



Shhh... Quiet Pavements Ahead

An Introduction to Quieter Pavements

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What is a Quieter Pavement?

Quieter pavement is a relative term for any pavement that produces less noise than another from the action of vehicles (traffic) rolling over it.

Quieter pavements are not limited to being asphalt or concrete, but rather incorporate known practices to make either quieter.



What is Traffic Noise?

Traffic noise is a combination of all sound generated by vehicles as they travel down the road (engine, exhaust, tires rolling on the pavement, etc.).



At highway speeds *tire-pavement noise* is the largest contributor to the total traffic noise.



Why aren't pavements designed and constructed quieter?



Traditionally, pavements have been designed and built to balance three factors: **Safety**, **Durability** and **Cost**.



What makes a pavement quiet or loud?

Texture and *porosity* are the two primary pavement factors affecting tire pavement noise, with texture being the most significant.

Texture should be “flattened” or negative with respect to roadway surface.

As a rule, any texture present on a quieter pavement will be negatively oriented (points down).



Tire Pavement Noise Texture Profiles

Bad



Good



How much does pavement contribute to traffic noise?

Powertrain and exhaust noise dominate under stop and go conditions, climbing lanes and speed < 30 mph.

Tire pavement noise is the primary contributor to the total traffic noise at highway speeds with free flowing traffic.



How is pavement noise measured ?

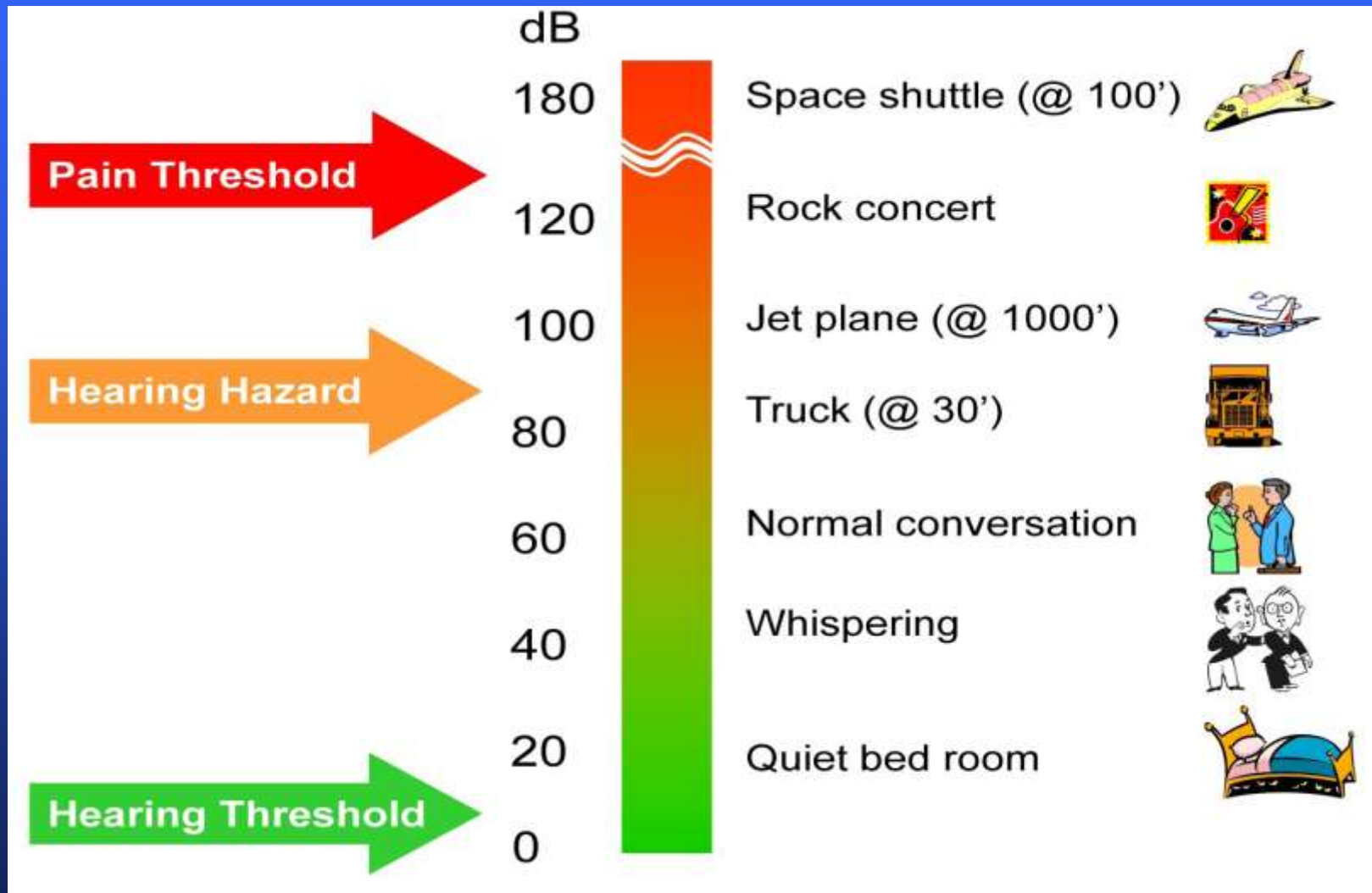
Sound levels are reported using units of decibels (dB). Higher decibels levels are louder.

Sound levels are not cumulative. For example: Two 60 dB sound sources do not combine to be 120 dB (they are 63 dB).

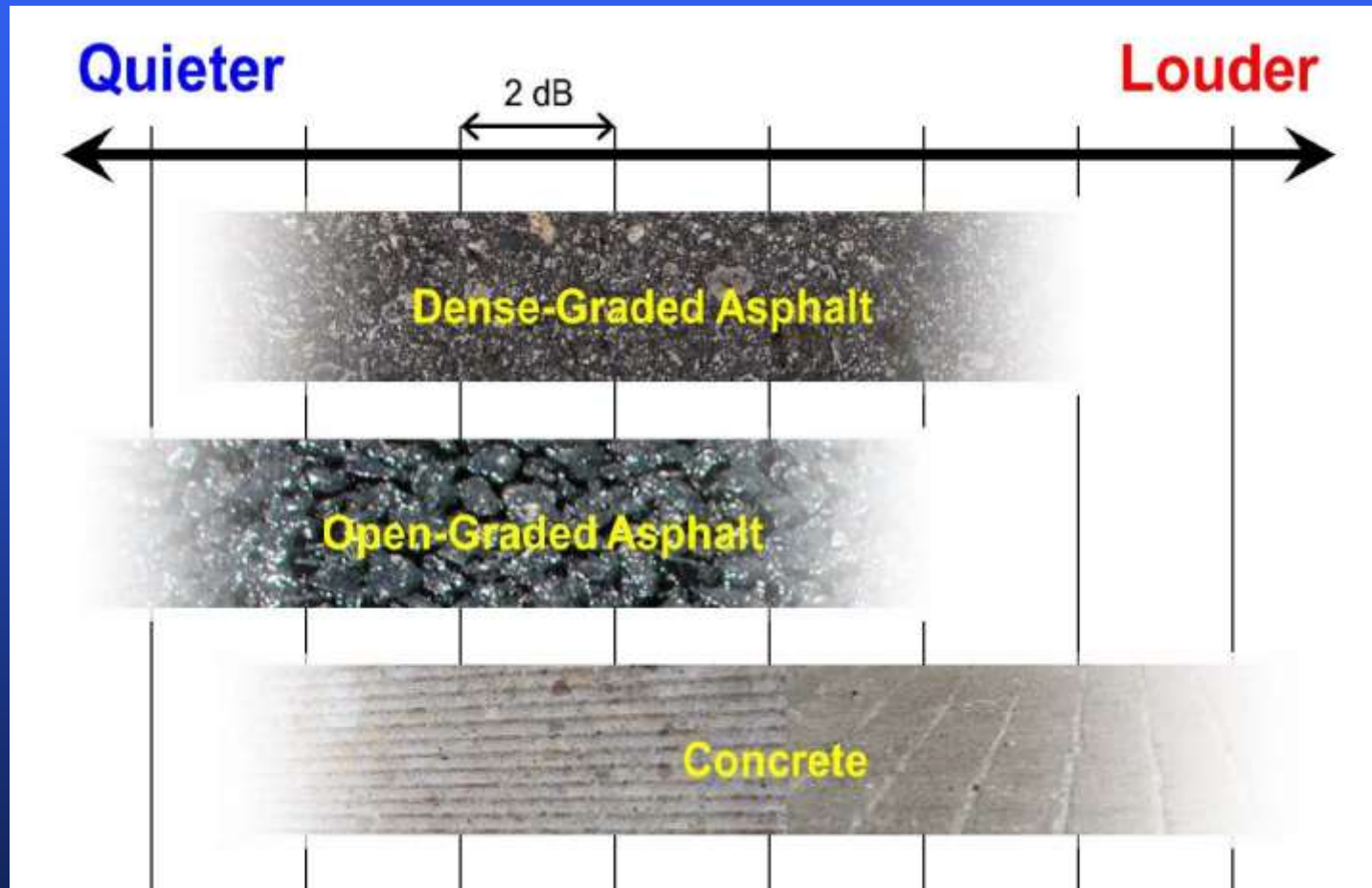
A-weighting is used to adjust sound levels to the human ear and reported as dBA or dB(A).



Typical Noise Sources and Sound Levels



Range of Tire-Pavement Noise Levels



How is pavement noise performance measured?

Two methods are commonly used to quantify pavements for reducing noise

- **On-board sound Intensity (OBSI)**
- **Wayside**

OBSI measures noise inches from the tire/pavement interface (where the rubber meets the road).

Wayside measures noise levels 25-50 feet from the center of the outside lane (more directly represents what people living/working near the roadway hear)



Do pavements get louder with time?

Yes. All pavements will get louder as they deteriorate from traffic and weather.

Some pavements increase in tire pavement noise faster than others.

Initial treatment noise levels and rate of noise increase should be considered.



Can a given quieter pavement alternative be used everywhere?

There is ***no “one-size-fits-all” solution*** for use of quieter pavements. Differences in weather, traffic, cost, and local experience can make what seems like a good idea, less than ideal.

If in doubt about the effectiveness of a quieter pavement for a given area, trials should be conducted before widespread implementation.



How does quieter pavement fit in with other noise abatement issues?



23 CFR 772 does not recognize pavement type as a factor in reducing traffic noise.

However, the use of specific pavement types in determination of noise impacts is planned for future implementation.



Quiet Pavements are coming to Virginia in 2011

House Bill 2001

“expedite the development of quiet pavement technology such that applicable contract solicitations for paving shall include specifications for quiet pavement in any case in which sound mitigation is a consideration.

To that end, the Department shall construct demonstration projects sufficient in number and scope to assess applicable technologies.”





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