LTRC Annual Research Program

Fiscal Year July 1, 2008 - June 30, 2009

Part II SPR Work Program

FAP Number SPR-0010(32)

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Annual State Funded Work Program

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Self Generated Funded Program

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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 2008

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Annual
SPR Work Program
Part 2

FAP Number SPR-0010(32)

LTRC ANNUAL RESEARCH PROGRAM

FISCAL YEAR 2008 - 2009

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 1557	09-1PM	$700,000	$700,000	LTRC	Morvant	Program Management	1-Jul-2008	30-Jun-2009		2
SPR:TT-FED/TT-REG	RS	736 99 1562	09-1EQM	$300,000	$300,000	LTRC	Morvant	Equipment Management	1-Jul-2008	30-Jun-2009		3
SPR:TT-FED/TT-REG	RS	736 99 1558	09-1LFT	$250,000	$250,000	LTRC	Morvant	Research Laboratory and Field Test Support	1-Jul-2008	30-Jun-2009		4
SPR:TT-FED/TT-REG	RS	736 99 1559	09-1NPE	$50,000	$50,000	LTRC	Morvant	New Products Evaluation	1-Jul-2008	30-Jun-2009		5
SPR:TT-FED/TT-REG	RS	736 99 1560	09-1TA	$900,000	$900,000	LTRC	Morvant	Technical Assistance	1-Jul-2008	30-Jun-2009		6
SPR:TT-FED/TT-REG	RS	736 99 1561	09-1TRS	$420,000	$420,000	LTRC	Morvant	Technical Research Surveillance	1-Jul-2008	30-Jun-2009		7
SPR:TT-FED/TT-REG	RS	736 99 1565	09-1TTRI	$300,000	$300,000	LTRC	Morvant	Technology Transfer & Research Implementation	1-Jul-2008	30-Jun-2009		8
SPR:TT-FED/TT-REG		736 99 1563	09-1CON	$100,000	$100,000	LTRC	Morvant	Contingencies	1-Jul-2008	30-Jun-2009		9
				$700,000	**$700,000**	TOTAL ADMINISTRATIVE ITEMS BUDGET						
				$2,220,000	**$2,220,000**	TOTAL RESEARCH SUPPORT STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
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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 0996	02-2GT	$20,000	$104,485	LTRC	Martinez	The Rideability of a Deflected Bridge Approach Slab	1-May-2003	30-Apr-2005	5-Nov-2008	11
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	31-May-2009		12
SPR:TT-FED/TT-REG	A	736 99 1449	04-4B	$110,000	$376,532	LTRC	Mohammad	Development of a Design Methodology for Asphalt Treated Base Mixtures	1-Jan-2007	31-Dec-2008		13
SPR:TT-FED/TT-REG	A	736 99 1300	04-5B	$66,960	$109,164	LTRC	King	Implementation of New OGFC Specifications	1-Jul-2005	30-Jul-2007	1-Dec-2008	14
SPR:TT-FED/TT-REG	A	736 99 1306	04-5GT	$27,000	$236,695	LTRC	Abu-Farsakh/Gautreau	Control of Embankment Settlement: Field Verification of PCPT Prediction Methods	1-Mar-2005	28-Feb-2009		15
SPR:TT-FED/TT-REG	A	736 99 1512	04-6B	$153,000	$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 1312	05-5GT	$120,000	$433,483	LTRC	Abu-Farsakh	Evaluation of the Base/Subgrade Soil Behavior Under Repeated Loading	1-Aug-2005	31-Jan-2008	31-Jul-2009	17
SPR:TT-FED/TT-REG	A	736 99 1366	06-1B	$31,106	$70,000	LTRC	King	Implementation of Testing Equipment for Asphalt Materials	1-Apr-2006	30-Jul-2008		18
SPR:TT-FED/TT-REG	A	736 99 1369	06-2P	$43,500	$293,753	LTRC	Wu	Mechanistic Flexible Pavement Overlay Design Program	1-Mar-2006	30-Apr-2008	31-Dec-2008	19
SPR:TT-FED/TT-REG	A	736 99 1405	07-1P	$68,000	$193,225	LTRC	Wu	Finite Element Simulation of Structural Performance on Flexible Pavements with Stabilized Base/Treated Subbase Materials under Accelerated Loading	1-Oct-2006	30-Sep-2008	31-Mar-2009	20
SPR:TT-FED/TT-REG	A	736 99 1408	07-2GT	$74,000	$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-Jun-2009	21
SPR:TT-FED/TT-REG	A	736 99 1507	08-3GT	$90,000	$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		22
SPR:TT-FED/TT-REG	A	736 99 1549	08-7GT	$48,000	$63,407	LTRC	Bhandari	LTRC Database Management and Tracking Project	1-May-2008	31-Aug-2009		23
SPR:TT-FED/TT-REG	A	736 99 1029	09-EMCRF	$135,000	$135,000	LTRC	Mohammad	Pavement Materials Research Using Special Equipment at the Engineering Materials Characterization Research Facility	1-Jul-2008	30-Jun-2009		24
SPR:TT-FED/TT-REG	A	736 99 1101	09-1GERL	$188,000	$188,000	LTRC	Abu-Farsakh	LTRC Support for Geosynthetic Research at the Geotechnical Engineering Laboratory (GERL)	1-Jul-2008	30-Jun-2009		25
				$1,179,566	**$3,074,243**	TOTAL ACTIVE IN-HOUSE STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
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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	05-1GT	$64,000	$209,320	LADOTD/LTRC	Fu / Abu-Farsakh	Field Study of Bridge Concrete Approach Slabs	1-Jul-2008	30-Sep-2011		27
SPR:TT-FED/TT-REG	P	736 99	06-3B	$116,315	$232,630	LTRC	Mohammad	Development Of A Semi-Circular Bending Test Procedure For Characterizing Fracture Properties Of Asphalt Mixtures	1-Jul-2008	30-Jun-2010		28
SPR:TT-FED/TT-REG	P	736 99	06-3GT	$42,000	$150,000	LTRC	Gautreau	Intelligent Compaction Technology	1-Jul-2008	30-Jun-2010		29
SPR:TT-FED/TT-REG	P	736 99 1404	06-4GT	$71,000	$150,000	LTRC	Gautreau	Implementation of Performance Specifications in Roadway Construction	1-Jul-2008	31-Jan-2010		30
SPR:TT-FED/TT-REG	P	736 99	07-1B	$91,000	$129,468	LTRC	Mohammad	Evaluation of Warm Mix Asphalt Technology in Flexible Pavements	1-Jul-2008	30-Jun-2010		31
SPR:TT-FED/TT-REG	P	736 99	07-3P	$185,000	$350,000	LTRC	Mohammad	Implementation of the Use of Subgrade Resilient Modulus in Flexible Pavement Design	1-Jul-2008	30-Jun-2010		32
SPR:TT-FED/TT-REG	P	736 99		$98,257	$98,257	LTRC	Mohammad	Characterization of HMA Mixtures Containing High Recycled Asphalt Pavement Content with Crumb Rubber Additives	1-Jul-2008	30-Jun-2009		33
SPR:TT-FED/TT-REG	P	736 99		$60,000	$150,000	LTRC	Abu-Farsakh	Evaluate the Effects of Various Factors and Parameters on the Strength and Stiffness of Base Course Layers for Pavements	1-Oct-2008	30-Sep-2010		34
SPR:TT-FED/TT-REG	P	736 99		$60,000	$200,000	LTRC		Support Study for Estimating of Setup of Piles Driven Into Louisiana Clayey Soils	1-Jan-2009	31-Jan-2011		35
SPR:TT-FED/TT-REG	P	736 99		$81,000	$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-2008	30-Jun-2010		36
SPR:TT-FED/TT-REG	P	736 99		$122,000	$500,000	LTRC		ALF 5 APT Testing	1-Jul-2008	30-Jun-2011		37
SPR:TT-FED/TT-REG	P	736 99		$30,000	$80,000	LTRC		LTRC Pavement Analysis Methods with Non-Destructive Test Equipment	1-Jul-2008	30-Jun-2010		38
SPR:TT-FED/TT-REG	P	736 99		$38,000	$110,000	LTRC	Gaspard	Support Development of System Preservation and Pavement Design Manuals for LADOTD	1-Jul-2008	30-Jun-2010		39
SPR:TT-FED/TT-REG	P	736 99		$86,000	$150,000	LTRC	Gaspard	Support Study for Cost Effective Prevention of Reflective Cracking of Composite Pavement	1-Jul-2008	31-Mar-2010		40
SPR:TT-FED/TT-REG	P	736 99		$40,000	$70,000	LTRC	Alaywan	Performance Evaluation of FRP Reinforced Bridge Railing System	1-Aug-2008	31-Jul-2009		41
				$1,184,572	**$2,729,675**	TOTAL PROPOSED IN-HOUSE STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM

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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	$73,000	$124,986	LTU	Wang	Estimating of Setup of Piles Driven Into Louisiana Clayey Soils	1-May-2008	31-Oct-2009		43
State-TT Reg	A	736 99 1215	04-2ST	$48,700	$214,700	Tulane	Bruce	Structural Monitoring of Rigolets Pass Bridge	1-Apr-2005	30-Apr-2008	30-Apr-2009	44
State-TT Reg	A	736 99 1498	04-3B	$125,315	$271,150	LSU	Daly	A Comparative Analysis of Modified Binders: Original Asphalts and Materials Extracted From Existing Pavements	1-Jul-2007	31-Jul-2009		45
State-TT Reg	A	736 99 1391	06-2ST	$22,146	$119,873	SU / LA Tech	Li/Saber	Elimination of Deck Joints Using a Corrosion Resistant FRP Approach	1-Mar-2006	31-Aug-2007	31-Aug-2008	46
State-TT Reg	A	736 99 1373	06-3ST	$21,495	$149,928	LA Tech	Saber	Field Evaluation of the Effectiveness of Continuity Diaphragms for Skewed Precast Prestressed Concrete Bridge Girders	1-Apr-2006	31-Mar-2008	30-Aug-2008	47
State-TT Reg	A	736 99 1450	07-2C	$59,000	$132,578	LSU	Shin	Determination of Coefficient of Thermal Expansion Effects on Louisiana's PCCP for the Mechanistic-Empirical Pavement Design Guide	1-Feb-2007	31-Jan-2008	31-Dec-2008	48
State-TT Reg	A	736 99 1411	07-2P	$79,986	$119,986	LSU	Ishak / Shin	Characterization and Development of Truck Load Spectra for Current and Future Pavement Design Practices in Louisiana	1-Apr-2007	30-Sep-2008		49
State-TT Reg	A	736 99 1503	07-2SS	$74,553	$140,000	LTRC	Wolshon	The Design of Lane Merges at Rural Freeway Construction Work Zones	1-Sep-2007	1-Nov-2007	31-Oct-2009	50
State-TT Reg	A	736 99 1483	07-3SS	$34,994	$49,994	LSU	Ishak	Establishing an Intelligent Transportation Systems (ITS) Lab at LTRC	1-Jul-2007	30-Jun-2008	31-Dec-2008	51
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		52
State-TT Reg	A	736 99 1496	07-9P	$54,355	$68,339	LSU	Lian	Support Study for Developing Embedded Wireless Strain/Stress/Temperature Sensors Platform for Highway Applications	1-Jun-2007	31-Dec-2008	30-Jun-2009	53
State-TT Reg	RS	736 99 1442	09-1AD	$177,000	$177,000	LTRC	Gopu	Research Expansion Program	1-Nov-2006	31-Oct-2009		54
State-TT Reg	A	736 99 0515	09-1ALF	$635,000	$635,000	LTRC	Wu	Management and Operation of the Pavement Research Facility	1-Jul-2008	30-Jun-2009		55
State-TT Reg	A	736 99 1518	08-1P	$46,000	$180,000	LSU	Elseifi	Cost Effective Prevention of Reflective Cracking of Composite Pavement	1-May-2008	30-Apr-2010		56
State-TT Reg	A	736 99 1513	08-1ST	$100,000	$249,578	LSU	Okeil	Evaluation of Continuity Details for Precast Prestressed Girders	10-Dec-2007	30-Nov-2009		57
State-TT Reg	A	736 99 1519	08-2P	$74,848	$115,048	LSU	Elseifi	Analysis of Seasonal Strain Measurements in Asphalt Materials Under Accelerated Loading	1-Jan-2008	31-Dec-2008		58
State-TT Reg	A	736 99 1441	08-2UTC	$142,500	$142,500	LTRC	Paul	University Transportation Center: TTEC	7-Aug-2006	30-Sep-2010		59
State-TT Reg	A	736 99 1514	08-1TIRE	$16,964	$30,000	LSU	Zhang	Developing an In-situ Characterization Technique to Assess the Scour Potential of Cohesive Soils	1-Feb-2008	31-Jan-2009		60
State-TT Reg	A	736 99 1515	08-2TIRE	$19,000	$30,000	LTU	Allouche	Application of Inorganic Polymer Concrete ('Geopolymer') in Transportation Structures Located in Harsh Environments	1-Jan-2007	30-Nov-2008		61
State-TT Reg	A	736 99 1516	08-3TIRE	$7,000	$30,000	LSU	Deng	First Flush Reactor for Stormwater Treatment for Elevated Linear Transportation Projects	1-Dec-2007	30-Nov-2008		62
State-TT Reg	A	736 99 1517	08-4TIRE	$25,583	$29,621	ULL	Benton	Automated Construction of 3D Road Models from Right-of-Way Video	1-Jan-2008	31-Dec-2008		63
State-TT Reg	A	736 99 1520	08-6GT	$40,682	$75,000	LTRC	Barbato	Performance Evaluation of Buried Pipe Installation	1-Jan-2008	1-Apr-2009		64
State-TT Reg	A	736 99 0643	09-1PLAN	$329,978	$329,978	LSU	Wilmot	LTRC Proposal for the Support of Research and Development in Transportation Planning	1-Jul-2006	30-Jun-2009		65
				$2,270,095	**$3,601,247**	TOTAL ACTIVE CONTRACT RESEARCH STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
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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 1365	06-2SS	$144,201	$200,849	LTRC/LSU	Wilmot	Development of a Time-Dependent Hurricane Evacuation Model for the New Orleans Area	1-Jul-2008	30-Jun-2010		67
State-TT Reg	P	736 99	07-6P	$100,000	$220,000			Evaluation of Current DOTD Pavement Structures Using PMS Data and New M-E Pavement Design Guide	15-Aug-2008	31-Jul-2010		68
State-TT Reg	P	736 99	08-1GT	$30,000	$100,000			Structure Instrumentation and Data Collection of Bridge Approach Slabs	1-Jan-2009	30-Jun-2012		69
State-TT Reg	P	736 99	08-2GT	$100,000	$150,000			Development of a Flood Protection Safety Program	1-Jul-2008	30-Jun-2010		70
State-TT Reg	P	736 99	08-3ST	$100,000	$200,000			Prediction of Reliable Scour Depths for Bridge Structures	1-Aug-2008	31-Jul-2010		71
State-TT Reg	P	736 99 1547	08-5GT	$131,000	$300,000	LSU	Sharma	Measurement of Seasonal Changes and Spatial Variations in Pavement Unbound Base and Subgrade Properties	1-Jul-2008	30-Jun-2011		72
State-TT Reg	P	736 99		$100,000	$100,000	LTRC		Performance and Construction of High Volume Surface Treatments	1-Jul-2008	30-Dec-2009		73
State-TT Reg	P	736 99		$100,000	$100,000	LTRC		Development of Surface Friction Guidelines for LADOTD	1-Jul-2008	30-Dec-2009		74
State-TT Reg	P	736 99		$50,000	$150,000	LTRC		Update LADOTD Policy on the Evaluation of Pile Driving Vibration Monitoring	1-Oct-2008	30-Sep-2010		75
State-TT Reg	P	736 99		$50,000	$100,000			Developing Louisiana Crash Reduction Factors	1-Jul-2008			76
State-TT Reg	P	736 99		$50,000	$100,000			Long-Term Monitoring for Bridges Subject to Sugarcane Truck Overloads	1-Aug-2008	30-Jun-2010		77
State-TT Reg	P	736 99	09-TIRE	$120,000	$120,000	TBA	Morvant	Transportation Innovation for Research Exploration	1-Jul-2008	30-Jun-2009		78
				$1,075,201	**$1,840,849**	TOTAL PROPOSED CONTRACT RESEARCH STUDIES BUDGET						

LTRC ANNUAL RESEARCH PROGRAM
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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 1357	05-3ST	$48,819	$225,000	LSU	Li	Development of Advanced Grid Stiffened (AGS) FRP Tube-Encased Concrete Columns	1-Sep-2005	31-Aug-2007	31-Aug-2008	81
FHWA - IBRC	A	736 99 1370	05-5ST	$110,000	$220,537	LSU	Cai	Development and Performance Evaluation of Fiber Reinforced Polymer Bridge	15-Nov-2005	14-May-2008	14-May-2009	82
NCHRP Project 9-40	A	736 99 1360	06-2B	$100,000	$405,468	LTRC	Mohammad	Optimization of Tack Coat for HMA Placement	1-Jul-2005	30-Jun-2009		83
FHWA - IBRD	A	736 99 1437	07-1ST	$402,000	$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		84
Corp of Engineers	A	736 99 1506	07-3GT	$37,297	$150,000	LSU	Dokka	Development of Operational Real-Time Kinematic Global Positioning Service for Southeastern Louisiana	1-Nov-2007	31-Oct-2008		85
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		86
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		87
NCHRP IDEA	A	736 99 1495	07-8P	$108,000	$125,000	LSU	Lian	Developing Embedded Wireless Strain / Stress / Temperature Sensors Platform for Highway Applications	1-Jun-2007	31-Dec-2008	30-Jun-2009	88
TENSAR Earth Tech	A	736 99 1511	08-4GT	$58,700	$101,251	LTRC	Abu-Farsakh/Chen	Support Study to Evaluation of the Base/Subgrade Soil Under Repeated Loading	1-Jan-2008	31-Dec-2008		89
Registration Fees	P	736 99	09-TTRF	$100,000	$100,000	LTRC	Cooper	Technology Transfer Registration Fees	1-Jul-2008	30-Jun-2009		90
FHWA - IBRD	P	736 99		$90,000	$200,000	LSU	Cai	Development of Scour Monitoring Techniques Using Fiber Optic Sensors	30-Sep-2008	31-Aug-2010		91
SHELL Oil	P	736 99		$62,000	$62,000	LTRC	Mohammad	Laboratory Evaluation of the Performance of Sulfur-Enhanced Asphalt Treated Base	1-Jul-2008	31-Dec-2009		92
				$1,281,816	**$2,639,181**	TOTAL SELF GENERATED FUNDING						

LTRC ANNUAL RESEARCH PROGRAM
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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/TT-REG	T²S	736 99 1570	09-1TSQ	$1,398,000	$1,398,000	LTRC	Cooper	Technology Transfer Program and Operations	1-Jul-2008	30-Jun-2009		94
STP:TT-FED/TT-REG	T²S	736 99 1571	09-1WD	$1,039,000	$1,039,000	LTRC	Cooper	Workforce Development	1-Jul-2008	30-Jun-2009		95
STP:TT-FED/TT-REG	T²S	736 99 1572	09-COOP	$400,000	$400,000	LTRC	Cooper	LADOTD COOP Program	1-Jul-2008	30-Jun-2009		96
STP:TT-FED/TT-REG	T²S	736 99 1569	09-WDC	$2,900,000	$2,900,000	LTRC	Cooper	Workforce Development Contracts	1-Jul-2008	30-Jun-2009		97
				$5,737,000	**$5,737,000**	TOTAL PROPOSED TECHNOLOGY TRANSFER STP BUDGET						
LTAP:TT-FED/TT-REG	A	736 99	08-LTAP	$150,000	$300,000	LTRC	Walsh	Local Technical Assistance Program (LTAP)	1-Jan-2008	31-Dec-2008		99
LTAP:TT-FED/TT-REG	P	736 99	09-LTAP	$150,000	$300,000	LTRC	Walsh	Local Technical Assistance Program (LTAP)	1-Jan-2009	31-Dec-2009		100
				$300,000	**$600,000**	LTAP TOTAL						

LTRC ANNUAL RESEARCH PROGRAM
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Funding	A/P	State Project No.	Research No.	FY Budget	Total Budget	Agency	Principal Investigator	Title	Start Date	End Date	End Date (rev)	Page#
Part I- SPR	A	736 99 1342	04-2P	$30,213	$173,183	LA Tech	Khattak	LADOTD Pavement Management System: Development of Uniform Sections for PMS Inventory and Applications	1-Oct-2006	30-Sep-2008		102
Part I- SPR	A	736 99 1301	05-1SS	$15,000	$330,013	LSU	Ishak/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 Atchafalaya Basin	1-Jan-2005	31-Aug-2007	31-Aug-2008	103
FHWA:Safety	A	737 99 0878	07-7P	$57,123	$107,060	ULL	Sun	Safety Improvement from Edge Line of Rural Two-Lane Highways	1-Jul-2007	30-Jun-2010		104
FHWA:Safety	P			$200,000	$200,000	LTRC	Walsh	Implementation and Project Management of the New Louisiana Local Road Safety Program	1-Jan-2009	31-Dec-2009		105
LOOP	A	766 99 1510	08-2SS	$15,000	$140,858	LTRC	Wilmot	LOOP Environmental Monitoring: 2008-2010 Beach Elevation, Beach Vegetation, and Land Loss and Habitat Change Surveys	1-Jan-2008	31-Dec-2010		106
				$317,336	**$951,114**	OTHER FUNDED PROJECTS TOTAL						

SPR Budget Recap

Category	Total
Total Administrative Budget	$700,000
Total Research Support Studies Budget	$2,220,000
Total In-House Studies Budget	$1,179,566
Total Proposed In-House Studies Budget	$1,184,572
Total Contingencies Budget	$100,000
Total Part II Program Budget	**$5,384,138**

*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	$2,270,095
Total Proposed Contract Studies Budget	$1,075,201
RFP's	$500,000
Total Part II Program Budget	**$3,845,296**

Self Generated Funds Recap

Category	Total
Active Studies	$1,029,816
Proposed Studies	$152,000
Total Self Generated Budget	**$1,181,816**

STP Technology Transfer Program Budget Recap

Category	Total
Technology Transfer Program and Operations	$1,398,000
Workforce Development	$1,039,000
LADOTD COOP Program	$400,000
Technology Transfer Contracts	$2,900,000
Total STP Budget	**$5,737,000**

LTAP Program Budget Recap

Category	Total
LTAP Program Total	**$300,000**

Other Funded Projects Recap

Category	Total
Active Studies	$117,336
Proposed Studies	$200,000
Total Other Fund Budget	**$317,336**

Part II SPR Funded Research Program

ADMINISTRATIVE LINE ITEMS AND RESEARCH SUPPORT STUDIES

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1557		Project Start Date:		07/01/08
Research Project Number:	09-1PM		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$700,000	Total		$700,000
	(revised)				
Est. Expended to Date			Salaries		$700,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

To cover 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 2007 – 2008 ACCOMPLISHMENTS

- Managed the LTRC research program including administrative duties, financial responsibilities, and personnel supervision.
- Hosted the 2008 LTRC Research Peer Exchange.
- Staff participation in Michigan and Florida Peer Exchanges.
- Participated in Transportation Research Board Activities.
- Participated on region and national RAC task groups.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Implement recommendations from 2008 Research Peer Exchange.
- Conduct 2008 Research Problem Identification Committee activities.
- Continue to manage the SPR research program.
- Staff participation in External Peer Exchanges – Mississippi DOT scheduled.
- Continued support for Transportation Research Board Activities.
- Continued support for region and national RAC task group activities.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1562		Project Start Date:		07/01/08
Research Project Number:	09-1EQM		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$300,000		Total		$300,000
	(revised)					
Est. Expended to Date				Salaries		$300,000
FY 2007 – 2008 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, and CRRL). Special emphasis will be on automation of instrumentation systems used for data collection.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Maintained AMRL accreditation of asphalt laboratory.
- Received AMRL accreditation of concrete laboratory.
- Maintained LTRC research laboratory and field equipment.
- Developed plans and prepared specifications for 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 2008 – 2009 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.
- Install for new lab equipment including new MTS load frame for Geotechnical Laboratory.
- Participate in Coop and CRRL testing programs.
- Decrease in anticipated funds from previous FY offset by anticipated increase in Technical Assistance activities.
- Safety Training and Reporting Duties.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1558		Project Start Date:		07/01/08
Research Project Number:	09-1LFT		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$250,000	Total		$250,000
	(revised)				
Est. Expended to Date			Salaries		$250,000
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

- Completed technical assistance projects and reports:
  - Use of Waste Bottom Ash for Roadway Embankments
  - Evaluation of Uretek Injection for PCCP Leveling
  - Evaluation of Mexican / Kentucky Limestone
  - Assessing Performance of Alternative Pavement Marking Materials
- Refer to LTRC performance measure database for more details.
- Provided assistance to the following "active" projects through inter-laboratory support and testing:
  - Alf IV: Materials Characterization
  - NCHRP-90-40; "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

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Continue to respond to request for technical assistance for laboratory, field work, & 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 2008 - 2009

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

State Project Number:	736-99-1559		Project Start Date:		07/01/08
Research Project Number:	09-1NPE		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$50,000	Total		$50,000
	(revised)				
Est. Expended to Date			Salaries		$50,000
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

- 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.
- Conex (IAI) Additive for production of shrinkage-compensating concrete.
- TerraCem (Lafarage) Soil stabilization aggregate.
- SF12 (Synteen) Base course confinement/stabilization fabric.
- SF11 (Synteen) Base course confinement/stabilization fabric.
- Mirafi (Ten Cate) Base course/sub grade reinforcement.
- PaveZyme (Omega Paving) Soil stabilization/paving/levee stabilization.
- Earathbind 100 (Enviroad) Dust palliative/penetrating prime cure.
- Admix C500 (Xypex) Waterproofing concrete structures.
- Strata (Koch) Reflective crack relief interlayer for HMA overlays on PCC.
- Road Rain (Tenax) Roadway drainage.
- BlackMax (NRG) Bottom ash for embankment fill/sub base material.
- Refer to LTRC performance measure database for more details.

FISCAL YEAR 2008 – 2009 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 2008 - 2009

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

State Project Number:	736-99-1560		Project Start Date:		07/01/08
Research Project Number:	09-1TA		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$900,000		Total		$900,000
	(revised)					
Est. Expended to Date				Salaries		$900,000
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

Responded to over 45 requests for technical assistance on DOTD projects including:

- 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; for example: Hamburg testing for District 03, Highway 659, and misc. questions of mix design.
- Pre-design structural information, fwd, Dynaflect, etc. for district design units.
- Pre-design DCP analysis.
- FHWA process review panel participation.

Refer to LTRC performance measure database for more details.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Respond to requests for laboratory, field work, & forensic analysis on DOTD projects not related to a formal research project.
Respond to requests for laboratory, field work, & analysis for university requests not related to an LTRC formal research project.
Provide general assistance to other public entities not related to research.
Increased budget requested is offset by decrease in EQM budget from previous FY.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1561		Project Start Date:		07/01/08
Research Project Number:	09-1TRS		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$420,000	Total		$420,000
	(revised)				
Est. Expended to Date			Salaries		$420,000
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

- Managed the research projects for over 30 external University contracts.
- Prepared seven RFP's for initiation of new projects.
- Provided review for draft reports on completed research projects.

FISCAL YEAR 2008 – 2009 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 2008 - 2009

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

State Project Number:	736-99-1565		Project Start Date:		07/01/08
Research Project Number:	09-1TTRI		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$300,000		Total		$300,000
	(revised)					
Est. Expended to Date				Salaries		$300,000
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

- LTRC Bridge Structures Workshop, New Orleans, Louisiana.
- TRB, Transportation Research Board Annual Meeting, Washington, DC; attendance and committee participation, two committee chairs, and twelve committee members, several presentations given.
- Intelligent compactor showcase *LTRC Project Review Committee meetings.
- SEAUPG, Southeast Asphalt User Producer Group meeting; Asphalt Treated Base and Stone Interlayer presentations.
- AAPT; Association of Asphalt Paving Technologist.
- FHWA Expert Task Group, Asphalt Binder.
- Pooled Fund for Concrete Pavement quality manual.
- Texas Asphalt Paving Association, “Louisiana Rubbelization and Overlay”.
- Pavement Preservation Workshop.
- Systems Preservation Workshop, LTRC.
- LTEP, Parish Engineers meeting, Asphalt Treated Base.
- District Lab Engineers meeting.
- Began planning for 2009 Transportation Conference.
- Presented research findings with greater than 50 formal presentations and papers: refer to LTRC annual report.

FISCAL YEAR 2008 – 2009 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 2008 - 2009

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

State Project Number:	736-99-1563		Project Start Date:		07/01/08
Research Project Number:	09-1CON		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$100,000		Total		$100,000
	(revised)					
Est. Expended to Date				Salaries		$100,000
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Part II SPR Funded Research Program

CONTINUING RESEARCH

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**The Rideability of a Deflected Bridge Approach Slab**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-0996		Project Start Date:		05/01/03
Research Project Number:	02-2GT		Completion Date	*(original)*	04/30/05
Research Agency:	LTRC		Completion Date	*(revised)*	11/05/08
Principal Investigator:	Mark Martinez				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$104,485		Total		$20,000
	(revised)					
Est. Expended to Date		$84,152		Salaries		$20,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$21,900		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$1,779		Other		

PURPOSE AND SCOPE

This proposal is intended as a response to the requirements of the Louisiana Quality Initiative (LQI) entitled "Preservation of Bridge Approach Rideability." The requirement is to preserve ride quality of bridge approach slabs in a technically feasible, designable, constructible, and cost-effective manner. The primary objective of this research is to develop a means of evaluating bridge approaches in terms of rideability. To achieve the objective of this project the following tasks will be carried out:

- Sampling bridge approach slabs by inertial profiler so that a correlation can be established that empirically relates profile to vehicular inertial response.
- Evaluate/Correct inertial profiler readings by rod-and-level survey to development of vehicular response relationship by field data.
- Establish a correlation ship index using the information obtained in the above tasks.
- Conduct a panel survey for bridge approach rating, and develop approach index criterion.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

This period saw the break-in of the prototype profiler needed to accomplish project requirements. Training and system break-in on the new profiler was completed. Despite this, the project had to be extended (the new closing date for this project is now 11/05/08) to accommodate shortfalls in manpower resulting from a period of extended leave that the PI had to take because of health problems in addition to a period of extended family leave which had to be taken by the principal technician relating to parental health issues. It still remains to run the required district survey and to develop the final report.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Work remaining:

1) Final survey as outlined in the project proposal is to be collected.
2) Final report to be drafted and submitted.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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)*	05/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Walid Alaywan				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$28,876		Total		$5,000
	(revised)					
Est. Expended to Date		$19,635		Salaries		$5,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$5,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$2,267		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 2007 – 2008 ACCOMPLISHMENTS

Collecting Data

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue data collection.
- Feasibility of automated data acquisition system for remote connection.
- Develop final report

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Development Of A Design Methodology For Asphalt Treated Base Mixtures**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1449		Project Start Date:		01/01/07
Research Project Number:	04-4B		Completion Date	*(original)*	12/31/08
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$337,668	Total		$110,000
	(revised)	$376,532			
Est. Expended to Date		$227,668	Salaries		$109,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$170,107	Equipment	*(non-expendable)*	
	(revised)	$184,000	Travel		$1,000
Est. FY Expenditure		$184,000	Other		

PURPOSE AND SCOPE

Asphalt Treated Base (ATB) is a dense-graded HMA mixture with a wide gradation band and lower asphalt content intended for use as a base course layer. ATB costs less than typical HMA mixtures because it can be produced with less expensive aggregates and lower percentages of asphalt binder. The use of ATB can provide a waterproof layer to prevent fines infiltration into the sub grade and other pavement structure. The ATB is also known to be about three times stronger than untreated granular base. Furthermore, the use of ATB mixtures can be advantageous in limiting problems associated with untreated granular base materials, such as segregation, and improve the roadway smoothness and the speed of construction. The primary objective of this research is to develop a simplified design methodology for ATB mixtures that are durable, stable, and cost effective through the examination of the performance of mixtures that have different aggregate gradation from typically available sources. A secondary objective of this research is to compare the performance of ATB mixtures to untreated granular base materials currently used in construction of base layers in Louisiana, and evaluate the cost effectiveness of using ATB as an alternative to those materials.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Acquired five additional aggregate sources as per test factorial.
- Developed mixture design.
- Fabricated test specimens.
- Completed fundamental materials characterization tests (ITS, LWT, E*, FN, SCB, DSCE).
- Presented findings at the Southeastern Asphalt User Producer Group conference.
- Recommended provisional specifications for ATB mixtures based on preliminary findings.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue acquisition of aggregate sources as per test factorial.
- Continue the development of mixture design.
- Continue fabrications of test specimens.
- Continue fundamental materials characterization.
- Prepare draft Final Report.

Title:	**Implementation of New OGFC 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)*	12/01/08
Principal Investigator:	Bill King				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$ 66,802		Total		$66,960
	(revised)	$109,164				
Est. Expended to Date		$42,204		Salaries		$64,960
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$42,204		Equipment	*(non-expendable)*	
	(revised)			Travel		$2,000
Est. FY Expenditure		$42,204		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 2007 – 2008 ACCOMPLISHMENTS

- Began Literature Search.
- Completed first construction project June 2007.
- Soliciting several other Field Projects.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Select additional construction projects for evaluation.
- Complete Final Report.

Title:	**Control of Embankment Settlement: Field Verification of 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)*	
Principal Investigator:	Dr. Murad Abu-Farsakh and Gavin Gautreau				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$236,695	**Total**		$27,000
	(revised)				
Est. Expended to Date		$104,350	Salaries		$14,700
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$12,000
FY Funds	*(original)*	$43,400	Equipment	*(non-expendable)*	
	(revised)		Travel		$0
Est. FY Expenditure		$1,850	Other (software)		$0

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 PCPT test 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 PCPT derived parameters.

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

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Worked on the development of visual basic software for estimating strength and consolidation properties of soils and for calculation consolidation settlement from PCPT data.
- No embankment site was identified for instrumentation during this fiscal year.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Identify new embankment(s) site(s) to be constructed during the next year for instrumentation and monitoring.
- Conduct in-situ piezocone penetration and dissipation tests in these site(s).
- Monitor the instrumented embankment site(s).
- Analyze the collected field settlement/CPT data.

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 2008– 2009Budget**		
Total Cost	*(original)*	$398,672	Total		$153,000
	(revised)				
Est. Expended to Date		$124,000	Salaries		$152,000
FY 2007– 2008Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$124,000	Equipment	*(non-expendable)*	
	(revised)		Travel		$1,000
Est. FY Expenditure		$124,000	Other		

PURPOSE AND SCOPE

The Superpave volumetric mix design procedure developed during the SHRP did not include a mechanical "proof" test similar to the ones commonly used in the Marshall mix design or Hveem mix design. The Superpave mix design method, however, did use strict requirement to material specifications and volumetric mix criteria to ensure satisfactory performance of mix designs that were intended for low volume traffic. In addition, the original Superpave mix design protocol required mix verification for intermediate and high volume traffic through advanced materials characterizations tests utilizing the Superpave Shear Tester test protocols. The complexity of those test protocols for routine mix design application was quickly recognized and that a simple performance test is needed to complement the Superpave volumetric mix design procedure. In response to this need, NCHRP Project 9-19, Superpave Support and Performance Models Management, recently recommended three candidate Simple Performance Tests (SPTs) to complement the Superpave volumetric mixture design method. These are flow time, flow number, and dynamic modulus tests. In addition, the dynamic modulus test was selected for the HMA materials characterization input utilized in the Mechanistic Empirical Pavement Design Guide (MEPDG). 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 measured and compared to the ones predicted from the MEPDG software.

FISCAL YEAR 2007– 2008 ACCOMPLISHMENTS

- Completed conduct of lliterature review.
- Design an experimental test factorial.
- Conduct simple performance tests.
- Perform preliminary data analysis.

FISCAL YEAR 2008– 2009 PROPOSED ACTIVITIES

- Select additional field projects.
- Secure and fabricate test specimens as per test factorial.
- Conduct NDTs.
- Conduct laboratory simple performance tests.
- Perform preliminary data analysis.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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)*	07/31/09
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$433,483		**Total**		$120,000
	(revised)					
Est. Expended to Date		$314,000		Salaries		$110,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$10,000
FY Funds	*(original)*	$131,000		Equipment	*(non-expendable)*	$0
	(revised)			Travel		$0
Est. FY Expenditure		$75,000		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 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 2007 – 2008 ACCOMPLISHMENTS

- Purchased instrumentations needed for testing of pavement sections, and the appropriate conditioners required to amplify the output signals to the data acquisition reading range.
- Conducted four cyclic plate loading tests inside the test box on selected pavement sections.
- Planned and started testing the ALF sections with the cyclic plate test actuator.
- Prepared an interim report on laboratory resilient and permanent deformation tests using 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.
- Started analyzing the cyclic loading test results in terms of extended service life benefit achieved from reinforcing bases with geogrids.
- Obtained external private funds from Tensar Earth Technologies, which reduced the FY funds needed.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue conducting cyclic plate tests on ALF sections.
- Analyze the results of cyclic loading tests on ALF sections and compare them with the results of rolling wheel accelerated load testing.
- Conduct five 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.
- Prepare a draft report.
- Repair to actuator may cause delay to next year's work.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Implementation of Testing Equipment for Asphalt Materials**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1366		Project Start Date:		04/01/06
Research Project Number:	06-1B		Completion Date	*(original)*	07/30/08
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Bill King				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$70,000		Total		$31,106
	(revised)					
Est. Expended to Date		$38,894		Salaries		$30,106
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$30,411		Equipment	*(non-expendable)*	
	(revised)			Travel		$1,000
Est. FY Expenditure		$24,202		Other		

PURPOSE AND SCOPE

There have been several suggested improvements in testing methods for simple volumetric analysis for asphalt mixtures in the last 5 years. LTRC, through technical assistance and Student Co-op studies has determined initial feasibility of each device. This project will fund the purchase of one device for each test procedure in order to facilitate field verification. These devices include:

1. Core Dryer: decreases drying time of roadway cores and therefore speeds up the process of acceptance based on roadway density, allowing same day calculation as opposed to next day.
2. SSDetect: facilitates mechanical measurement of fine aggregate specific gravity in a shorter time removing the human bias inherent in current procedures.
3. Corelok: enables accurate Gmb measurement of open mixtures.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Completed evaluation with Districts 03, 08, and 58. Equipment delivered to District 05.
- Began Compiling Data and Running Analysis on Data received.
- Presentation at the LAPA conference on the status and current evaluations.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Complete District Evaluations.
- Incorporate and Evaluate data from remaining districts.
- Write Final Report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Mechanistic Flexible Pavement Overlay Design Program**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1369		Project Start Date:		03/01/06
Research Project Number:	06-2P		Completion Date	*(original)*	04/30/08
Research Agency:	LTRC		Completion Date	*(revised)*	12/31/08
Principal Investigator:	Zhong Wu				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$293,753	Total		$43,500
	(revised)				
Est. Expended to Date		$250,222	Salaries		$43,500
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$183,000	Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure		$139,500	Other (LSU)		

PURPOSE AND SCOPE

The purpose of this experiment is to utilize the non-destructive testing equipment such as FWD and Dynaflect to assess the existing condition of pavements. These pavements have been designated for rehabilitation in the department's overlay program. The data collected will be used for mechanistic determination of overlay thicknesses of the selected jobs. The mechanistic design data will be compared to conventional methods of overlay design methodologies. Discrepancies will be addressed and methodology will be modified to reflect an accurate determination of the overlay thicknesses.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Performed Phase II field testing.
- Analyzed NDT data and performed overlay thickness design.
- Presented the recommended NDT based overlay design procedure at 08' TRB conference.
- Presented the recommended NDT procedure at the DOTD Headquarter.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Survey on how others handle the milling thickness in a NDT-based overlay design.
- Conduct both theoretic and field measurement comparison between FWD and Dynaflect Deflections.
- Perform the cost benefit analysis.
- Prepare an implementation statement.
- Prepare the final report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Finite Element Simulation of Structural Performance on Flexible Pavements with Stabilized Base/Treated Subbase Materials under Accelerated Loading**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:	736-99-1405		Project Start Date:		10/01/06
Research Project Number:	07-1P		Completion Date	*(original)*	09/30/08
Research Agency:	LTRC		Completion Date	*(revised)*	03/31/09
Principal Investigator:	Zhong Wu				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$193,225	Total		$68,000
	(revised)				
Est. Expended to Date		$125,000	Salaries		$66,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$87,555	Equipment	*(non-expendable)*	
	(revised)		Travel		$2,000
Est. FY Expenditure		$75,000	Other		

PURPOSE AND SCOPE

The objective of the research is to follow up with previous LTRC research projects on the prediction of ALF testing sections by modifying and/or developing a finite element simulation model(s) to predict pavement responses under accelerated loading for thin flexible pavements. Validation of the developed finite element model(s) will be focused on applying the results obtained from an ongoing LTRC project (No. 03-2GT), which includes both the lab and ALF Experiment 4: Accelerated Loading Evaluation of a Sub-base Layer on Pavement Performance.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Conducted finite element Literature Review.
- Evaluated different mathematic material models (e.g. E-P, D-P, Concrete, Creep, and etc.).
- Selected material models for each of ALF 4 pavement materials.
- Determined material model parameters and performed 2-D non-linear FE analysis.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue 2-D FE analysis.
- Construct 3-D Non-linear FE Simulation Model.
- Conduct Sensitivity Analyses.
- Finalize the FE Simulation Model.
- Predict Pavement Performance of Different Pavement Structures.
- Prepare a Final Report.

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)*	06/30/09
Principal Investigator:	Drs. Murad Abu-Farsakh, Ching Tsai, and Sungmin Yoon				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$177,671		**Total**		$74,000
	(revised)	$230.000				
Est. Expended to Date		$136,000		Salaries		$74,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$0
FY Funds	*(original)*	$78,500		Equipment	*(non-expendable)*	$0
	(revised)			Travel		$0
Est. FY Expenditure		$72,000		Other (Software)		$0

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 2007 – 2008 ACCOMPLISHMENTS

- Completed data on 53 driven piles that include pile load test, soil properties soundings, and CPT tests conducted close to the pile location.
- Searched LADOTD files, identified and collected information on 14 drilled shafts that have both load test and soil properties soundings close to the drilled shaft location.
- Conducted statistical analysis on the collected driven pile and drilled shaft data to obtain key statistical parameters such as the mean, standard deviation, and coefficient of variation (COV) as well as the type of distribution that best fits the data.
- Evaluated the target reliability index for both driven piles and drilled shafts,
- Conducted reliability analysis to determine the resistance factors for the different pile design methods and consistent with the selected target reliability index.
- Prepared a draft report.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue searching for more drilled shaft data from neighboring States (Mississippi and Texas).
- Conduct statistical analysis on the drilled shaft data to estimate the mean, standard deviation, and coefficient of variation (COV) as well as the type of distribution that best fits the data.
- Conduct reliability analysis to determine the resistance factors for the design of drilled shaft with the selected target reliability index for drilled shaft.
- Prepare a Final Report.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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 2008 – 2009 Budget**		
Total Cost	*(original)*	$88,776	**Total**		$90,000
	(revised)	$232,951			
Est. Expended to Date		$17,600	Salaries		$87,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$0
FY Funds	*(original)*	$17,600	Equipment	*(non-expendable)*	$0
	(revised)		Travel		$3,000
Est. FY Expenditure		$17,600	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 tilt meters, 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 2007 – 2008 ACCOMPLISHMENTS

- Communicated with the subcontractor and PRC to prepare a preliminary monitoring instrumentation plan for M19 pier of I-10 Twin Span Bridge.
- Prepared the scope of services for the subcontractor's contract.
- Coordinate with subcontractor and PRC to finalize the design of monitoring instrumentation system plan and necessary construction plan changes.
- Prepared a plan for lateral load test.
- Followed up in instrumentation of piles during pile casting phase.
- Increase in total funds due to increase in instrumentations devoted to health monitoring of superstructure in the main study.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Conduct literature review on pile instrumentation, substructure monitoring systems, and lateral load tests of single and group pile.
- Follow up with the subcontractor during all phases of instrumentations of piles, pile cap, and column.
- Coordinate with the subcontractor, contractor, and LADOTD bridge section during all phases of construction and instrumentations.
- Install and use the FB-multi pier program to analyze the Eastbound M19 pier of Twin Span Bridge.
- Prepare test procedure and manage the lateral load test.
- Start analyzing the lateral load test data.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

Title:	**LTRC Database Management and Tracking Project**
Funding Source:	**SPR : TT-FED/TT/REG**

State Project Number:	736-99-1549		Project Start Date:		05/01/08
Research Project Number:	08-7GT		Completion Date	*(original)*	08/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Pallavi Bhandari				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$63,407		**Total**		$48,000
	(revised)					
Est. Expended to Date		$4,000		Salaries		$46,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$15,266		Equipment	*(non-expendable)*	
	(revised)			Travel		$2,000
Est. FY Expenditure		$4,000		Other		

PURPOSE AND SCOPE

Management of research projects can be quite cumbersome since it involves keeping track of the timing and status of various committee meetings, research personnel meetings, and the actions resulting from these meetings relative to the time, monies and progress (work plan) defined in the research project. Another important aspect of this monitoring process is the tracking of the review and publication status of various reports (progress, interim, final and implementation) required of the research personnel responsible for the conduct of research. A web based application for project management and tracking can alleviate the cumbersome process of managing the research project – from the initial Problem Statement stage to development of full scale Research Project, through the final stage of implementation of research findings. Such a system can provide timely information to the various disciplines involved in the management of these projects.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

1. Requirements analysis.
2. System and Architecture Design.
3. Module Design.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Coding.
2. Unit Testing.
3. Integration Testing.
4. System Testing.
5. User Acceptance Testing.
6. Preparing and submitting Final Reports.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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:		07/01/08
Research Project Number:	09-EMCRF		Completion Date	(original)	06/30/09
Research Agency:	LTRC		Completion Date	(revised)	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	(original)	$135,000		**Total**		$135,000
	(revised)					
Est. Expended to Date				Salaries		$101,00
FY 2007 – 2008 Budget				Equipment	(expendable)	
FY Funds	(original)			Equipment	(non-expendable)	$30,000
	(revised)			Travel		$4,000
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; provides 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 2007 – 2008 ACCOMPLISHMENTS

- Participated in the Louisiana DOTD Asphaltic Concrete Specification Committee; and Louisiana DOTD Superpave Implementation Committee.
- Participated in several technical assistance Projects.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue participation in the Louisiana DOTD Asphaltic Concrete Specification Committee.
- Continue participation in technical assistance projects.
- Conduct workshops and seminars.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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:		07/01/08
Research Project Number:	09-1GERL		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget			**Estimated FY 2008– 2009 Budget**		
Total Cost	*(original)*	$188,000	**Total**		$188,000
	(revised)				
Est. Expended to Date		$0	Salaries		$126,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$20,000
FY Funds	*(original)*		Equipment	*(non-expendable)*	$20,000
	(revised)		Travel		$12,000
Est. FY Expenditure			Other:		$10,000

PURPOSE AND SCOPE

This project is a continuation of the work of the previous study of 99-1GERL. 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 2007 – 2008 ACCOMPLISHMENTS

- Provided geotechnical testing support and technical assistance for DOTD.
- Published several technical papers/reports on LTRC research results.
- Developed research proposal on the calibration of resistance factors for LRFD design of driven piles and drilled shafts.
- Maintained and upgraded software's related to CPT application.
- Conducted series of workshops on the application and implementation of CPT.

FISCAL YEAR 2008 – 2009 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.

Part II SPR Funded Research Program

PROPOSED RESEARCH

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Field Study of Bridge Concrete Approach Slabs**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			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:	Janet Fu/Murad Abu-Farsakh				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$209,320		Total		$64,000
	(revised)					
Est. Expended to Date				Salaries		$43,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$21,000
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				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 PROPOSED ACTIVITIES

Task 1. Literature Search: The comprehensive literature review has been conducted in the previous research projects. On-going literature search and review will be concentrated on the area of new technologies in field testing and monitoring.

Task 2. Select Construction Projects for the Testing Sections: Three testing sections with various embankment settlement, embankment compaction methods or embankment design, and approach slab configurations are proposed and listed in proposal. Construction projects that meet the requirements of these testing sections will be selected in this task.

Task 3. Conduct Bridge Approach System Design: The bridge approach system for each selected project, as shown in Figure 1, will be designed by the Bridge Design Section in conjunction with the geotechnical design section and LTRC according to specific site conditions. The approach embankments and foundations to support concrete approach slabs will be designed by the Geotechnical Design Section and LTRC.

Task 4. Develop Instrumentation and Testing Plan: The instrumentation and testing plan will be developed for each testing section and incorporated in the project plans and contract documents.

LTRC Annual Research Program
Fiscal Year 2008- 2009

Title:	**Development Of A Semi-Circular Bending Test Procedure For Characterizing Fracture Properties Of Asphalt Mixtures**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:	06-3B		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2008– 2009 Budget**		
Total Cost	*(original)*	$232,630	Total		$116,315
	(revised)				
Est. Expended to Date			Salaries		$116,315
FY 2007– 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

An increasing number of researchers realize the limitations associated with predicting true fracture (cracking) properties of asphalt mixtures based on tests performed on un-notched samples, such as the indirect tensile (IT) test, beam fatigue test, etc. As a consequence, a number of studies have started to investigate the application of the more complex fracture mechanics concepts to the behavior of bituminous materials. A recent research effort in the mechanistic testing of asphalt mixtures has resulted in the development of a Semi-Circular Bending (SCB) test as an alternative to the IT test to determine the fracture and fatigue behavior of asphalt concrete. This method is based on the elastic-plastic fracture mechanics concept that leads to the laboratory determination of the critical strain energy release rate, also called the critical value of J-integral. While the J-integral in a SCB test offers a direct evaluation for cracking performance of asphalt mixtures, there has been very little experience with it. There is a need to develop a standard test procedure for the SCB test for its suitable use as a simple (cracking) performance test in an asphalt mixture design and/or the quality control/quality assurance (QC/QA) process in field construction. Results of the SCB tests will be correlated to DMA and parallel plate rehology of PAV aged binders and binders extracted from field cores (7+ years old).

FISCAL YEAR 2008– 2009 PROPOSED ACTIVITIES

- Conduct a thorough literature review on fracture test procedures and analysis methods.
- Develop a rational test factorial by considering all possible effects on test results.
- Conduct the SCB tests based on the developed test factorials.
- Perform data analysis.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:			Project Start Date:		07/01/08
Research Project Number:	06-3GT		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Gavin Gautreau				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000		Total		$42,000
	(revised)					
Est. Expended to Date				Salaries		$42,000
FY 2007 – 2008 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 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:		07/01/08
Research Project Number:	06-4GT		Completion Date	*(original)*	01/31/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Gavin Gautreau				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000		Total		$71,000
	(revised)					
Est. Expended to Date				Salaries		$71,000
FY 2007 – 2008 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 subgrade materials.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

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

LTRC Annual Research Program
Fiscal Year 2008- 2009

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

State Project Number:			Project Start Date:		07/01/08
Research Project Number:	07-1B		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2008– 2009 Budget**		
Total Cost	*(original)*	$129,468	Total		$91,000
	(revised)				
			Salaries		$91,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			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. To achieve this goal, a new additive will be formulated that can be blended with the asphalt binder at a specific rate during the mixing stage in order to lower the binder viscosity and allow mixing and compaction to be carried out at reduced temperature levels. A hydrophilic block of block copolymers will be selected to facilitate moisture absorption from the aggregate and minimizes the tendency for stripping. 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 designed and characterized by a suite of fundamental engineering tests including the Superpave Shear Tester protocols. Those tests will be aimed at characterizing the stability and durability of the asphalt mixtures.

FISCAL YEAR 2008– 2009 PROPOSED ACTIVITIES

- Conduct a thorough literature review on Warm Mix Asphalt.
- Develop a rational test factorial by considering all possible effects on test results.
- Conduct fundamental materials characterization tests based on the developed test factorials.
- Perform data analysis.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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:		07/01/08
Research Project Number:	07-3P		Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$350,000	Total		$185,000
	(revised)				
Est. Expended to Date			Salaries		$185,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
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, LADOTD 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 LADOTD rehabilitation projects with varying subgrade types will be selected for this implementation

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Identify construction projects from LA DOTD.
- Help 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.

LTRC Annual Research Program
Fiscal Year 2008- 2009

Title:	**Characterization of HMA Mixtures Containing High Recycled Asphalt Pavement Content with Crumb Rubber Additives**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:			Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2008– 2009 Budget**		
Total Cost	*(original)*	$98,257	Total		$98,257
	(revised)				
			Salaries		$98,257
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

Asphalt cement prices, like gasoline and crude oil, are at an all time high with no relief in-site. With the increase in hot mix asphalt (HMA) mixtures prices continuously climbing, highway agencies and owners are continually searching for methods to decrease material costs and maximize their benefits with no compromise in performance. One such method is to develop innovative technology to incorporate waste and recycled materials, such as crumb rubber from waste tires and RAP, in HMA mixtures. RAP is currently allowed for use in limited percentages within HMA layers. As HMA pavements age over time the asphalt binders become hardened and oxidized causing premature cracking in pavements. Thus, the current limiting factor in increasing the percentages of RAP is the excessive stiffness of the resulting HMA mixture. Rejuvenating additives are often used to "soften" the asphalt cement binder of RAP materials. Therefore, the incorporation of these additives into the HMA mixture will enable the use of higher percentages of RAP in the finished product. Furthermore, absorption properties of crumb rubber, from waste tires, can be used to carry those additives to revitalize the properties of the aged binders. A limited comparative laboratory mechanistic performance evaluation of conventional HMA mixtures and mixtures that contain waste tire crumb rubber, additives, and RAP will be conducted. HMA mixture characterization in terms of fatigue cracking, moisture susceptibility, and rutting will be analyzed and evaluated to determine the effects of the crumb rubber, additives, and RAP on the HMA mixtures' performance.

FISCAL YEAR 2008– 2009 PROPOSED ACTIVITIES

- Conduct a thorough literature review.
- Develop a rational test factorial by considering all possible effects on test results.
- Conduct the durability and stability tests based on the developed test factorials.
- Perform data analysis.
- Prepare draft Final Report.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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:		10/01/08
Research Project Number:			Completion Date	*(original)*	09/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dr. Murad Abu-Farsakh				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000	**Total**		$60,000
	(revised)				
Est. Expended to Date		$0	Salaries		$50,700
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$10,000
FY Funds	*(original)*	$0	Equipment	*(non-expendable)*	$0
	(revised)		Travel		$0
Est. FY Expenditure		$0	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 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 tests, abrasion tests, and tube suction tests will be conducted.

FISCAL YEAR 2008 – 2009 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 tests.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Support Study for Estimating Setup of Piles Driven into Louisiana Clayey Soils**
Funding Source:	**SPR : TT-FED/TT/REG**

State Project Number:			Project Start Date:		01/01/09
Research Project Number:			Completion Date	*(original)*	01/31/11
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$200,000	Total		$60,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other (indirect cost (at 22%)		

PURPOSE AND SCOPE

Support the research activities of LTRC research project 04-1GT for pile setup. It is anticipated that more research needs will occur as the on-going research proceeds and the details of this research will be worked out as needs arise from the on- going research.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

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

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:		09/01/08
Research Project Number:			Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Gavin Gautreau				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000		Total		$81,000
	(revised)					
Est. Expended to Date		$0		Salaries		$81,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$0		Equipment	*(non-expendable)*	
	(revised)	$0		Travel		
Est. FY Expenditure		$0		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 subgrade 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 subgrade (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 PROPOSED ACTIVITIES

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

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**ALF 5 APT Testing**
Funding Source:	**SPR: TT-FED/TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:			Completion Date	*(original)*	06/30/11
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$500,000	Total		$122,000
	(revised)				
Est. Expended to Date			Salaries		$122,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

New testing sections that will benefit LADOTD for new pavement structures and materials will be determined through the peer exchange meeting and internal testing plan selection process of LA DOTD.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

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

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**LTRC Pavement Analysis Methods with Non-Destructive Test Equipment**
Funding Source:	**SPR: TT-FED/TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:			Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$80,000		Total		$30,000
	(revised)					
Est. Expended to Date				Salaries		$30,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

LTRC routinely uses the FWD and Dynaflect for forensic analysis as well as testing for research projects. There are several factors that can affect the results obtained from these devices. Pavement distress conditions such as cracking and rutting can influence the machines ability to accurately measure the in-situ conditions which influences the accuracy of the data processing procedures. The data processing procedures, back calculation software, nomographs, and analysis methods employed also influences the results. The purpose of this project is to select several projects and perform a detailed analysis of the pavement structure with various methods to ascertain which field testing factorial and data analysis method works best under the conditions of the pavement structure being assessed. Cores will be taken from the pavement structure and assessed to provide a benchmark for the conditions of the pavement structure, specifically the pavement and base course. Emphasis will be placed on the Pavement and base course, since LTRC has recently completed a study on subgrade assessment.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Literature review.
- Develop testing factorials to determine accuracy of devices.
- Conduct field and laboratory testing on forensic and research projects.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Support Development of System Preservation and Pavement Design Manuals for LADOTD**
Funding Source:	**SPR: TT-FED/TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:			Completion Date	*(original)*	06/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Kevin Gaspard				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$110,000		Total		$38,000
	(revised)					
Est. Expended to Date				Salaries		$38,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

PURPOSE AND SCOPE

DOTD has created a Systems Preservation section with the intention of developing a set of cost effective practices that extend pavement life, improve safety, and increase motorist satisfaction while saving public tax dollars. In congruence with this agenda, a detailed manual with guidelines to be used by the Design, Construction, Maintenance, and Planning sections is required to ensure the consistent applications of pavement preservation methodologies. This study will produce a manual in accord with national and international state of the art practices and LA DOTD standards and specifications. The LA DOTD pavement preservation section will oversee the development of the manual. The four major pavement types, Asphaltic concrete, Portland Cement concrete, Continuously reinforced concrete, and Composite, pavements will be covered by this manual.

The DOTD Pavement Design section has a need for a Pavement Design Manual. This study will produce a comprehensive pavement design manual in accord with the AASHTO Pavement design guide and LADOTD design procedures and practices.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Began Literature search.
- Draft copy of Pavement Design Guide submitted to DOTD.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Finish literature search.
- Provide model for Pavement Preservation guide to LA DOTD System Preservation section.
- Conduct field surveys to obtain illustrations to place in the Manual.
- Produce a draft copy of the Pavement Preservation Manual.
- Produce a draft copy of the Pavement Design Manual.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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:		07/01/08
Research Project Number:			Completion Date	*(original)*	03/31/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Kevin Gaspard				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000	Total		$86,000
	(revised)				
Est. Expended to Date			Salaries		$86,000
FY 2007 – 2008 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 PROPOSED ACTIVITIES

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

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Performance Evaluation of FRP Reinforced Bridge Railing System**
Funding Source:	**SPR: TT-FED / TT-REG**

State Project Number:			Project Start Date:		08/01/08
Research Project Number:			Completion Date	*(original)*	07/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Walid Alaywan				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$70,000		Total		$40,000
	(revised)					
Est. Expended to Date				Salaries		$30,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	$3,000
	(revised)			Travel		$2,000
Est. FY Expenditure				Other		$5,000

PURPOSE AND SCOPE

The purpose of this study is to fabricate a Jersey bridge railing reinforced with FRP bars and to compare its performance to that of a conventionally reinforced section. Static test will be conducted on both sections. Test levels and loads will be applied based on AASHTO Design Guidelines. Field data will be compared to compute data and a recommendation will be presented.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Selection of FRP rods.
- Designing the FRP reinforced section.
- Building 2 concrete Jersey Type barriers.
- Perform Finite Elements Analysis to predict performance.
- Perform Static load testing for both sections.
- Data collection and data comparison.
- Final Report.

State Funded
Research Program

CONTINUING RESEARCH

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1359		Project Start Date:		05/01/08
Research Project Number:	04-1GT		Completion Date	*(original)*	10/31/09
Research Agency:	LA Tech		Completion Date	*(revised)*	
Principal Investigator:	Xingran (Jay) Wang				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$124,986	Total		$73,000
	(revised)				
Est. Expended to Date		$5,000	Salaries		$50,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$2,000
FY Funds	*(original)*	$5,000	Equipment	*(non-expendable)*	$2,500
	(revised)		Travel		$6,000
Est. FY Expenditure		$5,000	Other (indirect cost (at 22%)		$12,500

PURPOSE AND SCOPE

- Collection, review and analysis of the documented research and pile setup data, in state and out of state.
- Establishment of a database covering all the available pile testing data in Louisiana, aimed at easily manipulating, re-grouping, plotting, displaying, and printing as needed. All the calculation will be embedded.
- Study and application of the popular empirical pile setup method, such as the Skov-Denver method, in an effort to find those parameters to best predict the time-dependent pile capacity.
- Improvement of the popular and well-documented empirical method.
- Reliability analysis of the pile setup at different elapsed time and incorporation of the pile setup into LRFD method.
- A study of the deterministic method incorporating pore pressure dissipation and soil aging.
- Validation and improvement of the established model for those completed and on-going projects. Development of guidelines for the future pile foundation design considering pile setup.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Task 1: 1. Perform state-of-the-art Literature review.
2. Search for relevant papers, and research reports etc.
3. Investigate different models used in predicting pile setup.

Task 2: 1. Systematically conduct a survey of the pile setup research conducted by different agencies.
2. Collect pile testing data and subsurface exploration data from LA DOTD and other states.

Task 3: 1. Pay special attention to the data available at the specified pile testing sites.
2. Classify the collected data.
3. Review the existing models for setup prediction.

Task 4: 1. Screen and assess the data.
2. Summarize the findings, and outline the research plan.
3. Submit an Interim Report.
4. Incorporate PRC comments in the future research.

Task 5: 1. Develop the GIS database to easily manipulate the collected data.

Task 6: 1. Analyze the collected data, and develop pile setup prediction model.
2. Revised and improve the mathematical model.
3. Develop the framework to incorporate the setup effect into LRFD method.
4. Establish the deterministic model.

LTRC Annual Research Program
Fiscal Year 2007 - 2008

Title:	**Structural Monitoring of Rigolets Pass Bridge**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1215		Project Start Date:		04/01/05
Research Project Number:	04-2ST		Completion Date	*(original)*	04/30/08
Research Agency:	Tulane		Completion Date	*(revised)*	04/30/09
Principal Investigator:	Bob Bruce, Ph.D., PE				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$168,345	Total		$48,700
	(revised)	$214,700			
Est. Expended to Date		$166,000	Salaries		$25,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$10,000
FY Funds	*(original)*	$50,000	Equipment	*(non-expendable)*	$10,000
	(revised)		Travel		$3,700
Est. FY Expenditure		$50,000	Other		

PURPOSE AND SCOPE

The Louisiana Department of Transportation and Development (LA DOTD) plans to use HSC/HPC with design strength of 10,000 psi for the prestressed concrete girders of the Rigolets Pass Bridge and high performance concrete for the deck slab. The bridge has a span length of 131 feet (40 m) for the prestressed concrete girders. The anticipated bid date of the structure was July 30, 2003. It is expected that the majority of future long-span prestressed concrete bridges will utilize high-strength concrete and high performance concrete.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

BT-78 Girders were erected and deck for those girders was cast. Data for both deck and girders are currently being collected.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Continue data collection.
Final report will be submitted to LTRC for review and publication.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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:		07/01/07
Research Project Number:	04-3B		Completion Date	*(original)*	07/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	William H. Daly				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$271,150		Total		$125,315
	(revised)					
Est. Expended to Date		$125,315		Salaries		$117,685
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$6,150
FY Funds	*(original)*	$125,315		Equipment	*(non-expendable)*	
	(revised)			Travel		$1,480
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 2007 – 2008 ACCOMPLISHMENTS

- Perform GPC analysis on more than 25 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.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Perform GPC analysis on more than 25 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

Title:	**Elimination of Deck Joints Using a Corrosion Resistant FRP Approach**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1391		Project Start Date:		03/01/06
Research Project Number:	06-2ST		Completion Date	*(original)*	08/31/07
Research Agency:	Southern		Completion Date	*(revised)*	08/31/08
Principal Investigator:	Guoqiang Li, Ph.D. (Southern) and Aziz Saber, Ph.D., PE (LTU)				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$119,873		Total		$22,146
	(revised)					
Est. Expended to Date		$97,726		Salaries		$15,000
FY 2007 – 2008				Equipment	*(expendable)*	
FY Funds	*(original)*	$60,000		Equipment	*(non-expendable)*	
	(revised)			Travel		$5,000
Est. FY Expenditure		$60,000		Other		$2,146

PURPOSE AND SCOPE

The objective of this project is to perform a deck integration of a bridge structure by eliminating the use of joints, which are known to create short and long–term problems. The objective will be carried out via the proposed activities below.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

1. Performed structural analysis.
2. Submitted a fourth interim report to LTRC.

FISCAL YEAR 2007 – 2008 PROPOSED ACTIVITIES

1. Apply the new product to a candidate bridge and instrument the joint.
2. Submit a final report for review, publication, and distribution.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Field Evaluation of the Effectiveness of Continuity Diaphragms for Skewed Precast Pre-stressed Concrete Bridge Girders**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1373		Project Start Date:		04/01/06
Research Project Number:	06-3ST		Completion Date	*(original)*	03/31/08
Research Agency:	LTU		Completion Date	*(revised)*	08/30/08
Principal Investigator:	Aziz Saber, Ph.D., PE				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$149,928	Total		$21,495
	(revised)				
Est. Expended to Date		$128,434	Salaries		$15,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$50,000	Equipment	*(non-expendable)*	
	(revised)		Travel		$5,000
Est. FY Expenditure		$50,000	Other		$1,495

PURPOSE AND SCOPE

This proposed study may be considered as a continuation study of a previously project research with a report published and distributed by LTRC. This study dealt with the theoretical aspects contained in the first and second parts of the objective: determining the need of continuity diaphragms and studying the load transfer mechanism through the diaphragm since the effectiveness of continuity diaphragms for skewed continuous bridges was found to be limited. Based on the findings, The Project Review Committee (PRC) recommended the objective of the study be revised and the research concluded.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

1. Instrumented the bridge.
2. Performed a load test of the bridge.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Compare theoretical results vs. field-collected data.
2. Submit a draft final report for review.
3. Print and distribute final report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Determination of Coefficient of Thermal Expansion Effects on Louisiana's PCCP for the Mechanistic-Empirical Pavement Design Guide**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1450		Project Start Date:		02/01/07
Research Project Number:	07-2C		Completion Date	*(original)*	01/31/08
Research Agency:	LTRC		Completion Date	*(revised)*	12/31/08
Principal Investigator:	Hak-Shul Shin				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$74,933	Total		$59,000
	(revised)	$132,578			
Est. Expended to Date		$51,000	Salaries		$41,500
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$5,000
FY Funds	*(original)*	$58,933	Equipment	*(non-expendable)*	
	(revised)	$73,586	Travel		$3,500
Est. FY Expenditure		$50,000	Other		

PURPOSE AND SCOPE

The coefficient of thermal expansion (CTE) is one of the parameters used in the design of Portland cement (PCC) pavements. It is a measure of the change in length relative to temperature changes. The CTE is affected by the materials used in concrete production, such as the aggregates and cementitious materials.
The purpose of this study is to determine the CTE variance for Louisiana's PCC pavements. This is an important parameter required in the Mechanistic-Empirical Pavement Design Guide (MEPDG), developed by the National Cooperative Highway Research Program (NCHRP). Having an accurate value of the CTE will be beneficial for the prediction of pavement distresses caused by thermally induced movements.
The findings will then be incorporated into Louisiana's new PCC Pavement Design Guidelines.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

All mixes are complete and test samples made. All testing will be completed by June 2008.
Added elastic modulus testing and modulus of rupture to test factorial as its relation to thermal conductivity may be important. Begin Testing Modulus and test Thermal coefficient testing is 80% complete.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue Testing of modulus. Collate and analyze test results for all mixes and samples.
- Analyze affects of Louisiana's typical JCP joint spacing (20').
- Write Final Report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Characterization and Development of Truck Load Spectra for Current and Future Pavement Design Practices in Louisiana**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1411		Project Start Date:		04/01/07
Research Project Number:	07-2P		Completion Date	*(original)*	09/30/08
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Sherif Ishak				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$119,986		Total		$79,986
	(revised)					
Est. Expended to Date		$40,000		Salaries		$76,986
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$70,000		Equipment	*(non-expendable)*	
	(revised)	$40,000		Travel		$3,000
Est. FY Expenditure		$40,000		Other		

PURPOSE AND SCOPE

This study addresses the current traffic characterization techniques and identifies critical changes needed, along with certain gaps and areas of potential development in the traffic monitoring process in the state of Louisiana. In addition, the study will develop Louisiana's traffic load spectra from the available traffic data, including any permanent and portable WIM stations, and estimate the ESAL values from the truck traffic load spectra. The traffic load spectra and derived ESALs will be used to support the requirements of the current Pavement Design Guide as well as the new M-E Pavement Design Guide.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Most of the literature review work has been completed. Research reports and published papers were compiled. The literature review was summarized in an interim report and presented to the PRC members in a meeting on 3/6/2008.
- Axle load and vehicle classification data was collected from DOTD.
- Progress was made towards the development of a strategic plan for data collection to support the implementation of the new pavement design guide in LA.
- Preliminary analysis of the collected data was conducted to examine the main characteristics and to identify the best approach for developing the axle load spectra.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Finalize the strategic plan for data collection.
- Collect more axle load data from the permanent weight enforcement stations in LA.
- Develop the axle load spectra using the data collected from all sources.
- Develop traffic growth factors and load equivalency factors.
- Prepare and submit a Final Report to LTRC.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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 2008 – 2009 Budget**		
Total Cost	*(original)*	$ 140,000		Total		$ 74,553
	(revised)	$ 140,000				
Est. Expended to Date		$ 6,580		Salaries		$ 57,410
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$ 0
FY Funds	*(original)*	$ 65,447			*(non-expendable)*	$ 200
	(revised)	$ 65,447				
Est. FY Expenditure		$ 50,000		Other		$ 16,943

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 2007 – 2008 ACCOMPLISHMENTS

During the reporting period the following project objectives were accomplished:

1. Identify and document both the state-of-the-art and state-of-the-practice with respect to the geometric design and traffic control at the entrance to construction work zones on rural freeways. Literature write-up and other documentation continue as part of student projects.
2. Generate alternate geometric and traffic control designs for the entrance to construction work zones on rural freeways. Currently awaiting DOTD/FHWA approval to implement plan in field.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Evaluate the traffic flow and safety performance of the design configurations by collecting field data and developing simulation models.
2. Begin the documentation of all process and results in a project report.
3. Provide recommended practice to the DOTD along with an expectation of the anticipated benefits of the configuration(s) that was tested**.**

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Establishing an Intelligent Transportation Systems (ITS) Lab at LTRC**
Funding Source:	**State – TT REG**

State Project Number:	736-99-1483		Project Start Date:		07/01/07
Research Project Number:	07-3SS		Completion Date	*(original)*	06/30/08
Research Agency:	LSU		Completion Date	*(revised)*	12/31/08
Principal Investigator:	Sherif Ishak				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$49,994		Total		$34,994
	(revised)					
Est. Expended to Date		$15,000		Salaries		$18,994
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$15,000
FY Funds	*(original)*	$49,994		Equipment	*(non-expendable)*	
	(revised)			Travel		$1,000
Est. FY Expenditure		$15,000		Other		

PURPOSE AND SCOPE

The purpose of this project is to test the feasibility of establishing an ITS Lab at LTRC so that if its establishment can be shown to be a practical possibility and the services it provides can be shown to be useful, the facility can be expanded in the future.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Literature review was conducted to gather information on ITS labs established at other state universities and the type of data and applications supported.
- A tour at the Baton Rouge ATMC was made in February 2008 to check the facility and the type of data being collected from detectors and signalized intersections.
- Two types of data were identified: digital data and video data. Both types can be transmitted to the proposed ITS lab in real time if there is sufficient bandwidth.
- A meeting with the ITS office of DOTD was made in March 2008 to discuss the connectivity issues that need to be resolved for the ITS data to be streamed over the DOTD private network. Cost estimates are required for possible rewiring of the LTRC facility to allow streaming of video data. On the other hand, digital data from the MIST system may be readily available and can be streamed to LTRC over the existing network.
- Trips to other ITS labs are scheduled during May and June of 2008 to collect information from other sites.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Information will be compiled from the literature review and the visits to other ITS lab sites and TMCs to produce a complete set of applications that ITS data in Louisiana can support.
- A plan will be furnished on the feasibility of establishing the ITS lab, including a short-term plan for streaming digital data and a long-term plan for streaming video data. Cost estimates will also be provided showing all software and hardware requirements to implement both plans.
- A set of operating policies for the proposed ITS lab will be drafted.
- An attempt will be made to establish communication between LTRC and DOTD over the existing network and stream detector data in real time and route it to a SQL database server. If successful, equipment will be acquired to build a digital data acquisition system as initially proposed.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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 2007 – 2008 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 2008– 2009 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 2008 - 2009

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:	LSU		Completion Date	*(revised)*	06/30/09
Principal Investigator:	Kun Lian				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$68,339		Total		$54,355
	(revised)					
Est. Expended to Date		$13,984		Salaries		$31,161
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$68,339		Equipment	*(non-expendable)*	
	(revised)	$13,984		Travel		$226
Est. FY Expenditure		$13,984		Other		$22,968

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 2007 – 2008 ACCOMPLISHMENTS

- Hired a post-doctoral research associate for the project at middle of January 2008.
- Finished the first run of RF/Data-Acquisition/Power-Manager circuit design and element selection.
- Finished the first version alignment shell calculation and the model design.
- Customized the first pressure measurement sensor and RF unit.
- Finished preliminary feasibility tests on preliminary RF unit and pressure sensor. The results are positive.
- Identified the partner that will customize the RF/Data-Acquisition/Power-Manager for the project.
- Finalized the basic flow and elements charts for prototype RF unit.
- Finished preliminary field tests parameters for the RF unit.
- Strength/structure simulation and design for self-alignment apparatus shell.
- Preliminary calculation fop Faraday device.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Finish the alignment shell fabrication, testing, and making up experiment if necessary.
- Finalize the integration of sensor-control-measurement unit.
- Test the sensor unit in Lab.
- Finish the preliminary unit fop Faraday device.
- Look for industrial partner/partners and prepare the IDEA phase II proposal.

LTRC Annual Research Program
Fiscal Year 2007 - 2008

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

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

BUDGET STATUS

Total Budget			**Estimated FY 2007 – 2008 Budget**		
Total Cost	*(original)*	$177,000	Total		$177,000
	(revised)				
Est. Expended to Date			Salaries		$166,500
FY 2006 – 2007 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$10,500
Est. FY Expenditure			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 2007 – 2008 PROPOSED ACTIVITIES

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

State Project Number:	736-99-0515		Project Start Date:		07/01/08
Research Project Number:	09-1ALF		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Zhong Wu				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$635,000		Total		$635,000
	(revised)					
Est. Expended to Date				Salaries		$323,360
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$201,000
FY Funds	*(original)*			Equipment	*(non-expendable)*	$61,020
	(revised)			Travel		$9,040
Est. FY Expenditure				Other		$40,680

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 2007 – 2008 ACCOMPLISHMENTS

- Completed load testing of Experiment No.4.
- Prepared plans for Experiment No.5.
- Replaced Max-PAC system.
- Installed New NI DAQ system.
- Replaced and installed various new parts to the ALF device.
- Scheduled and trenched three failed test sections on Phase B of Experiments No. 4.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Prepare specifications and construction of test lanes for Experiment No.5.
- Begin load testing on Experiment No.5.
- Continue maintenance and operation of the Pavement Research facility.
- Provide assistance for other research activities at LTRC (e.g. NCHRP 9-40, GERL study).
- Clean, sandblast, and repaint ALF.
- Acquire new Laser-base profile (and rutting) measurement system.
- Plan to build ALF Dolly.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1518		Project Start Date:		05/01/08
Research Project Number:	08-1P		Completion Date	*(original)*	04/31/10
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Mostafa Elseifi				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$180,000		Total		$46,000
	(revised)					
Est. Expended to Date		$10,000		Salaries		$41,080
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$10,000		Equipment	*(non-expendable)*	$750
	(revised)			Travel		$2,500
Est. FY Expenditure		$10,000		Other		$1,670

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 2007 – 2008 ACCOMPLISHMENTS

The following accomplishments are expected in the 2007-2008 fiscal year:

- Conduct a comprehensive literature review and a nationwide survey of highway agencies.
- Initiate a comprehensive survey of current practices in the state.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Conduct a comprehensive survey of pavement sections where reflective crack control treatments were used across the state.
- Collect performance and economic data for selected pavement test sections.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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 2008 – 2009 Budget**		
Total Cost	*(original)*	$249,578	Total		$100,000
	(revised)				
Est. Expended to Date			Salaries		$60,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$100,000	Equipment	*(non-expendable)*	$20,000
	(revised)		Travel		$10,000
Est. FY Expenditure		$100,000	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 2007 – 2008 ACCOMPLISHMENTS

1. Instrumentation plan was submitted and approved.
2. Data acquisition system will be purchased.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Validate the performance of the NCHRP 519 continuity detail.
2. Assess the effects of differential shrinkage between the girder and the slab.
3. Evaluate the performance of the skewed details of the connection.
4. Evaluate the performance of the detail in bridges with Bulb-T girders.
5. Installation of instrumentation system.
6. Data collection.
7. Data analysis and comparison of joint performance.
8. Final report to be reviewed published and distributed.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Analysis of Seasonal Strain Measurements in Asphalt Materials Under Accelerated Loading**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1519		Project Start Date:		01/01/08
Research Project Number:	08-2P		Completion Date	*(original)*	12/31/08
Research Agency:	LSU		Completion Date	*(revised)*	N/A
Principal Investigator:	Dr. Mostafa Elseifi				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$115,048		Total		$74,848
	(revised)					
Est. Expended to Date		$40,200		Salaries		$69,048
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$40,200		Equipment	*(non-expendable)*	
	(revised)			Travel		$3,000
Est. FY Expenditure		$40,200		Other		$2,800

PURPOSE AND SCOPE

- Instrument responses in past ALF Experiments (II, III, and IV) will be analyzed to quantify the impacts of seasonal variation of pavement responses with temperature and its relationship to pavement performance.
- Laboratory characterization will be used to determine the feasibility of using the DTT or the DSR as part of the current binder specification system in Louisiana instead of the current ductility test.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

This research project has recently started. To date, the following accomplishments are noted:

- Instrument responses for past ALF Experiments have been obtained. Analysis of instrument responses in ALF Experiment III is currently underway and is going at an adequate rate.
- Selection of asphalt binder for testing has been finalized and contact with suppliers has been made to obtain virgin samples. Dummy samples have been tested to assess the repeatability of the equipment and any minor adjustments needed prior to testing.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

This research project is expected to be completed by December 2008. Therefore, objectives of this study will be completed during the 2008 – 2009 fiscal year. Results of the conducted analysis will be used to suggest possible modifications to the instrumentation strategy in the upcoming ALF experiments V and to develop a successful instrumentation plan. Results of past ALF experiments will also be used to link laboratory measured properties of recovered asphalt binders to the measured performance at the ALF facility.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**University Transportation Center: TTEC**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1441		Project Start Date:		08/07/06
Research Project Number:	08-2UTC		Completion Date	*(original)*	09/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Skip Paul				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$142,500	Total		$142,500
	(revised)				
Est. Expended to Date			Salaries		
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The LTRC Transportation Training & Education Center has been designated as a Tier II University Transportation Center in the Federal SAFETEA-LU legislation. The purpose of the center is to provide technology transfer to include education and training as well as implementation and demonstrations of new transportation technologies. Development and delivery examples would include:

- Engineering Continuing Education/Professional Development.
- Demonstration Projects to Implement Research.
- Job Skills training for new technologies.
- FHWA National Highway Institute Courses.
- Graduate/Advanced degree opportunities.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

Worked on UTC Strategic Plan and proposed Curriculum Council.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Finalize Strategic Plan.
- Finalize Curriculum Council.
- Focus Group meetings to determine curriculum needs.
- Begin Development of course curriculums.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Developing an In-situ Characterization Technique to Assess the Scour Potential of Cohesive Soils**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1514		Project Start Date:		02/ 01/08
Research Project Number:	08-1TIRE		Completion Date	*(original)*	01/31/09
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Guoping Zhang				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$30,000		Total		$16,964
	(revised)					
Est. Expended to Date		$13,036		Salaries		$16,964
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$0
FY Funds	*(original)*	$13,036		Equipment	*(non-expendable)*	$0
	(revised)			Travel		$0
Est. FY Expenditure		$13,036		Other		$0

PURPOSE AND SCOPE

The purpose of this project is to develop an in-situ testing technique to characterize the scour/erosion potential of soft cohesive soils on streambeds.
The scope of work includes literature review, acquisition of a field shear vane tester, and design and manufacturing of a new shear vane, lab calibration of the new shear vane, and correlating the vane-measured undrained shear strength with the erosion critical shear stress.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- A conventional lab shear vane has been purchased, and literature review has been completed.
- A new student has been recruited, who is now focusing on design and develop a new modified Louisiana Scour Vane (LSV) tester.
- In the meanwhile, the student is developing sample preparation methods for the lab calibration of the LSV tester.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Modify the conventional Geonor shear vane tester.
- Re-calibrate the new LSV tester.
- Correlate the LSV undrained shear strength with the erosion critical shear stress.
- Validate and compare the lab data with published data and case studies.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Application of Inorganic Polymer Concrete ('Geopolymer') in Transportation Structures Located in Harsh Environments**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1515		Project Start Date:		01/ 01/07
Research Project Number:	08-2TIRE		Completion Date	*(original)*	11/30/08
Research Agency:	LA Tech		Completion Date	*(revised)*	
Principal Investigator:	Dr. Erez Allouche				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$30,000		Total		$19,000
	(revised)					
Est. Expended to Date		$5,390		Salaries		$19,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$11,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$11,000		Other		

PURPOSE AND SCOPE

The purpose of this study is to develop a geopolymer mix design that meets LA DOTD's standards using locally available fly ash feedstock. The study will encompass the design of several mixes in order to come up with the optimal mix to be recommended for use.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Literature review was performed.
- The establishment of mix design for geopolymer concrete based on locally available materials is being conducted.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Perform structural testing on optimal mix design to evaluate properties and assess performance
- Submit a final report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**First Flush Reactor for Stormwater Treatment for Elevated Linear Transportation Projects**
Funding Source:	**State: TT-REG**

State Project Number:	736-99-1516		Project Start Date:		12/01/2007
Research Project Number:	08-3TIRE		Completion Date	*(original)*	11/30/2008
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	ZHIQIANG DENG				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$30,000		Total		$7,000
	(revised)					
Est. Expended to Date		$7,000		Salaries		$7,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$23,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$23,000		Other		

PURPOSE AND SCOPE

The main objective of this TIRE project is to design and test a first flush-based storm water treatment device for elevated linear transportation projects for complying with the MS4 regulations. The innovative idea behind the novel device is to combine a first flush collection device with layered reactive filter media to form a first flush reactor and thereby to capture and treat the most polluted portion of runoff from a catchment site.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

1. Collection of highway storm water runoff data.
2. Design of laboratory scale first flush reactor.
3. Bench scale column experiments of the reactive filter materials to be used in the pilot scale first flush reactor.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Task 2: Laboratory Testing of Pilot Scale First Flush Device with Intermittent Influent

Task 3: Manual Preparation for Design and Construction and Maintenance of First Flush Reactor

Title:	**Automated Construction of 3-D Road Models From Right-of-Way Video**
Funding Source:	**State: TT-REG**

State Project Number:		736-99-1517	Project Start Date:		01/01/08
Research Project Number:		08-4TIRE	Completion Date	*(original)*	12/31/08
Research Agency:		ULL	Completion Date	*(revised)*	
Principal Investigator:		Ryan Benton, PhD			

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$29,621	Total		$25,583
	(revised)	$29,621			
Est. Expended to Date		$4,038	Salaries		$22,481
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$17,988	Equipment	*(non-expendable)*	
	(revised)	$4,037.95	Travel		$2,952
Est. FY Expenditure		$4,038	Other		$150

PURPOSE AND SCOPE

Currently, DOTD collects video data for all of its roadways. One limitation of this data is the amount of time and degree of difficulty required to extract meaningful measurements from the video. Data captured in the video would be of greater use if the data could be converted into a 3-D model.

In this study, techniques will be devised to convert video data, collected from a driver's perspective, into a 3-D model of the road and roadside elements. These techniques will enable highway engineers to design and evaluate highway infrastructures from perspectives that are not feasible with the currently available technology.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

Done for 2007-2008:
1. Developed algorithms to separate the ground plane (further subdivided into road and roadside), vegetation, and sky in rural highways.
2. Obtained curve data for District 3 highways.
    a. Some errors in the data have been identified and reported.
    b. We have also begun matching the curve data with 2007 DOTD Right-of-way images.

Expected to be done by end of June:
1. Map road and shoulder into 3D model.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Expected to be done by end of June:
1. Develop methods to detect man-made objects in scene, such as guardrails.
2. Map roadside features, such as guardrails, into 3D model.
3. Develop method to estimated curvature from images/model and validate the estimation.
4. Determine feasibility of extracting super evaluation from video cues.
5. Prepare Final Report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Performance Evaluation of Buried Pipe Installation**
Funding Source:	**State: TT-REG**

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)*	
Principal Investigator:	Dr. Michele Barbato				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$75,000		Total		$40,682
	(revised)					
Est. Expended to Date		$0		Salaries		$37,633
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$34.318		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$34,318		Other		$3,049

PURPOSE AND SCOPE

The research project aims at determining the effects of geometric and mechanical parameters characterizing the soil-structure interaction developed in a buried pipe installation. Parameters as pipe ring stiffness, bedding thickness, and fill cover height need to be considered.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

The soil-pipe interaction and effects of bedding thickness, fill cover height, backfill material stiffness and stiffness of the natural soil surrounding the trench have been studied by using the linear finite element method.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

The soil-pipe interaction and effects of bedding thickness fill cover height, backfill material stiffness and stiffness of the natural soil surrounding the trench will be studied by using advanced nonlinear finite element models.

LTRC Annual Research Program
Fiscal Year 2008- 2009

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)*	
Principal Investigator:	Chester Wilmot				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$329,978	**Total**		$329,978
	(revised)				
Est. Expended to Date			Salaries		$327,178
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$500
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$2,000
Est. FY Expenditure			Other		$300

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 2007 – 2008 ACCOMPLISHMENTS

1. Technical Assistance Report 07-3TA, "Analysis of Louisiana Vehicular Input Data for MOBILE 6".
2. Technical Assistance Report 08-1TA, "Assessing Performance of Alternative Pavement Marking Materials".
3. Development of proposal on time-dependent stated choice method of data collection of hurricane evacuation behavior.
4. Development of proposal on dynamic trip distribution models for hurricane evacuation.
5. Program Manager of Special Studies at LTRC.
6. Taught 4 courses in Department of Civil and Environmental Engineering at LSU.
7. Published 4 refereed journal articles, 3 papers in national/international proceedings, and made 3 presentations at national and international conferences.

FISCAL YEAR 2008- 2009 PROPOSED ACTIVITIES

1. Initiate research on hurricane evacuation data collection and evacuation destination choice.
2. Obtain external funding (NSF) on development and testing of a method of concurrent data collection during emergency events.
3. Continue administrative, technical assistance, and academic duties.

State Funded
Research Program

PROPOSED RESEARCH

LTRC Annual Research Program
Fiscal Year 2008- 2009

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 2008 – 2009 Budget**		
Total Cost	*(original)*	$200,849	**Total**		$144,201
	(revised)				
Est. Expended to Date		$0	Salaries		$60,201
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$0	Equipment	*(non-expendable)*	$3,000
	(revised)		Travel		$1,000
Est. FY Expenditure		$0	Other (subcontract)		$80,000

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 PROPOSED ACTIVITIES

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Evaluation of Current DOTD Pavement Structures Using PMS Data and New M-E Pavement Design Guide**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		08/15/08
Research Project Number:	07-6P		Completion Date	*(original)*	07/31/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$220,000		Total		$100,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure				Other		

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 (M-EPDG) 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 M-EPDG.
- Allow the Department to obtain practical experience with the new M-EPDG.
- Identify the directions of research for the implementation of new M-EPDG and future development of PMS.

FISCAL YEAR 2008 – 2009 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.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Structure Instrumentation and Data Collection of Bridge Approach Slabs**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		01/01/09
Research Project Number:	08-1GT		Completion Date	*(original)*	06/30/12
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$100,000	Total		$30,000
	(revised)				
Est. Expended to Date			Salaries		$15,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$0
FY Funds	*(original)*		Equipment	*(non-expendable)*	$15,000
	(revised)		Travel		$0
Est. FY Expenditure			Other		$0

PURPOSE AND SCOPE

This is a support study to the LTRC research project (LTRC 05-1GT) Field Study of Bridge Concrete Approach Slabs. The objective of this support study project is to design, acquire, install and monitor structure performance data on bridge approach slabs.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Develop field instrumentation plan for bridge approach slabs.
- Purchase equipment.
- Install instruments.
- Collect and analyze data.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Development of a Flood Protection Safety Program**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:	08-2GT		Completion Date	*(original)*	06/30/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000	Total		$100,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

Hurricanes Katrina and Rita caused massive flooding throughout South Louisiana. Most of this flooding can be attributed to levee and floodwall failures. Changes made to the Louisiana Revised Statues Title 38 in 2006 requires the Louisiana Department of Transportation and Development (LADOTD) Office of Public Works to provide oversight of the administration of all matters related to the engineering, design, construction, extension, improvement, repair, and regulation of a hurricane flood protection system, including but not limited to the construction and design of a hurricane flood protection system consisting of levees and associated elements to provide protection against tidal surges within the Louisiana Coastal Zone. With the requirements of R.S. Title 38 and emphasis of Levee Safety programs in the recent WRDA bill, LADOTD has initiated the creation of a flood protection safety program.

For the LADOTD to develop a robust and comprehensive safety program, it seeks to determine the necessary components of a flood protection safety program. The research will therefore identify critical parameters affecting the risk of failure for these flood protection structures. The research will determine the pertinent information necessary to the database, which affects the flood protection system from functioning as a "system." Items like height, slope, structure integrity and stability, must be quantified and statistically analyzed to determine the level of risk associated with each. This study has geotechnical elements but is primarily the development of a flood protection safety and management program focusing on the risks associated with flood protection.

The results of this study will provide LADOTD a logical method to evaluate and rate the components of their existing system and compare those ratings against associated risks as compared to minimum safety standards. The management tool will monitor the system as a network (of flood protection), and identify individual locations (red flags) based on inspections (collection factors) and inventory analysis based on risk.

This research will produce a flood protection rating and evaluation tool, to be combined with other socio-economic analyses to evaluate current conditions. Together these parts will be used to prioritize risks and allocate available funding to the most critical areas of the flood protection system in Louisiana.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

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

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Prediction of Reliable Scour Depths for Bridge Structures**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		08/01/08
Research Project Number:	08-3ST		Completion Date	*(original)*	07/31/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$200,000	Total		$100,000
	(revised)				
Est. Expended to Date			Salaries		$60,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	$20,000
	(revised)		Travel		$10,000
Est. FY Expenditure			Other (instrumentation Consultant)		$10,000

PURPOSE AND SCOPE

The objective of this research is to develop more reliable scour prediction tool to be used in bridge design in Louisiana.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Task 1 Perform an extensive literature search to identify all potential technology available in predicting bridge scours. Assess the current method used by DOTD.

Task 2 Submit a summary report documenting the findings of Task I.

Task 3 A detailed plan will be submitted by the research to the PRC for approval. The plan will use the new technologies in predicting scour depth for several bridges and compare them to ones predicted by HEC18.

Task 4 Prepare a final report documenting the entire research effort. Based on the performed work, the final report should include guidelines regarding the application and/ or limitation of such methods on new and existing structures.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1547		Project Start Date:		07/01/08
Research Project Number:	08-5GT		Completion Date	*(original)*	06/30/11
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Radhey S. Sharma				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$300,000	Total		$131,000
	(revised)				
Est. Expended to Date			Salaries		$55,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	$54,000
	(revised)		Travel		$5,000
Est. FY Expenditure			Other		$17,000

PURPOSE AND SCOPE

The proposed research aims to investigate field moisture variation over time in highway unbound bases and subgrade 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 subgrade (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 unsaturated soils to complement the field testing.
- Develop a mathematical framework for assessment of pavement performance as a function of variations in moisture regime.
- Formulate recommendations for implementation of the research findings into design methodology.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Following are the main activities proposed for 2008-2009:

- Literature review including compilation and evaluation of the research on the topic in the US, especially in DOTs and internationally so as to develop a useable framework for Louisiana conditions.
- Site selection for field monitoring, sample collection sites for laboratory tests, instrumentation plan.
- Prepare, submit, and present interim report.
- Purchase and installation of instrumentation and initiating monitoring.
- Refine plan for laboratory tests and conduct laboratory tests.
- Initiate work on modeling framework.

LTRC Annual Research Program
Fiscal Year 2008- 2009

Title:	**Performance and Construction of High Volume Surface Treatments**
Funding Source:	**STATE: TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:			Completion Date	*(original)*	12/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	TBA				

BUDGET STATUS

Total Budget			**Estimated FY 2008– 2009 Budget**		
Total Cost	*(original)*	$100,000	Total		$100,000
	(revised)				
			Salaries		$100,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

Louisiana has several hundred miles of asphalt pavement between the ages of 10 and 20 years who's IRI (< 120 in/mi.) is still considered in the good or very good range. The funds available for preservation are limited and a low cost preservation method is desired. Surface treatments have already proven to be an excellent tool for preserving our asphalt surfaces. Currently, Louisiana specifications limit the use of surface treatments to 7000 ADT and lower. The need exists to construct surface treatments on higher volume roadways as in other neighboring states. This project will follow the guidelines as set forth in the current, ongoing NCHRP 14-17 project and how it applies to Louisiana.

FISCAL YEAR 2008– 2009 PROPOSED ACTIVITIES

- Survey current LADOTD District Surface Treatment practices.
- Conduct a thorough literature review.
- Collect current available data.
- Develop a Construction proposal for High Volume Chip Seals.
- Construct and Evaluate Several Projects in both the Northern and Southern areas of the state.
- Prepare draft Final Report.

LTRC Annual Research Program
Fiscal Year 2008- 2009

Title:	**Development of Surface Friction Guidelines for LADOTD**
Funding Source:	**STATE: TT-REG**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:			Completion Date	*(original)*	12/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	TBA				

BUDGET STATUS

Total Budget			**Estimated FY 2008– 2009 Budget**		
Total Cost	*(original)*	$100,000	Total		$100,000
	(revised)				
			Salaries		$100,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

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 PROPOSED ACTIVITIES

- Conduct a thorough literature review.
- Collect available data.
- Prepare draft Interim report.
- Determine Industry impact.
- Perform data analysis.
- Initiate Specification Changes as needed.
- Prepare draft Final Report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Update LADOTD Policy on the Evaluation of Pile Driving Vibration Monitoring**
Funding Source:	**State: TT-REG**

State Project Number:			Project Start Date:		10/01/08
Research Project Number:			Completion Date	*(original)*	09/30/10
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000	Total		$50,000
	(revised)				
Est. Expended to Date			Salaries		$50,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

Pile driving operations can causes vibrations, which can affect adjacent buildings and structures. The extent of these vibrations depends upon the pile type, soil conditions, and other factors. The research will evaluate the Department's current limits of monitoring responsibility based on data collected from this widening project. Validation or modification of current coverage area standards should be fair and reasonable as dictated by the data, rather than public opinion. Without data clarification, public opinion could unnecessarily cost the department time and money to monitor structures outside of the affected area.

The results will be used to establish an accurate tool to manage vibration monitoring; save the department time and money with respect to unreasonable coverage extents; and serve as data to show the extents of driving vibrations during future driving events.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

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

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:			Project Start Date:		07/01/08
Research Project Number:			Completion Date	*(original)*	
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$100,000	Total		$50,000
	(revised)				
Est. Expended to Date		$0	Salaries		$48,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$0	Equipment	*(non-expendable)*	
	(revised)		Travel		$2,000
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The research is aimed at developing Crash Reduction Factors (CRFs) for roads within the Louisiana state highway system and, therefore, will be developed for roads ranging from two-lane roads to freeways within both urban and rural settings. The countermeasures that the CRFs relate to will concentrate on physical features of the road that the DOTD can influence, but they may also relate to operational aspects of the road such as speed limits, or human behavior issues such as the wearing of seat belts.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

Project to be initiated July 1, 2008, and will include execution of the following activities within the 08/09 FY:

1. Literature and State-Of-The-Practice Review.
2. Identification of countermeasures for which CRFs will be determined in this study.
3. Development of Louisiana CRFs for selected countermeasures.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Long-Term Monitoring for Bridges Subject to Sugarcane Truck Overloads**
Funding Source:	**STATE: TT-REG**

State Project Number:			Project Start Date:		08/01/08
Research Project Number:			Completion Date	*(original)*	06/30/10
Research Agency:			Completion Date	*(revised)*	
Principal Investigator:					

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$100,000	Total		$50,000
	(revised)				
Est. Expended to Date			Salaries		$30,000
FY 2008 – 2009 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	$13,000
	(revised)		Travel		$2,000
Est. FY Expenditure			Other		$5,000

PURPOSE AND SCOPE

A previously funded study dealt with the evaluation of sugarcane loaded trucks on US-90 south of Lafayette. A Data Acquisition System was mounted. It was hoped that this system would collect data for a good two (2) or three (3) years where sugarcane harvesting is a seasonal event (August to January). Unfortunately, the bridge had to be taken of the list of active bridges since a new one was constructed not far from it. The purpose of this study is to collect enough data to assess the damage due to fatigue of the bridge girders and deck.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Mounting of a Data Acquisition System.
- Data Collection.
- Data Analysis.
- Data collection and data comparison.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:			Project Start Date:		07/01/08
Research Project Number:	09-1TIRE		Completion Date	*(original)*	06/30/09
Research Agency:	TBA		Completion Date	*(revised)*	
Principal Investigator:	Mark Morvant				

BUDGET STATUS

Total Budget				**Estimated FY 2008– 2009 Budget**		
Total Cost	*(original)*	$120,000		**Total**		**$120,000**
	(revised)					
Est. Expended to Date				Salaries		
FY 2007 – 2008 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.

2008 RPIC PROBLEM STATEMENTS	
Final Ranking	**PROBLEM STATEMENT TITLE**
(Number)	
1 (RAC-21)	Evaluation of Levee Risk Analysis and Development of Safety Program
2 (RAC-4)	Develop Louisiana Crash Reduction Factors
3 (RAC-1)	Construction and Performance Evaluation of Chip Seals and other Surface Preservation Techniques
4 (RAC-13)	Prediction of Reliable Scour Depths for Bridge Structures
5 (RAC-8)	Estimating Setup of Piles Driven into Louisiana Clayey Soils
6 (RAC-22)	Cost Effective Prevention of Reflective Cracking of Composite Pavements
7 (RAC-6)	Measurement of Seasonal Changes and Spatial Variations in Pavement Subgrade Properties
8 (RAC-24)	Relate Aggregate Friction Rating to Skid Resistance
9 (RAC-5)	Development of Material Specifications of Self-Consolidating Concrete (SCC) for Bridge Elements in LA
10 (RAC-12)	Characterization of fly Ash and Critical Evaluation of Specifications of Fly Ash use in Highway Concrete
11 (RAC-20)	Evaluation of John James Audubon Continuity Detail for Pre-Cast, Pre-Stressed Girders
12 (RAC-10)	Guidelines for Non-Federal Levees
13 (RAC-11)	Development of Performance Measures for Incident Management Program Actions
14 (RAC-17)	An Intelligent Transportation System (ITS) Lab at LTRC *(dependent on results of feasibility study)*
15 (RAC-23)	Feasibility Study to develop cost estimate and strategic plan to update Louisiana's Paper and Digital GIS Base Map Data which are 25-40 Years Out of Date
16 (RAC-7)	Estimate the Future State Highway Safety Performance of Two Lane Highway Planning, Design and Operation
17 (RAC-18)	Development of Supplemental Guideline for Engineering Design, Construction, and Maintenance of Hwy Infrastructure
18 (RAC-9)	Detecting Over Compaction of HMA, both Aggregate Fracture and Low Volume Road
19 (RAC-15)	Sources of Revenue for Marine and Rail Projects / Programs
20 (RAC-19)	Development of Area-Reduction-Factors for Estimating Rainfall Design Storms over Medium & Large Drainage Basins in LA
21 (RAC-14)	Development of a Short-Term Traffic Forecasting Model for Travel Times on I-10 / I-12
22 (RAC-16)	Application of Predictive Methods in Identifying the "Most Promising Sites" for LA Hwy Safety Improvement Projects
23 (RAC-2)	Precipitation Analysis to Update Hydrologic Design in Louisiana
24 (RAC-3)	Void Detection for Concrete Pavements

Self Generated Funded Research Program

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Development of Advanced Grid Stiffened (AGS) FRP Tube-Encased Concrete Columns**
Funding Source:	**FHWA-IBRC**

State Project Number:	736-99-1357		Project Start Date:		09/01/05
Research Project Number:	05-3ST		Completion Date	*(original)*	08/31/07
Research Agency:	LSU		Completion Date	*(revised)*	08/31/08
Principal Investigator:	Guoqiang Li, Ph.D.				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$225,000		Total		$48,819
	(revised)					
Est. Expended to Date		$156,181		Salaries		$30,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$80,000		Equipment	*(non-expendable)*	
				Travel		$5,000
Est. FY Expenditure		$80,000		Other		$13,819

PURPOSE AND SCOPE

The objective of this project is to develop a formwork-free, steel-free, maintenance-free, high strength, and high ductility Advanced Grid Stiffened (AGS) Fiber Reinforced Polymer (FRP) tube-encased concrete column (AGS ECC) to meet the needs of new construction of bridge piers/piles or replacement of damaged piers such as rotten timber piers.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

1. Continue with the analytical modeling and design equation.
2. Characterize the mechanical/thermal/fire performance of a nanoparticle reinforced vinyl ester resin.
3. Using the modified vinyl ester to prepare AGS tube encased concrete cylinders and to evaluate their fire resistance and post-fire residual strength.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Manufacture a concrete column to use on a candidate bridge.
1. Erect the manufactured column.
2. Collect data from bridge site.
3. Compare field and theoretical data.
4. Submit final report for review, publishing, and distribution.

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

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

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$220,537	**Total**		$110,000
	(revised)				
Est. Expended to Date		$97,651	Salaries		$35,000
FY 2007 – 2008			Equipment	*(expendable)*	$5,000
FY Funds	*(original)*	$160,000	Equipment	*(non-expendable)*	$25,000
	(revised)	$35,000	Travel		$5,000
Est. FY Expenditure		$35,000	Other		$40,000

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.

Funding of this project is provided by FHWA – IBRC (Innovative Bridge Research and Construction).

FISCAL YEAR 2007 – 2008 ACCOMPLISHED ACTIVITIES

1. Task 3 – Some additional finite element analysis were performed.
2. Task 4 – Instrumentation plan has been fine-tuned.
3. Laboratory test to develop and verify slip monitoring concept.
4. Laboratory test to develop and verify moisture monitoring concept.

FISCAL YEAR 2007 – 2008 PROPOSED ACTIVITIES

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

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2007 – 2008 Budget**		
Total Cost	*(original)*	$350,000	**Total**		$100,000
	(revised)	$405,468			
Est. Expended to Date		$305,469	Salaries		$64,000
FY 2006 – 2007 Budget			Equipment	*(expendable)*	$0
FY Funds	*(original)*	$110,000	Equipment	*(non-expendable)*	$0
	(revised)		Travel		$2,000
Est. FY Expenditure		$110,000	Other (Subcontract)		$34,000

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 2007 – 2008 ACCOMPLISHMENTS

- Work continued on Task 4 Laboratory Experiment.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue the conduct of Task 4 Laboratory Experiment as per Phase I report.
- Recommend Test Methods, Criteria and Construction Guidelines for Tack Coats materials.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

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:	Drs. Murad Abu-Farsakh & Sungmin Yoon				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$449,925		**Total**		$402,000
	(revised)					
Est. Expended to Date		$47,700		Salaries		$0
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$0
FY Funds	*(original)*	$47,700		Equipment	*(non-expendable)*	$402,000
	(revised)			Travel		$0
Est. FY Expenditure		$47,700		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 tilt meters, 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 2007 – 2008 ACCOMPLISHMENTS

- Prepared and presented to PRC a general instrumentation plan for monitoring M19 pier of I-10 Twin Span Bridge.
- Prepared drawings for plan change of pile casting phase.
- Prepared drawings for plan change to pile-cap and column instrumentations.
- Purchased the instrumentations needed for pile casting phase.
- Install casing tubes for inclinometers; and calibrated and installed sister bar strain gauges to selected piles.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Prepare a complete instrumentation plan for short-term and long-term monitoring of M19 pier of I-10 Twin Span Bridge.
- Test pile instrumentations prior and post delivery to the site.
- Provide technical support to protect pile instrumentations during pile driving phase.
- Calibrate and install the MEMS inclinometers.
- Calibrate and install two triaxial accelerometers and four MEMS tilt meters at pile cap.
- Temporary assemble the monitoring system to collect the data during later load test.
- Provide engineering support and data collection during the lateral load test.

Title:	**Development of Operational Real-Time Kinematic Global Positioning Service for Southeastern Louisiana**
Funding Source:	**Self Generated: Army Corps of Engineers**

State Project Number:	751-99-1506		Project Start Date:		11-01-07
Research Project Number:	07-3GT		Completion Date	*(original)*	10-31-08
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Roy Dokka				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$150,000		Total		$37,297
	(revised)					
Est. Expended to Date		$112,703		Salaries		
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*			Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$112,703		Other		

PURPOSE AND SCOPE

The establishment of accurate and reliable vertical elevations in Louisiana is exceedingly critical due to the substantial impact on Flood Control, Hurricane Protection projects, and Navigation projects of rapidly changing vertical elevations due to subsidence, plate tectonics, mineral extraction, and other factors, Measurement of vertical elevations requires either very long survey level runs from a sparse network of National Geodetic survey (NGS) fixed monuments, or one-to-two days of continuous GPS observations (measurements) at a new benchmark to establish its absolute elevation.

The U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN) has identified a requirement to supplement and access enhanced services from LSU's Center for GeoInformatics GULFNet Global Positioning System (GPS) network in south Louisiana.

The project will expanded the RTK Network system and extend operational service for RTK surveying and related services throughout the Mississippi River and Atchafalaya River corridors. The north to south limits of this coverage shall be from OLD river near Simmesport to the Gulf of Mexico. To complete the RTK coverage in these corridors, LSU will establish three new CORS stations on USACE's behalf, at USACE Old River Auxiliary Control Structure, USACE Bayou Sorrel Lock Structure, and Atchafalaya DWF.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

LSU has setup two of the three additional CORS Stations and the USACE has begun using the equipment and RTK surveying services. Specifically the USACE has used the services to control construction of hurricane protection levees.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

The last CORS station will be completed, and enhanced connections to the USACE network will be finalized.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:		736-99-1438	Project Start Date:		10/01/07
Research Project Number:		07-3ST	Completion Date	*(original)*	04/30/09
Research Agency:		LSU	Completion Date	*(revised)*	
Principal Investigator:		Steve Cai, Ph.D., PE			

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$200,000	Total		$75,000
	(revised)				
Est. Expended to Date		$25,000	Salaries		$40,000
FY 2007 – 2008			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 2007 – 2008 ACCOMPLISHMENTS

1. Literature search is complete.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Perform bridge analysis.
2. Continue bridge analysis.
3. Apply post-tensioned FRP rods and data acquisition system.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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 2008 – 2009 Budget**		
Total Cost	*(original)*	$400,000		Total		$90,000
	(revised)					
Est. Expended to Date		$50,000		Salaries		$40,000
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$90,000		Equipment	*(non-expendable)*	$35,000
	(revised)			Travel		$10,000
Est. FY Expenditure		$50,000		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 2007 – 2008 ACCOMPLISHMENTS

1. Literature review and preliminary instrumentation planning.
2. Selection of two bridge sites.
3. Determine soil parameters for soft and dense soils started.
4. Preparation and planning for installation of instrumentation.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Continue the determination of soil parameters for soft and dense soils.
2. Design of integral abutments

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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:	LSU		Completion Date	*(revised)*	06/30/09
Principal Investigator:	Kun Lian				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$125,000		Total		$108,000
	(revised)					
Est. Expended to Date		$17,000		Salaries		$102,286
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$87,638		Equipment	*(non-expendable)*	
	(revised)	$17,000		Travel		$5,174
Est. FY Expenditure		$17,000		Other		

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 2007 – 2008 ACCOMPLISHMENTS

- Hired a post-doctoral research associate for the project at middle of January, 2008.
- Finished the first run of RF/Data-Acquisition/Power-Manager circuit design and element selection.
- Finished the first version alignment shell calculation and the model design.
- Customized the first pressure measurement sensor and RF unit.
- Finished preliminary feasibility tests on preliminary RF unit and pressure sensor. The results are positive.
- Identified the partner that will customize the RF/Data-Acquisition/Power-Manager for the project.
- Finalized the basic flow and elements charts for prototype RF unit.
- Finished preliminary field tests parameters for the RF unit.
- Strength/structure simulation and design for self-alignment apparatus shell.
- Preliminary calculation fop Faraday device.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Finish the alignment shell fabrication, testing, and making up experiment if necessary.
- Finalize the integration of sensor-control-measurement unit.
- Test the sensor unit in Lab.
- Finish the preliminary unit fop Faraday device.
- Look for industrial partner/partners and prepare the IDEA phase II proposal.

LTRC Annual Research Program
Fiscal Year 2008 – 2009

Title:	**Support Study to Evaluation of the Base/Subgrade Soil Under Repeated Loading**
Funding Source:	**Self Generated: 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)*	
Principal Investigator:	Drs. Murad Abu-Farsakh & Qiming Chen				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$101,251		**Total**		$58,700
	(revised)					
Est. Expended to Date		$40,000		Salaries		$58,700
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$0
FY Funds	*(original)*	$40,000		Equipment	*(non-expendable)*	$0
	(revised)			Travel		$0
Est. FY Expenditure		$40,000		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 2007 – 2008 ACCOMPLISHMENTS

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

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Conduct three cyclic loading tests inside the actuator-test box on instrumented geogrid reinforced-base pavement sections on soft silty sub grade.
- There is a possibility of conducting more small-scale repeated loading triaxial (RLT) tests.
- Continue analyzing the results of large-scale cyclic loading tests and small-scale repeated loading triaxial (RLT) test.
- Prepare a draft report.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Technology Transfer Registration Fees**
Funding Source:	**Self-Generated**

State Project Number:			Project Start Date:		07/01/08
Research Project Number:	09-TTRF		Completion Date	*(original)*	06/31/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$100,000		Total		$100,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Development of Scour Monitoring Techniques Using Fiber Optic Sensors**
Funding Source:	**FHWA – IBRD**

State Project Number:			Project Start Date:		09/30/2008
Research Project Number:			Completion Date	*(original)*	08/31/2010
Research Agency:	LSU		Completion Date	*(revised)*	
Principal Investigator:	Dr. Steve Cai				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$200,000	Total		$90,000
	(revised)				
Est. Expended to Date			Salaries		$40,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	$35,000
	(revised)		Travel		$10,000
Est. FY Expenditure			Other		$5,000

PURPOSE AND SCOPE

The proposed research aims to develop a scour monitoring system for bridge piers. The system may be used for existing or new constructed bridges. The existing equations and methods for bridge scour predictions are based primarily on laboratory research and have not been verified with field data. The developed system will collect field 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 encountered throughout 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 PROPOSED ACTIVITIES

Task 4 Conduct a state-of-the art review of all available literature, home and abroad, of all types of pier scour monitoring and protection systems.

Task 5 Submit a summary report of Task 1 review and a detailed work plan for the rest tasks based on finding of reviews.

Task 3 Develop a scour monitoring system using relatively inexpensive instrumentation and a robust, permanent sensor arrangement. It will be deployed in an economical and easily implemented sensor array that can be placed adjacent to or at some distance from structural elements of bridge piers, foundations, or abutments.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:			Project Start Date:		07/01/07
Research Project Number:			Completion Date	*(original)*	12/31/08
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Louay Mohammad				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$62,000	Total		$62,000
	(revised)				
Est. Expended to Date			Salaries		$60,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$2,000
Est. FY Expenditure			Other		

PURPOSE AND SCOPE

The objective of this study is to evaluate the laboratory performance of asphalt treated base mixture containing sulfur 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 2007 – 2008 ACCOMPLISHMENTS

FISCAL YEAR 2008 – 2009 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);
- Perform data analysis.
- Recommended provisional specifications for ATB mixtures based on preliminary findings.
- Prepare Final Report.

STP Funded
Technology Transfer
&
Education Program

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1570		Project Start Date:		07/01/08
Research Project Number:	09-1TSQ		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$1,398,000	Total		$1,398,000
	(revised)				
Est. Expended to Date			Salaries		$1,354,495
FY 2007 – 2008 Budget			Equipment	*(expendable)*	$24,255
FY Funds	*(original)*		Equipment	*(non-expendable)*	
	(revised)		Travel		$13,000
Est. FY Expenditure			Other		$6,250

PURPOSE AND SCOPE

The objectives of this study are to:

- Disseminate information on new technologies and methodologies to 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 2007 – 2008 ACCOMPLISHMENTS

- Published 8 newsletters, LTRC Annual Report, Bridge Structures Seminar documents, 2 implementation updates, 1 project capsule, and 1 technical summary.
- Publications edited: 10 final reports, 11 technical summaries, 7 project capsules, and 2 technical assistance reports.
- Videos produced were Electronic on-line bidding and profilograph presentations.
- Enhanced LTRC website and customer service features such as on-line registration for conferences and external educational classes.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Continue the production of project capsules and implementation bulletins.
- Continue publication of newsletters, project capsules, research reports, videos and LTRC Annual Report.
- Publish TTEC Brochure.
- Update LTRC Publication Guidelines.
- Planning, publication design/production, and on-line registration for 2009 LA Transportation Engineering Conference.
- Evaluate and update LTRC website appearance.
- Maintain website and on-line registration for 2009 AASHTO Subcommittee on Bridges and Structures Annual Meeting.
- Increase in estimated budget because of increase in staffing levels and salaries.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1571		Project Start Date:		07/01/08
Research Project Number:	09-1WD		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$1,039,000		Total		$1,039,000
	(revised)					
Est. Expended to Date				Salaries		$1,029,000
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

1. Developed 8 training courses, 55 recertification tests given, 167 specialty tests given, 42 certifications awarded Monitoring revised PPM 59 (Workforce Development) and noting future changes to PPM 59.
2. Scheduled and registered students for the following courses:
    - 3700 students for leadership/management/supervisory, computer based training courses.
    - 500 students for National Highway Institute Courses.
    - 1365 students in PC software courses.
    - 270 students in CADD/GIS software.
3. Approximately 4860 training opportunities provided to DOTD and transportation industry through TTEC.
4. Developed and published LTRC/TTEC Library website.
5. Coordinated the activities of 5 - ERDP participants and 30- Co-op students.

FISCAL YEAR 2008 – 2009 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.
- FY 07-08 Co-op Program increased from 10 students to FY 08-09 Co-op Program of 39 students.
- Increase in budget to reorganization of personnel within LTRC, promotions, salary increases.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1572		Project Start Date:		07/01/08
Research Project Number:	09-COOP		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$400,000	Total		$400,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

- Participation in this program increased from approximately 10 students per year to 30 students. This was due to revision in program during FY 07 that opened participation to other disciplines and eliminated the maximum number of students.
- 30 Co-op students placed in various sections across the state.
- Co-op presentations given at end of each semester.
- 3 students graduated.
- 20 students continuing in Co-op Program.
- 19 new Co-op students.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Placed 39 Co-op students in various DOTD Sections across state.
- Continue end of semester presentations.
- Retain students in co-op Program.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

State Project Number:	736-99-1569		Project Start Date:		07/01/08
Research Project Number:	09-WDC		Completion Date	*(original)*	06/30/09
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Sam Cooper				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$2,900,000		Total		$2,900,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

- Conducted 30 National Highway Institute courses (454 students).
- Conducted 181 PC software courses (1365 students).
- Conducted Project management Certification Pilot and regular courses (100 students).
- Trained 271 students on CADD/GIS software.
- 3700 students for leadership/management/supervisory and computer based training courses.
- Approximately 4860 training opportunities provided to DOTD and transportation industry through TTEC.
- Developed and published LTRC/TTEC Library website.
- Managed numerous workshops, meetings, seminars, and conferences.
- Conducted Levee school in conjunction with LSU and DNR.

FISCAL YEAR 2008 – 2009 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 2008 - 2009

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

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

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$300,000		Total		$150,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2007 – 2008 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$300,000		Equipment	*(non-expendable)*	
	(revised)			Travel		
Est. FY Expenditure		$150,000		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 2007 – 2008 ACCOMPLISHMENTS

1. Presented over 140 classes or workshops:
   - 4 road safety classes or workshops.
   - 36 Worker Safety classes.
   - 27 Infrastructure Maintenance classes.
   - 36 e-learning classes.
2. Nearly 13,000 hours of training provided.
3. Over 2,490 program participants.
4. Partnered with FHWA to present Road Safety Audit Program.
5. Managed implementation of LA Local Road Safety Program.
   - Administered selection process for $5 million in local road safety improvement projects.
   - Coordinated implementation of project awards.
   - Served on LA SHSP Implementation Team.
   - Served on Crash Data Coordinating Council Executive Committee.
6. Participated in implementation of LPESA, APWA, and ITE Professional Development programs.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Complete redesign and update of Roads Scholar and Road Master Programs.
- Design and implement local transportation asset management program.
- Continue management of Local Road Safety Program including local project implementation.
- Coordinate improvement of local crash data utilizing LDOTD; LSU; HSC and law enforcement participation.
- Complete analysis of local road safety and development local road safety profiles.
- Support APWA efforts to host 2008 National Congress in New Orleans.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

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

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$300,000		Total		$150,000
	(revised)					
Est. Expended to Date				Salaries		
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Complete redesign and update of Roads Scholar and Road Master Programs.
- Design and implement local transportation asset management program.
- Continue management of Local Road Safety Program including local project implementation.
- Coordinate improvement of local crash data utilizing LDOTD; LSU; HSC and law enforcement participation.
- Complete analysis of local road safety and development local road safety profiles.

Support APWA efforts to host 2008 National Congress in New Orleans.

Other Funded Projects

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**LADOTD Pavement Management System: Development of Uniform Sections for PMS Inventory and Applications**
Funding Source:	**SPR – Part I**

State Project Number:	736-99-1342		Project Start Date:		10/01/06
Research Project Number:	04-2P		Completion Date	*(original)*	09/30/08
Research Agency:	LTRC		Completion Date	*(revised)*	
Principal Investigator:	Dr. Mohammad Jamal Khattak				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$173,183	Total		$30,213
	(revised)				
Est. Expended to Date		$142,970	Salaries		$23,353
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$91,175	Equipment	*(non-expendable)*	
	(revised)		Travel		$977
Est. FY Expenditure		$90,590	Other		$5,883

PURPOSE AND SCOPE

In October 2003, a review team comprised of LADOTD employees and the Federal Highway Administration (FHWA) was tasked with assessing and evaluating the effectiveness of the PMS. The team concluded that the various functional sections of LADOTD did not effectively use the PMS as a whole due to the gap between the output of the PMS and the department users' needs. Some formality issues also need to be addressed. The main objective of this project is to find the most cost effective way to incorporate the PMS into LADOTD's regular operation and make the information in the PMS usable for engineers within the department (especially for district level personnel who schedule construction and maintenance activities). The tasks include:

- Evaluation of the Current Status of the LADOTD PMS. This includes the review and examination of the Current PMS practices, conduct departmental survey to identify the needs of the PMS users, and identification of available source of pavement data.
- Development of a PMS Roadway Identification System. This includes a review of the existing reference location systems and to establish a linkage between the systems in a way that is acceptable by the users.
- Update Pavement Performance Models. This includes a comprehensive assessment and development of the pavement performance models embedded in the PMS software for all pavement types and the treatment selection models used by LADOTD.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Reviewed the current practices of PMS within the state.
- Analyzed and documented the results of interviews and the district Survey.
- Evaluated the existing distress deduct points, calibrated and recommended a scheme of deduct points.
- Reviewed of the existing reference location systems and recommended the linkage of the systems using the existing software.
- Prepared, revised and submitted the Interim report.
- Review of existing pavement deterioration and treatment selection models in progress.
- Data sorting and analysis for the calibration and development of index based pavement deterioration models in progress. Analysis and recommendation on the pavement treatment selection models in progress.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

- Data sorting and analysis for the calibration and development of index based pavement deterioration models.
- Analysis and recommendation on the pavement treatment selection models.
- Preparation of Final Report.

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)*	08/31/08
Principal Investigator:	Dr. Ishak, Dr. Wolshon, and Dr. Sun				

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$330,013	**Total**		$15,000
	(revised)				
Est. Expended to Date		$315,000	Salaries		$15,000
FY 2007 – 2008 Budget			Equipment	*(expendable)*	
FY Funds	*(original)*	$0	Equipment	*(non-expendable)*	
	(revised)	$88,000	Travel		
Est. FY Expenditure		$88,000	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. More specifically, this research study will achieve the following objectives:

1. Monitor and study the traffic behavior and compliance rates for both cars and trucks on the study segment.
2. Conduct detailed crash analysis for the study segment before and after the implementation of such policies, as well as make comparative analysis with other similarly elevated sites.
3. Conduct an opinion survey to probe the perception of truckers, motorists, and law enforcement officials to the new policies.
4. Make final recommendations to the DOTD on the safety impact of existing policies and further possible modifications as appropriate.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

- Literature review was completed and summarized.
- Crash analysis was completed using crash data before and after the implementation of the lane restriction and speed differential policies and comparisons were made between the accident characteristics at the Atchafalaya section and other similarly elevated sections.
- Four RTMS units at the study section were installed and traffic data (counts, classification, speed, and lane occupancy) was collected continuously from June, 2007 to the end of September, 2007.
- A survey was mailed out to nearly 600 trucking companies to get their feedback on the lane restriction and speed limit reduction for trucks. A total of 159 responses were received back. Statistical analysis of the survey results is currently underway.
- A comprehensive statistical analysis was conducted on the traffic data to examine the truck's compliance to the imposed policies at each of the four sites.

FISCAL YEAR 2008– 2009 PROPOSED ACTIVITIES

- The study results will be documented in a final report to LTRC, followed by a final presentation of the study conclusions and recommendations.

LTRC Annual Research Program
Fiscal Year 2008 - 2009

Title:	**Safety Improvement from Edge Lines of Rural Two-Lane Highway**
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 2008 – 2009 Budget**		
Total Cost	*(original)*	$107,060		Total		$57,123
	(revised)					
Est. Expended to Date		$20,000		Salaries		$45.028
FY 2007 – 2008 Budget				Equipment	*(expendable)*	$1,500
FY Funds	*(original)*	$22,095		Equipment	*(non-expendable)*	
	(revised)			Travel		$1,600
Est. FY Expenditure		$20,000		Other		$8,995

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 2007 – 2008 ACCOMPLISHMENTS

1. Finished the literature reviewing on the highway network screening methods.
2. Performed the crash data analysis with the selected methods.
3. Identified segments of narrow rural/urban 2-lane highways that will be benefited most by implementing pavement edge lines.
4. Presented the results to all LaDOTD districts for next the step of the project.

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

1. Implementing pavement edge lines on the selected segments by all districts.
2. Performing detailed crash data analysis for the before periods (crash characteristics, timing, and vehicle type).

LTRC Annual Research Program
Fiscal Year 2008 - 2009

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

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

BUDGET STATUS

Total Budget			**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$200,000	Total		$200,000
	(revised)				
Est. Expended to Date			Salaries		
FY 2007 – 2008 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 2007 – 2008 ACCOMPLISHMENTS

FISCAL YEAR 2008 – 2009 PROPOSED ACTIVITIES

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

State Project Number:	766-99-1510		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:	Chester Wilmot				

BUDGET STATUS

Total Budget				**Estimated FY 2008 – 2009 Budget**		
Total Cost	*(original)*	$140,858		**Total**		$15,000
	(revised)					
Est. Expended to Date		$15,000		Salaries		$8,000
FY 2008 – 2009 Budget				Equipment	*(expendable)*	
FY Funds	*(original)*	$15,000		Equipment	*(non-expendable)*	$2,000
	(revised)			Travel		
Est. FY Expenditure		$15,000		Other (subcontract)		$5,000

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 2008 - 2009 is the estimated cost for the beach elevation survey.

FISCAL YEAR 2007 – 2008 ACCOMPLISHMENTS

Kickoff meeting and 1 Beach elevation survey event will have taken place before June 2008. Project meeting and coordination as needed.

FISCAL YEAR 2008- 2009 PROPOSED ACTIVITIES

1 Beach elevation survey and project management and coordination as needed.