

**Bureau  
of  
Materials and Physical  
Research**

**Quarterly  
Management Report  
on  
Research Progress**

**Quarter Ending March 31, 2009**

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## ILLINOIS CENTER FOR TRANSPORTATION

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# **SPECIAL STUDIES**



Project Title: Superpave Bituminous Mixture IL - 4.75		Today's Date: 3/31/2009					
		Function Code: R06					
		Project Number:					
QPR Author Name: David J. Lass		Estimated Dates		Fiscal Year: 2009			
Telephone: (217) 785 - 4888	% Project Completed: 70%			JUL	OCT	JAN	APR
Task Title		Start	Complete	SEP	DEC	MAR	JUN
Task 1: Preliminary Distress Surveys at Project Locations		5/2003	8/2003		C	C	
Task 2: Field Testing and Construction Observation		/	/		C	C	
Task 3: Construction Data Compilation		/	/		C	C	
Task 4: Yearly Distress Surveys at Project Locations - 5 Yr.		/	/		C	C	
Task 5: Long Term Performance Data Analysis		/	/		I	I	
Task 6: Final Report and Recommendations		/	/		I	I	
Task 7:		/	/				
Task 8:		/	/				
Task 9:		/	/				
Task 10:		/	/				
Principal Investigator Name/Contact: David Lass Telephone: (217) 785-4888 e-mail: David.Lass@illinois.gov		P.I. Organization Name/Address: IDOT BMPR 126 E. Ash Street Springfield, Illinois 62704		Co-Investigator Name/Contact:			
Description of Research: Evaluate the costs, constructibility and performance of SUPERPAVE Bituminous Concrete Mixture IL - 4.75 (IL - 4.75). The results of this evaluation will be used to determine if IL - 4.75 is suitable for widespread application as a level binder on non-interstate highways. The findings may be used to suggest revisions to the IL - 4.75 contract special provision, or to suggest further research, if needed.				Keywords: SUPERPAVE, Sand Mix, IL-4.75, 4.75 mm NMAS, permeability, compaction, reflective cracking, overlay, blisters			
Technical Review Panel Names	TRP Telephone	TRP E-mail Address		Meeting Dates	Minutes Available?		
	( ) -			/ /			
	( ) -			/ /			
	( ) -			/ /			
	( ) -			/ /			
	( ) -			/ /			
	( ) -			/ /			
	( ) -			/ /			
	( ) -			/ /			
Short Title & Date Reports Available:		End User(s) and Result(s) Expected:					

## QUARTERLY PROGRESS REPORT (CONTINUED)

Project Title: Superpave Bituminous Mixture IL - 4.75	Today's Date: 12/30/2008 Project Number: R 06
<p>Progress to Date (Limit narrative to what fits on this page):</p> <p>Detailed preliminary surveys of existing pavement distresses at the four (4) test locations were conducted to determine the location, severity and probable causes of existing pavement distresses prior to overlay.</p> <p>Data Collection Vehicles (DCVs) were dispatched to the test locations prior to construction for further assessment of preliminary pavement condition, including rutting and pavement smoothness. Follow-up surveys by the DCVs are to occur every year of the five (5) year study period, if funding permits; otherwise, DCV data collected every two (2) years for Condition Rating Surveys will be utilized.</p> <p>Bid Tabulations were compiled for calculation of the initial construction costs.</p> <p>Construction observation and field testing were completed at the test locations, with data collected regarding in-situ density and permeability, laboratory density, bituminous mix design, and aggregate gradation of the experimental and control level binders.</p> <p>Frictional properties of the IL - 4.75 level binder were gathered at two (2) of the test locations for consideration of IL - 4.75 as a surface mix at a future date.</p> <p>The process of compiling the pre-construction and construction field test data is complete.</p> <p>The fourth of five annual distress surveys are complete.</p> <p>The fourth of five annual DCV "follow-up" surveys at each location are complete.</p> <p>The principal investigator of this project, Aaron Toliver, will be leaving IDOT as of February 15, 2008. One more year of distress surveys at the four locations and the final report compilation remain to be completed by a whomever is designated to replace Mr. Toliver as principal investigator.</p> <p>March 2008 David Lass was recently appointed the principle investigator. There is no activity to report this quarter. A final field evaluation will be performed this year.</p> <p>June 30<sup>th</sup> 2008 There is no activity to report this quarter. A final field evaluation will be performed September 2008.</p> <p>September 30<sup>th</sup> 2008 There is no activity to report this quarter. A final field evaluation will be performed November 2008.</p> <p>December 30<sup>th</sup>, 2008 November 2008 a Distress survey was conducted by David Lass. IL130, IL17, IL117, IL76; Overall severity levels of the 2007 survey compared to 2008 distresses have not changed much. However, there is more new longitudinal (center of lane) cracking in the 4.75 sections. It is evident that distresses in the 4.75 sections are becoming equal to the control sections. Overall the study data is inconclusive at this date. After discussions with LaDonna Rowden it was recommend to extend this study for three additional years.</p> <p>March 31, 2009 There is no activity to report this quarter</p>	



Project Title: Hot Mix Asphalt Longitudinal Joint Sealants		Today's Date: 3/31/2009					
		Function Code: R 07					
		Project Number: R 06					
QPR Author Name: David J. Lass		Estimated Dates		Fiscal Year: 2009			
Telephone: (217) 785 - 4888	% Project Completed: 65%			JUL	OCT	JAN	APR
Task Title		Start	Complete	SEP	DEC	MAR	JUN
Task 1: Literature Search of Product Use and Experience		5/2003	6/2004		C	C	
Task 2: Project Construction		8/2003	10/2003		C	C	
Task 3: Construction Report		1/2004	6/2004		C	C	
Task 4: Project Evaluations		10/2003	10/2008		C	C	
Task 5: Final Report		10/2008	6/2009		I	I	
Task 6:		/	/				
Task 7:		/	/				
Task 8:		/	/				
Task 9:		/	/				
Task 10:		/	/				
Principal Investigator Name/Contact: David Lass Telephone: (217) 785-4888 e-mail: David.Lass@illinois.gov		P.I. Organization Name/Address: IDOT BMRP 126 E. Ash Street Springfield, Illinois 62704		Co-Investigator Name/Contact:			
Description of Research: The goal of this research is to evaluate the performance of two longitudinal joint sealants for hot mix asphalt pavements. The two products under evaluation are "J-Band" from Heritage Research Group and "Quik-Seam" from Hendy Products, Inc.. Documentation of the construction procedures and performance measures including density at the joint and permeability will be evaluated. Annual performance checks will be used to monitor the performance of the two materials.				Keywords: Hot Mix Asphalt, Longitudinal Joints, Sealants, J-Band, Quik-Seam, Density, Permeability			
Technical Review Panel Names		TRP Telephone	TRP E-mail Address		Meeting Dates	Minutes Available?	
David Lippert		(217) 782 - 6732			/ /		
Jim Trepanier		(217) 782 - 9607			/ /		
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		( ) -			/ /		
		( ) -			/ /		
		( ) -			/ /		
		( ) -			/ /		
		( ) -			/ /		
		( ) -			/ /		
Short Title & Date Reports Available:			End User(s) and Result(s) Expected:				

## QUARTERLY PROGRESS REPORT (CONTINUED)

Project Title: Hot Mix Asphalt Longitudinal Joint Sealants	Today's Date: 12/30/2008
	Project Number: R 06
Progress to Date (Limit narrative to what fits on this page):	
<p>2005 4th Quarter A field evaluation was completed for the experimental project on Interstate 70. No joint distress was found.</p> <p>2006 1st Quarter No activity to report.</p> <p>2006 2nd Quarter No activity to report.</p> <p>2006 3rd Quarter No activity to report.</p> <p>2006 4th Quarter No activity to report.</p> <p>2007 1st Quarter Field evaluations were not conducted in 2006. Aaron Toliver became the principle investigator in early 2007, after the resignation of Tom Winkelman. Field evaluations will be undertaken during the fall of 2007.</p> <p>2007 2nd Quarter No activity to report. The "Interim" Report scheduled for 2007 was decided to be eliminated due to the change in principle investigators from Tom Winkelman to Aaron Toliver. Time is required to become familiar with the project. The "Final" Report will remain on schedule for June 2009. Field evaluations will be undertaken during the fall of 2007.</p> <p>2007 3rd Quarter Field evaluations will resume in October 2007.</p> <p>2007 4th Quarter Field evaluations were conducted in October 2007, no significant difference was observed between the treated and untreated sections.</p> <p>The principal investigator of this project, Aaron Toliver, will be leaving IDOT as of February 15, 2008. One more year of field evaluations and the final report compilation remain to be completed by a whomever is designated to replace Mr. Toliver as principal investigator.</p> <p>March 2008 David Lass was recently appointed the principle investigator. There is no activity to report this quarter. A final field evaluation will be performed this year. The final report remains on schedule for June 2009.</p> <p>June 30, 2008 There is no activity to report this quarter. A final field evaluation will be performed this year. The final report remains on schedule for June 2009.</p> <p>September 30, 2008 There is no activity to report this quarter. A final field evaluation will be performed this year. The final report remains on schedule for June 2009.</p> <p>December 30<sup>th</sup>, 2008 November 2008 a Distress survey was conducted by David Lass. IL-26; Both J-Band and the Control sections show extreme weathering and Longitudinal cracking along the center line. Quick Seam has only a small amount of Longitudinal cracking along the centerline in the beginning of the run. I-57, I-70, IL-50; No significant differences between the J-Band and Control sections. After discussions with LaDonna Rowden it was recommend to extendthis study for three additional years.</p> <p>March 31, 2009 There is no activity to report this quarter</p>	

**ILLINOIS CENTER  
FOR TRANSPORTATION**

<b>Project Title:</b> Characterization of IL Aggregates for Subgrade Replacement and Subbase		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-1					
<b>QPR Author Name:</b> Prof. Erol Tutumluer		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-8637	<b>% Project Completed:</b> 95			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Characteristics of Illinois Aggregates Used for Subgrade Replacement and Subbase		1/1/2006	6/30/2006	C	-	-	-
<b>Task 2:</b> Development of Laboratory Aggregate Test Matrix		3/1/2006	9/30/2006	C	-	-	-
<b>Task 3:</b> ERI Atterberg Limits, Moisture-Density, IBV, and Shear Strength Tests		9/1/2006	6/30/2008	C	-	-	-
<b>Task 4:</b> UIUC Aggregate Shape, Permanent Deformation, and Directional Modulus Laboratory Tests		7/1/2008	3/31/2009	I	I	C	-
<b>Task 5:</b> Field Test Study and Evaluation of Field Performances -- Deferred until Phase 2				-	-	-	-
<b>Task 6:</b> Establishing Thickness Correlations with Aggregate Properties		1/1/2009	3/31/2009	-	-	C	-
<b>Task 7:</b> Final Report and Implementation		1/1/2009	6/30/2009	-	-	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Erol Tutumluer				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-8637				Univ of Illinois			
<b>Email:</b> tutumlue@illinois.edu				205 N. Mathews Ave. Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Dr. Abbas Butt				<b>Organization / Address</b>			
<b>Telephone:</b> 217-356-5945				Engineering & Research Int'l, Inc.			
<b>Email:</b> eri@erikuab.com							
<b>Description of Research:</b>							
<p>(i) Develop an experimental test matrix by carefully designing size or gradation, shape, angularity, PI, and fines content property ranges of aggregates selected for evaluation in the project;</p> <p>(ii) Determine in the laboratory strength (IBV, friction angle etc.), and directional modulus properties of aggregate samples from the established test matrix;</p> <p>(iii) Determine relationships between aggregate properties and strength(IBV)/stiffness properties;</p> <p>(iv) Determine the sensitivity of aggregate strength(IBV)/stiffness to changes in moisture content;</p> <p>(v) Conduct field experiments and evaluate performances of the test sections constructed with the same aggregate materials studied in the laboratory; and finally,</p> <p>(vi) Develop aggregate thickness correlations with aggregate properties to modify and improve the thickness requirement curve in Figure A-2 of the Subgrade Stability Manual based on laboratory and field performances.</p>							
<b>Keywords:</b> Aggregate type and quality, pavement working platform, subgrade stability, aggregate cover thickness requirement							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Riyad Wahab (Chair)		217-782-2704		Riyad.Wahab@illinois.gov			
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**Meeting Dates / Minutes Available?**

04/24/2008 / Yes  
11/13/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

With successful completion of all the research tasks, great savings will be realized in IDOT construction projects through proper aggregate selection/utilization according to aggregate properties and their validated field performances. The ultimate benefit will be achieved for making more economical use of the aggregates in the State of Illinois by either reducing treatment thickness or avoiding aggregate failures. IDOT Districts and local agencies would be the primary users of this information. The resulting revisions to the Subgrade Stability Manual and Specifications will reduce the Department's overall expenditure on aggregate in subgrade applications.

**Progress to Date:**

In the first quarter of 2009, the research team completed the remaining 48 aggregate permanent deformation and modulus tests. As a result, all the testing in the project was completed as follows:

- 24 Proctor tests (120 individual compaction tests);
- 120 IBV tests (many more were done to engineer percent fines effects);
- 24 PI tests (more than 40 were conducted in reality to adjust PI of fines);
- 216 Triaxial rapid shear strength samples tested;
- 9 Image analysis aggregate shape tests for form, angularity and texture;
- 72 Triaxial permanent deformation tests; and
- 72 Triaxial directional modulus tests.

After compiling and analyzing all the test results, the research team investigated trends and relationships between aggregate properties and strength (IBV)/stiffness characteristics. The sensitivities of individual aggregate strength (IBV)/stiffness behavior to types and amounts of fines and moisture contents were carefully evaluated to establish the laboratory based trends for establishing aggregate cover thickness corrections factors. Main findings as draft report chapters were submitted to the project TRP members for preliminary evaluation and review.

In the next quarter, the draft report will be submitted to the project TRP members. This draft report will provide an approach to predict aggregate thickness correction factors based on laboratory test results to be verified during field testing phase of this project, which was proposed in a separate problem statement for Phase II funding.

<b>Project Title:</b> Bus-Only Shoulder Riding		<b>Last Edited:</b> 5/19/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-5					
<b>QPR Author Name:</b> Vonu Thakuriah		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (312) 355-0447	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Identify Major Stakeholders		9/1/2007	11/30/2007	C	C	-	-
<b>Task 2:</b> Conduct Structured Interviews		11/1/2007	3/31/2008	C	C	-	-
<b>Task 3:</b> Address Stakeholder Concerns		2/29/2008	8/31/2008	C	C	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Vonu Thakuriah				<b>Organization / Address</b>			
<b>Telephone:</b> (312) 355-0447				UIC			
<b>Email:</b> vonu-pt@uic.edu							
<b>Co-Investigator:</b>							
<b>Name:</b> Paul Metaxatos				<b>Organization / Address</b>			
<b>Telephone:</b> (312) 996-4713				UIC			
<b>Email:</b> pavlos@uic.edu							
<b>Description of Research:</b>							
This study will review the literature on the safety and operational aspects of shoulder use and ways in which shoulder use has been incorporated as a part of congestion management in several regions. The study will conduct a stakeholder analysis of primary stakeholders, who might be involved in the planning and operations of buses riding of shoulder.							
<b>Keywords:</b> bus on shoulders, bus bypass, managed lanes, highway shoulder, stakeholder analysis							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
_____		_____		_____			
Chuck Abraham (Chair)		(312) 793-3510		Charles.Abraham@illinois.gov			
<b>Meeting Dates / Minutes Available?</b>							
_____							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
The purpose of the research is to describe the process by means of which the "first tier" stakeholders in the transportation, transit and law enforcement community, who might be directly involved if BOS operations to be implemented, are familiarized with the BOS concept. These stakeholders will be asked to identify the major areas of concern relating to safety, operations, physical design, cost and operating authority. Approaches to resolving these concerns will be synthesized from the literature; from experts and a primary data collection effort that utilizes a structured face-to-face interview approach of key stakeholders in the region. Finally, the major points that are in need of resolution in order to successfully implement BOS operations will be identified and a planning process that takes into account the major areas of concern will be recommended.							
<b>Progress to Date:</b>							
The UIC research team completed a Draft Final Report that addressed stakeholders concerns and submitted it for review to the the study TRP. ICT received a draft final report in February. Final editing and formatting are being made.							

<b>Project Title:</b> Illinois StreamStats		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-6					
<b>QPR Author Name:</b> David Soong, Ph.D., P.E.		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217 328 9717	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Review National Hydrography Dataset (1:100K Streams)		3/1/2006	6/30/2006	C	C	-	-
<b>Task 2:</b> Review Digital Elevation Model (DEM)		3/1/2006	6/30/2006	C	C	-	-
<b>Task 3:</b> Develop Project Coverage for GIS		3/1/2006	6/30/2006	C	C	-	-
<b>Task 4:</b> Data Preparation (7-Subtasks) for Test Case Basin (Kaskaskia) and Entire State		7/1/2006	12/31/2006	C	C	-	-
<b>Task 5:</b> Populate Streamstats Database with Actual Gage Data for Illinois		1/1/2007	6/30/2008	C	C	-	-
<b>Task 6:</b> Custom Programming from ESRI for Basin Length		7/1/2007	12/31/2007	C	C	-	-
<b>Task 7:</b> Random Testing by Regions of State for Basin Characteristics at Gaged and Ungaged Sites		10/1/2007	6/30/2008	C	C	-	-
<b>Task 8:</b> Analysis of Variance for Flood Frequencies at Gaging Stations		1/1/2008	6/30/2008	C	C	-	-
<b>Task 9:</b> Prepare Report and Documentation		1/1/2008	6/30/2008	C	C	-	-
<b>Task 10:</b> QA/QC; Metadata and Setup ArcIMSW Server		1/1/2007	6/30/2008	C	C	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> David Soong, Ph.D., P.E.				<b>Organization / Address</b>			
<b>Telephone:</b> 217 328 9717				U.S. Geological Survey			
<b>Email:</b> dsoong@usgs.gov				1201 W. University Ave. Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Audrey Ishii				<b>Organization / Address</b>			
<b>Telephone:</b> 217 328 9718				USGS - ILWSC			
<b>Email:</b> alishii@usgs.gov							
<b>Co-Investigator:</b>							
<b>Name:</b> Jennifer Sharpe				<b>Organization / Address</b>			
<b>Telephone:</b> 217 328 9731				USGS - ILWSC			
<b>Email:</b> jbsharpe@usgs.gov							
<b>Description of Research:</b>							
An automated Internet Map Server (IMS) tool, Illinois StreamStats, that makes peak flood discharge computations at gaged and ungaged rural sites consistent, easy to determine, and publicly available to the users in Illinois will be developed and served. Illinois StreamStats will provide a point and click interface to determine watershed delineations and basin characteristics. StreamStats is interfaced with the National Flood Frequency program to return peak flood discharges at various frequencies.							
<b>Keywords:</b> Flood-frequencies, rural watersheds, basin characteristics, StreamStats							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>
02/15/2006 / Yes
07/20/2006 / Yes
02/05/2007 / Yes
04/09/2007 / Yes
10/16/2007 / No
01/14/2008 / Yes
05/28/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The primary end result is a Web-based source of easily accessible, consistent and reliable solutions to the equations and methodology contained within the 2004 USGS report. This could produce cost savings benefits in reduced time and resources required by users statewide, including hydrologic / hydraulic staff and consultants of State (IDOT, IDNR & others) and local agencies that utilize the USGS methodology to size bridge and culvert waterway openings and to prepare / review other water resources studies.

**Progress to Date:**

All 10 tasks have been completed. The draft project report has been peer reviewed and all reviewers' comments received. Revisions and replies to reviewers have been completed and the report has been sent to USGS regional office for final editing and approval.

<b>Project Title:</b> I-39 Kishwaukee Bridge Monitoring			<b>Last Edited:</b> 5/19/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-9					
<b>QPR Author Name:</b> Prof. Ming L. Wang			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (312) 996-8260	<b>% Project Completed:</b> 99				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Ensure that continuous hardware and sensor integrity and calibrations are maintained.			7/1/2006	6/30/2008	C	C	-	-
<b>Task 2:</b> Ensure all the data in the database server are accessible and downloadable for all the authorized users.			7/1/2006	6/30/2008	C	C	-	-
<b>Task 3:</b> Provide information on presence and extent of crack growth and state of shear reinforcement in webs.			7/1/2006	6/30/2008	C	C	-	-
<b>Task 4:</b> Analyze the change of average shear strain and shear stress in webs.			7/1/2006	6/30/2008	C	C	-	-
<b>Task 5:</b> Archive modal frequency data with statistical comparisons to reference datasets from 1999.			7/1/2006	6/30/2008	C	C	-	-
<b>Task 6:</b> Perform annual analysis of temperature effects and correction of data.			7/1/2006	6/30/2008	C	C	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> Prof. Ming L. Wang			<b>Organization / Address</b>					
<b>Telephone:</b> (312) 996-8260			UIC					
<b>Email:</b> MLWang@uic.edu								
<b>Description of Research:</b>								
<b>Keywords:</b>								
<b>Technical Review Panel:</b>								
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>				
Todd Ahrens (Chair)		(217) 782-2125		todd.ahrens@illinois.gov				
<b>Meeting Dates / Minutes Available?</b>								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								
The measurements collected by the ICT will be used to infer possible structural changes and to guide retrofit strategies for compromised components, ensuring the bridge's integrity and stability into the future.								
<b>Progress to Date:</b>								
All tasks have been completed as of the end of July. A draft final report was sent to the Technical Review Panel on July 28, 2008.								
Edits are being made to the draft final report.								

<b>Project Title:</b> Determination of Usable Residual Asphalt Binder in RAP			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-11					
<b>QPR Author Name:</b> Prof. I. Al-Qadi			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-0427	<b>% Project Completed:</b> 100				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review			7/1/2006	10/1/2006	C	-	-	-
<b>Task 2:</b> Development of the Experimental Program			10/1/2006	12/1/2006	C	-	-	-
<b>Task 3:</b> Conduct the Experimental Program			1/1/2007	5/1/2008	C	-	-	-
<b>Task 4:</b> Data Analysis			1/1/2007	6/1/2008	C	-	-	-
<b>Task 5:</b> Prepare Final Report			11/1/2007	8/1/2008	I	C	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> Prof. I. Al-Qadi			<b>Organization / Address</b>					
<b>Telephone:</b> 217-265-0427			University of Illinois					
<b>Email:</b> alqadi@illinois.edu			205 N. Mathews Ave. Urbana, IL 61801					
<b>Co-Investigator:</b>								
<b>Name:</b> Prof. S. Carpenter			<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-4188			University of Illinois					
<b>Email:</b> scarpent@illinois.edu								
<b>Description of Research:</b>								
<p>The current method adopted by IDOT for the design of HMA with RAP provides 100% contribution for the residual asphalt binder from the RAP based on solvent extractions. This means that the amount of virgin asphalt binder is reduced by the full amount of asphalt binder in the RAP for the percentage specified. This has recently been reported to be inaccurate and could result in an erroneous HMA job mix formula and cause dry HMA. Hence, the HMA becomes vulnerable to durability cracking and premature failure. Therefore, it is the objective of this study to determine the appropriate level of the residual asphalt binder in RAP to be considered as part of the design binder content.</p>								
<b>Keywords:</b> HMA, Reclaimed Asphalt Pavement, Residual Binder								
<b>Technical Review Panel:</b>								
<b>Members</b>			<b>Telephone</b>			<b>Email Address</b>		
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Tom Zehr			217-524-7268			thomas.zehr@illinois.gov		
<b>Meeting Dates / Minutes Available?</b>								
7/21/2006 / Yes								

1/29/2007 / Yes

8/15/2007 / Yes

2/4/2008 / Yes

6/12/2008 / Yes

8/25/2008 / No

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The project outcome is a scientifically proven approach to optimize the use of RAP in new pavements.

**Progress to Date:**

Note: Percent project completed on page 1 is based upon revised 26 month project duration.

Task 1: The literature review was published as an ICT report.

Task 3: All extractions, complex modulus, and moisture susceptibility tests are completed. Additional fracture energy tests were also performed to investigate the affect of RAP on the thermal cracking properties of the mixes. All SEM images have been completed.

Task 4: All data has been analyzed.

Task 5: The report was accepted and published.

The project is complete. The report was finalized in December 2008 and posted to the ICT website (Publications Page) in January 2009.

<b>Project Title:</b> Cold In-Place Recycling with Asphalt Products (CIRwAP)		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-12					
<b>QPR Author Name:</b> Prof. Marshall Thompson		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-3930	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Conduct information/data survey		9/1/2006	12/31/2007	C	-	-	-
<b>Task 2:</b> Document and evaluate selected CI & FDR w AP projects (foamed asphalt & engineered emulsions)		9/1/2006	12/31/2007	C	-	-	-
<b>Task 3:</b> Prepare Summary Report and submit recommendations		1/1/2008	8/31/2008	I	I	C	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Marshall Thompson		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-3930		UIUC					
<b>Email:</b> mrthomps@uiuc.edu		Dept. of Civil & Environmental Engineering Urbana, IL 61801					
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Samuel H. Carpenter		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-4188		UIUC					
<b>Email:</b> scarpent@uiuc.edu							
<b>Description of Research:</b>							
Conduct "information/data" survey and summarize Best Demonstrated Available Technology (BDAT) / State of Practice; document/evaluate selected CI&FDRwAP projects, prepare summary report and present recommendations for IDOT implementation.							
<b>Keywords:</b> Cold recycling, asphalt, foamed asphalt, engineered emulsion							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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Richard May		918-524-7114		RMay@semgrouppl.com			
<b>Meeting Dates / Minutes Available?</b>							
07/10/2006 / Yes							
01/29/2007 / Yes							
11/29/2007 / Yes							

**Short Title & Date Reports Available:****End User(s) and Result(s) Expected:**

- \* Prepare a summary of BDAT and Best Practices for CIRwAP.
- \* Submit suggested recommendations for IDOT implementation of CIRwAP technology.

**Progress to Date:**

- \* The projects on the "Follow-Up-Project " list established at the January TRP meeting have been evaluated. General "condition surveys" and rut depth measurements were conducted. The projects were: Sangamon Co., Tazewell Co., Livingston Co., Champaign Co., Christian Co., Stephenson Co., and Carroll Co.
- \* Excessive rutting has been noted on the CH-1 project in Christian County. Project staff have cooperated with Cummings Engineering, Cliff Frye - Christian Co Highway Engineer, and SEM materials staff concerning the issue.
- \* IDOT has conducted FWD testing on all of FDR projects on the "Follow-Up-Project List." The U of I has received and analyzed the data for all of the projects.
- \* Pertinent publications and information continue to be collected and reviewed for inclusion in the Best Demonstrated Available Technology (BDAT) summary. Additional publications and information will continue to be collected and summarized. The BDAT Summary has been initiated. Computer files summarizing the efforts to date were submitted to the TRP Chair for distribution. Additional publications/ reports were obtained from the 2008 TRB CD. They are under review and will be included in the BDAT summary. Note in the progress data that Task 1 is continuing.
- \* The TRP met in Springfield on November 29, 2007. Project staff presented a summary of activities to date. Project staff emphasized that modulus and fatigue properties are not well defined and available data are inconsistent. Additional focus will be directed to these topics.
- \* It was emphasized that the comprehensive emulsion/ foamed project currently in progress in South Africa will provide essential/ very helpful data and information that will contribute to the successful completion of this project. The South African study will not be completed and available within the time frame of R27-12. The TRP endorsed the option of submitting a new ICT Proposal to facilitate the completion of the study. Project Staff submitted the ICT Proposal in early 2008.
- \* The Project PI has been in recent contact with the South African researchers (SABITA/SANRAL). Some preliminary draft reports are now available and are under review. Other reports will be forthcoming in the next several months. The final project reports will not be completed until later in 2008.
- \* Thompson participated in deliberations concerning the excessive rutting on the Christian County project. SEM Materials is currently conducting various tests on cores obtained from the "high-rut" section. The cores were taken from NB (high truck traffic) and SB (low truck traffic) lanes. Some cores were from the "wheel path" and others were from mid-lane." Trench sections were also opened in NB and SB lanes. Pertinent observations and measurements were made.
- \* The TRP Meeting was held in Springfield (Harry Hanley Bldg.) on May 12, 2008. Thompson presented a project update (Condition Surveys/ FWD Data Composite Modulus/ Modulus Data/ Mix Design Procedures/ Pavement Design Issues). A CD with the presentations was provided to K. Burke for distribution. Todd Thomas of SemMaterials presented the results of the testing on Christian Co. - CH-1. No definitive conclusions were apparent from the CH-1 study. The TRP recommended a two-month (no-cost) extension to the project.
- \* The Project Summary Report (DRAFT) was completed July 31, 2008 and submitted to the TRP for review.
- \* TRP comments were received prior to August 31, 2008.
- \* The TRP comments have been considered and a revised Project Summary Report prepared.
- \* The revised Project Summary Report was edited by ICT during December. It needs to be approved or corrected by the Principal Investigator in January 2009.
- \* The PI corrected the report and it was submitted to ICT for publication.
- \* The report (Cold In-Place Recycling and Full-Depth Recycling with Asphalt products [CIR&FDRwAP]) has been published in March of 2009 as ICT Research Report ICT-R27-12 and posted to the ICT website under publications.

<b>Project Title:</b> Effectiveness of Transit Strategies Targeting Elderly People		<b>Last Edited:</b> 5/14/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-17					
<b>QPR Author Name:</b> Prof. Kouros Mohammadian		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 312-996-9840	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review		9/1/2006	10/31/2006	C	C	-	-
<b>Task 2:</b> Analyses of Existing Travel Databases		9/1/2006	11/30/2006	C	C	-	-
<b>Task 3:</b> Attitudinal Survey Design and Pilot Test		10/1/2006	12/31/2006	C	C	-	-
<b>Task 4:</b> Attitudinal Survey of Elderly and their Opinions		1/1/2007	3/31/2007	C	C	-	-
<b>Task 5:</b> Analysis		4/1/2007	5/31/2007	C	C	-	-
<b>Task 6:</b> Identification of Opportunities		5/1/2007	6/30/2007	C	C	-	-
<b>Task 7:</b> Dissemination of Findings		6/1/2007	6/30/2007	C	C	-	-
<b>Task 8:</b> Prepare and Finalize Final Report		6/1/2008	11/30/2008	I	I	C	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Kouros Mohammadian		<b>Organization / Address</b>					
<b>Telephone:</b> 312-996-9840		UIC					
<b>Email:</b> kouros@uic.edu		UIC Dept of Civil & Materials Eng. 842 W. Taylor St., Chicago, IL 60607					
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Vonu Thakuriah		<b>Organization / Address</b>					
<b>Telephone:</b> 312-355-0447		UIC					
<b>Email:</b> vonu-pt@uic.edu							
<b>Description of Research:</b>							
This study analyzes strategies that have been implemented, or are being planned, to attract elderly transit users. Study results will enhance transit providers' awareness on how to more effectively attract senior riders.							
<b>Keywords:</b> Transit, Elderly							
<b>Technical Review Panel:</b>							
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Patty Broers		217-782-3547		Patricia.Broers@illinois.gov			
<b>Meeting Dates / Minutes Available?</b>							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
This study will provide a report that details the effectiveness of strategies that have been implemented or are being planned for elderly people.							

**Progress to Date:****Task 1: Literature Review**

Several articles in the literature addressing elderly travel behavior and related topics were reviewed, allowing us to identify important factors that can influence elderly transit use. Alternative methodologies, approaches, and survey questionnaires that were used in previous studies were reviewed and assessed. Also, various services provided to elderly people by transit agencies were reviewed.

**Task 2: Analyses of Existing Travel Databases**

Elderly observations from the Census Transportation Planning Package (CTPP) dataset, PACE's transit choice experiment, and Toronto's CHASE datasets were examined in order to better understand seniors' transit use habits. Also, correlations between seniors' household characteristics and the number of trips by mode were examined. The research team could therefore identify which groups of seniors have higher propensities to use transit. This analysis was used to identify appropriate target populations as well as design questions for the survey questionnaire.

**Task 3: Attitudinal Survey Design and Pilot Test**

Based on experiences gained from Tasks 1 and 2, the research team designed an attitudinal survey questionnaire, which was sent to several experts in the field for their review and comments. It was also sent to a number of elderly people for their general input on its format and design. The research team then modified the questionnaire after receiving their comments. A critical part of this task was obtaining approval of the survey protocol from the Institutional Review Board (IRB) of UIC's Office for Protection of Research Subjects (OPRS). Approval of the survey protocol was received on December 21, 2006 after revising the protocol and questionnaire several times over two months. The first set of questionnaires was mailed out on December 27 and participant recruiting started in January 2007.

**Task 4: Attitudinal Survey of Elderly and their Opinions**

Based on the results of pilot tests, survey questionnaires were revised and reformatted several times. Two thousand survey packages containing the questionnaire, a cover letter, an introduction letter from IDOT, and a stamped return envelope were mailed to senior citizens in Chicago and its suburbs. The response rate was over 14%, with 281 completed questionnaires received.

**Task 5: Analysis**

All returned questionnaires were screened and the information was entered into a relational database. The representativeness of the sample was validated against Census data for key socio-demographic variables including age, household size, and geographic location distributions. Univariate and Multivariate analyses of the dataset were performed and resulted in interesting findings. Cross tabulations of the observed choices and travel behavior were generated.

**Task 6: Identification of Opportunities**

The results of the analysis performed in Task 5 have been used to draw conclusions on seniors' behavior, decision processes, and preferences. The analysis of their responses to the stated choice and service and technology improvement questions reveals the opportunities available to transit agencies in order to improve transit services for this age group. Additionally, the analysis of respondents' ratings of the transit services provided some insight into their awareness of the current system and sensitivity to various available services.

**Task 7: Dissemination of Findings**

The Final Report was submitted to Chuck Abraham and Patricia Broers initially on 9/27/07 and then the final draft on 10/2/07. We are awaiting its approval and dissemination through the ICT. A research paper based on this study was presented at the Transport Chicago conference in June 2007. Another paper was presented at the Transportation Research Board (TRB) annual meeting in Washington DC in January 2008.

The report was finalized and posted to the ICT website (Publications Page) in February 2009.

<b>Project Title:</b> Crash Data Analysis and Engineering Solutions for Local Agencies		<b>Last Edited:</b> 5/18/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-18					
<b>QPR Author Name:</b> Prof. Yangeng Ouyang		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-9858	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Develop IL's plan after collecting info. on programs by FHWA and peer states (IA, OH, KY, MN, MO, MI)		7/1/2006	9/30/2006	C	-	-	-
<b>Task 2:</b> Collect and process local road crash data and determine types of data needed		10/1/2006	12/31/2006	C	-	-	-
<b>Task 3:</b> Survey types of data queries needed by Local Agencies to Data Mart developers, perform trend analysis		1/1/2007	3/31/2007	C	-	-	-
<b>Task 4:</b> Develop SPF and CRF using statistical and econometric methods		4/1/2007	6/30/2007	C	-	-	-
<b>Task 5:</b> Synthesize developed modules into one integrated software tool		7/1/2008	6/30/2008	C	-	-	-
<b>Task 6:</b> Technology Transfer		7/1/2008	12/31/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Yangeng Ouyang		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-9858		Dept. of CEE, UIUC					
<b>Email:</b> yfouyang@illinois.edu		Newmark Civil Engineering Lab 205 N. Mathews Ave. Urbana, IL 61801					
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Zongzhi Li		<b>Organization / Address</b>					
<b>Telephone:</b> 312-567-3556		Illinois Institute of Technology, Chicago, IL					
<b>Email:</b> lizz@iit.edu							
<b>Description of Research:</b>							
The intent of this project is to evaluate other state's safety service programs for Local Agencies so as to provide recommendations on the requirements to establish a successful Illinois program. The ultimate goal is to provide a full service safety program where the locals can access more effectively a means to identify high severe crash sites, identify solutions to reduce the severity of the crashes, and to utilize available safety funds in a manner to reduce severe injuries and fatalities.							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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Kim Cummins		217-785-5342		Kim.Cummins@illinois.gov			
Leigh Ann Lareau							
Mike Staggs		217-558-1793		Mike.Staggs@fhwa.dot.gov			
Roseanne Nance		217-558-6112		Roseanne.Nance@illinois.gov			

**Meeting Dates / Minutes Available?**

9/12/2006 / Yes  
1/12/2007 / Yes  
10/23/2007 / Yes  
12/11/2007 / Yes  
5/13/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

This research will enable local agencies to construct data-driven roadway improvements to reduce the number and severity of crashes on their system. A searchable local roads database will be created that allows local agencies to locate crashes on rural roads, and analyze and report crash data to develop engineering solutions.

**Progress to Date:**

As of December 31, 2008, the project is almost complete. The software has gone through a few rounds of testing and has been in final transfer. The website for the software is at [http://130.126.240.215/idot\\_safety/](http://130.126.240.215/idot_safety/). A revised draft final report is under review.

As of March 31, 2009, the review of the revised report is still underway. The report will be finalized in the next quarter.

<b>Project Title:</b> Pier Scour Prediction in Cohesive Soils: Use of EFA-SRICOS Method in IL		<b>Last Edited:</b> 5/28/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-19					
<b>QPR Author Name:</b> Timothy D. Straub, Ph.D., P.E.		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-621-9587	<b>% Project Completed:</b> 80			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Site Submittal		8/1/2006	6/30/2007	C	-	-	-
<b>Task 2:</b> Site Ratings		10/1/2006	7/31/2007	C	-	-	-
<b>Task 3:</b> Site Recons		4/1/2007	7/31/2007	C	-	-	-
<b>Task 4:</b> Site Selection		8/1/2006	7/31/2007	C	-	-	-
<b>Task 5:</b> Scour Measurements		7/1/2007	8/31/2007	C	-	-	-
<b>Task 6:</b> Shelby Tube Sampling		6/1/2007	10/31/2007	C	-	-	-
<b>Task 7:</b> EFA and Soils Testing		6/1/2007	9/30/2008	C	-	-	-
<b>Task 8:</b> Hydraulic and Hydrologic Modeling		10/1/2007	3/30/2009	I	I	C	-
<b>Task 9:</b> SRICOS-EFA Prediction		10/1/2008	4/30/2009	-	I	I	-
<b>Task 10:</b> Report Preparation and Reviews		4/1/2009	12/31/2009	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Timothy D. Straub, Ph.D., P.E.				<b>Organization / Address</b>			
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<b>Description of Research:</b>							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
06/07/2006 / Yes							
10/04/2006 / Yes							

12/06/2006 / Yes

04/27/2007 / Yes

10/11/2007 / Yes

01/24/2008 / Yes

06/06/2008 / Yes

09/30/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The research will determine the correction factors, if needed, for using EFA-SRICOS on the various cohesive soils throughout Illinois. Additionally, the project includes an analysis of standard soils testing data which will be used with EFA-SRICOS results and HEC-18 results to identify relationships that will allow designers to assess scour potential in cohesive soils using standard soils testing data when EFA soils samples cannot be obtained.

**Progress to Date:**

Hydraulic and hydrologic modeling were finished this quarter. Preliminary comparisons between HEC18 and SRICOS scour results were developed. The relation between SRICOS scour results and soil properties were also investigated in this quarter.

<b>Project Title:</b> Develop Safety Performance Functions (SPF) for Illinois			<b>Last Edited:</b> 5/18/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-20					
<b>QPR Author Name:</b> Y. Ouyang			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-9858	<b>% Project Completed:</b> 99				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review, Interview IDOT Personnel, and Obtain Data			1/1/2007	3/31/2007	C	-	-	-
<b>Task 2:</b> Develop SPF and Multivariate Models			4/1/2007	12/31/2007	C	-	-	-
<b>Task 3:</b> Develop an Automated Interactive System for IDOT			7/1/2008	12/31/2008	I	C	-	-
<b>Task 4:</b> Model Validation with New Data			1/1/2008	6/30/2008	C	-	-	-
<b>Task 5:</b> Final Report			12/1/2008	12/31/2008	I	I	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> Y. Ouyang			<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-9858			UIUC - CEE					
<b>Email:</b> yfouyang@uiuc.edu			Newmark Civil Engineering Lab 205 N. Mathews Ave. Urbana, IL 61801					
<b>Description of Research:</b>								
Using descriptive and advanced statistical techniques, this study will provide IDOT with analytical tools to identify and manage a program of site-specific and systematic improvements with the end goal of reducing fatalities and severe injuries from motor vehicle crashes. The project deliverables include a prototype software and a user's guide.								
<b>Keywords:</b>								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								
1/11/2007 / Yes								
3/20/2007 / Yes								
8/22/2007 / Yes								
11/14/2007 / Yes								
<b>Short Title &amp; Date Reports Available:</b>								

**End User(s) and Result(s) Expected:**

Develop SPF models that will be used to screen for candidate locations in Illinois for safety improvements.

**Progress to Date:**

As of December 31, 2008, all tasks of the project have been completed. The final report and all deliverables have been transferred to IDOT; however, the final report has not been finalized and published on the ICT website.

As of March 31, 2009, we have not heard from IDOT regarding approval of the final report.

<b>Project Title:</b> Alternative Intersections: Roundabout Evaluation and Design		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-21					
<b>QPR Author Name:</b> R. Benekokal		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-366-6006	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Brief Literature Review		1/1/2007	1/31/2008	C	-	-	-
<b>Task 2:</b> Obtain Crash and Traffic Data		1/1/2007	2/29/2008	C	-	-	-
<b>Task 3:</b> Identify Potential Sites for Roundabouts		1/1/2007	3/31/2008	C	-	-	-
<b>Task 4:</b> Discuss with District and Central Office		1/1/2007	3/31/2008	C	-	-	-
<b>Task 5:</b> Evaluate existing roundabout design software		1/1/2007	6/30/2007	C	-	-	-
<b>Task 6:</b> Develop a design/section guideline for roundabouts		1/1/2007	3/31/2008	C	-	-	-
<b>Task 7:</b> Prepare and Finalize Report		3/1/2008	6/30/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> R. Benekokal				<b>Organization / Address</b>			
<b>Telephone:</b> 217-366-6006				UIC - CEE			
<b>Email:</b> rbenekoh@illinois.edu				205 N. Mathews Ave. Urbana, IL 61801			
<b>Description of Research:</b>							
<p>Modern roundabouts are considered as an alternative intersection design and they may be effective in reducing the severity and injury crashes at intersections. Roundabouts have been used in several states in the US and IDOT is interested in promoting the use of roundabouts at appropriate locations to improve safety. IDOT does not have design guide for roundabouts. The objectives of this study are: 1) Identify 10 intersections in Illinois that have a potential to reduce fatalities and injuries using a roundabout design. 2) Evaluate existing roundabout design software. 3) Obtain feedback from IDOT District and Central offices about roundabouts. 4) Develop a design/section guideline for roundabouts.</p>							
<b>Keywords:</b> roundabouts, intersection type, site selection procedure							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
03/08/2007 / Yes							
09/18/2007 / No							
10/30/2007 / Yes							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

A design/section guideline for roundabouts.

**Progress to Date:**

Revised Final Report was submitted to TRP on Feb 26, 2009 and under review.

<b>Project Title:</b> Regional Data Archiving and Management for Northeast Illinois		<b>Last Edited:</b> 6/1/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-22					
<b>QPR Author Name:</b> Y. Ouyang		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-9858	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Needs, requirements, specifications of the new system		4/1/2007	8/31/2007	C	-	-	-
<b>Task 2:</b> Identify architectures and potential business alternatives		9/1/2007	12/31/2007	C	-	-	-
<b>Task 3:</b> Recommended business models, ROI, draft system requirements		1/1/2008	6/30/2008	C	-	-	-
<b>Task 4:</b> Final system requirements		7/1/2008	8/31/2008	C	-	-	-
<b>Task 5:</b> Prepare and Finalize Report		9/1/2008	12/31/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Y. Ouyang		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-9858		UIUC - CEE					
<b>Email:</b> yfouyang@illinois.edu		Newmark CE Lab 205 N. Mathews Ave. Urbana, IL 61801					
<b>Description of Research:</b>							
It has been realized by IDOT, ISTHA and other operating agencies covering the transportation system throughout the Northeast corner of the state that it is suboptimal to have several standalone transportation information systems not communicating to each other. For real time operations, the Gary-Chicago-Milwaukee (GCM) Gateway was created to solve this problem. The main objective of the proposed project is to provide a clear guidance to the regional agencies about building a single centralized transportation information system. Several implementation alternatives will be identified and each one analyzed thoroughly.							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
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Jeff Hochmuth							
<b>Meeting Dates / Minutes Available?</b>							
9/6/2007 / Yes							
12/13/2007 / Yes							
4/15/2008 / Yes							
6/20/2008 / Yes							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

To provide a clear guidance to the regional agencies about building a single centralized transportation information system. Several implementation alternatives will be identified and each one analyzed thoroughly.

**Progress to Date:**

As of August 31, 2008, the project has been completed to the satisfaction of the TRP. The final report has been reviewed and approved by the TRP committee; however, it needs to be formatted according to the ICT guidelines, edited by ICT, and published on the ICT website.

As of March 31, 2009, the final report has not been edited and posted to the ICT website yet (due to editing difficulties). The report will be finalized by the next quarter.

Last Updated: 6/1/2009

<b>Project Title:</b> Evaluation/Modification of IDOT Foundation Piling Design and Construction Policy			<b>Last Edited:</b> 5/14/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-24					
<b>QPR Author Name:</b> J. Long			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217 333 2543	<b>% Project Completed:</b> 100				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Preliminary Groundwork			1/1/2007	3/31/2007	C	C	-	-
<b>Task 2:</b> Collect/Select/Evaluate Test Pile Driving Records within Illinois			1/1/2007	8/31/2008	C	C	-	-
<b>Task 3:</b> Collect/Select/Evaluate Detailed Pile Load Test Data			4/1/2007	8/31/2008	C	C	-	-
<b>Task 4:</b> Collect/Select/Evaluate Results from other Pile Studies			3/1/2007	4/30/2008	C	C	-	-
<b>Task 5:</b> Improve Static method (method for estimating pile length)			1/1/2008	5/31/2008	I	C	-	-
<b>Task 6:</b> Evaluate Appropriate Resistance Factors for Estimation and Design Method			5/1/2008	8/31/2008	I	C	-	-
<b>Task 7:</b> Develop Recommendations for Improving Agreement between Estimated and Driven Pile Capacity			5/1/2008	8/31/2008	I	C	-	-
<b>Task 8:</b> Incorporate IDOT Dynamic Load Tests as Example Cases			6/1/2008	8/31/2008	C	C	-	-
<b>Task 9:</b> Write Draft and Submit to IDOT Technical Review Panel			7/1/2008	10/31/2008	I	C	-	-
<b>Task 10:</b> Make Revisions and Issue Final Report			11/1/2008	12/31/2008	-	I	C	-
<b>Principal Investigator:</b>								
<b>Name:</b> J. Long			<b>Organization / Address</b>					
<b>Telephone:</b> 217 333 2543			Univ. of Illinois					
<b>Email:</b> jhlong@uiuc.edu			205 North Mathews Urbana, IL 61801					
<b>Description of Research:</b>								
The research will collect and evaluate test pile driving records within Illinois, collect, select, and evaluate detailed pile load test data, collect, select, and evaluate results from other pile studies, improve static method (method for estimating pile length), evaluate appropriate resistance factors for estimation and design methods, develop recommendations for improving agreement between estimated and driven pile capacity, and submit a report documenting the results of this research.								
<b>Keywords:</b> Driven Piles, Dynamic Formula, Pile Capacity, LRFD, Pile Design								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								

01/30/2007 / Yes  
05/23/2007 / Yes  
11/30/2007 / Yes  
03/26/2008 / Yes  
8/27/2008 / Yes  
1/14/2009 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The results from this study will include the following: 1) an improved method for estimating pile length based on soil properties and the associated resistance factors for LRFD, 2) an improved method for estimating pile capacity based on behavior of the pile during driving and the associated resistance factors for LRFD, and 3) an approach using deliverables #1 and #2 that will quantify and improve the agreement between estimated pile lengths and driven pile lengths.

**Progress to Date:**

**Task 1 - Preliminary Groundwork (completed)**

The first sub-task within Task 1 was to review the work reported in NCHRP Rpt 507, Long(2000), and work with the technical Review Panel to select methods for predicting pile capacity for study in this investigation. The following methods to investigate have been recommended:

Estimation Methods Construction Control  
(based on soil properties) (based on behavior during pile driving)  
IDOT(current method) EN (previous IDOT)  
Driven (FHWA- Tomlinson/Nordlund) Gates(FHWA)  
IDOT (modified method) Gates(Allen)  
WEAP(capacity and driving stress)  
Gates (IDOT - modified)

Our second sub-task was to start collecting and developing spreadsheets, computer programs, and computational tools necessary for the efficient determination of pile capacity for several methods and several cases. We have the computer programs DRIVEN and WEAP. We have been developing spreadsheets to determine capacity based on driving formulas.

Our third sub-task was to meet with the technical review panel to present the approach and make appropriate adjustments to the plan of work as necessary. We accomplished this in our first meeting with the panel on January 30, 2007. We also met with them in May (2007) to further report on our progress and to seek additional input from the panel.

**Task 2 - Collect/Select/Evaluate Test Pile Driving Records within Illinois (completed)**

This objective of this task was to provide information on the agreement observed between estimated pile length and driven pile length by using the pile driving records from several sites around Illinois. We have completed the collection of this data and have completed the analysis for these cases.

The pile data has then been sorted into one of four categories according to pile type and soil type: 1) H-piles in coarse-grained soil, 2) H-piles in fine-grained soil, 3) shell-piles in coarse-grained soil, and 4) shell-piles in fine-grained soil. The target number of 25 piles per category has been reached but required we collect some additional driving tests from Wisconsin. All piles collected have had their location, length, section, and driving information entered into a spreadsheet. From the driving data, the bearing capacity has been calculated using the Engineering News formula, and 2 modifications of the Gates formula. In summary, we have a sufficient number of pile driving sites to satisfy the 25 piles for each category.

**Tasks 3 and 4 - Collect/Select/Evaluate Results from other Pile Studies (completed)**

We are finished all the work for collecting additional references and entering them into the database for Task 3 and 4.

**Task 4 We combined the results of pile studies in which static load tests have also been conducted.(completed)**

Task 5, which is to improve the Static method is completed. We compared methods suggested by FHWA as well as other methods for computing static capacity and are comparing them with current IDOT methods. We have also looked at a pile capacity methods proposed by Jardine (2005) and Olson(1999). The method by Jardine is based on field penetration test results (in sands/gravels) and undrained strength and effective stress in fine-grained soil. We believe Jardine's method shows great promise for all the pile methods. However, at this time there is not a significant enough amount of data (only 25 tests) to warrant moving to this method. A slight modification to the existing IDOT -static method appears to improve the current static method well.

Task 6 - (completed) we developed the spreadsheets necessary to calculate resistance factors based on FOSM (first order second moment) method and FORM (first order reliability method) and have determined the resistance factors.

Task 7 (completed) compared predicted capacities between static and dynamic information and is complete.

Task 8 - complete

Task 9 - The report was finalized and posted to the ICT website (Publications Page) in March 2009.

<b>Project Title:</b> Modification of IDOT Integral Abutment Design Limitations and Details		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-25					
<b>QPR Author Name:</b> Scott M. Olson		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-7584	<b>% Project Completed:</b> 95			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Compare current IDOT practice to other states' approaches		1/1/2007	7/31/2007	C	-	-	-
<b>Task 2:</b> Develop design guidelines for IABs		7/1/2007	6/30/2008	I	I	C	-
<b>Task 3:</b> Establish instrumentation plans for monitoring IABs		6/1/2008	10/31/2008	C	-	-	-
<b>Task 4:</b> Document project efforts in comprehensive report to IDOT		10/1/2008	12/31/2008	-	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Scott M. Olson				<b>Organization / Address</b>			
<b>Telephone:</b> 217-265-7584				University of Illinois			
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<b>Co-Investigator:</b>							
<b>Name:</b> James H. Long				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-2543				University of Illinois			
<b>Email:</b> jhlong@illinois.edu							
<b>Description of Research:</b>							
The overall objective of this study is to develop and document rational guidelines and limitations for Integral Abutment Bridges (IABs). We will also develop construction and monitoring plans for instrumenting existing and/or planned IABs as part of this project; but the project scope does not include procuring, installing, or monitoring instruments at any bridges.							
<b>Keywords:</b> Integral abutment bridges, IAB, jointless bridges, approach slabs, abutment, pile foundations							
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<b>Meeting Dates / Minutes Available?</b>							
2/5/2007 / Yes							
5/9/2007 / Yes							
11/5/2007 / Yes							

4/4/2008 / Yes

09/15/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The proposed work will potentially benefit the Illinois Department of Transportation by expanding (and better understanding) the current limitations and benefits of IABs. A more rational design approach would allow pile and soil modifications to meet the demands of an IAB for conditions in which they currently may not be considered. The end users would be the traveling public who would experience a smoother roadway ride, district construction and maintenance who benefit in reduced construction and repair costs, and structure designers who would have better understanding and improved guidance on what sites or treatments are necessary to utilize an IAB.

**Progress to Date:**

Through 03/30/2007

1. Developed draft detailed work plan for the project to discuss with the Technical Review Panel (TRP).
2. Held project kick-off meeting with TRP to discuss the draft work plan.
3. Modified the draft work plan based on discussions with TRP.
4. Conducted thorough literature review of recent surveys and field studies involving integral abutment, semi-integral abutment, and jointless bridges. Performing literature review on recent analytical work for these types of structures.
5. With aid of TRP, developing list of state DOT contacts to conduct targeted survey of cost and performance of IABs. And we are developing potential questions for the targeted DOT survey.

Through 06/30/07

1. Nearing completion of literature review of recent analytical work for IABs (~ 90% complete).
2. Nearing completion of targeted DOT survey (~ 75% complete).
3. Developing detailed plans and cost estimates for bridge instrumentation. Exploring additional funding avenues with IDOT to instrument select IABs in Illinois.
4. Nearing completion of initial geotechnical modeling (using LPILE) of lateral load response of H-piles (5 pile sizes and 2 pile orientations), pipe piles (4 pile sizes), and soil type (two soil types) (~ 90% complete).
5. Developing conceptual outline for FE model of IAB.
6. Held second meeting with TRP to discuss progress and project direction.

Through 09/30/07

1. Essentially complete with literature review of recent analytical work for IABs (~ 95% complete).
2. Essentially complete with targeted DOT survey (~ 95% complete).
3. Developing detailed plans and cost estimates for bridge instrumentation. Exploring additional funding avenues with IDOT, but at this time, we have been unsuccessful in finding a viable funding mechanism.
4. Completed initial geotechnical modeling (using LPILE) of lateral load response of H-piles and shell piles.
5. Working with faculty member in structural group and graduate students in geotechnical and structural engineering to develop ABAQUS finite element model for integral abutment bridge based on plans provided by Bill Kramer.

Through 12/31/07

1. Nearing completion of detailed preliminary plans and cost estimates for bridge instrumentation (~ 75% complete).
2. Nearing completion of structural frame modeling of bridge abutment and foundation system (~75% complete).
3. Developing finite element model for integral abutment bridge based on plans provided by Bill Kramer.

Through 3/31/08

1. Essentially complete with 2D (frame) modeling of bridge abutment and foundation system (~95% complete).
2. Started 3D (FE) modeling of IABs using SAP2000 software.
3. Continued working on bridge instrumentation plans.
4. Submitted ICT proposal to fund bridge instrumentation project. Project was recommended #1 by Structures TAG.

Through 6/30/08

1. Completed 2D (frame) modeling of bridge abutment and foundation system.
2. Developed 3D (FE) model of "typical" IAB using SAP2000 software and starting to perform FE analysis of IAB that accounts for factors and variables listed in the work plan.
3. Worked with IDOT engineers to develop and finalize first instrumentation plan for IAB.

Through 9/30/08

1. Performing 3D FE analysis of IAB using SAP2000 software.
2. Performing additional LPILE analyses to supplement SAP analysis

Through 12/31/08

1. Finalizing 3D FE analyses.
2. Preparing draft final report.

Through 3/31/09

1. Submitted draft final report and received comments from TRP at final panel meeting.
2. Revising final report.

<b>Project Title:</b> Free-Cutting Brass Breakaway Couplings			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-26					
<b>QPR Author Name:</b> D. Kuchma			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-1571	<b>% Project Completed:</b> 90				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Review Relevant Standards			4/1/2007	10/1/2007	C	-	-	-
<b>Task 2:</b> Contract and Oversee Coupling Drop Tests			4/1/2007	12/31/2008	I	C	-	-
<b>Task 3:</b> Create Finite Element Analysis (FEA) Model of Coupling and Device			2/1/2007	12/31/2007	C	-	-	-
<b>Task 4:</b> Analyze Result of Drop Tests and Update FEA			1/1/2008	12/31/2008	I	I	I	-
<b>Task 5:</b> Make Suggested Changes to Design			1/1/2008	12/31/2008	I	I	I	-
<b>Task 6:</b> Contract for Full Crash Test? -- Deferred Until Phase 2					-	-	-	-
<b>Task 7:</b> Prepare and Finalize Report			7/1/2008	12/31/2008	I	I	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> D. Kuchma			<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-1571			University of Illinois at Urbana-Champaign					
<b>Email:</b> kuchma@uiuc.edu								
<b>Description of Research:</b>								
Finite element analysis of brass couplings to predict distribution of stresses. Experimental testing of single and four-couplings assemblies to evaluate their energy absorbing capacity.								
<b>Keywords:</b> breakaway couplings, brass, light poles, crash testing								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								
03/27/2007 / Yes								
7/23/2008 / Yes								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								
An evaluation of the energy absorbing capacity of different shapes of single, and multiple brass couplings. A prototype shape for brass couplings to use in full-scale crash testing.								
<b>Progress to Date:</b>								

The finite element analysis of single brass-couplings without notches has been completed and can be used to predict distribution of stresses in couplers. The experimental evaluation of the capacity of single brass couplings with single notches has been completed. Evaluation of the capacity of four-coupling connections with different shapes of notches and in different setup configurations was completed. Work is continuing on the analysis of the drop tests and suggestions regarding the coupling design. The final report is being drafted.

<b>Project Title:</b> Expansive Characteristics of Reclaimed Asphalt		<b>Last Edited:</b> 5/27/2009						
		<b>Function Code:</b> R27						
		<b>Project Number:</b> R27-27						
<b>QPR Author Name:</b> E. Tutumluer		<b>Estimated Dates</b>			<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-8637	<b>% Project Completed:</b> 95				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>	
<b>Task 1:</b> Characteristics of Illinois RAP Materials Used in Pavement Bases		2/1/2007	8/31/2007	C	-	-	-	
<b>Task 2:</b> Literature Review – Pavement Substructure Use of RAP		2/1/2007	10/31/2007	C	-	-	-	
<b>Task 3:</b> Testing of RAP Materials for Expansive Characteristics		10/1/2007	8/31/2008	C	-	-	-	
<b>Task 4:</b> If Needed, Additional Petrographic and Chemical Analyses of RAP Materials		3/1/2008	8/31/2008	C	-	-	-	
<b>Task 5:</b> Development of a RAP Source and Material Property Database		5/1/2008	4/30/2009	I	I	I	-	
<b>Task 6:</b> Final Report and Training/Implementation		5/1/2008	4/30/2009	I	I	I	-	
<b>Principal Investigator:</b>								
<b>Name:</b> E. Tutumluer		<b>Organization / Address</b>						
<b>Telephone:</b> 217-333-8637		UIUC - CEE						
<b>Email:</b> tutumlue@illinois.edu		Newmark CE Lab 205 N. Mathews Ave. Urbana, IL 61801						
<b>Co-Investigator:</b>								
<b>Name:</b> J. Popovics		<b>Organization / Address</b>						
<b>Telephone:</b> 217-244-0843		UIUC - CEE						
<b>Email:</b> johnpop@illinois.edu								
<b>Description of Research:</b>								
Seventeen RAP materials and virgin aggregates were tested for their expansive characteristics in the laboratory following the ASTM D4792 “Potential Expansion of Aggregates from Hydration Reactions” test method. The specimens in California Bearing Ratio (CBR) test molds were submerged into a high alkali cement water solution (pH of 12) and kept always soaked at 70oC to accelerate hydration reactions. The percent expansion amounts of the CBR specimens and the temperature and pH levels of the solution were measured continuously on a daily basis during the soaking period for a minimum of 7 days and maximum 60 days until the expansion curve flattened or the expansion rate slowed down.								
<b>Keywords:</b> Reclaimed asphalt pavement (RAP), steel slag aggregate, expansion characteristics								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								

5/15/2007 / Yes

8/29/2007 / Yes

6/12/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Processed RAP consists of high quality, well-graded aggregates coated by asphalt cement. Currently, the use of RAP is not allowed in the pavement substructure layers according to Illinois Department of Transportation (IDOT) specifications. Whether or not this is a major concern for Illinois will need to be studied by first successfully identifying the expansive nature of RAP sources statewide and secondly by establishing guidelines for blending recycled and virgin aggregates for the pavement substructure use. This research project is therefore aimed at such an evaluation of steel slag commonly found in reclaimed asphalt pavement materials in Illinois.

**Progress to Date:**

Some steel slag aggregates showed considerably high expansion potentials, up to 6.2% swell, due to the hydration of free lime when compared to other virgin aggregates, such as siliceous gravel and crushed dolomite, which had minor or almost no expansion. The RAP materials, which had often lower densities, exhibited more of an initial settlement or contraction before any kind of expansion with time. Two RAP materials, surface RAP with 92% steel slag aggregates and steel slag RAP gave the maximum expansion amounts 1.69% and 1.46%, respectively. The RAP materials had much lower tendencies to expand when compared to high expansion potentials of especially the virgin steel slag aggregates most likely due to an effective asphalt coating around the aggregate which prevents any significant ingress of water into the aggregate.

The final report has been drafted and is being reviewed by IDOT.

<b>Project Title:</b> Evaluation of 3-D Laser Scanning for Construction Applications			<b>Last Edited:</b> 5/3/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-30					
<b>QPR Author Name:</b> Dianne K. Slattery			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 618-650-5019	<b>% Project Completed:</b> 80				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Identify Projects			12/1/2007	1/31/2008	C	C	C	-
<b>Task 2:</b> Evaluate/ analyze/ model proposed projects			1/1/2008	6/30/2008	I	C	C	-
<b>Task 3:</b> Develop Planning Software			1/1/2008	6/30/2008	C	C	C	-
<b>Task 4:</b> Develop Volume Calculation Software			2/1/2008	11/30/2008	I	I	I	-
<b>Task 5:</b> Scan Projects			1/1/2008	11/30/2008	I	I	I	-
<b>Task 6:</b> Evaluate Feasibility for Design			9/1/2008	3/31/2009	-	I	I	-
<b>Task 7:</b> Study Settlement Monitoring During Construction			4/1/2008	11/30/2008	I	I	I	-
<b>Task 8:</b> Final Report			6/1/2009	8/15/2009	-	I	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> Dianne K. Slattery			<b>Organization / Address</b>					
<b>Telephone:</b> 618-650-5019			SIUE					
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<b>Co-Investigator:</b>								
<b>Name:</b> Kerry T. Slattery			<b>Organization / Address</b>					
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<b>Email:</b> kslatte@siue.edu								
<b>Description of Research:</b>								
This research is investigating how 3-D laser scanning may be effectively used for highway construction projects.								
<b>Keywords:</b> laser scanning, earthwork operations, quantity determination								
<b>Technical Review Panel:</b>								
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**Meeting Dates / Minutes Available?**

12/17/2007 / Yes

03/25/2008 / Yes

06/25/2008 / Yes

09/26/08 / Yes

03/23/09 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Validation of the feasibility of using laser technology to monitor IDOT highway construction activities and transportation structures. A cost-effective and accurate laser technology has significant potential to impact the efficiency and cost control of future construction projects.

**Progress to Date:**

The team has scanned the Governor's Parkway project at several different stages of construction, scanned pile driving on Route 157 in Cahokia, done recon surveys on IL 255 north to evaluate feasibility of scanning for design, and several intersection/pavement surveys. Software development to plan scanning is completed, and software to analyze the data is in development. The as-built data from Governor's Parkway has been incorporated in the model. Scans of Cahokia have been completed at various stages of the earthwork operations and pile driving. New scanning of Illinois 255 extension north of Alton, and scanning of the intersection of Illinois 162 and 157 in Madison County was completed during the winter months. We continue to scan Governor's Parkway in Edwardsville as the last section of roadway is being completed to connect the road to Illinois 143 at I-55. We have a beta-test of the software scheduled on May 18, 2009 at SIUE, with approximately 10 District 8 personnel planning to attend a day-long training and feedback session. The final report is being assembled, and portions were submitted to the TRP for review in September 2008. The entire final report will be submitted in draft to the TRP by June 15, and the project completed by August 15, 2009.

<b>Project Title:</b> Wind Powered Electrical Systems: Highway Rest Areas and Weigh Stations and Team Section Buildings		<b>Last Edited:</b> 5/14/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-31					
<b>QPR Author Name:</b> Prof. Patrick Chapman		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-4694	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Estimate the wind resources available at each site.		8/1/2007	10/31/2007	C	-	-	-
<b>Task 2:</b> Load data acquisition.		8/1/2007	12/31/2007	C	-	-	-
<b>Task 3:</b> Wind turbine comparison.		1/1/2008	3/31/2008	C	-	-	-
<b>Task 4:</b> Quantify economic benefits.		3/1/2008	6/30/2008	C	-	-	-
<b>Task 5:</b> Prepare and Finalize Report		5/31/2008	12/31/2008	I	I	C	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Patrick Chapman				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-4694				University of Illinois			
<b>Email:</b> plchapm@illinois.edu				1406 W Green St Urbana, IL 61801			
<b>Description of Research:</b>							
This work is to analyze the potential value of wind turbines at IDOT weigh stations and rest stops. We are looking at wind data for these locations and the combined effect with many commercial wind turbines.							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
9/24/2007 / Yes							
3/25/2008 / Yes							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
The final product includes site-by-site recommendations along with an economic analysis for using wind turbines. The implementation of this project's recommendations would reduce IDOT's energy costs while protecting the environment.							
<b>Progress to Date:</b>							
The report was finalized and posted to the ICT website (Publications Page) in February 2009.							

<b>Project Title:</b> Rolling Lane Closures		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-32					
<b>QPR Author Name:</b> Doug Steele		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 356-4500	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Kickoff meeting		9/2/2007	10/15/2007	C	-	-	-
<b>Task 2:</b> Literature review		9/15/2007	3/31/2007	C	-	-	-
<b>Task 3:</b> Full-scale field experiments		4/1/2008	6/30/2008	C	-	-	-
<b>Task 4:</b> Roll-ahead distance evaluation		4/1/2008	7/31/2008	C	-	-	-
<b>Task 5:</b> Data analysis, findings, and application		5/15/2008	7/31/2008	C	-	-	-
<b>Task 6:</b> Preliminary report and panel meeting		7/1/2008	7/31/2008	C	-	-	-
<b>Task 7:</b> Final report		8/1/2008	12/31/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Doug Steele		<b>Organization / Address</b>					
<b>Telephone:</b> 356-4500		ARA, Inc.					
<b>Email:</b> dsteele@ara.com		100 Trade Centre Dr., Suite 200 Champaign, IL 61820					
<b>Co-Investigator:</b>							
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<b>Description of Research:</b>							
The research involves a literature review, rollahead distance analysis, full-scale field tests, data analysis, and reporting. The thrust of the research are the full scale field tests, which will be videotaped to study driver behavior around moving lane closures, and the influence of specific parameters, such as the no. of traffic protection vehicles, vehicle spacing, and the effect of various messages and signing.							
<b>Keywords:</b> Moving lane closures traffic safety							
<b>Technical Review Panel:</b>							
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**Meeting Dates / Minutes Available?**

07/10/12 / Yes

08/01/22 / Yes

08/03/28 / Yes

08/07/29 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

An improved understanding of driver behavior near and around rolling lane closures and recommendations for increasing the safety and effectiveness of moving lane closures.

**Progress to Date:**

The final report remaining task is formatting in ICT format. The report will be finalized by the next quarter.

<b>Project Title:</b> Queue and Users' Cost in Highway Work Zones			<b>Last Edited:</b> 5/14/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-33					
<b>QPR Author Name:</b> R. Benekohal			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-244-6288	<b>% Project Completed:</b> 65				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review			10/1/2007	3/31/2008	I	I	I	-
<b>Task 2:</b> Capacity Estimation Methods			10/1/2007	4/30/2008	I	C	-	-
<b>Task 3:</b> Field Data Collection			3/1/2008	10/31/2008	I	I	I	-
<b>Task 4:</b> Calculate Work Zone Capacity			6/1/2008	3/31/2009	I	I	I	-
<b>Task 5:</b> Determination of Cause and Effects of Queuing			3/1/2008	4/30/2009	I	I	I	-
<b>Task 6:</b> User's Cost Procedure			1/1/2009	6/30/2009	-	-	I	-
<b>Task 7:</b> Prepare and Finalize Report			6/1/2009	9/30/2009	-	-	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> R. Benekohal			<b>Organization / Address</b>					
<b>Telephone:</b> 217-244-6288			UIUC					
<b>Email:</b> rbenekoh@illinois.edu			205 N. Mathews Ave. Urbana, IL 61801					
<b>Description of Research:</b>								
<p>IDOT BDE manual requires that traffic control plans for freeway reconstruction projects include a queuing analysis. The manual does not provide procedures for calculating speed and capacity of work zone. Capacity plays a critical role in queue length and road user cost calculations. This study will develop methods for estimating speed, capacity, delay, queuing, and user's costs for interstate highway work zones where queuing and congestion occurs. The methods will help IDOT to meet the requirements of Work Zone Safety and Mobility Policy that went into effect in fall 2007.</p>								
<b>Keywords:</b> work zone, capacity, congestion, queue, user cost, construction zone traffic								
<b>Technical Review Panel:</b>								
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Dean Mentjes			217-492-4631			Dean.Mentjes@fhwa.gov		
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Patty Broers			217-782-3547			Patricia.Broers@illinois.gov		
<b>Meeting Dates / Minutes Available?</b>								
12/20/2007 / Yes								
4/10/2007 / Yes								
12/08/2008 / Yes								

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

IDOT's compliance with the Work Zone Safety and Mobility Policy.

**Progress to Date:**

Task 1. Literature Review- A literature review of published articles to learn the state of knowledge and activities directly related to this topic is near completion.

Task 2. Capacity Estimation Methods – Review of capacity estimation methods used for oversaturated work zones is in progress. A methodology to determine capacity of oversaturated work zones is developed and was discussed with the TRP meeting on April 11, 2008.

Task 3. Field Data Collection- Research team in cooperation with the TRP Chair identified data collections sites and collected data on I-39, I-57, I-72, I-74, I-80 Eastbound, and I-80 Westbound work zones. Video tapes are reviewed to extract information on headway, speed, capacity, and queue. At I-39 and I-80 sites, queue of slow moving vehicles were present and the research team was able to collect queue data, but at other sites queues did not develop.

Task 4. Calculate Work Zone Capacity - Based on information from Task 2 and data from Task 3, work zones capacities during queuing, congestion, or flow breakdown conditions (stop-and-go) are being determined.

Task 5. Determination of Causes and Effects Queuing - The causes and effects of queuing, congestion, and flow breakdown in the work zones are being determined. Their effects in computing, speed, delay, capacity and user's costs will be determined.

Task 6. User's Costs Procedure - During this task, a method to compute user's costs for the work zones are being developed.

Task 7. Final Report - For this task, a report documenting the steps and findings from the previous tasks will be prepared and finalized.

<b>Project Title:</b> Pavement Program Planning Process Based on Benefit-Cost Analysis		<b>Last Edited:</b> 6/1/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-34					
<b>QPR Author Name:</b> Y. Ouyang		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-9858	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature review to survey current analysis approaches in peer states		10/1/2007	11/15/2007	C	-	-	-
<b>Task 2:</b> Develop an easy-to-follow pavement management procedure to prioritize pavement MR&R projects based on benefit-cost		11/16/2007	3/31/2008	C	-	-	-
<b>Task 3:</b> Acquire related data from IDOT and validate the simple mathematical models		11/16/2007	3/31/2008	C	-	-	-
<b>Task 4:</b> Program a spreadsheet-based computer program		4/1/2008	6/30/2008	C	-	-	-
<b>Task 5:</b> Technical report, final product submission and technology transfer		7/1/2008	9/30/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Y. Ouyang				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-9858				UIUC			
<b>Email:</b> yfouyang@uiuc.edu							
<b>Description of Research:</b>							
<p>The objective of this project is to develop an advanced pavement program planning procedure based on life-cycle benefit-cost analysis. This project will conduct a study on successful pavement management programs to understand the state of the practice. Effective (yet simple) mathematical models will be developed to support pavement program planning practices. A spreadsheet-based computer program will be developed to serve as a decision-making support tool that facilitates the planning process.</p>							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Jeffrey South (Chair)							
<b>Meeting Dates / Minutes Available?</b>							
12/11/2007 / Yes							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
An advanced pavement program planning procedure based on life-cycle benefit-cost analysis.							
<b>Progress to Date:</b>							
<p>As of December 31, 2008, all tasks of the project have been completed. The revised final report and all deliverables were submitted to IDOT for review. The final report has not been edited and posted to the ICT website yet.</p> <p>As of March 31, 2009, we have not heard from IDOT regarding the revised final report (submitted Nov 2008). Hence, the final report has not been edited and posted to the ICT website yet.</p>							

Last Updated: 6/1/2009

<b>Project Title:</b> Simple Cost Effective Scour Sensor			<b>Last Edited:</b> 5/19/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-35					
<b>QPR Author Name:</b> Farhad Ansari			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (312) 996-2437	<b>% Project Completed:</b> 99				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Presentation to IDOT			8/1/2007	9/30/2007	C	-	-	-
<b>Task 2:</b> Literature Survey and Timelines			9/1/2007	9/30/2007	C	-	-	-
<b>Task 3:</b> Development & Fabrication of Small Scale Laboratory Sensor			10/1/2007	10/31/2007	C	-	-	-
<b>Task 4:</b> Laboratory Prototype Testing - Small Scale			11/1/2007	11/30/2007	C	-	-	-
<b>Task 5:</b> Literature search - vibration of rods in fluids			12/1/2007	12/31/2007	C	-	-	-
<b>Task 6:</b> Finite element modeling			1/1/2008	1/31/2008	C	-	-	-
<b>Task 7:</b> Small scale tests using larger rods (same tank)			2/1/2008	2/29/2008	C	-	-	-
<b>Task 8:</b> Development of field calibration curves using the finite element modeling results			3/1/2008	4/30/2008	C	-	-	-
<b>Task 9:</b> Finalization of field sensor and installation (work with IDOT)			5/1/2008	5/31/2008	C	-	-	-
<b>Task 10:</b> Field Monitoring & Final Report			6/1/2008	6/30/2008	I	I	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> Farhad Ansari			<b>Organization / Address</b>					
<b>Telephone:</b> (312) 996-2437			University of Illinois at Chicago					
<b>Email:</b> fansari@uic.edu			Civil & Materials Engineering 842 W. Taylor St. Chicago, IL 60607					
<b>Description of Research:</b>								
This research involved laboratory proof of concept tests, numerical modeling and software development, sensor fabrication and field testing.								
<b>Keywords:</b> Scour; sensor; fiber optic sensor; laboratory testing; field application								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								
<b>Short Title &amp; Date Reports Available:</b>								

**End User(s) and Result(s) Expected:**

A fiber optic scour sensor capable of monitoring and providing quantitative characteristics of both scour depth and flow processes, i.e. rate. The proposed fiber optic scour sensor will include a single Fiber Optic Bragg Grating (FBG) sensor embedded inside a rod cantilevered into the river bed. The sensor will allow for better monitoring of scour and therefore better bridge maintenance.

**Progress to Date:**

The sensor principle was verified through laboratory tests, and successful preliminary field tests were performed. The project is completed except for publishing a final report. A final report was drafted, but UIC's Office of Technology Management has requested that it not be released without additional editing.

A revised report from UIC is being reviewed and edited by ICT.

<b>Project Title:</b> Transfer and Development Length of Prestressing Tendons in Full-scale AASHTO Prestressed Concrete Girders using Self-Consolidating Concrete		<b>Last Edited:</b> 5/14/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-36					
<b>QPR Author Name:</b> Bassem Andrawes		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-244-4178	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review		7/1/2007	12/31/2007	C	C	-	-
<b>Task 2:</b> Document Previous Research Results		1/1/2008	3/31/2008	C	C	-	-
<b>Task 3:</b> Develop Recommendations and Guidelines		3/1/2008	6/30/2008	C	C	-	-
<b>Task 4:</b> Prepare and Finalize Report		4/1/2008	9/30/2008	I	I	C	-
<b>Principal Investigator:</b>							
<b>Name:</b> Bassem Andrawes				<b>Organization / Address</b>			
<b>Telephone:</b> 217-244-4178				UIUC			
<b>Email:</b> andrawes@illinois.edu							
<b>Description of Research:</b>							
Self-consolidating concrete (SCC) is the designation of a new innovative type of high performance concrete that does not have to be consolidated in order to fill up a form and to encase reinforcement. A limited amount of research has been completed on the structural performance of precast prestressed concrete girders in terms of transfer and development length in SCC. The primary objective of this project is to first identify research results on transfer and development lengths for prestressing tendons in SCC. Next, make recommendations on any necessary design changes.							
<b>Keywords:</b> Self-consolidating concrete, prestressed, precast, transfer length							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
Recommendations for any necessary design changes.							
<b>Progress to Date:</b>							
The project is complete and the final report was submitted to ICT for final revisions and posting. The report was finalized and posted to the ICT website (Publications Page) in March 2009.							

<b>Project Title:</b> Impact of High RAP Content on Pavement Structural Performance			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-37					
<b>QPR Author Name:</b> Prof. Samuel H. Carpenter			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-4188	<b>% Project Completed:</b> 20				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review and Mixture Selection			7/1/2008	3/31/2009	I	I	I	-
<b>Task 2:</b> Develop Experimental Program/ Work plan			10/1/2008	3/31/2009	-	I	C	-
<b>Task 3:</b> Conduct the Experimental Program			3/1/2009	6/30/2010	-	-	I	-
<b>Task 4:</b> Data Analysis			3/1/2010	9/30/2010	-	-	-	-
<b>Task 5:</b> Prepare and Finalize Report			9/1/2010	12/31/2010	-	-	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> Prof. Samuel H. Carpenter			<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-4188			University of Illinois					
<b>Email:</b> scarpent@illinois.edu			205 N Mathews MC-250 Urbana, IL 61801					
<b>Co-Investigator:</b>								
<b>Name:</b> Prof. Imad Al-Qadi			<b>Organization / Address</b>					
<b>Telephone:</b> 217-893-0705 x222			University of Illinois					
<b>Email:</b> AlQadi@illinois.edu								
<b>Description of Research:</b>								
Agencies in Illinois are attempting to use up to 50% RAP in HMA to realize an economic savings. Any structural behavior and durability differences from a standard Illinois Department of Transportation (IDOT) HMA resulting from the recycling operation have not been addressed. The performance properties of high RAP mixtures need to be investigated for their impact on pavement performance characteristics (McDaniel NCHRP 9-21 Report) and these will be investigated in this study through modulus, fatigue, stripping, wheel tracking and low temperature testing.								
<b>Keywords:</b> Hotmix asphalt (HMA), Reclaimed Asphalt Pavement (RAP), High RAP content, fatigue, dynamic modulus								
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<b>Meeting Dates / Minutes Available?</b>								

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Literature review, final report with recommendations on RAP percentages and performance changes, and level of blending.

**Progress to Date:**

Task 1. Literature Review and Mixture Selection - Preliminary literature review has been completed and updated. It is in internal review and will be submitted early in May.

Task 2. Develop Experimental Work Plan - The material previously acquired for the District 1 was found to be contaminated due to which further work on that material has been stopped. The new RAP has been identified by District 1, and when it is obtained it will be sent to IDOT for extraction and gradation. The district-1 virgin material has been identified and will be delivered with the RAP. Binder grade PG 64-22 has been acquired from Emulsicoat. Grade confirmation tests are being carried out to confirm the PG grade of a binder (PG58-22) obtained from Emulsicoat. Once the binder's grade is confirmed, the binder will be acquired from them.

Task 3. Conduct Experimental Work Plan - Nothing has been done on this

Task 4. Data Analysis - Nothing has been done on this

Task 5. Prepare Final Report - Nothing has been done on this.

<b>Project Title:</b> Development of an Improved Specification for Maximum Plastic Concrete Temperatures		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-38					
<b>QPR Author Name:</b> J. Popovics		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217 244 0843	<b>% Project Completed:</b> 58			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Carry out a comprehensive literature review of practice in other states to determine temperature specifications in use and best practices with regard to hot weather concreting		10/1/2007	1/31/2008	-	-	-	-
<b>Task 2:</b> Carry out a comprehensive literature review of pertinent research on the effects of high plastic concrete temperature on performance and properties of concrete		11/1/2007	2/1/2008	-	-	-	-
<b>Task 3:</b> Assess the performance of concrete placed at higher temperatures through interviews of field personnel		6/1/2008	5/31/2009	-	-	I	-
<b>Task 4:</b> As needed by the findings of tasks 1 and 2, carry out laboratory tests to examine particular effects of high plastic concrete temperature on performance and properties of concrete		3/1/2008	6/30/2009	-	-	I	-
<b>Task 5:</b> Recommend improved specification, procedures and practical considerations to assure quality of concrete placed at higher temperatures		5/1/2009	4/30/2010	-	-	-	-
<b>Task 6:</b> Final Report and Training/Implementation		4/1/2010	6/1/2010	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> J. Popovics				<b>Organization / Address</b>			
<b>Telephone:</b> 217 244 0843				University of Illinois			
<b>Email:</b> johnpop@illinois.edu				205 N. Mathews MC-250 Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> J. Roesler				<b>Organization / Address</b>			
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<b>Description of Research:</b>							
The main objective in this project is to develop improved specifications and procedures with regard to monitoring and maintaining plastic concrete temperatures to assure near and long-term concrete quality in the State of Illinois. An additional objective is to develop a better understanding of the effects of higher temperatures on fresh and hardened concrete properties overall, and to document this improved understanding.							
<b>Keywords:</b> concrete, high temperature, cracking							
<b>Technical Review Panel:</b>							
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**Meeting Dates / Minutes Available?**

06/05/2008 / No

11/13/2008 / No

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Improved specifications and procedures with regard to monitoring and maintaining plastic concrete temperatures to assure near and long-term concrete quality in the State of Illinois.

**Progress to Date:**

The main task completed this quarter was the extracted field specimens from 3 project locations were prepared for the resonance and boil tests and then the specimens were subsequently tested (ASTM C215 and C642). A summary of the tests and the results will be submitted to IDOT in the second quarter of 2009. Embedded sensors for maturity and infrared cameras were investigated for possible future applications in field projects to assess plastic temperature monitoring. Literature was also reviewed regarding the ring test and effect of higher placement temperatures.

<b>Project Title:</b> Context Sensitive Solutions Online Training Course Development		<b>Last Edited:</b> 5/20/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-39					
<b>QPR Author Name:</b> Prof. James Hall		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-206-7860	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> CSS Online Training Needs Assessment		2/1/2008	6/30/2008	C	-	-	-
<b>Task 2:</b> CSS Tutorial Content Acquisition and Course Development		2/1/2008	6/30/2008	C	-	-	-
<b>Task 3:</b> Webinar Deployment		4/1/2008	6/30/2008	I	C	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. James Hall		<b>Organization / Address</b>					
<b>Telephone:</b> 217-206-7860		UIS					
<b>Email:</b> jhall1@uis.edu		Univ. of IL at Springfield One University Plaza, MS UHB 4021 Springfield, IL 62703-5407					
<b>Description of Research:</b>							
The objective of this research is to develop an internet-based tutorial training course to provide information on Context Sensitive Solutions (CSS) policies and procedures to affected citizens, elected officials, local agencies, interest groups, and other stakeholders of the Illinois Department of Transportation (IDOT).							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
1/30/2008 / Yes							
6/19/2008 / Yes							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
Develop an internet-based tutorial training course to provide information on CSS policies and procedures to affected citizens, elected officials, local agencies, interest groups, and other stakeholders of IDOT.							

**Progress to Date:**

During July 2008, the project team, in conjunction with the Technical Review Panel, finalized the website design, streaming PowerPoint presentations with audio, video interviews and the Frequently Asked Questions segment. This completed Task 2.

For Task 3, Webinar Deployment, the CSS Online Webinar was deployed by IDOT in October 2008. The website link is:

<http://www.dot.state.il.us/css/training/index.html>

In November 2008 and February 2009, a draft Final Report was submitted for review by IDOT and ICT.

The Final Report was submitted to IDOT and ICT in March 2009 and published to the ICT website under publications.

<b>Project Title:</b> Safety Impacts of Highway Shoulder Attributes in Illinois			<b>Last Edited:</b> 5/21/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-40					
<b>QPR Author Name:</b> Zongzhi Li			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (312)567-3556	<b>% Project Completed:</b> 40				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Information Search: 1a) Literature Review; 1b) Questionnaire Surveys			1/1/2008	6/30/2008	C	-	-	-
<b>Task 2:</b> Data Collection			4/1/2008	12/31/2008	I	I	C	-
<b>Task 3:</b> Preliminary Data Analysis			10/1/2008	12/31/2008	-	I	C	-
<b>Task 4:</b> Empirical Bayesian Before-After Evaluation of the Shoulder Paving Effect			1/1/2009	6/30/2009	-	-	I	-
<b>Task 5:</b> Cross-Sectional After Period Evaluation the Shoulder Paving Effect			1/1/2009	6/30/2009	-	-	I	-
<b>Task 6:</b> Identification and Mapping of the Potential for Safety Improvements for Highway Segments			7/1/2009	9/30/2009	-	-	-	-
<b>Task 7:</b> Ranking and Prioritization of Highway Segments for Shoulder Paving			7/1/2009	9/30/2009	-	-	-	-
<b>Task 8:</b> Report Preparation and Submission			10/1/2009	12/31/2009	-	-	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> Zongzhi Li			<b>Organization / Address</b>					
<b>Telephone:</b> (312)567-3556			IIT					
<b>Email:</b> lizz@iit.edu			3201 South Dearborn Street, Chicago, IL 60616					
<b>Description of Research:</b>								
This research will primarily involve information search, data collection, preliminary data analysis, empirical Bayesian before-after evaluation of the shoulder treatment effect, cross-sectional after period evaluation the shoulder treatment effect, identification and mapping of high potential for safety improvements for highway segments, ranking and prioritization of highway segments for shoulder paving, and report preparation.								
<b>Keywords:</b> Safety impacts; pavement; shoulder attributes								
<b>Technical Review Panel:</b>								
<b>Members</b>			<b>Telephone</b>			<b>Email Address</b>		
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<b>Meeting Dates / Minutes Available?</b>								
05/01/2008 / Yes								
10/01/2008 / Yes								
3/23/2009 / No								

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The study will result in a better understanding of crashes and safety performance which occur in the presence/absence of paved shoulders as well as safety performance involving various widths of paved shoulders. A set of shoulder-related SPFs for two-lane and multilane rural roads will be developed for use to identify roadway segments with shoulder performance concerns and AMFs for use in predicting a benefit-cost relationship for proposed shoulder paving improvements. The findings will allow IDOT to update current guidelines and practices, identify critical shoulder improvement locations, assess the magnitude of the problems, and determine the most effective method for analysis.

**Progress to Date:**

The proposed project duration is January 2008 to December 2009. Even though the contract of this project was just signed in late March 2008, the IIT research team has mobilized as early as February 2008 to embark on the proposed research task in this quarter. During this quarter, the proposed research is concentrated on Task 2: Data Collection and Task 3: Preliminary Data Analysis.

- Task 2: Data Collection. This task aims to collect data on crashes by severity and type; available roadway geometrics; shoulder type and width; roadside features; traffic volume; and pavement resurfacing projects with and without shoulder paving for rural two-lane and multilane highways maintained by the Illinois DOT. So far we have obtained relevant data from the IDOT for period 2001-2006 and this task was completed.

- Task 3: Preliminary Data Analysis. Data analysis will be conducted to establish i) the characteristics of pavement shoulder attributes for rural two-lane and multilane highways in aspects of presence/absence and width of paved shoulders; ii) appropriate referencing groups considering shoulder presence, type, and any other critical factors (roadside condition, or others); iii) the frequency and characteristics of pavement shoulder related crashes; and iv) correlation of such crashes to pavement shoulder characteristics. A preliminary data analysis report was prepared at the end of this quarter and this task was completed.

The research in the next quarter will focus on Task 4: Empirical Bayesian Before-After Evaluation of the Shoulder Treatment Effect. The EB-based approach will be used to perform before-after comparison of vehicle crashes on a number of two-lane and multilane highway sites, classified as treated sites with pavement resurfaced with and without shoulder paving and comparable referencing sites not resurfaced. Appropriate before and after treatment periods will be established. Safety performance functions (SPFs) will be separately calibrated for rural two-lane highways with no paved shoulders, narrow paved shoulders, medium-width paved shoulders, and wide paved shoulders; multilane rural non-Interstate highways with narrow, medium-width, and wide paved shoulders, and multilane rural Interstate highways with narrow, medium-width, and wide paved shoulders. Correspondingly, Accident Modification Factors (AMFs) for resurfaced pavements with and without shoulder paving as the effectiveness of shoulder paving associated with rural two-lane and multilane highways will be developed, respectively.

<b>Project Title:</b> Performance of I-57 Recycled Concrete Pavement		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-41					
<b>QPR Author Name:</b> Prof. Jeffery R. Roesler		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-0218	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review		1/1/2008	6/30/2008	C	-	-	-
<b>Task 2:</b> Structural Evaluation of I-57 CRC Pavement		3/1/2008	6/30/2008	C	-	-	-
<b>Task 3:</b> Functional Evaluation of I-57 CRC Pavement		3/1/2008	6/30/2008	C	-	-	-
<b>Task 4:</b> Field Data Collection		4/1/2008	6/30/2008	C	-	-	-
<b>Task 5:</b> Final Report		2/1/2008	12/31/2008	-	C	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Jeffery R. Roesler			<b>Organization / Address</b>				
<b>Telephone:</b> 217-265-0218			University of Illinois				
<b>Email:</b> jroesler@illinois.edu			205 N. Mathews Ave., Urbana, IL 61801				
<b>Description of Research:</b>							
The research objectives are to summarize and document the twenty-year structural and functional performance of the I-57 CRCP inlay that utilized recycled concrete as the primary coarse and fine aggregates. The performance of the CRCP inlay will also be compared with the performance of similarly aged and trafficked CRCP in the state of the Illinois.							
<b>Keywords:</b> Recycled Concrete Aggregate (RCA), Continuously Reinforced Concrete Pavement (CRCP)							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>							
02/07/2008 / Yes							
07/28/2008 / Yes							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							

IDOT, consultants

**Progress to Date:**

A revised draft final report was submitted to IDOT in October which included the petrographic results from Michigan Tech. The IDOT TRP again reviewed the report and provided feedback to the PI. The report was finalized and posted to the ICT website (Publications Page) in January 2009.

<b>Project Title:</b> Thin Quiet Long-Lasting High Friction Surface Layer			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-42					
<b>QPR Author Name:</b> Prof. Imad Al-Qadi			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-0427	<b>% Project Completed:</b> 25				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review			7/1/2008	12/31/2008	C	C	-	-
<b>Task 2:</b> Field Data Survey and Analysis			10/1/2008	6/30/2009	-	I	I	-
<b>Task 3:</b> Laboratory Experiment Program			4/1/2009	3/31/2010	-	-	-	-
<b>Task 4:</b> Field Testing			1/1/2010	3/31/2011	-	-	-	-
<b>Task 5:</b> Engineering Benefit Analysis			10/1/2011	6/30/2011	-	-	-	-
<b>Task 6:</b> Final Report			4/11/2008	6/30/2011	-	-	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> Prof. Imad Al-Qadi			<b>Organization / Address</b>					
<b>Telephone:</b> 217-265-0427			University of Illinois at Urbana-Champaign					
<b>Email:</b> alqadi@uiuc.edu								
<b>Co-Investigator:</b>								
<b>Name:</b> Prof. Sam Carpenter			<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-4187			University of Illinois at Urbana-Champaign					
<b>Email:</b> scarpent@uiuc.edu								
<b>Description of Research:</b>								
The aim of this study is to develop a cost effective mix for a new generation of wearing surface/ overlay cross-section used in Illinois. The new developed surface mix is to be designed for better performance that possesses good durability, good friction, and low noise features.								
<b>Keywords:</b> surface layer, raveling, friction, quiet pavement								
<b>Technical Review Panel:</b>								
<b>Members</b>			<b>Telephone</b>			<b>Email Address</b>		
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<b>Meeting Dates / Minutes Available?</b>								
8/12/2008 / Yes								
11/7/2008 / Yes								

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

A wearing surface mix design which is durable and provides sufficient friction and possibly low noise.

**Progress to Date:**

TASK 1- Literature Review  
This task has been completed.

TASK 2- Field Data Survey and Analysis  
This task is on schedule.

The survey of aggregate usage and cost in Illinois is being conducted.

- The aggregate cost information has been updated.
- The information on the recycled materials is being collected: RAP, Steel Slag, Air-Cooled Blast Furnace Slag and Recycled Concrete Material

Twelve candidate surface mixture types have been identified and the information on the following candidate mixes are being collected:

- Stone Mastic Asphalt (SMA)
- Dense-Graded HMA
- HMA with Trap Rock
- Sprinkle Treatment
- HMA with RAP
- HMA with Steel Slag
- HMA with Air-Cooled Blast Furnace Slag
- HMA with Recycled Concrete Material
- Rubberized Asphalt Concrete (RAC-Gap Graded)
- Fiber Reinforced HMA (with Steel Slag)
- Fiber Reinforced WMA (with Steel Slag)
- Fine Dense-Graded HMA

<b>Project Title:</b> Utah LTAP GIS Software Conversion and Training for IL Use		<b>Last Edited:</b> 6/8/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-43					
<b>QPR Author Name:</b> Y. Ouyang		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-9858	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Make necessary minor modifications to existing modules		11/1/2007	6/30/2008	C	-	-	-
<b>Task 2:</b> Provide Software to IL Local Agencies		11/1/2007	12/31/2008	I	I	C	-
<b>Task 3:</b> Develop a roadside hardware module		3/1/2008	9/30/2008	I	I	C	-
<b>Task 4:</b> Develop a training plan		3/1/2008	12/31/2008	I	I	C	-
<b>Principal Investigator:</b>							
<b>Name:</b> Y. Ouyang		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-9858		UIUC					
<b>Email:</b> yfouyang@uiuc.edu		UIUC Dept. of Civil & Environmental Engineering					
<b>Description of Research:</b>							
<p>The federal government is currently finalizing rulemaking that will add minimum nighttime retro-reflectivity requirements to the Manual on Uniform Traffic Control Devices (MUTCD). Utah LTAP Center has created extensive infrastructure management GIS software for use by local agencies in Utah. Several of the modules are suitable for IL use immediately, while some enhancements are needed. The IL Center for Transportation would work with UT LTAP staff to make necessary minor modifications to existing modules, develop a roadside hardware module, and develop a training plan.</p>							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Kevin Burke III (Chair)		217-785-5048		kevin.burkeIII@illinois.gov			
<b>Meeting Dates / Minutes Available?</b>							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
Necessary minor modifications to existing modules, a roadside hardware module, and a training plan.							
<b>Progress to Date:</b>							
This project has been completed. The final deliverable for the project was the software, and that was completed in January 2009. There will not be a report.							

Last Updated: 6/8/2009

<b>Project Title:</b> Travel Demand Modeling for Small & Medium Size MPOs in Illinois		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-48					
<b>QPR Author Name:</b> Rita Morocoima-Black		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-328-3313	<b>% Project Completed:</b> 5			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review Part I		1/1/2009	3/31/2009	-	-	I	-
<b>Task 2:</b> Identify MPOs		3/1/2009	5/30/2009	-	-	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Rita Morocoima-Black		<b>Organization / Address</b>					
<b>Telephone:</b> 217-328-3313		Champaign Urbana Urbanized Area Transportation Study (CUUATS)					
<b>Email:</b> rmorocoi@ccrpc.org		Champaign Co. Regional Planning Commission (CCRPC), 1776 E. Washington St. Urbana, IL. 61802					
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Paul Metaxatos		<b>Organization / Address</b>					
<b>Telephone:</b> 312-996-4713		Urban Transportation Center, UIC, 412 S. Peoria St., Suite 340, Chicago, IL 60607					
<b>Email:</b> pavlos@uic.edu							
<b>Description of Research:</b>							
This research will establish the framework necessary for the development, maintenance, and application of small and medium size Metropolitan Planning Organization (MPO) urban travel demand models in several communities in Illinois, which will constitute the foundation for a statewide travel demand model. These models will help small and medium size communities assess transportation system performance, analyze deficiencies, and develop long range plans.							
<b>Keywords:</b> Travel demand model, MPO, transportation planning							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>							
01/26/09 / No							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
The expected outcomes of this research are:							
1. A common framework for the development and implementation of travel demand models in small and medium size MPOs in Illinois.							
2. A set of urban travel demand models and analytical background data that would form the foundation of a Statewide Travel Demand Model for the State of Illinois.							
3. Enhanced traffic forecasting factors based on region-level analysis of population, business growth, land-use, and traffic volumes.							
4. A better understanding for IDOT of travel patterns within the urban areas and their relationships with state roads, which would lead to improved highway planning, and ultimately to a highway network better suited for Illinois's economic future.							
The outcomes of this research will help small and medium size MPOs in Illinois to develop, maintain and apply travel demand modeling on a regular basis in their planning efforts. The framework created will help MPOs to update and maintain their model with minimal resources.							

**Progress to Date:**

## Task One: Literature Review Part I:

CUUATS staff is reviewing available literature resources and doing research on statewide and regional travel demand modeling; as well as issues, benefits and applications of travel demand modeling specific to small and medium sized MPOs.

Deliverable #1: CUUATS staff is preparing a report of the literature review that will submit it to the study Technical Review Panel (TRP). This report is 'Deliverable 1' of the project deliverables.

## Task 2: Identify MPOs:

CUUATS staff has identified eleven small and medium sized MPOs in Illinois that will benefit from being actively involved in this study. Each MPO was contacted and a survey was distributed to each of them to investigate their current modeling processes, needs and benefits.

A survey questionnaire for the eleven small and medium sized MPOs in the State of Illinois was developed, to collect information about the existing and planned resources available for travel forecasting. The draft of this survey was submitted to the Technical Review Panel for review and comments. On February 18th, the survey was distributed using survey monkey to the eleven (11) small and medium sized MPOs in Illinois. A summary of the responses received was prepared.

CUUATS staff is scheduling interviews with representatives from the eleven MPOs to investigate further processes used by them for transportation planning needs and also to identify required functionalities of the travel demand model by each MPO based on the characteristics of their Region and their needs.

<b>Project Title:</b> Documentation of Contract Quantities Training		<b>Last Edited:</b> 5/30/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-49					
<b>QPR Author Name:</b> Prof. Imad Al-Qadi		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-893-0705	<b>% Project Completed:</b> 78			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Update class materials, documentation manual, power point presentation, tests, and retests		6/1/2008	8/31/2008	C	C	C	-
<b>Task 2:</b> Rewrite IDOT website for Documentation of Contract Quantities class for use on ICT website and periodically refresh		6/1/2008	6/30/2009	I	I	I	-
<b>Task 3:</b> Schedule classes, instructors, retest dates and locations, catering orders for each location, and hotel reservations.		7/1/2008	5/31/2009	I	I	I	-
<b>Task 4:</b> Prepare budgets for this project and consultant instructors		7/1/2008	9/30/2008	C	C	C	-
<b>Task 5:</b> Learn how to input in the database, suggest updates and test the corrections made to the database		6/1/2008	5/31/2009	I	I	I	-
<b>Task 6:</b> Give retests, teach classes, and grade tests		10/1/2008	6/30/2009	-	I	I	-
<b>Task 7:</b> Monitor website for registration and training needs and input all data in ICT database		9/1/2008	6/30/2009	I	I	I	-
<b>Task 8:</b> Attend the fall, winter, spring and IDOT Documentation meetings		9/1/2008	4/30/2009	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Imad Al-Qadi				<b>Organization / Address</b>			
<b>Telephone:</b> 217-893-0705				UIUC, CEE, ICT			
<b>Email:</b> alqadi@illinois.edu				ICT at ATREL Rantoul, IL 61866			
<b>Description of Research:</b>							
The focus of this project is a training course for Consultant, State, and Local Agency personnel for IDOT Documentation of Contract Quantities. The 3 day training class and test is required for certification to perform duties on a Phase III construction job for IDOT, Tollway, and CDOT contracts. The project requires monitoring the ICT database for registration and certification and ICT website updates. This program will be responsible for class material, powerpoint presentation, test and source documents upgrades to adhere to the Specifications.							
<b>Keywords:</b> Training, database, website, class schedule, accurate forms and documents, Power Point presentation and budge							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>							
5/2/2008 / Yes							

6/6/2008 / Yes  
6/26/2008 / Yes  
9/2/2008 / Yes  
10/20/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Well-trained, prequalified consultants to perform construction inspection in Illinois.

**Progress to Date:**

1. All training classes are scheduled with locations and instructors.
2. All the class materials, tests, and retests are printed and being used for the classes.
3. The ICT website for training is up and running with registration occurring online.
4. As of March 31, the OJC consultants were ready to give Mary Fries access to the Documentation Training database from a remote site via the Internet. User training was provided by OJC in late March. Additional database improvements are planned during the next few months.
5. Pending registrations, confirmation letters, test score inputs are up to date for classes and retests and will be monitored bi-weekly.
6. Answering all phone calls and emails on registration problems and database errors.
7. A meeting with Documentation Training instructors was held in September 2008.

<b>Project Title:</b> Trip Chaining Behavior of Senior Travelers & Applications to Public Transportation Planning		<b>Last Edited:</b> 5/7/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-50					
<b>QPR Author Name:</b> Prof. Kouros Mohammadian		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 312-996-9840	<b>% Project Completed:</b> 20			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Survey Tool Development and Implementation of Training Program		8/16/2008	1/31/2009	I	I	C	-
<b>Task 2:</b> Participant Recruitment		2/1/2009	8/30/2009	-	-	I	-
<b>Task 3:</b> Survey Implementation		3/27/2009	9/30/2009	-	-	I	-
<b>Task 4:</b> Data Analysis		9/1/2009	11/30/2009	-	-	-	-
<b>Task 5:</b> Dissemination of Findings		11/1/2009	12/31/2009	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Kouros Mohammadian				<b>Organization / Address</b>			
<b>Telephone:</b> 312-996-9840				University of Illinois at Chicago			
<b>Email:</b> kouros@uic.edu				842 W Taylor St., Chicago, IL 60607-7023			
<b>Description of Research:</b>							
The main objective of this study is to conduct a survey of travel/activity scheduling behavior of senior citizens in Chicago region to better understand their trip chaining behavior. We will utilize GPS-based trajectories of seniors' travel patterns and trip chaining behavior followed by an activity/travel prompted recall interview with the goal to understand their underlying travel/activity scheduling process.							
<b>Keywords:</b> Seniors, Transit, GPS Survey, Prompted Recall							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Chuck Abraham (Chair)		312-793-3510		Charles.Abraham@illinois.gov			
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<b>Meeting Dates / Minutes Available?</b>							
2/20/2009 / Yes							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
The results can be used to plan more efficient transit services targeting senior travelers and to change their attitude toward public transportation. The study findings will also help transportation and transit agencies to further promote effective transportation solutions for an aging population.							
<b>Progress to Date:</b>							
Task 1: Survey Tool Development and Implementation of Training Program							
Survey tool and its website is developed (www.utrac.com). Survey protocol document and survey manual are also prepared. There were needed for IRB approval of the survey by the institutional review board. The IRB approval was obtained in late December 2008. Three undergraduate research assistants were recruited and trained.							

Task 2: Participant Recruitment

In the first wave of the survey, 60 recruitment packages were mailed to potential participants. Follow-up phone calls were scheduled and as a result five households agreed to participate in the survey.

Task 3: Survey Implementation

The first recruited household started a two-week long GPS prompted recall survey in late March 2009.

<b>Project Title:</b> Guidelines, Site Selection, and Design for Implementing Truck Parking/Rest Facilities in Chicago's South Suburbs			<b>Last Edited:</b> 5/13/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-51					
<b>QPR Author Name:</b> Peter Beltemacchi			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 312-567-3261	<b>% Project Completed:</b> 20				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Coordination of Ongoing Work			12/1/2008	12/1/2009	-	-	I	-
<b>Task 2:</b> Develop Trucker's Guidance			1/1/2009	9/1/2009	-	-	I	-
<b>Task 3:</b> Develop Policy Guidance			1/1/2009	9/1/2009	-	-	I	-
<b>Task 4:</b> Develop Design Guidance			1/1/2009	11/1/2009	-	-	I	-
<b>Task 5:</b> Develop Site Guidance			1/1/2009	11/1/2009	-	-	I	-
<b>Task 6:</b> Prepare & Finalize Reports			9/1/2009	12/1/2009	-	-	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> Peter Beltemacchi			<b>Organization / Address</b>					
<b>Telephone:</b> 312-567-3261			College of Architecture IIT					
<b>Email:</b> Beltemacchi@iit.edu			Illinois Institute of Technology Chicago IL 60616					
<b>Co-Investigator:</b>								
<b>Name:</b> Laurence Rohter, P.E.			<b>Organization / Address</b>					
<b>Telephone:</b> 708-442-6163			Civil Engineering IIT					
<b>Email:</b> rohter@iit.edu								
<b>Description of Research:</b>								
For this study, the research team will develop a brochure and ancillary electronic information that will help truckers safely and efficiently navigate south suburban freight corridors. This information would include truck parking and rest facility locations, truck route maps, restricted route maps, and emergency information. This information can help make the south suburbs a choice destination to rest, refuel, and pass through, especially since it is 10-11 hours away from many major cities, such as Pittsburgh; Charleston, West Virginia; Memphis, and Sioux Falls. This choice will be further enhanced with a major proposed interchange at I-57 and I-294.								
<b>Keywords:</b> truck, parking, design guide, engineering, handbook, brownfields, delivery, Interstate 80								
<b>Technical Review Panel:</b>								
<b>Members</b>			<b>Telephone</b>			<b>Email Address</b>		
Chuck Abraham (Chair)			312-793-3510			Charles.Abraham@illinois.gov		
Patty Broers			217-782-3547			Patricia.Broers@illinois.gov		
<b>Meeting Dates / Minutes Available?</b>								
2/09 / Yes								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								

The research team will review existing policies and rules that negatively affect the trucking support industry in the south suburbs and examine ways of eliminating or modifying them. This effort may ultimately help encourage trucking-dependent and manufacturing industries to stay, expand, or relocate to this area.

Besides examining the negative impacts of some rules and policies, the research team will also create a guide for developing environmentally-friendly and energy-efficient truck parking facilities as well as identify and design several truck parking facilities.

**Progress to Date:**

The Illinois Center for Transportation gave the research team notice to proceed in mid-November; with a start date of November 1, 2008. The first month of this study was dedicated to developing staff resources and coordinating with the South Suburban Mayors and Managers' Association, which represents 42 municipalities in the study area. The research team determined that a trial project would be useful and chose to investigate potential truck parking at the World Music Center in Tinley Park, after discussion with one of the study's consultants.

FOR Quarter Jan-Mar2009; The ratification of the formal sites has been completed and work has begun on a descriptive website. The local tourism board has been contacted and is in support. Next is to implement the sample website and provide in/outreach.

The potential RTA sites were reviewed and a baseline weighting criteria applied. Of the four highest ranked sites a "AA" rating went to the "PACE Homewood Park-N\_Ride" site after discussion with the Real Estate Consultant. A "C" rating was given to the "METRA RI Lenox Station". The methodology might be improved by using the COD Selector Tool developed for similar situations by CNT. This is being pursued for inclusion.

Pavement design and environmental improvements were researched in this quarter.

Good progress has been made and summer efforts should be strong and very productive with effective follow ons.

<b>Project Title:</b> Studying & Minimizing Traffic Related Work Zone Crashes in Illinois			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-52					
<b>QPR Author Name:</b> K. El Rayes			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (217) 265-0557	<b>% Project Completed:</b> 25				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Conduct Literature Review and Site Visits			9/16/2008	3/16/2009	I	I	C	-
<b>Task 2:</b> Gather and Analyze Data and Reports on Work Zone Crashes in Illinois			12/3/2008	7/30/2009	-	I	I	-
<b>Task 3:</b> Develop Recommendations to Improve Work Zone Layouts and Merge Techniques			11/2/2009	3/15/2010	-	-	-	-
<b>Task 4:</b> Conduct Field Evaluations of Temporary/Portable Rumble Strips			6/30/2009	10/30/2009	-	-	-	-
<b>Task 5:</b> Make Final Recommendations			3/15/2010	7/15/2010	-	-	-	-
<b>Principal Investigator:</b>								
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<b>Description of Research:</b>								
This research project plans to study and answer a number of important and challenging research questions, including: (1) What are the probable causes of work zone crashes in Illinois? (2) What are the probable work zone layout factors, if any, that contribute to an increase in traffic-related crashes? (3) How can work zone layouts and merge techniques be improved to minimize and control the probable causes of work zone crashes in Illinois? (4) How practical is the proposed ICHSP strategy of adding temporary rumble strips within and prior to work zones and how effective is it in enhancing work zone safety?								
<b>Keywords:</b>								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The expected outcomes of this project are (1) comprehensive literature review and site visits report; (2) comprehensive analysis of work zone crashes in Illinois; (3) recommendations for improving work zone layouts and merge techniques; (4) evaluation of the practicality and effectiveness of temporary rumble strips; and (5) final recommendations to improve IDOT traffic control standards and specifications.

**Progress to Date:**

The project started on September 16, 2008.

As of March 31, 2009, the research team completed the first task of literature review and submitted the first progress report outlining the main findings of this task on March 16, 2009. This report presented a comprehensive review of current practices and recent research studies on: (1) effective work zone layout and strategies; (2) temporary traffic control devices and transportation management plans for work zone areas; (3) merge techniques and queue detection systems for construction areas; (4) relevant and recent Federal and US DOTs rules on work zone safety and mobility; (5) methods and factors for analyzing work zone crash data to determine work zone crash characteristics and contributing factors; (6) statistical methods for analyzing both work zone crashes and roadway crashes; and (7) temporary rumble strips and their characteristics and possible deployment locations.

The research team is currently working on the second task of gathering and analyzing data and reports on work zone crashes in Illinois.

<b>Project Title:</b> Storm Water Pollution, Erosion & Sediment Control Products Demonstration & Training Center		<b>Last Edited:</b> 5/28/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-54					
<b>QPR Author Name:</b> Prasanta Kalita		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-0945	<b>% Project Completed:</b> 5			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Earth work construction		4/30/2009	6/30/2009	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prasanta Kalita		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-0945		UIUC Agricultural & Biological Engineering					
<b>Email:</b> pkalita@illinois.edu		1304 W. Pennsylvania Urbana, IL 61801					
<b>Co-Investigator:</b>							
<b>Name:</b> Richard A.C. Cooke		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-0944		UIUC Agricultural & Biological Engineering					
<b>Email:</b> RCooke@illinois.edu							
<b>Description of Research:</b>							
Centrally located Urbana-Champaign is easily accessible from all parts of Illinois through major highways. University of Illinois is ideal for establishing this center immediately and with future expansion potential. Furthermore, the proximity of the proposed site to Advanced Transportation Research and Engineering Laboratory (ATREL) provides a unique opportunity to promote interaction and joint training at reduced costs. For example, if research is required to access interactions between SWM BMPs and pavement practices this proximity would allow for collaboration. Additionally, the University of Illinois is partnering with the Construction Engineering Research Laboratory (CERL) of the US Department of Army for developing the training center.							
<b>Keywords:</b> Storm water, sediment control, best management practices, education, training							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>							
12/11/2008 / No							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
There are a multitude of anticipated outcomes that could generate from this proposal. First, we will develop a state-of-the art research, demonstration, and training center. Second, we will utilize this facility to evaluate the performance of IDOT identified storm water management and erosion control BMPs. Third, we will use evaluation study results to recommend improved BMP practices and installation guidelines. Fourth, we will provide IDOT with staff training in a timely and cost effective manner. Fifth, the research and training resulting from the proposed facility will help reduce IDOT construction and maintenance costs.							
<b>Progress to Date:</b>							
A series of meetings have been conducted with the IDOT Technical Review Panel members lead by Mr. Tom Ripka. These meetings helps all parties to mutually agree on various structures need to constructed at the University of Illinois demonstration facility. The construction site has been identified and earth work construction work is ready to begin. Two educational modules have been prepared and the drafts are under review at present. The preliminary irrigation system has been designed and is under review at present.							

<b>Project Title:</b> Instrumentation & Monitoring of Extreme Integral Abutment Bridges in Illinois		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-55					
<b>QPR Author Name:</b> Scott M. Olson		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-7584	<b>% Project Completed:</b> 10			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Finalize construction and monitoring plan for IABs		8/16/2008	10/16/2008	I	C	-	-
<b>Task 2:</b> Select three 'extreme' IABs for instrumentation		10/16/2008	11/16/2008	I	I	I	-
<b>Task 3:</b> Install and monitor instrumentation		11/16/2008	3/16/2011	I	I	I	-
<b>Task 4:</b> Compare monitoring program data to Project R27-25 numerical results		3/16/2011	7/16/2011	-	-	-	-
<b>Task 5:</b> Submit final project report		7/16/2011	8/15/2011	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Scott M. Olson				<b>Organization / Address</b>			
<b>Telephone:</b> 217-265-7584				University of Illinois			
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<b>Co-Investigator:</b>							
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<b>Description of Research:</b>							
<p>The primary objectives of this project are to: (1) evaluate and select candidate integral abutment bridges in at least one IDOT district that are "extreme" (i.e., exceed current usage limitations for IABs) in terms of span length or bridge skew; (2) modify construction documents and schedules to implement instrumentation plans developed in Project R27-25; (3) procure and install the required instruments and data acquisition systems at the selected bridges; and (4) monitor and interpret the instrument measurements. We will also develop a structure to facilitate long-term (on the order of 10 or more years) monitoring of the selected bridges.</p>							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Anticipated end users are IDOT Headquarters Bridge Division, Districts, Local Agencies, and consultants to IDOT, as well as potentially improving design and construction in other states. The result should include revising the Bridge Manual to expand the use of integral abutment bridges, improve design methods and construction procedures, and verify performance of these structures.

**Progress to Date:**

Progress through 9/30/2008

1. Selected first IAB for instrumentation (IL Route 108 over Macoupin Creek located 1.8 miles east of IL Route 4 east of Carlinville).
2. Developed instrumentation plan for first IAB in concert with IDOT engineers.
3. Held kick-off meeting with contractor, IDOT, and University of Illinois personnel to discuss instrumentation plans.

Progress through 12/31/2008

1. Contracted with URS Corporation to review instrumentation plan, assist with field installation of instruments, and to install and set-up data acquisition system.
2. Identifying second IAB for instrumentation.
3. Contacted manufacturer for procuring instruments.

Progress through 3/31/2009

1. Identified first two integral abutment bridges for instrumentation. In the process of identifying third bridge.
2. Observed Stage 1 pile driving at first bridge (IL 108 over Macoupin Creek). Reference piles were driving at this time. Contractor will contact project team to deliver production piles that will be instrumented.
3. Visited second bridge (Airport Rd. over UPRR and Kickapoo Creek in Peoria) to discuss instrumentation plans with contractor and IDOT resident engineer John Kantz.

<b>Project Title:</b> Transfer & Development Lengths in Prestressed Self-Consolidating Concrete Bridge Box & I-Girders			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-56					
<b>QPR Author Name:</b> B. Andrawes			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-244-4178	<b>% Project Completed:</b> 25				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Design of SCC Mixes			7/16/2008	10/15/2008	-	C	-	-
<b>Task 2:</b> Conducting SCC Qualifying Tests			10/16/2008	4/15/2009	-	C	-	-
<b>Task 3:</b> Conducting Pull-Out Tests			1/16/2009	7/15/2009	-	-	I	-
<b>Task 4:</b> Casting of Girders and Measuring the Transfer Length			4/16/2009	10/15/2009	-	-	-	-
<b>Task 5:</b> Conducting Flexural Tests			10/16/2009	4/15/2010	-	-	-	-
<b>Task 6:</b> Prepare and Finalize Final Report			4/16/2010	6/30/2010	-	-	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> B. Andrawes			<b>Organization / Address</b>					
<b>Telephone:</b> 217-244-4178			UIUC					
<b>Email:</b> andrawes@illinois.edu			Dept. of CEE 3122 Newmark CE Lab, MC 250 205 N. Mathews Urbana, IL 61801					
<b>Description of Research:</b>								
<p><b>Task (1): Design of SCC Mixes</b> This task will focus on defining the design of SCC mixes that will be used in the project. The PI will contact large number of Illinois precasters who are working on the development of SCC to obtain detailed information on the type and design of their SCC mixes as well as the type and size of precast elements they produce.</p> <p><b>Task (2): Conducting SCC Qualifying Tests</b> The SCC mixes identified in the previous task will be subjected to wide range of tests (J-ring, L-box, etc.) to examine its plasticity and physical properties and compare it with typical properties of SCC. Concrete cylinders will also be cast and tested at various ages to specify the mechanical properties of the SCC mixes.</p> <p><b>Task (3): Conducting Pull-Out Tests</b> The SCC mixes that was selected in Task (1) and passed the qualifying tests in Task (2) will be used in conducting a series of pull-out tests. The primary aim of these tests is to evaluate the bond strength between the concrete and prestressing strands. Concrete blocks (24in-wide x 36in-length x 24in-depth) will be used in these tests.</p> <p><b>Task (4): Casting of Girders and Measuring the Transfer Length</b> Based on the pull-out test results, two SCC mixes will be recommended and selected to be used in casting the girders. Two types of girders will be involved in this project. The first type is the 27''x48'' bridge deck box girders with void, while the second type is the 42'' I-girders. The transfer length of four full-scale girders will be measured during this task.</p> <p><b>Task (5): Conducting Flexural Tests</b> During this task, the precast girders will be transported by the precaster to the Newmark Structural Engineering Laboratory (NSEL) at the University of Illinois at Urbana-Champaign where the flexural tests will take place.</p>								
<b>Keywords:</b> Self Consolidating Concrete, Prestressed Girders, Bridges, Transfer and Development Length								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								

03/26/2009 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Completing essential step towards adopting the technology of SCC in the state of Illinois.

**Progress to Date:**

The PEC SCC mix that was selected for this project was used to cast four concrete blocks with 14-0.5in strands embedded in each block. Two of the blocks were cast with SCC while the other two were cast with normal concrete for comparison. Pullout tests were performed at the following ages: 1, 3, 7, and 28. Each day 7 strands were pulled out of the block and the mean pullout force was recorded. Currently, the results of the pullout tests are being analyzed and compared.

<b>Project Title:</b> Superiority & Constructability of Fibrous Additives for Bridge Deck Overlays		<b>Last Edited:</b> 5/5/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-57					
<b>QPR Author Name:</b> Dr. Mohammad Alhassan		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 260-481-6389	<b>% Project Completed:</b> 10			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Relevant Literature Review and Examination of the U.S. DOTs Practices		1/1/2009	10/1/2010	-	-	I	-
<b>Task 2:</b> Establishment of Target Performance Criteria		1/1/2009	3/31/2009	-	-	C	-
<b>Task 3:</b> Selection of Overlay Mixtures without Fibrous Additives		1/1/2009	3/31/2009	-	-	C	-
<b>Task 4:</b> Selection of Synthetic Fiber Types		1/1/2009	3/31/2009	-	-	C	-
<b>Task 5:</b> Proportioning of LMC and MSC Mixtures with Fibrous Additives		1/1/2009	3/31/2009	-	-	C	-
<b>Task 6:</b> Evaluation of the Mixtures Performance Characteristics		5/1/2009	9/30/2010	-	-	-	-
<b>Task 7:</b> Analysis of Test Results and Recommendation of Fibrous Overlay Mixtures		6/1/2009	10/31/2010	-	-	-	-
<b>Task 8:</b> Selection of Demonstration Bridge for Installation of the Recommended Overlays		4/1/2010	8/31/2010	-	-	-	-
<b>Task 9:</b> Life-cycle Cost Analysis		5/1/2010	10/1/2010	-	-	-	-
<b>Task 10:</b> Submission of the Final Report		10/31/2010	12/31/2010	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Dr. Mohammad Alhassan		<b>Organization / Address</b>					
<b>Telephone:</b> 260-481-6389		Indiana-Purdue Fort Wayne (IPFW)					
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<b>Co-Investigator:</b>							
<b>Name:</b> Dr. Suleiman Ashur		<b>Organization / Address</b>					
<b>Telephone:</b> 260-481-6080		Indiana-Purdue Fort Wayne (IPFW)					
<b>Email:</b> Ashur@engr.ipfw.edu							
<b>Description of Research:</b>							
<p>This research project studies the advantages that the fibrous additives can add to the performance of bridge deck concrete overlays. Three types of concrete overlays will be evaluated; latex-modified concrete (LMC), microsilica concrete (MSC), and fly ash concrete (FAC) overlay. Various types and contents of synthetic fibers will be investigated resulting in a total of 14 different overlay mixes. The major concern is whether a specific combination of fibers will provide post-crack residual strength measured according to ASTM C1609 while maintaining adequate constructibility.</p>							
<b>Keywords:</b> Concrete Overlay, Bridge Deck, Fibrous Additives, Fibers, LMC, MSC, Fly ash, Toughness, Residual strength, Constructibility							
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Meeting Dates / Minutes Available?
1/16/2009 / Yes
3/6/2009 / No

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The principal expected outcome from the research project is a synthesis submitted to the IDOT/ICT that documents the entire experimental procedures, obtained results, analysis of the results, and recommendations/guidelines on the design and construction of high performance, durable, and crack resistant LMC and MSC overlay mixtures with fibrous additives. This in turn will lead to substantial life-cycle cost savings, aesthetic product, good riding quality, and enhancement in the overall structural behavior and performance of bridges. The findings of the study will be presented at the TRB meetings and gathering of other organizations, such as ACI, PCI, ASCE, PCA, etc. The results will also be published in refereed journals and conference proceedings.

**Progress to Date:**

The progress to date in each task can be summarized as follows:

(1) Relevant Literature Review and Examination of the Practices of U.S. DOTs:  
Majority of the available studies in literature about bridge deck concrete overlays; mainly LMC and MSC overlays were reviewed. The reviewed studies include technical papers and reports, experience and observations of USDOTs obtained from various overlay projects, and data obtained from fibers companies and overlay concrete producers. The studies that were of particular interest include those that provide relevance to the objectives of this research project especially in terms of any aspect that is related to performance of fibrous bridge deck concrete overlays as well as cracking tendency and long-term performance of the concrete overlays.

(2) Establishment of Target Performance Criteria:  
The IDOT specifications for the concrete bridge deck overlays include criteria for the fresh properties, strength properties, toughness, bond strength, and other performance characteristics. The IDOT criteria will be used to evaluate the performance of the overlays. The IDOT criteria may be modified if necessary based on the test results for better performance characteristics of the overlay mixes with fibrous additives.

(3) Selection of Bridge Deck Overlay Mixtures without Fibrous Additives:  
The researchers through collaboration with Mel Kirchler and Doug Dirks from IDOT proportioned three types of bridge deck overlays; latex-modified concrete (LMC), microsilica concrete (MSC), and fly ash concrete (FAC) overlay. These mixes were proportioned based on the IDOT specifications and slightly modified to allow for better accommodation of the fibrous additives.

(4) Selection of Synthetic Fiber Types:  
Various fiber types were selected based on information obtained from Task (1). The selected fiber types include three types from Grace (Strux90/40, Grace Microfiber, and Grace Fibers), three types from Nycon (NyconXL, KURALON RSC15, and KURALON RF4000), and one type from CEM-FIL (AR Glass Fiber). The dictating parameters in selecting the fiber type is that whether it has properties that can add toughness characteristics to the overlay performance as well as maintaining adequate constructibility of the overlay.

(5) Proportioning of Bridge Deck Overlay Mixtures with Fibrous Additives:  
It is recognized that macro type fibers can provide post-first crack residual strength and reduce the early age and drying shrinkage cracking. Micro type fibers can significantly reduce plastic shrinkage cracking and keep the cracks width, if occurred, to hairline scale, but hard to provide post-crack residual strength. Therefore, in some of the proposed mixtures, macro & micro type fibers were combined to get benefits of the unique advantage provided by each type and to have different lengths of fibrous additives within the concrete. The principal goal is to produce constructible concrete overlay with toughness characteristics and minimal cracking. A total of 14 overlay mixtures were proportioned with different percentages, combinations, and types of fibers; 1 plain LMC, 9 LMC with fibrous additives, 2 MSC with fibrous additives, and 2 FAC with fibrous additives.

The experimental evaluation of the overlay mixtures will start shortly. The researchers are preparing the required materials and fibrous additives for each overlay mixture. Portion of the experimental program will be conducted at the IPFW laboratory and portion at IDOT District 1. Henry Frerk Sons, Inc. agreed to provide Mobile truck that is required for casting the LMC overlay mixtures.

<b>Project Title:</b> Evaluation of Wireless Detection Systems at RR Crossings & Signalized Intersections			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-58					
<b>QPR Author Name:</b> Prof. Ray Benekohal			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-244-6288	<b>% Project Completed:</b> 50				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature review			7/1/2008	12/31/2008	I	I	I	-
<b>Task 2:</b> Develop testing criteria and methods			7/1/2008	9/30/2008	C	-	-	-
<b>Task 3:</b> Obtain the needed equipment			7/1/2008	9/30/2008	C	-	-	-
<b>Task 4:</b> Install the detectors and prepare them for testing			9/1/2008	9/30/2008	I	C	-	-
<b>Task 5:</b> Data collection and analysis			10/1/2008	3/31/2010	I	I	I	-
<b>Task 6:</b> Report progress and findings			10/1/2008	3/31/2010	-	I	I	-
<b>Task 7:</b> Prepare reports			4/1/2010	6/30/2010	-	-	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> Prof. Ray Benekohal			<b>Organization / Address</b>					
<b>Telephone:</b> 217-244-6288			UIUC - CEE					
<b>Email:</b> rbenekoh@illinois.edu			Newmark Civil Engineering Lab 205 N Mathews Ave. Urbana, IL 61801					
<b>Description of Research:</b>								
<p>The performance the wireless vehicle detection system (Sensys brand) under variety of traffic and environmental conditions is evaluated. The evaluation is based on measure of effectiveness such as missed calls, false calls, stuck on calls, and dropped calls. Two intersections will be instrumented for data collection. The testing criteria and conditions will be decided. Field data at the two instrumented intersections will be collected and analyzed to determine the performance of the new detectors.</p>								
<b>Keywords:</b> vehicle detection at intersections, wireless vehicle detection, magnetic sensors for traffic, Sensys								
<b>Technical Review Panel:</b>								
<b>Members</b>			<b>Telephone</b>			<b>Email Address</b>		
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<b>Meeting Dates / Minutes Available?</b>								
Yes / Oct 8, 2008								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								

The proposed research potentially would improve traffic operation and safety at railroad grade crossings and at signalized intersections. Accurate detection can reduce train-vehicle crashes at railroad crossings, increase on-time train operations, and improve traffic signal operation at intersections.

**Progress to Date:**

Field data are being collected at the two instrumented intersections. Data analysis at the two intersections to determine the performance of the new detectors is continuing. A preliminary report on the findings of the data collected in fall 2008 was sent to TRP for review. Feedback from TRP is being incorporated into the report. Analysis of data collected in winter of 2009 is continuing.

<b>Project Title:</b> Evaluation of Performance of Solar Powered Flashing Beacons		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-59					
<b>QPR Author Name:</b> Prof. Ray Benekohal		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-366-6006	<b>% Project Completed:</b> 40			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature review		7/1/2008	12/31/2008	I	I	I	-
<b>Task 2:</b> Testing criteria and methods		7/1/2008	12/31/2008	I	C	-	-
<b>Task 3:</b> Obtain flashing beacons		1/1/2008	4/1/2008	C	-	-	-
<b>Task 4:</b> Install beacons and prepare them for testing		7/1/2008	9/1/2008	C	-	-	-
<b>Task 5:</b> Data collection and analysis		9/1/2008	6/30/2009	I	I	I	-
<b>Task 6:</b> Report progress and findings		7/1/2008	6/30/2010	I	I	I	-
<b>Task 7:</b> Prepare and Finalize Report		4/1/2010	6/30/2010	-	-	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Ray Benekohal				<b>Organization / Address</b>			
<b>Telephone:</b> 217-366-6006				UIUC - CEE			
<b>Email:</b> rbenekoh@illinois.edu				205 N. Mathews Ave. Urbana, IL 61801			
<b>Description of Research:</b>							
<p>Use of solar powered flashing beacons on state highway system is increasing. The beacons feasibility, reliability, and performance have improved with the advancement in technology, including the use of LED modules. However, the duration of time the beacons can function depends on the battery type used, environment it is operating at, and the flashing mode used. The flashing mode and visibility of the beacon change as the battery charge level decreases. Furthermore, the environmental conditions (temperature, cloud, etc.) affect on the battery charge level and thus its flashing mode and visibility. This research will determine the performance of the flashing beacons in a variety of lighting conditions, modes of flashing operation, and its compliance with the requirements.</p>							
<b>Keywords:</b> flashing beacon, solar panel, stop controlled intersection, rural intersections, flashing red yellow lights							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
Oct 8, 2008 / Yes							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The proposed research would lead to improved traffic safety and operation at intersections, reduction in crashes at sites where these portable flashing beacons are used, and a reduction in crashes at stop controlled intersections.

**Progress to Date:**

Solar powered flashing beacons have been installed in the Traffic Operations Lab (TOL) to determine the performance of the flashing beacons in a variety of lighting conditions, modes of flashing operation, as well as their compliance with the flashing requirements. Testing in room temperature for JSF Flashing Beacon is completed and for Carmanah Flashing beacon is about to be completed. Testing in cold temperature for the JSF module has been in progress, and for Carmanah Modules is about to start. An interim report on findings for tests at room temperature is being prepared.

<b>Project Title:</b> Mechanistic-Empirical Design, Implementation & Monitoring for Flexible Pavements		<b>Last Edited:</b> 5/13/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-60					
<b>QPR Author Name:</b> Marshall Thompson		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-3930	<b>% Project Completed:</b> 25			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Develop revised full-depth HMA design procedure		8/1/2008	12/31/2008	I	C	-	-
<b>Task 2:</b> Review/revise IDOT's rubblized PCCP HMA overlay thickness procedure		9/15/2008	6/30/2009	I	I	I	-
<b>Task 3:</b> Provide ad hoc engineering services to IDOT		7/1/2008	6/30/2011	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Marshall Thompson				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-3930				U of IL			
<b>Email:</b> mrthomps@illinois.edu				205 North Mathews Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Imad Al-Qadi				<b>Organization / Address</b>			
<b>Telephone:</b> 217-893-0705 x 222				UIUC - CEE			
<b>Email:</b> alqadi@illinois.edu							
<b>Description of Research:</b>							
Conduct evaluation and engineering analyses of IDOT's full-depth HMA pavement design and rubblized PCCP HMA thickness design procedures and provide/justify modifications based on Best Demonstrated Available Technology (BDAT). Ad hoc engineering services concerning the issues will be provided on an as-requested basis.							
<b>Keywords:</b> full-depth HMA, mechanistic-empirical design, rubblized PCCP, flexible pavements							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
9/4/2008 / Yes							
<b>Short Title &amp; Date Reports Available:</b>							

**End User(s) and Result(s) Expected:**

Provide improved full-depth HMA design and rubblized PCCP HMA overlay thickness design procedures for the IL DOT.

**Progress to Date:**

Task 1

Activities have progressed and a DRAFT report submitted (10-22-08) to IDOT for review. Additional project inputs will be provided as needed relative to issues concerning Task 1. The DRAFT report has been revised and was submitted (12-08) to the TRP Chair.

Task 2

This task has been initiated. A listing and FWD data for some of IDOT's rubblization projects have been provided by the TRP Chair. The current IDOT HMA overlay approach for rubblized PCCP has been reviewed. At the next TRP meeting, the researchers will provide recommendations to IDOT and the TRP for revising the procedure.

Task 3

Thompson cooperated with IDOT BM&PR concerning problems connected with the IL 13 full-depth HMA project in Harrisburg, IL.

<b>Project Title:</b> Mechanistic-Empirical Design, Implementation & Monitoring for Rigid Pavements			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-61					
<b>QPR Author Name:</b> Jeffery Roesler			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-0218	<b>% Project Completed:</b> 10				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Evaluation of IDOT's Video Survey of Interstate Concrete Pavement			1/1/2009	9/30/2009	-	-	I	-
<b>Task 2:</b> Assist IDOT in Implementing JPCP and CRCP Design Framework into BDE Manual			1/1/2009	9/30/2010	-	-	I	-
<b>Task 3:</b> Evaluation of Extended-Life Concepts for Concrete Pavements			4/1/2009	9/30/2009	-	-	-	-
<b>Task 4:</b> Review of IDOT's Concrete Patching Requirements			1/1/2009	9/30/2009	-	-	I	-
<b>Task 5:</b> Concrete Pavement Services			1/1/2009	6/30/2011	-	-	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> Jeffery Roesler				<b>Organization / Address</b> University of Illinois 205 N. Mathews Urbana, IL, 61801				
<b>Telephone:</b> 217-265-0218								
<b>Email:</b> jroesler@illinois.edu								
<b>Description of Research:</b>								
<p>The University of Illinois has provided IDOT a framework for the design of jointed plain and continuously reinforced concrete pavements under a previous research project (IHR-57). The design framework needs to be further refined before final implementation by IDOT into their BDE Manual. Implementation will require review of existing video survey data, extended-life concepts for rigid pavements, and adjustment of the inputs and design equations developed previously as necessary. IDOT also desires a state-of-the-art review on opening strength requirements for concrete patches. The PI will also provide IDOT with technical services related to concrete pavement design, analysis, and materials.</p>								
<b>Keywords:</b> Concrete Pavement, CRCP, JPCP, Design, Analysis								
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<b>Meeting Dates / Minutes Available?</b>								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								

The expected outcomes of this research are an updated JPCP method and a new CRCP design method in the BDE manual. The research will also provide IDOT with a document reviewing opening strength requirements for concrete patches and provide IDOT with short duration technical advice and services on concrete pavement-related issues.

**Progress to Date:**

Video survey data was collected from IDOT on several interstate CRCP sections (I-70, I-39, I-80, I-90/94). The viewing of the video survey data has begun to document the number of punchouts per mile and average crack spacing for 500 foot sample of each mile of pavement. The majority of the video survey work will be completed in the second quarter of 2009.

IDOT concrete patching requirements were reviewed with a focus on the concrete material requirements and opening strength. Concrete material and opening strength requirements for other large populated states (NY, FL, CA, TX) were reviewed and compared to Illinois requirements. Several reports published in the past 5 years on performance of high early strength concrete and accelerated loading of early-age concrete were also reviewed. A summary document on the findings of the concrete patching and strength requirement review will be developed in the 2nd and 3rd quarter of 2009.

Concrete pavement technical services were provided to IDOT on the fiber requirements for ultra-thin whitetopping applications. The UTW design spreadsheet was also updated to avoid error messages when inputs are out of range. The updated UTW spreadsheet will be sent to IDOT in the 2nd quarter.

The second quarter will also have a focused effort on generating thickness design curves for the JPCP and CRCP based on the framework proposed in IHR-57. IDOT is requesting draft design curves to be sent to them during the first week of June 2009.

<b>Project Title:</b> Material Quality Testing Risk Assessment & Multi-State Peer Exchange			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-62					
<b>QPR Author Name:</b> Timothy Murphy			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 773-874-9800	<b>% Project Completed:</b> 7				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Review IDOT testing and evaluation procedures, policies, and practices to determine areas for analysis.			3/1/2009	6/30/2009	-	-	I	-
<b>Task 2:</b> Conduct interviews with IDOT Central & District Lab units, Bureau of Bridges & Structures, Construction on current.			3/1/2009	9/30/2009	-	-	I	-
<b>Task 3:</b> Gather information on the select practices of other lead states.			6/1/2009	8/31/2009	-	-	-	-
<b>Task 4:</b> Organize and conduct a Multi-State Peer Exchange-Materials Testing Workshop with a minimum of four states.			6/1/2009	10/31/2009	-	-	-	-
<b>Task 5:</b> Provide documentation that summarizes the findings of the study by publishing completed final report.			8/1/2009	1/31/2010	-	-	-	-
<b>Principal Investigator:</b>			<b>Organization / Address</b>					
<b>Name:</b> Timothy Murphy			Murphy Pavement Technology, Inc.					
<b>Telephone:</b> 773-874-9800			7649 South State Street, Chicago, IL 60619					
<b>Email:</b> TMurphy@murhypavetech.com								
<b>Co-Investigator:</b>			<b>Organization / Address</b>					
<b>Name:</b> Lisa J. Taccola								
<b>Telephone:</b> 773-874-9800								
<b>Email:</b> lisataccola@sbcglobal.net								
<b>Description of Research:</b>								
Review IDOT inspection, sampling, and testing as well as evaluation procedures, policies, and practices to determine areas for enhancement specific to the acceptance of roadway materials. Conduct interviews with BMPR and Districts, Bureau of Bridges and Structures as well as Construction. Gather information on the practice of other lead states. Use information gathered to organize and conduct a Multi-State Peer Exchange - Materials Testing Workshop. Provide documentation that summarizes the findings of the study by publishing a completed final report.								
<b>Keywords:</b> Material Testing, Quality Assurance, Efficiencies								
<b>Technical Review Panel:</b>								
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Matt Mueller		217-782-4423		matthew.mueller@illinois.gov				
<b>Meeting Dates / Minutes Available?</b>								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								
Determining if Illinois can reduce its level of testing for material acceptance or if the risk warrants continued testing and reestablishment of key								

testing capability/staffing.

**Progress to Date:**

The work efforts this quarter consisted of:

- Gathering information from the Illinois Department of Transportation with respect to its current acceptance and inspection practices.
- Obtaining requirements / strategy from other industries with respect to what they do for material inspection and quality assurance through face-to-face meeting with GeoSynthetics, Inc. (WI) and Hamilton-Sundstrand. (IL)
- Set-up of data gathering and reporting forms and masters.

<b>Project Title:</b> Evaluation of the Long-Term Durability of Joints Cut Using Early-Entry Saws on Rigid Pavements		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-63					
<b>QPR Author Name:</b> Thomas Van Dam		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-398-3977	<b>% Project Completed:</b> 8.8			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Project Initiation Meeting		11/1/2008	12/31/2008	-	C	-	-
<b>Task 2:</b> Literature Review		12/1/2008	6/1/2009	-	I	I	-
<b>Task 3:</b> Field Monitoring		5/1/2009	6/30/2009	-	-	-	-
<b>Task 4:</b> Durability Testing		6/1/2009	11/30/2009	-	-	-	-
<b>Task 5:</b> Data Analysis		10/1/2009	12/31/2009	-	-	-	-
<b>Task 6:</b> Final Report		11/1/2009	1/31/2009	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Thomas Van Dam				<b>Organization / Address</b>			
<b>Telephone:</b> 217-398-3977				Applied Pavement Technology, Inc.			
<b>Email:</b> TVanDam@appliedpavement.com				115 W. Main St., Suite 400 Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Kurt Smith				<b>Organization / Address</b>			
<b>Telephone:</b> 217-398-3977				Applied Pavement Technology, Inc.			
<b>Email:</b> KSmith@appliedpavement.com							
<b>Description of Research:</b>							
This project will establish the current national state-of-the-practice regarding the use of early entry sawing for concrete pavements, and discuss how it differ from IDOT's current conventional wet sawing technique. Differences in freeze-thaw durability and resistance to deicers between conventionally sawed joints and early entry sawed joints will be determined. Based on the collected data, is will be determined whether the early entry saw technique is viable for IDOT work.							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Mark Gawedzinski (Chair)		217-782-2799		Mark.Gawedzinski@illinois.gov			
<b>Meeting Dates / Minutes Available?</b>							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
<ul style="list-style-type: none"> <li>• A brief synthesis on the early-entry sawing technique, including current practices in other states.</li> <li>• A thorough documentation of the construction process for an early-entry sawing project including a summary document, field notes, photographs, and video clips.</li> <li>• A final report, detailing the construction monitoring, laboratory testing, and data analysis, will be provided. It will include definitive conclusions</li> </ul>							

that IDOT can use in determining the viability of using early entry sawing technique and recommendations for future work will be made.

**Progress to Date:**

The project was initiated on 11/1/08. APTech was in the field on 11/12/08 to monitor the field site, but the work had to be delayed until the Spring 2009 due to inclement weather. Currently a new field site has been located and will be constructed at the end of May or beginning of June, 2009.

<b>Project Title:</b> National Safety Performance (SPF) Summit		<b>Last Edited:</b> 5/27/2009						
		<b>Function Code:</b> R27						
		<b>Project Number:</b> R27-67						
<b>QPR Author Name:</b> Yanfeng Ouyang		<b>Estimated Dates</b>			<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-9858	<b>% Project Completed:</b> 25				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>	
<b>Task 1:</b> Pre-registration Phase		1/1/2009	3/31/2009	-	-	I	-	
<b>Principal Investigator:</b>								
<b>Name:</b> Yanfeng Ouyang		<b>Organization / Address</b>						
<b>Telephone:</b> 217-333-9858		UIUC - CEE						
<b>Email:</b> yfouyang@illinois.edu		Newmark Engineering Lab, 205 North Mathews Ave., Urbana, IL 61801-2352						
<b>Description of Research:</b>								
It is tentatively planned that a two-day National SPF Summit be held in Chicago, IL, in summer 2009. The University of Illinois at Urbana-Champaign (UIUC) will coordinate and assist in facilitating this SPF Summit. UIUC will be responsible for establishing and maintaining a web site for the Summit, coordinating transportation and lodging, and payment of all conference related expenses. UIUC will also be responsible for preparation of the proceedings.								
<b>Keywords:</b>								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								
A national summit with researchers in the field will help in exchange of ideas and practices and will help in the implementation of the proposed AASHTO Highway Safety Manual Key. Illinois and these other states would benefit from a national summit with top researchers to discuss topics such as data needs, formatting of SPFs, development and methodologies of SPFs including consideration of the 4Es, applicability to low volume roadways, and implementation of SPFs including linkage to Safety Analyst. From this SPF Summit, IDOT and ICT would be able to take the next step with SPFs and expand to include local highway systems. These SPFs could then be incorporated into Safety Analyst and the HSM. The SPF Summit Proceedings would be of immense benefit to all state DOTs around the country, as safety continues to be a national focus and data driven decisions regarding allocating and directing resources to further reduce fatalities and serious injuries is required.								
<b>Progress to Date:</b>								
The work so far has been focusing on the pre-registration preparation (through collaboration with IDOT): (1) Identify potential attendees, the date and time of the Summit; (2) The hotel is identified; block reservation and logistics arrangements are being negotiated; (3) A tentative agenda has been developed; (4) A conference website has been developed and published (including registration capabilities). (5) A one-page flyer of the summit is prepared for dissemination to potential attendees.								

<b>Project Title:</b> Midwest Transportation Air Quality Summit		<b>Last Edited:</b> 5/26/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-68					
<b>QPR Author Name:</b> Michael Koerber		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 847-720-7880	<b>% Project Completed:</b> 3			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Prepare work plan		1/16/2009	3/16/2009	-	-	C	-
<b>Task 2:</b> Arrange workshop location		3/16/2009	4/17/2009	-	-	I	-
<b>Task 3:</b> Administer contracts		3/16/2009		-	-	I	-
<b>Task 4:</b> TRP conference calls		3/16/2009		-	-	I	-
<b>Task 5:</b> Develop draft agenda		3/16/2009		-	-	I	-
<b>Task 6:</b> Coordinate speakers, invite attendees		3/16/2009		-	-	I	-
<b>Task 7:</b> Establish website		3/16/2009		-	-	I	-
<b>Task 8:</b> Coordinate travel arrangements, pay workshop fees		3/16/2009		-	-	I	-
<b>Task 9:</b> Conduct workshop		10/27/2009	10/29/2009	-	-	-	-
<b>Task 10:</b> Prepare workshop proceedings		11/2/2009	12/31/2009	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Michael Koerber		<b>Organization / Address</b>					
<b>Telephone:</b> 847-720-7880		Lake Michigan Air Directors Consortium					
<b>Email:</b> Koerber@ladco.org		9501 W. Devon Avenue, Suite 701, Rosemont, IL 60018					
<b>Description of Research:</b>							
A workshop is planned for October 27-29, 2009 to review a range of air quality issues faced by government agencies in the Midwest.							
Workshop sessions will address SIP planning activities for the new air quality standards (e.g., mobile source emission inventories), highway project-level analyses, current diesel engine programs, climate change, mobile source air toxics, and on-going mobile source-related research studies.							
The workshop will attempt to both provide information on these issues and promote an open, constructive dialogue on appropriate regional, state, and local actions. Attendees (by invitation only) include staff from Midwest State DOT offices, State EPA's, FHWA, USEPA, and various MPOs.							
<b>Keywords:</b>							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The workshop goals and objections include:

- attendance by representatives of state departments of transportation, state air pollution control agencies, metropolitan planning organizations, and federal agencies (e.g., Federal Highway Administration and Environmental Protection Agency);
  - presentations of high quality, timely, and relevant research relating to transportation and air pollution problems;
  - an open dialogue and collaborative problem solving with a wide range of perspectives: and
- \* the preparation of proceedings that will document discussions from the workshop, including research needs.

**Progress to Date:**

A project work plan was prepared, in the form of the January 16 proposal (Task 1).

A Subaward Agreement was issued on March 16.

A contract was signed with Pere Marquette State Park in Grafton, IL on April 17, 2009, to host the workshop (Task 2).

The initial conference call was held with the TRP on March 26. The purpose of the call was to discuss the purpose of the workshop, date and location of the workshop, develop the draft agenda (Task 5), and identify potential speakers and attendees (Task 6).

Work was initiated on a website for the workshop (Task 7).

<b>Project Title:</b> Improved Design for Driven Piles Based on a Pile Load Test Program in Illinois		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-69					
<b>QPR Author Name:</b> James H. Long		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-2543	<b>% Project Completed:</b> 12.5			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Collecting field information during pile driving		1/1/2009	7/31/2010	-	-	I	-
<b>Task 2:</b> Collecting/Interpreting information on static load test results in Illinois and the Midwest		2/1/2009	7/31/2010	-	-	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> James H. Long		<b>Organization / Address</b>					
<b>Telephone:</b> 217-333-2543		UIUC - CEE					
<b>Email:</b> JHLong@illinois.edu		Newmark Civil Engineering Lab 205 North Mathews Urbana, IL 61801					
<b>Description of Research:</b>							
The research work plan is separated into 4 tasks: 1) Collecting information on the performance of piles during driving and restrrike, 2) Collecting/Interpreting information on static load test results in Illinois and the Midwest, 3) Interpreting results from 1 and 2 to assess and improve methods for limiting driving stresses and methods for predicting pile capacity, and 4) writing and submission of the final report.							
<b>Keywords:</b> Piles, Pile Driving, Pile Capacity, Bearing Capacity, Pile Stresses							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>							
01/14/2009 / Yes							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
It is estimated that IDOT can increase the maximum nominal required bearing design stress from 9.6ksi to between 12 and 18ksi which would translate into \$2.5 to \$6 million in annual savings. Additional savings will result from using better design procedure to account for site conditions in							

a more specific manner. The final report will discuss more economical recommendations for limiting stresses on piling, better prediction methods for stresses during driving and for pile capacities, resistance factors for driven piling based on local calibrations that consider effects of pile setup, collections of static and dynamic load test data focused on Illinois soils and geology, and training on the use of PDA and CAPWAP.

**Progress to Date:**

We have made progress this quarter on tasks 1 and 2.

Task 1: we have procured the Pile Driving Analyzer, and Prof. Long attended a 3-day class at PDI in Cleveland to get training on the use of the PDA and the interpretation of its results. We have also been working with IDOT on contract specifications for PDA measurements and testing.

Task 2: we have been looking at pile load test results and also have been reviewing some new formulations for determining resistance factors with better accuracy. We are in the process of collecting more load tests from Illinois and its surrounding states.

<b>Project Title:</b> Calibration & Refinement of Illinois' Earthquake Resisting System Bridge Design Methodology		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-70					
<b>QPR Author Name:</b> Jerome F. Hajjar		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (217) 244-4027	<b>% Project Completed:</b> 8			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Receive prototype bridges from IDOT		1/1/2009	1/15/2009	-	-	C	-
<b>Task 2:</b> Literature review and scope definition		1/1/2009	9/30/2009	-	-	I	-
<b>Task 3:</b> Analyze prototype bridges, fuse components, and specimens		1/16/2009	12/31/2009	-	-	I	-
<b>Task 4:</b> Develop fuse test matrix and drawings		7/1/2009	3/31/2010	-	-	-	-
<b>Task 5:</b> Fabricate specimen and load frame		10/1/2009	3/31/2010	-	-	-	-
<b>Task 6:</b> Conduct tests		1/1/2010	9/30/2010	-	-	-	-
<b>Task 7:</b> Reduce test data		1/1/2010	12/31/2010	-	-	-	-
<b>Task 8:</b> Identify parametric range of bridges and objectives and conduct system analyses		7/1/2009	6/30/2011	-	-	-	-
<b>Task 9:</b> Assess new R and phi factors and provide recommendations for ERS adjustments		1/1/2010	12/31/2011	-	-	-	-
<b>Task 10:</b> Write final report		6/30/2011	12/31/2011	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Jerome F. Hajjar		<b>Organization / Address</b>					
<b>Telephone:</b> (217) 244-4027		UIUC - CEE UIUC Dept. of Civil and Environmental Engineering, 2129b Newmark Civil Engineering Laboratory, MC-250, 205 North Mathews Ave., Urbana, Illinois 61801-2352					
<b>Email:</b> jfhajjar@illinois.edu							
<b>Co-Investigator:</b>							
<b>Name:</b> James M. LaFave		<b>Organization / Address</b>					
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<b>Co-Investigator:</b>							
<b>Name:</b> Larry A. Fahnestock		<b>Organization / Address</b>					
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<b>Description of Research:</b>							
<p>The key work stages include: Stage 1: Refinement and calibration of the first "fuse" capacity and seismic redundancy level that exists between superstructure and substructure through a series of experiments and analyses of bearing subassemblies. Stage 2: Computational simulation of response of bridge systems, including documentation of the progression of damage in the bridge; required seat widths; anticipated peak forces in the substructure; and evaluation of changes in stiffness or strength during the seismic event. Stage 3: Refinement of strength reduction factors and R-factors used for design of typical Illinois bridges and development of a simplified approach for pushover analysis.</p>							

**Keywords:** Bridges; Bridge Bearings; Superstructure; Substructure; Seismic

**Technical Review Panel:**

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**Meeting Dates / Minutes Available?**

12/12/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Results will include verification of bearing fuse capacities and prevention of span loss during a seismic event. New bridges will be expected to have enhanced safety and robustness; require less design effort since safe and effective configurations will be identified; and have reduced costs as compared to current approaches. Outcomes include: 1. Refined bearing fuse design criteria; 2. Improved bridge detailing methods as they relate to the overall seismic system performance; 3. Initial assessment of revised design values of R-factors for bridge systems and strength reduction factors ( ) for substructure design; 5. Time permitting, an appropriate method of pushover analysis.

**Progress to Date:**

The project began in December 2008 with a TRP meeting to discuss project objectives and expected outcomes.

A graduate research assistant and Ph.D. student, Joshua Steelman, has started on this project.

Task 1 on receiving prototype bridges from IDOT is completed.

Task 2 on literature review is well underway, and a large draft report has been completed that includes descriptions of prior experimental and computational research, with a focus on bridge bearings. As part of this report, a comprehensive set of tables is included that lists prior experiments on bridge bearings.

Task 3 on analyzing prototype bridges and fuse assemblies is well underway in preparation for designing the test setup and developing the test matrix.

<b>Project Title:</b> Field Implementation and Evaluation of the Simple Cost-Effective Scour Sensor		<b>Last Edited:</b> 6/5/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-71					
<b>QPR Author Name:</b> Farhad Ansari		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 312-996-2437	<b>% Project Completed:</b> 25			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Planning meeting with IDOT personnel		2/1/2009	2/28/2009	-	-	C	-
<b>Task 2:</b> Instrumentation system design and development		2/1/2009	3/31/2009	-	-	C	-
<b>Task 3:</b> Purchasing of instruments and software		2/1/2009	4/30/2009	-	-	C	-
<b>Task 4:</b> Operational software design, calibration inputs and development of automated data acquisition and data transfer system		2/1/2009	6/30/2009	-	-	I	-
<b>Task 5:</b> Machining and fabrication of sensor rods, and installation of the fiber optic sensors within the sensor rods		7/1/2009	7/31/2009	-	-	-	-
<b>Task 6:</b> Dry runs in the laboratory		7/1/2009	7/31/2009	-	-	-	-
<b>Task 7:</b> Installation of the sensors, instrumentation, and interface software		8/1/2009	8/31/2009	-	-	-	-
<b>Task 8:</b> Field tests		9/1/2009	10/31/2009	-	-	-	-
<b>Task 9:</b> Demonstration of system		9/1/2009	10/31/2009	-	-	-	-
<b>Task 10:</b> Final Report		12/1/2009	1/31/2010	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Farhad Ansari		<b>Organization / Address</b>					
<b>Telephone:</b> 312-996-2437		UIC 2095 Engineering Research Facility 842 W. Taylor Street (M/C 246) Chicago, Illinois 60607-7023					
<b>Email:</b> fansari@uic.edu							
<b>Description of Research:</b>							
The work plan will include the following tasks:							
Task 1. Instrumentation system design and development of sensor multiplexing strategies, data acquisition, and data transfer activities. A meeting with IDOT-TRP will be arranged to finalize the plans.							
Task 2. Purchase of the fiber optic interrogation instrument, sensor multiplexer, dedicated computer and interface software							
Task 3. Operational software design, calibration inputs and development of automated data acquisition and data transfer system							
Task 4. Machining and fabrication of sensor rods, and installation of the fiber optic sensors within the sensor rods. It is planned to fabricate 10 to 16 sensors for a three span bridge.							
Task 5. Dry runs in the laboratory to fine tune the sensor/software interaction and the data acquisition and transfer process. This experiments will be simulated for the sake of software optimization and do not require submergence of the sensors in the water							
Task 6. Meeting with IDOT personnel to identify the bridge, establish installation plans, request for installation assistance, and possibly coordinate with USGS for use of their instrumentation box							
Task 7. Installation of the sensors, instrumentation, and interface software at the multi-span bridge site with several piers.							
Task 8. Field tests by simultaneous monitoring of several scour sensors. Evaluate scour depth detection capability, numerical calibration scheme and data acquisition and processing of the system.							
Task 9. Demonstration of the system to IDOT-TRP							
Task 10. Final Report documenting the system design, installation procedures, scour monitoring results, and software operations for IDOT's use.							
<b>Keywords:</b> Bridge, piers, scour, remote monitoring, floods							
<b>Technical Review Panel:</b>							
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**Meeting Dates / Minutes Available?**

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The outcome of the project will be design and installation details, field implementation, instrumentation and software for the scour sensor. A multi-span bridge over salt creek river has been selected for permanent installation of scour sensors. Altogether, twelve to fourteen sensors sensors will be installed at the bridge piers and they will be wired to the field interrogation unit through a multiplexer. Wireless remote data acquisition system and software will be developed for monitoring from IDOT and UIC sites. User friendly software, field installation and instruction manuals will be developed for use by IDOT personnel.

**Progress to Date:**

Tasks 1 and 2 have been completed. Task 3 is in progress. Task 6 has been completed.

Last Updated: 6/5/2009

<b>Project Title:</b> Rolling Lane Closures - Phase II		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-72					
<b>QPR Author Name:</b> Doug Steele		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-356-4500	<b>% Project Completed:</b> 10			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Panel meetings		1/1/2009	12/31/2009	-	-	C	-
<b>Task 2:</b> Large group session preparation		2/1/2009	4/28/2009	-	-	I	-
<b>Task 3:</b> Conduct large group sessions		4/28/2009	5/14/2009	-	-	-	-
<b>Task 4:</b> Outside expert panel meeting		8/20/2009	9/15/2009	-	-	-	-
<b>Task 5:</b> Prepare recommendations		8/15/2009	10/30/2009	-	-	-	-
<b>Task 6:</b> Final report		10/15/2009	12/31/2009	-	-	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Doug Steele				<b>Organization / Address</b>			
<b>Telephone:</b> 217-356-4500				ARA, Inc.			
<b>Email:</b> dsteele@ara.com				100 Trade Centre Dr., Suite 200 Champaign, IL 61820			
<b>Co-Investigator:</b>							
<b>Name:</b> William Vavrik				<b>Organization / Address</b>			
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<b>Description of Research:</b>							
This is a Phase II continuation of R27-32, Improving the Safety of Moving Lane Closures. Phase I performed field investigation of driver behavior around moving work zones. This phase expands on the work in phase I, including a series of large group meetings of diverse professionals involved with moving lane closures, development of recommendations for revisions to current traffic control standards, and expert panel review.							
<b>Keywords:</b> Moving lane closures, mobile, rolling, highway safety							
<b>Technical Review Panel:</b>							
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Dean Mentjes							
Mike Renner							
Joe Monroe							
<b>Meeting Dates / Minutes Available?</b>							
1/21/09 / Yes							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Development of recommended revisions to current traffic control standards to improve the safety of moving lane closures.

**Progress to Date:**

Through March 31, 2009, the research team has held one meeting with the technical review panel to plan and coordinate the first of three large group meetings that will be held in IL.

<b>Project Title:</b> Distance Technology Transfer Course Content Development		<b>Last Edited:</b> 5/20/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-73					
<b>QPR Author Name:</b> James Hall		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-206-7860	<b>% Project Completed:</b> 3			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Flagger Course Content Assessment and Online Training Design		2/1/2009	8/1/2009	-	-	I	-
<b>Task 2:</b> Flagger Online Course Materials Development		4/1/2009	9/1/2009	-	-	-	-
<b>Task 3:</b> Flagger Online Course Deployment		2/1/2009	10/1/2009	-	-	I	-
<b>Task 4:</b> Learning Management System Vendor Assessments		2/1/2009	6/1/2009	-	-	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> James Hall		<b>Organization / Address</b>					
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<b>Email:</b> Jhall1@uis.edu		One University Plaza, MS UHB 4021 Springfield, IL 62703-5407					
<b>Co-Investigator:</b>							
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<b>Email:</b> buttlar@illinois.edu							
<b>Description of Research:</b>							
<p>This project, through the Technical Review Panel, would first identify up to three IDOT courses that would yield high benefits for distance learning conversion using such criteria as training importance, impact on operations and anticipated technology transfer audience. Then, course content would be specifically developed for each course consistent with the distance training needs of IDOT. Digital course content would potentially include text, PowerPoint, audio, video, and online testing. This project would include beta testing of the delivery mode. In addition, feedback regarding effectiveness of the delivery will be documented.</p>							
<b>Keywords:</b> Technology Transfer, distance learning, e-learning							
<b>Technical Review Panel:</b>							
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Aaron Weatherholt		217-782-2076		aaron.weatherholt@illinois.gov			
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<b>Meeting Dates / Minutes Available?</b>							
1/27/2009 / Yes							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

IDOT has an important training function to meet the technology transfer needs currently taught through LTAP and STTP. Decreasing staffs and increasing travel costs have limited IDOT's ability to deliver training in a timely and accessible manner. Distance training has proven to be an effective method to deliver specialized technical content, while enabling individuals to take courses anytime and anywhere through the Internet and/or other electronic media. Benefits would accrue from increased accessibility and flexibility. In addition, IDOT could build on the digital course content in future years.

**Progress to Date:**

TRP meeting on 1/27/2009.

During February and March 2009, UIS assisted with IDOT's Learning Management System Vendor assessment by attending online vendor presentations and providing feedback to IDOT on capabilities and limitations.

Initial online course development activities is on the "Flagger" traffic control training course for both local agencies and IDOT operations. On March 12 and on March 16, the UIS project team met with TRP Chair Kevin Burke and with instructor Roy Williamson to outline and schedule course development activities. On March 23, the UIS team met with IDOT Flagger instructor group including representatives from Local Roads and Streets, Safety Operations, District 6, District 9 and several local agencies. Course content and module development was discussed and the UIS videorecording of a future Flagger course delivery was scheduled.

<b>Project Title:</b> Online Training Course Prototype (Special Project)			<b>Last Edited:</b> 5/19/2009					
			<b>Function Code:</b> R27					
			<b>Project Number:</b> R27-SP10					
<b>QPR Author Name:</b> James Hall			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-206-7860	<b>% Project Completed:</b> 100				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> IDOT Online Training Needs and Content Assessment			5/1/2008	6/30/2008	C	C	-	-
<b>Task 2:</b> Prototype Online Course Development			5/1/2008	6/30/2008	C	C	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> James Hall			<b>Organization / Address</b>					
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<b>Email:</b> jhall1@uis.edu								
<b>Description of Research:</b>								
This research will investigate technology transfer/ training course delivery methods and develop a prototype online course for the Illinois Department of Transportation (IDOT). The subject of the the prototype course will be IDOT flagger training.								
<b>Keywords:</b>								
<b>Technical Review Panel:</b>								
<b>Members</b>			<b>Telephone</b>			<b>Email Address</b>		
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<b>Meeting Dates / Minutes Available?</b>								
5/5/2008 / Yes								
5/28/2008 / Yes								
<b>Short Title &amp; Date Reports Available:</b>								
<b>End User(s) and Result(s) Expected:</b>								
Analyzed the costs, benefits, and feasibility of delivering electronic and online training to meet IDOT needs.								
<b>Progress to Date:</b>								
For task 2, the UIS technical team developed the following prototype Flagger course products for evaluation by the Technical Review Panel:								
• Text and document course materials								

- Scripted audio presentation of PowerPoint slides
- Video demonstration of flagging techniques
- Online testing options
- Second Life examples of Flagger content delivery

The Technical Review Panel was able to access the training materials online to review for accessibility and understandability.

In August 2008, the Principal Investigator submitted a final report summarizing the results of the investigation with an analysis of the costs, benefits and feasibility of delivering electronic and online training to meet IDOT needs. IDOT accepted this report as a final deliverable and closed the project as of March 2009.

<b>Project Title:</b> Analysis of I-57 Recycled CRCP Cores (Special Project)		<b>Last Edited:</b> 5/14/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-SP11					
<b>QPR Author Name:</b> Jeffery R. Roesler		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-0218	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Petrographic Analysis of Recycled CRCP Cores		8/15/2008	9/15/2008	C	-	-	-
<b>Task 2:</b> Final Report		9/15/2008	12/31/2008	I	C	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Jeffery R. Roesler				<b>Organization / Address</b>			
<b>Telephone:</b> 217-265-0218				University of Illinois			
<b>Email:</b> jroesler@illinois.edu				205 N. Mathews Ave., Urbana, IL, 61801			
<b>Description of Research:</b>							
CRCP cores were extracted from the I-57 CRCP recycled concrete section and sent out for petrographic examination. The results of the analysis will be included in the final report of ICT project R27-41.							
<b>Keywords:</b> recycled concrete aggregate, CRCP, petrography							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Mark Gawedzinski (Chair)		217-782-2799		Mark.Gawedzinski@illinois.gov			
<b>Meeting Dates / Minutes Available?</b>							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
The expected outcome of this project is to determine if there is any deleterious ASR or inadequate air void system in the recycled concrete experimental CRCP section on I-57.							
<b>Progress to Date:</b>							
Eight cores were extracted by IDOT personnel and four cores were then sent to the University of Illinois (UIUC). These cores were then sent to Dr. Karl Peterson at the Michigan Tech University (MTU). Petrographic examination was completed at MTU and a summary report of the testing was sent to UIUC. The petrographic analysis found no durability problems in the recycled concrete cores which would have caused the surface cracking. The results of the petrographic examination have been included into the final report of ICT project R27-41 (Appendix A) and posted to the ICT website (Publications Page) in January 2009.							

<b>Project Title:</b> DeKalb County Bridge Collapse Investigation (Special Project)		<b>Last Edited:</b> 5/19/2009					
		<b>Function Code:</b> R27					
		<b>Project Number:</b> R27-SP12					
<b>QPR Author Name:</b> Prof. Bassem Andrawes		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (217) 244-4178	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Field Reconnaissance		9/10/2008	12/31/2008	-	C	-	-
<b>Task 2:</b> Office/Laboratory Studies		1/1/2009	1/31/2009	-	-	C	-
<b>Task 3:</b> Structural/Geotechnical Analysis		2/1/2009	5/15/2009	-	-	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Bassem Andrawes				<b>Organization / Address</b>			
<b>Telephone:</b> (217) 244-4178				UIUC-CEE			
<b>Email:</b> andrawes@illinois.edu				205 N. Mathews Ave. Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Jerome Hajjar				<b>Organization / Address</b>			
<b>Telephone:</b> (217) 244-4027				UIUC			
<b>Email:</b> JFHajjar@illinois.edu							
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Scott Olson				<b>Organization / Address</b>			
<b>Telephone:</b> (217) 265-7584				UIUC-CEE			
<b>Email:</b> OlsonS@uiuc.edu							
<b>Description of Research:</b>							
<p><b>Task (1): Field Reconnaissance:</b> The investigators will visit the bridge site one or more times to examine the damage that occurred to various structural and geotechnical elements of the bridge, especially the bridge deck and girders, the bridge substructure, and the pilings. During the visit(s) a number of photos will be taken before, during, and after bridge removal. These photos will assist in assessing the bridge condition prior to failure, as well as in identifying the collapse mechanism. In addition, a geotechnical field reconnaissance will be performed.</p> <p><b>Task (2): Office/Laboratory Studies:</b> The investigators will obtain from IDOT the bridge plans and construction records to prepare for the structural/geotechnical analyses that will be conducted in the next task. In order to better estimate soil properties for the structural model, the investigators will perform laboratory index tests on samples retrieved from the site.</p> <p><b>Task (3): Structural/Geotechnical Analysis:</b> The bridge plans and data obtained from Tasks (1) and (2) will be utilized to perform simplified geotechnical slope stability and scour analyses, and to develop a finite element model for the bridge, including the soil properties as appropriate.</p>							
<b>Keywords:</b> DeKalb County Bridge, Bridge Collapse, Timber Piles							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Jim Klein (Chair)		(217) 782-5928		James.Klein@illinois.gov			
<b>Meeting Dates / Minutes Available?</b>							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The final report of the project will include the following: 1) Detailed description of the experimental and analytical work conducted in the project. 2) Final conclusions in terms of the main cause(s) of failure.

**Progress to Date:**

Assessment based on site investigation, in situ readings, and analysis indicated that a geotechnical or superstructure failure may be ruled out.

Six specimens retrieved from the site and tested under pure compression exhibited capacity greatly exceeding the design capacity of the piles. Two specimens, tested with a modest eccentricity, showed a 60% reduction in the capacity compared to that of concentrically loaded specimens. These tests illustrated that the bent capacity is sensitive to eccentric loading, which could occur when only a single span of the bridge is loaded.

An analytical model of a single pile was created to determine the capacity of the pile under concentric and eccentric loading. The material properties used in the model was calibrated based on the response of the experimental testing. The structure-soil interaction was represented by nonlinear springs developed based on in situ soil conditions. Flexural buckling was accounted for with a geometrically nonlinear formulation. The analysis revealed that the live load capacity of a single pile is greatly reduced by eccentric loading compared to concentric loading. The single pile model was utilized to develop a full model for the bent. The skew of the bridge resulted in an uneven loading of the bent. The analysis results showed that the bent is capable of withstanding an Illinois legal load if all eight piles are resisting the load. However, a moderately overloaded vehicle was found to be sufficient to initiate collapse of the structure.

The experimental and analytical work and findings have been summarized in a final report which has been submitted to IDOT (Mr. Jim Klein) for review.

The TRP reviewed the draft final report. The report was edited and returned to IDOT in March and the report was approved by IDOT. ICT is editing and finalizing the report and it will be posted to the ICT website in the next quarter.

<b>Project Title:</b> Binder Analysis - Addition to IHR R28 Mechanistic Design		<b>Last Edited:</b> 5/14/2009					
		<b>Function Code:</b> R28					
		<b>Project Number:</b> R28-2					
<b>QPR Author Name:</b> Samuel H. Carpenter		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-4188	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Acquire RHEA Software		1/1/2008	2/29/2008	C	C	-	-
<b>Task 2:</b> Install Software and familiarize		2/1/2008	3/31/2008	C	C	-	-
<b>Task 3:</b> Reduce IDOT Binder data from NCSC		3/1/2008	6/30/2008	C	C	-	-
<b>Task 4:</b> Interim Briefing Paper on Presentation/Interpretation of Results		4/1/2008	5/31/2008	C	C	-	-
<b>Task 5:</b> Prepare and Finalize Report		5/1/2008	6/30/2008	I	I	C	-
<b>Principal Investigator:</b>							
<b>Name:</b> Samuel H. Carpenter				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-4188				UIUC			
<b>Email:</b> scarpent@illinois.edu				Dept. of CEE 205 N. Mathews, MC250 Urbana, IL 61801			
<b>Description of Research:</b>							
As mechanistic designs rely more on dynamic modulus predictions, the generation of rheological binder data (G*) and rheological mixture data (E*) is becoming more crucial. IDOT has gotten binder test data from the Superpave Center in Indiana this year, and will likely continue to receive data. Additionally, there are projects that require short-term turnaround of binder and mixture test data that must be generated internally. This project will provide support for data reduction, interpretation, and conduct limited testing as required. The researcher will analyze DSR data for IDOT binders to develop indications of expected dynamic modulus, E*, values which could be expected.							
<b>Keywords:</b> Asphalt binder, dynamic modulus, Shear modulus							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>							
<b>Short Title &amp; Date Reports Available:</b>							
<b>End User(s) and Result(s) Expected:</b>							
Generate data supporting E* selections for different binder grades							
<b>Progress to Date:</b>							
Task 1. Software was received in January, 2008. Two copies were ordered for the student and Professor.							
Task 2. The software has been installed, and initial examination of the IDOT binder data begun to establish familiarity with the software capabilities.							
Task 3. Initial reduction of several binders has been accomplished to demonstrate the software capabilities and generate graphs and reduced data that explain binder performance when interpreted properly.							

Task 4. The interpretation and presentation of the reduced binder data and G\* curves in a manner usable by IDOT was completed, and discussions were held with IDOT personnel to develop the appropriate reduction and presentation format that satisfies IDOT needs.

Task 5. Draft final report was completed. The report was reviewed by IDOT. Reviews have been received, and will be inserted. The report will be submitted as a white paper, and not formally published. Final revisions are being made and will be done within the month of January

The project received a time extension for completion of the report.

The white paper for the project is complete.

<b>Project Title:</b> Validation Of Extended Life HMA Pavement Design Concepts		<b>Last Edited:</b> 5/14/2009					
		<b>Function Code:</b> R39					
		<b>Project Number:</b> R39-1					
<b>QPR Author Name:</b> Prof. Samuel H. Carpenter		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-333-4188	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Laboratory Testing		7/1/2004	3/31/2006	C	C	-	-
<b>Task 2:</b> Response Testing		7/1/2004	6/30/2005	C	C	-	-
<b>Task 3:</b> Field Fatigue Testing		7/1/2004	6/30/2006	C	C	-	-
<b>Task 4:</b> AC Overlay/Tack Coat Study		10/1/2004	5/31/2005	C	C	-	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Samuel H. Carpenter				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-4188				UIUC			
<b>Email:</b> scarpent@illinois.edu				Dept. of CEE 205 N. Mathews, MC250 Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Marshall R. Thompson				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-3930				UIUC			
<b>Email:</b> mrthomps@illinois.edu							
<b>Description of Research:</b>							
This research will provide test data for dynamic modulus and fatigue for current IDOT mixes in accordance with the AASHTO 2002 data requirements for pavement design. The fatigue testing will validate fatigue algorithms and illustrate the existence and magnitude of a fatigue endurance limit.							
Constructed pavements will be tested for responses and fatigue behavior.							
<b>Keywords:</b> asphalt pavement, extended life pavement, fatigue, dynamic modulus							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
09/04/2002 / Yes							
04/22/2003 / Yes							

03/04/2004 / Yes

08/24/2004 / Yes

11/08/2005 / Yes

06/06/2006 / Yes

10/12/2006 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Background information will be generated that will allow an improved design procedure for Extended Life HMA pavements, with consideration of fatigue endurance limits to be developed.

**Progress to Date:**

Task 1. Laboratory Testing. Completed.

Task 2. Response Testing. Completed.

Task 3. Field Fatigue Testing. Completed.

Task 4. AC Overlay tack coat study. Completed.

Regarding the seven reports originally planned, five have been published and finalized.

Work progressed on revising the remaining reports. They will be submitted during the next quarter.

<b>Project Title:</b> Traffic Operations Lab - Signal Systems Testing			<b>Last Edited:</b> 5/27/2009					
			<b>Function Code:</b> R43					
			<b>Project Number:</b> R43					
<b>QPR Author Name:</b> Prof. Rahim F. Benekohal			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-355-6006	<b>% Project Completed:</b> 100				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Signal Coordination and Timing (SCAT) Workshops			7/1/2005	12/31/2008	I	C	-	-
<b>Task 2:</b> TOL Website and Computer Network			7/1/2005	12/31/2008	I	C	-	-
<b>Task 3:</b> Battery Back-up Systems (BBS) testing and evaluations			7/1/2004	9/30/2005	C	-	-	-
<b>Task 4:</b> Statewide Meetings and Training			7/1/2005	12/31/2008	I	C	-	-
<b>Task 5:</b> Installation of Video Detection (VD) Systems			4/1/2005	7/31/2005	C	-	-	-
<b>Task 6:</b> Video Data Collection Procedure			3/1/2005	12/31/2007	C	-	-	-
<b>Task 7:</b> Video Data Analysis			3/1/2005	6/30/2008	C	-	-	-
<b>Task 8:</b> Video Data Reports			7/1/2006	9/30/2008	I	I	C	-
<b>Task 9:</b> Evaluation of LED Modules			6/1/2006	12/31/2008	I	I	C	-
<b>Task 10:</b> Wireless Detector & Solar Powered Flashing Beacons			12/1/2007	12/31/2008	I	C	-	-
<b>Principal Investigator:</b>								
<b>Name:</b> Prof. Rahim F. Benekohal			<b>Organization / Address</b>					
<b>Telephone:</b> 217-355-6006			UIUC - CEE					
<b>Email:</b> rbenehoh@illinois.edu			205 N. Mathews Ave. Urbana, IL 61801					
<b>Description of Research:</b>								
The TOL activities are mainly focused on testing and evaluation of new traffic control devices, on investigative and solution oriented research to recommend countermeasures to problems faced in traffic operations, and on providing the hands-on training to the department and municipal employees as well as the students at the university. The main focus of this years research is evaluation of video detection systems. Regular activities on hands-on training will continue.								
<b>Keywords:</b> video detection, loop detection, traffic control devices; UPS for traffic signals, LED								
<b>Technical Review Panel:</b>								
<b>Members</b>			<b>Telephone</b>			<b>Email Address</b>		
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<b>Meeting Dates / Minutes Available?</b>								
1/31/2008 / Yes								
2/28/2008 / Yes								
4/3/2008 / Yes								
5/15/2008 / Yes								
6/25/2008 / Yes								

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Evaluate how well video detections systems and use that knowledge to develop specifications for video detections systems in Illinois. Trains engineers on video detections system and learn how they perform in the field.

**Progress to Date:**

Tasks 1 , 2, and 4 are Traffic Operations Laboratory (TOL) service activities that were on-going under the R43 TOL project; however, they have not been funded by IDOT since this project ended on June 30, 2008. They will be considered complete as of December 31, 2008.

Four video detection reports are approved for publication> Two of them are on ICT web page and other two are in queue to be put up on the web site soon.

A report on evaluation of Pedestrian and Vehicular LED is approved for publication and is available on ICT webpage.

As of July 1, 2008, the evaluation of wireless detection systems (at railroad crossings and signalized intersections) is a separate project: ICT R27-58.

<b>Project Title:</b> Development of Standard for Lifting Loops in Shallow Precast Deck Beams		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R54					
		<b>Project Number:</b> R54					
<b>QPR Author Name:</b> Prof. Dan Kuchma		<b>Estimated Dates</b>			<b>Fiscal Year:</b> 2009		
<b>Telephone:</b> 217-333-1571	<b>% Project Completed:</b> 99				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Survey of Current State Practice		7/1/2005	11/30/2005	C	-	-	-
<b>Task 2:</b> Survey of Practice in Other States		9/5/2005	6/30/2008	C	-	-	-
<b>Task 3:</b> Review of Bases for Guidelines		10/1/2005	3/30/2008	C	-	-	-
<b>Task 4:</b> Design of Research Program		10/1/2005	8/30/2006	C	-	-	-
<b>Task 5:</b> Conduct Experimental Research		1/1/2007	4/30/2008	C	-	-	-
<b>Task 6:</b> Analysis and Summary of Test Results		2/10/2007	8/30/2008	C	-	-	-
<b>Task 7:</b> Produce IDOT Guidelines		6/1/2007	8/30/2008	C	-	-	-
<b>Task 8:</b> Prepare and Finalize Project Report		7/1/2007	8/30/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Dan Kuchma				<b>Organization / Address</b>			
<b>Telephone:</b> 217-333-1571				University of Illinois at Urbana-Champaign			
<b>Email:</b> kuchma@uiuc.edu				205 N. Mathews Ave. Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Christopher Hart				<b>Organization / Address</b>			
<b>Telephone:</b> 217-244-8791				University of Illinois at Urbana-Champaign			
<b>Email:</b> chart3@uiuc.edu							
<b>Description of Research:</b>							
Review of available literature and current practice. Load testing to failure of lifting loops that are cast inside of shallow precast members such that the performance and capacity of the precast structure at the point of lifting is evaluated. Load testing to failure of lifting loops that are fully embedded within concrete cylinders so that the full rupture strength of the lifting loop strands is evaluated.							
<b>Keywords:</b> lifting ,loops, anchorage, precast, concrete, deck beams							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
Kevin Riechers (Chair)		217-782-9109		kevin.riechers@illinois.gov			
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<b>Meeting Dates / Minutes Available?</b>							
9/13/2005 / Yes							

4/25/2006 / Yes

8/22/2006 / No

10/18/2006 / Yes

1/08/2007 / Yes

4/30/2007 / Yes

5/11/2007 / Yes

11/09/2007 / No

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

A standard for the fabrication, embedment, anchorage, and use of lifting loops in shallow members.

**Progress to Date:**

All tasks have been completed, including the production of the draft final report. The TRP has provided comments on the final report and it is being adjusted to address these comments. The updated report was provided to the TRP.

<b>Project Title:</b> Tack Coat Optimization For HMA Overlays			<b>Last Edited:</b> 5/14/2009				
			<b>Function Code:</b> R55				
			<b>Project Number:</b> R55				
<b>QPR Author Name:</b> Prof. Imad Al-Qadi		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (217)265-0427	<b>% Project Completed:</b> 100			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review		7/1/2005	12/31/2008	C	-	-	-
<b>Task 2:</b> Interface Simulation		4/1/2006	12/31/2008	I	C	-	-
<b>Task 3:</b> Laboratory Evaluation		4/1/2006	6/30/2008	C	-	-	-
<b>Task 4:</b> Modify ATLAS (Suspended, then Reinstated)		1/1/2006	10/31/2008	C	-	-	-
<b>Task 5:</b> Overlay Construction		4/1/2007	7/31/2007	C	-	-	-
<b>Task 6:</b> Conduct Field Performance Testing		7/1/2007	10/31/2008	I	C	-	-
<b>Task 7:</b> Data Analysis		10/1/2006	10/31/2008	I	C	-	-
<b>Task 8:</b> Interim and Final Reports		10/1/2006	12/31/2008	I	C	C	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Imad Al-Qadi				<b>Organization / Address</b>			
<b>Telephone:</b> (217)265-0427				University of Illinois at Urbana-Champaign			
<b>Email:</b> alqadi@illinois.edu				205 N. Mathews Ave. Urbana, IL 61801			
<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Samuel Carpenter				<b>Organization / Address</b>			
<b>Telephone:</b> (217)333-4188				University of Illinois at Urbana-Champaign			
<b>Email:</b> scarpent@illinois.edu							
<b>Description of Research:</b>							
Perform a coordinated lab, computer simulation, and accelerated full scale testing to optimize tack coat type and application rate on PCC having different surface textures. Effect of HMA mix design will also be investigated.							
<b>Keywords:</b> Tack Coat, Interface, Overlay							
<b>Technical Review Panel:</b>							
<b>Members</b>		<b>Telephone</b>		<b>Email Address</b>			
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<b>Meeting Dates / Minutes Available?</b>							

8/30/2005 / Yes  
3/30/2006 / Yes  
7/25/2006 / Yes  
12/8/2006 / Yes  
12/21/2007 / Yes  
11/7/2008 / No

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Laboratory testing will establish the behavior properties of overlays with a variety of tack coat parameters and textures. These behavioral parameters will be used in computer simulations to model the behavior of the overlay as a function of the interface conditions. The field testing will be conducted to validate the computer predictions of performance. These findings will provide documentation of the importance of tack coat and interface conditions on overlay performance.

**Progress to Date:**

TASK 1 - Literature Review  
This task has been completed.

TASK 2 - Interface Simulations.  
This task has been completed

TASK 3 - Laboratory Evaluation  
This task has been completed.

TASK 4 - ATLAS Modification  
This task has been completed.

TASK 5 - Overlay Construction  
This task has been completed.

TASK 6 - Conduct Field Performance Testing  
All field tests have been completed in early November.

TASK 7 - Data Analysis  
This task has been completed.

TASK 8 - Interim and Final Report

Final report on the accelerated pavement tests is complete and is posted on the ICT website (Publications Page) in February 2009.

<b>Project Title:</b> Speed Photo-Enforcement in Illinois Work Zones		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R56					
		<b>Project Number:</b> R56					
<b>QPR Author Name:</b> Prof. Rahim F. Benekohal		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-366-6006	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Literature Review		7/1/2005	10/31/2007	C	-	-	-
<b>Task 2:</b> Select WZ and Collect Field Data		8/1/2005	10/31/2006	C	-	-	-
<b>Task 3:</b> Analyze Dist 7 WZ data		3/1/2006	12/31/2007	C	-	-	-
<b>Task 4:</b> Effects of Police and "YOUR SPEED IS" Sign on Speed		3/1/2006	12/31/2007	C	-	-	-
<b>Task 5:</b> Effects of SPE on Speed and Speed Variation		3/1/2006	12/31/2007	C	-	-	-
<b>Task 6:</b> Spatial effects of SPE on Speed in WZ		3/1/2006	12/31/2007	C	-	-	-
<b>Task 7:</b> Temporal effects of SPE on Speed in WZ		3/1/2006	12/31/2007	C	-	-	-
<b>Task 8:</b> Speeding tickets and Court Decisions		9/1/2006	3/31/2008	C	-	-	-
<b>Task 9:</b> Prepare Reports		5/1/2007	6/30/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Rahim F. Benekohal		<b>Organization / Address</b>					
<b>Telephone:</b> 217-366-6006		UIUC - CEE					
<b>Email:</b> rbenekoh@illinois.edu		Newmark CE Lab 205 N. Mathews Ave. Urbana, IL 61801					
<b>Description of Research:</b>							
<p>This study will evaluate the effects of using speed photo enforcement (SPE) systems on traffic flow characteristics and safety in work zones (WZ). The overall goal is to determine the effectiveness of SPE in work zones using criteria such as: speed, speeding tickets issued and fraction upheld as valid in courts. The net effects of SPE above and beyond the "typical" traffic control procedure IDOT uses in WZ will be determined. Effects of police presence, "YOUR SPEED IS" sign, and SPE van in work zone alone or in combination will be studied.</p>							
<b>Keywords:</b> speed photo enforcement, police presence in work zone, speed in work zones							
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<b>Meeting Dates / Minutes Available?</b>							
8/25/2006 / Yes							
2/2/2007 / No							
5/2/2007 / No							
7/12/2007 / No							

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The net effects of SPE above and beyond the “typical” traffic control procedure IDOT uses in WZ will be determined. Effects of police presence, “YOUR SPEED IS” sign, and SPE van in work zone alone or in combination will be studied.

**Progress to Date:**

Final report was submitted to IDOT on Late June 2008 and is under review.

<b>Project Title:</b> Evaluation and Implementation of Improved CRCP And JPCP Design		<b>Last Edited:</b> 5/27/2009					
		<b>Function Code:</b> R57					
		<b>Project Number:</b> R57					
<b>QPR Author Name:</b> Prof. Jeffery R. Roesler		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 217-265-0218	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Evaluation of DG2002 for Concrete Pavements		7/1/2005	12/31/2007	C	-	-	-
<b>Task 2:</b> Laboratory Characterization of Material Inputs		1/1/2006	12/31/2007	C	-	-	-
<b>Task 3:</b> Traffic Characterization		10/1/2005	12/31/2007	C	-	-	-
<b>Task 4:</b> Field Survey Review		10/1/2005	5/31/2008	C	-	-	-
<b>Task 5:</b> Calibration and Validation of Design Methodology		7/1/2007	12/31/2008	I	C	-	-
<b>Task 6:</b> CRCP Model Refinements		10/1/2006	5/31/2008	C	-	-	-
<b>Task 7:</b> Built-in Curl Characterization		10/1/2005	12/31/2006	C	-	-	-
<b>Task 8:</b> Climatic Zone Study		1/1/2006	12/31/2007	C	-	-	-
<b>Task 9:</b> Special Case Studies for JPCP		1/1/2006	12/31/2007	C	-	-	-
<b>Task 10:</b> Final Report		1/1/2008	12/31/2008	-	-	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. Jeffery R. Roesler				<b>Organization / Address</b>			
<b>Telephone:</b> 217-265-0218				University of Illinois			
<b>Email:</b> jroesler@illinois.edu				205 N. Mathews Ave., Urbana, IL, 61801			
<b>Description of Research:</b>							
<p>With the recent release of the M-EPDG, many states are evaluating its applicability against their existing design methods. IDOT already has an existing jointed plain concrete pavement (JPCP) design based on M-E principles. However, IDOT does not have a M-E based continuously reinforced concrete pavement (CRCP) design procedure. The objectives of the study are to refine the JPCP design method based on new findings from the past 15 years and to develop and implement a CRCP design process that IDOT can use for routine design.</p>							
<b>Keywords:</b> Concrete pavement design, concrete materials, JPCP, CRCP							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							
09/13/2005 / Yes							
05/1/2006 / Yes							

09/07/2006 / Yes

02/16/2007 / Yes

07/24/2007 / Yes

11/29/2007 / Yes

09/30/2008 / Yes

04/15/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

The expected outcomes of this research effort are a new mechanistic-empirical continuously reinforced concrete pavement design guide and an updated jointed plain concrete pavement design guide for IDOT.

**Progress to Date:**

The PI submitted a revised report to ICT editor in mid-January 2009 based on the IDOT TRP comments. The PI is finalized the report in March 2009 and it is now posted on the ICT website as a final publication.

The PI addressed IDOT's initial comments to the JPCP report submitted in December 2008, the ICT editor reviewed the JPCP report in February 2009, the PI submitted the revised JPCP report to IDOT at the end of March 2009. The PI is currently waiting for final comments from the IDOT TRP. It is expected that the JPCP report will be finalized by the end of the second quarter of 2009.

<b>Project Title:</b> Cost-Effectiveness and Performance of Overlay Systems in IL / Reflective Crack Control		<b>Last Edited:</b> 5/14/2009					
		<b>Function Code:</b> R58					
		<b>Project Number:</b> R58					
<b>QPR Author Name:</b> Prof. William Buttlar		<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> (217) 333-5966	<b>% Project Completed:</b> 99			<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>		<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Survey Districts		1/1/2006	12/31/2006	C	C	-	-
<b>Task 2:</b> Site Visits and Performance Data Gathering		7/1/2005	6/30/2008	C	C	-	-
<b>Task 3:</b> Forensic Investigation		4/1/2006	6/30/2008	C	C	-	-
<b>Task 4:</b> Laboratory Testing		7/1/2006	1/31/2008	C	C	-	-
<b>Task 5:</b> Pavement Analysis		1/1/2006	3/31/2008	C	C	-	-
<b>Task 6:</b> LCCA		4/1/2007	12/31/2007	C	C	-	-
<b>Task 7:</b> Preliminary Usage Guide		7/1/2007	6/30/2008	C	C	-	-
<b>Task 8:</b> Project Deliverables, including Final Report		4/1/2007	10/31/2008	I	I	I	-
<b>Principal Investigator:</b>							
<b>Name:</b> Prof. William Buttlar				<b>Organization / Address</b>			
<b>Telephone:</b> (217) 333-5966				University of Illinois at Urbana-Champaign			
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<b>Co-Investigator:</b>							
<b>Name:</b> Prof. Imad Al-Qadi				<b>Organization / Address</b>			
<b>Telephone:</b> (217) 265-0427				University of Illinois at Urbana-Champaign			
<b>Email:</b> alqadi@illinois.edu							
<b>Description of Research:</b>							
Evaluate the cost-effectiveness of traditional overlay systems used in Illinois and to evaluate recent reflective crack control strategies through laboratory, field demonstration projects, and LCCA. A preliminary guide to assist the pavement engineer in the selection of rehabilitation techniques to control reflective cracking will be developed.							
<b>Keywords:</b> Reflective Cracking, Crack Control, Interlayer, Overlay, Asphalt, Life-cycle cost analysis, Rehabilitation							
<b>Technical Review Panel:</b>							
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<b>Meeting Dates / Minutes Available?</b>							

8/30/2005 / Yes  
12/16/2005 / Yes  
4/10/2006 / Yes  
8/24/2006 / Yes  
1/1/2007 / Yes  
8/17/2007 / Yes  
12/4/2007 / Yes  
4/8/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

Life cycle costs, technical briefs, new experimental sections and monitoring guidance, and a preliminary user guide.

**Progress to Date:**

Note: Percent project completed on pg. 1 is based upon three year project duration.

Task 8: Project Deliverables: As of December 31, 2008, one report had been edited and returned to IDOT for final review. Volume one will be complete by the next quarter.

The second volume has been edited by ICT and returned to IDOT for final review.

<b>Project Title:</b> Evaluation of Pavement Damage Due to New Tire Designs			<b>Last Edited:</b> 5/14/2009					
			<b>Function Code:</b> R59					
			<b>Project Number:</b> R59					
<b>QPR Author Name:</b> Prof. Imad Al-Qadi			<b>Estimated Dates</b>		<b>Fiscal Year:</b> 2009			
<b>Telephone:</b> 2172650427	<b>% Project Completed:</b> 99				<b>JUL</b>	<b>OCT</b>	<b>JAN</b>	<b>APR</b>
<b>Task Title</b>			<b>Start</b>	<b>Complete</b>	<b>SEP</b>	<b>DEC</b>	<b>MAR</b>	<b>JUN</b>
<b>Task 1:</b> Accelerated Loading Experiment on the Full-Depth HMA Flexible Pavement Test Sections			1/1/2006	6/30/2006	C	-	-	-
<b>Task 2:</b> Analyze Collected Data from Accelerated Pavement Testing			6/1/2006	12/30/2006	C	-	-	-
<b>Task 3:</b> Quantify Pavement Damage due to Different Tire Configurations Using Experimental Measurements			7/1/2006	12/30/2006	C	-	-	-
<b>Task 4:</b> Finite Element Modeling of the Experimental Test Sections			7/1/2006	6/30/2007	C	-	-	-
<b>Task 5:</b> FE Simulation of Loading Response at Highway Speeds			1/1/2007	9/30/2007	C	-	-	-
<b>Task 6:</b> Incorporation of Dynamic Tire Impacts and Lateral Loading			4/1/2007	12/30/2007	C	-	-	-
<b>Task 7:</b> FE Analysis of Overweight Axle Loads			7/1/2007	6/30/2008	C	-	-	-
<b>Task 8:</b> Life-Cycle Cost Analysis			4/1/2008	12/31/2008	I	C	-	-
<b>Task 9:</b> Reports and Communication			9/1/2008	12/31/2008	I	I	I	-
<b>Principal Investigator:</b>								
<b>Name:</b> Prof. Imad Al-Qadi			<b>Organization / Address</b>					
<b>Telephone:</b> 2172650427			University of IL at Urbana-Champaign					
<b>Email:</b> alqadi@uiuc.edu			205 N. Mathews Ave. Urbana, IL 61801					
<b>Description of Research:</b>								
Quantify pavement damage due to different tire and axle configurations based on accelerated pavement testing and numerical modeling using the finite element method for moving load simulation.								
<b>Keywords:</b> Pavement Damage, Tire Loading, Widebase, Simulation								
<b>Technical Review Panel:</b>								
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<b>Meeting Dates / Minutes Available?</b>								
01/05/2006 / No								
01/11/2007 / Yes								
04/24/2007 / Yes								

07/26/2007 / Yes

11/19/2007 / Yes

03/31/2008 / Yes

06/12/2008 / Yes

**Short Title & Date Reports Available:**

**End User(s) and Result(s) Expected:**

To characterize the impact of different pavement responses with different tire designs to improve asphalt thickness selection.

**Progress to Date:**

**TASK 1:**

This task is completed. The testing of section B last November was conducted at relatively low temperature. Retesting of section B was conducted in May 2007. Test results verified adequacy of the temperature calibration model used for analysis.

**TASK 2:**

Data analysis of the collected responses from Sections F, D, B, and A is complete. The longitudinal strain was selected to calculate the relative response ratio between dual-tire assembly and wide-base tire under various testing conditions. The following variables were considered: wheel load, speed, tire offset, tire inflation pressure (including differential pressure for dual-tire), and pavement structure. The average peak longitudinal tensile strain ratios between wide-base tire and dual-tire assembly are 1.25 for W-425 and 1.16 for W-455.

**TASK 3:**

Pavement fatigue damage of Sections F, D, and B due to different tire configurations utilizing experimental measurement is completed using IDOT fatigue equation and MEPDG A-37-1 transfer functions.

**TASK 4:**

Cores were obtained from Sections F, D and B; three cores from each section. The cores were prepared for creep and complex modulus testing. Creep tests were conducted at -15, -5, 5, 15, and 25 C. Creep compliance was calculated and used for HMA viscoelastic characterization utilized in FE simulation. Complex modulus test (IDT setup) was conducted at three temperatures (-10, 5, and 25 C) and seven loading frequencies (0.01, 0.1, 0.5, 1, 5, 10, and 25 Hz). The complex modulus results were consistent with creep compliance using linear viscoelastic inter-conversion. FWD field tests were conducted in May 2007 to determine moduli of the 12in lime-treated layer and the natural subgrade. Finite element models for sections F, D and B were developed and validated using field measurements.

**TASK 5:**

The calculation of pavement response to vehicular loading at highway speed is completed. At highway speed, loading pulse is shorter due to shorter loading period and the vehicle dynamic impact is relatively higher. In this task, only changes in loading period are considered. The response ratio between dual-tire assembly and wide-base tire is insignificantly influenced by speed.

**TASK 6:**

In order to simulate real vehicle loading conditions, the developed FE models have been modified to incorporate the measured three-dimensional tire/pavement contact stresses using continuous moving load. Implicit dynamic analysis was utilized. It was found that pavement critical response is tensile strain at the bottom of thin HMA layer, while vertical shear strain at near-surface is the critical response for thick HMA layer. Compared to dual-tire assembly, wide-base 455 tire resulted in greater longitudinal tensile strain and less vertical shear strain.

**TASK 7:**

FE analysis of overweight axle loads has been conducted using a 12-kip load. Tire contact stresses and contact areas under various loading levels, and their effects on pavement responses were evaluated. It was found that load had more effect on the lower part of the HMA layer; while contact stresses had more effect at/near the surface.

**TASK 8:**

Combined damage ratios with respect to a reference load (10-kip dual-tire assembly) were calculated including five distresses: bottom-up fatigue cracking, top-down cracking, near-surface cracking, HMA rutting, and subgrade rutting. The contribution of the aforementioned distresses vary depending on the road type (interstate, primary, and secondary road). Pavement cost analysis associated with wide-base tire and overweight has started using calculated damage ratios and pavement cost (\$/mile per ESAL) as provided by IDOT (from a recent report). The benefits of using wide-base tire on truck operation, environmental impacts, and safety are summarized based on a literature review.

**TASK 9:**

The draft final report has been submitted for review.