

**NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT**

Project Title:	Feasibility of Lane Closures Using Probe Data					
RFP Number: 2012-05	NJDOT Project Manager: Paul Thomas					
Task Order Number: TO-104	Consultant: New Jersey Institute of Technology					
Customer: Dhanesh Motiani	Principal Investigator: Chien, Steven I-Jy					
Project Starting Date: 4/15/2013	Period Starting Date: 01/01/2014					
Original Project Ending Date: 12/15/2014	Period Ending Date: 03/31/2014					
Modified Completion Date:						

Task	% of Total Budget	Total Budget	% of Task this quarter	Cost this quarter	% of Task to date	Cost To Date
Literature Review	5.0%	\$22,517	0.00%	\$0	100.00%	\$22,517
Evaluation of Real Time Surveillance Technologies	4.0%	\$18,014	40.00%	\$7,206	100.00%	\$18,014
Data Sources and Data Collection	9.0%	\$40,531	32.00%	\$12,970	32.00%	\$12,970
Database Development	15.0%	\$67,551	5.00%	\$3,378	5.00%	\$3,378
NJLCAM Development	21.0%	\$94,571	0.00%	\$0	0.00%	\$0
Case Study	5.0%	\$22,517	0.00%	\$0	0.00%	\$0
Benefit/Cost Analysis	12.0%	\$54,041	0.00%	\$0	0.00%	\$0
NJLCAM Software Tool	20.0%	\$90,068	0.00%	\$0	0.00%	\$0
Presentation, Implementation, and Training	5.0%	\$22,517	0.00%	\$0	0.00%	\$0
Final Report	4.0%	\$18,014	0.00%	\$0	0.00%	\$0
TOTAL	100 %	\$450,341		\$23,553		\$56,878

Project Objectives:

The objective of this research project is to develop a methodology for integrating probe-vehicle data into the traffic impact analysis model, and to develop a user-friendly software tool that would implement the calculation methodology.

Project Abstract:

NJDOT must develop an adequate traffic operations management and congestion mitigation plan for every roadway maintenance and construction project requiring lane closures. To do this properly, NJDOT needs accurate and reliable estimates of traffic impacts associated with pertinent maintenance and construction projects, and the corresponding roadway capacity reductions. The

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current analytical model used by NJDOT for this purpose is based on traditional volume/capacity formulae and deterministic traffic queuing modeling method. NJDOT recognizes the shortcomings of these methods that often result in inaccurate estimates of the impact of lane closures in terms of vehicle delays and queue lengths. These estimates may be significantly improved by utilizing probe-vehicle traffic data. Probe-vehicle traffic data is based on the "actual" vehicle travel times and speeds, measured in reference to roadway segment in question, traveled distance, and time of travel. It is expected that use of this data can significantly improve accuracy of the estimated vehicle delays associated with lane closures. The objective of this research project is to develop a methodology for integrating probe-vehicle data into the traffic impact analysis model, and to develop a user-friendly software tool that would implement the calculation methodology.

1. Progress this quarter by task:

Task 2:

- Evaluated Real Time Traffic Surveillance Technologies on the cost of data collection, processing, and maintenance.
- Prepared Memorandum documenting the evaluation process and findings.

Task 3:

- Identified probe-vehicle and other data required for the development of the model.
- The data sources were identified in collaboration with NJDOT, and the probe-vehicle data from available vendor sources are collected.
- Collected, processed, and stored the available real-time and historical data in a database.
- The data collection process ensured that necessary level of detail was achieved with respect to the locations of lane closures to be studied, reporting intervals, and availability of real-time traffic data, including vehicle speeds and volumes.

Task 4:

- A preliminary data processing algorithm and method was developed to translate the data from various sources into a unified data format appropriate for the analysis.
- The data collected to be stored in the database include roadway geometry data (e.g. number of lanes, lane width, shoulder width etc.), work zone information (e.g. date and location of the lane closure, lanes closed, duration, and length) and incident data (e.g. location, duration, affected lanes, severity) for the analysis period.
- The collected data was analyzed using conventional

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statistical methods (e.g., significance tests, correlation analysis, regression analysis) to develop relationships among lane closure work zone characteristics, safety effects, and delays.

2. Proposed activities for next quarter by task:

Task 3:

- Continue collect, process, and store the data required for the model development.

Task 4:

- Continue develop the proposed database that will effectively integrate the data sets determined in Task 3.

Task 5:

- A methodology for estimating user costs will be developed and documented.
- Develop a method for estimating average queue propagation speed and assessing the performance and impact of lane closures

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

Task 1&2:

- Memorandum documenting the evaluation process and findings.
- Presentation of the literature search results.

Task 3&4:

- Present collected data and database development status

4. Progress on implementation and training activities:

5. Problems/proposed solutions:

6. Budget summary:

Total Project Budget	\$231,060
Modified Contract Amount	\$450,341
Total Project Expenditure to date	\$56,878
% of Total Project Budget Expended	12.63 %

NJDOT Research Project Manager Concurrence: _____ Date: _____