LTRC Annual Research Program

Fiscal Year July 1, 2009 - June 30, 2010

Part II SPR Work Program

FAP Number SPR-0010(33)

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Annual State Funded Work Program

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Self Generated Funded Program

&

STP Funded Program

Conducted by:
Louisiana Department of Transportation and Development
Louisiana Transportation Research Center
In cooperation with
United States Department of Transportation
Federal Highway Administration
June 2009

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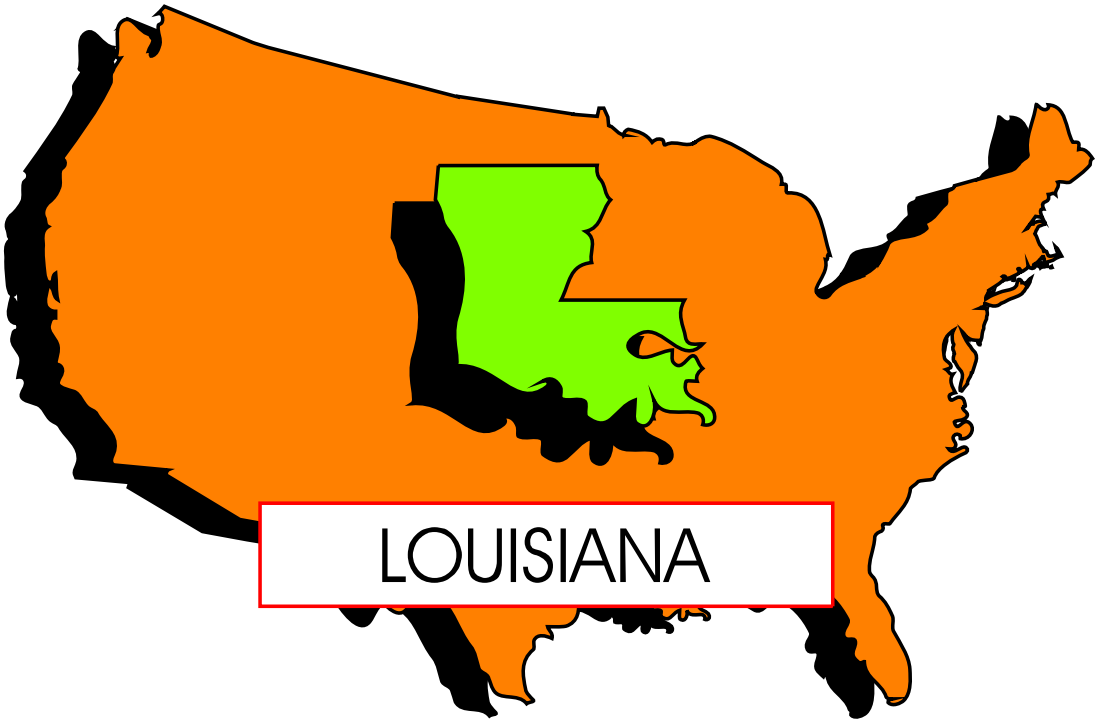
Annual
SPR Work Program
Part 2

FAP Number SPR-0010(33)



LTRC ANNUAL RESEARCH PROGRAM

FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
SPR:TT-FED/TT-REG	ADM	736 99 1632	10-1PM	$937,400	$937,400	LTRC	Paul	Program Management	1-Jul-2009	30-Jun-2010		2
SPR:TT-FED/TT-REG	RS	736 99 1627	10-1EQM	$314,000	$314,000	LTRC	Paul	Equipment Management	1-Jul-2009	30-Jun-2010		3
SPR:TT-FED/TT-REG	RS	736 99 1631	10-1LFT	$211,000	$211,000	LTRC	Paul	Research Laboratory and Field Test Support	1-Jul-2009	30-Jun-2010		4
SPR:TT-FED/TT-REG	RS	736 99 1628	10-1NPE	$53,000	$53,000	LTRC	Paul	New Products Evaluation	1-Jul-2009	30-Jun-2010		5
SPR:TT-FED/TT-REG	RS	736 99 1634	10-1TA	$654,000	$654,000	LTRC	Paul	Technical Assistance	1-Jul-2009	30-Jun-2010		6
SPR:TT-FED/TT-REG	RS	736 99 1633	10-1TRS	$354,000	$354,000	LTRC	Paul	Technical Research Surveillance	1-Jul-2009	30-Jun-2010		8
SPR:TT-FED/TT-REG	RS	736 99 1630	10-1TTRI	$232,000	$232,000	LTRC	Paul	Technology Transfer & Research Implementation	1-Jul-2009	30-Jun-2010		9
SPR:TT-FED/TT-REG	RS	736 99 1629	10-1CON	$100,000	$100,000	LTRC	Paul	Contingencies	1-Jul-2009	30-Jun-2010		10
				$937,400	**$937,400**	TOTAL ADMINISTRATIVE ITEMS BUDGET						
				$1,818,000	**$1,818,000**	TOTAL RESEARCH SUPPORT STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
SPR:TT-FED/TT-REG	A	736 99 1122	03-7ST	$5,000	$28,876	LTRC	Alaywan	Long-Term Monitoring of the HPC Charenton Bridge	1-Jun-2004	30-Jun-2009		12
SPR:TT-FED/TT-REG	A	736 99 1300	04-5B	$42,000	$109,164	LTRC	King	Implementation of New OGFC Specifications	1-Jul-2005	30-Jul-2007	1-Dec-2009	13
SPR:TT-FED/TT-REG	A	736 99 1306	04-5GT	$99,400	$236,695	LTRC	Abu-Farsakh/Gautreau	Control of Embankment Settlement: Field Verification of PCPT Prediction Methods	1-Mar-2005	28-Feb-2009	30-Jun-2010	14
SPR:TT-FED/TT-REG	A	736 99 1512	04-6B	$144,000	$398,672	LTRC	Mohammad	Characterization of Louisiana Asphalt Mixtures Using Simple Performance Tests and MEPDG	1-Jan-2008	30-Dec-2010		16
SPR:TT-FED/TT-REG	A	736 99 1556	05-1GT	$77,500	$393,176	LTRC	Abu-Farsakh	Field Demonstration of New Bridge Approach Slab Designs and Performance	1-Jul-2008	30-Sep-2011		17
SPR:TT-FED/TT-REG	A	736 99 1312	05-5GT	$107,600	$509,600	LTRC	Abu-Farsakh	Evaluation of the Base/Subgrade Soil Behavior Under Repeated Loading	1-Aug-2005	31-Jan-2008	31-Jul-2010	19
SPR:TT-FED/TT-REG	A	736 99 1624	07-1B	$191,000	$325,420	LTRC	King	Evaluation of Warm Mix Asphalt Technology in Flexible Pavements	15-Mar-2009	15-Mar-2011		21
SPR:TT-FED/TT-REG	A	736 99 1408	07-2GT	$19,000	$210,000	LTRC	Abu-Farsakh / Tsai / Yoon	Calibration of Resistance Factors needed in the LRFD Design of Driven Piles	1-Sep-2006	30-Aug-2008	30-Dec-2009	22
SPR:TT-FED/TT-REG	A	736 99 1507	08-3GT	$81,000	$232,951	LTRC	Abu-Farsakh / Yoon	Support Study to Structure Health Monitoring of the I-10 Twin Span Bridge Over Lake Pontchartrain	1-Jan-2008	31-Dec-2010		24
SPR:TT-FED/TT-REG	A	736 99 1584	09-1C	$68,114	$108,772	LTRC	Rupnow	Evaluation of Fly Ash Quality Control Tools	1-Mar-2009	1-Mar-2010		26
SPR:TT-FED/TT-REG	A	736 99 1101	09-1GERL	$160,900	$160,900	LTRC	Abu-Farsakh	LTRC Support for Geosynthetic Research at the Geotechnical Engineering Laboratory (GERL)	1-Jul-2009	30-Jun-2010		27
SPR:TT-FED/TT-REG	A	736 99 1586	09-2C	$84,760	$121,044	LTRC	Rupnow	Evaluation of Cement and Fly Ash Treated RAP and Marginal Aggregates for Base Construction	1-Mar-2009	1-Mar-2010		28
SPR:TT-FED/TT-REG	A	736 99 1619	09-2ST	$68,930	$82,410	LTRC	Alaywan	Performance and Analysis of Concrete Bridge Railig Usijng Conventional and Composite Reinforcement Materials	1-Apr-2009	30-Sep-2009		29
SPR:TT-FED/TT-REG	A	736 99 1587	09-4C	$101,171	$202,343	LTRC	Rupnow	Evaluation of Ternary Cementitious Combinations	1-Mar-2009	1-Mar-2011		30
SPR:TT-FED/TT-REG	A	736 99	09-5C	$85,447	$112,851	LTRC	Icenogle	Evaluation of Non-Destructive Technologies for Construction Quality Control of HMA and PCC Pavements in Louisiana	1-Apr-2009	1-Jul-2010		31
SPR:TT-FED/TT-REG	A	736 99 1029	10-1EMCRF	$187,000	$187,000	LTRC	Mohammad	Pavement Materials Research Using Special Equipment at the Engineering Materials Characterization Research Facility	1-Jul-2009	30-Jun-2010		33
				$1,522,822	**$3,419,874**	TOTAL ACTIVE IN-HOUSE STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
SPR:TT-FED/TT-REG	P	736 99	06-3GT	$102,860	$150,000	LTRC	Gautreau	Intelligent Compaction Technology	1-Jul-2009	30-Jun-2011		36
SPR:TT-FED/TT-REG	P	736 99 1404	06-4GT	$50,000	$150,000	LTRC	Gautreau	Implementation of Performance Specifications in Roadway Construction	1-Jul-2009	31-Jan-2011		37
SPR:TT-FED/TT-REG	P	736 99	07-3P	$88,262	$342,372	LTRC	Mohammad	Implementation of the Use of Subgrade Resilient Modulus in Flexible Pavement Design	1-Jul-2009	30-Jun-2011		39
SPR:TT-FED/TT-REG	P	736 99	07-6P	$125,000	$220,000	LTRC	Wu	Evaluation of Current DOTD Pavement Structures Using PMS Data and New M-E Pavement Design Guide	1-Jul-2009	30-Jun-2011		40
SPR:TT-FED/TT-REG	P	736 99	09-4P	$49,000	$150,000	LTRC	Gaspard	Characterizing the Effective Modulus for Asphaltic Concrete Pavements for the MEPDG and Forensic Engineering	30-Jan-2010	30-Jun-2012		42
SPR:TT-FED/TT-REG	P	736 99	09-5P	$63,000	$150,000	LTRC	Martinez	Development of Improved QA/QC Protocols for Portable WM Data Collection	1-Jul-2009	30-Dec-2010		43
SPR:TT-FED/TT-REG	P	736 99	09-6P	$82,251	$82,251	LTRC	Martinez	Field Testing Support for Pavement Material Characterization Studies	1-Jul-2009	30-Jun-2010		45
SPR:TT-FED/TT-REG	P	736 99	10-3B	$144,000	$144,000	LTRC	Glover	Examine Performance of Low Ductility Materials	1-Jul-2009	30-Jun-2010		46
SPR:TT-FED/TT-REG	P	736 99 1652	10-XXB	$100,000	$100,000	LTRC	Wu	Development of New Surface Friction Guidelines for LADOTD	1-Jul-2009	30-Jun-2010		48
SPR:TT-FED/TT-REG	P	736 99	10-XXB(1)	$137,500	$275,000	LTRC	Mohammad	Investigation of the Use of High RAP Content in Hot-Mix Asphalt Mixtures	1-Jul-2009	30-Jun-2011		49
SPR:TT-FED/TT-REG	P	736 99	10-XXB(2)	$137,844	$275,688	LTRC	Mohammad	Investigation of the In-Situ Tests in QC/QA Applications for Hot-Mix Asphalt	1-Jul-2009	30-Jun-2011		50
SPR:TT-FED/TT-REG	P	736 99	10-XXC	$50,000	$250,000			Evaluation of Thin PCC Overlays in the Accelerated Loading Facility	1-Jul-2009	1-Jul-2011		51
SPR:TT-FED/TT-REG	P	736 99	10-XXC(1)	$50,000	$400,000			Development of Performance Based Specifications for Design Build Projects	1-Jul-2009	1-Jul-2012		52
SPR:TT-FED/TT-REG	P	736 99	10-XXC(2)	$50,000	$250,000			Investigation of Roller Compacted Concrete for Low Volume Roads	1-Jul-2009	1-Jul-2011		53
SPR:TT-FED/TT-REG	P	736 99	10-XXGT	$60,000	$180,000	LTRC	Abu-Farsakh	Evaluate the Effects of Various Factors and Parameters on the Strength and Stiffness of Base Course Layers	1-Sep-2009	31-Aug-2011		54
SPR:TT-FED/TT-REG	P	736 99	101-XXGT(1)	$60,000	$180,000	LTRC	Abu-Farsakh	Optimizing Techniques for Stabilizing Soft Subgrades using Traditional and Recycled Materials	1-Sep-2009	1-Aug-2011		56
SPR:TT-FED/TT-REG	P	736 99	10-XXGT(2)	$80,060	$150,000	LTRC	Gautreau	Support Study for the Measurement of Seasonal Changes and Spatial Variations in Pavement Unbound Base and Sub Grade Properties	1-Sep-2009	30-Jun-2011		58
SPR:TT-FED/TT-REG	P	736 99	10-XXP	$45,000	$150,000	LTRC	Martinez	Support Study for Cost Effective Prevention of Reflective Cracking of Composite Pavement	1-Jul-2009	0/31/2011		59
				$1,474,777	**$3,599,311**	TOTAL PROPOSED IN-HOUSE STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
State-TT REG	A	736 99 1359	04-1GT	$51,818	$124,986	LA Tech	Wang	Estimating Setup of Piles Driven into Louisiana Clayey Soils	15-May-2008	14-Nov-2009		61
State-TT REG	A	736 99 1498	04-3B	$36,118	$271,150	LSU	Daly	A Comparative Analysis of Modified Binders: Original and Materials Extracted from Existing Pavements	1-May-2007	31-Jul-2009	17-Jan-2010	63
State-TT REG	A	736 99 1365	06-2SS	$111,266	$211,266	LTRC/LSU	Wilmot	Development of a Time-Dependent Hurricane Evacuation Model for the New Orleans Area	1-Jul-2008	30-Jun-2010		64
State-TT REG	A	736 99 503	07-2SS	$36,632	$140,000	LTRC/LSU	Wolshon	The Design of Lane Merges at Rural Freeway Construction Work Zones	1-Sep-2007	1-Nov-2007	31-Oct-2009	65
State-TT REG	A	736 99 1479	07-4SS	$61,996	$185,988	SU	Parsons	LADOTD Customer Service Process and Outcome Evaluation	1-May-2007	30-Jun-2010		66
State-TT REG	A	736 99 1496	07-9P	$9,383	$68,339	LTRC/IDEA	Lian	Support Study for Developing Embedded Wireless Strain/Stress/Temperature Sensors Platform for Highway Applications	1-Jun-2007	12/31/208	31-Dec-2009	67
State-TT REG	A	736 99 1518	08-1P	$112,425	$165,444	LSU	Elseifi	Cost Effective Prevention of Reflective Cracking of Composite Pavement	1-May-2008	31-May-2010		68
State-TT REG	A	736 99 1513	08-1ST	$76,578	$249,578	LSU	Okeil	Evaluation of Continuity Details for Precast Prestressed Girders	10-Dec-2007	30-Nov-2009		69
State-TT REG	A	736 99 1620	08-3ST	$100,000	$200,004	LSU	Zhang	Evaluation of Design Methods to Determine Scour Depths for Bridge Structures	1-Apr-2009	31-Mar-2011		70
State-TT REG	A	736 99 1520	08-6GT	$37,902	$75,000	LTRC	Barbato	Performance Evaluation of Buried Pipe Installation	1-Jan-2008	1-Apr-2009	1-Jan-2010	71
State-TT REG	A	736 99 1589	09-1GT	$61,522	$193,054	WPI	Tao	Update LADOTD Pile Driving Vibration Monitoring Policies	1-Jun-2009	1-Dec-2011		72
State-TT REG	A	736 99 0643	09-1PLAN	$338,907	$973,340	LSU	Wilmot	LTRC Proposal for the Support of Research and Development in Transportation Planning	1-Jul-2006	30-Jun-2009	30-Jun-2012	74
State-TT REG	A	736 99 1621	09-1ST	$100,000	$269,742	LA Tech	Saber	Load Distribution and Fatigue Cost Estimates of Heavy Truck Loads on Louisiana State Bridges	1-Apr-2009	31-Mar-2011		75
State-TT REG	RS	736 99	09-2P	$90,000	$100,000	LTRC	Elesifi	Implementation of the Rolling Wheel Deflectometer (RWD) in PMS and Pavement Preservation	1-May-2009	30-Jun-2010		76
State-TT REG	A	736 99 1622	09-5ST	$35,000	$43,750	LTRC	Li	Support Study for a Shape Memory Polymer Based Self-Healing Sealant for Expansion	1-Mar-2009	31-Aug-2010		77
State-TT REG	A	736 99 1442	10-1AD	$219,465	$363,309	LTRC	Gopu	Research Expansion Program	1-Nov-2006	31-Oct-2009	30-Jun-2012	78
State-TT REG	A	736 99 0515	10-1ALF	$680,300	$680,300	LTRC	Wu	Management and Operation of the Pavement Research Facility	1-Jul-2009	30-Jun-2010		79
				$2,159,312	**$4,315,250**	TOTAL ACTIVE CONTRACT RESEARCH STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
State-TT REG	P	736 99	08-3SS	$80,000	$175,000	ULL	Sun	Developing Louisiana Crash Reduction Factors	1-Jul-2009	30-Jun-2011		82
State-TT REG	P	736 99	09-XGT	$83,951	$300,000	LSU	Sharma	Measurement of Seasonal Changes and Spatial Variations in Pavement Unbound Base and Subgrade Properties	15-Jul-2008	14-Jul-2011		83
State-TT REG	P	736 99	09-3P	$70,000	$150,000			Assessment of Pavement Management Distress Analysis Methods and Establishment of Network, Project Level, Research Target Distress Accuracies	1-Jul-2009	30-Jun-2011		85
State-TT REG	P	736 99	09-XXGT	$100,000	$100,000			Geotechnical Information Database - Phase 2	1-Jul-2009	30-Jun-2010		86
State-TT REG	P	736 99	09-6C	$99,271	$99,271	LSU	Shin	Support Study on the Characterization of Ternary Mixes with Various SCMs	1-Jul-2009	30-Jun-2010		87
State-TT REG	P	736 99	10-XXP	$100,000	$100,000			Traffic Pattern Study in Support of the MEPDG	1-Jul-2009	30-Jun-2010		88
State-TT REG	P	736 99	10-XXSS	$50,000	$100,000			Cost Effective Alternate for Noise Abatement	1-Jul-2009	30-Jun-2011		90
State-TT REG	P	736 99	10-XXSS(1)	$75,000	$150,000			Travel Time Study for Baton Rouge Road Network	1-Jul-2009	30-Jun-2011		91
State-TT REG	P	736 99	10-XXSS(2)	$125,000	$125,000			Phase II: Establishing and Intelligent Transportation System (ITS) Lab at LTRC	1-Jul-2009	30-Jun-2010		92
State-TT REG	P	736 99	10-TIRE	$120,000	$120,000	LTRC	Paul	Transportation Innovation for Research Exploration	1-Jul-2009	30-Jun-2010		93
				$903,222	**$1,419,271**	TOTAL PROPOSED CONTRACT RESEARCH STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
FHWA - IBRC	A	736 99 1370	05-5ST	$40,059	$220,537	LSU	Cai	Development and Performance Evaluation of Fiber Reinforced Polymer Bridge (FRP)	15-Nov-2005	14-May-2008	14-Nov-2009	95
NCHRP Project 9-40	A	736 99 1360	06-2B	$78,704	$428,000	LTRC	Mohammad	Optimization of Tack Coat for HMA Placement	1-Jul-2005	30-Jun-2009	30-Sep-2009	96
FHWA - IBRD	A	736 99 1437	07-1ST	$317,077	$449,925	LTRC	Abu-Farsakh / Yoon	Structure Health Monitoring of the I-10 Twin Span Bridge Over Lake Pontchartrain	1-Nov-2007	31-Oct-2010		97
FHWA - IBRC	A	736 99 1438	07-3ST	$75,000	$200,000	LSU	Cai	Use of Fiber Reinforced Polymer (FRP) Bars in Highway Concrete Bridges	1-Oct-2007	30-Apr-2009	30-Apr-2011	99
FHWA - IBRD	A	736 99 1439	07-4ST	$90,000	$400,000	LSU	Voyiadjis/Cai/Sharma	Integral Abutment Bridge for Louisiana's Soft Soil	1-Oct-2007	31-Aug-2011		100
NCHRP - IDEA	A	736 99 1495	07-8P	$95,335	$125,000	LTRC/IDEA	Lian	Developing Embedded Wireless Strain/Stress/Temperature Sensors Platform for Highway Applications	1-Jun-2007	31-Dec-2008	31-Dec-2009	101
FHWA - IBRD	A	736 99 15736	08-2ST	$100,000	$200,000	LSU	Cai	Monitoing Bridge Scour Using Fiber Optic Sensors	1-Jan-2009	30-Jun-2011		102
TENSAR Earth Technologies	A	736 99 1511	08-4GT	$54,200	$101,251	LTRC	Abu-Farsakh/Chen	Support Study to Evaluation of the Base/Subgrade Soil Under Repeated Loading	1-Jan-2008	31-Dec-2008	31-Dec-2009	103
				$850,375	**$2,124,713**	TOTAL ACTIVE SELF GENERATED FUNDING						
U.S. Army Corps of Engineers	P	736 99	09-3GT	$54,961	$79,961	LSU	Dokka	Real-Time Kinematic Global Positioning Service for Louisiana	15-May-2009	15-Feb-2010		106
NCHRP - IDEA 142	P	736 99 1622	09-4ST	$90,000	$135,000	LSU	Li	A Shape Memory Polymer Based Self-Healing Sealant for Expansion Joint	1-Mar-2009	31-Aug-2010		107
Office of Coastal Protection and Restoration (OCPR)	P	736 99	09-XXGT(1)	$50,000	$100,000			Historical Boring Log Data Acquisition, Posting and Sharing	2-May-2009	1-May-2010		108
NCHRP Project 9-48	P	736 99	10-1B	$152,000	$500,000	LTRC	Mohammad	Field versus Laboratory Volumetrics and Mechanical Properties	1-Jul-2009	31-Jan-2012		109
TEXAS Transportation Institute (TTI)	P	736 99	10-XX	$50,000	$100,000	LTRC	Wu	Construction and Accelerated Pavement Testing of TTI Pavement Test Sections	1-May-2009	31-Mar-2011		110
SHELL Oil	P	736 99	10-XXB	$125,000	$125,000	LTRC	Mohammad	Laboratory Evaluation of the Performance of Sulfur-Enhanced Asphalt Treated Base Mixtures	1-Jul-2009	30-Jun-2010		111
				$521,961	**$1,039,961**	TOTAL PROPOSED SELF GENERATED FUNDING						

LTRC ANNUAL RESEARCH PROGRAM
FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
STP:TT-FED	T²S	736 99 1638	10-1TSQ	$893,215	$893,215	LTRC	Cooper	Technology Transfer Program and Operations	1-Jul-2009	30-Jun-2010		113
STP:TT-FED	T²S	736 99 1640	10-1WD	$1,103,132	$1,103,132	LTRC	Cooper	Workforce Development	1-Jul-2009	30-Jun-2010		115
STP:TT-FED	T²S	701 65 1311	10-2AD	$37,500	$37,500	LTRC	Cooper	Support for Senior Project Courses	1-Jul-2009	30-Jun-2010		116
STP:TT-FED	T²S	701 65 1310	10-3AD	$147,000	$147,000	LTRC	Cooper	LTRC Student Program	1-Jul-2009	30-Jun-2010		117
STP:TT-FED	T²S	736 99 1639	10-COOP	$400,000	$400,000	LTRC	Cooper	LADOTD COOP Program	1-Jul-2009	30-Jun-2010		118
STP:TT-FED	P	736 99 1636	10-TTRF	$100,000	$100,000	LTRC	Cooper	Technology Transfer Registration Fee	1-Jul-2009	30-Jun-2010		119
STP:TT-FED	T²S	736 99 1637	10-WDC	$2,605,000	$2,605,000	LTRC	Cooper	Workforce Development Contracts	1-Jul-2009	30-Jun-2010		120
				$5,285,847	**$5,285,847**	TOTAL STP FUNDING						

LTRC ANNUAL RESEARCH PROGRAM

FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
LTAP:TT-FED/TT-REG	A	736 99 1497	08-LTAP	$362,000	$300,000	LTRC	Walsh	Local Technical Assistance Program (LTAP)	1-Jan-2008	31-Dec-2009		123
LTAP:TT-FED	P	737 99 0787	LTAP Safety	$200,000	$200,000	LTRC	Walsh	Implementation and Project Management of the New Louisiana Local Road Safety Program	1-Jan-2008	31-Dec-2009		124
				$562,000	**$500,000**	LTAP TOTAL						

LTRC ANNUAL RESEARCH PROGRAM
FISCAL YEAR 2009 - 2010

Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
FHWA - Safety	A	712 99 0003	02-3SS	$14,925	$175,560	ULL	Sun	Developing a Comprehensive Highway Accident Data Analyis System with GIS (III)	1-Aug-2004	30-Jan-2006	30-Jul-2009	126
FHWA - Safety	A	736 99 1301	05-1SS	$32,948	$33,003	LSU	Wolshon/Sun	Evaluation of the Traffic Safety Benefits of a Lower Speed Limit and Restriction of Trucks to use of Right Lane Only on I-10 over the Atchafalya Basin	1-Jan-2005	31-Aug-2007	31-Aug-2009	127
FHWA - Safety	A	736 99 0878	07-7P	$27,842	$107,060	ULL	Sun	Safety Improvement from Edge Line of Rural Two-Lane Highways	1-Sep-2007	30-Aug-2010		128
LOOP	A	736 99 1510	08-2SS	$106,588	$140,858	LTRC	Strecker	LOOP Environmental Monitoring: 2008-2010 Beach Elevation, Beach Vegetation, and Land Loss and Habitat Change Surveys	1-Jan-2008	31-Dec-2010		129
				$134,430	**$247,918**	OTHER FUNDED PROJECTS TOTAL						

SPR Budget Recap

Category	Total
Total Administrative Budget	$937,400
Total Research Support Studies Budget	$1,818,000
Total In-House Studies Budget	$1,522,822
Total Proposed In-House Studies Budget	$1,474,777
Total Contingencies Budget	$100,000
Total Part II Program Budget	**$5,852,999**

*NCHRP	$571,687
*TRB Correlation	$125,270
*Pool Funded Studies	$130,000

*(Handled under separate agreement)

State Budget Recap

Category	Total
Total Active Contract Studies Budget	$2,159,312
Total Proposed Contract Studies Budget	$903,222
RFP's	$500,000
Total Part II Program Budget	**$3,562,534**

Self Generated Funds Recap

Category	Total
Active Studies	$850,375
Proposed Studies	$521,961
Total Self Generated Budget	**$1,372,336**

STP Technology Transfer Program Budget Recap

Category	Total
Technology Transfer Program and Operations	$893,215
Workforce Development	$1,103,132
Support for Senior Project Courses	$37,500
LTRC Student Program	$147,000
LADOTD COOP Program	$400,000
Technology Transfer Registration Fee	$100,000
Technology Transfer Contracts	$2,605,000
Total STP Budget	**$5,285,847**

LTAP Program Budget Recap

Category	Total
LTAP Program Total	**$562,000**

Other Funded Projects Recap

Category	Total
Active Studies	$134,430
Total Other Fund Budget	**$134,430**

Part II SPR Funded Research Program

ADMINISTRATIVE LINE ITEMS AND RESEARCH SUPPORT STUDIES

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Program Management**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1632		Project Start Date:		07/01/09
Research Project Number:	10-1PM		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$937,400	Total		$937,400
	(revised)				
Est. Expended to Date			Salaries		$937,400
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

To cover administrative costs of the staff members involved in the planning and supervision of the SPR program. This item will cover all general expenditures incurred in the management of the SPR Program, including the expense of the Policy Committee and Project Review Committee.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Managed the LTRC research program including administrative duties, financial responsibilities, and personnel supervision.
- Conducted LTRC 2009 Research Project Identification Committee (RPIC) activities.
- Participated in Transportation Research Board Activities.
- Participated on region and national RAC task groups.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Implement recommendations from 2008 Research Peer Exchange.
- Implement LTRC 2009 RPIC results.
- Continue to manage the SPR Research Program.
- Staff participation in External Peer Exchanges.
- Continued support for Transportation Research Board Activities.
- Continued support for region and national RAC task group activities.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Equipment Management**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1627		Project Start Date:		07/01/09
Research Project Number:	10-1EQM		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$314,000		Total		$314,000
	(revised)					
Est. Expended to Date				Salaries		$314,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

To cover costs incurred to provide support for the purchase, fabrication, evaluation, and maintenance of rolling equipment, special equipment, and instrumentation for research projects. To provide for participation in standardized testing programs for laboratory certification (Co-Op, AMRL,CRRL). Special emphasis will be on automation of instrumentation systems used for data collection.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Maintained AMRL accreditation of asphalt laboratory.
- Maintained AMRL accreditation of concrete laboratory.
- Maintained LTRC research laboratory and field equipment.
- Installed new lab equipment including new MTS load frame for Geotechnical Laboratory.
- CCRL Certification submittal and Technician Certification through ACI.
- Calibration of Profiler, FWD, Dynaflect, and Friction Tester.
- Calibration of Mobile Imaging System.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Maintain AMRL laboratory accreditations.
- Perform routine and unscheduled maintenance of LTRC research laboratory and field equipment.
- Developed plans and prepared specifications for new lab equipment need to maintain state-of-the –art laboratory facilities.
- Participate in Coop and CRRL testing programs.
- Safety Training and Reporting Duties.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Research Laboratory and Field Test Support**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1631		Project Start Date:		07/01/09
Research Project Number:	10-1LFT		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$211,000	Total		$211,000
	(revised)				
Est. Expended to Date			Salaries		$211,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The broad objectives of this study are to provide support to the department's request for investigative studies on new materials and/or techniques in the laboratory and/or field. The effort will be confined to materials and/or techniques considered new or unique and those of the generic type such as admixtures, modified asphalts, etc.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Provided assistance to the following "active" projects through inter-laboratory support and testing:

- ALF IV: Materials Characterization.
- NCHRP- 9-40; "Tack Coat": test lane coordination by ALF team.
- Thermal Coefficient of Concrete Mixtures; Concrete Lab.
- FRP- Columns; Concrete Lab.
- FWD and Dynaflect testing for Asphalt Treated Base Study.
- Aided Districts in the collection and analysis of data derived from FWD, High-Speed Profiler, Dynatest and Skid.
- Assessment of LA 1 By-Pass.
- Development of Best Practices guidelines for Polyurethane Usage.
- Shrinkage crack mitigation for soil cement base courses.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Continue to respond to request for technical assistance for laboratory, field work, and forensic analysis on DOTD projects not related to a formal research project that require a substantial amount of time and Laboratory effort.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**New Products Evaluation**
Funding Source:	**SPR: TT-REG / TT-REG**

State Project Number:	736-99-1628		Project Start Date:		07/01/09
Research Project Number:	10-1NPE		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$53,000	Total		$53,000
	(revised)				
Est. Expended to Date			Salaries		$53,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

To support evaluation of products for LADOTD New Products Evaluation Committee. To provide general evaluation of new products or technologies not associated with a research project.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

The examples for LADOTD New Products Evaluation include:

- Material Transfer Vehicle review.
- Trackless Tack Coat Specifications.
- Stargrid pavement reinforcing fabric construction and performance review.
- Implementation of new Tack Coat Specifications for roadway reinforcing mesh.
- Evaluation of Polycon Overlay System.
- Evaluation of TyreGrip Overlay System.
- TerraCem, Lafarge, Phase 1, 2 & 3.
- Lime Kiln Dust, Omni Materials, Phase 1 & 2.
- Black Max Bottom Ash, Big River Industries, Phase 1 & 2.
- EarthBind 100, EnviroRoads, Inc., Phase 1 & 2.
- Nen Dry Powder, Georgia Pacific, Phase 1 & 2.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Continue managing the necessary evaluations of new products submitted to LTRC by the LADOTD new product evaluation committees.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Technical Assistance**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1634		Project Start Date:		07/01/09
Research Project Number:	10-1TA		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$654,000	Total		$654,000
	(revised)				
Est. Expended to Date			Salaries		$654,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

To cover costs incurred in providing laboratory, field testing and forensic analysis in direct response to departmental inquiries for assistance on DOTD projects which are not related to formal research studies. To provide assistance to state university requests for laboratory or field testing on research projects not funded by LTRC.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

LTRC has responded to the requests from DOTD and universities on a timely manner. The examples include:

- Permeability Testing of Concrete for bridge structures: LA 1, Twin Span, Rigolets.
- Concrete mix design verification testing for Audubon Bridge.
- Forensic Assistance for asphalt projects; Hwy 659, miscellaneous; questions of mix design.
- Pre-design structural information, FWD, Dynaflect, etc. for district design units.
- Pre design DCP analysis.
- Provided support to contract researches in their effort to develop new LEF factors for LADOTD.
- Help LADOTD instrument a pile at LA1 for lateral load test.
- Help LADOTD collect the data during the lateral load test.
- Evaluation of aggregate materials for use as base layer in pavements.
- Rapid Chloride Permeability testing for HPC (Lab).
- Various items for Dr. Shin (Lab).
- Various items for Dr. Lee (Lab).
- Responded to various questions concerning concrete (statewide).

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Respond to requests for laboratory, field work, and forensic analysis on DOTD projects not related to a formal research project. • Respond to requests for laboratory, field work, and analysis for university requests not related to an LTRC formal research project. • Provide general assistance to other public entities not related to research.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Technical Research Surveillance**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1633		Project Start Date:		07/01/09
Research Project Number:	10-1TRS		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$354,000		Total		$354,000
	(revised)					
Est. Expended to Date				Salaries		$354,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

To cover costs incurred in providing Administration of LTRC Research Project Contracts, preparation of research proposals, participation on LTRC Project Review Committees and participation on LTRC Report Review Committees. To provide laboratory and field assistance to LTRC contract researchers on projects funded by LTRC.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Managed the research projects for over 36 external University contracts.
- Prepared 4 RFP's for initiation of new projects.
- Provided review for draft reports on completed research projects.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Provide management of LTRC research project contracts.
- Prepare new research proposals for initiation of new projects in accordance with proposed in-house projects as approved in this annual work program document.
- Participation on LTRC Project Review Committees.
- Participation on LTRC Report Review Committees.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Technology Transfer and Research Implementation**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1630		Project Start Date:		07/01/09
Research Project Number:	10-1TTRI		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$232,000		Total		$232,000
	(revised)					
Est. Expended to Date				Salaries		$232,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

To cover costs incurred in providing research implementation activities, technology transfer seminars and participation in external research/training activities (NCHRP/FHWA panels, TRB meetings, technical conferences, and research review committees).

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- TRB, Transportation Research Board Annual Meeting, Washington, DC; attendance and committee participation, two committee chairs, and thirteen committee members, several presentations given.
- Attended and presented at American Concrete Institute Spring Convention.
- Intelligent Compactor Showcase *LTRC Project Review Committee Meetings.
- Southeast new MEPDG User Group Meeting.
- Fly Ash Seminar sponsored by Headwaters and LTRC.
- Attended Louisiana Transportation Conference.
- Development of Specifications for Polyurethane Usage.
- Louisiana Transportation Conference (2 presentations).
- Attended two National Concrete Consortium (NCC) Meetings.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Continue Research Implementation Activities.
- Development of program for 2009 Transportation Conference.
- Development and hosting of Technology Transfer Seminars: Construction Quality Seminar Scheduled in November.
- Participation in external research/training activities: NCHRP/FHWA panels, TRB meetings, technical conferences).

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Contingencies**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1629		Project Start Date:		07/01/09
Research Project Number:	10-1CON		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Harold Paul				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000	Total		$100,000
	(revised)				
Est. Expended to Date			Salaries		$100,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The purpose is to provide contingency funding for unforeseen budget increases needed on on-going projects and for initiation of new research studies not programmed as individual line items in the current work program.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Part II SPR Funded Research Program

CONTINUING RESEARCH

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Long-Term Monitoring of the HPC Charenton Bridge**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1122		Project Start Date:		06/01/04
Research Project Number:	03-7ST		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Walid Alaywan				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$28,876		Total		$5,000
	(revised)					
Est. Expended to Date		$13,184		Salaries		$5,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$5,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$5,000		Other		

PURPOSE AND SCOPE

The Charenton bridge is made out of High Performance Concrete (HPC) mixtures. This is a demonstration project implementing an earlier study funded by LTRC earlier. The bridge was instrumented with strain gauges in order to collect data to study the long-term performance of this structure. The PI who performed the study and his graduate student performed prior data collection. Now that the structure is operational, LTRC personnel will assume the data collection. Previously there was a gap in the collected data because there were no personnel dedicated to this assignment.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Reviewing collected (strain, temperature, and deflection) data and updating chart for all instrumented girders.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Continue data collection.
- Investigate the feasibility of automated data acquisition system for remote connection.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Implementation of New Open Graded Friction Course Specifications**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1300		Project Start Date:		07/01/05
Research Project Number:	04-5B		Completion Date	*(original)*	07/30/07
Research Agency:	LTRC		Completion Date	*(revised)*	12/01/09
Principal Investigator:	Bill King				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$ 66,802		Total		$42,000
	(revised)	$109,164				
Est. Expended to Date		$67,164		Salaries		$42,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$42,204		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$16,000		Other		

PURPOSE AND SCOPE

FHWA and many states have utilized polymer modified asphalts and fibers to enhance the performance of OGFC. This research will examine the OGFC specifications in other states and will construct a minimum of three OGFC projects. The mix design methods and performance of the OGFC in relation to skid resistance, water and overspray mitigation, and noise abatement will be documented.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Compiled data from construction project June, 2007.
- Worked on Specifications for several projects.
- Investigating other field projects.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Currently working to add at least two additional projects for evaluation.
- Complete Final Report.

LTRC Annual Research Program
Fiscal Year 2009- 2010

Title:	**Control of Embankment Settlement: Field Verification of Piezocone Penetration Test (PCPT) Prediction Methods**
Funding Source:	**SPR: TT-FED/TT-REG**

State Project Number:	736-99-1306		Project Start Date:		03/01/05
Research Project Number:	04-5GT		Completion Date	*(original)*	02/28/09
Research Agency:	LTRC		Completion Date	*(revised)*	06/30/10
Principal Investigator:	Dr. Murad Abu-Farsakh and Gavin Gautreau				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$236,695		**Total**		$99,400
	(revised)					
Est. Expended to Date		$135,350		Salaries		$99,400
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$27,000		Equipment	*(non-expendable)*	
	(revised)	$31,000		Travel		
Est. FY Expenditure		$31,000		Other		

PURPOSE AND SCOPE

Settlement of approach embankments is one of the major reasons that cause the “bump” feeling at bridge ends. This extra settlement can come from either the embankment itself or from the natural soil foundation, or both. Therefore, understanding the mechanisms of the settlement is very important so that counter-measures can be taken to prevent it from occurring. A research project was conducted at LTRC to evaluate the consolidation parameters from the Piezocone Penetration Test (PCPT) data. The first objective of this study is to verify the findings of the consolidation project and implement it for future estimation of embankment settlements. To achieve this, five embankments are proposed to be instrumented with time using magnet extensometers, horizontal inclinometers, and settlement plates to monitor the consolidation settlement for each soil layer with time. The measured settlements will be used to back-calculate the consolidation parameters of the soil, which will then be compared with both the laboratory and Piezocone Penetration Test (PCPT) derived parameters.

Another objective of this research project is to develop a visual basic program to estimate the consolidation settlement of embankments from Piezocone Penetration Test (PCPT) data and input from the user.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS
• Identified one site at Bayou Courtableau Bridge for monitoring embankment settlement. • Conducted two borings, one in each side to retrieve samples for laboratory consolidation, unconfined compression, and triaxial tests. • Conducted in-situ PCPT tests on both embankment sides. There was difficulty in dissipation tests. • Started the laboratory testing of soil samples. • Purchased one set of horizontal inclinometer and one set of vertical extensometer for monitoring the settlements of both embankments at Bayou Courtableau Bridge. We are ready to install these instrumentations at any time, depending on construction progress. • Worked on the development of visual basic software for estimating consolidation settlement.
FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Conduct in-situ Piezocone dissipation tests at Bayou Courtableau Bridge site. • Calculate embankment settlement from result of laboratory consolidation and in-situ PCPT tests. • Monitor the settlement with time of the instrumented embankment site. • Analyze the collected data. • Prepare a Final Report.

LTRC Annual Research Program
Fiscal Year 2009- 2010

Title:	**Characterization of Louisiana Asphalt Mixtures Using Simple Performance Tests and MEPDG**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:		736-99-1512	Project Start Date:		01/01/08
Research Project Number:		04-6B	Completion Date	*(original)*	12/30/10
Research Agency:		LTRC	Completion Date	*(revised)*	
Principal Investigator:		Louay Mohammad			

BUDGET STATUS

Total Budget			**Estimated FY 2009– 2010 Budget**		
Total Cost	*(original)*	$398,672	Total		$144,000
	(revised)				
Est. Expended to Date		$222,000	Salaries		$144,000
FY 2008– 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$113,000	Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure		$113,000	Other		

PURPOSE AND SCOPE

The primary objective of this research is to characterize common Louisiana hot mix asphalt mixtures as defined by the SPTs protocols for QA and to create a catalog for dynamic modulus values inputs in the MEPDG software. The secondary objective is to evaluate the sensitivity of rut prediction models from MEPDG software using the dynamic modulus |E*| test results. In addition, the Witczak and Hirch models will be evaluated, for the prediction of dynamic modulus |E*| values for the asphalt mixtures. Field performance parameters will also be measures and compared to the ones predicted from the MEPDG software.

FISCAL YEAR 2008– 2009 ACCOMPLISHMENTS

- Continued progress in the following tasks as per the proposal test factorial.
- Develop Test Factorial.
- Mixture Design.
- Sample Fabrication.
- Conducting Laboratory Tests.
- Field Performance Evaluation.
- Conduct Data Analysis.

FISCAL YEAR 2009– 2010 PROPOSED ACTIVITIES

- Continue the following tasks as per the proposal test factorial.
- Develop Test Factorial.
- Mixture Design.
- Sample Fabrication.
- Conducting Laboratory Tests.
- Field Performance Evaluation.
- Conduct Data Analysis.

LTRC Annual Research Program
Fiscal Year 2009- 2010

Title:	**Field Demonstration of New Bridge Approach Slab Designs and Performance**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1556		Project Start Date:		07/01/08
Research Project Number:	05-1GT		Completion Date	*(original)*	09/30/11
Research Agency:	LADOTD/LTRC		Completion Date	*(revised)*	
Principal Investigator:	Murad Abu-Farsakh				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$393,176		**Total**		$77,500
	(revised)					
Est. Expended to Date		$62,000		Salaries		$52,900
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$24,600
FY Funds	*(original)*	$64,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$62,000		Other		

PURPOSE AND SCOPE

This project implements the findings from two LTRC Projects: **"**The Rideability of a Deflected Bridge Approach Slab" (02-2GT) and "Determination of Interaction between Bridge Concrete Approach Slab and Embankment Settlement" (03-4GT). It will also study such major causes of extra settlement from the collapsive behavior of embankment soils and its relation with construction methods, the erosion control of embankment, the settlement of native ground as embankment foundation and its control, and etc. In this project, lab and field tests will be conducted for soil deformation. Field-testing sections of bridge concrete approach slabs will be built and their performance will be monitored and analyzed so that final recommendation can be made to DOTD on the bump issue at bridge ends. These bridge approach slabs tested are based on new design from the Bridge Design Section in comply with the recommendations from the two finished research projects.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Started the literature review on relevant research projects on field testing, geogrid soil reinforcement, instrumentation, and monitoring.
- Identified one site at Bayou Courtableau Bridge for implementing new approach slab design with geogrid-reinforced soil supported foundation.
- Designed the geogrid-reinforced foundation to support the approach slab.
- Developed instrumentation and testing plan for Bayou Courtableau Bridge approach slab.
- Purchased the instrumentations needed for monitoring the performance of approach slab at Bayou Courtableau Bridge, including both substructure and superstructure instrumentation.
- Installed strain gauges along geogrid reinforcements. We are ready to install the geogrid reinforcements and other instrumentations at any time, depending on construction progress.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Install the geogrid reinforcement layers and other instrumentations beneath the approach slab at Bayou Courtableau Bridge. • Install sister bar strain gauges within the approach slab structure. • Monitor the performance of approach slab at Bayou Courtableau Bridge. • Collect data for all instrumentations. • Analyze the collected data from approach slab at Bayou Courtableau Bridge. • Look for new bridge approach slab embankment sites for instrumentation and monitoring.

Title:	**Evaluation of the Base/Subgrade Soil under Repeated Loading**
Funding Source:	**SPR : TT-FED/TT/REG**

State Project Number:	736-99-1312		Project Start Date:		08/01/05
Research Project Number:	05-5GT		Completion Date	*(original)*	01/31/08
Research Agency:	LTRC		Completion Date	*(revised)*	06/30/10
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$433,483		**Total**		$107,600
	(revised)	$509,600				
Est. Expended to Date		$402,000		Salaries		$95,300
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$12,300
FY Funds	*(original)*	$120,000		Equipment	*(non-expendable)*	
	(revised)	$88,000		Travel		
Est. FY Expenditure		$88,000		Other		

PURPOSE AND SCOPE

The purpose of this project is to develop a laboratory testing facility for the evaluation of the base and subgrade system of paved/unpaved roads that is capable of simulating the actual field loads and conditions under repeated loading. The equipment will permit evaluating various types and properties of base-subgrade systems.

An experimental study will be conducted to evaluate the influences of subgrade strength, reinforcement type and stiffness, as well as the base thickness on reinforcement benefits. An instrumentation array will be developed to monitor strains, vertical stresses, and deformation during loading.

Finite element parametric analyses will be conducted using ABAQUS program on reinforced base sections to study of influential factors in the design of reinforced pavements, and attempt to evaluate the extended service life and determine the equivalent additional base layer thickness due to the presence of the geogrid reinforcement

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Analyzed the results of cyclic loading tests conducted inside the test box in terms of extended service life benefit achieved from reinforcing bases with geogrids.
- Conducted seven cyclic plate loading tests on ALF test sections,
- Conducted two cyclic plate loading tests inside the test box on selected pavement base reinforced sections.
- Start analyzing the results of cyclic loading tests on ALF sections and compare them with the results of rolling wheel accelerated load testing.
- Prepared an interim report on results of laboratory repeated loading triaxial tests on base samples reinforced with different types of geogrids and finite element analyses on the effect of subgrade strength, base thickness, and geogrid stiffness on the extended service life benefit of base-reinforced pavement sections.
- Obtained external private funds from Tensar Earth Technologies, which reduced the FY funds needed.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Conduct three cyclic loading tests inside the actuator-test box on instrumented geogrid reinforced-base pavement sections on soft silty subgrade. • Continue analyzing the cyclic loading test results in terms of extended service life benefit achieved from reinforcing bases with geogrids. • Continue analyzing the results of cyclic loading tests on ALF sections and compare them with the results of rolling wheel accelerated load testing. • Prepare a draft report.

LTRC Annual Research Program
Fiscal Year 2009- 2010

Title:	**Evaluation of Warm Mix Asphalt Technology in Flexible Pavements**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1624		Project Start Date:		03/15/09
Research Project Number:	07-1B		Completion Date	*(original)*	03/15/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	William "Bill" King				

BUDGET STATUS

Total Budget				**Estimated FY 2009– 2010 Budget**		
Total Cost	*(original)*	$325,420		Total		$191,000
	(revised)					
Est. Expend to Date		$40,000		Salaries		$190,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$40,000		Equipment	*(non-expendable)*	
	(revised)			Travel		$1,000
Est. FY Expenditure		$40,000		Other		

PURPOSE AND SCOPE

The objective of this research is to evaluate existing technologies that allow the reduction of mixing and compaction temperatures of asphalt mixtures and ultimately develop an innovative approach to achieve that without compromising the performance and durability of the resulting mixtures. Reduced production and paving temperatures would have beneficial environmental and economic effects. A comparison of conventional mix designs to existing Warm-Mix technologies will be conducted on Field mixtures. Chemical properties and engineering (rheological) properties of the modified asphalt binder in this study will be evaluated using standard analytical method and Superpave binder tests. Asphalt mixtures that contain different levels of additives will be characterized by a suite of fundamental engineering tests. Those tests will be aimed at characterizing the stability and durability of the asphalt mixtures.

FISCAL YEAR 2008– 2009 ACCOMPLISHMENTS

- Conduct a thorough literature review on Warm Mix Asphalt.
- Develop a rational test factorial by considering all possible effects on test results.
- Construction of three field projects.
- Conduct fundamental materials characterization tests based on the developed test factorials for the three constructed projects.

FISCAL YEAR 2009– 2010 PROPOSED ACTIVITIES

- Begin data analysis and evaluation.
- Schedule and construct at least two field projects.
- Conduct fundamental materials characterization tests based on the developed test factorials for the three constructed projects.

Title:	**Calibration of Resistance factors needed in the LRFD design of Driven Piles**
Funding Source:	**SPR : TT-FED/TT/REG**

State Project Number:	736 99 1408		Project Start Date:		09/01/06
Research Project Number:	07-2GT		Completion Date	*(original)*	08/30/08
Research Agency:	LTRC		Completion Date	*(revised)*	12/31/09
Principal Investigator:	Drs. Murad Abu-Farsakh, Ching Tsai, and Sungmin Yoon				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$210,000		**Total**		$19,000
	(revised)					
Est. Expended to Date		$191,000		Salaries		$19,000
FY 2008 – 2009 Budget				Equipment	(expendable)	
FY Funds	*(original)*	$74,000		Equipment	(non-expendable)	
	(revised)			Travel		
Est. FY Expenditure		$55,000		Other		

PURPOSE AND SCOPE

The purpose of this research is to implement the LRFD methodology in the design of driven piles and drilled shafts in Louisiana. A search in the DOTD files will be conducted to identify, collect, and analyze pile load test reports with soil properties and in-situ testing adjacent to test piles. The ultimate load carrying capacity for each pile will be determined from the pile load test using Davisson and Butler-Hoy methods. The ultimate load carrying capacity for each pile will be predicted using the methods used by DOTD for pile design and analysis. Reliability analyses will be performed to calibrate the target reliability indices and resistance factors for the different methods and procedures. Recommendations of the target reliability indices and resistance factors as well as the efficiency factors for different methods will be provided. Procedures for the implementation of the LRFD design will be recommended as well. This research is expected to result in cost saving and improved safety in driven piles design due to more efficiently balanced design and more rationally and rigorously treated uncertainties.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Completed statistical reliability analysis on 53 driven piles to calibrate resistance factors for different pile design methods based on soil borings and CPT data for the selected target reliability index.
- Collected and analyzed 12 drilled shafts from Louisiana.
- Conducted statistical analysis on collected drilled shafts from Louisiana to obtain key statistical parameters such as mean, standard deviation, and coefficient of variation as well as the type of distribution that best fits the data.
- Evaluate the target reliability index for drilled shafts.
- Conduct preliminary reliability analysis on the collected drilled shafts in Louisiana to determine the resistance factors for O'Neil and Reese design method.
- Collected and analyzed 29 drilled shafts from Mississippi State
- Prepared a final report on LRFD of driven piles.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Conduct statistical analysis on collected drilled shaft data to obtain key statistical parameters such as the mean, standard deviation, and coefficient of variation as well as the type of distribution that best fits the data. • Evaluate the target reliability index for drilled shafts. • Conduct reliability analysis to determine the resistance factors for O'Neil and Reese drilled shaft design method with the selected target reliability index. • Prepare a final report on LRFD of drilled shafts.

Title:	**Support Study to Structure Health Monitoring of the I-10 Twin Span Bridge Over Lake Pontchartrain**
Funding Source:	**SPR : TT-FED/TT/REG**

State Project Number:		736-99-1507	Project Start Date:		01/01/08
Research Project Number:		08-3GT	Completion Date	*(original)*	12/31/10
Research Agency:		LTRC	Completion Date	*(revised)*	
Principal Investigator:		Drs. Murad Abu-Farsakh & Sungmin Yoon			

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$88,776	**Total**		$81,000
	(revised)	$232,951			
Est. Expended to Date		$72,600	Salaries		$81,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$90,000	Equipment	*(non-expendable)*	
	(revised)	$55,000	Travel		
Est. FY Expenditure		$55,000	Other		

PURPOSE AND SCOPE

The objective of this proposal is to provide additional funding for research project No. 07-1ST to cover the cost required to instrument the I-10 Twin Span Bridge for short-term and long-term monitoring. The objective of the primary research project is to establish a structure health monitoring system of the I-10 Twin Span bridge through instrumentation of the M19 Eastbound pier for use in the short-term and long-term monitoring purposes. This includes instrument selected piles with inclinometers and strain gauges, instrument pile-cap with accelerometers and tiltmeters, and instrument column with water pressure cells.

Static lateral load test will be performed by LADOTD immediately after completing the installation of the monitoring system in the Eastbound pier M19. The short-term monitoring will be used to validate the applicability of the FB-MultiPier analysis for predicting the performance of battered pile group system under lateral loading; and to develop (or back-calculated) the p-y multipliers for battered pile groups in similar soil conditions.

The long-term monitoring will be used to evaluate the behavior of pile group structure under dynamic loads caused by selected events (winds, waves, and vessel collision).

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Conducted literature review on pile instrumentation, substructure monitoring systems, and lateral load tests of single and group of piles.
- Coordinated with contractor, subcontractor, and PRC to finalize the design of substructure and superstructure instrumentation monitoring systems and the necessary construction plan changes.
- Installed the FB-multi pier program and used it to analyze the Eastbound M19 pier of Twin Span bridge.
- Completed substructure instrumentation of Eastbound M19 pier. This included instrumenting piles with strain gauges and IPI sensors; and instrumenting footing with accelerometers, tiltmeters, and water pressure cells.
- Prepared a detailed plan for the lateral load test.
- Conducted the lateral load test at M19 twin span; and collected data from all instrumentations during test.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Start analyzing the lateral load test data. • Prepare an interim report on substructure instrumentation and lateral load testing phases. • Back-calculate the p-y multipliers for FB-Multipier analysis of battered pile groups in similar soil conditions. • Complete the superstructure instrumentation (columns, cap bent, deck), including installing WIM. • Coordinate with the subcontractor to setup the long-term monitoring system.

LTRC Annual Research Program
Fiscal Year 2009- 2010

Title:	**Evaluation of Fly Ash Quality Control Tools**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1584		Project Start Date:		03-01-09
Research Project Number:	09-1C		Completion Date	*(original)*	03-01-10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Tyson Rupnow, Ph.D.				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$108,772		**Total**		$68,114
	(revised)					
Est. Expended to Date		$40,658		Salaries		$66,114
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$2,000
FY Funds	*(original)*	$57,186		Equipment	*(non-expendable)*	
	(revised)	$40,658		Travel		
Est. FY Expenditure		$40,658		Other		

PURPOSE AND SCOPE

The purpose of this study is to investigate the use of quick calorimetry and penetration type set time devices as QC tools for as delivered class C fly ash. This evaluation will provide a much needed QC tool for fly ash.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

To date, we have obtained about 1/2 of the fly ash samples for testing from the various sources of class C fly ash noted on the QPL. The materials laboratory is currently conducting the loss on ignition, fineness, and chemical analysis of each sample. Concrete personnel are currently in the process of physical testing.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Continue and finish laboratory testing by January 1, 2010. Analyze the data and perform any further testing as needed. Write the final report.

Title:	**LTRC Support for Geotechnical Research at the Geotechnical Engineering Research Laboratory [GERL]**
Funding Source:	**SPR:TT-FED / TT-REG**

State Project Number:	736-99-1101		Project Start Date:		07/01/09
Research Project Number:	09-1GERL		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*		**Total**		$160,900
	(revised)				
Est. Expended to Date			Salaries		$82,800
FY 2008 – 2009 Budget			Equipment	*(expendable)*	$30,800
FY Funds	*(original)*		Equipment	*(non-expendable)*	$25,000
	(revised)		Travel		$12,300
Est. FY Expenditure			Other		$10,000

PURPOSE AND SCOPE

This project is a continuation of the work of the previous study of 09-1GERL. The objectives of the research are to:

- Perform support studies to meet the beneficiary requirements for geotechnical and geosynthetic testing, technical assistance and research.
- Advance the state-of-the-art in geotechnical and geosynthetic research.
- Provide Cone Penetration Testing as necessary for research and technical assistance on DOTD projects.
- Provide development, support and training of new and innovative techniques, software and equipment for advancing the performance of the transportation system.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Provided geotechnical testing support and technical assistance for DOTD.
- Published several technical papers/reports on LTRC research results.
- Developed research proposal on Field Demonstration of New Bridge Approach Slab Designs and Performance and Structure Health Monitoring of the I-10 Twin Span Bridge over Lake Pontchartrain.
- Maintained and upgraded software's related to CPT application.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Provide geotechnical and geosynthetic testing support and technical assistance for DOTD.
- Provide support and training for implementation of research results.
- Develop research proposals and problem statements for future activities.
- Publish research findings on technical papers and reports.
- Maintain CPT software's.

Title:	**Evaluation of Cement and Fly Ash Treated RAP and Marginal Aggregates for Base Construction**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1586		Project Start Date:	03/01/09
Research Project Number:	09-2C		Completion Date *(original)*	03/01/11
Research Agency:	LTRC		Completion Date *(revised)*	
Principal Investigator:	Tyson Rupnow, Ph.D.			

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$121,044		**Total**		$84,760
	(revised)					
Est. Expended to Date		$27,588		Salaries		$82,760
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$2,000
FY Funds	*(original)*	$43,381		Equipment	*(non-expendable)*	
	(revised)	$27,588		Travel		
Est. FY Expenditure		$27,588		Other		

PURPOSE AND SCOPE

The purpose of this study is to determine mixtures of cement treated rap (CTRAP) and possible marginal aggregates that will prove acceptable for both Portland cement concrete and hot mix asphalt pavement systems. Fly ash treated RAP (FTRAP) and marginal aggregates will also be investigated to determine if they are suitable alternatives to cement treated materials. The respective mixtures will be characterized and the performance of a mixture to be determined upon further testing will be evaluated in the accelerated load testing facility (ALF).

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

To date, we have obtained the cement and fly ash to be used in the study. Other materials are currently being acquired.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Procure the remaining material, limestone and gravel based RAP, limestone screenings, blended calcium sulfate, referenced aggregate, sand, and recycled soil cement trimmings for the study and proceed with the laboratory testing.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Performance and Analysis of Concrete Bridge Railing Using Conventional and Composite Reinforcement Materials**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1619		Project Start Date:		04/01/09
Research Project Number:	09-2ST		Completion Date	*(original)*	09/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Walid Alaywan, MSCE, P.E.				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$ 82,410		Total		$68,930
	(revised)					
Est. Expended to Date		$13,000		Salaries		$54,930
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$12,000
FY Funds	*(original)*	$13,000		Equipment	*(non-expendable)*	
	(revised)			Travel		$2,000
Est. FY Expenditure		$13,000		Other		

PURPOSE AND SCOPE

Bridge Barriers are designed to resist accidental impact of a standard test vehicle. NCHRP 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features," specifies various levels of test vehicles for different applications. The LA Department of Transportation and Development (LA DOTD) uses the F-Shape concrete railing over many of its highway bridges.

There were several approved changes to the current NCHRP Report 350. Based on that, it is necessary to reevaluate the performance of the new detail.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS (WHEN PROJECT STARTS)

Task 1 Conduct literature review.
Task 2 Perform computational analysis on currently used section to verify it can withstand TL-4 impact based on NCHRP 350 requirement and the newly proposed TL-4 test.
Task 3 Based on the results of task 2, Design the reinforcement of two F-Shape railings; one section using FRP bars for reinforcement and the other using conventional bars.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Task 4 Develop an instrumentation plan for field performance. The purpose of the instrumentation is to collect data while performing a static load testing on both sections.
Task 5 Cast the two sections and perform a static load test on each one. The static load test will be performed through hydraulic rams which will transmit a force of 76 kips to the sections. The conventionally reinforced concrete section will serve as: (1) a control section when comparing the FRP results and (2) also will contain the revised reinforcement based on the new NCHRP proposed loads.
Task 6 Analyze collected data and compare to results obtained through computations
Task 7 Submit a final report with research findings and recommendations.

LTRC Annual Research Program
Fiscal Year 2009- 2010

Title:	**Evaluation of Ternary Cementitious Combinations**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1587		Project Start Date:		03/01/09
Research Project Number:	09-4C		Completion Date	*(original)*	03/01/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Tyson Rupnow, Ph.D.				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$202,343	**Total**		$101,171
	(revised)				
Est. Expended to Date		$35,058	Salaries		$99,171
FY 2008 – 2009 Budget			Equipment	*(expendable)*	$2,000
FY Funds	*(original)*	$51,586	Equipment	*(non-expendable)*	
	(revised)	$35,058	Travel		
Est. FY Expenditure		$35,058	Other		

PURPOSE AND SCOPE

The purpose of this study is to determine the properties of various ternary cementitious combinations for the state of Louisiana. Mixtures will be evaluated in the fresh and hardened state. Current specifications allow the use of both fly ash and slag, and the results from this research will provide guidance on possible ternary combinations.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Material quantities needed are currently being estimated and procured.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Procure cementitious materials (grade 100 and grade 120 slag, class C and class F fly ash, cement). Chemical characterization of each cementitious material. Laboratory testing of the proposed test matrix.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Evaluation of Non -Destructive Technologies for Construction Quality Control of HMA and PCC Pavements in Louisiana**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		04/01/09
Research Project Number:	09-5C		Completion Date	*(original)*	07/01/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Patrick Icenogle				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$112,851	**Total**		$85,447
	(revised)				
Est. Expended to Date		27,404	Salaries		$85,447
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	27,404	Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure		27,404	Other		

PURPOSE AND SCOPE

The purpose of this study is to evaluate the Light Weight Deflectometer (LWD) and Portable Seismic Pavement Analyzer (PSPA) for use as non-destructive in-situ quality control tools. This research will use data collected from the devices on three hot-mix asphalt and three concrete jobs to determine the ruggedness and consistency of each device independently. Also, an operating procedure for each device will be developed and the in-situ measurements will be compared to lab samples from the same roadway locations.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

The project is just getting started with: a literature search, locating previously collected data, and locating field projects for use in research. Several field projects are currently underway with the collection of data completed.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
Continue field and laboratory testing to complete by April 2010. Analyze the data and perform any further testing as needed. Write the Final Report.

Title:	**Pavement Materials Research Using Special Equipment at the Engineering Materials Characterization Research Facility**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1029		Project Start Date:		07/01/09
Research Project Number:	10-1EMCRF		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*			**Total**		$187,000
	(revised)					
Est. Expended to Date				Salaries		$151,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	$30,000
	(revised)			Travel		$6,000
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The Engineering Materials Characterization and Research Facility, EMCRF, provides a multi-disciplinary expertise and state-of-the-art research capabilities to assess the fundamental engineering properties of materials used in the transportation industry in Louisiana. EMCRF plays an important role in the evaluation of the engineering properties of materials used in the LTRC's regional pavement testing facility, ALF. In addition, EMCRF provides specialized analytical expertise for on-going as well as newly initiated in-house research projects; develops new software to be used by DOTD engineers; provides experimental design and analysis; provide training for DOTD employees for the purpose of adopting newly developed technology and implementation methodology into the daily operations of DOTD, and, assists in-house LTRC investigators to develop thorough research programs.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Participated in the LDOTD Asphaltic Concrete Specification Committee.
- Developed and submitted the following proposals for external funding:
  - Two NCHRP proposals, one was funded ($500,000).
  - One LEQSF proposal.
  - Two proposals to Shell USA, both were funded ($550,000).
- Prepared several papers and reports from LTRC projects.
- Made several invited presentations at LDOTD meetings, and national and international conferences.
- Participated in several technical assistance projects.
- Managed and maintained state-of-the-art testing capability at EMCRF.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Continue participation in the Louisiana DOTD Asphaltic Concrete Specification Committee. • Continue participation in technical assistance projects. • Conduct workshops and seminars. • Developed and submit proposals for external funding. • Continue to manage and maintain state-of-the-art testing capability at EMCRF.

Part II SPR Funded Research Program

PROPOSED RESEARCH

Title:	**Intelligent Compaction Technology**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	06-3GT		Completion Date	*(original)*	06/30/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Gavin Gautreau				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000		Total		$102,860
	(revised)					
Est. Expended to Date				Salaries		$102,860
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Intelligent compaction refers to the use of instrumented rollers that record soil stiffness (vibration load/soil displacement) and GPS position. These measurements are used to create a stiffness index. Once calibrated, subsequent passes are compared against target values. The roller receives feedback from the soil based on the resistance encountered; the intelligent roller then automatically and "instantaneously" modifies its settings (force amplitude, frequency) to meet the target modulus.

The on-board computer is used to help the operator avoid over and under compaction. The goal of the technology is to ensure proper compaction is achieved while reducing delays and "pumping" problems.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

The project will begin and work will be directed toward the purpose and scope as detailed above.

Title:	**Implementation of Performance Specifications in Roadway Construction**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1404		Project Start Date:		07/01/09
Research Project Number:	06-4GT		Completion Date	*(original)*	01/31/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Gavin Gautreau				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000		Total		$50,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Performance-based specifications are the next logical step in the evolution of roadway construction. These specifications should assign the appropriate separate and joint responsibilities for compliance without limiting innovation, which may reduce time and or construction costs. Innovation must still maintain acceptable levels of quality, and the assigned responsibilities for achieving certain objectives must be clear. This project proposes to evaluate and set standards for different in-situ devices.

The DCP, GeoGauge, Light-Falling Weight Deflectometer (LFWD), and other in-situ devices is simple and economical hand tool that provides measurements of the in-situ strength/stiffness of pavement sections and/or the underlying subgrade layers without the need for digging the existing pavement. The calculations are simple and the device requires minimal maintenance.

Performance-based specifications will address requirements desired for strength, stiffness, and durability, rather than necessarily for example: moisture and density. Performance-based specifications can result in innovative products and construction processes, higher quality, reduced cost, reduced construction time, and therefore satisfied customers (the public).

LTRC Report #385, Assessment of In-Situ Test Technology for Construction of Base Courses and Embankments, outlined the benefits of the DCP device. For example, the DCP can verify both the level and uniformity of compaction, which makes it an excellent tool for quality control of pavement construction. Moreover, it can be used to determine the tested layer thickness. Demonstrated that the results from penetration tests correlate well with the in-situ CBR values.

One goal of this project is to implement the DCP as an additional field evaluation tool. The project hopes to establish target values of acceptance for initially base course materials, and secondly sub-base and sub grade materials.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS
FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
The project will begin and work will be directed toward the purpose and scope as detailed above.

Title:	**Implementation of the Use of Subgrade Resilient Modulus in Flexible Pavement Design**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	07-3P		Completion Date	*(original)*	06/30/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$342,372		Total		$88,262
	(revised)					
Est. Expended to Date				Salaries		$8,7262
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		1,000
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Characterization of subgrade soil is essential for the design and analysis of pavement structures. Design of flexible pavements is generally based on static properties such as California Bearing Ratio (CBR) and soil support value. These properties do not represent the actual response of the pavement layers under traffic loadings. Recognizing this, the current AASHTO design guide for pavement structures and the Mechanistic Empirical Pavement Design Guide (MEPDG) recommend the use of a Dynamic Resilient Modulus for the mechanistic analysis and design of pavement structures. Currently, LA DOTD estimates resilient modulus using correlation developed based on soil support values. The objective of this study is to implement the use of resilient modulus of subgrade soils estimated from various in-situ methods such as the dynamic cone penetration test, falling weight Deflectometer, Dynaflect, and Minicone Penetration test. Several LA DOTD rehabilitation projects with varying subgrade types will be selected for this implementation.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Identify construction projects from LA DOTD.
- Assist LA DOTD develop contract specifications to collect field data, which uses the results from LTRC study to predict field modulus.
- Collect field samples for lab modulus testing from the construction projects selected.

Title:	**Evaluation of Current DOTD Flexible Pavement Structures Using PMS Data and New Mechanistic Empirical Pavement Design Guide (MEPDG)**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	07-6P		Completion Date	*(original)*	06/30/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Zhong Wu				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$220,000		**Total**		$125,000
	(revised)					
Est. Expended to Date				Salaries		$78,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		$1,500
Est. FY Expenditure				Other (Pavement Testing)		$32,900

PURPOSE AND SCOPE

This research will statistically evaluate the performance of the current DOTD pavement design procedure using the accumulated Pavement Management System (PMS) data, traffic data, and other material properties available within the Department. Different pavement performance groups will be developed through the evaluation and be analyzed using the new Mechanistic Empirical Pavement Design Guide (MEPDG) for possible causes. The possible benefits from this approach will be:

- Provide immediate help to the current DOTD pavement design practice.
- Summarize DOTD's experience.
- Connect pavement design with PMS.
- Build a bridge between the existing DOTD pavement design procedures with the new MEPDG.
- Allow the Department to obtain practical experience with the new MEPDG.
- Identify the directions of research for the implementation of new MEPDG and future development of PMS.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
TASK 1 - Literature Search and Fact-gathering The researcher must familiarize himself with the current practices of pavement structure design and data collecting within LA DOTD and must acquire the knowledge of the new M-EPDG and local calibration requirements. The researcher will be required to conduct literature search for the experience and practices of other states and agencies in this regard. **TASK 2 – Classify Pavement Structures Currently Used** Pavement structures currently used in Louisiana will be classified by material, design, construction technology. The researcher is expected to review LA DOTD's construction program and interview the design personnel of the department to gather the information required for this task. **TASK 3 – Evaluate Group Performance of Pavement Structures** The pavement structure groups determined in Task 2 will be evaluated for their performance using the data from LA PMS. The performance indicators will be the ones that are used in the new M-E design guide.

Title:	**Characterizing the Effective Modulus for Asphaltic Concrete Pavements for the MEPDG and Forensic Engineering**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		01/30/10
Research Project Number:	09-4P		Completion Date	*(original)*	06/30/12
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Kevin Gaspard P.E.				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000		**Total**		$49,000
	(revised)					
Est. Expended to Date				Salaries		$49,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The purpose of this research is to develop an effective modulus for asphaltic concrete pavement when distresses are present. This is an important input for the new MEPDG. Currently the modulus is obtained by backcalculation routines using FWD data or performing laboratory tests on cores taken from the roadway. FWD tests are generally conducted in both distressed and non-distressed areas which can lead to errors in representing the effective modulus. Distresses can cause errors in both the FWD sensor readings and backcalculation values. Coring the roadway generally occurs in non-distressed areas. This can misrepresent the effective modulus of the roadway since non-distressed areas generally will have a higher modulus and less variance than distressed areas. This research will focus on developing a methodology to determine the effective modulus of asphaltic concrete pavements

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct literature search and develop testing factorial.
- Test sample projects for empirical review.

Title:	**Development of Improved QA/QC Protocols for Portable WIM Data Collection**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	09-5P		Completion Date	*(original)*	12/30/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:	Mark Martinez				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000		**Total**		$63,000
	(revised)					
Est. Expended to Date				Salaries		$63,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

To facilitate implementation of the Mechanistic Empirical Pavement Design Guide (MEPDG), the Louisiana Department of Transportation (LADOTD) funded a study that examined current traffic characterization techniques used in Louisiana. A component part of this study required that data from Louisiana's portable WIM data collection program be evaluated. It was discovered during this evaluation that 45 out of the 96 sites examined could not pass QAQC tests. The principal reason for the failures was that the piezoelectric sensors associated with the problem WIM sites were either out of calibration or had failed. This project proposes to investigate the causes behind the failures. It will also attempt to determine the factors which led to loss of calibration such as poor training, complexity of setting up and/or maintaining calibration and failure of equipment in reporting loss of calibration. The project will also seek to determine what might be done to improve the quality of data derived from portable WIM equipment and will attempt to develop a procedural flowchart or checklist to aid field personnel in carrying out and maintaining calibration more effectively.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Examine literature and consult with original equipment manufacturers in an effort to develop an understanding of project requirements. • Consult with field personnel (possibly through survey form) to help determine mechanism behind equipment failure and to gain insights into how and why equipment goes out of calibration. • Develop procedural approach to improving QAQC. • Develop a training program and QAQC policy that can be used by field personnel in WIM set-up. • Attempt to automate processes to aid field personnel in quickly assessing if equipment is failing or going out of calibration. • Develop Final Report.

Title:	**Field Testing Support for Pavement Material Characterization Studies**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	09-6P		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Martinez				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$82,251		**Total**		$82,251
	(revised)					
Est. Expended to Date				Salaries		$82,251
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

This project is proposed to make provisions for the support services needed to carry out pavement material characterization. Field testing to be rendered from support units is to be carried out under the auspices of this project when requests for Friction number, IRI, rut depth, pavement surface condition analysis, FWD and Dynaflect are made in conjunction with a number of ongoing projects. These projects include but are not limited to the following:

- 07-1B “Warm Mix”.
- 10-1C “In-situ” measures.
- 09-2C Cement Treated RAP.
- 04-6B E* Material Characterization for MEPDG.
- 10-2C “Aggregate Friction Analysis”.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Staff from support units will carry out needed support functions as requested. Friction number, IRI, rut depth, pavement surface condition analysis, FWD and Dynaflect are data that may be requested. The Materials unit may also request the same information for proposal development and in response to department needs in the materials area.

LTRC Annual Research Program
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Title:	**Examine Performance of Low Ductility Materials**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-3B		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Ionela Glover				

BUDGET STATUS

Total Budget				**Estimated FY 2009– 2010 Budget**		
Total Cost	*(original)*	$144,000		Total		$144,000
	(revised)					
				Salaries		$119,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		$25,000

PURPOSE AND SCOPE

Low ductility materials appear to be more susceptible to hardening in the field. Current SHRP characterization of asphalts entails a combination of binder rheology using a dynamic shear rheometer (DSR) G*/sin δ measurement of virgin and RTFO asphalts and relating the results of the DSR tests with ductility measurement. An alternate aging process, the rolling cylinder aging test (RCAT) originally developed by Verhasselt in Belgium, allows the aging of large quantities (~500 g) of asphalt at varied temperatures and reaction times. The RCAT will facilitate asphalt aging at intermediate oxidation times to produce aged asphalts in quantities suitable for aggregate blend preparations. The process will allow an estimation of the rate of aging, which could be quite different for low ductility materials as compared with materials with high ductility. The aging process can be followed by changes in the asphaltene content with time as measured by Gel Permeation Chromatography (GPC). Preliminary examination of asphalt samples confirms that higher molecular weight asphaltene aggregates form when the samples are subjected to an RTFO/PAV sequence. The extent of the asphaltene changes upon aging will be correlated with changes in sample ductility and the spot test. The development of toluene insoluble asphalt fractions upon aging will also be evaluated. The aged samples will be characterized by DSR and ductility measurements and the results correlated with changes the binder composition observed during aging.

FISCAL YEAR 2008– 2009ACCOMPLISHMENTS

FISCAL YEAR 2009– 2010 PROPOSED ACTIVITIES
• Conduct a thorough literature review. • Develop a rational test factorial by considering all possible effects on test results. • Conduct the RCAT oxidation, GPC, DSR and ductility tests based on the developed test factorials. • Perform data analysis. • Prepare draft Final Report.

Title:	**Development of New Surface Friction Guidelines for LADOTD**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXB		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Zhong Wu				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000	**Total**		$100,000
	(revised)				
Est. Expended to Date			Salaries		$46,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$1,200
Est. FY Expenditure			Other (NCAT Testing)		$40,000

PURPOSE AND SCOPE

Existing design guidelines for selecting aggregates for asphalt mixtures used in the surface course are based on the polish value, or BPN, obtained using the British Pendulum Test. There are many parameters that affect the safety of the highway surfaces and Micro-texture, related the BPN being only one of these parameters. NCHRP 1-43 draft report by Jim Hall of ARA on this topic examines many parameters that influence surface friction. Given the fact that only two high friction aggregate sources are available in Louisiana, a system that utilizes more information when qualifying aggregates may increase the sources of aggregate supply for our asphalt surface mixtures. The objective of this research will be to develop Pavement Surface Friction Management Guidelines for use in Louisiana DOTD and to also validate NCHRP 1-43 findings using Louisiana data.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct a thorough literature review.
- Collect available data.
- Prepare/Collect HMA mixture for NCAT Lab Friction Testing.
- Conduct Lab Friction Tests.
- Perform data analysis.
- Initiate Specification Changes as needed.
- Prepare draft Final Report.

Title:	**Investigation of the Use of High RAP Content in Hot-Mix Asphalt Mixtures**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXB(1)		Completion Date	*(original)*	06/30/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$275,000		Total		$137,500
	(revised)					
Est. Expended to Date				Salaries		$137,500
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Many state agencies are considering increasing the allowable percentages of RAP in hot-mix asphalt (HMA) to take full advantages of this promising technology. For instance, up to 50% RAP has been used in some asphalt mixtures, which produced an acceptable level of performance. However, to ensure successful use of RAP, confidences in the mixture design procedure require addressing many concerns related to the interaction between virgin and recycled materials and durability of the produced mixture. In addition, the use of RAP allows decreasing the amount of produced waste and helps to resolve the disposal problems of highway construction materials. The main objective of the proposed research is to evaluate the laboratory and field performance of HMA produced with various levels of high RAP contents. The optimum level of RAP contents to achieve the required high, intermediate, and low temperature properties will be examined. It is anticipated that the proposed research activities will provide the LDOTD with specifications, recommendations for the use of HMA mixtures containing high RAP contents. With the increasing costs of asphalt, coupled with the scarcity of quality aggregates and the pressuring need to preserve the environment, the use of RAP has a strong potential to provide the State with significant saving.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct a thorough literature review.
- Develop a laboratory and field experiments.
- Conduct Laboratory experiment.

Title:	**Investigation of In-situ Tests in QC/QA Applications for Hot-Mix Asphalt**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXB(2)		Completion Date	*(original)*	06/30/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$275,688		Total		$137,844
	(revised)					
Est. Expended to Date				Salaries		$137,844
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Adequate QA practices are the key to obtain a satisfactory product and to ensure that an installed HMA pavement is what the designer specified. Years of experience support that deviation from either material or construction specifications often lead to premature pavement distress or even failure. While volumetric and laboratory properties are widely used in current specifications, in-situ tests such as light falling weight Deflectometer, Portable Pavement Seismic Analyzer (PSPA), ground penetrating radar can be used in QC/QA activities. These tests may be used to complement current volumetric specifications in order to achieve better construction practices of asphalt construction. The main objective of the proposed research is to evaluate these in-situ tests in the field in order to complement current QC/QA specifications. A number of field projects will be selected for evaluation and for establishing correlations to predict field performance from the results of these tests.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct a thorough literature review.
- Develop a rational test factorial.
- Select field project.
- Conduct field NDT and laboratory tests.

Title:	**Evaluation of Thin PCC Overlays in the Accelerated Loading Facility**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:		Project Start Date:		07/01/09
Research Project Number:	10-XXC	Completion Date	*(original)*	07/01/11
Research Agency:		Completion Date	*(revised)*	
Principal Investigator:				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$250,000	**Total**		$50,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The purpose of this study will be to evaluate concrete mixtures for thin unbonded overlays and then evaluating said mixtures in the accelerated loading facility to see their respective performance. Items evaluated will be underlying stratum condition, PCC thickness, and joint details.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Title:	**Development of Performance Based Specifications for Design Build Projects**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXC(1)		Completion Date	*(original)*	07/01/12
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$400,000	**Total**		$50,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The purpose of the research is to develop a comprehensive set of performance based specifications specifically for design build applications. It is anticipated that the specifications would be developed, piloted and then implemented over a three year period. The results of this study could then be incorporated into current bid-build type situations after proving acceptable in design build applications.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Title:	**Investigation of Roller Compacted Concrete for Low Volume Roads**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXC(2)		Completion Date	*(original)*	07/01/11
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$250,000		**Total**		$50,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The purpose of this study is to investigate potential roller compacted concrete mixtures and then to evaluate thin (3-5 inch) RCC sections constructed immediately over soil cement subgrade in the accelerated load testing facility. It is envisioned that this research will lead to an alternate design for low volume roads.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Title:	**Evaluate the Effects of Various Factors and Parameters on the Strength and Stiffness of Base Course Layers for Pavements**
Funding Source:	**SPR : TT-FED / TT/REG**

State Project Number:			Project Start Date:		09/01/09
Research Project Number:	10-XXGT		Completion Date	*(original)*	08/31/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$180,000		**Total**		$60,000
	(revised)					
Est. Expended to Date				Salaries		$50,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$10,000
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The purpose of this research study is to investigate the effects of various parameters on the strength and stiffness of base course layers for pavement applications. This includes the influenced of base material type, source, and geology, the influence of physical properties such as variations in gradation, percent of fines, angularity, water absorption, and hardness; and the influence of moisture content, degree of saturation, and degree of compaction.

The new 2002 AASHTO Guide for Pavement Design uses the resilient modulus parameter for characterizing the different base aggregate materials for use in flexible pavements. The multi-factors that affect the strength and stiffness behavior of granular material make the determination of the resilient modulus and permanent deformation at different loading and physical conditions crucial for the pavement design process.

The work program includes conducting tradition laboratory tests such as gradation, Standard and Modified Proctor tests, water absorption, etc. In addition, advanced laboratory monotonic triaxial tests, resilient modulus tests, single and multi-stages Repeated Loading Triaxial (RLT) tests, abrasion tests, and tube suction tests will be conducted.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Perform literature review on the effect of several factors and parameters on the strength and stiffness of base aggregate materials. • Identify the different types/sources of base aggregate materials used in Louisiana. • Start characterizing the variation in physical properties of base aggregate materials. • Start conducting laboratory monotonic, resilient, and repeated loading triaxial (RLT) tests on samples of different gradations, different compaction, and at different moisture contents/degree of saturation.

Title:	**Optimizing Techniques for Stabilizing Soft Sub grades using Traditional and Recycled Materials**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		09/01/09
Research Project Number:	10-XXGT(1)		Completion Date	*(original)*	08/31/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$180,000		**Total**		$60,000
	(revised)					
Est. Expended to Date				Salaries		$60,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The purpose of this research study is to explore different options for stabilizing soft subgrade soils that enhance their performance during the pavement service life, establish time-dependent gain in their strength/ stiffness modulus, and study effect of saturation on their strength/ stiffness modulus. The research work will also include determining an equivalent resilient modulus of treated and natural subgrade for use as input in pavement design. This include both traditional stabilizing materials such as cement and lime, and recycled materials such as ash, slag, shredded tires, or combination.

Studies have shown that the mineralogy of the soils (rather than plasticity indices) controls their mechanical and chemical behavior when mixed with chemical additives, especially in the case of soft and expansive clayey soil. It is therefore important to identify the most appropriate and economical material(s) recipe to stabilize the soil and optimize its performance. The proper stabilizing recipe can be better defined if the clay mineralogy of fine fractions of the soil can be identified.

The work program includes dividing soft sub grade soils in Louisiana into groups of similar mineralogy, identify different potential stabilizing materials, and conduct strength and stiffness laboratory tests. The laboratory testing program will include conducting traditional laboratory tests, in addition to monotonic, resilient and single and multi-stage repeated loading triaxial (RLT) tests.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Perform literature review on the traditional and recycled materials used to stabilize soft sub grades. • Divide soft sub grade soils in Louisiana into groups of similar mineralogy,. • Start characterizing the mineralogy and physical properties of sub grade soils. • Start conducting laboratory monotonic, resilient, and repeated loading triaxial (RLT) tests.

Title:	**Support Study for the Measurement of Seasonal Changes and Spatial Variations in Pavement Unbound Base and Sub Grade Properties**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		09/01/09
Research Project Number:	10-XXGT(2)		Completion Date	*(original)*	06/30/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Gavin Gautreau				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000		Total		$80,060
	(revised)					
Est. Expended to Date				Salaries		$80,060
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Provide the field testing service to LTRC research project 08-5GT (SPN 736-99-1547). The proposed research aims to investigate field moisture variation over time in highway unbound bases and sub grade soils and its impact on their engineering properties and to develop a reliable design methodology to consider such impact. The main objectives of this research are:

1. Conduct field tests on newly compacted sub grade (after construction and prior to paving) to document spatial variation in stiffness parameters.
2. Monitor changes in pavement performance due to seasonal variation in moisture. Measure the influence of matric suction (difference of pore air pressure and pore water pressure) and the water content of the soil in the laboratory to establish a database for Louisiana soil types.
3. Conduct laboratory tests on unsaturated soils to complement the field testing.
4. Develop a mathematical framework for assessment of pavement performance as a function of variations in moisture regime.
5. Formulate recommendations for implementation of the research findings into design methodology.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

The project will begin and work will be directed toward the purpose and scope as detailed above.

Title:	**Support study for Cost Effective Prevention of Reflective Cracking of Composite Pavement**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXP		Completion Date	*(original)*	03/31/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Martinez				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000		Total		$45,000
	(revised)					
Est. Expended to Date				Salaries		$45,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Provide support services such as testing pavements with the FWD and Dynaflect for LTRC 08-1P, “Cost effective prevention of reflective cracking of composite pavement”. Additional support services from the asphalt lab such as coring asphalt pavement and testing the cores may be required as well.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

The project will begin and work will be directed toward the purpose and scope as detailed above.

State Funded Research Program

CONTINUING RESEARCH

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Estimating Setup of Piles Driven into Louisiana Clayey Soils**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1359	Project Start Date:		05/15/08
Research Project Number:	04-1GT	Completion Date	*(original)*	11/14/09
Research Agency:	LA Tech	Completion Date	*(revised)*	
Principal Investigator:	Jay Wang			

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$124,986	**Total**		$51,818
	(revised)	$67,899			
Est. Expended to Date (06/30/09)		$67,899	Salaries		$35,524
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$73,168	Equipment	*(non-expendable)*	$2,500
	(revised)		Travel		$4,000.
Est. FY Expenditure		$67,899	Other		$9,794

PURPOSE AND SCOPE

- Collect, review, and analyze the documented research and pile setup data.
- Develop the semi-logarithmic model (Skov-Denver method) to Louisiana soils to obtain pile setups at different time for different types of soils.
- Achieve a lower bound setup factor A for the calculation of the predicted pile capacity for Louisiana soils.
- Make a national survey of the pile foundation practice in different states, and see how the pile setup is handled in pile foundation design.
- Improve and enhance the quality of the pile setup prediction equation, and develop new mathematical models, such as the bearing capacity growth rate-based differential equations.
- Incorporate the pile foundation design and construction practice with LA DOTD into the development of the mathematical models.
- Perform the reliability analysis of the pile setup, and incorporate the significant growth of pile capacity Qsetup into the LRFD method, corresponding to different setup time.
- Integrate the calculated static bearing capacity into the prediction models, and try to predict pile setup using fundamental soil properties.
- Attempt to develop a mechaniscally-based model incorporating the factors of pore pressure dissipation and frictional angle increase due to soil aging (no pore pressure data required).
- Validate and improve the established models by applying them to those completed and on-going pile foundation projects.
- Establish a database including all the available pile testing data in Louisiana. The database will be easily manipulated, re-grouped, plotted, displayed, and printed as needed. All the calculations will be embedded in the database.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Completed the statistical analysis of the pile setup data, implementing the conventional pile setup prediction model (Skov-Denver) and studying the relevant parameters and their distributions by applying the average unit skin friction, and the normalized pile capacities from different piles, such as the average unit skin frictions, the setup factor A-values, the reference time, and their frequencies and distributions.
- Found the average, upper and lower bounds of the A-values for the conventional Skov-Denver model. Based on the pile restrike data, it is appropriate to use a minimum setup factor A = 0.2 for predicting shaft capacities, with the maximum A = 1.8, and the average A = 0.7.
- Investigated the restrike, static and statnamic pile load testing data. The research results indicate that a small reference time does not cause a large statistical variation of A values, which implies a good agreement between the measured bearing capacities and predicted ones even though a very small reference time such as t_0 = 2.2, 3.9, 5.8 or 7.5 hours is taken.
- Estimated, analyzed and examined the growth rate of pile capacities, and implemented the growth-rate based capacity prediction models from the restrike data of the North Connector and pile load testing data at the four pile load testing sites. The rate-based model usually gives more accurate predictions than the Skov-Denver model.
- Predicted the ultimate shaft capacity using the rate-based model for the piles at the site of North Connector. It is approximately twice as much as the shaft capacity measured at around 24-hour restrikes. The model can also provide required time after the initial driving for any expected pile setup. All the predictions cannot be conducted using the Skov-Denver model.
- Computed the static capacities of the piles at the site of the North Connector from the available boring logs and CPT data records, and compared them with the measured restriking capacities. The computed static capacities will be integrated with the measured capacities in establishing and improving the new prediction models.
- Submitted on time the interim report to the PRC committee and presented the intermediate results to the PRC members and also gave a presentation at the LTC 2008 conference.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- in their design and construction practice of pile foundation.
- Incorporate the DOTD pile design practice into the mathematical model for pile setup prediction, in the hopes of estimating pile set-up without altering the current DOTD practice.
- Extend the statistics and model establishment to cover all the available pile testing data.
- Find the feasible Complete the nation-wide pile setup survey, and investigate the ways other states have dealt with pile setup Skov-Denver and rate-based models for pile setup prediction (appropriate parameters for the models).
- Integrate the pile setup predictions into the LRFD method.
- *Establish the deterministic model in the hopes of incorporating pore pressure dissipation and soil aging effect with different types of soils.*
- Collaborate with LA DOTD colleagues to validate, revise and improve the models.
- Provide recommendations for the incorporation of pile setup in design.
- Make recommendations for future research.
- Submit the final report draft for PRC members for reviews, discussions and revisions.
- Submit the final report before the project deadline.

Title:	**A Comparative Analysis of Modified Binders: Original Asphalts and Materials Extracted from Existing Pavements**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1498		Project Start Date:		05/01/07
Research Project Number:	04-3B		Completion Date	*(original)*	07/31/09
Research Agency:	LSU		Completion Date	*(revised)*	01/17/10
Principal Investigator:	William H. Daly				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$271,150	Total		$36,118
	(revised)				
Est. Expended to Date		$235,032	Salaries		$36,118
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$125,315	Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure		$125,315	Other		

PURPOSE AND SCOPE

This research will be performed in order to develop procedure and standard for using gel permeation chromatography (GPC) method as an analytical tool to define the percent amounts of polymer modifiers in polymer modified asphalt cements soluble in eluting GPC solvents. It will also address quantification of GPC solvent insoluble crumb rubber modifier present in crumb rubber modified binders for which a repeated solvent/non-solvent precipitation procedure will be developed. Attention will be paid also to the assessment of the extent of oxidative aging of modified asphalt binders by using both GPC and chemical analyses.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Perform GPC analysis on more than 27 different Asphalt Binder liquids.
- Perform DSR analysis on Both Aged and Un-aged Asphalt Binder Liquids.
- Perform Extraction of liquids from actual roadway and mix samples.
- Perform Extraction of liquids from actual roadway after six months and one year.
- Perform the same analysis as described above on Actual Roadway Projects.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Perform GPC analysis on more than 27 different Asphalt Binder liquids.
- Perform DSR analysis on Both Aged and Un-aged Asphalt Binder Liquids.
- Perform Extraction of liquids from actual roadway and mix samples.
- Perform the same analysis as described above on Actual Roadway Projects.
- Prepare Final Report.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Development of a Time-Dependent Hurricane Evacuation Model for the New Orleans Area**
Funding Source:	**State: TT-REG**

State Project Number:	736 99 1365		Project Start Date:		07/01/08
Research Project Number:	06-2SS		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC/LSU		Completion Date	*(revised)*	
Principal Investigator:	Chester Wilmot				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$211,266		**Total**		$111,266
	(revised)					
Est. Expended to Date		$100,000		Salaries		$62,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$134,401		Equipment	*(non-expendable)*	
	(revised)			Travel		$1,000
Est. FY Expenditure		$100,000		Other (subcontract)		$48,266

PURPOSE AND SCOPE

The purpose of this project is to collect data on evacuation behavior in the New Orleans area using a new data collection technique (time-dependent stated choice data collection), and to use the data to estimate a time-dependent evacuation demand model and a time-dependent evacuation destination choice model for the area.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

1. Draft survey instrument developed.
2. Pretest of survey instrument among students and families of students.
3. Negotiated with Public Policy Research Lab on LSU campus to conduct survey.

FISCAL YEAR 2009- 2010 PROPOSED ACTIVITIES

1. Complete survey.
2. Evaluate survey procedure using results from survey.
3. Estimate dynamic hurricane evacuation demand model.
4. Estimate dynamic hurricane evacuation destination choice model.

Title:	**The Design of Lane Merges at Rural Freeway Construction Work Zones**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1503		Project Start Date:		09/01/07
Research Project Number:	07-2SS		Completion Date	*(original)*	11/01/07
Research Agency:	LTRC		Completion Date	*(revised)*	10/31/09
Principal Investigator:	Brian Wolshon				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$140,000		Total		$36,632
	(revised)					
Est. Expended to Date		$56,671		Salaries		$35,132
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$500
FY Funds	*(original)*	$74,553			*(non-expendable)*	
	(revised)			Travel		$1,000
Est. FY Expenditure		$50,091		Other		

PURPOSE AND SCOPE

The goal of this project is to evaluate non-conventional lane-drop merge configurations at the entrance to work zones on rural freeways so as to evaluate their impact on traffic flow, safety, and delay. The study will include the investigation of four different configurations of lane merges from two to one lane. The analysis will be conducted by means of both simulation and field measurements.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

During the reporting period the following project objectives were accomplished:

- Laid out lane merge designs on the I-55 and measured traffic flow and safety performance of conventional and non-conventional lane merge designs.
- Conducted analysis on measured observations.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Prepare final report and technical summary.
- Present results to Project Review Committee.
- Prepare dissertation and publications.

Title:	**LADOTD Customer Service Process and Outcome Evaluation**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1479		Project Start Date:		05/01/07
Research Project Number:	07-4SS		Completion Date	*(original)*	06/30/10
Research Agency:	SU		Completion Date	*(revised)*	
Principal Investigator:	Sharon Parsons, PhD				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$185,988		**Total**		$61,996
	(revised)					
Est. Expended to Date				Salaries		$61,996
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$61,996		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure to date				Other		

PURPOSE AND SCOPE

The purpose of this project is to assess DOTD customer satisfaction over time, to provide reports on customer satisfaction that include action steps to improve the level of customer satisfaction, and to measure the success of the suggested action steps in subsequent assessments. The first objective of this research involves outcome monitoring while the remaining two objectives involve process monitoring. The project will provide an evaluation that will monitor program outcomes and program processes. Program outcome monitoring involves the continual measurement of the intended conditions the program intends to improve. Program process monitoring is the continual observation of program performance criteria in order to determine whether the program is operating as intended.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

First year of the time series analysis. Survey approved. Completed the phone surveying with approximately 450 participants. Completed the data input and data analysis. First draft of the report submitted.

FISCAL YEAR 2009– 2010 PROPOSED ACTIVITIES

Second year of the time series analysis. Revise instrument, if necessary, particularly to include any new DOTD innovations. Collect data using a random sample of phone numbers in the state (late fall/early winter 2008). Produce a report.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Support Study for Developing Embedded Wireless Strain/Stress/Temperature Sensors Platform for Highway Applications**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1496		Project Start Date:		06/01/07
Research Project Number:	07-9P		Completion Date	*(original)*	12/31/08
Research Agency:	LTRC/IDEA		Completion Date	*(revised)*	12/31/09
Principal Investigator:	Kun Lian				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$68,339		Total		$9,383
	(revised)					
Est. Expended to Date		$58,956		Salaries		$0
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$68,339		Equipment	*(non-expendable)*	
	(revised)	$58,956		Travel		$0
Est. FY Expenditure		$58,956		Other		$9,383

PURPOSE AND SCOPE

This project will develop and test a radiofrequency wireless embedded sensor platform for monitoring strain, stress, temperature, and moisture parameters inside asphalt, soil, and concrete structures. Work in the first phase will focus on developing and integrating the components of a prototype platform system consisting of three modules – sensor system, radiofrequency (RF) data transmission system, and Faraday power harvesting system. The components of each module will be tested, integrated, and calibrated to produce the respective modules. Work in the second phase will involve laboratory and field testing of the sensor platform system. The system's modules will be further refined based on tests results and integrated to improve the prototype platform system. The laboratory tests will be followed by field tests in actual highway environment. Data on stress, strain, and moisture content will be collected and evaluated for accuracy and reliability. The final report will document all data and developments of the project along with an assessment of the technology for implementation and commercialization.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Finished the alignment shell fabrication and testing.
- Finished preliminary road acceleration parameter test and possible application of vehicle axial pattern recognition.
- Finished the preliminary calibrations for strain gauge embedded in asphalt and moisture sensor in clay environment.
- Finished the preliminary unit fabrication of Faraday energy harvesting device.
- Finished the reliability improvement for data acquisition software.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Prepare the final integration or sensor platform.
- Characterize the Faraday energy harvesting device.
- Test the sensor platform embedded in asphalt at Lab. Environment.
- Finish the data acquisition software interface.
- Finish the Final Report.
- Look for industrial partner/partners and prepare the IDEA phase II proposal.

Title:	**Cost Effective Prevention of Reflective Cracking of Composite Pavement**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1518		Project Start Date:		06/01/08
Research Project Number:	08-1P		Completion Date	*(original)*	05/31/10
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Mostafa Elseifi				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$165,444		Total		$112,425
	(revised)					
Est. Expended to Date		$53,019		Salaries		$70,425
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$46,000		Equipment	*(non-expendable)*	$2,250
	(revised)			Travel		$9,500
Est. FY Expenditure		$46,000		Other (Fringe and Admin Costs)		$30,250

PURPOSE AND SCOPE

- Evaluate and compare different reflection cracking control treatments by evaluating the performance, constructability, and cost-effectiveness of pavements built with these methods across the state.
- Develop a standard state-wide policy for control of this distress in composite pavements and for pavement preservation.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

This research project started in June 1st 2008. The following accomplishments were achieved in the 2008-2009 Fiscal Year:

- Conducted a comprehensive literature review and a nationwide survey of highway agencies.
- Conducted a comprehensive survey of current practices in the state.
- Started collecting performance data from LA DOTD PMS Database.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Complete collection of performance data from LA DOTD PMS Database for selected pavement test sections.
- Conduct district visits to conduct data collection process for selected test sites.
- Conduct data analysis planned.
- Develop a standard state-wide policy for control of this distress in composite pavements and for pavement preservation.
- Prepare final report to document the entire research work which includes the recommendation to the Department.

Title:	**Evaluation of Continuity Details for Precast Prestressed Girders**
Funding Source:	**State: TT-REG**

State Project Number:		736-99-1513	Project Start Date:		12/10/07
Research Project Number:		08-1ST	Completion Date	*(original)*	11/30/09
Research Agency:		LSU	Completion Date	*(revised)*	
Principal Investigator:		Ayman Okeil, Ph.D., PE			

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$249,578	Total		$76,578
	(revised)				
Est. Expended to Date		$173,000	Salaries		$40,578
FY 2008 – 2009 Budget			Equipment	*(expendable)*	$7,000
FY Funds	*(original)*	$150,000	Equipment	*(non-expendable)*	$9,000
	(revised)		Travel		$10,000
Est. FY Expenditure		$150,000	Other (instrumentation Consultant)		$10,000

PURPOSE AND SCOPE

The main objective of this project is to install a monitoring system for the purpose of investigating the performance of the continuity diaphragm detail including the positive moment detail that is employed in Bridge #2 of the James Audubon Bridge Project under long-term effects. The ultimate goal of the project is to provide LADOTD with a successful continuity detail for implementation in future projects based on a full understanding of the behavior of the continuity diaphragm connection detail.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Validate the performance of the NCHRP 519 continuity detail.
- Assess the effects of differential shrinkage between the girder and the slab.
- Evaluate the performance of the skewed details of the connection.
- Evaluate the performance of the detail in bridges with Bulb-T girders.
- Installation of instrumentation system.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Data collection.
- Data analysis and comparison of joint performance.
- Final Report to be reviewed published and distributed.

Title:	**Evaluation of Design Methods to Determine Scour Depths for Bridge Structures**
Funding Source:	**State: TT-REG**

State Project Number:		736-99-1620	Project Start Date:		04/01/09
Research Project Number:		08-3ST	Completion Date	*(original)*	03/31/11
Research Agency:		LSU	Completion Date	*(revised)*	
Principal Investigator:		Guoping (Gregg) Zhang, Ph.D., P.E.			

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$200,004	Total		$100,000
	(revised)				
Est. Expended to Date		$30,000	Salaries		$60,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$30,000	Equipment	*(non-expendable)*	$20,000
	(revised)		Travel		$10,000
Est. FY Expenditure		$30,000	Other (instrumentation Consultant)		$10,000

PURPOSE AND SCOPE

The overall goal of the project is to develop a more reliable tool for scour depth and scour rate prediction in the state of Louisiana (LA), with the consideration of the LA's special meteorological and climatic characteristics and soil/sediment properties. The newly developed technique will still be based on the fundamental frameworks set by FHWA-approved HEC-18, but include some new statistically derived components and/or parameters in the models.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Review of literature and available technologies.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Analysis and evaluation of historical field survey scour data
- Reporting of interim progress
- Re-development of historical hydrometeorological forcing and hydrological analysis
- Validation and calibration of hydrometeorological data using USGS data

Title:	**Performance Evaluation of Buried Pipe Installation**
Funding Source:	**State: LADOTD**

State Project Number:	736-99-1520		Project Start Date:		01/01/08
Research Project Number:	08-6GT		Completion Date	*(original)*	04/01/09
Research Agency:	LTRC		Completion Date	*(revised)*	01/01/10
Principal Investigator:	Michele Barbato				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$75,000		**Total**		$37,902
	(revised)					
Est. Expended to Date		$37,098		Salaries		$30,061
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$754
FY Funds	*(original)*	$40,682		Equipment	*(non-expendable)*	
	(revised)	$37,098		Travel		
Est. FY Expenditure		$37,098		Other (indirect costs)		$7,087

PURPOSE AND SCOPE

The Louisiana Department of Transportation and Development (LADOTD) is in the process of revising the current specifications to obtain a more cost efficient design and installation of buried pipes for highway infrastructure. This research project aims at determining the effects of geometric and mechanical parameters characterizing the soil structure interaction developed in a buried pipe installation. Parameters such as pipe ring stiffness, bedding thickness, and fill cover height need to be considered.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

A) New linear elastic FE analysis have been performed providing the following noteworthy findings:
   a. The modeling of the soil surrounding the trench has a significant effect on the analysis results. FE meshes need to extend to 3 times the trench width horizontally and one trench width below.
   b. 3-dimensional effects are also significant. The model thickness must equal at least 1 trench width.
B) Linear elastic analysis results have been verified using different FE programs (Abaqus, SAP2000).
C) The graduate student working on the project has been trained in linear and nonlinear FE analysis and in using the problem-specific program CANDE for two-dimensional analysis and design of buried culverts.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

A) Use of nonlinear FE analysis to study buried pipe sensitivity in terms of maximum pipe stress (06/09).
B) Use of nonlinear FE analysis to study buried pipe sensitivity in terms of road surface dip and depth (06/09).
C) Use of nonlinear FE analysis to determine geometric and mechanical requirements for satisfactory performance of buried pipe installation (08/09).
D) Linear and nonlinear finite element analysis of case studies corresponding to the new proposed LA DOTD directive “PIPE/SYSTEM POLICY GUIDELINES FOR CROSS DRAINS, SIDE DRAINS AND STORM DRAINS” (10/09).
E) Completion of LTRC Research Report with research results and recommendations (draft: 10/09).

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Update LADOTD Pile Driving Vibration Monitoring Policies**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1589		Project Start Date:		06/01/09
Research Project Number:	09-1GT		Completion Date	*(original)*	12/01/11
Research Agency:	WPI		Completion Date	*(revised)*	
Principal Investigator:	Dr. Mingjiang Tao				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$193,054	Total:		$61,522
	(revised)				
Est. Expended to Date		$35,000	Salaries		$50,688
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$10,000	Equipment	*(non-expendable)*	
	(revised)		Travel		$4,000
Est. FY Expenditure		$10,000	Other (Total indirect cost)		$6,834

PURPOSE AND SCOPE

Because people have become increasingly intolerant of pile driving vibration, the public has requested that the department extend the vibration monitoring range beyond 500 feet. This has led to the question of what is a reasonable monitoring range for pile driving vibration and what is the cut-off limit for probe setting. An unreasonable (large) coverage area of vibration monitoring will waste the taxpayers' dollars. The key issue is the acceleration distribution caused by a pile-driving event and its correlation with surrounding structure damage. Such impact varies with geotechnical conditions, the types of structures, the types of piles, and driving equipment, etc. All of these should be explored and investigated as a part of the risk management of pile driving. Therefore, there is a need to evaluate the current department policy on the issue, based on new developments in technology and accumulated historical data in the state. The results of this study will help the department update its pile driving monitoring policy and conduct a more cost-effective pile driving monitoring program and risk management.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

The project will begin and work will be directed toward the purpose and scope as detailed above, with the following activities planned for fiscal year of 2008-2009:

- Conduct comprehensive Literature Review.
- Conduct a survey on the state of practice and policies on pile driving risk management.
- Collect available field monitoring data on pile driving.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Prepare an Interim Report. • Determine threshold peak particle velocity (PPV). • Validate or develop correlations between ground vibrations and structural damage. • Develop simple models to determine vibration monitoring range. • Evaluate and identify mitigation strategies to control ground vibrations. • Update LA DOTD pre-construction inspection survey.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**LTRC Proposal for the Support of Research and Development in Transportation Planning**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-0643		Project Start Date:		07/01/06
Research Project Number:	09-1PLAN		Completion Date	*(original)*	06/30/09
Research Agency:	LSU		Completion Date	*(revised)*	06/30/12
Principal Investigator:	Chester Wilmot				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$973,340		**Total**		$338,907
	(revised)	$2,021,859				
Est. Expended to Date		$681,019		Salaries		$333,707
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$3,000
FY Funds	*(original)*	$329,978		Equipment	*(non-expendable)*	
	(revised)			Travel		$2,000
Est. FY Expenditure		$295,000		Other		$200

PURPOSE AND SCOPE

The purpose of this project is to conduct research on topics that LTRC or the Louisiana Department of Transportation and Development identify from time to time. The scope of the project is dictated by the requests for research. The Principal Investigator's administrative duties in LTRC and his teaching responsibilities at LSU are also funded under this project.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Technical Assistance Report 08-4TA, "Assessing Performance of Alternative Pavement Marking Materials", August 2008.
- Technical Assistance Report 09-1TA, "Impact of Left Lane Truck Restriction Strategies on Multilane Highways in Louisiana – A Literature Review", March 2009.
- Fu, H., and C.G. Wilmot, "The Effect of Passenger Age and Gender on Young Driver Crash Risks", Transportation Research Record 2078, Journal of the Transportation Research Board, Washington D.C., 2008. pp. 33-40.
- Deis, D.R., H. Schneider, C.G. Wilmot, and C.H. Coates, Jr., "Simulation Approach to In-House versus Contracted Out Cost Comparisons", Chapter 7 in the International Handbook on Public Procurement, Khi V. Thai (ed.), Auerbach Publications, 2009. pp. 157-174.
- Cheng, G., and C.G. Wilmot, "Time-Dependent Travel Cost Impact on Hurricane Evacuation Destination Choice Models", poster session at Annual Meeting of the Transportation Research Board, Washington D.C., January 11-15, 2009.
- Wilmot, C.G., "Factors Affecting Highway Safety in Louisiana", presented at the South Central Safe Community Partnership Traffic Summit, Houma, Louisiana July 17, 2008.
- Program Manager of Special Studies at LTRC.

FISCAL YEAR 2009- 2010 PROPOSED ACTIVITIES

- Respond to technical assistance requests.
- Continue research, administrative, and academic duties.

Title:	**Load Distribution and Fatigue Cost Estimates of Heavy Truck Loads on Louisiana State Bridges**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1621		Project Start Date:		04/01/09
Research Project Number:	09-1ST		Completion Date	*(original)*	03/31/11
Research Agency:	LA Tech		Completion Date	*(revised)*	
Principal Investigator:	Aziz Saber, P.E., Ph.D.				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$269,742		Total		$100,000
	(revised)					
Est. Expended to Date		$17,000		Salaries		$60,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$17,000		Equipment	*(non-expendable)*	$20,000
	(revised)			Travel		$10,000
Est. FY Expenditure		$17,000		Other (instrumentation Consultant)		$10,000

PURPOSE AND SCOPE

The objective of this research is to develop an integrated system for monitoring live load and verify the carrying capacity of highway bridges in Louisiana where heavy truck loads may have caused significant damage to State bridges. This study will develop a monitoring system for synchronous measurement of live load and structural response of bridge components. The monitoring system will integrate a distributed network of advanced strain and displacement sensors (continuous and peak). The anticipated major contributions will include accumulated fatigue load spectra, strain measurements to determine in-service conditions, assess adverse loading conditions and distribution factors.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Select a candidate bridge suitable for the study.
- Identify, analyze, and develop instrumentation plan for bridge.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Acquiring a Data acquisition system.
- Review LADOTD practice.
- Review inspection & maintenance reports.
- Install and calibrate the monitoring system for the bridge.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Implementation of the Rolling Wheel Deflectometer (RWD) in PMS and Pavement Preservation**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		05/01/09
Research Project Number:	09-2P		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mostafa Elesifi, PH.D				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000	**Total**		$90,000
	(revised)				
Est. Expended to Date		$10,000	Salaries		$90,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$10,000	Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure		$10,000	Other		

PURPOSE AND SCOPE

The Rolling Wheel Deflectometer (RWD) measures deflections at highway speeds and has the potential to provide the structural capacity with network accuracy of the Highways without major delays and in a cost-effective way. Proposed research activities will generate an electronic map with current DOTD Pavement Management (PMS) distress data as well as RWD deflection data indices. Additionally, the relationship between FWD deflection data and RWD measurements will be established as well as a methodology to predict the pavements structural number (SN) directly from RWD data. This project has two phases. Phase 1 entails collecting RWD data on roadways in District 05, developing a detailed testing factorial for selected routes on which FWD tests will be conducted, reviewing the current DOTD PMS distress data presentation methods, and merging RWD deflection data/indices with the PMS map. In phase 2, correlations between FWD and RWD deflection data will be made, and a methodology to predict SN from those values will be established.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Conduct literature review for the research project.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Develop Testing factorial for RWD tests.
- Evaluate current DOTD PMS distress management presentation system.
- Develop an electronic map which combines both PMS distress data and RWD data.
- Evaluate the RWD deflection data.
- Develop a correlation between FWD and RWD deflection data.
- Develop a methodology to determine the SN from RWD data.
- Publish an Interim report for Phase 1 and a final report for Phases 1 & 2.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Support Study for A Shape Memory Polymer based Self-healing Sealant for Expansion Joint**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1622		Project Start Date:		03/01/09
Research Project Number:	09-5ST		Completion Date	*(original)*	08/31/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Guoqiang Li, Ph.D.				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$43,750		Total		$35,000
	(revised)					
Est. Expended to Date		$5,000		Salaries		$35,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$5,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$5,000		Other (instrumentation Consultant)		

PURPOSE AND SCOPE

The purpose of this study is to provide technical and managerial support for a self- generated one titled "A Shape Memory Polymer based Self-healing Sealant for Expansion Joint." The support will be in the form coordinating the selection of two bridges to place the self-healing sealant, reviewing the design of the product and the placement and the monitoring of the product, ensuring quarterly progress reports are delivered on time to the IDEA Program manager.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Coordinate work with the PI of the main study "A Shape Memory Polymer based Self-healing Sealant for Expansion Joint."

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Continue working with the Principal Investigator. Work encompasses:

1. Assisting the PI in the selection of a candidate bridge.
2. Reviewing PI's technical quarterly reports that are submitted to the FHWA-IDEA program.
3. Holding Technical meeting with the Project Review Committee (PRC).

	Research Expansion Program
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1442		Project Start Date:		11/01/06
Research Project Number:	10-1AD		Completion Date	*(original)*	10/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	06/30/12
Principal Investigator:	V.J. Gopu				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$363,309		**Total**		$219,465
	(revised)	$1,088,594				
Est. Expended to Date		$395,832		Salaries		$208,965
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$176,405		Equipment	*(non-expendable)*	
	(revised)	$211,428		Travel		$10,500
Est. FY Expenditure		$208,928		Other		

PURPOSE AND SCOPE

To cover administrative costs handled under contract to support the LTRC research, development and technology transfer expansion funding programs.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

1. Submitted the following proposals that were developed in collaboration with CEE faculty at various Louisiana universities to the National Science Foundation.
    - Cyber-enabled Learning of Structural Health Monitoring of Highway Bridges
    - State-wide Field Measurement and Monitoring Model for CEE Engineering Curricula
    - 2011 CMMI Research and Innovation Conference
2. Coordinated TIER Research Program.
3. Coordinated NSF Program Director's (Dr. Fragaszy) visit to LTRC and other campuses.
4. Served on the NSF Site Visit Teams to UC-Berkeley, U of Illinois, Purdue and Georgia Tech.
5. Taught an advanced steel design course at the graduate level to LSU and UNO students.
6. Published three peer reviewed papers in the proceedings of two international conferences.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

1. Increase NHI course offerings by recruiting faculty at various campuses to serve as instructors.
2. Offer effective proposal writing workshop to university faculty.
3. Coordinate and facilitate the development and submittal of research proposals in the transportation related areas by university faculty to funding agencies.
4. Organize campus visits of the senior LTRC staff for town hall meetings.
5. Offer a timber design course on a state-wide basis utilizing LTRC's distance learning capability.
6. Continue coordination of TIER program.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Management and Operation of the Pavement Research Facility**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-0515		Project Start Date:		07/01/09
Research Project Number:	10-1ALF		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Zhong Wu				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$680,300	**Total**		$680,300
	(revised)				
Est. Expended to Date			Salaries		$335,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	$200,000
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$12,000
Est. FY Expenditure			Other		$36,000

PURPOSE AND SCOPE

The PRF is a full scale test facility site designed to test any and all types of pavements using the Australian designed ALF. The purpose of LTRC's Pavement Research Facility is to investigate and evaluate economic and practical alternatives to current design and construction practices. The objective of this study is to provide for the management and operation structure of the PRF site in performing full-scale accelerated pavement testing.

A manager, two operators and a research associate will be funded in this study. The scope of the work includes management of the facility, maintenance and operation, preparations of plans for individual experiments, construction and instrumentation activities and planning.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Prepared construction specifications for Experiment No.5 (TTI test lanes).
- Continued maintenance and operation of the Pavement Research facility.
- Provided assistance for other research activities at LTRC (e.g. NCHRP 9-40, GERL study).
- Cleaned-sandblasted ALF.
- Acquired new Laser-base profile (and rutting) measurement system.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Construct eight TTI test sections as shown in the construction specification.
- ALF loading on sections 1 & 2 (during Summer 2009).
- ALF loading on sections 3 & 4 (during Fall 2009 or Spring 2010).

State Funded
Research Program

PROPOSED RESEARCH

2009 RPIC PROBLEM STATEMENTS	
Final Ranking Number	**PROBLEM STATEMENT TITLE**
1	Automatic Enforcement And Highway Safety
2	Performance Evaluation Of Flexible Pavement Treatments For Cost Effective Pavement Preservation
3	Developing Inexpensive Crash Countermeasures For Louisiana Local Roadways.
4	Why Air Entrain Bridge Decks In Southern Louisiana?
5	Development Of Wave Map For The Design Of Coastal Bridges In South Louisiana
6	Reflectivity Of Paint Or Thermoplastic On Chip Seals And Open Pavement Surfaces
7	Developing Prestressed Members Transportation Guidelines
8	Performance Related Specifications For Concrete Pavement Construction
9	Develop Model Truck Facility Site Access Design Standards. (Louisiana Statewide Transportation Plan-Recommendation T-7)
10	Utilizing ITS Data To Develop An Integrated Corridor Management Framework For Congestion Mitigation.
11	Prevention Of Extensive Dessication Cracking On Rural Highways
12	Investigation Of The Use Of High RAP Contents In Asphalt Mixtures
13	Development Of A Short-Term Traffic Prediction Model For Travel Times On I-10/I-12
14	Travel Time Study For Baton Rouge Road Network
15	Evaluation And Implementation Of Maturity For PCC
16	Validation Of Multiple Stress Creep Recovery (Mscr) Test
17	Left Turn Traffic Signal Operation
18	Investigation Of In-Situ In QC/QA Applications For Hot-Mix Asphalt
19	Development Of A Fiber Optic-Based Monitoring System To Assess Pile Damages Due To Transportation, Lifting And Pile Driving.
20	Advanced Grid Stiffened Frp Tube Encased Concrete Piles
21	Cost Effective Alternative For Noise Abatement
22	Application Of Titanium Dioxide Photocatalysis To Create Self-Cleaning, Air-Purifying Concrete Pavements
23	Field Performance Of Rubblized Pavements
24	Disaster Debris Forecasting, Estimating, Modeling, And Tracking For Linear Assets Using GIS
25	Determine The Statewide Need For Replacing Pipes, Guardrail, Striping And Joints
26	Work Zone Speed Control
27	Joining Advanced Grid Stiffened Frp Tube Encased Concrete Columns
28	Developing Horizontal Curve Crash Countermeasures Through Crash Data Analysis
29	Evaluate The Need To Calibrate The Pavement Performance Models Using PMS Database

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Developing Louisiana Crash Reduction Factors**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	08-3SS		Completion Date	*(original)*	06/30/11
Research Agency:	ULL		Completion Date	*(revised)*	
Principal Investigator:	Dr. X. Sun				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$175,000		Total		$80,000
	(revised)					
Est. Expended to Date				Salaries		$80,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*				*(non-expendable)*	
	(revised)					
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The goal of this project is to develop crash reduction factors that are specifically relevant to Louisiana. The project is being conducted by two investigators in order to expand the expertise in safety research in the state.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct literature review.
- Categorize countermeasures.
- Identify countermeasures for further study.
- Start to develop selected crash reduction factors and web-based tool.

Title:	**Measurement of Seasonal Changes and Spatial Variations in Pavement Unbound Base and Sub grade Properties**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/15/08
Research Project Number:	09-XGT		Completion Date	*(original)*	07/14/11
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Radhey Sharma				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$300,000		**Total**		$83,951
	(revised)	-				
Est. Expended to Date		$130,680		Salaries		$58,253
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$130,680		Equipment	*(non-expendable)*	
	(revised)			Travel		$7,000
Est. FY Expenditure		$130,680		Other including Overhead		$18,698

PURPOSE AND SCOPE

The proposed research aims to investigate field moisture variation over time in highway unbound bases and sub grade soils and its impact on their engineering properties and to develop a reliable design methodology to consider such impact. The main objectives of this research are:

- Conduct field tests on newly compacted sub grade (after construction and prior to paving) to document spatial variation in stiffness parameters.
- Monitor changes in pavement performance due to seasonal variation in moisture. Measure the influence of matric suction (difference of pore air pressure and pore water pressure) and the water content of the soil in the laboratory to establish a database for Louisiana soil types.
- Conduct laboratory tests on soils to complement the field testing.
- Formulate recommendations for implementation of the research findings into design methodology.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Majority of literature review (95%) has been completed and remaining will be completed in parallel with other tasks of the project.
- Selection of sites for field monitoring and for collection of soil samples has been completed, which will be finalized in consultation with the PRC.
- The PI and the graduate student had 2 meetings with the project manager to update on the progress of research, especially focusing on site selection for field monitoring and literature review aspects.
- Instrumentation plans are being finalized. The Principal Investigator is in contact with LTRC and LA DOTD.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Purchase of instruments will be completed and installation will be initiated. • Collection of soil samples from different sites will start along with laboratory tests. • Monitoring of sites will be started.

Title:	**Assessment of Pavement Management Distress Analysis Methods and Establishment of Network, Project Level, Research Target Distress Accuracies**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	09-3P		Completion Date	*(original)*	06/30/11
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000		**Total**		$70,000
	(revised)					
Est. Expended to Date				Salaries		$70,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

Currently, distresses on pavements can be catalogued either manually or with automated methods. Either method has its assets and liabilities. Manual methods are subject to error due to user judgement, poor images, and inconsistent categorization of distresses. Automated methods are subject to error due to crack recognition and labeling algorithms and poor image quality. The purpose of this research in multifold. Currently, LTRC owns a pavement imaging system and automated distress analysis software (ADA) developed by Waylink. The ADA software will be statistically compared to manual distress readings to determine its accuracy. DOTD pavement management currently collects and catalogues distresses by contract using the Fugro-Roadware ARAN system. Distresses are catalogued with a two step process. First, distresses are determined using an automated software package called Wise Crack developed by Roadware. Second, the wise crack data is reviewed and adjusted by a technician. A comparison between the distresses catalogued by the ARAN system and ADA system will be conducted.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct literature search.
- Select projects for evaluation of ADA system.
- Conduct statistical analysis of ADA versus manual system.
- Select projects for ARAN and ADA comparison.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Geotechnical Information Database – Phase 2**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	09-XXGT		Completion Date	*(original)*	06/30/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000		Total		$100,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

With advancements in technology, people (especially Engineers) expect and need quick responsive and interactive data. This project is a follow up study to LTRC Project 03-1GT. The project will encompass digitally storing geotechnical data within the department for easy retrieval, rather than being lost in the hardcopy archives. Current and future data should be recorded and stored digitally so that as the data grows it can be accessed via Content Manager, Site /Materials manager, this GIS website, etc.

Enhancements to the website and application should be incorporated in phases so that the Geotechnical Information Database becomes an even more valuable resource. This project will expand into future studies by including data from other various sources to provide more information and details to designers.

Gint, a geotechnical database has many additional features not fully utilized by the department. This project will expand the use of Gint and create a tool to digitally interpret the data and present the findings in a specified DOTD format.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

The project will begin and work will be directed toward the purpose and scope as detailed above.

Title:	**Support Study on the Characterization of Ternary Mixes with Various SCMs**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	09-6C		Completion Date	*(original)*	06/30/10
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Hak-Chul Shin, LSU				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$99,271		Total		$99,271
	(revised)					
Est. Expended to Date				Salaries		$97,271
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		$2,000
Est. FY Expenditure				Other (instrumentation Consultant)		

PURPOSE AND SCOPE

This study will determine the coefficient of thermal expansion variance for various ternary mixtures as described in LTRC project 09-4C by Rupnow. This project will also provide shear bond strength information on same mixtures. With this data recommendations on limits of supplementary cementitious materials will be made for standard LADOTD concrete mixtures for bridge decks, pavements and concrete overlays.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Review of data found in literature.
- Testing CTE for ternary mixes as supplied by LTRC project 09-4C.
- Testing shear bond strength for mixes supplied by LTRC project 09-4C.
- Final Report.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

Title:	**Traffic Pattern Study in Support of the MEPDG**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXP		Completion Date	*(original)*	06/30/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000	**Total**		$100,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

To facilitate implementation of the Mechanistic-Empirical Pavement Design Guide (MEPDG), the Louisiana Department of Transportation (LADOTD) funded a study that examined current traffic characterization techniques used in Louisiana. This study identified critical problems associated with the current traffic monitoring program and developed the outline for a strategic plan to refine the Department's WIM data collection process. The plan called for a number of new permanent weigh-in-motion (WIM) sites to be built with the extensive utilization of axle load data from existing weight enforcement stations. In support of the proposed plan it will be necessary to conduct a pilot investigation of all projected permanent WIM sites wherein each site is intensively monitored for seven continuous days. This monitoring program is to be repeated four times in one year (once per season) to determine if the current and projected sites will yield sufficient coverage to meet MEPDG guidelines (current, projected and weight enforcement sites inclusive). Quality Assurance/Control (QAQC) issues like shortfalls in coverage and inadequacies/ inaccuracies In data collection are to be examined and reported on as well (current, projected and weight enf. sites inclusive).

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Examine literature to develop an understanding of project requirements. • Contact personnel operating the existing permanent WIM and weight enforcement sites so as to gather traffic data needed to begin analysis. • Obtain equipment and training necessary to conduct the required seven-day traffic tests at the projected permanent WIM sites. • Carry out the testing at the projected permanent WIM sites. • Carry out the QAQC analysis (current, projected and weight enforcement sites inclusive). • Report findings.

Title:	**Cost Effective Alternative for Noise Abatement**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXSS		Completion Date	*(original)*	06/30/11
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000		Total		$50,000
	(revised)					
Est. Expended to Date				Salaries		$50,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*				*(non-expendable)*	
	(revised)					
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The goal of this project is to investigate the potential of bamboo as a sound barrier on highways in Louisiana.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct literature review.
- Identify species that would suit conditions.
- Identify sites where the selected species are in existence and establish contract with owner to conduct sound abatement experiments at site.
- Start conducting sound abatement tests.

Title:	**Travel Time Study for Baton Rouge Road Network**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXSS(1)		Completion Date	*(original)*	06/30/11
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$150,000	Total		$75,000
	(revised)				
Est. Expended to Date			Salaries		$67,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	$2,000
FY Funds	*(original)*			*(non-expendable)*	$3,000
	(revised)				
Est. FY Expenditure			Other		$3,000

PURPOSE AND SCOPE

The goal of this project is to develop a procedure that will estimate the travel time on the Baton Rouge network, and estimate how it would change with modifications of the network or its operation. The procedure will also be able to compare travel times in Baton Rouge with the travel time in other cities.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Conduct literature review.
- Collect network delay data in Baton Rouge using either probe vehicles or cell phone data.
- Use data to establish estimates of travel time on the network.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Phase II: Establishing an Intelligent Transportation System (ITS) Lab at LTRC**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXSS(2)		Completion Date	*(original)*	06/30/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	125,000	Total		$125,000
	(revised)				
Est. Expended to Date			Salaries		$115,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	$8,000
	(revised)		Travel		$2,000
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

This is the second phase of the ITS lab project. The first phase was to test the feasibility of establishing the ITS Lab at LTRC and outline the potential research needs the data collected at the lab can meet. This phase is expected to expand the ITS lab equipment and establish a data warehouse for various sources of traffic data. This includes the implementation of a business plan that is currently in preparation.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Additional data sources will be identified to support applications of interest to DOTD and plans will be made to compile the data from such sources in real time or on a regular basis. This includes traffic signal data, WIM data, crash data, etc.
- Additional equipment will be acquired to expand the lab's capability to house the data from all sources considered. SQL and GIS servers will be considered to facilitate data archival and retrieval processes.
- A system to access the archived data will be established. This system will allow users to collect statistics and generate reports over a web interface similar to other systems developed in other states such as California.
- A procedure will be developed to measure congestion and it will be applied to identify congestion hotspots, identify the trend in congestion, compare congestion in Baton Rouge with other cities, validate existing transportation models, and observe the impact of incidents, planned construction, and special events.

Title:	**Transportation Innovation for Research Exploration**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-TIRE		Completion Date	(original)	06/30/10
Research Agency:			Completion Date	(revised)	
Principal Investigator:	Harold "Skip" Paul, Director				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	(original)	$120,000	**Total**		$120,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2008 – 2009 Budget			Equipment	(expendable)	
FY Funds	(original)		Equipment	(non-expendable)	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

To conduct small scale exploratory studies in all fields of transportation science engineering and education. LTRC TIRE awards are limited to $30,000, non-renewable for a one year period.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Self Generated Funded Research Program

CONTINUING RESEARCH

Title:	**Development and Performance Evaluation of Fiber Reinforced Polymer (FRP) Bridge**
Funding Source:	**FHWA - IBRC**

State Project Number:		736-99-1370	Project Start Date:		11/15/05
Research Project Number:		05-5ST	Completion Date	*(original)*	05/14/08
Research Agency:		LSU	Completion Date	*(revised)*	11/14/09
Principal Investigator:		Steve Cai, Ph.D., PE			

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$220,537	**Total**		$40,059
	(revised)				
Est. Expended to Date		$180,478	Salaries		$25,059
FY 2008 – 2009			Equipment	*(expendable)*	$5,000
FY Funds	*(original)*	$70,000	Equipment	*(non-expendable)*	$5,000
	(revised)		Travel		$5,000
Est. FY Expenditure		$70,000	Other		

PURPOSE AND SCOPE

This is a thirty-month study. It has been approved and is federally funded through the Innovative Bridge Research and Construction Program (IBRC) Program. The purpose of the study is to investigate the application of Fiber Reinforced Polymer (FRP) products to replace a low-rated, deteriorated bridge deck. The study encompasses the design and purchasing of an FRP deck, computer analysis and finite element modeling of the candidate bridge, as well as instrumentation and data acquisition. Successful results will add "FRP deck" as another option for bridge deck replacement.

FISCAL YEAR 2008 – 2009 ACCOMPLISHED ACTIVITIES

1. Task 3 – Some additional finite element analysis were performed.
2. Task 4 – Instrumentation Plan has been fine-tuned.

Six 6' x 25' balsawood/FRP Deck panels were manufactured and delivered to LADOTD Bridge Maintenance Section. The manufacturing took longer than anticipated due to unexpected shortage of some materials and also to production problems.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

1. Task 5 – Field bridge installation and instrumentation will be conducted by coordinating the LA DOTD and manufacturer's schedule.
2. Task 6 – Guidelines for monitoring the bridge performance will be developed.
3. The Principal Investigator will submit a draft final report to the PRC for reviewing.
4. Report will be edited after Project Review Committee's comments are addressed. LTRC will publish and distribute Final Report as well as the Technical Summary.

Title:	**Optimization of Tack Coat for HMA Placement**
Funding Source:	**NCHRP Project 9-40**

State Project Number:	736-99-1360		Project Start Date:		07/01/05
Research Project Number:	06-2B		Completion Date	*(original)*	06/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	09/30/09
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$350,000		**Total**		$78,704
	(revised)	$428,000				
Est. Expended to Date		$349,000		Salaries		$50,704
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$80,000		Equipment	*(non-expendable)*	
	(revised)			Travel		$3,000
Est. FY Expenditure		$80,000		Other (Subcontract)		$25,000

PURPOSE AND SCOPE

The objective of this project is to determine the optimum application methods, equipment type and calibration procedures, application rates, and asphalt binder materials for the various uses of tack coats and to recommend revisions to relevant AASHTO methods and practices related to tack coats. Optimum tack coat type and application rate will be determined by the type and condition of the existing pavement surface as well as other factors including material type and permeability of the HMA pavement overlay to be placed, the traffic loading, and the climate.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Task 6 was eliminated.
- Continued progress on Task 4: Conduct Experiment approved in Task 3 –
- Based on preliminary findings, technical paper titled *"Development of Pull-Off Test Device and Methodology to Evaluate the Bond Strength of Tack Coat Materials in the Field"* was presented at the 2009 TRB Annual Meeting and accepted for publication in the Journal of Transportation Research Record.
- Based on preliminary findings, technical paper titled *"Interface Shear Strength Characteristics of Emulsified Tack Coats"* was presented at the 2009 AAPT Annual Meeting and accepted for publication in the Journal of Asphalt Paving Technologist.
- Developed Test method in AASHTO format for Tack Coat Quality and interface bond strength test has been completed.
- Continued progress on the preparation in instructional materials for a training course.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Prepare test methods and construction guidelines.
- Prepare instructional materials for training course.
- Prepare Draft Final Report.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Structure Health Monitoring of the I-10 Twin Span Bridge Over Lake Pontchartrain**
Funding Source:	**FHWA - IBRD**

State Project Number:	736-99-1437		Project Start Date:		11/01/07
Research Project Number:	07-1ST		Completion Date	*(original)*	10/31/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$449,925		**Total**		$317,077
	(revised)	$ 565,550				
Est. Expended to Date		$248,473		Salaries		$0
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$0
FY Funds	*(original)*	$402,225		Equipment	*(non-expendable)*	$317,077
	(revised)	$200,773		Travel		$0
Est. FY Expenditure		$ 200,773		Other		

PURPOSE AND SCOPE

The objective of this research project is to establish a structure Health Monitoring System of the I-10 Twin Span Bridge through instrumentation of the M19 Eastbound Pier for use in the short-term and long-term monitoring purposes. This includes instrument selected piles with inclinometers and strain gauges, instrument pile-cap with accelerometers and tiltmeters, and instrument column with water pressure cells.

Static lateral load test will be performed by LA DOTD immediately after completing the installation of the monitoring system in the Eastbound Pier M19. The short-term monitoring will be used to validate the applicability of the FB-MultiPier analysis for predicting the performance of battered pile group system under lateral loading; and to develop (or back-calculated) the p-y multipliers for battered pile groups in similar soil conditions.

The long-term monitoring will be used to evaluate the behavior of pile group structure under dynamic loads caused by selected events (winds, waves, and vessel collision).

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS
• Prepared and presented to Project Review Committee a complete instrumentation plan for short-term and long-term monitoring of M19 pier of I-10 Twin Span Bridge, including substructure and superstructure instrumentations. • Prepared drawings for plan changes needed for the substructure and superstructure instrumentations. • Test pile instrumentations prior and post delivery to the site, and after pile driving. • Provided technical support to protect pile instrumentations during pile driving phase. • Calibrated and installed IPI MEMS inclinometers on eight selected piles. • Installed two triaxial accelerometers, four MEMS tiltmeters, four corrosion meters, and eight water pressure cells at pile footing. • Installed corrosion meters at columns; and installed strain gauges at columns, cap bent, steel girders, and concrete girders. • Temporary assembled the Monitoring System to collect the data during later load test. • Provided engineering support and data collection during the lateral load test.
FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Install Osmos WIM at M19 pier to capture live loads for three lanes. • Complete the superstructure instrumentation. • Assemble the long-term Health Monitoring System. • Setup the data acquisition monitoring system to trigger recording data under dynamic loads caused by selected events (winds, waves, and vessel collision). • Provide technical support to the long-term Health Monitoring System. • Train LTRC research team and LA DOTD bridge engineers on the use of long-term Health Monitoring System.

Title:	**Use of Fiber Reinforced Polymer (FRP) Bars in Highway Concrete Bridges**
Funding Source:	**FHWA – IBRC**

State Project Number:		736-99-1438	Project Start Date:		10/01/07
Research Project Number:		07-3ST	Completion Date	*(original)*	04/30/11
Research Agency:		LSU	Completion Date	*(revised)*	
Principal Investigator:		Steve Cai, Ph.D., PE			

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$200,000	Total		$75,000
	(revised)				
Est. Expended to Date		$50,000	Salaries		$40,000
FY 2008 – 2009			Equipment	*(expendable)*	$25,000
FY Funds	*(original)*	$75,000	Equipment	*(non-expendable)*	
	(revised)		Travel		$10,000
Est. FY Expenditure		$25,000	Other		

PURPOSE AND SCOPE

The purpose of this study is to experiment with the use of FRP bars in concrete girders. FRP rods will be used as post-tensioning rods for the ultimate purpose of improving bridge load-carrying capacities.

This study has been approved and is federally funded through the Innovative Bridge Research and Construction Program (IBRC) program.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

1. A load-posted bridge with a steel and concrete span was selected.
2. Perform bridge analysis will be started.
3. Acquiring post-tensioned FRP rods and data acquisition system.

FISCAL YEAR 200 – 2010 PROPOSED ACTIVITIES

4. Continue bridge analysis.
5. Submit a strengthening plan.
6. Submit an instrumentation plan.

Title:	**Integral Abutment Bridge for Louisiana's Soft Soil**
Funding Source:	**FHWA – IBRD**

State Project Number:	736-99-1439		Project Start Date:		10/01/07
Research Project Number:	07-4ST		Completion Date	*(original)*	08/31/11
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Drs. Voyiadjis, Cai, and Sharma				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$400,000	Total		$90,000
	(revised)				
Est. Expended to Date		$150,000	Salaries		$40,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$90,000	Equipment	*(non-expendable)*	$35,000
	(revised)		Travel		$10,000
Est. FY Expenditure		120,000	Other		$5,000

PURPOSE AND SCOPE

The proposed project is to design a full Integral Abutment Bridge for Louisiana's soft soil condition and use a new Fiber Optic Sensor (FOS) System (embedded instrumentations) to monitor and evaluate the long-term performance of the Integral Abutment Bridges. This project incorporates the use of smart materials or embedded instrumentation for future continuous monitoring of operational performance of such bridges.

This study has been approved and is federally funded through the Innovative Bridge Research and Deployment Program (IBRD) program.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

1. LA DOTD provided the design plans to the Principal Investigator.
2. An instrumentation plan was submitted to and approved by the Project Review Committee.
3. A contract was signed with the instrumentation company to design the Data Acquisition System.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

1. Install the data acquisition system.
2. Collect and analyze the data.
3. Submit a draft final report.

Title:	**Developing Embedded Wireless Strain/Stress/Temperature Sensors Platform for Highway Applications**
Funding Source:	**NCHRP IDEA**

State Project Number:	736-99-1495		Project Start Date:		06/01/07
Research Project Number:	07-8P		Completion Date	*(original)*	12/31/08
Research Agency:	LTRC/IDEA		Completion Date	*(revised)*	12/31/09
Principal Investigator:	Kun Lian				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$125,000		Total		$95,335
	(revised)					
Est. Expended to Date		$29,665		Salaries		$57,249
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$87,638		Equipment	*(non-expendable)*	
	(revised)	$29,665		Travel		$10,365
Est. FY Expenditure		$29,665		Other		$27,721

PURPOSE AND SCOPE

This project will develop and test a radiofrequency wireless embedded sensor platform for monitoring strain, stress, temperature, and moisture parameters inside asphalt, soil, and concrete structures. Work in the first phase will focus on developing and integrating the components of a prototype platform system consisting of three modules – sensor system, radiofrequency (RF) data transmission system, and Faraday power harvesting system. The components of each module will be tested, integrated, and calibrated to produce the respective modules. Work in the second phase will involve laboratory and field testing of the sensor platform system. The system's modules will be further refined based on tests results and integrated to improve the prototype platform system. The laboratory tests will be followed by field tests in actual highway environment. Data on stress, strain, and moisture content will be collected and evaluated for accuracy and reliability. The final report will document all data and developments of the project along with an assessment of the technology for implementation and commercialization.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Finished the alignment shell fabrication and testing.
- Finished preliminary road acceleration parameter test and possible application of vehicle axial pattern recognition.
- Finished the preliminary calibrations for strain gauge embedded in asphalt and moisture sensor in clay environment.
- Finished the preliminary unit fabrication of Faraday energy harvesting device.
- Finished the reliability improvement for data acquisition software.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Prepare the final integration or sensor platform.
- Characterize the Faraday energy harvesting device.
- Test the sensor platform embedded in asphalt at Lab Environment.
- Finish the data acquisition software interface.
- Finish the Final Report.
- Look for industrial partner/partners and prepare the IDEA phase II proposal

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Monitoring Bridge Scour Using Fiber Optic Sensors**
Funding Source:	**FHWA – IBRD**

State Project Number:	736-99-1573		Project Start Date:		01/01/09
Research Project Number:	08-2ST		Completion Date	*(original)*	06/30/11
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Steve Cai, Ph.D., PE				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$200,000		Total		$100,000
	(revised)					
Est. Expended to Date		$20,000		Salaries		$60,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$20,000		Equipment	*(non-expendable)*	$20,000
	(revised)			Travel		$10,000
Est. FY Expenditure		$20,000		Other (instrumentation Consultant)		$10,000

PURPOSE AND SCOPE

In the last 30 year more than 1,000 bridges collapsed in the United States and about 60% failures are related to the scour of bridge's foundations. Due to the difficulty in inspecting bridge scour, scour-induced failures tend to occur suddenly without prior warning or signs of distress to the structures. Owing to the threat of hurricane-induced flooding and the fact that there are a significant number of coastal and river/bayou bridges in Louisiana, a more reliable inspection and monitoring procedure for bridge scour is needed. The objective of the study is to develop a Scour Monitoring System for bridge piers using Fiber Optic sensors. The system may be used for existing or new constructed bridges. The developed system will collect filed data that can be used to verify the applicability and accuracy of the various design procedures for the range of soil conditions, stream flow conditions, and bridge designs in Louisiana and eventually to result in improving existing scour prediction methods.

This study has been approved and is federally funded through the Innovative Bridge Research and Deployment Program (IBRD) program.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Task 1. Literature search is being performed.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Task 1. Submit a summary report of Task 1 review and a more detailed work plan for the rest tasks based on the finding of reviews.

Task 2. Develop a scour monitoring system.

Task 3. Testing of the monitoring system in the lab.

Title:	**Support Study to Evaluation of the Base/Subgrade Soil under Repeated Loading**
Funding Source:	**TENSAR Earth Technologies**

State Project Number:	736-99-1511		Project Start Date:		01/01/08
Research Project Number:	08-4GT		Completion Date	*(original)*	12/31/08
Research Agency:	LTRC		Completion Date	*(revised)*	12/31/09
Principal Investigator:	Drs. Murad Abu-Farsakh & Qiming Chen				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$101,251		**Total**		$54,200
	(revised)	$144,200				
Est. Expended to Date		$90,000		Salaries		$49,250
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$4,950
FY Funds	*(original)*	$58,700		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$50,000		Other		

PURPOSE AND SCOPE

The purpose of this support study is to extend the scope of the primary proposal (05-5GT) to incorporate the testing work program for Tensar International Corporation. The scope of this proposed Support Study is to provide extra funding to perform TENSAR large-scale tests on geogrid reinforced pavement sections and laboratory small scale tests on geogrid reinforced base material samples.

The work program includes conducting six cyclic plate tests on instrumented geogrid reinforced-base sections constructed inside the actuator-test box, in addition to nine single-stage repeated loading triaxial (RLT) tests on geogrid reinforced base material specimens using MTS machine. The purpose of these tests is to evaluate the reinforcing benefits of new Tensar TriAx geogrid products (TX 160 and TX 170) as compared to the current Tensar Biaxial geogrid product (BX 1200 and BX 1500).

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Conducted two cyclic plate loading tests inside the test box actuator on selected base-reinforced pavement sections.
- Conducted five single-stage repeated loading triaxial (RLT) tests on geogrid-reinforced base material specimens.
- Conducted seventeen multi-stage repeated loading triaxial (RLT) tests on geogrid-reinforced base material specimens.
- Provided support to ALF testing using cyclic plate loading tests.
- Started analyzing the results of laboratory RLT tests and in-box cyclic loading test results in terms of extended service life benefit achieved from reinforcing bases with geogrids.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Conduct three cyclic loading tests inside the actuator-test box on instrumented geogrid reinforced-base pavement sections on soft silty subgrade. • Conduct more small-scale repeated loading triaxial (RLT) tests on geogrid-reinforced specimens. • Continue analyzing the results of repeated loading triaxial (RLT) tests and in-box cyclic loading tests, • Prepare a draft report. • More funds will be provided by TENSAR to cover the multi-stage RLT tests.

Self Generated Funded Research Program

PROPOSED RESEARCH

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Real-Time Kinematic Global Positioning Service for Louisiana**
Funding Source:	**U.S. Army Corps of Engineering**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	09-3GT		Completion Date	*(original)*	02/15/10
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Roy K. Dokka				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$79,961		Total		$54,961
	(revised)					
Est. Expended to Date		$25,000		Salaries		$37,220
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$79,961		Equipment	*(non-expendable)*	$500
	(revised)			Travel		$2,400
Est. FY Expenditure		$25,000		Other (does not include indirect cost; $11,341)		$3,500

PURPOSE AND SCOPE

The U.S. Army Corps of Engineers, New Orleans District (USACE-NOD) has expressed a desire to access enhanced services of Louisiana State University's (LSU) Center for GeoInformatics GULFNet Global Positioning network in south Louisiana. LSU currently operates a Real-Time GNSS System (RTN) system to serve surveying, engineering, construction, dredging, GIS, and other sources. The LSU RTN system currently consists of 50 continuous GPS stations, 50 stations equipped with RTN controller software, and servers located at LSU. Users connect to the system via commercial cellular data service provided by users. LSU seeks sponsorship to provide operational service for RTN surveying and related purposes throughout Louisiana.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Provide operational service for RTN survey.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

The project will begin 07/01/09 and work is being directed toward the purpose and scope as detailed above.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**A Shape Memory Polymer Based Self-Healing Sealant for Expansion Joint**
Funding Source:	**NCHRP – IDEA**

State Project Number:		736-99-1622	Project Start Date:		03/01/09
Research Project Number:		09-4ST	Completion Date	*(original)*	08/31/10
Research Agency:		LSU	Completion Date	*(revised)*	
Principal Investigator:		Guoqiang Li, Ph.D.			

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$135,000	Total		$90,000
	(revised)				
Est. Expended to Date		$30,000	Salaries		$55,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$30,000	Equipment	*(non-expendable)*	$20,000
	(revised)		Travel		$5,000
Est. FY Expenditure		$30,000	Other (instrumentation Consultant)		$10,000

PURPOSE AND SCOPE

The objective of this study is to develop a Novel Shape Memory Polymer (SMP) based syntactic foam joint sealant which will be able to self-heal cohesive damage by its shape memory characteristic and avoid adhesive failure by consistently and autonomously applying a compressive stress to the edge of the concrete. The proposed novel sealant belongs to the category of compression seal joint.

This study has been approved and is FHWA funded through the Ideas Deserving Exploratory Analysis (IDEA) Program.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

1. Perform a literature search to categorize various factors that cause the failure of sealed joints.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Preliminary study has shown that the syntactic foam self-heals damage repeatedly. In order to accomplish the objective, a three-phase study will be conducted.

Phase 1 will focus on characterization and programming of the foam sealant.

Phase 2 will involve a well designed lab-scale testing to evaluate the performance of the programmed sealant.

Phase 3 will deal with field-level evaluation by application of the sealant at two expansion joints on a selected bridge.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Historical Boring Log Data Acquisition, Posting and Sharing**
Funding Source:	**Office of Coastal Protection and Restoration (OCPR)**

State Project Number:			Project Start Date:		05/02/09
Research Project Number:	09-XXGT(1)		Completion Date	*(original)*	05/01/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000		Total		$50,000
	(revised)					
Est. Expended to Date		$5,000		Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$5,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$5,000		Other		

PURPOSE AND SCOPE

LTRC Project 03-1GT, created a Global Information System (GIS) to host geotechnical information for use by the department. The scope however was limited to boring logs previously scanned and saved in a digital format by the Materials Laboratory. The project did not cover older borings stored in historical formats. The information contained in these hardcopy, microfiche, CD, and DVD records contain valuable soil information, though there may be some effort to acquire this information from these historical records.

OCPR through their efforts is seeking additional data to aide in their agency task. Acquiring this information through file research could save their agency from having to conduct additional borings. The project proposed to collect the historical information from the following geographical area: Texas to the Atchafalaya, and south of Gulf Intercoastal Waterway (GIWW)

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Begin data collection.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

The project began 05/02/09 and work is being directed toward the purpose and scope as detailed above.

Title:	**Field versus Laboratory Volumetrics and Mechanical Properties**
Funding Source:	**NCHRP Project 9-48**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-1B		Completion Date	*(original)*	01/31/12
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$500,000	**Total**		$152,000
	(revised)				
Est. Expended to Date			Salaries		$98,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$4,000
Est. FY Expenditure			Other (Subcontract)		$50,000

PURPOSE AND SCOPE

The objectives of this study are (1.) quantify sources and causes of variability in the measurements of volumetric and mechanical properties of dense-graded asphalt mixtures for three types of specimens that may be encountered in QA and mix design activities (laboratory mixed and compacted [LL], plant mixed and laboratory compacted [PL], and plant mixed and field compacted [PF]), and (2.) develop a recommended practice for state DOTs to incorporate these results in specifications and criteria for (a) quality assurance; (b) mix design and verification or validation, and (c) structural design and forensic studies.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Perform The Following Tasks:

Task 1. Comprehensive Literature Review.
Task 2. Conduct A Meta-Analysis Of Collected Data.
Task 3. Design An Experimental Work Plan And Submit An Interim Report.
Task 4. Conduct Laboratory Experiments approved in Task 3.

Title:	**Construction and Accelerated Pavement Testing of TTI Pavement Test Sections**
Funding Source:	**Texas Transportation Institute (TTI)**

State Project Number:			Project Start Date:		05/01/09
Research Project Number:	10-XX		Completion Date	*(original)*	03/31/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Zhong Wu				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000		Total		$50,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The purpose of this study is to provide special pavement testing services in relation to TX DOT Project 0-6132, "Development and Field Evaluation of the Next Generation of HMA Mix Design Procedures,"

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Prepared construction specification
- Prepared draft contract

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- LTRC will be responsible for the construction of three 215-ft long by 13-ft wide test lanes with 8 test sections as shown in the construction specification.
- Loading on sections 1 & 2 (during Summer 2009).
- Loading on sections 3 & 4 (during Fall 2009 or Spring 2010).

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Laboratory Evaluation of the Performance of Sulfur-Enhanced Asphalt Treated Base Mixtures**
Funding Source:	**Shell Oil Products**

State Project Number:			Project Start Date:		07/01/09
Research Project Number:	10-XXB		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$125,000	Total		$125,000
	(revised)				
Est. Expended to Date			Salaries		$123,660
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$1,340
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The objective of this study is to evaluate the laboratory performance of conventional mixtures and asphalt treated base mixture containing sulphur extended additives. The ATB mixture will be designed using the methodology developed under LTRC project 04-4B "*Development Of A Design Methodology For Asphalt Treated Base Mixtures*."

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Acquire and characterize aggregate, binder, and sulphur extended additives.
- Perform mixture design.
- Fabricated test specimens.
- Perform fundamental materials characterization tests (ITS, LWT, E*, FN, SCB, DSCE, RSCH, Beam Fatigue).
- Perform data analysis.
- Prepare Final Report.

STP Funded
Technology Transfer
&
Education Program

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Technology Transfer Program and Operations**
Funding Source:	**STP: TT-FED**

State Project Number:	736-99-1638		Project Start Date:		07/01/09
Research Project Number:	10-1TSQ		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$893,215	Total		$ 893,215
	(revised)				
Est. Expended to Date			Salaries		$863,710
FY 2008 – 2009 Budget			Equipment	*(expendable)*	$17,255
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$6,000
Est. FY Expenditure			Other		$6,250

PURPOSE AND SCOPE

The objectives of this study are to:

- Disseminate information on new technologies and methodologies to LA DOTD and other transportation-oriented agencies.
- Improve communications on technical, transportation-related issues between the department and other agencies.
- Encourage implementation of new procedures and technologies.
- Disseminate information on transportation subjects to appropriate managers and engineers in the department.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Published 15 reports, 4 Technical Assistance Reports, 5 Technical Summaries, 9 Project Capsules, 4 Tech Today Newsletters, and 1 Annual Report.
- Online registration established for 12 classes hosted at TTEC (NHI, FHWA, LA DOTD).
- Videos produced: Customer Service and LA Highway Construction. Filmed DOTD Legal Seminar and Audubon Bridge Project.
- LTRC logo and coin design established and approved. LTRC logo, new letterhead release and initiated. Updated design of all LTRC publications to include new logo.
- Publication Guidelines updated, re-designed and approved. Publication Guidelines released and distributed. Develop class for researchers on how to utilize the LTRC Word template and adhere to the Publication Guidelines.
- Collecting information for Annual Report.
- Held 2009 Louisiana Transportation Conference. Conference registration and publication development of 2009 Louisiana Transportation Conference. Assisted in conference registration and publication development of emulsion seminar and pavement seminar.
- Re-designed LTRC and Training Intranet website.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• Continue the production of Project Capsules and Implementation Bulletins, Technical Reports, continue publication of Newsletters, Project Capsules, Research Reports, Videos and LTRC Annual Report. • Maintain website and on-line registration for 2009 AASHTO Subcommittee on Bridges and Structures Annual Meeting. • Continue online registration for classes hosted by TTEC. • Begin planning for the 2011 Louisiana Transportation Conference.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Workforce Development**
Funding Source:	**STP: TT-FED**

State Project Number:	736-99-1640		Project Start Date:		07/01/09
Research Project Number:	10-1WD		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$1,103,132		Total		$1,103,132
	(revised)					
Est. Expended to Date				Salaries		$1,093,132
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$10,000
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The purpose of this study is to provide for the strategic planning, program development and delivery management of the workforce development programs for DOTD personnel. The scope of this study also includes the development, delivery and administration of the LTRC Transportation & Training Center's transportation outreach program.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Developed 10 training courses, 53 recertification tests given, 91 specialty tests given, 40 certifications awarded.
- Monitoring revised PPM 59 (Workforce Development) and noting future changes to PPM 59.
- Scheduled and registered students for the following courses:
  - Leadership, Management, Supervisory, Computer Based training Courses, NHI, CADD/GIS and other specialty courses.
- Coordinated the activities of 4 - ERDP participants and 40- Co-op students.
- Approximately 4500 training opportunities provided to LA DOTD and transportation industry.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Continue to meet with principal customers to prioritize needs to develop training courses, performance evaluations, and safe operating checklists.
- Manage PC and CAAD software, leadership, technical skills training, and professional development and continuing education.
- Continue the program of safety training.
- Maintain and build library collection in support of workforce development and research activities
- Continue coordinating activities of ERDP participants and co-op students.
- Revise Workforce Development Policy and Procedures (PPM 59).

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Support for Senior Project Courses**
Funding Source:	**STP: TT-FED**

State Project Number:	701-65-1311		Project Start Date:		07/01/09
Research Project Number:	10-2AD		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$37,500		Total		$37,500
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

To provide support for senior project engineering courses up to a maximum of $7,500 / university / year.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- LSU, LA TECH, and UNO Universities participated in this program this reporting period.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**LTRC Student Program**
Funding Source:	**STP: TT-FED**

State Project Number:	701-65-1310		Project Start Date:		07/01/09
Research Project Number:	10-3AD		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$147,000		Total		$147,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

To pay for salaries for undergraduate students employed to provide support to various LTRC projects.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- 22 Undergraduate students were employed by LTRC to provide support in fulfilling necessary job tasks.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**LADOTD CO-OP Program**
Funding Source:	**STP: TT-FED**

State Project Number:	736-99-1639		Project Start Date:		07/01/09
Research Project Number:	10-COOP		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$400,000		Total		$400,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The LADOTD CO-OP program is a cooperative endeavor between the LADOTD and Louisiana Universities, providing practical experience to junior and senior level undergraduates through part-time employment in public transportation engineering work. This program is intended to enhance the educational process by providing opportunities for participants to explore their interest in transportation engineering through practical experience. This program also provides opportunities for LADOTD to evaluate participants of this program as potential employees.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- 41 students participated in CO-OP in fall semester 2009. 11 students graduated, 4 hired.
- 24 students participated in CO-OP in spring semester 2009. Number of students reduced because of funding issues. Students graduated in May 2009, 1 hired.
- 11 students continuing in program through the summer.
- 1 graduate from CO-OP hired by LA DOTD into ERDP Program.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Place CO-OP approximately 30 students in various DOTD Sections across the state.
- Continue end of semester presentations.
- Retain students in CO-OP.

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Technology Transfer Registration Fees**
Funding Source:	**STP: TT-FED**

State Project Number:	736-99-1636		Project Start Date:		07/01/09
Research Project Number:	10-TTRF		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$100,000	Total		$100,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

To provide cost effective transfer of technology and workforce development opportunities to Louisiana's parish and municipality public transportation and public works agencies through training, technical assistance and information dissemination.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Workforce Development Contracts**
Funding Source:	**STP: TT-FED**

State Project Number:	736-99-1637		Project Start Date:		07/01/08
Research Project Number:	10-WDC		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$2,605,000		Total		$2,605,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

The purpose of this study is to provide contractual services through federal, university and private sector suppliers for continuing education, professional development, technical skills, software, leadership, management, supervisory training. The scope of this project also includes providing individual registration fees for DOTD employees to attend workshops, courses and conferences to enhance their professional and technical development.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Conducted 14 National Highway Institute courses (340 students).
- Conducted 135 PC software courses (1350 students).
- Conducted 57 CADD/ArcGIS courses (548 students)
- Conducted 2 LanTEC-ERP courses (24 students).
- Conducted 25 safety related courses (393 students).
- Conducted 53 specialty courses (995 students).
- Individual training registrations (147 classes/454 LA DOTD Employees).
- Over 3500 students for leadership/management/supervisory and computer based training courses.
- Approximately 10,000 employees trained (LA DOTD and transportation industry) this year (includes course and conferences/workshops/seminars attendance).
- Managed numerous workshops, meetings, seminars, and conferences.
    - 2009 Louisiana Transportation Conference (over 1500 participants).
    - 8 conferences/workshops/seminars (over 1700 participants).

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES
• National Highway Institute courses. • PC software training. • CADD/GIS and specialty software training. • Professional Development training contracts. • Technical skills training contracts. • Safety related training contracts. • Leadership, management, & supervisory training contracts. • Individual training registrations. • Research tools training. • Library resource orientation and training. • Maintain and build library collection in support of workforce development and research activities. • Training events management.

LTAP
Funded
Program

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Local Technical Assistance Program (LTAP)**
Funding Source:	**LTAP: TT-FED / TT-REG**

State Project Number:	736-99-1497		Project Start Date:		01/01/08
Research Project Number:	08-LTAP		Completion Date	*(original)*	12/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Marie Walsh				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$300,000		Total		$362,000
	(revised)	$701,000				
Est. Expended to Date		$339,000		Salaries		
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$300,000		Equipment	*(non-expendable)*	
	(revised)	$363,000		Travel		
Est. FY Expenditure		$339,000		Other		

PURPOSE AND SCOPE

To provide cost effective transfer of technology and workforce development opportunities to Louisiana's parish and municipality public transportation and public works agencies through training, technical assistance and information dissemination.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

1. Presented 94 classes or workshops:
   - 31 Worker Safety classes.
   - 23 Highway Safety classes.
   - 32 Infrastructure Management classes.
   - 8 Workforce Development classes.
2. 9,808 hours of training provided.
3. 1,816 program participants

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Administer Roads Scholar and Road Master Programs.
- Continue management of Local Road Safety Program including local project implementation.
- Provide new workforce development opportunities to local agencies

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**Implementation and Project Management of the New Louisiana Local Road Safety Program**
Funding Source:	**LTAP: TT-FED**

State Project Number:	737-99-0787		Project Start Date:		01/01/08
Research Project Number:	LTAP Safety		Completion Date	*(original)*	12/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Marie Walsh				

BUDGET STATUS

Total Budget			**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$200,000	Total		$200,000
	(revised)	$296,000			
Est. Expended to Date		$96,000	Salaries		
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$200,000	Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure		$96,000	Other		

PURPOSE AND SCOPE

To implement the Louisiana Strategic Highway Safety Plan initiatives at the local level through data analysis, education, and outreach and management of low cost safety improvement projects for the local transportation system.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Conducted 23 highway safety classes including major intersection safety improvement workshops and work zone safety training.
- Identified and assessed priority local road intersections and roadway departure locations for possible mitigation.
- Managed implementation process for 100 low cost safety improvement projects totalling more than $13 million.
- Spearheaded major coalition effort for enhanced “click it or ticket” campaign in cooperation with DOTD, LA Highway Safety Commission and LA State Police.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Coordinate improvement and use of local crash data utilizing LDOTD; LSU; HSC and law enforcement participation.
- Complete analysis of local crash data and develop local road safety profiles or other tools for local agencies.
- Conduct roadway departure workshop and technical assistance for local agencies.
- Implement projects currently in development and design stages.

Other Funded Projects

Title:	**Developing a Comprehensive Highway Accident Data Analysis System with GIS (III)**
Funding Source:	**FHWA--Safety**

State Project Number:	712-99-0003		Project Start Date:		08/01/04
Research Project Number:	02-3SS		Completion Date	*(original)*	01/30/06
Research Agency:	University of Louisiana		Completion Date	*(revised)*	07/30/09
Principal Investigator:	Xiaoduan Sun				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$175,560		Total		$14,925
	(revised)					
Est. Expended to Date		$160,635		Salaries		$10,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$81,236		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$80,000		Other		$4,925

PURPOSE AND SCOPE

The Louisiana crash data analysis program has evolved with the constant improvement in computing/programming techniques and the new highway safety analysis needs since 2002. The initial objective of the program focuses mainly on the analysis of crash characteristics along all possible dimensions: spatial, temporal, causation factors, and GIS maps. The new requirements on highway safety call for better crash data analysis tools that can not only demonstrate what happened but also help engineers to select appropriate countermeasures, prioritize the implementation of these countermeasures, and evaluate the effectiveness of these countermeasures after implementation. The Phase III of this project will be conducted with these objectives in mind.

FISCAL YEAR 2008– 2009 ACCOMPLISHMENTS

- Modified the program based on users' comments and suggestions.
- Completed program conversion.
- Performed GIS platform conversion.
- Continue the intersection safety database and Lafayette crash data analysis program.
- Start User's Manual as suggested by several users from the Louisiana Traffic Record Committee.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

Finish final report including the program USER MANUAL based on users' feedback.

Title:	**Evaluation Of The Traffic Safety Benefits Of A Lower Speed Limit And Restriction of Trucks To Use Of Right Lane Only On I-10 Over The Atchafalaya Basin**
Funding Source:	**FHWA: Safety**

State Project Number:	736-99-1301		Project Start Date:		01/01/05
Research Project Number:	05-1SS		Completion Date	*(original)*	08/31/07
Research Agency:	LSU		Completion Date	*(revised)*	08/31/09
Principal Investigator:	Dr. Ishak, Dr. Wolshon, and Dr. Sun				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$330,013		**Total**		$32,948
	(revised)	$362,961				
Est. Expended to Date		$330,013		Salaries		$32,948
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)	$22,948		Travel		
Est. FY Expenditure		$22,948		Other		

PURPOSE AND SCOPE

The primary goal of this study is to assess the safety impact of the newly implemented policies (differential speed limit and truck lane restriction) on the Atchafalaya segment. The study will investigate and quantify the effectiveness of such policies using long-term monitoring of the safety and operational conditions of traffic on the study segment.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- The study was completed and the final report was submitted. Meetings were conducted with the PRC members of the project and comments were received on the Final Report.

FISCAL YEAR 2009– 2010 PROPOSED ACTIVITIES

- In order to address the comments and feedback from the PRC members, a cost extension was approved to make the necessary revisions to the Final Report.
- The truckers' opinion survey will be repeated to address the bias issue with the first survey. The new survey will be conducted online on the DOTD website.
- Revisions and updates of the survey results will be made to the final report and submitted by 08/31/09.

Title:	**Safety Improvement from Edge Lines of Rural Two-Lane Highways**
Funding Source:	**FHWA - Safety**

State Project Number:	739-99-0878		Project Start Date:		09/01/07
Research Project Number:	07-7P		Completion Date	*(original)*	08/30/10
Research Agency:	UL Lafayette		Completion Date	*(revised)*	
Principal Investigator:	Dr, Xiaoduan Sun				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$107,060		**Total**		$27,842
	(revised)					
Est. Expended to Date		$45,000		Salaries		$21,167
FY 2008 – 2009 Budget				Equipment	*(expendable)*	$60
FY Funds	*(original)*	$57,132		Equipment	*(non-expendable)*	
	(revised)			Travel		$1,300
Est. FY Expenditure		$30,000		Other		

PURPOSE AND SCOPE

The goal of this project is to improve the safety of narrow rural two-lane highways in Louisiana. Specifically, the research team will:

1. Identify the 47 segments that will benefit from implementing the pavement edge line the most.
2. Implement pavement edge lines at selected locations.
3. Conduct the Before-and-After study at these locations to estimate the crash reduction factors.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

- Finished selected site visits to the locations where edges lines are implemented for taking the “after” pictures.
- Documented field trip findings.
- Started development of the crash data analysis for the “before” period.

FISCAL YEAR 2009 – 2010 PROPOSED ACTIVITIES

- Collecting after crash data.
- Contacting each district for potential issues.
- Perform cross-sectional analysis to see the impact of edge lines based on crash data analysis for potential CRF (Crash Reduction Factor).

LTRC Annual Research Program
Fiscal Year 2009 - 2010

Title:	**LOOP Environmental Monitoring: 2008-2010 Beach Elevation, Beach Vegetation, and Land Loss and habitat Change Surveys**
Funding Source:	**LOOP**

State Project Number:	736-99-1510		Project Start Date:		01/01/08
Research Project Number:	08-2SS		Completion Date	*(original)*	12/31/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dan Strecker, C-K Associates				

BUDGET STATUS

Total Budget				**Estimated FY 2009 – 2010 Budget**		
Total Cost	*(original)*	$140,858		**Total**		$106,588
	(revised)					
Est. Expended to Date		$34,270		Salaries		$92,588
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$15,000		Equipment	*(non-expendable)*	
	(revised)	$33,130		Travel		$2,000
Est. FY Expenditure		$33,130		Other (subcontract)		$12,000

PURPOSE AND SCOPE

This project is part of a continuous monitoring of the Louisiana Offshore Oil Pipeline to determine its impact on the environment. The project involves an annual beach elevation survey in May each year, beach vegetation survey every second year in May, and a land loss and habitat change survey once every three years. The beach vegetation and land loss and habitat change survey will be conducted in 2009. The budget for 2009 - 2010 is the estimated cost for the beach vegetation and beach elevation survey, as well as the completion of the land-loss analysis.

FISCAL YEAR 2008 – 2009 ACCOMPLISHMENTS

Beach Elevation Survey was completed in May of 2008. The PRC met and discussed initiating the land-loss aerial photo acquisition early following Hurricane Gustav. It was agreed that this portion of the project would be performed earlier than the contract stated in order to capture the land loss associated with the Hurricane and establish a new baseline. The aerial photography was completed and classification of the imagery was initiated

FISCAL YEAR 2009- 2010 PROPOSED ACTIVITIES

Second Beach Elevation and the Beach Vegetation field work will be performed. All field work will be completed and the data analyzed and incorporated into a draft report for review. Comments from the draft will be incorporated into the final report to be submitted in July 2010.