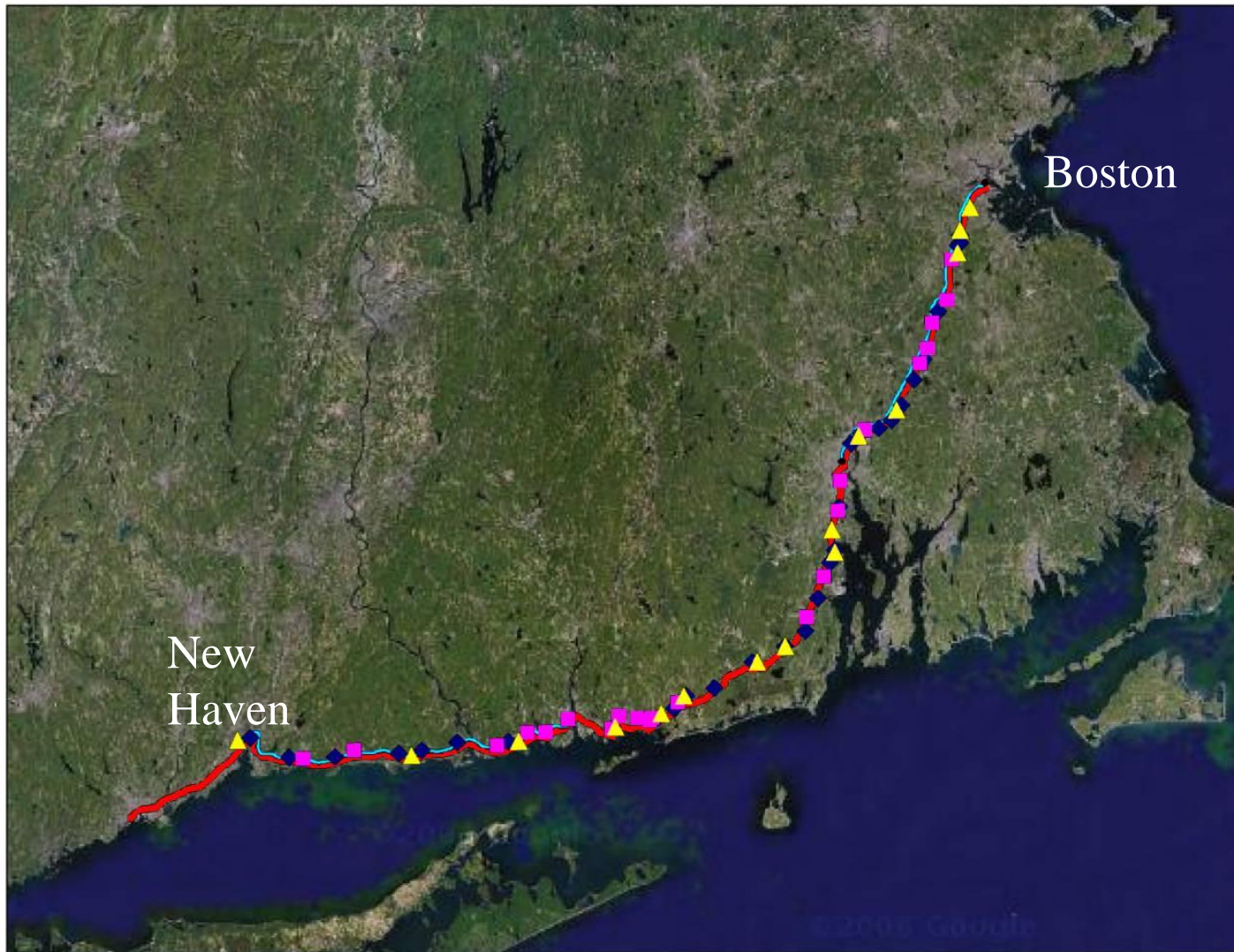


High Speed Rail Noise and Vibration along the Northeast Corridor

Eric W. Wood
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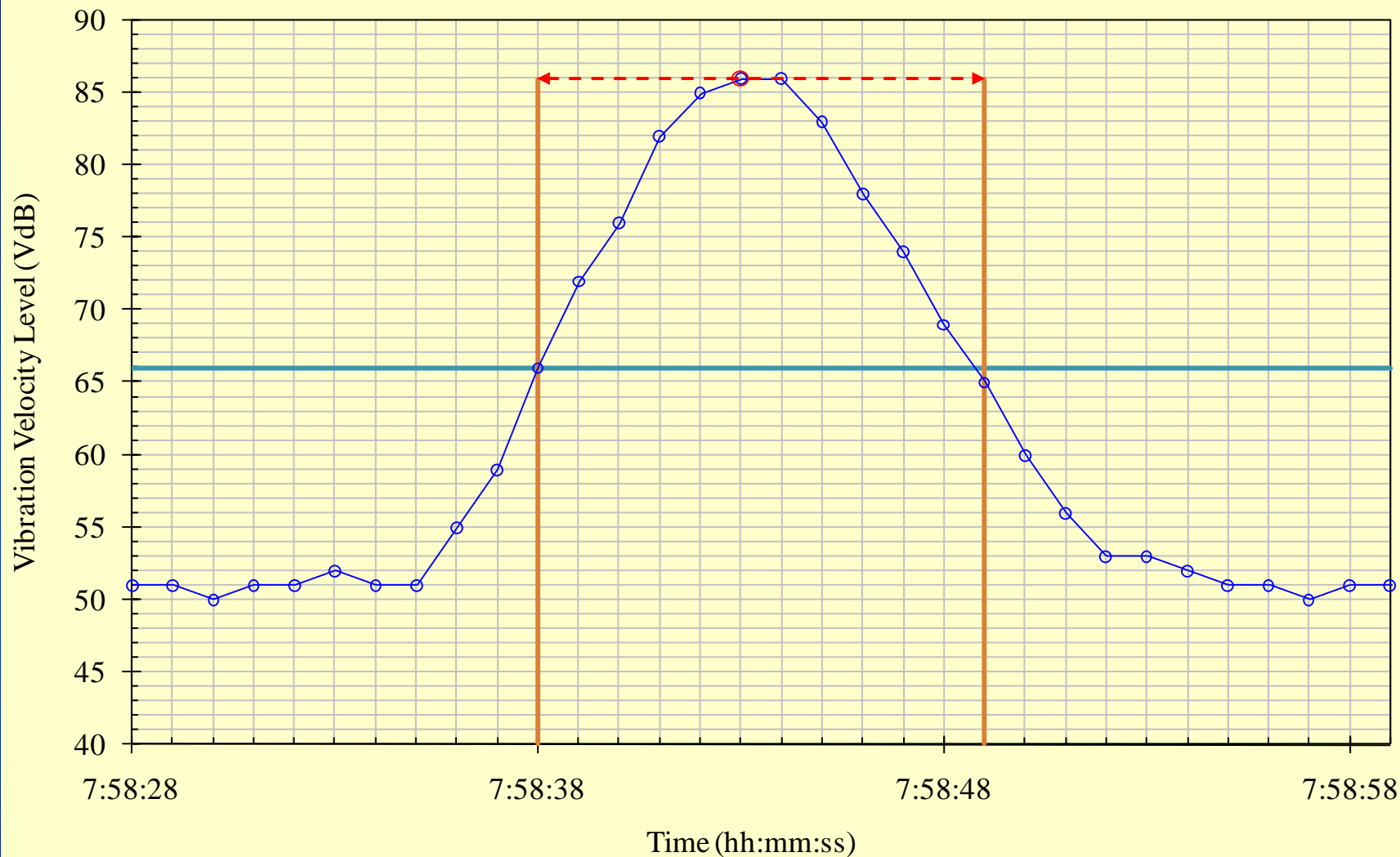
APTA 2011 Rail Conference



Measurement Locations along the Corridor

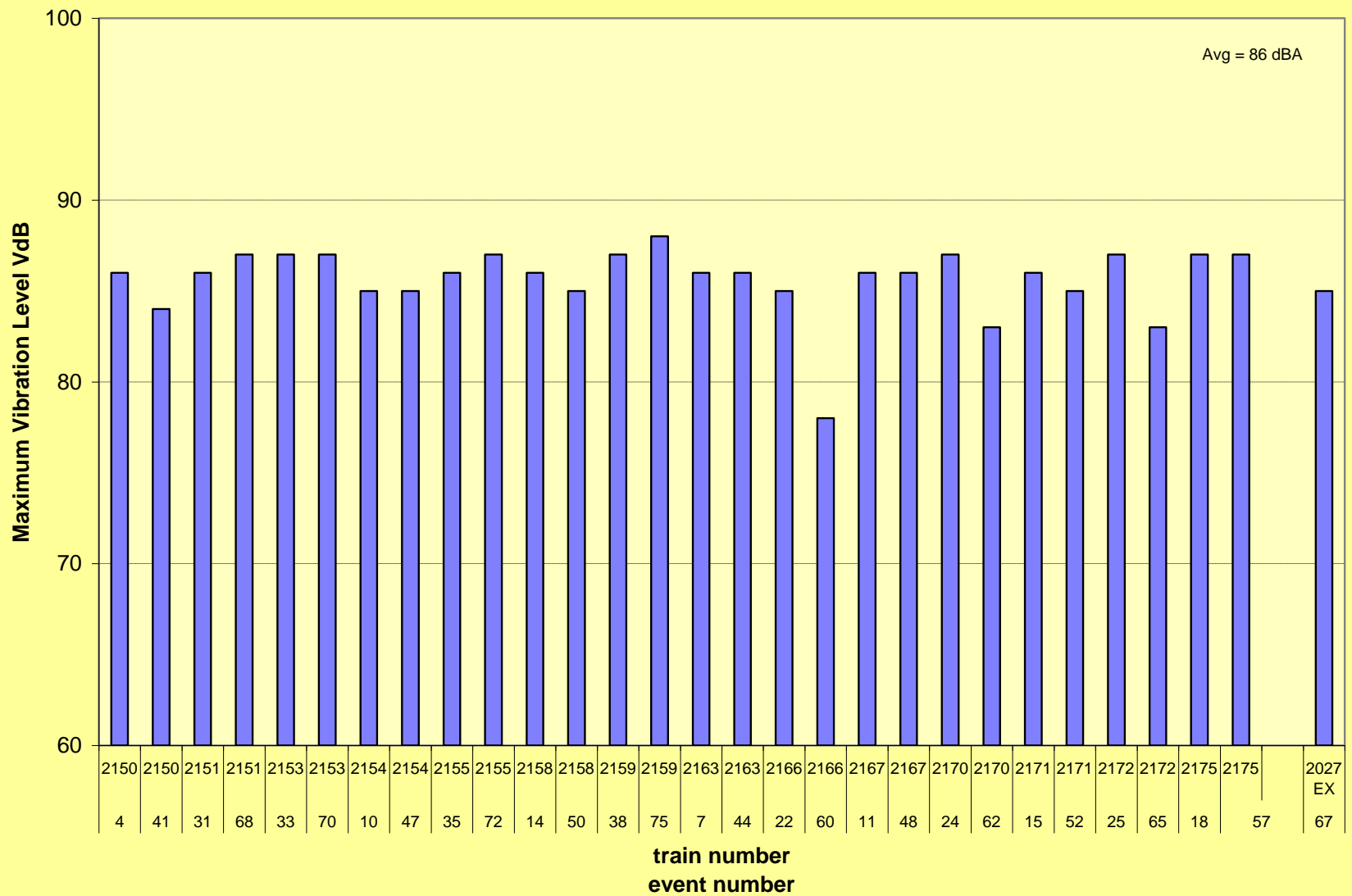


Amtrak Acela Passing Measurement Location in North Kingston, RI

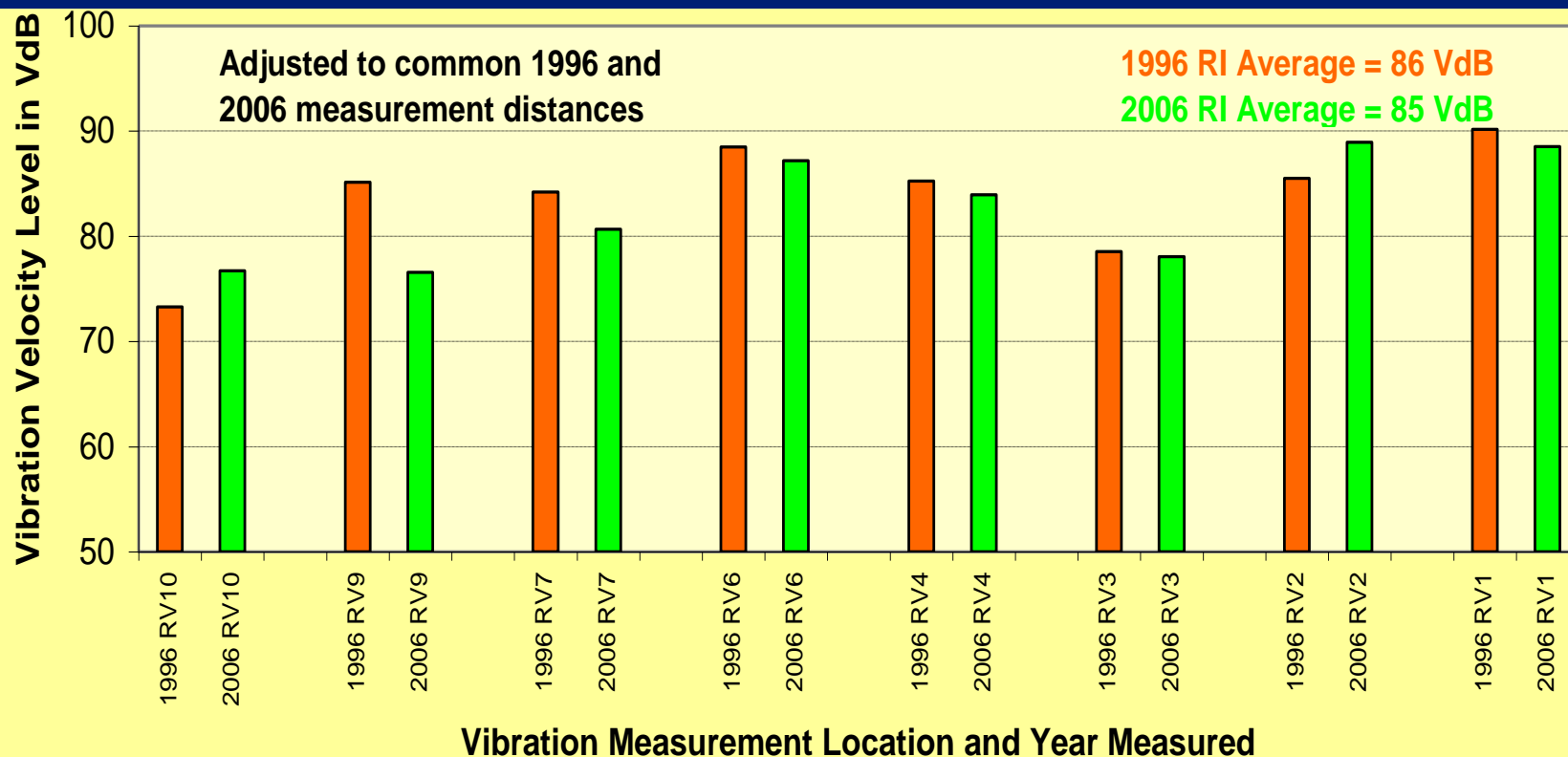


Time-history Vibration Levels, Amtrak Acela Train No. 2155

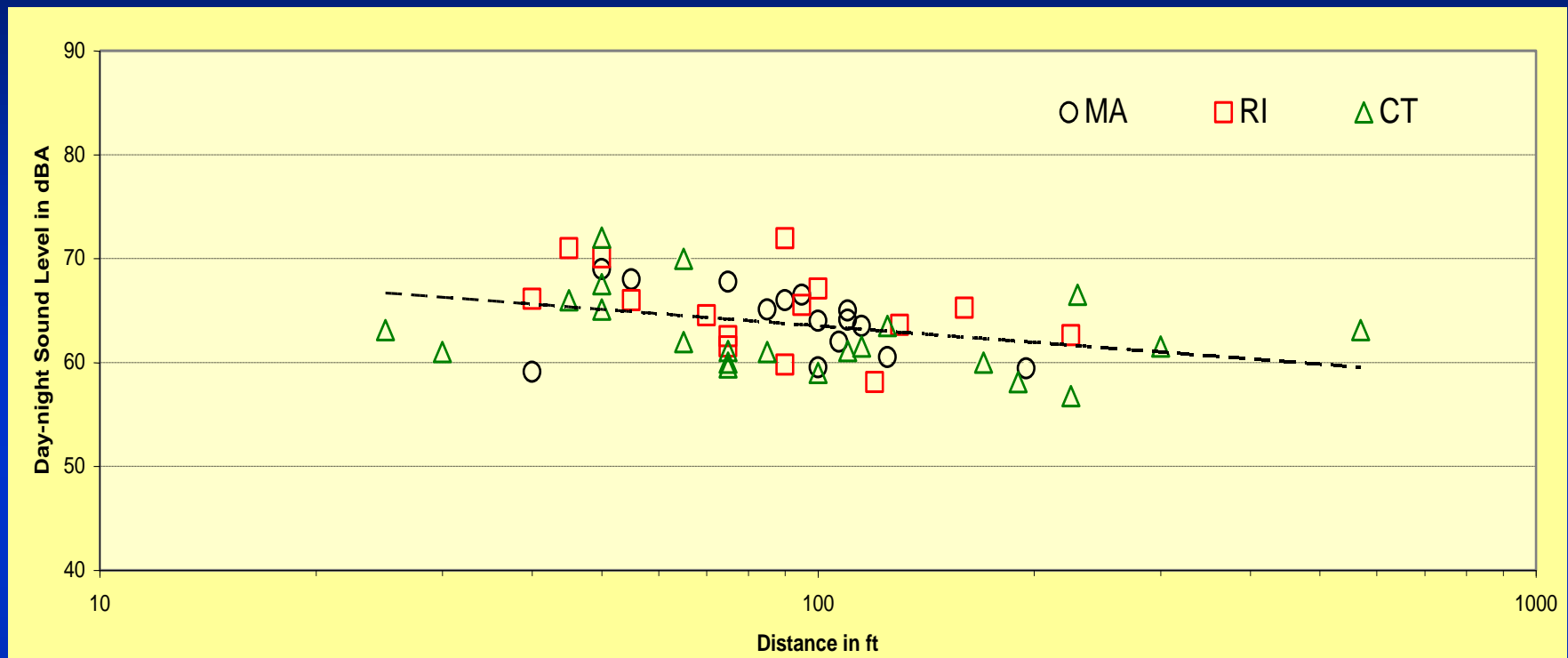
rv8



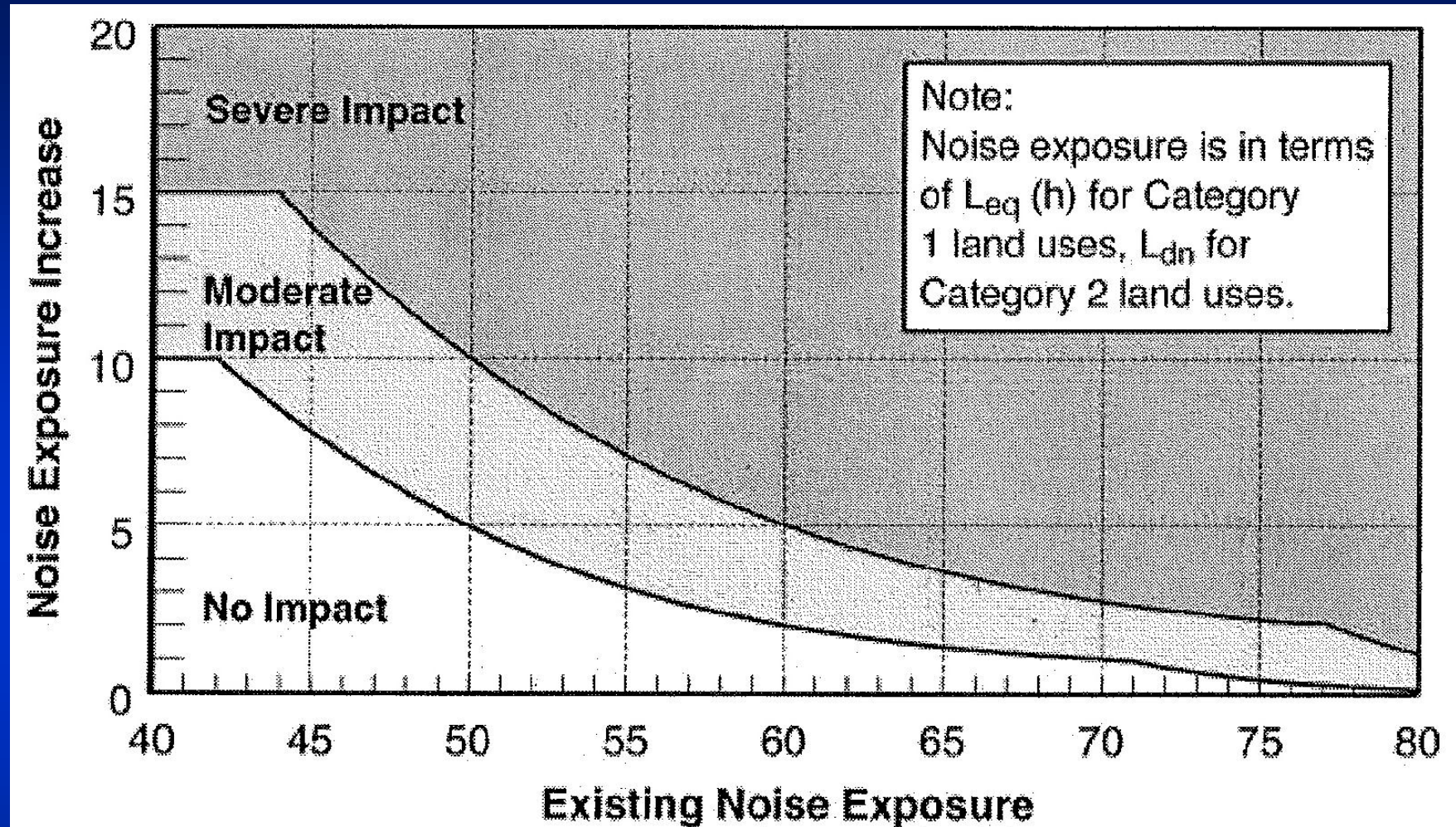
Maximum Vibration Levels Amtrak Acela Express Trains, One RI Location
rv8



Maximum Vibration Velocity Levels Rhode Island Sites
Average (energy basis) all Trains 1996 and 2006



Average of the Day-night Sound Levels Measured at 52 Sites
2006 all trains all sounds



Cumulative Noise Increase Allowed by FRA Criteria

Method Developed to Implement FRA Noise Criteria

Step 1.

We identified and isolated noise from the 36 daily Amtrak electric trains in the 2006 measurements.

Removed from our data that Amtrak train noise.

This represents the 2006 calculated ambient noise environment without Amtrak electric operations.

Method Developed to Implement FRA Noise Criteria

Step 2:

We inserted into our data noise representing 24 diesel-electric F40 trains (circa 1996).

This now represents the "Existing Noise Exposure" that would have been realized if electrification had not occurred.

Method Developed to Implement FRA Noise Criteria

Step 3:

We then compared the 2006 actual measured noise levels to the calculated 2006 noise levels with diesel operations.

It is these data we used to implement the FRA criteria for wayside noise.

Method Developed to Implement FRA Noise Criteria

Step 4:

This allowed us to evaluate any net noise impacts associated with Project Electrification.

This method removed concerns regarding changes in the background level from 1996 to 2006.

It enables the examination of diesel vs. electric operations, both in 2006.

Conclusions Reported to Amtrak and FRA

Acela Express between New Haven and Boston

- no additional operating noise impacts
- no additional operating vibration impacts
- conclusions are supported by informal survey of opinions from neighbors

Adjacent Neighbors Told Me

I much prefer living near the rail line than near a busy street, said one neighbor.

Neighbors offered the opinion that train noise or vibration is probably less noticeable now than they remember it being before the electrification project.

Adjacent Neighbors Also Told Me

I became used to the noise of trains passing within a few days of moving into my home.

It is only the occasional slow-moving late-night train that awakens me.

We certainly hear the trains going by, but only for a few seconds.

Project support received from:

Art Misiaszek and Paul Dubuque, Amtrak

Paul Burge, URS

Jeff Zapfe, Acentech

Brenda Wood

Thank you for your attention

Time for Questions

