



**OREGON DEPARTMENT OF TRANSPORTATION**

Research Unit  
200 Hawthorne, Ste., B-240  
Salem, OR 97301

**SPR Quarterly Progress Report**

October 1, 2008 through December 31, 2008  
(2<sup>nd</sup> quarter ODOT FY 2009)

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

Date: February 2, 2009

**TO:** Technical Advisory Committee Members:

Scott McCanna, Traffic Control Plans Engineer  
Sunday Alberding, Region 3 Safety Manager  
Don Morris, Traffic Control Plans Designer  
Anne Holder, Roadway Safety Program Manager, Transportation Safety Division  
Keith Scoggins, Senior Roadway Engineer, Oregon Bridge Delivery Partners  
Nick Fortey, Federal Highway Administration  
Ted Paselk, Project Manager, ODOT Region 3  
Jon Lazarus, ODOT Research Unit

FROM: Jon Lazarus, Research Coordinator, (503) 986-2852

**1. Project**

Work Zone Design and Operations Enhancements  
SPR # 669

**2. Key Dates**

Start Date for ODOT: November 2007  
Completion Date for ODOT: June 2009

**3. Principal Investigator**

John Gambatese, Ph.D., Associate Professor (PI)  
School of Civil and Construction Engineering  
Oregon State University  
220 Owen Hall  
Corvallis, OR 97331  
Phone: (541) 737-8913  
Email: john.gambatese@oregonstate.edu

**4. Progress**

- Task 1: Project Initiation
  - This task has been completed. The first interim report submitted to the TAC describes the results of this task.
- Task 2: Literature Review

- This task has been completed. The results of this task are described in the first interim report submitted to the TAC.
- Publications and article databases are periodically being monitored during the course of the study to collect newly published literature on the topic. Any new literature found is being incorporated into the research and will be included in the final report where applicable.
- Task 3: Survey ODOT Personnel and Consultants
  - This task is complete. The survey has been closed and the data from the survey responses (50 responses) is being analyzed. The results of the survey will be referenced when working on Tasks 6 and 7 (data analysis and development of guidelines for implementation).
- Task 4: Develop Sample of Study Projects
  - This task is complete. A total of 39 ODOT projects were identified as case study projects for the research. The list includes both OBDP and non-OBDP projects, and projects of different size, location, type, etc.
- Task 5: Collect Project Data
  - This task is currently on-going. A table is provided at the end of this report that shows a summary of the case study projects and data collected to date.
  - For each study project, contact information of those involved in the project (designer, reviewer, inspector, contractor, ODOT PM/APM) is being collected. To date, contact information has been located for 63% of all of the contacts on the case study projects. Surveys are being sent out to the project personnel on each case study project to gather information about the nature of the work zone on the project. To date, 22% of all of the possible surveys have been filled out and returned.
  - Data on crashes that occurred during each project is being collected. Crash data obtained so far comes from the ODOT crash database. Efforts are underway to collect crash data from the TripCheck database as well to cross-reference the crashes from the crash database.
  - Traffic control plans (TCPs) for each project have been collected and are being reviewed. The nature and characteristics of the TCPs and work zones are being recorded for use in the analysis of crashes.
  - Work zone tour scores have been received from ODOT and will be used in the case study project analysis.
  - Inspection reports from several of the projects have been collected. Reports from the other case study projects will be collected and reviewed to determine if any information is available related to the design of the work zones.
- Task 6: Analyze Data
  - As project data is being collected, the data is being reviewed. In depth analyses will be conducted once the data collection task is further along. The data will be analyzed to determine: the TCP features (both design and implementation) that were contributing factors to work zone crashes; potential revisions to the TCP design and review process to improve safety; and the impacts of ODOT's TCP design practices on the quality and consistency of TCPs with respect to design standard compliance, staging methods, device usage, and drafting similarities.

## 5. **Problems**

Potential issues related to successful completion of the project are as follows:

- We have not been able to locate contact information for all of the identified project personnel. Collection of contact information for some of the projects has been difficult. As a result, the distribution and receipt of survey responses is taking a little longer than initially planned, although it is not expected at this point to impact the completion of the overall study. Additional assistance by the TAC and/or ODOT to gather contact information is needed.
- While the data available in the TripCheck database is up-to-date within approximately 6-10 days, the data available in the crash database lags the project timeline by approximately 6-8 months. As a result, for on-going projects and for some recently completed projects, we will not be able to get all of the crash data for all of the projects from the crash database. Other efforts, including using the TripCheck data, may be needed to “fill in” the gaps in crash data. If it is desired to have the crash data from the crash database for all of the projects, extending the study timeline would be needed. Further discussion about the availability of the crash data, and guidance from the TAC, is needed at the upcoming TAC meeting.

## 6. **Work Planned for Next Quarter**

- Task 3: Survey ODOT Personnel and Consultants
  - Finalize the analysis of the survey responses.
- Task 5: Collect Project Data
  - Continue to locate contact information and send out surveys.
  - Gather additional crash data from the crash database and TripCheck database.
  - Finish TCP and inspection report reviews.
  - Visit the sites of the currently on-going case study projects to interview construction workers about the hazards they experience on the sites. This will provide an assessment of the hazards experienced by the workers on the on-going projects. This data will augment the crash data in the analysis to assess the quality of the TCP design and implementation.
- Task 6: Analyze Data
  - Analyze the TCP documentation and work zone data.
  - Determine if sufficient project data has been gathered or whether additional time should be spent to wait until the on-going projects are more complete, and/or obtain missing project contact information and collect additional data.
  - Write interim report for TAC meeting.
  - Participate in TAC meeting, currently planned for March 20, 2009.
- Task 7: Develop Guidelines for Implementation
  - Prepare draft of guidelines for implementation of the study results.

## 7. **Finances**

SPR Project Summary

<b>VENDOR</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 50,000	\$ 81,716	\$ -		\$ 131,716
<b>REVISED BUDGET</b>	\$ 15,770	\$ 115,946	\$ -		\$ 131,716
EXPENDITURES - VENDOR	\$ 15,770	\$ 45,961	\$ -	\$ -	\$ 61,731
<b>BALANCE</b>	\$ -	\$ 69,985	\$ -	\$ -	\$ 69,985
<b>ODOT</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 2,500	\$ 5,000	\$ 2,000		\$ 9,500
<b>REVISED BUDGET</b>	\$ 5,234	\$ 13,500	\$ 2,000		\$ 20,734
EXPENDITURES - ODOT	\$ 5,234	\$ 13,157	\$ -	\$ -	\$ 18,391
<b>BALANCE</b>	\$ -	\$ 343	\$ 2,000	\$ -	\$ 2,343
<b>PROJECT</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 52,500	\$ 86,716	\$ 2,000	\$ -	\$ 141,216
<b>REVISED BUDGET</b>	\$ 21,004	\$ 129,446	\$ 2,000	\$ -	\$ 152,450
EXPENDITURES - PROJECT	\$ 21,004	\$ 59,118	\$ -		\$ 80,122
<b>BALANCE</b>	\$ -	\$ 70,328	\$ 2,000	\$ -	\$ 72,328

Work Zone Case Study Update - 1.30.09

			Surveys		Crash Data				TCP	Work Zone Scores	Inspection Reports
Project Number	RTE Number	Project Name	Sent ( 10)	Responses	Crashes/Month	Crashes/Month (previous year)	% Complete	Expected Completion Date	TCP's	Work Zone Tour Score	Inspection Reports
1	I-205	Willamette River Bridge – Pacific Hwy. (Unit 3) Sec.	8	4	12.1	10.8	100%	4/1/2008	yes - H	7.3/7.8	tcs reports
2	I-5	Marquam Bridge – Capitol Hwy. Sec.	4	1	24.4	19.8	100%	2/28/2005	yes -E	N/A	
3	OR-219	Hillsboro-Silverton Hwy. at Farmington Road	7	3	1.1	1.1	100%	12/31/2007	yes - E	N/A	
4	US-26	Langensand Rd. – Cherryville Dr. Sec.	7	3	0.8	3.0	100%	10/19/2007	ask pm	8.5	
5	I-5	Sodom Ditch-Calapooia (Bundle 216 (08233 and 08235))	8	4	0.5	0.2	68%	9/30/2009	yes - H	N/A	
6	OR-18	Fort Hill – Wallace Bridge	9	3	0.0	1.6	45%	1/1/2010	yes - H	7.4	
7	OR-18	Oregon Coast HWY – Oldsville Road (megapave)	7	1	10.8	9.4	100%	10/31/2007	yes - E	7.1/6.8	
8	OR-213	Lone Pine Corner – Hwy. 214	4	1	need cons. dates	need cons. dates			yes - H	N/A	
9	OR-219	Springbrook Road - Wyooski Road (Newberg )	7	2	no data available	no data available	100%	10/29/2008	yes - H	N/A	
10	OR-22	Sublimity Interchange	7	3	no data available	no data available	43%	1/1/2010	yes -E	7.8	
11	US-101	Jetty Creek Fish Passage	6	1	no data available	no data available	100%	11/29/2008	yes -E	7.8	

12	US-101	Latimer Road	6	2	no data available	no data available	100%	11/30/2008	yes - E	8	
13	US-101	Meda Loop Road - Redburg Road	5	2	no data available	no data available	46%	9/26/2009	yes - H	7.3	
14	US-101	New Youngs Bay Bridge	8	1	1.6	0.6	86%	4/28/2009	yes - E	8.4	
15	US-101	Newport Signal Upgrades	9	3	need cons. dates	need cons. dates			yes - E	N/A	
16	US-101	Otis Junction – Boiler Bay Sec.	7	1	10.1	9.6	100%	11/1/2006	yes - E	7.6	
17	US-30	John Day River Bridge	7	3	0.0	0.0	100%	11/15/2008	yes - H	N/A	
18	I-5	Azalea – Glendale Reconstruction	5	2	0.3	0.2	100%	9/30/2007	yes - E	8.3	daily reports
19	I-5	Louse Creek US 199 (Bundle 304(08018))	8	4	3.2	1.6	39%	7/1/2010	yes - E	7.8	
20	I-5	S. Wolf Creek (Bundle 303-Bridge 08333)	5	3	need cons. dates	need cons. dates			yes - H	8.1	
21	I-5	Seven Oaks Interchange (Bundle A06)	3	0	need cons. dates	need cons. dates			yes - H	8.2	
22	I-5	South Medford Interchange	4	0	0.7	0.8	64%	7/29/2010	yes - E	6.9	
23	OR-42	Lookingglass Creek - Glenhart	4	2	0.9	1.0	100%	10/31/2006	yes - E	7	daily reports
24	OR-62	Corridor Solutions - Medford	4	1	need cons. dates	need cons. dates			yes - E	7.9	
25	OR-58	US 97 Overcrossing (Bundle 221 (07984))	6	1	need cons. dates	need cons. dates			yes - E	7.3	
26	US-126	MP 97 – Rimrock Way	3	1	no data available	no data available	100%	10/23/2008	yes - E	7.6	
27	US-97	Re-route Phase 1, Unit 2	7	2	7.5	7.3	100%	1/31/2009	yes - E	N/A	
28	US-97	Re-route Phase 1, Unit 3	6	3	no data available	no data available	73%	4/30/2009	yes - E	8.1	
29	I-84	Burnt R. (Dixie Cr)-Lime Interchange (Bundle 203,	7	6	0.7	0.0	48%	1/1/2010	yes - E	7.9	

		01786)									
30	I-84	Cabbage Hill Chain-up – Meacham	6	0	0.2	0.0	100%	9/30/2007	yes - E	7.4	
31	I-84 connection	Grande Ronde R./UPRR U'Xing Upper Perry Arch	6	1	0.0	0.0	61%	8/30/2009	yes - H	7.6	
32	I-84 & OR207	MP214 Mission and OR-207: MP26.5 Madison VMS	7	2	need cons. dates	need cons. dates			yes - H	N/A	
33	I-84	North Ontario Interchange	4	1	5.1	4.4	100%	10/31/2008	yes - E	N/A	
34	I-84	Pendleton - North Powder (Bundle 205, 07292)	10	5	2.5	3.2	65%	10/31/2009	yes -E	N/A	
35	I-84	Pleasant Valley - Durbin Creek	8	5	no data available	no data available	0%	11/30/2010	yes -E	6.8	
36	I-84	Pleasant Valley Interchange Bridges Section	9	1	0.4	0.2	100%	10/31/2006	yes - E	8.5	
37	I-84	Stanton Blvd - Snake River (Bundle 202, 08397)	6	3	need cons. dates	need cons. dates	0%		yes -E	8.3	
38	OR-244	Irrigon Jct - Hilgard Interchange (Bundle 206, 08502)	8	4	0.0	0.0	100%	12/31/2008	yes - H	N/A	
39	US-20	Riley Jct. - Warm Springs Rd/US 395 Chip seal	5	1	2.5	2.5	100%	10/31/2008	yes	N/A	

<b>Total Number</b>	247	86
<b>Percent of Total</b>	63%	22%

23
59%

38	26	3
97%	67%	8%