

Patrick Leahy Burlington International Airport



**BTV Noise Exposure Map Update 2024/2029
Technical Advisory Committee Meeting #3**

April 11, 2024

- **Introductions**
- **Part 150 Overview**
- **Existing Noise Exposure Map (NEM)**
- **Existing Noise Compatibility Program (NCP)**
- **Responses to Questions from TAC Meeting #2**
- **Public Comment**



INTRODUCTIONS



Diane Carter | Principal-in-Charge
Brianna Whiteman | Assistant Project Manager

Responsible for:

- Overall Project Management/Client/Agency Coordination
- Community Outreach



Gene Reindel | Principal-in-Charge
Kate Larson | Project Manager
Paul Krusell | Assistant Project Manager
David Crandall | Technical Advisor

Responsible for:

- Noise Modeling
- Compliance with Federal Regulations

- Vermont National Army Guard
- Burlington Airport Commission
- Patrick Leahy Burlington International Airport
- Chittenden County Regional Planning Commission (CCRPC)
- City of South Burlington
- City of Winooski
- Community College of Vermont
- FAA (Air Traffic Manager)
- FAA (New England Regional Office) – Advisory
- Heritage Aviation (FBO)
- South Burlington School District
- Town of Williston
- Vermont National Air Guard (VTANG)
- Williston School District
- Winooski School District



PART 150 OVERVIEW

City of Burlington

- As airport owner and operator, the City is responsible for conducting the Noise Exposure Map (NEM) analysis and submitting the study for acceptance
- Consulting team is retained to conduct technical work and prepare documentation related to the NEM process

Federal Aviation Administration (FAA)

- Determines whether the NEM process has met Part 150 requirements and approves individual noise mitigation measures

Technical Advisory Committee (TAC)

- Provides representation for stakeholder organizations, including local jurisdictions, airlines, local business interests

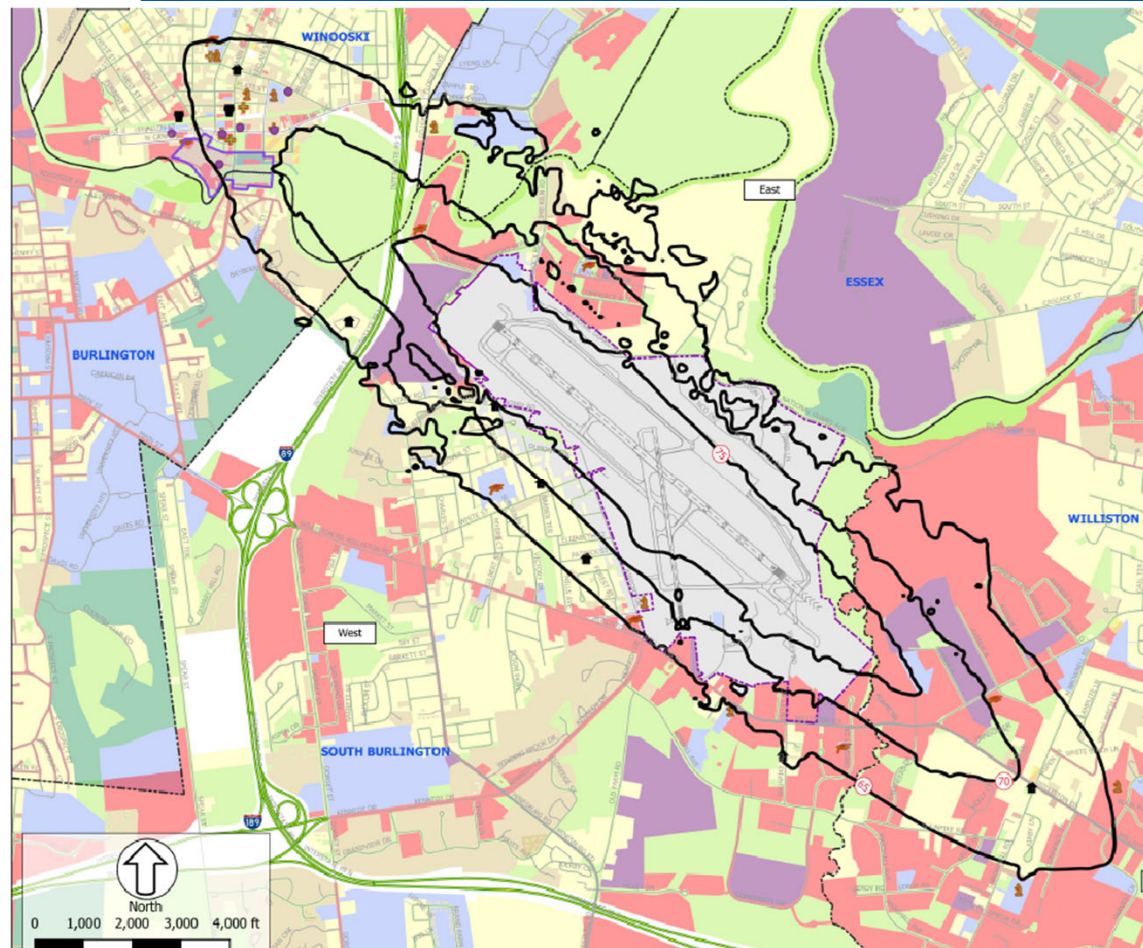
FAA “accepts” NEM as compliant with Part 150 standards

NEM must include detailed description of:

- Airport layout, aircraft operations, and other inputs to noise model
- Aircraft noise exposure in terms of Day-Night Average Sound Level (DNL)
- Land use compatibility assessment

NEM must address two calendar years

- Year of submission
- Forecast year (at least five years from year of submission)



2023 NEM Est. Dwelling Units & Population

Day-Night Level (DNL)	Est. Dwelling Units and Population	Total
65-70 dB	Dwelling Units	2,344
	Population	5,438
70-75 dB	Dwelling Units	283
	Population	657
75 dB+	Dwelling Units	13
	Population	30
Total 65+ dB	Dwelling Units	2,640
	Population	6,125

Source: BTV 2018 and 2023 Noise Exposure Map, September 2019, Table 4

Land Use Compatibility Guidelines

Land Use	DNL <65 dB	DNL 65-70 dB	DNL 70-75 dB	DNL > 75 dB
Residential	Compatible	Incompatible ⁽¹⁾	Incompatible ⁽¹⁾	Incompatible
Mobile home park	Compatible	Incompatible	Incompatible	Incompatible
Transient lodgings	Compatible	Incompatible ⁽²⁾	Incompatible ⁽²⁾	Incompatible ⁽²⁾
Schools	Compatible	Incompatible ⁽³⁾	Incompatible ⁽³⁾	Incompatible
Hospitals and nursing homes	Compatible	25 ⁽⁴⁾	30 ⁽⁴⁾	Incompatible
Churches, auditoriums and concert halls	Compatible	25 ⁽⁴⁾	30 ⁽⁴⁾	Incompatible

⁽¹⁾ Measures are required to achieve 25 to 30 dB of noise level reduction for aircraft noise from outside to inside.

⁽²⁾ “Transient lodgings” include, but are not limited to, hotels and motels.

⁽³⁾ Measures are required to achieve 25 to 30 dB of noise level reduction for aircraft noise from outside to inside.

⁽⁴⁾ The measures to achieve NLR of 25 or 30 dB must be incorporated into design and construction of structure.

REVIEW OF EXISTING NCP

#	TYPE OF MEASURE	BTV IMPLEMENTATION STATUS
Operational Measures (2008 Record of Approval)		
O-1	Extension of Taxiway G	Completed
O-2	Terminal Power Installation & APU/GPU Restrictions	Implemented
O-3	Nighttime Bi-direction Runway Use	Unable to Implement
O-4	Noise Abatement Flight Paths for Runway 15 & 33 Departures and 15 Arrivals	Implemented
O-5	Voluntary Limits on Military C-5A Training	Implemented
O-6	Voluntary Minimization of F-16 Multiple Aircraft Flights	No Longer Applicable
O-7	Voluntary Army Guard Helicopter Training Controls	Not Implemented
Land Use Measures (2020 Record of Approval)		
L-1	Land Acquisition and Relocation	Implemented
L-2	Sound Insulation of Residential Structures	Implemented
L-3	Sound Insulation of Noise Sensitive Buildings	Implemented
L-4	Purchase Assurance for Single Family Parcels	Available for Implementation
L-5	Sales Assistance for Single Family Parcels	Available for Implementation
Programmatic Measures (2020 Record of Approval)		
P-1	Ongoing Monitoring and Review of Noise Exposure Map (NEM) and Noise Compatibility Program (NCP) Status	Ongoing
P-2	Noise and Flight Track Monitoring	Ongoing

The Operational Measures were contained in the 2008 NCP Record of Approval (ROA). Many are outdated and no longer applicable. These measures will be reviewed during the next NCP Update.

The Land Use & Programmatic Measures were contained in the 2020 NCP ROA. All measures are voluntary.

OPERATIONAL MEASURES

2008 Record of Approval

O-1: Extension of Taxiway G

Extend Taxiway G, which would be extended from the existing intersection with Taxiway A to Taxiway C, remaining parallel with Runway 15/33 in order to reduce noise levels for residents along Airport Drive.

Status: Completed

The extension of Taxiway G was completed in 2023.

O-2: Terminal Power Installation

Install terminal power hookups for aircraft, which would reduce the need for aircraft to use internal auxiliary power units (APU) or ground power units (GPU). Following the installation, a rule prohibiting the use of APUs or GPUs between 10:00 p.m. and 7:00 a.m. would be put in place.

Status: Implemented

The Airport terminal now has “aircraft ground power” capability at all Passenger Boarding Bridges. The City will not be implementing the GPU/APU rule between 10:00 p.m. and 7:00 a.m., as too many flights arrive/depart during those hours. However, use of ground power is required for all aircraft in proximity to an available hookup.

O-3: Nighttime Bi-direction Runway Use

In order to minimize late-night operations over the City of Winooski, the Air Traffic Control Tower (ATCT) would use Runway 15 for departures and Runway 33 for arrivals, traffic conditions permitting.

Implementation Status: Unable to Implement

The BTV ATCT is closed from midnight until 5:30 a.m., which makes implementation of this measure infeasible during these hours. The ATCT has not implemented the procedure during the remaining DNL “nighttime” hours, i.e., from 5:30 to 7:00 a.m.

O-4: Noise Abatement Flight Paths

Development of new flight procedures that would have civil aircraft fly over less populated areas. Runway 33 departures would turn to a heading of 310 degrees. Runway 15 departures would turn to a heading of 180 degrees.

Implementation Status: Implemented

O-5: Voluntary Limits on Military C-5A Training

Develop an informal agreement with the military that would limit C-5A operations to only necessary takeoffs and landings.

Implementation Status: Implemented

An agreement is not currently in place, however:

- (1) BTV Operations strongly discourage C-5A training at the Airport, as the runways are only 150 feet wide and wake turbulence from C-5A operations tears up runway-edge lighting
- (2) Historically, the military has always coordinated the arrival of a C-5A with BTV Operations because of the constraints on the airfield
- (3) All transient military aircraft are limited to two practice approaches

O-6: Minimization of F-16 Multiple Aircraft Flights

Voluntary minimization of F-16 multiple aircraft flights. Military personnel would schedule as many single-aircraft, as opposed to multiple-aircraft, flights as possible.

Implementation Status: No Longer Applicable

The VTANG fighter wing changed from the F-16 aircraft to the F-35A in 2020.

O-7: Voluntary Army Guard Helicopter Training Controls

The Army National Guard helicopter training operations be conducted away from the Airport when conditions permit. In terms of long-range planning, the Guard should consider consolidating operations at Camp Johnson.

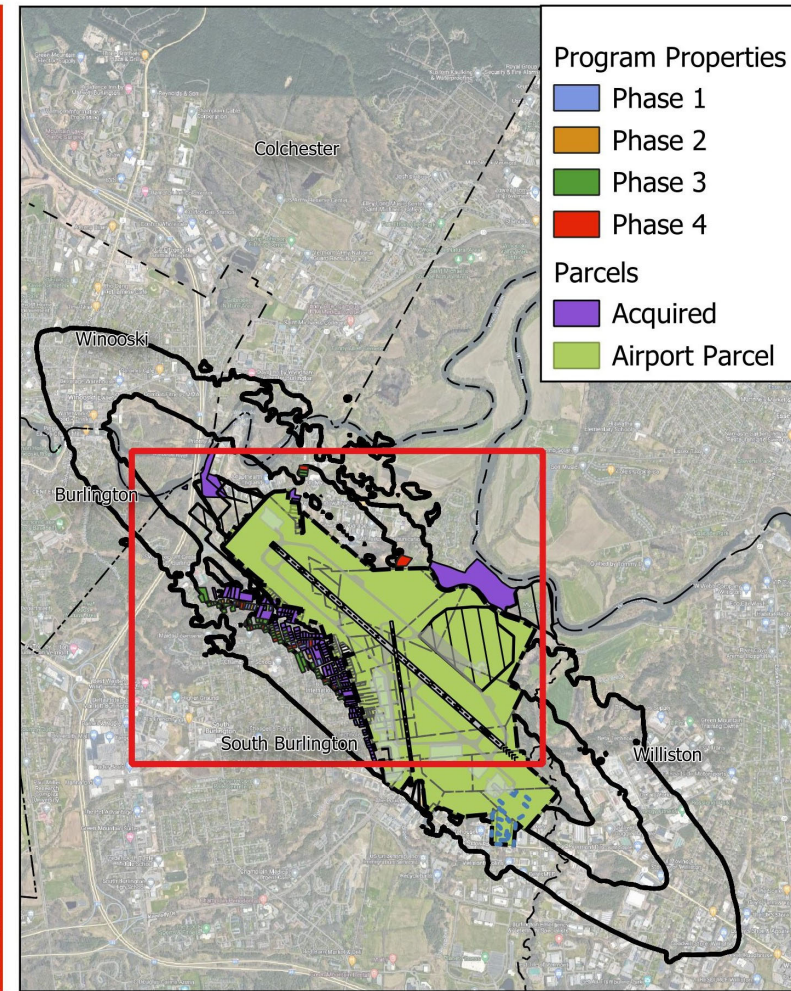
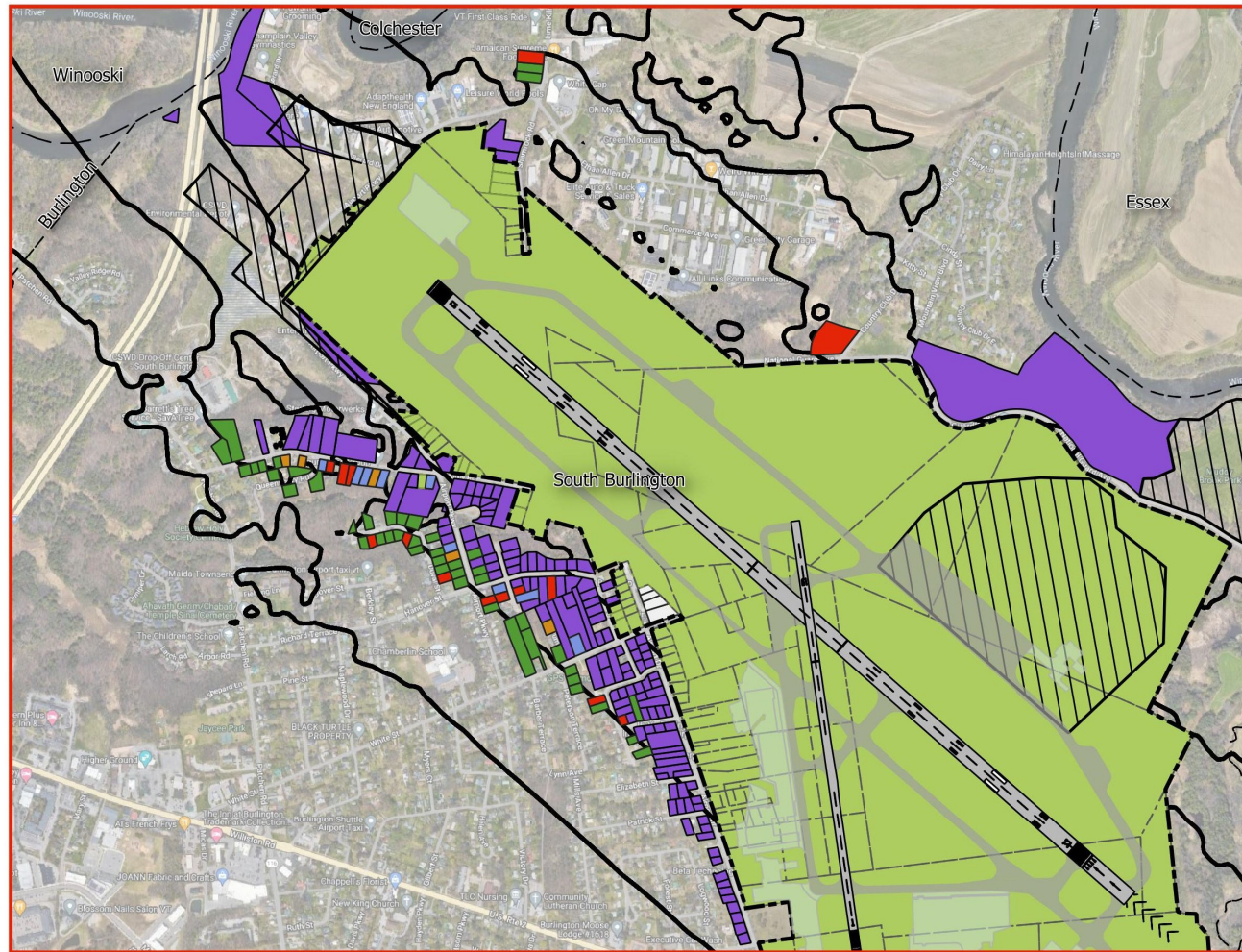
Implementation Status: Not Implemented

The Vermont Army National Guard has continued training operations at BTV.

LAND USE MEASURES

2020 Record of Approval

Noise Mitigation Program Status – April 2024



L-1: Land Acquisition and Relocation

Land Acquisition and Relocation of parcels where the majority of the parcel is within the 75 dB DNL contour (to preserve neighborhood continuity).

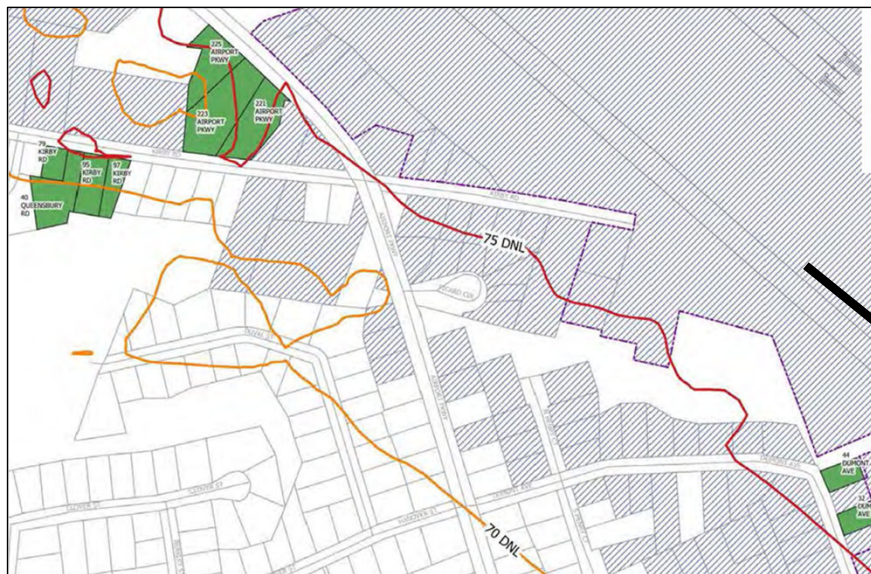
The program is voluntary for eligible owners wishing to participate. Owners are paid fair market value and provided relocation assistance.


Status: Implemented – Available for the 5 homes located in the 75 dB DNL

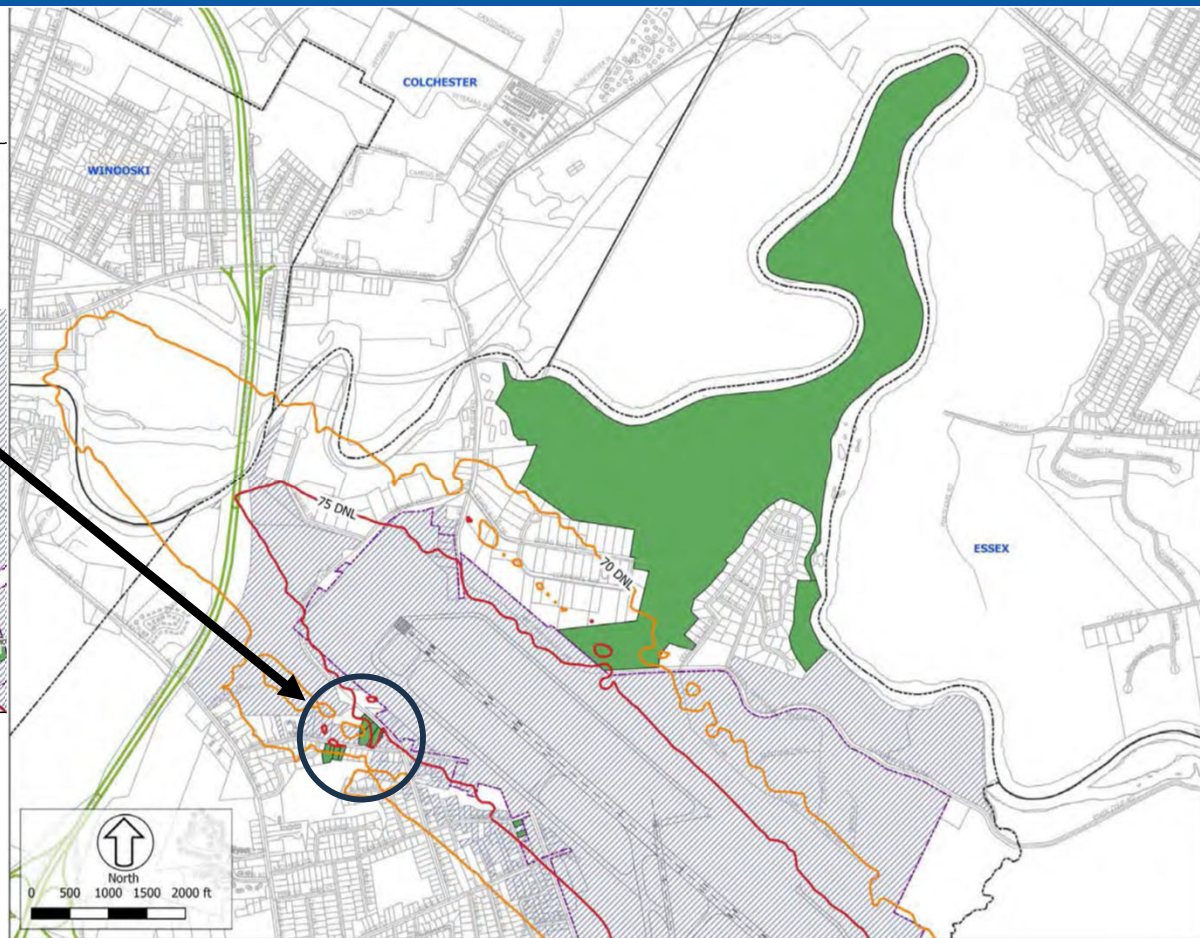
Eligible homes have previously declined participation in this program.

Since the start of federal Fiscal Year 2007 through September 2017, the FAA has issued 13 grants to the City of Burlington totaling approximately \$48 million.

Chamberlin Neighborhood 75 dB DNL Homes



75 DNL Properties are shown in 



L-2: Sound Insulation of Residential Structures

Provide sound insulation for homes within the 65 dB and 70 dB DNL contours of the approved NEM. These qualified homes would receive an acoustical treatment package, in accordance with FAA guidelines, to:

- reduce interior noise levels to 45 DNL and
- provide a minimum reduction of 5 dB from the existing interior noise level

Status: Implemented and Ongoing

The City began the program in 2021. To date, 82 homes have been designed over 4 phases and construction has been completed on 14 homes. There are an additional 23 homes currently under design. The City plans to complete 50 homes per year based on available FAA funding.

L-3: Sound Insulation of Noise Sensitive Buildings

Provide sound insulation of qualified non-compatible non-residential land uses (schools, hospitals, places of worship) within the 65 dB and 70 dB DNL noise contour

Status: Implemented and Ongoing

There are 24 noise sensitive buildings located in the 65 dB and 70 dB DNL contours.

The Gertrude E. Chamberlin Elementary School, located within the DNL 65 dB contour received a positive ventilation system upgrade in 2021. Acoustical testing determined the existing interior noise level was below 45 dB DNL and did not qualify for a full treatment.

Annually, the City selects potentially eligible properties for sound insulation for the FAA AIP grant program. Properties are selected by noise level contour, starting with the highest contour and working outward, for both residential and non-residential properties within the project area.

L-4: Purchase Assurance for Single Family Parcels

A voluntary purchase assurance program would include any qualified non-compatible owner-occupied single-family parcels within the 65 dB DNL and 70 dB DNL contours.

Status: Available for Implementation

This program has not been requested by eligible homeowners.

The City would:

- Determine if the home is eligible for sound insulation (if not, home is eligible for sales assistance)
- Acquire the home (with FAA AIP grant funds) in exchange for an aviation easement
- Provide sound insulation treatment package
- Resell the home on the open market for fair market value
- Utilize the proceeds from the sale to fund further noise mitigation programs

L-5: Sales Assistance for Single Family Parcels

A voluntary sales assistance program would include qualified owner-occupied single-family parcels that are not eligible for sound insulation within the 65 dB DNL and 70 dB DNL contours.

The City would provide an incentive to assure homeowners receive fair market value for the sale of their home on the open market in exchange for an aviation easement.

Status: Available for Implementation

This program has not been requested by eligible homeowners.

PROGRAMMATIC MEASURES

2020 Record of Approval

P-1: Ongoing Review of NEM and NCP Status

The City will update the NEM and NCP, when the following occurs:

- Changes in airport layout
- Unanticipated changes in airport activity
- Non-compliance with NCP

Status: Ongoing

The City continues to regularly assess the Airport's noise exposure. This NEM update is to assess the noise impacts of the VTANG use of the F-35A aircraft.

This measure also created a standing noise abatement committee (Sound Committee) which meets as directed by the Airport.

P-2: Noise and Flight Track Monitoring

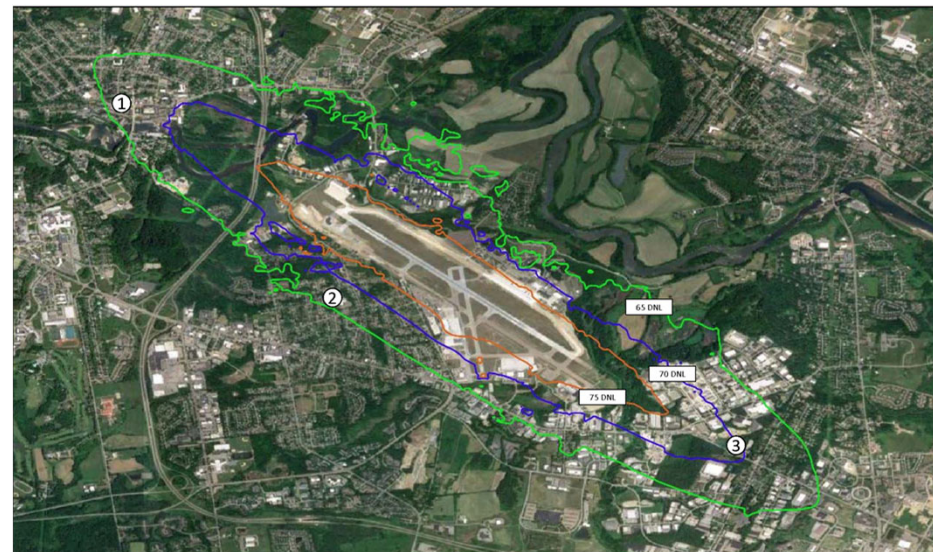
Recommends the acquisition of an aircraft noise and flight track monitoring system. The system is intended to make the information accessible to the public.

Status: Ongoing

Installed in 2021, there are 3 noise monitors and a website for the community to view flight operations and their associated noise levels, and submit any noise complaints.

BTV staff report monthly to the Airport Commission on the status of the system and any complaints received.

Noise Monitoring Terminal Locations



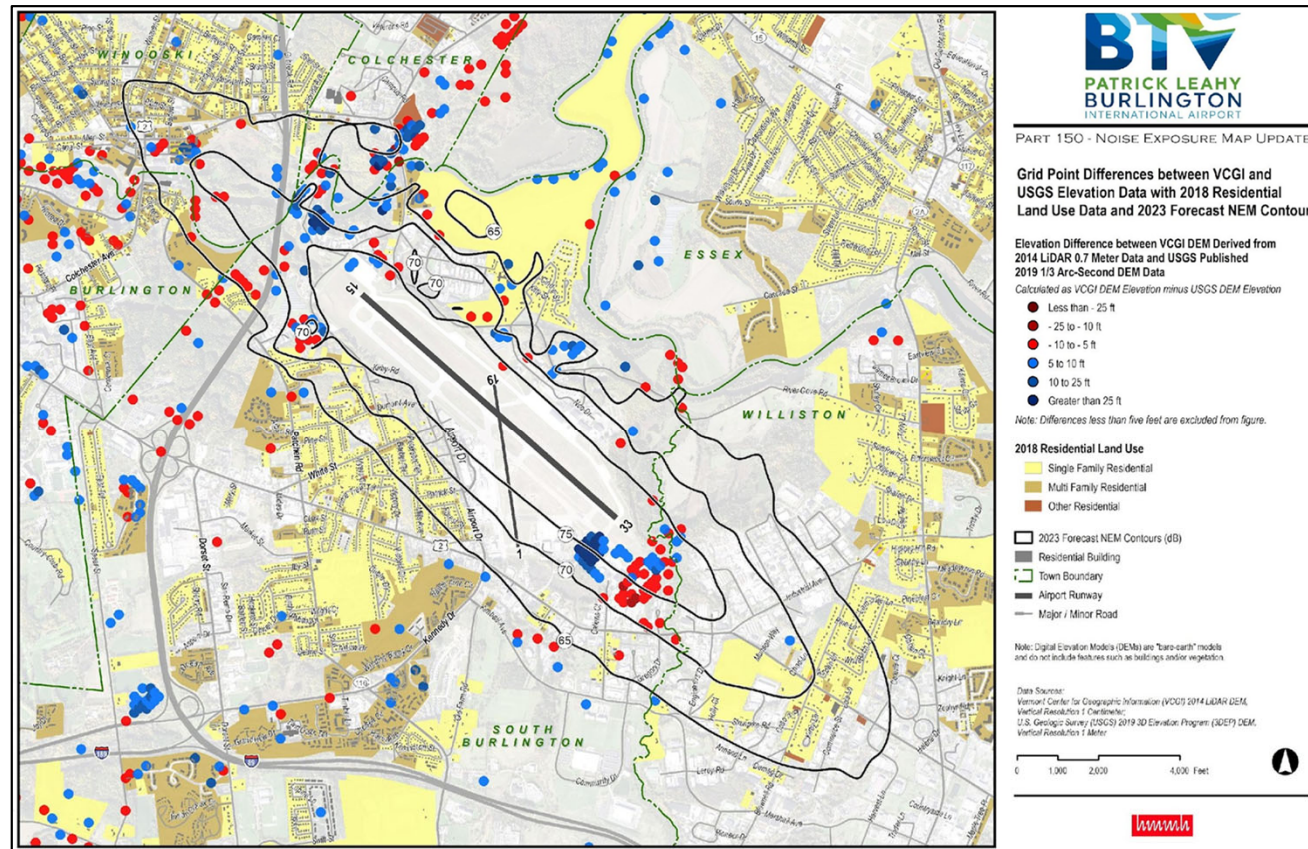
- #1 – Winooski City Hall
- #2 – Chamberlin Elementary School
- #3 – Town of Williston (Chad Ln.)

	Project Phase	2023						2024													
		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB
1	Data Collection; approval of military aircraft modeling; development of operational forecasts																				
2	Development of draft contours; land use analysis																				
3	Draft NEM document for public review; public meeting; public comment period																				
4	Finalize and submit final NEM to FAA for approval																				
		Consultant Task						Community Input						Agency Review							

The next three slides respond to two inquiries from the previous TAC meeting:

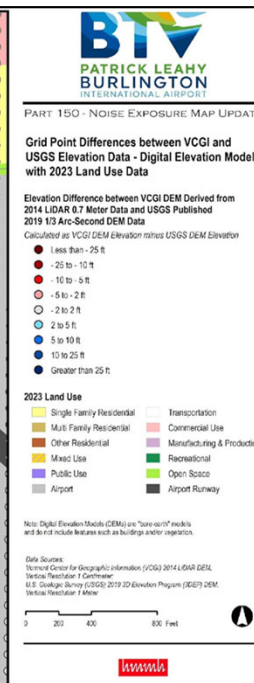
- Terrain data in the AEDT model
- How the 2024 and 2029 forecast aircraft operations data compares to the previous NEM Forecast Condition (for 2023)

- HMMH sampled the 1/3 arc-second USGS and 1m VCGI data at 100 ft intervals
- Found the elevation differences at these sampled points
 - Blue dots indicate VCGI elevation higher by 5 ft or more
 - Red dots indicate VCGI elevation lower by 5 ft or more
- Largest off-airport differences are around steep grades

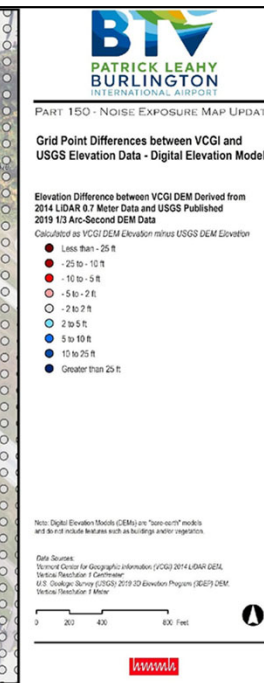
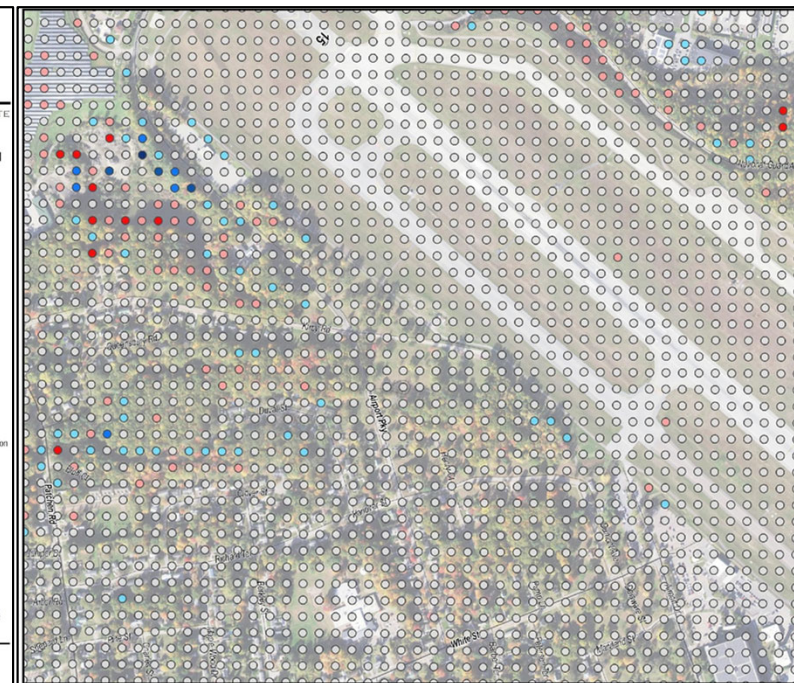


Difference Grid Between 1/3 Arc-S and VT LIDAR DEM

Elevation Difference Grid Between 1/3 Arc-S and VT LIDAR DEM - Northwest of Airfield



Difference Grid with 2023 Land Use



Difference Grid with Aerial

Comparison of Aircraft Operations to Previous NEM

- 73% increase in total operations for Existing 2024 compared to previous forecast
- Most of the increase in operations are by GA aircraft, both local and itinerant
- Air carrier/air taxi operations together are essentially same
- Military operations are lower

Category	2023 Forecast (prior NEM)	Tower Counts CY2023	2024 Existing	% Difference between Forecast 2023 and Existing 2024	2029 Forecast
Itinerant					
Civilian Air Carrier	17,378	16,887	16,720	-4%	18,233
Air Taxi	5,087	7,383	6,013	18%	6,358
GA	22,636	37,279	41,758	84%	43,064
Military	6,846	3,424	5,374	-22%	5,354
Total Itinerant	51,947	64,973	69,864	34%	73,009
Local					
Civilian GA	11,138	35,262	45,258	306%	46,263
Military	3,423	366	106	-97%	106
Total Local	14,561	35,628	45,364	212%	46,369
Grand Total	66,508	100,601	115,227	73%	119,377

TAC Meeting 3 Thursday, April 11, 2024

- Noise Compatibility Program Review

TAC Meeting 4 TBD, July 2024

- Noise Modeling Results – Presentation of the Noise Exposure Maps

Public Meeting TBD, Fall 2024

- Presentation of the draft NEM Document

TAC MEMBER DISCUSSION

PUBLIC COMMENT