Bureau of Transportation Statistics

National Transportation Noise Map

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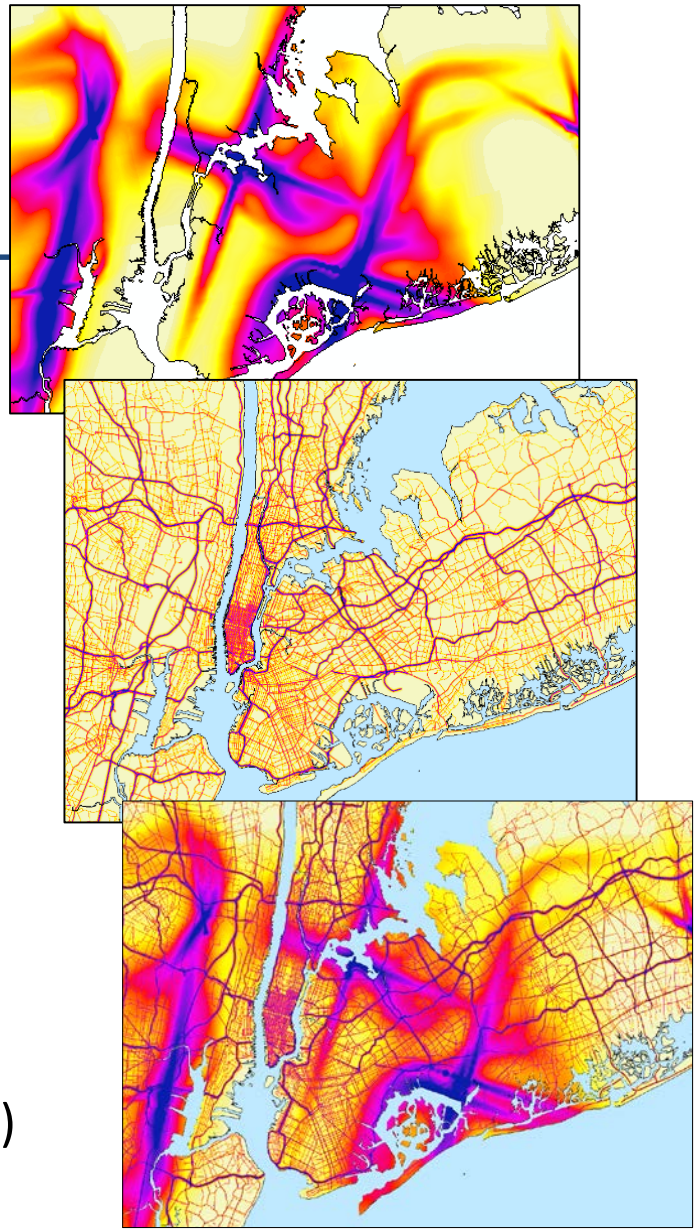
Transportation Growth

- The U.S. population is projected to grow by over 100 million by 2050
- As demand for transportation increases, transportation-related noise will also change
- Consistent, comprehensive noise data have the potential to help policy makers and community planners make informed decisions when prioritizing transportation and other investments

Overview

- The first national, multi-modal, transportation-focused noise dataset by BTS has been released
- Airplane and road noise sources are available separately or cumulatively
- 2014 analysis year
- 24-hour average sound level (L_{Aeq})



Modeling Software

- Aviation noise:
  - Aviation Environmental Design Tool (AEDT) version 2b, Service Pack 2 *(https://aedt.faa.gov/)*
- Road noise:
  - Calculations: Newly built National Transportation Noise Modeling Tool (NTNMT)
  - Acoustical algorithms: Federal Highway Administration's (FHWA) Traffic Noise Model (TNM) version 2.5

    (https://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_v25/)

Data

Category	Aviation	Road
Data Sources	Aircraft flight operation data: Enhanced Traffic Management System (ETMS) schedule dataset	Roadway Average Annual Daily Traffic (AADT): FHWA's Highway Performance Monitoring System (HPMS)
Airports/ Vehicles	Airports with an average of 1 or more jet departures per day, 683 airports for the year 2014	Automobiles, medium trucks, heavy trucks
Tracks/ Roads	Actual Track data available for 121 airports Remaining 562 airports were modeled with straight-in and straight-out procedures	• Interstates • Principal arterial – other freeways and expressways • Principal arterial – other • Minor arterial • Major collector

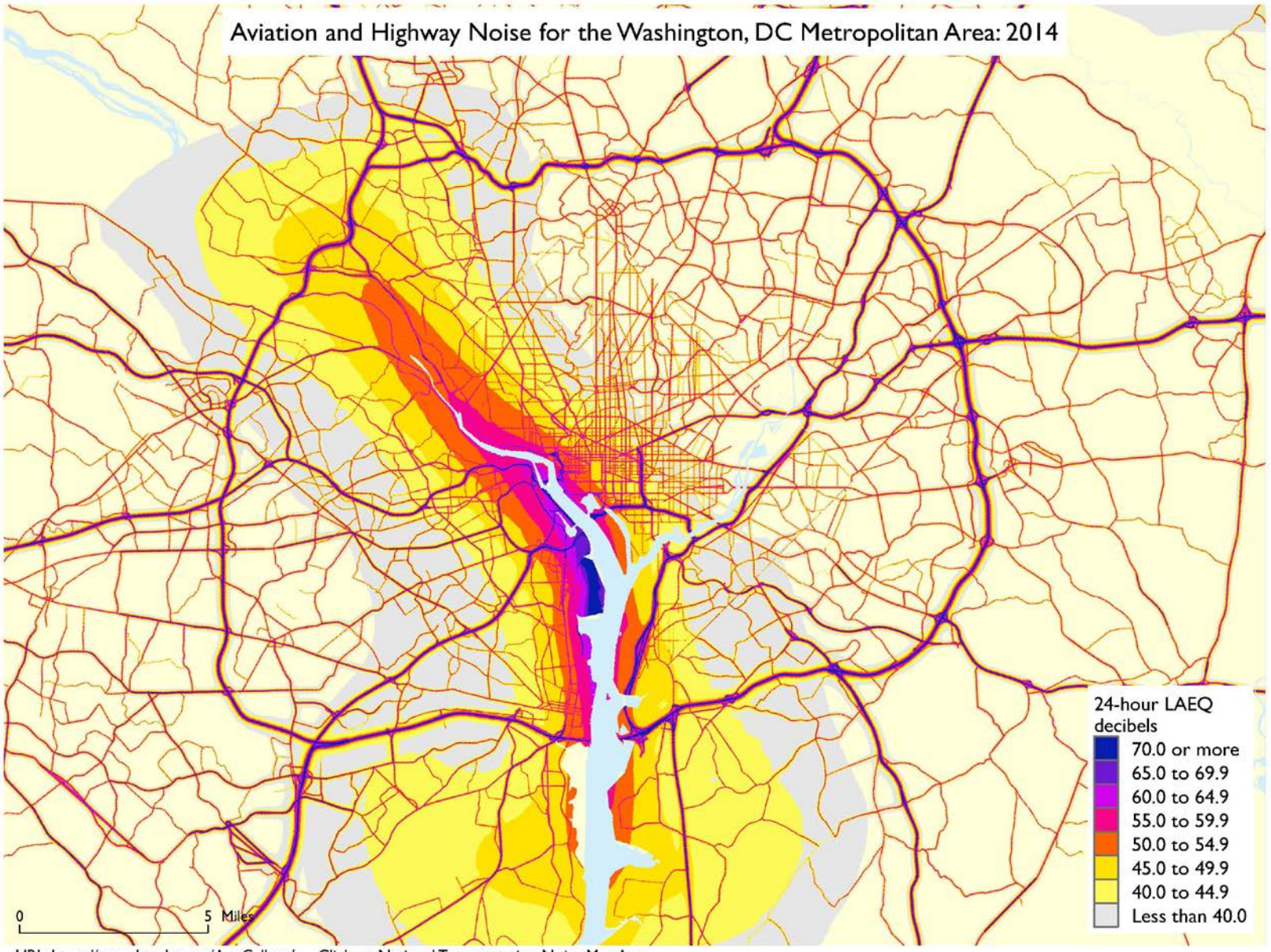
Acoustics Assumptions

Category	Aviation	Road
Weather	NOAA 30-Year Normals data (1971-2000) specific to each airport for atmospheric absorption	TNM default temperature and humidity data (68 deg F, 50% relative humidity)
Ground Type	Acoustically soft ground	Acoustically soft ground
Noise Level Cutoff	Calculated down to 35 dB(A)	Calculated down to 35 dB(A)
Additional Assumptions		• Average pavement • Average Annual Daily Traffic (AADT) distributed evenly across 24 hours • Acoustic shielding due to barriers and terrain is not included

See the full documentation that accompanies the dataset for more information on noise modeling and assumptions

Applications

- Track trends in noise over time
- Track trends in noise exposure on communities
- Demonstrate multi-modal effects on noise exposure
- Inform noise mitigation investment decisions
- Demonstrate effects of noise mitigation efforts


Aviation and Highway Noise for the Washington, DC Metropolitan Area: 2014
24-hour LAEQ decibels
70.0 or more
65.0 to 69.9
60.0 to 64.9
55.0 to 59.9
50.0 to 54.9
45.0 to 49.9
40.0 to 44.9
Less than 40.0
0
5 Miles
URL: https://maps.bts.dot.gov/AppGallery/ Click on National Transportation Noise Map App

Estimating population affected by aviation and highway noise

Process:

- Convert the noise raster to a vector file
- Intersect Census block groups layer with the noise vector file
- Tabulate intersection: estimate percentage of each block group contained within each noise band

Assumptions:

- Only interstate noise used from the road noise data
- Even population distribution across block groups
- Ignore margin of error for ACS population counts

Percentage of US Population with the Potential to be Exposed to Transportation Noise: 2014

24-hour Average Sound Level (L_{Aeq})	Common Comparable Sounds	Aviation (% of US Population)	Road (Interstate) (% of US Population)
Less than 50	Refrigerator humming (~40 dBA)	97.12	98.00
50 to 59	Quiet office (~50 dBA)	2.65	1.30
60 to 69	Conversational speech (~60 dBA)	0.21	0.44
70 to 79	Vacuum cleaner (~70 dBA)	0.01	0.25
80 or more	Garbage disposal (~80 dBA)	<0.01	0.06

Noise map web mapping applications

- National Road Noise Map
- National Aviation Noise Map
- National Transportation Noise Map
  (combined highway and aviation)

Thank you!