents the expected future operating conditions and noise exposure patterns at HVN for the five-year Future (2017) Baseline condition. This five-year forecast condition takes into account various factors which may influence the patterns of noise exposure around the airport, such as planned air service development activities as well as expected increases in General Aviation (GA) operations as a result of improving economic conditions.

Section 1.0 outlines the forecasting methodology and noise modeling input data used for the Future (2017) Baseline Condition and provides a detailed explanation of operational projections for each input category. Section 2.0 provides information about the resulting noise exposure contours for the Future (2017) Baseline Condition and its associated impact assessment. The Future (2017) Noise Exposure Map will serve as the basis for the development of the Noise Compatibility Program.

## 4.1 Methodology

A comprehensive and integrated methodology was applied to the assessment of forecast trends in air traffic at Tweed-New Haven Regional Airport in order to develop input for noise modeling of Future (2017) Baseline airport conditions. Various operational databases from the Federal Aviation Administration (FAA), as well as other federal and state agencies were leveraged and several interviews were conducted with airport management and tenants to collect data on planned air service development activities and local air traffic projections at HVN. The data sources leveraged for this study include:

- FAA Air Traffic Activity Database System (ATADS) to perform historical traffic trend analysis (Regional and local);
- HVN Fixed-Based Operator (FBO) data to develop input for user projections of GA traffic;
- FAA Terminal Area Forecasts (TAF) for input on FAA air traffic forecast at HVN;
- General Aviation Information and Statistics from the Aircraft Owners and Pilots Association (AOPA);
- Industry Trends and aviation forecasts from FAA Administrator's 2011 Fact Book;
- Economic indicators and short-term forecasts (national, regional, and local) from U.S. Department of Commerce (DOC);
- State and local economic data from the Connecticut Economic Digest;
- Economic Impact indicators from 2011 Tweed-New Haven Regional Airport Economic Impact Statement.

**Figure 4-1** provides an overview of the overall methodology and data sources used to develop input for the noise modeling of Future (2017) Baseline HVN airport conditions. Traffic and economic trend analyses have been performed to take into account both historical information and emerging data indicating a recovery in economic and traffic conditions following recent declines following the 2008 economic crisis.

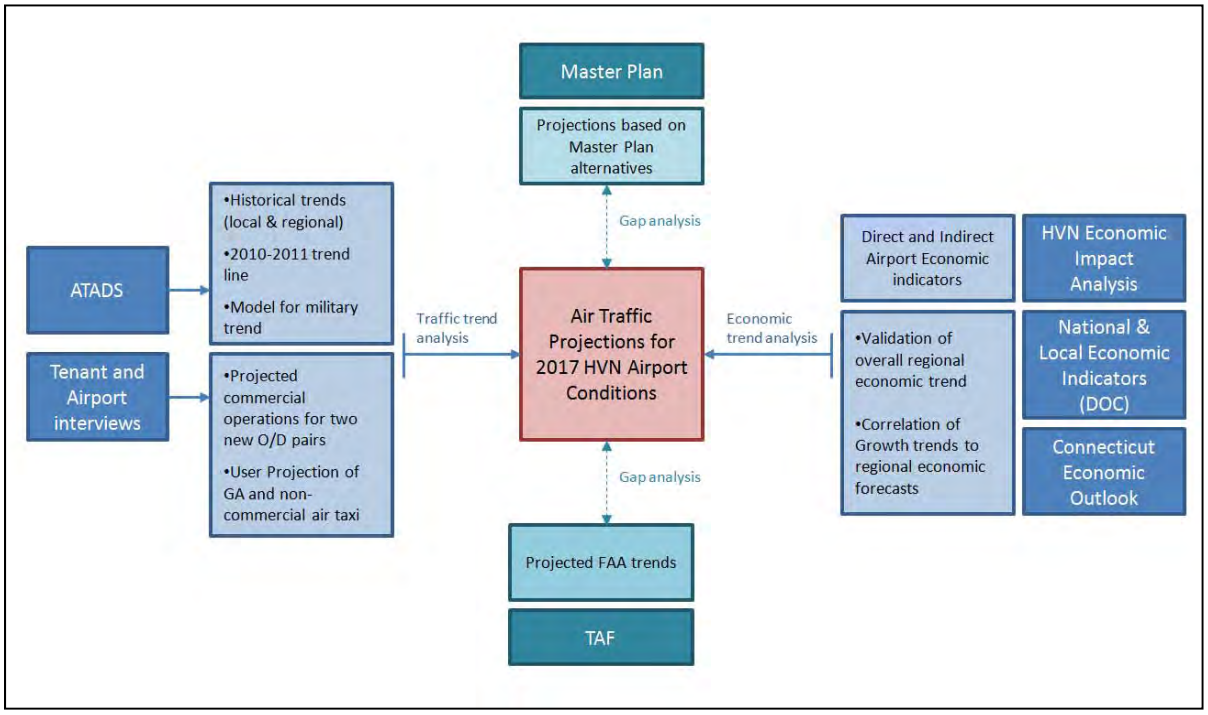



**Figure 4-1: Overview of Forecasting Methodology for HVN Future (2017) Baseline Conditions**

The study team coordinated with HVN airport and reviewed the forecasting assumptions with the study Technical Advisory Committee (TAC), which is comprised of various airport stakeholders, including the State of Connecticut Department of Transportation, Air Traffic Control Tower, and the Fixed-Base Operator.

### 4.1.1 Airport Facilities

No changes to the existing runways, taxiways, or other airport facilities which may impact noise exposure patterns are expected to occur within the FAR Part 150 Study timeframe. As such, the model parameters used in the Existing (2012) Baseline noise exposure contour were carried forward unchanged for Future (2017) Baseline conditions. The only exception is that the Runway 20 displaced threshold that was modeled for arrivals in the Existing (2012) Baseline model was removed for the Future (2017) Baseline condition, accounting for current airport activities relative to airside obstruction planning.

### 4.1.2 Aircraft Fleet Mix

Modeled changes to the Future (2017) fleet mix include the potential introduction of two regional aircraft types (Embraer EMB-120 and Embraer ERJ-170) to provide new air service to two new destinations; Washington-Dulles (IAD) and Chicago O'Hare (ORD). These potential air service development plans are currently being pursued by HVN airport and included in the forecast assumptions of this study.

| Embraer EMB-120 Turboprop |  | Embraer ERJ-170 Regional Jet |  |
|---|---|---|---|
| **Engines:** | | **Engines:** | |
| –Two (2) Pratt & Whitney PW118/A turboprops | | –Two (2) General Electric CF34-8E turbofans | |
| **Performance:** | | **Performance:** | |
| –Max cruising speed: 300kt–310kt | | –Max cruising speed: Mach 0.82 or 481kt | |
| –Service ceiling 30,000-32,000ft. | | – Service ceiling: 41,000 ft | |
| –Range: 500-550nm. | | –Standard range: 1,800 nm | |
| **Weights:** | | **Weights:** | |
| –Empty equipped: 15,655lb | | –Basic operating: 44,422lb | |
| –Max takeoff: 25,353lb | | –Standard max takeoff: 78,153lb | |
| **Dimensions** | | **Dimensions** | |
| –Wing span: 64ft 11 in | | –Wing span: 85 ft 4 in | |
| –Length: 65 ft 8 in | | –Length: 98 ft 1 in | |
| –Height: 20 ft 10 in | | –Height: 31 ft 9 in | |
| **Capacity** | | **Capacity** | |
| –Flightcrew : 2 | | –Flightcrew: 2 | |
| –Standard seating: 30 | | –Standard seating: 70 | |

Source: Adapted from Embraer at http://www.embraer.com/en-US

**Figure 4-2: Aircraft Specifications for EMB-120 and ERJ-170 Modeled for Future (2017) Baseline Conditions**

The Embraer EMB-120 Brasilia is a twin-turboprop commuter airliner with a seating capacity of 30 passengers and a range of about 1,000 nautical miles. This aircraft is comparable to the Bombardier Dash 8-100 aircraft currently operated on behalf of US Airways at HVN and providing air service to and from Philadelphia International Airport (PHL). The Embraer ERJ-170 aircraft is a small regional jet aircraft with a seating capacity of about 70 passengers and a standard range of 1,800 nautical miles. It is powered by two noise Stage 3 turbofan engines. **Figure 4-2** provides a summary of the operating specifications of both EMB-120 and ERJ-170 aircraft.

Note that over 75 percent of HVN operations are conducted by a variety of propeller-driven GA aircraft that are representative of the U.S. stock in this category of aviation operations. The fleet mix in the GA category is forecast to remain unchanged from the Existing (2012) Baseline condition over a five year forecast. This is confirmed by a review and analysis of market outlooks produced by the industry[6] and federal agencies, including the FAA. Furthermore, it is unlikely that game changers (e.g. Very Light Jets) can replace the main drivers of GA activity at HVN (single- and multi-engine propeller aircraft) within the GA category at HVN over the forecast period given current market and economic factors, the state of the industry, and local traffic demand enablers, in the short- and medium-term.

Nonetheless, in accordance with Section 506 of the FAA Modernization and Reform Act of 2012, signed into law by President Obama on 14 February 2012, the Future (2017) Baseline conditions assume a full phase-out of Noise Stage 2 aircraft below 75,000 lbs. The fleet mix for the Future (2017) Baseline was

[6] Embraer Market Outlook 2011-2030 and GA trends and statistics by the Aircraft Owners and Pilots Association (AOPA).

updated to comply with the prohibition stated by the current law. The relevant provision of Section 506 reads as follows:

> *(a) PROHIBITION.—Except as otherwise provided by this section, after December 31, 2015, a person may not operate a civil subsonic jet airplane with a maximum weight of 75,000 pounds or less, and for which an airworthiness certificate (other than an experimental certificate) has been issued, to or from an airport in the United States unless the Secretary of Transportation finds that the aircraft complies with stage 3 noise levels.*

As such, Stage 2 aircraft that meet the criteria set forth by the current regulatory requirement and which were modeled under the Existing (2012) Baseline condition were replaced by compliant stage 3 equivalent aircraft and modeled as such under Future (2017) Baseline conditions as outlined in **Table 4-1**.

**Table 4-1: Modeled Noise Stage 3 Replacements for Future (2017) Baseline Condition at HVN**

| Existing Stage 2 Aircraft | | Stage 3 Replacement | |
|---|---|---|---|
| **Type** | **Engine** | **Type** | **Engine** |
| Falcon 20 | CF700-2D-2 | Falcon 900 | TAY 650-15 |
| Gulfstream II/IIB | SPEY 511-8 | Gulfstream IV | TAY 611-8 |
| Learjet 25 | CJ610-8 | Learjet 35 | TFE731-2 |

### 4.1.3 Temporal Utilization

For Future (2017) Baseline conditions, the temporal distribution of operations is expected to remain the same as that modeled for Existing (2012) Baseline conditions. With the future condition assuming the potential introduction of two commercial operations at HVN by 2017, the forecast schedule for these operations anticipates two Embraer 170 flights and one Embraer 120 flight at nighttime (10:00pm–7:00am local time).

### 4.1.4 Runway Utilization

The runway utilization data modeled for Future (2017) Baseline conditions remains unchanged from that modeled for Existing (2012) Baseline conditions. The latter data was developed based on an analysis of detailed wind data for a full calendar year and in coordination with HVN ATCT to integrate operational and air traffic management procedures affecting runway use at the airport into the analysis. There are no plans in effect to change the configuration of the current runways at HVN and the prevailing wind conditions modeled for existing conditions are assumed to be the same as those for forecast conditions.

### 4.1.5 Airspace and Flight Track Utilization

The airspace and flight track utilization data modeled for Future (2017) Baseline conditions remains unchanged from that modeled for Existing (2012) Baseline conditions. The latter data was developed based on detailed radar analysis and in close coordination with FAA Air Traffic control personnel. No plans have been identified that anticipate changes or fundamental updates to the configuration of the local airspace and/or local air traffic control procedures at HVN over the forecasting period of this study. Therefore, the modeled flight tracks, including procedural flight tracks, are anticipated to be the same as is currently in effect. The new commercial service introduced in the forecast was modeled along existing flight tracks matching the Origin-Destination routes under current plans for service to and from the Washington and Chicago metropolitan areas.

### 4.1.6 Flight Profiles

The modeled aircraft performance profiles along flight tracks, including altitude, thrust, and speed for Future (2017) Baseline conditions relied on INM performance data, as described in Section 3.1.7. INM flight profiles for each aircraft type, including for forecast commercial operations, were modeled to project noise exposure for HVN as described in this chapter.

### 4.1.7 Ground Run-Up Operations

The characteristics of ground operations modeled for Future (2017) Baseline conditions are the same as those modeled for Existing (2012) Baseline conditions in that maintenance and pre-flight run-ups at the airport are conducted in support of specific flight operations and based aircraft at HVN. Therefore, the modeled pre-flight run-up operations for Future (2017) Baseline conditions were updated to reflect in a proportional and equivalent manner the modeled growth in GA flight operations. Maintenance run-up operations are a function of the number of based aircraft at HVN, which is estimated to remain unchanged for GA activity over the forecasting period of the study. However, the potential addition of commercial service, assumed under the forecast, provides for additional ground operations at the terminal ramp location—those additional ground operations were modeled as part of the Future (2017) Baseline conditions.

### 4.1.8 Weather

The average weather conditions modeled in INM for the Future (2017) Baseline condition are the same as those modeled for the Existing (2012) Baseline condition. A 5-year average from 2007 through 2011 of temperature, pressure, and relative humidity was used for noise modeling. The derived average values modeled for HVN are 52.4°F temperature, 29.99 inHG pressure, and 67.6% relative humidity.

## 4.2 Future Noise Exposure

### 4.2.1 Future Noise Exposure Contours

Noise exposure contours were modeled using the latest version of the FAA's INM (version 7.0c) and DNL levels from DNL 65 to DNL 75 dB were calculated for the Future (2017) Baseline condition. The resulting noise exposure contours are shown in **Figures 4-3 and 4-4**. The shape of the noise contour reflects the configuration of the operational runways with operations on the primary runway, 02-20, having more influence on noise exposure at HVN. The overall noise exposure contour is also influenced, to a smaller degree, by ground run-up and helipad operations.

The introduction of new commercial service and modest growth in air traffic under Future (2017) Baseline conditions results in an increase in modeled DNL noise exposure relative to modeled Existing (2012) Baseline Conditions. Yet, the phase-out of Noise Stage 2 aircraft below 75,000lbs results in a contraction of the modeled DNL contour, most visibility on the north and south ends of the primary runway (02-20). Therefore, two factors introduced into the Future (2017) Baseline condition have opposite effects ("Push and Pull") on the extents of the modeled DNL 65 dB noise exposure contour as shown in **Figure 4-5**. There are three areas where the modeled DNL 65 dB noise exposure increases over non-compatible land-use:

- Northwest of HVN in areas within the jurisdictional boundaries of New Haven: The increase is the result of both forecast growth in air traffic on the primary runway and the ground operations associated with the potential introduction of new commercial service at the airport.
- Northeast of HVN in areas within the jurisdictional boundaries of East Haven: A slight increase mainly due to forecast growth in air traffic on the primary runway.
- Southwest of HVN in areas within the jurisdictional boundaries of New Haven: A slight increase mainly due to forecast growth in air traffic on the primary runway.

- The modeled DNL 75 dB noise contour remains fully on airport property. The modeled DNL 70 dB noise contour extends off-airport property slightly on the northwest and southwest sides of the airfield within New Haven and very slight to the northeast within East Haven. This contour encompasses non-compatible land uses where it extends beyond the airport boundary in New Haven, and compatible land use where it extends beyond the airport boundary in East Haven. As mentioned previously, the modeled DNL 65 dB noise contour extends to areas off-airport property and encompasses various categories of land uses, including residential. The majority of the area within the modeled DNL 65 dB noise exposure contour remains on airport property. The Future (2017) Baseline Noise Exposure Contour also serves as the Future (2017) Noise Compatibility Plan noise contour, and is the basis for the recommended mitigation components outlined in the Noise Compatibility Plan.

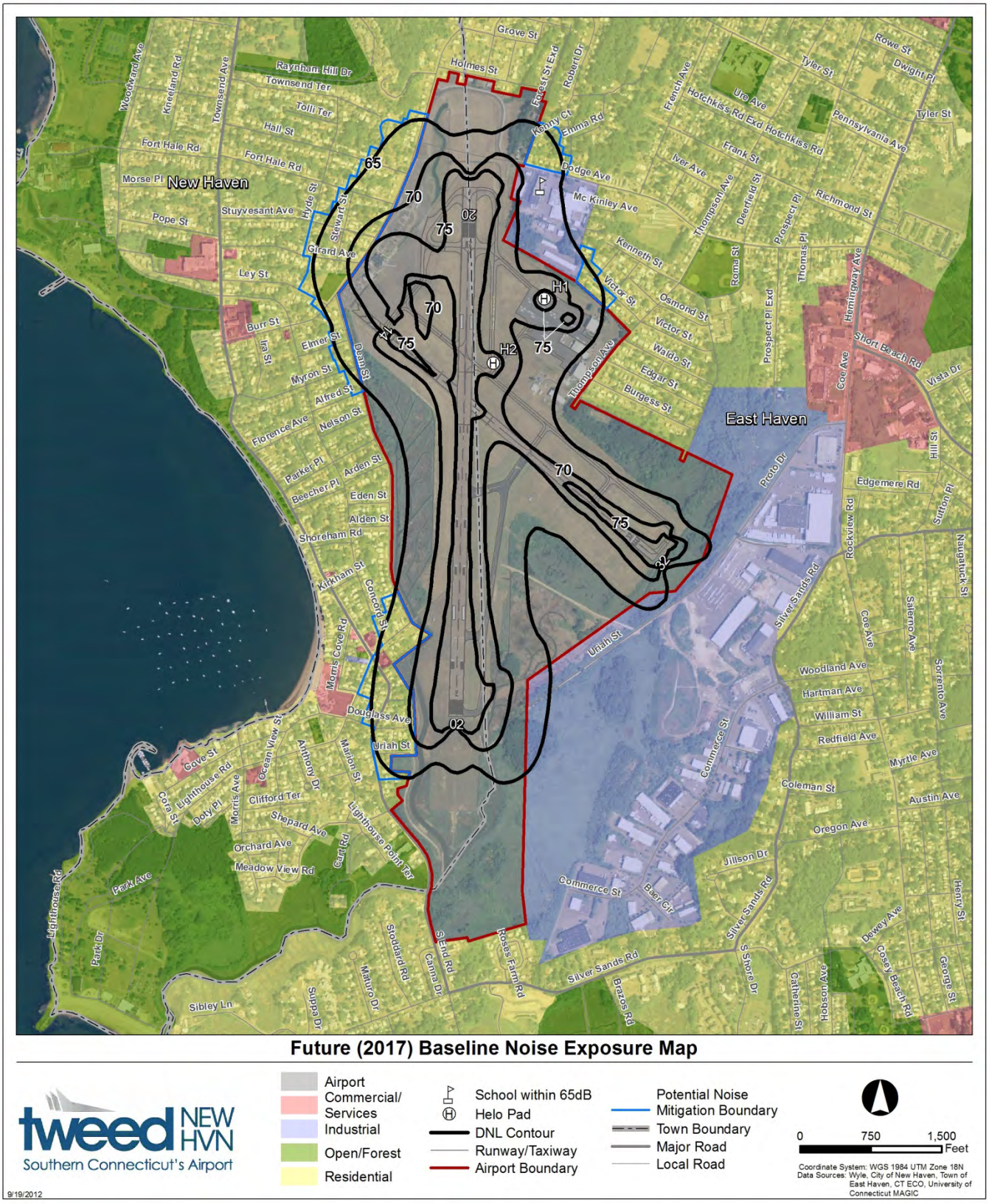



**Figure 4-3: Existing (2012) Baseline Noise Exposure DNL Contours with Land Use Areas**

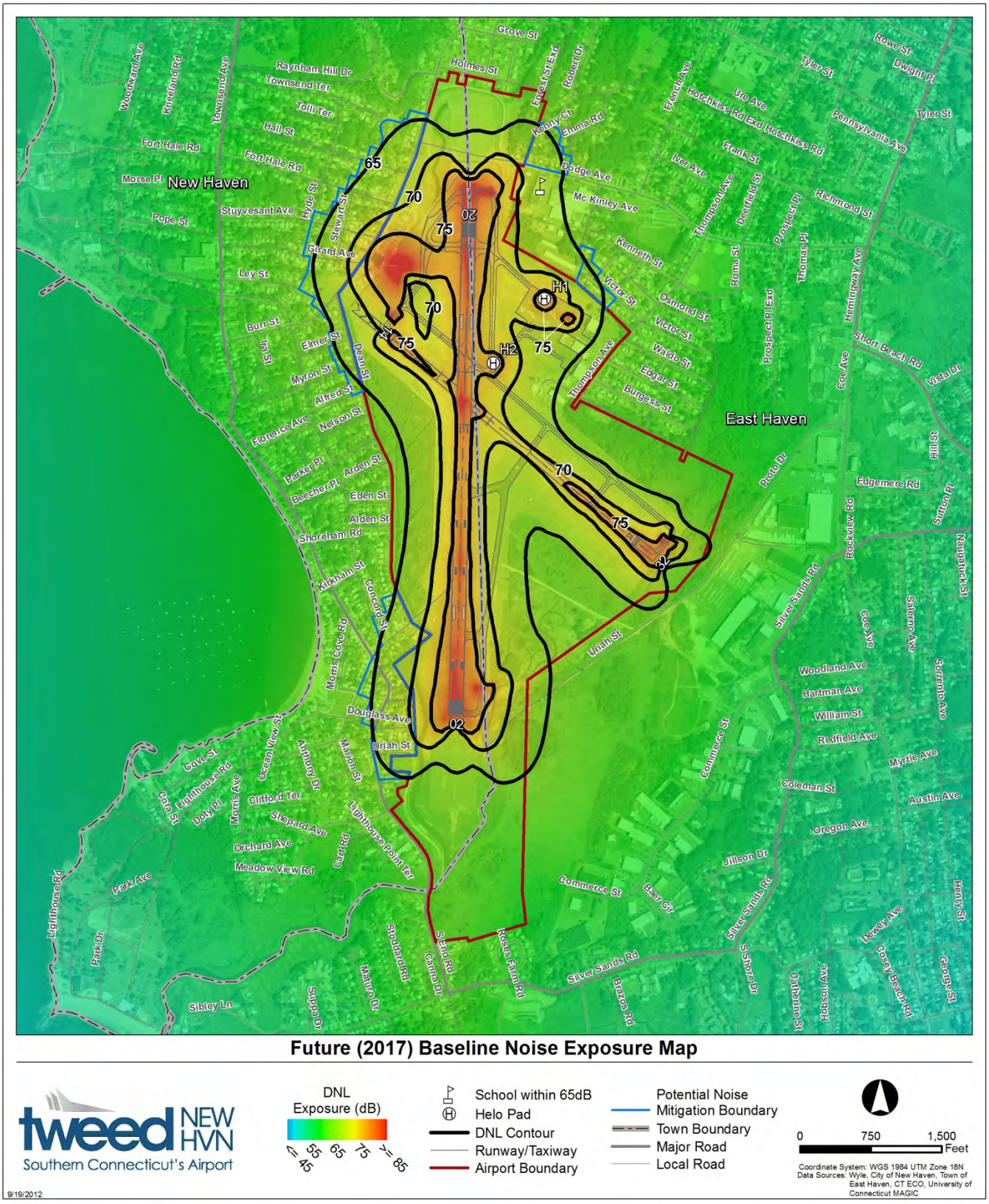



**Figure 4-4: Existing (2012) Baseline Noise Exposure DNL Contours with Noise Gradients**

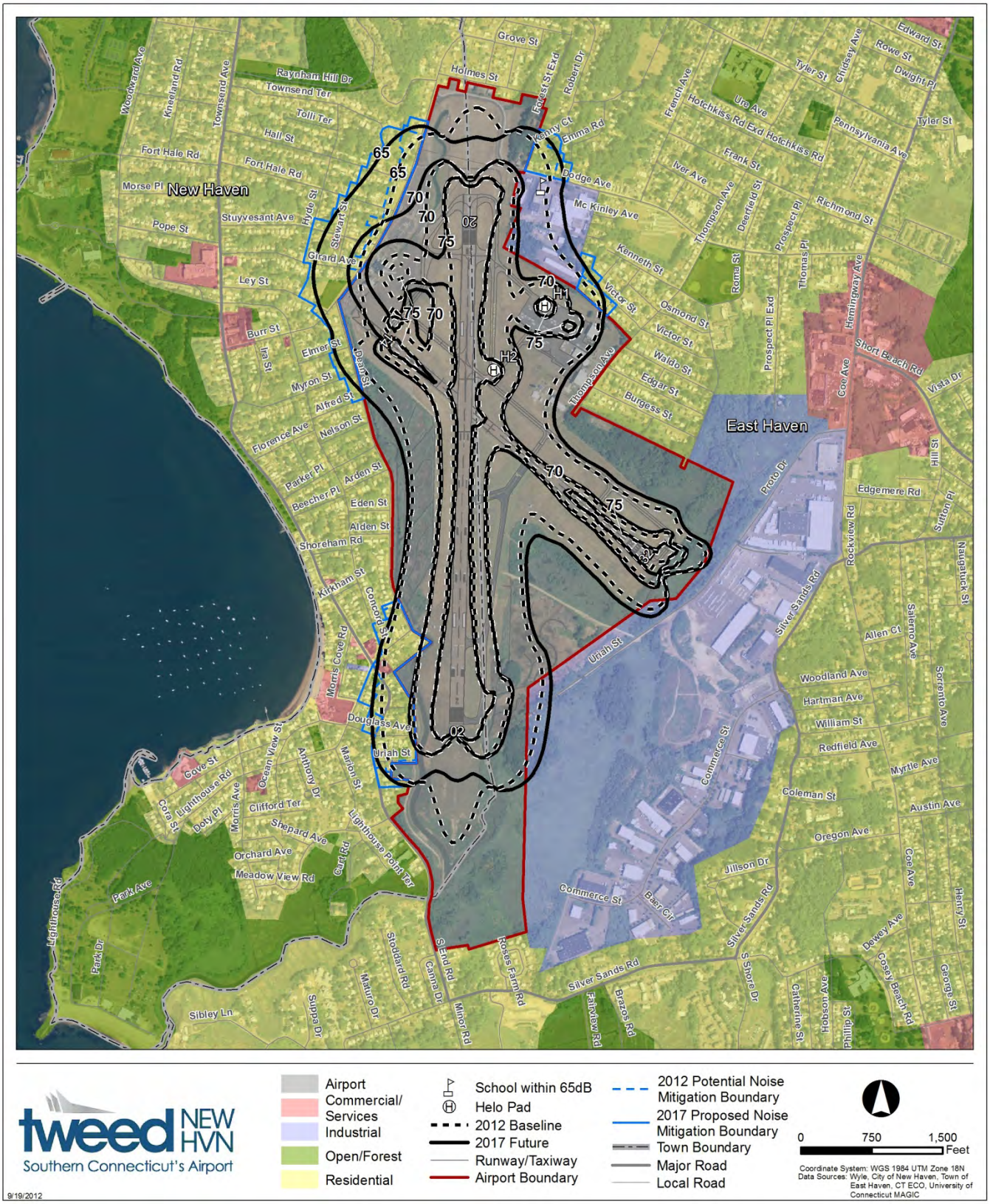



**Figure 4-5: Comparison between Future (2017) Solid and Existing (2012) Dashed Contours**

### 4.2.2 Future Noise Impacts

Estimated population and housing units information was calculated based on data from the 2010 US Census. The population exposure was computed by proportion, which means that the population in each block was proportionally included in the count based on the percentage of each block area that fell within the noise contour. This approach assumes that the population within each block is evenly distributed over the entire census block area, which is not necessarily indicative of the actual population distribution of the census block. Additionally, the area within the airport boundary was removed from the census data to insure no population was included within the airport property. The housing counts were further refined by using the parcel data on the New Haven side of the airport. **Table 4-2** provides a summary of the modeled future impacts by land-use category and type of noise sensitive facilities. Overall, approximately 82% of the area inside the modeled DNL 65 dB noise exposure contour lies on airport property, and 87% of the overall area inside the modeled DNL 65 dB noise exposure contour lies over compatible land uses. The remaining 13% impacts residential land uses. No noise sensitive facilities are located within modeled DNL levels of 70 dB or above. Noise sensitive facilities are schools, places of worship, libraries, hospitals, and care facilities. Levels of modeled DNL 70 dB noise exposure do impact two small noise sensitive areas (approximately 3 acres total) of incompatible land uses west of the terminal and southwest of the airfield, affecting approximately 15 homes. The modeled DNL 65 dB noise exposure contour encompasses residential areas surrounding the airport, and includes approximately 203 homes. There is a noise sensitive facility located within the modeled DNL 65 dB noise exposure contour. The Shoreline Clinical Day School and East Haven Adult Education both rent out the same facility in a commercial/industrial center at 290 Dodge Ave in East Haven.

**Table 4-2. Future (2017) Baseline Noise Exposure Contour Impacts**

| Future (2017) Baseline Noise Exposure Contour | | | | |
|---|---|---|---|---|
| **Category** | **65 - 70 DNL** | **70 - 75 DNL** | **75 + DNL** | **65+ DNL** |
| **Land Use Impacts (Acres)** | | | | |
| On-Airport | 129 | 95 | 62 | 286 |
| Open/Forest | 1 | 0 | 0 | 1 |
| Commercial | <1 | 0 | 0 | <1 |
| Industrial | 17 | 1 | 0 | 18 |
| Residential | 41 | 3 | 0 | 44 |
| Total | 188 | 99 | 62 | 349 |
| **Estimated Population** | | | | |
| Residences | 189 | 14 | 0 | 203 |
| Estimated Population* | 439 | 32 | 0 | 471 |
| **Noise-Sensitive Facilities** | | | | |
| Schools | 2 | 0 | 0 | 3 |
| Places of Worship | 0 | 0 | 0 | 0 |
| Libraries | 0 | 0 | 0 | 0 |
| Hospitals | 0 | 0 | 0 | 0 |
| Care Facilities | 0 | 0 | 0 | 0 |

Note: * Population figures are derived from determining the percentage of each census block contained within each contour band.

Source: Wyle, 2012

While the noise exposure contour prepared for 2012 serves as the baseline for the evaluation of noise exposure at HVN, it also acts as a baseline for the evaluation of abatement and mitigation alternatives identified in the NCP. The Future (2017) Baseline Noise Exposure Contour represents the five-year forecast NEM at HVN and ultimately serves as the Future (2017) Noise Compatibility Plan noise contour and the basis for the recommended mitigation components outlined in the Noise Compatibility Plan, as forecast operations materialize at HVN.

*Intentionally left blank*

# TARGETS

# AEDT Environmental Plug-in Report

# For

# Tweed-New Haven Airport

# KHVN

# New Haven, Connecticut

Prepared by:

Justin Hodgins

ATO, AJV-114, Environmental Policy Team Office

202-267-6619

Justin.CTR.Hodgins@faa.gov

May 4, 2016

# Summary

A new arrival procedure, RNAV (GPS) RWY 20, has been proposed for Tweed-New Haven Airport in New, Haven Connecticut. Using the FAA-approved noise screening tool, Terminal Area Route Generation, Evaluation, and Traffic Simulation (TARGETS) Aviation Environmental Design Tool (AEDT) Environmental Plug-In, a noise modeling analysis was completed to screen for potential increases in noise resulting from implementation of the proposed procedure.

Historic track data was obtained and modeled to establish a baseline scenario. After the baseline scenario was established, aircraft operations assigned to the proposed procedure were modeled as flying the proposed procedure instead of their historical tracks to establish an alternative scenario. Aircraft operation counts were adjusted to represent an average annual day (AAD), and the model was used to calculate the noise exposure for the baseline and alternative scenarios on that AAD. The baseline and alternative scenarios were then compared to determine whether the procedure would result in an increase in noise by the standards of the National Environmental Policy Act (NEPA) in the environment surrounding the airport.

The results of the noise analysis indicated that no noise impact is expected as a result of implementation of the procedure RNAV (GPS) RWY 20 at Tweed-New Haven Airport (HVN), New Haven, Connecticut.

# Tweed-New Haven Airport **(**HVN**)**

# TARGETS Environmental Analysis Process

## 1. Purpose

The purpose of this report is to document the process used to analyze the noise impact of a proposed air traffic action at Tweed-New Haven Airport (HVN). Figure 1-1 shows the airport diagram for HVN. This report shows the analysis of instrument flight procedures at HVN using the Terminal Area Route Generation, Evaluation, and Traffic Simulation (TARGETS) Aviation Environmental Design Tool (AEDT) Environmental Plug-In tool. Table 1-1 shows the procedure name, type and publication date. Figure 1-2 shows the location of the arrival procedure.

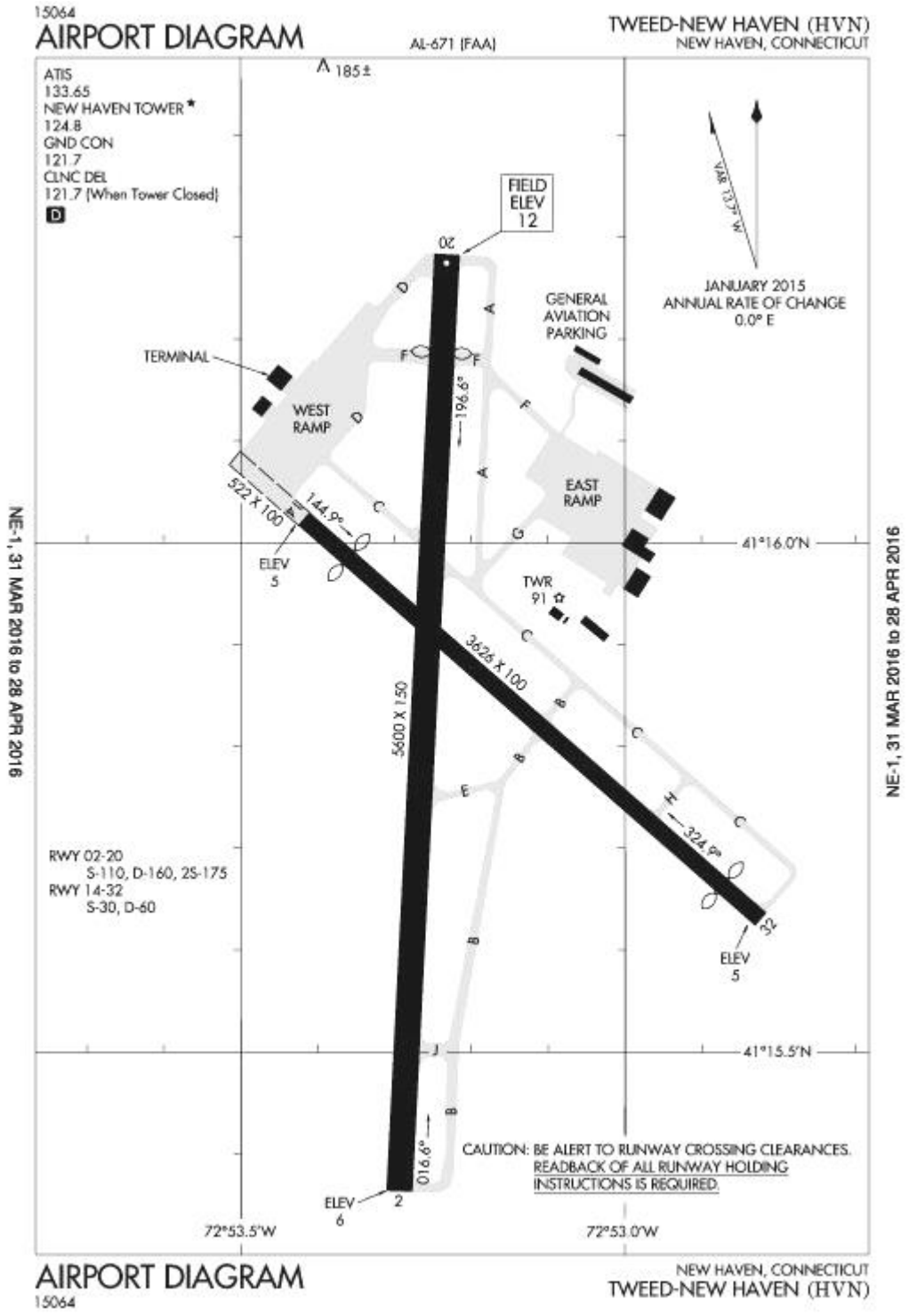



**Figure 1-1: Airport Diagram of HVN**

| Procedure Name | Procedure Type | Publication Date |
|---|---|---|
| RNAV (GPS) RWY 20 | Instrument Approach | November 10, 2016 |

**Table 1: HVN Procedure to Be Modeled**

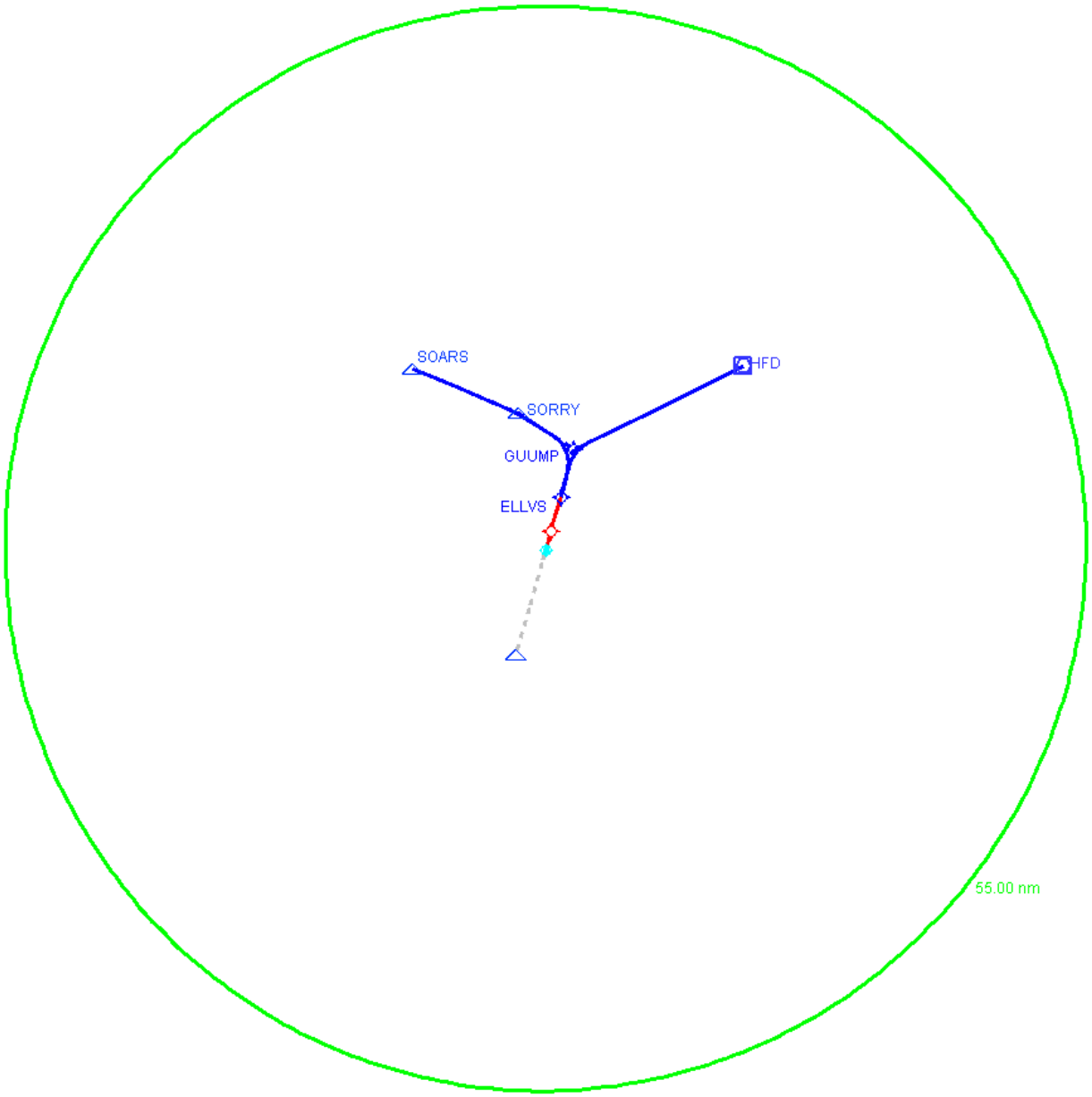



**Figure 1-2: HVN RNAV (GPS) RWY 20 Procedure**

## 2. Methodology

Historic radar track data for HVN was obtained from the FAA's National Offload Program (NOP) after concurrence of the dates to be used by the environmental specialist and air traffic facility. Twenty eight days of radar track data were selected for the HVN analysis representing a range of temperature and wind conditions according to historic weather data for HVN provided by weather underground (http://www.weatherunderground.com) as well as being representative of the average runway usage.

All traffic data for HVN was obtained using the New York TRACON (N90) as the radar source facility. After the removal of overflights, incomplete track segments, and other irrelevant tracks, 510 tracks were used for the analysis.

The dates selected for this project were the following:

April 10 – 16, 2015
July 19 – 25, 2015
October 22 – 28, 2015
January 24 – 30, 2016

These dates represent average traffic counts and traffic flows through various seasons and peak travel times for HVN. There were no significant runway outages or significant conditions that would otherwise result in abnormal traffic counts or traffic flows. In order to calculate the accurate average annual day parameter, traffic counts for average daily departures and arrivals used for annualization in this analysis were obtained through the FAA's Traffic Flow Management System Counts (TFMSC) database.

Historical radar track data (figures 2-1 and 2-2) was used to create a baseline noise exposure, which provides lateral path definition, aircraft fleet mix, departure/arrival stream proportions for each runway, and day/night traffic ratios. A legend (Table 2-2) shows, by color, the altitudes of the track data.

After the baseline scenario was built, aircraft operations assigned to the proposed procedure were modeled as flying the proposed procedure instead of their historical tracks, which gives us the alternative scenario. For this analysis, the aircraft assigned to the procedure was based on information provided by the facility. In the correspondence between the facility and the environmental specialist, the facility indicated the following procedure information:

| Procedure | Aircraft Type |
|---|---|
| RNAV (GPS) RWY 20 | Approximately 60% Prop/Turbo Prop<br>Approximately 40% Jet |

**Table 2-1: Aircraft Assignment**

Additionally, the facility indicated via email on April 17, 2016 that less than 50% of the arrivals to runway 20 using the existing procedure (baseline) will be assigned to the new RNAV (GPS) RWY 20 procedure. The remaining arrivals to runway 20 would continue on the visual approach currently in use. Selections for track assignments were made based on historic flight paths, and all RNAV capable aircraft following historic paths in the vicinity of the new procedure were assigned to the procedure in the alternative scenario. The tracks selected for each procedure are shown in figures 2-3 and 2-4. The resulting selections included 59 of 117 total arrivals (including RNAV and Non-RNAV equipped aircraft) being assigned to the new procedure in the alternative scenario (46.15%). All non-RNAV equipped flights were assigned to the visual approach in the alternative (historic tracks).

The analysis does not take into account terrain. All calculations were based on "above field elevation" (AFE) using the airport's reference elevation. The altitude controls of the RNAV procedures were used to adjust the vertical profile for each modeled aircraft flying the proposed procedure. When a range of altitudes was given for a particular waypoint, the lowest point of the range was used in order to model the most conservative environmental case. The TARGETS Environmental Plug-in uses 0.3 nautical mile dispersion on either side of the centerline of a procedure as its default dispersion value.

Once the baseline and alternative scenarios were built, the TARGETS Environmental Plug-in Tool was used to generate noise outputs for both scenarios. The Environmental Plug-in Tool uses the Aviation Environmental Design Tool version 2b (AEDT 2b) to calculate noise. The noise output files from AEDT 2b for both the baseline and alternative noise exposures consist of a series of equally spaced grid points, each assigned a day-night average noise level (DNL) value. The grid used for noise screening is a 60 nautical mile square grid centered on the airport. The grid is composed of points set .25 nautical miles (nm) apart. This data is then loaded back into TARGETS by the Environmental Plug-in Tool, which generates three outputs: baseline noise exposure, alternative noise exposure, and noise impact.

The noise impact is a comparison between the baseline and the alternative noise exposure that depicts reportable and significant noise changes at all affected locations per the criteria indicated in FAA Order 1050.1F ("Environmental Impacts: Policies and Procedures") and Chapter 32 of FAA Order 7400.2K ("Procedures for Handling Airspace Matters"). The reportable and significant noise increases and decreases (if any) are then depicted on an aerial photograph using Google Earth as well as on a sectional chart.

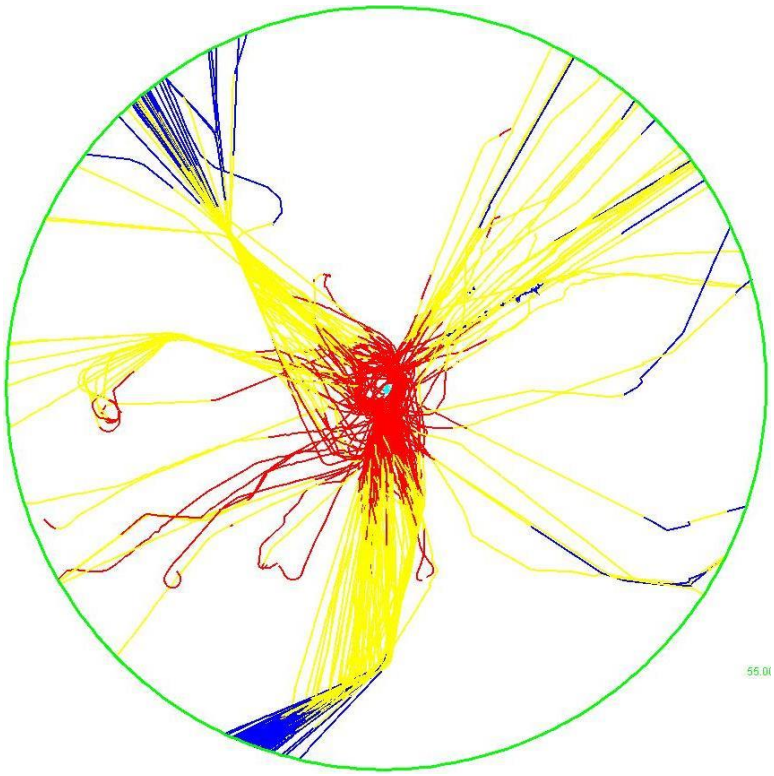


**Figure 2-1: HVN Arrival Traffic Used in Analysis**

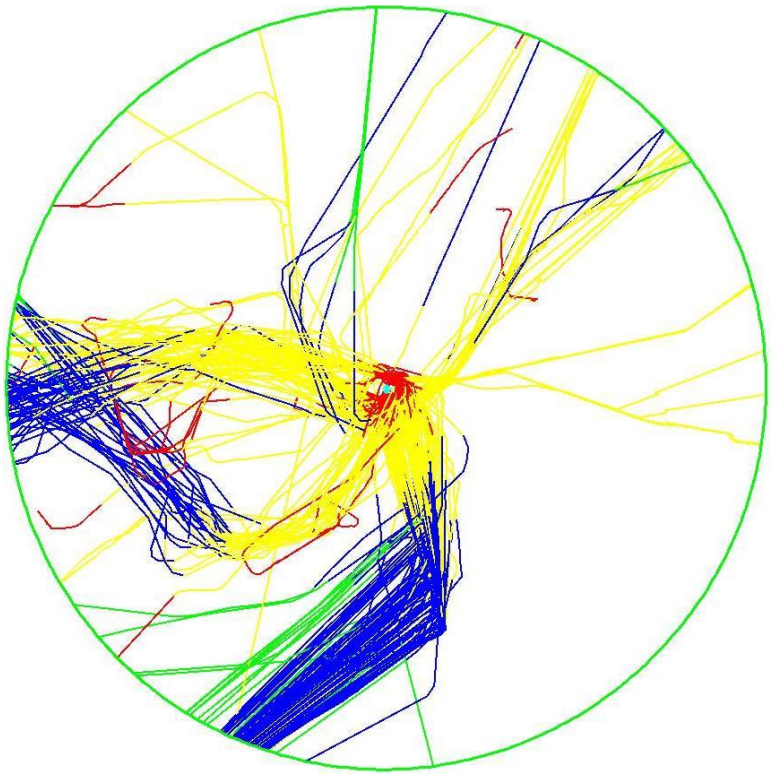


**Figure 2-2: HVN Departure Traffic Used in Analysis**

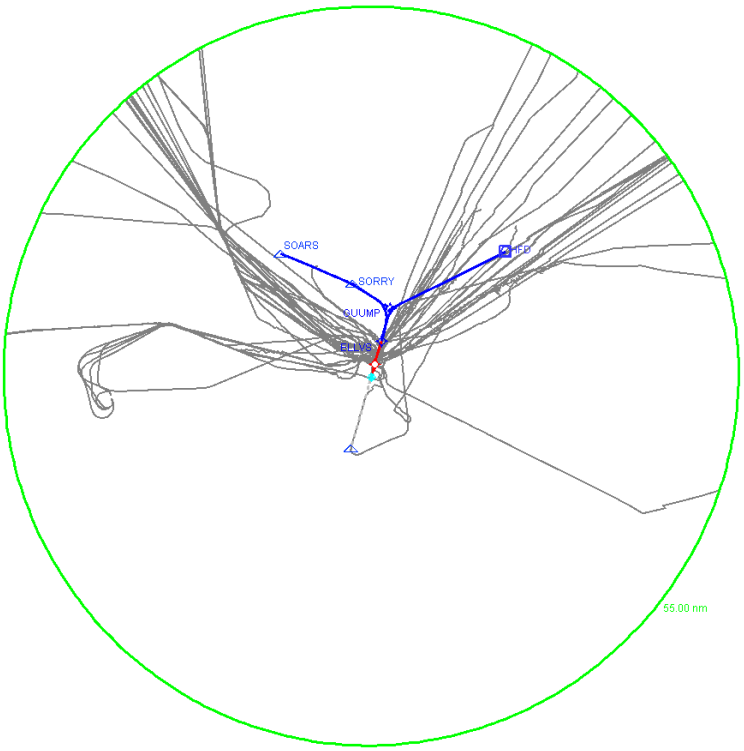



**Figure 2-3: Flights Selected for New Procedure**

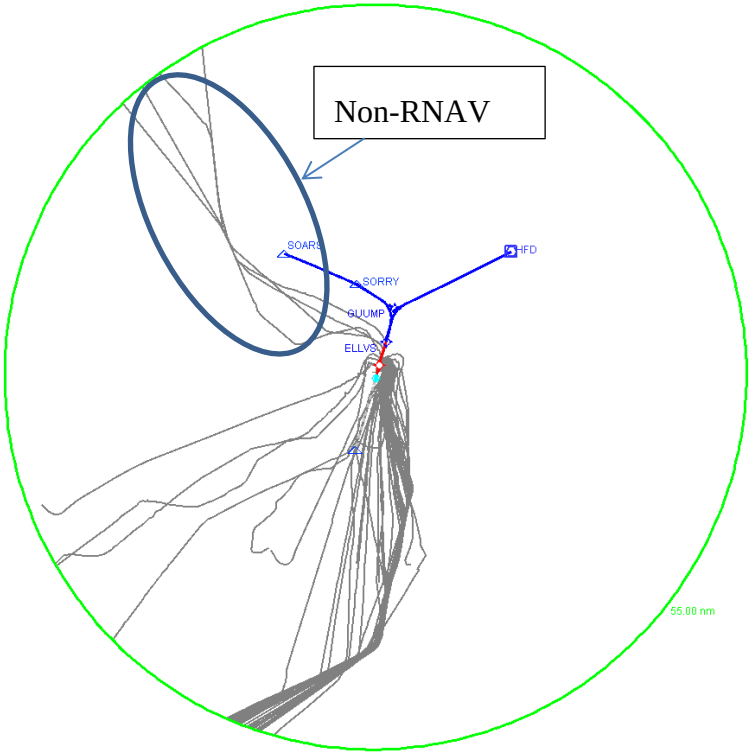



**Figure 2-4: Flights Remaining on Visual Approach**

| *Track Data Legend with Above Ground Level (AGL) and Mean Sea Level (MSL) Altitudes* | | | |
|---|---|---|---|
| ***Airport: HVN*** | | ***Field Elevation*** | ***13*** |
| | | | |
| **AGL Altitudes** | | **MSL Altitudes** | **Legend Colors** |
| 1000 | | 1013 | |
| 2000 | | 2013 | |
| 3000 | | 3013 | |
| 4000 | | 4013 | |
| 5000 | | 5013 | |
| 6000 | | 6013 | |
| 7000 | | 7013 | |
| 8000 | | 8013 | |
| 9000 | | 9013 | |
| 10000 | | 10013 | |
| 11000 | | 11013 | |
| 12000 | | 12013 | |
| 13000 | | 13013 | |
| 14000 | | 14013 | |
| 15000 | | 15013 | |
| 16000 | | 16013 | |
| 17000 | | 17013 | |
| 18000 | | 18013 | |
| Above | | Above | |

**Table 2-2: Legend for Baseline Arrival and Departure Traffic**

## 3. Baseline Noise Exposure

The baseline noise exposure is shown in Figure 3-1, which depicts the levels and locations of the noise produced by the historical radar track data for arrivals and departures. Figure 3-2 depicts the results on an aerial photograph using Google Earth. Table 3-1 is the legend for the baseline noise exposure figures The TARGETS Runway Usage Report provides information on fleet mix by runway for both day and night operations. Runway usage for the baseline scenario is shown in Table 3-2.

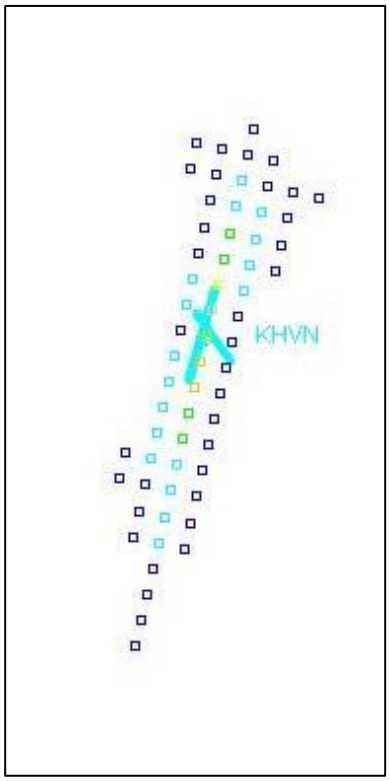



**Figure 3-1: Baseline Noise Exposure in TARGETS**

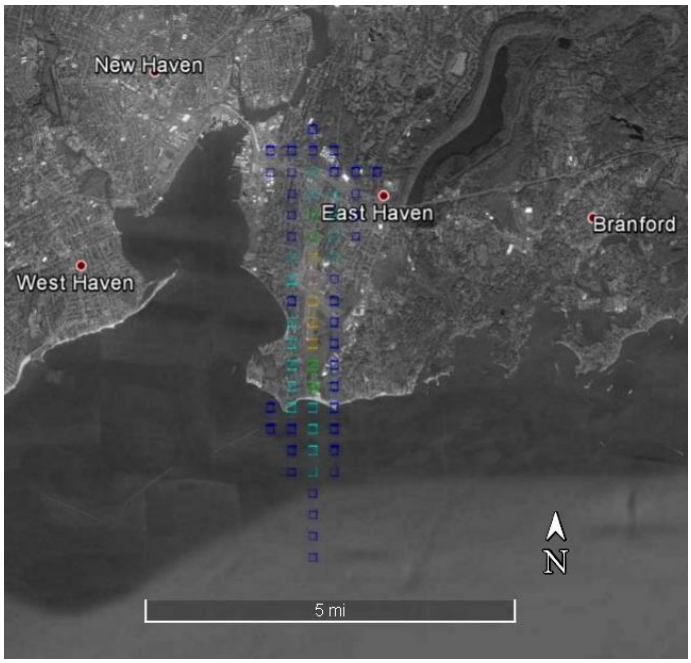



**Figure 3-2: Baseline Noise Exposure in Google Earth**

| Geometric Shape | Color | DNL Value |
|---|---|---|
| SQUARE | BLUE | 45–50 dB |
| SQUARE | LIGHT BLUE | 50–55 dB |
| SQUARE | GREEN | 55–60 dB |
| SQUARE | YELLOW | 60–65 dB |
| SQUARE | ORANGE | 65–70 dB |
| SQUARE | PINK | 70–75 dB |
| SQUARE | RED | 75 dB OR MORE |

**Table 3-1: Legend for Noise Exposure**

| | Runway 02 | | Runway 20 | |
|---|---|---|---|---|
| ARRIVALS | DAY | NIGHT | DAY | NIGHT |
| Heavy Jet | 0 | 0 | 0 | 0 |
| Large Jet | 11 | 2 | 13 | 0 |
| Small Jet | 53 | 4 | 53 | 1 |
| Turbo-Prop | 58 | 3 | 38 | 0 |
| Military | 0 | 0 | 0 | 0 |
| Piston | 8 | 0 | 12 | 0 |
| DEPARTURES | DAY | NIGHT | DAY | NIGHT |
| Heavy Jet | 0 | 0 | 0 | 0 |
| Large Jet | 11 | 0 | 10 | 1 |
| Small Jet | 42 | 2 | 66 | 4 |
| Turbo-Prop | 44 | 2 | 52 | 1 |
| Military | 0 | 0 | 0 | 0 |
| Piston | 3 | 0 | 14 | 0 |

**Table 3-2: Baseline Runway Usage for all 28 Days of Track Data**

## 4. Alternative Noise Exposure

The alternative noise exposure is shown in Figure 4-1, which depicts the levels and locations of the noise using the proposed procedures. Table 4-1 is the legend for the alternative noise exposure figures. Figure 4-2 depicts the results on an aerial photograph using Google Earth. The TARGETS Runway Usage Report provides information on fleet mix by runway for both day and night operations. Runway usage for the alternative scenario is shown in Table 4-2.

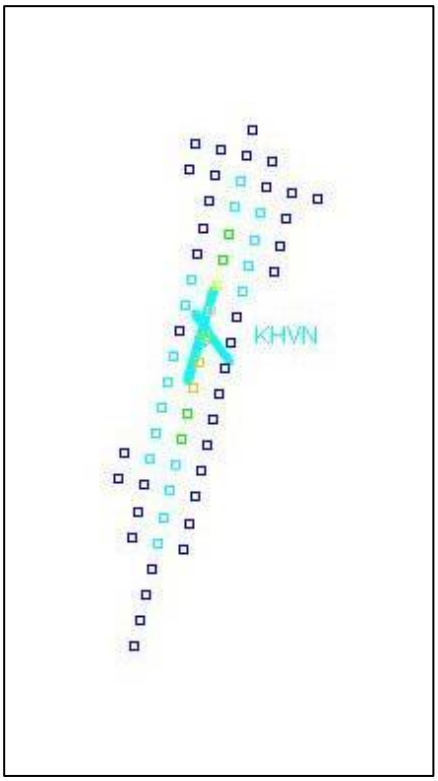



**Figure 4-1: Alternative Noise Exposure for the Proposed Procedures in TARGETS**

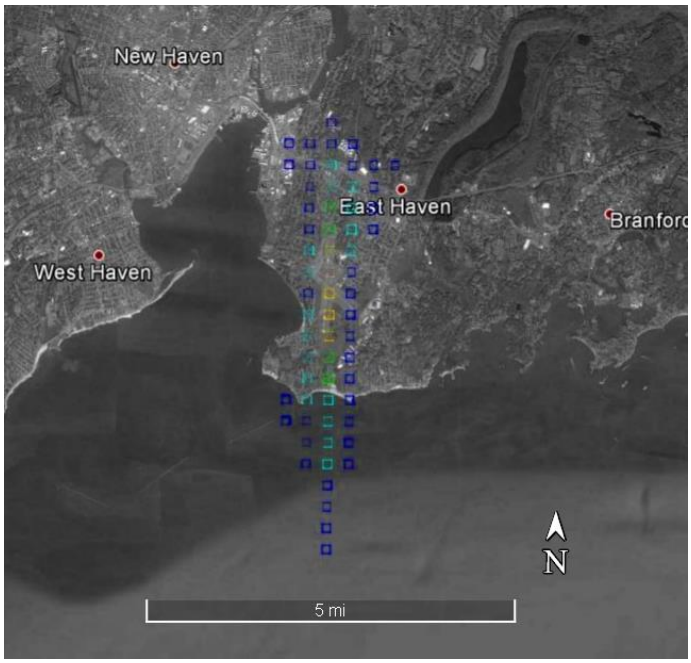



**Figure 4-2: Baseline Noise Exposure in Google Earth**

| Geometric Shape | Color | DNL Value |
|---|---|---|
| SQUARE | BLUE | 45–50 dB |
| SQUARE | LIGHT BLUE | 50–55 dB |
| SQUARE | GREEN | 55–60 dB |
| SQUARE | YELLOW | 60–65 dB |
| SQUARE | ORANGE | 65–70 dB |
| SQUARE | PINK | 70–75 dB |
| SQUARE | RED | 75 dB OR MORE |

**Table 4-1: Legend for Noise Exposure**

| | Runway 02 | | Runway 20 | |
|---|---|---|---|---|
| ARRIVALS | DAY | NIGHT | DAY | NIGHT |
| Heavy Jet | 0 | 0 | 0 | 0 |
| Large Jet | 11 | 2 | 13 | 0 |
| Small Jet | 53 | 4 | 53 | 1 |
| Turbo-Prop | 58 | 3 | 38 | 0 |
| Military | 0 | 0 | 0 | 0 |
| Piston | 8 | 0 | 12 | 0 |
| DEPARTURES | DAY | NIGHT | DAY | NIGHT |
| Heavy Jet | 0 | 0 | 0 | 0 |
| Large Jet | 11 | 0 | 10 | 1 |
| Small Jet | 42 | 2 | 66 | 4 |
| Turbo-Prop | 44 | 2 | 52 | 1 |
| Military | 0 | 0 | 0 | 0 |
| Piston | 3 | 0 | 14 | 0 |

**Table 4-2: Alternative Runway Usage for all 28 Days of Track Data**

## 5. Comparison of Baseline and Alternative Noise Exposure

In the case of this procedure, the baseline and alternative noise exposures were compared by the TARGETS AEDT Environmental plug-in to determine the impacts per the appropriate criteria in FAA Order 1050.1F (shown in Table 5-1). Table 5-2 shows the results of the impact report generated by TARGETS AEDT Environmental Plug-in, showing no change in noise exposure between the baseline and alternative scenarios.

| GEOMETRIC SHAPE | COLOR | DNL DIFFERENCE |
|---|---|---|
| SQUARE | PURPLE | 45-60 DB BASELINE WITH A DECREASE OF 5.0 DB OR GREATER IN THE ALTERNATIVE |
| SQUARE | BLUE | 60-65 DB BASELINE WITH A DECREASE OF 3.0 DB OR GREATER IN THE ALTERNATIVE |
| SQUARE | GREEN | 65 DB BASELINE OR GREATER WITH A DECREASE OF 1.5 DB OR GREATER IN THE ALTERNATIVE |
| OVAL | RED | 65 DB OR GREATER ALTERNATIVE WITH AN INCREASE OF 1.5 DB OR GREATER OVER THE BASELINE |
| OVAL | ORANGE | 60-65 DB ALTERNATIVE WITH AN INCREASE OF 3.0 DB OR GRTEATER OVER THE BASELINE |
| OVAL | YELLOW | 45-60 ALTERNATIVE DB WITH AN INCREASE OF 5.0 DB OR GREATER OVER THE BASELINE |

**Table 5-1: Legend for Noise Impact**

| % Red | % Orange | % Yellow | % NoChange | % Green | % Blue | % Purple |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 100 | 0 | 0 | 0 |

**Table 5-2: Targets Noise Impact Report**

**HMMH**
77 South Bedford Street
Burlington, Massachusetts 01803
781.229.0707
www.hmmh.com

# MEMORANDUM

| | |
|---|---|
| **To:** | John Hansen III, Assoc. AIA<br>Vice President of Marketing and Business Development<br>The Jones Payne Group, Inc.<br>123 N. Washington St, 3rd Floor<br>Boston, MA 02114 |
| **From:** | Gene Reindel<br>Vice President |
| **Date:** | March 2, 2018 |
| **Subject:** | Evaluation of Displaced Thresholds as Modeled in the Most Recent FAA-Approved Noise Exposure Map for Tweed New Haven Regional Airport |
| **Reference:** | HMMH Project Number 307121 |

This memorandum provides requested information contained within the email from John Hansen received Tuesday, January 30, 2018, with the subject "HVN - Part 150 Evaluation re Future Conditions". HMMH reviewed the November 2012 FAR Part 150 Noise Compatibility Study for Tweed New Haven Regional Airport for the responses to the following:

- Noise modeling of the displaced thresholds
- Inclusion of regional jets in the forecast noise modeling
- Taxiway noise modeling
- Noise effect of the proposed Taxiway A relocation

## Displaced Thresholds

The following information was obtained from the November 2012 FAR Part 150 Noise Compatibility Study:

***Section 2.3.3 Runways:***

> *HVN has two runways, Runway 02-20 and Runway 14-32. Runway 02-20, which serves as the primary runway at the airport, is 5,600 feet long and 150 feet wide. Runway 14-32, is 3,626 feet long and has a width of 100 feet. Runway 20 end has a displaced threshold of 352 feet, while the displaced threshold of runway 14 is 361 feet and that of runway 32 is 300 feet. A displaced threshold is a limited area on the runway that can be used for take-off, but not for landing. At HVN, displaced thresholds allow aircraft clearance over trees and obstructions on landing. They also bring aircraft on a higher descent slope outside the boundary of the airport. Figure 2-1 shows the locations of the runways in relation to the surrounding areas of New Haven and East Haven.*

***Section 4.1.1 Airport Facilities:***

> *No changes to the existing runways, taxiways, or other airport facilities which may impact noise exposure patterns are expected to occur within the FAR Part 150 Study timeframe. As such, the model parameters used in the Existing (2012) Baseline noise exposure contour were carried forward unchanged for Future (2017) Baseline conditions. The only exception is that the Runway 20 displaced threshold that was modeled for arrivals in the Existing (2012) Baseline model was removed for the Future (2017) Baseline condition, accounting for current airport activities relative to airside obstruction planning.*

**HMMH concludes** that arrivals to Runways 20 and 32 were modeled using displaced thresholds of 352 feet and 361 feet, respectively, for the existing condition (2012). For the forecast conditions (2017), only the displaced threshold on Runway 32 remained and the Runway 20 threshold was removed for modeling.

## Regional Jets

The following information was obtained from the November 2012 FAR Part 150 Noise Compatibility Study:

***Section 4.1.2 Aircraft Fleet Mix:***

*Modeled changes to the Future (2017) fleet mix include the potential introduction of two regional aircraft types (Embraer EMB-120 and Embraer ERJ-170) to provide new air service to two new destinations; Washington-Dulles (IAD) and Chicago O'Hare (ORD). These potential air service development plans are currently being pursued by HVN airport and included in the forecast assumptions of this study.*

*The Embraer EMB-120 Brasilia is a twin-turboprop commuter airliner with a seating capacity of 30 passengers and a range of about 1,000 nautical miles. This aircraft is comparable to the Bombardier Dash 8-100 aircraft currently operated on behalf of US Airways at HVN and providing air service to and from Philadelphia International Airport (PHL). The Embraer ERJ-170 aircraft is a small regional jet aircraft with a seating capacity of about 70 passengers and a standard range of 1,800 nautical miles. It is powered by two noise Stage 3 turbofan engines. Figure 4-2 provides a summary of the operating specifications of both EMB-120 and ERJ-170 aircraft.*

**HMMH concludes** that regional jets, specifically ERJ-170 aircraft types, were included in the forecast condition modeling.

## Taxiway

The following information was obtained from the November 2012 FAR Part 150 Noise Compatibility Study:

***Table 3-3: Runway Utilization Percentages by Aircraft Category***

Table 3-3 includes aircraft arrivals, departures and closed pattern operations. Note the actual table was not reproduced to include in this memorandum.

***3.1.5 Flight Profiles:***

*While a flight track refers to a representation of the aircraft position as projected on the ground, the flight profile is a representation of an aircraft's performance along that flight track, accounting for altitude, thrust, and speed. The INM takes all of these factors into account for each flight trajectory and aircraft type to model noise exposure from individual events and produce the cumulative DNL results for average annual conditions. INM flight profiles for each aircraft type and flight track at HVN were modeled for the Existing (2012) Baseline Condition.*

***3.1.6 Ground Run-Up Operations:***

*Aircraft perform ground operations on airfield ramp areas for pre-flight, shutdown, and maintenance operations. These ground activities, referred in this study as run-up operations, vary in duration and by aircraft type. The modeled run-up operations at HVN consist of: Maintenance run-ups conducted by based GA aircraft at the East ramp serving the FBO, Pre-flight run-ups performed by GA aircraft prior to departure at runway hold-short locations, and Engine start-up and shut-down operations by commercial aircraft at Terminal ramp location. Figure 3-23 shows the locations of all the modeled run-up operations. Engine maintenance run-ups are conducted by GA aircraft at a ramp location adjacent to the FBO facility operated by Robinson Aviation LLC. The modeled maintenance run-up operations data, including location, duration, average daily operations, as well as aircraft type, power setting, and heading are summarized in Table 3-4.*

*Pre-flight run-ups are conducted at each of the four runway hold-short locations by single-engine GA aircraft for a short duration prior to departure. The number of pre-flight run-up operations performed by each single-engine GA aircraft at each runway hold-short location corresponds to the number of departures on each runway that those aircraft perform. The modeled duration of pre-flight run-ups is 30 seconds at 2,000 RPM based on user input obtained from the airport FBO.*

*Finally, the modeled engine start-up and shut-down operations at the terminal ramp location are performed by US Airways using the Dash-8 aircraft. Six (6) daily engine start-up and shut-down operations occur during daytime (7:00am – 10:00pm) and Two (2) during nighttime (10:00pm – 7:00am) on an annual average-day basis. Based on input from US Airway ground personnel at HVN, these ground operations have an average duration of 5 minutes at idle power.*

***4.1.6 Flight Profiles:***

*The modeled aircraft performance profiles along flight tracks, including altitude, thrust, and speed for Future (2017) Baseline conditions relied on INM performance data, as described in Section 3.1.7. INM flight profiles for each aircraft type, including for forecast commercial operations, were modeled to project noise exposure for HVN as described in this chapter.*

***4.1.7 Ground Run-Up Operations:***

*The characteristics of ground operations modeled for Future (2017) Baseline conditions are the same as those modeled for Existing (2012) Baseline conditions in that maintenance and pre-flight run-ups at the airport are conducted in support of specific flight operations and based aircraft at HVN. Therefore, the modeled pre-flight run-up operations for Future (2017) Baseline conditions were updated to reflect in a proportional and equivalent manner the modeled growth in GA flight operations. Maintenance run-up operations are a function of the number of based aircraft at HVN, which is estimated to remain unchanged for GA activity over the forecasting period of the study. However, the potential addition of commercial service, assumed under the forecast, provides for additional ground operations at the terminal ramp location—those additional ground operations were modeled as part of the Future (2017) Baseline conditions.*

**HMMH concludes** that ground run-up operations were included as input to the noise model and that aircraft taxi operations were not included to produce the noise exposure maps in the November 2012 FAR Part 150 Noise Compatibility Study.

## Proposed Relocation to Taxiway A

According to Chuck Kurtz, Tweed New Haven Regional Airport, the proposed relocation of Taxiway A would result in the aircraft holding position, for which ground run-up operations occur (and modeled for the 2012 Noise Exposure Map) 50 feet further to the east than aircraft currently hold and run up the engines. Based on the NEM forecast (2017) condition noise contours, the engine run-ups from aircraft holding short of Runway 20 effect the 70 and 75 DNL contours, but appear to have minimal, if any effect on the 65 DNL contour. This implies the engine run-ups from aircraft holding short to depart on Runway 20 are not the predominant noise contributor to the 65 DNL contour, but rather noise from aircraft beginning their takeoff roll. If the engine run-ups from aircraft holding short to depart Runway 20 were the predominant noise source in this area of the 65 DNL contour, moving the run-ups 50 feet to the east would result in moving the 65 DNL contour 50 feet to the east.

**HMMH concludes** that moving the aircraft holding position for Runway 20 a distance of 50 feet to the east will result in the 65 DNL contour moving less than 50 feet to the east near the relocated hold position. Most of the change, if any, in terms of DNL would be in the area of the school property rather than extending into residential areas beyond those within the block rounding boundary shown in the forecast condition NEM. Noise modeling is required to determine the exact change to the 65 DNL, if analysis beyond the qualitative analysis provided above is warranted.

# Appendix K

# USEPA Comments, December 17, 2019

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

OFFICE OF THE
REGIONAL ADMINISTRATOR

December 17, 2019

Richard Doucette
Federal Aviation Administration
1200 District Avenue
Burlington, Massachusetts 01803

RE: Tweed-New Haven Regional Airport Taxiway and Drainage Improvement Project Draft Environmental Assessment, New Haven, Connecticut

Dear Mr. Doucette:

We are writing in response to your October, 2019 Draft Environmental Assessment (EA) for the Tweed-New Haven Airport Taxiway and Drainage Improvement Project in New Haven, Connecticut. We submit the following response to the Draft EA in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

The Draft EA explains that the Tweed-New Haven Regional Airport proposes improvements to taxiways and drainage at the airport to increase safety and address existing flooding issues. The Draft EA documents the need for the project and considers a reasonable range of alternatives. We reviewed the Draft EA and developed the attached comments and recommendations and ask that you address them in the Final EA for the project.

EPA would appreciate the opportunity to participate in any future discussions or meetings hosted by the U.S. Army Corps of Engineers regarding the proposed project.

Thank you for the opportunity to review the Draft EA for the Tweed-New Haven Taxiway and Drainage Improvement Project. Please contact me at (617) 918-1025 with any questions regarding our comments.

Sincerely,

Timothy Timmermann
Director Office of Environmental Review

**Comments on the Draft Environmental Assessment for the Tweed-New Haven Regional Airport Taxiway and Drainage Improvements Project**

Wetland Delineation

- The jurisdictional status of potential wetland areas is an important part of the quantification of project impacts in the Draft EA. The Draft EA (page 21) states that, "[w]etland jurisdictional boundaries within the project area were field delineated on November 2, 2016 to identify both inland and tidal wetlands as defined by the Connecticut General Statutes (CGS) as well as federal wetlands and navigable waters as defined by the U.S. Army Corp (*sic*) of Engineers (ACOE) under Section 10 of the Rivers and Harbors Act of 1899." The Draft EA also states that "[b]ecause the proposed wetland impacts total less than one (1) acre, the project could require a US Army Corps of Engineers (USACE) General Permit (GP), however, this low-quality wetland may not be considered jurisdictional to USACE." These two statements appear to contradict each other with respect to the jurisdictional status of project area wetlands. As such, we recommend that the Federal jurisdictional status of potential wetland areas under Section 404 of the Clean Water Act (even so-called "low-quality wetlands) be established prior to the publication of the Final EA so that the discussion of impacts by alternative is fully informed. Delineation of project area wetlands should be conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (January 2012), and associated Corps guidance.[1]

Alternatives

- We recommend that the Final EA describe whether there is a minimum distance requirement for separation of the access road and taxiway for Action Alternative A. It appears that the northern taxiway extension could be moved further east to bring it into closer alignment with the rest of taxiway A and increase separation distance from the runway. However, to stay on airport property, we recognize that this would mean the access road would be closer to the taxiway. The Final EA should explain whether such a design is acceptable.
- The Draft EA description of Action Alternative B (page 10) states that this alignment is "…presented as a way to keep all work within the existing airport boundary and reduce wetland impacts." However, it appears from the figures presented in Table 2, and by comparing Figures 2-5 and 2-6, the amount of wetland impact resulting from Action Alternative A is less than that of Action Alternative B. Action Alternative A also appears to have a more desirable geometry at the taxiway/runway interface, resulting in a near perpendicular holding angle, compared to the 30° holding angle of Action Alternative B. The discussion of wetland impacts in the Draft EA are limited by the lack of specific jurisdictional determinations (as noted above) and it is unclear whether or how the wetland impact totals across alternatives would change if areas are determined to be non-

[1] https://www.nae.usace.army.mil/Missions/Regulatory/Jurisdiction-and-Wetlands/

jurisdictional. We recommend that jurisdictional determinations be completed, impact totals confirmed or re-calculated and the analysis of impacts adjusted appropriately for presentation in the Final EA.

- It would also be helpful it the Final EA could describe whether Action Alternatives A and B, which only partially meet the Purpose and Need, remain viable as they both can be implemented with a smaller wetland impact than the proposed action. If they are viable Action Alternative A would appear to be the preferable of the three build Alternatives considered solely from a wetland impact perspective. We recommend that the Final EA explain if that conclusion is reasonable and if not, why.

Wetland Mitigation

- We note that no compensatory mitigation for wetland impacts is proposed in the Draft EA. Compensatory mitigation may be required under the CWA Section 404 permitting process and it would be helpful if the Final EA more fully explains proposed mitigation to address expected wetland impacts.

General Recommendations

- The project plans should indicate the direction of flow within drainage ditches.
- It would be helpful if the Final EA more fully describes where on-site stormwater will ultimately discharge (via a drainage ditch or other conveyance) as well as any stormwater treatment proposed.

# Appendix L

# Finding of No Significant Impact

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

# FINDING OF NO SIGNIFICANT IMPACT

## Tweed-New Haven Airport
## New Haven and East Haven, CT
## Taxiway and Drainage Improvement Project

After careful and thorough consideration of the facts contained in the attached EA, I find the proposed Federal action is consistent with existing national environmental policies and objectives of Section 101(a) of the National Environmental Policy Act of 1969 (NEPA) and other applicable environmental requirements. I also find the proposed Federal action will not significantly affect the quality of the human environment or include any condition requiring any consultation pursuant to section 102(2)(C) of NEPA.

APPROVED:  Date: January 3, 2020