



How does Caltrans “do” noise?

CASTROVILLE

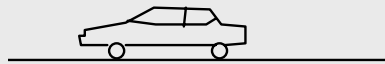


- What is noise?
- Where does it come from?
- Why do we care?
- How do we measure it?
- What can we do about it?
- How will the project affect local noise levels?
- The noise study

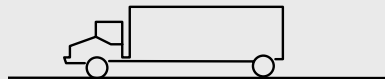




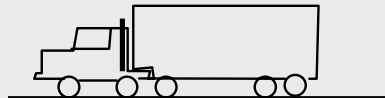
What is noise? Where is it from?



Autos



Medium Trucks



Heavy Trucks

Source heights

Autos -0-1.5 feet

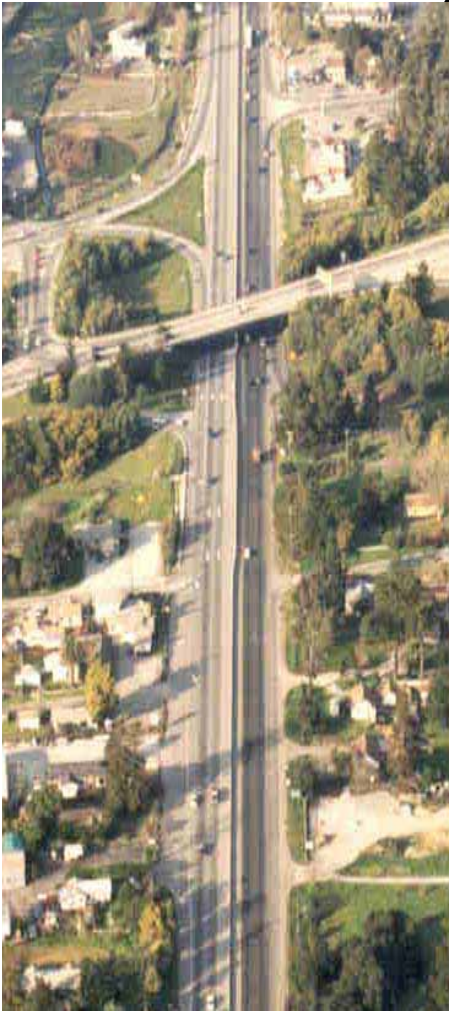
Med. Trucks- 0-5 feet

Heavy trucks- 0-11.5 feet

- Noise is unwanted sound. It is all around us.
- Along the highway it comes from tires, engines and exhaust of cars, trucks, busses and motorcycles.
- Source heights for the noise are from 0-11.5 feet above the roadway.
- Smooth paved surfaces are generally quieter than irregular ones.



Why do we care?



- Noise is one of the most objectionable by-products of highways.
- We receive many complaints about highway noise.
- With increasing consciousness about environmental aspects in the 1960's and 70s, came increasing regulation of these factors.
- Under CEQA/NEPA, requirements to consider all environmental affects of our projects at local, state and federal levels

How do we measure noise?

- Hear it – outdoors normal hearing can detect 2-3 dBA difference
- Noise meters- measure in tenths of a dB
- Noise prediction programs—using future parameters, predict for impacts

Decibel is a logarithmic scale. 10-dBA doubles, 20-dBA quadruples level.

Noise is measured in decibels on the A-weighted scale adapted for the human range of hearing.

Caltrans uses the Leq descriptor—a time weighted average.





What can we do about noise?

- Move the source further away.
- Install sound walls
- Install quieter pavement (smooth joints, etc.)
- Improve the mufflers and tires of cars, trucks, motorcycles
- Insulate homes



Slovenian
soundwall



How will project affect local noise levels?



- In most cases highway will be further from residences. With doubling of distance, reduction of noise by 3 to 4.5- dBA. Berms with Alt 11 even further reduce noise for most residences north of 156
- Levels may raise for some residents at 101/156 IC.



Noise Analysis

see Traffic Noise Analysis Protocol (October 2006)

- Is the project a Type 1 project?
- If yes, will project result in noise impact?
- If yes, noise abatement must be considered.
- Is the proposed noise abatement reasonable and feasible?



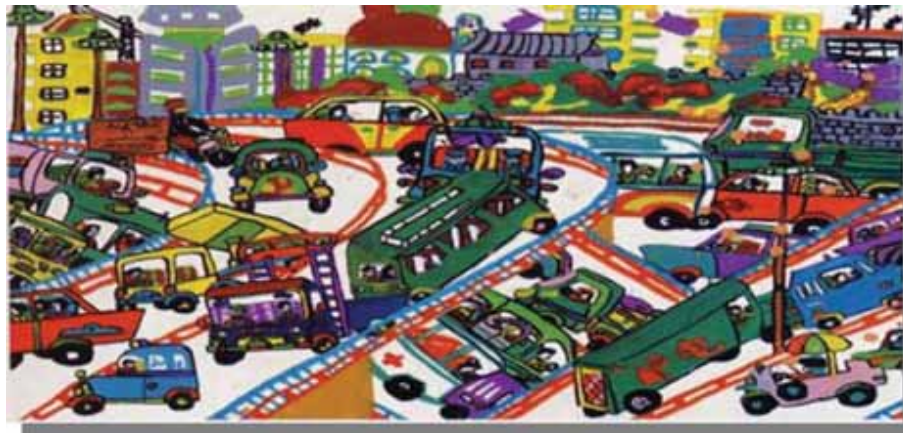
Noise Analysis

- **Is the project a Type 1 project?**
 - Proposed Federal or Federal-aid project that will:
 - construct highway on new location; or
 - alter vertical or horizontal alignment of existing highway; or
 - increase number of through lanes, or
 - raise local noise levels



Noise Analysis

- Will Project result in a noise impact?
 - Step 1: Identify Sensitive Receptors
 - Step 2: Measure Existing Noise Levels
 - Step 3: Model Future Noise Levels
 - Step 4: Determine whether there is a substantial increase; or whether the future noise approaches or exceeds the noise abatement criteria (NAC)



Noise Analysis

- Will Project result in a noise impact?
 - Step 1: Identify Sensitive Receptors
 - Examples
 - Homes
 - Schools
 - Businesses
 - Recreation Areas
 - Hospitals



Noise Analysis

- Will Project result in a noise impact?
 - Step 2: Measure Existing Noise Levels
 - Noise specialists set up noise meters at selected receptor locations.
 - Take measurements during worst hourly traffic noise. (Count traffic to calibrate noise model)



Noise Analysis

- Will Project result in a noise impact?
 - **Step 3: Model Future Noise Levels**
 - Prediction is based on (FHWA) Traffic Noise Model for projects initiated after after March 2005.
 - Traffic Volume (average daily traffic)
 - Traffic Mix (% truck traffic)
 - Topography
 - Distance from Receptors

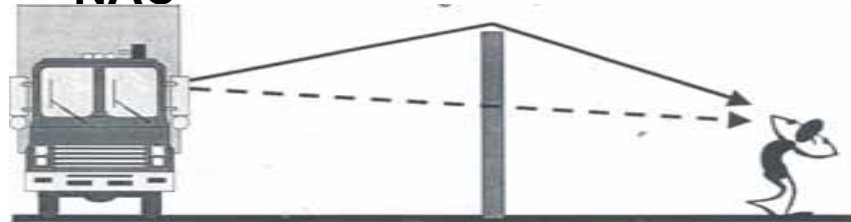


Noise Analysis

- Will Project result in a noise impact?
 - **Step 4:** Determine whether there is a **substantial increase**; or whether the future noise **approaches or exceeds the noise abatement criteria (NAC) 67-dBA for residences**

Substantial Increase = 12-dBA increase

Approach or Exceed = come with 1-dBA of NAC



 **ROUTE 156 WEST**
Monterey County
CORRIDOR PROJECT

If yes (there's a noise impact), then noise abatement must be considered.



Noise Analysis

Is the proposed noise abatement reasonable and feasible?

Feasible

- Engineering Concerns
 - Must achieve 5-dBA reduction.

Reasonable

- Cost-Benefit Analysis (Worksheet A & B in CATNAP)
 - Absolute Noise Levels
 - Build Vs. Existing Noise Levels
 - Environmental Impacts of Abatement
 - Public and Local Agencies Input
 - New Construction, or Predate 1978
 - Total Noise Abatement Allowance Vs Project Cost



Noise Analysis

Will **construction** cause noise impacts?

- normal operations** 86-dBA at 50 feet, >NAC at 300 feet.
- extraordinary operations** like pile driving 100-dBA at 50 feet, >NAC at 1200 feet.
- vibration** can damage structures within 100 feet, cause annoyance within 200 feet.
- Night work** more objectionable than day work.



Minimization-

Schedule, temporary barrier, advanced notice, early barrier construction, hot-line, hotels

Pile driving



Noise Analysis-Summary

- **Is the project a Type 1 project?**
- **If yes, will project result in noise impact?**
- **If yes, noise abatement must be considered.**
- **Is the proposed noise abatement reasonable and feasible?**
- **Are minimization measures for all long and short term (construction) impacts included?**

