OKLAHOMA DEPARTMENT OF TRANSPORTATION

State Planning and Research Work Program
FFY 2016
(October 1, 2015 to September 30, 2016)

Part 1
Strategic Asset and Performance Management

Part 2
Research

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

October 2015

U.S. Department of Transportation
Federal Highway Administration

Oklahoma Division

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September 22, 2015

In Reply Refer To:
HDA-OK

J. Michael Patterson
Executive Director
Oklahoma Department of Transportation
200 NE 21st Street
Oklahoma City, OK 73105

Dear Mr. Patterson:

The FHWA-OK Division has reviewed Fiscal Year 2016 State Planning and Research (SPR) Part I (Planning) and Part II (Research) Work Programs and Budget for the Oklahoma Department of Transportation (ODOT) as submitted by Mr. John Bowman, Director of Capital Programs, on September 14, 2015. Part I (Planning) also includes metropolitan planning (PL) program funds we previously reviewed as part of our approval of FY 2016 Unified Planning Work Programs (UPWP) and budget for MPOs in Tulsa, Oklahoma City, Lawton, and Fort Smith, respectively.

Title 23 CFR 420.111 requires the use of FHWA planning and research funds to be documented by state DOTs and sub recipients in a work program or other document that describes the work to be accomplished. ODOT developed the FY 2016 SPR in accordance with Title 23 CFR 420. ODOT's FY 2016 SPR Work Program provides an outline of planning, planning-related and research activities to be undertaken, and the budget associated with each work element.

Part I (Planning) of the Work Program is divided into seven functional areas including GIS\Data Management; Mapping; Traffic Data Collection; Systems & Programs; Urban\Regional Transportation Planning; Long Range Plan\Other Planning Activities and Economic\ Safety\ Fiscal Studies. Each functional area is supported by a number of work elements. For example, the Systems and Management functional area includes Federal-Aid Systems, Highway Needs Study, and Pavement Management Systems. Work elements are further subdivided into of activities are divided into separate tasks and each task consists of five elements, including: (i) Purpose & Scope (ii) FY 2015 Accomplishments (iii) FY 2016 Proposed Activities (iv) Financial Information, and (v) Staff Contact.

The summary budget page identifies federal, state and local funding sources as well as state and local matching funds associated with each task as required under 23 CFR 420.11 l (b)(l). The financial information for each task identifies the programmed and estimated costs for current and future years. In addition, a separate budget line item and task description (1440) support the Oklahoma Local Technical Assistance Program (LTAP), administered by the Center for Local Government Technology (CLGT) at Oklahoma State University (OSU).

The FY 2016 Work Program also supports Subpart B Title 23 CFR 420 – which describes research, development, and technology (RD&T) transfer activities ODOT will undertake in FY 2016. Research, development and technology activities are designed to mitigate transportation issues before they become critical problems. SPR Part II also supports technology transfer initiatives that facilitate dissemination of new research findings and the promotion of new technology.

The SPR Part II (Research) Work Program is divided into five functional areas including General Activities, Annual Research, Continuing Research, New Research, and Pooled Fund Studies. ODOT supports new and continuing research initiatives, and participates in several national pooled fund studies. An example of new research initiatives includes *"Performance of Moisture Barriers to Enhance Pavement Performance over Swelling Decks"*. Details of this and other research activities are provided in the work program document.

The SPTC replaced the old University Transportation Center (UTC) concept and now consists of regional and international institutions, including the University of Oklahoma (OU), Oklahoma State University (OSU), Langston University (LU), other regional and international research institutions. As an example, the Research Program work elements 2160-B and 2160-C provide evidence of ODOT's commitment to continue collaboration with the Southern Plains Transportation Center (SPTC) in transportation research, related studies and initiatives.

We urge ODOT to finalize and publish the Research Manual; revise the Public Participation Plan (PPP) and continue contributions to TRB activities including outreach and future SPR peer exchange opportunities, and pooled fund studies.

The FHWA commends ODOT for committing more than the federal minimum (25%) in Research and for continued support of the Local Technical Assistance Program (LTAP), administered by the Center for Local Government Technology (CLGT) at Oklahoma State University. It is also favorably noted as a new SPR Part I (Planning) activity, ODOT has initiated Project 1914, Transportation Asset Management Plan (TAPM) that directly supports the federal program requirements identified in Moving Ahead for Progress in the 21st Century Act (P.L. 112-141) (MAP-21).

Based on our review of the draft document we recommend approval of the FY 2016 SPR I & II Work Program and Budget. If you have questions or comments regarding our approval, please contact Mr. Isaac N. Akem, Community Planner at 405-254-3343, or by email at isaac.akem@dot.gov.

Sincerely

Carl Selby
Program Support &
Technical Services Team Leader

cc: Mr. John Bowman, ODOT Director of Capitol Programs

Introduction

This document describes the Federal Fiscal Year (FFY) 2016 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 Strategic Asset and Performance Management (SAPM) activities and Part 2, the Research activities. The work program is developed and updated annually in cooperation with the Federal Highway Administration.

SAPM activities to be conducted in FFY 2016 include data collection/analysis/reporting, mapping, public involvement, and planning coordination/studies. Additional efforts are planned for data collection related to air quality and pavement structural condition. Funding for the SAPM portion of the work program is approximately $16.4million.

Research activities for FFY 2016 will include four new projects and ten continuing projects. Some of the focus areas for current research projects include: design/construction/maintenance of infrastructure and safety. Over $1 million in federal funds was granted to the Southern Plains Transportation Center (SPTC) with a focus on "*Climate-adaptive Freight and Transportation Infrastructure*" as the SPTC theme with complementary goals of: (i) developing comprehensive, cost-effective and immediately implementable solutions to critical infrastructure-related issues facing the transportation system in Region 6 and the nation; and (ii) preparing transportation professionals for leadership roles in professional and research careers in support of the nation's transportation systems. In addition, ODOT is participating in twenty four national pooled fund projects, one of which, Oklahoma acts as the lead state. Funding for the research program totals approximately $3.9 million in FFY 2016.

The detailed projects for each section are listed by item number and include a description of the purpose and scope of the project, the accomplishments during the current federal fiscal year (FFY 2015) and the proposed activities for the upcoming fiscal year (FFY 2016). In addition, the Financials Section shows the amount programmed for the FFY 2015 in the last work program, an estimate of the total funds that will be expended by the end of FFY 2015, and the projected costs for the upcoming fiscal year (FFY 2016).

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SP&R Part 1 Items

SP&R Part 2 Items

State Planning & Research Program Management

October 1, 2015

John R. Bowman, PE
Director of Capital Programs

Amanda Houska, APO
SP&R Program Manager

Part 1

Laura Chaney, TM
MPO Coordinator/Planning
Local Government Division

David A. Ooten, PE
Division Engineer
Strategic Asset & Performance Management

Part 2

Ron F. Curb, PE
Engineering Manager
Materials and Research Division

Bryan Hurst, APO
SP&R Part 2 Program Administrator
Materials and Research Division

ODOT SP&R DIRECTORY

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CIVIL RIGHTS DIVISION		
Chong, Jenny	Civil Rights Assistant Project Manager	405-521-2072
Penney, Andy	Civil Rights Project Manager	405-522-3174
LOCAL GOVERNMENT DIVISION		
Chaney, Laura	Transportation Manager I	405-521-2705
MATERIALS and RESEARCH DIVISION		
Cooper, Bryan	Transportation Manager I	405-736-9475
Curb, Ron	Engineering Manager II	405-522-3795
Hurst, Bryan	SP&R-2 Program Administrator	405-522-3794
PROGRAMS DIVISION		
Adkins, Sam	Programs Division Manager	405-521-2521
RAIL PROGRAMS DIVISION		
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Barber, Wayne	Transportation Manager I	405-522-6705
Blakeslee, Matthew	PE: Traffic Data Analyst	405-522-6713
Brown, Mark	GIS Manager I	405-522-1036
Fridrich, Aaron	Transportation Manager II	405-736-9466
Houska, Amanda	APO IV	405-522-6879
Howell, Gary R.	Transportation Specialist V	405-521-3385
Johnson, Daryl G.	PE III	405-522-6376
Koenig, Linda	APO IV	405-522-0171
Lee, Randy	Engineering Manager III	405-522-1447
Maxwell, Ron	Transportation Manager II	405-521-2728
Renbarger, Thomas	CAD Specialist VI	405-521-2526
Roesler, Frank V. III	Transportation Manager I	405-521-2350
Swift, Matthew	Engineering Manager II	405-522-5904
Woodhams, Mike	Transportation Manager I	405-522-3793

OKLAHOMA DEPARTMENT OF TRANSPORTATION
State Planning & Research (SPR) Financial Summary Sheet
Federal Fiscal Year 2016
Program Period October 1, 2015 through September 30, 2016

SPR Part 1 - Planning, SPRY-0010(63)PL, JP# 01946(65)

A. Estimated Costs

SPR Part 1 - Planning	$7,797,000.00
LTAP (SPR Part 1)	$209,156.00
Metropolitan Planning (PL)	$8,447,353.20
Total Estimated Costs	***$16,453,509.20***

B. Available Funds

SPR Part 1 Unobligated Balance	$10,066,000.00
PL Funding	$7,039,461.00
Local	$1,407,892.20
Total Available Funds	***$18,513,353.20***

C. Proposed Financing

Type	Federal	Ratio	State	Local	Total
SPR	$8,006,156.00	80%	$0.00	$0.00	$8,006,156.00
PL	$7,039,461.00	80%	$0.00	$1,407,892.20	$8,447,353.20
			Total Proposed Financing		***$16,453,509.20***

SPR Part 2 - Research, SPRY-0010(64)RS, JP# 01946(66)

A. Estimated Costs

SPR Part 2 - Research	**$3,954,544.00**
Total Estimated Costs	***$3,954,544.00***

B. Available Federal Funds

SPR Part 2 Unobligated Balance	$1,894,700.00
SPR Part 1 Unobligated Balance (remainder)	$2,059,844.00
Total Available Funds	***$3,954,544.00***

C. Proposed Financing

Type	Federal	Ratio	State	Local	Total
SPR Part 1 & 2	$3,954,544.00	80%	$0.00	$0.00	$3,954,544.00
			Total Proposed Financing		***$3,954,544.00***

SPR Part 1 & Part 2 Totals

Total SPR Unobligated Balance	$11,960,700.00
Total Other Funds (PL, State, Local)	$8,447,353.20
Total Available Funding	***$20,408,053.20***
Total SPR Part 1 and Part 2 Estimated Costs	***$20,408,053.20***
Total SPR Pooled Fund Commitments	**$1,158,472.00**
Total SPR Research Funding	**$5,113,016.00**
% of SPR Funds for Research	**25%**
Total LTAP ($208,888.77 Fed LTAP; $161,000.00 SPR; $ 48,156.00Local)	**$418,044.77**

SPR PART 1 - PLANNING, SPRY-0010(63)PL, JP# 01946(65)
FEDERAL FISCAL YEAR 2016

		2016 SPR	STATE	PL	LOCAL	TOTAL
GIS AND DATA MANAGEMENT						
1101	Continuing Inventory Data Studies	$800,000.00	$0.00			$800,000.00
1102	Highway Performance Monitoring System	$100,000.00	$0.00			$100,000.00
1103	Geographical Information Management System for Transportation	$965,000.00	$0.00			$965,000.00
	Total GIS and Data Management	***$1,865,000.00***	***$0.00***			***$1,865,000.00***
MAPPING						
1201	County, City and other Planning Maps	$390,000.00	$0.00			$390,000.00
	Total Mapping	***$390,000.00***	***$0.00***			***$390,000.00***
TRAFFIC AND DATA COLLECTION						
1301	Coverage Count Program	$750,000.00	$0.00			$750,000.00
1302	Permanent Traffic Count Program	$775,000.00	$0.00			$775,000.00
1304	Purchase of Traffic Counting Equipment	$190,000.00	$0.00			$190,000.00
1305	Vehicle Classification Counting Program	$550,000.00	$0.00			$550,000.00
1306	Weigh-in-Motion Program	$360,000.00	$0.00			$360,000.00
1308	Traffic Monitoring System	$224,000.00	$0.00			$224,000.00
1309	Traffic Analysis and Projections	$155,000.00	$0.00			$155,000.00
1310	Skid Studies Program	$175,000.00	$0.00			$175,000.00
	Total Traffic and Data Collection	***$3,179,000.00***	***$0.00***			***$3,179,000.00***
ECONOMIC, SAFETY, AND FISCAL STUDIES						
1404	Safety Planning	$5,000.00	$0.00			$5,000.00
1405	Motorcycle Safety and Education Program	$50,000.00	$0.00			$50,000.00
1510	Justification Studies	$20,000.00	$0.00			$20,000.00
	Total Economic, Safety, Fiscal Studies	***$75,000.00***	***$0.00***			***$75,000.00***
SYSTEMS AND PROGRAMS						
1601	Federal-Aid Systems Coordination	$85,000.00	$0.00			$85,000.00
1603	Highway Needs Study	$350,000.00	$0.00			$350,000.00
1604	Pavement Management Systems	$950,000.00	$0.00			$950,000.00
	Total Systems and Programs	***$1,385,000.00***	***$0.00***			***$1,385,000.00***
URBAN / REGIONAL TRANSPORTATION PLANNING						
1700	General Urban Transportation Planning	$10,000.00	$0.00			$10,000.00
1701	Oklahoma City Area Regional Transportation Study (OCARTS)	$10,000.00	$0.00	$4,274,621.00	$854,924.20	$5,139,545.20
1702	Tulsa Metropolitan Area Transportation Study	$10,000.00	$0.00	$2,623,840.00	$524,768.00	$3,158,608.00
1703	Lawton Metropolitan Area Transportation	$10,000.00	$0.00	$120,000.00	$24,000.00	$154,000.00
1709	Ft. Smith Transportation Study	$10,000.00	$0.00	$21,000.00	$4,200.00	$35,200.00
1710	Substate Planning	$310,000.00	$0.00			$310,000.00
	Total Urban Transportation Planning	***$360,000.00***	***$0.00***	***$7,039,461.00***	***$1,407,892.20***	***$8,807,353.20***
LONG RANGE PLAN / OTHER PLANNING ACTIVITIES						
1902	Statewide Long Range Transportation	$20,000.00	$0.00			$20,000.00
1903	Intelligent Transportation Systems Planning	$0.00	$0.00			$0.00
1904	Air Quality Transportation Planning	$25,000.00	$0.00			$25,000.00
1905	Freight Planning	$53,000.00	$0.00			$53,000.00
1910	Public Involvement & Visualization	$200,000.00	$0.00			$200,000.00
1912	DBE Software Database	$100,000.00				$100,000.00
1913	Bicycle & Pedestrian Planning	$45,000.00				$50,000.00
1914	TAMP	$100,000.00				$100,000.00
	Total Long Range Plan and Planning	***$543,000.00***	***$0.00***			***$543,000.00***
	Grand Total SPRY-0010(059)PL	***$7,797,000.00***	***$0.00***	***$7,039,461.00***	***$1,407,892.20***	***$16,244,353.20***
LOCAL TECHNICAL ASSISTANCE PROGRAM						
					LTAP (Fed)	
1440	Local Technical Assistance Program	$161,000.00	$67,325.00		$208,888.77	$437,213.77
	Total LTAP	***$161,000.00***	***$67,325.00***		***$208,888.77***	***$437,213.77***

1101 Continuing Inventory Data Studies

PURPOSE AND SCOPE: Catalogue physical characteristics of statewide public roads; which are used to update the Department's Oracle Spatial Road Inventory Database. Generate maps to conduct meetings with County Commissioners relating to inventory modifications. These are based on completed construction projects and County Action Reports. Use SQL queries, procedures and reports to extract inventory data to publish various mileage reports for state, federal and public needs. Maintain data for the National Network of Defense, NHS System, Control Section and Public Roads. Produce AVMT figures that will be used to calculate Annual Accident and Fatality Rates. Keep abreast of the latest technological advances through the attendance of seminars and conferences.

ACCOMPLISHMENTS DURING FFY 2015: Four county inventories were completed and verified with the Board of County Commissioners: (Caddo, Choctaw, Craig, and Roger Mills.) Seven counties are awaiting verification of results with County Commissioners: (Creek, Delaware, Garfield, Grady, Okfuskee, Pittsburg and Stephens.) Four counties were coded: (Coal, Dewey, Latimer, Roger Mills) with Creek currently in progress. Verified and processed all Highway construction projects, County Action Reports, Graphical Roadway Network (NLF) revisions and updates to the Reference Point database. The following publications, or reports were completed: 2015 Certification of County Road Mileage, 2015 Statewide Mileage Table Book, 2015 HPMS Report and Travel Summary Tables. Continued to process modifications to the functional classification, and urban boundaries due to the 2010 census.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to code and update the Department's Central Database files. Incorporate technological advancements in data collection to streamline all field inventory operations. Seven of the following eleven counties are scheduled to be inventoried: (Cherokee, Cleveland, Comanche, Cotton, Kingfisher, Marshall, Mayes, Oklahoma, Pushmataha, Sequoyah, Wagoner.) Six of the following seven counties are scheduled to be coded: (Caddo, Choctaw, Creek, LeFlore, Major, Murray, and Roger Mills.) Continue monitoring all County Action Reports, Highway Construction projects and collecting HPMS data items. Use GPS technology to continue to identify traffic count sites within Oklahoma. Compile and publish various state and federal reports including: 2016 Oklahoma Statewide Statistics Book, 2016 Certification of County Road Mileage and 2016 HPMS Mileage and Travel Summary Tables.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$686,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$548,000	SPR	-0-	STATE
Projected Cost FFY 2016	$800,000	SPR	-0-	STATE

CONTACT INFORMATION

Ron Maxwell: Transportation Manager II, 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.

ACCOMPLISHMENTS DURING FFY 2015: ODOT continues to update our existing web based HPMS Console V2 to accommodate changes occurring to the new FHWA HPMS Version 8 software. We added 4 new validation constraints from the previous submittal year. Field Review documents were produce for 30 sample sections with the primary vicinity located around the Tulsa Urbanized area and north eastern region of Oklahoma. Our overall sample size will increase by 143 sections to around 1800 total samples, We added 143 new samples from the previous year, which should put us in-line with latest FHWA guidelines. The 2014 HPMS data submittal was completed in a timely manner, delays were caused by data overload issues on the FHWA uploading methods. Continue to enhance an web based pull-down form and or spreadsheet for MPO's, so they can update their required HPMS information which maps their sample locations accordingly utilizing Google Maps and Street view. We currently have 15 fields that can be updated and linked to our HPMS tables/spreadsheets from this form. We continue to update and verify sample items through field inspection, ODOT Video-Log, Google-Street view, Bing-StreetSide, etc. Implementation for all Urban Boundaries were completed and submitted the past year based on the 2010 Census.

PROPOSED ACTIVITIES FOR FFY 2016: Primary focus will be updating the functional classifications changes into the system. ODDT will continue to focus on data quality improvement and add more validations cross-checks to the console for submittal. Our Visidata video log along with Google Earth and Street view will be used to verify and collect HPMS sample data. A HPMS sample adequacy review will be conducted and additional samples will be added in the appropriate strata. Any changes in the HPMS data structure and HPMS console interface as required by changing FHWA requirements will be implemented and tested. Field review documents will be generated and a HPMS data field review will be conducted in cooperation with FHWA Oklahoma Division. The 2015 HPMS data submittal will be transmitted to FHWA using the HPMS Console V2 and the FHWA Version 8 web-based software.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$95,000	SPR	-0-	STATE
Projected Cost FFY 2016	$100,000	SPR	-0-	STATE

CONTACT INFORMATION

Ron Maxwell: Transportation Manager II, 405-521-2728

1103 Geographical Information Management System for Transportation

PURPOSE AND SCOPE: To design, develop, implement and maintain a Geospatial Information Management System for Transportation (GIMS-T). The system supports transportation related decision making by producing high quality map products and reports generated from enterprise data as well as geospatial data management for various ODOT divisions. The maps convey specific topics of interest that require customer input and the use of complex GIS software. GIS services are offered to OKDOT staff as well as customers outside the Department. The system utilizes aerial photography, global positioning and other sources of data. The efficient use of resources requires a considerable investment in hardware, software, and training for GIMS-T staff. New methods and software are continuously being investigated and tested in order to improve the effectiveness, efficiency, and usability of the Departments applications.

ACCOMPLISHMENTS DURING FFY 2015: Generated numerous custom maps and KML files, such as 2015-2022 Work plan maps, County Bridge & County Roadway, MAP21, Environmental Programs. Provided geospatial data management services for Environmental and Rail divisions. Began coordination of Right-of-Way digitization effort. The Rural and Urban Functional Classification Map Books were redesigned, updated and automated. Development of OKTAB is progressing with Spiral 1 completed and Spiral 2 started. Creation of OKIEPRO KML files for DPS in case of a network failure. Products were provided to Senior Staff, Division Engineers and others in the selection of projects to be included in the annual re-balance of the 8 Year Work Plan. Created a client side application to view the Departments datasets. Continue to attend GIS training and workshops. Creation of training material for GIS software. Conducted several GIS training sessions for various Department employees.

PROPOSED ACTIVITIES FOR FFY 2016: Continue development of the OKTAB Portal. Continue to create ways to automate creation of the 8 Year Work Plan and other map products where appropriate. Continue to provide support to ODOT personnel, other state agencies and partners with map and other products to assist them in their transportation needs. Coordinate with the Environmental Programs, Right of Way, Rail Programs and Traffic Engineering Division's to identify needs and develop solutions that will enable them to efficiently and accurately perform their individual missions. Continue to utilize training of staff in program languages (SQL, HTML, XML,KML,JSON, RoboHelp, and JAVA Script) and provide both certified and in house training in the latest GIS software products.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$959,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$700,000	SPR	-0-	STATE
Projected Cost FFY 2016	$965,000	SPR	-0-	STATE

CONTACT INFORMATION

Mark Brown: GIS Manager I, 405-522-1036

1201 County, City, and Other Planning Maps

PURPOSE AND SCOPE: The purpose and scope of the Cartographic Design Section is to produce County and City maps showing the most current, reliable and accurate information for roads, hydrology, street names, city limits and historical boundaries with symbology for man-made culture and natural features. The CADD maps are implemented using Microstation V8i software allowing integration into most G.I.S. database line work. All county and city maps denote 2010 U.S. Census populations. The scope also includes the creation of other special purpose planning maps and supporting graphics produced as needed for Strategic Asset & Performance Management Division studies and to facilitate other ODOT personnel with their SPR assignments. Click here to enter text.

ACCOMPLISHMENTS DURING FFY 2015: Thirteen counties were completed: Adair, Alfalfa, Caddo, Coal, Craig, Dewey, Ellis, Jackson, Latimer, LeFlore, Love, Nowata and Tillman. Overall ninety cities were completed and the larger cities over the population of 1,500 included: Altus, Anadarko, Apache, Arkoma, Carnegie, Cherokee, Coalgate, Heavener, Hinton, Frederick, Marietta, Nowata, Pocola, Poteau, Spiro, Stillwell, Vinita, Westville, Wilburton.

PROPOSED ACTIVITIES FOR FFY 2016: The Cartographic Design Section will continue drawing all county and city maps with improved accuracy in geospatial format. Three county maps are in progress: Murray, Nowata and Oklahoma, with a goal to complete ten or more counties in the coming fiscal year. All city and county maps will have state highway system revisions updated that include any realignments, new interchanges, divided or multilane lane changes or re-designations. Individual map design features are available in DGN format to facilitate CADD uses or as reference files for our GIS projects. Hard copies or digital versions are available for other governmental agencies. Full-size printable PDF map files are free to the general public and government agencies via our web site as completed through our maps page at: http://www.okladot.state.ok.us/maps/index.htm Page links are listed under Oklahoma's General County Roads and Oklahoma's Incorporated City Maps.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$350,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$345,000	SPR	-0-	STATE
Projected Cost FFY 2016	$390,000	SPR	-0-	STATE

CONTACT INFORMATION

Thomas Renbarger: CAD Specialist VI, 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 2015: 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 2015. Continuous updating of the GPS coordinates and site characteristics for all traffic count sites on all systems was performed. A project to completely overhaul the Oklahoma Traffic Count Information System Web Page is nearing completion but is on hold at this time.

PROPOSED ACTIVITIES FOR FFY 2016: 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 states highway system, county off-system and small urban system in the 25 counties scheduled for FY 2016. Collect 15 minute interval counts for the Ramp/Frontage Road Count System as requested. Collect and update GPS coordinates and site characteristics for all traffic count sites on all systems as needed. We will entertain the possibility of initiating a new Short Duration Traffic Count Contract for the collection of traffic counts in the Cleveland County, Comanche County, Oklahoma County and Tulsa County areas, as well as, any additional counts as we deem necessary. We plan on implementing a new enhanced version of the Oklahoma Traffic Count Information System Web Page which will include enhanced maps, report printing and possibly truck traffic information. 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 2015	$710,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$575,000	SPR	-0-	STATE
Projected Cost FFY 2016	$750,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich: Transportation Manager II, 405-736-9466

1302 Permanent Traffic Count Program

PURPOSE AND SCOPE: To collect hourly and 15 minute increment traffic data by lane for traffic monitoring design needs. There are 72 Automatic Vehicle Classification (AVC) station locations and 24 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. Utilities provided for operational support are maintained for permanent AVC/WIM stations through accounts with 2 different electric power companies and 4 different telephone companies.

ACCOMPLISHMENTS DURING FFY 2015: The Traffic Monitoring Systems (TMS) Operations and Maintenance Services are provided through two contracts, the TMS Data Collection Contract and the TMS Site Repair Contract. The contractor provided enhanced services and expertise, particularly in the area of data collection, systems validation and TMS site repair. 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 2015 included renovation of eighteen (18) existing sites (4 WIM and 14 AVC). It is expected that site visits to carry out routine maintenance and equipment testing will be completed at all 96 AVC/WIM sites this year.

PROPOSED ACTIVITIES FOR FFY 2016: The TMS Data Collection Contract will continue to improve data collection efficiency. The TMS Site Repair Contract addressed in this section will commence with ongoing repair and replacement construction projects identified and planned during FY 2015. Both of these contracts will be sent out for bid in FY 2016. The scope of work to be accomplished in FY 2016 is as follows:

1) Execute scheduled maintenance for up to 96 sites.
2) Complete site renovations and repairs to estimated 30 permanent sites.
3) WIM Site calibrations.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	775,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$775,000	SPR	-0-	STATE
Projected Cost FFY 2016	$775,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich: Transportation Manager II, 405-736-9466

1304 Purchase of Traffic Counting Equipment

PURPOSE AND SCOPE: To improve the efficiency of the traffic counting operation by systematic replacement of older outdated equipment and stolen or damaged equipment as well as support of increased equipment requirements resulting from expanded operations.

ACCOMPLISHMENTS DURING FFY 2015: Equipment purchases executed in FY 2015 continued to support on-going projects in traffic monitoring systems operations in both permanent sites and short-duration count site locations.

PROPOSED ACTIVITIES FOR FFY 2016: The proposed construction of new traffic monitoring stations, replacement of old equipment and the continuing requirement for additional GPS equipment comprises the majority of the expenditure requirement for FY 2016. As older, outdated 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.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	118,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$80,000	SPR	-0-	STATE
Projected Cost FFY 2016	$190,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich: Transportation Manager II, 405-736-9466

1305 Vehicle Classification Counting Program

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

ACCOMPLISHMENTS DURING FFY 2015: Vehicle classification data collection continued at the short term sites in support of the traffic analyst's effort in the development of updated annual average truck volumes. The vehicle classification counting program for FY 2015 was performed by contract with RDSC for collection of all classification data statewide including multi-lane urban, multi-lane rural and all 2-lane highway sites. During FY 2015, various special studies were conducted throughout the year providing timely data for traffic engineers, planners and designers in the department's central office divisions as well as for traffic engineers, construction and maintenance managers in the eight field divisions.

PROPOSED ACTIVITIES FOR FFY 2016: The vehicle classification counting program for FY 2016 will continue to be performed by contract. A new contract will be bid in order to collect all classification data statewide including multi-lane urban, multi-lane rural and all 2-lane highway sites. During FY 2016, various special studies will be conducted throughout the year providing timely data for traffic engineers, planners and designers in the department's central office division as well as for traffic engineers, construction and maintenance managers in the eight field divisions. We will 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 2015	$440,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$440,000	SPR	-0-	STATE
Projected Cost FFY 2016	$550,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich: Transportation Manager II, 405-736-9466

1306 Weigh-in-Motion Program

PURPOSE AND SCOPE: To collect and conduct preliminary analysis of data describing vehicle characteristics and vehicle weight trends. The Department uses this data as an intricate 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 for the Strategic Highway Research Program (SHRP) and the Long Term Pavement Performance (LTPP) program. The Department operates 24 permanent weigh- in- motion (WIM) data collection sites and 72 Automatic Vehicle Classifier (AVC) sites located throughout the state.

ACCOMPLISHMENTS DURING FFY 2015: The progress made in the TMS Data Collection contract resulted in the collection of monthly data from 72 AVC and 24 WIM sites. The contractor is continuing efforts to develop data validation software using historical data. The contract also provides ongoing support for the digital wireless communication network. The wireless network conversions continue to improve the speed and dependability of traffic data transfers as compared to land line telephone service. The contractor provided traffic data transfers to an IP address on the internet which allowed import into the department's Traffic Operations and Planning Software data base. The contractor is improving software to remotely program and configure traffic data recorders. The solar power conversion project has reduced electric utility costs and increased site operational rates. The TMS Repair contract provided ongoing, essential repairs/replacements of defective sensors and equipment to maintain operational efficiency. The contractor successfully installed a Virtual Weigh Station (WIM 33) at Purcell, Oklahoma.

PROPOSED ACTIVITIES FOR FFY 2016: The TMS Data Collection Contract will focus on: Data Collection, Development of data validation software using historical data, Support services for the digital wireless data communications network, and Development of software supporting remote programming and configuration of traffic data recorders. The TMS Site Repair Contract will focus on repair or replacement of sensors and equipment at all AVC and WIM sites and WIM site calibration. Both of these contracts will be renewed in FFY 16.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$350,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$340,000	SPR	-0-	STATE
Projected Cost FFY 2016	$360,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich: Transportation Manager II, 405-736-9466

1308 Traffic Monitoring System

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) and the subsequent MAP – 21. The purpose of TMS is to manage, estimate, report, and publish traffic data estimates, including data from public and private non – state government entities, as specified in the Highway Performance Monitoring System and FHWA's Traffic Monitoring Guide.

ACCOMPLISHMENTS DURING FFY 2015: Annual AADT processing including continuous counter analysis and annualized factor generation was completed for the traffic year 2014. Some programming was moved to the Oracle system. The traffic count data was checked for accuracy along with the correction of count site placement in the Highway Inventory File. 2014 AADT, Peak Hour, Truck estimates, and Forecast AADTs were updated on existing HPMS Sample locations. 2014 Truck counts from contract, state forces, and the Oklahoma Turnpike Authority were also used to update the 2014 NHS Truck System. One third of the counties had truck counts and urban area ramp classification counts taken by contract. State forces counted one third of the counties and the rural ramp system in calendar year 2014. A three year contract to take statewide vehicle classification counts began in 2013. The annual publication of the 2014 AADT Map was completed. The 2014 Oklahoma Traffic Characteristics Report was partially completed. The new statewide ramp system was partially estimated to 2014 AADTs. A count site inventory database was created to manage and report collected data. The ramp AADT count system, first required in 2010 HPMS Field Manual, was completed in 2014 with all ramps counted by state forces and contract (classification counts). An employee has been added to the Traffic Analysis Branch (Oct 2013) for TMS computer support and to manage the RFC and UFC traffic estimation systems. Robbie completed the Oklahoma, Canadian, and Cleveland Counties UFC 2014 AADT estimation process. He also completed the 2014 AADT updates for the RFC system.

PROPOSED ACTIVITIES FOR FFY 2016: The Vehicle Classification Contract will be put out to bid and monitoring vehicle classification data statewide will be initiated. 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 2015 AADT Map. Develop an Oracle estimation system for statewide AADTs. Keep personnel informed of technological advances through attendance of seminars, conferences, and workshops.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$220,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$220,000	SPR	-0-	STATE
Projected Cost FFY 2016	$224,000	SPR	-0-	STATE

CONTACT INFORMATION

Daryl G. Johnson, PE: Traffic Data Analyst, 405 522-6376

Mike Woodhams: Transportation Manager, 405- 522-3793

1309 Traffic Analysis and Projections

PURPOSE AND SCOPE: Traffic forecasts provide the basis for geometric and structural design of new highways, roadway planning functions, roadway maintenance, and improvement of existing highways. The existing or assigned traffic volumes are projected twenty (20) years into the future for design and operational analysis purposes. Design Hourly Volume (DHV) of the Annual Average Daily Traffic (AADT), percent of trucks of the AADT and DHV, and the percent of heavy trucks (of AADT) are prepared for each request of design traffic information. Writing specifications, review and correction, and approval of consultant Design Traffic Projects and Research Projects is to be performed as needed.

ACCOMPLISHMENTS DURING FFY 2015: Design traffic was furnished to the city and county governments, design and environmental consultants and various divisions within ODOT. Information prepared for the larger population areas was based on site specific special traffic counting and the comprehensive area and regional transportation studies in those cities. Information for urban, 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 148 requests for design traffic were completed. Several consultant traffic analyses were overseen, edited, and approved at some level of completion including the US 70 Madill Bypass Study, SH 20 Claremore Realignment Study, US 169 Interchange Design Study, the I-35/I-240 Interchange Arterial Frontages Study, the I-40/I-44 Interchange Design Study, The I-40 MWC One Way Frontage Road Design Study, and the I-40 West of I-44 Design Study. The US 70 Madill Bypass and the US 70 Kingston Bypass design traffic studies were completed. The Oklahoma Vehicle Classification Accuracy Research project was completed. A Research project for speed data research NPMRDS has been initiated.

PROPOSED ACTIVITIES FOR FFY 2016: Design traffic data will continue to be furnished for cities, counties, and to ODOT divisions upon approved requests. Consultant Design Projects will be overseen. Traffic analysis and projections will be completed, as requested for all programmed construction and maintenance 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 2015	$203,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$200,000	SPR	-0-	STATE
Projected Cost FFY 2016	$155,000	SPR	-0-	STATE

CONTACT INFORMATION

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

Matthew Blakeslee, PE: Traffic Data Analyst, 405 522-6713

1310 Skid Studies Program

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. This also includes the annual testing of all interstate highways and the Strategic Highway Research Program (SHRP) sites. Conduct special skid resistance testing as requested

ACCOMPLISHMENTS DURING FFY 2015: The annual test cycle for FY 2015 encompassed pavement friction testing of highways in Divisions 1 & 8, US 69 and all Interstates. This year's testing cycle totals 6,848 miles. Highway mileage with less than adequate skid resistance value registers an average of approximately 8 percent of all pavements tested. Skid testing & data collection began in May of 2015 and some software problems & repairs have slowed testing, but completion of this year's testing cycle is expected by the fall of 2015.

PROPOSED ACTIVITIES FOR FFY 2016: The FY-2016 test cycle encompasses state, federal and interstate highways totaling approximately 8,204 miles in Division 2 & 3, US 69 and all interstates. Completion is scheduled for the fall of 2016. Calibration of the skid testing equipment is done on a biannual basis and will be scheduled for FY 2016.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$175,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$170,000	SPR	-0-	STATE
Projected Cost FFY 2016	$175,000	SPR	-0-	STATE

CONTACT INFORMATION

Aaron Fridrich: Transportation Manager II, 405-736-9466

1404 Safety Planning

PURPOSE AND SCOPE: The project scope is designed to address transportation safety in the implementation of Statewide Long Range Transportation Plan (LRTP) and to ensure compatibility with the Strategic Highway Safety Plan. To collaborate with ODOT Traffic Engineering Division in implementation and update of Oklahoma's Strategic Highway Safety Plan in accordance with MAP-21.

ACCOMPLISHMENTS DURING FFY 2015: Addressed transportation safety and safety performance measures in the 2015-2040 Oklahoma Long Range Transportation Plan, and ensured consistency with Strategic Highway Safety Plan performance measures, as required in MAP 21. Provided review and comment in relation to Federal Register safety performance measure rulemaking; also provided review and comment for Strategic Highway Safety Plan update.

PROPOSED ACTIVITIES FOR FFY 2016: Provide review of projects and programs to ensure consistency with the LRTP and inclusion in the STIP, as requested. Collaborate with ODOT Traffic Engineering Division in implementation and update of Oklahoma's Strategic Highway Safety Plan in accordance with MAP-21.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$10,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$7,500	SPR	-0-	STATE
Projected Cost FFY 2016	$5,000	SPR	-0-	STATE

CONTACT INFORMATION

Linda Koenig: Planning and Policy Analyst, 405-522-0171

1405 Motorcycle Safety & Education Program

PURPOSE AND SCOPE: The statewide motorcycle safety and education program seeks to reduce motorcycle crashes that result in fatalities and injuries. The program focuses on curbing aggressive driving and speeding by motorcycle users. The Oklahoma Highway Patrol, in coordination with the ODOT Traffic Engineering Division's Collision Analysis & Safety Branch, will implement a motorcycle safety course as a means of improving motorcycle user safety on the public roadways.

ACCOMPLISHMENTS DURING FFY 2015: This program was not funded in the FFY 2015 SPR work program.

PROPOSED ACTIVITIES FOR FFY 2016: The Oklahoma Highway Patrol, in partnership with ODOT, will continue development and implementation of a statewide motorcycle safety and education program. The program will deliver classroom and experiential educational training; and provide summary "before and after" data in geographical areas where programs have been concentrated (since the earlier phase of the program beginning in 2012) to determine program effectiveness. Variables such as age, type of crash etc. may be examined.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	$-0-	SPR	-0-	STATE
Projected Cost FFY 2016	$50,000	SPR	-0-	STATE

CONTACT INFORMATION

Linda Koenig: Planning and Policy Analyst, 405-522-0171

1440 Local Technical Assistance Program

PURPOSE AND SCOPE: The Local Technical Assistance Program (LTAP) is an education program contracted through Oklahoma State University's Center for Local Government Technology (CLGT) to provide training and technical assistance to county, municipal and tribal governments responsible for the planning, maintenance, and construction of transportation systems at the local level.

ACCOMPLISHMENTS DURING FFY 2015: Conducted over fifty training sessions to more than 2000 individuals for a total of over 20,000 training hours; awarded over forty Roads Scholar Completion Certificates; conducted the annual LTAP Advisory Meeting and developed and conducted new training courses as requested; conducted training in the FHWA focus areas of Roadway Safety, Worker Safety, Work Zone Safety, Infrastructure Management, and Workforce Development; conducted FHWA Every Day Counts webinars and associated supplementary training; conducted seminars in conjunction with industry professionals on emerging technologies; maintained the LTAP website and list-serve; published various books, plans and DVDs for distribution; served as chapter headquarters for the American Public Works Association Oklahoma chapter and planned and conducted their annual conference; coordinated training activities with CLGT's Southern Plains TTAP; coordinated activities with CLGT's Transportation Intern Program to include those promoting the use of GIS/GPS technologies; attended various association and professional meetings to include the Association of County Commissioners of Oklahoma, County Officers and Deputies Association, Oklahoma Municipal League, National LTAP Association and LTAP Region VI Meeting; provided program progress reports to ODOT and FHWA.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to develop activities to facilitate the implementation of FHWA's Every Day Counts initiative; continue the Roads Scholar curriculum in conducting at least two of each course offering during the fiscal year; participate in Association of County Commissioners of Oklahoma, County Officers and Deputies Association, Oklahoma Municipal League, National LTAP Association and LTAP Region VI meetings and conferences; continue to teach and develop courses in the FHWA focus areas of Roadway Safety, Worker Safety, Work Zone Safety, Infrastructure Management, and Workforce Development; continue to serve as the state chapter office of APWA and to plan and conduct their annual conference; continue to implement principals taught in LTAP course through the projects conducted by students assisting agencies through the Transportation Intern Program; serve on various local and national committees; provide technical assistance as requested; continue to provide website, list-serve, books, plans, tapes, DVD's, etc. for distribution; conduct LTAP Advisory Meeting and develop requested activities where possible; provide program progress reports to ODOT and FHWA.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$164,993	SPR	$65,794	STATE	$175,027	FHWA
Estimated Cost FFY 2015	$100,000	SPR	$65,794	STATE	$222,000	FHWA
Projected Cost FFY 2016	$161,000	SPR	$67,325	STATE	$208,888	FHWA

CONTACT INFORMATION

Bryan Cooper: Transportation Manager, 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 2015: No consultant studies reviews needed.

PROPOSED ACTIVITIES FOR FFY 2016: 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 2015	$0	SPR	-0-	STATE
Estimated Cost FFY 2015	$0	SPR	-0-	STATE
Projected Cost FFY 2016	$20,000	SPR	-0-	STATE

CONTACT INFORMATION

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

Matthew Blakeslee, PE: Traffic Data Analyst, 405 522-6713

1601 Federal-Aid Systems Coordination

PURPOSE AND SCOPE: The project scope is designed to be responsible for the coordination of the State's Highway System, Federal-aid Highway System, National Highway System and the Functional Classification System. Prepare and coordinate all highway and roadway 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 2015: All highway revisions were approved by the Transportation Commission. Completed the revisions of Functional Classification Systems for Tulsa Urbanized area and approved by FHWA. This completed the final revisions to the Functional Classification Systems base off the latest 2010 Census. There were over 1,000 miles driven this year, to complete these adjustments to the system.

PROPOSED ACTIVITIES FOR FFY 2016: The Functional Classification System revisions base off the latest 2010 Census will be finalized and recorded in the data base. New Urban and Rural Functional Classification System books will be published with all updated revisions made since 2012. Approximately 2,000 miles will be driven to do necessary on-site reviews of revisions as needed. The "Oklahoma's Memorial Highways & Bridges" book will be updated and revised for 2015. The name will be changed to "Oklahoma's Commemorative Highways & Bridges". May have approximately six to ten highway revisions to be approved by the Transportation Commission.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$79,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$79,000	SPR	-0-	STATE
Projected Cost FFY 2016	$85,000	SPR	-0-	STATE

CONTACT INFORMATION

Gary R. Howell: Transportation Specialist V, 405-521-3385

1603 Highway Needs Study

PURPOSE AND SCOPE: To estimate the current and future needs of the State Highway System. To publish a Needs Study and Sufficiency Report biennially showing the investment needed to raise the State Highway System to a sufficient rating over a twenty-year period for construction, maintenance, and administration. To maintain a file of geometric deficiencies on the State Highway System. To maintain a construction status log of highway projects. To maintain a list of highway segments for potential removal from the State Highway System. To maintain a database indicating sufficiency ratings for roadways and bridges along with suggested improvements and costs.

ACCOMPLISHMENTS DURING FFY 2015: Continued field data collection for upcoming 2015 Needs Study and Sufficiency Report. Updated highway subsections, inventory, and improvement data. Updated geometric data contained in the Needs Study Deficiency database file. Processed collected field data. Produced graphs, charts, and tables for the Needs Study and Sufficiency Report. Compiled maintenance and construction costs for the Needs Study and Sufficiency Report. Continued assembling the 2015 Needs Study and Sufficiency Report. Updated the Field Division Pavement Preservation Manual and the Needs Study and Sufficiency Report Procedure Manual. Documented current processes and evaluated strategies to improve reporting process.

PROPOSED ACTIVITIES FOR FFY 2016: Update highway inventory data for use in the collection of field data. Update the geometric data contained in the Needs Study Deficiency database file. Update the Sufficiency Rating, Procedure and Field Division Preservation Manuals. Document current processes, evaluate strategies to improve the reporting process, and replace failed programs. Update the Field Manual and work sheets. Collect and process field data for the upcoming 2016 Needs Study and Sufficiency Report. Produce graphs, charts, and tables for the Needs Study and Sufficiency Report. Compile maintenance and construction costs for the Needs Study and Sufficiency Report. Produce Needs Study and Sufficiency Report and the Potential Removals from the State Highway System Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$297,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$280,000	SPR	-0-	STATE
Projected Cost FFY 2016	$350,000	SPR	-0-	STATE

CONTACT INFORMATION

Matthew Swift: Pavement Management Engineer, 405-522-5904

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

1604 Pavement Management System

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

ACCOMPLISHMENTS DURING FFY 2015: Performed Pavement Management System analysis of the National and Statewide Highway Systems in Oklahoma. Began implementation of analysis software upgrade. Began to update performance curves, treatment costs, and triggers. Provided technical support for the video log software. Performed data collection on all National Highway System routes, all non-National Highway System routes in Divisions 1, 2, 5, 6, and 7, and Highway Performance Monitoring System non-highway sample sections in Divisions 1, 2, 5, 6, and 7. Kept informed of the latest technological advances and practices by attending the Transportation Research Board Annual Meeting in Washington, D.C. as well as webinars and workshops. Documented current processes and evaluated strategies to improve analysis process.

PROPOSED ACTIVITIES FOR FFY 2016: Perform Pavement Management System analysis of the National and Statewide Highway Systems in Oklahoma. Continue implementation of analysis software upgrade. Provide technical support for the video log software. Perform full condition data collection on all National Highway System routes, all non-National Highway System routes in Divisions 3, 4, and 8, and Highway Performance Monitoring System non-highway sample sections in Divisions 3, 4, and 8. Keep informed of the latest technological advances and practices by attending the Transportation Research Board Annual Meeting in Washington, D.C. as well as webinars and workshops.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$925,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$925,000	SPR	-0-	STATE
Projected Cost FFY 2016	$950,000	SPR	-0-	STATE

CONTACT INFORMATION

Matthew Swift: Pavement Management Engineer, 405-522-5904

1700 General Urban Transportation Planning

PURPOSE AND SCOPE: This item includes coordinating with staff in the Strategic Asset & Performance Management and various other ODOT Divisions which cannot be ascribed to specific transportation studies contained in the unified planning work programs or the SPR work program. Provide linkage between transportation planning and project development, environmental review, and other topics as needed.

ACCOMPLISHMENTS DURING FFY 2015: Continued coordination with appropriate ODOT Central Office and Field Divisions. Provided socioeconomic data, planning and transportation data upon request, to local and state officials and to citizens. Attended seminars and workshops related to transportation planning and policies in order to maintain, upgrade and develop needed expertise, proficiency and professionalism. Coordinated with and among local, state and federal officials. Provided assistance at public meetings. Monitored and provided comments on federal and state legislation and regulations affecting the Department. Provided review and comment on Moving Ahead for Progress in the 21st Century (MAP-21) proposed rules.

PROPOSED ACTIVITIES FOR FFY 2016: Provide coordination with ODOT Central Office, Field Divisions and local, state and federal officials. Disseminate pertinent planning data and information as needed. Provide technical assistance as requested concerning transportation planning and reauthorization of MAP-21. Pursue professional enrichment through attendance at workshops, seminars and conferences

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$15,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$10,000	SPR	-0-	STATE
Projected Cost FFY 2016	$10,000	SPR	-0-	STATE

CONTACT INFORMATION

Linda Koenig: Planning and Policy Analyst, 405-522-0171

1701 Oklahoma City Area Regional 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 MAP-21 provisions and all applicable transportation planning regulations and requirements for the Tulsa urbanized area.

ACCOMPLISHMENTS DURING FFY 2015: Transportation planning for the OCARTS Area was carried out as described in the FFY 2015 Unified Planning Work Program (UPWP). Accomplishments during FY 2015 included: preparation and finalization of the FY 2015 UPWP was completed; the FY 2015 Agreement was executed and authorization to expend federal funds effective July 1, 2013 through June 30, 2015 was granted by FHWA; the Transportation Improvement Program (TIP) for FFY 2016-2018 was developed and adopted; implemented projects from Encompass 2035; continued development of the Metropolitan Transportation Plan, Encompass 2040, Intermodal Transportation Hub Study, and Commuter Corridor Study; continued development and maintenance of the Geospatial Information System to assist member entities and integration with the travel demand model; continued work with Air Quality by monitoring and evaluating levels and administering a comprehensive public education program; reviewed and analyzed the Congestion Management Process and implemented modified system; completed the development of a comprehensive pedestrian, bicycle plan for the region, implementation of bicycle elements of the Regional Transportation Plan.

PROPOSED ACTIVITIES FOR FFY 2016: Complete and approve of the Metropolitan Transportation Plan, Encompass 2040; data collection and monitoring of social, economic, environmental and transportation system data; Long Range Planning including major streets and highways; Short Range Planning and coordination; Elderly and Disabled Transportation Planning; Congestion Management; complete the Commuter Corridor Study; continue development and maintenance of the Geospatial Information System to assist member entities and regional planning efforts; continue to develop the Intelligent Transportation System; continue work with air quality, ozone reduction and environmental programs; Alternative Transportation Planning including Pedestrian and Bicycle, Public Transit, Human Services Transportation and Passenger Rail; public education planning of the citizen participation and public information, nondiscrimination compliance plan and conducting broad-based public involvement; program administration and implementation.

FINANCIALS	Amount	Fund	Amount	Fund	Amount	Fund
Programmed Amount FFY 2015	$20,000	SPR	$1,326,308	PL	$265,261	LOCAL
Estimated Cost FFY 2015	$15,000	SPR	$1,326,308	PL	$265,261	LOCAL
Estimated Cost FFY 2016	$10,000	SPR	$4,274,621	PL	$854,924	LOCAL

CONTACT INFORMATION

Laura Chaney: Transportation Manager I, 405-521-2705

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 MAP-21 provisions and all applicable transportation planning regulations and requirements for the Tulsa urbanized area.

ACCOMPLISHMENTS DURING FFY 2015: Transportation planning for the Tulsa TMA was carried out as described in the FFY 2015 Unified Planning Work Program (UPWP). Accomplishments during FY 2015 included: preparation and finalization of the FY 2015 UPWP was completed; the FY 2015 Agreement was executed and authorization to expend federal funds effective July 1, 2013 through June 30, 2015 was granted by FHWA; the Transportation Improvement Program (TIP) for FFY 2016-2018 was developed and adopted; continued development of the Regional Transportation Plan, Connections 2035; assisted member entities and citizens, providing technical assistance in demographic and traffic information and other information related to major transportation projects; initiated a comprehensive update to the Regional Trails Master Plan & developed a bicycle and pedestrian plan for the Tulsa region; continued the coordination of the Ozone Alert! Clean Cities and Green Traveler Alternative programs.

PROPOSED ACTIVITIES FOR FFY 2016: Complete the update of the Metropolitan Transportation Plan, Connections 2040; data collection and monitoring of social, economic, environmental and transportation system data; Long Range Planning including major streets and highways; Short Range Planning and coordination; Elderly and Disabled Transportation Planning; Congestion Management; complete the Commuter Corridor Study; Development and maintenance of the Geospatial Information System and integration with the travel demand model; continue to assist member entities and citizens, providing technical assistance in demographic and traffic information and other information related to major transportation projects; continue to develop the Intelligent Transportation System; continue work with air quality, ozone reduction and environmental programs; Alternative Transportation Planning including Pedestrian and Bicycle, Public Transit, Human Services Transportation and Passenger Rail; public education planning of the citizen participation and public information, nondiscrimination compliance plan and conducting broad-based public involvement; program administration and implementation.

FINANCIALS	Amount	Fund	Amount	Fund	Amount	Fund
Programmed Amount FFY 2015	$20,000	SPR	$969,037	PL	$193,807	LOCAL
Estimated Cost for FFY 2015	$15,000	SPR	$969,037	PL	$193,807	LOCAL
Estimated Cost for FFY 2016	$10,000	SPR	$2,623,840	PL	$524,768	LOCAL

CONTACT INFORMATION

Laura Chaney: Transportation Manager I, 405-521-2705

1703 Lawton 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 MAP-21 provisions and all applicable transportation planning regulations and requirements for the Lawton Metropolitan area.

ACCOMPLISHMENTS DURING FFY 2015: Transportation planning for the Lawton Metropolitan Planning Area was carried out as described in the FFY 2015 Unified Planning Work Program (UPWP). Accomplishments during FFY 2015 included: published the Annual Listing of Obligated Projects; preparation of the annual transportation planning funding documents; completed the 2040 Metropolitan Transportation Plan; continued work of a feasibility study to provide a freight route to the Lawton Industrial Park from Interstate 44; continued the air quality education program in cooperation with local media and the Lawton Metropolitan Area Air Quality Committee; participated in Transportation Air Quality Work Group meetings; and participated in committee to review transportation enhancement grant applications.

PROPOSED ACTIVITIES FOR FFY 2016:
As defined in the UPWP; finalize and update the Land Use Plan; implement a study of the Lawton bus route system; review pedestrian facilities and connectivity to transit along arterials and bus routes; analyze intersections for potential safety improvements; review and update the Public Participation Plan to ensure it is in compliance with MAP-21 requirements; complete the feasibility study to provide a freight route to the Lawton Industrial Park form Interstate 44; manage the contract for the Lawton Metropolitan Bicycle and Pedestrian Plan improvements; continue development of an education campaign for bicycle safety; and increase public awareness of air quality through various outreach efforts.

FINANCIALS	Amount	Fund	Amount	Fund	Amount	Fund
Programmed Amount FFY 2015	$15,000	SPR	$200,241	PL	$40,048	LOCAL
Estimated Cost for FFY 2015	$15,000	SPR	$200,241	PL	$40,048	LOCAL
Estimated Cost for FFY 2016	$10,000	SPR	$120,000	PL	$24,000	LOCAL

CONTACT INFORMATION

Laura Chaney: Transportation Manager I, 405-521-2705

1709 Ft. Smith Transportation Study

PURPOSE AND SCOPE: To maintain up-to-date socioeconomic and land use data and a viable Metropolitan Transportation Plan in compliance with the provisions of existing federal regulations and MAP-21 provisions and all applicable transportation planning regulations and requirements for the Fort Smith urbanized area.

ACCOMPLISHMENTS DURING FFY 2015: Transportation planning for the Frontier Metropolitan Planning Area was carried out as described in the FFY 2015 Unified Planning Work Program (UPWP). Accomplishments during FFY 2015 included published the Annual Listing of Obligated Projects; data collection and monitoring of social, economic and transportation system data, preparation of the annual transportation planning funding documents and maintenance and update of the Frontier MPO website; development of the Transportation Improvement Program (TIP) for FFY 2016-2019.

PROPOSED ACTIVITIES FOR FFY 2016: The Oklahoma Department of Transportation will continue coordination with the Frontier Metropolitan Planning Organization and the Arkansas Highway and Transportation Department (AHTD) in maintaining the 3-C planning process in the Fort Smith area. 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 2015	$15,000	SPR	$21,000	PL	$4,200	LOCAL
Estimated Cost for FFY 2015	$15,000	SPR	$21,000	PL	$4,200	LOCAL
Estimated Cost for FFY 2016	$10,000	SPR	$21,000	PL	$4,200	LOCAL

CONTACT INFORMATION

Laura Chaney: Transportation Manager I, 405-521-2705

1710 Regional Transportation Planning

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 2015: Transportation planning for the three RTPO pilot regions was carried out as described in the RTPOs FFY 2015 Planning Work Program (PWP). Accomplishments during FFY 2015 included data collection and monitoring of social, economic and transportation system data, preparation of the annual transportation planning funding documents and maintenance and update of the RTPO websites; completion of one county, per RTPO, Regional Long Range Transportation Plan.

PROPOSED ACTIVITIES FOR FFY 2016: The Oklahoma Department of Transportation will continue coordination with the pilot RTPOs in maintaining the 3-C planning process in non-metropolitan areas. 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. The RTPO pilot program will enter its second phase, two additional COG regions were selected, thru an RFP process, to carry out transportation planning in non-metropolitan areas; data collection and monitoring of social, economic, environmental and transportation system data; development and maintenance of the Geospatial Information System; continued development of other counties Regional Long Range Transportation Plan, per RTPO.

FFY 2016 Pilot RTPOs	Amount	Fund	Amount	Fund
Association of South Central Oklahoma Governments	$50,000	SPR	$10,000	LOCAL
Central Oklahoma Economic Development District	$55,000	SPR	$11,000	LOCAL
Grand Gateway Economic Development District	$50,000	SPR	$10,000	LOCAL
Northern Oklahoma Development Authority	$65,000	SPR	$13,000	LOCAL
Southwestern Oklahoma Development Authority	$65,000	SPR	$13,000	LOCAL

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$250,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$250,000	SPR	-0-	STATE
Projected Cost FFY 2016	$310,000	SPR	-0-	STATE

CONTACT INFORMATION

Laura Chaney: Transportation Manager I, 405-521-2705

1902 Statewide Long Range Transportation Planning

PURPOSE AND SCOPE: To maintain the Oklahoma Long Range Transportation Plan (LRTP) and other associated statewide planning activities in accordance with the provisions of federal law.

ACCOMPLISHMENTS DURING FFY 2015: Completed development of 2015-2040 Oklahoma Long Range Transportation Plan, and ensured smooth transition from previous 2010-2035 Oklahoma LRTP. Involved Personal Travel, Freight, and Tribal Committees and public in plan development. Confirmed that LRTP product met requirements of federal law

PROPOSED ACTIVITIES FOR FFY 2016: Finalize publication of 2015-2040 Oklahoma Long Range Transportation Plan, and coordinate with the MPOs and local governments in relation to long range transportation plans. Provide assistance to ODOT project development activities as needed in relation to project consistency with LRTP policies. Provide assistance with reviewing notices of proposed rulemaking (NPRMs) related to the State LRTP.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$125,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$125,000	SPR	-0-	STATE
Projected Cost FFY 2016	$20,000	SPR	-0-	STATE

CONTACT INFORMATION

Linda Koenig: Planning and Policy Analyst, 405-522-0171

1903 Intelligent Systems Planning

PURPOSE AND SCOPE: The project scope is designed to Incorporate Intelligent Transportation Programs (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 Systems (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/Regional Architectures and related ITS standards.

ACCOMPLISHMENTS DURING FFY 2015: Program accomplishments were not accomplished through the SPR program. This program is currently being administered by the ITS Branch of the Maintenance Division.

PROPOSED ACTIVITIES FOR FFY 2016: This program is currently being administered by the ITS Branch of the Oklahoma Department of Transportation Maintenance Division.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	$-0-	SPR	-0-	STATE
Projected Cost FFY 2016	$-0-	SPR	-0-	STATE

CONTACT INFORMATION

Aruna Mathuranayagam, PE: Leidos, 405-607-6185

Alan Stevenson, PE: Assistant Maintenance Division Engineer, 405-522-2557

1904 Air Quality Planning

PURPOSE AND SCOPE: Monitor and participate in air quality transportation planning developments relating to requirements of the Clean Air Act Amendments and SAFETEA-LU. Represent the Department in air quality nonattainment and transportation conformity actions. Analyze and comment on air quality nonattainment and transportation regulations and laws. 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 2015: Participated in the air quality/transportation planning activities of 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. 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 modeling 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.

PROPOSED ACTIVITIES FOR FFY 2016: Maintain research and participation in air quality/transportation issues, developments, regulations and laws. Assist in providing data for air quality modeling 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 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 modeling outside of the study areas to establish base data for air quality issues in rural/donut areas. Facilitate meetings of the Oklahoma Transportation Air Quality Work Group. Continue staff education through courses, seminars, and conferences.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$30,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$25,000	SPR	-0-	STATE
Projected Cost FFY 2016	$25,000	SPR	-0-	STATE

CONTACT INFORMATION

Laura Chaney: Transportation Manager I, 405-521-2705

1905 Freight Planning

PURPOSE AND SCOPE: To coordinate freight planning and freight data analysis with the Long Range Transportation Plan (LRTP), the Oklahoma Statewide Freight and Passenger Rail Plan, waterway freight planning reports, and project development processes. To ensure Oklahoma's freight planning efforts are in compliance with federal legislation.

ACCOMPLISHMENTS DURING FFY 2015: Considered impact of multimodal freight on the state transportation system as a part of the 2015-2040 Oklahoma Long Range Transportation Plan. Monitored federal rules in relation to proposed National Freight Network and freight planning. Prepared Freight Brochure explaining freight impact on economic and transportation goals of the state. Convened Freight Advisory Committee to assist with development of LRTP.

PROPOSED ACTIVITIES FOR FFY 2016: Continue review of proposed federal regulations. In particular, monitor federal rules in relation to proposed National Freight Network including national freight program goals, national highway freight network, primary highway freight system and national freight strategic plan. Consider development of State Freight Plan. Continue communication and analysis regarding freight analysis framework (FAF) data, freight and freight congestion performance measures, national performance measures roadway data set, and urban and rural urban freight transport.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$25,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$25,000	SPR	-0-	STATE
Projected Cost FFY 2016	$53,000	SPR	-0-	STATE

CONTACT INFORMATION

Linda Koenig: Planning and Policy Analyst, 405-522-0171

1910 Public Participation and Visualization Techniques

PURPOSE AND SCOPE: The project scope is designed to develop and maintain a Public Participation Plan (PPP) that would encourage full public participation in the transportation planning and programming process, including, but not limited to; the Statewide Transportation Improvement Program (STIP), the Long Range Transportation Plan (LRTP) and the National Environmental Policy Act (NEPA) process.

ACCOMPLISHMENTS DURING FFY 2015: The PPP held several Public Meetings this year throughout the state. These meetings included big projects like the I-35/I-240 Interchange, the LRTP, and the STIP. These public meetings implemented the use of several Visualization Techniques, including, but not limited to: 3-D Design and Projection, Video, Animation, High-Resolution Graphics, Automated Presentations, and new commenting techniques. The current ODOT Public Involvement web site was updated and improved in several locations

PROPOSED ACTIVITIES FOR FFY 2016: The PPP will continue to provide Public Involvement for any and all Construction Projects, Planning Projects, Division needs, and Environmental needs. This includes special outreach to non-metropolitan public officials as well as the traditionally underserved and those with limited English proficiency. We currently propose the use of new techniques for public outreach and public involvement to better suit the needs of the project manager as well as the project information. This also includes the development and improvement of our presentation and visualization processes and techniques, alternative venues, a more robust email blast system, and better commenting systems. We also plan to provide visualization of proposed projects as well as proposed and existing conditions for presentation to the public and other agencies at public and stakeholder meetings for the planning processes. We currently project greater needs for translation services in FFU 2016.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$200,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$195,000	SPR	-0-	STATE
Projected Cost FFY 2016	$200,000	SPR	-0-	STATE

CONTACT INFORMATION

Frank V. Roesler III: Transportation Manager I, (405) 521-2350

1912 DBE Database Software

PURPOSE AND SCOPE: The Oklahoma Department of Transportation (ODOT) is requesting proposals for a software program that is capable of managing various programs within the Civil Rights Division. The desired software program should be a 100 percent web-based solution. The software will need to be an online program that has the capability to store high levels of Federal contract data, track progress on contracts and generate various reports.

ACCOMPLISHMENTS DURING FFY 2015: The purchase of Disadvantaged Business (DBE) database software.

PROPOSED ACTIVITIES FOR FFY 2016: Manage data collection and verify contract payment information on all Federal contracts. This includes all aspects of a contract. Collect, track, and report DBE participation, goals, and utilization on Federal projects. Maintain software licenses, maintenance, and upgrades.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$75,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$70,000	SPR	-0-	STATE
Projected Cost FFY 2016	$100,000	SPR	-0-	STATE

CONTACT INFORMATION

Andy Penney: Civil Rights Project Manager, 405-522-3174

Jenny Chong: Civil Rights Assistant Project Manager, 405-521-2072

Langston Transportation Center: Project Sponsor

1913 Bicycle and Pedestrian Planning

PURPOSE AND SCOPE: To coordinate and develop a bicycle and pedestrian program for the state of Oklahoma in compliance with the provisions of existing federal regulations and MAP-21 provisions and all applicable transportation planning regulations and requirements in compliance with the FHWA, FTA, the four Metropolitan Planning Organizations (ACOG, INCOG, LMPO, and Frontier MPO), and non-metropolitan areas.

ACCOMPLISHMENTS DURING FFY 2015: Accomplishments include: Attended seminars and workshops related to bicycle and pedestrian transportation planning and policies in order to maintain, upgrade, and develop needed experience and expertise; attended public meetings to field and answer questions from staff and citizens; monitored state legislation regarding bicyclists and pedestrians; participated in the bicycle and pedestrian transportation planning activities of Lawton, Frontier, ACOG, and INCOG MPO; researched bicycle and pedestrian safety, education, and infrastructure; assisted department personnel with bicycle and pedestrian related questions; shared training opportunities, information, and guidance to department personnel; made connections with various outside entities to further bicycle and pedestrian initiatives, education, user safety and awareness; provided an opportunity for staff to participate in Bike To Work Day and offered safety instruction; created a Statewide Bicycle and Pedestrian committee to further the intentions of this position while working closely with Oklahoma MPOs and state departments.

PROPOSED ACTIVITIES FOR FFY 2016: Research and participate in bicycle and pedestrian issues, developments, regulations and laws. Develop education materials and resources for Department personnel regarding bicycle and pedestrian transportation. Attend bicycle and pedestrian transportation planning activities of the Lawton, ACOG, and INCOG MPO. Participate in bicycle and pedestrian transportation planning initiatives and educational programs across the state. Enhance staff education through courses, seminars, trainings, and conferences hosted by FHWA, LTAP, and others.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$40,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$40,000	SPR	-0-	STATE
Projected Cost FFY 2016	$45,000	SPR	-0-	STATE

CONTACT INFORMATION

Laura Chaney: Transportation Manager I, 405-521-2705

1914 Transportation Asset Management Plan

PURPOSE AND SCOPE: The project purpose is to develop, maintain and enhance a transportation asset management plan (TAMP) for the Oklahoma Department of Transportation. The TAMP is a federal requirement identified in MAP-21. The TAMP will incorporate many working areas covering target areas of maintenance, construction, financials, inventory and performance data, and programming. Agency personnel will support this effort through membership on the TAMP Steering Committee, the TAMP Working Group, TAMP Task Forces, and through requested assistance with various needs required by these committees. The TAMP will meet requirements of the CFR, which is still in development.

ACCOMPLISHMENTS DURING FFY 2015: This is a new project, initiated with the FFY 2016 SPR Program.

PROPOSED ACTIVITIES FOR FFY 2016: The noted committees will be formalized and approved by ODOT leadership. The TAMP framework will be published. Initial meetings will be held toward developing project focus and targets for the committees. The rulemaking process in being monitored and final rules will guide the focus points. ODOT staff identified in supporting the TAMP will participate in various activities as they are available including webinars, conferences, and scanning tours. The rulemaking process related to performance measures will also be monitored as a primary influencing factor the TAMP.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	$100,000	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Terri Holley, TAMP Coordinator, 405-521-22694

Project Sponsor: David Ooten, SAPM Division Engineer, 405-521-2704

SP&R Part 2 Financial Summary Sheet

SPR PART 2 - RESEARCH, SPRY-0010(64)RS, JP# 01946(66)
FEDERAL FISCAL YEAR 2016

		SPR	***STATE***	***LOCAL***	***TOTAL***
GENERAL ACTIVITIES					
2100	Transportation Research Board (TRB)	$15,000.00			$15,000.00
2115	Long Term Pavement Performance (LTPP)	$45,000.00			$45,000.00
2120	Technical Assistance - Special Studies	$140,000.00			$140,000.00
2130	General Research Activities	$502,764.00			$502,764.00
2160B	Southern Plains Transportation Center (SPTC)	$1,000,168.00			$1,000,168.00
2160C	Southern Plains Transportation Center (SPTC) Manage ODOT Transp. Library	$178,693.00			$178,693.00
2300	Research Implementation	$548,059.00			$548,059.00
2700	Experimental Product Evaluation Program	$45,000.00			$45,000.00
	TOTAL GENERAL ACTIVITIES	**$2,474,684.00**			**$2,474,684.00**
ANNUAL RESEARCH PROJECTS					
2156	Roadside Vegetation Management Training & Consultation	$165,762.00			$165,762.00
2157	Roadside Vegetation Management Research	$59,269.00			$59,269.00
	TOTAL ANNUAL RESEARCH PROGRAMS	**$225,031.00**			**$225,031.00**
CONTINUING RESEARCH PROJECTS					
2208	Development and Implementation of an MEPDG for Rigid Pavements - Phase 3	$96,685.00			$96,685.00
2228	Overturning Forces at Bridge Abutments - Phase 3	$51,941.00			$51,941.00
2243	Recommended Fatigue Test for Oklahoma DOT	$74,820.00			$74,820.00
2252	Develop. of Inexpensive Vehicle Sensor Node System - Phase 3	$87,966.00			$87,966.00
2256	Understanding the Behavior of Prestressed Concrete Girders	$99,996.00			$99,996.00
2260	Shrinkage Induced Deformations in Steel Bridges - Phase 2	$100,000.00			$100,000.00
2262	Feasibility Study of GRS Systems for Bridge Abutments in Oklahoma	$89,190.00			$89,190.00
2265	Precast Prestressed Concrete Pavement to Abate Settlement Problems	$99,955.00			$99,955.00
2266	The Use of Resistivity Testing for Quality Control of Concrete Mixtures	$88,908.00			$88,908.00
2268	Use of a Novel Controlled Release Surface Curing Agent for Bridge Decks	$94,378.00			$94,378.00
	TOTAL CONTINUING RESEARCH PROJECTS	**$883,839.00**			**$883,839.00**
NEW RESEARCH PROJECTS					
2272	Performance of Moisture Barriers to Enhance Pvmt Performance Over Swelling Soils	$89,812.00			$89,812.00
2273	Development of Guidelines for Selection and Evaluation of Tack Coats in Oklahoma	$82,087.00			$82,087.00
2274	Development of Concrete Mixtures to Mitigate Bridge Deck Cracking	$99,997.00			$99,997.00
2275	Dev. of Aggr. Char-Based Prev Maint using 3D Laser/AIMS Tech for Opt Skid Resist	$99,094.00			$99,094.00
	TOTAL NEW RESEARCH PROJECTS	**$370,990.00**			**$370,990.00**
	GRAND TOTAL SPRY-0010(64)RS	**$3,954,544.00**			**$3,954,544.00**
POOLED FUND STUDIES					
TPF-F(408)	NCHRP	$663,972.00			$663,972.00
TPF-5(328)	Sensors (Prev Solic 1372)	$25,000.00			$25,000.00
TPF-5(313)	Technology Transfer Concrete Consortium (TTCC) (prev Solic 1363)	$12,000.00			$12,000.00
TPF-5(312)	Western Maintenance Partnership	$5,000.00			$5,000.00
TPF-5(297)	Improving Specifications to Resist Frost Damage in Modern Concrete Mixtures	$17,500.00			$17,500.00
TPF-5(278)	Real-Time Quality Control Monitoring and Characterization of Aggregate Materials	$75,000.00			$75,000.00
TPF-5(267)	Acelerated Performance Testing for the NCAT Pavement test tracek (cont 3 yrs)	$360,000.00			$360,000.00
	Total Pooled Fund Projects	**$1,158,472.00**			**$1,158,472.00**
	Total Research Funding	**$5,113,016.00**			**$5,113,016.00**

ENDING RESEARCH PROJECTS			
2228	Overturning Forces at Bridge Abutments - Phase 2	$0.00	$0.00
2229	Expected Life of Silanes - Phase 2	$0.00	$0.00
2252	Develop. of Inexpensive Vehicle Sensor Node System - Phase 2	$0.00	$0.00
2253	Investigation of Optimized Graded Concrete for Oklahoma - Phase 2	$0.00	$0.00
2258	Evaluate Densifier-Over-Shotblasting (DOS) Treatment Performance	$0.00	$0.00
2261	Selection of Long Lasting Rehab. Treatment using Life Cycle Cost Analysis	$0.00	$0.00
2269	Development of Alternative High Friction Surfaces for Oklahoma (NCAT)	$0.00	$0.00
2270	Development of an Asphalt Pavement Test Facility at the OSU UAV Facility	$0.00	$0.00
2271	Comparative Assess. of Current Gross & Axle Truck Weight & Permit Laws in the US	$0.00	$0.00
RECENTLY COMPLETED RESEARCH PROJECTS			
2160	SPTC - Interpretation of In Situ Tests as Affected by Soil Suction	$0.00	$0.00
2160	SPTC - The Effects of Soil Suction on Shallow Slope Stability	$0.00	$0.00
2160	SPTC - Prototype Reinforced Soil Embankment for Reconstruction of US-62 Slope	$0.00	$0.00
2200	Instrumented Pavement Construction - Phase 2	$0.00	$0.00
2208	Development and Implementation of an MEPDG for Rigid Pavements - Phase 2	$0.00	$0.00
2240	Portable WIM for Pavement Design - Phase 2	$0.00	$0.00
2245	Fatigue Performance of Asphalt Pavements Containing RAS and RAP	$0.00	$0.00
2246	Eval. of Perf. of Asphalt Pavements Using Intelligent Compaction	$0.00	$0.00
2248	Creep Compl. and Percent Recovery of Oklahoma Certified Binders Using MSCR	$0.00	$0.00
2249	Black Ice Detection and Road Closure Control System for Oklahoma	$0.00	$0.00
2250	The Study of Vehicle Classif. Equip. with Solutions to Improve Accuracy - Phase 2	$0.00	$0.00
2251	3D Laser Imaging for ODOT Interstate Network at True 1-mm Resolution	$0.00	$0.00
2252	Develop. of Inexpensive Vehicle Sensor Node System - Phase 1	$0.00	$0.00
2254	Energy Dissipation in 30' Broken-back Culverts Using Laboratory Models	$0.00	$0.00
2255	Regional Economic Impact Study for the MKARNS	$0.00	$0.00
2257	Understand. A + B Bidding Patterns and Policy Implications for ODOT Proj. Lettings	$0.00	$0.00
2259	Development of a Prototype Geotechnical Report Database	$0.00	$0.00
2260	Shrinkage Induced Deformations in Steel Bridges - Phase 1	$0.00	$0.00
2263	The Use of On-Board CNG as a Locomotive Fuel - Phase 3	$0.00	$0.00
ACTIVE AND PAID POOLED FUND STUDIES			
TPF-5(317)	Evaluation of Low Cost Safety Improvements (No New OK Commitments)	0.00	0.00
TPF-5(286)	Next Generation Concrete Pavement Road Map (canceled last 2 commitments)	0.00	0.00
TPF-5(255)	Highway Safety Manual Implementation	0.00	0.00
TPF-5(231)	ITS Pooled Fund Program (ENTERPRISE)	0.00	0.00
PAID AND ENDED IN 2015 POOLED FUND STUDIES			
TPF-5(275)	2014 Asset Management Conference and Training on Implementation Strategies	$0.00	$0.00
TPF-5(269)	Development of an Improved Design Procedure for Un-bonded Concrete Overlays	$0.00	$0.00
TPF-5(256)	HY-12 Storm Drain Hydraulic Analysis Program - Phase Two of Development Efforts	$0.00	$0.00
TPF-5(243)	Motorcycle Crash Causation Study	$0.00	$0.00
TPF-5(229)	Characterization of Drainage Layer Properties for MEPDG	$0.00	$0.00
TPF-5(205)	Implementation of Concrete Pavement Mixture Design and Analysis (MDA)	$0.00	$0.00
TPF-5(187)	Updating U.S. Precipitation Frequency Estimates for the Midwestern Region	$0.00	$0.00

2100 Transportation Research Board (TRB) Core Program

PURPOSE AND SCOPE: This item will cover TRB subscription costs, travel expenses and time for ODOT personnel to attend the annual TRB meeting.

ACCOMPLISHMENTS DURING FFY 2015: Attended annual TRB meeting.

PROPOSED ACTIVITIES FOR FFY 2016: Attend annual TRB meeting.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$10,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$10,000	SPR	-0-	STATE
Projected Cost FFY 2016	$15,000	SPR	-0-	STATE

CONTACT INFORMATION

Materials and Research Div. Engineer: Scott Seiter, 405-521-2677

2115 Long Term Pavement Performance (LTPP)

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 ODOT. Maintain working knowledge related to SHRP product implementation, act as general liaison between FHWA and ODOT for product implementation activities.

ACCOMPLISHMENTS DURING FFY 2015: Performed annual site investigations, recorded observations, and reported findings; monitored rehabilitation activities at one location: A Mill and Overlay project at the 4001 sections, US-62 East Bound, Comanche County, near Cache, in June 2014; applied new pavement markings to the rehabilitated sites; completed the nomination process for new Warm Mix Asphalt experiment and a site was selected on SH-66 in Canadian County between Yukon and El Reno; the SRCO and the Oklahoma LTPP Coordinator conducted preliminary testing for the new experiment, construction should begin in late July or August 2015; executed a contract with OSU to utilize 3D Laser Imaging technology to perform data collection and evaluation of pavement surface characteristics and performance using 1mm 3D technology and other instrumentation to further understand the short-term and long-term performance of WMA.

PROPOSED ACTIVITIES FOR FFY 2016: Facilitate any further implementation of the new Warm Mix Asphalt experiment; install new pavement markings and ID signs after construction is completed; perform annual site investigations, record observations, and report findings; obtain information from the SRCO for specific continued data collection; arrange for continued testing and monitoring of current SPS and GPS site locations in Oklahoma in FFY 2016.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$5,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$5,000	SPR	-0-	STATE
Projected Cost FFY 2016	$45,000	SPR	-0-	STATE

CONTACT INFORMATION

ODOT LTPP Coordinator: Bryan Cooper, 405-736-9475

2120 Technical Assistance Special Studies

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

ACCOMPLISHMENTS DURING FFY 2015: Provided support for the Department with assistance and equipment in special investigations, and other activities where needed; deployed the pipe inspection equipment to a construction project on US-412 in Major County where a cave was discovered in the shoulder area during some excavation. Were able to feed a small camera to a depth of about 30 feet into the cave system; performed a pipe inspection on SH-3 in Atoka County on July 1, 2015; continued to collect other still photographs for various in-house and SP&R research projects and monitored Every Day Counts related issues such as the Accelerated Bridge Construction (Slide-In Bridge) on SH-51 over Cottonwood Creek, Creek County, since the slide was delayed due to bird habitation; monitored the High Friction Surface Treatment Demonstration on SH-20 in Mayes County; observed the installation of the 3D Crosswalk for ODOT's Traffic Division on US-62B, Kiowa County in Snyder; conducted two six week sessions of monitoring traffic behavior and recording video and speed; evaluated two Centerline Rumble Strip projects in Marshall and Kay County for deterioration for Traffic Division; continued to consult with ODOT staff to address situations where further technical support may be needed.

PROPOSED ACTIVITIES FOR FFY 2016: Continue monitoring and collecting data on the 3D Crosswalk project, for one more 6 week session; observe and monitor performance of the existing HFST site in Mayes County and the new sites to be constructed on I-40 and I-44 in Oklahoma City and another site on SH-20 in Mayes County, utilizing mine chat; continue to provide support for the Department with assistance and equipment in special investigations, storm drain inspections, pavement testing, traffic control and any other activities or services as requested; acquire, calibrate, test and/or compare new equipment or instruments to existing equipment or instruments where necessary.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$95,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$90,000	SPR	-0-	STATE
Projected Cost FFY 2016	$140,000	SPR	-0-	STATE

CONTACT INFORMATION

ODOT Field Research Manager: 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; preparing new and continuing research contracts and contract modifications; research project management; maintaining electronic research project records, i.e., project progress, invoicing, contractual deadlines; reviewing final 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 SP&R 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.

ACCOMPLISHMENTS DURING FFY 2015: Solicited ODOT subject matter experts, Field Division personnel, university and private industry staff for new research ideas and problem statements for possible FFY 2016 research project funding; coordinated and carried out the Research Steering Committee (RSC) meeting; received and compiled 31 new research problem statements; reviewed 17 new research ideas and/or problem statements for priority ranking; generated and posted 5 FFY 2016 Request for Proposals (RFP's) for research proposal submissions; reviewed 17 new research proposals submitted for possible FFY 2016 project funding; discussed proposed project work with researchers and ODOT subject matter experts; awarded and prepared 2 general research contracts for FFY 2016; awarded and prepared 2 annual research contracts for FFY 2016; awarded and prepared 9 continuing research contracts for FFY 2016; awarded and prepared 4 new research contracts for FFY 2016; approved and prepared 4 no cost time extension (NCTE) contract modifications for FFY 2015; organized initiation and final project meetings; performed technical reviews of final research project reports for formatting and ADA compliance; prepared Part 2 of the FFY 2016 SP&R Work Program.

PROPOSED ACTIVITIES FOR FFY 2016: Solicit for new research ideas for possible FFY 2017 research project funding; coordinate RSC meeting for review of new FFY 2017 research ideas and proposals; generate and post FFY 2017 RFP's; generate FFY 2017 research project contracts and contract modifications; organize initiation and final project meetings; coordinate and assemble research implementation task forces and committees; facilitate project implementation plans and direction; continue to perform technical review of final research project reports for required formatting and ADA compliance; make funds available for various research contracts/activities which may not be foreseen while the FFY 2016 SP&R Work Plan and budget is being prepared; prepare Part 2 of the FFY 2017 SP&R Work Program.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$402,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$400,000	SPR	-0-	STATE
Projected Cost FFY 2016	$502,764	SPR	-0-	STATE

CONTACT INFORMATION

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

2156 Roadside Vegetation Management (RVM) Training & Consultation

PURPOSE AND SCOPE: This training and consultation initiative is designed to meet the roadside vegetation management (RVM) needs of ODOT and builds upon the previous 29 years of RVM training offered by OSU to ODOT. This service and its tasks have been designed based upon knowledge of and being observant of Federal and State Pesticide Laws and Regulations, communications and feedback from ODOT field and headquarters staff, observing areas of continued consultation needs by networking with RVM industry professionals.

ACCOMPLISHMENTS DURING FFY 2015: Conducted and completed Annual Pesticide Applicator Certified Training and Continuing Education Applicator Workshops for all ODOT field divisions and continued to maintain 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 AHAL; assisted ODOT in Statewide Herbicide Contract review; attended the Oklahoma Vegetation Management Association "National Southern Weeds Science" conference and the "National Roadside Vegetation Management Association" conference and included findings in Certified Training and Continuing Education Applicator Workshops; produced project progress reports; completed and produced FFY 2014 annual research reports; FFY 2015 annual report submissions are pending.

PROPOSED ACTIVITIES FOR FFY 2016: Deliver 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; coordinate Herbicide Application and Equipment Calibration Workshops for new employees; assist ODOT in updating the Approved Herbicides and Adjuvants List (AHAL); assist with AHAL contract review; perform survey and review all ODOT field divisions herbicide program and prepare and submit annual report; prepare and submit RVM Technology Report; attend two national annual conferences; produce project progress reports; produce FFY 2016 annual reports.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 1)	$165,036	SPR	-0-	STATE
Estimated Cost FFY 2015	$165,000	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 1)	$165,762	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Dennis Martin, Oklahoma State University, 405-744-5419

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Luis Malave, ODOT Maintenance Division, 405-521-2557

2157 Herbicide Research Program

PURPOSE AND SCOPE: A progressive Roadside Vegetation Management (RVM) program integrates proper vegetation selection, establishment and maintenance. Placing a well-adapted native or introduced species of vegetation on the roadside is the foundation of a successful program but not the end of the required inputs for successful long term roadside beauty and stabilization. The maintenance portion of the RVM program involves a combination of decisions concerning to mow or not mow, specific mowing heights and frequency of mowing, herbicide use or avoidance for weed control in the specific vegetation system at hand. Mowing and herbicide use on roadsides replace fire and herbivore grazing found in rangeland or natural perennial grass ecosystems. Grazing and fire are not considered available management tools in roadside right of way at this time.

ACCOMPLISHMENTS DURING FFY 2015: Completed evaluations of new and generic herbicide formulations for integration into the ODOT RVM program and implemented findings in winter training workshops, as well as, in the 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; produced project progress reports; completed and produced FFY 2014 Annual Report; FFY 2015 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to perform evaluations of new and generic herbicide formulations and combinations for roadside and cable barrier management and implement findings in winter training workshops; perform evaluation of tank mix compatibility of adjuvants and herbicides and included findings into the AHAL; perform evaluation of herbicide tolerance of new candidate roadside bermudagrass varieties; perform evaluation of select roadside areas containing natural milkweed populations for monarch butterfly utility; produce project progress reports; produce FFY 2016 Annual Reports.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 1)	$59,457	SPR	-0-	STATE
Estimated Cost FFY 2015	$59,400	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 1)	$59,269	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Dennis Martin, Oklahoma State University, 405-744-5419

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Luis Malave, ODOT Maintenance Division, 405-521-2557

2160 Southern Plains Transportation Center (SPTC) Joint Project Management

PURPOSE AND SCOPE: The purpose of this item is for the SPTC to coordinate and contract research activities covering various topics in a mix of research projects on behalf of ODOT with provided matching funds to the SPTC.

ACCOMPLISHMENTS DURING FFY 2015: Submitted 1 of 3 Final Reports; remaining 2 Final Reports are in progress and pending submission.

PROPOSED ACTIVITIES FOR FFY 2016: End of projects.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

SPTC Director: Musharraf Zaman, 405-325-2626

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

2160B Southern Plains Transportation Center (SPTC)

PURPOSE AND SCOPE: The Research and Innovative Technology Administration (RITA) of the U.S. Department of Transportation recently announced the results of the competition for the University Transportation Center (UTC) program for FY 2013 and 2014 MAP-21 funds. In that announcement, the Southern Plains Transportation Center (SPTC) was designated as the Region 6 UTC. The SPTC consortium consists of eight academic institutions from Region 6, namely The University of Oklahoma (OU; Consortium Lead), Oklahoma State University (OSU), Langston University (LU), University of Arkansas (UARK), The University of New Mexico (UNM), Louisiana Tech University (LTU), The University of Texas at El Paso (UTEP), and Texas Tech University (TTU). Two international universities will also collaborate with the consortium: Indian Institute of Technology – Bombay, Mumbai, India, and Shandong University, Jinan, China. ODOT played a pivotal role in making the SPTC a reality. In addition to supporting the SPTC Proposal Team in identifying potential research topics that led to selecting "Climate-adaptive freight and transportation infrastructure" as the SPTC theme, ODOT's financial commitment to support key SPTC activities was extremely important to this success. The two complementary goals of the SPTC are: (i) to develop comprehensive, cost-effective and immediately implementable solutions to critical infrastructure-related issues facing the transportation system in Region 6 and the nation; and (ii) to prepare transportation professionals for leadership roles in professional and research careers in support of the nation's transportation systems.

ACCOMPLISHMENTS DURING FFY 2015: Provided extensive literature reviews as requested; selected proposals submitted in response to SPTC's Request for Proposal SPTC 14.2; conducted research through the SPTC Work Program which addresses ODOT's transportation research needs; supplied matching funds for other SPTC activities: workforce development, outreach, Center support, experiential learning, workforce symposium, student competition, student internship, communications, and technology transfer; submitted FFY 2014 Annual Report; FFY 2015 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to provide essential literature reviews when requested; select proposals submitted in response to SPTC's Request for Proposals; conduct research through the SPTC Work Program which addresses ODOT's transportation research needs; continue to supply matching funds for other SPTC activities: workforce development, outreach, center support, experiential learning, workforce symposium, student competition, student internship, communications, and technology transfer; prepare and submit FFY 2016 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$1,000,168	SPR	-0-	STATE
Estimated Cost FFY 2015	$1,000,168	SPR	-0-	STATE
Projected Cost FFY 2016	$1,000,168	SPR	-0-	STATE

CONTACT INFORMATION

SPTC Director: Musharraf Zaman, 405-325-2626

Director of Capital Programs: John R. Bowman, 405-522-6000

2160C Southern Plains Transportation Center (SPTC)
Management of the ODOT Transportation Library

PURPOSE AND SCOPE: The Oklahoma Department of Transportation (ODOT) wishes to maintain and operate a sound, progressive, and flexible transportation library, which is available to ODOT, local, regional and national users. The goal is to keep ODOT staff and their stakeholders informed of recent developments and innovations in transportation technologies, methodologies and programs. A complementary goal is to increase operational efficiency and reduce cost. With the WKTN membership in place, the library seeks to integrate with other transportation libraries nationally while moving toward digital contents and an Internet-based service system.

ACCOMPLISHMENTS DURING FFY 2015: Conducted audit of past accomplishments of the library; joined the Western Transportation Knowledge Network (WTKN) of Libraries; coordinated printing of ODOT reports and other pertinent documents with outside vendors of ODOT's choice; used the EOS System to complete the cataloging process; conducted literature and database searches; provided traditional services such as maintaining records and using a tracking system for borrowed materials; formed a Library Advisory Committee; produced project progress reports; submitted FFY 2014 Annual Report; FFY 2015 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Conduct resource inventory; integrate with Western Transportation Knowledge Network (WTKN) of Libraries; serve as a transportation clearinghouse; coordinate printing, binding and distribution services; provide electronic access to ODOT SP&R research project final reports; complete cataloging process; conduct literature search related services; provide traditional library services; develop an online presence; provide additional services such as pick-up and delivery of library materials; produce project progress reports; prepare and submit FFY 2016 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$149,803	SPR	-0-	STATE
Estimated Cost FFY 2015	$149,800	SPR	-0-	STATE
Projected Cost FFY 2016	$178,693	SPR	-0-	STATE

CONTACT INFORMATION

SPTC Director: Musharraf Zaman, 405-325-2626

Project Sponsor: Ron Curb, ODOT Research Engineering Manager II, 405-522-3795

2200 Instrumented Pavement Construction - Phase 2

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 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: 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 - Phase 3

PURPOSE AND SCOPE: The Mechanistic-Empirical Pavement Design Guide (MEPDG) is the new pavement design guide released by the American Association of State Highway and Transportation Officials (AASHTO). AASHTO suggests each state highway agency validates and, if necessary, calibrates the MEPDG design models based on local conditions. ODOT is currently under the process of accepting the MEPDG to replace the 1993 design guide. In the first two phases of this project, a comprehensive research work has been carried out which involved laboratory tests, road section instrumentation and sensitivity analysis. The research revealed valuable information regarding local climate data, concrete material properties, and the performance data of Oklahoma rigid pavements. In view of other states' experience, Oklahoma extended the SP&R 2208 project to a Phase 3 that focuses on the local validation/calibration of the MEPDG for Oklahoma rigid pavements and also addresses the uncertainty in the slab/base friction property. The primary objective of Phase 3 is to validate and calibrate the MEPDG for the design of typical Oklahoma rigid pavements. The secondary objectives of the proposed research are (1) to continue to monitor the field performance of the instrumented road section on I-44 and (2) to investigate the slab/base friction property of typical Oklahoma rigid pavement structures.

ACCOMPLISHMENTS DURING FFY 2015: Collected information and selected new road sections from the Oklahoma LTPP and PMS databases; started defining input strategies; continued to monitor the I-44 road section in Tulsa, OK; started local calibration of the MEPDG; produced project progress reports; submitted Phase 2 Final Report; FFY 2015 Phase 3 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to determine input strategies; continue to monitor the I-44 road section in Tulsa, OK.; continue to perform local calibration of the MEPDG; perform a cost benefit analysis comparing calibrated MEPDG, default MEPDG and the 1993 design guide; develop design examples and a materials database file; produce project progress reports; prepare and submit Phase 3 Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 2)	$94,915	SPR	-0-	STATE
Estimated Cost FFY 2015	$94,900	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 2 of 2)	$96,685	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Xiaoming Yang, Oklahoma State University, 405-744-5257

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2228 Overturning Forces at Bridge Abutments and the Interaction of Horizontal Forces from Adjacent Roadways - Phase 2

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, 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. Where Phase 2 addressed additional instrumentation, pre and post-repair monitoring, evaluation and recommendations, Phase 3 will address work related to removing sensors out of the way to accommodate ODOT repairs to the SH-3 north and 19th Street bridges, post repair monitoring of instruments, data analysis and recommendations. Pre- and post repair monitoring of the instruments will provide ODOT valuable information regarding the repairs carried out at these bridges. This will provide ODOT with an opportunity to monitor the behavior of a bridge before and after repairs to understand the effects of the repairs and therefore perform future repairs effectively. Ultimately, repair guidelines for bridges with similar distresses will be developed based on the results of this study.

ACCOMPLISHMENTS DURING FFY 2015: **Phase 2** - Continued to monitor all installed instrumentation before and after repairs; analyzed the results and evaluated the effectiveness of the repairs to the SH-3 North Bridge; produced project progress reports; submitted FFY 2014 Phase 1 Annual Report; FFY 2015 Phase 2 Annual Report submission is pending. ODOT has approved a 2 year extension for this project as Phase 3 in FFY 2016 for continued project operations in addition to new project work activities as a result of research findings and the completion of the final report.

PROPOSED ACTIVITIES FOR FFY 2016: **Phase 3** - continue to monitor all unremoved instrumentation; remove and reinstall instrumentation on Sh-3 and 19th Street bridges where necessary; provided input on proposed location of pressure relief joints; monitor instruments before and after construction; perform data analysis; produce project progress reports; prepare and submit FFY 2016 Phase 3 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 2)	$52,135	SPR	-0-	STATE
Estimated Cost FFY 2015	$52,100	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 2)	$51,941	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2229 Expected Life of Silane Water Repellant Treatments on Bridge Decks - Phase 2

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. As part of Phase 2 the research team plans to continue to answer questions raised in Phase 1 of the testing while investigating a new sealer that ODOT plans on using on several critical bridge structures in high traffic areas. The examination methods established in the previous project will provide a suite of useful tools to evaluate these new products. This research is timely and will help ODOT to make sound investments in the long term performance of their bridges. This research has the potential to greatly extend the service life of these bridges and therefore could likely save the state of Oklahoma millions of dollars.

ACCOMPLISHMENTS DURING FFY 2015: Completed investigation of new silane treatment coating system; continued inspections of additional In-Service silane coated bridge decks; completed investigations of long-lasting silane coatings service life; produced project progress reports; submitted FFY 2014 Annual Report; Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: None.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 2)	$75,259	SPR	-0-	STATE
Estimated Cost FFY 2015	$75,200	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Tyler Ley, Oklahoma State University, 405-744-5257

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2240 Portable Weigh-In-Motion (WIM) for Pavement Design - Phase 2

PURPOSE AND SCOPE: Keeping the public's roads, highways and bridges in good condition is not only vital to safety, economical productivity and success, but also necessary to save billions of dollars used for road repair and replacement each year. Road deterioration depends on many factors: road characteristics (pavement materials and thickness); weather conditions (temperature cycles and precipitation); and dynamic interaction between vehicle and road (speed, suspension characteristics, and surface roughness), in addition to loads distinguished by axles spacing, tire pressure, and weight per axle. Of these, vehicle axle weight proves to be the factor that most extremely increases road wear. Therefore, both appropriately weighted and overweight trucks are chiefly responsible for the rapid deterioration of roads. Reducing the average weight of truck axles would substantially reduce the rate of pavement wear. Analyzing historical WIM data collected by ODOT to aid in the improvement of pavement design, and collecting weight data at strategic temporary sites using the OTC funded portable system could accomplish this.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Daryl Johnson, ODOT Traffic Analyst Engineer, 405-52-6376

2243 Recommended Fatigue Test for ODOT

PURPOSE AND SCOPE: Fatigue cracking and rutting are two dominant distresses in flexible pavements. Oklahoma Department of Transportation (ODOT) currently evaluates the rutting potential of asphalt mixes through the Hamburg rut test in accordance to OHD L-55, which is similar to AASHTO T324. However, no standard test procedure is currently available to ODOT for screening of mixes for fatigue resistance, which is extremely important for quality control and quality assurance of flexible pavements. The proposed study will investigate selected test methods and procedures to measure fatigue resistance or fatigue life of different types of asphalt mixes. Mechanistic frameworks, namely dissipated energy, fracture mechanics, and viscoelastic continuum damage, will be utilized to analyze the data, as appropriate. The variability and repeatability of each test method will be evaluated statistically. The results from this study will lead to test methods/protocols and the associated equipment will be recommended that can be used by ODOT for screening of asphalt mixes for their fatigue resistance during the mix design phase.

ACCOMPLISHMENTS DURING FFY 2015: Continued literature review; selected, collected and performed laboratory testing of WMA from plant with chemical additive; continued laboratory testing of asphalt mixes; continued to prepare cylindrical samples for testing and analysis; continued analysis of data; continued to compare test results and rank asphalt mixes; continued to perform analysis of repeatability and variability of selected test methods; initiated comparison of equipment test results; developed test protocol and method for equipment purchased for ODOT; collected and prepared SGC cylinders from designed mixes; prepared SGC cylinders from field mixes; collected cores from field; prepared SCB specimens for fatigue testing; performed AMPT test on all SCB specimens; conducted a SCB and CDT tests and Dynamic Modulus demonstration session; produced project progress reports; submitted FFY 2014 Annual Report; FFY 2015 Annual Report submission is pending.

ODOT has approved a 1 year extension for this project for FFY 2016 for continued project operations, as well as, the inclusion of a new Long Term Pavement Performance (LTPP) section study on SH-66 west of Yukon, OK. in Canadian County.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to collect and prepare SGC cylinders from designed mixes; continue to prepare SGC cylinders from field mixes; continue to prepare SCB specimens for fatigue testing; continue to perform AMPT test on all SCB specimens; perform statistical analysis of mechanistic characterization of fatigue between field and laboratory specimens; conduct fatigue test training workshop; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 3 of 4)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$99,900	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 4 of 4)	$74,820	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenneth Hobson, ODOT Bituminous Engineer, 405-521-2677

2245 Fatigue Performance of Asphalt Pavements Containing RAS and RAP

PURPOSE AND SCOPE: Recycled asphalt shingles (RAS) and reclaimed asphalt pavements (RAP) are increasingly used in hot mix asphalt (HMA) for environmental, economic and other reasons. Although previous studies have shown improved resistance to rutting and moisture damage, contradictory results have been reported on fatigue life and thermal cracking of pavements constructed with mixes containing RAS and RAP. Several states have specifications for design of mixes containing RAS and RAP, but such specifications are not yet developed by the Oklahoma Department of Transportation (ODOT). The proposed study seeks to evaluate the fatigue performance of HMA mixes containing RAS and RAP. The primary objectives of this study are: (i) to generate laboratory data on fatigue performance or fatigue life of HMA mixes containing RAS and RAP in Oklahoma; and (ii) to make recommendations on guidelines/special provisions for the design of HMA containing RAS and RAP.

ACCOMPLISHMENTS DURING FFY 2015: Completed Outreach and Technology Transfer Workshop; Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenneth Hobson, ODOT Bituminous Engineer, 405-521-2677

2246 Evaluation of Performance of Asphalt Pavements Constructed Using Intelligent Compaction Techniques

PURPOSE AND SCOPE: Improving the quality of asphalt pavements during construction can greatly enhance performance and longevity. Lack of adequate tools to determine the quality of compaction of the entire pavement in a non-destructive manner is a leading factor in the early deterioration of pavements. Tools that can estimate the quality in real-time can help avoid over/under-compaction during the construction process. Improved quality of the roads can minimize rutting, cracking and other forms of pavement distresses, while improving long-term performance of the pavement. Several original equipment manufacturers (OEMs) have proposed Intelligent Compaction (IC) as a means of achieving uniformity in the compaction of soil subgrades and asphalt pavements. Over the past nine years, the lead researchers of this proposal have developed the Intelligent Asphalt Compaction Analyzer (IACA) technology to estimate the density and stiffness (dynamic modulus, $|E^*|$) of an asphalt pavement during its construction. The technology has been extended to estimate the resilient modulus (M_R) of stabilized subgrades that form the base of asphalt pavements. Improvement in the quality obtained through the use of IACA during the construction of asphalt pavements, as well as the stabilized subgrades that form the base of these pavements, will be demonstrated and compared to conventional construction practices under this study.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Sesh Commuri, University of Oklahoma, 405-325-4302

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenneth Hobson, ODOT Bituminous Engineer, 405-521-2677

2248 Creep Compliance and Percent Recovery of Oklahoma Certified Binders Using the Multiple Stress Creep Recovery (MSCR) Method

PURPOSE AND SCOPE: To enhance the durability and strength of asphalt concrete (AC) pavements in order to sustain high traffic volume, coupled with heavier loads and extreme weather conditions, asphalt industries in the United States and around the world are increasingly using polymer-modified binders. The recently released Multi Stress Creep Recovery (MSCR) test (AASHTO TP 70) on short-term aged binders can better relate the predicted laboratory-based high temperature properties of asphalt binders (virgin and recovered) to actual rutting performance of in-service pavements. The objectives of this research are: (1) to evaluate the creep compliance and percent recovery of various asphalt binders used by the Oklahoma Department of Transportation (ODOT); and (2) to determine the feasibility of the adoption of the MSCR test by ODOT. If recommended, specific guidelines (MSCR letter grade and acceptable minimum percentage of elastic recovery) will be developed for use by ODOT. Furthermore, this study will evaluate binders recovered from reclaimed asphalt pavement (RAP) materials and assess the presence of polymer through the percent recovery of the MSCR test method.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenneth Hobson, ODOT Bituminous Engineer, 405-521-2677

2249 Black Ice Detection and Road Closure Control System for Oklahoma

PURPOSE AND SCOPE: Black ice is a thin coating of glazed ice on roadways or other transportation surfaces and has a similar appearance of a wet black pavement road. Black ice often forms during calm weather and is highly transparent and thus difficult to see. Black ice usually forms at night or early morning, first on bridges and overpasses, then on the roads as temperatures continue to drop. Black ice is especially hazardous and is a factor in many auto accidents, some of which are deadly, each year in Oklahoma and many other states. Unfortunately, the current static road-side warning signs (such as “Ice May Form on Bridge”) simply do not draw enough attention from drivers. Objectives of this study include, 1) the development of a decision support system (DSS) to predict and detect black ice formation and pin point dangerous road sections, 2) the development of an Oklahoma Black Ice Database and Black Ice Risk Index Prediction and 3) the development of a functionally competent and economically feasible sensing system for black-ice detection by using arrays of MEMS temperature and humidity sensors, together with existing road monitoring cameras.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Tieming Liu, Oklahoma State University, 405-744-9871

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Ron Curb, ODOT Research Engineering Manager II, 405-522-3795

2250 The Study of Vehicle Classification Equipment with Solutions to Improve Accuracy in Oklahoma - Phase 2

PURPOSE AND SCOPE: The Federal Highway Administration (FHWA) and Oklahoma Department of Transportation (ODOT) are unremittingly interested in ever-evolving vehicle classification systems. More accurate systems are essential for suitable roadway design and to ensure adequate capacity, surface durability, and commuter safety for all motorists. Proper Vehicle Classification is essential for proper roadway planning and design. Phase 2 of this study extensively examines vehicle misclassification made by ODOT AVC and WIM statewide systems and attempts to determine the causes for such errors. Among other benefits, the results of Phase 2 include improved vehicle classification, accurate traffic flows and vehicle type distribution data, enhanced roadway design and reduced construction costs and optimal algorithm (e.g., axle spacing) for statewide AVC and WIM deployments.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Daryl Johnson, ODOT Traffic Analyst Engineer, 405-522-6376

2251 3D Laser Imaging for ODOT Interstate Network at True 1-mm Resolution

PURPOSE AND SCOPE: Pavement data collection technologies have improved gradually in the last few decades. Particularly after steady investments in pavement profile measurements since the 1980's, roughness, rutting, and macro-texture data can be inexpensively obtained at acceptable accuracy levels. Due to sensor and computing limitations and inadequate research funding, the hardware and software necessary to automatically obtain pavement cracking and other distress data at acceptable precision and bias levels have not been realized. With 3D image data representing actual pavement surface at full-lane coverage, it is possible to create a true representation of pavement surface at 1mm resolution which in turn can be used as input data for various condition evaluations and safety analysis. Results of this research would result in documentation and technical procedure on using the collected 3D pavement data of an ODOT network and the provided analysis software programs. Pavement management at ODOT will have a virtual tool to examine pavement surface characteristics through the provided software solutions to fulfill both data needs at network level and project level.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Kelvin Wang, Oklahoma State University, 405-744-5189

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Matthew Swift, ODOT Pavement Management Engineer, 405-522-5904

2252 Development of Inexpensive Vehicle Sensor Node System for Volume, Turn Movement and Collision Avoidance - Phase 3

PURPOSE AND SCOPE: ODOT is responsible for collecting temporary vehicle counts from thousands of various locations throughout the state each year. As a continuance of Phase 2 of this study, the purpose of Phase 3 of this study is to develop and implement a non-intrusive, inexpensive, portable vehicular traffic monitoring system for temporary installment on the surface of highways, roadways, or roadsides. Sensor design is comprised of solid-state electronics for detecting, counting, and classifying vehicles while eliminating inherent limitations of systems fabricated with loops and hoses. Utilization of the proposed design can be extended to improve work zone safety by reducing installation time and providing real-time traffic monitoring. The system can be integrated with other networks, such as inter-vehicle communication and road-to-vehicle communication for enhancing traffic safety control at intersections.

ACCOMPLISHMENTS DURING FFY 2015: **Phase 2** - Developed embedded software code to collect vehicle magnetic signature; conducted testing of the developed system for implementation; developed Matlab codes for offline vehicle signatures data analysis; developed software code for real-time vehicle volume detection; developed software code for real-time vehicle speed calculation and length estimation; developed software code for real-time vehicle class identification; incorporated multiple magnetometer chips and developing diversity algorithms; developed software code for weather condition sensing; conducted field-testing and accuracy validation of the overall developed system; finalized and fabricated the final system including the enclosure; produced project progress reports; submitted FFY 2014 Phase 1 Annual Report; FFY 2015 Phase 2 Annual Report submission is pending. ODOT has approved a 1 year extension for this project as Phase 3 in FFY 2016 for continued project operations and the completion of the final report.

PROPOSED ACTIVITIES FOR FFY 2016: Phase 3 – Perform data collection for vehicle classification system development; develop algorithms for training set normalization and clustering; develop algorithms for feature extraction and dimensionality reduction; develop artificial neural network for vehicle classification; perform testing and optimizing vehicle classification system; develop software algorithms for automated deployment and system auto-configuration; develop a graphical user interface for real time system monitoring and data visualization; develop software code for energy-aware system operation and communication; develop software code for system recovery and over-air firmware upgrade; conduct field-testing and accuracy validation of the overall developed system; produce project progress reports; prepare and submit Phases 1-3 Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 1)	$76,220	SPR	-0-	STATE
Estimated Cost FFY 2015	$76,200	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 1)	$87,966	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Aaron Fridrich, Transportation Manager II, 405-736-9466

2253 Investigation of Optimized Graded Concrete for Oklahoma - Phase 2

PURPOSE AND SCOPE: Oklahoma has started to implement “optimized graded concrete”. These concrete mixtures are designed to use less cement, and proportionately more aggregate with a more optimized and continuous distribution of aggregate sizes. This allows a concrete mixture to achieve increased workability and strength through using less mortar (sand, cement and water). Cement is the most expensive ingredient in concrete, the largest contributor to the carbon footprint, and can also lead to increased cracking through shrinkage. Both the initial cost and long term performance of concrete would benefit from the reduction of cement content in concrete mixtures. The primary focus of this research will be to investigate the interplay between gradation and mortar content in a concrete mixture and how that impacts the necessary performance requirements for structural concrete: workability, strength, and durability. In addition the research team will also be available to work with any contractors that are implementing optimized graded concrete in the field. This is an important step in the validation of the research completed in the laboratory and is essential to the implementation of this new approach. Finally, the team will work with ODOT to create a new specification that will help implement optimized graded concrete for structural concrete in the state of Oklahoma.

ACCOMPLISHMENTS DURING FFY 2015: Continued to develop test methods to evaluate the constructability of optimized graded concrete; continued laboratory testing to determine aggregate gradations; continued to monitor contractor use and implementation of optimized graded concrete for ODOT; created a new and easily implementable concrete gradation specification for ODOT; produced project progress reports; submitted FFY 2014 Annual Report; Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: None.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 2)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$99,900	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Tyler Ley, Oklahoma State University, 405-744-5257

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenny Seward, Assistant Materials Division Engineer, 405-522-4999

2254 Energy Dissipation in 30-Foot Broken-Back Culverts Using Laboratory Models

PURPOSE AND SCOPE: To develop a methodology to analyze broken-back culverts in Oklahoma such that the energy is mostly dissipated within the culverts or downstream of the culverts in order to minimize the degradation downstream. This project will study dissipation efficiency and appurtenances design for 30 foot drop using laboratory scale modeling techniques that may result in effective energy dissipation and consequently minimize scour downstream of broken-back culverts, thus, reducing construction and rehabilitation costs of culverts in Oklahoma.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Steve Jacobi, ODOT Bridge Division Engineer, 405-521-2606

2255 Regional Economic Impact Study for the McClellan-Kerr Arkansas River Navigation System (MKARNS)

PURPOSE AND SCOPE: With the growing backlog of critical maintenance and the decreased funding of Federal appropriations, it is imperative to maintain the infrastructure designed to move freight through the McClellan-Kerr Arkansas River Navigation System (MKARNS) for waterborne commerce, as well as provide hydropower generation, recreation, water supply, fish and wildlife and flood risk management for the State of Oklahoma. Among other objectives, the main objective of this study is to identify, evaluate, and measure—as comprehensively as possible—the full extent of regional economic benefits/impacts that are expected to accrue to the citizens of Oklahoma and Arkansas, as well as, other significantly affected areas of the country (e.g., the States of Kansas and Missouri) from operational activities of the MKARNS (waterborne commerce, hydropower, water supply, flood control, game and wildlife management, and recreation). The results of this project will lead to the implementation of a "state-of-the-art" regional economic impact assessment tool (the MKARNS-MRVIO Calculator) that can evaluate regional economic impacts due to all types of water resource investments (i.e., navigation, flood control, recreation, etc.) and is tailored especially for the MKARNS and its regional economies. The "Calculator" will be designed and the user guides will be written for use by non-economic experts within the Oklahoma Department of Transportation (ODOT). It is expected that the MKARNS-MRVIO Calculator will be able to be used by ODOT personnel responsible for the development of water resources in the State of Oklahoma

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Dennis Robinson, University of Arkansas, 501-569-8519

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Deidre Smith, ODOT Waterways Branch Manager, 918-270-5804

2256 Understanding the Behavior of Prestressed Concrete Girders after Years of Service

PURPOSE AND SCOPE: The proposed project consists of a comprehensive study including both testing and analysis of two real-world AASHTO Type II girders to be obtained during replacement of the I-244 bridge over the Arkansas River in Tulsa after about 47 years in service. It also includes detailed study of composite action in the form of testing the real-world girders and a scaled composite bridge section. This research will provide critical supplemental information to and improve upon previous research focused on the shear capacity of one real-world girder sponsored by ODOT at the University of Oklahoma and answer numerous questions concerning bridge girders put into service during the same time period. It will provide detailed information concerning composite behavior of prestressed girder bridges critical to shear. It also has the potential to provide opportunities for a significant quantity of additional research during the process of determining shear capacity and studying prestress transfer. The results of this research would be used to evaluate the condition and safety of prestressed concrete girders designed for shear using the quarter-point rule described in the AASHTO Standard Specifications (AASHTO 1973) in comparison to the current AASHTO LRFD Specifications (AASHTO 2004). Additionally, improved procedures for using nondestructive methods to determine condition of in-service structural members would be recommended.

ACCOMPLISHMENTS DURING FFY 2015: Prepared and load tested remaining girder; performed analysis of composite action, stresses, strains and shear obtained from load testing; performed literature searches on bond transfer, airy stress function and dynamics; extracted nonlinear backbone; performed other inverse analysis; performed transfer bond parameter analysis; continued numerical analysis; started construction of scaled composite section; produced project progress reports; submitted FFY 2014 Annual Report; FFY 2015 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to perform analysis of composite action, stresses, strains and shear obtained from load testing; continue literature searches on bond transfer, airy stress function and dynamics; continue to perform other inverse analysis; continue construction of scaled composite section and perform testing; continue to perform numerical analysis; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 3)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$99,900	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 3 of 3)	$99,996	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Royce Floyd, University of Oklahoma, 405-325-1010

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2257 Understanding A+B Bidding Patterns and Policy Implications for ODOT Project Lettings

PURPOSE AND SCOPE: A key challenge for Departments of Transportation around the country is to keep the cost of construction low while ensuring that projects will be completed in a timely manner. Those goals can often be conflicting. The purpose of this research project is to investigate the empirical relationship between project cost and project duration to offer recommendations to the Department of Transportation on the optimal use of time incentives in the procurement process. We will utilize program evaluation techniques to assess the performance of "incentive/disincentive" (I/D) and A+B auctions in comparison to the standard contracting low bid practice. Using our statistical knowledge and information on alternative contracting methods adopted by ODOT and other state Departments of Transportation, we will conduct economic evaluation of contracting practices.

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Georgia Kosmopoulou, University of Oklahoma, 405-325-3083

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Anthony Delce, ODOT Office Engineer, 405-521-2625

2258 Evaluate Densifier-Over-Shotblasting (DOS) Treatment Performance for Pavements and Bridge Decks

PURPOSE AND SCOPE: With increased demands on aging infrastructure, rapidly increasing truck traffic, and shrinking budgets, transportation agencies are continually being asked to "do more with less" in maintaining pavements and bridges. The proposed research provides a method for combining chemical treatment (densifier) and shotblasting, called Densifier-Over-Shotblasting (DOS), to economically harden the aggregates of concrete and asphalt pavements and bridge decks. The proposed DOS method will make surfaces safer and more durable, reduce maintenance costs and increase service life of pavements and bridge decks. The proposed study will have the following major benefits: (i) specifications of the required characteristics of DOS; (ii) identification of polishing tendency of aggregates that are available in each ODOT division; and (iii) documentation of effective construction practice and Inspector's guide.

ACCOMPLISHMENTS DURING FFY 2015: Continued literature review; continued aggregate testing; continued accelerated polishing testing; continued characterization of chemically-treated and non-treated aggregates; continued to analyze and report laboratory test data; selected pavement/bridge deck test section(s); constructed and characterized test sections; conducted performance testing; analyzed test section data; prepared draft specification of chemical treatment over shotblasting along with an inspector field guide; produced project progress reports; submitted FFY 2014 Annual Report; Final Report submission is pending.

ODOT has approved a no cost time extension for continued project operations and the completion of the Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: None.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 2)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$99,900	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Dominique Pittenger, University of Oklahoma, 405-325-4536

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2259 Development of a Prototype Geotechnical Report Database

PURPOSE AND SCOPE: Historical ODOT geotechnical reports are a valuable resource of information which includes borehole data, laboratory and field test data, construction and maintenance records, etc. A proper use of these data will help the design decision-making and bring significant cost saving for future ODOT projects. The current practice of geotechnical data storage is cumbersome to access by users. The ODOT geotechnical branch has been scanning and storing project reports in portable document format (PDF) since 2007, however, the process of scanning and cataloging is time consuming and labor intensive. There is an urgent need to develop a new system to allow easy data archiving and instant data access by searching the key information of projects (e.g., location, project number, etc.). The primary objective of the current proposal is to develop a proof-of-concept geotechnical report database that best fit the current need of the ODOT geotechnical branch. As a minimum, the system will feature data stemming from (1) in-house archived files, (2) in-house files currently being recorded in a quasi-automated recall-system, and (3) data provided to the department via contract services. The Department will save time and costs associated with efforts to locate archived geotechnical information. Improved record keeping and accuracy in maintaining accounts of geotechnical work previously completed will prove a cost savings while decreasing redundancy in efforts. Further, the end user will be given the alternatives of Mapping and Querying geotechnical information in a fashion that is most valuable to their own task(s)

ACCOMPLISHMENTS DURING FFY 2015: Submitted Final Report.

PROPOSED ACTIVITIES FOR FFY 2016: End of project.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Xiaoming Yang, Oklahoma State University, 405-744-5223

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Christopher Clarke, ODOT Geotechnical Engineer, 405-522-4994

2260 Shrinkage Induced Deformations in Steel Bridges Made Composite with Concrete Deck Slabs – Phase 2

PURPOSE AND SCOPE: Phase 2 research will build upon the Phase 1 research. The goals of Phase 2 research are to further investigate the phenomena of concrete shrinkage and other volume changes, and to assess their effects on deflections in steel bridges made composite with concrete decks. In Phase 2 the research team will investigate the effects of temperature changes on overall bridge deflections and material deformations. Phase 2 research objectives include identifying the likely causes for excessive or unpredicted deflections in steel girder bridges made composite with concrete deck slabs; developing design and construction methods that will mitigate future problems associated with excessive or unexpected deflections in ODOT bridges; and, assessing the effects of bracing formwork and concrete screeds and assessing their importance in maintaining ride quality for ODOT bridges.

ACCOMPLISHMENTS DURING FFY 2015: Submitted FFY 2014 Phase 1 Annual Report; continued literature review; continued forensic investigation of known bridges and added the I-40 Bridge over the Eufaula Reservoir; built a full-sized prototype bridge to monitor and test; began laboratory testing on concrete materials; started field instrumentation and monitoring; performed computational analysis of shrinkage and other effects; began the development of design and construction methods for ODOT bridges; produced project progress reports; FFY 2015 Phase 2 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue literature review; continue forensic investigation of bridges; continue to monitor and test full-sized prototype bridge; continue laboratory testing on concrete materials; continue field instrumentation and monitoring; identify likely causes for excessive or unpredicted deflections; continue development of design and construction methods for ODOT bridges; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 2)	$60,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$60,000	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 2 of 2)	$100,000	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Bruce Russell, Oklahoma State University, 405-742-7450

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2261 Selection of Long Lasting Rehabilitation Treatment using Life Cycle Cost Analysis and Pavement Serviceability Rating

PURPOSE AND SCOPE: The desire for a more comprehensive assessment of pavement performance, reinforced by the emphasis on cost, is the purpose of the proposed research. Preserving the current pavement network has become one of the top priorities for many highway agencies including Oklahoma Department of Transportation (ODOT). There are many pavements on important routes that have exceeded their design lives and are in need of cost effective and sustainable rehabilitation. A well-planned preservation approach helps agencies like ODOT to determine the needs for enhancement of the system's functional ability with a multi-year maintenance and rehabilitation (M&R) treatment programs. It also helps the agency optimize the allocations of annual investment in pavement rehabilitation programs at network and project levels. Therefore the researchers and practitioners from two universities (Texas A&M University (TAMU) and Arizona State University (ASU)) team up to develop an innovative methodology that can be used by ODOT for determining the most cost-effective and long-lasting treatment alternatives. The objective of this research study is to develop an engineering decision tool that facilitates the selection of maintenance and rehabilitation activities and their timing for different types of high-volume asphalt pavement roads in the state of Oklahoma. This analysis tool will use historical data, materials characterization and performance testing, deterioration modeling and life-cycle cost analysis to establish and select the maintenance and rehabilitation program.

ACCOMPLISHMENTS DURING FFY 2015: Continued literature review; continued to conduct and analyze various field and laboratory tests; continued to develop and construct deterioration models; continued development of database catalog; based on task findings, investigated the preliminary set of feasible rehabilitation treatments; produced project progress reports; submitted FFY 2014 Annual Report; Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: None.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 2)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$99,900	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Maryam Sakhaeifar, Texas A&M University, 979-845-9961

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2262 Feasibility Study of GRS Systems for Bridge Abutments in Oklahoma

PURPOSE AND SCOPE: The primary objective of the proposed project is to carry out a feasibility study to identify the types of bridge projects that would be suitable candidates for the use of GRS bridge abutments in Oklahoma. The research team will review the state of the art and practice on the GRS technology and develop guidelines for its adoption and implementation in Oklahoma. The primary focus of this study will be on bridges that are built on the low-volume and rural roads, (i.e. off the National Highway System, NHS), which can directly and immediately benefit from a viable and speedy bridge construction technology involving recycled girders and bridge abutment construction materials that are produced locally. However, the research team will explore the circumstances in which GRS abutments could also be adopted for bridges on major roads and highways across the state, (i.e. on-NHS system bridges). The Principal Investigators (PIs), in collaboration with ODOT and FHWA-OK engineers, will provide an assessment of the results of the study which will include expected benefits and actions needed for successful implementation of the study to meet the ODOT goals and those of other state transportation agencies.

ACCOMPLISHMENTS DURING FFY 2015: Continued literature review; continued to participate and assist with the selection and planning for the construction of pilot GRS bridge abutments in Oklahoma; continued laboratory and field tests on the backfill, subgrade soils and the geosynthetic reinforcement; continued reduction and analysis of data; produced project progress reports; submitted FFY 2014 Annual Report; FFY 2015 Annual report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue literature review; monitor the performance of the pilot GRS bridge abutments during and after construction; continue laboratory and field tests on backfill, subgrade soils and geosynthetic reinforcement; continue reduction and analysis of data; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 3)	$88,680	SPR	-0-	STATE
Estimated Cost FFY 2015	$88,600	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 3 of 3)	$89,190	SPR	-0-	STATE

CONTACT INFORMATION

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

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Shannon Sheffert, ODOT Local Government Division Engineer, 405-521-2553

2263 Use of On-Board Compressed Natural Gas (CNG) as a Locomotive Fuel - Phase 3

PURPOSE AND SCOPE: To design/ test/ certify/ study an alternative locomotive fueling system based on the use of CNG. The project scope will focus on addressing all of the necessary safety concerns and any and all statutory requirements at the State and federal levels, while also addressing the testing and study of the entire fueling system from CNG fuel source to fueling infrastructure, down to the actual on-board system to be installed on the locomotive.

ACCOMPLISHMENTS DURING FFY 2015: Phase 3 did not develop and no FFY 2015 contract was prepared or executed; Phase 1 Final Report submission is pending. Discussions between the ODOT Executive Director, the ODOT Director of Capital Programs and the Rail Programs Division Manager regarding the direction of this study continue.

PROPOSED ACTIVITIES FOR FFY 2016: Currently, there are no known FFY 2016 proposed contractor work activities.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 1)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Les Olsen, Strategic Development Consulting

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Craig Moody, Rail Programs Division Manager, 405-522-1465

2265 Precast Prestressed Concrete Pavement to Abate Settlement Problems Under Bridge Approach Slabs

PURPOSE AND SCOPE: The problems encountered in bridge approach embankments have often been found to be due to settlement caused by poor compaction of the soil behind the abutments, expansion of the soil behind the abutment or settlement of the soft soil underlying the embankment. Failure of bridge deck approach slabs have also been due to shoving from the adjacent pavement structure causing slope failure of the surrounding fill areas. Malfunctions associated with transition joints between the slab and the adjacent structure are also a major concern. Although several measures have been attempted, some more extreme than others, the settlement problem seems to persist. Three objectives are identified for this project:
1. the development of construction specifications and design guidelines for the use of Precast Pre-tensioned Concrete Pavement (PPCP) approach slabs, 2. the development of construction specifications and design guidelines for the use of soil columns and similar technologies to strengthen and reinforcement approach slab fills and embankments and 3. the development of guidelines to monitor and maintain PPC pavements as approach slab structures. Guidelines for PPCP approach slabs will address the details of design including slab thickness, joint stiffness, subbase strength, required prestressing and thickness, and joint sealant requirements among other aspects of the design. Guidelines for soil columns and similar technologies will consider the characteristics of the fill materials, such as moisture, density, size distribution, type and other pertinent properties in which to make them less susceptible to consolidation will be addressed.

ACCOMPLISHMENTS DURING FFY 2015: Performed subbase and soil characterization and validation scheme for embankment materials; began formulation of a PPCP design process for approach slabs; began formulation of a design process for soil columns and similar technologies; began the development of design guidelines and specifications; produced project progress reports; FFY 2015 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to formulate a PPCP design process for approach slabs; continue to formulate a design process for soil columns and similar technologies; continue the development of design guidelines and specifications; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 2)	$98,595	SPR	-0-	STATE
Estimated Cost FFY 2015	$98,500	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 2 of 2)	$99,955	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Dan Zollinger, Texas A&M Transportation Institute, 979-845-9918

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2266 The Use of Resistivity Testing for Quality Control of Concrete Mixtures

PURPOSE AND SCOPE: The durability of concrete is widely recognized to be controlled by the ingress of water and aggressive chemicals. One way to promote long term durability of concrete is to produce a material with a low permeability so that these outside fluids cannot rapidly ingress into the concrete. The challenge has been that permeability was not measured or specified by engineers because there was not a good way to measure it. This has recently changed with the widespread introduction of the resistivity meters which are used to measure the flow of electrons through concrete. This work will aim to develop specifications for Oklahoma, standardizing sample conditioning, and focusing on further investigation of the use of resistivity for concrete in field structures. The objective of this project is to investigate the potential of resistivity testing in assessing the performance of typical concrete mixtures used in bridge and pavement infrastructure in Oklahoma. The sensitivity and reliability of the method with Oklahoma materials will be investigated in order to formulate new guidelines and specification that would allow ODOT to produce high quality concrete. These specifications could be used to approve and accept concrete mixtures. Strength would no longer be the only value that is used to accept a concrete mixture and instead a measurement of permeability could be included. This study will evaluate the use of resistivity to evaluate field structures. This research shows promise to make great changes to the quality and long term performance of Oklahoma concrete by using this simple by utilitarian testing method.

ACCOMPLISHMENTS DURING FFY 2015: Performed literature review; began investigation on applicability of standard procedures for typical Oklahoma concrete mixtures; began investigation on other possible applications of resistivity testing to complement onsite quality control measures; produced project progress reports; FFY 2015 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue literature review; continue investigation on applicability of standard procedures for typical Oklahoma concrete mixtures; continue investigation on other possible applications of resistivity testing to complement onsite quality control measures; prepare guidelines and specifications for implementing resistivity testing; execute training workshop; produce project progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 2)	$92,065	SPR	-0-	STATE
Estimated Cost FFY 2015	$92,000	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 2 of 2)	$88,908	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Julie Hartell, Oklahoma State University, 405-744-5222

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenny Seward, Assistant Materials Division Engineer, 405-522-4999

2268 Use of a Novel Controlled Release Surface Curing Agent for Bridge Decks

PURPOSE AND SCOPE: The durability of concrete bridge decks is critical to the satisfactory long term performance of the Oklahoma highway infrastructure system. It is currently required in Oklahoma to place wet burlap or blankets within 10 minutes of strike off of the concrete surface. The job of these materials is to minimize moisture loss, promote hydration, reduce permeability, increase strength gain, and minimize cracking. Current wet curing techniques are labor intensive, logistically challenging, and quite costly. Also the placement of these materials too early can cause unwanted deformations or damage in the surface of the concrete that may nullify any benefits from the curing. The objective of the project is to use a novel curing technique that can be rapidly applied to the surface of the fresh concrete and not cause deformations in the concrete surface. This material should show equal or better curing performance then typical wet curing methods and be sustainable and safe for the environment. The specific objectives for this project include:

1. Develop a field application method for the novel curing material
2. Develop specifications for the quality control and usage of the novel curing material
3. Work with contractors in Oklahoma to implement this technology in the field and evaluate the effectiveness

ACCOMPLISHMENTS DURING FFY 2015: Performed literature review; began laboratory study to evaluate current ODOT curing specifications; started field application methods of FiberCure on a laboratory constructed concrete slab; started development of new curing specifications; began preparations for the usage of FiberCure on an Oklahoma bridge deck; produced project progress reports; FFY 2015 Annual Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Continue to conduct laboratory study to evaluate current ODOT curing specifications; continue to perform field application methods; continue the development of new curing specifications; apply FiberCure on an Oklahoma bridge deck and evaluate the effectiveness; produce project progress reports; prepare and submit FFY 2016 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 4)	$91,685	SPR	-0-	STATE
Estimated Cost FFY 2015	$91,600	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 2 of 4)	$94,378	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Tyler Ley, Oklahoma State University, 405-744-5257

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2269 Development of Alternative High Friction Surfaces for Oklahoma

PURPOSE AND SCOPE: Oklahoma DOT would like to explore alternative surface mixtures that can provide acceptable high friction performance in critical safety locations. Pavement surface friction is measured by skid resistance (aggregate micro-texture) and surface texture (mixture macro-texture). Pavement surface mixtures are routinely dense-graded asphalt, stone matrix asphalt (SMA) or porous friction course (OGFC). The key components of this study are aggregate type and size, binder type and application, and mixture type. Since there is no standard value for pavement friction, the study will use results from Oklahoma sections on the NCAT Test Track as a point of reference to compare the measurements from the study. This study will provide an objective measure of friction performance for four alternative surfaces that OK DOT can review and determine if the alternative surfaces provide an acceptable level of high friction. The objectives are to develop asphalt mixtures for high friction surface (HFS) locations with regionally available aggregates and appropriate asphalt binders as alternatives to standard HFS using resin binder and calcined bauxite aggregate, and, to identify a more conventional asphalt mixture that can be placed as a 0.75-inch thin surface lift and maintain acceptable high friction characteristics.

ACCOMPLISHMENTS DURING FFY 2015: Collected available friction data and selected aggregates; selected surface mixture types; prepared mixtures and treated slabs for testing; conditioned and tested surfaces with the TWPD, DFT and CTM; compared friction performance of tested surfaces and reported findings; prepared slabs for testing; measured effectiveness of tack coats; compared bond strength of tested surfaces and applications; produced project progress reports; Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: None.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 1 of 1)	$25,675	SPR	-0-	STATE
Estimated Cost FFY 2015	$25,600	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Michael Heitzman, Auburn University (NCAT), 334-844-7309

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenneth Hobson, ODOT Bituminous Engineer, 405-521-2677

2270 Development of an Asphalt Pavement Test Facility at the OSU Unmanned Aerial Vehicle (UAV) Facility

PURPOSE AND SCOPE: The objective of this study is to assist in the construction of the UAV runway to develop a pavement that can be used as a test facility for evaluation of pavement materials including, but not limited to, plant-mixed warm and hot mix asphalt pavements, high RAP and RAS mixes, asphalt surface treatments, pavement preservation treatments, 100% RAP cold mixes and aggregate bases with surface treatments. These mixtures would need to be incorporated into the planned expansion of the facility or placed as an overlay or surface treatment on the planned existing surface. It would be difficult to load the facility to typical highway conditions; therefore, the facility would be best suited for measurement of environmental effects. At the completion of the construction, ODOT would have a facility available through OSU to test and evaluate surface treatments, surface mixes, including high RAP and RAS mixtures, and pavement preservation treatments for a variety of applications.

ACCOMPLISHMENTS DURING FFY 2015: Discussed runway expansion design and construction and finalized plans to include shoulders to the runway; provided invitations to bid to 47 contractors; prepared quarterly progress reports; Final Report submission is pending.

PROPOSED ACTIVITIES FOR FFY 2016: Due to runway expansion delays, ODOT has approved a 1 year project extension to complete the proposed work activities; monitor runway expansion construction; complete measurements of material properties; perform non-destructive FWD testing; collect cores; collect soil samples; perform laboratory testing and analysis; prepare quarterly progress reports; prepare and submit Final Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015 (Yr 2 of 2)	$100,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$100,000	SPR	-0-	STATE
Projected Cost FFY 2016 (1 Yr Extension)	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Stephen Cross, Oklahoma State University, 405-744-7200

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenneth Hobson, ODOT Bituminous Engineer, 405-521-2677

2271 Comparative Assessment of the Current Gross and Axle Truck Weight and Truck Permitting Laws in the United States

PURPOSE AND SCOPE: The Governor of Oklahoma signed Senate Bill 638 that raises the legal truck weight limits under certain conditions. Under the law, and by annual purchase of a permit, the gross weight limit on the non-interstate highway system is increased by nominally five percent (5%) and individual axle weight limit is increased eight percent (8%). The ODOT Senior Staff requires information regarding the impact of the increase in legal load limits on the Highway Infrastructure. Chief among their concerns are the impact of increased truck weight limits on the existing highway infrastructure, and what the costs to new projects, rehabilitation projects, and maintenance will be. There are also questions about what policies are in force in the contiguous United States with particular emphasis on the states adjacent to Oklahoma. The proposed investigation will respond to the needs of the ODOT Senior Staff by providing key answers to these concerns.

ACCOMPLISHMENTS DURING FFY 2015: Interim Report A submission is pending; Interim Report B submission is pending; Executive Summary submission is pending; presentation materials submission is pending; produced project progress reports; Final Report submission is pending.

This is an ODOT Executive Director and Senior Staff initiative study which has a strict November 1, 2015 deadline. It should be noted that the study is currently under way and the above items have not come due as of the writing of this page or the preparation of the FFY 2016 SP&R Work Program document.

PROPOSED ACTIVITIES FOR FFY 2016: None.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$181,373	SPR	-0-	STATE
Estimated Cost FFY 2015	$181,300	SPR	-0-	STATE
Projected Cost FFY 2016	-0-	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Bruce Russell, Oklahoma State University, 405-742-7450

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Tim Gatz, ODOT Deputy Director, 405-522-6000

2272 Performance of Moisture Barriers to Enhance Pavement Performance Over Swelling Soils

PURPOSE AND SCOPE: The Oklahoma Department of Transportation has invested significant amounts of money on several projects to construct low-permeability barriers to prevent moisture changes in swelling soils beneath pavements. However, there has been relatively little post-construction monitoring of these sites to assess the performance and cost-effectiveness of the moisture barriers and associated pavements. Given the high material cost and additional construction cost associated with installing moisture barriers, there is a need to assess performance relative to reductions in moisture infiltration into swelling subgrades. Given the current state-of-the-art knowledge in this field, there is a need for laboratory soil testing, field monitoring, and numerical modeling of the problem. This research will assess the performance of moisture barriers, determine whether these are cost-effective solutions for pavement design over swelling soils, and develop recommendations for enhancing the design of moisture barriers.

ACCOMPLISHMENTS DURING FFY 2015: New project.

PROPOSED ACTIVITIES FOR FFY 2016: Perform literature review; identify and select 3 potential test sites and collect background information; perform subsurface investigations; install test site instrumentation and monitoring; perform pavement surveys; collect historical weather data; perform laboratory soil testing; produce project progress reports; prepare and submit FFY 2016 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 3)	$89,812	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Rifat Bulut, Oklahoma State University, 405-744-5189

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Christopher Clarke, ODOT Geotechnical Engineer, 405-522-4994

2273 Development of Guidelines for Selection and Evaluation of Tack Coats in Oklahoma

PURPOSE AND SCOPE: Flexible pavements are typically constructed by compacting asphalt mixes in multiple layers. It is important that the pavement structure behave as one system, rather than multiple independent layers. Inadequate interlayer bond leads to distresses such as half-moon-shaped cracks, delamination (debonding), followed by longitudinal wheel path cracking, potholes, fatigue cracks, slippage, and rutting. The quality and integrity of the bond between the asphalt layers, especially the bond between the existing road surface and an overlay is crucial to pavement performance and durability. In order to improve the interlayer bonding of asphalt pavements, tack coat is used frequently. Tack coat involves application of a thin layer of liquid asphalt to promote bonding between the existing pavement and the new layer or between two lifts and provide a waterproofing barrier. This study will aid ODOT in improving its current practice of selection of tack coat type and application rate. The results from this study will be used to develop recommendations and development of quality control measures for tack coats for enhanced performance. Such measures will benefit ODOT by reducing pavement maintenance costs by minimizing tack coat-related failures of pavements.

ACCOMPLISHMENTS DURING FFY 2015: New project.

PROPOSED ACTIVITIES FOR FFY 2016: Perform literature review; identify and select materials, i.e., tack coats, asphalt mix and field cores; prepare laboratory samples for various testing techniques; begin laboratory performance testing; begin simulated long-term oven aging and surface wearing; begin various samples conditioning; start determination of superpave PG and rheological properties of tack residues, i.e., DSR and BBR testing; perform analysis of test data; begin the development of a database on tack coat performance evaluated in the laboratory; produce project progress reports; prepare and submit FFY 2016 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 2)	$82,087	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Rouzbeh Ghabchi, University of Oklahoma, 405-325-2626

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenneth Hobson, ODOT Bituminous Engineer, 405-521-2677

2274 Development of Concrete Mixtures to Mitigate Bridge Deck Cracking, Validated Using 3D Bridge Deck Surface Evaluations

PURPOSE AND SCOPE: Cracking in concrete is a significant threat to the long term durability of a bridge deck. These cracks allow outside chemicals direct access to the reinforcing steel within the bridge. These outside chemicals can then cause corrosion, which will in turn cause more cracking and will again lead to penetration of more outside chemicals. In addition to corrosion, these cracks can cause or exacerbate many other deterioration mechanisms, including freeze thaw, alkali-silica reaction, and sulfate attack. Cracking of concrete can cause a vicious cycle that can quickly shorten the life of a bridge. The goals of this project are to use a number of different technologies to help reduce cracking in Oklahoma bridges with economical and practical solutions. It is anticipated that this research will help bring crack-resistant concrete to Oklahoma bridges. This research will not only be completed in the laboratory, but will also be implemented and then evaluated in the field. Furthermore, a specification will be developed that will help ODOT to implement these technologies on their bridges.

ACCOMPLISHMENTS DURING FFY 2015: New project.

PROPOSED ACTIVITIES FOR FFY 2016: Host an expert bridge deck cracking technologies workshop; begin laboratory evaluation into the investigation of fresh, hardened and durability performance of concrete mixtures utilizing the findings of a current research project using aggregate gradations to minimize paste content in concrete mixtures. The research team will be able to start the project with mixtures that have a proven aggregate gradation and reduced paste content that are representative of Oklahoma bridge deck concrete; produce project progress reports, prepare and submit FFY 2016 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 5)	$99,997	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Tyler Ley, Oklahoma State University, 405-744-5257

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

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

2275 Development of Aggregate Characteristics-Based Preventive Maintenance Treatments Using 3D Laser Imaging and Aggregate Imaging Technology for Optimized Skid Resistance of Pavements

PURPOSE AND SCOPE: Skid resistance of pavements plays a significant role in road safety as the friction between tire and pavement surface is a critical contributing factor in reducing potential crashes. The skid resistance of a pavement surface has been related to two main properties of the pavement: microtexture and macrotexture. Microtexture is mainly dependent on aggregate shape, angularity and texture, while macrotexture is a function of asphalt mix properties, compaction method, and aggregate gradation. Many studies in recent years, such as NCHRP 4-30A and NCHRP 4-34 projects, have focused on evaluating and developing comprehensive test methods to measure aggregate shape, texture and angularity. However, none of these studies has clearly established any relationships between the aggregate properties and the ultimate pavement performance. The most recent developments in 3D laser imaging technology will be used to collect 3D pavement surface texture data at highway speed at 1 mm accuracy. The project also uses several other state-of-the-art laboratory and field data collection instruments, including the Aggregate Imaging System (AIMS) and a portable 3D surface analyzer to collect ultrahigh resolution aggregate morphological characteristics data, including shape, angularity, and surface texture related index properties. Moreover, pavement skid resistance data will be collected using a skid trailer, grip tester, and dynamic friction tester. This study presents a detailed analysis of aggregate characteristics and its relationship to skid resistance of pavements. An understanding of the relation of the aggregate physical properties and implementing the recommended aggregate selection procedure will result in an immediate improvement in pavement performance, especially for pavement safety.

ACCOMPLISHMENTS DURING FFY 2015: New project.

PROPOSED ACTIVITIES FOR FFY 2016: Perform literature review; develop laboratory and field experimental design based on commonly used aggregate sources and preventive maintenance treatments; perform various laboratory testing techniques; perform several types of field data collection; perform data analysis; produce project progress reports; prepare and submit FFY 2016 Annual Report.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	-0-	SPR	-0-	STATE
Estimated Cost FFY 2015	-0-	SPR	-0-	STATE
Projected Cost FFY 2016 (Yr 1 of 2)	$99,094	SPR	-0-	STATE

CONTACT INFORMATION

Principal Investigator: Joshua Li, Oklahoma State University, 405-744-6328

SP&R-2 Program Administrator: Bryan Hurst, 405-522-3794

Project Sponsor: Kenny Seward, Assistant Materials Division Engineer, 405-522-4999

2300 Research Implementation

PURPOSE AND SCOPE: Implementation is a crucial stage in the research process. Implementation is the incorporation of research results into everyday practices of the organization. Research findings from national and regional studies are also considered for implementation. No matter how the research is derived, it is of little importance if it is not implemented.

ACCOMPLISHMENTS DURING FFY 2015: Continued with the implementation of the three implementation projects from FY14; conducted a meeting with ODOT Senior Staff and functional experts to discuss FFY 2016 Problem Statements and Implementation; worked on the implementation of the RoadRunner 3, Expected Life of Silanes and Bridge Deck Replacement using Stainless Steel projects; performed literature review and held briefing on Post Earthquake Bridge Inspection Methodologies.

PROPOSED ACTIVITIES FOR FFY 2016: 40 RoadRunner 3 traffic counters and 3 IPADs were purchased and programed to receive date from the RoadRunner instrument during FFY 2015. During FFY 2016 this project will be implemented by selecting a county near Tulsa and using the RoadRunner in place of the current instruments; data will be validated and data time collection savings will be calculated; continue data collection on the Expected Life of Silanes implementation; work with the ODOT Bridge Division to identify a bridge deck replacement where Stainless Steel Reinforcement bar can be used; implement a study where speed traffic data will be collected; document the ODOT implementation process with the state of Oklahoma through the research manual.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$150,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$150,000	SPR	-0-	STATE
Projected Cost FFY 2016	$548,059	SPR	-0-	STATE

CONTACT INFORMATION

ODOT Research Engineer: Gary Hook, 405-522-1042

2700 Experimental Product and Evaluation Program

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

ACCOMPLISHMENTS DURING FFY 2015: 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; monitored the performance of six different types of Erosion Control Blankets, submitted by US Erosion Control, the blankets were installed on September 29 and 30, 2014, on a slope on a project on US-412, Woodward County, 3 miles west of the Major County line; monitored the performance of a tack coat product, Ultra Fuse, submitted to ODOT Materials Division and applied in November 2014, the project locations are on SH-3, McCurtain County near Broken Bow and on a county road in Carter County, near Ardmore.

PROPOSED ACTIVITIES FOR FFY 2016: Complete the Final Report on the Erosion Control Blankets submitted by US Erosion Control; continue to monitor the Ultra Fuse sites, because the Ardmore site is showing numerous defects, but the Broken Bow site has not exhibited any failure at all; Mr. Wayne Rice began working in the Research Section in October 2014 and is training to begin managing the Product Evaluation Program; 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; coordinate product meetings and presentations for new product evaluation forms received; continue to conduct product performance evaluations and monitoring; continue collection of monthly photographic records for current and new product applications as they are implemented.

FINANCIALS	AMOUNT	FUND	AMOUNT	FUND
Programmed Amount FFY 2015	$10,000	SPR	-0-	STATE
Estimated Cost FFY 2015	$7,000	SPR	-0-	STATE
Projected Cost FFY 2016	$45,000	SPR	-0-	STATE

CONTACT INFORMATION

ODOT Field Research Manager: Jerry Rice, 405-537-6726