

Long-Term, Multiple Pavement Type, Tire / Road Noise Study

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Pavement Study Overview

Sponsored by



- Study to assess 5 types of pavement for the purpose of noise abatement
- Involves highway traffic noise data collection and analysis
 - Side-of-road sound pressure Volpe Center
 - Near-tire sound intensity Illingworth & Rodkin



Pavement Study Overview (continued)

- Measurements
 - Reference section and 4 test sections simultaneously
 - 2 times a year for five years
- ♦ Analysis
 - Compare reference and test sections
 - Observe degradation of individual sections over time
- Results
 - Safe and quiet pavement found? REPAVE California!





Rte 138 Measurement Area





Pavement Sections



- Leveling course of 30mm DGAC in all sections (baseline measurements)
- Overlays in Sections 2-5: OGAC (75 & 30mm), RAC, BWC (after baseline measurements)



Field Measurements

- Preliminary measurements (May 2001)
 - Determined need for leveling course
 - Sparse traffic indicated need for pass-by methodology (as opposed to time-averaged)
- Baseline measurements (March 2002)
 - Leveling course completed in December 2001
 - Collected data for over 600 pass-by events at each site
- Subsequent measurements (starting October 2002)
 - Overlays completed in June 2002



Field Measurements – acoustical instrumentation







Field Measurements – meteorological and video





Field Measurements – effective flow resistivity





Field Measurements – core samples





Test Vehicle

Subaru Outback





Goodyear
Aquatred 3
tires



Data Analysis

- Statistical pass-by method (ISO 11819-1)
 - Paired pavement analysis:

DGAC section and 75mm OGAC section DGAC section and 30mm OGAC section DGAC section and RAC section DGAC section and BWC section

- Identical vehicle sets for paired data
- Baseline measurement analysis near completion should indicate any measurement section bias prior to overlays
- Test vehicle pass-bys
 - All five pavement types, same vehicle
 - Final data presented as averages of multiple pass-bys for each speed (40, 50, 60, and 70 mph - or - approximately 65, 80, 100, and 115 km/h)









Test Vehicle; distance = 50 ft, height = 5 ft





Test Vehicle; distance = 50 ft, height = 15 ft





Conclusions

- Test vehicle results suggest no measurement section bias (independent of pavement influence)
- Need to complete statistical pass-by method analysis to determine measurement section biases, if any
- Results from October 2002 measurements will allow comparison of the OGAC, RAC, and BWC overlays to DGAC