

Burlington International Airport

Sound Mitigation Committee Meeting

Presented to: BTV Stakeholders

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Date: September 14, 2016



Air Traffic Control Responsibilities:

- Safe
- Orderly

• Expeditious flow of air traffic

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Burlington Air Traffic Control Tower and Approach Control.

Air Traffic Control Basics:

- VFR Visual Flight Rules
 Ceiling at or above 1000', Visibility greater than or equal to 3 miles
- IFR Instrument Flight Rules
 - Ceiling less than 1000' AGL, Visibility less than 3 miles





Flight Rule Demonstration

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Volunteers?

946



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VFR Departures and Arrivals

- Aircraft proceed visually to and from the airport on flight paths at their discretion
- BTV Airport and I-89



IFR Departures and Arrivals

 Aircraft proceed utilizing cockpit instruments via designed procedures to and from the airport while protected from terrain and obstacles.





Typical Published Instrument Approach Procedure

- Note:
 - Overhead View with Airport
 - Final Approach Course
 - Terrain and Obstructions
 - Profile View with Glideslope and Altitudes





Approach to BTV coming over Camel's Hump



3 NM 954 AGL Above Touchdown

116

189

127

7

2NM 635' AGL Above Touchdown

1 NM 318 AGL Above Touchdown

Burlington International Airport

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M 339 AGL Above Touchdown

2A 2NM 679' AGL of Touchdown

o 3 NM AGL 1019' Above Touchdown





Burlington Approach Control Radar Presentation



BTV AIRPORT DIAGRAM







Runway Numbers and Lengths

- Length and Width are designed to the aircraft that will utilize the surface.
- Runway Number is
 approximate magnetic heading.



Runway Designations and Markings



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B B B. 848

Federal Aviation Administration

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Factors that affect runway use:

Winds

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- Convective Activity
- Aircraft Performance / Power Settings

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jetblue.com

- Accidents
 - Snow Removal

- Maintenance
- Demand

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- Airport Altitude
- Temperature
- Navigation Limitations
 - Formal Noise
 - **Mitigation Procedures**



Observations collected at BTV Airport

Wind Roses compiled by Iowa Environmental Mesonet (IEM) http://mesonet.agron.iastate.edu/

Yearly Climatology



Winter Climatology (Dec-Jan-Feb)



Spring Climatology (Mar-Apr-May)



Summer Climatology (Jun-Jul-Aug)



Fall Climatology (Sep-Oct-Nov)













Stats

n: 48259

Calm: 21.3%

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How does this all relate to sound (noise)?



VERMONT AIR NATIONAL GUARD

OUNTAIN BOYS

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1776

Federal Aviation Administration Burlington International Airport 14 CFR Part 150 Update 2015 and 2020 Noise Exposure Maps







HMMH Report No. 305661.000 December 2015

Prepared for: City of Burlington, Vermont 1200 Airport Drive, #1 Burlington, VT 05403

> Prepared by: HMMH

in association with: Campbell and Paris Engineers P.C.



Burlington International Airport 14 CFR Part 150 Update 2015 and 2020 Noise Exposure Maps



Sound Basics Contained in Section 3.

- > Noise Terminology
- Common Sound Levels
- Day-Night Average Sound Level (DNL)
- Nighttime Intrusiveness
- Weather-Related Effects
- Distance
- Land Use / Compatibility

Burlington International Airport 14 CFR Part 150 Update 2015 and 2020 Noise Exposure Maps

3 INTRODUCTION TO NOISE TERMINOLOGY AND EVALUATION

Noise is a complex physical quantity. The properties, measurement, and presentation of noise involve specialized terminology that can be difficult to understand. Throughout the Part 150 update, we will use graphics and everyday comparisons to communicate noise-related quantities and effects in reasonably simple terms.

To provide a basic reference on these technical issues, this chapter introduces fundamentals of noise terminology (Section 3.1), the effects of noise on human activity (Section 3.2), weather and distance effects (Section 3.3), and Part 150 noise-land use compatibility guidelines (Section 3.4).

3.1 Introduction to Noise Terminology

Part 150 relies largely on a measure of cumulative noise exposure over an entire calendar year, in terms of a metric called the Day-Night Average Sound Level (DNL). However, DNL does not provide an adequate description of noise for many purposes. A variety of other measures are available to address essentially any issue of concern, including:

- · Sound Pressure Level, SPL, and the Decibel, dB
- A-Weighted Decibel, dBA
- Maximum A-Weighted Sound Level, Lmax
- Sound Exposure Level, SEL
- Equivalent A-Weighted Sound Level, Leq
- · Day-Night Average Sound Level, DNL

3.1.1 Sound Pressure Level, SPL, and the Decibel, dB

All sounds come from a sound source – a musical instrument, a voice speaking, an airplane passing overhead. It takes energy to produce sound. The sound energy produced by any sound source travels through the air in sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. The ear senses these pressure variations and – with much processing in our brain – translates them into "sound."

Our ears are sensitive to a wide range of sound pressures. The loudest sounds that we can hear without pain contain about one million times more energy than the quietest sounds we can detect. To allow us to perceive sound over this very wide range, our ear/brain "auditory system" compresses our response in a complex manner, represented by a term called sound pressure level (SPL), which we express in units called decibels (dB).

Mathematically, SPL is a logarithmic quantity based on the ratio of two sound pressures, the numerator being the pressure of the sound source of interest (P_{source}), and the denominator being a reference pressure ($P_{reference}$)¹⁰

Sound Pressure Level (SPL) = $20 * Log \left(\frac{P_{source}}{P_{reference}}\right) dB$

HMMH Report No. 305661.000



December 2015

¹⁰ The reference pressure is approximately the quietest sound that a healthy young adult can hear.

2015 Noise Exposure Map





Data Sources Chittenden County Regional Planning Commission. Vermont Center for Geographic Information. Inc. (VCGI). Unted States Census Bureiau. Burlington International Airport. Campbell & Paris Engineers P.C., Harris Miller Miller & Hanson Inc.







INTERNATIONAL AIRPORT

PART 150 - NOISE EXPOSURE MAP UPDATE

Figure 12 2015 Existing Conditions Noise Exposure Map



(1) Potentially non-compatible within 65 dB DNL contour as discussed in Section 3.3. (2) Potentially non-compatible within 70 dB DNL contour as discussed in Section 3.3.

Data Sources:

Chittenden County Regional Planning Commission. Vermont Center for Geographic Information. Inc. (VCGI). United States Census Bureau. Burlington International Airport. Campbell & Paris Engineers P.C., Harris Miller Miller & Hanson Inc.

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Primary Variables of Sound Analysis and DNL Contours:

Runway Use and Procedures

Questions?

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Thank you!