

**Oklahoma Department of Transportation  
Planning and Research Division**



**State Planning and Research Work Program  
FFY 2010**

**(October 1, 2009 to September 30, 2010)**

**Part 1—Planning  
Part 2—Research**

**Prepared by the  
Oklahoma Department of Transportation  
in cooperation with the  
US Department of Transportation  
Federal Highway Administration**

**October 2009**



# Introduction

This document describes the Federal Fiscal Year (FFY) 2010 State Planning and Research Work Program for the Oklahoma Department of Transportation (ODOT). This program is prepared and submitted according to provisions of Title 23, United States Code, regulated under 23 CFR Part 420. Part 1 of the work program describes the Planning activities and Part 2, the Research activities. The work program is developed and updated annually in cooperation with the Federal Highway Administration.

Planning activities to be conducted in FFY 2010 include data collection/analysis/reporting, mapping, public involvement, and planning coordination/studies. Additional efforts are planned for data collection related to air quality and pavement structural condition. Funding for the planning portion of the work program is approximately \$12 million.

Research activities for FFY 2010 will include seven new projects and eleven continuing projects. Some of the focus areas for current research projects include: design/construction/maintenance of infrastructure; safety; and minority participation in ODOT contracts. In addition, ODOT is participating in 14 national pooled fund projects. Funding for the research program totals approximately \$4 million in FFY 2010.

The detailed projects for each section are listed by item number and include a description of the purpose and scope of the project, the accomplishments during the current federal fiscal year (FFY 2009) and the proposed activities for the upcoming fiscal year (FFY 2010). In addition, the Financials Section shows the amount programmed for the FFY 2009 in the last work program, an estimate of the total funds that will be expended by the end of FFY 2009, and the projected costs for the upcoming fiscal year (FFY 2010).



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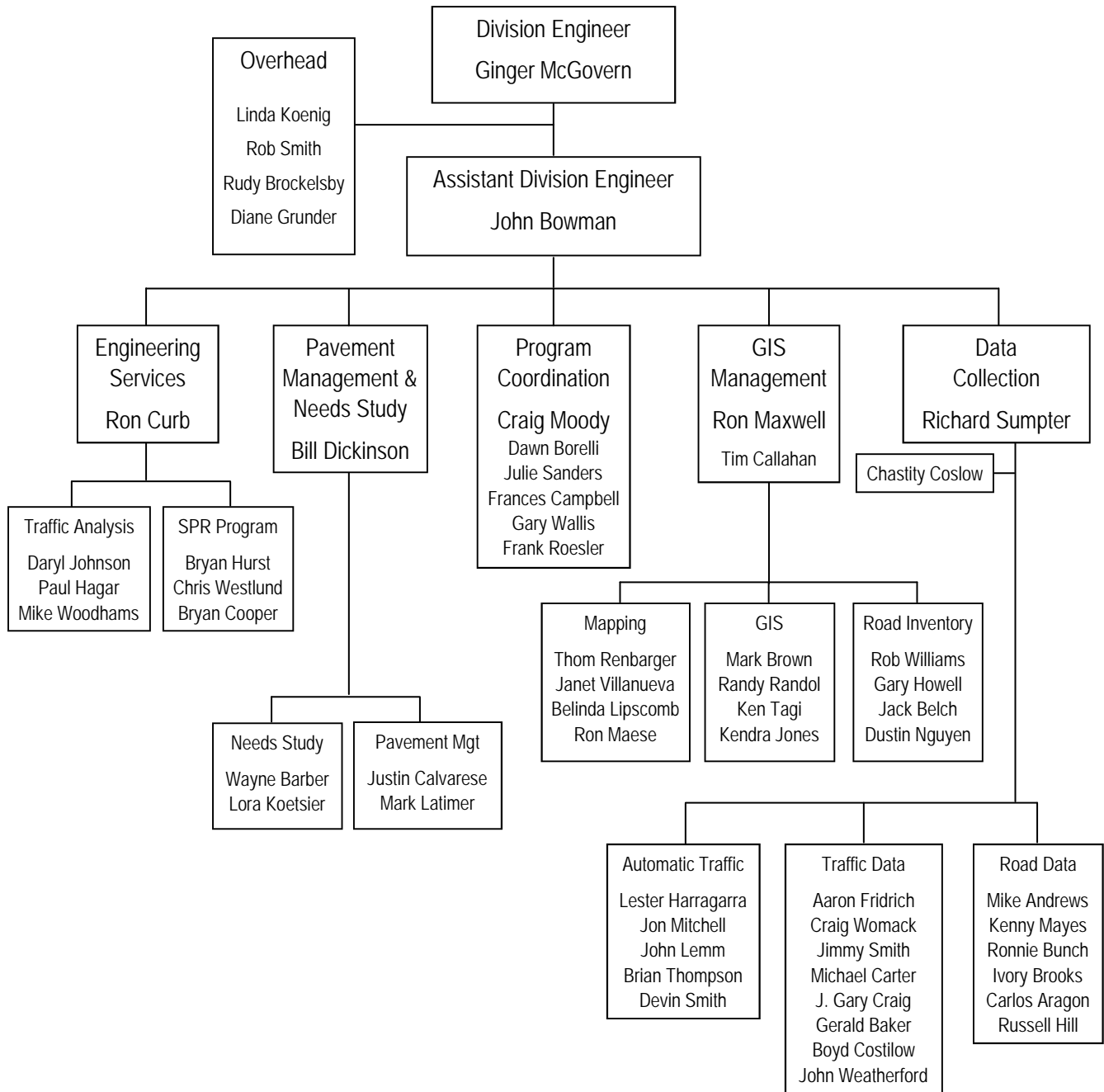
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# Planning and Research Table of Organization

## October 1, 2009





**OKLAHOMA DEPARTMENT OF TRANSPORTATION**  
**State Planning & Research (SPR) Financial Summary Sheet**  
**Federal Fiscal Year 2010**  
**Program Period October 1, 2009 through September 30, 2010**

**SPR Part 1 - Planning, SPRY 0010(47) PL, J/P 01946(53)**

**A. Estimated Costs**

SPR Part 1 - Planning	\$9,013,869.00
Metropolitan Planning (PL)	\$2,719,193.00
<b>Total Estimated Costs</b>	<b>\$11,733,062.00</b>

**B. Available Funds**

SPR Part 1 Unobligated Balance	\$9,256,349.00
PL Unobligated Balance	\$2,305,329.00
Local	\$413,864.00
<b>Total Available Funds</b>	<b>\$11,975,542.00</b>

**C. Proposed Financing**

<u>Type</u>	<u>Federal</u>	<u>Ratio</u>	<u>State</u>	<u>Local</u>	<u>Total</u>
SPR	\$9,013,869.00	80%	\$0.00	\$0.00	\$9,013,869.00
PL	\$2,305,329.00	80%	\$0.00	\$413,864.00	\$2,719,193.00
<b>Total Proposed Financing</b>					<b>\$11,733,062.00</b>

**SPR Part 2 - Research, SPRY 0010(48) RS, J/P 01946(54)**

**A. Estimated Costs**

SPR Part 2 - Research	\$2,751,832.00
<b>Total Estimated Costs</b>	<b>\$2,751,832.00</b>

**B. Available Federal Funds**

SPR Part 2 Unobligated Balance	\$2,751,832.00
<b>Total Available Funds</b>	<b>\$2,751,832.00</b>

**C. Proposed Financing**

<u>Type</u>	<u>Federal</u>	<u>Ratio</u>	<u>State</u>	<u>Local</u>	<u>Total</u>
SPR	\$2,751,832.00	80%	\$0.00	\$0.00	\$2,751,832.00
<b>Total Proposed Financing</b>					<b>\$2,751,832.00</b>

**SPR Part 1 & Part 2 Totals**

Total SPR Unobligated Balance	\$12,008,181.00
Total Other Funds (PL, State, Local)	\$2,719,193.00
<b>Total Available Funding</b>	<b>\$14,727,374.00</b>
<b>Total SPR Part1 and Part 2 Estimated Costs</b>	<b>\$14,484,894.00</b>

**Total FY2010 LTAP** **\$387,778.00**

**Total FY2010 Pooled Fund Commitments** **\$1,393,688.00**

**Total FY2010 Research Funding** **\$4,145,520.00**

**% SPR for Research Funding** **29%**



**SPR PART 1 - PLANNING, SPRY-0010(047)PL, JP# 01946(53)  
FEDERAL FISCAL YEAR 2010**

<u>PROGRAM</u>	<u>SPR</u>	<u>STATE</u>	<u>PL</u>	<u>LOCAL</u>	<u>TOTAL</u>
<b>GIS AND DATA MANAGEMENT</b>					
1101 Continuing Inventory Data Studies	\$775,800.00	\$0.00			\$775,800.00
1102 Highway Performance Monitoring System	\$187,700.00	\$0.00			\$187,700.00
1103 Geographical Information Management System for Transportation	\$443,300.00	\$0.00			\$443,300.00
1105 Crash Location Data Entry Project	<u>\$0.00</u>	<u>\$0.00</u>			<u>\$0.00</u>
<b>Total GIS and Data Management</b>	<b>\$1,406,800.00</b>	<b>\$0.00</b>			<b>\$1,406,800.00</b>
<b>MAPPING</b>					
1201 County, City and other Planning Maps	<u>\$295,300.00</u>	<u>\$0.00</u>			<u>\$295,300.00</u>
<b>Total Mapping</b>	<b>\$295,300.00</b>	<b>\$0.00</b>			<b>\$295,300.00</b>
<b>TRAFFIC AND DATA COLLECTION</b>					
1301 Coverage Count Program	\$867,000.00	\$0.00			\$867,000.00
1302 Permanent Traffic Count Program	\$451,000.00	\$0.00			\$451,000.00
1304 Purchase of Traffic Counting Equipment	\$259,100.00	\$0.00			\$259,100.00
1305 Vehicle Classification Counting Program	\$479,000.00	\$0.00			\$479,000.00
1306 Weigh-in-Motion Program	\$1,162,200.00	\$0.00			\$1,162,200.00
1308 Traffic Monitoring System	\$177,000.00	\$0.00			\$177,000.00
1309 Traffic Analysis and Projections	\$177,000.00	\$0.00			\$177,000.00
1310 Skid Studies Program	<u>\$154,200.00</u>	<u>\$0.00</u>			<u>\$154,200.00</u>
<b>Total Traffic and Data Collection</b>	<b>\$3,726,500.00</b>	<b>\$0.00</b>			<b>\$3,726,500.00</b>
<b>ECONOMIC, SAFETY, AND FISCAL STUDIES</b>					
1404 Safety Planning	\$20,000.00	\$0.00			\$20,000.00
1510 Justification Studies	\$10,000.00	\$0.00			<u>\$10,000.00</u>
<b>Total Economic, Safety, Fiscal Studies</b>	<b>\$30,000.00</b>	<b>\$0.00</b>			<b>\$30,000.00</b>
<b>SYSTEMS AND PROGRAMS</b>					
1601 Federal-aid Systems Coordination	\$77,000.00	\$0.00			\$77,000.00
1603 Highway Needs Study	\$151,600.00	\$0.00			\$151,600.00
1604 Pavement Management Systems	<u>\$1,861,741.00</u>	<u>\$0.00</u>			<u>\$1,861,741.00</u>
<b>Total Systems and Programs</b>	<b>\$2,090,341.00</b>	<b>\$0.00</b>			<b>\$2,090,341.00</b>
<b>URBAN TRANSPORTATION PLANNING</b>					
				<i>Local</i>	
1700 General Urban Transportation Planning	\$33,500.00	\$0.00			\$33,500.00
1701 Oklahoma City Area Regional Transportation Study (OCARTS)	\$20,000.00	\$0.00	\$1,449,874.00	\$200,000.00 (In-Kind)	\$1,669,874.00
1702 Tulsa Metropolitan Area Transportation Study	\$16,500.00	\$0.00	\$707,615.00	\$176,904.00	\$901,019.00
1703 Lawton Metropolitan Area Transportation	\$15,900.00	\$0.00	\$123,940.00	\$30,985.00	\$170,825.00
1709 Ft. Smith Transportation Study	\$6,600.00	\$0.00	\$23,900.00	\$5,975.00	\$36,475.00
1719 Statewide Transportation Improvement Program (STIP)	<u>\$70,000.00</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$0.00</u>	<u>\$70,000.00</u>
<b>Total Urban Transportation Planning</b>	<b>\$162,500.00</b>	<b>\$0.00</b>	<b>\$2,305,329.00</b>	<b>\$413,864.00</b>	<b>\$2,881,693.00</b>
<b>LONG RANGE PLANNING / PLANNING ACTIVITIES</b>					
1902 Statewide Long Range Transportation	\$100,000.00	\$0.00			\$100,000.00
1903 Intelligent Transportation Systems Planning	\$100,000.00	\$0.00			\$100,000.00
1904 Air Quality Transportation Planning	\$830,000.00	\$0.00			\$830,000.00
1905 Freight Planning	\$15,428.00	\$0.00			\$15,428.00
1910 Public Involvement & Visualization	<u>\$257,000.00</u>	<u>\$0.00</u>			<u>\$257,000.00</u>
<b>Total Long Range Plan and Planning</b>	<b>\$1,302,428.00</b>	<b>\$0.00</b>			<b>\$1,302,428.00</b>
<b>Grand Total SPRY-0010(047)PL</b>	<b>\$9,013,869.00</b>	<b>\$0.00</b>	<b>\$2,305,329.00</b>	<b>\$413,864.00</b>	<b>\$11,733,062.00</b>
<b>LOCAL TECHNICAL ASSISTANCE PROGRAM</b>					
				<i>LTAP (Fed)</i>	
1440 Local Technical Assistance Program	<u>\$194,702.00</u>	<u>\$47,778.00</u>		<u>\$145,298.00</u>	<u>\$387,778.00</u>
<b>Total LTAP</b>	<b>\$194,702.00</b>	<b>\$47,778.00</b>		<b>\$145,298.00</b>	<b>\$387,778.00</b>



**PURPOSE AND SCOPE:** To collect, record, and compile data on the physical characteristics for all statewide public roads and streets implementing established road inventory procedures and GPS/GIS technology. Catalogue cultural features used to update the Departments official County Highway Maps. Generate detailed maps used to conduct inventory meetings with County Commissioners pertaining to roadway modifications. Maintain current Oracle Spatial Database tables of inventory data and update the Department's Central Data file. Write SQL procedure definitions necessary to extract needed summary data from the files. Produce and publish various mileage summary tables for the state, federal and public needs. Maintain necessary information for the National Network of Defense and NHS routes. Develop and maintain Control Section numbers and other unique identification systems for all public roads. Established AVMT will be used to calculate Annual Accident and Fatality Rates.

**ACCOMPLISHMENTS DURING FY 2009:** The County Road inventory procedures were continued with six county inventories completed; (Blaine, Bryan, Carter, Harper, McIntosh and Seminole) and two (Beaver and Pontotoc) in progress. Six counties were reassessed and coded; (Atoka, Garvin, Grant, Harper, Johnston, and Ottawa) and one (Blaine) in progress. Approximately 25% of the local road network has been geo-located (GIS). All County Action Reports were verified and processed. All highway construction projects pertaining to the Department's Highway, Graphical Roadway Network, Reference Point, and Open to Traffic databases were completed. The following annual publications and reports were completed; 2009 Statewide Mileage Table Book, 2008 Oklahoma Statewide Statistics Book, 2009 Certification of County Road Mileage, and 2009 HPMS mileage, and Travel Summary Tables.

**PROPOSED ACTIVITIES FOR FY 2010:** An additional 10% of the local road network will be geo-located this year, and is currently in progress. Continue coding and updating the Department's Central Database files. Incorporate technology advancements in data collecting to insure the process of efficient information. Continue to improve on all procedural inventory operations. Seven of the following eleven counties are scheduled to be inventoried; (Beaver, Canadian, Cimarron, Harmon, Kiowa, McCurtain, Muskogee, Pontotoc, Tillman, Texas and Washita). Six of the following eleven counties are scheduled to be reassessed and coded; (Atoka, Beaver, Carter, Canadian, Cimarron, Kiowa, McIntosh, Pontotoc, Seminole, Texas and Washita). Continue monitoring all County Action Reports, and Highway Construction projects. Continue collecting HPMS data items. Continue identifying traffic count sites statewide using GPS technology. Compile and publish various state and federal reports including the 2010 Control Section Map Book, 2009 Oklahoma Statewide Statistics Book, 2008 Certification of County Road Mileage, and 2010 HPMS Mileage and Travel Summary Tables. Keep abreast of the latest technological advances through attendance of seminars, conferences and workshops.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$667,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$629,100	SPR	-0-	STATE
Projected Cost FFY 2010	\$775,800	SPR	-0-	STATE

**CONTACT INFORMATION**

Ron Maxwell, GIS Management Branch Manager, 405-521-2728

## 1102 Highway Performance Monitoring System

**PURPOSE AND SCOPE:** To collect, process, and compile data and information as needed to prepare and submit an accurate and timely HPMS submission to the Federal Highway Administration (FHWA) according to the reporting requirements established in the HPMS Reassessment 2010+ Data Specifications.

**ACCOMPLISHMENTS DURING FY 2009:** The HPMS submittal was created using adjusted urban/urbanized areas based on the 2000 census and authorized smoothing techniques. Summer help was utilized to review videolog for HPMS sample sections and continue to build a HPMS sample database populated with At-Grade intersections and left/right turn lanes information. This database was used to generate the 2009 submittal. Oklahoma continues to include native linear reference system (LRS) information as part of its submittal. All LRS data required to perform dynamic segmentation has been included. The HPMS submittal process uses a web based graphical user interface known as the HPMS Console and is very effective in managing the entire life cycle of the HPMS submittal process. The HPMS Console is intranet based and is designed to support the sharing of tasks with the appropriate HPMS data owners and personnel responsible for each of the six different phases of HPMS submittal development. Additional training was conducted to allow data owners to be responsible for their phase of the HPMS submittal process. ODOT continued to review and re-author the online HPMS Console help system. The 2008 HPMS data was made available to anyone having access to the OKDOT computer network through the Geographical Resource Intranet Portal (GRIP) Version 3 browser application. The HPMS data was also made available through an Internet web site known as GRIPLite. The web site is open to the public. (<http://192.149.244.31/griplite/>) All data submitted to the FHWA in the 2009 HPMS submittal was formatted as defined by the HPMS field manual. The 2009 submittal was created using both the FHWA supported desktop HPMS software and the web based product. All data domain and cross-check validation was done in Oracle before inserting the data into Microsoft Access through the HPMS software.

**PROPOSED ACTIVITIES FOR FY 2010:** A primary focus will be placed on implementing changes as specified in the final 2010+ HPMS Reassessment Study. A new HPMS data model will be defined that is focused on the new 2010+ requirements. Staff will gain a thorough understanding of the methods and techniques to be used by FHWA for data validation and incorporating GIS into the HPMS workflow. Methodologies and results will be reviewed and comprehended. Staff will work with a Consultant on achieving these significant tasks. The Consultants and ODOT will work closely with FHWA administrator of the HPMS system to ensure that all technical specifications are adhered to. A new approach to storing HPMS sample data will be implemented that should improve the quality and maintenance of sample data in the HPMS process. With the help of a Consultant and the FHWA the goal is to submit the 2010 HPMS submittal using the newly defined HPMS requirements. The interface to the upgraded HPMS console has not yet been designed and Staff will investigate the possibility of integrating the HPMS submittal into other GIS functional tasks.



1102 Highway Performance Monitoring System (cont.)

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$194,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$87,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$187,700	SPR	-0-	STATE

**CONTACT INFORMATION**

Timothy M. Callahan, GIS Management Branch, 405-522-1062

## 1103 Geographic Information Management System for Transportation

**PURPOSE AND SCOPE:** To design, develop, implement and maintain a Geospatial Information Management System for Transportation (GIMS-T). The system supports transportation related decision making by producing high quality map products and reports generated from Enterprise data. The maps convey specific topics of interest that require customer input and the use of complex GIS software. GIMS-T staff also supports GIS projects initiated by other ODOT Divisions. GIS services are offered to ODOT staff and customers outside the Department. An intranet GIS enterprise-wide portal is available to anyone having access to the ODOT network. The web portal is known as the Geographical Resource Intranet Portal (GRIP). An internet application known as GRIP Lite is also supported and is made available to the general public. The efficient use of resources require a considerable investment in training for GIMS-T staff. The system utilizes aerial photography, global positioning data and other sources of data. The data provided includes but is not limited to 8 Year Construction Work Plan, 4 Yr STIP, Road Characteristic Inventory, Highway Needs Study Reports, Construction and Transportation Improvement Programs, Projects under Construction, Crashes and Speed Limits, Pontis Bridge Inventory and Rating Systems, Pavement Management International Roughness Indexes and Structural History, Highway Performance Monitoring System (HPMS), Rail Crossing Inventory, Videolog Inventory and Environmental Information.

**ACCOMPLISHMENTS DURING FY 2009:** Using state-of-the-art GIS software and custom scripts a series of maps known as the 2009-2016 Construction Work Plan and Statewide Transportation Improvement Plan (STIP) maps were completed as well as creation of map products for the 2035 Long Range Plan. Staff continued working with GeoDecisions, on improvements to GRIP3 including the ability to turn on and off shields and route text, access to the General Highway and City maps and the integration of the Department's video log system (by providing a map interface to the video log images and ODOT's Linear Referencing System (LRS)). Staff generated numerous custom maps such as Bridge Vertical Clearance and Posted Load/Design Load maps used for routing oversize/overweight trucks; a series of maps based on the 2008 Needs Study Report; updates to the Posted Load Bridge Maps; and continued support for the Environmental Programs Division, with detour, wetland maps, and other maps requested by the NEPA Coordinators, biologists, and others. Both the Rural and Urban Functional Classification Map Books were redesigned and updated. The GIS Team continues to develop a foundation for an Environmental business layer in the GRIP browser application. A routable road network was created that will be sufficient to support the Department's routing needs to include but not limited to the routing and permitting of oversize / overweight (OSOW) trucks. The network includes all of the grade-separated ramps for Interstate, U.S. and State Highway Systems. Staff has begun work on a new naming convention for ramps which will more closely follow the ODOT Network Linear Feature (NLF) and will allow for the querying of data, calculating lengths and configuration of the ramps. In collaboration with the Traffic Data Section, staff is producing maps of the ramps in order to more accurately locate and retrieve AADT for each ramp segment. A product was generated to compute Point to Point mileages between various populated places within the State. Staff continues to provide limited GeoMedia user support on the GMUSERS Schema. Staff is developing a workflow for accurately reproducing the County Maps using features stored within an Oracle Database. Staff received training in the reading and use of U.S. Census Bureau's 2010 Census Data in preparation for the 2010 Census. Staff is developing 2 new themes under the Bridge business layer in GRIP Lite, one for Vertical Clearance and one for Posted Load/Design Load. Staff is working with Bridge Division, assisting them in developing the ability to accurately locate and collect latitude\longitude data for their off-system bridges. Staff is working with the Inventory Section in creating a template within GeoMedia for

## 1103 Geographic Information Management System for Transportation (cont.)

the digitizing of the Local Road Database. Staff is also assisting the Traffic Division by creating maps showing the location of road segments with narrow or no shoulders, along with the crash data associated with those segments, and also supplying them with the tabular data used to create the maps for their use in analysis of the crash data in relation to the roadway shoulder width\type.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue maintenance of the OSOW Truck Routing and Point to Point Mileage LRS and Applications. Continue working with the consultants on the enhancements to the GRIP family of products, including the continued integration and improvement of the video log, the integration of the OSOW Truck Routing, and Environmental Business Layers into the GRIP product(s) including themes within the Bridge Business Layer for Vertical Clearance and Posted Load\Design Load. Using GIS software design and create updated County/Urban Functional Classification Atlases. Utilizing GIS techniques and software develop a workflow for the County Action Report System (CARS) which will allow for increased speed, efficiency, and accuracy in the addition/deletion of roads to/from the Certified County Road Mileage Report, to include the digitizing of the Local Road database. In coordination with the ODOT Environmental Programs Division, continue to identify needs and develop solutions that will enable them to efficiently and accurately perform their mission. Use existing software (RoboHelp) to create an Index of Workflows for the various products and applications created by the GIS Team. Continue to work with the Bridge Division in accurately locating and capturing latitude\longitude and mapping of Off-System Bridge locations. Continue the major initiative aimed at CADD integration into the GIS environment. Continue coordination with the Traffic Data section in creating map products to assist in collecting AADT for Ramps. Continue to conduct certified training to personnel in the software products required for the GIMS-T staff to continue to provide efficient and high quality GIS products to customers.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$341,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$380,200	SPR	-0-	STATE
Projected Cost FFY 2010	\$443,300	SPR	-0-	STATE

### **CONTACT INFORMATION**

Mark Brown, GIS Management Branch, 405-522-1036

## 1105 Crash Location Data Entry Project

**PURPOSE AND SCOPE:** ODOT proposes a joint effort with the Department of Public Safety (DPS) to eliminate the backlog of crashes waiting to be processed at both agencies due to limited resources. By partnering together to contract for the data entry of 90,750 crash data records, both agencies will have current information by June 2009. ODOT provides crash data reports to ODOT Engineering Divisions, City Governments, Tribal Governments, City Police, County Governments and DPS. Crash data is used in Safety analysis, law enforcement placement and roadway, traffic, and bridge design. All crash location data is critical to the implementation of the State Highway Safety Plan.

**ACCOMPLISHMENTS DURING FY 2009:** Implemented a joint project to contract the data entry of approximately 90,750 crash records and locations into the DPS and ODOT crash systems database. Verified location information through GIS mapping and submitted current crash data reports to both agencies. Estimate of backlogged crashes processed:

2007 Crashes: 26,250 Records

2008 Crashes: 52,000 Records

2009 Crashes: 37,500 Records

**PROPOSED ACTIVITIES FOR FY 2010:** End of Project

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$200,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$200,000	SPR	-0-	STATE
Projected Cost FFY 2010	-0-	SPR	-0-	STATE

### **CONTACT INFORMATION**

Ginger Miller, Traffic Engineering Division, 405-522-0985

## 1201 County, City, and other Planning Maps

**PURPOSE AND SCOPE:** The purpose and scope of the Cartographic Design Section is to produce county and city CADD maps showing reliable, accurate, legible and current information for roads, drainage features, street names, city limits, boundaries and indicate man-made culture features and the creation of other special purpose planning maps and supporting graphics.

**ACCOMPLISHMENTS DURING FY 2009:** Five counties and 40 cities were completed using the latest available information, aerial photography and digital data. Counties completed were Comanche, Craig, Lincoln, Pushmataha and Sequoyah. The Section continues to review all workflows with particular emphasis placed on implementing changes that will improve accuracy and boost productivity. The Section has completed improvements on city and county designs and fully implemented Microstation Geographics that allows future graphic integration into most GIS databases.

The 40 following incorporated city maps, listed by county, were drafted using CADD software (Cities formats have been revised so that they are geospatially referenced within the Oklahoma Coordinate System; three major municipalities with substantial growth are shown in bold letters.):

Comanche County: Cache, Chattanooga, Elgin, Faxon, Fletcher, Geronimo, Indianola, **Lawton**, Medicine Park, Sterling. Craig County: Big Cabin, Blue Jacket, **Vinita**, Welch. Lincoln County: Agra, Carney, Chandler, Davenport, Fallis, Kendrick, Meeker, Prague, Sparks, Stroud, Tryon, Warwick, Wellston. Pushmataha County: Albion, Antlers, Clayton, Rattan. Sequoyah County: Arkoma, Gans, Gore, Marble City, Moffett, Muldrow, Paradise Hills, Roland, **Sallisaw**.

Special map graphics and other supporting graphics were produced as needed for the Planning & Research Division's reports and to facilitate other ODOT SPR projects.

**PROPOSED ACTIVITIES FOR FY 2010:** The Cartographic Design Section will continue drawing all county and city maps in a geospatially referenced format that will allow future GIS usage compatibility and improved accuracy. Three county maps are in progress: Cherokee, Mayes and Stephens, with a goal to complete eight or more counties in the coming year. All maps currently in CADD format will be updated as highway system revisions are completed that affect alignments, interchanges or numbers of lanes. Map design features will be integrated into the Oracle Spatial database to facilitate the use of map features from Cartographic Design to other GIS Management Sections needs and for use by other governmental agencies.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$272,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$295,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$295,300	SPR	-0-	STATE

### **CONTACT INFORMATION**

Thom Renbarger, Mapping Section, GIS Management Branch, 405-521-2526

## 1301 Coverage Count Program

**PURPOSE AND SCOPE:** To collect traffic data on state highways, interstates and the National Functional Classified System for establishing average daily traffic volumes. Approximately 3,300 short duration locations are counted on the highway system and 11,700 on the secondary system that includes the county road coverage and urban city street coverage in cities populations over 5,000. State highway and interstate locations are counted on a three-year cycle along with the county and city system coverage. Counts collected on the highway system are incorporated into an Annual Average Daily Traffic (AADT) map published annually for distribution. Counts collected on the county and city system are recorded and retained for office use. Highway traffic maps are published for public distribution.

**ACCOMPLISHMENTS DURING FY 2009:** Beginning in FY 2009, the Data Collection Branch implemented a new three-year coverage count cycle to accommodate the increasing number of vehicle classification sites being added by the Traffic Data Analyst (see Item 1305). Short duration traffic counts were completed on the state highway system and Small Urban System in the 25 counties scheduled for FY 2009. Collection of GPS coordinates and site characteristics for all traffic count sites on the state highway system and part of the off-system was completed. A new contract was initiated and awarded for the development of enhanced features to the Oklahoma Traffic Count Information System Web Page, which will incorporate truck traffic percentages and all historical traffic counts dating back to 1978. The contract will also include web page maintenance and support. The Oklahoma Traffic Count Information System Web Page was continuously updated throughout the year.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue to analyze all road systems for areas where coverage is deficient, establish new count locations as needed and retire locations that are no longer needed. Collect short duration traffic counts on the state highway system and Small Urban System in the 26 counties scheduled for FY 2010. Collect and update GPS coordinates and site characteristics for off-system traffic count sites. The Short Duration Traffic Count Contract will be renewed for a 3<sup>rd</sup> year for the completion of approximately 2,000 designated highway, county, and city street locations in Oklahoma County. The contract for enhanced features to the Oklahoma Traffic Count Information System Web Page will be renewed for a 2<sup>nd</sup> year, which will include enhanced mapping updates and additional truck traffic information, web page maintenance, and support. Attend seminars, conferences and workshops to keep abreast of the latest technological advances in traffic counting equipment and data collection processes.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$855,600	SPR	-0-	STATE
Estimated Cost FFY 2009	\$515,400	SPR	-0-	STATE
Projected Cost FFY 2010	\$867,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

Richard Sumpter, Data Collection Branch Manager, 405-736-9466

**PURPOSE AND SCOPE:** To collect hourly and 15 minute increment traffic data by lane for traffic monitoring design needs. There are 71 Automatic Vehicle Classification (AVC) continuous count traffic monitoring station locations and 21 Weigh-in-Motion (WIM) station locations in Oklahoma. The traffic data obtained are the basis for seasonal and axle factor variation as recommended for traffic monitoring in FHWA's Traffic Monitoring Guide. A biennial traffic characteristic report is generated from the data collected at these sites.

**ACCOMPLISHMENTS DURING FY 2009:** Conversion of all AVC sites' electric utilities from AC power to solar power in order to reduce electric utility costs was completed. A contract with the University of Oklahoma to support alternatives to data communication media other than land line telephone, was renewed for the 3<sup>rd</sup> and final year in FY 2009. The progress made in this year's effort resulted in the successful deployment of digital wireless data communications at 49 of the existing AVC stations. Deployments, involving the testing of different wireless service providers has demonstrated the capability of traffic data transfer to an IP address on the internet to facilitate import into the department's Traffic Operations and Planning Software data base at a significant increased speed as compared to land line telephone data download. Data collected from 5 new AVC permanent sites (see Item 1306) will provide for enhanced input for updated seasonal, axle, and day-of-week factor development.

**PROPOSED ACTIVITIES FOR FY 2010:** Four new AVC sites are planned to be constructed in FY 2010 (see Item 1306) and will be equipped with solar power and wireless communication to continue the utilities cost reduction effort. Additionally, the wireless communications conversion is expected to be completed at the end of FY 2009. Further refinement of the wireless system in FY 2010 will focus on: 1) support services for the digital wireless data communications network, 2) development of software supporting remote programming and configuration of traffic data recorders, 3) development of software allowing for the addition of multiple analog sensors to the communications terminal unit, 4) development of remote diagnostics for trouble shooting, and 5) development of a power monitoring system for calculating charging rate and power consumption rate to adjust wireless transmission frequency.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$466,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$373,400	SPR	-0-	STATE
Projected Cost FFY 2010	\$451,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Richard Sumpter, Data Collection Branch Manager, 405-736-9466

## 1304 Purchase of Traffic Counting Equipment

**PURPOSE AND SCOPE:** To improve the efficiency of the traffic counting operation by systematic replacement of older outdated equipment and stolen or damaged equipment as well as support of increased equipment requirements resulting from expanded operations. As older, out-dated data recorders become uneconomically repairable and obsolete, timely replacement becomes vital to maintaining data integrity and continuity of operations in the permanent traffic monitoring stations and particularly the short duration count program which depends on hardware availability and continuous replacement of road tubes and accessories.

**ACCOMPLISHMENTS DURING FY 2009:** Equipment purchases executed in FY 2009 continued to support on-going projects in traffic monitoring systems operations in both permanent sites and short-duration count site locations. Specifically, these purchases consisted of 1) traffic counters and traffic count/classifiers for the Permanent Traffic Count Program and the Continuous Count Program, 2) solar panels and accessories for the on-going project for site power conversion, 3) wireless communications terminals for the on-going wireless communications deployment in support of data collection at the permanent traffic monitoring stations.

Additionally, GPS units and accessories were purchased in support of updating the site location description database from which data is transferred to the Oklahoma Traffic Count Information System Web Page. The Road Data Section executed purchases in support of instruments and hardware required to meet data collection requirements under the HPMS program.

**PROPOSED ACTIVITIES FOR FY 2010:** Equipment purchases are planned for the replacement of two older WIM systems; wind power for two WIM sites; replacement of outdated, damaged, or uneconomically repairable counters/classifiers; additional GPS equipment; replacement road tubes; and other miscellaneous traffic counting equipment.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$222,300	SPR	-0-	STATE
Estimated Cost FFY 2009	\$38,800	SPR	-0-	STATE
Projected Cost FFY 2010	\$259,100	SPR	-0-	STATE

### **CONTACT INFORMATION**

Richard Sumpter, Data Collection Branch Manager, 405-736-9466



## 1305 Vehicle Classification Counting Program

**PURPOSE AND SCOPE:** To gather vehicle classification data and develop estimates of the composition of traffic on the various functional classifications of roadways in the state and to collect complex traffic data required for planning, traffic and design studies. Data gathered and used to facilitate these studies includes short-term machine counts, vehicle classification counts, and turning movement studies with pedestrian counts.

**ACCOMPLISHMENTS DURING FY 2009:** Vehicle classification data collection continued at the short term sites in support of the development of updated annual average truck volumes. Over 400 new short-term vehicle classification sites have been selected by the Traffic Data Analyst and will be incorporated in the 3-year collection cycle. All 2-lane highway classification site locations were counted for 24 hours using Automatic Traffic Recorders (ATRs). During FY 2009, various special studies were conducted providing timely data for traffic engineers, planners and designers in the department's central office division as well as for engineers and managers in the eight field divisions. The type and scope of these various special studies and the activities supported are as follows:

- |   |   |
|---|---|
| <p>(A) For the Data Collection Branch</p> <ul style="list-style-type: none"> <li>0 - Turning movements with pedestrian counts</li> <li>11 - (24 hour) Hourly Machine Count</li> <li>16 - (24 hour) Cumulative Machine Count</li> <li>136 - (24 hour) Vehicle Classification Counts</li> </ul>       | <p>(C) For the Traffic Engineering Division (and field divisions)</p> <ul style="list-style-type: none"> <li>39 - Turning movements with pedestrian counts</li> <li>95 - (24 hour) Hourly Machine Counts</li> <li>7 - (24 hour) Cumulative Machine Counts</li> <li>5 - (24 hour) Vehicle Classification Counts</li> </ul> |
| <p>(B) For the Engineering Services Branch</p> <ul style="list-style-type: none"> <li>15 - Turning movements with pedestrian counts</li> <li>213 - (24 hour) Hourly Machine Counts</li> <li>0 - (24 hour) Cumulative Machine Counts</li> <li>3 - (24 hour) Vehicle Classification Counts</li> </ul> | <p>(D) For other Divisions</p> <ul style="list-style-type: none"> <li>1 - Turning movements with pedestrian counts</li> <li>4 - (24 hour) Hourly Machine Counts</li> <li>1 - (24 hour) Cumulative Machine Counts</li> <li>0 - (24 hour) Vehicle Classification Counts</li> </ul>  |

**PROPOSED ACTIVITIES FOR FY 2010:** The vehicle classification counting program for FY 2010 will be supplemented with a new contract for collection of multi-lane urban and rural classification data statewide. Additional classification counts will be conducted in accordance with the annual cycle of designated highway systems and county and city systems programmed for this year. Continue to provide resources to fulfill the requests for various types of traffic studies and produce all reports associated with those studies.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$447,800	SPR	-0-	STATE
Estimated Cost FFY 2009	\$214,500	SPR	-0-	STATE
Projected Cost FFY 2010	\$479,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

Richard Sumpter, Data Collection Branch Manager, 405-736-9466

## 1306 Weigh-in-Motion Program

**PURPOSE AND SCOPE:** To collect and conduct preliminary analysis of data describing vehicle characteristics and vehicle weight trends. The Department uses this data as an integral part of the traffic monitoring system. These data collection systems provide axle weight factors used in design and pavement management studies and to fulfill FHWA requirements. The Department operates 21 permanent weigh-in-motion (WIM) data collection sites located throughout the state.

**ACCOMPLISHMENTS DURING FY 2009:** The Traffic Monitoring Systems Operations and Maintenance Contract initiated in FY 2008 covers both AVC and WIM sites and provides enhanced services and expertise particularly in the area of data collection and systems validation. The scope of work accomplished during FY 2009 included:

- 1) Data uploading and systems validation of 91 permanent AVC and WIM sites
- 2) Video collection and analysis to verify vehicle classification
- 3) Construction of five (5) new AVC sites
- 4) Renovation of thirty six (36) existing sites (11 WIM and 25 AVC)
- 5) Performed scheduled maintenance and annual calibration for all operational WIM and AVC sites

**PROPOSED ACTIVITIES FOR FY 2010:** The 3rd year renewal of the Traffic Monitoring Systems Operations and Maintenance Contract will continue repair and replacement projects begun in FY 2009. Several of these new projects were submitted by the Traffic Data Analyst as necessary to emphasize functional classifications of roadways which require additional continuous count sites at specific locations for improved accuracy in computing seasonal, axle, and day-of-week factors for short-duration site AADT development. The scope of work to be accomplished in FY 2010 is as follows:

- 1) Add 4 permanent AVC sites bringing the total continuous count site inventory to 95
- 2) Continue and expand classification data collection and analysis
- 3) Execute scheduled maintenance for up to 95 sites
- 4) Complete site renovations and repairs at approximately 20 permanent sites

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$1,166,600	SPR	-0-	STATE
Estimated Cost FFY 2009	\$1,144,800	SPR	-0-	STATE
Projected Cost FFY 2010	\$1,162,200	SPR	-0-	STATE

### **CONTACT INFORMATION**

Richard Sumpter, Data Collection Branch Manager, 405-736-9466

**PURPOSE AND SCOPE:** The Oklahoma Traffic Monitoring System (TMS) is a comprehensive state-wide traffic data gathering, editing, and reporting system created to fulfill the requirements of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The purpose of TMS is to computerize traffic estimation and reporting, including data from public and private non – state government entities.

**ACCOMPLISHMENTS DURING FY 2009:** Annual processing was completed for the traffic year 2008 and the data was checked for accuracy. The biennial publication of the 2007 Oklahoma Traffic Characteristics report was completed. The annual publication of the 2008 AADT Map was completed. The work toward updating the TMS mapping system to GeoMedia has begun. This will allow a more efficient accounting of all traffic monitoring locations and the new ramp and truck estimation requirements. Over 400 short-term vehicle classification locations have been selected to be added to the system.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue the process of moving the TMS into GeoMedia. Revise and streamline the process of recording and compiling short term counts and producing seasonal and axle factors for AADT estimation in the HPMS System and 2009 AADT Map. Compile and report the 2009 Oklahoma Traffic Characteristics Report. Keep informed of technological advances through attendance of seminars, conferences, and workshops.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$170,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$170,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$177,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Daryl Johnson, Traffic Data Analyst, 405-522-6376

## 1309 Traffic Analysis and Projections

**PURPOSE AND SCOPE:** Traffic forecasts provide the basis for geometric and structural design of new highways and improvement of existing highways. The existing or assigned traffic volumes are projected twenty (20) years into the future for design purposes. Also, the factors for determining Design Hourly Volume (DHV) of the Annual Average Daily Traffic (AADT), percent of trucks of the DHV, and the percent of heavy trucks (AADT) are prepared for each request of design traffic information.

**ACCOMPLISHMENTS DURING FY 2009:** Design traffic was furnished to the city and county governments and various divisions within ODOT. Information prepared for the larger population areas was based on the comprehensive area and regional transportation studies in those cities. Information for rural communities and small cities was prepared utilizing historical data, such as traffic volumes, vehicle use, population trends, special traffic counts and other related traffic information gathered through special studies. Approximately 64 requests for design traffic were completed. Approximately 62 Stimulus Bridge Projects had Design Traffic prepared. Several consultant traffic analyses were overseen and edited.

**PROPOSED ACTIVITIES FOR FY 2010:** Design traffic data will continue to be furnished for cities, counties and to ODOT divisions upon approved requests. Traffic analysis and projections will be completed, as requested for all programmed construction projects. Project Planning Reports and other required special studies will be developed. Remain informed of technological advances through attendance of seminars, conferences and workshops.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$170,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$170,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$177,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

Daryl Johnson, Traffic Data Analyst, 405-522-6376

**PURPOSE AND SCOPE:** To assess the skid resistance for pavement surfaces of Oklahoma’s highway system in accordance with the guidelines of the Highway Safety Improvement Program and ASTM standards. The scope of the program includes: scheduled testing of all roadways comprising the National Highway System in a three-year test cycle, annual testing of all interstate highways and Strategic Highway Research Program (SHRP) sites, and special testing conducted as required.

**ACCOMPLISHMENTS DURING FY 2009:** The annual test cycle for FY 2009 encompassed pavement friction testing of highways in Divisions 1, 2 and 3. The new Pavement Friction (Skid) Testing System purchased in FY 2007 was in its 3<sup>rd</sup> year of use in this year’s test cycle and again experienced increased productivity in test miles. This year’s testing cycle totaled 10,460 miles. The new system’s software provides for efficient and streamlined reporting. Highway mileage with less than adequate skid resistance registers an average of approximately 8 percent.

**PROPOSED ACTIVITIES FOR FY 2010:** The annual test cycle for FY 2010 is planned for the highways in Divisions 5, 6 & 7 and is scheduled to be completed by this spring. This cycle’s testing encompasses all state, federal and interstate highways totaling approximately 10,625 miles.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$175,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$156,900	SPR	-0-	STATE
Projected Cost FFY 2010	\$154,200	SPR	-0-	STATE

**CONTACT INFORMATION**

Richard Sumpter, Data Collection Branch Manager, 405-736-9466

1404 Safety Planning

**PURPOSE AND SCOPE:** To coordinate implementation, evaluation, and documentation of Oklahoma's Strategic Highway Safety Plan (SHSP) and to address SHSP emphasis areas in the development of Oklahoma's Statewide Transportation Improvement Program and Statewide Long Range Transportation Plan.

**ACCOMPLISHMENTS DURING FY 2009:** Attended workshops/training on Roadway Safety Audits, Roadway Departures, and Highway Traffic Safety. Coordinated further review and more extensive analysis of existing data by consultants. Conducted SHSP meetings with stakeholders from other agencies and entities in November 2008 and April 2009. Requested and received updates to safety software and renewed contract for an additional year.

**PROPOSED ACTIVITIES FOR FY 2010:** Strengthen coordination with ODOT Traffic Engineering Division, Oklahoma High Patrol, MPOs, and other agencies in development of Transportation Safety Plans. Evaluate transportation safety strategies. Continue to work with Emphasis Area Champions to develop and coordinate implementation efforts.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$75,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$20,805	SPR	-0-	STATE
Projected Cost FFY 2010	\$20,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Linda Koenig, Transportation Planner, 405-522-0171

**PURPOSE AND SCOPE:** The Local Technical Assistance Program (LTAP) is a training program contracted through Oklahoma State University’s Center for Local Government Technology to provide technical maintenance training and assistance to Oklahoma’s 77 counties’ personnel in the areas of road and bridge construction, repair and maintenance and other transportation related issues. This is accomplished by (1) conducting workshops, seminars and other training opportunities; (2) providing on-site technical assistance; (3) maintaining a lending library for publications, videotapes, DVDs and other technology resource documents; (4) providing information on new and existing technology; (5) coordinating with faculty and staff at OSU and ODOT to provide technical expertise and support; and (6) publishing a quarterly newsletter and (7) maintaining a database of rural, local and state transportation officials and other resources in Oklahoma and nationwide.

**ACCOMPLISHMENTS DURING FY 2009:** Conducted forty training sessions of the Roads Scholar Program’s subjects statewide with over a thousand county personnel trained through attendance at the Roads Scholar and other training programs. Published and distributed to county commissioners various newsletters, papers technical literature and video materials through the LTAP Library and ODOT’s Technical Library. Developed and conducted new training courses as requested by the LTAP Advisory Board and counties, with emphasis on Safety. Developed hands on training through cooperation efforts with industry. LTAP has successfully implemented a Welder’s Certification Program. Hands on demonstrations with maintenance equipment sponsored and furnished by national companies were successfully held. LTAP offices continued to serve as the American Public Works Association State Chapter office. Newsletters were published and various literature, tapes, DVD, etc., were distributed.

**PROPOSED ACTIVITIES FOR FY 2010:** Oklahoma LTAP will host the National LTAP Association (NLTAPA) Annual Conference in Oklahoma City July 12-15, 2010. Continuation of the Roads Scholar curriculum. Develop and conduct new training courses as requested by the LTAP Advisory Board and counties, with emphasis on Safety. Continue to develop hands on training through cooperation efforts with industry. Continue to publish newsletters and various literature, tapes, DVD, etc. for distribution.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$155,552	SPR	\$47,778	STATE	\$184,448	FHWA
Estimated Cost FFY 2009	\$155,552	SPR	\$47,778	STATE	\$184,448	FHWA
Projected Cost FFY 2010	\$194,702	SPR	\$47,778	STATE	\$145,298	FHWA

**CONTACT INFORMATION**

Craig Moody, Program Coordination Branch Manager, 405-522-1465

1510 Justification Studies

**PURPOSE AND SCOPE:** To study the economic, environmental and other effects of design features of roadway improvements such as interchanges, grade separations, bypasses, utility structures, pedestrian structures, etc., for the purpose of determining the economic and engineering feasibility of such proposals.

**ACCOMPLISHMENTS DURING FY 2009:** Reviewed consultant studies as needed.

**PROPOSED ACTIVITIES FOR FY 2010:** Consultant studies will be overseen as needed. Keep informed of technological advances through attendance of seminars, conferences, and workshops.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$5,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$2,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$10,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Daryl Johnson, Traffic Data Analyst, 405-522-6376



**PURPOSE AND SCOPE:** To be responsible for the coordination of the State and United States Highway System, Federal-aid Highway System (includes the Interstate System and National Highway System) and the Functional Classification System. To prepare and coordinate any highway and classification revisions pertaining to these systems. To record, maintain, research, and provide any documents and historical data relating and pertaining to these systems. To communicate, inform and coordinate with city, county, state and federal officials pertaining to these systems.

**ACCOMPLISHMENTS DURING FY 2009:** Three revisions to the State Highway System: the relocation of US 77 in Norman and Pauls Valley, and the realignment of US 64 south of Haskell in Muskogee County. Completion of 15 county collector and 10 urban for a total of 25 necessary revisions to the Functional Classification System. Completed reclassification of North McClain, Northeast Grady, and Southeast Canadian Counties for SH 4, SH 9, SH 37 and US 62 to become a principal arterial or a minor arterial with other upgrades of local roads in the area. Reviewed the Functional Classification System of 57 counties for improper routing and corrections. This makes all 77 counties of the Functional Classification System that have been reviewed resulting in finding 55 improper routing that would need attending. Three of the many highway history questions this office received, required an intensive research. The *Oklahoma's Memorial Highways & Bridges* book, except for maps, has been updated for 2008.

**PROPOSED ACTIVITES FOR FY 2010:** Make highway revision for the removal of SH 92 in Canadian County. Make approximately 4 to 6 other highway revisions that would be necessary within the State. Do necessary on-site reviews of revisions. Reclassify US 60 between Vinita, Oklahoma and the State of Missouri to a principal arterial. The Functional Classification Systems has 55 county collector routes and 26 urban routes that need to be revised for improper routing or connection. Update and publish the *Highway Functional Classification within the State of Oklahoma* booklet and the *Oklahoma's Memorial Highways & Bridges* book for 2009.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$69,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$102,900	SPR	-0-	STATE
Projected Cost FFY 2010	\$77,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Gary Howell, Systems Coordinator, GIS Management Branch, 405-522-1041

## 1603 Highway Needs Study

**PURPOSE AND SCOPE:** To estimate the current and future needs of the state highway system using up-to-date software and techniques. Publish a Needs Study and Sufficiency Report biennially showing the physical and financial needs of the state highway system over a twenty-year period for construction, maintenance, and administration. Identify the Top 25 Highway Construction Priority List of critical projects by Commission District based on the Needs Study and Sufficiency Rating Report. Maintain a file of geometric deficiencies on the state highway system, a construction and maintenance status log of highway projects, and a database indicating sufficiency ratings for roadways and bridges along with recommended improvements and costs. Develop, maintain, and recommend a list of highway segments for potential removal from the state highway system and its associated costs.

**ACCOMPLISHMENTS FOR FY 2009:** Updated the Sufficiency Rating Manual. Updated the Field Division maintenance study guide. Revised the Needs Study Procedure Manual to correspond with the new Windows-based programs. Updated the state highway subsections, inventory, and improvement data for the Sufficiency file prior to collection of field data. Updated geometric data contained in the Deficiency file. Began field data collection. Began revisions of the Needs Study Report, Volumes 1 & 2. Continued conversion of mainframe programs to Windows-based programs.

**PROPOSED DURING FY 2010:** Publish and distribute the Top 25 Highway Construction Priority List by Commission District. Publish and distribute the 2009 Needs Study and Sufficiency Rating Report, Volumes I & II and the Needs Study Top 25 Highway Construction Priority List. Review, revise, print and distribute Potential Removals from the State Highway System Report. Continue converting of mainframe programs to Windows-based programs and continue updating the Needs Study procedural manual.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$124,854	SPR	-0-	STATE
Estimated Cost FFY 2009	\$75,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$151,600	SPR	-0-	STATE

### **CONTACT INFORMATION**

Wayne Barber, Needs Study Program Manager, 405-522-6705

**PURPOSE AND SCOPE:** To develop and implement the Department's Pavement Management System (PMS); maintain a computer database of pavement distresses and other roadway characteristics used for the analysis of pavement condition and performance and as an aid to pavement design; maintain application software necessary to analyze roadway information for pavement management; and supply data for inclusion in the Highway Performance Monitoring System (HPMS).

**ACCOMPLISHMENTS DURING FY 2009:** Provided technical support for the Intranet Analysis Tool and the video log software. Completed a round of condition data collection and began a new round. Collected all routes (including HPMS samples) in Divisions 1, 2, 3, 5, 6 and 7. Collected IRI only for NHS routes in Divisions 4 and 8. Continued implementing web-based version of video log and coordinated integration with GRIP. Performed Interstate PMS analysis. Kept informed of the latest technological advances and practices by attending the Southeast Pavement Management Conference.

**PROPOSED ACTIVITIES FOR FY 2010:** Perform PMS analysis of the Statewide Highway System in Oklahoma. Continue refinement of PMS procedures by updating performance curves, treatment costs, and triggers. Provide technical support for the video log software, both in-house and web-based. Collect Falling Weight Deflectometer (FWD) data on the portions of the NHS. Initiate pavement condition data collection on the following:

- All routes in Divisions 4 and 8
- NHS routes only in Divisions 1, 2, 3, 5, 6 and 7
- HPMS non-highway sample sections in Divisions 4 and 8

Keep informed of the latest technological advances and practices through seminars, conferences, and workshops.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$1,571,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$887,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$1,861,741	SPR	-0-	STATE

**CONTACT INFORMATION**

William Dickinson, Pavement Management Acting Branch Manager, 405-522-1448

## 1700 General Urban Transportation Planning

**PURPOSE AND SCOPE:** This item includes managing staff members in Program Coordination Branch and the conduct of those general planning and research activities which cannot be ascribed to specific transportation studies contained in the unified planning work programs or the SPR Report. These activities include: a) coordination between ODOT Central Office and Field Divisions; b) coordination with and among local, state, and federal officials; c) dissemination of social and economic data and traffic counts to the public and private sector on request; d) providing technical assistance on planning and research activities/studies at request; e) tracking federal and state legislation and regulations affecting the Department, and; f) keeping abreast with the latest technological advances and federal regulations in transportation planning, ITS, etc. through seminars, workshops and reading materials.

**ACCOMPLISHMENTS DURING FY 2009:** Coordination work was continued with appropriate ODOT staff members and Field Divisions. Socioeconomic data and traffic counts were provided, at request, to local and state officials and to citizens. Attended various seminars and workshops related to transportation planning and policies in order to maintain, upgrade and develop needed expertise, proficiency and professionalism. Assistance related to Program Coordination functions was provided. Coordination with and among local, state and federal officials was continued. Monitored federal and state legislation and regulations affecting the Department.

**PROPOSED ACTIVITIES FOR FY 2010:** Coordination with ODOT staff members, Field Divisions and local, state and federal officials will be continued. Dissemination of pertinent planning data and information will be accomplished on request. Technical assistance will be provided on request concerning transportation planning and the SAFETEA-LU legislation. Professional enrichment of Program Coordination members will be pursued through attendance at workshops, seminars and conferences.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$33,500	SPR	-0-	STATE
Estimated Cost FFY 2009	\$33,500	SPR	-0-	STATE
Projected Cost FFY 2010	\$33,500	SPR	-0-	STATE

### **CONTACT INFORMATION**

Linda Koenig, Transportation Planner, 405-522-0171

**PURPOSE AND SCOPE:** To maintain up-to-date socioeconomic and land use data and a viable Long Range Transportation Plan in compliance with the provisions of existing federal regulations and SAFETEA-LU provisions and all applicable transportation planning regulations and requirements for the Oklahoma City Area Regional Transportation Study (OCARTS) area.

**ACCOMPLISHMENTS DURING FY 2009:** Continued efforts for the preparation of the 2035 OCARTS Long-Range Transportation Plan. Review of demographic areas in OCARTS area for assessing high growth areas. Continued development and refinement of the transit model for OCARTS. Participated in the ongoing process to implement strategies recommended in the Central Oklahoma Transportation and Parking Authority (COTPA) Fixed Guideway Study. Continued coordination with collection and assessment of socioeconomic data and transportation data. Continued program coordination and local technical assistance. Began work on updating the Regional Travel Demand Model. Maintained staff training and dissemination of planning documents and updating of socioeconomic and traffic data for the Oklahoma City area.

**PROPOSED ACTIVITIES FOR FY 2010:** Data collection and monitoring of social, economic, environmental and transportation system data; simulation and forecasting of land use, travel demand for the Destination 2035 Plan and mobile emissions models; long range planning including major streets and highways, comprehensive and regional transportation plans and coordination; short range planning including the Congestion Management Process, ITS, Safety Management and special studies; program implementation of the TIP, Urbanized Area Surface Transportation Program and project coordination and monitoring; alternative transportation planning including Pedestrian and Bicycle, Public Transit, Human Services Transportation and Passenger Rail; transportation effects of air quality, ozone reduction and environmental programs; public education planning of the public participation process (PPP), nondiscrimination compliance plan and conducting broad-based public involvement activities; program administration and implementation of the FY 2010 Unified Planning Work Program (UPWP) and COTPA Program.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$20,000	SPR	\$1,801,133	PL	\$350,000	Local
Estimated Cost FFY 2009	\$10,252	SPR	\$1,176,000	PL	\$200,000	Local
Projected Cost FFY 2010	\$20,000	SPR	\$1,449,874	PL	\$200,000	In-Kind

**CONTACT INFORMATION**

Dawn Borelli, Program Coordination Branch, 405-521-6433

## 1702 Tulsa Metropolitan Area Transportation Study

**PURPOSE AND SCOPE:** To maintain up-to-date socioeconomic and land use data and a viable Long Range Transportation Plan in compliance with the provisions of existing federal regulations and SAFETEA-LU provisions and all applicable transportation planning regulations and requirements for the Tulsa urbanized area.

**ACCOMPLISHMENTS DURING FY 2009:** Continued development of the Regional Transportation Plan, *Connections 2035*. Preparation and finalization of the FY 2010 Unified Planning Work Program (UPWP) was completed. The FY 2010 Agreement was executed and authorization to expend federal funds effective July 1, 2009 through June 30, 2010 was granted by FHWA. The Transportation Improvement Program (TIP) for FFY 2009-2012 was developed, maintained and amended as necessary. Applications for FFY 2011 STP-UZA program were reviewed and selected for funding. Continued the coordination of the Ozone Alert!, Clean Cities and Green Traveler Alternative programs. Reviewed and analyzed the Congestion Management Process and implemented modified system. Assisted in the planning, funding and development of the Bicycle/Pedestrian Trail system as well as developed a pedestrian master plan for the region.

**PROPOSED ACTIVITIES FOR FY 2010:** Data collection and monitoring of social, economic, environmental and transportation system data; simulation and forecasting of land use, maintain travel demand model developed for the *Destination 2030* Plan and mobile emissions models; long range planning includes continued development of the regional transportation plan, *Connections 2035*, including continued data collection validation and development of the draft plan document. *Destination 2030* plan will be monitored for potential amendments resulting from ongoing studies; short range planning including the Congestion Management Process, ITS, Safety Management and special studies; program implementation of the TIP, Urbanized Area Surface Transportation Program and project coordination and monitoring; alternative transportation planning including Pedestrian and Bicycle, Public Transit, Human Services Transportation and Passenger Rail; transportation effects of air quality, ozone reduction and environmental programs; public education planning of the PPP, nondiscrimination compliance plan and conducting broad-based public involvement activities; program administration and implementation of the FY 2010 UPWP and MTTA Program.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$16,500	SPR	\$771,693	PL	\$154,339	Local
Estimated Cost FFY 2009	\$1,315	SPR	\$729,760	PL	\$182,440	Local
Projected Cost FFY 2010	\$16,500	SPR	\$707,615	PL	\$176,904	Local

### **CONTACT INFORMATION**

Dawn Borelli, Program Coordination Branch, 405-521-6433

**PURPOSE AND SCOPE:** To maintain up-to-date socioeconomic and land use data and a viable Long Range Transportation Plan in compliance with the provisions of existing federal regulations and SAFETEA-LU.

**ACCOMPLISHMENTS DURING FY 2009:** Transportation Planning for the Lawton Metropolitan Area was carried out as described in the FY 09 Unified Planning Work Program (UPWP). During FY 09 staffing shortages and lack of transportation planning experience by employees of the Lawton Metropolitan Planning Organization (LMPO) postponed numerous projects and required significant hands on assistance and training by the MPO coordinator. Accomplishments during FY 09 included: update of the Public Participation Plan, publish the Annual listing of obligated projects and preparation of the annual transportation planning funding documents. The LMPO website is maintained and updated by staff.

**PROPOSED ACTIVITIES FOR FY 2010:** Develop policies and plans regarding transportation areas such as air quality, reducing congestion and preserving street network capacity. Assist the LMPO in development and adoption of the transportation planning and procedures manual. Continue staff education, training and attendance at workshops and seminars. Monitor the transportation planning process for compliance with administrative, financial and legal requirements for maintaining a continuous, cooperative and comprehensive process. Undertake planning activities leading to the development and implementation of the short-range (5 year) elements of the 25 year Long Range Transportation Plan.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$15,900	SPR	\$130,172	PL	\$32,543	Local
Estimated Cost FFY 2009	\$15,000	SPR	\$67,000	PL	\$16,714	Local
Projected Cost FFY 2010	\$15,900	SPR	\$123,940	PL	\$30,985	Local

**CONTACT INFORMATION**

Julie Sanders, Program Coordination Branch, 580-255-7586

## 1709 Ft. Smith Transportation Study

**PURPOSE AND SCOPE:** To maintain up-to-date socioeconomic and land use data and a viable Long Range Transportation Plan in compliance with the provisions of existing federal regulations and SAFETEA-LU and all applicable transportation planning regulations and requirements for the Fort Smith urbanized area.

**ACCOMPLISHMENTS DURING FY 2009:** Transportation Planning for the Bi-State Metropolitan Area was carried out as described in the FY 09 Unified Planning Work Program (UPWP). General administrative functions and coordination among the local, state, and federal agencies were continued. Accomplishments during FY 09 included: published Annual Listing of Obligated Projects, developed and hosted Freight Summit and Freight Roundtable. Continued to work with Fort Smith Transit in development of a position for a coordination of service providers position.

**PROPOSED ACTIVITIES FOR FY 2010:** The Oklahoma Department of Transportation will continue coordination with the Bi-State Metropolitan Planning Organization and the Arkansas DOT in maintaining the 3-C planning process in the Fort Smith area. Organize and facilitate the Freight Summit and Freight Roundtable. Assist Arkansas Highway and Transportation Department and Bi-State MPO in development of transportation planning procedures manual, and educational/training opportunities for Technical and Policy Board. Monitor the transportation planning process for compliance with administrative, financial and legal requirements for maintaining a continuous, cooperative and comprehensive process. Continue staff education, training and attendance at workshops and seminars.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$6,600	SPR	\$23,864	PL	\$5,966	Local
Estimated Cost FFY 2009	\$9,000	SPR	\$20,000	PL	\$5,000	Local
Projected Cost FFY 2010	\$6,600	SPR	\$23,900	PL	\$5,975	Local

### **CONTACT INFORMATION**

Julie Sanders, Program Coordination Branch, 580-255-7586



## 1719 Statewide Transportation Improvement Program

**PURPOSE AND SCOPE:** To develop, administer and revise a financially-constrained federally funded transportation construction program for the State of Oklahoma in compliance with SAFETEA-LU and in cooperation with the FHWA, FTA, the four Metropolitan Planning Organizations (ACOG, INCOG, LMPO, and Bi-State MPO), the Bureau of Indian Affairs, and Tribal Governments.

**ACCOMPLISHMENTS DURING FY 2009:** Developed the FFY 2009-2012 Statewide Transportation Improvement Program (STIP) for approval and implementation in accordance with the revised *Procedures for Developing and Amending the STIP and TIP*. The FFY 2009 portion of the STIP contains the American Recovery and Reinvestment (ARRA) funded statewide line item. The STIP webpage was revised to reflect the Amendments and Statewide Line Items which includes the ARRA projects.

The FFY 2009 – 2012 STIP contains an Executive Introduction of the Transportation Commission; Explanation of STIP; Balancing Process including Clarification, Anticipated Revenues and Expenditures; Project Selection and Prioritization including Construction Program Maps by Division and Project Listing by Year; Transit Program including Project listing by Year; MPO TIPs; Indian Reservation Roads TIP; County Improvements for Roads and Bridges (CIRB); Federal Lands Program including Applications; ODOT Certification; Public Involvement Process including the *Procedures for Developing and Amending the STIP and TIP*.

The FFY 2007-2010 STIP and the FFY 2009 portion of the current STIP were administered through administrative modifications, statewide line items and amendments. All amendments to the STIP and TIPs were in accordance with the federally approved revised *Procedures for Developing and Amending the STIP and TIP*. The Process includes publication of proposed amendments for a minimum of 14 days for review and comment. The public involvement process was completed in accordance with TEA 21 and SAFETEA-LU, regarding publication of project amendments. Revised the Definitions included in the *Procedures for Developing and Amending the STIP and TIP* in coordination with the FHWA, FTA, and MPOs.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue administration of current STIP using currently approved procedures. Develop an Amendment document for the FFY 2010 portion of the current STIP based upon revision of the ODOT 8 Year Construction Work Plan. Begin initial development of the FFY 2011 – 2014 STIP.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$51,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$62,790	SPR	-0-	STATE
Projected Cost FFY 2010	\$70,000	SPR	-0-	STATE

### CONTACT INFORMATION

Dawn Borelli, Program Coordination Branch, 405-521-6433

## 1902 Statewide Long Range Transportation Planning

**PURPOSE AND SCOPE:** To update the Statewide Intermodal Transportation Plan (SITP) and other associated statewide planning activities in accordance with the provisions of SAFETEA-LU. To conduct and/or participate in the development of plans related to Transportation Improvement Corridors and other corridors/activities identified in the SITP.

**ACCOMPLISHMENTS DURING FY 2009:** Prepared contract and negotiated scope of work for SITP with PB Americas Inc. Requested services of Langston University for researching socioeconomic and demographic data for the SITP, and assisting with public involvement activities. Developed email database for public involvement activities. Launched SITP website and developed draft newsletter content. Identified membership for, and met with, four SITP committees: Freight, Tribal, Technical, and Personal Transportation. Developed interview questions and conducted interviews with about 70 SITP advisory committee members as a part of identifying key plan issues. Provided review and comment on the following SITP documents: Project Management Plan, Socioeconomic & Demographic Data, and Economic Conditions and Freight-related Transportation. Tabulated initial plan policy themes from committee meetings and ODOT senior staff. Assisted with analysis of multi-modal projects in current SITP in preparation for further project development.

**PROPOSED ACTIVITIES FOR FY 2010:** Conduct community meetings in 8 divisions of the State to learn more about public's perceived transportation needs. Publish, and provide for public distribution, at least two SITP newsletters. Continue coordination with MPOs and other local governments in relation to transportation plans. Conduct SITP tasks related to inventory, assessment of strengths and weaknesses, planning for modal diversification, evaluation of expected revenues and expenditures, and defining long range policies for the statewide intermodal transportation system. Continue to review documents/chapters that will form the basis of the 2035 Oklahoma Statewide Intermodal Transportation Plan.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$300,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$28,516	SPR	-0-	STATE
Projected Cost FFY 2010	\$100,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

Linda Koenig, Transportation Planner, 405-522-0171

**PURPOSE AND SCOPE:** Incorporate Intelligent Transportation Systems (ITS) into the transportation planning process in compliance with the provisions of Federal regulations [23 Code of Federal Regulations, Parts 655 and 940, Intelligent Transportation System (ITS) Architecture and Standards]. Use an ITS integration strategy by defining roles, responsibilities and shared operational strategies to address key policy and operational issues creating and/or updating the conceptual design for ITS within the planning area. Ensure the interoperability and institutional/technical integration of ITS efforts through compliance with ITS Statewide and Regional Architectures and related ITS standards.

**ACCOMPLISHMENTS DURING FY 2009:** Processed ITS funded contracts and invoices for the systems analysis, design and deployment of Oklahoma’s Commercial Vehicle Information Systems and Network (CVISN) Program plan projects and other ITS and technology based transportation research contracts and activities. Executed contract for services to update Oklahoma’s Commercial Vehicle Operations (CVO) Program Plan and Top Level Design for CVISN Core and Expanded Deployment. ODOT meeting held to initiate revision process for the Statewide ITS Plan and Architecture.

**PROPOSED ACTIVITIES FOR FY 2010:** Contract services to update the Statewide ITS Plan, Architecture and Implementation. Continue to process ITS funded contracts and invoices for the systems analysis, design and deployment of Oklahoma’s CVISN Program plan projects. Assist MPOs and individual cities in maintenance of their regional ITS and architecture. Coordinate ITS and other technology based transportation research contracts and activities.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$100,000	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010	\$100,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Ron F. Curb, Engineering Services Branch Manager, 405-522-3795

## 1904 Air Quality Planning

**PURPOSE AND SCOPE:** Monitor and participate in air quality transportation planning developments relating to requirements of the Clean Air Act Amendments and SAFETEA-LU. Represent the Department in air quality nonattainment and transportation conformity actions, if necessary. Analyze and comment on air quality nonattainment and transportation regulations and law. Maintain information flow to and from decision-makers regarding air quality/transportation issues, developments, regulations and laws. Continue staff education, training and attendance at workshops and seminars. Assist the Department to be a progressive participant in reducing the impacts of transportation-related pollution.

**ACCOMPLISHMENTS DURING FY 2009:** Participated in the air quality/transportation planning activities of the Lawton, Association of Central Oklahoma Governments (ACOG), and Indian Nations Council of Governments (INCOG) Metropolitan Planning Organizations (MPO). Attended air quality meetings with partners at the Federal Highway Administration (FHWA) and Oklahoma Department of Environmental Quality. Coordinated with FHWA in development of agenda for Air Quality Scanning Tour. Other accomplishments: Research and development of resource materials on air quality/transportation issues; and review and comment on MPO air quality education programs. Coordinate the planning process for air quality modelling funding and actions between the States, MPOs, ODOT, and the ODEQ; monitoring regulations on National Ambient Air Quality Standards (NAAQS), Climate Change and Greenhouse Gas Emissions. Attended conferences on air quality planning and regulations.

**PROPOSED ACTIVITIES FOR FY 2010:** Maintain research and participation in air quality/transportation issues, developments, regulations and laws. Provide data for air quality modelling efforts. Continue to develop education materials and resources for Department personnel regarding air quality and transportation. Continue to monitor the air quality regulations and impact to the Department. Attend air quality/transportation planning activities of the Lawton, ACOG and INCOG MPO. Participate in Memorandum of Agreement and other requirements (transportation conformity) of nonattainment status if any area of the State becomes nonattainment. Participate in MPO and ODEQ air quality/transportation initiatives, educational programs, and efforts to reduce pollution. Partner with ACOG and INCOG to enhance and extend data collection and modelling outside of the study areas to establish base data for air quality issues in rural/donut areas. Continue staff education through FHWA, EPA, NHI, NTI and other agency courses, seminars, and conferences.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$915,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$9,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$830,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

Julie Sanders, Program Coordination Branch, 580-255-7586

**PURPOSE AND SCOPE:** To coordinate freight planning and freight analysis with the Long Range Transportation Plan, Statewide Transportation Improvement Program (STIP), and project development processes.

**ACCOMPLISHMENTS DURING FY 2009:** Collaborated with the Statewide Intermodal Transportation Plan and STIP process in addressing freight solutions on the designated transportation improvement corridors identified in the Statewide Plan.

**PROPOSED ACTIVITIES FOR FY 2010:** Establish a framework and schedule for ongoing freight data collection and analysis to establish gaps between existing freight system conditions and capabilities and projected freight transportation needs for the State. Collaborate with the Statewide Intermodal Transportation Plan and STIP process in addressing freight solutions. Identify and explore funding strategies for freight projects. Coordinate with Engineering Services Branch (Research Section) on implementing a freight movement model developed for the State.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$39,910	SPR	-0-	STATE
Estimated Cost FFY 2009	\$5,500	SPR	-0-	STATE
Projected Cost FFY 2010	\$15,428	SPR	-0-	STATE

#### **CONTACT INFORMATION**

Julie Sanders, Program Coordination Branch, 580-255-7586

## 1910 Public Involvement and Visualization Techniques

**PURPOSE AND SCOPE:** To develop and maintain a Public Participation Plan (PPP) to encourage full public participation in the transportation planning and programming process including the State-wide Transportation Improvement Plan (STIP), the Long Range Plan, and the National Environment Protection Act (NEPA) Process.

**ACCOMPLISHMENTS DURING FY 2009:** Held 30+ public meetings statewide. Visualization techniques were implemented utilizing 3-dimensional design, video and animation and were incorporated into public meetings. Began development of public meeting plan for the update to the Long Range Plan.

**PROPOSED ACTIVITIES FOR FY 2010:** Provide for public involvement for environmental, planning and construction projects. Include special outreach to non-metropolitan public officials, and the traditionally underserved. Develop and improve upon presentation processes and techniques. Provide visualization of proposed projects for the STIP. Provide visualization of existing and proposed conditions for presentation to public and other agencies at public and stakeholders meetings for planning purposes.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$140,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$140,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$257,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

Craig Moody, Program Coordination Branch Manager, 405-522-1465

**SPR PART 2 - RESEARCH, SPRY-0010(048)RS, JP# 01946(54)  
FEDERAL FISCAL YEAR 2010**

<u>PROGRAM</u>		<u>SPR</u>	<u>STATE</u>	<u>LOCAL</u>	<u>TOTAL</u>
<b>GENERAL ACTIVITIES</b>					
2100	Transportation Research Board	\$5,000.00	\$0.00	\$0.00	\$5,000.00
2102	Research Library Services	\$151,500.00	\$0.00	\$0.00	\$151,500.00
2103	Transportation Research Day	\$25,532.00	\$0.00	\$0.00	\$25,532.00
2115	Long Term Pavement Performance	\$5,000.00	\$0.00	\$0.00	\$5,000.00
2120	Technical Assistance - Special Studies	\$25,000.00	\$0.00	\$0.00	\$25,000.00
2130	General Research Activity	\$475,989.00	\$0.00	\$0.00	\$475,989.00
2156	Roadside Vegetation Management	\$186,000.00	\$0.00	\$0.00	\$186,000.00
2157	Herbicide Research Program	\$65,783.00	\$0.00	\$0.00	\$65,783.00
2160	Oklahoma Transportation Center	\$500,000.00	\$0.00	\$0.00	\$500,000.00
2700	Experimental Product Evaluation Program	\$10,000.00	\$0.00	\$0.00	\$10,000.00
	<b>Total General Activities</b>	<b>\$1,449,804.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$1,449,804.00</b>
<b>CONTINUING RESEARCH PROJECTS</b>					
2188	Vegetative Rehabilitation of Highway Cut Slopes	\$50,000.00	\$0.00	\$0.00	\$50,000.00
2200	Instrumented Pavement Construction	\$60,976.00	\$0.00	\$0.00	\$60,976.00
2207	Validation and Refinement of Chemical Stabilization Procedures for Pavement Subgrade Soils in Oklahoma	\$109,467.00	\$0.00	\$0.00	\$109,467.00
2208	Development and Implementation of MEPDG for Rigid Pavements	\$88,619.00	\$0.00	\$0.00	\$88,619.00
2209	Development of a Flexible Pavement Database for Local Calibration of MEPDG	\$103,872.00	\$0.00	\$0.00	\$103,872.00
2210	Calcium-Based Stabilizer Induced Heave in Oklahoma Sulfate-Bearing Soils	\$101,760.00	\$0.00	\$0.00	\$101,760.00
2211	Modeling of 85th Percentile Speed for Rural Highways for Enhanced Traffic Safety	\$48,501.00	\$0.00	\$0.00	\$48,501.00
2213	Quantifying the Costs and Benefits of Pavement Retexturing as a Pavement Preservation Tool	\$17,950.00	\$0.00	\$0.00	\$17,950.00
2214	Use of MSE Technology to Stabilize Highway Embankments and Slopes in Oklahoma	\$83,103.00	\$0.00	\$0.00	\$83,103.00
2215	Tube Suction Test for Evaluating Durability of Cementitiously Stabilized Soils	\$48,685.00	\$0.00	\$0.00	\$48,685.00
2217	Development of Best Practices Program for a Collaboration of Minority Truckers	\$17,024.00	\$0.00	\$0.00	\$17,024.00
	<b>Total Continuing Research Projects</b>	<b>\$712,933.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$712,933.00</b>
<b>NEW RESEARCH PROJECTS</b>					
2218	QC/QA Testing Differences Between HMA and Warm Mix Asphalt	\$98,195.00	\$0.00	\$0.00	\$98,195.00
2219	Evaluation of the Effectiveness of ODOT's Cable Barrier Program	\$66,575.00	\$0.00	\$0.00	\$66,575.00
2220	Development of ODOT Guidelines for Use of Geogrids in Aggregate Bases	\$83,757.00	\$0.00	\$0.00	\$83,757.00
2221	Analysis of Aggregates and Binders Used for the ODOT's Chip Seal Program	\$111,084.00	\$0.00	\$0.00	\$111,084.00
2222	Performance of Ultra Thin Whitetopping (UTW) in Oklahoma	\$40,190.00	\$0.00	\$0.00	\$40,190.00
2223	Test Methods for Use of Recycled Asphalt Pavement in Asphalt Mixes	\$89,294.00	\$0.00	\$0.00	\$89,294.00
2224	Energy Harvesting on Highway Bridges	\$100,000.00	\$0.00	\$0.00	\$100,000.00
	<b>Total New Research Projects</b>	<b>\$589,095.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$589,095.00</b>
	<b>Grand Total SPRY-0010(048)RS</b>	<b>\$2,751,832.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$2,751,832.00</b>
<b>POOLED FUND STUDIES</b>					
Sol. 990	Updating US Precipitation Frequency Southern Region	\$82,438.00	\$0.00	\$0.00	\$82,438.00
Sol. 1220	WASHTO-X	\$10,000.00	\$0.00	\$0.00	\$10,000.00
Sol. 1221	Motorcycle Crash Causation Study	\$50,000.00	\$0.00	\$0.00	\$50,000.00
Sol. 1225	Char. of Drainage Layer Prop for MEPDG	\$30,000.00	\$0.00	\$0.00	\$30,000.00
TPF-5(068)	LRFD Bridge Specifications	\$10,000.00	\$0.00	\$0.00	\$10,000.00
TPF-5(099)	Evaluation of Low Cost Safety Improvements	\$30,000.00	\$0.00	\$0.00	\$30,000.00
TPF-5(117)	Dev of Perf Properties of Ternary Mixes	\$15,000.00	\$0.00	\$0.00	\$15,000.00
TPF-5(159)	Tech Transfer Concrete Consortium	\$5,000.00	\$0.00	\$0.00	\$5,000.00
TPF-5(174)	Constr of Crack-Free Conc Bridge Decks, Phase II	\$20,000.00	\$0.00	\$0.00	\$20,000.00
TPF-5(195)	TRB Core Program	\$128,250.00	\$0.00	\$0.00	\$128,250.00
TPF-5(205)	Impl of Conc Pave Mix Des & Analysis Track of CP Road Map	\$15,000.00	\$0.00	\$0.00	\$15,000.00
TPF-5(208)	NCAT	\$400,000.00	\$0.00	\$0.00	\$400,000.00
TPF-5(209)	Support of Transp Curriculum Coord Council (TCCC)	\$20,000.00	\$0.00	\$0.00	\$20,000.00
TPF-5(408)	NCHRP	\$578,000.00	\$0.00	\$0.00	\$578,000.00
	<b>Total Pooled Fund Studies</b>	<b>\$1,393,688.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$1,393,688.00</b>
	<b>Total Research Funding</b>	<b>\$4,145,520.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$4,145,520.00</b>

<b>RECENTLY COMPLETED OR ENDING RESEARCH PROJECTS</b>		<b><u>SPR</u></b>	<b><u>STATE</u></b>	<b><u>LOCAL</u></b>	<b><u>TOTAL</u></b>
2184	Creation of an ODOT Specification for Patching or Overlay of Bridge Decks	\$0.00	\$0.00	\$0.00	\$0.00
2194	Degradation in Selected Tributaries of Washita River in Oklahoma for Transportation Planning	\$0.00	\$0.00	\$0.00	\$0.00
2196	Stability and Permeability of Proposed Aggregate Bases in Oklahoma	\$0.00	\$0.00	\$0.00	\$0.00
2199	Optimizing Concrete Mix Designs to Produce Cost Effective Paving Mixes	\$0.00	\$0.00	\$0.00	\$0.00
2212	Roadway Weather Information System and Automatic Vehicle Location (AVL) Coordination	\$0.00	\$0.00	\$0.00	\$0.00
2216	Auto-Collision Avoidance System at Intersections	\$0.00	\$0.00	\$0.00	\$0.00



**PURPOSE AND SCOPE:** Beginning with FFY08, this project will only cover travel expenses and time for ODOT personnel to attend the annual TRB meeting. The TRB subscription costs are covered under a pooled fund study.

**ACCOMPLISHMENTS DURING FY 2009:** Attended TRB annual meeting.

**PROPOSED ACTIVITIES FOR FY 2010:** Attend TRB annual meeting.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$5,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$5,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$5,000	SPR	-0-	STATE

**CONTACT INFORMATION**

ODOT Planning and Research Div. Engineer: Ginger McGovern, 405-522-1447

## 2102 Research Library Services

**PURPOSE AND SCOPE:** Provide the Oklahoma Department of Transportation (ODOT) and customers with an information clearinghouse. The primary goals of this Technology Transfer Office are to provide a sound, progressive, flexible library available to ODOT and Oklahoma Transportation Center's university personnel statewide and to keep them informed of recent innovations in transportation technology, methodologies and programs as soon as information becomes available. Aligning with this is the goal of providing proficient systematic searches of all resources when needed and knowing where to reference the needed information. Additional services are aimed at providing ODOT with editing and publishing capabilities to assist the Planning & Research Division in generating and distributing reports and publications. Langston University (LU) has developed the Transportation Center of Excellence to assist government entities and others in the transportation industry in the conduct of research and to provide technical assistance and training services in the resolution of transportation issues. Contract with LU to provide information, services and updates to ODOT and other state universities.

**ACCOMPLISHMENTS DURING FY 2009:** Provided transportation information, services and updates to ODOT and other state universities; accessed the Transportation Research Information Services (TRIS) database and maintained the Research In Progress (RIP) database; developed procedures to enhance services and accessibility to Transportation Library resources by ODOT and Oklahoma Transportation Center's university personnel; maintained software and application capabilities to enhance services and accessibility to library by ODOT and local university personnel; produced monthly reports; Final Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue to contract with Langston University (LU) to provide current information, publications, articles, services and updates to ODOT, other state universities and transportation industry entities; continue to utilize resources such as the TRIS and RIP databases to enhance services performance; develop ODOT Research Library link on the LU website; maintain software and application capabilities to enhance services and accessibility to library by ODOT and local university personnel; convert and implement the Paradox 10 Database System to the Library of Congress System; perform report binding; append university Final Reports to the ODOT Research Library database for more adequate access; produce monthly reports; complete and produce Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 Yr 1 of 1)	\$140,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$140,000	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$151,500	SPR	-0-	STATE

### **CONTACT INFORMATION**

Principal Investigator: Wilson B. Brewer, Langston University, 405-521-1379

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

2103 Transportation Research Day  
Technical Support Services

**PURPOSE AND SCOPE:** To provide technical assistance in preparing for and organizing the Oklahoma Department of Transportation (ODOT) & Oklahoma Transportation Center (OTC) Transportation Research Day activities. This includes arranging logistics, sending invitations, and soliciting presenters, soliciting poster presentation presenters and generating the event agenda/itinerary. Other services include coordinating with OTC, OU, OSU and LU in setting up videotaping, still photography, reservations, catered lunch (if any), and other expenses such as coffee and refreshments. A Final Report will be submitted at the end of the agreement to include summaries of poster presentations, a list of attendees and a categorized list of brainstorming ideas. A survey of attendees will be conducted in an effort to produce results for new future Research Day ideas and/or activities. This project was funded and set up as SPR item number 2130 in FY-09. A formal request to amend SPR item number 2130 to reflect 2103 was approved by FHWA on April 8, 2009.

**ACCOMPLISHMENTS DURING FY 2009:** Generated FY-09 ODOT/OTC Transportation Research Day agenda/itinerary; assisted ODOT and OTC in planning, preparations & organization of events; solicited project presentation speakers; solicited and organized lobby poster presentations; completed a survey of attendees for future Transportation Research Day ideas; completed assessment of brainstorming session and submitted results; compiled list of attendees; began preparations for fiscal year 2010 Transportation Research Day to be held October, 2009; produced project progress reports; Final Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue to work with OTC and ODOT to develop the FFY 2010 ODOT/OTC Transportation Research Day program; arrange for presenters; compile and update invitee list and furnish invitations; arrange for rental of table and chairs; prepare sign in sheets and name tags; coordinate with OTC for breakfast and break refreshments for event attendees; coordinate with OTC for catered lunch for event attendees; reserve event conference rooms and lobby at ODOT for event presentations, poster presentations and catered lunch; secure videotaping and still photography of the event by ODOT Video Productions Branch; continue to produce project progress reports; complete and produce Final Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 1)	\$24,180	SPR	-0-	STATE
Estimated Cost FFY 2009	\$24,180	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$25,532	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Wilson B. Brewer, Langston University, 405-521-1379  
ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

## 2115 Long Term Pavement Performance

**PURPOSE AND SCOPE:** The purpose of this project is to maintain LTPP test sites, markings and current status, report maintenance to Southern Region Contract Office (SRCO), assist SRCO with data gathering as necessary, act as general liaison between SRCO and the Department. Maintain working knowledge related to SHRP product implementation, act as general liaison between FHWA and the Department for product implementation activities.

**ACCOMPLISHMENTS DURING FY 2009:** SRCO contacted ODOT to discuss further LTPP testing and monitoring; discussed maintenance rehabilitation plans for targeted test sites; provided a list of the current Oklahoma “in-study” and “out-of-study” test locations; coordinated 2009 LTPP Database Workshop training and provided database CDs to ODOT and university staff.

**PROPOSED ACTIVITIES FOR FY 2010:** Request reports for specific locations for possible continued data collection; arrange possible continued testing and monitoring of current site locations; prepare possible new construction design, testing and monitoring; consultation with ODOT staff concerning LTPP database inquiries and issues.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$10,000	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010	\$5,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

ODOT Field Research Specialist: Bryan Cooper, 405-736-9475

2120 Technical Assistance Special Studies

**PURPOSE AND SCOPE:** Provide ongoing technical support, or special investigations, to the Department when a full-scale research project is not warranted or when a quick turnaround is required.

**ACCOMPLISHMENTS DURING FY 2009:** Provided support for the Department with assistance and equipment in special investigations, and other activities when needed; performed Storm Drain Inspection in ODOT Divisions II and IV; performed core drilling for in-house research in ODOT Division IV; continued research and project operations and projections for the project entitled "Development of Liquidated Damages for the Oklahoma Department of Transportation"; produced monthly reports; completed and produced Final Report and additional deliverables.

**PROPOSED ACTIVITIES FOR FY 2010:** Provide support for the Department with assistance and equipment in special investigations, storm drain inspections, bridge deck testing, pavement testing, traffic control and any other activities as requested; purchase, calibrate, test and/or compare new equipment or instruments to existing equipment or instruments where necessary.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$270,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$150,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$25,000	SPR	-0-	STATE

**CONTACT INFORMATION**

ODOT Field Research Specialist: Bryan Cooper, 405-736-9475

## 2130 General Research Activities

**PURPOSE AND SCOPE:** This activity covers various research activities which are necessary for the operation of a research section but which cannot be accurately included in other projects. Examples of this type of activity include: Attending quality task force meetings; Writing work plans for emerging research projects which have not been assigned an item number when the work plan is written; Reviewing research reports; Meeting with university and private researchers regarding proposed projects; Attending industry seminars, conferences, etc. This item also covers costs of various professional services contracts for research projects which fill needs of the Department but were not foreseen when the SPR budget was written and therefore were not included as separate items. This may include special technical assistance on multiple projects, and providing matching funds for leveraging research program funds, such as, OCAST/IDEA programs for research significant to the Department. This activity would also include routine maintenance of the ODOT Planning & Research internet and intranet websites.

**ACCOMPLISHMENTS DURING FY 2009:** Solicited ODOT subject matter experts and Field Division personnel for research "Needs" ideas for possible FY-10 project funding; developed ODOT Research Advisory Committee (RAC) for reviewing Department Research Needs Problem Statements, as well as, project proposals submitted in response to posted Request for Proposals (RFP's); coordinated two RAC meetings, wrote work plans, reviewed reports, discussed proposed work with researchers and ODOT subject matter experts; reviewed 12 research Needs Problem Statement proposals for possible FY-10 funding; prepared new research project agreement format with language modifications; generated 13 FY-10 continuing project research agreement modifications; generated 10 new FY-10 university project agreements; organized various meetings concerning all SPR projects; generated and implemented newly formatted research forms for ODOT Planning & Research Division internet inclusion; developed an SPR Program Part 2 activity timeline schedule to track monthly and annual program tasks; reviewed Annual and Final SPR project reports.

**PROPOSED ACTIVITIES FOR FY 2010:** Solicit research needs from ODOT divisions; coordinate RAC meetings for review of research problem statements and proposals; generate FY-11 continuing project supplemental agreements; generate new project agreements for FY-11; attend various meetings, conferences, seminars and webinars as they arise; review Annual and Final reports; update, maintain and improve the Planning & Research Division website; make funds available for various research contracts/activities which were not foreseen when the SPR budget was written and therefore were not included as a separate item.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$1,015,250	SPR	-0-	STATE
Estimated Cost FFY 2009	\$591,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$475,989	SPR	-0-	STATE

### **CONTACT INFORMATION**

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

**PURPOSE AND SCOPE:** The purpose of this project is to provide ODOT with certified training related to Roadside Vegetation Management (RVM), consultation to ODOT field divisions, and development of manuals of practice for ODOT.

**ACCOMPLISHMENTS DURING FY 2009:** Completed Annual Certified Pesticide Applicator Training for all ODOT field divisions and maintained Pesticide Applicator Training Records for ODOT Certified Pesticide Applicators; provided consultation to ODOT field personnel as requested and produced monthly activity reports; conducted Sprayer Equipment inspection and calibration workshops; assisted ODOT in maintaining and producing an updated Approved Herbicide and Adjuvants List; assisted ODOT in Statewide Herbicide Contract review; conducted and produced an Annual ODOT Herbicide Program Survey and Divisional Report; produced Annual Roadside Vegetation Management Herbicide Technologies Report and Annual Equipment Report; completed 4th Edition of the Roadside Vegetation Management Guidelines; completed the production of Sprayer Equipment Assessment Guide; organized and conducted the Annual RVM Implementation Tour; conducted preliminary meeting and scheduling with ODOT P&R Division personnel for the fiscal year 2010; produced project progress reports.

**PROPOSED ACTIVITIES FOR FY 2010:** Conduct annual pesticide applicator certification schools and continuing education applicator workshops and produce Final Report; maintain pesticide applicator training records for ODOT certified pesticide applicators; provide as-needed consultation to ODOT personnel; conduct herbicide application equipment calibration workshops for new employees; assist ODOT in maintaining the "Approved Herbicide and Adjuvants List"; Assist ODOT in annual statewide herbicide contract review; conduct and produce an Annual ODOT herbicide Program Survey and Report; produce Annual Roadside Vegetation Management Herbicide Technologies Advisory Report; produce project progress reports.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 3 of 3)	\$188,336	SPR	-0-	STATE
Estimated Cost FFY 2009	\$188,336	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$186,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Dennis Martin, Okla. State Univ., 405-744-5419

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Kevin Bloss, ODOT Maintenance Division Engineer, 405-521-2557

2157 Herbicide Research Program

**PURPOSE AND SCOPE:** The purpose of the project is to conduct field investigations which evaluate herbicide products, applications and equipment.

**ACCOMPLISHMENTS DURING FY 2009:** Completed evaluations of new and generic herbicide formulations for integration into the ODOT Roadside Vegetation Management Programs and implemented findings in winter CEU Training Workshops; produced Annual Report; completed evaluation of adjuvants and recommended herbicides for tank mix compatibility and implemented findings into Approved Herbicides and Adjuvants List, (AHAL); completed field experiments, data collection and analysis; executed summer Roadside Research Bus Tour; executed the Summer Roadside Research Van Tour; produced project progress reports; completed and produced Final Report and additional deliverables.

**PROPOSED ACTIVITIES FOR FY 2010:** Evaluate new and generic herbicide formulations for integration into ODOT roadside vegetation management programs and submit Final Report; evaluate tank mix compatibility of adjuvants and herbicides and submit Final Report; organize and conduct summer roadside research van tour; produce project progress reports.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 3 of 3)	\$66,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$66,000	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$65,783	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Dennis Martin, Okla. State Univ., 405-744-5419

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Kevin Bloss, ODOT Maintenance Division Engineer, 405-521-2557



**PURPOSE AND SCOPE:** The Oklahoma Transportation Center (OTC) is a nationally-designated university transportation center (UTC) composed of researchers at the University of Oklahoma, Oklahoma State University, and Langston University. Research personnel in this organization have expertise and experience covering a wide range of transportation-related topics. The purpose of this item is to coordinate and contract research activities covering various topics on behalf of ODOT and to provide matching funds to OTC.

**ACCOMPLISHMENTS DURING FY 2009:** Contributed \$500,000.00 towards OTC matching funds. Participated in board and committee meetings; coordinated ODOT expert review of reports; helped select reviewers and oversaw proposal review process. Held brainstorming session to solicit and rank research topics for OTC “pull” projects.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue support of OTC. A mix of transportation research projects will be completed. Participate in board and committee meetings. Help select reviewers and oversee proposal review process. Provide ODOT expert review of research reports. Provide new list of ranked topics for OTC “pull” project solicitation. OTC intends to conduct training for ODOT employees on subjects related to the research projects through ODOT/OTC Transportation Research Day at ODOT.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$500,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$500,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$500,000	SPR	-0-	STATE

**CONTACT INFORMATION**

OTC Executive Director: Tony Dark, 918-527-3275

ODOT Contact: Ginger McGovern, Planning & Research Division Engineer, 405-522-1447

2184 Creation of an ODOT Specification for  
Patching or Overlay of Bridge Decks

**PURPOSE AND SCOPE:** This project builds upon the work done under a previous research project on patching materials (SPR Item Number 2174, "Patching Materials for PCC Pavements") where commonly used patching materials were evaluated with regard to their performance. This project will consider patching materials identified as demonstrating good performance under the previous project, materials identified by ODOT Maintenance personnel for showing good field performance, and other (new) materials recommended by ODOT personnel. The materials will be tested for chemical, electric and permeability compatibility with existing deck material, drying shrinkage, thermal expansion, creep and modulus of elasticity. Those showing superior will be identified, along with patching procedures, which have proven to produce patches with good performance in the field. Information gathered under this project will be used to write a specification (or modify existing specifications) for patching and overlaying bridge decks.

**ACCOMPLISHMENTS DURING FY 2009:** Final Report and additional deliverables submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** End of Project.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010	-0-	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Chris Ramseyer, Univ. of Oklahoma, 405-325-1415

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Walt Peters, ODOT Asst. Bridge Engineer, 405-521-2606

2188 Vegetative Rehabilitation of  
Highway Cut Slopes

**PURPOSE AND SCOPE:** The purpose of this project is to develop improved vegetation specifications to be used on relatively steep slopes. Areas of moderate to severe erosion are occurring on highway rights of way in Eastern Oklahoma. Silt resulting from this erosion is filling ditch bottoms causing drainage problems. The answer to these recurring problems is to vegetate the erosive areas so that the soil remains on the slope and out of the drainage system. This is intended to be a five-year research project during which time, soil amendments, plant species, planting methods, planting dates, planting rates, mulches, mulch rates and application methods which demonstrate the most success will be identified. These will then be incorporated into improved vegetation specifications.

**ACCOMPLISHMENTS DURING FY 2009:** Maintained photo records for both US-59 and SH-128 slopes; organized continuing project meeting in February; re-Hydro-seeded, hay mulched and tacked SH-128 slope in Spring of 2009 due to loss of Fall 2007 materials during spring 2008 rain events; monitored ODOT mowing procedures for US-59 slopes; conducted semi-annual meeting in June of 2009 to discuss project direction; coordinated Arkansas USDA-NRCS Plant Materials Center Tour and I-540 field trip; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue to maintain photo records for both US-59 and SH-128 slopes; continue to monitor ODOT mowing procedures for US-59 slopes; organize necessary project panel member meetings; produce project progress reports; submit FY-10 Annual Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 3 of 5)	\$52,500	SPR	-0-	STATE
Estimated Cost FFY 2009	\$52,500	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 4 of 5)	\$50,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Randy King, USDA/NCRS, 479-675-5182

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Vincent G. Reidenbach, Geotechnical Engineer, 405-522-4998

2194 Degradation in Selected Tributaries of Washita River  
in Oklahoma for Transportation Planning

**PURPOSE AND SCOPE:** To research ODOT files and digital flowline data for the preparation of longitudinal profiles of flowline for the Salt Fork Creek, Wildhorse Creek and Rush Creek tributaries of the Washita River in Oklahoma. Culverts and bridge structures will be located along these creeks, as well as, other pertinent information to obtain degradation criteria for replacement or rehabilitation. Digital data will include ArcGIS and Excel files.

**ACCOMPLISHMENTS DURING FY 2009:** Collected and reviewed flowline data from the ODOT files on three Tributaries of the Washita River; located ODOT bridges and culverts on Excel platform to manage the database; analyzed the available flowline data at all ODOT bridges and culverts; prepared longitudinal profiles of flowline, with time, along three tributaries of the Washita River; produced project progress reports; Final Report and additional deliverables submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** End of Project.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 2 of 2)	\$50,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$50,000	SPR	-0-	STATE
Projected Cost FFY 2010	-0-	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Avdhesh Tyagi, Oklahoma State Univ., 405-744-9307

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Kacie Braddy, ODOT Hydraulics Engineer, 405-522-0613

2196 Stability and Permeability of Proposed  
Aggregate Bases in Oklahoma

**PURPOSE AND SCOPE:** Assess the permeability of unbound aggregates that are widely used as pavement bases in Oklahoma. Laboratory results will be used to develop statistical models. Field samples will be tested for comparison. The models will be available to the pavement designers to facilitate implementation of the new AASHTO 2002 pavement design guide.

**ACCOMPLISHMENTS DURING FY 2009:** Set up and performed additional field construction testing; completed laboratory testing and regression analysis and statistical models; produced project progress reports; Final Report and additional deliverables submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** End of Project.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 3 of 3)	\$85,843	SPR	-0-	STATE
Estimated Cost FFY 2009	\$85,843	SPR	-0-	STATE
Projected Cost FFY 2010	-0-	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Musharraf Zaman, Univ. of Oklahoma, 405-325-2626

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Jeff Dean, ODOT Pavement Design Engineer, 405-522-0988

2199 Optimizing Concrete Mix Designs to Produce  
Cost Effective Paving Mixes

**PURPOSE AND SCOPE:** Determine best methods of manipulating aggregate gradations in order to optimize the designs of concrete mix which are cost effective.

**ACCOMPLISHMENTS DURING FY 2009:** Final Report and additional deliverables submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** End of project.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010	-0-	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Chris Ramseyer, Univ. of Oklahoma, 405-325-1415

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Jeff Dean, ODOT Pavement Design Engineer, 405-522-0988

**PURPOSE AND SCOPE:** Conduct instrumented pavement research to collect and analyze mechanistic-empirical pavement design data on I-35 in McClain County, Oklahoma in an accelerated manner. Field Division 3 will construct an 800' flexible pavement test section. The National Center for Asphalt Technology (NCAT) will purchase equipment and install pavement monitoring instrumentation of test section. The University of Oklahoma (OU) will conduct monitoring and modeling of the test section over a five year period.

**ACCOMPLISHMENTS DURING FY 2009:** Continued to monitor site instrumentation for accuracy and/or failure; repaired or replaced faulty instrumentation as necessary; performed site rehabilitation for areas of concern; continued to collect and download field data; continued to execute data analysis and modeling efforts; conducted regular interval Falling Weight Deflectometer (FWD) field testing; performed regular interval rut depth measurements; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue to monitor site instrumentation; perform necessary site repairs as needed; continue to collect and download field data; continue to execute data analysis and modeling efforts; conduct regular interval Falling Weight Deflectometer (FWD) field testing; perform regular interval Dip Stick and straight edge rut depth measurement comparisons; organize Annual Workshop with NCAT, ODOT and OU to discuss project findings so as to maximize project benefits; produce project progress reports; submit FY-10 Annual Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 3 of 5)	\$121,548	SPR	-0-	STATE
Estimated Cost FFY 2009	\$136,048	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 4 of 5)	\$60,976	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Musharraf Zaman, Univ. of Oklahoma, 405-325-2626

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Scott Seiter, ODOT Asst. Materials Engineer, 405-521-2677

2207 Validation and Refinement of Chemical Stabilization Procedures for Pavement Subgrade Soils in Oklahoma

**PURPOSE AND SCOPE:** The goal of this research project is to assist the state in validating and improving the recommendations of OHD L-50 "Soil Stabilization Mix Design Procedure." The proposed research will primarily focus on AASHTO Soil Group Classifications falling under the fine-grained soil category (i.e. A-4 to A-7). It is expected that the results of testing on fine-grained soils may be intuitively extended to address variability found in fines of the A-2 soil class. Granular soils in the A-1 category and fine sandy soils of the A-3 category are not included in this proposal. In addition to the exclusions mentioned above, soils containing appreciable levels of sulfate will be excluded as these soils are not recommended for stabilization using calcium-based chemical additives. Note: a current research project at OU, funded through OTC, is focused on determining threshold levels of soluble sulfates that cause adverse behavior in chemically treated Oklahoma soils. Soils used in the currently proposed research will be subjected to soluble sulfate testing and current research on sulfate soils will help to guide the selection of suitable soil candidates for the proposed research.

**ACCOMPLISHMENTS DURING FY 2009:** Quantified change in plasticity of stabilized soil using Atterberg Limit tests; determined unconfined compressive strength of raw and treated soils using the recommended ODOT additive quantities and determined whether the additive met the required strength limits as defined in the ASTM D4609 and OHD L-50; employed linear shrinkage and conductivity tests to determine protocols related to strength gain; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Select roadway projects in alignment characterization or grading and drainage stages which represent different sub-grade soil types, chemical additive types, and climatic conditions across Oklahoma; collect representative soil samples from project locations for classification, quality control, and engineering property testing; collect representative chemically treated soil samples from construction project sites for engineering property testing; following compaction and acceptance of the chemically treated subgrade; conduct a time sequence (1, 3, 7, 14, 28 days) field evaluation of strength and stiffness using field test equipment, including the Dynamic Cone Penetration and PANDA Penetration Tests; establish time rate of development and maximum level of strength gain relationships and compare to previous structural number correlations and adjust design equation input parameters accordingly; produce project progress reports; prepare and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 2 of 3)	\$106,850	SPR	-0-	STATE
Estimated Cost FFY 2009	\$106,850	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 3 of 3)	\$109,467	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Amy B. Cerato, Univ. of Oklahoma, 405-325-5625

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Jeff Dean, ODOT Pavement Design Engineer, 405-522-0988



## 2208 Development and Implementation of a Mechanistic and Empirical Pavement Design Guide (MEPDG) for Rigid Pavements

**PURPOSE AND SCOPE:** To utilize representative materials, construction methods and weather values and realistic material inputs that are typical of those used in ODOT to improve the MEPDG in an effort to improve the economy, durability and performance of rigid pavements in Oklahoma. Furthermore, results from this research study will produce several new tools that will assist ODOT to design and specify a high quality and economical concrete pavement.

**ACCOMPLISHMENTS DURING FY 2009:** Attended and participated in the project kick-off meeting; provided presentations obtained during the National American Concrete Institute Conference; attended the American Concrete Pavement Association National meeting in San Antonio and provided presentations to P&R; began characterizing representative concrete pavement mixtures used in the state of Oklahoma; performed literature review of MEPDG; investigated several curing methods and evaluated findings; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Investigate base material practices for concrete pavements through literature searches and survey of experiences from other DOT officials; investigate and evaluate alternate base material techniques and how to improve them; produce project progress reports; submit FY-10 Annual report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 3)	\$91,487	SPR	-0-	STATE
Estimated Cost FFY 2009	\$91,487	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 2 of 3)	\$88,619	SPR	-0-	STATE

### **CONTACT INFORMATION**

Principal Investigator: Tyler Ley, Okla. State Univ., 405-744-9307

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Jeff Dean, ODOT Pavement Design Engineer, 405-522-0988

2209 Development of a Flexible Pavement Database for  
Local Calibration of the MEPDG

**PURPOSE AND SCOPE:** To develop a flexible pavement database and to populate this database with data required for calibration of the new Mechanistic Empirical Pavement Design Guide (MEPDG) design criteria. Results from this project are expected to provide pavement design professionals with appropriate tools and a better understanding of how the new MEPDG will allow for optimization of materials, evaluate and incorporate new materials into designs, and evaluate the impacts of anticipated heavier loads and new axle configurations on pavement performance in Oklahoma.

**ACCOMPLISHMENTS DURING FY 2009:** Performed regression analysis from an existing OU database to determine input parameters for resilient modulus on soils and granular base; utilized laboratory data to determine the MEPDG input parameters for stabilized soils; performed SMA Mixtures made from high quality aggregates from Oklahoma and evaluated the performance properties of each mixture by testing for dynamic modulus and Hamburg and APA rut resistance; produce project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Sample binders meeting pre-determined grades from two ODOT suppliers; perform data analysis of binders to determine differences in grades and/or suppliers and to recommend default values for use in the MEPDG; utilize a populated OSU database to sample and test ODOT S-2 mixtures; produce project progress reports; complete and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 2)	\$102,677	SPR	-0-	STATE
Estimated Cost FFY 2009	\$102,677	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 2 of 2)	\$103,872	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Stephen Cross, Okla. State Univ., 405-744-7200

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Jeff Dean, ODOT Pavement Design Engineer, 405-522-0988

2210 Calcium-Based Stabilizer Induced Heave in  
Oklahoma Sulfate-Bearing Soils

**PURPOSE AND SCOPE:** To reveal the physical, mineralogical, electrical and chemical characteristics of Oklahoma soils that is vulnerable to adverse sulfate reactions due to calcium-based stabilizers and to develop a methodology for assessing this threat. To evaluate ODOT's current method of soil-sulfate testing to determine the most accurate and repeatable soil sulfate test methodology possible.

**ACCOMPLISHMENTS DURING FY 2009:** Formulated and validated an improved soil sulfate test methodology to be used by ODOT; identified soils containing sulfates and obtained sufficient samples to add to the testing program and database; conducted basic index property and physical property tests; determined electrical and chemical properties of test soils; conducted free swell tests with and without calcium-based stabilizer; begin compiling information concerning each testing site into a central database that will form the basis for the interactive, online soil-sulfate hazard map; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Complete population of the central database concerning each testing site data; create, maintain and update interactive map and make available online; utilize the database to examine the relationship between individual soil properties and combinations of soil properties and volume change behaviors measured in the lab in both natural and manufactured soils; validate the statistically determined relationships with additional test soils; produce project progress reports; complete and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 2)	\$102,050	SPR	-0-	STATE
Estimated Cost FFY 2009	\$102,050	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 2 of 2)	\$101,760	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Amy B. Cerato, Univ. of Oklahoma, 405-325-5625

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Jeff Dean, ODOT Pavement Design Engineer, 405-522-0988

## 2211 Modeling of 85<sup>TH</sup> Percentile Speed for Rural Highways for Enhanced Traffic Safety

**PURPOSE AND SCOPE:** To develop a Neural Network (NN) model based on appropriate pavement, traffic and environmental data such as pavement width, type and width of shoulder, topography, weather, roadside development, and accident experience as an effective tool for the Oklahoma Department of Transportation (ODOT) in determining the 85<sup>th</sup> percentile speed on two-lane rural highways in Oklahoma. With this research, the model is expected to be useful in enhancing traffic safety and reducing accidents and fatalities resulting from improper posting of speed limits on rural highways in the state of Oklahoma.

**ACCOMPLISHMENTS DURING FY 2009:** Completed selection of model parameters; updated previous model data from an earlier study utilizing electronically available current data; completed scaling or transformation of input data in an effort to normalize parameters; conducted Principal Component Analysis (PCA) to aid in identifying redundancies; began the development of Improved Neural Network (NN) Model; began to evaluate probabilities that are valuable in assessing NN system behavior; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue to evaluate probabilities that are valuable in assessing NN system behavior; refine NN Model using revised analyzed data; organize a workshop for NN Model introduction to ODOT, FHWA and the industry; produce project progress reports; complete and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 2)	\$47,691	SPR	-0-	STATE
Estimated Cost FFY 2009	\$47,691	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 2 of 2)	\$48,501	SPR	-0-	STATE

### **CONTACT INFORMATION**

Principal Investigator: Musharraf Zaman, Univ. of Oklahoma, 405-325-5625

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Harold Smart, ODOT Traffic Engineer, 405-521-2861

## 2212 Roadway Weather Information System and Automatic Vehicle Location (AVL) Coordination

**PURPOSE AND SCOPE:** To develop an intelligent winter weather vehicle monitoring system that integrates automatic vehicle location (AVL) information from relevant vehicles with information regarding where and which chemicals have been recently applied. This information will also be integrated with weather sensor data from ODOT pavement and bridge sensors as well as other weather information including data from the Oklahoma Mesonet. This information will allow for improved monitoring of road conditions across the state and improved coordination and deployment of relevant vehicles. By maximizing the application of winter weather techniques (including the application of chemicals) to areas in which conditions pose the highest risk of accidents, traveler safety can be improved while at the same time, the destructive impacts of these techniques can be applied less frequently to pavement and bridges in areas in which conditions pose a lower risk.

**ACCOMPLISHMENTS DURING FY 2009:** Developed prototype system for visualizing AVL and RWIS data; developed real-time data set simulation of AVL data stream; created time lapse simulation of tracked vehicles; expanded data set to include RWIS weather station data; implemented JS algorithm to encode lat/long points; integrated data from ODOT; created algorithm to show correct orientation and direction of vehicles; added ability to select type of vehicle display; produced project progress reports; Final Report and additional deliverables submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** End of Project.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 1)	\$52,729	SPR	-0-	STATE
Estimated Cost FFY 2009	\$52,729	SPR	-0-	STATE
Projected Cost FFY 2010	-0-	SPR	-0-	STATE

### **CONTACT INFORMATION**

Principal Investigator: Ronald D. Barnes, Univ. of Oklahoma, 405-325-1879

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Alan Stevenson, ODOT ITS Engineer, 405-521-6460

2213 Quantifying the Costs and Benefits of Pavement  
Retexturing as a Pavement Preservation Tool

**PURPOSE AND SCOPE:** To build on research done in Australia and New Zealand (Austroads 2005) by conducting a long-term study of various methods to restore pavement skid resistance by retexturing the existing surface with either a surface treatment, chemical treatment, or a mechanical process and furnish ODOT with the technical engineering data for each treatment coupled with an economic analysis of the costs and benefits associated with each treatment. This will furnish ODOT pavement managers the required information to make rational engineering decisions based on physical and financial data for the use of potential pavement preservation tools, evaluated under the same conditions over the same period by an impartial investigator. Researchers expect to produce a guidebook for use by ODOT pavement managers that represents a pavement preservation “toolbox” of available tools to restore both skid resistance and pavement macrotexture. The cost index and life cycle cost analyses will furnish ODOT personnel with the financial information to enable them to make an informed business decision as to the value added by each alternative in the trial. This project will produce a product that potentially can achieve an immediate impact on the safety of Oklahoma roads and highways.

**ACCOMPLISHMENTS DURING FY 2009:** Performed literature review; collected unpublished commercial research data; established test sections; developed field testing protocol; completed pretreatment characterization of the existing pavement surface; performed laboratory characterization of aggregates; constructed surface treatment on test sections; characterized change in pavement macrotexture and skid resistance; collected construction cost and time data; initiated monthly friction and pavement macrotexture field test protocol; analyzed field test data; developed economic and life cycle cost analysis; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Install additional test section using Single Sized Aggregate Armor Coat; performance of several unique testing services by Transtec; produce project progress reports; submit FY-10 Annual Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 3)	\$92,854	SPR	-0-	STATE
Estimated Cost FFY 2009	\$92,854	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 2 of 3)	\$17,950	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Douglas D. Gransberg, Univ. of Oklahoma, 405-325-4278

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Caleb Riemer, Assistant Area Maintenance Engineer, 580-332-1526

2214 Use of MSE Technology to Stabilize Highway  
Embankments and Slopes In Oklahoma

**PURPOSE AND SCOPE:** To determine a moisture reduction factor (MRF) to account for the influence of soil moisture content on pullout resistance of soil-geotextile interfaces in reinforced soil. This study will be part of a long-term research that is aimed at developing a better understanding of the mechanics of unsaturated soil-reinforcement interfaces involving marginal soils. The outcome of this study will help to develop reliable procedures to account for the loss of soil-reinforcement interface strength due to wetting, in order to achieve a safer design and disseminate them into the current state of practice.

**ACCOMPLISHMENTS DURING FY 2009:** Performed a series of lab pullout tests to obtain an accurate distribution of positive and negative pore water pressure, pore air pressure and moisture content in soils from current failed slopes; measured soil-reinforcement interface properties using a direct shear device; designed a reinforced soil slope for the repair of the failure site using test results representing recommended field conditions; compared slope safety factors from two analysis cases to quantify the influence of moisture content on slope stability; conveyed to ODOT engineers differences in reinforcement quantities between two designs to carry out a cost-benefit analysis between added reinforcement vs. providing additional drainage measures to achieve comparable factors of safety against slope failure; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Collect a new Oklahoma soil from a candidate site; select geotextile and calibrate equipment; perform laboratory testing on the new soil, geotextile and geotextile interface; perform nine (9) large-scale pullout tests; perform nine (9) small-scale pullout tests; carry out reduction and analysis of test data and determine MRF value; repeat testing for verification if necessary; design examples of reinforced soil slopes using different MRF values and compare safety factors; produce project progress reports; prepare and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 1)	\$40,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$40,000	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$83,103	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Kianoosh Hatami, Univ. of Oklahoma, 405-325-5911

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Vincent G. Reidenbach, Geotechnical Engineer, 405-522-4998

## 2215 Tube Suction Test for Evaluating Durability of Cementitiously Stabilized Soils

**PURPOSE AND SCOPE:** Changes in climatic conditions, namely freeze-thaw (F-T) and wet-dry (W-D), have been recognized by pavement engineers as a major factor in poor pavement performance. Strength and stability of subgrade soil, which supports the pavement structure, is a key factor in pavement performance. A more time-efficient, inexpensive and non-abrasive method, called Tube Suction Test, (TST), will be used in the proposed study to evaluate durability of selected stabilized soils that are frequently encountered in Oklahoma. A test protocol for the assessment of durability using the TST will be developed in this study and verified by comparing results with the current test methods, namely wet-dry (ASTM D 559), freeze-thaw (ASTMD560), vacuum saturation (ASTM C 593), and unconfined compressive strength (UCS). The results from this study will be useful in modifying the current ODOT procedure, Soil Stabilization Mix Design Procedure (OHD L-50), for the selection of additive percent. Assessment of durability using the TST will be time-efficient, non-abrasive, and inexpensive, making it attractive to design engineers and industry.

**ACCOMPLISHMENTS DURING FY 2009:** Collected common Oklahoma soil samples and additives; began laboratory testing for soil classification, moisture density, conventional freeze-thaw, conventional wet-dry, vacuum saturation and tube suction tests; began development of TST protocol; began statistical analyses and correlations of soil properties; began modifications to the current ODOT procedures for stabilized subgrade soils; produced project progress reports; FY-09 Annual Report submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** Complete laboratory testing for soil classification, moisture density, conventional freeze-thaw, conventional wet-dry, vacuum saturation and tube suction tests; complete development of TST protocol; conclude statistical analyses and correlations of soil properties; complete modifications to the current ODOT procedures for stabilized subgrade soils; produce project progress reports; complete and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 2)	\$45,627	SPR	-0-	STATE
Estimated Cost FFY 2009	\$45,627	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 2 of 2)	\$48,685	SPR	-0-	STATE

### **CONTACT INFORMATION**

Principal Investigator: Musharraf Zaman, Univ. of Oklahoma, 405-325-5625

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Vincent G. Reidenbach, Geotechnical Engineer, 405-522-4998



2216 Auto-Collision Avoidance System  
at Intersections

**PURPOSE AND SCOPE:** To reduce collisions at intersections by designing a prototype system that will provide real-time forewarning to drivers who are in danger of a collision as they approach an intersection. This system assists existing passive intersection control devices by implementing better methods for attracting all approaching drivers' attention. The warning system will gather the attention of approaching motorists in a timely fashion, so they will have time to react to the impending danger. This innovative system provides better effectiveness in reducing collisions compared to the existing intersection control devices, because it makes the intersection active and aware of its surroundings and enables it to convey this knowledge to approaching drivers in real-time. Reduction in traffic accidents will be effective in alleviating property damage and loss of life and health due to these collisions at intersections.

**ACCOMPLISHMENTS DURING FY 2009:** Performed literature review; developed wireless sensor node; selected microcontroller for base station development; developed 2 algorithms, one to predict collision probability and the other to facilitate communication between sensor nodes and the base station; analyzed system power consumption; performed system integration; performed scalability analysis to evaluate maximum number of sensor nodes deployable at one intersection; developed and performed emulation runs on a lab test bed that simulates vehicles approaching an intersection; performed system hardware and software modifications as problems were/are encountered in system; purchased Open Module Driver Simulator software to study human factor assessment of driver behavior and performance; produced project progress reports; Final Report and additional deliverables submission is pending.

**PROPOSED ACTIVITIES FOR FY 2010:** End of project .

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 2 of 2)	\$33,450	SPR	-0-	STATE
Estimated Cost FFY 2009	\$46,450	SPR	-0-	STATE
Projected Cost FFY 2010	-0-	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Hazem Refai, Univ. of Oklahoma, 918-660-3243

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Harold Smart, ODOT Traffic Engineer, 405-521-2861

2217 Development of Best Practices Program for a  
Collaboration of Minority Truckers

**PURPOSE AND SCOPE:** The ODOT Regulatory Services Office has an efficient certification program, however, they cannot require the large prime contractors to utilize small minority subcontractors when it is not cost effective. This research will focus on assisting the disadvantaged business enterprise (DBE) Certification program to evaluate and develop processes and training to eliminate challenges DBE firms face. Research will reveal if, by pooling resources, DBE truckers can achieve an effective economy of scale by operating together more efficiently at a lower costs than they could individually which will eventually make their bids more attractive to prime contractors. Langston University will aid in the development of a collaborative venture of minority truckers that will address both availability and capacity shortcomings which will enhance DBE participation in ODOT contracts. Ultimately the research findings can be duplicated and used for other DBE transportation related businesses.

**ACCOMPLISHMENTS DURING FY 2009:** New project as of March 24, 2009. Identified DBE trucking firms and coordinated meeting of minority truckers to expose obstacles individual DBE truckers face when bidding; documented concerns and experiences of DBE program participants and provided information to the ODOT Regulatory Services Division; generated a needs report and a cost usage analysis from which a feasibility assessment was derived; provided a practical framework for creating collaboration for minority trucking firms to the participants; presented alternative forms of legal business structures, forming a cooperative or Limited Liability Corporation; analyzed research findings and provided evidence about the benefits, risks and results of a collaboration of minority truckers; identified effective strategies the Regulatory Services Division may implement to address the utilization of small DBE trucking firms and/or owner-operators in the federal-aid highway program; produced project progress reports.

**PROPOSED ACTIVITIES FOR FY 2010:** Execute a series of workshops and seminars; prepare and submit deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009 (Yr 1 of 1)	\$51,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$33,977	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$17,024	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Wilson B. Brewer, Langston University, 405-521-1379

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Susan McClune, ODOT Regulatory Services, 405-521-6046

2218 QCQA Testing Differences Between Hot Mix  
Asphalt and Warm Mix Asphalt

**PURPOSE AND SCOPE:** ODOT Materials Division has conducted preliminary inquiries into QC/QA testing for warm mix asphalt (WMA). Some respondents indicate that WMA can be tested exactly the same as hot mix asphalt (HMA) for the same results. Other data shows that lab-molded and other volumetric properties are significantly different for WMA. The objectives of this study are to develop testing protocols for the different WMA additives for mix design and QC/QA procedures. For mix design, testing protocols need to be developed for rut testing and moisture sensitivity testing. For QC/QA, protocols need to be developed for lab-molded void properties and asphalt content. To meet the objectives, equivalent compaction temperatures and/or compactive efforts need to be established for WMA additives. Once this is established, the effect of WMA additives on lab-molded volumetric results from Superpave Gyratory Compactor (SGC) samples (QC/QA properties) and mix design results (moisture sensitivity and rutting) could be determined. If properties/results differ significantly from those obtained from the same conventional HMA mix, standard testing protocol(s) using the SGC would be developed that would provide test results consistent with conventional HMA test results. Test protocols could be dependent upon the specific WMA technology. The proposed research is essential in formulating the design requirements necessary to write new QC/QA specifications and mix design tests that will produce quality WMA, allowing full implementation of this new technology.

**ACCOMPLISHMENTS DURING FY 2009:** New project.

**PROPOSED ACTIVITIES FOR FY 2010:** Perform a literature review to concentrate on QC/QA procedures for WMA; obtain two mix type and two aggregate type materials identified from existing ODOT projects to be sampled for evaluation with different WMA additives; perform laboratory mix design testing and analysis; prepare samples and conduct lab-molded void testing; produce project progress reports; prepare FY-10 Annual Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 2)	\$98,195	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Steve Cross, Oklahoma State Univ., 405-744-7200

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Scott Seiter, ODOT Asst. Materials Engineer, 405-521-2677

2219 Evaluation of the Effectiveness of  
ODOT's Cable Barrier Program

**PURPOSE AND SCOPE:** Oklahoma has been using cable barrier systems for several years as a method of reducing or eliminating cross-over crashes. At present, Oklahoma uses several types of cable barrier systems. They differ in the types of support posts/bases, heights of cables, types of cables/anchorage, as well as, the placement of the system. As more median cable barrier systems are installed, there is a need to study their effectiveness in reducing crossover accidents and the cost-effectiveness of the various cable barrier systems. This study would include all crashes related to the systems being hit, types of systems, system placement, initial cost per mile, repair cost analysis related to manufacture type, and an analysis of prevented accidents since the installation. This research program will help identify successful designs, placement and implementation practices.

**ACCOMPLISHMENTS DURING FY 2009:** New project.

**PROPOSED ACTIVITIES FOR FY 2010:** Perform literature search; inspect cable barrier projects including photographic documentation; observe construction staging issues to produce cost per mile calculation; evaluate the performance of all types of cable barriers used by ODOT; create a matrix of the various elements used per location; perform an analysis of the initial and repair cost as related to manufacture type; prepare assessment of problems observed; prepare opinion of possible improvements; perform an analysis of preventable accidents since the installation; investigate and compare historic crossover crash data to the present deflective crashes; use multi-variant regression analysis to prove effectiveness of the cable barriers; compare to prior crash history; compare to other barrier systems (Jersey Barriers); prepare modeling as a means to determine site specific system placement; produce project progress reports; prepare and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$66,575	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Chris Ramseyer, Univ. of Oklahoma, 405-325-1415

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Harold Smart, ODOT Traffic Engineer, 405-521-2861

2220 Development of ODOT Guidelines for  
Use of Geogrids in Aggregate Bases

**PURPOSE AND SCOPE:** The objective of this study is to help ODOT develop materials specifications and guidelines for the acceptance and use of geogrids for aggregate base reinforcement. ODOT's current geogrid specifications are very limited and exclusive of many new types of geogrids that could be equally effective for base reinforcement applications at lower costs. Currently, ODOT engineers are unsure of minimum material properties that are necessary to ensure that a geogrid will perform adequately in base reinforcement applications in the field. Using geogrids to reinforce aggregate bases and/or subgrades can result in considerable cost-savings and improved performance. The focus of this study is to address current shortcomings of the AASHTO and FHWA guidelines with respect to the influences of junction mechanical properties and type of geogrids on their performance in reinforced bases. The goal of this study is to help make the new ODOT specifications more generic, consistent and cost-effective by including a wider variety of commercially available products than what is currently included in their specifications.

**ACCOMPLISHMENTS DURING FY 2009:** New project.

**PROPOSED ACTIVITIES FOR FY 2010:** Perform literature search; perform in-isolation testing of geogrids; perform installation damage tests; perform pullout tests; produce project progress reports; prepare FY-10 Annual Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 2)	\$83,757	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Kianoosh Hatami, Univ. of Oklahoma, 405-325-5911

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Vincent G. Reidenbach, Geotechnical Engineer, 405-522-4998

2221 Analysis of Aggregates and Binders  
Used for the ODOT Chip Seal Program

**PURPOSE AND SCOPE:** Chip seals are widely used for preventative maintenance of pavements. While there has been extensive research on the various parts of the surface treatment, there is little research on how the various materials and methods are brought together. Hence, chip sealing continues to be considered an art rather than a rationally engineered composite system. In most cases ODOT maintenance engineers use empirical design based on trial and error. Additional technical information is needed that defines binder selection based on environment and local traffic conditions. This information must be integrated with locally available aggregate properties to permit ODOT engineers to calculate appropriate emulsion/binder and aggregate application rates during chip seal placement based on local conditions. This information can then be used to revise ODOT chip seal specifications and update ODOT chip design methods. The major products of this project will be recommendations for revising ODOT chip seal specifications, fine-tuning division-specific chip seal design procedures, and training for ODOT maintenance engineers in each division.

**ACCOMPLISHMENTS DURING FY 2009:** New project.

**PROPOSED ACTIVITIES FOR FY 2010:** Perform literature search; perform ODOT Division case study identification to determine the state-of-the-practice; identify locally available chip seal and binder materials; collect and characterize division case study of good and bad projects from each division; perform laboratory characterization of aggregate samples collected; correlate project performance to identify successful chip seal binder-aggregate combinations in each ODOT division; recommend ODOT chip seal specifications revisions; conduct Oklahoma Chip Seal Best Practices seminar for ODOT division maintenance personnel, other interested ODOT employees, and other invitees as determined by ODOT; produce project progress reports; prepare and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$111,084	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Douglas D. Gransberg, Univ. of Oklahoma, 405-325-4278

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Scott Seiter, ODOT Asst. Materials Engineer, 405-521-2677

2222 Performance of Ultra-Thin Whitetopping  
(UTW) in Oklahoma

**PURPOSE AND SCOPE:** ODOT is in need of a long-life, cost effective means of repairing low to medium volume roadways. Ultra Thin Whitetopping (UTW) has been used around the country well as in Oklahoma, and has proven itself as a cost-effective and rapid means of repairing damaged asphalt pavement roads. Concrete overlays have been used over hot-mix asphalt (HMA) pavements and intersections as a method to restore ride quality. The objective of this project is to determine the performance and cost-efficiency of UTW projects within Oklahoma and provide recommendations for their future use. The development of an effective UTW guidelines and best practices document would provide ODOT with an option for repairing low to medium volume HMA roadways with a long lasting repair. This in turn would provide ODOT with a lower life cycle cost for their pavements and would allow the state dollars to be extended to other needs. This research will provide a review of UTW projects in Oklahoma and their current performance. Guidelines will also be provided over the best practices established from Oklahoma and national experiences.

**ACCOMPLISHMENTS DURING FY 2009:** New project.

**PROPOSED ACTIVITIES FOR FY 2010:** Perform literature search; compile UTW projects within Oklahoma and gather relevant design procedures, construction procedures, traffic data, and pavement condition data of the current UTW as well as the existing HMA and maintenance information; produce project progress reports; prepare and submit Final Report and additional deliverables.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 1)	\$40,190	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: Tyler Ley, Okla. State Univ., 405-744-9307

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Kenny Seward, ODOT Structural Materials Engineer, 405-522-4999

## 2223 Test Methods for Use of Recycled Asphalt Pavement in Asphalt Mixes

**PURPOSE AND SCOPE:** Although ODOT has adopted the use of RAP in asphalt pavements, some field divisions are concerned about the quality of aggregates in some RAPs. Such concerns arise partly from the use of aggregates in original pavements from quarries that might not meet current ODOT specifications. Also, there are questions on possible influence of the Abson Recovery method, which is commonly used by ODOT, on the Performance Grade of recovered binders. To help address such questions and concerns, the proposed study will compare the physical and mechanical properties of recovered aggregates with those of the virgin aggregates from the same source to examine potential statistical differences. This study will also evaluate the influence of the Abson Recovery method on the Performance Grade of recovered binders, and demonstrate if an alternate recovery method is better. The objective of this study is to generate laboratory data on recovered and virgin aggregates and binders that will help address the aforementioned concerns on the use of RAP in asphalt pavements. The results from this study will be very useful in revising specifications for use of RAP in asphalt pavements and are expected to be useful for ODOT in devising better management plan for the usage of RAP in HMA.

**ACCOMPLISHMENTS DURING FY 2009:** New project.

**PROPOSED ACTIVITIES FOR FY 2010:** Perform literature search; collect bulk RAP, virgin aggregates and virgin binders; extract aggregates from bulk RAP; evaluate physical and mechanical properties of recovered and virgin aggregates; recover binder from bulk RAP and fresh HMA mix; binder rheology testing and performance grading; perform statistical analysis; produce project progress reports; prepare FY-10 Annual Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 2)	\$89,294	SPR	-0-	STATE

### **CONTACT INFORMATION**

Principal Investigator: Musharraf Zaman, Univ. of Oklahoma, 405-325-5625

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Scott Seiter, ODOT Asst. Materials Engineer, 405-521-2677



**PURPOSE AND SCOPE:** Since the energy crisis of the 1970s, many schemes for harvesting energy from vehicular motion have been proposed, but none have gained widespread use. This project will investigate the potential for generating electrical power from the vibrations of a bridge due to large vehicles. It will utilize state-of-the-art technology and interdisciplinary expertise in solid-state electronics and bridge engineering to develop a system for providing electricity to power sensor networks, lighting, and other systems. The resulting technology will allow Oklahoma access to locally-generated power, minimizing vulnerability to disruptions in the power grid and contribute to the overall goal of sustainable infrastructure.

**ACCOMPLISHMENTS DURING FY 2009:** New project.

**PROPOSED ACTIVITIES FOR FY 2010:** Investigate currently-available commercial piezoelectric materials; evaluate preliminary designs for bridge bearings incorporating the new technology; design bridge sensor system prototype that can be feasibly powered by the resulting technologies; investigate competing technologies for energy harvesting and generate an appropriate thermodynamic context for evaluation; construct initial prototypes and perform iterative refinement of designs leading to deployment outside of lab setting. Produce project progress reports and prepare Annual Report.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	-0-	SPR	-0-	STATE
Estimated Cost FFY 2009	-0-	SPR	-0-	STATE
Projected Cost FFY 2010 (Yr 1 of 2)	\$100,000	SPR	-0-	STATE

**CONTACT INFORMATION**

Principal Investigator: J. David Baldwin, Univ. of Oklahoma, 405-325-1090

ODOT SPR Part 2 Manager: Bryan Hurst, 405-522-3794

Project Sponsor: Walt Peters, ODOT Asst. Bridge Engineer, 405-521-2606

## 2700 Experimental Product and Evaluation Program

**PURPOSE AND SCOPE:** This project was established to provide ODOT with a means of providing for the (experimental) use, monitoring, evaluation and implementation of products for highway and bridge construction where the products do not meet current ODOT standards and specifications.

**ACCOMPLISHMENTS DURING FY 2009:** Maintained records of new products where manufacturers provided literature or made presentations; provided product information to and consulted with applicable ODOT division subject matter experts on new product evaluations; organized product meetings and presentations; consulted with product vendors, representatives and firms.

**PROPOSED ACTIVITIES FOR FY 2010:** Continue to maintain records on products submitted to ODOT; meet with vendor representatives; circulate product literature and provide information to applicable ODOT division subject matter experts; hold product meetings and presentations for new product evaluation forms received; conduct product evaluations and monitoring as new products are being implemented.

<b>FINANCIALS</b>	<b>AMOUNT</b>	<b>FUND</b>	<b>AMOUNT</b>	<b>FUND</b>
Programmed Amount FFY 2009	\$10,000	SPR	-0-	STATE
Estimated Cost FFY 2009	\$5,000	SPR	-0-	STATE
Projected Cost FFY 2010	\$10,000	SPR	-0-	STATE

### **CONTACT INFORMATION**

ODOT Field Research Specialist: Bryan Cooper, 405-736-9475