Oklahoma Department of Transportation

Planning and Research Division

State Planning and Research Work Program
FFY 2011

(October 1, 2010 to September 30, 2011)

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 2010

U.S. Department of Transportation
Federal Highway Administration

Oklahoma Division

September 23, 2010

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In Reply Refer To:
HDA-OK

Mr. Gary Ridley
Director
Oklahoma Department of Transportation
200 NE 21st Street
Oklahoma City, OK 73105

Attention: Ms. Ginger McGovern

Dear Mr. Ridley:

The Federal Highway Administration (FHWA) Oklahoma Division has reviewed the Fiscal Year 2011 State Planning and Research (SPR) Part I (Planning) and Part II (Research) work programs and budget for the Oklahoma Department of Transportation as submitted by Ms. Ginger McGovern, Planning and Research Division Engineer, on September 17, 2010. Part I (Planning) also includes the metropolitan planning (PL) program funds previously approved by the FHWA as part of the FY 2011 Unified Planning Work Programs (UPWP) and budget for Tulsa, Oklahoma City, and Lawton MPO's, as well as the Ft. Smith, Arkansas, Bi-State planning area.

The FY 2011 SPR work program and budget is developed by ODOT and complies with 23 CFR 420.111, regarding work programs for transportation planning activities. As required by 23 CFR 420.111, ODOT's FY2011 SPR work program includes the description of work tasks to be accomplished and the estimate of costs associated with each task. In addition, the work program also identifies federal, state, and local funding sources as required under 23 CFR 420.111(b)(1). Part 1 of the FY 2011 SPR (Planning) also identifies funding for the Oklahoma Local Technical Assistance Program (LTAP), administered by the Center for Local Government Technology (CLGT) at Oklahoma State University.

ODOT's FY 2011 SPR program also complies with Subpart B, 23 CFR 420.207(a) regarding work programs and budgets for statewide Research, Development and Technology (RD&T) transfer activities. Part II activities represent more than 25 percent of FY 2011 SPR funds (23 CFR 420.107(a)). Part II (Research) is divided into general activities, continuing research projects, new

research projects, and pooled fund studies. ODOT has included a description of research activities expected to be undertaken in FY 2011 and the estimate of costs associated with each activity. ODOT supports a number of national pooled fund studies; including updating US precipitation frequency in the southern regions, the Evaluation of Low Cost Safety improvements, etc, and the research program includes an inventory of studies funded under previous work programs pending the release of a final study report.

The SPR provides a description of every work activity, including the purpose and scope; accomplishments during FY 2010; activities proposed in FY 2011; estimate of costs; and contact information. The estimated total cost provides further details in terms of FY 2010 programmed amount and actual costs, and the estimated cost for each activity in FY 2011.

ODOT has worked steadily to improve the structure and content of the SPR program and budget. We acknowledge that the program has added several worthy planning initiatives such as the Substate Planning and Rail Planning Activities. ODOT has plans to add funds and activities to Safety Planning tasks which are highly commended. FHWA appreciates the continued cooperation and collaboration with ODOT managers and staff in the development and review of the program.

It is evident from the program review that ODOT has worked to address previous recommendations and observations regarding increasing funding for tasks that did not see corresponding increased costs as this has been greatly reduced. Also it is evident ODOT has worked to improve the SPR program by ending research projects or planning tasks that were not bringing the expected results or benefits. It is recommended that ODOT continue to work on the completion of the Research Manual as this is an important element necessary for future required Peer Exchanges.

Based on our review and our meetings with Ms. Ginger McGovern, Mr. John Bowman and staff of the Planning and Research Division, we have determined that the FY 2011 SPR program complies with 23 CFR 420 subpart A and B, and will address the planning and research needs in Oklahoma. We hereby approve the FY 2011 SPR work program and budget as submitted. We thank you for your cooperation and your efforts in developing the planning and research work program and budget. Please contact Mr. Isaac N. Akem, Community Planner, at 405-254-3343 if you have any questions or comments regarding this action.

Sincerely,

Elizabeth A. Romero
Planning and Technical Services Team Leader

Introduction

This document describes the Federal Fiscal Year (FFY) 2011 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 2011 include data collection/analysis/reporting, mapping, public involvement, and planning coordination/studies. Additional efforts are planned for transit, rail, and rural planning; safety asset inventory data collection and safety peer exchange; and pavement structural condition testing. Funding for the planning portion of the work program is approximately $13 million.

Research activities for FFY 2011 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 22 national pooled fund projects. Funding for the research program totals approximately $3.8 million.

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 and the proposed activities for the upcoming fiscal year. In addition, the Financials Section shows the amount programmed for the FFY 2010 in the last work program, an estimate of the total funds that will be expended by the end of FFY 2010, and the projected costs for the upcoming fiscal year.

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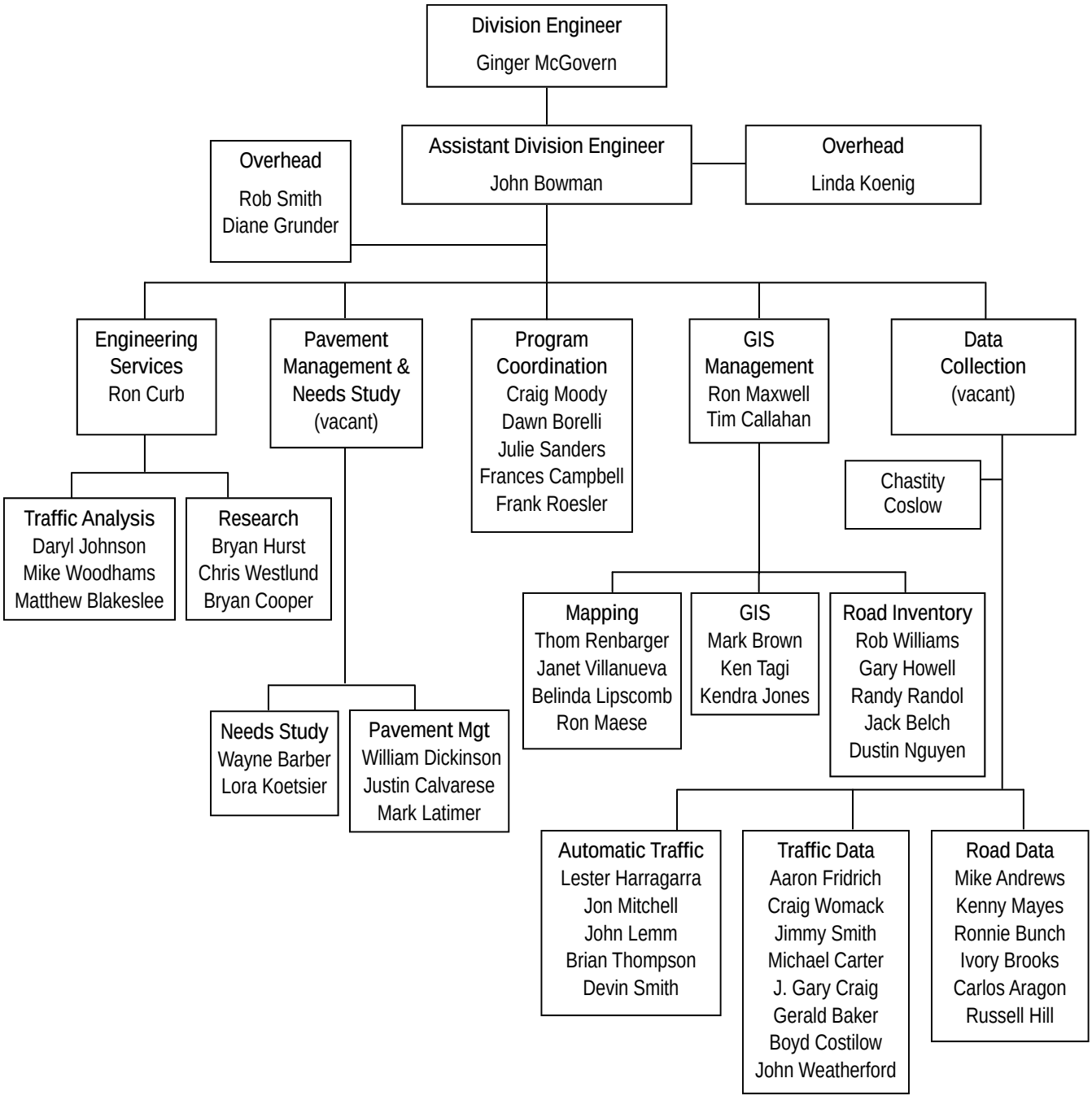

OKLAHOMA DEPARTMENT OF TRANSPORTATION
State Planning & Research (SPR) Financial Summary Sheet
Federal Fiscal Year 2011
Program Period October 1, 2010 through September 30, 2011

SPR Part 1 - Planning, SPRY-0010(51)PL, JP# 01946(55)

A. Estimated Costs

SPR Part 1 - Planning	$10,539,500.00
Metropolitan Planning (PL)	$2,423,530.00
Total Estimated Costs	***$12,963,030.00***

B. Available Funds

SPR Part 1 Unobligated Balance	$11,136,125.00
PL Funding	$2,053,756.00
Local	$369,774.00
Total Available Funds	***$13,559,655.00***

C. Proposed Financing

Type	Federal	Ratio	State	Local	Total
SPR	$10,539,500.00	80%	$0.00	$0.00	$10,539,500.00
PL	$2,053,756.00	80%	$0.00	$369,774.00	$2,423,530.00
			Total Proposed Financing		***$12,963,030.00***

SPR Part 2 - Research, SPRY-0010(52)RS, JP# 01946(56)

A. Estimated Costs

SPR Part 2 - Research	$2,289,601.00
Total Estimated Costs	***$2,289,601.00***

B. Available Federal Funds

SPR Part 2 Unobligated Balance	$1,811,485.00
SPR Part 1 Unobligated Balance (remainder)	$479,457.00
Total Available Funds	***$2,290,942.00***

C. Proposed Financing

Type	Federal	Ratio	State	Local	Total
SPR	$2,289,601.00	80%	$0.00	$0.00	$2,289,601.00
			Total Proposed Financing		***$2,289,601.00***

SPR Part 1 & Part 2 Totals

Total SPR Unobligated Balance	$12,947,610.00
Total Other Funds (PL, State, Local)	$2,423,530.00
Total Available Funding	***$15,371,140.00***
Total SPR Part 1 and Part 2 Estimated Costs	***$15,252,631.00***
Total SPR Pooled Fund Commitments	**$1,507,241.00**
Total SPR Research Funding	**$3,796,842.00**
% of SPR Funds for Research	**26%**
Total LTAP ($222,832 Fed LTAP; $117,168 SPR; $48,156 Local)	**$388,156.00**

SPR PART 1 - PLANNING, SPRY-0010(51)PL, JP# 01946(55)
FEDERAL FISCAL YEAR 2011

		SPR	STATE	PL	LOCAL	TOTAL
GIS AND DATA MANAGEMENT						
1101	Continuing Inventory Data Studies	$810,000.00	$0.00			$810,000.00
1102	Highway Performance Monitoring System	$190,000.00	$0.00			$190,000.00
1103	Geographical Information Management System for Transportation	$520,000.00	$0.00			$520,000.00
	Total GIS and Data Management	***$1,520,000.00***	***$0.00***			***$1,520,000.00***
MAPPING						
1201	County, City and other Planning Maps	$305,000.00	$0.00			$305,000.00
	Total Mapping	***$305,000.00***	***$0.00***			***$305,000.00***
TRAFFIC AND DATA COLLECTION						
1301	Coverage Count Program	$790,000.00	$0.00			$790,000.00
1302	Permanent Traffic Count Program	$700,000.00	$0.00			$700,000.00
1304	Purchase of Traffic Counting Equipment	$265,000.00	$0.00			$265,000.00
1305	Vehicle Classification Counting Program	$490,000.00	$0.00			$490,000.00
1306	Weigh-in-Motion Program	$615,000.00	$0.00			$615,000.00
1308	Traffic Monitoring System	$192,000.00	$0.00			$192,000.00
1309	Traffic Analysis and Projections	$130,000.00	$0.00			$130,000.00
1310	Skid Studies Program	$176,000.00	$0.00			$176,000.00
	Total Traffic and Data Collection	***$3,358,000.00***	***$0.00***			***$3,358,000.00***
ECONOMIC, SAFETY, AND FISCAL STUDIES						
1404	Safety Planning	$441,000.00	$0.00			$441,000.00
1510	Justification Studies	$20,000.00	$0.00			$20,000.00
	Total Economic, Safety, Fiscal Studies	***$461,000.00***	***$0.00***			***$461,000.00***
SYSTEMS AND PROGRAMS						
1601	Federal-Aid Systems Coordination	$81,000.00	$0.00			$81,000.00
1603	Highway Needs Study	$166,000.00	$0.00			$166,000.00
1604	Pavement Management Systems	$2,750,000.00	$0.00			$2,750,000.00
	Total Systems and Programs	***$2,997,000.00***	***$0.00***			***$2,997,000.00***
URBAN / REGIONAL TRANSPORTATION PLANNING						
1700	General Urban Transportation Planning	$33,500.00	$0.00			$33,500.00
1701	Oklahoma City Area Regional Transportation Study (OCARTS)	$70,000.00	$0.00	$1,219,141.00	$200,000.00 (ODOT in-kind)	$1,489,141.00
1702	Tulsa Metropolitan Area Transportation Study	$27,500.00	$0.00	$723,501.00	$142,000 (ODOT in-kind)	$893,001.00
1703	Lawton Metropolitan Area Transportation	$29,000.00	$0.00	$75,341.00	$18,831.00	$123,172.00
1709	Ft. Smith Transportation Study	$17,000.00	$0.00	$35,773.00	$8,943.00	$61,716.00
1710	Substate Planning	$200,000.00	$0.00			$200,000.00
1719	Statewide Transportation Improvement Program (STIP)	$70,000.00	$0.00	$0.00	$0.00	$70,000.00
	Total Urban Transportation Planning	***$447,000.00***	***$0.00***	***$2,053,756.00***	***$369,774.00***	***$2,870,530.00***
LONG RANGE PLAN / OTHER PLANNING ACTIVITIES						
1902	Statewide Long Range Transportation	$248,000.00	$0.00			$248,000.00
1903	Intelligent Transportation Systems Planning	$25,000.00	$0.00			$25,000.00
1904	Air Quality Transportation Planning	$45,000.00	$0.00			$45,000.00
1905	Freight Planning	$8,500.00	$0.00			$8,500.00
1906	Rail Planning	$870,000.00	$0.00			$870,000.00
1910	Public Involvement & Visualization	$255,000.00	$0.00			$255,000.00
	Total Long Range Plan and Planning	***$1,451,500.00***	***$0.00***			***$1,451,500.00***
	Grand Total SPRY-0010(051)PL	***$10,539,500.00***	***$0.00***	***$2,053,756.00***	***$369,774.00***	***$12,963,030.00***
LOCAL TECHNICAL ASSISTANCE PROGRAM						
					LTAP (Fed)	
1440	Local Technical Assistance Program	$117,168.00	$48,156.00		$222,832.00	$388,156.00
	Total LTAP	***$117,168.00***	***$48,156.00***		***$222,832.00***	***$388,156.00***

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 FFY 2010: The County Road inventory procedures were continued with eight county inventories completed (Beaver, Greer, Kiowa, Love, Muskogee, Pontotoc, Washington and Washita) and two (Canadian and Texas) in progress. Six counties were reassessed and coded (Atoka, Garvin, Grant, Harper, Johnston, and Ottawa) and one (Blaine) in progress. Approximately 50% 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 (NLF), Reference Point, and Open to Traffic databases were completed. The following annual publications and reports were completed; 2010 Oklahoma Statewide Statistics Book, 2010 Certification of County Road Mileage, 2010 Control Section Map Book, 2010 HPMS mileage, and Travel Summary Tables.

PROPOSED ACTIVITIES FOR FFY 2011: An additional 10% of the local road network will be geo-located this year. Continue coding and updating the Department's Central Database files. Incorporate technology advancements in data collecting to ensure efficiency. Continue to improve on all procedural inventory operations. Seven of the following ten counties are scheduled to be inventoried: Cimarron, Custer, Ellis, Harmon, Jackson, Jefferson, Major, McCurtain, Oklahoma and Tillman. Six of the following thirteen counties are scheduled to be reassessed and coded: Atoka, Beaver, Canadian, Cimarron, Greer, Harmon, Oklahoma, Kiowa, Muskogee, Pontotoc, Seminole, Washington 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 2011 Oklahoma Statewide Statistics Book, 2011 Statewide Mileage Table Book, 2011 Certification of County Road Mileage, and 2011 HPMS Mileage and Travel Summary Tables. Keep abreast of the latest technological advances through attendance of seminars, conferences and workshops.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$775,800	SPR	-0-	STATE
Estimated Cost FFY 2010	$760,600	SPR	-0-	STATE
Projected Cost FFY 2011	$810,000	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 FFY 2010: ODOT worked with a consultant to design a new HPMS data model reflecting the changing needs and requirements as specified in the 2010+ Reassessment Study and the new Data Requirements document. A web based graphical user interface, Oracle stored procedures, and C#/ASP code were designed, implemented and tested. The GUI interface is named the HPMS Console Version 2. Sweeping changes were mandated requiring a “ground up” approach. ODOT also worked closely with FHWA, Washington DC, in providing testing and feedback on the new web based HPMS software Version 8 which was designed, built, tested and implemented by FHWA for use in the 2009 submittal process. The 2009 HPMS data submittal was completed using the new HPMS Console and the new FHWA HPMS Version 8 software. A field review of 2008 HPMS data was conducted with the FHWA Oklahoma Division office.

PROPOSED ACTIVITIES FOR FFY 2011: A primary focus will be placed on continued data quality improvement. Videolog data will be used to verify and collect HPMS sample data. An HPMS sample adequacy review will be conducted and additional samples added in the appropriate strata. Continue to improve data cross-check and domain validation table structures and functionality. Any changes in the HPMS data structure and HPMS console interface as required by changing FHWA requirements will be implemented and tested. On-Line help in the form of a series of readme files and/or a Robo-Help help system will be authored and implemented. Continue to work closely with FHWA Washington DC in providing feedback on the HPMS Version 8 web based software. Field review documents will be generated and a HPMS data field review will be conducted in cooperation with FHWA Oklahoma Division. The 2010 HPMS data submittal will be transmitted to FHWA using the HPMS Console V2 and the FHWA Version 8 web-based software. Ramp data will be included with the 2010 HPMS submittal.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$187,700	SPR	-0-	STATE
Estimated Cost FFY 2010	$178,900	SPR	-0-	STATE
Projected Cost FFY 2011	$190,000	SPR	-0-	STATE

CONTACT INFORMATION

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

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 FFY 2010: Using state-of-the-art GIS software and custom scripts a series of maps known as the 2011-2018 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. Continued working with a consultant on improvements to GRIP3 including adding the ODOT Storm Water regulated areas and Routes. 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 2010 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 continue to be redesigned and updated. Continued to develop a foundation for an Environmental business layer in the GRIP browser application as well as for a layer reflecting the Regulated Routes and supporting data for the Outdoor Advertising Branch. A network including all of the grade-separated ramps for Interstate, U.S. and State Highway Systems as well as Climbing Lanes, Frontage Roads continues to be updated with new data as it becomes available. Continued to 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, produced 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. Provided limited GeoMedia user support on the GMUSERS Schema. Developed a workflow for accurately reproducing the County Maps using features stored within an Oracle Database. Received training in the reading and use of U.S. Census Bureau's 2010 Census Data in preparation for the 2010 Census. Assisted Bridge Division in developing the ability to accurately locate and collect latitude\longitude data for their off-system bridges and to create the annual Red-Green Map and for a Truck Routing Network. Assisted 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 supplied 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 FFY 2011: Continue maintenance of the Point to Point Mileage LRS and Applications. Create a more efficient method for creating the 8 Year Work Plan and STIP Map products. Continue to provide support to Senior Staff as well as others within the Department in the creation of GIS Map products which facilitate and improve the decision making process within ODOT. 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 continue to improve on the design and creation of updated County/Urban Functional Classification Atlases. In coordination with both the ODOT Environmental Programs Division, and the Outdoor Advertising Branch continue to identify needs and develop solutions that will enable them to efficiently and accurately perform their individual missions. 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. Continue to search for and provide certified GIS Training to the GIS Section and others within the GIS Management Branch. Update the oracle database from 10G to 11G. Redesign data loaders for construction work plans for use in data mapping.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$443,300	SPR	-0-	STATE
Estimated Cost FFY 2010	$380,200	SPR	-0-	STATE
Projected Cost FFY 2011	$520,000	SPR	-0-	STATE

CONTACT INFORMATION

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

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 FFY 2010: Seven counties and 48 cities were completed using CADD software from the latest available information, aerial photography and digital data. Counties completed were Cherokee, Kingfisher, Marshall, Mayes, Okfuskee, Payne and Stephens. 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 these are fully implemented in Microstation Geographics that allows future graphic integration into most GIS databases. 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.

The 48 following incorporated city maps, listed by county, were drafted using CADD software (City formats have been revised so that they are geospatially referenced within the Oklahoma Coordinate System; five municipalities over 5,000 in population are shown in bold letters.): Cherokee County: Hulbert, **Tahlequah**. Kingfisher County: Cashion, Dover, Hennessey, **Kingfisher,** Loyal, Okarche, **Piedmont**. Marshall County: Kingstown, Madill, New Woodville, Oakland. Mayes County: Adair, Chouteau, Disney, Grand Lake, Towne, Langley, Locust Grove, Pensacola, **Pryor**, Salina, Spavinaw, Sportsman Acres, Strang. Okfuskee County: Bearden, Boley, Castle, Clearview, Okemah, Paden, Weleetka. Payne County: **Cushing**, Drumright, Glencoe, Perkins, Ripley, Quay, **Stillwater,** Yale. Stephens County: Bray, Central High, Comanche, **Duncan**, Empire City, Loco, Marlow, Velma.

PROPOSED ACTIVITIES FOR FFY 2011: The Cartographic Design Section will continue drawing all county and city maps in a geospatially referenced format with GIS usage compatibility and improved accuracy. Two county maps are in progress: Delaware and Pottawatomie, 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 future use by other governmental agencies.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$295,300	SPR	-0-	STATE
Estimated Cost FFY 2010	$295,000	SPR	-0-	STATE
Projected Cost FFY 2011	$305,000	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 FFY 2010: Short duration traffic counts were completed on the state highway system, county off-system and small urban system in the 25 counties scheduled for FY 2010. Continuous updating of the GPS coordinates and site characteristics for all traffic count sites on all systems was performed. The 3rd and final year of the Short Duration Traffic Count Contract with RDS (Road Data Systems Corporation) was completed. RDS conducted traffic count data collection, reporting and site location description verification at highway, county, and city count locations in Oklahoma and Cleveland Counties. The Oklahoma Traffic Count Information System Web Page was continuously updated throughout the year.

PROPOSED ACTIVITIES FOR FFY 2011: 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, county off-system and small urban system in the 27 counties scheduled for FY 2011. Collect and update GPS coordinates and site characteristics for all traffic count sites on all systems. The Short Duration Traffic Count Contract will be rebid for the collection of the Tulsa County in FY 2011. We will be looking into an agreement for enhanced features to the Oklahoma Traffic Count Information System Web Page 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.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$867,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$724,000	SPR	-0-	STATE
Projected Cost FFY 2011	$790,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich, Traffic Data Section Manager, 405-736-9467

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 FFY 2010: The progress made in this year's effort resulted in the successful conversion to solar power and the deployment of digital wireless data communications at all 70 existing AVC continuous count traffic monitoring stations. The solar power conversion project has reduced electric utility costs and increased site operational rates. The wireless network conversions have dramatically improved the speed and dependability of traffic data transfers as compared to land line telephone service. The wireless conversions have been facilitated through the "Traffic Data Collection Using Wide Area Wireless, GPRS" research study with the University of Oklahoma. The University has developed software to facilitate traffic data transfers to an IP address on the internet which allows import into the department's Traffic Operations and Planning Software data base. The University has also developed a web page which allows for real time monitoring of Wireless Traffic Monitoring Sites operations. The conversion of old WIM 1068 systems to newer iSync Lite systems has been completed at two newly constructed and 10 existing WIM sites. The iSync Lite system allows for wireless conversion and also communicates with the University's developed software for data transfer through the internet.

PROPOSED ACTIVITIES FOR FFY 2011: Twenty one existing WIM sites are planned to be equipped with solar power and eleven existing WIM sites are planned to be converted to wireless communication. These conversions will continue the site utilities cost reduction, data transfer speed improvement and site operational rate enhancement efforts begun in FY 2010. Continue to repair and maintain existing AVC and WIM sites.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$451,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$254,000	SPR	-0-	STATE
Projected Cost FFY 2011	$700,000	SPR	-0-	STATE

CONTACT INFORMATION

Lester Harragarra, Automatic Traffic Section Manager, 405-736-9469

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 FFY 2010: Equipment purchases executed in FY 2010 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 data base 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 FFY 2011: Purchase PEAK ADR-2000 classifiers, and PEAK ADR-1000 counters and road tubes to replace worn out equipment. Purchase batteries for solar and wind powered sites. Purchase wireless communications terminals for WIM sites. Purchase GPS in-vehicle devices.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$259,100	SPR	-0-	STATE
Estimated Cost FFY 2010	$38,800	SPR	-0-	STATE
Projected Cost FFY 2011	$265,000	SPR	-0-	STATE

CONTACT INFORMATION

Lester Harragarra, Automatic Traffic Section Manager, 405-736-9469

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 FFY 2010: Collected short term vehicle classification data for development of annual average truck volumes. Over 400 new short-term vehicle classification sites are being incorporated in the 3-year collection cycle. All 2-lane highway classification site locations were counted twice for 24 hours using Automatic Traffic Recorders (ATRs). The vehicle classification counting program for FY 2010 was supplemented with a new contract for collection of multi-lane urban and rural classification data statewide. Special studies were conducted as follows:

(A) For Data Collection Branch
- 2 - Turning movements with pedestrian counts
- 27 - (24 hour) Hourly Machine Count
- 0 - (24 hour) Cumulative Machine Count
- 218 - (24 hour) Vehicle Classification Counts

(B) For the Engineering Services Branch
- 14 - Turning movements w/ pedestrian counts
- 160 - (24 hour) Hourly Machine Counts
- 2 - (24 hour) Cumulative Machine Counts
- 10 - (24 hour) Vehicle Classification Counts

(C) For Traffic Engineering and field divisions
- 26 - Turning movements with pedestrian counts
- 85 - (24 hour) Hourly Machine Counts
- 6 - (24 hour) Cumulative Machine Counts
- 0 - (24 hour) Vehicle Classification Counts

(D) For other Divisions
- 0 - Turning movements with pedestrian counts
- 1 - (24 hour) Hourly Machine Counts
- 0 - (24 hour) Cumulative Machine Counts
- 3 - (24 hour) Vehicle Classification Counts

PROPOSED ACTIVITIES FOR FFY 2011: The vehicle classification counting program for FY 2011 will be supplemented with a 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.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$479,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$450,500	SPR	-0-	STATE
Projected Cost FFY 2011	$490,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich, Traffic Data Section Manager, 405-736-9467

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 23 permanent weigh-in-motion (WIM) data collection sites located throughout the state.

ACCOMPLISHMENTS DURING FFY 2010: The Traffic Monitoring Systems Operations and Maintenance Contract provides enhanced services and expertise particularly in the area of data collection and systems validation. The TMS site operational rate experienced a marked increase. Additionally, improved systems diagnostics and trend analysis provided by contract data systems experts have resulted in a much needed systems approach towards operations and maintenance support as evident in the detailed construction and renovation project coordination executed during this period. The scope of work accomplished during FY 2010 includes:

1) Data Collection and systems validation of 91 permanent AVC and WIM sites
2) Classification video data collection and analysis
3) Construction of two (2) new WIM sites.
4) Renovation of sixteen (16) existing sites (8 WIM and 8 AVC)
5) Scheduled maintenance and calibration for all operational AVC and WIM sites

PROPOSED ACTIVITIES FOR FFY 2011: The Data Collection, Software Development, and Web Page Enhancements Contract will involve the monthly collection of data and enhancements to the existing ODOT Traffic Count web page. The scope of this contract will focus on: 1) Data collection, 2) development of data validation software using historical data, 3) support services for the digital wireless data communications network, 4) development of software supporting remote programming and configuration of traffic data recorders, 5) development of software allowing for the addition of multiple analog sensors to the communications terminal unit, 6) development of remote monitoring and diagnostics for trouble shooting, and 7) development of a power monitoring system for calculating charging rate and power consumption rate to adjust wireless transmission frequency. Additional expenditures are programmed in FY 2011 to support firmware and memory storage enhancements in several of the older data recorders.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$1,166,600	SPR	-0-	STATE
Estimated Cost FFY 2010	$1,142,000	SPR	-0-	STATE
Projected Cost FFY 2011	$615,000	SPR	-0-	STATE

CONTACT INFORMATION

Lester Harragarra, Automatic Traffic Section Manager, 405-736-9469

PURPOSE AND SCOPE: The Oklahoma Traffic Monitoring System (TMS) is a comprehensive statewide 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 FFY 2010: Annual processing was completed for the traffic year 2009 and the data was checked for accuracy. The HPMS sample data was estimated with 20 year forecasts first time. Trucks were estimated on the NHS for the first time. The annual publication of the 2009 AADT Map was completed. The work toward updating the TMS mapping system to GeoMedia is approaching completion. This allows for a more efficient accounting of all traffic monitoring locations and is a necessary step toward completing the new ramp and truck traffic estimation requirements. Over 500 vehicle classification locations have been added to the Oklahoma TMS.

PROPOSED ACTIVITIES FOR FFY 2011: 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 2010 AADT Map. Compile and report the 2009 Oklahoma Traffic Characteristics Report. Keep informed of technological advances through attendance of seminars, conferences, and workshops.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$177,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$177,000	SPR	-0-	STATE
Projected Cost FFY 2011	$192,000	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 FFY 2010: 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 134 requests for design traffic were completed. Several consultant traffic analyses were overseen and edited.

PROPOSED ACTIVITIES FOR FFY 2011: 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.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$177,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$130,000	SPR	-0-	STATE
Projected Cost FFY 2011	$130,000	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 FFY 2010: The annual test cycle encompassed pavement friction testing of highways in Divisions 5, 6, 7, US-69 and all Interstates. The new Pavement Friction (Skid) Testing System purchased in FY 2007 was in its 4th year of use in this year's test cycle and again experienced increased productivity in test miles. This year's testing cycle totaled 10,623 miles. The new system's software provides a more efficient and streamlined reporting process.

PROPOSED ACTIVITIES FOR FFY 2011: The upcoming test cycle encompasses state, federal and interstate highways totaling approximately 7,366 miles in Division 4 & 8. Testing is done annually on all interstate highways and US-69. Completion is scheduled for the fall of 2011. This year the pavement friction system is scheduled for calibration at the Texas Transportation Institute located at Texas A&M. It is recommended that this be done biannually.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$154,200	SPR	-0-	STATE
Estimated Cost FFY 2010	$146,200	SPR	-0-	STATE
Projected Cost FFY 2011	$176,000	SPR	-0-	STATE

CONTACT INFORMATION

Lester Harragarra, Automatic Traffic Section Manager, 405-736-9469

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 FFY 2010: Continued communication regarding use of safety strategy software. Processed claims and managed contract with consultant. Participated in monthly status meetings. Worked with ODOT Traffic Engineering staff to transition project management from Planning Division to Traffic Engineering Division. Maintained communication with Traffic Engineering Division regarding monthly and/or annual reports. Provided interface necessary to include safety and security considerations in Long Range Transportation Plan.

PROPOSED ACTIVITIES FOR FFY 2011: Continue coordination with ODOT Traffic Engineering Division, Oklahoma High Patrol, MPOs, and other agencies in development of Transportation Safety Plans. Evaluate transportation safety strategies. Engage Transportation Safety Institute (TSI) to host a Highway Safety Peer Exchange in Oklahoma City. Continue work with integrating safety priorities into Long Range Plan implementation efforts. Coordinate with Safe Routes to Schools Program on educational and/or planning efforts.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$20,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$5,040	SPR	-0-	STATE
Projected Cost FFY 2011	$441,000	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 onsite 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 2010: Oklahoma LTAP hosted the National LTAP Association (NLTAPA) Annual Conference in Oklahoma City in July; continued the Roads Scholar curriculum in conducting numerous training sessions; developed and conducted new training courses as requested by the LTAP Advisory Board and counties, with emphasis on safety; continued to develop hands on training through cooperation efforts with industry; continued to publish newsletters and various literature, tapes, DVD, etc. for distribution; attended year end meeting with ODOT staff aimed to further improve LTAP program direction and goals; provided program progress reports.

PROPOSED ACTIVITIES FOR FY 2011: Continue the Roads Scholar safety and training courses including Road Safety Audit, Welding Safety, OSHA Forklift, MUTCD Flagman, Comprehensive MUTCD, Windland Fire Training, as well as, several other courses; provide Infrastructure Management training to include Motor Grader Operation, Chip Seal Class and Demonstration, Asphalt operations. Two new classes will be presented to include Bridge Maintenance and Retro-Reflectivity management. Participate in Assoc. of County Commissioner of Oklahoma (ACCO) conferences and County Officer & Deputies Assoc. (CODA) conferences; continue to lead Workforce Development related classes; continue to improve and serve as the state office of the Oklahoma Chapter of the American Public Works Assoc. (APWA) in handling daily office functions, organizing and conducting the annual conference and attendance of board meetings; continue to build on and improve the Transportation Intern Program developed by the Center for Local Government Technology (CLTG); serve on various local and national committees such as the Assoc. of County Commissioners of Okla. Strategic Planning, National LTAP Assoc. Confr. Planning, etc.; attend various conferences including the TRB Annual Confr. and the National LTAP Confr.; provide technical assistance in all areas; continue to provide various literature, tapes, DVD's, etc. for distribution; provide program progress reports.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$194,702	SPR	$47,778	STATE	$145,298	FHWA
Estimated Cost FFY 2010	$155,552	SPR	$47,778	STATE	$184,448	FHWA
Projected Cost FFY 2011	$117,168	SPR	$48,156	STATE	$222,832	FHWA

CONTACT INFORMATION

Bryan Cooper, Transportation Research Section, 405-736-9475

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 FFY 2010: Reviewed consultant studies as needed.

PROPOSED ACTIVITIES FOR FFY 2011: Consultant studies will be overseen as needed. Keep informed of technological advances through attendance of seminars, conferences, and workshops.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$10,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$2,000	SPR	-0-	STATE
Projected Cost FFY 2011	$20,000	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 FFY 2010: A total of 11 revisions were approved by the Commission to the State Highway System. Examples include the relocation or realignment of US 59 south of Sallisaw, SH 3 west of Farris, SH 34 south of Leedey, US 270 south of Greenfield and SH 37 west of Tuttle, and the removal of SH 92 in Canadian County. Completion of 35 rural county collectors and 4 urban revisions for a total of 39 revisions to the Functional Classification System. Ten of the many highway history questions this office received required extensive research. Completed an intensive research of the ODOT's 100 year history and a 115 page book was compiled to be utilized by the ODOT staff in preparation for the Department's 100 year celebration. The *Oklahoma's Memorial Highways & Bridges* book was updated and published for 2009.

PROPOSED ACTIVITES FOR FFY 2011: Continue to coordinate all necessary highway revisions within the State. Reclassifiy US 60 between Vinita, Oklahoma and the State of Missouri to a principal arterial. Continue to do necessary on-site reviews of revisions. The Functional Classification Systems has 54 rural county routes and 27 urban routes that need to be revised for improper routing or connection. Only approximately 25% of these are expected to be completed the coming year. County Functional Classified requested revisions will be completed. Continue to prepare for the completion of the 2010 Census information pertaining to the rural and urban areas. Update and publish the County Collector System map book for July, 2011. Update and publish the *Oklahoma's Memorial Highways & Bridges* book for 2010.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$77,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$76,000	SPR	-0-	STATE
Projected Cost FFY 2011	$81,000	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 FFY 2010: Updated the Sufficiency Rating Manual. Updated the Field Division maintenance study guide. Updated the state highway subsection, inventory, and improvement data for the Sufficiency database prior to collection of field data. Collected field division study data. Published and distributed the Top 25 Highway Construction Priority List by Commission District. Published and distributed the 2009 Needs Study and Sufficiency Rating Report, Volumes I & II and the Needs Study Top 25 Highway Construction Priority List. Reviewed, revised, printed and distributed the Potential Removals from the State Highway System Report. Updated the Construction Status database.

PROPOSED DURING FFY 2011: Update geometric data contained in the Deficiency file. Apply field division study data. Begin program runs for the 2011 Needs Study and Sufficiency Rating Report. Revise the Needs Study Procedural Manual.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$151,600	SPR	-0-	STATE
Estimated Cost FFY 2010	$151,600	SPR	-0-	STATE
Projected Cost FFY 2011	$166,000	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 FFY 2010: 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 3, 4 and 8. Collected IRI only for NHS routes in Divisions 3, 4 and 8. Continued implementing web-based version of video log and coordinated integration with GRIP. Began collecting Falling Weight Deflectometer (FWD), Ground Penetrating Radar (GPR) and core data on the NHS and Division 5. Began sign inventory data collection. Kept informed of the latest technological advances and practices by attending the Pavement Management Roadmap Development Conference in Nashville.

PROPOSED ACTIVITIES FOR FFY 2011: Perform PMS analysis of the Interstate and/or NHS Highway Systems 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. Continue collect Falling Weight Deflectometer (FWD), Ground Penetrating Radar (GPR) and core data on portions of the NHS. Complete sign inventory data collection. Begin inventory collection of safety barrier, guardrail, and crash attenuators. Initiate pavement condition data collection on the following:

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

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

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$1,861,741	SPR	-0-	STATE
Estimated Cost FFY 2010	$1,861,741	SPR	-0-	STATE
Projected Cost FFY 2011	$2,750,000	SPR	-0-	STATE

CONTACT INFORMATION

William Dickinson, Pavement Management Program Manager, 405-522-1448

1700 General Urban Transportation Planning

PURPOSE AND SCOPE: This item includes 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 FFY 2010: Coordination continued with appropriate ODOT staff members and Field Divisions. Socioeconomic data and traffic counts were provided, upon request, to local and state officials and to citizens. Initiated Miami area SH 69A Improvement Study. Staff attended various seminars and workshops related to transportation planning and policies in order to maintain, upgrade and develop needed expertise, proficiency and professionalism. Coordination with and among local, state and federal officials was continued. Monitored federal and state legislation and regulations affecting the Department. Provided review and comment on Surface Transportation Act reauthorization language.

PROPOSED ACTIVITIES FOR FFY 2011: 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 upon request concerning transportation planning and reauthorization of SAFETEA-LU legislation. Professional enrichment of Program Coordination members will be pursued through attendance at workshops, seminars and conferences.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$33,500	SPR	-0-	STATE
Estimated Cost FFY 2010	$26,800	SPR	-0-	STATE
Projected Cost FFY 2011	$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 FFY 2010: Continued work on the 2035 Growth Allocation Model (GAM); updated regional traffic count database on monthly basis; continued membership with State Data Center Affiliate program; refined 2035 OCARTS Plan network; continued coordination with ODOT and local governments concerning STP-UZA funds, adopted STP Procedures for Oklahoma City Urbanized Area funds and criteria and process for evaluation of projects; started a new Central Oklahoma rideshare program; continued working with Air Quality Division of ODEQ on monitoring CO and ozone levels. The Transportation Improvement Program (TIP) for FFY 2010-2013 was developed and maintained and amended as necessary. The Transportation Improvement Program (TIP) for FFY 2011-2014 was developed. Preparation and finalization of the FY 2011 Unified Planning Work Program (UPWP) was completed. The FY 2011 Agreement was executed and authorization to expend federal funds effective July 1, 2010 through June 30, 2011 was granted by FHWA.

PROPOSED ACTIVITIES FOR FFY 2011: Data development and information management - finalize socioeconomic data for 2035 Plan and reports; regional transportation planning includes 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.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$20,000	SPR	$1,449,874	PL	$200,000	In-Kind
Estimated Cost FFY 2010	$4,480	SPR	$1,168,222	PL	$200,000	In-Kind
Projected Cost FFY 2011	$70,000	SPR	$1,219,141	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 FFY 2010: Continued development of the Regional Transportation Plan, Connections 2035. Preparation and finalization of the FY 2011 Unified Planning Work Program (UPWP) was completed. The FY 2011 Agreement was executed and authorization to expend federal funds effective July 1, 2010 through June 30, 2011 was granted by FHWA. The Transportation Improvement Program (TIP) for FFY 2009-2012 was maintained and amended as necessary. The Transportation Improvement Program (TIP) for FFY 2011-2014 was developed. Applications for FFY 2014 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 FFY 2011: Data collection–develop and maintain socioeconomic data and transportation system data in the region; simulation and forecasting of land use to be incorporated into the 2035 travel demand model, maintain 2030 travel demand model developed for the 2035 Plan, transition to the MOVES mobile emissions model; long range planning includes a maintained valid major street and highway plan, comprehensive plan and transportation coordination, regional transportation plan; short range planning includes the Congestion Management Process to revise document as necessary, ITS, Safety and Incident Management in improving safety in region; project and program implementation of the FFY 2011-2014 TIP, revise projects selected for the FFY 2014 STP-UZA program; alternative transportation planning includes initiation of development of a comprehensive pedestrian, bicycle plan for the region, public transit system and updated financial plan for MTTA, implementation of Coordinated Public Transit—Human Services Transportation Plan, coordination with ODOT on High Speed Passenger Rail implementation and initiation in region; transportation effects includes air quality planning, ozone reduction and environmental programs; public education planning includes revision of the PPP, Nondiscrimination Compliance Plan and initiation of several outreach events; program administration of the transportation and MTTA planning process.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$16,500	SPR	$707,615	PL	$176,904	Local
Estimated Cost FFY 2010	$6,550	SPR	$662,645	PL	$165,661	Local
Projected Cost FFY 2011	$27,500	SPR	$723,501	PL	$142,000	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 FFY 2010: Transportation Planning for the Lawton Metropolitan Area was carried out as described in the FY 10 Unified Planning Work Program (UPWP). During FY 10 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 10 included: publish the Annual listing of obligated projects, adoption of the FFY 2011-2014 Transportation Improvement Program (TIP) processing amendments to the FFY 2009-2012 TIP, preparation of the annual transportation planning funding documents and maintenance and update of the LMPO website.

PROPOSED ACTIVITIES FOR FFY 2011: Data collection and monitoring of social, economic, environmental and transportation system data. Review and re-affirm the 2030 Long Range Transportation Plan to 2035. Conduct assessment of transit and pedestrian accessibility around element and middle schools. Assist the LMPO in development and adoption of the transportation planning and procedures manual. Review and update the Public Participation Process to address Limited English Proficiency and Title VI. 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.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$15,900	SPR	$123,940	PL	$30,985	Local
Estimated Cost FFY 2010	$31,600	SPR	$46,168	PL	$11,542	Local
Projected Cost FFY 2011	$29,000	SPR	$75,341	PL	$18,831	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 FFY 2010: Transportation Planning for the Bi-State Metropolitan Area was carried out as described in the FY 10 Unified Planning Work Program (UPWP). Accomplishments during FY 10 included: published Annual Listing of Obligated Projects, adopted the FFY 2010-2013 Transportation Improvement Program (TIP), developed and hosted Freight Summit and Freight Roundtable, published the Annual listing of obligated projects, preparation of the annual transportation planning funding documents and maintenance and update of the LMPO website.

PROPOSED ACTIVITIES FOR FFY 2011: The Oklahoma Department of Transportation will continue coordination with the Bi-State Metropolitan Planning Organization and the Arkansas Highway and Transportation Department (AHTD) in maintaining the 3-C planning process in the Fort Smith area. In coordination with AHTD provide technical assistance in the reorganization of the BiState MPO and the update of the Metropolitan Transportation Plan. Monitor progress on the update of the Metropolitan Transportation Plan. 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.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$6,600	SPR	$23,900	PL	$5,975	Local
Estimated Cost FFY 2010	$15,370	SPR	$20,087	PL	$5,021	Local
Projected Cost FFY 2011	$17,000	SPR	$35,773	PL	$8,943	Local

CONTACT INFORMATION

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

PURPOSE AND SCOPE: To provide transportation planning assistance for the non-metropolitan areas of the State thru the Oklahoma Association of Regional Councils (OARC). The rural transportation program will assist ODOT in meeting Federal and State requirements for the Statewide Planning Process to address the transportation needs in non-metropolitan areas. Develop and provide ongoing public participation for the transportation planning process.

ACCOMPLISHMENTS DURING FFY 2010: None. New project in FY 2011.

PROPOSED ACTIVITIES FOR FFY 2011: Develop an Oklahoma Rural Transportation Planning Manual. Implement the public participation process thru OARC. Begin the development of long range regional transportation planning.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$0	SPR	-0-	STATE
Estimated Cost FFY 2010	$0	SPR	-0-	STATE
Projected Cost FFY 2011	$200,000	SPR	-0-	STATE

CONTACT INFORMATION

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

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 FFY 2010: Developed the FFY 2011-2014 Statewide Transportation Improvement Program (STIP) for approval and implementation in accordance with the revised *Procedures for Developing and Amending the STIP and TIP.* The 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 FY 2010 portion of the FFY 2009-2012 STIP was 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 FFY 2011: Continue administration of FFY 2011-2014 STIP using currently approved procedures. Develop an Amendment document for the FFY 2012 portion of the current STIP based upon revision of the ODOT 8 Year Construction Work Plan. Begin integration of the People Soft software program with the administration of the current STIP and preliminary development of the FFY 2013 – 2016 STIP.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$70,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$85,310	SPR	-0-	STATE
Projected Cost FFY 2011	$70,000	SPR	-0-	STATE

CONTACT INFORMATION

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

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 FFY 2010: Managed consultant contract for SITP. Monitored services provided by Langston University regarding presentation of socioeconomic and demographic data for the SITP, and assistance with public involvement activities. Hosted two rounds of public meetings around the state to gather input and feedback. Initiated Transit Gaps study. Maintained email database for public involvement activities. Continued sponsorship of SITP website and posting of new SITP information. Hosted meeting of modal experts to discuss transportation systems strengths and weaknesses. Analyzed needs, related data, and public input; and developed proposed policy and strategies as basis for Plan document. Communicated with, and convened meeting of membership of four SITP committees: Freight, Tribal, Technical, and Personal Transportation. Received comments from committees and public regarding proposed policies. Provided review and comment on the following SITP task reports: Policy Context, Economic Conditions and Freight-related Transportation, and Transportation Mode Inventory & Utilization. Assisted with planning and analysis of multi-modal projects in current SITP in preparation for TIGER II grant application and further project development.

PROPOSED ACTIVITIES FOR FFY 2011: Finalize 2035 SITP, including preparation of detailed Plan documentation and Summary Brochure. Continue coordination with MPOs and other local governments in relation to transportation plans. Continue contract for, and monitoring of, Transit Gap study. Monitor progress of TIGER project implementation, pending application, and future funding opportunities.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$105,350	SPR	-0-	STATE
Projected Cost FFY 2011	$248,000	SPR	-0-	STATE

CONTACT INFORMATION

Linda Koenig, Transportation Planner, 405-522-0171

1903 Intelligent Transportation Systems Planning

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 FFY 2010: Processed ITS funded contracts / invoices for the systems analysis / design and deployment of Oklahoma's CVISN Program plan projects and other ITS and technology based transportation research contracts and activities. Oklahoma's CVO Program Plan and Top Level Design for CVISN Core and Expanded Deployment update in progress. No activity on the Oklahoma ITS Plans or Architecture. Approved quarterly CVISN expenditure reports sent to Federal Motor Carrier Safety Administration.

PROPOSED ACTIVITIES FOR FFY 2011: Update the Statewide ITS Plan, ITS Architecture and Implementation Plan. Continue to process ITS funded contracts / invoices for the systems analysis / design and deployment of Oklahoma's CVISN Program plan projects. Coordinate ITS and other technology based transportation research contracts and activities.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	$25,000	SPR	-0-	STATE

CONTACT INFORMATION

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

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 FFY 2010: 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. Facilitated meetings of the Oklahoma Transportation Air Quality Work Group (OTAC). Researched and maintained resource materials on air quality/transportation issues; and reviewed and commented on MPO air quality education programs. Coordinated the planning process for air quality modelling funding and actions between the States, MPOs, ODOT, and the ODEQ. Monitored regulations on National Ambient Air Quality Standards (NAAQS), Climate Change and Greenhouse Gas Emissions. Partnered with 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.

PROPOSED ACTIVITIES FOR FFY 2011: Maintain research and participation in air quality/transportation issues, developments, regulations and laws. Assist in providing 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. Continue partnership with INCOG and ACOG 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. Schedule and host OTAC meetings. Continue staff education through courses, seminars, and conferences.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$830,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$19,455	SPR	-0-	STATE
Projected Cost FFY 2011	$45,000	SPR	-0-	STATE

CONTACT INFORMATION

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

1905 Freight Planning

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 FFY 2010: Participated in freight webinars and maintained a reading material resource file.

PROPOSED ACTIVITIES FOR FFY 2011: Participate in freight webinars and continue enhancing the reading material resource file.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$15,428	SPR	-0-	STATE
Estimated Cost FFY 2010	$0	SPR	-0-	STATE
Projected Cost FFY 2011	$8,500	SPR	-0-	STATE

CONTACT INFORMATION

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

PURPOSE AND SCOPE: To coordinate rail planning in the state in accordance with the provisions of SAFETEA-LU and the requirements of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA).

ACCOMPLISHMENTS DURING FFY 2010: None. New project in FFY 2011.

PROPOSED ACTIVITIES FOR FFY 2011: Coordinate preparation of the State Rail Plan to include: 1) public involvement; 2) data collection; 3) establish vision, goals, and objectives; 4) profile the rail planning institutional structure in Oklahoma; 4) analyze the freight and passenger rail inventory; 5) evaluate freight and passenger rail system needs and improvements; 6) develop investment program; 7) identify policy and institutional improvements; 8) develop state rail plan document.

Conduct a study of the feasibility of freight rail improvements from Shawnee to McAlester. The study will look at the cost to rehabilitate the rail line (including cost to borrow the funds), the potential users of the line and the income that could be generated, and the estimated time needed to pay back the funds borrowed for the improvements.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$0	SPR	-0-	STATE
Estimated Cost FFY 2010	$0	SPR	-0-	STATE
Projected Cost FFY 2011	$870,000	SPR	-0-	STATE

CONTACT INFORMATION

Johnson Bridgwater, Rail Programs Division, 405-521-4203

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 Statewide Transportation Improvement Plan (STIP), the Long Range Plan, and the National Environment Protection Act (NEPA) Process.

ACCOMPLISHMENTS DURING FFY 2010: Held over 40 public meetings statewide. Visualization techniques were implemented utilizing 3-dimensional design, video, and animation and were incorporated into public meetings. A new ODOT Public Involvement web page was developed. The development of the public meeting plan was completed for the update to the Long Range Plan and the STIP. Conducted meetings for Long Range Plan and STIP with special outreach to the traditionally underserved coordinated with Langston University.

PROPOSED ACTIVITIES FOR FFY 2011: 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. Update the current PPP.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$257,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$275,000	SPR	-0-	STATE
Projected Cost FFY 2011	$255,000	SPR	-0-	STATE

CONTACT INFORMATION

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

SPR PART 2 - RESEARCH, SPRY-0010(52)RS, JP# 01946(56)
FEDERAL FISCAL YEAR 2011

		SPR	***STATE***	***LOCAL***	***TOTAL***
GENERAL ACTIVITIES					
2100	Transportation Research Board	$5,000.00			$5,000.00
2102	Research Library Services	$150,000.00			$150,000.00
2103	Transportation Research Day	$18,875.00			$18,875.00
2115	Long Term Pavement Performance	$5,000.00			$5,000.00
2120	Technical Assistance - Special Studies	$55,000.00			$55,000.00
2130	General Research Activity	$390,000.00			$390,000.00
2156	Roadside Vegetation Management	$193,707.00			$193,707.00
2157	Herbicide Research Program	$66,619.00			$66,619.00
2160	Oklahoma Transportation Center	$50,000.00			$50,000.00
2700	Experimental Product Evaluation Program	$20,000.00			$20,000.00
	Total General Activities	***$954,201.00***			***$954,201.00***
CONTINUING RESEARCH PROJECTS					
2188	Vegetative Rehabilitation of Highway Cut Slopes	$50,000.00			$50,000.00
2200	Instrumented Pavement Construction	$55,834.00			$55,834.00
2208	Development and Implementation of MEPDG for Rigid Pavements	$83,317.00			$83,317.00
2217	Development of Best Practices Program for a Collaboration of Minority	$85,861.00			$85,861.00
2218	QC/QA Testing Differences Between HMA and Warm Mix Asphalt	$61,336.00			$61,336.00
2220	Development of ODOT Guidelines for Use of Geogrids in Aggr. Bases	$110,367.00			$110,367.00
2223	Test Methods for Use of Recycled Asphalt Pavement in Asphalt Mixes	$93,072.00			$93,072.00
	Total Continuing Research Projects	***$539,787.00***			***$539,787.00***
NEW RESEARCH PROJECTS					
2226	Evaluation of Hamburg Rut Tester for Field Control of HMA	$76,055.00			$76,055.00
2227	Applied Approach Slab Settlement Research, Design/Construction	$99,474.00			$99,474.00
2228	Overturning Forces at Bridge Abutments and the Interaction of Horizontal	$134,880.00			$134,880.00
2229	Expected Life of Silane Water Repellant Treatments on Bridge Decks	$99,100.00			$99,100.00
2230	Effect of Y-Cracking on CRCP Performance	$77,438.00			$77,438.00
2231	Stainless Steel Reinforcement as a Replacement for Epoxy Coated Steel	$83,013.00			$83,013.00
2232	Next Generation Smart Barrel System for Workzone Safety Enhancement	$75,653.00			$75,653.00
2233	Rail Diesel Car Demonstration	$150,000.00			$150,000.00
	Total New Research Projects	***$795,613.00***			***$795,613.00***
	Grand Total SPRY-0010(52)RS	***$2,289,601.00***			***$2,289,601.00***
POOLED FUND STUDIES					
TPF-5(408)	NCHRP	$661,508.00			$661,508.00
TPF-5(229)	Char. of Drainage Layer Prop for MEPDG	$30,000.00			$30,000.00
TPF-5(209)	Support of Transp Curriculum Coord Council (TCCC)	$20,000.00			$20,000.00
TPF-5(208)	NCAT	$400,000.00			$400,000.00
TPF-5(205)	Impl of Conc Pave Mix Des & Analysis Track of CP Road Map	$15,000.00			$15,000.00
TPF-5(197)	The Impact of Wide-Base Tires on Pavement Damage: A National Study	$25,000.00			$25,000.00
TPF-5(223)	TRB Core Program	$128,250.00			$128,250.00
TPF-5(159)	Tech Transfer Concrete Consortium	$5,000.00			$5,000.00
TPF-5(117)	Dev of Perf Properties of Ternary Mixes	$15,000.00			$15,000.00
TPF-5(099)	Evaluation of Low Cost Safety Improvements	$30,000.00			$30,000.00
Sol. 1263	Study of the Impacts of Implements of Husbandry on Bridges	$10,000.00			$10,000.00
Sol. 1251	ITS Pooled Fund Program (ENTERPRISE)	$30,000.00			$30,000.00
Sol. 1250	WASHTO-X III	$5,000.00			$5,000.00
Sol. 1221	Motorcycle Crash Causation Study	$50,000.00			$50,000.00
Sol. 0990	Updating US Precipitation Frequency Southern Region	$82,483.00			$82,483.00
	Total Pooled Fund Projects	***$1,507,241.00***			***$1,507,241.00***
	Total Research Funding	***$3,796,842.00***			***$3,796,842.00***

RECENTLY COMPLETED OR ENDING RESEARCH PROJECTS			
2184	Creation of an ODOT Specification for Patching or Overlay of Bridge	$0.00	$0.00
2194	Degradation in Selected Tributaries of the Washita River in Oklahoma for	$0.00	$0.00
2196	Stability and Permeability of Proposed Aggregate Bases in Oklahoma	$0.00	$0.00
2199	Optimizing Concrete Mix Designs to Produce Cost Effective Paving Mixes	$0.00	$0.00
2207	Validation and Refinement of Chemical Stabilization Procedures for	$0.00	$0.00
2209	Development of a Flexible Pavement Database for Local Calibration of	$0.00	$0.00
2210	Calcium-Based Stabilizer Induced Heave in Oklahoma Sulfate-Bearing	$0.00	$0.00
2211	Modeling of 85th Percentile Speed for Rural Highways for Enhanced	$0.00	$0.00
2212	Roadway Weather Information System and Automatic Vehicle Location	$0.00	$0.00
2213	Quantifying the Costs and Benefits of Pavement Retexturing as a	$0.00	$0.00
2214	Use of MSE Technology to Stabilize Highway Embankments and Slopes	$0.00	$0.00
2215	Tube Suction Test for Evaluating Durability of Cementitiously Stabilized	$0.00	$0.00
2216	Auto-Collision Avoidance System at Intersections	$0.00	$0.00
2219	Evaluation of the Effectiveness of ODOT's Cable Barrier Program	$0.00	$0.00
2221	Analysis of Aggregates and Binders Used for the ODOT's Chip Seal	$0.00	$0.00
2222	Performance of Ultra Thin Whitetopping (UTW) in Oklahoma	$0.00	$0.00
2224	Energy Harvesting on Highway Bridges	$0.00	$0.00
2225	Correlation of Fully Softened Shear Strength of Clay Soil with Index Properties - Phase I	$0.00	$0.00
ACTIVE AND PAID POOLED FUND STUDIES			
TPF-5(174)	Constr of Crack-Free Conc Bridge Decks, Phase II	$0.00	$0.00
TPF-5(145)	Western Maintenance Partnership	$0.00	$0.00
TPF-5(068)	LRFD Bridge Specifications	$0.00	$0.00
TPF-5(063)	Improving the Quality of Pavement Profiler Measurement	$0.00	$0.00
TPF-5(051)	Constr of Crack-Free Conc Bridge Decks, Phase I	$0.00	$0.00
TPF-5(036)	Transportation Asset Management Research Program	$0.00	$0.00
Sol. 1207	Investigation of Highway Asset Inventory & Data Collection Methods	$0.00	$0.00

PURPOSE AND SCOPE: 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 FFY 2010: Attendance of the annual TRB meeting was cancelled due to economic constraints.

PROPOSED ACTIVITIES FOR FFY 2011: Attend TRB annual meeting.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	$5,000	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	$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: To provide the Oklahoma Department of Transportation (ODOT) and customers with an information clearinghouse. The primary goals 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. Aligning with this is the goal of providing proficient systematic searches of all resources when requested. 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.

ACCOMPLISHMENTS DURING FFY 2010: Provided transportation information, services and updates to ODOT and other state universities; developed procedures to enhance services and accessibility to Transportation Library resources by ODOT and Oklahoma Transportation Center's university personnel; began converting and implementing the Paradox 10 Database System to the Library of Congress System; acquired report binding and copier equipment for report reproduction, binding and distribution; retrieved new publications, reports and various documents for Library inclusion; delivered documents as requested; produced monthly reports as required.

PROPOSED ACTIVITIES FOR FFY 2011: Continue to contract with LU to provide current information, publications, articles, services and updates to ODOT, other state universities and transportation industry entities; maintain data base of pertinent resources for each information category; perform literature and information searches both electronically and manually as requested; coordinate and distribute research information, executive summaries, surveys, reports and journals to ODOT personnel; track borrowed materials; conduct data entry in the Paradox system and/or Library of Congress system of publications; retrieve and deliver research materials back and forth between ODOT and LU; continue to convert the Paradox system to a Library of Congress system; perform report reproduction, binding and distribution where required; produce project progress reports as required.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 Yr 1 of 1)	$151,500	SPR	-0-	STATE
Estimated Cost FFY 2010	$151,450	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 1)	$150,000	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 project was funded and set up as SPR item number 2130 in FFY 2009. A formal request to amend SPR item number 2130 to reflect 2103 was approved by FHWA on April 8, 2009.

ACCOMPLISHMENTS DURING FFY 2010: Generated FY-2010 ODOT/OTC Transportation Research Day agenda/itinerary; assisted ODOT and OTC in planning, preparations & organization of events and materials; solicited project presentation speakers; solicited for and organized lobby poster presentations; generated and submitted a survey of attendees for future Transportation Research Day ideas; completed assessment of brainstorming session and submitted results; compiled and delivered list of FFY 2010 Research Day attendees; secured and presented videotaping and still photography of the event; began preparations for FFY 2011 Transportation Research Day to be held October, 2010; produced project progress reports as required.

PROPOSED ACTIVITIES FOR FFY 2011: Continue to work with OTC, OU, OSU and ODOT to develop the FFY 2011 ODOT/OTC Transportation Research Day program; reserve ODOT facilities for presentations, poster presentation exhibits and catered lunch; arrange for presenters and speakers; compile, update and submit invitee list and furnish invitations; prepare sign in sheets and name tags and greet and register participants as they arrive; coordinate with OTC and university personnel for breakfast and break refreshments for event attendees; coordinate with OTC and university personnel for catered lunch; arrange for rental, delivery, set-up and pick-up of table and chairs; secure and submit videotaping and still photography of the event; submit FFY 2011 Transportation Research Day program, list of attendees speakers and poster presenters, and a categorized list of brainstorming ideas for potential ODOT research projects for FFY 2012; begin preparations for FFY 2012 Transportation Research Day to be held October 2011; produce project progress reports as required.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 1)	$25,532	SPR	-0-	STATE
Estimated Cost FFY 2010	$25,500	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 1)	$18,875	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 FFY 2010: Performed manual distress surveys, dipstick and video-taping of GPS sites; prepared information concerning LTPP data collection procedures and protocol for extended SPS site testing during the summer/fall of 2010.

PROPOSED ACTIVITIES FOR FFY 2011: Request reports for specific locations for possible continued data collection; arrange continued testing plans and monitoring of current SPS and GPS site locations in Oklahoma during spring 2011; consult with ODOT staff concerning LTPP database inquiries and issues; LTPP to publish benefits report that discusses tangible and intangible benefits of the LTPP study; SRCO to visit Oklahoma to discuss LTPP benefits study, recent accomplishments and future activities.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$5,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$5,000	SPR	-0-	STATE
Projected Cost FFY 2011	$5,000	SPR	-0-	STATE

CONTACT INFORMATION

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

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 FFY 2010: Provided support for the Department with assistance and equipment in special investigations, and other activities when needed; performed in-house research on whitetopping project in Kingfisher County west of Okarche; researched feasibility of supplemental solar energy to provide power for ODOT parking lot lighting and generated a report of findings; assisted in the installation of anemometers and collected still photograph records of wind turbine study on I-35 in Cleveland county for purposes of capturing wind turbulence created by large trucks to generate power for highway lighting; assisted in FWD testing and coring operations in Pittsburg and Atoka counties in evaluating the performance of whitetopping projects; identified production sources and located asphalt millings to be used in current SP&R projects for forensic studies and environmental effects on asphalt pavements; performed storm drain inspection in Div. 3 to determine causes of obstruction and insufficient drainage; collected still photographs for various in-house and SP&R research projects; continued to consult with ODOT staff to address situations where further technical support may be needed.

PROPOSED ACTIVITIES FOR FFY 2011: Continue to 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 or services as requested; purchase, calibrate, test and/or compare new equipment or instruments to existing equipment or instruments where necessary.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$25,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$25,000	SPR	-0-	STATE
Projected Cost FFY 2011	$55,000	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 FFY 2010: Solicited ODOT subject matter experts, Field Division personnel and university staff for new research ideas and problem statements for possible FFY 2011 research project funding; coordinated and carried out two Research Advisory Committee (RAC) meetings; reviewed 32 new research ideas and/or problem statements for priority ranking; generated and posted 9 FFY 2011 Request for Proposals (RFP's) for research proposal submissions; reviewed 21 new research proposals submitted for possible FFY 2011 funding; discussed proposed project work with researchers and ODOT subject matter experts; awarded 6 new research projects for FFY 2011and generated project agreements for each; awarded 10 continuing research projects for FFY 2011and generated project agreements and/or modifications for each; organized initiation and semi-annual meetings concerning all SPR projects; generated and implemented newly formatted research forms for ODOT Planning & Research Division website inclusion; reviewed Annual and Final SPR project reports for formatting and ADA compliance; generated SPR Program Part 2 work plan; developed an on-line reports link on the ODOT Planning & Research Division home page.

PROPOSED ACTIVITIES FOR FFY 2011: Solicit for new research ideas and problem statements for possible FFY 2012 research project funding; coordinate two RAC meetings for review of new FFY 2012 research ideas and problem statements and proposals; generate new FFY 2012 RFP's; generate new FFY 2012 research project agreements and continuing research project agreement modifications; organize initiation and semi-annual meetings; review Annual and Final reports for required formatting; make funds available for various research contracts/activities which were not foreseen when the SPR budget was written.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$475,989	SPR	-0-	STATE
Estimated Cost FFY 2010	$475,900	SPR	-0-	STATE
Projected Cost FFY 2011	$390,000	SPR	-0-	STATE

CONTACT INFORMATION

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

PURPOSE AND SCOPE: The objectives of this program are to conduct yearly herbicide applicator certification schools related to Roadside Vegetation Management (RVM) that will help prepare new ODOT personnel for subsequent pesticide applicator testing & certification and to provide each of the eight ODOT field divisions with yearly herbicide applicator continuing education workshops.

ACCOMPLISHMENTS DURING FFY 2010: Conducted and completed Annual Pesticide Applicator Certified Training and Continuing Education Applicator Workshops for all ODOT field divisions and maintained records on all ODOT certified applicators; provided consultation to ODOT office and field personnel as needed; 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; collected digital photographs of implementation demonstration plots; attended the Oklahoma Vegetation Management Association "National Southern Weeds Science" meeting and the "National Roadside Vegetation Management Association" meeting; produced project progress reports; completed and submitted the following comprehensive reports: Pesticide Applicator Certified Training and Continuing Education Applicator Workshops Final Report, Annual ODOT Herbicide Program Survey and Divisional Report and the Annual Roadside Vegetation Management Herbicide Technologies Report; conducted preliminary FFY 2011 meeting and scheduling with ODOT P&R Division personnel and project panel members.

PROPOSED ACTIVITIES FOR FFY 2011: Conduct and complete Annual Pesticide Applicator Certified Training and Continuing Education Applicator Workshops for all ODOT field divisions and maintain records on all ODOT certified applicators; provide as needed consultation to ODOT office and field personnel; conduct Herbicide Application and Equipment Calibration Workshops for new employees; assist ODOT in maintaining the Approved Herbicide and Adjuvants List; assist ODOT in Statewide Herbicide Contract review; conduct and produce an Annual ODOT Herbicide Program Survey and Report; produce an Annual RVM Herbicide Technologies Report; produce project progress reports.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 1)	$186,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$185,900	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 1)	$193,707	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: Luis Malave, ODOT Maintenance Division, 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 FFY 2010: 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; included findings in the Annual Approved Herbicides and Adjuvants List (AHAL); completed evaluation of adjuvants and recommended herbicides for tank mix compatibility and included findings into the AHAL; constructed research test plots and completed field experiments, data collection and analysis; collected digital photographs of each plot treatment; executed the Summer Roadside Research Van Tour; produced project progress reports; completed and produced the following comprehensive reports: 2010 Evaluations of New Broadleaf Weed Control Herbicide Formulations for ODOT Roadside Vegetation Management Programs Final Report and the Annual Report on the Evaluation of Herbicide Tank Mix Compatibility.

PROPOSED ACTIVITIES FOR FFY 2011: Continue to perform evaluations of new and generic herbicide formulations for integration into the ODOT Roadside Vegetation Management (RVM) Programs and implemented findings in winter CEU Training Workshops; complete evaluation of adjuvants and recommended herbicides for tank mix compatibility and included findings into the Annual Approved Herbicides and Adjuvants List (AHAL); construct research test plots and complete field experiments, data collection and analysis; collect digital photographs of each plot treatment; execute the Summer Roadside Research Van Tour; produce project progress reports; complete and produce the following comprehensive reports: 2011 Evaluations of New Broadleaf Weed Control Herbicide Formulations for ODOT RVM Programs Final Report and the Annual Report on the Evaluation of Herbicide Tank Mix Compatibility.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 1)	$65,783	SPR	-0-	STATE
Estimated Cost FFY 2010	$65,700	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 1)	$66,619	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: Luis Malave, ODOT Maintenance Division, 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 FFY 2010: 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 FFY 2011: 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; serve as co-sponsor for the Broken Back Culverts project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$500,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$500,000	SPR	-0-	STATE
Projected Cost FFY 2011	$50,000	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: The 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 properties 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 overlay bridge decks.

ACCOMPLISHMENTS DURING FFY 2010: Completed and produced Final Report.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

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FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	-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 Assist. Bridge Engineer, 405-521-2606

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 FFY 2010: Maintained photo records for both US-59 and SH-128 slopes; organized continuing project meeting in November 2009; monitored ODOT mowing procedures for US-59 slopes; carried out the Arkansas USDA-NRCS Plant Materials Center Tour and I-540 field trip; conducted semi-annual meeting in June 2010 to discuss project accomplishments, current work being performed and proposed activities; began a final sod study, tilling the study sight and laying sod; produced project progress reports; submitted FFY 2009 Annual Report; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Continue to maintain photo records for both US-59 and SH-128 slopes for both the slope and sod studies; continue to monitor ODOT mowing procedures for US-59 slopes; hydro-seed and mulch the SH-128 sod study slope in the fall; organize necessary project panel member meetings; produce project progress reports; submit Final Report.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 4 of 5)	$50,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$50,000	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 5 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 the Washita River in Oklahoma for Transportation

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 FFY 2010: The project PI requested a three month time extension in the fall of FFY 2009 for the completion of the research work and Final Report.

Continued to collect and finalize review of 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; completed analysis of the available flowline data at all ODOT bridges and culverts; completed longitudinal profiles of flowline, with time, along all three tributaries; produced project progress reports; completed and produced Final Report.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	-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 FFY 2010: Completed and produced Final Report.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	-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 FFY 2010: Completed and produced Final Report.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	-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 FFY 2010: Monitored 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 Dip Stick and straight edge rut depth measurements; attended semi-annual project meeting and presented presentation of project accomplishments, work in progress and proposed activities for FFY 2011; produced project progress reports; submitted FFY 2009 Annual Report; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Continue to monitor instrumentation and 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 rut depth measurement; organize Annual Workshop with NCAT, ODOT and OU to discuss project findings so as to maximize project benefits; produce project progress reports; submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 4 of 5)	$60,976	SPR	-0-	STATE
Estimated Cost FFY 2010	$60,900	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 5 of 5)	$55,834	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 FFY 2010: Selected roadway projects which represent different subgrade soil types, chemical additive types, and climatic conditions; collected representative soil samples from project locations for classification, quality control, and engineering property testing; collected representative chemically treated soil samples from construction project sites following compaction and acceptance for engineering property testing; conducted 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; established time rate of development and maximum level of strength gain relationships and compared to previous structural number correlations and adjusted design equation input parameters accordingly; produce project progress reports; submitted FFY 2009 Annual Report. The PI requested a 3 month extension to complete the research work and the project Final Report. Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 3 of 3)	$109,467	SPR	-0-	STATE
Estimated Cost FFY 2010	$109,400	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 FFY 2010: Investigated base material practices for concrete pavements through literature searches and surveyed experiences from other DOT officials; investigated and evaluated alternate base material techniques and how to improve them; produced project progress reports; submitted FFY 2009 Annual Report; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Examine several different curing methods and techniques for effectiveness to provide relative humidity profile for rigid pavement construction; discuss possible curing methods with contractors and ODOT personnel to identify acceptable alternatives to a wet mat cure; construct full scale test sections of a CRCP pavement on the Oklahoma State campus or possibly on an ODOT pavement project to provide bench mark for the equivalency of the different curing methods to a wet mat cure in which real world cost, and schedule data can also be obtained; provide regional input parameters that can be used in the MEPDG based on different areas of the state of Oklahoma for the design of rigid pavements such as, typical mixture proportions, coefficient of thermal expansion (CTE), strength testing and concrete shrinkage; produce project progress reports; submit Final Report.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 2 of 3)	$88,619	SPR	-0-	STATE
Estimated Cost FFY 2010	$88,600	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 3 of 3)	$83,317	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 FFY 2010: Sampled binders meeting pre-determined grades from two ODOT suppliers; performed data analysis of binders to determine differences in grades and/or suppliers and recommended default values for use in the MEPDG; utilized a populated OSU database to sample and test ODOT S-2 mixtures; produced project progress reports; submitted FFY 2009 Annual Report; Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 2 of 2)	$103,872	SPR	-0-	STATE
Estimated Cost FFY 2010	$103,800	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 FFY 2010: Completed population of the central database concerning each testing site data; created, maintained and updated interactive map; utilized 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; validated the statistically determined relationships with additional test soils; produced project progress reports; submitted FFY 2009 Annual Report. The PI requested a 3 month extension to complete the research work and the project Final Report. Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 2 of 2)	$101,760	SPR	-0-	STATE
Estimated Cost FFY 2010	$101,700	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 85TH 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 85th 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 FFY 2010: Evaluated probabilities that are valuable in assessing NN system behavior; refined NN model using revised analyzed data; organized a workshop for NN model introduction to ODOT, FHWA and the industry; produced project progress reports; submitted FFY 2009 Annual Report. The PI requested a 3 month extension to complete the research work and the project Final Report. Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 2 of 2)	$47,691	SPR	-0-	STATE
Estimated Cost FFY 2010	$47,600	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 date 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 FFY 2010: Completed and produced Final Report.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	-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 FFY 2010: Installed additional test section using Single Sized Aggregate Armor Coat; several unique testing services were performed on various sections by Transtec; produced project progress reports; submitted FFY 2009 Annual Report; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of ODOT funding obligation. Project and OTC funding continues in FFY 2011. It has been requested by ODOT that the PI produce an electronic copy of the completed Final Report at the conclusion of the project.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 3 of 3)	$22,617	SPR	-0-	STATE
Estimated Cost FFY 2010	$22,600	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 FFY 2010: Collected an additional Oklahoma soil from a candidate site; selected geotextile and calibrated equipment; performed laboratory testing on the new soil, geotextile and geotextile interface; performed several large-scale pullout tests; performed several small-scale pullout tests; carried out reduction and analysis of test data and determined MRF value; repeated testing for verification where necessary; designed examples of reinforced soil slopes using different MRF values and compared safety factors; produced project progress reports; submitted FFY 2009 Annual Report. The PI requested a 3 month extension to complete the research work and the project Final Report. Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 1)	$83,103	SPR	-0-	STATE
Estimated Cost FFY 2010	$83,000	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 FFY 2010: Completed laboratory testing for soil classification, moisture density, conventional freeze-thaw, conventional wet-dry, vacuum saturation and tube suction tests; completed development of TST protocol; concluded statistical analyses and correlations of soil properties; completed modifications to the current ODOT procedures for stabilized subgrade soils; produced project progress reports; submitted FFY 2009 Annual Report; The PI requested a 3 month extension to complete the research work and the project Final Report. Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 2 of 2)	$48,685	SPR	-0-	STATE
Estimated Cost FFY 201	$48,600	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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

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 FFY 2010: Completed and produced Final Report.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	-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 FFY 2010: Executed a series of workshops and seminars; created new Oklahoma Minority Trucking Cooperative; assembled cooperative officers; established cooperative By-Laws which build the framework for which truckers will abide; generated a comprehensive business plan; secured consulting firm to work with truckers in operating the cooperative; developed a management team to work with the cooperative in preparing contracts; produced project progress reports; submitted FFY 2009 Annual Report; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Provide administrative oversight to cooperative officers and minority truckers; provide business plan for the cooperative of minority trucking firms and issue stocks to members; develop a series of workshops to train the cooperative board in recordkeeping and accounting procedures; outline a creative bid process for the cooperative and estimate a marketable price for hauling services; negotiate contracts between the cooperative and the Primary contractor on ODOT projects; generate an Oklahoma Minority Truckers Cooperative (OMTC) processes and procedures manual; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 1)	$17,024	SPR	-0-	STATE
Estimated Cost FFY 2010	$17,024	SPR	-0-	STATE
Projected Cost FFY 2011	$85,861	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 FFY 2010: Performed literature review to concentrate on QC/QA procedures for WMA; sampled and evaluated two mix type and two aggregate type materials identified from existing ODOT projects with different WMA additives; performed laboratory mix design testing and analysis; prepared samples and conducted lab-molded void testing; produced project progress reports; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Determine mix design equivalent laboratory compaction temperature and compactive effort; evaluate lab-molded voids; perform rut depth testing, perform moisture sensitivity testing; produce project progress reports; prepare and submit Final Report.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 1 of 2)	$98,195	SPR	-0-	STATE
Estimated Cost FFY 2010	$98,000	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 2 of 2)	$61,336	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: Kenneth Hobson, Bituminous 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 FFY 2010: Performed literature search; inspected cable barrier projects including photographic documentation; observed construction staging issues to produce cost per mile calculations; evaluated the performance of all types of cable barriers used by ODOT; created a matrix of the various elements used per location; performed an analysis of the initial and repair cost as related to manufacture type; prepared an assessment of problems observed; prepared opinion of possible improvements; performed an analysis of preventable accidents since the installation; investigated and compared historic crossover crash data to the present deflective crashes; used multivariant regression analysis to prove effectiveness of the cable barriers and compared to prior crash history and other barrier systems (Jersey Barriers); prepared modeling as a means to determine site specific system placement; produced project progress reports; The PI requested a 3 month extension to complete the research work and the project Final Report. Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 1)	$66,575	SPR	-0-	STATE
Estimated Cost FFY 2010	$66,500	SPR	-0-	STATE
Projected Cost FFY 2011	-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: 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 FFY 2010: Performed literature search; performed in-isolation testing of geogrids; performed installation damage tests; performed pullout tests; produced project progress reports; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Carry out large-scale cyclic plate load tests emulating resilient modulus testing of the base layer; perform field study testing instrumenting sections using earth pressure cells, strain gauges, LVDTs and other instruments in coordination with ODOT design engineers to help draft their revised geogrid specifications for base reinforcement applications; use the laboratory test results to identify candidate geogrid products for side-by-side comparisons of their field performance; coordinate with contractor(s) to carry out installation damage tests on selected geogrids during construction using construction equipment to obtain field data for comparing to results with simulated installation damage test data; reduce and analyze data to determine the influence of the geogrid type and mechanical properties on the field performance of reinforced aggregate bases; produce project progress reports, submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 2)	$83,757	SPR	-0-	STATE
Estimated Cost FFY 2010	$83,700	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 2 of 2)	$110,367	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 FFY 2010: Performed literature search; performed ODOT Division case study identification to determine the state-of-the-practice; identified locally available chip seal and binder materials; collected and characterized division case study of good and bad projects from each division; performed laboratory characterization of aggregate samples collected; correlated project performance and identified successful chip seal binder-aggregate combinations in each ODOT division; recommended ODOT chip seal specifications revisions; conducted Oklahoma Chip Seal Best Practices seminar for ODOT division maintenance personnel, other interested ODOT employees, and other invitees as determined by ODOT; produced project progress reports; Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 1 of 1)	$111,084	SPR	-0-	STATE
Estimated Cost FFY 2010	$111,000	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 FFY 2010: Performed literature search; compiled UTW projects within Oklahoma and gathered relevant design procedures, construction procedures, traffic data, and pavement condition data of the current UTW as well as the existing HMA and maintenance information; produced project progress reports; The PI requested a 2 month extension to complete the project Final Report. Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 1)	$40,190	SPR	-0-	STATE
Estimated Cost FFY 2010	$40,000	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	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 FFY 2010: Performed literature search; collected bulk RAP and extracted aggregates; recovered binder from bulk RAP and fresh HMA mix; carried out binder rheology testing and performance grading; performed statistical analysis; produced project progress reports; FFY 2010 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Continue literature review; collect 2 additional bulk RAP; study laboratory simulated RAP while investigating the softer binder and focus on field RAP for high grade binder; continue to recover or extract aggregates from bulk RAP using NCAT ignition oven and determine binder content; evaluate physical and mechanical properties of recovered and virgin aggregates; extract and recover binder from bulk RAP and fresh HMA mix; perform binder rheology testing and performance grading of rheological properties; perform statistical analysis and documentation of recovered aggregate properties for different RAP's; produce project progress reports; submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 2)	$89,294	SPR	-0-	STATE
Estimated Cost FFY 2010	$89,200	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 2 of 2)	$93,072	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: Kenneth Hobson, Bituminous Engineer, 405-521-2677

PURPOSE AND SCOPE: This project is investigating the potential for generating electrical power from the vibrations of a bridge due to large vehicles. It utilizes 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. The following outlines Phase II and Phase III of the current project. Phase I, which is ongoing through FFY 2010, is dedicated to the design and construction of a prototype piezoelectric energy harvester for highway bridges. Phases II (FFY 2011) and III (FFY 2012) will extend the implementation of the power harvesting technology to a field demonstration on a highway bridge (Phase II) and rollout to one or more additional bridges including integration into local sensor and/or lighting systems (Phase III).

ACCOMPLISHMENTS DURING FFY 2010: Investigated currently-available commercial piezoelectric materials; evaluated preliminary designs for bridge bearings incorporating the new technology; designed bridge sensor system prototype; investigated and evaluated competing technologies for energy harvesting; constructed initial prototype and performed repetitive refinement of design leading to deployment outside of lab setting; The PI requested a 1 month extension to complete the research work. Produced project progress reports; FFY 2010 Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: Project will likely be terminated. Laboratory simulated load testing results of the bridge bearing prototype concluded that the energy harvesting capabilities of the prototype are not sufficient to feasibly generate a significant amount of electricity at a typical installation.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010 (Yr 1 of 3)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$100,000	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 2 of 3)	-0-	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

2225 Correlation of Fully Softened Shear Strength of Clay Soil with Index Properties—Phase I

PURPOSE AND SCOPE: Slope failures in clay soils cause damage annually on highway embankments and cut slopes and necessitate difficult and expensive repairs that negatively impact budgets, traffic flow, and the environment. The use of peak strength in the analyses tends to overestimate the factor of safety (stability) and the use of residual shear strength in the analysis tends to underestimate the factor of safety (stability). The use of fully-softened shear strength values results in a more accurate analysis and leads to designs or repair methods that provide long-term stability at reasonable costs. Understanding the mechanisms of these slope failures and being able to economically predict the fully softened shear strength of clay soils is key to successful design, repair, and stabilization of clay slopes. The objectives of this research project are to develop a correlation between peak strength values and fully-softened strength values using index properties (Atterberg Limits and Percent Passing No. 200 Sieve) and moisture content of the test samples and to formalize an equation for calculating fully-soften shear strength values from available peak values. The results of this study will facilitate more accurate and cost effective analysis and design of new highway slopes and repair/stabilization of existing slopes.

ACCOMPLISHMENTS DURING FFY 2010: Selected and collected soil samples; performed peak shear strength testing of approximately 18 specimens of soil; tested each specimen in the fully-softened state; analyzed test results to refine the coefficients for the equation; developed a final simple model to facilitate calculation of fully softened shear strength values from peak strength data; produced project progress reports; FFY 2010 Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2011: End of project.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010 (Yr 1 of 1)	$5,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$5,000	SPR	-0-	STATE
Projected Cost FFY 2011	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Garry Gregory, Oklahoma State University, 405-744-5189

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

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

2226 Evaluation of Hamburg Rut Tester for Field Control of HMA

PURPOSE AND SCOPE: The Asphalt Pavement Analyzer (APA) and AASHTO T 283, Resistance of Compacted Bituminous Mixture to Moisture-Induced Damage, are currently used in mix designs to evaluate rutting and moisture damage potential of hot mix asphalt (HMA) mixtures. AASHTO T 283 is also used for field control of HMA mixtures. ODOT is moving toward replacing the APA with the Hamburg Wheel Test. Variability of T 283 field test results has always been an issue and currently ODOT does not check rutting potential of field produced mixtures. The Hamburg rut tester is being used by other DOTs to monitor field produced mixtures for rutting and moisture susceptibility. Use of the Hamburg rut tester needs to be evaluated for field control of HMA mixtures in Oklahoma. Laboratory prepared (mix design) samples and field produced mix from across Oklahoma will be sampled and tested for Hamburg rutting resistance and AASHTO T 283. APA testing could be included for comparison. Results of this research could lead to the implementation of the Hamburg Rut Tester as a viable test method for evaluating the field performance of HMA.

ACCOMPLISHMENTS DURING FFY 2010: New Project

PROPOSED ACTIVITIES FOR FFY 2011: Perform a surrounding states literature review concentrating on Hamburg Rut Testing and how it is used to replace or supplement moisture damage testing; evaluate laboratory produced mix design samples using AASHTO T 283 and OHD L-55 test results in an effort to balance the number of mixtures that pass AASHTO T 283 and those that do not pass AASHTO T 283; evaluate and test field produced mix for AASHTO T 283 and OHD L-55 testing; perform analysis of data on all test results; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 1)	$76,055	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: Kenneth Hobson, Bituminous Engineer, 405-521-2677

2227 Applied Approach Slab Settlement
Research, Design/Construction

PURPOSE AND SCOPE: Approach slab settlement is a recurring problem in Oklahoma, resulting in countless repair efforts and utilizing limited labor and dollars. Substantial research has been conducted on the mechanisms involved with bridge approach embankment settlement both nationally and locally. Further research is needed to validate the design and construction procedures currently being used for bridge approach slabs in Oklahoma. An effort is needed to identify lessons learned and the determine ways in which ODOT is not applying state of the practice in design or construction of approach slabs. Proposed research for this project includes performing a thorough literature search in addition to surveying other state DOTs about how they have dealt with bridge approach slab settlement issues and to investigate the problems associated with settling of bridge approach slabs in Oklahoma. With assistance from ODOT personnel, a select number of problem bridge approach slabs will be investigated from design through the construction practices used to complete the approach slab construction. From these findings, the researcher will provide ODOT with the state of practice solutions for mitigating the potential for approach slab settlement problems both in design and construction.

ACCOMPLISHMENTS DURING FFY 2010: New Project

PROPOSED ACTIVITIES FOR FFY 2011: Collect and summarize available literature of approach slab settlement problems and solutions; select approach slab sites for forensic analysis and perform critical investigation of ODOT design and construction practices related to bridge approach slab performance; assemble pertinent information concerning design and as-built plans, geologic and hydraulic info, climatic records, construction records, geotechnical info, etc.; perform field investigation of existing approach slab settlement sites including visual inspections of approach slabs, abutments, and paving drainage outlets, manual measurements, and subsurface investigations; nondestructive testing methods and collection of borrowed soils; perform several laboratory soil sample tests; produce project progress reports; prepare and submit FFY 2011 Annual Report.

FINANCIALS	**AMOUNT**	**FUND**	**AMOUNT**	**FUND**
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 2)	$99,474	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Gerald Miller, Oklahoma University, 405-325-4253

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

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

2228 Overturning Forces at Bridge Abutments and the Interaction of Horizontal Forces from Adjacent Roadways

PURPOSE AND SCOPE: ODOT has numerous bridges throughout the state where the expansion joints have closed up, roller support bearings tilted, and beams have pushed up against the abutment backwall. Abutments are not performing as expected which has led to frequent and costly repairs that strain limited maintenance budgets. After repairs, some of these bridges experience more movement resulting in further damage. Factors needing further exploration are the thermal expansion of rigid pavements exerting horizontal forces perhaps combining with the embankment forces on the abutments to cause movement of the abutment, premature expansion joint failure, damage to back walls, and tilting of roller bearings. Due to the numerous bridges that are affected by expansion joint failure and the resulting problems caused to the various bridge elements (e.g. roller bearing failure, abutments rotated, beam ends with lack of clearance to the backwall) there is a need to instrument roadways adjacent to bridges, the embankments, and the abutments themselves to monitor and better understand what is taking place. Results of this research could result in modifications to standard abutment details and may influence the way ODOT approaches repair projects.

ACCOMPLISHMENTS DURING FFY 2010: New Project

PROPOSED ACTIVITIES FOR FFY 2011: Perform literature search and collection of background information; perform filed investigations of distressed bridge sites to included visual inspections of expansion joints, pavement and approach slabs, abutments, roller supports, etc; selection of two bridges for instrumentation; prepare detailed field instrumentation plan and acquire instruments to measure/ determine movement across expansion joints across joints to concrete slabs; produce project progress reports; prepare and submit FFY 2011 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 3)	$134,880	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Kanthasamy Muraleetharan, Oklahoma University, 405-325-4247

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

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

2229 Expected Life of Silane Water Repellant Treatments on Bridge Decks

PURPOSE AND SCOPE: With the ever increasing costs to the maintenance of concrete bridge decks due to corrosion of reinforcing steel from the environment and routine maintenance applications of salt, it is important to have a better understanding of the effectiveness and durability of silane-treated bridge decks. Historically, bridge decks in Oklahoma are treated once at the time of construction. Little is known of the time frame for which silane remains as an effective barrier to prevent the intrusion of corrosive salts into the bridge deck. Through an extensive literature search, survey of state DOT's, and coring and analyzing of bridge deck cores from bridges of various ages, the researcher will determine the life expectancy of a onetime application of silane. ODOT Bridge Division will assist the PI in the selection of bridges to be used in this study. It is expected that an effective duration range can be determined. With these findings it is expected that a routine maintenance practice can be established for the re-treatment of bridge decks based on environment, salt application, regional and age considerations resulting in extended bridge deck life expectancy and lower life cycle costs.

ACCOMPLISHMENTS DURING FFY 2010: New Project

PROPOSED ACTIVITIES FOR FFY 2011: Perform literature review focusing on previous research on the mechanisms of silane bond and deterioration, methods of reapplying silane to existing concrete, and previous tests that have been used to evaluate the effectiveness of silanes; establish laboratory procedures to evaluate silane performance by performing destructive chemical method tests on field and laboratory samples to determine the presence and performance of silanes; investigate nondestructive field techniques to evaluate silane performance using the Germann Water Permeability and Concrete Surface Resistivity tests methods; determine and evaluate the effectiveness of silanes for in-service bridge decks using the destructive and nondestructive techniques; produce project progress reports; prepare and submit FFY 2011 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 2)	$99,100	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: Walt Peters, ODOT Assist. Bridge Engineer, 405-521-2606

PURPOSE AND SCOPE: Performance of Continuously Reinforced Concrete Pavement (CRCP) is thought to be highly dependent on the early age cracking pattern. Punchouts, the primary failure mechanism in CRCP, are found to occur more frequently at Y-crack and other irregular or closely spaced crack locations. In 1996, Y- cracking was observed on some newer ODOT CRCP projects and there was a concern about the effect it might have on future performance. This project would determine if the early age Y-cracking observed on those projects has had a detrimental effect on the long-term performance of the pavements. The researcher will gather information from previous reports, the pavement management condition database, and the ODOT CRCP database to attempt to correlate present condition to the presence or absence of early age Y-cracking. If Y-cracking is correlated to poor performance in Oklahoma CRC pavements, further examination would include looking at different variables (base type, % reinforcement, absence of transverse steel, tied vs. free or AC shoulders, tube fed vs. tied steel, season and or time of construction, and other design features) that could have contributed to Y- cracking on those specific pavements. The results of this study are anticipated to lead to improved CRCP design, construction, and performance

ACCOMPLISHMENTS DURING FFY 2010: New Project

PROPOSED ACTIVITIES FOR FFY 2011: A literature review of both previous national reports and papers and ODOT reports will be performed to determine previous experience with Y-cracking, mitigation methods used, and potential future cost-effective solutions to prevent Y-cracking; update the ODOT CRCP project database for projects constructed since 2003 utilizing available data; review pavement management condition data to determine current and previous performance levels of CRCP with and without Y-cracking; perform field visual inspections and core sampling of 4 pavement sections with and without Y-cracking; perform early-age stress development and time to first cracking modeling for the pavements evaluated in this study using the HIPERPAV III software package; develop investigation correlations between the occurrence of Y-cracking and pavement performance; produce project progress reports; prepare and submit FFY 2011 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 2)	$77,438	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

2231 Stainless Steel Reinforcement as a Replacement for Epoxy Coated Steel in Bridge Decks

PURPOSE AND SCOPE: Corrosion of reinforcing steel is a primary cause of bridge deck deterioration. Epoxy coatings have been used since the 1980s to protect reinforcing steel from penetration of de-icing salts and anti-icing chemicals and delay the onset of corrosion. However, epoxy coatings are imperfect and defects allow intrusion of corrosive salts and chemicals. Stainless steel reinforcing has emerged as one alternative to epoxy coated steel but it is substantially more expensive. Little is known about the time to corrosion for stainless steel reinforcing as compared to epoxy coated reinforcing. Research is also needed to quantify the costs and benefits of using stainless steel reinforcement as a replacement for epoxy coated steel in conventional bridge construction. This study will compare the basic performance of stainless steel, epoxy coated, and other commonly used bridge deck reinforcing steels. The researcher will perform a thorough life cycle cost analysis of stainless steel reinforcement and identify when it is cost effective to use in bridge construction. The study will also document the construction of a specific bridge using stainless steel deck reinforcement.

ACCOMPLISHMENTS DURING FFY 2010: New Project

PROPOSED ACTIVITIES FOR FFY 2011: Perform literature search concerning the corrosion resistance of reinforcing steel and the durability of bridge decks. This includes reviewing current research which evaluates accelerated testing techniques for concrete reinforcing bar corrosion protection systems and selection of the most cost-effective systems, as well as, the evaluation of multiple corrosion protection systems involving epoxy-coated reinforcement combined with other corrosion protection methods, such as corrosion inhibitors, increased adhesion between the epoxy and the steel, and the use of multiple coatings; perform several accelerated lab testing procedures on Arminox® 2304 stainless steel, NX-SCR™ stainless steel clad reinforcement, conventional black steel, and epoxy-coated steel; produce project progress reports; prepare and submit FFY 2011 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 3)	$83,013	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: David Darwin, Kansas University, 785-864-3827

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

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

2232 Next Generation Smart Barrel System for Workzone Safety Enhancement

PURPOSE AND SCOPE: Work zones are among the most safety-critical areas on the state and national roadways. A “smart barrel”, as originally proposed by University of Michigan for FHWA, is a device appearing to be a normal traffic control barrel while internally equipped with low-cost sensors and wireless transceivers. Once deployed as a distributed system, the smart barrels can adaptively sense the condition of traffic flow in the area, send speed and queue advisory signals through LED flashes automatically, and inform the “site supervisor” or traffic monitoring centers. The past four years of development in distributed sensor network protocols, integrated sensors and new battery sources has come to a matured stage. This will allow researchers to develop a completely new generation of smart barrel which transforms the centralized system control into a fully distributed scheme, enables more autonomous and intelligent behaviors of the smart barrels, and greatly reduces the costs and power consumptions in the overall system. It is envisioned that the new smart barrels will have mesh-networking capability and enhanced onboard processing, be capable of sensing the work zone environments (including both traffic and roadway environment condition) in real-time, at lower cost per unit, and lower power consumption for normal operations. The objective of this effort is to achieve a very low-cost single-chip package that utilizes the same RF frequency band for shared traffic detection, speed monitoring, relative localization, and mesh networking functions.

ACCOMPLISHMENTS DURING FFY 2010: New Project

PROPOSED ACTIVITIES FOR FFY 2011: Perform literature search focusing on effective warning and alert mechanisms to reduce workzone related crashes, accidents and congestions; meet with ODOT traffic engineers to determine the desired specifications for the workzone collision warning system and specify system requirements; implement simulation tools to predict system performance and deployment costs, response time, communication bandwidth and synchronizations; design and test a smaller Doppler Radar sensor with better speed sensitivity; Acquire the latest ZigBee development and control kit and develop ZigBee-based distributed control software; Integrate and field test smart barrel modules together with preliminary site supervisor software; produce project progress reports; prepare and submit FFY 2011 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011 (Yr 1 of 1)	$75,653	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Yan Zhang, Oklahoma University, 405-325-6036

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

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

2233 Rail Diesel Car Demonstration

PURPOSE AND SCOPE: The Rail Diesel Car (RDC) is a self-propelled diesel-hydraulic multiple unit railcar originally built in the 1950s and primarily used for passenger service in rural areas with low traffic density or in short-haul commuter service. The RDCs were less expensive to operate in this context than a traditional locomotive-drawn train. The cars can be used singly or several coupled together in train sets and controlled from the cab of the front unit. The purpose of this project is to introduce the concept of RDC use into Oklahoma transportation practice.

ACCOMPLISHMENTS DURING FFY 2010: New for FFY 2011.

PROPOSED ACTIVITIES FOR FFY 2011: The Oklahoma Department of Transportation will conduct a commuter rail demonstration project in the Oklahoma City area. A private sector company will provide self-propelled commuter rail cars along with the personnel necessary for the operations of the demonstration project. Project funds will also be used to pay for operating expenses, such as, fuel and vehicle maintenance for the demonstration. The project will provide commuter rail service between Edmond, OK and Oklahoma City, OK. The final report will include the history, concept, operating procedures and cost data for RDCs.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	-0-	SPR	-0-	STATE
Estimated Cost FFY 2010	-0-	SPR	-0-	STATE
Projected Cost FFY 2011	$150,000	SPR	-0-	STATE

CONTACT INFORMATION

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

Project Sponsor: Ken LaRue, ODOT Transit Programs, 405-521-2584

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 FFY 2010: 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; furnished technical support and services to observe, monitor and collect still photograph records of the following products: “Scour Stop” on US-281 in western Canadian county for purposes of retarding or eliminating scour to prone structures; “Spray Matt” erosion control product on US-277 in Comanche county; observed application of “Road Boss” on SH-4 in Canadian county for soil stabilization and dust control; initiated “Hydro-Straw” and “EarthGuard” hydromulch product evaluations and monitoring on SH-82 in Cherokee county for seeding steep slopes for the mitigation of soil erosion in marginal spoil types; initiated Cusak “Hay Wattle” product evaluation and monitoring on SH-82 in Cherokee county for purposes of decelerating and redirecting storm water runoff on steep slopes; observed installation of “SnapTite” storm drain pipe liner on two highways in Div. 3 east of Ada, OK.; observed and performed crack mapping for the incorporation of “Fiber Matt” application used for chip sealing operations to reduce effects of typical flexible pavement reflective cracking.

PROPOSED ACTIVITIES FOR FFY 2011: 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; continue to conduct product performance evaluations and monitoring and collection of photographic records for current and new product applications as they are being implemented through monthly site visits.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2010	$10,000	SPR	-0-	STATE
Estimated Cost FFY 2010	$10,000	SPR	-0-	STATE
Projected Cost FFY 2011	$20,000	SPR	-0-	STATE

CONTACT INFORMATION

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