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 9/15/2014.

Cover Period: 4/1/2014 – 9/15/2014

NTC Funded Project Information (Round/Year 1, 2013-2014)	
University Name	Arizona State University
Project Title	Behavioral Study for Managed Lane Pricing with Refund Option
Principal Investigator	Yingyan Lou (PI) and Ram Pendyala (CoPI)
PI Contact Information	Yingyan.lou@asu.edu 480-965-6361

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.

Part I – Performance Indicators	
Reporting Period	**4/1/2014 – 9/15/2014**
1. Transportation-related courses offered during the reporting period that were taught by faculty and/or teaching assistants who are associated with the UTC	N/A
Undergraduate courses	Spring 2014, CEE 372 Transportation Engineering, Lou
Graduate courses	
2. Students supported by this grant	
Undergraduate students	
Masters students	Melissa Archer
Doctoral students	
3. Students participating in transportation research projects funded by this grant (but not supported by this grant)	
Undergraduate students	Kale Aziz Hanna Housenga
Graduate students	
4. Students supported by this grant who received degrees	N/A
Undergraduate degrees	
Masters degrees	
Doctoral degrees	

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.	
Reporting Period	**4/1/2014 – 9/15/2014**
1. What are the major goals of the program?	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: • **Advanced & Applied Research Promoting Economic Competitiveness:** 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. • **Education, Workforce Development, Technology Transfer, & Diversity** 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.

2. What was accomplished under these goals?	**Scheduled Activities for This Period** 1. Task 1: Survey preparation 2. Task 2: Perform survey 3. Task 3.2: Identify potential behavioral models 4. Task 4: Report writing **Work Performed in This Period** ***Task 1 Survey preparation (100% completed).*** Survey Subjects: Faculty and graduate students in the School of Sustainable Transportation and The Built Environment are recruited as pre-survey subjects. Commuters in the Phoenix area are chosen as the main subjects for the full survey. The full survey will be distributed through ASU parking and transit service email list, as well as social media sites such as Facebook and LinkedIn. Survey Design and Delivery Methods: An adaptive random design will be employed for this survey. The survey will be delivered online through emails and web links. Experimental Scenarios: Five main factors are identified: trip distance, toll rates, refund rates, average travel time, and travel time reliability. With the exception of travel time reliability, each factor has three levels. Up to four scenarios will be randomly generated for each subject. The first scenario is based on the travelers' last trip in the Phoenix Valley area. The travel distance in this scenario is the same as the subject's last trip, while the travel time, toll rate, and refund rate are randomly generated. The next three scenarios are hypothetical with each scenario representing one level of travel distance and other factors generated randomly. Survey Questionnaire: The questionnaire is developed through FluidSurvey. The research team created customized survey scripts to facilitate the random generation of scenarios and data collection. IRB Approval: Approval acquired on 6/13/2014.

	Task 2 Perform survey: (33% completed). Pretesting: Pretesting is completed. A total of 52 responses were received. The research team is analyzing data from the pretest to further refine the survey. Full-scale deployment: This task was originally scheduled for Month 5 – 6 (June – July 2014). Since the survey development and pretesting took longer than expected, this task is now scheduled for Months 8 – 10 (September – November 2014). ***Task 4 Report writing: (20% completed).*** The team has started writing the project report. A draft write-up of project introduction and literature review are completed. The team is in the process of documenting survey design and development. **Relation to the Goals** ***Advanced & Applied Research Promoting Economic Competitiveness:*** This research project aims to address the use of managed lane facilities as one solution to freeway congestion problems. The problem itself is a nationally and regionally significant transportation issue pertinent to economic competitiveness. The full survey to be deployed will cover the entire nation through email listings and social media, with an emphasis on the phoenix metropolitan region. ***Education, Workforce Development, Technology Transfer, & Diversity*** So far, this project has been supporting one thesis-based master student at ASU. Additionally, two undergraduate students were involved in this research project as part of their Honor's research. This is an enhanced education experience for all three students. All three students involved are female, supporting the diversity goal of the center. The students have obtained skills in transportation survey development, programming, research protocol development, and technical writing.
3. How have the results been disseminated?	No research results have been disseminated. The pre-survey has been deployed through ASU's School of Sustainable Engineering and The Built Environment email list,

	reaching out to faculty, staff, and students who are not in the field of transportation engineering.
4. What do you plan to do during the next reporting period to accomplish the goals? (10/1/2014 – 3/31/2015)	**Scheduled Activities for This Period** 1. Task 2: Perform survey (full deployment) 2. Task 3: Preliminary behavioral modeling 3. Task 4: Report writing **Relation to the Goals** ***Advanced & Applied Research Promoting Economic Competitiveness:*** This research project aims to address the use of managed lane facilities as one solution to freeway congestion problems. The problem itself is a nationally and regionally significant transportation issue pertinent to economic competitiveness. By finishing the remaining tasks, this project is expected to shed more light on the implication of risks and uncertainties on ML users' travel behaviors. Results from the study will provide a more realistic behavioral basis for future modeling and analysis of priced MLs. ***Education, Workforce Development, Technology Transfer, & Diversity*** The PI plans to continually support and involve both graduate and undergraduate students in this project, supporting the education and workforce development goals. The PIs plan to write one refereed journal paper on the proposed study. The results will also be presented at national venues such as Transportation Research Board annual meeting. The dissemination of the results supports the education, workforce development, and technology transfer goals. The full-survey will be deployed through local government agencies, professional organizations, ASU mailing lists, and social networks. This will bring the issue to a broader general-public audience, enhancing public understanding and increasing interest.

Part III – Products: What has the program produced?	
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.	
Reporting Period	**4/1/2014 – 9/15/2014**
1. Journal publications:	None.
2. Books or other non-periodical, one-time publications	None.
3. Other publications, conference papers and presentations	None.
4. Website(s) or other Internet site(s)	A pre-survey is developed through fluid survey. http://fluidsurveys.com/surveys/asutransengr/hot-refund-pretest/?TEST_DATA=&_cb=ePAcVFe97i
5. Technologies or techniques	None.
6. Outreach activities	The pre-survey has been deployed through ASU's School of Sustainable Engineering and The Built Environment email list, reaching out to faculty, staff, and students who are not in the field of transportation engineering.
7. Courses and workshops	None.
8. Inventions, patent applications, and/or licenses	None.

9. Other products	An internet-based survey instrument is developed. http://fluidsurveys.com/surveys/asutransengr/hot-refund-pretest/?TEST_DATA=&_cb=ePAcVFe97i A small sample dataset is collected through the pre-survey.

Part IV – Participants & Collaborating Organizations: Who has been involved?	
OST-R needs to know who has worked on the project to gauge and report performance in promoting partnerships and collaborations.	
Reporting Period	**4/1/2014 – 9/15/2014**
1. What organizations have been involved as partners?	ASU School of Sustainable Engineering and The Built Environment ASU Parking and Transit Service
2. Have other collaborators or contacts been involved?	No.

Part V – 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.**

Reporting Period	**4/1/2014 – 9/15/2014**
1. What is the impact on the development of the principal discipline(s) of the program?	The project is expected to shed more light on the implication of risks and uncertainties on managed lane users' travel behaviors. Results from the study will provide a more realistic behavioral basis for future modeling and analysis of priced MLs.
2. What is the impact on other disciplines?	The findings of the project regarding managed lane users' risk-taking behaviors may have an impact on behavioral sciences.
3. What is the impact on the development of transportation workforce development?	So far, this project has been supporting one thesis-based master student at ASU. Additionally, two undergraduate students were involved in this research project as part of their Honor's research. This project has provided an enhanced education experience and exposure to transportation for all three students. All three students involved are female, supporting the diversity goal of the center. The students have obtained skills in transportation survey development, programming, research protocol development, and technical writing. The pre-survey has been deployed through ASU's School of Sustainable Engineering and The Built Environment email list, exposing faculty, staff, and students who are not in the field of transportation engineering.

4. What is the impact on physical, institutional, and information resources at the university or other partner institutions?	None.
5. What is the impact on technology transfer?	None.
6. What is the impact on society beyond science and technology?	The activities performed in this research include a pre-survey deployed through ASU's School of Sustainable Engineering and The Built Environment email list. The preserve has likely exposed faculty, staff, and students who are not in the field of transportation engineering to freeway congestion problems, and has likely brought to their attention managed lane facilities as a solution. The information and hypothetic scenarios provided in the pre-survey are likely to raise their awareness of the connection between individual behaviors and the congestion problems, and may affect their future decision-making behaviors when it comes to traveling.
7. Additional impacts	None

Part VI – 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:	
Reporting Period	**4/1/2014 – 9/15/2014**
1. Changes in approach and reasons for change	Nothing to report.
2. Actual or anticipated problems or delays and actions or plans to resolve them	The survey development and pretesting took longer than expected. At the time of the report, the full survey finalized and is ready to deploy.
3. Changes that have a significant impact on expenditures	Nothing to report.
4. Significant changes in use or care of human subjects, vertebrate animals, and/or biohazards	No significant changes or problems encountered. ASU IRB approval acquired on 6/13/2014 (ASU IRB Study 00001132).
5. Change of primary performance site location from that originally proposed	Nothing to report.