Research Section
555 13th Street NE
Salem, OR 97301

ph: (503) 986-2700
fax: (503) 986-2844

OREGON DEPARTMENT OF TRANSPORTATION

SPR Quarterly Progress Report

October 1, 2016 through December 31st, 2016

Date December 28, 2016

TO: Technical Advisory Committee Members:
Craig Black, Craig.B.Black@odot.state.or.us
Scott Cramer, Scott.B.Cramer@odot.state.or.us
Julie Infante, Julie.K.Infante@odot.state.or.us
Katryn (Katie) Johnson, Katryn.L.Johnson@odot.state.or.us
Bikram Raghubansh, BikramRag@co.Clackamas.or.us
Zahidul Siddique, Zahidul.Q.Siddique@odot.state.or.us

Friends of the TAC:
John Fasana, John_Fasana@co.Washington.or.us
Tiffany Slauter, Tiffany.Slauter@odot.state.or.us

1. Project

Title: Improved Safety and Efficiency of Protected/Permitted Right Turns in Oregon
SPR # 789

2. Project Investigator

David S. Hurwitz, Ph.D.
Associate Professor
Oregon State University
School of Civil and Construction Engineering
Corvallis, OR 97331-2106
Office phone: 541-737-9242
David.Hurwitz@oregonstate.edu

Co-PI Chris Monsere, Ph.D., P.E.
Associate Professor
Portland State University
Department of Civil and Environmental Engineering
Portland, OR 97221
Office phone: 503-725-9746
monsere@pdx.edu

3. Project Coordinator

Name: Mark Joerger, Research Coordinator
Phone: (503) 986-3464
E-mail: Mark.D.Joerger@odot.state.or.us

4. Key Dates

Project start date: 9/8/2015
Project completion date: 2/28/2018

5. Project Status

Task #1: Complete a Brief Literature and Crash Data Review

Percent completed reported in last quarterly report: 100%
Percent completed after this quarter: 100%

Key Progress-To-Date
- Draft Interim Report #1 submitted to TAC for review.
- TAC meeting #1 was held.
- TAC feedback was incorporated into Final Interim Report #1.
- Interim Report #1 was approved and Task #1 was closed.

Specific Progress This Quarter
- None.

Work Planned for Next Quarter
- None. Task is closed.

Task #2: Develop a Sampling and Subject Recruiting Plan

Percent completed reported in last quarterly report: 100%
Percent completed after this quarter: 100%

Key Progress-To-Date
- Drafted Protocol, Informed Consent, Demographic Survey, and Advertising Materials.
- Submitted draft documents for IRB Review.
- Pre-approval review comments addressed in an in-person meeting.
- OSU IRB approval was granted and Task #2 was closed.

Specific Progress This Quarter
- None.

Work Planned for Next Quarter
- None. Task is closed.

Task #3: Develop, Pilot, Conduct and Analyze Survey of Driver Comprehension

Percent completed reported in last quarterly report: 100%
Percent completed after this quarter: 100%

Key Progress-To-Date
- Designed and coded online survey in Qualtrics.
- Beta tested survey on PSU and OSU graduate students.
- Submitted survey for TAC review.
- Prepared and submitted IRB documentation at PSU and Approval was granted.
- Designed and ordered postcards, purchased mailing list of addresses.
- Update survey based on beta responses and TAC input.
- Mailed survey postcards.
- 414 survey responses have been received and the survey has been closed.
- Findings of the survey were documented in Interim Report #2.
- Interim Report #2 was drafted, presented to and approved by the TAC.

Specific Progress This Quarter
- None

Work Planned for Next Quarter
- None. Task is closed.

Task #4: Conduct Software in the Loop Simulation

Percent completed reported in last quarterly report: 90%
Percent completed after this quarter: 95%

Key Progress-To-Date
- Collected Phasing and Timing Plans for 2 FYA PPRT locations in OR (Corvallis and Washington County).
- Collected volume data for 2 FYA PPRT locations.
- Designed a VISSIM software in the loop (SITL) model of 1 location in OR, and performed a sensitivity analysis on several independent variables.
- Findings of the SITL model were documented in Interim Report #2.
- Interim Report #2 was drafted, presented to and approved by the TAC.

Specific Progress This Quarter
- For the final report and testing of results from the driving simulator, built an existing conditions model for a second location in Corvallis, OR.

Problems

- Significant difficulty getting the different software applications to work together. Many calls to customer service /IT support for Econolite and VISSIM. Issues have been resolved.

Work Planned for Next Quarter

- Run a sensitivity analysis on the second intersection model and add the findings to the simulation chapter in the final report.

Task #5: Experimental Design and Coding of Simulation Test Environment

Percent completed reported in last quarterly report: 50%
Percent completed after this quarter: 60%

Key Progress-To-Date

- Development of an improved calibration drive for the simulator experiment
- The demographic and follow-up survey for driving simulator participants was developed, coded, and tested in Qualtrics.
- Hard copies of the IRB paperwork (informed consent documents, receipts, etc.) have been prepared for 50 subjects. IRB paperwork has been updated to account for revisions to the demographics survey and approval has been received.
- The driving simulator experimental design was developed and documented in Interim Report #2.
- Interim Report #2 was drafted, presented to and approved by the TAC. Based on feedback received during the TAC meeting, several variables and variable levels were adjusted to improve the applicability of the results to future ODOT signal timing practices.

Specific Progress This Quarter

- IRB paperwork has been updated to account for revisions to the demographics survey and approval has been received.
- Draft scene tiles for incorporation in the driving simulator have been created and rendered.

Problems

- As part of a facility remodel, the OSU Driving Simulator is being moved on the campus. Construction delays have impacted the ability of the research team to run subjects (originally scheduled to start 10/1/16). This issue has been discussed with ODOT Research and a no-cost extension has been approved for the project.

Work Planned for Next Quarter

- Work with construction vendor to complete the construction of the 2,000 sq-ft laboratory.
- Work with simulator vendor to move, install, and calibrate the new simulator equipment.
- Finish all scene rendering and develop active coding for experimental variables with new hardware and software.
- Prepare complete simulator driving experiments and beta-test experimental and lab protocols.

Task #6: Conduct Subject Testing in Simulator

Percent completed reported in last quarterly report: 0% (Revised scheduled start 5/1/17)
Percent completed after this quarter: 0%

Key Progress-To-Date
- None.

Specific Progress This Quarter
- None.

Problems
- The delay in the construction and move of the driving simulator laboratory have delayed the start of subject testing in the simulator.

Work Planned for Next Quarter
- Begin recruiting and scheduling subjects.

Task #7: Data Analysis

Percent completed reported in last quarterly report: 0% (Revised scheduled start 9/1/17)
Percent completed after this quarter: 0%

Key Progress-To-Date
- None.

Specific Progress This Quarter
- None.

Problems
- None.

Work Planned for Next Quarter
- None.

Task #8: Prepare and Submit Draft and Final Reports

Percent completed reported in last quarterly report: 0% (Revised scheduled start 9/01/17)

Percent completed after this quarter: 0%

Key Progress-To-Date
- None.

Specific Progress This Quarter
- None.

Problems

- None.

Work Planned for Next Quarter

- None.

6. **Project Coordinator's Comments** (Completed by ODOT)

The project is approaching a 'dead' schedule period due to construction delay at the new simulator facility at OSU. Work order extensions are out for signature. No other issues with the project are known at this time.

7. **Finances** (Completed by ODOT)

VENDOR	FY'16	FY'17	FY'18	FY'19	TOTALS
ORIGINAL BUDGET					$ -
WORK PLAN BUDGET	$ 70,000	$ 90,000	$ -	$ -	$ 160,000
REVISED BUDGET	**$ 70,000**	**$ 80,000**	**$ 10,000**	**$ -**	**$ 160,000**
EXPENDITURES - VENDOR	$ 44,376	$ 16,003	$ -	$ -	$ 60,379
BALANCE	$ 25,624	$ 63,997	$ 10,000	$ -	$ 99,621
ODOT	FY'16	FY'17	FY'18	FY'19	TOTALS
ORIGINAL BUDGET	$ 52,500	$ 87,500	$ 35,000		$ 175,000
REVISED BUDGET	**$ 10,000**	**$ 10,000**	**$ 6,000**		**$ 26,000**
EXPENDITURES - ODOT	$ 7,559	$ 2,771	$ -	$ -	$ 10,330
BALANCE	$ 2,441	$ 7,229	$ 6,000	$ -	$ 15,670
PROJECT	FY'16	FY'17	FY'18	FY'19	TOTALS
ORIGINAL BUDGET	$ 122,500	$ 90,000	$ 6,000	$ -	$ 218,500
REVISED BUDGET	**$ 80,000**	**$ 90,000**	**$ 16,000**	**$ -**	**$ 186,000**
EXPENDITURES - PROJECT	$ 51,935	$ 18,774	$ -	$ -	$ 70,709
BALANCE	$ 28,065	$ 71,226	$ 16,000	$ -	$ 115,291