

Aviation Environmental Impacts an Airport Perspective

FAA Forecasting Conference
March 16, 2007

R. Marchi

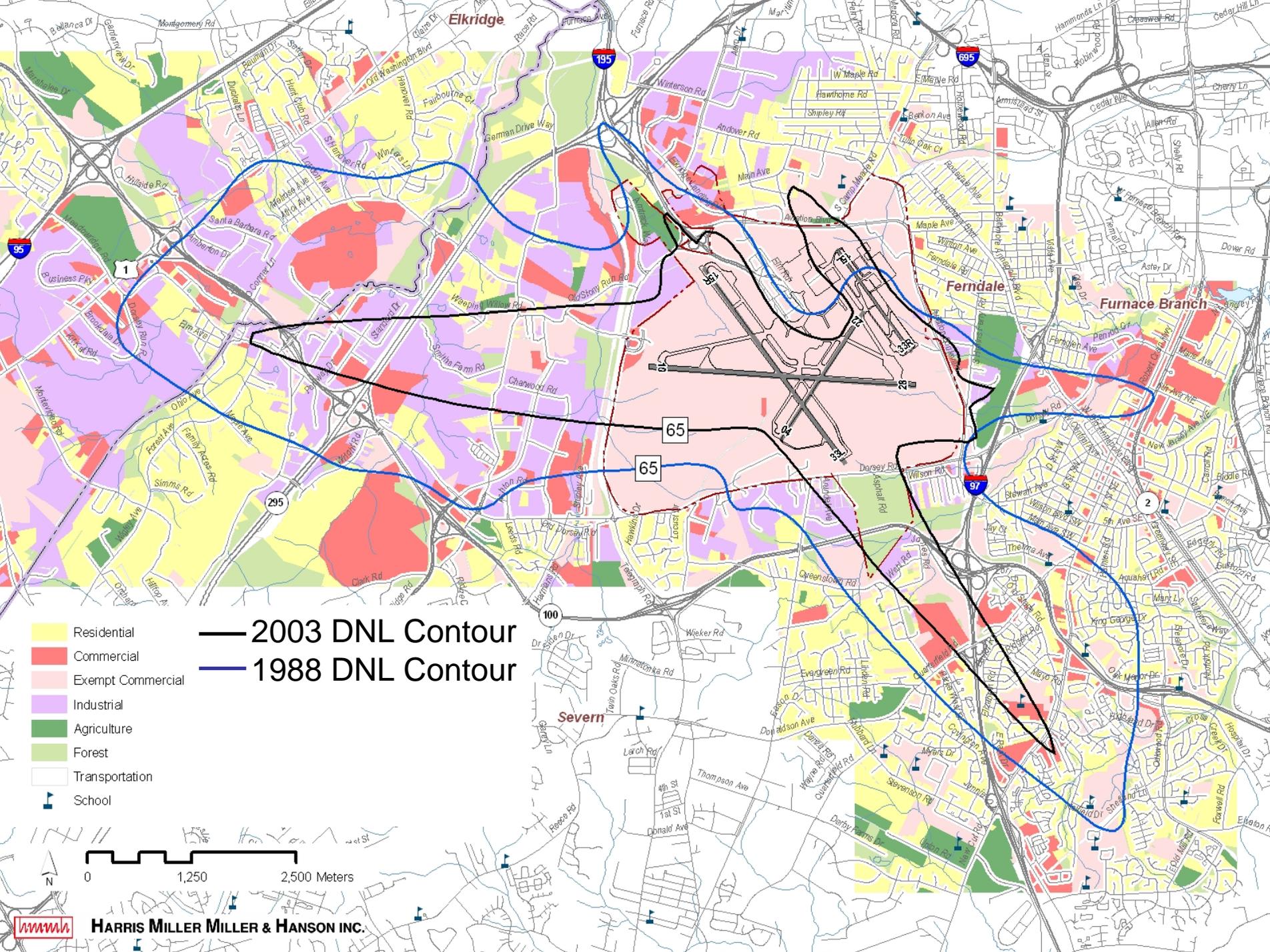
Airports Council International – North America

Despite Much Progress Environmental Problems Persist

- **FAA Environmental COE (PARTNER) Report to Congress, September 2004:**
 - “Environmental impacts may be the *fundamental constraint* on air transportation growth in the 21st century.”
 - “There has been a *95% reduction* in the number of people affected by aircraft noise ... The current situation is that aircraft noise is the *single most significant local objection* to airport expansion and construction.”
 - “The nation should develop *more effective metrics* to assess and communicate aviation’s environmental effects.”
- **JPDO CONOPS v 1.2, February 2007**
 - “Current operational trends show that environmental impacts such as noise, air emissions, water pollution, land use, climate change, and fuel consumption will be the primary constraints on the capacity and flexibility of the NextGen...”

Five Major Environmental Issues

- Well understood:
 - Water Quality
 - Local Air Quality
 - Sustainability (new issue)
- Poorly Understood:
 - Noise
 - Global Warming (new issue)



- Residential
- Commercial
- Exempt Commercial
- Industrial
- Agriculture
- Forest
- Transportation
- School

— 2003 DNL Contour
— 1988 DNL Contour

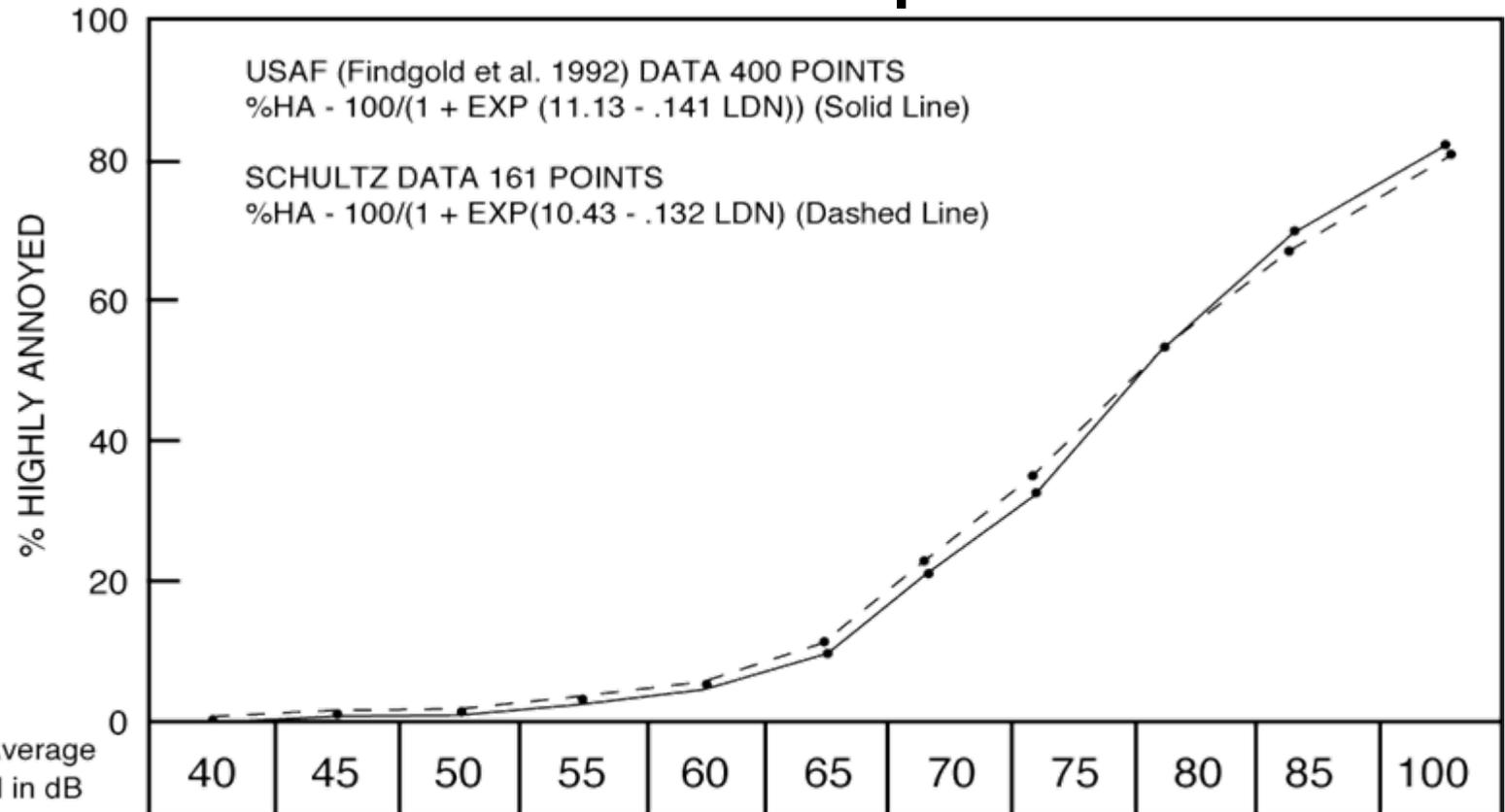
0 1,250 2,500 Meters

Is BWI's noise problem solved?

Year	Daily Air Carrier Operations	Population inside DNL 65
1988	360	14,200
2003	579	1,314

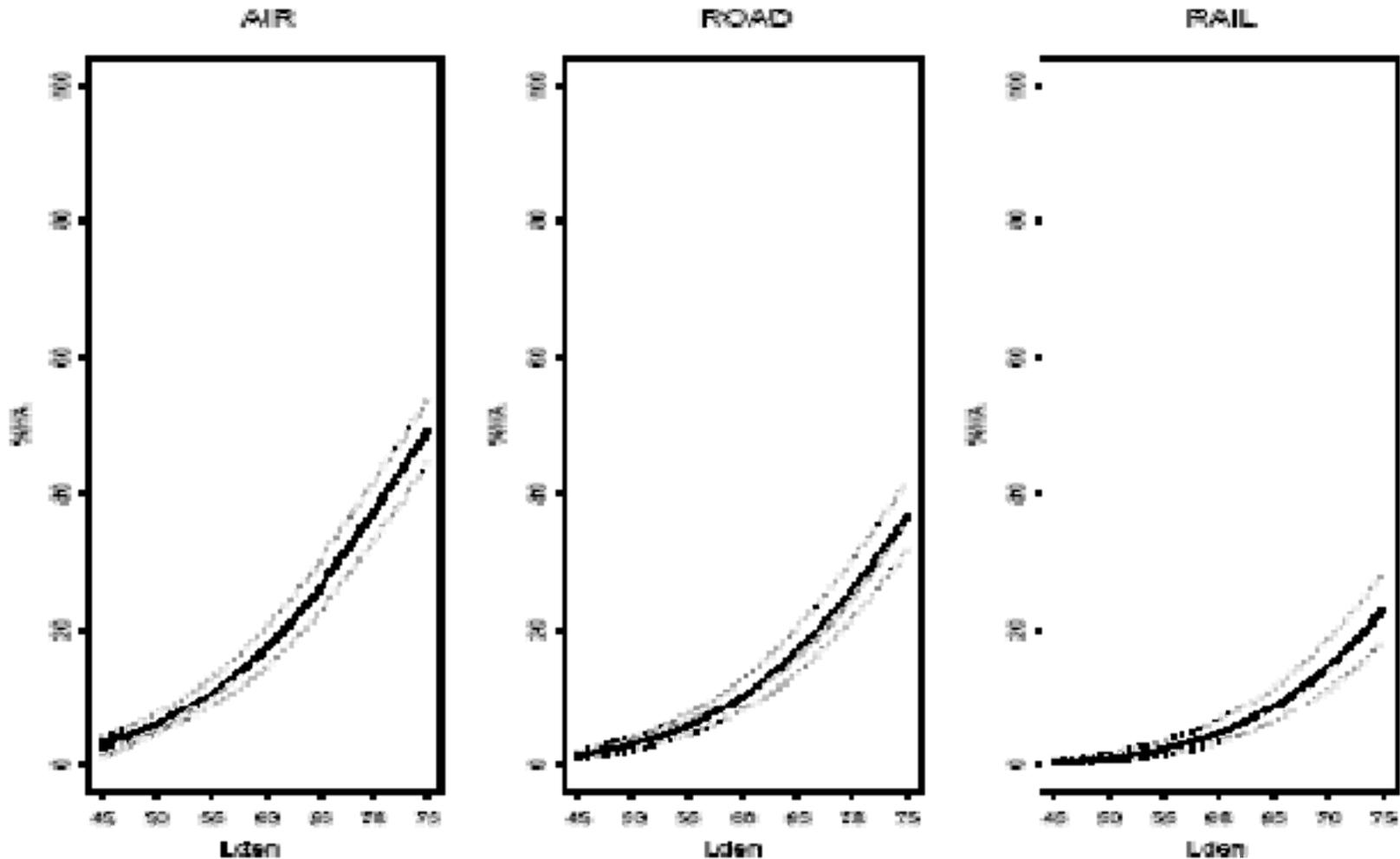
- Air carrier activity increased 60%
- Impacted population reduced 90%

Annoyance: Familiar dose-response relationship



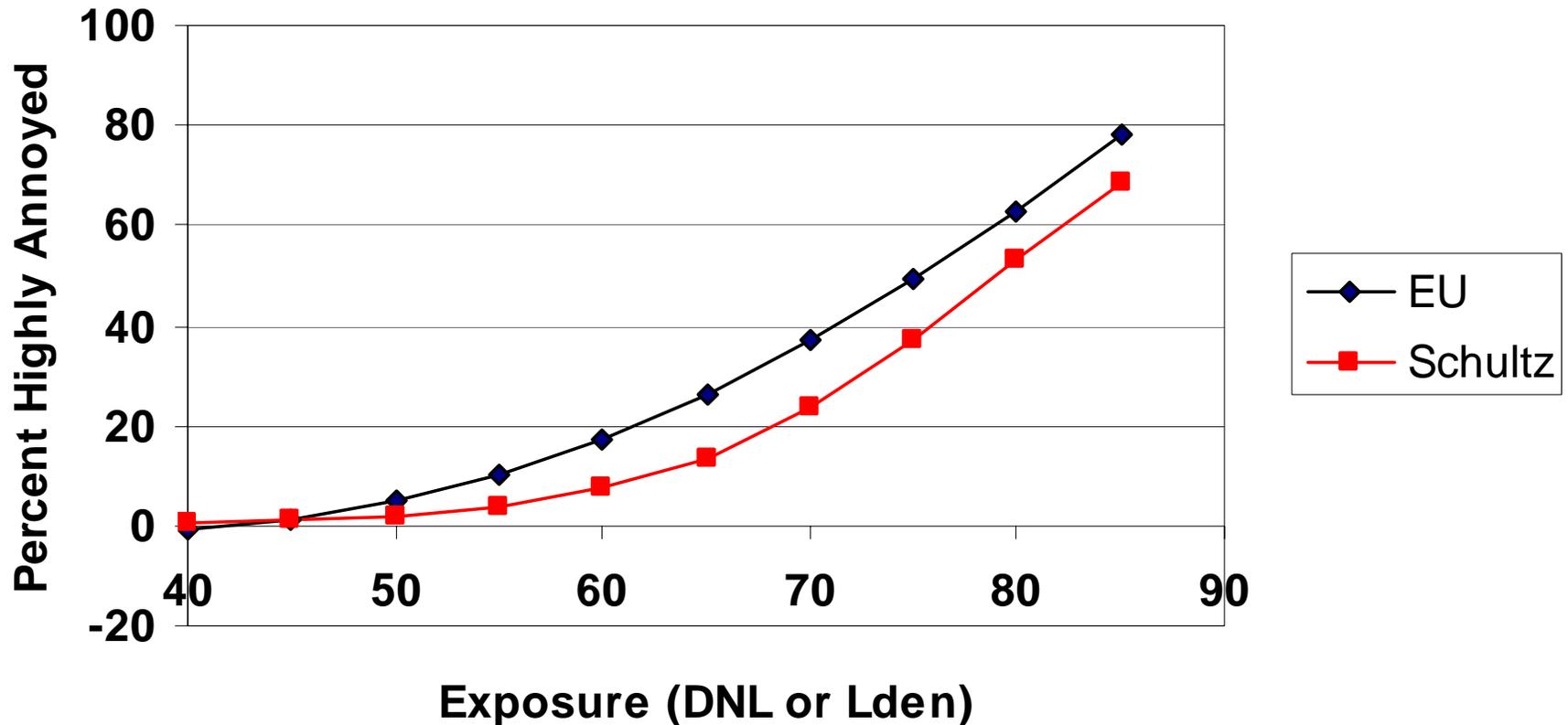
Calculated %HA Points	USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
	SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Annoyance: recent analysis conducted in EU



Comparison of EU and Schultz annoyance curves

Annoyance dose-response

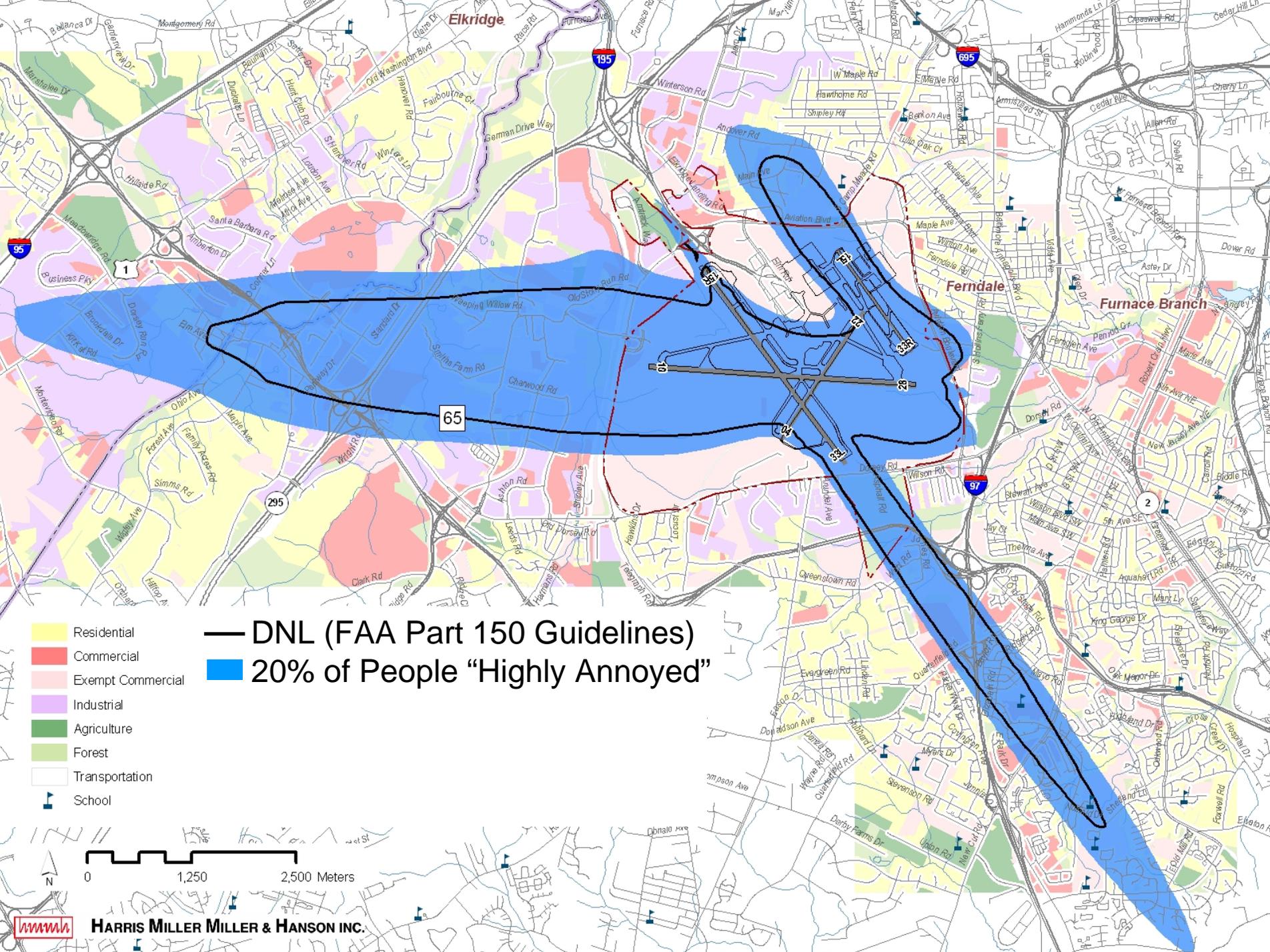


Noise Background

Current FAA impact criteria (DNL 65) address land use compatibility planning

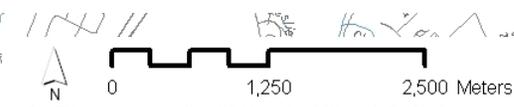
Other effects may help explain community reaction to aviation noise

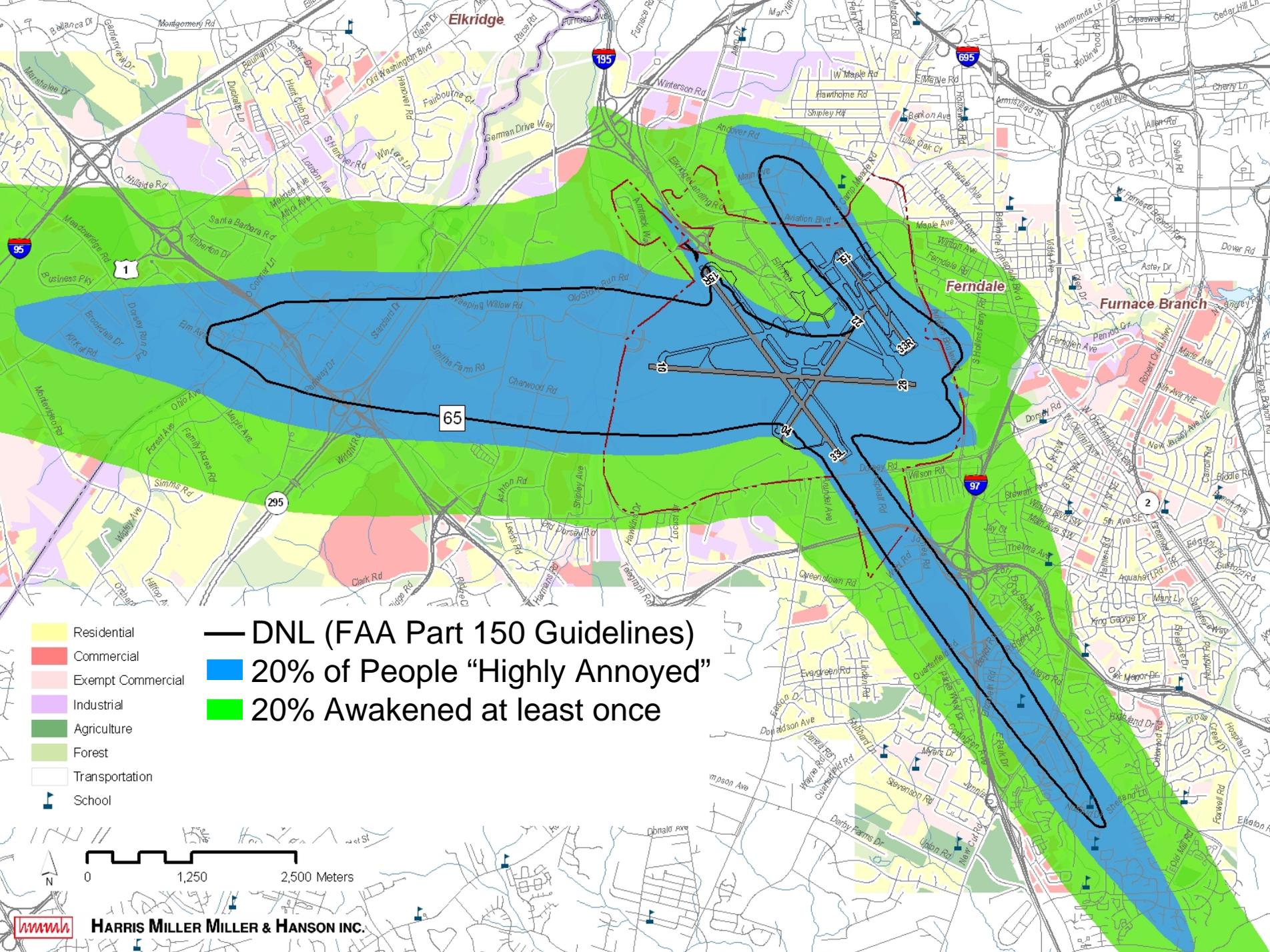
- Annoyance
- Sleep disruption
- Speech interference
- Learning
- Low frequency noise
- NIMBY



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— DNL (FAA Part 150 Guidelines)
 20% of People "Highly Annoyed"

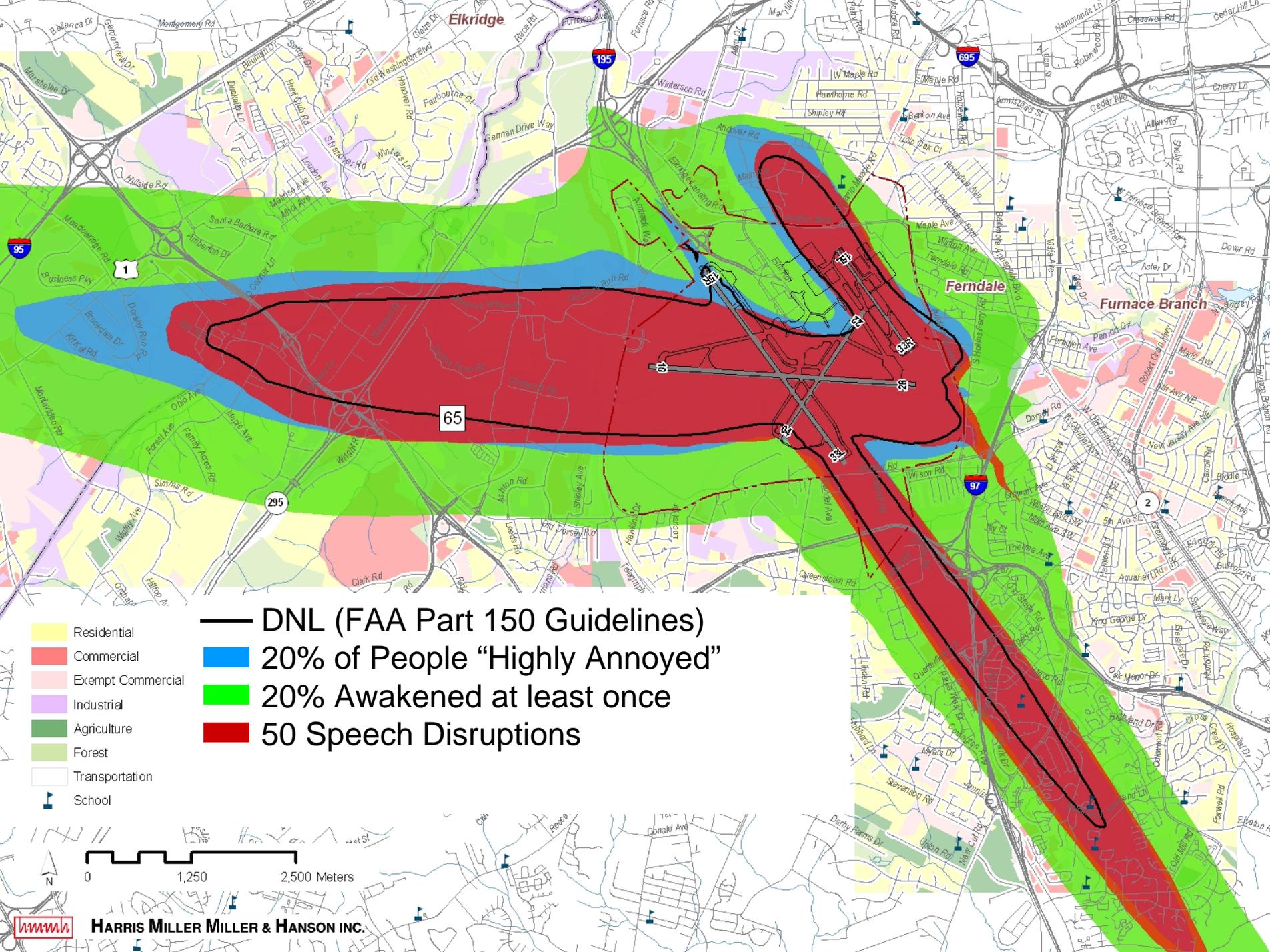




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DNL (FAA Part 150 Guidelines)
 20% of People "Highly Annoyed"
 20% Awakened at least once

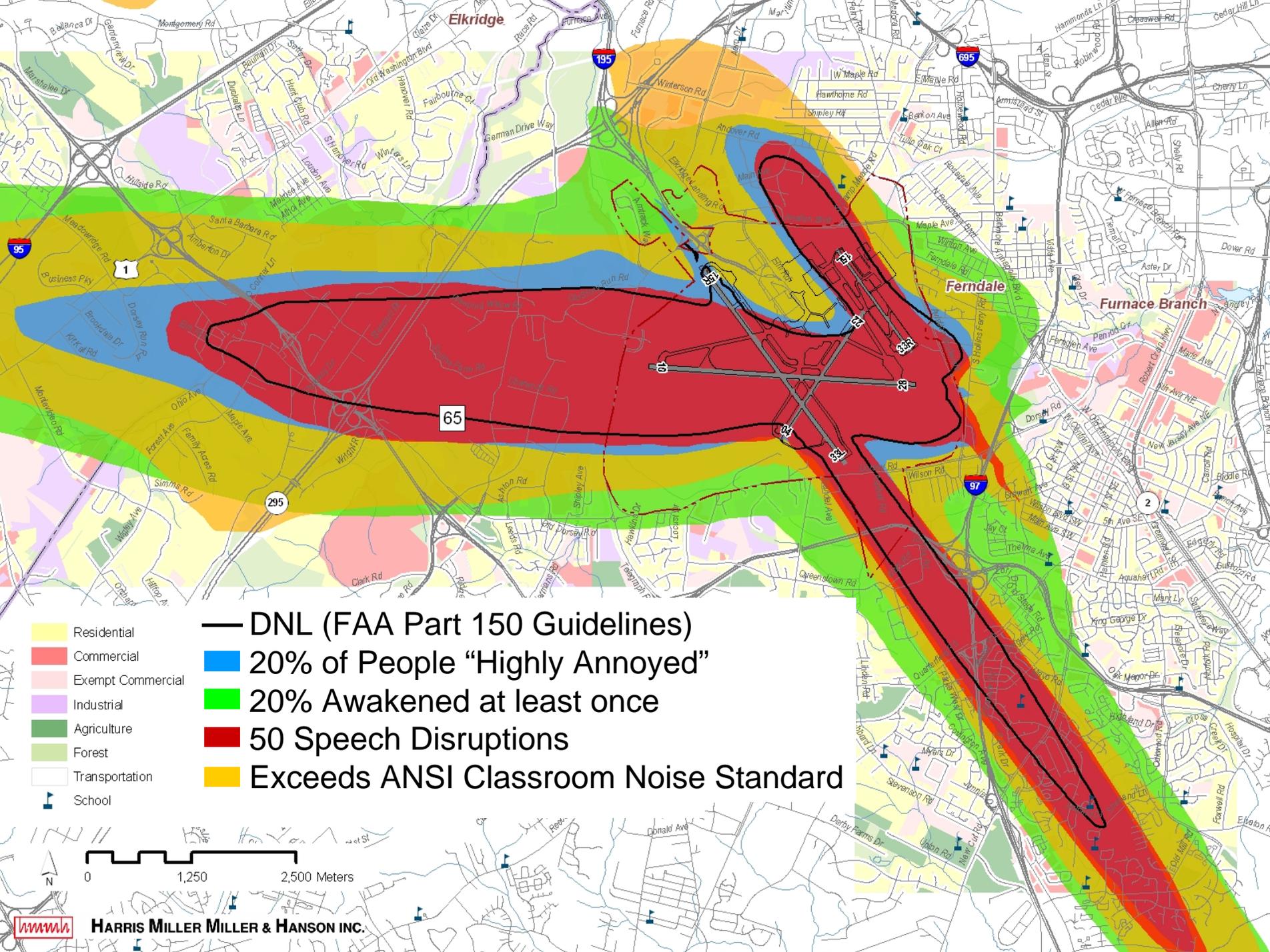
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- 20% Awakened at least once
- 50 Speech Disruptions

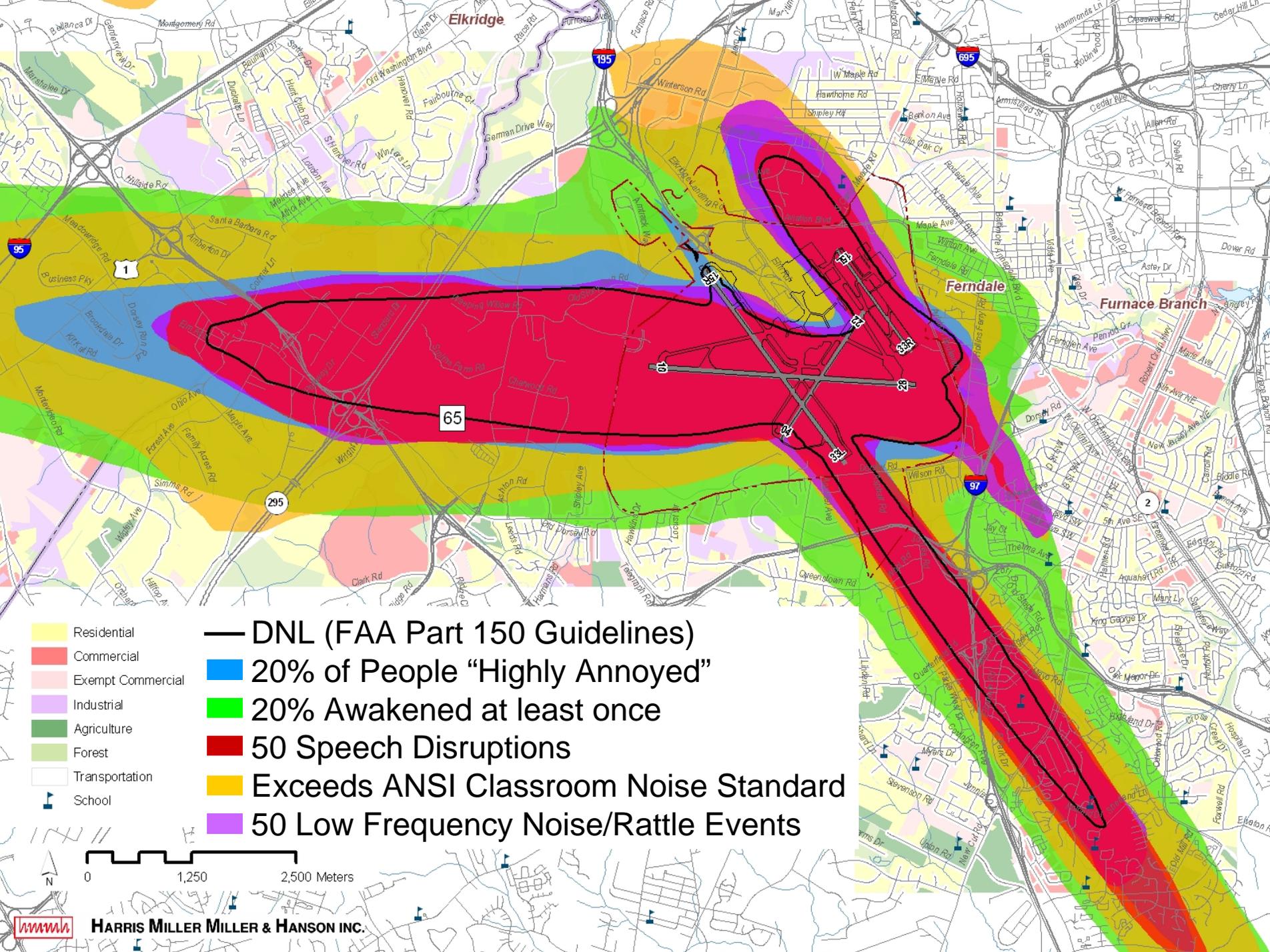




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- 50 Speech Disruptions
- Exceeds ANSI Classroom Noise Standard





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- 50 Speech Disruptions
- Exceeds ANSI Classroom Noise Standard
- 50 Low Frequency Noise/Rattle Events

0 1,250 2,500 Meters



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Future Prospects and Needs

Water Quality, Local Air Quality and Sustainability need more of the same:

Money

Better deicing methods and fluids

Alternative aircraft, GSE and vehicle fleet fuels

Further aircraft fleet improvements

Improved facility design & management

Persistence

Future Prospects and Needs

- Noise and Global Warming need substantial additional research:
 - Current approach to noise is not working ... we may be measuring the wrong thing.
 - JPDO may have adopted the wrong environmental goal (reduction in impacts).
 - Global Warming is entirely new area for the industry as a whole, and airports in particular.