Environmental Assessment
RNAV (GPS) Runway 20 Instrument Procedure Establishment

Hoyle, Tanner Project Number: 063223

Prepared for:  Tweed-New Haven Airport Authority
               155 Burr St
               New Haven, CT

Prepared by:

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

Responsible Federal Official: ___________________________  Date: ________________
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1. INTRODUCTION

1.1 Project Overview

The Tweed-New Haven Airport Authority (TNHAA) has prepared this document to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969 to evaluate the creation of an Area Navigation (RNAV) Global Positioning System (GPS) based instrument approach procedure to Runway 20 at Tweed-New Haven Regional Airport (HVN).

The project would entail development of instrument flight routes and procedures that would permit an aircraft operator to safely make an instrument approach in visual or instrument weather conditions and visually transition to land on Runway 20 when the winds are coming from the south. Currently, pilots must fly an instrument approach to Runway 02 and then circle to land on Runway 20 during southerly wind conditions. This circling maneuver can be challenging and result in the pilot becoming spatially disoriented, particularly if there is a ragged cloud ceiling and/or at night. According to National Transportation Safety Board (NTSB) findings, a fatal aircraft accident at Tweed-New Haven in 2013 is attributed to a pilot failing to maintain control during a circling instrument approach to Runway 20 in poor weather (Appendix A). Implementation of the proposed project would not require changes to existing runway or taxiway configurations or add any ground based instrumentation, lighting or marking.

1.2 Tweed-New Haven Regional Airport

Tweed New-Haven Regional Airport (HVN) is a public airport located on the coast of Connecticut on the town line boundary of the City of New Haven and the Town of East Haven (Figure 1). The Airport is owned by the City of New Haven and operated by the Tweed New Haven Airport Authority, a public instrumentality established by the Connecticut General Statutes 15-120i in 1997. Under the Airport and Airways Improvement Act, the Secretary of Transportation is required to publish a national plan for the development of public-use airports. The plan is published as the National Plan of Integrated Airport Systems (NPIAS), which identifies more than 3,400 airports that are significant to the nation’s air transportation system and thus eligible to receive Federal funding. The Airport is classified as a Commercial Service-Primary-Short Haul (less than 500 miles) airport with both air carrier and general aviation (GA) activity (FAA, 2002). The Airport is certified under Federal Aviation Regulations (FAR) Part 139 and is inspected annually to ensure compliance with appropriate design criteria by FAA.

The greater New Haven area is comprised of urban and suburban residential neighborhoods, as well as institutional, commercial, industrial/manufacturing and port facilities, and a network of highways, bridges and parklands located throughout the City and adjacent communities. The Airport is bordered by residential homes to the west, southeast, and north of the airfield. A variety of commercial properties border the east side of the airfield, including a capped landfill and transfer station, while west of the airfield lays Morris Cove. South of the airfield is Long Island Sound, and south and west of the Airport are tidally influenced wetlands.
1.3 Environmental Assessment (EA) Requirement

The proposed Federal action conducted by the Federal Aviation Administration (FAA) would include using Federal funding to develop a standardized instrument approach procedure to be used by trained and certificated pilots flying properly instrumented and equipped aircraft to enhance airport safety and increase operational efficiency. This Federal action must comply with FAA NEPA requirements. This analysis was conducted in accordance with FAA-issued guidelines, including the "Environmental Desk Reference for Airport Actions", FAA Order 5050.4B "National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions" and FAA Order 1050.1F "Environmental Impacts: Policies and Procedures."

FAA Order 1050.1F lists actions that may be Categorically Excluded from environmental analysis under specific conditions. Creation of new air traffic control procedures (e.g., instrument approach procedures) and modifications to currently approved procedures that routinely route aircraft over noise sensitive areas at less than 3,000 feet above ground level (AGL) is specifically not categorically excluded from analysis, and is noted as normally requiring an Environmental Assessment (EA) under Order 1050.1F, Paragraph 3-1.2.b.(12).

2. PURPOSE AND NEED/ PUBLIC INVOLVEMENT

2.1 Purpose and Need

The purpose of the proposed project is to develop and publish a new instrument approach procedure aligned with Runway 20. Currently, no instrument approach procedure to Runway 20 exists. A Noise Study completed in 2012 determined that turboprop aircraft arrive and depart on Runway 20 46% of the time and jet aircraft landings and takeoffs occur on Runway 20 56% of the time. There is a need to allow pilots to safely navigate using aircraft instruments and descend using a published procedure to a point in space where the visibility and ceiling will permit them to proceed visually to a straight-in landing on Runway 20. The proposed instrument procedure is depicted in Figure 2.

This procedure would improve airport safety and operational efficiency in times of reduced visibility and/or low cloud heights as follows:

- It would improve airport safety by permitting pilots to fly a stabilized approach aligned with the runway of intended landing to a safe height above ground where a decision can be made to either proceed visually and land or execute a missed approach. A missed approach allows the pilot to either try again or proceed to an alternate airport with better weather. A straight-in approach is safer for pilots to perform as it is the norm and requires less turning and less division of attention between cockpit instruments and outside visual cues as is required by a circling approach. Excessive division of attention is a contributing factor to spatial disorientation and loss of situational awareness which can lead to loss of control. Loss of control at low altitude is often catastrophic as there is insufficient altitude to regain control prior to ground impact.
It would improve the operational efficiency of the airport by providing pilots with a consistent, safe method to complete an approach and landing to Runway 20 without the need for a circle to land maneuver as is currently required when the winds favor landing to the south.
2.2 Background and Public Involvement

The proposed project was discussed at a publicly advertised Tweed-New Haven Airport Authority Board meeting on April 20, 2016. All TNHAA meetings are open to the public, and meeting agendas and minutes are posted on the HVN website www.flytweed.com/community-regulations/#airport-authority-meetings. At that meeting TNHAA was informed that an Environmental Assessment would need to be prepared by the FAA to satisfy the NEPA requirements for a proposed Federal Action. Per standard FAA protocol, an airport’s operator (or sponsor) may prepare the NEPA analysis for FAA review and adoption.

The project was advertised as available for review and public comment for 30 days from August 12, 2016 to September 12, 2016. Public comments that were received during this period are attached as Appendix B.

Coordination between the United States of America and Tribal Leaders was initiated by letter from the FAA Regional Administrator to the two tribal coordinators dated August 8, 2016 (Appendix C).

3. PROPOSED ACTION AND ALTERNATIVES

The following alternatives have been developed by TNHAA in conjunction with the FAA. The alternatives are evaluated based on the ability to meet current FAA criteria and meet the purpose and need for the project as stated in Section 2 of this document. There are no alternatives presented here beyond the No Action and Proposed Action because there are no other options for meeting the purpose and need of the project.

3.1 No Action

This alternative would maintain the existing circle-to-land approach procedure that requires pilots to follow an instrument approach path leading to Runway 02. Visual contact with the runway is necessary to be established, while maintaining continuous visual contact, remaining clear of clouds, and circling at a minimum mean sea level altitude of not lower than 720 feet (708 feet above the airport elevation) in order to land visually on Runway 20 if the winds are favoring landing to the south. If any of these factors are not able to be completed by the pilot, a safe landing cannot be completed and the pilot must try again or proceed to another airport.

3.2 Alternative A: Develop an RNAV based Instrument Approach to Runway 20 (Proposed Action)

This alternative would allow the FAA to create and publish an Area Navigation (RNAV) Global Positioning System (GPS) based instrument approach procedure to Runway 20 (Figure 2). The Proposed Action would permit an aircraft operator with the proper training and equipment to safely make a straight-in instrument approach to a landing on Runway 20 when the winds are favoring a southerly landing.

4. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 Introduction
There are 14 environmental impact categories identified by FAA Order 1050.1F. Per direction provided in FAA Guidance Memo #2, 2011, “Guidance on Preparing Focused, Concise and Timely Environmental Assessments”, it is not the intent of this document to provide detailed discussion or analysis of all categories. Only those areas where there may be significant environmental impact caused by the proposed action, or where there are uncertainties which require evaluation, are identified in this document.

Implementation of the proposed project would not require changes to existing runway or taxiway configurations, add any ground based instrumentation, lighting or marking or result in land-based actions of any kind. Thus, for the following potential environmental impact categories, analysis is not required because the resource is not present within the project boundary or the No Action or Proposed Action would not affect it:

- Air Quality
- Biological Resources (Fish, Wildlife and Botanical Habitat)
- Climate
- Coastal Resources
- Department of Transportation Act, Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Land use
- Natural Resources and Energy Supply
- Socioeconomic, Environmental Justice, and Children’s Environmental Health and Safety/Public Health and Safety
- Visual Effects and Light Emissions
- Water Resources (Including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

The project area identified for review in the analysis described below includes the areas under and along the proposed final approach course, approximately five (5) nautical miles to the north of the airport as shown on Figures 3 and 4.
The Proposed Action, as defined in Section 3, could potentially affect the following environmental categories:

4.2 Noise and Noise-Compatible Land Use

On May 4, 2016 the FAA completed an 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. The noise modeling analysis was completed to screen for potential increases in noise resulting from implementation of the proposed procedure. 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. The analysis is provided as Appendix D.

4.3 Historic, Architectural, Archaeological and Cultural Resources

The Connecticut State Historic Preservation Office was contacted via letter dated 1 August 2016 for a project review (Appendix E). A follow up email was sent on 8 August 2016.

Instrument Approach Procedure development would not alter the land nor affect any unidentified historic, architectural, archaeological or cultural resources.
5. MITIGATION

Mitigation is typically used to offset impacts caused by the proposed project. The primary methods to reduce environmental impacts are to avoid the resource when possible or minimize the impacts to the resource being impacted. Each method of mitigation is proposed to the regulatory agency where it is revised through an interim process. Ultimately, mitigation is confirmed through the permitting process with local, state, and federal resource agencies.

Because the development and publishing of an instrument approach would not result in impacts, no additional mitigation is proposed for this action.

6. AGENCIES CONTACTED, PERSONS CONSULTED AND EA PREPARERS

EA Preparers

Agencies and Organizations Contacted/Consulted

Federal Aviation Administration, Lee Kyker, Environmental Specialist, North Team, Operations Support Group, AJV-E2

Federal Aviation Administration, New England Region, Airports Division (ANE-600), 12 New England Executive Park, Burlington, MA 01803. Contact: Richard Doucette, Environmental Manager

Connecticut State Historic Preservation Office (SHPO), One Constitution Plaza, 2nd Floor, Hartford, CT 06103 Contact: Mr. Todd Levine

Intergovernmental Consultation

Mashantucket Pequot Indian Tribe of Connecticut, 2 Matts Path, Mashantucket, CT 06338, The Honorable Rodney Butler, Chairman

Mohegan Indian Tribe of Connecticut, 5 Crow Hill Road Uncasville, CT 06382, The Honorable Bruce Bozsum, Chairman
PREVENT LOSS OF CONTROL IN FLIGHT IN GENERAL AVIATION

What is the issue?

While airline accidents have become relatively rare in the United States, pilots and passengers involved in general aviation (GA) operations still die at alarming rates every year due to loss of aircraft control by the pilot.

Between 2008 and 2014, about 47 percent of fatal fixed-wing GA accidents in the United States involved pilots losing control of their aircraft in flight, resulting in 1,210 fatalities.

GA pilot proficiency requirements are much less rigorous than those of airline pilots. GA pilots are much more likely to have longer intervals between training sessions and longer intervals between flights.

They typically only need to complete a flight review, consisting of one hour of ground training and one hour of flight training, every 24 months. They almost exclusively maintain and improve skills on their own, and their conduct of safe flight depends more on individual abilities and judgment, potentially leaving them unprepared for situations that can lead to loss of control.

Statistically, approach to landing, maneuvering, and initial climb are the deadliest phases of flight for loss-of-control accidents. For example, on August 9, 2013, in East Haven, Connecticut, while attempting a tight circling approach in and out of clouds during gusty wind conditions, a Rockwell International 690B entered an inadvertent aerodynamic stall/spin and crashed into a house, killing the pilot, his passenger, and two children in the house.

What can be done?

In October 2015, the NTSB held a forum on “Humans and Hardware: Preventing General Aviation Inflight Loss of Control.” The forum addressed some of the common causes of loss-of-control events, such as pilot inattention due to workload, distractions or complacency, and a lack of understanding how a stall actually relates to exceeding a wing’s critical angle of attack (AOA), as opposed to the more common idea that it’s just related to airspeed. Also noteworthy is that when airplanes are close to the ground, such as in a landing pattern, there is limited time and altitude available to recover from a stall, thus making these stalls particularly deadly.
What can be done? continued

The 2015 forum provided potential hardware solutions, such as the use of AOA indicators, and human solutions, such as increased pilot training to ensure a full understanding of stall phenomena. This training should also include understanding AOA concepts and how elements such as weight, center of gravity, turbulence, maneuvering loads, and other factors can affect an airplane’s stall characteristics.

Pilots should:

• Be prepared to recognize stall characteristics and warning signs, and be able to apply appropriate recovery techniques before stall onset.
• Be honest with themselves about their knowledge level of stalls, and their ability to recognize and handle them.
• Use effective aeronautical decision-making techniques and flight risk assessment tools during both preflight planning and inflight operations.
• Manage distractions so that they do not interfere with situational awareness.
• Understand, properly train, and maintain currency in the equipment and airplanes they operate.
• Take advantage of available commercial trainer, type club, and transition training opportunities.
• Realize stall characteristics can vary with aircraft loading and are usually worse at aft CG (center of gravity).

Airplane owners should consider installing an AOA indicator, which, coupled with pilot understanding and training on how best to use it, can enhance situational awareness during critical or high-workload phases of flight.

The Federal Aviation Administration, aviation advocacy groups, type clubs, and manufacturers, including kit manufacturers, are creating and maintaining educational initiatives that include general principles, best practices, and operational specifics as they relate to loss of control. These resources can be helpful in learning effectiveness countermeasures.

All stakeholders should recognize the importance of their roles in the reduction of loss-of-control accidents. However, individual pilots play the most critical role; they have both the ultimate responsibility and the ultimate opportunity to reduce these needless accidents through ongoing education, flight currency, self-assessment, use of available technologies, and vigilant situational awareness in the cockpit.

*RELATED ACCIDENTS:
February 22, 2014; LaGrange, GA; ERA14FA128; 3 dead (pictured at right)
December 12, 2013; Collbran, CO; CEN14FA084; 3 dead
August 9, 2013; East Haven, CT; ERA13FA358; 4 dead
December 29, 2012; Lakeside, CA; WPR13FA076; 3 dead
February 14, 2013; St. Lucie, FL; ERA13FA201; 1 dead (pictured at left)

*For detailed accident reports, visit www.ntsb.gov
Public Comments

Appendix B
CERTIFIED MAIL – RETURN RECEIPT REQUESTED

The Honorable Rodney Butler, Chairman
Mashantucket Pequot Indian Tribe of Connecticut
2 Matts Path
Mashantucket, CT 06338

Dear Chairman Butler:

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 the 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 Indian Tribe of Connecticut to consult on concerns that may significantly affect your Tribe related to the proposed airport project. Early identification of Tribal concerns will allow the FAA and 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 FAA proposes to develop and publish an Area Navigation (RNAV) Global Positioning System (GPS) based instrument approach procedure to Runway 20 at Tweed-New Haven Airport. The Proposed Action entails developing instrument flight routes and procedures that will permit an aircraft operator to safely make an instrument approach in poor weather conditions and visually transition to land on Runway 20 when the winds are coming from the south.
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 the FAA within thirty days of your receipt of this correspondence as to your interest in Government-to-Government Consultation regarding this project.

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
Regional Administrator

Enclosure

cc: Ms. Melissa Zobel, Tribal Historian, Mohegan Indian Tribe of Connecticut
(Certified Mail - Return Receipt Requested)
CERTIFIED MAIL – RETURN RECEIPT REQUESTED

The Honorable Bruce Bozsum, Chairman
Mohogan Indian Tribe of Connecticut
5 Crow Hill Road
Uncasville, CT 06382

Dear Chairman Bozsum:

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 the Tweed-New Haven Airport, New Haven, Connecticut, as outlined herein.

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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 project. Early identification of Tribal concerns will allow the FAA and 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 FAA proposes to develop and publish an Area Navigation (RNAV) Global Positioning System (GPS) based instrument approach procedure to Runway 20 at Tweed-New Haven Airport. The Proposed Action entails developing instrument flight routes and procedures that will permit an aircraft operator to safely make an instrument approach in poor weather conditions and visually transition to land on Runway 20 when the winds are coming from the south.
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Sincerely,

Amy L. Corbett
Regional Administrator

Enclosure

cc: Ms. Melissa Zobel, Tribal Historian, Mohegan Indian Tribe of Connecticut
    (Certified Mail - Return Receipt Requested)
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

<table>
<thead>
<tr>
<th>Procedure Name</th>
<th>Procedure Type</th>
<th>Publication Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>RNAV (GPS) RWY 20</td>
<td>Instrument Approach</td>
<td>November 10, 2016</td>
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</table>

Table 1: HVN Procedure to Be Modeled
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:

<table>
<thead>
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<th>Procedure</th>
<th>Aircraft Type</th>
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<tr>
<td>RNAV (GPS) RWY 20</td>
<td>Approximately 60% Prop/Turbo Prop</td>
</tr>
<tr>
<td></td>
<td>Approximately 40% Jet</td>
</tr>
</tbody>
</table>

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
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<td>15013</td>
<td></td>
</tr>
<tr>
<td>16000</td>
<td>16013</td>
<td></td>
</tr>
<tr>
<td>17000</td>
<td>17013</td>
<td></td>
</tr>
<tr>
<td>18000</td>
<td>18013</td>
<td></td>
</tr>
<tr>
<td>Above</td>
<td>Above</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Geometric Shape</th>
<th>Color</th>
<th>DNL Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQUARE</td>
<td>BLUE</td>
<td>45–50 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>LIGHT BLUE</td>
<td>50–55 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>GREEN</td>
<td>55–60 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>YELLOW</td>
<td>60–65 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>ORANGE</td>
<td>65–70 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>PINK</td>
<td>70–75 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>RED</td>
<td>75 dB OR MORE</td>
</tr>
</tbody>
</table>

Table 3-1: Legend for Noise Exposure
<table>
<thead>
<tr>
<th></th>
<th>Runway 02</th>
<th></th>
<th>Runway 20</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DAY</td>
<td>NIGHT</td>
<td>DAY</td>
<td>NIGHT</td>
</tr>
<tr>
<td>ARRIVALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Jet</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>Small Jet</td>
<td>53</td>
<td>4</td>
<td>53</td>
<td>1</td>
</tr>
<tr>
<td>Turbo-Prop</td>
<td>58</td>
<td>3</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td>Military</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Piston</td>
<td>8</td>
<td>0</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>DEPARTURES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Jet</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>1</td>
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<td>Small Jet</td>
<td>42</td>
<td>2</td>
<td>66</td>
<td>4</td>
</tr>
<tr>
<td>Turbo-Prop</td>
<td>44</td>
<td>2</td>
<td>52</td>
<td>1</td>
</tr>
<tr>
<td>Military</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Piston</td>
<td>3</td>
<td>0</td>
<td>14</td>
<td>0</td>
</tr>
</tbody>
</table>

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](image)

Figure 4-1: Alternative Noise Exposure for the Proposed Procedures in TARGETS
Figure 4-2: Baseline Noise Exposure in Google Earth

<table>
<thead>
<tr>
<th>Geometric Shape</th>
<th>Color</th>
<th>DNL Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQUARE</td>
<td>BLUE</td>
<td>45–50 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>LIGHT BLUE</td>
<td>50–55 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>GREEN</td>
<td>55–60 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>YELLOW</td>
<td>60–65 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>ORANGE</td>
<td>65–70 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>PINK</td>
<td>70–75 dB</td>
</tr>
<tr>
<td>SQUARE</td>
<td>RED</td>
<td>75 dB OR MORE</td>
</tr>
</tbody>
</table>

Table 4-1: Legend for Noise Exposure
<table>
<thead>
<tr>
<th></th>
<th>Runway 02</th>
<th>Runway 20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DAY</td>
<td>NIGHT</td>
</tr>
<tr>
<td><strong>ARRIVALS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Jet</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Large Jet</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Small Jet</td>
<td>53</td>
<td>4</td>
</tr>
<tr>
<td>Turbo-Prop</td>
<td>58</td>
<td>3</td>
</tr>
<tr>
<td>Military</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Piston</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td><strong>DEPARTURES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Jet</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Large Jet</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Small Jet</td>
<td>42</td>
<td>2</td>
</tr>
<tr>
<td>Turbo-Prop</td>
<td>44</td>
<td>2</td>
</tr>
<tr>
<td>Military</td>
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<td>0</td>
</tr>
<tr>
<td>Piston</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>GEOMETRIC SHAPE</th>
<th>COLOR</th>
<th>DNL DIFFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQUARE</td>
<td>PURPLE</td>
<td>45-60 DB BASELINE WITH A DECREASE OF 5.0 DB OR GREATER IN THE ALTERNATIVE</td>
</tr>
<tr>
<td>SQUARE</td>
<td>BLUE</td>
<td>60-65 DB BASELINE WITH A DECREASE OF 3.0 DB OR GREATER IN THE ALTERNATIVE</td>
</tr>
<tr>
<td>SQUARE</td>
<td>GREEN</td>
<td>65 DB BASELINE OR GREATER WITH A DECREASE OF 1.5 DB OR GREATER IN THE ALTERNATIVE</td>
</tr>
<tr>
<td>OVAL</td>
<td>RED</td>
<td>65 DB OR GREATER ALTERNATIVE WITH AN INCREASE OF 1.5 DB OR GREATER OVER THE BASELINE</td>
</tr>
<tr>
<td>OVAL</td>
<td>ORANGE</td>
<td>60-65 DB ALTERNATIVE WITH AN INCREASE OF 3.0 DB OR GREATER OVER THE BASELINE</td>
</tr>
<tr>
<td>OVAL</td>
<td>YELLOW</td>
<td>45-60 ALTERNATIVE DB WITH AN INCREASE OF 5.0 DB OR GREATER OVER THE BASELINE</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>% Red</th>
<th>% Orange</th>
<th>% Yellow</th>
<th>% NoChange</th>
<th>% Green</th>
<th>% Blue</th>
<th>% Purple</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 5-2: Targets Noise Impact Report**
August 1, 2016

Mr. Todd Levine
State Historic Preservation Office
One Constitution Plaza, 2nd Floor
Hartford, CT 06103

Re: Develop GPS Instrument Approach Procedure to Runway 20
Tweed-New Haven Regional Airport

Dear Mr. Levine,

Hoyle, Tanner & Associates, Inc. is submitting this letter on behalf of the Tweed-New Haven Regional Airport Authority (Sponsor) and the Federal Aviation Administration (FAA), who is acting as the lead federal agency for the U.S. Department of Transportation. The purpose of this letter is to gather data so that a finding may be made in conformance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA) and state law (if applicable).

The Tweed-New Haven Airport Authority (TNHAA) has requested the Federal Aviation Administration (FAA) create a GPS based RNAV approach to Runway 20 at HVN. The Proposed Action entails developing instrument flight routes and procedures that will permit an aircraft operator to safely make an instrument approach in poor weather conditions and visually transition to land on runway 20 when the winds are out of the south. Currently pilots must fly an approach to the north to runway 02 and then circle to land on runway 20 during southerly wind conditions. This circling maneuver can be challenging and result in the pilot becoming spatially disoriented, particularly if there is a ragged cloud ceiling and at night. According to the NTSB a fatal accident in 2014 is attributed to a pilot becoming spatially disoriented and failing to maintain control during a circling approach to Runway 20 in poor weather.

The preferred procedure is for pilots to maintain a stabilized straight-in approach and descent into the wind to the intended runway of landing. Upon reaching a published minimum descent altitude or decision altitude they must either continue visually to a landing or, if unable to see the runway environment, execute a missed approach procedure and hold for better weather, or proceed to an alternate airport with better weather. There are no changes proposed to any existing on ground facilities and no existing structures will be affected as a result of this project.

Environmental Assessment
Appendix D
Enclosed, please find a Locus Map showing the vicinity of the airport. A copy of the proposed instrument procedure leading to Runway 20 is enclosed which is considered the Area of Potential Effect (APE), along with an FAA study indicating the proposed procedure will not create any additional significant noise. Aircraft are currently fly over the same locations during good weather at similar altitudes above the ground as they conduct visual landings to Runway 20. This procedure will provide additional standardization and safety during poor weather conditions.

Please provide any knowledge of, or concerns with, historic properties in the area, and identify issues relating to the proposed action’s potential effect on historic properties. Kindly respond within 15 days of receiving this letter. Feel free to contact me at 603-669-5555, x-143, or by email, emcdougal@hoyletanner.com with any questions. Thank you.

Sincerely,

HOYLE, TANNER & ASSOCIATES, INC.

Evan R. McDougal C.M.
Airport Planning Manager

Enclosures