



NJDOT Bureau of Research  
QUARTERLY PROGRESS REPORT

Project Title:	Demonstration Project – The Measurement of Pavement Noise Using the NCAT Noise Trailer		
RFP NUMBER:		NJDOT RESEARCH PROJECT MANAGER: Mr. W. Lad Szalaj	
TASK ORDER NUMBER: 140 / 4-29052		PRINCIPAL INVESTIGATOR: Thomas Bennert	
Project Starting Date: 8/1/2003 <b>Original Project Ending Date: 12/31/2003</b> <b>Modified Completion Date: 6/30/2004</b>		Period Covered: 2 <sup>nd</sup> Quarter 2004	

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Pavement Type Selection	10%	100%	100%	10%
2. Pavement Noise Testing	70%	100%	100%	70%
3. Data Analysis and Reporting	20%	100%	100%	20%
Final Report				
<b>TOTAL</b>	<b>100%</b>			<b>100%</b>
<b>TOTAL</b>	<b>100%</b>			

Project Objectives:

- To evaluate the use of the NCAT Noise Trailer as a means of providing repeatability values of tire/pavement related noise
- To provide the NJDOT with an initial database of typical tire/pavement noise for different pavement surfaces in New Jersey
- To evaluate the affect of vehicle speed on the magnitude of tire/pavement related noise

Project Abstract:

A demonstration project was conducted for the New Jersey Department of Transportation (NJDOT) to evaluate the measurement of pavement/tire noise on New Jersey pavements. The pavement/tire noise is defined as the noise directly produced by the tire traveling over the pavement surface. It does not consider other traffic-related noise such as automobile/truck engines, braking, etc. This is important since the only factor the NJDOT can truly control to aid in the traffic noise reduction is the pavement surface.

The demonstration project was developed to provide two key pieces of information: 1) An evaluation of the NCAT Noise Trailer as a means of measuring pavement/tire related noise, and 2) To develop an initial database of noise values for different pavement surfaces that are typically encountered on New Jersey highways.

The NCAT (National Center for Asphalt Technology) Noise Trailer uses the Close-Proximity Method (CPX) to measure the pavement/tire noise. In this method, microphones are placed near the pavement/tire interface to directly measure the pavement/tire noise levels. The microphone set-up and tires are enclosed in a chamber that is insulated with noise absorbing insulation. This provides an enclosure that is only measuring the noise developed by the pavement/tire interface and not any external noise of the passing vehicles or environment.

The NCAT Noise Trailer was evaluated for repeatability and also to evaluate the effect of traffic speed on the pavement/tire noise. Results of the testing showed the repeatability to be quite consistent, with the average standard deviation to be 0.15 decibels, as long as the test section is greater than 0.1 miles. The standard deviation proved to increase when the test section was less than 0.1 miles, such as for bridge decks. The effect of traffic speed was evaluated by testing the same pavement section at three different speeds; 55, 60, and 65 mph. The results indicated that the 55 mph speed produced the lowest pavement/tire noise and that it can be assumed that the noise increases linearly (at least within this range of traffic speed).



# CAIT

Center for Advanced Infrastructure & Transportation  
Rutgers, The State University of New Jersey

The NCAT Noise Trailer was also used to develop an initial database of pavement/tire noise levels for different pavement surfaces tested. In general, the Portland Concrete (PCC) sections produced the loudest pavement surface while the Open-graded Friction Course (OGFC) produced the lowest pavement/tire noise.

1. Progress this quarter by task:

The corrections to the final report were completed and the revised final report was submitted. The results generated with the data collected from the study is currently being evaluated, along with wet skid numbers to provide NJDOT engineers guidance in selecting quieter and safer surface course materials.

2. Proposed activities for next quarter by task:

N.A.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	\$15,000
<b>Modified Contract Amount:</b>	
Total Project Expenditure to date	\$13,928
% of Total Project Budget Expended	93%

\* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.