SOUND AND CALIFORNIA'S HIGH-SPEED TRAINS

October 25, 2010

CALIFORNIA High-Speed Rail

SOUND AND CALIFORNIA'S HIGH-SPEED TRAINS

- We understand that sound is a key concern.
- The Federal Railroad Administration has rigorous procedures to measure sound that the Authority will follow.
- The Authority will work with the public and partner agencies to consider ways to mitigate significant sound impacts.

CALIFORNIA High-Speed Rail

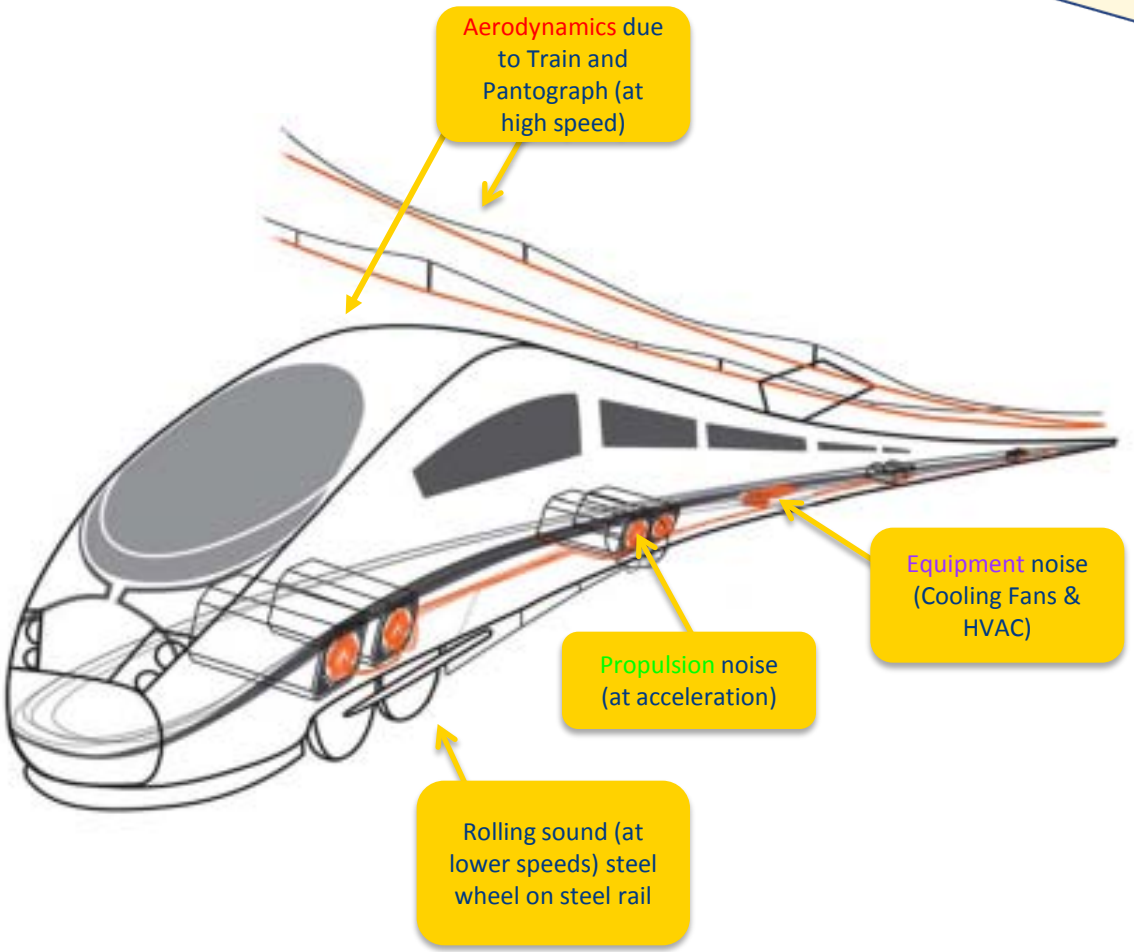
HIGH-SPEED TRAINS CREATE FOUR KINDS OF SOUND

Rolling – sound from the wheels as trains move along the tracks.

Propulsion – sound from motors and gears that make the train move.

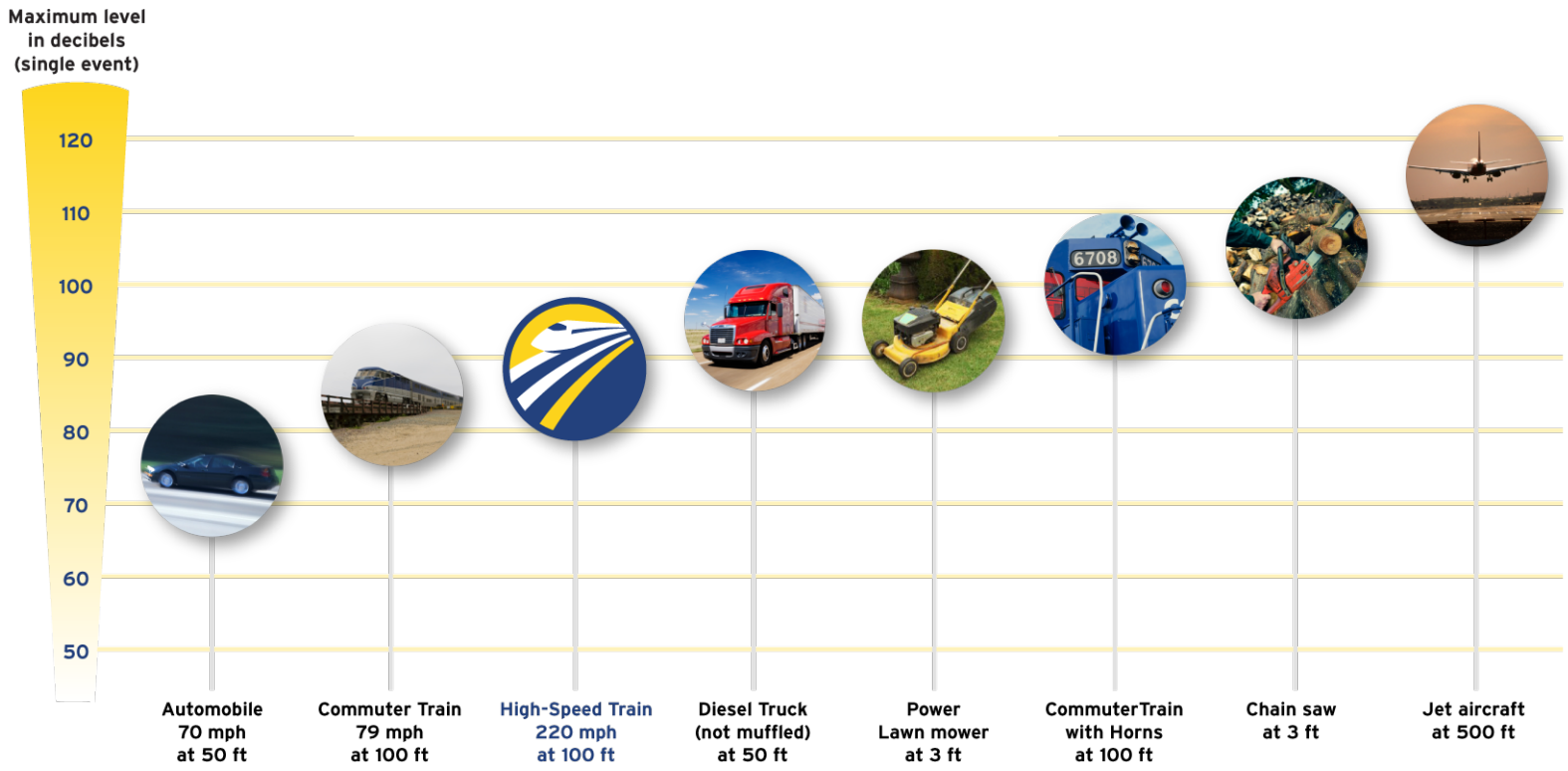
Equipment – sound from cooling fans and air conditioners.

Aerodynamics – sound from the flow of air moving past the train at high speed.



CALIFORNIA High-Speed Rail

HOW DOES THE SOUND FROM HIGH-SPEED TRAINS MEASURE UP?



CALIFORNIA High-Speed Rail

THOROUGH ENVIRONMENTAL ANALYSIS

The review will look at two key measurements:

- ***One-Hour Equivalent Sound Level***, which measures the moment-to-moment fluctuations in sound **over a single hour** – taking into account both the number of trains and the time they take to pass by – the best measure for assessing the impacts on offices, schools and libraries.

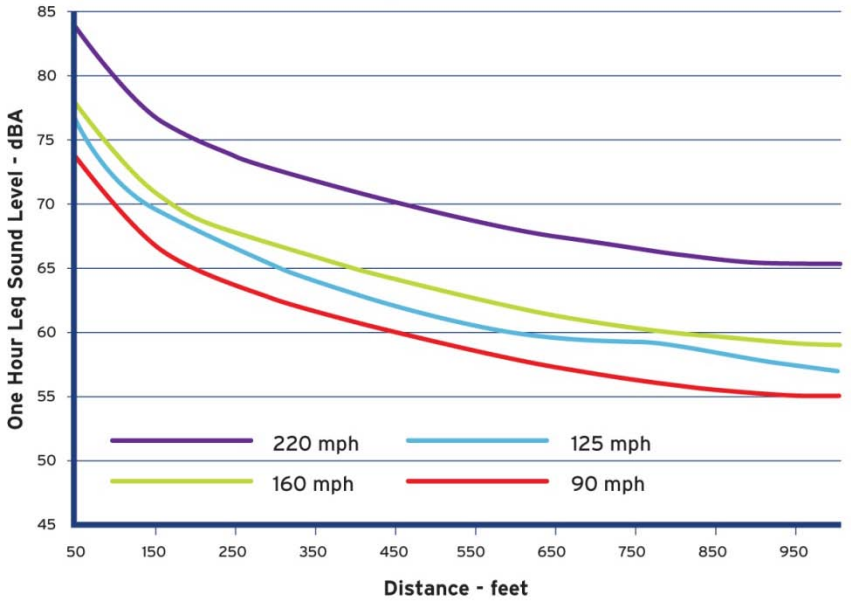
- ***Day-Night Sound Level*** looks at sound fluctuations **over a full 24 hours**, taking into account the heightened sensitivity in residential areas to sounds made late at night.

HERE'S WHAT YOU CAN EXPECT

For offices, schools and libraries:

- In urban and highly developed suburban areas, **a high-speed train traveling 125 mph** will produce an hourly equivalent sound level of about **73 decibels from a distance of 100 feet** – less than a commuter train with a blowing horn.

One-Hour Noise Levels

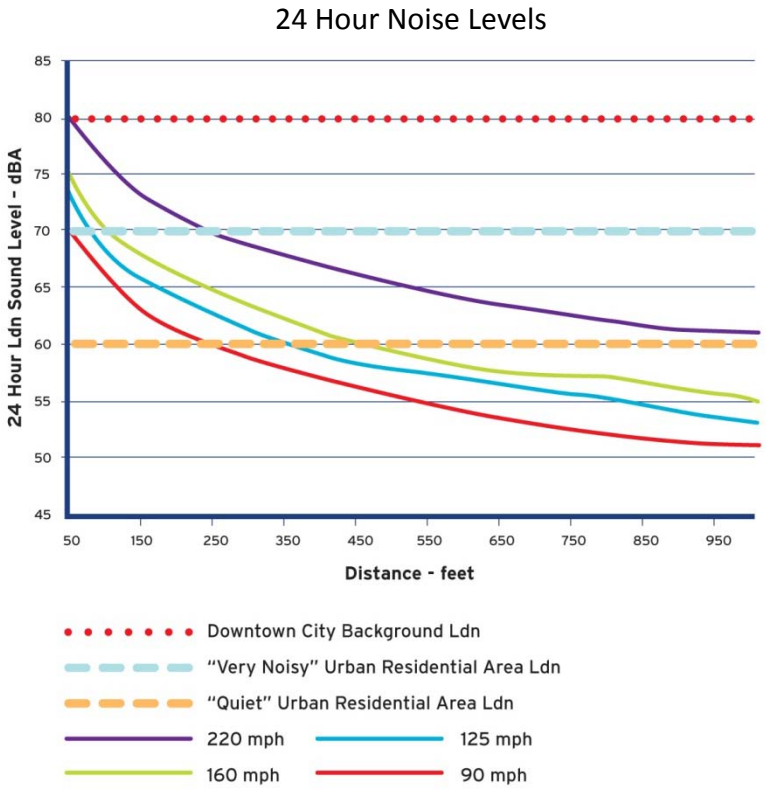


CALIFORNIA High-Speed Rail

HERE'S WHAT YOU CAN EXPECT

For residential neighborhoods:

- In downtown city settings, high-speed trains – even at top speed – will be **within the existing noise levels** from traffic and other sources.
- In noisy urban residential areas, high-speed trains – even at top speed – will be **within existing noise levels for everyone except listeners within 250 feet of the tracks.**
- In quiet residential areas, high-speed trains – depending upon speed – **could affect noise levels for listeners within 1,000 feet** of the tracks.



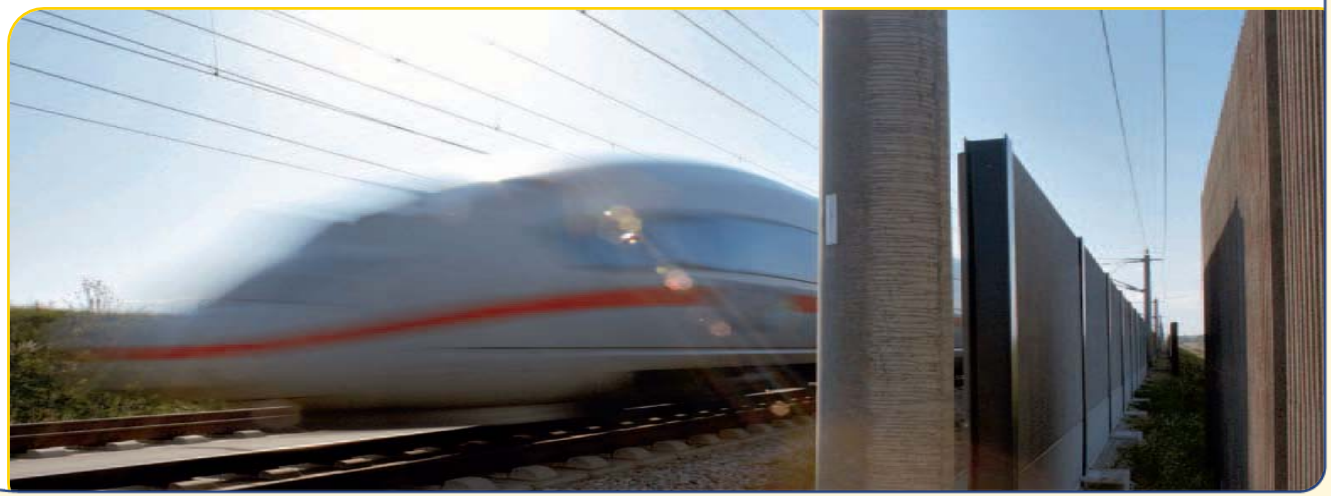
CALIFORNIA High-Speed Rail

FAST TRAINS MAKE FOR SHORTER SOUNDS

A train moving at 220 mph – the top speed of California's high-speed trains – will be heard for about **four seconds**

By comparison….

A 50-car freight train traveling at 30 mph can be heard for **one minute**



CALIFORNIA High-Speed Rail

COMMITMENT TO SOUND MITIGATION

Operations

- In major urban areas (Bay Area, Los Angeles and San Diego) high-speed trains will mostly run at speeds of **125 mph or less.**
- High-speed trains won't have scheduled passenger service between midnight and 5 a.m.
- Grade-separated system will **eliminate the need for blaring horns.**

Technology

- Newer high-speed trains **quieter than earlier models** and conventional trains
- Electrically powered, **no noisy diesel engines**

Rhine River Viaduct, Germany

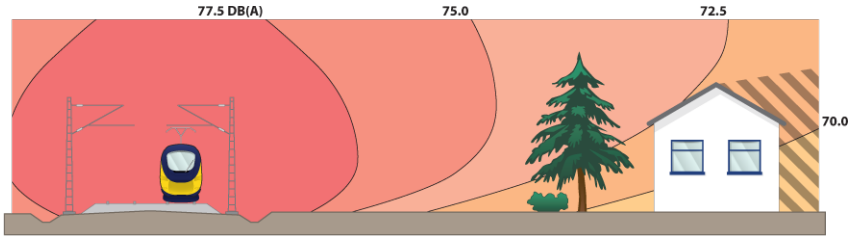
SCNF High-Speed Train System, France

CALIFORNIA High-Speed Rail

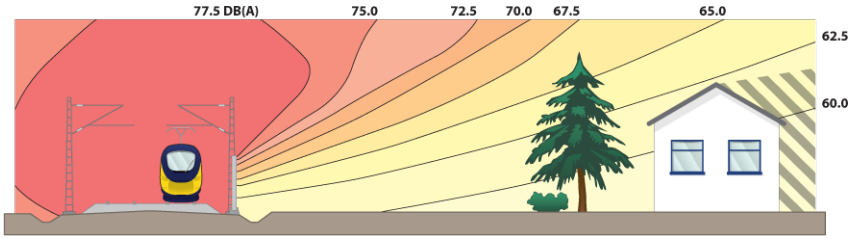
COMMITMENT TO SOUND MITIGATION

Engineering and design will make a big difference

- Sound engineers and train builders have over 40 years experience – and good mitigation measures are working around the world.
- For a train traveling less than 160 mph, a six to 12-foot sound barrier will **reduce noise by five to nine decibels** (the human ear perceives a 10-decibel reduction as cutting the sound in half).
- The sound from a high-speed train operating on an aerial structure could be **one or two decibels higher** than at ground level.
- The sound from a high-speed train operating in an open trench could be **five to seven decibels lower** than at ground level.



Noise levels without sound barrier



Noise levels with sound barrier

CALIFORNIA High-Speed Rail

GET INFORMED AND BE HEARD

- The California High-Speed Rail Authority has issued a detailed fact sheet and posted it on our website so that people concerned about these issues can understand them and participate in the process.
- Your feedback will help make sure California's high-speed train project becomes a good neighbor to the communities it serves.

www.cahighspeedrail.ca.gov

CALIFORNIA High-Speed Rail