

## NTC Program Progress Performance Report (PPPR) Information Form

### For P.I.'s Use

On a semi-annual basis the NTC sponsored P.I. must report Program Progress Performance Report (PPPR) using the format specified in this PPPR Information Form. The form must be submitted electronically to the corresponding NTC Associate Director by **9/22/2016**.

**Cover Period: 4/1/2016 – 9/30/2016**

NTC Funded Project Information (Round/Year 3, 2015-2016)	
University Name	Louisiana State University
Project Title	Optimizing Highway Efficiency in Real-Time
Principal Investigator	Brian Wolshon
PI Contact Information	phone: 225-578-5247 fax: 225-578-8652 email: <a href="mailto:brian@rsip.lsu.edu">brian@rsip.lsu.edu</a>

**The form includes the following six parts:**

- Part I – Performance Indicators
- Part II – Accomplishments: What was done? What was learned?
- Part III – Products: What has the program produced?
- Part IV – Participants & Collaborating Organizations: Who has been involved?
- Part V – Impact: What is the impact of the program? How has it contributed to transportation education, research and technology transfer?
- Part VI – Changes/Problems

*Supplementary documents/materials can be attached to this form with the submission.*

<b>Part I – Performance Indicators</b>	
<b>Reporting Period</b>	<b>4/1/2016 – 9/30/2016</b>
<b>1. Transportation-related courses offered during the reporting period that were taught by faculty and/or teaching assistants who are associated with the UTC</b>	
Undergraduate courses	CE 3600: Principles of Highway and Traffic Engineering CE 4600: Geometric Design of Highways and Airports
Graduate courses	CE 7600: Advanced Highway Design and Traffic Safety
<b>2. Students supported by this grant</b>	
Undergraduate students	Nothing to report
Masters students	
Doctoral students	Siavash Shojaat supervised by Brian Wolshon
<b>3. Students participating in transportation research projects funded by this grant (but not supported by this grant)</b>	
Undergraduate students	Nothing to report
Graduate students	Nothing to report
<b>4. Students supported by this grant who received degrees</b>	
Undergraduate degrees	Nothing to report
Masters degrees	Nothing to report
Doctoral degrees	Nothing to report

**Part II – Accomplishments: What was done? What was learned?**

The information provided in this section allows the OST-R grants official to assess whether satisfactory progress has been made during the reporting period.

<p><b>Reporting Period</b></p>	<p><b>4/1/2016 – 9/30/2016</b></p>
<p><b>1. What are the major goals of the program?</b></p>	<p>The National UTC aims to promote strategic transportation policies, investment, and decisions that bring lasting and equitable economic benefits to the U.S. and its citizens. The Center is concerned with the integrated operations and planning of all modes serving the nation’s passenger and freight transportation system, including the institutional issues associated with their management and investments. A balanced multi-modal approach will be used that considers freight and passenger travel mobility, reliability, and sustainability, as well as system operations during periods of both recurring and non-recurring incidents, including response to major emergencies. The modes in this theme include highway, transit, rail, and inter-modal interfaces including ports, terminals and airports. In particular, the center focuses on research, education, and technology transfer activities that can lead to (1) Freight efficiency for domestic shipping and for our international land, air, and sea ports; (2) Highway congestion mitigation with multi-modal strategies; and (3) Smart investments in intercity passenger travel facilities such as high speed rail. Major center activities are as following:</p> <ul style="list-style-type: none"> <li>• <b>Advanced &amp; Applied Research Promoting Economic Competitiveness:</b> Our research activities are multimodal/intermodal and multidisciplinary in scope, with the aims of addressing nationally and regionally significant transportation issues pertinent to economic competitiveness and providing practice-ready solutions.</li> <li>• <b>Education, Workforce Development, Technology Transfer, &amp; Diversity</b> The consortium is committed to providing high-quality transportation education and workforce development programs for a broad and diverse audience. Center’s efforts will support the development of a critical transportation knowledge base and a transportation workforce that is prepared to design, deploy, operate, and maintain the complex transportation systems of the future.</li> </ul>

<p><b>2. What was accomplished under these goals?</b></p>	<ol style="list-style-type: none"> <li>1. Quantifying Efficiency: Task 3 will utilize the processed data to generate the fundamental traffic flow diagrams for the study area using a curve fitting methodology. Once the fundamental traffic flow diagrams have been verified, the methodology describe by Brillon (2000) will be applied to calculate the roadway section’s efficiency.</li> <li>2. Simulation Model Development: Task 4 will develop a simulation model for the study area. This task includes the calibration and validation of the model to ensure the simulation model can reproduce the fundamental traffic diagrams observed in the field.</li> </ol>
<p><b>3. How have the results been disseminated?</b></p>	<ol style="list-style-type: none"> <li>1. Shojaat, S., Geistefeldt, J., Parr, S., Wilmot, C., and B. Wolshon. “Sustained Flow Index: A stochastic Measure of Freeway Performance.” Accepted for Publication in <i>Transportation Research Record, Journal of the Transportation Research Board</i>, (anticipated date) 2016.</li> </ol>
<p><b>4. What do you plan to do during the next reporting period to accomplish the goals? (10/1/2014 – 3/10/2016)</b></p>	<ol style="list-style-type: none"> <li>1. Simulation Model Development: Task 4 will develop a simulation model for the study area. This task includes the calibration and validation of the model to ensure the simulation model can reproduce the fundamental traffic diagrams observed in the field (12 months).</li> <li>2. Ramp Metering: Task 5 will develop an online adaptive ramp metering algorithm which seeks to maximize freeway efficiency in real-time (7 months).</li> </ol>

**Part II – Products: What has the program produced?**

<p><b>Publications are the characteristic product of research projects funded by the UTC Program. OST-R may evaluate what the publications demonstrate about the excellence and significance of the research and the efficacy with which the results are being communicated to colleagues, potential users, and the public, not the number of publications. Many research projects (though not all) develop significant products other than publications. OST-R may assess and report both publications and other products to Congress, communities of interest, and the public.</b></p>	
<b>Reporting Period</b>	<b>4/1/2016 – 9/30/2016</b>
<b>1. Journal publications:</b>	1. Shojaat, S., Geistefeldt, J., Parr, S., Escobar, L., and B. Wolshon. "Applying the Sustained Flow Index to Estimate Freeway Capacity." Submitted for publication in the <i>Transportation Research Record, Journal of the Transportation Research Board</i> , (anticipated date) 2017.
<b>2. Books or other non-periodical, one-time publications</b>	Nothing to report
<b>3. Other publications, conference papers and presentations</b>	Nothing to report
<b>4. Website(s) or other Internet site(s)</b>	evaccenter.lsu.edu
<b>5. Technologies or techniques</b>	Nothing to report
<b>6. Outreach activities</b>	Nothing to report
<b>7. Courses and workshops</b>	Nothing to report
<b>8. Inventions, patent applications, and/or licenses</b>	Nothing to report
<b>9. Other products</b>	Nothing to report

**Part III – Participants & Collaborating Organizations: Who has been involved?**

<b>OST-R needs to know who has worked on the project to gauge and report performance in promoting partnerships and collaborations.</b>	
<b>Reporting Period</b>	<b>4/1/2016 – 9/30/2016</b>
<b>1. What organizations have been involved as partners?</b>	Nothing to report
<b>2. Have other collaborators or contacts been involved?</b>	Nothing to report

**Part IV – Impact: What is the impact of the program? How has it contributed to transportation education, research and technology transfer?**

**DOT uses this information to assess how the research and education programs:**

- increase the body of knowledge and techniques;
- enlarge the pool of people trained to develop that knowledge and techniques or
- put it to use; and,
- improve the physical, institutional, and information resources that enable those people to get their training and perform their functions.

<b>Reporting Period</b>	<b>4/1/2016 – 9/30/2016</b>
<b>1. What is the impact on the development of the principal discipline(s) of the program?</b>	It is anticipated that the developed ramp metering algorithm will increase freeway efficiency, reducing overall congestion, delay, and travel time on the metered section. This project will deliver the details of the developed algorithm as well as a calibrated and validated microscopic traffic simulation model of the study sites.
<b>2. What is the impact on other disciplines?</b>	Nothing to report
<b>3. What is the impact on the development of transportation workforce development?</b>	The impact on workforce development has been primarily in the education and development of the undergraduate, master’s and Ph.D. students involved in the project.
<b>4. What is the impact on physical, institutional, and information resources at the university or other partner institutions?</b>	Nothing to report

<b>5. What is the impact on technology transfer?</b>	Nothing to report
<b>6. What is the impact on society beyond science and technology?</b>	This research could lead to decreased freeway congestion, reducing vehicle emissions and an overall increase the efficiency of daily commuting.
<b>7. Additional impacts</b>	Nothing to report



**Part V – Changes/Problems**

If not previously reported in writing to OST-R through other mechanisms, provide the following additional information or state, “Nothing to Report, if applicable:

<b>Reporting Period</b>	<b>4/1/2016 – 9/30/2016</b>
<b>1. Changes in approach and reasons for change</b>	Nothing to report
<b>2. Actual or anticipated problems or delays and actions or plans to resolve them</b>	Nothing to report
<b>3. Changes that have a significant impact on expenditures</b>	Nothing to report
<b>4. Significant changes in use or care of human subjects, vertebrate animals, and/or biohazards</b>	Nothing to report
<b>5. Change of primary performance site location from that originally proposed</b>	Nothing to report