LEGISLATIVE APPROPRIATIONS REQUEST

For Fiscal Years 2028 and 2029

Submitted to the
Office of the Governor, Budget and Policy Division
and the Legislative Budget Board

by

Texas A&M Transportation Institute

August 14, 2026


Texas A&M
Transportation
Institute

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The Texas A&M University System

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Schedules Not Included

For the schedules identified below, Texas A&M Transportation Institute either has no information to report or the schedule is not applicable. Accordingly, these schedules have been excluded from the Texas A&M Transportation Institute Legislative Appropriations Request for the FY 2028-2029 biennium.

Number	Name
3.C.	Rider Appropriations and Unexpended Balances Request
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Schedule 1B	Health Related Institutions Patient Income
Schedule 2	Selected Educational, General, and Other Funds
Schedule 8A	Proposed Tuition Revenue Bond Projects
Schedule 8B	Tuition Revenue Bond Issuance History

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Schedules Not Included

For the schedules identified below, Texas A&M Transportation Institute either has no information to report or the schedule is not applicable. Accordingly, these schedules have been excluded from the Texas A&M Transportation Institute Legislative Appropriations Request for the FY 2028-2029 biennium.

Number	Name
Schedule 8C	Tuition Revenue Bond Request by Project
Schedule 9	Non-Formula Support Information

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THE IMPACT OF THE TEXAS A&M TRANSPORTATION INSTITUTE

Virtually every mile of roadway in Texas, as well as every major transit system in Texas, has been positively affected by Texas A&M Transportation Institute (TTI) research. TTI's mission is to deliver practical, innovative, and sustainable solutions to improve the movement of people, data, and goods through research, education, and technology transfer. For over 75 years, TTI has addressed complex transportation challenges and opportunities with innovation, objectivity, and unmatched technical expertise. The results of TTI's extensive research findings have provided innovative strategies and programs that have saved the State of Texas and the United States billions of dollars and tens of thousands of lives.

TTI researchers are leading the development of transportation solutions for emerging and disruptive changes currently underway in the transportation arena , ensuring Texas is a national transportation leader in automated and connected vehicles, infrastructure, safety, and supply chain management. Research in these evolving and emerging areas helps Texas build upon its strong position as the economic growth engine of our nation . As the state population continues to grow, the burden on transportation system also grows. The need for innovative transportation solutions has never been greater than it is today, and proper funding from the Legislature is critical to ensure Texas remains successful in this rapidly changing environment.

Widely recognized as the largest and most respected higher education-affiliated transportation research institute in the nation, TTI conducts over 700 research projects each year for more than 200 customers at all levels of government and the private sector. TTI supports its principal customer, the Texas Department of Transportation (TxDOT), through research agreements to develop innovations and improvements for the state's transportation system .

With headquarters and laboratories on the Texas A&M-RELLIS campus in Bryan, TTI maintains several research and testing facilities, including roadside safety and physical security, visibility, infrastructure, driving simulation, a smart intersection, and environmental testing facilities. Additionally, researchers at TTI's eight urban offices around the state work with local and regional transportation jurisdictions to develop localized solutions and implement new and innovative research results .

The General Revenue funds requested for FY 2028-2029 will be used to attract and retain premier expertise necessary to meet the needs of Texans. Funding also meets matching requirements for both existing and new national centers that can bring significant non-state funds to Texas, which are reflected as federal funds in TTI's bill pattern. Demonstrating the state's support for current and potential national centers of excellence is critical for TTI to ensure continued success in bringing federal transportation research dollars to Texas to benefit all Texans.

EXCEPTIONAL ITEM REQUEST – PRIORITY 1

Ready the Roads: Tackling Emerging Transportation Issues

Request: $10.0 million for the biennium ($5 million for FY28/$5 million for FY29)

Texas A&M Transportation Institute (TTI) requests $10 million to help Texas keep pace with emerging and rapidly evolving transportation technologies and to ensure that Texas-driven solutions remain the benchmark for safe, efficient, and forward-looking innovation across the nation. The Texas A&M System has supported TTI with $8.8 million in Permanent University Funds (PUF) for research equipment, facilities purchases, and enhancements. The impact of the PUF investment will be accelerated and magnified with this complementary investment in funding TTI's workforce, allowing them to advance in rapidly emerging and evolving transportation areas and technologies.

The funding request of $10 million will be used to recruit and retain exceptional innovators in rapidly emerging and evolving transportation areas and technologies to shape the future of infrastructure and technology integration. Additionally, these funds will support hiring students to work alongside TTI researchers, building the workforce leadership and training necessary for students and the next generation of overseers of the largest transportation system in the country . This funding would enable TTI to deliver transportation solutions that reduce congestion, develop safer roadway designs, improve infrastructure, and create new tools for managing freight movement.

Transportation is changing rapidly. Artificial intelligence, automation, connected infrastructure, advanced communications, autonomous systems, and real-time data technologies are reshaping how people and goods move. These changes require new capabilities to safely deploy and manage the next generation transportation system.

Other states, universities, and companies are competing for the same skilled workforce and funding, putting Texas at risk of losing expertise and falling behind in transportation innovation. This can result in Texas being forced to adopt technological solutions developed in places like California and New York.
TTI's General Revenue funding from the state has not kept pace with needs to develop the next generation of transportation research engineers nor provided research scientists and engineers with the research equipment needed to do their jobs. Moreover, TTI is an independent, standalone agency that does not receive foundational funding from Texas A&M University, TxDOT, Prop 1, Prop 7, or any other state transportation funding source. The ability of TTI to obtain external funding has been hampered because of these challenges.

EXCEPTIONAL ITEM REQUEST – PRIORITY 2

Restore the 3% General Revenue Baseline Reduction

Request: $579,256 for the biennium ($289,628 for FY28/$289,628 for FY29)

The 3% general revenue baseline reduction will reduce the scope of the Center for International Intelligent Transportation, Transportation Safety Center, and TTI's research program and operations. These funds are critical to TTI's research program and are leveraged to obtain federal and other research funding. We respectfully request restoration of funding to ensure TTI remains positioned to address the state's growing transportation needs. As Texas continues to expand, the widening imbalance between agency resources and responsibilities reduces TTI's ability to provide border transportation support, transportation safety outreach, and manage the agency's research.

CONTRIBUTIONS TO THE TEXAS LEGISLATURE

The Legislature regularly calls upon TTI's expertise on a broad range of policy topics, including potential financial impacts of transportation policy decisions, freight, congestion, safety, and technology. TTI addresses specific topic areas of state interest, bringing together engineering, finance, economics, technology, policy, and public engagement experts from within TTI, the broader Texas A&M System, other institutions of higher education, and the private sector.

The challenges and changes the state will experience in future years – from the increasing importance of transportation information to help guide decision-making, to the introduction of connected and autonomous technologies, to evolving traffic pattern changes in personal and freight travel, to changes in the way many vehicles are powered, to continued transportation infrastructure and funding challenges – all have enormous implications for transportation policy and practice.

TEXAS A&M UNIVERSITY SYSTEM-WIDE FUNDING ISSUES AND NEEDS

A robust higher education sector is key to long-term economic growth and resiliency through a well-educated and prepared workforce. With a direct presence in all 254 Texas counties, Texas A&M System agencies offer research, training, and service to the state's citizens, to improve the social, economic, educational, and health status of Texans. These agencies also play a critical role in supporting statewide disaster preparedness and response, from natural disasters such as wildfires and hurricanes to the coronavirus pandemic.

Thank you for the investment you have made in our agency employees by providing state-wide pay raises which included the A&M System agencies. This investment in employee salaries has made a significant difference in our ability to recruit and retain employees, but sustainable base funding to keep up with growth continues to be an issue as agencies face steep cost increases in every area, from employee health insurance to fuel to labor costs.
We request continued investment in higher education and the A&M System agencies to ensure we maintain our ability to serve our rapidly growing state. Key agency funding issues are detailed below:

Base Funding – The A&M System agencies are continuously tapped to help meet Texas' needs not only for emergency preparedness and response to hurricanes, tornados, flooding, wildfires, the pandemic and other events, but also in fulfilling their ongoing research and service missions to improve the lives of Texans. While base funding is provided to institutions of higher education by the state through both formula and non-formula support, there is no mechanism to provide base funding to our agencies or to address increased need for their services as the state's population grows. These agencies are rapidly reaching the point where they cannot keep up. While funding provided last session was valuable, the agencies continue to face turnover, difficulty in attracting qualified applicants, high fuel costs, and high inflation for other operating costs and needed equipment.

Restoration of 3% Reductions – The Texas A&M University System is building extraordinary momentum in support of the state of Texas, leveraging the collective strength of its universities and state agencies to expand educational opportunity, fuel economic growth, and address critical challenges facing Texans. However, reductions in base funding threaten to slow this momentum, reducing the services provided to our students, regional communities, industries, and citizens across the state. To continue fulfilling their missions and meeting the growing needs of Texas, our institutions and agencies have included an exceptional item request to restore these cuts for the upcoming biennium and discuss the impacts in their LARs. We respectfully request that this funding be restored.

Higher Education Group Health Insurance – Declining state support for our employees' health insurance over the last several biennia has become a direct cost to our agencies to cover these additional costs. We request funding to cover increases in covered enrollments and in health care costs. We also request restoration of the gap in funding for our employees compared to state employees in the ERS group plan. Additional funding to cover the state's proportional share of our health insurance will help us keep costs lower and preserve vital programs and services for the people of Texas.

SUMMARY

For the FY 2028-2029 biennium, TTI seeks to establish robust transportation solution competencies currently lacking in Texas. To meet these goals, the agency seeks to increase its research expenditures, research collaboration, the number of researchers and students participating in the research program, and the number of research products implemented. State funds are essential to TTI's ability to anticipate emerging transportation issues, compete for external funding, and maintain research equipment and facilities.

TTI appreciates the Legislature's continued support for the research programs conducted by the Texas A&M Transportation Institute for the benefit of the people of

Texas. The investment of state resources has paid significant returns to Texas in terms of lives, time, money, and resources saved. TTI will continue to be a good steward of state resources.

INDIRECT COST RECOVERY EARNED BY TEXAS A&M TRANSPORTATION INSTITUTE

In compliance with Section 29, Article III Special Provisions Relating Only to State Agencies of Higher Education, General Appropriations Act, indirect cost recovery revenue earned on TTI sponsored research contracts for the last full year (FY 2025), including amounts collected by Texas A&M Sponsored Research Services (SRS) is as follows:

Fiscal Year 2025

Total Indirect Cost Recovery.....$17,882,899

Background Checks – Texas Government Code 411.094 permits institutions of higher education to use the following sources to obtain criminal history record information: the Texas Department of Public Safety's Crime Records Service-Public Site or any other publicly available local, state or federal source. TTI, using this authority, performs a background check on all candidates for employment and on all existing employees that transfer into a security-sensitive position.

TTI's Presence

EXTENDS TO ALL 254 COUNTIES IN TEXAS

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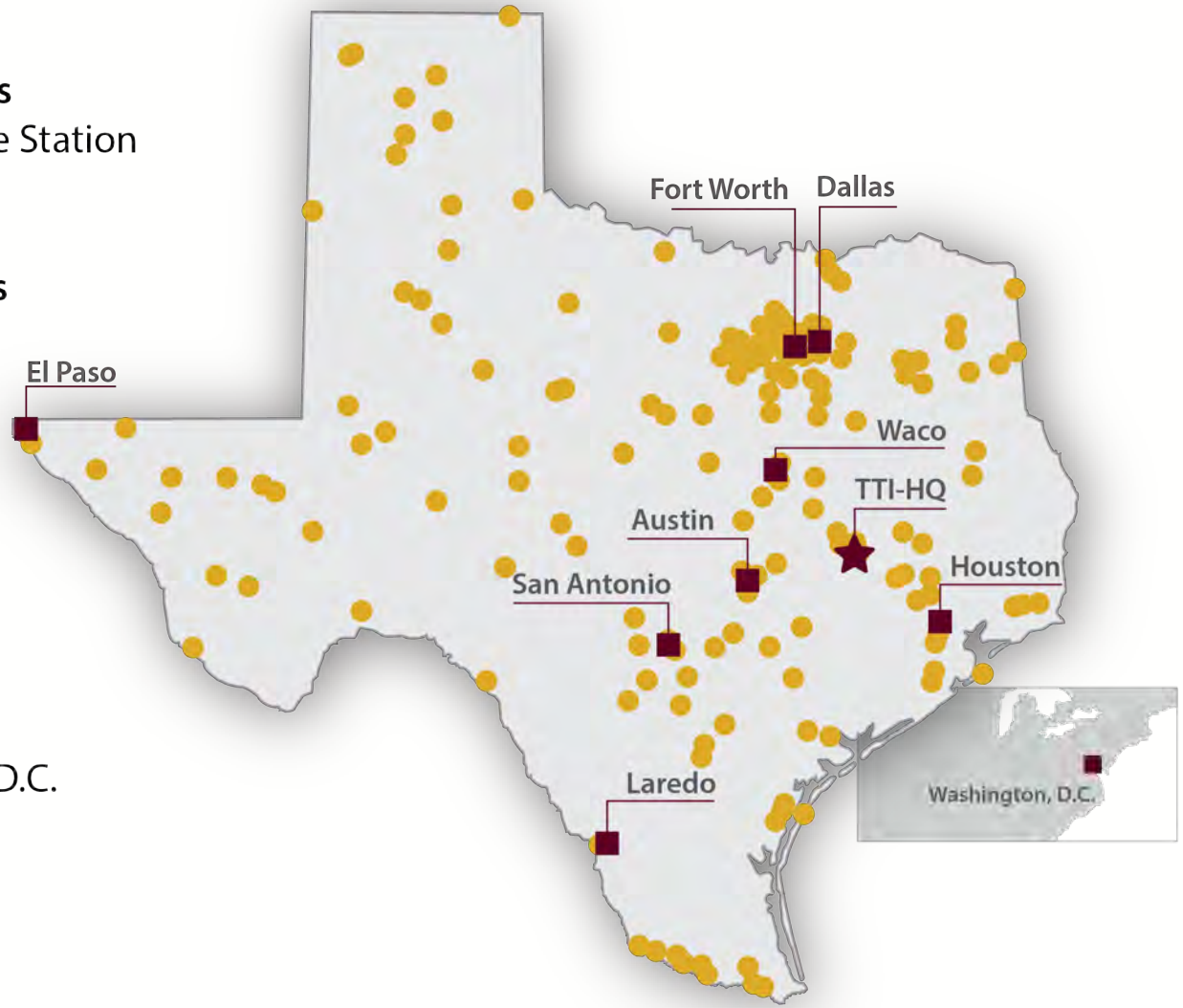
LOCATIONS

Headquarters
Bryan/College Station

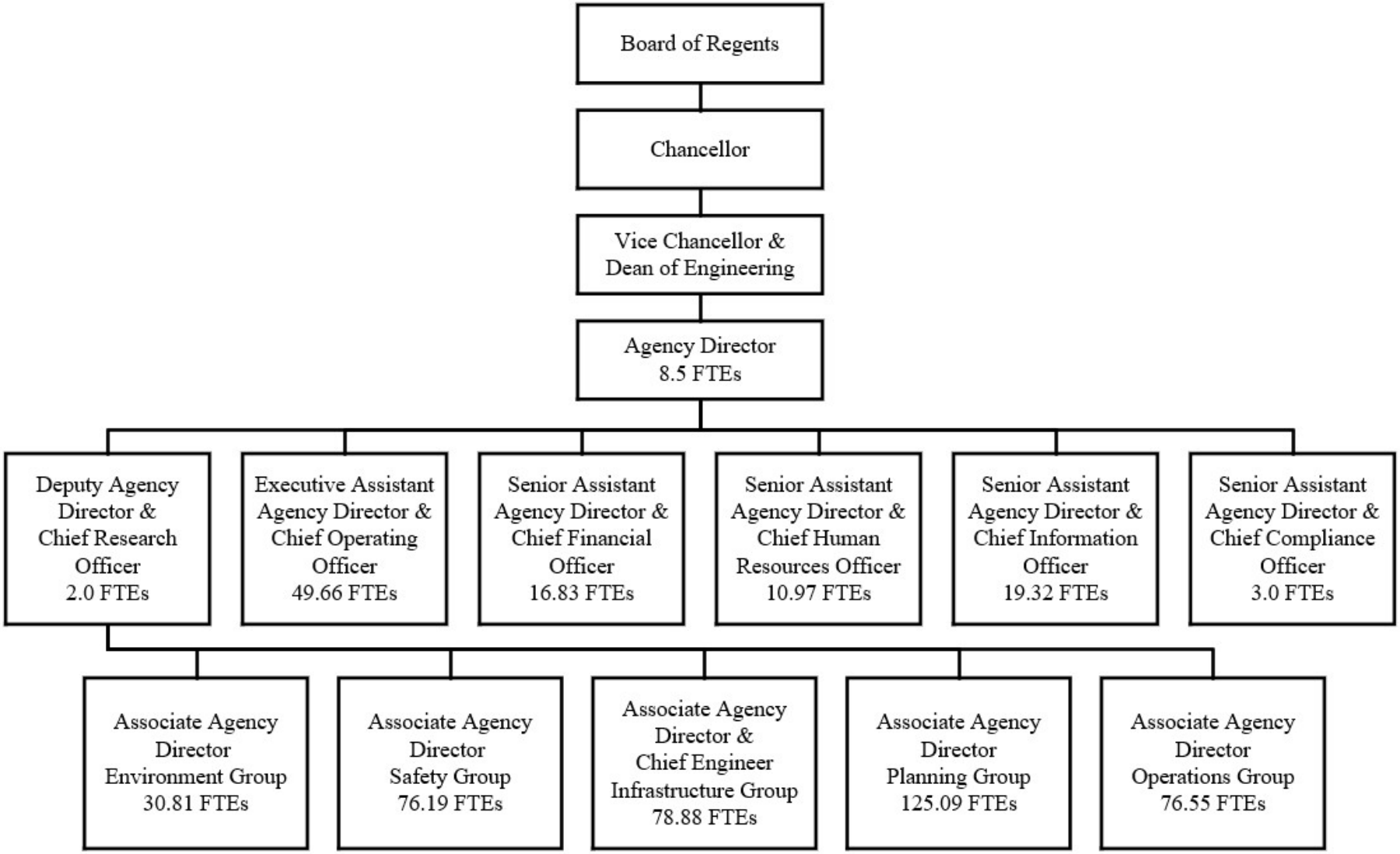
Urban Offices
Austin
Dallas
El Paso
Fort Worth
Houston
Laredo
San Antonio
Waco

Washington, D.C.

TTI Presence



Texas A&M Transportation Institute
Organizational Chart



Texas A&M Transportation Institute
Organizational Chart Position Descriptions

The Agency Director oversees the Texas A&M Transportation Institute. This position provides administrative leadership in support of TTI's mission of conducting research, transferring technology and providing professional education to develop next generation talent for the transportation profession. This position also oversees the agency's compliance program, state relations, scientific integrity initiatives and university transportation center programs.

The Deputy Agency Director & Chief Research Officer is responsible for the research programs of the agency, including research execution, sponsor relations, technology commercialization and workforce development. This position also serves as the Center Director for the Center for Efficient Mobility.

The Executive Assistant Agency Director & Chief Operating Officer is responsible for the business operations programs of the agency, including events management program; marketing & communications; facilities safety and support; and research administration functions.

The Senior Assistant Agency Director & Chief Financial Officer is responsible for the agency's financial operations.

The Senior Assistant Agency Director & Chief Human Resources Officer is responsible for the agency's human resources and people operations function.

The Senior Assistant Agency Director & Chief Information Officer is responsible for the agency's information technology function.

The Associate Agency Director for Environment is responsible for the air quality, energy and health research program.

The Associate Agency Director for Safety oversees research programs and facilities related to roadside safety and physical security and the agency's transportation safety center.

The Associate Agency Director and Chief Engineer for Infrastructure oversees research programs related to the materials and pavements research program and facilities and construction, geotechnical and structures research.

The Associate Agency Director for Planning oversees research programs related to transportation planning, policy, economic and environmental issues, and the center for ports and waterways. As part of that responsibility, the Associate Agency Director also oversees TTI's urban offices located in Austin and Laredo.

The Associate Agency Director for Operations oversees research programs related to transportation operations. As part of that responsibility, the Associate Agency Director oversees TTI's urban offices located in Dallas, Fort Worth, Houston, Waco, San Antonio and El Paso.

CERTIFICATE

Agency Name Texas A&M Transportation Institute

This is to certify that the information contained in the agency Legislative Appropriations Request filed with the Legislative Budget Board (LBB) and the Office of the Governor, Budget and Policy Division, is accurate to the best of my knowledge and that the electronic submission to the LBB via the Automated Budget and Evaluation System of Texas (ABEST) and the PDF file submitted via the LBB Document Submission application are identical.

Additionally, should it become likely at any time that unexpended balances will accrue for any account, the LBB and the Office of the Governor will be notified in writing in accordance with Senate Bill 1, Article IX, Section 7.01, Eighty-ninth Legislature, Regular Session, 2025.

Chief Executive Office or Presiding Judge

Gregory D. Winfree

Signature

Gregory D. Winfree, J.D.

Printed Name

Agency Director

Title

July 29, 2026

Date

Board or Commission Chair

Signature

Robert L. Albritton

Printed Name

Chairman - Board of Regents

Title

08/05/2026

Date

Chief Financial Officer

Tyler Theobald

Signature

Tyler Theobald

Printed Name

Senior Assistant Agency Director and CFO

Title

July 29, 2026

Date

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Appropriation Years: 2028-29

	GENERAL REVENUE FUNDS		GR DEDICATED		FEDERAL FUNDS		OTHER FUNDS		ALL FUNDS		EXCEPTIONAL ITEM FUNDS
	2026-27	2028-29	2026-27	2028-29	2026-27	2028-29	2026-27	2028-29	2026-27	2028-29	2028-29
Goal: 1. Transportation Research, Dissemination & Transportation Education											
1.1.1. Sponsored Research	4,399,280	5,567,820			56,452,185	58,735,759	128,428,397	133,625,046	189,279,862	197,928,625	10,039,470
1.1.2. National Centers	3,287,000	3,184,484			7,358,548	7,656,133	1,125,677	1,171,170	11,771,225	12,011,787	97,516
Total, Goal	**7,686,280**	**8,752,304**			**63,810,733**	**66,391,892**	**129,554,074**	**134,796,216**	**201,051,087**	**209,940,412**	**10,136,986**
Goal: 2. Indirect Administration											
2.1.1. Indirect Administration	14,644,598	9,976,976					9,688,880	13,588,219	24,333,478	23,565,195	442,270
2.1.2. Infrastructure Support	1,620,000						1,936,221		3,556,221		
Total, Goal	**16,264,598**	**9,976,976**					**11,625,101**	**13,588,219**	**27,889,699**	**23,565,195**	**442,270**
Goal: 3. Staff Benefits Contributions											
3.1.1. Staff Group Insurance					3,171,063	3,295,969	8,047,740	8,364,734	11,218,803	11,660,703	
Total, Goal					**3,171,063**	**3,295,969**	**8,047,740**	**8,364,734**	**11,218,803**	**11,660,703**	
Total, Agency	**23,950,878**	**18,729,280**			**66,981,796**	**69,687,861**	**149,226,915**	**156,749,169**	**240,159,589**	**245,166,310**	**10,579,256**
Total FTEs									**498.0**	**498.0**	**18.0**

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Goal / *Objective* / STRATEGY	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
1 Transportation Research, Dissemination & Transportation Education					
1 *Increase Transportation Research Volume*					
1 SPONSORED RESEARCH	80,861,815	93,115,315	96,164,547	98,012,031	99,916,594
2 NATIONAL CENTERS	4,309,386	5,845,958	5,925,267	5,962,194	6,049,593
TOTAL, GOAL 1	**$85,171,201**	**$98,961,273**	**$102,089,814**	**$103,974,225**	**$105,966,187**
2 Indirect Administration					
1 *Indirect Administration*					
1 INDIRECT ADMINISTRATION	9,546,077	12,740,102	11,593,376	11,715,329	11,849,866
2 INFRASTRUCTURE SUPPORT (1)	1,560,647	1,748,710	1,807,511	0	0
TOTAL, GOAL 2	**$11,106,724**	**$14,488,812**	**$13,400,887**	**$11,715,329**	**$11,849,866**
3 Staff Benefits Contributions					
1 *Staff Benefits Contributions*					
1 STAFF GROUP INSURANCE	5,202,500	5,559,367	5,659,436	5,772,626	5,888,077

(1) - Formula funded strategies are not requested in 2028-29 because amounts are not determined by institutions.

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Goal / *Objective* / STRATEGY	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
TOTAL, GOAL 3	**$5,202,500**	**$5,559,367**	**$5,659,436**	**$5,772,626**	**$5,888,077**
TOTAL, AGENCY STRATEGY REQUEST	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**
TOTAL, AGENCY RIDER APPROPRIATIONS REQUEST*				**$0**	**$0**
GRAND TOTAL, AGENCY REQUEST	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**

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Goal / *Objective* / STRATEGY	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
METHOD OF FINANCING:					
General Revenue Funds:					
1 General Revenue Fund	11,951,940	11,975,439	11,975,439	9,364,640	9,364,640
SUBTOTAL	**$11,951,940**	**$11,975,439**	**$11,975,439**	**$9,364,640**	**$9,364,640**
Federal Funds:					
555 Federal Funds	20,786,897	33,159,305	33,822,491	34,498,941	35,188,920
SUBTOTAL	**$20,786,897**	**$33,159,305**	**$33,822,491**	**$34,498,941**	**$35,188,920**
Other Funds:					
666 Appropriated Receipts	5,306,214	5,932,358	6,051,010	6,172,030	6,295,471
777 Interagency Contracts	45,552,475	48,782,204	49,757,848	50,753,004	51,768,064
8089 Indirect Cost Recov, Loc Held, est	17,882,899	19,160,146	19,543,349	20,673,565	21,087,035
SUBTOTAL	**$68,741,588**	**$73,874,708**	**$75,352,207**	**$77,598,599**	**$79,150,570**
TOTAL, METHOD OF FINANCING	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**

*Rider appropriations for the historical years are included in the strategy amounts.

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
GENERAL REVENUE					
1 General Revenue Fund					
REGULAR APPROPRIATIONS					
Regular Appropriations from MOF Table (2024-25 GAA)	$12,245,926	$0	$0	$0	$0
Regular Appropriations from MOF Table (2026-27 GAA)	$0	$11,975,439	$11,975,439	$0	$0
Regular Appropriations from MOF Table (2028-29 REQ)	$0	$0	$0	$9,364,640	$9,364,640
RIDER APPROPRIATION					
Art IX, Section 18.61, 88th Leg, Regular Session	$132,500	$0	$0	$0	$0
Comments: Funding contingent on the enactment of SB 1500					
LAPSED APPROPRIATIONS					
Regular Appropriations from MOF Table (2024-25 GAA)	$(293,986)	$0	$0	$0	$0

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
GENERAL REVENUE					
Comments: Excess budget return of Appropriation 10727 statewide salary support					
Art IX, Section 18.61, 88th Leg, Regular Session	$(132,500)	$0	$0	$0	$0
Comments: Texas A&M Transportation Institute was ultimately removed from the final version of SB 1500					
TOTAL, General Revenue Fund	**$11,951,940**	**$11,975,439**	**$11,975,439**	**$9,364,640**	**$9,364,640**
TOTAL, ALL GENERAL REVENUE	**$11,951,940**	**$11,975,439**	**$11,975,439**	**$9,364,640**	**$9,364,640**
FEDERAL FUNDS					
555 Federal Funds					
REGULAR APPROPRIATIONS					
Regular Appropriations from MOF Table (2024-25 GAA)	$14,834,321	$0	$0	$0	$0
Regular Appropriations from MOF Table (2026-27 GAA)	$0	$21,174,659	$21,598,152	$0	$0

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
FEDERAL FUNDS					
Regular Appropriations from MOF Table (2028-29 REQ)	$0	$0	$0	$34,498,941	$35,188,920
RIDER APPROPRIATION					
Art IX, Sec 13.01, Federal Funds/Block Grants (2024-25 GAA)	$5,952,576	$0	$0	$0	$0
Art IX, Sec 13.01, Federal Funds/Block Grants (2026-27 GAA)	$0	$11,984,646	$12,224,339	$0	$0
TOTAL, Federal Funds	**$20,786,897**	**$33,159,305**	**$33,822,491**	**$34,498,941**	**$35,188,920**
TOTAL, ALL FEDERAL FUNDS	**$20,786,897**	**$33,159,305**	**$33,822,491**	**$34,498,941**	**$35,188,920**
OTHER FUNDS					
666 Appropriated Receipts					
REGULAR APPROPRIATIONS					
Regular Appropriations from MOF Table (2024-25 GAA)	$8,766,850	$0	$0	$0	$0

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
OTHER FUNDS					
Regular Appropriations from MOF Table (2026-27 GAA)	$0	$5,886,218	$6,003,942	$0	$0
Regular Appropriations from MOF Table (2028-29 REQ)	$0	$0	$0	$6,172,030	$6,295,471
RIDER APPROPRIATION					
Art IX, Sec 8.02, Reimbursements and Payments (2024-25 GAA)	$(3,460,636)	$0	$0	$0	$0
Art IX, Sec 8.02, Reimbursements and Payments (2026-27 GAA)	$0	$46,140	$47,068	$0	$0
TOTAL, Appropriated Receipts	**$5,306,214**	**$5,932,358**	**$6,051,010**	**$6,172,030**	**$6,295,471**
777 Interagency Contracts					
REGULAR APPROPRIATIONS					
Regular Appropriations from MOF Table (2024-25 GAA)	$28,566,499	$0	$0	$0	$0

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
OTHER FUNDS					
Regular Appropriations from MOF Table (2026-27 GAA)	$0	$38,908,664	$39,686,837	$0	$0
Regular Appropriations from MOF Table (2028-29 REQ)	$0	$0	$0	$50,753,004	$51,768,064
RIDER APPROPRIATION					
Art IX, Sec 8.02, Reimbursements and Payments (2024-25 GAA)	$16,985,976	$0	$0	$0	$0
Art IX, Sec 8.02, Reimbursements and Payments (2026-27 GAA)	$0	$9,873,540	$10,071,011	$0	$0
TOTAL, Interagency Contracts	**$45,552,475**	**$48,782,204**	**$49,757,848**	**$50,753,004**	**$51,768,064**
8089 Indirect Cost Recovery, Locally Held, estimated					
REGULAR APPROPRIATIONS					
Regular Appropriations from MOF Table (2024-25 GAA)	$15,124,947	$0	$0	$0	$0

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
OTHER FUNDS					
Regular Appropriations from MOF Table (2026-27 GAA)	$0	$18,489,858	$18,829,176	$0	$0
Regular Appropriations from MOF Table (2028-29 REQ)	$0	$0	$0	$20,673,565	$21,087,035
BASE ADJUSTMENT					
Revised Receipts	$2,757,952	$670,288	$714,173	$0	$0
TOTAL, Indirect Cost Recovery, Locally Held, estimated	**$17,882,899**	**$19,160,146**	**$19,543,349**	**$20,673,565**	**$21,087,035**
TOTAL, ALL OTHER FUNDS	**$68,741,588**	**$73,874,708**	**$75,352,207**	**$77,598,599**	**$79,150,570**
GRAND TOTAL	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
FULL-TIME-EQUIVALENT POSITIONS					
REGULAR APPROPRIATIONS					
Regular Appropriations from MOF Table (2024-25 GAA)	438.0	0.0	0.0	0.0	0.0
Regular Appropriations from MOF Table (2026-27 GAA)	0.0	438.0	438.0	0.0	0.0
Regular Appropriations from MOF Table (2028-29 REQ)	0.0	0.0	0.0	498.0	498.0
RIDER APPROPRIATION					
Art IX, Sec 6.10(b), Board or Administrator FTE Adjustment (2024-25 GAA) **Comments:** On 12/17/2024, the FTE report that exceeded the FTE limitations was approved. The additional FTEs are necessary due to an increase in sponsored research grants and contracts. It should be noted that these employees are funded from external research sponsors and not by general revenue. The proposed additional FTEs are necessary because the increased workload resulting from additional sponsored research contracts exceeds the workload capacity of the previous staffing levels.	43.8	0.0	0.0	0.0	0.0
Art IX, Sec 6.10(b), Board or Administrator FTE Adjustment (2026-27 GAA) **Comments:** On 12/17/2024, the FTE report that exceeded the FTE limitations was approved. The additional FTEs are necessary due to an increase in sponsored research grants and contracts. It should be noted that these employees are funded from external research sponsors and not by general revenue. The proposed additional FTEs are necessary because the increased workload resulting from additional sponsored research contracts exceeds the workload capacity of the previous staffing levels.	0.0	43.8	43.8	0.0	0.0

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

METHOD OF FINANCING	Exp 2025	Est 2026	Bud 2027	Req 2028	Req 2029
UNAUTHORIZED NUMBER OVER (BELOW) CAP					
Unauthorized FTE's Over (Below) Cap	16.0	16.2	16.2	0.0	0.0
TOTAL, ADJUSTED FTES	**497.8**	**498.0**	**498.0**	**498.0**	**498.0**

NUMBER OF 100% FEDERALLY FUNDED FTEs

727 Texas A&M Transportation Institute

OBJECT OF EXPENSE	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
1001 SALARIES AND WAGES	$55,861,860	$65,680,081	$67,024,112	$67,370,564	$68,618,036
1002 OTHER PERSONNEL COSTS	$12,119,804	$13,582,053	$13,909,406	$14,138,899	$14,414,279
2001 PROFESSIONAL FEES AND SERVICES	$145,826	$167,929	$173,424	$176,755	$180,189
2002 FUELS AND LUBRICANTS	$13,333	$15,353	$15,856	$16,161	$16,475
2003 CONSUMABLE SUPPLIES	$574,782	$665,286	$685,117	$698,041	$711,457
2004 UTILITIES	$507,563	$586,682	$603,923	$615,398	$627,240
2005 TRAVEL	$1,626,758	$1,888,180	$1,941,136	$1,977,397	$2,015,149
2006 RENT - BUILDING	$1,365,167	$1,646,680	$1,691,192	$1,723,052	$1,755,966
2007 RENT - MACHINE AND OTHER	$2,266,346	$2,647,733	$2,702,687	$2,752,337	$2,803,858
2009 OTHER OPERATING EXPENSE	$22,762,036	$27,250,473	$27,364,511	$26,857,999	$27,326,110
5000 CAPITAL EXPENDITURES	$4,236,950	$4,879,002	$5,038,773	$5,135,577	$5,235,371
OOE Total (Excluding Riders)	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**
OOE Total (Riders)					
Grand Total	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**

2.D. Summary of Base Request Objective Outcomes

90th Regular Session, Agency Submission, Version 1
Automated Budget and Evaluation system of Texas (ABEST)

727 Texas A&M Transportation Institute

Goal/ *Objective* / **Outcome**	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
1 Transportation Research, Dissemination & Transportation Education					
1 Increase Transportation Research Volume					
KEY 1 Total Dollar Volume of Sponsored Research Expenditures (Millions)					
	98,506,440.00	110,305,034.00	112,438,591.00	113,577,449.00	115,802,914.00
KEY 2 Leverage Ratio of Direct State to Total Funds (Excl Infr Funds)					
	9.54	9.63	9.73	9.73	9.73
KEY 3 Total Dollar Volume of Cross-Division Research Performed					
	12,208,599.00	14,481,061.00	14,698,277.00	14,918,751.00	15,142,532.00
4 Number of Invention Disclosures Credited to TTI Researchers					
	1.00	1.00	2.00	3.00	3.00

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

		2028			2029			Biennium	
Priority	**Item**	**GR and GR/GR Dedicated**	**All Funds**	**FTEs**	**GR and GR Dedicated**	**All Funds**	**FTEs**	**GR and GR Dedicated**	**All Funds**
1	Ready the Roads	$5,000,000	$5,000,000	18.0	$5,000,000	$5,000,000	18.0	$10,000,000	$10,000,000
2	Restore 3% GR Baseline Reduction	$289,628	$289,628		$289,628	$289,628		$579,256	$579,256
Total, Exceptional Items Request		**$5,289,628**	**$5,289,628**	**18.0**	**$5,289,628**	**$5,289,628**	**18.0**	**$10,579,256**	**$10,579,256**
Method of Financing									
	General Revenue	$5,289,628	$5,289,628		$5,289,628	$5,289,628		$10,579,256	$10,579,256
	General Revenue - Dedicated								
	Federal Funds								
	Other Funds								
		$5,289,628	**$5,289,628**		**$5,289,628**	**$5,289,628**		**$10,579,256**	**$10,579,256**
Full Time Equivalent Positions				**18.0**			**18.0**		
Number of 100% Federally Funded FTEs									

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

Goal/*Objective*/STRATEGY	Base 2028	Base 2029	Exceptional 2028	Exceptional 2029	Total Request 2028	Total Request 2029
1 Transportation Research, Dissemination & Transportation Education						
1 *Increase Transportation Research Volume*						
1 SPONSORED RESEARCH	$98,012,031	$99,916,594	$5,019,735	$5,019,735	$103,031,766	$104,936,329
2 NATIONAL CENTERS	5,962,194	6,049,593	48,758	48,758	6,010,952	6,098,351
TOTAL, GOAL 1	**$103,974,225**	**$105,966,187**	**$5,068,493**	**$5,068,493**	**$109,042,718**	**$111,034,680**
2 Indirect Administration						
1 *Indirect Administration*						
1 INDIRECT ADMINISTRATION	11,715,329	11,849,866	221,135	221,135	11,936,464	12,071,001
2 INFRASTRUCTURE SUPPORT	0	0	0	0	0	0
TOTAL, GOAL 2	**$11,715,329**	**$11,849,866**	**$221,135**	**$221,135**	**$11,936,464**	**$12,071,001**
3 Staff Benefits Contributions						
1 *Staff Benefits Contributions*						
1 STAFF GROUP INSURANCE	5,772,626	5,888,077	0	0	5,772,626	5,888,077
TOTAL, GOAL 3	**$5,772,626**	**$5,888,077**	**$0**	**$0**	**$5,772,626**	**$5,888,077**
TOTAL, AGENCY STRATEGY REQUEST	**$121,462,180**	**$123,704,130**	**$5,289,628**	**$5,289,628**	**$126,751,808**	**$128,993,758**
TOTAL, AGENCY RIDER APPROPRIATIONS REQUEST						
GRAND TOTAL, AGENCY REQUEST	**$121,462,180**	**$123,704,130**	**$5,289,628**	**$5,289,628**	**$126,751,808**	**$128,993,758**

2.F. Summary of Total Request by Strategy
90th Regular Session, Agency Submission, Version 1
Automated Budget and Evaluation System of Texas (ABEST)

DATE : **8/6/2026**
TIME : **8:56:53AM**

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

Goal/*Objective*/STRATEGY	Base 2028	Base 2029	Exceptional 2028	Exceptional 2029	Total Request 2028	Total Request 2029
General Revenue Funds:						
1 General Revenue Fund	$9,364,640	$9,364,640	$5,289,628	$5,289,628	$14,654,268	$14,654,268
	$9,364,640	**$9,364,640**	**$5,289,628**	**$5,289,628**	**$14,654,268**	**$14,654,268**
Federal Funds:						
555 Federal Funds	34,498,941	35,188,920	0	0	34,498,941	35,188,920
	$34,498,941	**$35,188,920**	**$0**	**$0**	**$34,498,941**	**$35,188,920**
Other Funds:						
666 Appropriated Receipts	6,172,030	6,295,471	0	0	6,172,030	6,295,471
777 Interagency Contracts	50,753,004	51,768,064	0	0	50,753,004	51,768,064
8089 Indirect Cost Recov, Loc Held, est	20,673,565	21,087,035	0	0	20,673,565	21,087,035
	$77,598,599	**$79,150,570**	**$0**	**$0**	**$77,598,599**	**$79,150,570**
TOTAL, METHOD OF FINANCING	**$121,462,180**	**$123,704,130**	**$5,289,628**	**$5,289,628**	**$126,751,808**	**$128,993,758**
FULL TIME EQUIVALENT POSITIONS	**498.0**	**498.0**	**18.0**	**18.0**	**516.0**	**516.0**

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

Goal/ *Objective* / **Outcome**

	BL 2028	BL 2029	Excp 2028	Excp 2029	Total Request 2028	Total Request 2029
1 Transportation Research, Dissemination & Transportation Education						
1 *Increase Transportation Research Volume*						
KEY **1 Total Dollar Volume of Sponsored Research Expenditures (Millions)**						
	113,577,449.00	115,802,914.00			113,577,449.00	115,802,914.00
KEY **2 Leverage Ratio of Direct State to Total Funds (Excl Infr Funds)**						
	9.73	9.73			9.73	9.73
KEY **3 Total Dollar Volume of Cross-Division Research Performed**						
	14,918,751.00	15,142,532.00			14,918,751.00	15,142,532.00
4 Number of Invention Disclosures Credited to TTI Researchers						
	3.00	3.00			3.00	3.00

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727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 1 Sponsored Transportation Research — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
Output Measures:						
KEY 1	Number of TTI Patented Safety Devices Installed	1,134,481.00	1,145,257.00	1,154,257.00	1,163,257.00	1,172,257.00
KEY 2	Avg Number of Students Involved in TTI Education & Research Activities	118.00	122.50	125.00	126.80	128.70
KEY 3	Dollar Volume of Sponsored Research Expenditures (Millions)	92,858,592.00	103,198,420.00	104,983,752.00	106,086,082.00	108,239,629.00
Efficiency Measures:						
1	Research Expenditures Per FTE Researcher	217,213.00	252,319.00	256,183.00	258,873.00	264,128.00
Objects of Expense:						
1001	SALARIES AND WAGES	$47,954,825	$55,221,721	$57,030,058	$58,125,703	$59,255,197
1002	OTHER PERSONNEL COSTS	$6,579,838	$7,576,921	$7,825,041	$7,975,373	$8,130,350
2001	PROFESSIONAL FEES AND SERVICES	$145,794	$167,887	$173,386	$176,716	$180,150
2002	FUELS AND LUBRICANTS	$13,333	$15,353	$15,856	$16,161	$16,475
2003	CONSUMABLE SUPPLIES	$557,005	$641,411	$662,415	$675,141	$688,264
2004	UTILITIES	$495,541	$570,636	$589,322	$600,644	$612,316
2005	TRAVEL	$1,548,717	$1,783,404	$1,841,805	$1,877,189	$1,913,666
2006	RENT - BUILDING	$1,361,854	$1,568,224	$1,619,579	$1,650,694	$1,682,770
2007	RENT - MACHINE AND OTHER	$2,060,707	$2,372,979	$2,450,685	$2,497,768	$2,546,304

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 1 Sponsored Transportation Research — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
2009	OTHER OPERATING EXPENSE	$15,907,251	$18,317,777	$18,917,627	$19,281,065	$19,655,731
5000	CAPITAL EXPENDITURES	$4,236,950	$4,879,002	$5,038,773	$5,135,577	$5,235,371
TOTAL, OBJECT OF EXPENSE		**$80,861,815**	**$93,115,315**	**$96,164,547**	**$98,012,031**	**$99,916,594**
Method of Financing:						
1	General Revenue Fund	$5,866,923	$1,595,636	$2,803,644	$2,783,910	$2,783,910
SUBTOTAL, MOF (GENERAL REVENUE FUNDS)		**$5,866,923**	**$1,595,636**	**$2,803,644**	**$2,783,910**	**$2,783,910**
Method of Financing:						
555	Federal Funds					
10.310.000	Agriculture Food Research (AFRI)	$763	$0	$0	$0	$0
11.432.000	Environmental Research L	$244,359	$249,200	$254,209	$259,294	$264,479
11.617.000	TEES project B5490 - Congr-Id Proj	$186,927	$624,795	$637,355	$650,100	$663,102
12.630.000	Basic, Applied, and Adva	$46,285	$105,590	$107,712	$109,867	$112,064
17.502.000	Occupational Safety and H	$41,305	$33,934	$34,617	$35,309	$36,015
20.000.727	MISC DOT FOR TTI	$927,992	$1,336,223	$1,363,083	$1,390,345	$1,418,153
20.106.000	Airport Improvement Progr	$893	$0	$0	$0	$0
20.108.000	Aviation Research Grants	$0	$63,731	$65,011	$66,314	$67,637
20.200.000	Highway Research and Development	$7,468,389	$16,079,645	$16,402,876	$16,730,934	$17,065,553
20.205.000	Highway Planning and Cons	$2,012,539	$1,963,193	$2,002,657	$2,042,710	$2,083,565
20.215.000	Highway Training and Educ	$297,692	$257,024	$262,191	$267,435	$272,784

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 1 Sponsored Transportation Research — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
20.237.000	Commercial Vehicle Information Net.	$736,049	$796,520	$812,532	$828,782	$845,358
20.301.000	Railroad Safety	$9,550	$0	$0	$0	$0
20.313.000	Railroad Research and Development	$422	$0	$0	$0	$0
20.500.000	Federal Transit Capital I	$359,013	$250,089	$255,116	$260,219	$265,423
20.505.000	Metropolitan Planning	$85,653	$53,347	$54,420	$55,508	$56,618
20.507.000	Fed Transit Formula Urbanized	$978	$0	$0	$0	$0
20.509.000	Non-Urbanized Area Formula Grants	$12,706	$20,377	$20,787	$21,202	$21,627
20.514.000	Transit Planning and Rese	$24,195	$36,493	$37,226	$37,971	$38,730
20.530.000	Public Transportation Innovation	$37,379	$97,811	$99,778	$101,773	$103,809
20.600.000	State and Community Highw	$2,624,054	$3,072,912	$3,134,683	$3,197,377	$3,261,324
20.612.000	Grant to Increase Motorcycle Safety	$11,462	$6,894	$7,033	$7,173	$7,317
20.614.000	NHTSA Discretionary Safety Grants	$196,849	$423,078	$431,583	$440,214	$449,019
20.616.000	National Priority Safety Programs	$1,236,159	$1,580,246	$1,612,012	$1,644,252	$1,677,137
66.000.000	County-wide Environment Assessment	$12,954	$(102)	$(104)	$(106)	$(108)
66.046.000	CLIMATE POLLUTION REDUCTION GRANT	$0	$28,689	$29,266	$29,851	$30,448
81.000.010	DOE FOR TTI	$(5,173)	$0	$0	$0	$0
84.116.000	Fund for the Improvement	$431,400	$259,020	$264,227	$269,511	$274,902
93.113.000	Biological Response to En	$426,214	$554,970	$566,126	$577,449	$588,998
93.262.000	Occupational Safety and H	$0	$51,597	$52,635	$53,687	$54,761
93.273.000	Alcohol Research Programs	$34,179	$(60)	$(62)	$(63)	$(64)
98.001.000	USAid Asst for Programs Overseas	$(2,054)	$0	$0	$0	$0

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 1 Sponsored Transportation Research — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
CFDA Subtotal, Fund 555		$17,459,133	$27,945,216	$28,506,969	$29,077,108	$29,658,651
SUBTOTAL, MOF (FEDERAL FUNDS)		**$17,459,133**	**$27,945,216**	**$28,506,969**	**$29,077,108**	**$29,658,651**
Method of Financing:						
666	Appropriated Receipts	$5,101,374	$5,621,884	$5,734,947	$5,849,646	$5,966,639
777	Interagency Contracts	$43,083,943	$45,420,852	$46,335,992	$47,262,711	$48,207,965
8089	Indirect Cost Recov, Loc Held, est	$9,350,442	$12,531,727	$12,782,995	$13,038,656	$13,299,429
SUBTOTAL, MOF (OTHER FUNDS)		**$57,535,759**	**$63,574,463**	**$64,853,934**	**$66,151,013**	**$67,474,033**
TOTAL, METHOD OF FINANCE (INCLUDING RIDERS)					**$98,012,031**	**$99,916,594**
TOTAL, METHOD OF FINANCE (EXCLUDING RIDERS)		**$80,861,815**	**$93,115,315**	**$96,164,547**	**$98,012,031**	**$99,916,594**
FULL TIME EQUIVALENT POSITIONS:		**427.5**	**409.0**	**409.8**	**409.8**	**409.8**

STRATEGY DESCRIPTION AND JUSTIFICATION:

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 1 Sponsored Transportation Research — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

With over $96 million in research expenditures annually, TTI is widely recognized as the largest and most respected higher education-affiliated transportation research institute in the nation. The sponsored research strategy is the heart of the TTI's research program; that is, the submission of research proposals and development of programs to secure contracts from a variety of federal, state, local and private sources. This strategy also includes supporting transportation-related educational programs at Texas A&M University, within the Texas A&M System and at other Texas universities. TTI's research and development activities improve all aspects of the transportation system and create new ideas and innovations that save lives, time and resources.

TTI's broad base of expertise in all modes of transportation offers a unique blend of researcher proficiency, accredited laboratory facilities and proving grounds, and practical, hands-on experience. TTI's researchers have expertise in fields such as engineering, planning, economics, policy, landscape architecture, environmental sciences, computer science and social sciences. TTI's research field-testing facilities are essential in providing real-world findings to state and national sponsors. These facilities provide the realistic conditions needed for subjects such as: crash testing; pavement friction and smoothness testing; erosion and sediment control product testing; connected and automated vehicle testing; environmental testing; visibility testing; driver behavior testing; and traffic engineering studies.

EXTERNAL/INTERNAL FACTORS IMPACTING STRATEGY:

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 1 Sponsored Transportation Research — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

TTI's ability to secure research contracts is linked to state and national transportation budgets and the status of the transportation sector within the economy . The uncertainty of federal transportation research funding requires TTI to ensure a diversified research portfolio by identifying new research sponsors and enhancing existing relationships.

Another factor affecting this strategy (and the agency more broadly) is the recent period of historically high federal and state transportation funding, including funding for transportation research, that is now showing signs of moderation. TTI's breadth and depth of research capabilities, combined with its researchers' expertise, have demonstrated clear value to TTI sponsors and contributed to demonstrable value that has been recognized through steady research growth . However, sustaining that growth has become increasingly more challenging as funding levels normalize.

Salary competition from the private sector for well-trained transportation researchers and professionals continues to present challenges to attract and retain experienced professionals and to recruit recent graduates. To continue the national and international status as a premier transportation research institute , TTI must attract the best and the brightest research employees.

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 1 Sponsored Transportation Research — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

EXPLANATION OF BIENNIAL CHANGE (includes Rider amounts):

STRATEGY BIENNIAL TOTAL - ALL FUNDS		BIENNIAL	EXPLANATION OF BIENNIAL CHANGE	
Base Spending (Est 2026 + Bud 2027)	Baseline Request (BL 2028 + BL 2029)	CHANGE	$ Amount	Explanation(s) of Amount (must specify MOFs and FTEs)
$189,279,862	$197,928,625	$8,648,763	$1,168,539	Reallocation of GR between strategies to meet operational needs along with 3% baseline general revenue reduction.
			$2,283,574	Growth in Federal sponsored contract research from the U.S. Department of Transportation.
			$459,455	Growth in sponsored contract research from private, local, foreign and other sponsors.
			$3,713,831	Growth in sponsored contract research from the Texas Department of Transportation (TxDOT).
			$1,023,364	Growth in indirect cost recovery resulting from growth in sponsored contract research.
			$8,648,763	**Total of Explanation of Biennial Change**

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 2 Research/Education within the National Centers — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
Output Measures:						
KEY 1	Avg Number of Students Involved in NC Education & Research Activities	55.50	54.40	55.50	56.40	57.20
KEY 2	Dollar Volume of National Centers Research Expenditures (Millions)	5,647,848.00	7,106,614.00	7,454,838.00	7,491,367.00	7,563,284.00
Efficiency Measures:						
1	National Center Research Expenditures Per FTE Researcher	233,382.00	266,165.00	280,257.00	281,630.00	284,334.00
Objects of Expense:						
1001	SALARIES AND WAGES	$2,688,796	$3,647,524	$3,697,008	$3,720,049	$3,774,581
1002	OTHER PERSONNEL COSTS	$105,354	$142,920	$144,859	$145,761	$147,898
2003	CONSUMABLE SUPPLIES	$6,943	$9,418	$9,546	$9,605	$9,746
2005	TRAVEL	$28,360	$38,472	$38,994	$39,237	$39,812
2006	RENT - BUILDING	$1,562	$2,119	$2,147	$2,161	$2,193
2007	RENT - MACHINE AND OTHER	$14,081	$19,102	$19,361	$19,482	$19,766
2009	OTHER OPERATING EXPENSE	$1,464,290	$1,986,403	$2,013,352	$2,025,899	$2,055,597
TOTAL, OBJECT OF EXPENSE		**$4,309,386**	**$5,845,958**	**$5,925,267**	**$5,962,194**	**$6,049,593**

Method of Financing:

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 2 Research/Education within the National Centers — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
1	General Revenue Fund	$1,486,564	$1,646,000	$1,641,000	$1,592,242	$1,592,242
SUBTOTAL, MOF (GENERAL REVENUE FUNDS)		**$1,486,564**	**$1,646,000**	**$1,641,000**	**$1,592,242**	**$1,592,242**
Method of Financing:						
555	Federal Funds					
11.432.000	Environmental Research L	$380,973	$665,971	$679,343	$692,930	$706,788
20.000.727	MISC DOT FOR TTI	$(4,201)	$0	$0	$0	$0
20.701.000	University Transportation	$1,984,544	$2,976,729	$3,036,505	$3,097,235	$3,159,180
CFDA Subtotal, Fund 555		$2,361,316	$3,642,700	$3,715,848	$3,790,165	$3,865,968
SUBTOTAL, MOF (FEDERAL FUNDS)		**$2,361,316**	**$3,642,700**	**$3,715,848**	**$3,790,165**	**$3,865,968**
Method of Financing:						
8089	Indirect Cost Recov, Loc Held, est	$461,506	$557,258	$568,419	$579,787	$591,383
SUBTOTAL, MOF (OTHER FUNDS)		**$461,506**	**$557,258**	**$568,419**	**$579,787**	**$591,383**
TOTAL, METHOD OF FINANCE (INCLUDING RIDERS)					**$5,962,194**	**$6,049,593**
TOTAL, METHOD OF FINANCE (EXCLUDING RIDERS)		**$4,309,386**	**$5,845,958**	**$5,925,267**	**$5,962,194**	**$6,049,593**
FULL TIME EQUIVALENT POSITIONS:		**24.2**	**26.7**	**26.6**	**26.6**	**26.6**

727 Texas A&M Transportation Institute

GOAL:	1	Transportation Research, Dissemination & Transportation Education			
OBJECTIVE:	1	Increase Transportation Research Volume	Service Categories:		
STRATEGY:	2	Research/Education within the National Centers	Service: 21	Income: A.2	Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

STRATEGY DESCRIPTION AND JUSTIFICATION:

Submitting proposals and developing programs to advance transportation-related research of national significance remains the focus of the National Centers Strategy. As recognized leaders in many fields, TTI researchers are active in developing the national and state transportation research agendas. TTI is home or a partner to six federally funded centers of excellence: the Center for Efficient Mobility; the National Center for Infrastructure Transformation; the Maritime Transportation Research and Education Center; the National Institute for Congestion Reduction; the Center for Railway Research; and the Center for Transportation Computational Mechanics. The Agency is also home to four state-authorized centers: the Center for Transportation Safety, the Center for Ports and Waterways, the Center for International Intelligent Transportation Research, and the Center for Infrastructure Renewal, which is a joint center with the Texas A&M Engineering Experiment Station. TTI also has one center created by the A&M System, the Center for Alcohol and Drug Education Studies. These interdisciplinary centers address the state and nation's most pressing transportation concerns and position TTI to respond quickly and effectively to provide solutions.

The funds requested for FY 2028-2029 will sustain competitive research capabilities and meet matching requirements for these centers that bring significant non-state funds to Texas. Demonstrating the state's support for national centers is critical, as states compete for limited federal transportation dollars.

EXTERNAL/INTERNAL FACTORS IMPACTING STRATEGY:

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 2 Research/Education within the National Centers — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

TTI's track record in developing public/private partnerships for major national programs is important to the state's transportation knowledge base. The agency's national centers cover all aspects of transportation research and education from transportation safety, mobility and systems management, to transportation economics and workforce development, to port and railway safety and rural public transportation. The funds requested in this strategy are used to retain researcher capabilities and to meet matching requirements for both existing centers and for new centers that can bring significant non-state funds to Texas. Demonstrating the state's support for current and potential national centers of excellence is critical, as states compete for limited federal transportation dollars.

As with the Sponsored Research Strategy, the National Centers Strategy is impacted by the status and reliability of national transportation budgets and the status of the transportation sector within the economy. TTI is fortunate to have an environment in which highly skilled researchers pursue innovative research initiatives at the national and state level.

727 Texas A&M Transportation Institute

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume — Service Categories:

STRATEGY: 2 Research/Education within the National Centers — Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

EXPLANATION OF BIENNIAL CHANGE (includes Rider amounts):

STRATEGY BIENNIAL TOTAL - ALL FUNDS		BIENNIAL	EXPLANATION OF BIENNIAL CHANGE	
Base Spending (Est 2026 + Bud 2027)	Baseline Request (BL 2028 + BL 2029)	CHANGE	$ Amount	Explanation(s) of Amount (must specify MOFs and FTEs)
$11,771,225	$12,011,787	$240,562	$(102,516)	Reallocation of GR between strategies to meet operational needs along with 3% baseline general revenue reduction in the amount of ($97,516).
			$297,585	Growth in Federal sponsored contract research.
			$45,493	Growth in indirect cost recovery resulting from growth in sponsored contract research.
			$240,562	**Total of Explanation of Biennial Change**

727 Texas A&M Transportation Institute

GOAL: 2 Indirect Administration

OBJECTIVE: 1 Indirect Administration — Service Categories:

STRATEGY: 1 Indirect Administration — Service: 09 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
Objects of Expense:						
1001	SALARIES AND WAGES	$4,501,818	$6,008,083	$5,467,300	$5,524,812	$5,588,258
1002	OTHER PERSONNEL COSTS	$199,748	$266,582	$242,587	$245,139	$247,954
2001	PROFESSIONAL FEES AND SERVICES	$32	$42	$38	$39	$39
2003	CONSUMABLE SUPPLIES	$10,834	$14,457	$13,156	$13,295	$13,447
2004	UTILITIES	$12,022	$16,046	$14,601	$14,754	$14,924
2005	TRAVEL	$49,681	$66,304	$60,337	$60,971	$61,671
2006	RENT - BUILDING	$1,751	$76,337	$69,466	$70,197	$71,003
2007	RENT - MACHINE AND OTHER	$191,558	$255,652	$232,641	$235,087	$237,788
2009	OTHER OPERATING EXPENSE	$4,578,633	$6,036,599	$5,493,250	$5,551,035	$5,614,782
TOTAL, OBJECT OF EXPENSE		**$9,546,077**	**$12,740,102**	**$11,593,376**	**$11,715,329**	**$11,849,866**
Method of Financing:						
1	General Revenue Fund	$3,312,965	$7,943,803	$6,700,795	$4,988,488	$4,988,488
SUBTOTAL, MOF (GENERAL REVENUE FUNDS)		**$3,312,965**	**$7,943,803**	**$6,700,795**	**$4,988,488**	**$4,988,488**
Method of Financing:						
8089	Indirect Cost Recov, Loc Held, est	$6,233,112	$4,796,299	$4,892,581	$6,726,841	$6,861,378

727 Texas A&M Transportation Institute

GOAL: 2 Indirect Administration

OBJECTIVE: 1 Indirect Administration — Service Categories:

STRATEGY: 1 Indirect Administration — Service: 09 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
SUBTOTAL, MOF (OTHER FUNDS)		**$6,233,112**	**$4,796,299**	**$4,892,581**	**$6,726,841**	**$6,861,378**
TOTAL, METHOD OF FINANCE (INCLUDING RIDERS)					**$11,715,329**	**$11,849,866**
TOTAL, METHOD OF FINANCE (EXCLUDING RIDERS)		**$9,546,077**	**$12,740,102**	**$11,593,376**	**$11,715,329**	**$11,849,866**
FULL TIME EQUIVALENT POSITIONS:		**40.6**	**59.1**	**58.4**	**58.4**	**58.4**

STRATEGY DESCRIPTION AND JUSTIFICATION:

To provide funding for administration, fiscal, and support services for the agency.

EXTERNAL/INTERNAL FACTORS IMPACTING STRATEGY:

External factors affecting this strategy include increases in costs of repairs and maintenance of facilities. These pressures also create opportunities to pursue administrative efficiencies that allow the agency to maximize operational capacity while maintaining core support functions.

727 Texas A&M Transportation Institute

GOAL: 2 Indirect Administration

OBJECTIVE: 1 Indirect Administration — Service Categories:

STRATEGY: 1 Indirect Administration — Service: 09 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

EXPLANATION OF BIENNIAL CHANGE (includes Rider amounts):

STRATEGY BIENNIAL TOTAL - ALL FUNDS		BIENNIAL	EXPLANATION OF BIENNIAL CHANGE	
Base Spending (Est 2026 + Bud 2027)	Baseline Request (BL 2028 + BL 2029)	CHANGE	$ Amount	Explanation(s) of Amount (must specify MOFs and FTEs)
$24,333,478	$23,565,195	$(768,283)	$(4,667,622)	Reallocation of GR between strategies to meet operational needs along with 3% baseline general revenue reduction in the amount of ($442,270).
			$3,899,339	Growth in indirect cost recovery resulting from growth in sponsored contract research.
			$(768,283)	**Total of Explanation of Biennial Change**

727 Texas A&M Transportation Institute

GOAL: 2 Indirect Administration

OBJECTIVE: 1 Indirect Administration — Service Categories:

STRATEGY: 2 Infrastructure Support — Service: 10 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028 (1)	BL 2029 (1)
Objects of Expense:						
1001	SALARIES AND WAGES	$716,421	$802,753	$829,746	$0	$0
1002	OTHER PERSONNEL COSTS	$32,364	$36,263	$37,483	$0	$0
2009	OTHER OPERATING EXPENSE	$811,862	$909,694	$940,282	$0	$0
TOTAL, OBJECT OF EXPENSE		**$1,560,647**	**$1,748,710**	**$1,807,511**	**$0**	**$0**
Method of Financing:						
1	General Revenue Fund	$597,198	$790,000	$830,000	$0	$0
SUBTOTAL, MOF (GENERAL REVENUE FUNDS)		**$597,198**	**$790,000**	**$830,000**	**$0**	**$0**
Method of Financing:						
8089	Indirect Cost Recov, Loc Held, est	$963,449	$958,710	$977,511	$0	$0
SUBTOTAL, MOF (OTHER FUNDS)		**$963,449**	**$958,710**	**$977,511**	**$0**	**$0**
TOTAL, METHOD OF FINANCE (INCLUDING RIDERS)					**$0**	**$0**
TOTAL, METHOD OF FINANCE (EXCLUDING RIDERS)		**$1,560,647**	**$1,748,710**	**$1,807,511**	**$0**	**$0**
FULL TIME EQUIVALENT POSITIONS:		**5.5**	**3.2**	**3.2**	**3.2**	**3.2**

(1) - Formula funded strategies are not requested in 2028-29 because amounts are not determined by institutions.

727 Texas A&M Transportation Institute

GOAL: 2 Indirect Administration

OBJECTIVE: 1 Indirect Administration — Service Categories:

STRATEGY: 2 Infrastructure Support — Service: 10 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028 (1)	BL 2029 (1)

STRATEGY DESCRIPTION AND JUSTIFICATION:

To provide infrastructure support for buildings and facilities located in Brazos County. The services provided include physical plant support, routine building maintenance, custodial services, and utilities services.

EXTERNAL/INTERNAL FACTORS IMPACTING STRATEGY:

EXPLANATION OF BIENNIAL CHANGE (includes Rider amounts):

STRATEGY BIENNIAL TOTAL - ALL FUNDS		BIENNIAL	EXPLANATION OF BIENNIAL CHANGE	
Base Spending (Est 2026 + Bud 2027)	Baseline Request (BL 2028 + BL 2029)	CHANGE	$ Amount	Explanation(s) of Amount (must specify MOFs and FTEs)
$3,556,221	$0	$(3,556,221)	$(3,556,221)	Infrastructure support is formula funded and isn't reflected in the FY 2028-2029 base request.
			$(3,556,221)	**Total of Explanation of Biennial Change**

(1) - Formula funded strategies are not requested in 2028-29 because amounts are not determined by institutions.

727 Texas A&M Transportation Institute

GOAL: 3 Staff Benefits Contributions

OBJECTIVE: 1 Staff Benefits Contributions — Service Categories:

STRATEGY: 1 Staff Group Insurance Contributions — Service: 06 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
Objects of Expense:						
1002	OTHER PERSONNEL COSTS	$5,202,500	$5,559,367	$5,659,436	$5,772,626	$5,888,077
TOTAL, OBJECT OF EXPENSE		**$5,202,500**	**$5,559,367**	**$5,659,436**	**$5,772,626**	**$5,888,077**
Method of Financing:						
1	General Revenue Fund	$688,290	$0	$0	$0	$0
SUBTOTAL, MOF (GENERAL REVENUE FUNDS)		**$688,290**	**$0**	**$0**	**$0**	**$0**
Method of Financing:						
555	Federal Funds					
10.310.000	Agriculture Food Research (AFRI)	$49	$0	$0	$0	$0
11.432.000	Environmental Research L	$19,667	$47,299	$48,150	$49,113	$50,096
11.617.000	TEES project B5490 - Congr-Id Proj	$7,440	$26,190	$26,661	$27,195	$27,739
12.630.000	Basic, Applied, and Adva	$2,099	$16,560	$16,858	$17,195	$17,539
17.502.000	Occupational Safety and H	$4,081	$4,153	$4,228	$4,312	$4,399
20.000.727	MISC DOT FOR TTI	$53,444	$81,372	$82,839	$84,492	$86,183
20.200.000	Highway Research and Development	$255,057	$483,110	$491,806	$501,643	$511,675
20.205.000	Highway Planning and Cons	$113,933	$155,700	$158,503	$161,673	$164,906
20.215.000	Highway Training and Educ	$13,725	$15,233	$15,507	$15,817	$16,134
20.237.000	Commercial Vehicle Information Net.	$37,639	$78,045	$79,450	$81,039	$82,660

727 Texas A&M Transportation Institute

GOAL: 3 Staff Benefits Contributions

OBJECTIVE: 1 Staff Benefits Contributions — Service Categories:

STRATEGY: 1 Staff Group Insurance Contributions — Service: 06 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
20.301.000	Railroad Safety	$683	$0	$0	$0	$0
20.500.000	Federal Transit Capital I	$21,590	$12,361	$12,583	$12,835	$13,092
20.505.000	Metropolitan Planning	$7,954	$4,358	$4,437	$4,526	$4,616
20.507.000	Fed Transit Formula Urbanized	$98	$0	$0	$0	$0
20.509.000	Non-Urbanized Area Formula Grants	$839	$922	$938	$957	$976
20.514.000	Transit Planning and Rese	$1,858	$2,408	$2,452	$2,501	$2,551
20.530.000	Public Transportation Innovation	$3,007	$10,014	$10,194	$10,398	$10,606
20.600.000	State and Community Highw	$212,385	$303,354	$308,815	$314,991	$321,291
20.612.000	Grant to Increase Motorcycle Safety	$19	$25	$25	$26	$26
20.614.000	NHTSA Discretionary Safety Grants	$2,451	$23,407	$23,828	$24,305	$24,791
20.616.000	National Priority Safety Programs	$102,708	$158,994	$161,856	$165,093	$168,395
20.701.000	University Transportation	$83,696	$107,561	$109,497	$111,687	$113,920
66.000.000	County-wide Environment Assessment	$1,086	$(126)	$(128)	$(130)	$(133)
66.046.000	CLIMATE POLLUTION REDUCTION GRANT	$0	$2,691	$2,739	$2,794	$2,850
81.000.010	DOE FOR TTI	$(555)	$0	$0	$0	$0
84.116.000	Fund for the Improvement	$(68)	$0	$0	$0	$0
93.113.000	Biological Response to En	$20,150	$33,436	$34,037	$34,718	$35,412
93.262.000	Occupational Safety and H	$0	$4,396	$4,475	$4,565	$4,656
93.273.000	Alcohol Research Programs	$1,639	$(74)	$(76)	$(77)	$(79)
98.001.000	USAid Asst for Programs Overseas	$(226)	$0	$0	$0	$0
CFDA Subtotal, Fund	555	$966,448	$1,571,389	$1,599,674	$1,631,668	$1,664,301

727 Texas A&M Transportation Institute

GOAL: 3 Staff Benefits Contributions

OBJECTIVE: 1 Staff Benefits Contributions — Service Categories:

STRATEGY: 1 Staff Group Insurance Contributions — Service: 06 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
SUBTOTAL, MOF (FEDERAL FUNDS)		**$966,448**	**$1,571,389**	**$1,599,674**	**$1,631,668**	**$1,664,301**
Method of Financing:						
666	Appropriated Receipts	$204,840	$310,474	$316,063	$322,384	$328,832
777	Interagency Contracts	$2,468,532	$3,361,352	$3,421,856	$3,490,293	$3,560,099
8089	Indirect Cost Recov, Loc Held, est	$874,390	$316,152	$321,843	$328,281	$334,845
SUBTOTAL, MOF (OTHER FUNDS)		**$3,547,762**	**$3,987,978**	**$4,059,762**	**$4,140,958**	**$4,223,776**
TOTAL, METHOD OF FINANCE (INCLUDING RIDERS)					**$5,772,626**	**$5,888,077**
TOTAL, METHOD OF FINANCE (EXCLUDING RIDERS)		**$5,202,500**	**$5,559,367**	**$5,659,436**	**$5,772,626**	**$5,888,077**

FULL TIME EQUIVALENT POSITIONS:

STRATEGY DESCRIPTION AND JUSTIFICATION:

This strategy is to provide proportional share of staff group insurance premiums paid from other non -GR appropriated sources of funding.

EXTERNAL/INTERNAL FACTORS IMPACTING STRATEGY:

The A&M Agencies have authority under HEGI rider #3 to use funds appropriated elsewhere in the GAA to pay for health insurance.

727 Texas A&M Transportation Institute

GOAL: 3 Staff Benefits Contributions

OBJECTIVE: 1 Staff Benefits Contributions — Service Categories:

STRATEGY: 1 Staff Group Insurance Contributions — Service: 06 Income: A.2 Age: B.3

CODE	DESCRIPTION	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029

EXPLANATION OF BIENNIAL CHANGE (includes Rider amounts):

STRATEGY BIENNIAL TOTAL - ALL FUNDS		BIENNIAL	EXPLANATION OF BIENNIAL CHANGE	
Base Spending (Est 2026 + Bud 2027)	Baseline Request (BL 2028 + BL 2029)	CHANGE	$ Amount	Explanation(s) of Amount (must specify MOFs and FTEs)
$11,218,803	$11,660,703	$441,900	$124,905	Growth in Federal sponsored contract research.
			$24,679	Growth in sponsored contract research from private, local, foreign and other sponsors.
			$267,186	Growth in sponsored contract research from the Texas Department of Transportation (TxDOT).
			$25,130	Growth in indirect cost recovery resulting from growth in sponsored contract research.
			$441,900	**Total of Explanation of Biennial Change**

SUMMARY TOTALS:

OBJECTS OF EXPENSE:	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**
METHODS OF FINANCE (INCLUDING RIDERS):				**$121,462,180**	**$123,704,130**
METHODS OF FINANCE (EXCLUDING RIDERS):	**$101,480,425**	**$119,009,452**	**$121,150,137**	**$121,462,180**	**$123,704,130**
FULL TIME EQUIVALENT POSITIONS:	**497.8**	**498.0**	**498.0**	**498.0**	**498.0**

3.B. Rider Revisions and Additions Request

Agency Code:	Agency Name:	Prepared By:	Date:	Request Level:
727	Texas A&M Transportation Institute	Greg Chavarria	07/27/2026	Baseline

Current Rider Number	Page Number in 2026–27 GAA	Proposed Rider Language
3	III-94	**Transportation Safety Center.** Out of funds appropriated above, $936,782~~$960,000~~ in fiscal year 2028~~2026~~ and $936,782~~$960,000~~ in fiscal year 2029~~2027~~ out of the General Revenue Fund shall be used to fund the Transportation Safety Center to conduct research, education, and technology transfer to improve the safety of Texas' roads and highways. *The proposed revision updates the annual amount set aside out of funds above to be used for the Transportation Safety Center to account for the 3% reduction. If the funds were restored in full through the Exceptional Item request, these amounts would be reinstated to prior biennial amounts.*
4	III-94	**Center for International Intelligent Transportation.** Out of funds appropriated above, $796,265~~$816,000~~ in fiscal year 2028~~2026~~ and $796,265~~$816,000~~ in fiscal year 2029~~2027~~ out of the General Revenue Fund shall be used to fund the Center for International Intelligent Transportation in El Paso to conduct research, education, and technology transfer to improve the safety of Texas' roads and highways for secure international transportation and other issues specific to the El Paso region, international and border settings. *The proposed revision updates the annual amount set aside out of funds above to be used for the Center for International Intelligent Transportation to account for the 3% reduction. If the funds were restored in full through the Exceptional Item request, these amounts would be reinstated to prior biennial amounts.*

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Agency code: **727** Agency name: **Texas A&M Transportation Institute**

CODE	DESCRIPTION	Excp 2028	Excp 2029
	Item Name: Ready the Roads: Tackling Emerging Transportation Issues		
	Item Priority: 1		
	IT Component: No		
	Anticipated Out-year Costs: Yes		
	Involve Contracts > $50,000: No		
	Includes Funding for the Following Strategy or Strategies: 01-01-01 Sponsored Transportation Research		
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	4,166,000	4,166,000
1002	OTHER PERSONNEL COSTS	834,000	834,000
	TOTAL, OBJECT OF EXPENSE	**$5,000,000**	**$5,000,000**
METHOD OF FINANCING:			
1	General Revenue Fund	5,000,000	5,000,000
	TOTAL, METHOD OF FINANCING	**$5,000,000**	**$5,000,000**
FULL-TIME EQUIVALENT POSITIONS (FTE):		18.00	18.00

DESCRIPTION / JUSTIFICATION:

In order to meet Texas' growing transportation needs and maintain the state's position as a national leader in transportation innovation, the Texas A&M Transportation Institute (TTI) seeks additional state support to address emerging transportation technologies and challenges. With this request, TTI aims to strengthen Texas' ability to develop safe, efficient, and forward-looking transportation solutions through investments in world-class research talent, student workforce development, advanced research capabilities, and transportation technology innovation. Funding would enable TTI to recruit and retain leading researchers, engineers, and scientists while expanding opportunities for students to participate in applied transportation research. TTI's existing funding model for sponsored research is one which places limitations on what TTI can research because the scope is limited to the sponsor's need. State investment would provide the flexibility needed to anticipate future transportation challenges, compete successfully for federal research funding, advance technologies such as artificial intelligence, automation, connected infrastructure, and autonomous systems, and deliver practical solutions that improve safety, mobility, freight movement, and economic competitiveness for all Texans.

EXTERNAL/INTERNAL FACTORS:

Transportation is changing rapidly. Artificial intelligence, automation, connected infrastructure, advanced communications, autonomous systems, and real-time data technologies are reshaping how people and goods move. These changes require new capabilities to safely deploy and manage the next generation transportation system.

Other states, universities, and companies are competing for the same skilled workforce and funding, putting Texas at risk of losing expertise and falling behind in transportation innovation. This can result in Texas being forced to adopt technological solutions developed in places like California and New York.

PCLS TRACKING KEY:

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

CODE	DESCRIPTION	Excp 2028	Excp 2029

DESCRIPTION OF ANTICIPATED OUT-YEAR COSTS :

Additional out-year costs represent funding to continue the program beyond the biennium.

ESTIMATED ANTICIPATED OUT-YEAR COSTS FOR ITEM:

	2030	2031	2032
OUT-YEAR ALL FUNDS:	$5,000,000	$5,000,000	$5,000,000

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

CODE	DESCRIPTION			Excp 2028	Excp 2029
	Item Name:	Restore the 3% General Revenue Baseline Reduction			
	Item Priority:	2			
	IT Component:	No			
	Anticipated Out-year Costs:	Yes			
	Involve Contracts > $50,000:	No			
	Includes Funding for the Following Strategy or Strategies:	01-01-01	Sponsored Transportation Research		
		01-01-02	Research/Education within the National Centers		
		02-01-01	Indirect Administration		
OBJECTS OF EXPENSE:					
1001	SALARIES AND WAGES			145,181	145,181
1002	OTHER PERSONNEL COSTS			9,339	9,339
2003	CONSUMABLE SUPPLIES			458	458
2004	UTILITIES			393	393
2005	TRAVEL			1,825	1,825
2006	RENT - BUILDING			1,659	1,659
2007	RENT - MACHINE AND OTHER			5,072	5,072
2009	OTHER OPERATING EXPENSE			124,716	124,716
5000	CAPITAL EXPENDITURES			985	985
	TOTAL, OBJECT OF EXPENSE			**$289,628**	**$289,628**
METHOD OF FINANCING:					
1	General Revenue Fund			289,628	289,628
	TOTAL, METHOD OF FINANCING			**$289,628**	**$289,628**

DESCRIPTION / JUSTIFICATION:

The 3% general revenue baseline reduction will reduce the scope of the Transportation Safety Center, Center for International Intelligent Transportation, and TTI's research program and operations. This decrease in state support further exacerbates the existing imbalance in general revenue funding that is critical to sustaining TTI's mission. To the limited extent possible, TTI will rely on indirect cost recovery revenue to partially offset the funding gap created by the reduction; however, such revenues are insufficient to fully mitigate the long-term impact of the loss in state support.

EXTERNAL/INTERNAL FACTORS:

These funds are critical to TTI’s research program and are leveraged to obtain federal and other research funding.

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

CODE	DESCRIPTION	Excp 2028	Excp 2029

PCLS TRACKING KEY:

DESCRIPTION OF ANTICIPATED OUT-YEAR COSTS :

An estimated $289,628 per fiscal year is anticipated for fiscal years 2030 through 2032 if the 3% general revenue baseline reduction is not restored.

ESTIMATED ANTICIPATED OUT-YEAR COSTS FOR ITEM:

	2030	2031	2032
OUT-YEAR ALL FUNDS:	$289,628	$289,628	$289,628

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

Code	Description	Excp 2028	Excp 2029
Item Name:	Ready the Roads: Tackling Emerging Transportation Issues		
Allocation to Strategy:	1-1-1 Sponsored Transportation Research		
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	4,166,000	4,166,000
1002	OTHER PERSONNEL COSTS	834,000	834,000
TOTAL, OBJECT OF EXPENSE		**$5,000,000**	**$5,000,000**
METHOD OF FINANCING:			
1	General Revenue Fund	5,000,000	5,000,000
TOTAL, METHOD OF FINANCING		**$5,000,000**	**$5,000,000**
FULL-TIME EQUIVALENT POSITIONS (FTE):		18.0	18.0

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

Code	Description	Excp 2028	Excp 2029
Item Name:	Restore the 3% General Revenue Baseline Reduction		
Allocation to Strategy:	1-1-1 Sponsored Transportation Research		
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	11,149	11,149
1002	OTHER PERSONNEL COSTS	2,465	2,465
2003	CONSUMABLE SUPPLIES	130	130
2004	UTILITIES	115	115
2005	TRAVEL	360	360
2006	RENT - BUILDING	317	317
2007	RENT - MACHINE AND OTHER	479	479
2009	OTHER OPERATING EXPENSE	3,735	3,735
5000	CAPITAL EXPENDITURES	985	985
TOTAL, OBJECT OF EXPENSE		**$19,735**	**$19,735**
METHOD OF FINANCING:			
1	General Revenue Fund	19,735	19,735
TOTAL, METHOD OF FINANCING		**$19,735**	**$19,735**

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

Code	Description	Excp 2028	Excp 2029
Item Name:	Restore the 3% General Revenue Baseline Reduction		
Allocation to Strategy:	1-1-2 Research/Education within the National Centers		
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	29,747	29,747
1002	OTHER PERSONNEL COSTS	2,247	2,247
2003	CONSUMABLE SUPPLIES	77	77
2005	TRAVEL	314	314
2006	RENT - BUILDING	17	17
2007	RENT - MACHINE AND OTHER	156	156
2009	OTHER OPERATING EXPENSE	16,200	16,200
TOTAL, OBJECT OF EXPENSE		**$48,758**	**$48,758**
METHOD OF FINANCING:			
1	General Revenue Fund	48,758	48,758
TOTAL, METHOD OF FINANCING		**$48,758**	**$48,758**

Agency code: **727** Agency name: **Texas A&M Transportation Institute**

Code	Description	Excp 2028	Excp 2029
Item Name:	Restore the 3% General Revenue Baseline Reduction		
Allocation to Strategy:	2-1-1 Indirect Administration		
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	104,285	104,285
1002	OTHER PERSONNEL COSTS	4,627	4,627
2003	CONSUMABLE SUPPLIES	251	251
2004	UTILITIES	278	278
2005	TRAVEL	1,151	1,151
2006	RENT - BUILDING	1,325	1,325
2007	RENT - MACHINE AND OTHER	4,437	4,437
2009	OTHER OPERATING EXPENSE	104,781	104,781
TOTAL, OBJECT OF EXPENSE		**$221,135**	**$221,135**
METHOD OF FINANCING:			
1	General Revenue Fund	221,135	221,135
TOTAL, METHOD OF FINANCING		**$221,135**	**$221,135**

Agency Code: **727** Agency name: **Texas A&M Transportation Institute**

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume Service Categories:

STRATEGY: 1 Sponsored Transportation Research Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Excp 2028	Excp 2029
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	4,177,149	4,177,149
1002	OTHER PERSONNEL COSTS	836,465	836,465
2003	CONSUMABLE SUPPLIES	130	130
2004	UTILITIES	115	115
2005	TRAVEL	360	360
2006	RENT - BUILDING	317	317
2007	RENT - MACHINE AND OTHER	479	479
2009	OTHER OPERATING EXPENSE	3,735	3,735
5000	CAPITAL EXPENDITURES	985	985
	Total, Objects of Expense	**$5,019,735**	**$5,019,735**
METHOD OF FINANCING:			
1	General Revenue Fund	5,019,735	5,019,735
	Total, Method of Finance	**$5,019,735**	**$5,019,735**
FULL-TIME EQUIVALENT POSITIONS (FTE):		18.0	18.0

EXCEPTIONAL ITEM(S) INCLUDED IN STRATEGY:

Ready the Roads: Tackling Emerging Transportation Issues

Restore the 3% General Revenue Baseline Reduction

Agency Code: **727** Agency name: **Texas A&M Transportation Institute**

GOAL: 1 Transportation Research, Dissemination & Transportation Education

OBJECTIVE: 1 Increase Transportation Research Volume Service Categories:

STRATEGY: 2 Research/Education within the National Centers Service: 21 Income: A.2 Age: B.3

CODE	DESCRIPTION	Excp 2028	Excp 2029
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	29,747	29,747
1002	OTHER PERSONNEL COSTS	2,247	2,247
2003	CONSUMABLE SUPPLIES	77	77
2005	TRAVEL	314	314
2006	RENT - BUILDING	17	17
2007	RENT - MACHINE AND OTHER	156	156
2009	OTHER OPERATING EXPENSE	16,200	16,200
	Total, Objects of Expense	**$48,758**	**$48,758**
METHOD OF FINANCING:			
1	General Revenue Fund	48,758	48,758
	Total, Method of Finance	**$48,758**	**$48,758**

EXCEPTIONAL ITEM(S) INCLUDED IN STRATEGY:

Restore the 3% General Revenue Baseline Reduction

Agency Code: **727** Agency name: **Texas A&M Transportation Institute**

GOAL: 2 Indirect Administration
OBJECTIVE: 1 Indirect Administration
STRATEGY: 1 Indirect Administration

Service Categories:
Service: 09 Income: A.2 Age: B.3

CODE	DESCRIPTION	Excp 2028	Excp 2029
OBJECTS OF EXPENSE:			
1001	SALARIES AND WAGES	104,285	104,285
1002	OTHER PERSONNEL COSTS	4,627	4,627
2003	CONSUMABLE SUPPLIES	251	251
2004	UTILITIES	278	278
2005	TRAVEL	1,151	1,151
2006	RENT - BUILDING	1,325	1,325
2007	RENT - MACHINE AND OTHER	4,437	4,437
2009	OTHER OPERATING EXPENSE	104,781	104,781
	Total, Objects of Expense	**$221,135**	**$221,135**
METHOD OF FINANCING:			
1	General Revenue Fund	221,135	221,135
	Total, Method of Finance	**$221,135**	**$221,135**

EXCEPTIONAL ITEM(S) INCLUDED IN STRATEGY:

Restore the 3% General Revenue Baseline Reduction

Agency Code: **727** Agency: **Texas A&M Transportation Institute**

COMPARISON TO STATEWIDE HUB PROCUREMENT GOALS

A. Fiscal Year - HUB Expenditure Information

Statewide HUB Goals	Procurement Category	% Goal	HUB Expenditures FY 2024 % Actual	Diff	Actual $	Total Expenditures FY 2024	% Goal	HUB Expenditures FY 2025 % Actual	Diff	Actual $	Total Expenditures FY 2025
11.2%	Heavy Construction	0.0 %	0.0%	0.0%	$0	$0	0.0 %	0.0%	0.0%	$0	$0
21.1%	Building Construction	0.0 %	0.0%	0.0%	$0	$0	0.0 %	91.4%	91.4%	$377,600	$412,929
32.9%	Special Trade	32.9 %	3.9%	-29.0%	$2,400	$62,043	32.9 %	3.0%	-29.9%	$5,119	$171,797
23.7%	Professional Services	23.7 %	0.0%	-23.7%	$0	$850	23.7 %	0.0%	-23.7%	$0	$0
26.0%	Other Services	26.0 %	6.4%	-19.6%	$148,497	$2,332,063	26.0 %	6.4%	-19.6%	$124,918	$1,951,875
21.1%	Commodities	28.0 %	33.6%	5.6%	$3,054,111	$9,099,073	28.1 %	27.6%	-0.5%	$2,408,276	$8,717,853
	Total Expenditures		**27.9%**		**$3,205,008**	**$11,494,029**		**25.9%**		**$2,915,913**	**$11,254,454**

B. Assessment of Attainment of HUB Procurement Goals

Attainment:

The agency attained or exceeded one of four, or 25%, of the applicable agency HUB procurement goals in FY 2024.
The agency attained or exceeded one of five, or 20%, of the applicable agency HUB procurement goals in FY 2025.

Applicability:

The mission of the Texas A&M Transportation Institute (TTI) is to solve transportation problems through research, to transfer technology and to develop human resources to meet the transportation challenges of tomorrow. In accomplishing the mission, TTI does not typically have Heavy Construction. TTI typically has very limited expenditures in the category of Building Construction (no reportable expenditures in FY 2024).

Factors Affecting Attainment:

More than 75% of agency funding is earned through competitively-bid research proposals in the federal, state, international, local and private sectors. The sponsored research dollars received are spent to meet the sponsors' requirements. This process sometimes limits the ability to award bids to HUB vendors. Also, due to the nature of some purchases being very specialized, there are limited vendors who can supply the goods or services. Expenditures for conferences and meeting space often prevent the use of HUBs. These types of expenditures significantly reduce HUB participation percentages in the Other Services category. Additionally, Texas A&M University System outsourced building construction and maintenance to a non-HUB vendor which makes it very difficult to set goals in the Building Construction, Special Trades, and Professional Services as TTI does not have control over the vendors selected to provide these services.

Agency Code: **727** Agency: **Texas A&M Transportation Institute**

C. Good-Faith Efforts to Increase HUB Participation

Outreach Efforts and Mentor-Protégé Programs:

TTI remains committed to continue outreach efforts with VetHub vendors by attending Economic Opportunity Forums and VetHUB related trainings and meetings.

TTI attended the following events and activities:

FY24:
Economic Opportunity Forum: 2
Annual Meeting/Setting: 1

FY25:
Economic Opportunity Forum: 2

HUB Program Staffing:

TTI has one VetHUB Program Coordinator and receives procurement support from three FTEs in the Texas A&M Engineering Experiment Station (TEES) Purchasing Office through a shared service arrangement. These staff members support TTI's VetHUB procurement efforts.

Current and Future Good-Faith Efforts:

TTI has encouraged the use of VetHUB vendors for various contracts and - maintained awareness of the VetHUB program and it's importance via meetings and communication with agency support staff.

TTI has maintained an open door policy for VetHUB vendor visits and provided certification assistance to vendors.

TTI's VetHub coordinator will attend fututre Economic Opportunity Forums (EOF) and Spot Bid Fairs.

TTI has and will continue to attend meetings at the State and Texas A&M University System levels.

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
10.310.000 Agriculture Food Research (AFRI)					
1 - 1 - 1 SPONSORED RESEARCH	763	0	0	0	0
3 - 1 - 1 STAFF GROUP INSURANCE	49	0	0	0	0
TOTAL, ALL STRATEGIES	**$812**	**$0**	**$0**	**$0**	**$0**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$812**	**$0**	**$0**	**$0**	**$0**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
11.432.000 Environmental Research L					
1 - 1 - 1 SPONSORED RESEARCH	244,359	249,200	254,209	259,294	264,479
1 - 1 - 2 NATIONAL CENTERS	380,973	665,971	679,343	692,930	706,788
3 - 1 - 1 STAFF GROUP INSURANCE	19,667	47,299	48,150	49,113	50,096
TOTAL, ALL STRATEGIES	**$644,999**	**$962,470**	**$981,702**	**$1,001,337**	**$1,021,363**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$644,999**	**$962,470**	**$981,702**	**$1,001,337**	**$1,021,363**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
11.617.000 TEES project B5490 - Congr-Id Proj					
1 - 1 - 1 SPONSORED RESEARCH	186,927	624,795	637,355	650,100	663,102
3 - 1 - 1 STAFF GROUP INSURANCE	7,440	26,190	26,661	27,195	27,739
TOTAL, ALL STRATEGIES	**$194,367**	**$650,985**	**$664,016**	**$677,295**	**$690,841**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$194,367**	**$650,985**	**$664,016**	**$677,295**	**$690,841**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
12.630.000 Basic, Applied, and Adva					
1 - 1 - 1 SPONSORED RESEARCH	46,285	105,590	107,712	109,867	112,064
3 - 1 - 1 STAFF GROUP INSURANCE	2,099	16,560	16,858	17,195	17,539

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
TOTAL, ALL STRATEGIES	**$48,384**	**$122,150**	**$124,570**	**$127,062**	**$129,603**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$48,384**	**$122,150**	**$124,570**	**$127,062**	**$129,603**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
17.502.000 Occupational Safety and H					
1 - 1 - 1 SPONSORED RESEARCH	41,305	33,934	34,617	35,309	36,015
3 - 1 - 1 STAFF GROUP INSURANCE	4,081	4,153	4,228	4,312	4,399
TOTAL, ALL STRATEGIES	**$45,386**	**$38,087**	**$38,845**	**$39,621**	**$40,414**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$45,386**	**$38,087**	**$38,845**	**$39,621**	**$40,414**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.000.727 MISC DOT FOR TTI					
1 - 1 - 1 SPONSORED RESEARCH	927,992	1,336,223	1,363,083	1,390,345	1,418,153
1 - 1 - 2 NATIONAL CENTERS	-4,201	0	0	0	0
3 - 1 - 1 STAFF GROUP INSURANCE	53,444	81,372	82,839	84,492	86,183
TOTAL, ALL STRATEGIES	**$977,235**	**$1,417,595**	**$1,445,922**	**$1,474,837**	**$1,504,336**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$977,235**	**$1,417,595**	**$1,445,922**	**$1,474,837**	**$1,504,336**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.106.000 Airport Improvement Progr					
1 - 1 - 1 SPONSORED RESEARCH	893	0	0	0	0
TOTAL, ALL STRATEGIES	**$893**	**$0**	**$0**	**$0**	**$0**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$893**	**$0**	**$0**	**$0**	**$0**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
20.108.000 Aviation Research Grants					
1 - 1 - 1 SPONSORED RESEARCH	0	63,731	65,011	66,314	67,637
TOTAL, ALL STRATEGIES	**$0**	**$63,731**	**$65,011**	**$66,314**	**$67,637**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$0**	**$63,731**	**$65,011**	**$66,314**	**$67,637**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.200.000 Highway Research and Development					
1 - 1 - 1 SPONSORED RESEARCH	7,468,389	16,079,645	16,402,876	16,730,934	17,065,553
3 - 1 - 1 STAFF GROUP INSURANCE	255,057	483,110	491,806	501,643	511,675
TOTAL, ALL STRATEGIES	**$7,723,446**	**$16,562,755**	**$16,894,682**	**$17,232,577**	**$17,577,228**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$7,723,446**	**$16,562,755**	**$16,894,682**	**$17,232,577**	**$17,577,228**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.205.000 Highway Planning and Cons					
1 - 1 - 1 SPONSORED RESEARCH	2,012,539	1,963,193	2,002,657	2,042,710	2,083,565
3 - 1 - 1 STAFF GROUP INSURANCE	113,933	155,700	158,503	161,673	164,906
TOTAL, ALL STRATEGIES	**$2,126,472**	**$2,118,893**	**$2,161,160**	**$2,204,383**	**$2,248,471**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$2,126,472**	**$2,118,893**	**$2,161,160**	**$2,204,383**	**$2,248,471**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.215.000 Highway Training and Educ					
1 - 1 - 1 SPONSORED RESEARCH	297,692	257,024	262,191	267,435	272,784
3 - 1 - 1 STAFF GROUP INSURANCE	13,725	15,233	15,507	15,817	16,134

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
TOTAL, ALL STRATEGIES	**$311,417**	**$272,257**	**$277,698**	**$283,252**	**$288,918**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$311,417**	**$272,257**	**$277,698**	**$283,252**	**$288,918**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.237.000 Commercial Vehicle Information Net.					
1 - 1 - 1 SPONSORED RESEARCH	736,049	796,520	812,532	828,782	845,358
3 - 1 - 1 STAFF GROUP INSURANCE	37,639	78,045	79,450	81,039	82,660
TOTAL, ALL STRATEGIES	**$773,688**	**$874,565**	**$891,982**	**$909,821**	**$928,018**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$773,688**	**$874,565**	**$891,982**	**$909,821**	**$928,018**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.301.000 Railroad Safety					
1 - 1 - 1 SPONSORED RESEARCH	9,550	0	0	0	0
3 - 1 - 1 STAFF GROUP INSURANCE	683	0	0	0	0
TOTAL, ALL STRATEGIES	**$10,233**	**$0**	**$0**	**$0**	**$0**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$10,233**	**$0**	**$0**	**$0**	**$0**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.313.000 Railroad Research and Development					
1 - 1 - 1 SPONSORED RESEARCH	422	0	0	0	0
TOTAL, ALL STRATEGIES	**$422**	**$0**	**$0**	**$0**	**$0**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$422**	**$0**	**$0**	**$0**	**$0**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.500.000 Federal Transit Capital I					

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
1 - 1 - 1 SPONSORED RESEARCH	359,013	250,089	255,116	260,219	265,423
3 - 1 - 1 STAFF GROUP INSURANCE	21,590	12,361	12,583	12,835	13,092
TOTAL, ALL STRATEGIES	**$380,603**	**$262,450**	**$267,699**	**$273,054**	**$278,515**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$380,603**	**$262,450**	**$267,699**	**$273,054**	**$278,515**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.505.000 Metropolitan Planning					
1 - 1 - 1 SPONSORED RESEARCH	85,653	53,347	54,420	55,508	56,618
3 - 1 - 1 STAFF GROUP INSURANCE	7,954	4,358	4,437	4,526	4,616
TOTAL, ALL STRATEGIES	**$93,607**	**$57,705**	**$58,857**	**$60,034**	**$61,234**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$93,607**	**$57,705**	**$58,857**	**$60,034**	**$61,234**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.507.000 Fed Transit Formula Urbanized					
1 - 1 - 1 SPONSORED RESEARCH	978	0	0	0	0
3 - 1 - 1 STAFF GROUP INSURANCE	98	0	0	0	0
TOTAL, ALL STRATEGIES	**$1,076**	**$0**	**$0**	**$0**	**$0**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$1,076**	**$0**	**$0**	**$0**	**$0**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.509.000 Non-Urbanized Area Formula Grants					
1 - 1 - 1 SPONSORED RESEARCH	12,706	20,377	20,787	21,202	21,627
3 - 1 - 1 STAFF GROUP INSURANCE	839	922	938	957	976

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
TOTAL, ALL STRATEGIES	**$13,545**	**$21,299**	**$21,725**	**$22,159**	**$22,603**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$13,545**	**$21,299**	**$21,725**	**$22,159**	**$22,603**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.514.000 Transit Planning and Rese					
1 - 1 - 1 SPONSORED RESEARCH	24,195	36,493	37,226	37,971	38,730
3 - 1 - 1 STAFF GROUP INSURANCE	1,858	2,408	2,452	2,501	2,551
TOTAL, ALL STRATEGIES	**$26,053**	**$38,901**	**$39,678**	**$40,472**	**$41,281**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$26,053**	**$38,901**	**$39,678**	**$40,472**	**$41,281**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.530.000 Public Transportation Innovation					
1 - 1 - 1 SPONSORED RESEARCH	37,379	97,811	99,778	101,773	103,809
3 - 1 - 1 STAFF GROUP INSURANCE	3,007	10,014	10,194	10,398	10,606
TOTAL, ALL STRATEGIES	**$40,386**	**$107,825**	**$109,972**	**$112,171**	**$114,415**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$40,386**	**$107,825**	**$109,972**	**$112,171**	**$114,415**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.600.000 State and Community Highw					
1 - 1 - 1 SPONSORED RESEARCH	2,624,054	3,072,912	3,134,683	3,197,377	3,261,324
3 - 1 - 1 STAFF GROUP INSURANCE	212,385	303,354	308,815	314,991	321,291
TOTAL, ALL STRATEGIES	**$2,836,439**	**$3,376,266**	**$3,443,498**	**$3,512,368**	**$3,582,615**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$2,836,439**	**$3,376,266**	**$3,443,498**	**$3,512,368**	**$3,582,615**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
20.612.000 Grant to Increase Motorcycle Safety					
1 - 1 - 1 SPONSORED RESEARCH	11,462	6,894	7,033	7,173	7,317
3 - 1 - 1 STAFF GROUP INSURANCE	19	25	25	26	26
TOTAL, ALL STRATEGIES	**$11,481**	**$6,919**	**$7,058**	**$7,199**	**$7,343**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$11,481**	**$6,919**	**$7,058**	**$7,199**	**$7,343**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.614.000 NHTSA Discretionary Safety Grants					
1 - 1 - 1 SPONSORED RESEARCH	196,849	423,078	431,583	440,214	449,019
3 - 1 - 1 STAFF GROUP INSURANCE	2,451	23,407	23,828	24,305	24,791
TOTAL, ALL STRATEGIES	**$199,300**	**$446,485**	**$455,411**	**$464,519**	**$473,810**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$199,300**	**$446,485**	**$455,411**	**$464,519**	**$473,810**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.616.000 National Priority Safety Programs					
1 - 1 - 1 SPONSORED RESEARCH	1,236,159	1,580,246	1,612,012	1,644,252	1,677,137
3 - 1 - 1 STAFF GROUP INSURANCE	102,708	158,994	161,856	165,093	168,395
TOTAL, ALL STRATEGIES	**$1,338,867**	**$1,739,240**	**$1,773,868**	**$1,809,345**	**$1,845,532**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$1,338,867**	**$1,739,240**	**$1,773,868**	**$1,809,345**	**$1,845,532**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
20.701.000 University Transportation					
1 - 1 - 2 NATIONAL CENTERS	1,984,544	2,976,729	3,036,505	3,097,235	3,159,180
3 - 1 - 1 STAFF GROUP INSURANCE	83,696	107,561	109,497	111,687	113,920

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
TOTAL, ALL STRATEGIES	**$2,068,240**	**$3,084,290**	**$3,146,002**	**$3,208,922**	**$3,273,100**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$2,068,240**	**$3,084,290**	**$3,146,002**	**$3,208,922**	**$3,273,100**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
66.000.000 County-wide Environment Assessment					
1 - 1 - 1 SPONSORED RESEARCH	12,954	-102	-104	-106	-108
3 - 1 - 1 STAFF GROUP INSURANCE	1,086	-126	-128	-130	-133
TOTAL, ALL STRATEGIES	**$14,040**	**-$228**	**-$232**	**-$236**	**-$241**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$14,040**	**-$228**	**-$232**	**-$236**	**-$241**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
66.046.000 CLIMATE POLLUTION REDUCTION GRANTS					
1 - 1 - 1 SPONSORED RESEARCH	0	28,689	29,266	29,851	30,448
3 - 1 - 1 STAFF GROUP INSURANCE	0	2,691	2,739	2,794	2,850
TOTAL, ALL STRATEGIES	**$0**	**$31,380**	**$32,005**	**$32,645**	**$33,298**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$0**	**$31,380**	**$32,005**	**$32,645**	**$33,298**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
81.000.010 DOE FOR TTI					
1 - 1 - 1 SPONSORED RESEARCH	-5,173	0	0	0	0
3 - 1 - 1 STAFF GROUP INSURANCE	-555	0	0	0	0
TOTAL, ALL STRATEGIES	**-$5,728**	**$0**	**$0**	**$0**	**$0**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**-$5,728**	**$0**	**$0**	**$0**	**$0**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
84.116.000 Fund for the Improvement					
1 - 1 - 1 SPONSORED RESEARCH	431,400	259,020	264,227	269,511	274,902
3 - 1 - 1 STAFF GROUP INSURANCE	-68	0	0	0	0
TOTAL, ALL STRATEGIES	**$431,332**	**$259,020**	**$264,227**	**$269,511**	**$274,902**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$431,332**	**$259,020**	**$264,227**	**$269,511**	**$274,902**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
93.113.000 Biological Response to En					
1 - 1 - 1 SPONSORED RESEARCH	426,214	554,970	566,126	577,449	588,998
3 - 1 - 1 STAFF GROUP INSURANCE	20,150	33,436	34,037	34,718	35,412
TOTAL, ALL STRATEGIES	**$446,364**	**$588,406**	**$600,163**	**$612,167**	**$624,410**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$446,364**	**$588,406**	**$600,163**	**$612,167**	**$624,410**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
93.262.000 Occupational Safety and H					
1 - 1 - 1 SPONSORED RESEARCH	0	51,597	52,635	53,687	54,761
3 - 1 - 1 STAFF GROUP INSURANCE	0	4,396	4,475	4,565	4,656
TOTAL, ALL STRATEGIES	**$0**	**$55,993**	**$57,110**	**$58,252**	**$59,417**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$0**	**$55,993**	**$57,110**	**$58,252**	**$59,417**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
93.273.000 Alcohol Research Programs					
1 - 1 - 1 SPONSORED RESEARCH	34,179	-60	-62	-63	-64
3 - 1 - 1 STAFF GROUP INSURANCE	1,639	-74	-76	-77	-79

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CFDA/ALN NUMBER/ STRATEGY	Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
TOTAL, ALL STRATEGIES	**$35,818**	**-$134**	**-$138**	**-$140**	**-$143**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$35,818**	**-$134**	**-$138**	**-$140**	**-$143**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**
98.001.000 USAid Asst for Programs Overseas					
1 - 1 - 1 SPONSORED RESEARCH	-2,054	0	0	0	0
3 - 1 - 1 STAFF GROUP INSURANCE	-226	0	0	0	0
TOTAL, ALL STRATEGIES	**-$2,280**	**$0**	**$0**	**$0**	**$0**
ADDL FED FNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**-$2,280**	**$0**	**$0**	**$0**	**$0**
ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**

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CFDA/ALN NUMBER/ STRATEGY		Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
SUMMARY LISTING OF FEDERAL PROGRAM AMOUNTS						
10.310.000	Agriculture Food Research (AFRI)	812	0	0	0	0
11.432.000	Environmental Research L	644,999	962,470	981,702	1,001,337	1,021,363
11.617.000	TEES project B5490 - Congr-Id Proj	194,367	650,985	664,016	677,295	690,841
12.630.000	Basic, Applied, and Adva	48,384	122,150	124,570	127,062	129,603
17.502.000	Occupational Safety and H	45,386	38,087	38,845	39,621	40,414
20.000.727	MISC DOT FOR TTI	977,235	1,417,595	1,445,922	1,474,837	1,504,336
20.106.000	Airport Improvement Progr	893	0	0	0	0
20.108.000	Aviation Research Grants	0	63,731	65,011	66,314	67,637
20.200.000	Highway Research and Development	7,723,446	16,562,755	16,894,682	17,232,577	17,577,228
20.205.000	Highway Planning and Cons	2,126,472	2,118,893	2,161,160	2,204,383	2,248,471
20.215.000	Highway Training and Educ	311,417	272,257	277,698	283,252	288,918
20.237.000	Commercial Vehicle Information Net.	773,688	874,565	891,982	909,821	928,018
20.301.000	Railroad Safety	10,233	0	0	0	0
20.313.000	Railroad Research and Development	422	0	0	0	0
20.500.000	Federal Transit Capital I	380,603	262,450	267,699	273,054	278,515
20.505.000	Metropolitan Planning	93,607	57,705	58,857	60,034	61,234
20.507.000	Fed Transit Formula Urbanized	1,076	0	0	0	0

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CFDA/ALN NUMBER/ STRATEGY		Exp 2025	Est 2026	Bud 2027	BL 2028	BL 2029
20.509.000	Non-Urbanized Area Formula Grants	13,545	21,299	21,725	22,159	22,603
20.514.000	Transit Planning and Rese	26,053	38,901	39,678	40,472	41,281
20.530.000	Public Transportation Innovation	40,386	107,825	109,972	112,171	114,415
20.600.000	State and Community Highw	2,836,439	3,376,266	3,443,498	3,512,368	3,582,615
20.612.000	Grant to Increase Motorcycle Safety	11,481	6,919	7,058	7,199	7,343
20.614.000	NHTSA Discretionary Safety Grants	199,300	446,485	455,411	464,519	473,810
20.616.000	National Priority Safety Programs	1,338,867	1,739,240	1,773,868	1,809,345	1,845,532
20.701.000	University Transportation	2,068,240	3,084,290	3,146,002	3,208,922	3,273,100
66.000.000	County-wide Environment Assessment	14,040	-228	-232	-236	-241
66.046.000	CLIMATE POLLUTION REDUCTION GRANTS	0	31,380	32,005	32,645	33,298
81.000.010	DOE FOR TTI	-5,728	0	0	0	0
84.116.000	Fund for the Improvement	431,332	259,020	264,227	269,511	274,902
93.113.000	Biological Response to En	446,364	588,406	600,163	612,167	624,410
93.262.000	Occupational Safety and H	0	55,993	57,110	58,252	59,417
93.273.000	Alcohol Research Programs	35,818	-134	-138	-140	-143
98.001.000	USAid Asst for Programs Overseas	-2,280	0	0	0	0

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CFDA/ALN NUMBER/ STRATEGY	**Exp 2025**	**Est 2026**	**Bud 2027**	**BL 2028**	**BL 2029**
TOTAL, ALL STRATEGIES	$20,786,897	$33,159,305	$33,822,491	$34,498,941	$35,188,920
TOTAL , ADDL FED FUNDS FOR EMPL BENEFITS	0	0	0	0	0
TOTAL, FEDERAL FUNDS	**$20,786,897**	**$33,159,305**	**$33,822,491**	**$34,498,941**	**$35,188,920**
TOTAL, ADDL GR FOR EMPL BENEFITS	**$0**	**$0**	**$0**	**$0**	**$0**

SUMMARY OF SPECIAL CONCERNS/ISSUES

Assumptions and Methodology:

Federal funds for FY 2026 and FY 2027 are estimated based on anticipated funding levels.

Potential Loss:

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	FY 2026 Revenue	FY 2027 Revenue	Biennium Total	Percentage of Total	FY 2028 Revenue	FY 2029 Revenue	Biennium Total	Percentage of Total
Appropriated Sources Inside The Bill Pattern								
State Appropriations (excluding HEGI & State Paid Fringes)	11,975,439	11,975,439	23,950,878	9.97%	11,975,439	11,975,439	23,950,878	9.57%
Tuition and Fees (net of Discounts and Allowances)	0	0	0	0.00%	0	0	0	0.00%
Endowment and Interest Income	0	0	0	0.00%	0	0	0	0.00%
Sales and Services of Educational Activities (net)	0	0	0	0.00%	0	0	0	0.00%
Sales and Services of Hospitals (net)	0	0	0	0.00%	0	0	0	0.00%
Other Income	107,034,013	109,174,698	216,208,711	90.03%	112,097,546	114,339,491	226,437,037	90.43%
Subtotal, Appropriated Sources Inside The Bill Pattern	**119,009,452**	**121,150,137**	**240,159,589**	**100%**	**124,072,985**	**126,314,930**	**250,387,915**	**100%**
Appropriated Sources Outside The Bill Pattern								
State Appropriations (HEGI & State Paid Fringes)	7,191,761	7,773,372	14,965,133	100.00%	7,191,761	7,773,372	14,965,133	100.00%
Higher Education Fund	0	0	0	0.00%	0	0	0	0.00%
Available University Fund	0	0	0	0.00%	0	0	0	0.00%
State Grants and Contracts	0	0	0	0.00%	0	0	0	0.00%
Subtotal, Appropriated Sources Outside The Bill Pattern	**7,191,761**	**7,773,372**	**14,965,133**	**100%**	**7,191,761**	**7,773,372**	**14,965,133**	**100%**
Non-Appropriated Sources								
Tuition and Fees (net of Discounts and Allowances)	0	0	0	0.00%	0	0	0	0.00%
Federal Grants and Contracts	0	0	0	0.00%	0	0	0	0.00%
State Grants and Contracts	0	0	0	0.00%	0	0	0	0.00%
Local Government Grants and Contracts	0	0	0	0.00%	0	0	0	0.00%
Private Gifts and Grants	500,000	500,000	1,000,000	20.64%	500,000	500,000	1,000,000	20.35%
Endowment and Interest Income	355,000	357,000	712,000	14.70%	359,000	361,000	720,000	14.65%
Sales and Services of Educational Activities (net)	1,493,622	1,508,558	3,002,180	61.98%	1,523,644	1,538,880	3,062,524	62.31%
Sales and Services of Hospitals (net)	0	0	0	0.00%	0	0	0	0.00%
Professional Fees (net)	0	0	0	0.00%	0	0	0	0.00%
Auxiliary Enterprises (net)	0	0	0	0.00%	0	0	0	0.00%
Other Income	64,547	65,192	129,739	2.68%	65,844	66,503	132,347	2.69%
Subtotal, Non-Appropriated Sources	**2,413,169**	**2,430,750**	**4,843,919**	**100%**	**2,448,488**	**2,466,383**	**4,914,871**	**100%**
Total Sources:	**128,614,382**	**131,354,259**	**259,968,641**	**100%**	**133,713,234**	**136,554,685**	**270,267,919**	**100%**

Agency Code:	Agency: 727	Prepared by: Greg Chavarria
Date: 08-04-2026		

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall meet with TPP section managers to (a) develop and document the sections' core functions and how these core functions are conducted, and (b) identify workforce/ workload drivers (production metrics) to allow the Receiving Agency to predict workload and inform staffing needs. The Performing Agency shall develop and refine the scope for Database and Performance Metric Support, based on the information and insight obtained in TPP Section Mapping and Analysis. The Performing Agency shall develop and refine the scope for Final TPP Strategic Staffing Framework, based on the information and insight obtained in Database and Performance Metric Support and TPP Section Mapping and Analysis.	$ (171.74)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency is responsible for satisfying the federal requirements for transportation plans and programs throughout the State pursuant to 23 U.S.C. 135 and 49 U.S.C. 5304 and oversight responsibilities for transportation plans and programs developed by metropolitan planning organizations (MPOs) pursuant to 23 U.S.C. 134 and 49 U.S.C. 5303 as well as the state requirements under Texas Transportation Code 201, Subchapter H. In addition, the Receiving Agency is responsible for carrying out a continuing, cooperative, and comprehensive statewide transportation planning process, including the development of a long-range statewide transportation plan and statewide transportation improvement program and overseeing the development of the metropolitan transportation planning process. The Performing Agency shall provide technical expertise to the Receiving Agency for statewide and metropolitan transportation planning and programming and comply with the Receiving Agency's Service Request Process outlined in EXHIBIT 1.	$ 1,436.46	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall update and deliver seal coat training and provide general support to the Receiving Agency to address strategic maintenance and pavement preservation activities.	$ 14.02	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide a variety of quick response services, such as planning, evaluation, and technical support, to the Receiving Agency as it addresses state and federal legislative inquiries and specific requests from Receiving Agency Administration and Texas Transportation Commission (Commission). The Receiving Agency will identify each task and will issue a Notice to Proceed (NTP) to the Performing Agency. The NTP will include a work plan for the requested task, maximum amount payable, and initiation and completion dates. Tasks may vary from the development of a performance measures governance document to assistance with renewed energy sector program impact analysis and repair strategies. As required by the Receiving Agency, and identified in each NTP, the Performing Agency's staff shall travel to various locations around the state to perform its contracted activities.	$ 139.19	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency [TxDOT's Bicycle and Pedestrian Program in the Public Transportation Division (PTN)] is responsible for planning, technical assistance, and statewide coordination of bicycle and pedestrian transportation. The scope of responsibility includes coordinating the development of planning and design guidelines, providing information resources, and distributing federal and state funding for bicycle and pedestrian transportation projects. In anticipation of eventual mandatory reporting of bicycle and pedestrian counts to the federal Traffic Monitoring Analysis System, the Receiving Agency has built the foundation of a bicyclist and pedestrian count program by engaging the Performing Agency to establish a statewide database, guidance, and training through research and implementation projects. Through the further collection of bicyclist and pedestrian count data, the Receiving Agency will be better informed about how to quantify walking and bicycling activity on state highways and therefore make better transportation investment decisions about how to accommodate increased demand. The Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions, collaboration and partnerships, and advanced problem-solving capabilities. Additionally, the Receiving Agency has limited staff and technical expertise to implement and manage this new count program.	$ 37,034.80	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide nondestructive testing (NDT), field testing, pavement design and materials testing expertise to assist in identifying the most cost-effective pavement rehabilitation alternatives for candidate projects identified by the Receiving Agency. The Performing Agency shall perform corridor analysis evaluations for routes in Texas identified by the Receiving Agency by using pavement evaluation tools such as NDT, pavement auguring and coring, lab testing, and structural analysis. This task will be performed on an as-needed basis upon request from the Receiving Agency.	$ 162.75	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall travel to the Receiving Agency's statewide districts to perform full pavement forensic investigations of prematurely distressed highway sections identified by the Receiving Agency to include identifying the causes of distress, conducting routine and advanced physical and chemical materials characterization testing, and recommend the most cost-effective repair alternative to resolve the issue. The Performing Agency shall also develop recommendations for the modification of specifications, materials selection, construction and design practices to avoid future occurrences.	$ 6,688.60	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI will provide technical support and assistance to the TPP Division in developing required state-mandated reports on congestion and congestion reduction, congestion and Congestion Mitigation and Air Quality (CMAQ) performance measures and targets, performance–based project selection, and congestion forecasts.	$ 1,227.31	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall evaluate implementation of existing and emerging travel behavior (including origin/destination [OD]) data platforms and tools. The Performing Agency shall conduct user assessments and product reviews of the Receiving Agency and all pooled fund participant's experiences with platform tools such as Streetlight, Regional Integrated Transportation Information System (RITIS), and Moonshadow. Assessments shall include interviews, and observations of members using each platform. The Performing Agency shall document the results of this assessment in a technical memorandum. In FY22, the Performing Agency shall also develop an update to the Technical Memorandum "Tools and Best Practices for Using Passive Origin-Destination Data," which was first developed in FY19 (through this pooled fund project) and needs an update to current practices. In FY23, the Performing Agency shall work with the Receiving Agency and all pooled fund participants to develop recommendations and a needs assessment that can be shared with travel behavior platform and data providers to facilitate implementation and best practices of the Receiving Agency and all pooled participants.	$ 5,636.35	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency's Maintenance Division, with erosion control materials testing. Assistance shall include, equipment calibrations and baseline testing and erosion control product testing.	$ (4,109.42)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines general task areas the Performing Agency shall perform for the Receiving Agency's Waco District to support the I-35 construction and operations and routes that are significant to the overall mobility and operations of I-35 around the Waco District. These tasks detail state-of-the-art traveler information and mobility coordination services. The Performing Agency shall provide documentation of work performed in the form of technical memorandum/reports, task specific outreach materials, meeting handouts, status reports, and other written materials.	$ 82,945.94	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services for the Performing Agency are outlined in the following tasks to be performed for the Receiving Agency's Dallas District (District). A written Notice to Proceed will be required before any of the following services can be performed. The Notice to Proceed (NTP) can only be authorized by the Receiving Agency's Dallas District by the Advance Project Development Engineer, Transportation Engineering Supervisor, or higher level of authority. Any NTP under Tasks 1,2, 4, 6, 7, or 10 must also be signed by TxDOT's Information Management Division before it is authorized to ensure compliance with State law and TxDOT policy governing hardware, software, and data. Documentation of work performed will be provided in the form of technical memorandums or reports, meeting handouts, monthly progress reports, status meetings, and other written materials as requested by the Receiving Agency. Note, any work related to hardware, software and new or external data will be coordinated with the Information Management Division (IMD), Traffic Safety Division (TRF) and/or any other Divisions as appropriate.	$ 561.23	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall perform data collection using the Receiving Agency's real-time profiler device on at least two to three concrete pavement projects per fiscal year (FY) during this contract term. The Performing Agency shall collect and analyze the Real Time Profiler (RTP) data and summarize findings for each project.	$ 577.91	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency for a variety of tasks related to carrying out the Receiving Agency's Data Analytics and Tools Program.	$ 4,824.05	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This Interagency Cooperation Contract outlines a comprehensive two-year program to enhance Texas freight planning, analysis, and decision-support capabilities. The primary focus is maintaining and expanding the Truck Congestion Analysis Tool (TCAT), including annual updates using TxDOT's 100 Most Congested Roadways database, quarterly truck mobility reporting, advanced interactive visualizations, origin-destination and truck flow analysis, and integration of truck crash and safety performance data. The contract also supports strategic freight planning through workshops, policy briefings, and development of innovative freight performance tools that help TxDOT better understand truck congestion, mobility, safety, and freight system operations across the state. Beyond congestion analysis, the contract advances freight fluidity, oversize/overweight (OS/OW) truck analysis, truck parking analytics, electronic logging device (ELD) data applications, freight-focused traffic management strategies, and general freight planning support. Major deliverables include development of web-based visualization tools, data dashboards, query systems, technical memoranda, planning studies, stakeholder workshops, and communication resources. Collectively, these efforts are intended to provide TxDOT with actionable data, performance measures, and analytical tools to improve freight mobility, supply chain resiliency, infrastructure planning, truck parking management, safety analysis, and freight-related decision-making throughout Texas while ensuring strong project management, reporting, and data security compliance. Provide your feedback on BizChat	$ 33,969.88	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide photometric and visibility measurements, forensic analysis, related technical assistance, and specification support.	$ (160.60)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide photometric and visibility measurements, forensic analysis, related technical assistance, and specification support.	$ 230.87	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Scope of Services The Receiving Agency (TxDOT's Public Transportation Division) is responsible for administering the state's program for public transportation. The scope of responsibility includes the distribution of federal and state funding for public transportation in small urban and rural areas, and state funding for eligible large urban areas. Receiving Agency is also responsible for managing the programs for planning, technical assistance, and statewide coordination of public transportation. Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions and advanced problem-solving capabilities.	$ 1,102.90	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall develop a guide to commercially available transportation data and data services and create plans for pilot deployments that may benefit the Receiving Agency. The Performing Agency shall, on an iterative basis, group data and data services into logical market segments. One possible approach to logical market segments is the implementing Division or District Workgroup of the Receiving Agency. This organization makes it explicit about which group within the Receiving Agency is responsible for a pilot deployment to be recommended in Task 5. A final decision on the preferred organizational approach for logical market segments will be made during conduct of this task.	$ 5,774.31	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Emergency response services play a vital role in saving lives and minimizing property damage when major events or incidents happen. The Dedicated Short Range Communication (DSRC) and Bluetooth Low Energy (BLE) technologies have the potential to improve the efficiency and roadway safety related to emergency management services. The primary objective of this project is to develop and test DSRC- and BLE-based prototype systems for enhancing emergency preemption and notification. Another objective is to provide the Receiving Agency with guidelines for implementing DSRC and BLE technologies for supporting emergency response services. To this end, the Performing Agency shall: (1) Identify methodologies for improving emergency vehicle signal preemption in a connected environment; (2) Develop and test prototype DSRC-based and BLE-based systems to broadcast Signal Phase and Time (SPaT) messages, Emergency Vehicle Alerts (EVAs), and other notifications to emergency vehicles and other roadway users in the vicinity; (3) Enhance signal preemption performance; (4) Assist the Receiving Agency in implementing the prototype systems at selected Houston field sites; and (5) Identify anticipated cost and benefit of the connected emergency response system. The key products of the project include DSRC and BLE prototype systems that operate with the Receiving Agency's infrastructure and guidelines for implementing the system.	$ 5,072.84	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ 2,439.62	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The majority of bridges in Texas are constructed with girders as simple spans. A simple-span deck requires expansion joints which are sources for maintenance and durability issues. To avoid this, continuous decks are an attractive option, however cracks may develop. The Receiving Agency utilizes a detail that intentionally forms these crack, referred to as the “Texas Poor Boy” detail. Despite a four decade history of such detailing, a comprehensive evaluation of performance of this detailing has not been conducted. The Performing Agency shall conduct a multi-tiered survey to identify the performance of the current “Poor Boy” continuous bridge deck details within different environments (high ADT, high rainfall, or high deicing salt zones), as well as a literature and state-of-the practice survey to establish the detailing and expected performance of alternative connection designs. Using the results of these surveys, the Performing Agency shall develop candidate modifications to the current poor-boy details for new construction and candidate details for rehabilitation of existing bridges. The Performing Agency shall use the modeling and full-scale experimental tests to assess the performance of the recommended details. The Performing Agency shall use the results of the modeling and experimental to make final recommendations for design methodologies and details.	$ 211.51	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, “Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation” has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ 27,144.72	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Stabilization of roadway or stockpile materials allows for enhancing strength and stiffness properties of pavement base layers to meet structural requirements in a cost-effective and sustainable manner. Historically, stabilization mixture design criteria relied on compressive strength results and, depending on the treatment and test method, could take nearly a month to complete. Additionally, the different treatments currently require different preparation, curing, and acceptance criteria. This project shall develop a harmonized accelerated design procedure for base materials with the objective of producing an acceptable design recommendation within seven (7) days. This project shall include stabilizer types such as cement, lime, lime-fly-ash, asphalt emulsion, and foamed asphalt, and shall focus on rapid test turnaround time, lab curing techniques to rapidly simulate cured field conditions, inclusion of moisture susceptibility in the mix design, and performance-related design criteria. This project shall develop recommended harmonized test procedures, suggested specification modifications as applicable, and perform training workshops.	$ 611.24	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project will use a phased work plan to develop a freight model within one or more urban areas of the state of Texas using the most current state of the practice methods and data sources. The Performing Agency shall produce a freight model through an interactive and iterative process by the the Performing Agency, Receiving Agency, and Metropolitan Planning Organizations (MPO) partners using the concept of first creating a “minimum viable product” as used in commercial software development. Key initial steps to this process will be investigation of similar recent freight modeling efforts in the United States (U.S.), early identification of freight model requirements for both Receiving Agency and local/regional planning efforts, selection of the type/function of model that will address those requirements, and an assessment of data availability and of any fatal flaws that might be encountered. The Performing Agency shall then work cooperatively with the selected MPO partner to build and implement a state-of-the practice model that can be iteratively improved over time as additional data or methods emerge. Training for model users and an ongoing, web-based forum for users to share insights and questions are also part of the work plan. Reporting of results and transferability to diverse MPOs are other key features of the project.	$ (11,211.85)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Corrosion of steel has been causing millions of dollars of loss in infrastructure to the state of Texas. The use of corrosion-resistant reinforcement in concrete structures and painting of steel elements have been the most common mitigation strategies. In addition, the use of weathering steel, metalizing on steel and concrete elements, and cathodic protection (sacrificial anode) have also been applied on the Receiving Agency bridges. The performances of different approaches vary with different bridges in different geographic areas; i.e., cold, arid, and humid districts. It is imperative for the Receiving Agency to have a decision tool to conduct effective corrosion prevention for new construction and corrosion mitigation for effective maintenance. The objectives of this project are to (1) conduct a synthesis of worldwide field investigations of the performance of corrosion mitigation, (2) perform field evaluations statewide to investigate the effectiveness of corrosion mitigation instrumented in the past, and to (3) perform lab tests, as necessary, to verify findings and to obtain a better understanding of corrosion mitigation approaches.	$ (2,894.03)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Roadway departure crashes are the most common type of crash in Texas. These crashes represent over 45% of all fatal crashes and 34% of all serious injury crashes. Texas data shows that there were 9,560 fatal and 30,766 serious injury roadway departure crashes from 2010-2016. Roadside safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. To improve the safety of the motoring public, there is a need to develop new or improved safety devices that accommodate a variety of site conditions, placement locations, and a changing vehicle fleet. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively address high priority issues related to roadside safety devices. The Performing Agency shall provide results in new and improved safety features that minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes. The Performing Agency shall develop roadside safety devices to meet the new American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH), to address the continuing trend of larger vehicles in the statewide vehicle fleet.	$ 2,250.00	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.	$ 317.50	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Cross frames are critical for the stability of steel bridges during erection and construction and play an important role for completed bridges. Historically, the brace locations have been regions of fatigue concerns. In addition, the braces require significant handling and processing during fabrication and represent one of the most expensive components per unit weight on the bridge. Therefore, there are major benefits in terms of economics and structural performance to minimize the number of cross frames. Lean-on bracing concepts that replace full cross frames in certain bracing lines with top and bottom struts that allow a single cross frame to brace several girders is a method of minimizing the number of cross frames on a bridge. Lean-on concepts were developed in for TxDOT in the early 2000s. While the previous study developed design guidelines, recent applications of leanon bracing on two TxDOT bridge designs demonstrated the need for improved efficiency and clarity. This project consists of instrumenting the bridges with lean-on bracing during construction to better understand the behavior. The Performing Agency shall carry out parametric finite element analyses (FEA) along with the field monitoring, and develop improved guidelines to facilitate widespread use of lean-on bracing applications in Texas bridges.	$ 300.96	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Traffic control devices (TCDs) are the primary means of communicating highway information to road users. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project may represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ 10.82	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Environmental Protection Agency (EPA) guidance document National Management Measure to Control Nonpoint Source Pollution from Urban Areas (November 2005, EPA-841-B-05-004) requires all construction site activities to reduce the amount of sediment generated (erosion control) and reduce the off-site transport of sediment and construction-related chemicals (sediment and chemical control). While there are several pollutants of concern (oils, gasoline, degreasers, paints, etc.), sediment from construction sites is by far the largest pollutant source (Canning, 1988). Eroded sediment from construction sites causes many problems, including adverse impacts on water quality as well as decreased capacity of reservoirs and streams, resulting in possible flooding. Sediment control devices (SCDs) are used on construction sites to retain sediment and prevent stormwater from adversely affecting adjacent waterways. SCDs include silt fences, wattles, sediment logs and basins, filter dams, and inlet protection devices. These products are designed to be installed for specific applications (curb inlets, drop inlets, perimeter protection, etc.) However, there is no scientifically sound, repeatable testing methodology that replicates field conditions to test and determine SCD performance. This project shall develop a formal testing protocol, test apparatus and propose thresholds for a performance-based sediment control device testing program that will assist the designer/engineer in selecting the most effective sediment control best management practice.	$ (2,388.73)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this research project is to determine where, when, and why a prime or cure is needed for a pavement layer. Materials such as prime coats, curing materials, seal coats, and tack coat are typically considered non-structural, but integral to the pavement structure. Some materials can be used for multiple purposes: prime, bond or help cure; however, the rates and timing of use may change depending on why the material is being used. Guidance is needed to help designers, inspectors and construction personnel understand the materials and where, when, and why to use them. This project shall develop guidelines for prime and curing through a series of laboratory and field testing and develop tests and procedures to determine the best materials for a prime, cure or a combination. These guidelines shall aid decision makers in determining whether a prime, cure or bonding material is needed, and where, when and why to design and use the appropriate materials.	$ 15.27	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Lab-molded density of asphalt mixes is a critical factor for laboratory mix design, plant production, and field performance. Current mix design and production quality control and quality assurance (QC/QA) are developed around a fixed lab-molded density of 96 percent. Adherence to a fixed lab-molded density is not only one of the main factors leading to drier, more crack susceptible mixes where low asphalt binder content is often caused by balancing high lab-molded density values at plant production, but it also impacts the implementation of the Balanced Mix Design approach. Furthermore, various field test sections designed with densities ranging from 96.5 to 98 percent were previously constructed in different areas of Texas, and they performed well in the field with no observed rutting problems. Thus, the objective of this project is to establish an acceptable range of lab-molded densities for laboratory mix design and production QC/QA testing. To achieve the objective, the Performing Agencies shall review the literature, conduct extensive laboratory performance tests, construct test sections and monitor their performance, and finally recommend an acceptable range of lab-molded density based on all the information and data collected.	$ 13.97	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this research project is to develop measurable and repeatable adjustment criteria for seal coat application rates based on pavement condition, traffic and material properties for the design method developed in research project 0-6989 Update Seal Coat Application Rate Design Method (TxDM6989).[1] Current practice requires experienced personnel to understand the adjustments needed for application rates, including changing the adjustments as conditions on the pavement change. The adjustments in the TxDM6989 combine multiple pavement conditions into one description. By measuring the conditions, a combined adjustment based upon measured parameters will remove subjectivity from the procedure. This will lead to more consistently constructed projects that meet the objectives of designing the rates so that the resulting seal will not have too much binder so that it flushes or bleeds in the summer; but there is enough binder to prevent rock loss over the winter. This research project will produce measurable methods for adjustments to the rate design procedures that will help engineers and inspectors make better decisions resulting in successful projects.	$ 1,000.23	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Traffic Speed Deflection Devices (TSDD) non-destructively measure structural condition while traveling at traffic speeds. Advancements in TSDD's have enabled these evaluations to be made with the benefit of reducing safety hazards associated with traditional stop and go Falling Weight Deflectometer (FWD) devices. The Receiving Agency is an active participant in the Transportation Pooled Fund TPF-5(385) "Pavement Structural Evaluation with Traffic Speed Deflection Devices". As a participant, the Receiving Agency has collected more than 1000 miles of TSDD data in several Receiving Agency Districts and is expected to continue to collect TSDD data for the next three (3) years. Recent interest from Receiving Agency Districts on using continuous structural data in network level treatment decisions has necessitated the need to verify TSDD measurements and provide guidelines and analysis methodologies to implement structural condition data for both network and project level pavement management applications. Incorporating a structural condition index into network level decisions has been a goal of the Receiving Agency's for over 30 years with the objective of providing Receiving Agency Districts a comprehensive integrated assessment of both visual and structural condition. Use of this tool shall provide Receiving Agency Districts with what level of pavement rehabilitation treatment is required as they develop their 4-year plans.	$ (1,455.98)	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The overall project objective is to develop a system where prefabricated steel ABC units perform continuous for live load. The system must be: easily constructible, fast to assemble, durable long-term, safe, and cost-effective. The Performing Agency shall achieve this objective by synthesizing what has been done by state departments of transportation and other agencies (through literature review) along with evaluating the behavior of related Receiving Agency bridges (through visual inspection and monitoring). Next, a system development program shall be performed utilizing this information in conjunction with expert feedback from an Industry Review Panel (IRP) workshop (including the Receiving Agency Panel). The three best system designs shall be selected for full-scale laboratory testing followed by an analytical parametric study. All the results shall be compiled and presented at an IRP meeting with the Receiving Agency, where the final system shall be selected. The Performing Agency shall develop full Microstation details and specifications along with a user-friendly design guide. The guide shall identify: • Span length capabilities for girder sizes/depths/spacings, • General details for establishing live load continuity, • Closure pour details at interior bents and how to achieve acceptable deck stresses, • Structural steel splice details and acceptable tolerances, and • Bearing layout to meet the Receiving Agency substructure details.	$ 3,989.29	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Minimum shear reinforcement requirements in the Association of State Highway Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications are based on tests conducted on reinforced concrete panels and beams. The extension of these requirements to prestressed concrete beams introduced significant conservatism in the current LRFD provisions for shear design. More accurate provisions are necessary to better predict the shear strength of prestressed beams. The objective of this project is to investigate the validity of the minimum shear reinforcement requirements and develop new/revised guideline specifications. The Performing Agency shall achieve this objective by: Performing literature review and outreach in order to synthesize a unique database of load tests for prestressed concrete beams, which the Performing Agency shall subsequently analyze using data driven methods to identify major design parameters and missing information that will inform an experimental program. Performing twenty (20) full scale tests on ten (10) commonly used prestressed girders combining a range of identified design parameters to comprehensively re-examine the minimum reinforcement requirements of AASHTO LRFD Bridge Design Specifications accounting for reserve strength and ductility and as well as performance under service conditions. The Performing Agency shall complement the experimental program by analytical modelling to expand its impact. Developing design guidelines for the minimum reinforcement requirements based on the synthesized comprehensive dataset complemented by the full-scale tests and analytical modeling. The Performing Agency shall also pursue integration of these guidelines in the AASHTO LRFD Bridge Design Specifications.	$ 2,636.77	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The American Association of State Highway and Transportation Official (AASHTO) Manual for Assessing Safety Hardware (MASH) specifies the highest impact speed for crash testing of barrier systems with passenger vehicles is 62 miles per hour (mph). This impact speed was derived from analyses of reconstructed crash data, which is nearly 20 years old. Preliminary crash data from National Cooperative Highway Research Program (NCHRP) 17-43, Long-Term Roadside Crash Data Collection Program, under which a new database of reconstructed run-off-road crashes is being developed, indicates that for highways with a posted speed limit greater than 70 mph, the 85th percentile impact speed is 67.7 mph. This means there is a need for a higher design impact speed for barriers used on these higher speed roadways. Increased impact speeds will place more demand on barrier systems. Observations of guardrail systems developing partial rail tears when tested under MASH impact conditions indicate that these systems are near their containment capacity. The Receiving Agency has over 3,500 miles of roadways with posted speeds of 75 mph or higher. The Performing Agency shall assess performance limits of identified commonly used barrier systems for higher impact speeds using engineering analysis and finite element (FE) simulations and shall provide design guidance for selection and installati	$ 579.32	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project will make improvements to the practices followed for placement of pavement markings as well as a tool to assess the current visibility of pavement markings. To achieve these objectives, the work to be performed shall include: 1. Identify the diversity of pavement surfaces in the state of Texas across different geographic regions along with the type of pavement marking. 2. For a diverse set of pavement types and markings, catalog the types of surface markings, age of these markings, their present condition, measured retroreflectivity, and measured contrast ratio using a gloss meter or other devices. 3. Investigate and estimate the visibility of these markings for both human drivers and automated vehicles and develop a model to predict this visibility as a function of the pavement type, marking type, age of the pavement, and environmental conditions. 4. Examine feasibility of using other technologies to improve pavement markings and safety as well as technologies to improve the quality of the existing pavement marking. 5. Use the findings from this study to develop recommendations for improving specifications and practices for placement of new pavement markings. 6. Provide a tool to effectively assess the visibility of existing pavement markings and make suggestions for maintenance or replacement as necessary. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ 364.84	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research will develop user interfaces for the fast scenario analysis tool and automate the coupling of bridge and pavement conditions, economic analysis and truck traffic composition. To achieve these objectives, the work to be performed shall include: 1. Identify potential design improvements, such as the introduction of auxiliary lanes near on-ramps. 2. Determine location of optimal dedicated truck lanes; i.e., right lane versus other lanes. 3. Recommend most effective pavement hardening options. 4. Identify bridges that could benefit from upgrades or hardening. 5. Evaluate impacts of bridge height restrictions. 6. Prepare recommendations for platoon truck following distances and truck weight axle distributions. 7. Prepare for requiring wheel wander for automated truck technologies to minimize negative impacts on pavements. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ 5,700.87	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Mapping of buried utilities using rigorous subsurface utility engineering (SUE) quality level B (QLB), as is frequently performed or recommended, can be costly. It can also be ineffective for unknown utilities (i.e., utilities that exist but for which no information is available). This is particularly common and problematic in areas of oil and gas operations. When undiscovered until construction, these unknown utilities may cause serious scheduling disruptions as well as higher construction costs, along with safety and environmental risks. There is a need for a faster, less expensive method of scanning the right of way (ROW) for these unknown utilities. This research evaluates, selects the most appropriate, and tests the application of newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown pipelines or other utilities in the ROW. It compares the effectiveness and cost of deployment to standard QLB SUE and reports on technologies that are both technically and cost effective for identifying unknown utilities.	$ (22,927.66)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	High precision road maps are a crucial component to facilitating autonomous driving techniques. Autonomous vehicles (AVs) are experiencing exponential growth. According to the latest forecast from IHS Markit, over 33 million AVs will be on the road globally by 2040, posing a higher requirement to ensure AVs' driving safety. Although current AVs rely on vehicular sensing techniques (e.g., Camera, Lidar, Radar), studies have suggested that creating high-quality road maps with traffic control infrastructures (TCIs) (e.g., traffic signs, signals, intersections) precisely digitized is necessary to enhance safe-driving operations of AVs. Meanwhile, digitizing TCIs is also of great importance for road assets planning and management. However, a readily available database with precisely digitized TCIs is still missing in most areas. Traditionally, TCIs are manually digitized by conducting field studies, which is time-consuming and labor-intensive. With the advancement of data collection and processing techniques, numerous emerging data sources are becoming available, posing great potential to capture and digitize TCIs more efficiently. This project shall recommend an effective framework for the digitization, maintenance, and sharing of Receiving Agency roadway assets, especially for TCIs. The Performing Agency shall evaluate commercially available solutions and propose new approaches by leveraging emerging data sources and techniques.	$ 3,994.32	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research will identify potential new legal issues that might arise from TxDOT's involvement in CAV technologies. To achieve these objectives, the work to be performed shall include: 1. Conduct a comprehensive national literature review and stakeholder interviews to identify potential liabilities and mitigation techniques. 2. Perform an analysis under Texas and federal laws (case law and statute) and provide issue spotting and mitigation recommendations. 3. Address specific questions to be answered: a. How does Texas tort limitation affect TxDOT's efforts in these areas? b. How do TxDOT and local government entities position themselves to address increased liability concerns? c. What can be learned from existing law (case law and statute) that might indicate what liability TxDOT and local jurisdictions might have? 4. Perform a legal analysis and provide recommendations to address liability concerns for up to seven specific use cases currently being explored by TxDOT, two to be defined by the project team and five to include: a. The operation of a CAV shuttle between two TxDOT campuses by TxDOT. b. A scenario in which CAVs operating on Texas roads cause damage to TxDOT assets and TxDOT seeks to recover damages. c. Digital sharing of TxDOT infrastructure information to CAVs. d. Receiving data of maintenance issues from private entities. e. A public shuttle for general use. The expectation of the project end product(s) shall attain a Technology Readiness Level of 4.	$ 695.95	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	To improve the quality and effectiveness of the Texas surface transportation system, it is important to be able to predict where and when prolonged congestion will start and how it will spread, as well as to track atypical events and estimate their evolution. Artificial intelligence (AI) approaches provide a unique opportunity to estimate precise congestion measures by utilizing data from agency-owned sensors, third-party providers, and big enterprise data. This project envisions to mitigate the current research gap by conducting two major project phases. The first phase can confirm the validity of commercial data sources for planning and operations, while the second involves understanding which AI models/ algorithm are the most suitable for addressing Receiving Agency needs based on desirable use cases and data availability. Furthermore, it is important to analyse the required data models and workflows to determine whether it is sustainable to train, test, and validate the proposed AI techniques.	$ (2,602.51)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Highways and streets in Texas contain a wide variety of cross-sections, with through lanes, turning lanes, medians, shoulders, parking, and bicycle lanes as common components. Providing an appropriate cross-section is important for both operational and safety performance. It is useful to periodically evaluate whether a given cross-section is the most appropriate based on expected road users and related contextual application. One alternative cross-section treatment is the “road diet”, in which existing through lanes or shoulders may be reduced and that cross-section width reassigned for other purposes. Road diet concepts have been implemented in selected locations in Texas, but there is currently no specific guidance on implementing road diets in Texas. The Performing Agency shall compile and review existing road diet guidance (on both urban/suburban and rural environments) from across the United States, along with research findings, to identify content that would be appropriate for inclusion in Texas-based guidelines for road diet treatments. The Performing Agency shall also consider the data needs for assessing a proposed road diet treatment. The Performing Agency shall use the results from these efforts to determine if existing guidance and data are sufficient to develop road diet guidelines and, if so, provide recommendations for adoption.	$ 3,856.15	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Outdoor advertising signs impact millions of travelers around the world every day. These signs are designed to attract driver attention thus taking it away from the driving task. Driver inattention and distraction are two of the most critical factors for road safety. Receiving Agency regulation of outdoor advertising signs must deal with changing technologies, including digital billboards, which allow for modifications to sign illumination, motion, and content. Regulations are not keeping pace with changing sign trends and must be updated to address potential impacts on road user safety. The Performing Agencies shall focus on the degree of driver distraction caused by typical and digital advertising sign contents. The Performing Agencies shall perform a comprehensive state-of-the-practice review, crash investigation, and an on road human factors evaluation, considering illumination levels and content (including motion) during daytime and nighttime travel for dry and wet-weather conditions. This Performing Agencies shall provide the Receiving Agency with tools and resources to help manage outdoor digital advertising billboards by establishing practical criteria for sign illumination and content. These resources shall allow the Receiving Agency to manage the advertising signs such that road user safety is accounted for while maintaining the ability of sign owners to develop effective means of communicating with the public.	$ (240.90)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Existing queue warning (QW) systems predominantly use infrastructure-based sensors to detect the formation of queues and use dynamic message signs (DMS) to warn drivers. These QW systems, may be inadequate where the required number or density of sensors are not available. Research has shown that crowd sourced probe and connected vehicle (CV) trajectory data used in combination with sensor data can significantly improve the accuracy and latency of queue detection. Furthermore, because of gaps between fixed location of DMSs a subset of drivers can encounter a queue without seeing any warning. Sharing queue information through third-party providers and providing vehicle-specific queue warning in CVs can ensure provision of queue warning to a broader audience in a timely manner. The Performing Agency shall: 1. Develop detailed design of an enhanced queue detection and warning system that combine point-, probe-, and vehicle trajectory data. 2. Test and fine-tune the queue detection algorithm design using computer simulation. 3. Conduct a proof of concept, prototype deployment and field evaluation of the new QW system design on a freeway segment where vehicle queues frequently form. 4. Document the systems engineering and algorithm for the QW system as a potential enhancement to the Lonestar™ advanced traffic management system software application.	$ 2,212.38	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ 907.38	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Due to the complex nature of urban roadways, conventional crash prediction models are limited as these models omit operating speed, short-duration volume, and weather data. To mitigate this research gap, the following three national databases can be utilized: (1) National Performance Management Research Data Set (NPMRDS) with passenger and freight speed data, (2) Travel Monitoring Analysis System (TMAS) data with both temporary traffic counting and continuous traffic counting programs, and (3) real-time weather data from the National Oceanic and Atmospheric Administration (NOAA). The fatality rate on Texas roadways for 2020 was 1.50 deaths per hundred million vehicle miles traveled, which is an 18.94% increase from 1.26 in 2019. From 2011 to 2020, the fatalities on rural roadways increased by 19%, and this increase on urban roadways is disproportionately high (31%). Research and a supporting decision support tool are necessary to improve urban safety. The Performing Agencies shall leverage ongoing staff leadership and engagement in several national and state Department of Transportation (DOT) speed-safety projects. This research shall provide updated safety performance functions (SPFs) for urban roadways and a real-time decision support tool on risk scoring with the applicability of new data input and model updating pipeline.	$ (710.96)	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ 601.71	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The performing agencies shall establish a method to evaluate the existing pavement structural condition and design continuously reinforced concrete pavement (CRCP) overlays, both thin and thick. The design methods will include non-destructive (NDT) pavement evaluation techniques and tools, deflection based CRCP slab thickness design procedures, and CRCP reinforcing design details.	$ 56.99	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ 3,178.93	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's Roadway Design Manual was updated in July 2020 and incorporates considerations for and accommodations of bicyclists and pedestrians, including preferred design order toward Shared Use Paths (SUPs) compared to bicycle lanes and shared lanes. However, the Guidance does not include specific procedures to estimate the anticipated volumes of non-motorized path users. The Receiving Agency's Bicycle Accommodation Design Guidance makes it clear that anticipated user volumes should be considered when designing facilities. The objective of this project is to develop a simple sketch planning-level demand estimation tool that provides anticipated user volumes for SUPs. The project shall also incorporate the results into the future editions of The Receiving Agency's design guidance/manuals. Given the uncertainty in resources, this project shall not use an overly complicated method or a method that requires complex data or data architecture. The project shall benefit from existing data sources, including The Receiving Agency's Texas Bicycle and Pedestrian Count Exchange and other count data resources in the State as well as other secondary and spatial data sources. The project shall develop an easy-to-use tool responding to the needs and requirements of the intended audience while incorporating advancements to improve the accuracy of the demand estimation.	$ 1,731.28	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Different from patching materials, hot-mix cold-laid (HMCL) asphalt mixes are often used as a blade-on/level up material in Texas. Currently, the HMCL asphalt mixes are designed with a Texas Gyratory Compactor (TGC) and checked with the Hveem stability test. The Materials and Tests Division (MTD) of the Receiving Agency is undertaking an initiative to design all asphalt mixes with the Superpave Gyratory Compactor (SGC) and officially phase out the TGC in the upcoming Standard Specifications Book update in 2024. As a result, there is an urgent need to study HMCL mix design with the SGC and replace the Hveem stability test with a new performance related test. The objective of this project is to establish a new HMCL mix design method with the SGC and new performance tests ensuring high quality and long-lasting HMCL mixes which will save millions of dollars of taxpayer money annually. To achieve this objective, the Performing Agency shall review the literature and conduct extensive laboratory TGC, SGC, and performance tests; then develop the SGC-based HMCL mix design method including performance tests and associated criteria; and finally recommend specifications changes.	$ (2,624.97)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ 67,385.95	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's current practice is to conduct numerous speed studies throughout the year to determine if the speed limits should be changed due to new traffic patterns, development, crash history, and other factors. These studies are driven by stakeholder requests or as part of routine annual reviews. The number of studies performed at any given time is limited by staff and consultant resources, resulting in a process that can take several months to complete. Can the increasing availability of vehicle probe data, along with other big datasets, be used to reduce the level of effort and time needed to collect speed data? If so, what data can be readily obtained from big data sources and what procedure would be needed to refine the use of probe speed information and produce speed limit recommendations that are consistent with the sound engineering practices currently used by Receiving Agency staff? This project will explore if there are more efficient methods for conducting Texas speed limit studies that would allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. Such a program would also provide a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ (260.06)	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ 17,324.01	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	A scour analysis is required for all new bridges over water, including bridges through lakes and reservoirs. Wave action may be the primary driver of erosion in these lacustrine environments; however, Federal Highway Administration (FHWA) provides no guidance on predicting scour depths caused by wave action in still waters. The Receiving Agency is required to perform a scour evaluation for all bridges over water, but there is no guidance on how to do so for bridges in lakes and reservoirs. This means several bridges are currently out of compliance with the National Bridge Inspection Standards, and this synthesis will help bring them back into compliance. The Performing Agency shall review the existing literature, survey the practice of Departments of Transportation (DOTs) in the country, collect case histories of bridges subjected to wave scour, analyze all the data collected, and make practical recommendations for addressing the problem of bridge scour in lacustrine environments. These recommendations will include one or more methods for predicting the potential depth of wave scour for bridges in lakes and reservoirs and will investigate whether readily obtainable parameters like fetch, water depth, and wind speed can be used as screening criteria to determine where a wave scour analysis is not needed.	$ (6,987.66)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Long-range transportation planning (LRTP) and travel demand models (TDMs) play an important role in the planning process, which assists transportation agencies with prioritizing future transportation investments. Improved LRTP and TDMs can bring direct benefits to transportation planning in the state. Effective transportation planning and investment decision making depends on timely, comprehensive, and accurate data. However, traditional data collection methods only provide a “snapshot” of the travel information, which limits the performance of conventional LRTP and TDMs. In this regard, while these sources are still used, transportation planners at the state, metropolitan, and local levels are beginning to incorporate third-party traffic data into their planning processes. Planners also start to look at the opportunities afforded through third-party data and provide guidance on how to take advantage of that data to expand and improve planning practices. This project aims to utilize probe-based data to improve the LRTP process and TDMs used by the Receiving Agency, MPOs and other planning agencies in the state. The Performing Agencies shall study and understand how probe-based and location-based data may be leveraged to facilitate the validation and calibration of existing planning models, enhance existing modeling tools, and incorporate advanced modeling techniques.	$ 4,336.68	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project will develop a statewide EV charging infrastructure readiness plan that will fill an important gap and create a guidance resource for entities in determining infrastructure investment locations. By having a plan to determine needs for EV charging infrastructure other stakeholders will benefit as well. For example, utilities can ensure make-readiness and sufficient power capacity to areas considered for deployment. The statewide plan will determine and guide infrastructure investment across the state with a goal of a stable and consistent charging network. The project will also help guide future charging infrastructure funding opportunities in identifying locations of greatest need and impact, and provide guidance to most effectively and equitably distribute available funding.	$ 559.38	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency’s Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ 225.59	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall increase the Receiving Agency’s understanding of the fundamental relationships between posted and operating speed along with providing content to support external and internal Receiving Agency dialog about speed limits and their development for all roadway environments. This project shall include three (3) workshops along with developing Spanish versions of videos on speed limit setting practices.	$ 1,271.59	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency Research Projects 0-7083 Develop Highway Safety Manual (HSM) Safety Performance Functions (SPFs) and Calibration Factors for Texas and 0-7067 Enhancing Freeway Safety Prediction Models developed safety prediction methods for all Texas highways. These methods are used to predict safety performance and help with the complex trade-offs between safety, operations, community impacts, and costs that are often necessary when planning and designing highway projects. These resources shall form a powerful tool for selecting Highway Safety Improvement Program projects and will support and defend safety decisions made by the Design Division and districts. The Performing Agency incorporated these methods into spreadsheet tools to implement the new models and facilitate analysis of all rural and urban roadway segments and intersections. The Performing Agency shall develop and present webinars and workshops for Receiving Agency personnel who are responsible for traffic safety analysis. The webinars and workshops will make the personnel familiarize with the safety prediction methods and the analysis tools.	$ 681.93	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency’s Research and Technology Implementation (RTI) Division funded research project 0-6701 in FY 2012 to investigate potential methods of linking transportation planning in Texas with the environmental clearance process required of the National Environmental Policy Act (NEPA). The study approach and findings were documented in a research report (0-6701-1) and a guidance document entitled Texas Department of Transportation (TxDOT) Resource for Linking Planning with Project Planning in Support of NEPA (0-6701-P1). The Performing Agency shall: (1) Conduct structured interviews with the Receiving Agency’s planning and environmental subject matter experts, five of the state’s Metropolitan Planning Organizations (MPOs), and up to five State Departments of Transportation (DOTs) that pioneered Planning and Environmental Linkages (PEL) in FY 2012 to determine the need for updated/new PEL Guidance given that 0-6701-P1 was developed a decade ago as well as the Receiving Agency’s participation in the NEPA Assignment program under 23 U.S.C. 327 and the Memorandum of Understanding with FHWA originally dated December 16, 2014 and renewed on December 9, 2019 (Phase 1) and, (2) Update 0-6701-P1 if the interviews reveal the need for updated/additional guidance (Phase 2). The structured interviews conducted in Phase 1 revealed the need for updated/additional guidance. The objective of Phase 2 is to develop a user-friendly PEL guidebook that the Performing Agency’s Divisions and District staff can reference in the implementation of PELs in Texas, as well as the Texas Metropolitan Planning Organizations.	$ 8,521.66	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	De-icing using geothermal energy can provide the Receiving Agency with a better alternative than the existing method of using de-icing with sands and/or salts. This research project shall explore the potential for retrofitting bridges with a fluid-filled piping system and move through Technology Readiness Levels (TRL) from concept (TRL level 1) through to prototype demonstration in a relevant environment (TRL level 6).	$ 22,896.90	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall produce Video Summary Report's (VSRs) for the Receiving Agency which summarize transportation research and implementation projects. Additionally, the Performing Agency shall also produce outreach materials for the Receiving Agency that will be transportation research related material and may include additional related subjects of interest.	$ 3,414.02	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This pooled fund study will provide a cooperative approach to conducting research to address roadside safety issues specifically related to improving motorcyclist safety. Furthermore, this program is intended to provide participating states collaborative opportunities to stay abreast of best practices, new regulatory issues, risk management strategies, and other research pertaining to roadside safety improvements for motorcyclists. The research activities will include the identification, development, and evaluation of strategies and devices for mitigating the frequency and severity of roadway departure motorcyclist crashes.	$ 1,395.49	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This contract will be funded, in part, from allocations to the Receiving Agency from the Federal Highway Administration (FHWA) under the 23 USC Section 130 (k) planning set-aside, which funds the compilation and analysis of data in support of the Railway-Highway Grade Crossing portion of the Highway Safety Improvement Program (HSIP), implementing safety projects with the objective to reduce the number and severity of auto-train collisions by decreasing the potential for crashes at public highway-rail grade crossings. Given this funding source, 23 USC Section 148(h)(4) mandates that data compiled or collected for this program "…shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in an action for damages arising from any occurrence at a location identified or addressed in such reports…" This information is also protected by 23 U.S.C. 409 (discovery and admission as evidence of certain reports and surveys). Deliverables produced under this contract will be prefaced by this Section 148(h)(4) disclaimer to protect the data and analysis supported by these federal funds.	$ 25,953.45	$ 30.40	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Stabilization of roadway or stockpile materials allows for enhancing strength and stiffness properties of pavement base layers to meet structural requirements in a cost-effective and sustainable manner. Historically, stabilization mixture design criteria relied on compressive strength results and, depending on the treatment and test method, could take nearly a month to complete. Additionally, the different treatments currently require different preparation, curing, and acceptance criteria. This project shall develop a harmonized accelerated design procedure for base materials with the objective of producing an acceptable design recommendation within seven (7) days. This project shall include stabilizer types such as cement, lime, lime-fly-ash, asphalt emulsion, and foamed asphalt, and shall focus on rapid test turnaround time, lab curing techniques to rapidly simulate cured field conditions, inclusion of moisture susceptibility in the mix design, and performance-related design criteria. This project shall develop recommended harmonized test procedures, suggested specification modifications as applicable, and perform training workshops.	$ 8,008.21	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Roadway departure crashes are the most common type of crash in Texas. These crashes represent over 45% of all fatal crashes and 34% of all serious injury crashes. Texas data shows that there were 9,560 fatal and 30,766 serious injury roadway departure crashes from 2010-2016. Roadside safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. To improve the safety of the motoring public, there is a need to develop new or improved safety devices that accommodate a variety of site conditions, placement locations, and a changing vehicle fleet. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively address high priority issues related to roadside safety devices. The Performing Agency shall provide results in new and improved safety features that minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes. The Performing Agency shall develop roadside safety devices to meet the new American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH), to address the continuing trend of larger vehicles in the statewide vehicle fleet.	$ 34,349.31	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.	$ 11,491.76	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Corrosion of steel has been causing millions of dollars of loss in infrastructure to the state of Texas. The use of corrosion-resistant reinforcement in concrete structures and painting of steel elements have been the most common mitigation strategies. In addition, the use of weathering steel, metalizing on steel and concrete elements, and cathodic protection (sacrificial anode) have also been applied on the Receiving Agency bridges. The performances of different approaches vary with different bridges in different geographic areas; i.e., cold, arid, and humid districts. It is imperative for the Receiving Agency to have a decision tool to conduct effective corrosion prevention for new construction and corrosion mitigation for effective maintenance. The objectives of this project are to (1) conduct a synthesis of worldwide field investigations of the performance of corrosion mitigation, (2) perform field evaluations statewide to investigate the effectiveness of corrosion mitigation instrumented in the past, and to (3) perform lab tests, as necessary, to verify findings and to obtain a better understanding of corrosion mitigation approaches.	$ 12,235.52	$ (17.01)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Different from patching materials, hot-mix cold-laid (HMCL) asphalt mixes are often used as a blade-on/level up material in Texas. Currently, the HMCL asphalt mixes are designed with a Texas Gyratory Compactor (TGC) and checked with the Hveem stability test. The Materials and Tests Division (MTD) of the Receiving Agency is undertaking an initiative to design all asphalt mixes with the Superpave Gyratory Compactor (SGC) and officially phase out the TGC in the upcoming Standard Specifications Book update in 2024. As a result, there is an urgent need to study HMCL mix design with the SGC and replace the Hveem stability test with a new performance related test. The objective of this project is to establish a new HMCL mix design method with the SGC and new performance tests ensuring high quality and long-lasting HMCL mixes which will save millions of dollars of taxpayer money annually. To achieve this objective, the Performing Agency shall review the literature and conduct extensive laboratory TGC, SGC, and performance tests; then develop the SGC-based HMCL mix design method including performance tests and associated criteria; and finally recommend specifications changes.	$ 31,686.78	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall continue to support the Receiving Agency in border related activities in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements.	$ 200,666.62	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency with the implementation of the UCM approach that was developed as part of the second Strategic Highway Research Program 2 (SHRP2) Projects R15B, "Identification of Utility Conflicts and Solutions," and R15C, "Pilot Testing of the Utility Conflict Matrix." The Performing Agency shall gather information and data as it relates to the UCM approach to measure the effectiveness of the implementation including during construction.	$ 71,644.67	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Emergency response services play a vital role in saving lives and minimizing property damage when major events or incidents happen. The Dedicated Short Range Communication (DSRC) and Bluetooth Low Energy (BLE) technologies have the potential to improve the efficiency and roadway safety related to emergency management services. The primary objective of this project is to develop and test DSRC- and BLE-based prototype systems for enhancing emergency preemption and notification. Another objective is to provide the Receiving Agency with guidelines for implementing DSRC and BLE technologies for supporting emergency response services. To this end, the Performing Agency shall: (1) Identify methodologies for improving emergency vehicle signal preemption in a connected environment; (2) Develop and test prototype DSRC-based and BLE-based systems to broadcast Signal Phase and Time (SPaT) messages, Emergency Vehicle Alerts (EVAs), and other notifications to emergency vehicles and other roadway users in the vicinity; (3) Enhance signal preemption performance; (4) Assist the Receiving Agency in implementing the prototype systems at selected Houston field sites; and (5) Identify anticipated cost and benefit of the connected emergency response system. The key products of the project include DSRC and BLE prototype systems that operate with the Receiving Agency's infrastructure and guidelines for implementing the system.	$ 10,028.88	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research will develop user interfaces for the fast scenario analysis tool and automate the coupling of bridge and pavement conditions, economic analysis and truck traffic composition. To achieve these objectives, the work to be performed shall include: 1. Identify potential design improvements, such as the introduction of auxiliary lanes near on-ramps. 2. Determine location of optimal dedicated truck lanes; i.e., right lane versus other lanes. 3. Recommend most effective pavement hardening options. 4. Identify bridges that could benefit from upgrades or hardening. 5. Evaluate impacts of bridge height restrictions. 6. Prepare recommendations for platoon truck following distances and truck weight axle distributions. 7. Prepare for requiring wheel wander for automated truck technologies to minimize negative impacts on pavements. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ 44,804.20	$ (4.63)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Federal law establishes federally funded highway programs, including the State Planning and Research Program and the Technology and Innovation Deployment Program (TIDP) (as specified in Section 503(c) of Title 23 of the United States Code (U.S.C.)), specifically under the accelerated innovation deployment (AID) initiative. The State Transportation Innovation Council (STIC) Incentive program is one tool to address the AID requirements by providing resources to foster a culture of innovation and advance innovations into standard practices in a State Transportation Authority or other public sector STIC stakeholders. The Receiving Agency's Traffic Management Centers (TMCs) are responsible for monitoring freeways within their respective metropolitan areas for crashes, stalls, and other incident impacting traffic flow, contacting the appropriate responding agencies (police/fire/emergency medical services/tow), and tracking incident progress. Receiving Agency TMC staff predominantly use Closed Circuit television (CCTV) camera feeds to find incidents, as well as volume/speed detectors on the Receiving Agency Intelligent Transportation Systems (ITS) map, and the traffic layer on Google Maps. While these methods help to some degree, they are not always effective or efficient. CCTV tours (which show 5-10 second feeds of a freeway segment) can miss an incident if the camera is pointing in a different direction. Receiving Agency TMC staff focusing on one freeway may miss an event on another freeway. Google traffic indicators only show the level of traffic but not incidents that caused the traffic. Often, those involved in incidents immediately contact 9-1-1 for assistance. The Performing Agency shall develop a system that collects essential incident management information from 9-1-1 systems and transmits said information to regional TMCs to speed up the identification and response to an incident, and collect needed incident management data to better assess incident management programs in the region.	$ 13,497.86	$ -	$ -	$ -	$ -	$ -
754 - Texas State University	1.1.1. - Sponsored Transportation Research	Performing Agency will perform the following services ("services"): 1. Create an empty, reusable, non-SharePoint version of the Data Collection System; 2. Optional, if funding permits: upgrades from Attachment A, selected separately, as needed; and 3. Optional, if funding permits: upgrades from Attachment B, selected separately, as needed.	$ 2,119.90	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Cross frames are critical for the stability of steel bridges during erection and construction and play an important role for completed bridges. Historically, the brace locations have been regions of fatigue concerns. In addition, the braces require significant handling and processing during fabrication and represent one of the most expensive components per unit weight on the bridge. Therefore, there are major benefits in terms of economics and structural performance to minimize the number of cross frames. Lean-on bracing concepts that replace full cross frames in certain bracing lines with top and bottom struts that allow a single cross frame to brace several girders is a method of minimizing the number of cross frames on a bridge. Lean-on concepts were developed in for TxDOT in the early 2000s. While the previous study developed design guidelines, recent applications of leanon bracing on two TxDOT bridge designs demonstrated the need for improved efficiency and clarity. This project consists of instrumenting the bridges with lean-on bracing during construction to better understand the behavior. The Performing Agency shall carry out parametric finite element analyses (FEA) along with the field monitoring, and develop improved guidelines to facilitate widespread use of lean-on bracing applications in Texas bridges.	$ 27,241.07	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide tools and strategies to implement the findings of the Permian Basin Freight and Energy Sector Transportation Plan and to mitigate impacts of energy and natural resources development in partnership with key stakeholders.	$ 235,883.03	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency Research Projects 0-7083 Develop Highway Safety Manual (HSM) Safety Performance Functions (SPFs) and Calibration Factors for Texas and 0-7067 Enhancing Freeway Safety Prediction Models developed safety prediction methods for all Texas highways. These methods are used to predict safety performance and help with the complex trade-offs between safety, operations, community impacts, and costs that are often necessary when planning and designing highway projects. These resources shall form a powerful tool for selecting Highway Safety Improvement Program projects and will support and defend safety decisions made by the Design Division and districts. The Performing Agency incorporated these methods into spreadsheet tools to implement the new models and facilitate analysis of all rural and urban roadway segments and intersections. The Performing Agency shall develop and present webinars and workshops for Receiving Agency personnel who are responsible for traffic safety analysis. The webinars and workshops will make the personnel familiarize with the safety prediction methods and the analysis tools.	$ 24,836.31	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall support the Receiving Agency's planning initiatives related to innovation and technology deployments at the District level. The Performing Agency shall conduct state-of-the-art engagement communication, assistance, and planning services.	$ 1,004,074.84	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Through the Highway Construction Workforce Partnership Grant (HCWP), TxDOT will build strategic partnerships to train and educate the next generation of the heavy highway workforce. This training will offer the state's diverse population an opportunity to obtain consistent and high paying employment in the heavy highway industry. Furthermore, increasing the knowledge and skills of the heavy highway workforce will result in higher quality projects that are completed on budget and on time. To meet the various needs of the state, TxDOT will build HCWP partnerships in two locations: Dallas County (metro region) and Brazos County (rural region). The dual approach will allow TxDOT to create a model for identifying and engaging locally sourced, effective wrap-around supportive services that target underrepresented communities, as well as develop better structured career pathways for new workforce. As a result, TxDOT will be able to scale HCWP programs faster and more efficiently across the state. The Performing Agency, Texas Transportation Institute shall perform tasks in Bryan-College Station, Texas, Brazos County, and surrounding county areas, all in accordance with the scope of services attached below. The Performing Agency shall perform the tasks in the more detailed scope of services incorporated by reference to this contract, provided in the Highway Construction Workforce Partnership (HCWP) Grant Application Supplemental Narrative, March 8, 2021.	$ 8,293.06	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI shall provide evaluation and technical support of Traffic Management and Planning Systems for the TxDOT Houston District.	$ 678,421.85	$ 44,533.44	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines various tasks in which the Performing Agency shall perform technology transfer and technical support services for the Receiving Agency in the area of project planning, development, and delivery.	$ 59,868.61	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Rural and small urban transit systems across the United States face fiscal challenges caused by the growing gap between the cost of providing transit service and available federal, state, and local funding. In Texas, the fiscal challenges facing rural and small urban transit systems are compounded by not only an increasing population but also revenue and ridership impacts related to COVID-19. Rural and small urban transit systems also often face high levels of staff turnover and a lack of knowledge management procedures to sustain cost management practices over time. The Performing Agency shall equip transit systems to understand, predict, and manage operational and capital costs and provide a reliable go-to-resource for cost management best practices. The Performing Agency shall develop a guidebook, workshop, and online course for rural and small urban public transit systems to better manage operational and capital costs. The research will (1) conduct a national scan of rural and small urban best practices in cost management; (2) synthesize findings into a series of best practice topically-based modules—each with supporting tools and resources; and (3) develop and test a guidebook, workshop, and online course for rural and small urban operational and capital cost management.	$ 26,431.63	$ -	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to assess and improve the development process and identify data sources for required AERR Motor Vehicle Emission Simulator (MOVES) inventory mode county databases (CDBs). This will require the TTI (Grantee) to perform a thorough review of the regulatory requirements and associated guidance documents. Additionally, the Grantee shall perform a sensitivity assessment to determine the MOVES3 activity input parameters with the greatest effect on emissions by assessing the recently completed 2020 AERR on-road modeling files and the MOVES3 trend information being developed as part of a separate PGA. This PGA will also assess the suitability of using MOVES3 default modeling parameters developed by the United States Environmental Protection Agency (EPA) in place of Texas-specific activity data. Lastly, the Grantee shall use the results from the sensitivity assessment to identify potential on-road vehicle activity data sources for use in future regulatory and State Implementation Plan (SIP) emissions inventory development.	$ 27,130.33	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency in the areas of project planning, development, and delivery; operations; and maintenance.	$ 66,579.96	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	In the past, achieving high strength was considered by the Receiving Agency as the main design criteria to formulate high performance concrete. The Receiving Agency considers mix design options 1-4 in item 421 as high performance concrete (HPC) and these options were developed for ASR mitigation and not for other durability aspects. Very little work has been done to determine if these options are adequate to provide long-term durability often needed when HPC is specified. The main objective of this study is to develop performance specification for high performance concrete in order to ensure high performance in terms of durability. The Performing Agency will conduct a combination of both field investigation and laboratory study in order to achieve this objective. The Performing Agency shall use both conventional and innovative new lab testing methods to determine the key performance characteristics (i.e., prescribing acceptable limits of permeability, shrinkage, surface resistivity, and chloride ingress - basis for developing performance specification) followed by developing specific prescriptive requirements in order to formulate wide varieties of prescriptive mixes that can meet the durability requirements matching with different exposure conditions. A combined approach of relating mix design parameters, lab based durability test results, mechanical properties, structural dimensions, climatic conditions, and / exposure conditions through suitable service life prediction model and predicting will be used to ensure long term durability (at least 75 years) for the HPCs in typical aggressive environments. This will lead to develop performance- and prescriptive-based concrete specifications for HPC. This could potentially encourage contractors to effectively use these fine-tuned prescriptive HPC mixtures without the need of conducing additional long duration testing and ensure making long lasting durable concrete and save tax payers dollars.	$ 108,157.69	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical support for planning and evaluation of operational improvements. Operational improvements are also commonly referred to as low-cost treatments, early-action projects, congestion mitigation projects and ramp reversals.	$ 618,899.82	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this study is to assess the performance of INRIX data by conducting a comparative analysis against ground truth data. In 2018, the Performing Agency carried out a study for the Receiving Agency's El Paso District, serving as a proof-of-concept for developing a methodology to compare travel time estimates from traditional sources and crowdsourced data, such as INRIX. This methodology was subsequently applied with success for a study performed by the Performing Agency for the Receiving Agency's Waco District. The previous study for the Receiving Agency's El Paso District had limitations due to the limited availability of crowdsourced data at the time. With the increased availability of such data since then, conducting a new study using the methodology developed in 2018 will provide valuable information for the Receiving Agency to determine whether crowdsourced data can be utilized to offer real-time travel time estimates to travelers. The Performing Agency will establish accurate ground truth data for the selected corridors using the test vehicle technique, adhering to the Travel Time Data Collection Handbook Guidelines provided by the Federal Highway Administration (FHWA) to ensure the desired accuracy for the analysis.	$ 43,394.81	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	As part of its efforts to take advantage of technology to be more efficient, the Receiving Agency is looking at various data sets to modernize and make more accessible to those that work with the data. One of these data sets is speed zone data. The Receiving Agency documents speed zone data in strip maps in dgn (MicroStation CAD) electronic format. This speed zone strip data is not aggregated, and it is placed in electronic folders organized by date created. This data is not catalogued. Speed zones are approved via minute orders signed by the Texas Transportation commissions. The minute orders become complementary sets of data to the strip maps. Minute order data is catalogued in a spreadsheet, but currently these data sets are not linked in any way. The objective of this task is to assist the Receiving Agency in using technology to aggregate speed zone and minute order data in one location for the El Paso District. More specifically, the Performing Agency shall: • Review speed zone and minute order data to identify all critical attributes. • Identify most appropriate GIS format (point or linear) for the various pieces of data, corresponding attributes for each layer (including any complementary file attachments), and geolocate data in GIS map. • Develop a dashboard to make data more accessible. This study was originally funded and began on 9/21/2020. Due to the Receiving Agency experiencing funding issues, the Receiving Agency requested for Performing Agency to stop work on this study on 4/9/2021, before it was completed. Out of the five original tasks, the following tasks were completed before work on the study was stopped: Task 1. Literature Review The Performing Agency shall perform a literature review to complement technology tools and processes recently developed by the Performing Agency for the Receiving Agency's El Paso District in terms of online GIS mapping. These tools include ESRI ArcGIS Online and components within this environment, specifically the map and dashboard components. The literature review should also show which functions within these components have been implemented to build a more robust asset management system. Task 2. Review Speed Zone and Minute Order Data The Performing Agency shall review all data received. The Performing Agency shall further coordinate with the Receiving Agency to identify all critical attributes for all data sets and identify all data that needs to be linked with the speed zones besides minute orders.	$ 26,827.07	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical support to the Receiving Agency for the Texas Connected Freight Corridors (TCFC) Project from grant funding with the U.S. Department of Transportation (USDOT) grant program, Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD). The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency and will end after the Receiving Agency accepts the final Deliverable. The NTP will include a work plan, the maximum amount payable, and initiation and completion dates.	$ 66,752.88	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall prepare a feasibility study for container-on-barge services along the Texas Coast. The study shall answer the following questions: • Is there enough potential traffic to justify container-on-barge service in Texas? • Which Texas ports are willing to acquire or provide the infrastructure and equipment to allow container-on-barge service to operate? • Can container-on-barge service be competitive with other available freight transportation modes in terms of cost and schedule? • Which location(s) are optimal for container-on-barge service in terms of the connection between barge and ocean traffic? The study shall include the following ports: • Port of Port Arthur • Port of Brownsville • Port Freeport • Port of Galveston • Port of Harlingen • Port of Palacios • Port of Victoria • Port of West Calhoun • Greens Port Terminal (Houston) • Port of Beaumont • Calhoun Port Authority • Port of Corpus Christi • Port of Orange	$ 73,856.62	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines general task areas the Performing Agency shall perform for the Receiving Agency to support the Texas Connected and Autonomous Vehicle (CAV) Task Force. The goal of the Texas CAV Task Force is to be a single point of information and coordination for all CAV activities in Texas. The Texas CAV Task Force will host industry meetings, create a knowledge base for best practices and collaboration, and report out on lessons learned. The Texas CAV Task Force will serve as a clearing house of information for those seeking to pursue innovative technology in Texas. The Texas CAV Task Force will be an incubating hub for any policy recommendations that may need to be brought before the Texas Legislature and Governor.	$ 730,544.71	$ (30.13)	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to update the electronic utilities titled "TTI On-Road Emissions Inventory Utilities" and the "On-Road Emissions Quality Assurance Tool" for use with the latest version of the United States Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) model, titled MOVES4. The updated methodologies are required for the development of on-road emissions inventories (EI) used in state implementation plan (SIP) revisions and related reporting requirements.	$ 35,695.13	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall use its nondestructive testing (NDT) capabilities to evaluate candidate sections proposed by the District. The Performing Agency shall review and evaluate historic plan sets, available soils information, and ground-penetrating radar (GPR) and falling weight deflectometer (FWD) results. The Performing Agency shall recommend if the proposed pavement section is a good candidate for FDR, and if so, shall recommend where and what type of samples to collect from the roadway. Pavement sections which are good candidates shall proceed to Task 2. If FDR us not viable or not necessary, the Performing Agency shall recommend other alternatives for District consideration.	$ 68,410.54	$ (17.96)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall perform the following tasks for the Receiving Agency at the onset of receiving a Notice to Proceed (NTP) from the Receiving Agency. The Notice to Proceed will be authorized by the Receiving Agency's Director of Design. The Notice to Proceed will include a work plan for the tasks requested, maximum amount payable, and will specify an initiation and completion date. This contract includes in-state travel that will be conducted by Performing Agency staff as the Receiving Agency requests. Performing Agency staff shall participate in meetings and discussions, make presentations, and conduct site visits within the Houston District geographical area when the Receiving Agency requests. The Performing Agency shall provide the equipment needed to conduct the tasks and shall make those equipment available for this contract. The Receiving Agency will be required to provide traffic control support when low speed non-destructive testing and field sampling is performed.	$ 63,005.35	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency (Pharr District) in the areas of project planning, development, and delivery; operations; and maintenance.	$ 38,727.87	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide transfer of technology and knowledge. The Performing Agency shall serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, and county and local agencies. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics shall include, but not be limited to, any of the following at the request of the Receiving Agency: 1. traffic engineering study management and optimization, 2. processes and procedures for traffic study review, 3. access management, 4. asset management, 5. techniques to support operations analysis functions, 6. public outreach, 7. 3D visualization and design procedures, 8. advancements in data collection techniques, 9. simulation and analysis, 10. safety, 11. the production of a guide to assist the Receiving Agency in a consistent design approach and installation of traffic control devices, 12. assistance in the deployment of a hardware-in-the-loop application for modeling and demonstration purposes, 13. production of guidelines to assist the Receiving Agency in meeting sign retro reflectivity requirements, and 14. traffic engineering study guidelines for performing a variety of different field studies.	$ 171,166.31	$ 651.44	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall perform technology transfer and technical support services for the Receiving Agency in the area of project planning, development, and delivery.	$ 188,121.18	$ 1,031.49	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall develop and test a simple and straightforward methodology that directly incorporates safety considerations into the urban roadway design process. The Performing Agency shall develop and deliver three products: 1) a score-based methodology to incorporate safety into the urban roadway project development and design process; 2) a companion web-based tool for the methodology; and 3) a set of training or reference materials to distribute among designers to help clarify how safety can be part of the design process. The Performing Agency shall develop the reference materials oriented to designers to better frame the concept of safety enhancements in urban roadway configuration and design decisions. These materials will highlight that adding safety enhancements is not overdesigning, because of the additional value to the public when implementing treatments that improve safety above and beyond basic design criteria.	$ 114,166.10	$ 649.02	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall review and document national best practices in the processing of Functional Classification (FC) change requests. The Performing Agency will reach out to and conduct interviews with up to ten peer states, selected in conjunction with the Receiving Agency, to document FC change request processes and identify best practices in implementing FC change requests (e.g., the process) and the tools/platforms/applications used in tracking FC changes.	$ 446,366.48	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Task A Provide Technical Assistance and Support for Updating and Managing Implementation of the Texas Strategic Highway Safety Plan (SHSP) in Compliance with Federal Requirements. The Performing Agency shall: • Facilitate meetings (primarily held virtually): o With the Management Team (MT) up to quarterly o With the Executive Committee (EC) as determined by the MT (up to two times per year, e.g., midyear to address progress, get feedback and ask the EC for help where possible, and end of the year for a report on the year's progress and receive recommendations and advice from the EC). • Revise and digitally disseminate the "consumer version" of the updated SHSP to aid understanding and implementation. • Facilitate at least one meeting with each Emphasis Area Team. Additionally, use other methods of communication including, but not limited to, information posted to the Texas SHSP website, webinars to share best/promising practices, and published case studies to share projects and processes. • Expand the crash analysis in specific an emphasis area(s) to target geographic and/demographic areas. • Identify and pilot a SHSP measurement tool(s) to illustrate/communicate progress quarterly. Develop a dashboard infographic to publish progress on the SHSP website and distribute through social media. • Develop and implement a stakeholder engagement plan. o Survey the District Traffic Safety Specialists and Program Managers within the TxDOT BTS group to determine their level of knowledge of and engagement with the SHSP; develop materials; host or engage in existing meetings to ensure all the District Traffic Safety Specialists and their coalitions understand how they can assist with implementation. o Develop and pilot workshop that integrate engineering and behavioral countermeasures based on targeted areas. • Maintain a digital Traffic Safety Calendar on the SHSP website at least quarterly. • Maintain, update, and enhance the Texas SHSP website including updating crash trends. • Update the SHSP and website with the VRU assessment when it is released. Task B Provide Assistance Related to Highway Safety Improvement Program (HSIP). The Performing Agency shall: • Prepare the Crash Analysis and Visualization (CAVS) data based on the updated HSIP work code tables and provide the data to the Receiving Agency. • Conduct up to two training webinars on the use of CAVS tools for selecting the projects for HSIP.	$ -	$ (632.09)	$ (5.84)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall continue to verify ride quality data on final pavement surfaces for projects constructed by Receiving Agency contractors that meet the requirements of: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B) and 2) Item 585, "Ride Quality for Pavement Surfaces." 23 CFR 637B requires state departments of transportation (DOTs) to verify test results determined from contractor's quality control data if the results are used for acceptance on federal-aid highway projects included in the National Highway System (NHS). The Federal Highway Administration (FHWA) guideline for state DOTs is to perform verification tests on a minimum 10 percent sample of projects. Item 585, Surface Test Type B, requires contractors to collect pavement ride quality data with a certified inertial profiler and a certified inertial profiler operator and submit test profiles to the Receiving Agency's project engineer for acceptance, pay adjustments and corrective work. The Receiving Agency may perform verification testing, and disputes are settled with referee testing. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates.	$ 125,865.72	$ 247.62	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide organizational and management support, check lists and briefing documents, technical documentation and develop several educational series units or modules to the Receiving Agency. The Performing Agency shall provide expertise in asphalt binder, aggregates, seal coat design and seal coat construction. The Performing Agency's tasks shall include the preparation of a variety of documents including check list, briefs, technical discuss of selected subject matter, educational series units and a manual. The Performing Agency shall prepare these documents based on input from the Texas Seal Coat Performance Improvement Steering Committee as well as the Educational Series Working Group. This committee and working group has a membership from the Receiving Agency, asphalt binder supplies, aggregate producers and contractors.	$ 322,074.64	$ 456.94	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI will support district planning and operations through this Interagency Cooperation Contract.	$ 238,937.54	$ (16,722.23)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide lab and field testing support to identify the cause of poorly performing pavements in the Receiving Agency's Austin District. If required, the Performing Agency shall evaluate these projects using an array of nondestructive testing (NDT) equipment such as Rolling Deflectometers, Ground Penetrating Radar, Mobile Lidar and Falling Weight Deflectometers. Field coring and auguring equipment is available; and additional advanced laboratory testing shall be used where and when required. The Performing Agency has an array of advanced testing equipment, including but not limited to X-Ray Diffraction, Scanning Electron-microscope, tube suction test equipment, overlay tester, pull-off test for soils, base, stabilized materials, asphalts and concrete.	$ 47,107.52	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ 215,103.67	$ 7,541.05	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, "Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation" has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ 80,159.35	$ (8.01)	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project will use a phased work plan to develop a freight model within one or more urban areas of the state of Texas using the most current state of the practice methods and data sources. The Performing Agency shall produce a freight model through an interactive and iterative process by the the Performing Agency, Receiving Agency, and Metropolitan Planning Organizations (MPO) partners using the concept of first creating a “minimum viable product” as used in commercial software development. Key initial steps to this process will be investigation of similar recent freight modeling efforts in the United States (U.S.), early identification of freight model requirements for both Receiving Agency and local/regional planning efforts, selection of the type/function of model that will address those requirements, and an assessment of data availability and of any fatal flaws that might be encountered. The Performing Agency shall then work cooperatively with the selected MPO partner to build and implement a state-of-the practice model that can be iteratively improved over time as additional data or methods emerge. Training for model users and an ongoing, web-based forum for users to share insights and questions are also part of the work plan. Reporting of results and transferability to diverse MPOs are other key features of the project.	$ 254,415.30	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency’s standard specification Item 300, Asphalts, Oils, and Emulsions, includes more than 48 different test procedures or conditioning procedures for asphalt concrete (AC) graded binders (12), cutbacks (8), emulsified binders (17), and performance-graded (PG) binders (11) used in different pavement construction and maintenance applications. This does not include testing requirements for recycling agents, crack sealants, or asphalt rubber binder. The Receiving Agency regularly performs many of these tests for quality management or quality assurance purposes. This test schedule presents a challenge for the binder lab in terms of maintaining test procedures, acquiring and maintaining test equipment, calibrating equipment, and training personnel. Some specification tests are legacy tests that once were the state-of-the-art and thought to be related to asphalt binder performance. Many of these legacy tests are not used in more recently developed specifications, as other tests are now available and may be more indicative of performance. This project seeks to review the Receiving Agency’s Item 300 binder specifications and tests for relevance; determine whether they assess safety, performance, or constructability; and take into account accuracy, efficiency, and environmental considerations. The project shall also make recommendations for changes.	$ 59,933.41	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Full depth reclamation (FDR) is a cost-effective recycling strategy that reuses both asphalt bound and unbound granular materials. FDR was implemented in Texas in the early 1990s in the Bryan and Lubbock Districts. In the past five years, the Receiving Agency has implemented FDR using either foamed asphalt or emulsions. The current specification allows for 4-inch diameter by 2-inch height specimens or 6-inch diameter by 3.75-inch height specimens to be tested, with identical acceptance criteria for both sample sizes. This practice has raised concern regarding the effect of sample size on the indirect tensile (IDT) strength because larger specimens have shown lower IDT strength compared to 4-inch diameter specimens regardless of material source, binder type, binder content, or conditioning procedure. The Performing Agency shall evaluate the strength differences between the two specimen sizes and provide acceptance criteria revisions, as appropriate. In addition, the effect of testing temperature is critical with regard to IDT strength of FDR specimens. Therefore, the Performing Agency shall evaluate the specimens at various testing temperatures and recommend a target temperature to substitute the more general test conditions currently specified. The Performing Agency shall validate the revised criteria by evaluating the performance of selected field projects.	$ 82,948.42	$ (379.27)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this research project is to determine where, when, and why a prime or cure is needed for a pavement layer. Materials such as prime coats, curing materials, seal coats, and tack coat are typically considered non-structural, but integral to the pavement structure. Some materials can be used for multiple purposes: prime, bond or help cure; however, the rates and timing of use may change depending on why the material is being used. Guidance is needed to help designers, inspectors and construction personnel understand the materials and where, when, and why to use them. This project shall develop guidelines for prime and curing through a series of laboratory and field testing and develop tests and procedures to determine the best materials for a prime, cure or a combination. These guidelines shall aid decision makers in determining whether a prime, cure or bonding material is needed, and where, when and why to design and use the appropriate materials.	$ 99,333.06	$ 5,798.63	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Lab-molded density of asphalt mixes is a critical factor for laboratory mix design, plant production, and field performance. Current mix design and production quality control and quality assurance (QC/QA) are developed around a fixed lab-molded density of 96 percent. Adherence to a fixed lab-molded density is not only one of the main factors leading to drier, more crack susceptible mixes where low asphalt binder content is often caused by balancing high lab-molded density values at plant production, but it also impacts the implementation of the Balanced Mix Design approach. Furthermore, various field test sections designed with densities ranging from 96.5 to 98 percent were previously constructed in different areas of Texas, and they performed well in the field with no observed rutting problems. Thus, the objective of this project is to establish an acceptable range of lab-molded densities for laboratory mix design and production QC/QA testing. To achieve the objective, the Performing Agencies shall review the literature, conduct extensive laboratory performance tests, construct test sections and monitor their performance, and finally recommend an acceptable range of lab-molded density based on all the information and data collected.	$ 86,157.40	$ 3,665.97	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this research project is to develop measurable and repeatable adjustment criteria for seal coat application rates based on pavement condition, traffic and material properties for the design method developed in research project 0-6989 Update Seal Coat Application Rate Design Method (TxDM6989).[1] Current practice requires experienced personnel to understand the adjustments needed for application rates, including changing the adjustments as conditions on the pavement change. The adjustments in the TxDM6989 combine multiple pavement conditions into one description. By measuring the conditions, a combined adjustment based upon measured parameters will remove subjectivity from the procedure. This will lead to more consistently constructed projects that meet the objectives of designing the rates so that the resulting seal will not have too much binder so that it flushes or bleeds in the summer; but there is enough binder to prevent rock loss over the winter. This research project will produce measurable methods for adjustments to the rate design procedures that will help engineers and inspectors make better decisions resulting in successful projects.	$ 89,854.94	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency invests over $250 million annually on seal coats, it is therefore critical to apply the right treatment to the right road at the right time. Projects are typically selected based on the time since the last seal coat (an average of 7 years) with little to no testing performed to ensure that the section is a good candidate for seal coat and how many seal coats to apply. The objective of this research is to determine the maximum number of seal coats that can be applied to a pavement surface before the accumulated layers of seal coats become unstable. The Performing Agencies shall evaluate the stability of existing accumulated seal coat substrate layers through a series of laboratory and field testing and develop tests and procedures to determine when an additional seal coat may not perform well. The Performing Agencies shall develop guidelines to select candidate seal coat projects with multiple seal coat layers ensuring that a new seal coat is used on a good candidate pavement will lower risk to the Receiving Agency, improve life cycle costs and lead to better performing sections of pavement.	$ 83,519.12	$ 209.52	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Traffic Speed Deflection Devices (TSDD) non-destructively measure structural condition while traveling at traffic speeds. Advancements in TSDD's have enabled these evaluations to be made with the benefit of reducing safety hazards associated with traditional stop and go Falling Weight Deflectometer (FWD) devices. The Receiving Agency is an active participant in the Transportation Pooled Fund TPF-5(385) "Pavement Structural Evaluation with Traffic Speed Deflection Devices". As a participant, the Receiving Agency has collected more than 1000 miles of TSDD data in several Receiving Agency Districts and is expected to continue to collect TSDD data for the next three (3) years. Recent interest from Receiving Agency Districts on using continuous structural data in network level treatment decisions has necessitated the need to verify TSDD measurements and provide guidelines and analysis methodologies to implement structural condition data for both network and project level pavement management applications. Incorporating a structural condition index into network level decisions has been a goal of the Receiving Agency's for over 30 years with the objective of providing Receiving Agency Districts a comprehensive integrated assessment of both visual and structural condition. Use of this tool shall provide Receiving Agency Districts with what level of pavement rehabilitation treatment is required as they develop their 4-year plans.	$ 113,341.11	$ (1,678.35)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Field sands have been used in hot mix asphalt (HMA) pavements to reduce binder requirement since they are readily available and are less expensive than crushed materials. Considering their adverse effects on the performance, field sands are limited to 10% to 15% of the aggregates. The most common feature of field sand that may have a significant detrimental effect on the Asphalt Concrete (AC) performance is the presence of harmful clay particles. Understanding the impact of these clay particles on AC performance is the subject of this research. The upper limit of specific field sand, given the amount of active clay present in it, the process to determine the clay content, and how they may affect the performance of AC mixes will be evaluated. Since field sands are more round compared to the crushed aggregates, mixes containing more field sands can be compacted to a given density at lower binder contents. Given the less particle to particle interlocking of such mixes, however, they are more suspect to excessive rutting. Thus, this study will investigate the effect of clay minerals as well as	$ 27,490.45	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The overall project objective is to develop a system where prefabricated steel ABC units perform continuous for live load. The system must be: easily constructible, fast to assemble, durable long-term, safe, and cost-effective. The Performing Agency shall achieve this objective by synthesizing what has been done by state departments of transportation and other agencies (through literature review) along with evaluating the behavior of related Receiving Agency bridges (through visual inspection and monitoring). Next, a system development program shall be performed utilizing this information in conjunction with expert feedback from an Industry Review Panel (IRP) workshop (including the Receiving Agency Panel). The three best system designs shall be selected for full-scale laboratory testing followed by an analytical parametric study. All the results shall be compiled and presented at an IRP meeting with the Receiving Agency, where the final system shall be selected. The Performing Agency shall develop full Microstation details and specifications along with a user-friendly design guide. The guide shall identify: • Span length capabilities for girder sizes/depths/spacings, • General details for establishing live load continuity, • Closure pour details at interior bents and how to achieve acceptable deck stresses, • Structural steel splice details and acceptable tolerances, and • Bearing layout to meet the Receiving Agency substructure details.	$ 155,996.40	$ 2,463.50	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	"Minimum shear reinforcement requirements in the Association of State Highway Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications are based on tests conducted on reinforced concrete panels and beams. The extension of these requirements to prestressed concrete beams introduced significant conservatism in the current LRFD provisions for shear design. More accurate provisions are necessary to better predict the shear strength of prestressed beams. The objective of this project is to investigate the validity of the minimum shear reinforcement requirements and develop new/revised guideline specifications. The Performing Agency shall achieve this objective by: Performing literature review and outreach in order to synthesize a unique database of load tests for prestressed concrete beams, which the Performing Agency shall subsequently analyze using data driven methods to identify major design parameters and missing information that will inform an experimental program. Performing twenty (20) full scale tests on ten (10) commonly used prestressed girders combining a range of identified design parameters to comprehensively re-examine the minimum reinforcement requirements of AASHTO LRFD Bridge Design Specifications accounting for reserve strength and ductility and as well as performance under service conditions. The Performing Agency shall complement the experimental program by analytical modelling to expand its impact. Developing design guidelines for the minimum reinforcement requirements based on the synthesized comprehensive dataset complemented by the full-scale tests and analytical modeling. The Performing Agency shall also pursue integration of these guidelines in the AASHTO LRFD Bridge Design Specifications."	$ 217,903.81	$ (86.06)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project will make improvements to the practices followed for placement of pavement markings as well as a tool to assess the current visibility of pavement markings. To achieve these objectives, the work to be performed shall include: 1. Identify the diversity of pavement surfaces in the state of Texas across different geographic regions along with the type of pavement marking. 2. For a diverse set of pavement types and markings, catalog the types of surface markings, age of these markings, their present condition, measured retroreflectivity, and measured contrast ratio using a gloss meter or other devices. 3. Investigate and estimate the visibility of these markings for both human drivers and automated vehicles and develop a model to predict this visibility as a function of the pavement type, marking type, age of the pavement, and environmental conditions. 4. Examine feasibility of using other technologies to improve pavement markings and safety as well as technologies to improve the quality of the existing pavement marking. 5. Use the findings from this study to develop recommendations for improving specifications and practices for placement of new pavement markings. 6. Provide a tool to effectively assess the visibility of existing pavement markings and make suggestions for maintenance or replacement as necessary. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ 78,977.86	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Mapping of buried utilities using rigorous subsurface utility engineering (SUE) quality level B (QLB), as is frequently performed or recommended, can be costly. It can also be ineffective for unknown utilities (i.e., utilities that exist but for which no information is available). This is particularly common and problematic in areas of oil and gas operations. When undiscovered until construction, these unknown utilities may cause serious scheduling disruptions as well as higher construction costs, along with safety and environmental risks. There is a need for a faster, less expensive method of scanning the right of way (ROW) for these unknown utilities. This research evaluates, selects the most appropriate, and tests the application of newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown pipelines or other utilities in the ROW. It compares the effectiveness and cost of deployment to standard QLB SUE and reports on technologies that are both technically and cost effective for identifying unknown utilities.	$ 377,657.23	$ 702.02	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency and its partner agencies are required to comply with the requirements of the transportation conformity requirement. Transportation conformity is an emissions control-centric process built on the assumption that that reducing emissions from transportation activities would lead to better air quality. However, the air quality observations collected since the onset of the COVID-19 pandemic shows ambient ozone and PM2.5 concentrations have a mixed response to the significant changes in traffic activities and emissions. This trend has raised questions regarding the extent of the transportation's impacts on air quality. This study will bridge the gap in the understanding of the actual extent of transportation activities' impacts on regional and near-road air quality. The study will consist of three major activities for selected case study areas: ─ Analysis of before- and during-pandemic traffic activity and air quality monitoring data. ─ Evaluate the performance of air dispersion modeling in capturing the changes of near-road PM2.5 concentrations in near-road environment resulting from traffic activity variations. ─ Evaluate the performance of photochemical modeling in capturing the changes of regional ozone in response to changes of traffic activities. The study will also result in a characterization of COVID-19 restrictions' impacts on traffic activities and air quality.	$ 67,352.32	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Outdoor advertising signs impact millions of travelers around the world every day. These signs are designed to attract driver attention thus taking it away from the driving task. Driver inattention and distraction are two of the most critical factors for road safety. Receiving Agency regulation of outdoor advertising signs must deal with changing technologies, including digital billboards, which allow for modifications to sign illumination, motion, and content. Regulations are not keeping pace with changing sign trends and must be updated to address potential impacts on road user safety. The Performing Agencies shall focus on the degree of driver distraction caused by typical and digital advertising sign contents. The Performing Agencies shall perform a comprehensive state-of-the-practice review, crash investigation, and an on road human factors evaluation, considering illumination levels and content (including motion) during daytime and nighttime travel for dry and wet-weather conditions. This Performing Agencies shall provide the Receiving Agency with tools and resources to help manage outdoor digital advertising billboards by establishing practical criteria for sign illumination and content. These resources shall allow the Receiving Agency to manage the advertising signs such that road user safety is accounted for while maintaining the ability of sign owners to develop effective means of communicating with the public.	$ 129,588.91	$ 3,733.56	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Existing queue warning (QW) systems predominantly use infrastructure-based sensors to detect the formation of queues and use dynamic message signs (DMS) to warn drivers. These QW systems, may be inadequate where the required number or density of sensors are not available. Research has shown that crowd sourced probe and connected vehicle (CV) trajectory data used in combination with sensor data can significantly improve the accuracy and latency of queue detection. Furthermore, because of gaps between fixed location of DMSs a subset of drivers can encounter a queue without seeing any warning. Sharing queue information through third-party providers and providing vehicle-specific queue warning in CVs can ensure provision of queue warning to a broader audience in a timely manner. The Performing Agency shall: 1. Develop detailed design of an enhanced queue detection and warning system that combine point-, probe-, and vehicle trajectory data. 2. Test and fine-tune the queue detection algorithm design using computer simulation. 3. Conduct a proof of concept, prototype deployment and field evaluation of the new QW system design on a freeway segment where vehicle queues frequently form. 4. Document the systems engineering and algorithm for the QW system as a potential enhancement to the Lonestar™ advanced traffic management system software application.	$ 134,516.20	$ 415.34	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall develop a risk assessment procedure related to the reduction of wet weather crashes that incorporates pavement surface type and aggregate selection and will be integrated into the safety scoring tool (SST). The scoring tool developed in this project will bridge the gap between the approaches in the two current tools, the SST and Receiving Agency Form 2088. This project shall leverage the inputs and framework of the SST and the communalities with Receiving Agency Form 2088 to improve the SST and the wet surface crash reduction program (WSCRP). Integration of the SST and Receiving Agency Form 2088 will provide the benefits of streamlining the data inputs already required for the SST to avoid duplication of efforts and will effectively improve the quality of the assessment of pavement friction safety.	$ 50,762.78	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ 143,112.79	$ 726.78	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Due to the complex nature of urban roadways, conventional crash prediction models are limited as these models omit operating speed, short-duration volume, and weather data. To mitigate this research gap, the following three national databases can be utilized: (1) National Performance Management Research Data Set (NPMRDS) with passenger and freight speed data, (2) Travel Monitoring Analysis System (TMAS) data with both temporary traffic counting and continuous traffic counting programs, and (3) real-time weather data from the National Oceanic and Atmospheric Administration (NOAA). The fatality rate on Texas roadways for 2020 was 1.50 deaths per hundred million vehicle miles traveled, which is an 18.94% increase from 1.26 in 2019. From 2011 to 2020, the fatalities on rural roadways increased by 19%, and this increase on urban roadways is disproportionately high (31%). Research and a supporting decision support tool are necessary to improve urban safety. The Performing Agencies shall leverage ongoing staff leadership and engagement in several national and state Department of Transportation (DOT) speed-safety projects. This research shall provide updated safety performance functions (SPFs) for urban roadways and a real-time decision support tool on risk scoring with the applicability of new data input and model updating pipeline.	$ 54,975.09	$ (2,070.38)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ 315,192.85	$ 540.72	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The performing agencies shall establish a method to evaluate the existing pavement structural condition and design continuously reinforced concrete pavement (CRCP) overlays, both thin and thick. The design methods will include non-destructive (NDT) pavement evaluation techniques and tools, deflection based CRCP slab thickness design procedures, and CRCP reinforcing design details.	$ 73,589.14	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ 151,135.35	$ 1,135.06	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's Roadway Design Manual was updated in July 2020 and incorporates considerations for and accommodations of bicyclists and pedestrians, including preferred design order toward Shared Use Paths (SUPs) compared to bicycle lanes and shared lanes. However, the Guidance does not include specific procedures to estimate the anticipated volumes of non-motorized path users. The Receiving Agency's Bicycle Accommodation Design Guidance makes it clear that anticipated user volumes should be considered when designing facilities. The objective of this project is to develop a simple sketch planning-level demand estimation tool that provides anticipated user volumes for SUPs. The project shall also incorporate the results into the future editions of The Receiving Agency's design guidance/manuals. Given the uncertainty in resources, this project shall not use an overly complicated method or a method that requires complex data or data architecture. The project shall benefit from existing data sources, including The Receiving Agency's Texas Bicycle and Pedestrian Count Exchange and other count data resources in the State as well as other secondary and spatial data sources. The project shall develop an easy-to-use tool responding to the needs and requirements of the intended audience while incorporating advancements to improve the accuracy of the demand estimation.	$ 86,182.67	$ 3,802.40	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ 213,183.27	$ 6,942.53	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's current practice is to conduct numerous speed studies throughout the year to determine if the speed limits should be changed due to new traffic patterns, development, crash history, and other factors. These studies are driven by stakeholder requests or as part of routine annual reviews. The number of studies performed at any given time is limited by staff and consultant resources, resulting in a process that can take several months to complete. Can the increasing availability of vehicle probe data, along with other big datasets, be used to reduce the level of effort and time needed to collect speed data? If so, what data can be readily obtained from big data sources and what procedure would be needed to refine the use of probe speed information and produce speed limit recommendations that are consistent with the sound engineering practices currently used by Receiving Agency staff? This project will explore if there are more efficient methods for conducting Texas speed limit studies that would allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. Such a program would also provide a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ 166,265.97	$ 578.88	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Unmanned aircraft systems (UASs) equipped with digital cameras, light detection and ranging (LiDAR) sensors, or both enable the collection of high spatial resolution three-dimensional (3D) quantitative geospatial data. This data can be used to support a variety of surveying and mapping activities, potentially with lower costs and greater safety than traditional survey methods. When using a camera, the technique is called Structure-from-Motion photogrammetry or UAS-SfM. In practice, there are important differences between UAS-SfM and UAS-LiDAR including measurement fidelity, operational considerations, post-processing workflows, and cost-effectiveness. With a lack of clear guidance on when UAS-SfM versus UAS-LiDAR is the best fit for a specific task, there is a need to evaluate the real-world performance capabilities and limitations of both technologies. This research shall document state of practice in UAS-SfM and UAS-LiDAR technologies; prepare a list of use cases to test relevant technologies; conduct field tests and comparative analyses to identify and document advantages, disadvantages, implementation scenarios, and costs; prepare recommended settings and operational workflows for repeatable, survey-grade data collection; prepare guidelines for quality assurance and control of UAS projects conducted with LiDAR and SfM, as well as identify project suitability for the adoption of UAS to support land surveying activities at the Receiving Agency.	$ 47,400.23	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ 131,615.95	$ 468.00	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Long-range transportation planning (LRTP) and travel demand models (TDMs) play an important role in the planning process, which assists transportation agencies with prioritizing future transportation investments. Improved LRTP and TDMs can bring direct benefits to transportation planning in the state. Effective transportation planning and investment decision making depends on timely, comprehensive, and accurate data. However, traditional data collection methods only provide a "snapshot" of the travel information, which limits the performance of conventional LRTP and TDMs. In this regard, while these sources are still used, transportation planners at the state, metropolitan, and local levels are beginning to incorporate third-party traffic data into their planning processes. Planners also start to look at the opportunities afforded through third-party data and provide guidance on how to take advantage of that data to expand and improve planning practices. This project aims to utilize probe-based data to improve the LRTP process and TDMs used by the Receiving Agency, MPOs and other planning agencies in the state. The Performing Agencies shall study and understand how probe-based and location-based data may be leveraged to facilitate the validation and calibration of existing planning models, enhance existing modeling tools, and incorporate advanced modeling techniques.	$ 60,287.64	$ (2,161.66)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall perform a comprehensive evaluation of concrete sealers and coatings applied to bridge substructure in the state of Texas. The Performing Agency shall investigate the need for and extent of surface preparation on both new and existing concrete surfaces including those with previously applied coatings. A focus is placed on material testing to evaluate the performance of coatings applied with various surface preparation methods and exposed to environmental conditions. The potential benefits are the development of recommendations for the level of surface preparation required for various sealer or coating systems and for the optimal coating type for the Receiving Agency's substructures with or without previously applied coatings.	$ 195,713.59	$ (3,459.71)	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	coverage of EV charging infrastructure. While currently comprising less than one percent of all registered vehicles in Texas, projections forecast that EVs could comprise up to 55 percent of all vehicles by the year 2040. This significant industry shift will require considerable and proactive efforts to support this transition, focusing on infrastructure readiness, customer experience, interregional connectivity, and equity. Texas needs to identify optimal places where infrastructure will be needed in advance of federal and local funding that will be available to build out additional stations. Since implementation of EV charging infrastructure will occur in phases over multiple years, information will be needed at recurring intervals to determine locations of EV chargers based on a multitude of parameters and considerations to serve EV mobility. This project will develop a statewide EV charging infrastructure readiness plan that will fill an important gap and create a guidance resource for entities in determining infrastructure investment locations. By having a plan to determine needs for EV charging infrastructure other stakeholders will benefit as well. For example, utilities can ensure make-readiness and sufficient power capacity to areas considered for deployment. The statewide plan will determine and guide infrastructure investment across the state with a goal of a stable and consistent charging network. The project will also help guide future charging infrastructure funding opportunities in identifying locations of greatest need and impact, and provide guidance to most effectively and equitably distribute available funding.	$ 128,565.91	$ 468.00	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency's Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ 162,688.39	$ 18,672.64	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Traffic Safety Division (TRF) of the Receiving Agency drafted a special specification (SS) for the vertical application of a retroreflective solid stripe on concrete barriers, approximately six (6) inches below the barrier's top. During the phase of new product approval, this SS describes an application similar to three (3) locations already installed on Texas roadways in previous years. Barrier striping increases motorist awareness of the roadway's edge and the barrier itself, particularly in low-visibility conditions (i.e., heavy rain and snow). These existing implementation sites have not been formally evaluated. Furthermore, the short-term effectiveness of the treatments has not been investigated; therefore, there is a need for long-term and short-term safety effectiveness evaluation of these treatments. The Performing Agencies shall collect before-and-after collision data from Crash Record Information System (CRIS) and near-collision data from connected vehicle data vendor (e.g., Wejo) to evaluate the effectiveness of vertical application of a retroreflective solid stripe on concrete barriers. Furthermore, the Performing Agencies shall install these treatments at six (6) high crash locations with different barrier types including, but not limited to concrete barriers and metal beam guard fences to evaluate their short-term effectiveness using non-traditional safety evaluation approaches. The Performing Agencies shall utilize the findings to update the drafted SS for the future use across the state and beyond.	$ 138,254.58	$ 57,987.00	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Understanding and estimating realistic production rates of major work items in a highway project are critical to determining a reasonable project contract time, evaluating the contractor's baseline schedule, monitoring progress schedules, and ultimately completing the project on time. The Performing Agency shall leverage the Receiving Agency's historical project data to obtain the as-built information of production rates of various work items, and shall develop a) an expanded version of the Receiving Agency's construction production rates table, b) an interactive tool that can generate color-coded heat maps to visualize feasible ranges of production rates of major work items across Texas, and c) implementation guidance and recommendations. An advanced and interactive production rate estimation tool could significantly help the Receiving Agency achieve the goal of completing highway projects on time. Such a decision-aid tool could significantly improve the Receiving Agency's practice in determining more accurate production rates, resulting in more accurate contract time determination, the contractor's baseline schedule evaluation, and progress schedule monitoring. Such data-driven and practical production rates may provide higher certainty and reliability than the Receiving Agency's current construction production rates table.	$ 100,491.36	$ 12,930.18	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research study aims to perform a study focusing on best practices for performing pavement preparatory work in advance of preventive maintenance (PM) surfacing contracts. The study will determine the best practices for repairing a roadway before a new surface is placed. Seal coats or thin overlays are typical PM surfacing projects. The preparatory work performed by in-house maintenance forces or maintenance contracts may include crack sealing, fog seal, repairs, milling, and level-up. The preparatory work should be completed well before the PM contract. The Performing Agencies shall identify the main flexible pavement repair types and investigate best practices for performing both in-house and contracted repairs. The Performing Agency 1 shall develop a procedure to determine the limits and type of flexible pavement repair. The Performing Agency 1 shall develop an evaluation process of the repair, including its performance and effects on the PM surfacing.	$ 93,946.28	$ 721.80	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Of the various situations in which a utility relocation is eligible for reimbursement at the Receiving Agency, one of the most complex situations is when parts of the existing utility facility involve a property interest. For utility facilities that involve a private property interest, the Receiving Agency uses an eligibility ratio, which is defined as the percentage of utility facilities that are reimbursable in relation to the total amount of utility facilities being relocated. In practice, eligibility calculations can be convoluted or complex, particularly in situations where the utility facility spans multiple property interest locations. The Performing Agency shall develop and test an improved methodology to determine reimbursement eligibility and calculate utility reimbursement amounts. The Performing Agency shall document a significant sample of utility relocations and their associated reimbursement costs to develop a reliable baseline of practices throughout the state, evaluate practices in other states, develop and test an updated methodology for utility reimbursement eligibility criteria and calculations, prepare a guidebook with examples on how to determine utility reimbursement criteria and calculate reimbursement amounts, and prepare and test training materials.	$ 166,175.20	$ 585.02	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall develop a method and tool for analyzing safety-related pavement data to identify candidate pavement safety projects, such as cross-slope improvement projects and flushing treatment projects. The Performing Agencies shall assemble a dataset containing comprehensive data on the pavement, site condition, and crashes for a representative sample of on-system roadways. The Performing Agencies shall conduct a comprehensive analysis of the integrated dataset to identify critical combinations and thresholds of pavement conditions that may pose a safety hazard and use these factors to assess pavement susceptibility to crashes. The Performing Agencies shall quantify the pavement crash susceptibility based on measurable pavement characteristics such as cross-slope, geometrics, distresses (e.g., rutting, flushing), skid resistance, and roughness. Finally, the Performing Agencies shall develop a data analysis and visualization tool for assessing pavement crash susceptibility and recommending solutions to reduce crash risks. The Receiving Agency's districts will be able to use this tool to identify potential site-specific crash contributing factors and proactively select appropriate pavement safety improvement projects.	$ 118,758.29	$ 2,118.18	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Drainage is a critical element of roadside design. Roadway drainage design often calls for the use of cross-drainage and parallel-drainage culverts. If untreated, the ends of the drainage structures can become roadside hazards that can result in serious injury when an errant vehicle leaves the roadway. The most cost-effective strategy is often to make the culvert end traversable using grates comprised of pipe runners across the culvert end. The Performing Agency shall investigate the safety performance of traversable cross-drainage and parallel-drainage culvert end treatments installed on roadside slopes. The Performing Agency shall address the various design variations of safety end treatments supported by current standards to investigate the safety performance. The Performing Agency shall develop design guidance to recommend slopes and size, length, and spacing of the pipe runners for both cross-drainage and parallel-drainage culverts that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH). The Performing Agency shall use full-scale crash testing to aid with validating the design guidance.	$ 93,990.65	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Super 2 highways have been used across Texas for over 20 years, providing operational and safety benefits to rural two-lane highways at lower cost than widening to four-lane, and more are planned as the demand increases on the state highway system. Previous Super 2 research has provided insights on safety improvements, but the Receiving Agency would benefit from an updated crash modification factor (CMF) based on a rigorous review and analysis of recent crash data from the state's many Super 2 highways. This CMF would provide additional support for installing Super 2 corridors throughout the state and complement existing guidance. The Performing Agencies shall use their existing database of Super 2 highways and site characteristics, combined with additional data on traffic volumes, crashes, and other relevant factors, to develop a comprehensive Super 2 dataset for analysis and identification of relationships between crashes and other characteristics. Using the results of this analysis, the Performing Agencies shall define one (1) or more CMFs or crash modification functions (CMFunctions) that the Receiving Agency and other practitioners can use to make decisions on installing future Super 2 corridors. The Performing Agencies shall disseminate these CMFs to the Federal Highway Administration's (FHWA's) CMF Clearinghouse for inclusion in their database.	$ 109,933.38	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Texas continues to use cold recycling for pavement rehabilitation and performs a significant amount of full depth reclamation (FDR). While cement remains the most widely used treatment, use of asphalt emulsion and foamed asphalt continues to grow. This project shall identify and evaluate topics to strategically enhance cold recycling practices in Texas. This project shall perform a comprehensive performance analysis of recent as-built projects to identify strengths and opportunities for process enhancement. For cement, this project shall evaluate how cement type may influence mixture properties, analyze the Texas Flexible Pavement System (FPS) structural design assumptions based on current mix design and construction practices, and summarize methods to improve early trafficking. For emulsified and foamed asphalt, this project shall develop cold-in-place recycling (CIR) applications for Texas and identify, evaluate, and recommend enhanced pavement design procedures for cold recycling with asphalt binders. This project shall use all results to develop enhanced cold recycling project selection procedures, recommend updates to the Receiving Agency's specifications, and develop and perform training.	$ 270,414.15	$ 2,852.29	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Hamburg Wheel Track (HWT) rutting test generally serves well as the standard rutting test for asphalt mixes in Texas; however, in the last several years, some premium mixes (i.e. stone matrix asphalt), designed with PG76-22 and low HWT rut depth, have experienced premature rutting failures under slow moving (or stop/ go) traffic in several Receiving Agency Districts. Such failures burden the Receiving Agency with extra cost. Furthermore, it was reported that the HWT test cannot accurately quantify the better rutting performance of some tougher mixes with highly modified asphalt (HiMA). Thus, the Performing Agencies shall develop the next generation of HWT test to accurately screen out asphalt mixes that are prone to rutting failures. The Performing Agencies shall review the literature, survey Districts, and other state departments of transportation (DOTs) to identify the proper rutting test(s) and asphalt mixes for addressing the rutting failure caused by the slow-moving traffic. The Performing Agencies shall further develop the next generation of HWT test and associated acceptance criteria through finite element analysis, laboratory testing, field accelerated pavement testing and survey of in-service pavement intersections, round robin test, and recommendation of specification changes.	$ 108,628.61	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	State agencies must report vehicle miles traveled (VMT) estimates for local roads compiled in the statewide summaries dataset of the Highway Performance Monitoring System (HPMS) database. While the VMTs for higher functional class roads are the product of annual average daily traffic (AADT) with the corresponding roadway segment length (L); the states produce the VMT estimates for local roads as an aggregate measure using a variety of methods. Currently, the local road network accounts for more than two-thirds (67%) of the total roadway mileage in Texas and is the largest in the United States. Conducting short-term counts (STCs) (e.g., for a few hours up to a few weeks) on an extensive local road network to develop VMT is logistically challenging; hence, the Receiving Agency uses statistical methods to obtain aggregated VMT. Although the current methods are statistically verified, advancements in technology and available resources have been made since the methodology was developed. The Performing Agencies shall investigate and develop data-driven methods for VMT estimation that can be implemented in Texas and advance the analysis methods of the Receiving Agency. The developed methods shall also reduce any bias in the estimation of VMTs on local roads that can lead to the overestimation or underestimation of travel demand.	$ 120,262.71	$ (323.77)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency has observed premature pavement failures on several widening projects, including shoulder widenings, conversion of two-lane roadways to Super 2 sections, and other safety enhancements. Repairing these early failures is time-consuming, expensive, disrupts traffic, and poses safety hazards. Key contributing factors include poor-quality materials, poor joint construction, inadequate drainage, differential settlement, etc. These issues could have been avoided through proper pavement condition assessment, design, and construction practices; but detailed guidance on which methods to employ, which can be project specific, is not readily available to district personnel. Therefore, there is a need to document and implement better widening practices across the Agency. The objectives of this synthesis project are to document pavement widening best practices by: • Reviewing the literature for effective widening practices. • Reviewing current widening practices employed by the Receiving Agency, including: o Pre-design pavement evaluation, o Pavement layer and cross-section design, o Material selection, o Project plans, specifications, and estimates, and o Construction practices. • Evaluating previous widening projects both in good and poor condition. • Identifying issues and practices that can lead to premature failure, and practices that should be adopted more widely. • Developing comprehensive guidelines and modifications to specifications.	$ 35,207.82	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Shared or multiuse paths invite a wide range of users, including pedestrians, bicyclists, and other wheeled users, with a range of transportation purposes such as commuting, exercise, and recreation. Although shared use path (SUP) users are physically separated from traffic, they remain vulnerable at roadway crossings. In the absence of roadway cross-section designs for accommodating pedestrians and bicyclists, SUP crossings can present users with complex tasks including gap selection, scanning for turning vehicles, and interacting with other path users. Ensuring safe crossings for all users at these locations is essential. Pedestrian and bicycle treatments have been developed and their safety effectiveness has been assessed in several studies and practices. Although technically these designs can be applied to SUPs, it is not clear how to integrate treatments for different types of path users, road classifications, land-use contexts, and crossing geometries. With the increasing implementation practices of SUPs across Texas, there is a need to assess the potential safety concerns involving pedestrians, bicyclists, micromobility users, and people with disabilities at these locations and develop guidance for treatment selection, including for paths next to railroads. The Performing Agencies shall explore the pedestrian and bicyclist crashes at the vicinity of SUPs and develop design and planning guidance for implementation purposes.	$ 138,608.50	$ 2,070.38	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Road to Zero has targeted a goal of zero deaths and serious injuries on Texas roadways. Recent trends in Texas indicate a continued increase in highway fatalities each of the past three years. In 2021, roadway departure crashes were responsible for 40 percent of all crash-related fatalities in Texas, which is the largest single category by crash type. In October 2021, Federal Highway Administration (FHWA) designated Texas as one of 16 Roadway Departure Focus States based on being over-represented on three (3) different roadway departure crash fatality metrics. Roadside safety devices are a key element of an effective roadway departure safety strategy. These safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively evaluate high priority issues related to roadside safety devices. This includes development of both new and improved safety features that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) and help minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes.	$ 616,966.16	$ 41,561.04	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research will focus on the impact on pavements and bridges following the statewide resilience plan. Research findings will not only be used to meet federal requirements, but more importantly, the recommendations and analysis will be used to guide TxDOT's future project selection and development process in term of addressing extreme weather and resilience impacts. To achieve the project objectives, the research team shall: • Perform literature review of available state and national research projects, legislative requirements, and best practices from state DOTs and local agencies. • Identify and characterize risk factors to TxDOT's highway and bridge infrastructure both temporally and spatially, and estimate their potential intensity. • Assess the risk or likelihood of the identified factors occurring based on a thorough quantitative statistical analysis of available data. • Calculate the potential impact occurring based on the characteristics of the TxDOT managed highway/bridge network system using available relevant databases based on current condition, age, traffic, and environmental conditions. • Create an analytical decision-making framework for probabilistic scenario simulations to prioritize assets for maintenance and retrofit based on climate hazards and asset's criticality and vulnerability. • Quantify the mitigation strategies and their benefits and associated costs for the life cycle planning analysis. • Conduct scenario analysis and scenario planning to evaluate and prioritize the identified risks. • Identify proxy indicators that TxDOT can track to monitor high priority risks. • Implement probabilistic resilience economic analysis for adaptation strategies vulnerable and critical assets. The expected technology readiness level (TRL) for this project is 8.	$ 111,411.16	$ 17,165.17	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency cantilever overhead sign structures (COSS) and traffic signal pole structures have a socketed fillet welded connection between the column and the baseplate. While economical, this connection has a low fatigue-resistance threshold. The objectives of this research are to (1) outline fabrication practices and economic considerations that may affect proposed connection type and design, (2) develop an inventory database of COSS and traffic signal pole structures that are representative, (3) utilize structural modeling to identify from within the inventory critical cases that should be advanced to a testing program, (4) develop and execute a targeted testing program that isolates critical design parameters for the fatigue performance of both the critical cases found in the inventory and recommended connection types and designs, (5) provide recommendations for connection types and designs based on fatigue provisions, and (6) provide recommendations for identifying fatigue-critical of existing inventory.	$ 160,864.66	$ 8,804.91	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Ancillary structures (AS) exist in a wide variety of applications critical to safety and daily needs of the travelling public. The long-term corrosion performance of these structures is of utmost importance to prevent deterioration and extend the structural design life and safety. While hot-dipped galvanizing provides excellent long-term behavior for corrosion control of these critical structures, over the past 20 years this process has been found to create extensive cracking of welds on base plate connections that is detrimental to the fatigue lives of these poles. Although improved details are used in new designs, thousands of High Mast Illumination Poles (HMIP), Cantilever Overhead Sign Structures (COSS), and traffic signal poles (TSP) exist in Texas with varying levels of cracking in the welds between the baseplates and pole shafts. During this research project, the Performing Agency shall identify and provide critical assessment parameters and guidance for the Receiving Agency to determine if cracks should be monitored, repaired, or the structural component replaced. The research includes a representative assessment of weld cracking in the AS inventory, the development of monitoring hardware and techniques, the development and assessment of repair techniques, and the development of certification methods/standards for inspection personnel.	$ 89,664.51	$ 42.18	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	In 2012, the Rider 36 study indicated that damage caused to bridges and pavements by overweight (OW) vehicles surpassed the revenue collected by permit fees by approximately $200 million annually. This finding was corroborated by a recent 2022 study mandated by House Bill 2223, which quantified this gap at $168 million. Besides the revenue shortage to cover bridge and pavement maintenance and rehabilitation costs due to the damage cause by OW vehicles, the 2022 study also identified additional shortcomings that need to be urgently addressed. These shortcomings include: 1) lack of a methodology for periodically adjusting permit fees to account for changes in traffic patterns and configurations and higher inflation rates; 2) lack of accurate data and process for calculating annual vehicles-miles-travelled (VMT) by each permit type; 3) uncertainty in the identification of routes and number of trips for monthly, quarterly, or annual permits; 4) absence of a method and process to assess the damage caused by OW vehicles to the off-system bridges and highways. The objective of this research is to address these shortcomings and to develop, recommend and provide the Receiving Agency a well-established and documented step-by-step method to periodically update such method.	$ 22,401.26	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Polymer additives are used to design high PG virgin binders that meet the PG requirements to protect the mix against rutting and cracking under the climate and traffic conditions of an HMA project. When RAP is added to the mixture, the effective binder may not meet the desired grade. This project shall quantify the extent to which polymer dilution is a problem that should be addressed in the Receiving Agency's HMA specifications and if so, develop specification language to address it. This project involves evaluating binder blends and mixtures with RAP. Both lab blended and commercial PG binders shall be evaluated for continuous grade, elasticity, polymer content, and other rheological parameters. Then these binders shall be mixed with recovered RAP binders at several percentages and retested to determine the same properties. Standard mixtures(s) shall also be used with several of these binders and various RAP percentages to measure mixture performance-related properties (cracking and rutting). The Performing Agencies shall use the results from binder and mixture results on the impact of "virgin binder – RAP binder dilution" and work with the Receiving Agency to develop specification language for inclusion in the Receiving Agency's HMA specifications, as needed.	$ 58,542.78	$ 388.39	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Traffic control devices (TCDs) are the primary means of communicating highway information to road users and play a key role in highway automation. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. In addition, vehicle technologies and the roadway infrastructure industry are rapidly evolving, spurred by technology advancements, customer demand, changes in the vehicle fleet, and changes in national and state policies. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project could represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ 408,157.85	$ 10,019.17	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The number of vehicles with automated functions continues to increase on Texas roadways. Several companies are testing or will soon deploy demonstrations of Level 4 automated vehicles or connected automated vehicles (CAV/AVs) within the state, with no notification requirements. Additionally, several automated commercial motor vehicle (ACMV) projects are testing Level 4 automation. While safety goals are aimed at minimizing the number of adverse incidents that occur, it is inevitable that a crash or other adverse operations will happen involving one (1) of these automated vehicles. The Receiving Agency's Highway Emergency Response Operator (HERO) program and other first responders are part of the front line that must be prepared to encounter a CAV/AV or ACMV during a routine interaction or adverse event/accident. This project will identify needs and strategies for first responders to understand how these vehicles operate, how to safely approach and disable these vehicles as needed during routine and adverse incident interactions and how to interact with AVs during an accident or emergency.	$ -	$ 1,264.00	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Detecting problematic exits and places of wrong turns and identifying signal and other issues will result in improving safety on highways by reducing crashes as well as optimizing traffic flows while minimizing disruptions. This project will also provide TxDOT with data-driven justification for future highway investments. To achieve the project objectives, the research team shall: • Explore telematics data for a given set of roadways in Texas where issues have been identified by local TxDOT staff as frequent problems. These issues may include motorists missing exits or making wrong turns, traffic signals are not reliably detecting vehicles or vehicles waiting through multiple cycles at the same signal, motorists repeatedly driving outside their permitted lanes of travel while merging on highway ramps or improper merging at lane drops. • Clean and reformat; i.e, preprocess, explored data in a way that is suitable for further analysis. • Study the dataset closely to identify patterns in the data that indicate issues. • Develop rules; i.e, heuristics, or an artificial intelligence platform that can automatically detect events that indicate the issues. When applied on the entire dataset, problematic highway locations will be located and shared with TxDOT to be considered for future interventions. The expected technology readiness level (TRL) for this project is 6	$ 93,934.12	$ 1,642.06	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The United States Geological Survey (USGS) and other government entities have begun to use non-contact radar for stream gauging to collect near-real-time stream velocity, discharge, and stage. Use of these devices is limited compared to traditional stream gauge methods that are typically used by the USGS and local government agencies in Texas. At the state level, TxDOT is leading the way, through partnership with the USGS, to deploy these stream gauges and is constantly learning how they can best be deployed. Because the gauges measure stream velocity and water level, they are easier and more useful to install in tidal areas than traditional gauges. In some streams, there is a peak in velocity wave in advance of a peak in water surface elevation, potentially acting as an advance warning of flood levels. Installation of these gauges is far simpler than traditional gauges in areas where channel vegetation, slope, or size, may affect equipment that must be installed down in the channel. While these gages appear to be less expensive to operate and maintain than traditional USGS gauging approaches, it would be beneficial to learn from the experiences in other US state and federal agencies, and other countries who have used these devices for longer periods of time. The Performing Agencies shall provide a synthesis on the state of knowledge and the state of practice for non-contact radar stream gauges, including how to site gauges, e.g., multiple gauges across a wide floodplain, use in steep and flashy systems, upstream versus downstream mounting on bridges. The scope should include local governments in Texas, other state and federal agencies, including other State DOTs, and countries with longer experience.	$ 32,005.92	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency with implementing the Surface Aggregate Classification (SAC) for reclaimed asphalt pavement (RAP) developed in research project 0-7025, Develop Surface Aggregate Classification of Reclaimed Asphalt Pavement. The Performing Agency shall implement and verify the methodology of SAC-A RAP classification in a minimum of four (4) Receiving Agency Districts. In each selected Receiving Agency District, the Performing Agency shall work with lab and pavement engineers and their staff to characterize the RAP in terms of SAC, design surface mixtures with the RAP, evaluate the friction and skid resistance of mixtures, and construct and monitor the selected test sections in each Receiving Agency District. The Performing Agency shall then use the data generated in these test sections to develop and teach implementation workshops for Receiving Agency Districts.	$ 95,579.96	$ 1,255.35	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall increase the Receiving Agency's understanding of the fundamental relationships between posted and operating speed along with providing content to support external and internal Receiving Agency dialog about speed limits and their development for all roadway environments. This project shall include three (3) workshops along with developing Spanish versions of videos on speed limit setting practices.	$ 27,099.76	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objectives of this project are to complete the design and construction of the automated test system for asphalt mixtures and asphalt binders and to deliver an automated IDEAL cracking and rutting test unit and an automated asphalt binder specific gravity and dynamic shear rheometer testing unit to the Receiving Agency's MTD lab. The automated asphalt mixture testing unit includes (1) auto-air void measurement subunit, (2) specimen conditioning subunit for both room and high temperature, (3) automation arm subunit, (4) automated IDEAL cracking test (IDEAL-CT), IDEAL rutting test (IDEAL-RT), indirect tensile (IDT) strength test subunit, and (5) waste disposal subunit. The automated asphalt binder testing unit includes (1) asphalt binder specific gravity testing subunit and dynamic shear rheometer testing subunit. The automated asphalt mixture and binder test units shall shorten test time and improve lab safety, test efficiency and accuracy.	$ 250,241.79	$ 5,155.48	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's Research and Technology Implementation (RTI) Division funded research project 0-6701 in FY 2012 to investigate potential methods of linking transportation planning in Texas with the environmental clearance process required of the National Environmental Policy Act (NEPA). The study approach and findings were documented in a research report (0-6701-1) and a guidance document entitled Texas Department of Transportation (TxDOT) Resource for Linking Planning with Project Planning in Support of NEPA (0-6701-P1). The Performing Agency shall: (1) Conduct structured interviews with the Receiving Agency's planning and environmental subject matter experts, five of the state's Metropolitan Planning Organizations (MPOs), and up to five State Departments of Transportation (DOTs) that pioneered Planning and Environmental Linkages (PEL) in FY 2012 to determine the need for updated/new PEL Guidance given that 0-6701-P1 was developed a decade ago as well as the Receiving Agency's participation in the NEPA Assignment program under 23 U.S.C. 327 and the Memorandum of Understanding with FHWA originally dated December 16, 2014 and renewed on December 9, 2019 (Phase 1) and, (2) Update 0-6701-P1 if the interviews reveal the need for updated/additional guidance (Phase 2). The structured interviews conducted in Phase 1 revealed the need for updated/additional guidance. The objective of Phase 2 is to develop a user-friendly PEL guidebook that the Performing Agency's Divisions and District staff can reference in the implementation of PELs in Texas, as well as the Texas Metropolitan Planning Organizations.	$ 126,783.26	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	De-icing using geothermal energy can provide the Receiving Agency with a better alternative than the existing method of using de-icing with sands and/or salts. This research project shall explore the potential for retrofitting bridges with a fluid-filled piping system and move through Technology Readiness Levels (TRL) from concept (TRL level 1) through to prototype demonstration in a relevant environment (TRL level 6).	$ 109,106.72	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall produce Video Summary Report's (VSRs) for the Receiving Agency which summarize transportation research and implementation projects. Additionally, the Performing Agency shall also produce outreach materials for the Receiving Agency that will be transportation research related material and may include additional related subjects of interest.	$ 256,833.36	$ 1,656.90	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This pooled fund study will provide a cooperative approach to conducting research to address roadside safety issues specifically related to improving motorcyclist safety. Furthermore, this program is intended to provide participating states collaborative opportunities to stay abreast of best practices, new regulatory issues, risk management strategies, and other research pertaining to roadside safety improvements for motorcyclists. The research activities will include the identification, development, and evaluation of strategies and devices for mitigating the frequency and severity of roadway departure motorcyclist crashes.	$ 367,326.85	$ -	$ -	$ -	$ -	$ -
575 - Texas Division of Emergency Management	1.1.1. - Sponsored Transportation Research	The Performing Agency will provide personnel, equipment, and supplies to conduct the responsibilities, projects, and associated tasks for a program of hazardous materials (hazmat) transport emergency planning projects and activities. This Agreement will cover work to be performed during Fiscal Year 2024 in relation to three projects (respectively titled Project 2, Project 5, and Project 6). The responsibilities of both Parties are detailed in the Scopes of Work in Attachment A, which are hereby incorporated into this Contract. The Scopes of Work includes an overview of each project and specific details of the portion of the work to be performed for that project in the current fiscal year.	$ 51,853.28	$ 17,994.26	$ -	$ -	$ -	$ -
575 - Texas Division of Emergency Management	1.1.1. - Sponsored Transportation Research	The Performing Agency will provide personnel, equipment, and supplies to conduct the responsibilities, projects, and associated tasks for a program of hazardous materials (hazmat) transport emergency planning projects and activities. This Agreement will cover work to be performed during Fiscal Year 2024 in relation to three projects (respectively titled Project 2, Project 5, and Project 6). The responsibilities of both Parties are detailed in the Scopes of Work in Attachment A, which are hereby incorporated into this Contract. The Scopes of Work includes an overview of each project and specific details of the portion of the work to be performed for that project in the current fiscal year.	$ 18,371.92	$ 9,009.83	$ -	$ -	$ -	$ -
575 - Texas Division of Emergency Management	1.1.1. - Sponsored Transportation Research	The Performing Agency will provide personnel, equipment, and supplies to conduct the responsibilities, projects, and associated tasks for a program of hazardous materials (hazmat) transport emergency planning projects and activities. This Agreement will cover work to be performed during Fiscal Year 2024 in relation to three projects (respectively titled Project 2, Project 5, and Project 6). The responsibilities of both Parties are detailed in the Scopes of Work in Attachment A, which are hereby incorporated into this Contract. The Scopes of Work includes an overview of each project and specific details of the portion of the work to be performed for that project in the current fiscal year.	$ 45,383.38	$ 987.08	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	This project will develop a set of statewide emissions inventories (EI) for all locomotive and rail yard source categories in Texas. These EIs are needed to fulfill the federal Air Emissions Reporting Requirements (AERR) and to support state implementation plan (SIP) development. The Grantee shall develop annual (short tons per year) and average summer weekday (short tons per day) controlled and uncontrolled EI estimates of criteria air pollutants (CAP), CAP precursors, and hazardous air pollutants (HAPs). The Grantee shall use compiled activity data developed during the previous locomotive and rail yard activity data sourcing project, PGA 582-22-32564-007, to develop the required EIs.	$ 32,844.31	$ 9,597.89	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	This project will develop a set of statewide emissions inventories (EI) for all airport source categories in Texas, including aircraft, auxiliary power units (APU), and ground support equipment (GSE). These EIs are needed to fulfill the federal Air Emissions Reporting Requirements (AERR) and to support state implementation plan (SIP) development. The Grantee shall develop annual (tons per year) and average summer weekday (tons per day) controlled and uncontrolled EI estimates of criteria air pollutants (CAP), CAP precursors, and hazardous air pollutants (HAP) using the Federal Aviation Agency's (FAA) Aviation Environmental Design Tool (AEDT). The Grantee shall use compiled activity data, control strategy information, and airport facility data developed during the previous aircraft, APU, and GSE activity data collection projects PGA 582-21-10369, PGA 582-22-32383-005, PGA 582-21-11196-018, and PGA 582-22-32383-005 to develop the required modeling input files for use with AEDT and to further process and analyze the output file data as needed.	$ 29,985.12	$ 37,954.11	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to develop and produce on-road mobile emissions inventories necessary to support the ELP County RFP state implementation plan (SIP) revision for the 2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS). Specifically, the Grantee shall develop and produce on-road mobile link-based emissions inventories for the ELP County ozone nonattainment area for analysis years 2017, 2023, and 2024.	$ 45,835.82	$ 5,288.62	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall organize and document the air quality activities among city, state and federal agencies selected by the Receiving Agency, through the activities of the Technical Working Group for Mobile Source Emissions (TWG). The Performing Agency shall provide technical analysis of current and emerging air quality planning issues, including regulations and legislation, identified by the Receiving Agency or through TWG and other platforms. The Performing Agency shall provide assistance for on-road mobile source emissions analyses required for these areas to support conformity analysis and attainment strategy demonstrations. This will include on- demand assistance for existing non-attainment areas (Houston-Galveston, Dallas/Fort Worth, El Paso, and San Antonio), as well as for areas in Texas which are at risk of or anticipate exceeding current or anticipated emissions standards, but have not been officially designated as non-attainment areas.	$ 662,766.20	$ 97,663.67	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall perform a comprehensive evaluation of concrete sealers and coatings applied to bridge substructure in the state of Texas. The Performing Agency shall investigate the need for and extent of surface preparation on both new and existing concrete surfaces including those with previously applied coatings. A focus is placed on material testing to evaluate the performance of coatings applied with various surface preparation methods and exposed to environmental conditions. The potential benefits are the development of recommendations for the level of surface preparation required for various sealer or coating systems and for the optimal coating type for the Receiving Agency's substructures with or without previously applied coatings.	$ -	$ 15,889.63	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to provide the requisite on-road mobile source portion of the 2023 periodic year emissions inventories and county database files (CDBs) for all 254 Texas counties. The State of Texas is required to submit periodic emissions inventories and United States Environmental Protection Agency's (EPA) Motor Vehicle Emissions Simulator (MOVES) CDBs under the Air Emissions Reporting Requirements (AERR) to support the EPA's comprehensive three-year cycle National Emissions Inventory (NEI). This PGA will provide annual, summer work weekday, and winter work weekday emissions inventory estimates of criteria air pollutants (CAP), CAP precursors, and hazardous air pollutants (HAP). This PGA will also provide the requisite vehicle miles traveled (VMT) inputs for the TCEQ Texas Road Dust Calculator necessary to develop a statewide 2023 calendar year emissions inventory.	$ 15,014.91	$ 52,356.21	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this research project is to determine where, when, and why a prime or cure is needed for a pavement layer. Materials such as prime coats, curing materials, seal coats, and tack coat are typically considered non-structural, but integral to the pavement structure. Some materials can be used for multiple purposes: prime, bond or help cure; however, the rates and timing of use may change depending on why the material is being used. Guidance is needed to help designers, inspectors and construction personnel understand the materials and where, when, and why to use them. This project shall develop guidelines for prime and curing through a series of laboratory and field testing and develop tests and procedures to determine the best materials for a prime, cure or a combination. These guidelines shall aid decision makers in determining whether a prime, cure or bonding material is needed, and where, when and why to design and use the appropriate materials.	$ -	$ 12,230.73	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this research project is to develop measurable and repeatable adjustment criteria for seal coat application rates based on pavement condition, traffic and material properties for the design method developed in research project 0-6989 Update Seal Coat Application Rate Design Method (TxDM6989).[1] Current practice requires experienced personnel to understand the adjustments needed for application rates, including changing the adjustments as conditions on the pavement change. The adjustments in the TxDM6989 combine multiple pavement conditions into one description. By measuring the conditions, a combined adjustment based upon measured parameters will remove subjectivity from the procedure. This will lead to more consistently constructed projects that meet the objectives of designing the rates so that the resulting seal will not have too much binder so that it flushes or bleeds in the summer; but there is enough binder to prevent rock loss over the winter. This research project will produce measurable methods for adjustments to the rate design procedures that will help engineers and inspectors make better decisions resulting in successful projects.	$ -	$ 4,931.17	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency invests over $250 million annually on seal coats, it is therefore critical to apply the right treatment to the right road at the right time. Projects are typically selected based on the time since the last seal coat (an average of 7 years) with little to no testing performed to ensure that the section is a good candidate for seal coat and how many seal coats to apply. The objective of this research is to determine the maximum number of seal coats that can be applied to a pavement surface before the accumulated layers of seal coats become unstable. The Performing Agencies shall evaluate the stability of existing accumulated seal coat substrate layers through a series of laboratory and field testing and develop tests and procedures to determine when an additional seal coat may not perform well. The Performing Agencies shall develop guidelines to select candidate seal coat projects with multiple seal coat layers ensuring that a new seal coat is used on a good candidate pavement will lower risk to the Receiving Agency, improve life cycle costs and lead to better performing sections of pavement.	$ -	$ 4,062.59	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Outdoor advertising signs impact millions of travelers around the world every day. These signs are designed to attract driver attention thus taking it away from the driving task. Driver inattention and distraction are two of the most critical factors for road safety. Receiving Agency regulation of outdoor advertising signs must deal with changing technologies, including digital billboards, which allow for modifications to sign illumination, motion, and content. Regulations are not keeping pace with changing sign trends and must be updated to address potential impacts on road user safety. The Performing Agencies shall focus on the degree of driver distraction caused by typical and digital advertising sign contents. The Performing Agencies shall perform a comprehensive state-of-the-practice review, crash investigation, and an on road human factors evaluation, considering illumination levels and content (including motion) during daytime and nighttime travel for dry and wet-weather conditions. This Performing Agencies shall provide the Receiving Agency with tools and resources to help manage outdoor digital advertising billboards by establishing practical criteria for sign illumination and content. These resources shall allow the Receiving Agency to manage the advertising signs such that road user safety is accounted for while maintaining the ability of sign owners to develop effective means of communicating with the public.	$ -	$ 15,985.24	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Super 2 highways have been used across Texas for over 20 years, providing operational and safety benefits to rural two-lane highways at lower cost than widening to four-lane, and more are planned as the demand increases on the state highway system. Previous Super 2 research has provided insights on safety improvements, but the Receiving Agency would benefit from an updated crash modification factor (CMF) based on a rigorous review and analysis of recent crash data from the state's many Super 2 highways. This CMF would provide additional support for installing Super 2 corridors throughout the state and complement existing guidance. The Performing Agencies shall use their existing database of Super 2 highways and site characteristics, combined with additional data on traffic volumes, crashes, and other relevant factors, to develop a comprehensive Super 2 dataset for analysis and identification of relationships between crashes and other characteristics. Using the results of this analysis, the Performing Agencies shall define one (1) or more CMFs or crash modification functions (CMFunctions) that the Receiving Agency and other practitioners can use to make decisions on installing future Super 2 corridors. The Performing Agencies shall disseminate these CMFs to the Federal Highway Administration's (FHWA's) CMF Clearinghouse for inclusion in their database.	$ -	$ 17,013.99	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to develop on-road emission inventories that will be used as air quality modeling inputs for the calendar years of 2019 and 2026 as well as to develop activity data for 2022. For the eight-county Houston-Galveston-Brazoria (HGB) area and twelve counties within Dallas-Fort Worth (DFW) metropolitan area, link-based on-road emissions inventories will be developed based on vehicle miles traveled (VMT) activity estimates from the local travel demand model (TDM). For all 254 Texas counties, on-road emissions inventories will be developed based on VMT activity estimates from the Highway Performance Monitoring System (HPMS) that is managed by the Texas Department of Transportation (TxDOT). For all 254 Texas counties, on-road activity data will be developed based on VMT activity estimates from the HPMS to estimate forthcoming 2022 base case emissions. The TCEQ is planning for future State Implementation Plan (SIP) submissions to the U.S. Environmental Protection Agency (EPA) that will likely be required under the 2015 eight-hour ozone standard of 70 ppb. To support attainment demonstration modeling for these efforts, the TCEQ is currently developing a 2019 base case modeling episode. At this time, eight counties in the HGB area and nine counties in the DFW area are expected to be reclassified as serious nonattainment for the 2015 eight-hour ozone standard with an attainment year of 2026. For the 2019 base case and the 2026 future case, on-road emissions inventories for all 254 Texas counties are needed based on HPMS activity data from TxDOT. For the 2019 base case and 2026 future year, on-road emissions inventories are needed for the eight-county HGB area based on TDM activity data from the Houston-Galveston Area Council (HGAC), and from the North Central Texas Council of Governments (NCTCOG) for the nine-county DFW area. For all 254 Texas counties, on-road activity data based on VMT activity estimates from the HPMS for 2022 is needed to estimate 2022 emissions. The TDM network for the DFW area covers Collin, Dallas, Denton, Ellis, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise counties. Hood, Hunt and Rockwall counties are not classified as nonattainment under the 70 parts per billion (ppb) standard. They are included in work under this PGA because these counties are part of the large regional domain used by the TCEQ for air quality modeling purposes. This PGA requires the use of the Motor Vehicle Emission Simulator (MOVES) model from the U.S. EPA. At this time, MOVES4 is the latest available version of MOVES. Inventory development work under this PGA requires the use of this latest version, which will be referred to as MOVES in this PGA.	$ 57,969.16	$ 60,848.56	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The TCEQ is planning for future State Implementation Plan (SIP) revision submissions to the U.S. Environmental Protection Agency (EPA) that will likely be required under the 2015 eight-hour ozone standard of 70 ppb. Currently, Bexar County within the SAN area is classified as a moderate nonattainment area for the 2015 eight-hour ozone standard with an attainment date of September 24, 2024. At this time, Bexar County is expected to be reclassified as a serious nonattainment area for the 2015 eight-hour ozone standard with an attainment date of September 24, 2027. If reclassified, attainment demonstration analyses would need to be based on future year emissions estimates for 2026, which represents the complete ozone season prior to the required attainment date. Therefore, for the 2026 future year, on-road linked-based emission inventories for the five counties in the SAN area including Bexar, Comal, Guadalupe, Kendall, and Wilson are needed based on TDM activity data from the Alamo Area Metropolitan Planning Organization (AAMPO). This study requires the use of the latest version of the MOtor Vehicle Emission Simulator (MOVES) model from the U.S. EPA. The purpose of this study is to develop on-road emission inventories that will be used as air quality modeling inputs for the 2026 calendar year. For the five counties within the San Antonio metropolitan area (SAN), link-based on-road emission inventories will be developed based on vehicle miles traveled (VMT) and activity estimates from the local travel demand model (TDM).	$ 35,422.10	$ 19,498.57	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall continue to support the Receiving Agency in the operations and expansion of the Border Wait Time Measurement System (BWTMS) in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements.	$ 1,096,833.67	$ 430,875.67	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's Roadway Design Manual was updated in July 2020 and incorporates considerations for and accommodations of bicyclists and pedestrians, including preferred design order toward Shared Use Paths (SUPs) compared to bicycle lanes and shared lanes. However, the Guidance does not include specific procedures to estimate the anticipated volumes of non-motorized path users. The Receiving Agency's Bicycle Accommodation Design Guidance makes it clear that anticipated user volumes should be considered when designing facilities. The objective of this project is to develop a simple sketch planning-level demand estimation tool that provides anticipated user volumes for SUPs. The project shall also incorporate the results into the future editions of The Receiving Agency's design guidance/manuals. Given the uncertainty in resources, this project shall not use an overly complicated method or a method that requires complex data or data architecture. The project shall benefit from existing data sources, including The Receiving Agency's Texas Bicycle and Pedestrian Count Exchange and other count data resources in the State as well as other secondary and spatial data sources. The project shall develop an easy-to-use tool responding to the needs and requirements of the intended audience while incorporating advancements to improve the accuracy of the demand estimation.	$ -	$ 14,588.05	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Dallas County Sheriff's Courtesy Patrol program, in coordination with the Receiving Agency Dallas, is piloting a system to digitize and automate the incident reporting process. The Performing Agency shall equip each patroller, and patrol dispatchers in Daltrans, with tablets that have a commercially available application installed on it. The application will provide a centralized web and app-based incident management tool that patrollers can use to log relevant data in real-time, including auto location information, and managers can use to generate reports and performance measures. It will help mitigate crash risks by minimizing time patrollers and motorists are parked on shoulders and improve efficiency of data entry and provide insightful analytics.	$ 38,465.42	$ 7,253.63	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Improving CEI Contract Invoicing Validation and Efficiency	$ -	$ 53,465.17	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The overall project objective is to develop a system where prefabricated steel ABC units perform continuous for live load. The system must be: easily constructible, fast to assemble, durable long-term, safe, and cost-effective. The Performing Agency shall achieve this objective by synthesizing what has been done by state departments of transportation and other agencies (through literature review) along with evaluating the behavior of related Receiving Agency bridges (through visual inspection and monitoring). Next, a system development program shall be performed utilizing this information in conjunction with expert feedback from an Industry Review Panel (IRP) workshop (including the Receiving Agency Panel). The three best system designs shall be selected for full-scale laboratory testing followed by an analytical parametric study. All the results shall be compiled and presented at an IRP meeting with the Receiving Agency, where the final system shall be selected. The Performing Agency shall develop full Microstation details and specifications along with a user-friendly design guide. The guide shall identify: • Span length capabilities for girder sizes/depths/spacings, • General details for establishing live load continuity, • Closure pour details at interior bents and how to achieve acceptable deck stresses, • Structural steel splice details and acceptable tolerances, and • Bearing layout to meet the Receiving Agency substructure details.	$ -	$ 52,999.38	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Mapping of buried utilities using rigorous subsurface utility engineering (SUE) quality level B (QLB), as is frequently performed or recommended, can be costly. It can also be ineffective for unknown utilities (i.e., utilities that exist but for which no information is available). This is particularly common and problematic in areas of oil and gas operations. When undiscovered until construction, these unknown utilities may cause serious scheduling disruptions as well as higher construction costs, along with safety and environmental risks. There is a need for a faster, less expensive method of scanning the right of way (ROW) for these unknown utilities. This research evaluates, selects the most appropriate, and tests the application of newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown pipelines or other utilities in the ROW. It compares the effectiveness and cost of deployment to standard QLB SUE and reports on technologies that are both technically and cost effective for identifying unknown utilities.	$ -	$ 63,258.44	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Objectives The Texas Department of Transportation (Receiving Agency) was selected by the U.S. Department of Transportation (USDOT) for a Strengthening Mobility and Revolutionizing Transportation (SMART) Grant for the Smarter Intersections Pilot Project. The Texas A&M Transportation Institute (Performing Agency) assisted with the grant proposal and was identified as the sub-recipient to conduct the pilot project. The Smarter Intersections Pilot Project focuses on improving intersection safety and mobility for vulnerable road users (VRUs) such as pedestrians, including people with mobility and visual disabilities, bicyclists, and those using other mobility devices. The Performing Agency shall develop and test Cellular-Vehicle-to-Everything (C-V2X) technologies at five intersections in College Station, in tandem with on-board units on transit and emergency response vehicles or other technologies. The Performing Agency shall also potentially explore the feasibility of incorporating that vehicle information into a Smart Phone application (app) that blind/low-vision (B/LV) people can use to navigate the intersections. Further, the Performing Agency shall identify methods to communicate with automated shuttles to alert them of approaching and/or turning buses and emergency vehicles at the intersections.	$ 660,254.03	$ 557,894.32	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Lab-molded density of asphalt mixes is a critical factor for laboratory mix design, plant production, and field performance. Current mix design and production quality control and quality assurance (QC/QA) are developed around a fixed lab-molded density of 96 percent. Adherence to a fixed lab-molded density is not only one of the main factors leading to drier, more crack susceptible mixes where low asphalt binder content is often caused by balancing high lab-molded density values at plant production, but it also impacts the implementation of the Balanced Mix Design approach. Furthermore, various field test sections designed with densities ranging from 96.5 to 98 percent were previously constructed in different areas of Texas, and they performed well in the field with no observed rutting problems. Thus, the objective of this project is to establish an acceptable range of lab-molded densities for laboratory mix design and production QC/QA testing. To achieve the objective, the Performing Agencies shall review the literature, conduct extensive laboratory performance tests, construct test sections and monitor their performance, and finally recommend an acceptable range of lab-molded density based on all the information and data collected.	$ -	$ 54,082.95	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The number of vehicles with automated functions continues to increase on Texas roadways. Several companies are testing or will soon deploy demonstrations of Level 4 automated vehicles or connected automated vehicles (CAV/AVs) within the state, with no notification requirements. Additionally, several automated commercial motor vehicle (ACMV) projects are testing Level 4 automation. While safety goals are aimed at minimizing the number of adverse incidents that occur, it is inevitable that a crash or other adverse operations will happen involving one (1) of these automated vehicles. The Receiving Agency's Highway Emergency Response Operator (HERO) program and other first responders are part of the front line that must be prepared to encounter a CAV/AV or ACMV during a routine interaction or adverse event/accident. This project will identify needs and strategies for first responders to understand how these vehicles operate, how to safely approach and disable these vehicles as needed during routine and adverse incident interactions and how to interact with AVs during an accident or emergency.	$ -	$ 45,018.17	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	This project will assess and quantify nitrogen oxides (NOX) emissions reductions from the use of Texas Low Emissions Diesel (TxLED) fuel in diesel engines or vehicles representative of the current on-road mobile source fleet. The Grantee shall measure engine or vehicle emissions in a controlled laboratory environment while collecting and analyzing all process and operational data necessary to quantify emissions reductions. If resources and time permit, the scope of the project may be extended to particulate matter (PM) emissions testing and/or non-road mobile source testing.	$ 14,065.65	$ 141,371.33	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to develop and produce on-road mobile emissions inventories necessary to support the HGB-area, DFW-area, and Bexar County RFP state implementation plan (SIP) revisions for the 2008 and 2015 eight-hour ozone National Ambient Air Quality Standards (NAAQS). Specifically, for the 2015 eight-hour ozone NAAQS, the Grantee shall develop and produce on-road mobile link-based emissions inventories for the six HGB ozone nonattainment counties, the nine DFW ozone nonattainment counties, and the Bexar County ozone nonattainment area for analysis years 2017, 2023, 2024, 2026, and 2027. For the 2008 eight-hour ozone NAAQS, the Grantee shall develop on-road mobile link-based emissions inventories for the ten DFW ozone nonattainment counties for analysis years 2026 and 2027.	$ 60,709.09	$ 127,335.18	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Due to the complex nature of urban roadways, conventional crash prediction models are limited as these models omit operating speed, short-duration volume, and weather data. To mitigate this research gap, the following three national databases can be utilized: (1) National Performance Management Research Data Set (NPMRDS) with passenger and freight speed data, (2) Travel Monitoring Analysis System (TMAS) data with both temporary traffic counting and continuous traffic counting programs, and (3) real-time weather data from the National Oceanic and Atmospheric Administration (NOAA). The fatality rate on Texas roadways for 2020 was 1.50 deaths per hundred million vehicle miles traveled, which is an 18.94% increase from 1.26 in 2019. From 2011 to 2020, the fatalities on rural roadways increased by 19%, and this increase on urban roadways is disproportionately high (31%). Research and a supporting decision support tool are necessary to improve urban safety. The Performing Agencies shall leverage ongoing staff leadership and engagement in several national and state Department of Transportation (DOT) speed-safety projects. This research shall provide updated safety performance functions (SPFs) for urban roadways and a real-time decision support tool on risk scoring with the applicability of new data input and model updating pipeline.	$ -	$ 7,710.33	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI will provide complete support to TxDOT for the ConnectSmart project, an advanced framework integrating Transportation Systems Management and Operations (TSMO) and Active Demand Management (ADM) with multi-modal demand and mobility management.	$ 15,838.98	$ 37,374.29	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this study is to update the electronic utilities titled “TTI On-Road Emissions Inventory Utilities” and the “On-Road Emissions Quality Assurance Tool” for use with the latest version of the United States Environmental Protection Agency’s (EPA) Motor Vehicle Emission Simulator (MOVES) model, titled MOVES5 as specified in Section 10.1 - Purpose and Background of this document, informed by, and consistent with, the appropriate guidance and methods provided in the references in Section 10.4 of this document, and consultation with the TCEQ PM. Basic criteria will be used to assure that the acceptable quality of the product is met – product developers will verify that the processes and products are as stated previously, including: • The product meets the usage in the development of TCEQ mobile source emission inventories (i.e., utilities to calculate emissions and tool to QA the MOVES county input databases and output databases for all analysis years needed for SIP demonstration); • Agreed methods, models, tools, and data are used; • The required output data sets are produced in the appropriate formats; • Any deficiencies found during development and end-product quality checks are corrected; and • No installation is needed, and it can operate on TCEQ’s operating system	$ -	$ 43,109.60	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide Ground Penetrating Radar (GPR) technical expertise, to include conducting surveys, validation testing, training workshops and performing analysis on data collected with non-contact GPR systems. The Performing Agency shall also assist in performing maintenance on all the Receiving Agency’s non-contact GPR antenna systems and assist with semi-annual calibrations and system to system reproducibility measurements when requested by the Receiving Agency. All work shall adhere to applicable federal, state, and Receiving Agency regulatory security requirements and must follow TAC-202. The Performing Agency shall meet with the Receiving Agency to ensure all aspects are reviewed prior to issuance of the Notice to Proceed.	$ 146,093.63	$ 111,971.39	$ 2,755.00	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide certification of the Receiving Agency’s inertial profilers and profiler operators, provide assistance on measurement of pavement surface characteristics, set up profiler verification sections, and support the use of pavement condition data for highway safety management. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates.	$ 181,111.71	$ 154,984.65	$ 9,420.22	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency (and implementation partners) shall provide coordination, laboratory testing and analyses, field project development and monitoring, and syntheses to support further refinement and implementation of Special Specification 3074 (SS3074) to Item 344, “Superpave Mixtures - Balanced Mix Design (BMD)”. As shown in Figure 1, these activities shall result in a revised SS30YY with performance thresholds and revised test methods as needed for mix design and quality assurance (QA) to provide a practical method to engineer each unique materials combination to realize substantial economic and environmental benefits without sacrificing balanced engineering performance. The first revision of SS3074 shall be SS30XX based on results from the 2019-2022 Interagency Cooperation Contracts (IACs).	$ 442,237.97	$ 487,636.76	$ 11,608.19	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed may only be authorized by the Receiving Agency’s Construction Section Director or a higher level of authority. The Notice to Proceed will activate all tasks associated with this contract and described within. The Notice to Proceed will identify the end date of activities. An additional Notice to Proceed will be required to continue work beyond that date. Through previous Interagency Cooperation Contracts (IACs), the Performing Agency developed curriculum for CON 511 – Basic Construction Schedule Analysis and CON 512 – Time Impact Analysis. Through these IACs, the Performing Agency has virtually delivered each of these courses several times. Through this IAC, the Performing Agency shall continue to deliver CON 511 and CON 512. As part of this IAC, the Performing Agency shall use feedback and additional construction data to improve the tools developed for CON 511 and CON 512 and refresh the curriculum of these courses to integrate the new tools. Finally, as part of this IAC, the Performing Agency shall develop a Construction Project Management training course. This course is envisioned as a one-day to one-and-a-half day introductory course to the Receiving Agency construction project management.	$ 103,372.70	$ 72,932.27	$ 1,729.22	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI and Virginia Tech will perform Errors and Omissions Management Training and Construction Engineering and Inspection by Professional Services Firms Training through this IAC with TxDOT.	$ 166,555.28	$ 179,045.72	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The scope of services provided by the Performing Agency is outlined in the following tasks to be performed for the Receiving Agency’s Materials and Tests Division (MTD). The Performing Agency shall develop a Materials Academy Workshop training program for Receiving Agency personnel with an emphasis on highway construction materials. The Performing Agency shall travel to the Receiving Agency’s Facilities in Austin, TX and conduct five (5) week workshops according to the schedule in Task 3. The workshop shall consist of up to two (2) weeks of preparation and webinars, two (2) weeks of in-class lecture and laboratory hands-on sessions at the Receiving Agency, and one (1) week of class sessions with manufacturing plant visits at non-Receiving Agency facilities including, but not limited to the TxAPA (Texas Asphalt Pavement Association) Buda facility. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed may only be authorized by the Receiving Agency’s Materials and Tests Deputy Director or a higher level of authority. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates.	$ 347,733.09	$ 441,324.84	$ 52,226.12	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency (TxDOT's Public Transportation Division) is responsible for administering the state's program for public transportation. The scope of responsibility includes the distribution of federal and state funding for public transportation in small urban and rural areas, and state funding for eligible large urban areas. Receiving Agency is also responsible for managing the programs for planning, technical assistance, and statewide coordination of public transportation. Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions and advanced problem-solving capabilities.	$ 497,771.47	$ 579,417.64	$ 9,889.02	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide the Receiving Agency with UTP technical assistance and support, The Performing Agency shall support the Receiving Agency with database development, data analysis, data processing, data visualization, and dashboard development. The Performing Agency shall assist the Receiving Agency with developing the Annual Portfolio Achievement Report (APAR), document Standard Operating Procedures (SOPs) and swimlanes, provide process improvements including form development, and provide guidance for the centralization of the data used by the Receiving Agency. The Performing Agency shall coordinate with the Receiving Agency to maintain a project tracking system in SharePoint that: 1. Collects information on project schedules. 2. Notates deliverable submissions from the Performing Agency. 3. Identifies deliverable reviews required of the Receiving Agency. 4. Maintains copies of deliverables, reports, progress reports, and other project communication.	$ 562,632.14	$ 706,101.79	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	IAC with TxDOT Division to provide technical assistance and support and database and performance metric support	$ 34,173.90	$ 18,977.62	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical assistance for improving TxME as part of the Receiving Agency's flexible pavement design system. This will include software enhancement and upgrade, materials laboratory testing to assist in generating default inputs for the latest generation of paving materials, and incorporation of the latest portable weigh-in-motion (WIM) traffic load data.	$ 80,146.02	$ 39,124.43	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Support construction, planning, operations, and maintenance in the Waco District to include District-wide traveler information needs, support of construction activities, planning and operation analysis, special investigations and other initiatives as requested.	$ 1,636,913.92	$ 1,266,183.43	$ 64,615.26	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency's Maintenance Division with testing and evaluating erosion and sediment control products. Assistance shall include, but not be limited to, equipment and instrument calibrations, baseline testing, erosion and sediment control product testing, reporting test results, and updating the Receiving Agency's Interactive Approved Product List (IAPL).	$ 443,152.23	$ 426,923.87	$ (6,957.87)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency [TxDOT's Bicycle and Pedestrian Program in the Public Transportation Division (PTN)] is responsible for planning, technical assistance, and statewide coordination of bicycle and pedestrian transportation. The scope of responsibility includes coordinating the development of planning and design guidelines, providing information resources, and distributing federal and state funding for bicycle and pedestrian transportation projects. In anticipation of eventual mandatory reporting of bicycle and pedestrian counts to the federal Traffic Monitoring Analysis System, the Receiving Agency has built the foundation of a bicyclist and pedestrian count program by engaging the Performing Agency to establish a statewide database, guidance, and training through research and implementation projects. Through the further collection of bicyclist and pedestrian count data, the Receiving Agency will be better informed about how to quantify walking and bicycling activity on state highways and therefore make better transportation investment decisions about how to accommodate increased demand. The Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions, collaboration and partnerships, and advanced problem-solving capabilities. Additionally, the Receiving Agency has limited staff and technical expertise to implement and manage this new count program.	$ 503,104.71	$ 561,701.08	$ (843.61)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Strategic Planning for Expedited Data Innovations (SPEDI2) - The Performing Agency shall develop a guide to commercially available transportation data and data services and create plans for pilot deployments that may benefit TxDOT.	$ 915,131.93	$ 880,740.72	$ 45,342.08	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency's Rigid Pavements and Concrete Materials Section (RPCM), Materials and Tests Division, with utilizing a Real Time Profiler (RTP) devise on new concrete pavement projects. The Performing Agency shall also evaluate ride quality data from rigid pavements and identify industry best practices.	$ 14,828.23	$ 34,808.47	$ 1,450.04	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services for the Performing Agency are outlined in the following tasks to be performed for the Receiving Agency's Dallas District (District). A written Notice to Proceed will be required before any of the following services can be performed. The Notice to Proceed (NTP) can only be authorized by the Receiving Agency's Dallas District by the Advance Project Development Engineer, Transportation Engineering Supervisor, or higher level of authority. Any NTP under Tasks 1,2, 4, 6, 7, or 10 must also be signed by TxDOT's Information Management Division (IMD) before it is authorized to ensure compliance with State law and TxDOT policy governing hardware, software, and data. Documentation of work performed will be provided in the form of technical memorandums or reports, meeting handouts, monthly progress reports, status meetings, and other written materials as requested by the Receiving Agency. Note, any work related to hardware, software and new or external data will be coordinated with the IMD, Traffic Safety Division (TRF) and/or any other Divisions as appropriate.	$ 614,229.65	$ 588,597.08	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical support for sampling and laboratory mixture designs of full-depth reclamation (FDR) using asphalt or other treatments, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division.	$ 74,831.06	$ 62,331.51	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency with materials non-routine testing, to include, but not limited to, concrete, aggregates and cement materials. Preforming Agency shall travel to Receiving Agency Headquarters (Austin, TX) for progress meetings as requested by the Receiving Agency.	$ 67,379.81	$ 52,583.66	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall operate the Mobile Pavement Marking Retroreflectivity Verification Program which was initiated in 2015 to verify pavement marking retroreflectivity data on projects completed by the Receiving Agency's contractors. Projects included in the verification program must meet the following requirements: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B). 2) Item 666, "Retroreflectorized Pavement Markings." The Performing Agency shall also conduct pavement marking retroreflectivity service life evaluations. These evaluations require retroreflectivity measurements over time and conducting analyses needed to determine the pavement marking service life. This will help Receiving Agency to establish a tool to satisfy the FHWA minimum retroreflectivity requirements.	$ 106,198.62	$ 141,459.36	$ 1,328.94	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide laboratory and field testing, and technical support for coating and traffic materials. Technical support will include, but not be limited to, forensic analysis, related technical assistance, and specification support.	$ 140,135.29	$ 76,918.79	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency in the area of transportation operations and maintenance.	$ 129,558.71	$ 148,581.19	$ 986.03	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical support for testing soils and aggregtates, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division. The Performing Agency shall review and summarize existing practices and research findings from soils and aggregates topics. This review shall include but is not necessarily limited to test procedures, methods, and past research. The Performing Agency shall identify how results from this task could enhance or streamline current practices. The Performing Agency shall recommend updates to existing practices based on the findings, and may develop outreach content to support the recommendations.	$ 38,036.77	$ 39,950.76	$ (36.94)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide pavement technical support for the development of a whole-life lifecycle assessment (LCA) for the Federal Highway Administration (FHWA) Climate Challenge Program. The Performing Agency shall develop the following: A pavement materials library for the LCAPave tool software based on Receiving Agency specific bid codes. List of typical pavement structures currently used in Texas, including new construction, rehabilitation and maintenance that can be used for developing pavement information for an alternative pavement analysis.	$ 34,711.44	$ 206,209.76	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency for a variety of tasks related to carrying out the Receiving Agency's Metropolitan Planning Organization (MPO) assistance program. A formal Notice to Proceed (NTP) will precede all Performing Agency's work on the tasks and subtasks contained herein. The NTP may only be authorized by the Receiving Agency's designated project director or higher level of authority. The NTP will include a work plan for the task(s) requested, maximum amount payable, and will specify an initiation and completion date. The Performing Agency shall be on-call and shall provide services at the request of the Receiving Agency. The Performing Agency shall accomplish work products related to this contract through the following Work Order procedure. 1. Request Work Order – The Receiving Agency identifies a Work Order for the Performing Agency to deliver. A link is made to the request to one of the six Service Area Tasks in this Contract. 2. Develop Proposal – The Receiving Agency will request a proposal from the Performing Agency for the Work Order containing a scope, work products, budget, and timeline. The Performing Agency shall assign a Work Order project manager in collaboration with the Receiving Agency. 3. Review and Approve Proposal – The Receiving Agency will review the Performing Agency's proposal with appropriate staff. Upon acceptance, the Receiving Agency approves the proposal and issues a NTP. 4. Conduct Work Order – The Performing Agency, upon receipt of a NTP, shall conduct the Work Order and provide the work products within the Receiving Agency's approved budget and timeline. The Performing Agency shall establish a schedule for progress meetings for conduct of the Work Order. 5. Close-out Work Order – Upon Work Order completion and following work product delivery, the Performing Agency and the Receiving Agency will close-out the Work Order with the following, but not limited to, transmittal of final documents and document archive. This contract identifies the following six Service Area Tasks from which the Receiving Agency may select and receive metropolitan transportation planning work products from the Performing Agency. As noted in the first step in the procedure, the Receiving Agency links a Work Order to the Service Area Task. The task descriptions contain a budget for each service area from which Work Order budgets will be subtracted. To reduce unnecessary travel costs, the Performing Agency shall try to combine travel from multiple Tasks where possible. Prior approval for out-of-state travel, including for Performing Agency staff based outside Texas traveling to Texas, is required when using funds under this contract. Reimbursement for travel expenses is conditioned on prior approval by the Receiving Agency upon Performing Agency submission of adequate support documentation including agenda or program, estimated travel costs, and justification related to this contract. The Receiving Agency will follow its established travel procurement procedures and consideration should be given to the necessity and reasonableness of the travel as it relates to this contract. The Performing Agency shall request approval for out-of-state travel at least five business days prior to expenditure of funds.	$ 371,053.15	$ 518,793.67	$ 18.36	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency is assisting each Metropolitan Planning Organization (MPO) in transportation safety planning activities. Nineteen of the twenty-three Texas MPOs plan to participate in this project. The safety planning effort will be split into two phases. In Phase I, the Performing Agency shall develop information that characterizes the safety issues within the participating MPOs, review existing materials for safety planning opportunities, and identify locations with excess crashes, prioritize locations for pedestrian safety improvements, and evaluate safety performance based on national benchmarks. In Phase II, the Performing Agency shall assist the MPOs in demonstrating how countermeasures can be applied to locations, how safety can be incorporated into the project selection and development process, what programs are available to address safety focus areas identified in Phase I, and to assist with developing safety plans. Accordingly, the Performing Agency shall conduct the following tasks and activities for the 19 MPOs in fulfillment of this contract's objectives. The budget estimates for each task reflect the total cost. TASK 1: CONTRACT ADMINISTRATION AND PROJECT MANAGEMENT Estimated Budget - $75,000 The Performing Agency shall administer and manage this contract through the following formal processes: 1. Prepare and submit monthly invoices, accompanied by a single monthly progress report summarizing all work completed by subtask for the prior month. 2. Meet monthly, virtually or in-person, with the Receiving Agency's Project Director (PD) and Task Leads to review the progress on tasks and planned work efforts. The Performing Agency shall include highlights from the monthly meeting with the PD as part of monthly reporting. 3. Track project efforts and related costs by specific MPO. 4. Establish a project tracking tool (e.g., a SharePoint site) to allow access to resources and results. TASK 2: IDENTIFY SAFETY ISSUES, ASSESS OVERALL SAFETY PERFORMANCE, AND IDENTIFY POTENTIAL LOCATIONS FOR SAFETY IMPROVEMENTS 2.1: Conduct Kick-Off Meetings with Participating MPOs and Key Stakeholders to Discuss Project Activities, Timelines, and Identify Known or Suspected Safety Issues. The Performing Agency shall schedule and administer a kick-off meeting with all 19 MPOs and the Receiving Agency to: 1. Explain the products that will be developed in Phase 1. 2. Solicit input regarding any known or suspected safety issues within each MPO. This initial task will include additional demonstrations of the products (e.g., analytical tools, maps, lists, graphics, etc.). The Performing Agency shall consolidate kick-off meetings into groups/regions when possible in the collective interest of time and resources, with multiple date options being offered to MPOs for participation in these meetings. PHASE 2 Estimated Budget - $350,000 The Performing Agency shall build upon the multiple analyses conducted in Phase 1 to (based upon the remaining funds available for a particular MPO) assist MPOs with additional technical support in their regional safety planning efforts in Phase 2. TASK 3: ASSIST MPOS WITH DEVELOPING SAFETY PLANS AND SAFETY PLAN ELEMENTS Work conducted under Task 3 will be determined through discussions with each MPO and the approval of the Receiving Agency commensurate with budget remaining for each MPO after the completion of Phase 1. Due to the unique safety needs of each MPO, it is not expected that all subtasks will be undertaken for each MPO, unless noted on the subtask. For reference in the remaining tasks, the term "eligible MPO" refers to an MPO that is budgeted for that task while the term "participating MPO" refers to the 19 MPOs that have opted into this project. 3.1: Assist Regional or Community-Based Working Groups Established by the MPO to Address Safety Issues The Performing Agency shall assist with the establishment of a regional or community-based working group for all eligible MPOs. This will include: 1. Identifying potential stakeholders. 2. Delivering a briefing of the issues and locations identified in Phase I. 3. Leading a workshop to develop focus areas for safety improvement. Documentation of these workshops will include related agenda items and list of participants.	$ 125,135.93	$ 462,163.66	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Accurate border crossing and wait time information is crucial for planning and operating the international border. Private sector stakeholders such as shippers, carriers and bridge operators use this information for planning purposes. Public sector stakeholders that include U.S. CBP, international bridge operators, MPOs and Cities along the border use the information for operational and financial planning purposes and to estimate economic impacts. Commuters traveling on POVs also use the information to better plan cross-border trips. The Receiving Agency in coordination with the FHWA and CBP have been investing in the development, implementation, maintenance, and operation of a border wait time measurement system for over a decade. The system, BCIS, developed by the Performing Agency, measures in a systematic and consistent way CMV and POV border crossing and wait times. The system provides real time and historical crossing and wait times to all stakeholders. Two NB commercial, three NB passenger and two SB passenger crossings in the El Paso region have been equipped with the BCIS under this joint effort by federal and state agencies. The receiving agency in coordination with the City of El Paso (the City) have expressed interest in expanding the BCIS to enhance the BCIS coverage at the following crossings: - Ysleta-Zaragoza SB passenger vehicle crossing Along with the enhancements listed above, the receiving agency and the City have expressed interest in adding the following crossings to BCIS: - Ysleta-Zaragoza SB commercial vehicle crossing - BOTA SB commercial vehicle crossing - BOTA SB passenger vehicle crossing Through past research it has been inferred that the wait time accuracy at border crossings can be enhanced by using a real-time vehicle counting system. For this reason, the deployment of vehicle counting systems based on technology developed by the Performing Agency, is planned as a part of this effort: - Real-time vehicle counting system at Ysleta-Zaragoza SB commercial crossing - Real-time vehicle counting system at Ysleta-Zaragoza SB passenger crossing - Real-time vehicle counting system at BOTA SB commercial crossing - Real-time vehicle counting system at BOTA SB passenger crossing	$ 222,439.58	$ 414,267.74	$ 27,625.28	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Technology Transfer to Analyze Various Sources of Wrong-Way Driver (WWD) Crash and Incident Data to Propose WWD Countermeasures using Innovative Geo-Reference Analysis and Mapping Techniques Task 1. AECOM Reports Review and WWD Data Collection The Performing Agency shall review AECOM reports to familiarize with the current WWD countermeasure current technologies, guidelines, and implementation plan. The Performing Agency shall also review the AECOM ramp inventory and add any missing or erroneous data. The inventory includes the following sections: A. Interchange Details B. Signage At C. Pavement Markings and Striping D. Lighting Conditions E. Intelligent Transportation System (ITS) Infrastructure F. Geometry G. Wrong Way Driver Detection System with Detector The Performing Agency shall collect the following data for the last ten years, if possible, to identify WWD crashes and incidents and other pertinent data: • Receiving Agency Crash Records Information System (CRIS) crash data • 911 traffic incident data • Department of Public Safety (DPS) • High alcoholic beverages sales data from Texas Alcoholic Beverage Commission Task 2. WWD Crash Data Analysis and Assessment of WWD Infrastructure Needs The Performing Agency shall review and extract all WWD related crashes and incidents from the various crash data sources in Task 1. The Performing Agency shall add all WWD crashes and incidents to a geographic information system map to determine hotspots. The Performing Agency shall also add locations of high alcoholic beverage sales to the map to provide an additional perspective to hotspots or possible future hotspots. Based on the ramp inventory, the Performing Agency shall generate an assessment and summary of WWD infrastructure needs. These needs, in conjunctionwith the WWD hotspots, will provide a basis to determine the level of WWD countermeasures (WWDC) needed for each ramp. Level 1 WWDC, Enhanced Texas Manual on Uniform Traffic Control Devices (TMUTCD), is now mandatory for all existing and new ramps. Level 2 WWDC, Advanced TMUTCD, is recommended if WWD crashes have occurred in the nearby area/ramp. Level 3 WWDC, Standalone ITS or Integrated ITS, is recommended at a ramp where it is known that it was a WWD event's point of entry. Task 3. WWD Countermeasures Recommendations and Prepare Final Technical Memorandum Based on Task 2 results, the Performing Agency shall determine the level of WWDC needed for each ramp. The Performing Agency shall use the previous analysis to recommend priorities for WWDC improvements at higher risk locations. Task 4. Long-term WWD Technical Support The Performing Agency shall utilize their experience from long-term WWD analysis in the Receiving Agency's San Antonio District and experience gained in past WWD projects to assist the Recieing Agency to continue to expand and grow their WWD Program. The Performing Agency shall repeat data collection and analysis, as detailed in Tasks 1 and 2, to determine the current status of WWD incidents and crashes. This will show if any installed WWD countermeasures are being effective and provide a basis for the next set of recommend priorities for WWDC improvements at the next highest risk locations. The Performing Agency shall revise the ramp inventories as WWD countermeasures are added to reflect actual signage at updated ramp locations.	$ 8,097.42	$ 39,197.38	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Work performed under this contract will build-off, and further refine, the work performed in the Quick Response Planning, Evaluation and Technical Support Contract No. 000030140 which identified and analyzed preliminary data and project parameters for key connectivity corridors in the state of Texas.	$ 89,584.69	$ 31,449.44	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide safety analysis in support of the Traffic Safety Division. A written Notice to Proceed (NTP) will be required before any services can be performed for Tasks A and B. The NTP may only be authorized by the Receiving Agency's Traffic Safety Engineer or higher level of authority. The NTP will include a work plan for the tasks requested, maximum amount payable, and will specify an initiation and completion date. Task A: Provide Technical Assistance and Support for Updating and Managing Implementation of the Texas Strategic Highway Safety Plan (SHSP) in Compliance with Federal Requirements. Estimated Cost - $120,000 The Performing Agency shall: • Facilitate meetings (primarily held virtually): o With the Management Team (MT) up to quarterly o With the Executive Committee (EC) as determined by the MT (up to two times per year, e.g., midyear to address progress, get feedback and ask the EC for help where possible, and at the end of the year for a report on the year's progress and receive recommendations and advice from the EC). • Revise and digitally disseminate a "consumer version" of the updated SHSP to aid understanding and implementation. • Facilitate at least one meeting with each Emphasis Area Team. Additionally, use other methods of communication including, but not limited to, information posted to the Texas SHSP website, webinars to share best/promising practices, and published case studies to share projects and processes. • Expand the crash analysis in specific and emphasis area(s) to target geographic and/demographic areas. • Develop a dashboard infographic to publish progress on the SHSP website and distribute through social media. • Develop and implement a stakeholder engagement plan. o Communicate with the District Traffic Safety Specialists and Program Managers within the Receiving Agency Behavioral Traffic Safety group to engage them with the Emphasis Area Teams to raise awareness of the SHSP within their community. o Develop and deploy workshops/webinars to increase sharing of promising practices/initiatives in traffic safety across the state. • Maintain a digital Traffic Safety Calendar on the SHSP website at least quarterly. • Maintain, update, and enhance the Texas SHSP website including, but not limited to, updating crash trends including the improvement of the maintenance process for the website's framework. The Performing Agency shall prepare a Final Activities and Evaluation Report detailing task activities and results of any evaluations by August 23, 2025. Task B: Provide Assistance Related to Highway Safety Improvement Program (HSIP) and Provide Ad-Hoc Data Analysis Assistance. Estimated Cost - $20,000 The Performing Agency shall: • Prepare the Crash Analysis and Visualization (CAVS) data based on the updated HSIP work code tables and provide the data to the Receiving Agency. • Conduct up to two training webinars on the use of CAVS tools for selecting the projects for HSIP. • Conduct additional analysis and safety studies as needed and as requested by the Receiving Agency with data compiled and technical memorandums produced in a timely manner. Meetings and briefing presentations will be accommodated by appropriate Performing Agency staff as required. The Performing Agency shall produce and submit a Technical Memorandum detailing all task activities and the results of any evaluation by August 23, 2025.	$ -	$ 109,404.34	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall develop and test a simple and straightforward methodology that directly incorporates safety considerations into the rural roadway design process. The Performing Agency shall develop and deliver two products: (1) a web-based tool for the index-based (e.g., score) methodology to incorporate safety into the rural roadway project development and design process; and (2) a set of training or reference materials to distribute among designers to help clarify how safety can be part of the design process. The Performing Agency shall develop the reference materials oriented to designers to better frame the concept of safety enhancements in rural configuration and design decisions for rural segments and intersections. These materials will highlight that adding safety enhancements is not overdesigning, because of the additional value to the public when implementing treatments that improve safety above and beyond basic design criteria. A written Notice to Proceed (NTP) will be issued prior to any service being performed. Each NTP will be authorized by the Receiving Agency's Design Division Deputy Director or higher level of authority and will be delivered to the Performing Agency via electronic mail (e-mail). The Notice to Proceed will include a work plan, maximum amount to be expended, and a completion date for the work.	$ -	$ 135,626.81	$ 1,877.80	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance in support of the Receiving Agency's statewide Pavement Surface Distress Data Collection (PSDDC) project by assisting with data collection and providing an independent audit of the Receiving Agency's contractors responsible for data collection in each of the PSDDC region.	$ 410,550.68	$ 323,711.14	$ 2,679.36	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall maintain and operate the Receiving Agency's Falling Weight Deflectometer (FWD) calibration facility used to calibrate FWD units. The Performing Agency shall perform annual calibrations on FWD units to American Association of State Highway and Transportation Officials (AASHTO) and Long-Term Pavement Performance (LTPP) standards, as specified by Federal Highway Administration (FHWA). The Performing Agency shall use the calibration facility both as a FWD Operation training facility and as a maintenance facility for the Receiving Agency's fleet of FWD's.	$ 46,089.17	$ 56,012.37	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ -	$ 282,658.58	$ 39,620.00	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, "Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation" has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ -	$ 79,943.73	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's standard specification Item 300, Asphalts, Oils, and Emulsions, includes more than 48 different test procedures or conditioning procedures for asphalt concrete (AC) graded binders (12), cutbacks (8), emulsified binders (17), and performance-graded (PG) binders (11) used in different pavement construction and maintenance applications. This does not include testing requirements for recycling agents, crack sealants, or asphalt rubber binder. The Receiving Agency regularly performs many of these tests for quality management or quality assurance purposes. This test schedule presents a challenge for the binder lab in terms of maintaining test procedures, acquiring and maintaining test equipment, calibrating equipment, and training personnel. Some specification tests are legacy tests that once were the state-of-the-art and thought to be related to asphalt binder performance. Many of these legacy tests are not used in more recently developed specifications, as other tests are now available and may be more indicative of performance. This project seeks to review the Receiving Agency's Item 300 binder specifications and tests for relevance; determine whether they assess safety, performance, or constructability; and take into account accuracy, efficiency, and environmental considerations. The project shall also make recommendations for changes.	$ -	$ 97,708.56	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ -	$ 155,319.17	$ 188.82	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ -	$ 164,960.46	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The performing agencies shall establish a method to evaluate the existing pavement structural condition and design continuously reinforced concrete pavement (CRCP) overlays, both thin and thick. The design methods will include non-destructive (NDT) pavement evaluation techniques and tools, deflection based CRCP slab thickness design procedures, and CRCP reinforcing design details.	$ -	$ 64,044.23	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ -	$ 146,569.11	$ (16,497.83)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ -	$ 149,173.92	$ (137.04)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall explore if there are refinements that could be made to the recently developed protocol for using third party data in generating suggested speed limits. The suggested speed limit probe data (SSL-Probe) protocol was developed to allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. The protocol also provides a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ -	$ 84,967.44	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ -	$ 187,095.59	$ (100.00)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency's Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ -	$ 170,556.37	$ (648.82)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Traffic Safety Division (TRF) of the Receiving Agency drafted a special specification (SS) for the vertical application of a retroreflective solid stripe on concrete barriers, approximately six (6) inches below the barrier's top. During the phase of new product approval, this SS describes an application similar to three (3) locations already installed on Texas roadways in previous years. Barrier striping increases motorist awareness of the roadway's edge and the barrier itself, particularly in low-visibility conditions (i.e., heavy rain and snow). These existing implementation sites have not been formally evaluated. Furthermore, the short-term effectiveness of the treatments has not been investigated; therefore, there is a need for long-term and short-term safety effectiveness evaluation of these treatments. The Performing Agencies shall collect before-and-after collision data from Crash Record Information System (CRIS) and near-collision data from connected vehicle data vendor (e.g., Wejo) to evaluate the effectiveness of vertical application of a retroreflective solid stripe on concrete barriers. Furthermore, the Performing Agencies shall install these treatments at six (6) high crash locations with different barrier types including, but not limited to concrete barriers and metal beam guard fences to evaluate their short-term effectiveness using non-traditional safety evaluation approaches. The Performing Agencies shall utilize the findings to update the drafted SS for the future use across the state and beyond.	$ -	$ 34,511.37	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Understanding and estimating realistic production rates of major work items in a highway project are critical to determining a reasonable project contract time, evaluating the contractor's baseline schedule, monitoring progress schedules, and ultimately completing the project on time. The Performing Agency shall leverage the Receiving Agency's historical project data to obtain the as-built information of production rates of various work items, and shall develop a) an expanded version of the Receiving Agency's construction production rates table, b) an interactive tool that can generate color-coded heat maps to visualize feasible ranges of production rates of major work items across Texas, and c) implementation guidance and recommendations. An advanced and interactive production rate estimation tool could significantly help the Receiving Agency achieve the goal of completing highway projects on time. Such a decision-aid tool could significantly improve the Receiving Agency's practice in determining more accurate production rates, resulting in more accurate contract time determination, the contractor's baseline schedule evaluation, and progress schedule monitoring. Such data-driven and practical production rates may provide higher certainty and reliability than the Receiving Agency's current construction production rates table.	$ -	$ 110,243.56	$ 2,035.26	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research study aims to perform a study focusing on best practices for performing pavement preparatory work in advance of preventive maintenance (PM) surfacing contracts. The study will determine the best practices for repairing a roadway before a new surface is placed. Seal coats or thin overlays are typical PM surfacing projects. The preparatory work performed by in-house maintenance forces or maintenance contracts may include crack sealing, fog seal, repairs, milling, and level-up. The preparatory work should be completed well before the PM contract. The Performing Agencies shall identify the main flexible pavement repair types and investigate best practices for performing both in-house and contracted repairs. The Performing Agency 1 shall develop a procedure to determine the limits and type of flexible pavement repair. The Performing Agency 1 shall develop an evaluation process of the repair, including its performance and effects on the PM surfacing.	$ -	$ 113,810.80	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Of the various situations in which a utility relocation is eligible for reimbursement at the Receiving Agency, one of the most complex situations is when parts of the existing utility facility involve a property interest. For utility facilities that involve a private property interest, the Receiving Agency uses an eligibility ratio, which is defined as the percentage of utility facilities that are reimbursable in relation to the total amount of utility facilities being relocated. In practice, eligibility calculations can be convoluted or complex, particularly in situations where the utility facility spans multiple property interest locations. The Performing Agency shall develop and test an improved methodology to determine reimbursement eligibility and calculate utility reimbursement amounts. The Performing Agency shall document a significant sample of utility relocations and their associated reimbursement costs to develop a reliable baseline of practices throughout the state, evaluate practices in other states, develop and test an updated methodology for utility reimbursement eligibility criteria and calculations, prepare a guidebook with examples on how to determine utility reimbursement criteria and calculate reimbursement amounts, and prepare and test training materials.	$ -	$ 76,726.04	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall develop a method and tool for analyzing safety-related pavement data to identify candidate pavement safety projects, such as cross-slope improvement projects and flushing treatment projects. The Performing Agencies shall assemble a dataset containing comprehensive data on the pavement, site condition, and crashes for a representative sample of on-system roadways. The Performing Agencies shall conduct a comprehensive analysis of the integrated dataset to identify critical combinations and thresholds of pavement conditions that may pose a safety hazard and use these factors to assess pavement susceptibility to crashes. The Performing Agencies shall quantify the pavement crash susceptibility based on measurable pavement characteristics such as cross-slope, geometrics, distresses (e.g., rutting, flushing), skid resistance, and roughness. Finally, the Performing Agencies shall develop a data analysis and visualization tool for assessing pavement crash susceptibility and recommending solutions to reduce crash risks. The Receiving Agency's districts will be able to use this tool to identify potential site-specific crash contributing factors and proactively select appropriate pavement safety improvement projects.	$ -	$ 118,955.73	$ 2,004.80	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Drainage is a critical element of roadside design. Roadway drainage design often calls for the use of cross-drainage and parallel-drainage culverts. If untreated, the ends of the drainage structures can become roadside hazards that can result in serious injury when an errant vehicle leaves the roadway. The most cost-effective strategy is often to make the culvert end traversable using grates comprised of pipe runners across the culvert end. The Performing Agency shall investigate the safety performance of traversable cross-drainage and parallel-drainage culvert end treatments installed on roadside slopes. The Performing Agency shall address the various design variations of safety end treatments supported by current standards to investigate the safety performance. The Performing Agency shall develop design guidance to recommend slopes and size, length, and spacing of the pipe runners for both cross-drainage and parallel-drainage culverts that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH). The Performing Agency shall use full-scale crash testing to aid with validating the design guidance.	$ -	$ 210,945.20	$ 272,122.58	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Texas continues to use cold recycling for pavement rehabilitation and performs a significant amount of full depth reclamation (FDR). While cement remains the most widely used treatment, use of asphalt emulsion and foamed asphalt continues to grow. This project shall identify and evaluate topics to strategically enhance cold recycling practices in Texas. This project shall perform a comprehensive performance analysis of recent as-built projects to identify strengths and opportunities for process enhancement. For cement, this project shall evaluate how cement type may influence mixture properties, analyze the Texas Flexible Pavement System (FPS) structural design assumptions based on current mix design and construction practices, and summarize methods to improve early trafficking. For emulsified and foamed asphalt, this project shall develop cold-in-place recycling (CIR) applications for Texas and identify, evaluate, and recommend enhanced pavement design procedures for cold recycling with asphalt binders. This project shall use all results to develop enhanced cold recycling project selection procedures, recommend updates to the Receiving Agency's specifications, and develop and perform training.	$ -	$ 286,819.88	$ 3,045.64	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Hamburg Wheel Track (HWT) rutting test generally serves well as the standard rutting test for asphalt mixes in Texas; however, in the last several years, some premium mixes (i.e. stone matrix asphalt), designed with PG76-22 and low HWT rut depth, have experienced premature rutting failures under slow moving (or stop/ go) traffic in several Receiving Agency Districts. Such failures burden the Receiving Agency with extra cost. Furthermore, it was reported that the HWT test cannot accurately quantify the better rutting performance of some tougher mixes with highly modified asphalt (HiMA). Thus, the Performing Agencies shall develop the next generation of HWT test to accurately screen out asphalt mixes that are prone to rutting failures. The Performing Agencies shall review the literature, survey Districts, and other state departments of transportation (DOTs) to identify the proper rutting test(s) and asphalt mixes for addressing the rutting failure caused by the slow-moving traffic. The Performing Agencies shall further develop the next generation of HWT test and associated acceptance criteria through finite element analysis, laboratory testing, field accelerated pavement testing and survey of in-service pavement intersections, round robin test, and recommendation of specification changes.	$ -	$ 147,654.81	$ 109,318.01	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	State agencies must report vehicle miles traveled (VMT) estimates for local roads compiled in the statewide summaries dataset of the Highway Performance Monitoring System (HPMS) database. While the VMTs for higher functional class roads are the product of annual average daily traffic (AADT) with the corresponding roadway segment length (L); the states produce the VMT estimates for local roads as an aggregate measure using a variety of methods. Currently, the local road network accounts for more than two-thirds (67%) of the total roadway mileage in Texas and is the largest in the United States. Conducting short-term counts (STCs) (e.g., for a few hours up to a few weeks) on an extensive local road network to develop VMT is logistically challenging; hence, the Receiving Agency uses statistical methods to obtain aggregated VMT. Although the current methods are statistically verified, advancements in technology and available resources have been made since the methodology was developed. The Performing Agencies shall investigate and develop data-driven methods for VMT estimation that can be implemented in Texas and advance the analysis methods of the Receiving Agency. The developed methods shall also reduce any bias in the estimation of VMTs on local roads that can lead to the overestimation or underestimation of travel demand.	$ -	$ 153,437.47	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Shared or multiuse paths invite a wide range of users, including pedestrians, bicyclists, and other wheeled users, with a range of transportation purposes such as commuting, exercise, and recreation. Although shared use path (SUP) users are physically separated from traffic, they remain vulnerable at roadway crossings. In the absence of roadway cross-section designs for accommodating pedestrians and bicyclists, SUP crossings can present users with complex tasks including gap selection, scanning for turning vehicles, and interacting with other path users. Ensuring safe crossings for all users at these locations is essential. Pedestrian and bicycle treatments have been developed and their safety effectiveness has been assessed in several studies and practices. Although technically these designs can be applied to SUPs, it is not clear how to integrate treatments for different types of path users, road classifications, land-use contexts, and crossing geometries. With the increasing implementation practices of SUPs across Texas, there is a need to assess the potential safety concerns involving pedestrians, bicyclists, micromobility users, and people with disabilities at these locations and develop guidance for treatment selection, including for paths next to railroads. The Performing Agencies shall explore the pedestrian and bicyclist crashes at the vicinity of SUPs and develop design and planning guidance for implementation purposes.	$ -	$ 101,656.80	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Road to Zero has targeted a goal of zero deaths and serious injuries on Texas roadways. Recent trends in Texas indicate a continued increase in highway fatalities each of the past three years. In 2021, roadway departure crashes were responsible for 40 percent of all crash-related fatalities in Texas, which is the largest single category by crash type. In October 2021, Federal Highway Administration (FHWA) designated Texas as one of 16 Roadway Departure Focus States based on being over-represented on three (3) different roadway departure crash fatality metrics. Roadside safety devices are a key element of an effective roadway departure safety strategy. These safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively evaluate high priority issues related to roadside safety devices. This includes development of both new and improved safety features that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) and help minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes.	$ -	$ 725,538.84	$ 5,712.56	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research will focus on the impact on pavements and bridges following the statewide resilience plan. Research findings will not only be used to meet federal requirements, but more importantly, the recommendations and analysis will be used to guide TxDOT's future project selection and development process in term of addressing extreme weather and resilience impacts. To achieve the project objectives, the research team shall: • Perform literature review of available state and national research projects, legislative requirements, and best practices from state DOTs and local agencies. • Identify and characterize risk factors to TxDOT's highway and bridge infrastructure both temporally and spatially, and estimate their potential intensity. • Assess the risk or likelihood of the identified factors occurring based on a thorough quantitative statistical analysis of available data. • Calculate the potential impact occurring based on the characteristics of the TxDOT managed highway/bridge network system using available relevant databases based on current condition, age, traffic, and environmental conditions. • Create an analytical decision-making framework for probabilistic scenario simulations to prioritize assets for maintenance and retrofit based on climate hazards and asset's criticality and vulnerability. • Quantify the mitigation strategies and their benefits and associated costs for the life cycle planning analysis. • Conduct scenario analysis and scenario planning to evaluate and prioritize the identified risks. • Identify proxy indicators that TxDOT can track to monitor high priority risks. • Implement probabilistic resilience economic analysis for adaptation strategies vulnerable and critical assets. The expected technology readiness level (TRL) for this project is 8.	$ -	$ 122,446.14	$ 11,664.27	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency cantilever overhead sign structures (COSS) and traffic signal pole structures have a socketed fillet welded connection between the column and the baseplate. While economical, this connection has a low fatigue-resistance threshold. The objectives of this research are to (1) outline fabrication practices and economic considerations that may affect proposed connection type and design, (2) develop an inventory database of COSS and traffic signal pole structures that are representative, (3) utilize structural modeling to identify from within the inventory critical cases that should be advanced to a testing program, (4) develop and execute a targeted testing program that isolates critical design parameters for the fatigue performance of both the critical cases found in the inventory and recommended connection types and designs, (5) provide recommendations for connection types and designs based on fatigue provisions, and (6) provide recommendations for identifying fatigue-critical of existing inventory.	$ -	$ 272,493.24	$ (8,836.07)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Ancillary structures (AS) exist in a wide variety of applications critical to safety and daily needs of the travelling public. The long-term corrosion performance of these structures is of utmost importance to prevent deterioration and extend the structural design life and safety. While hot-dipped galvanizing provides excellent long-term behavior for corrosion control of these critical structures, over the past 20 years this process has been found to create extensive cracking of welds on base plate connections that is detrimental to the fatigue lives of these poles. Although improved details are used in new designs, thousands of High Mast Illumination Poles (HMIP), Cantilever Overhead Sign Structures (COSS), and traffic signal poles (TSP) exist in Texas with varying levels of cracking in the welds between the baseplates and pole shafts. During this research project, the Performing Agency shall identify and provide critical assessment parameters and guidance for the Receiving Agency to determine if cracks should be monitored, repaired, or the structural component replaced. The research includes a representative assessment of weld cracking in the AS inventory, the development of monitoring hardware and techniques, the development and assessment of repair techniques, and the development of certification methods/standards for inspection personnel.	$ -	$ 158,233.26	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	In 2012, the Rider 36 study indicated that damage caused to bridges and pavements by overweight (OW) vehicles surpassed the revenue collected by permit fees by approximately $200 million annually. This finding was corroborated by a recent 2022 study mandated by House Bill 2223, which quantified this gap at $168 million. Besides the revenue shortage to cover bridge and pavement maintenance and rehabilitation costs due to the damage cause by OW vehicles, the 2022 study also identified additional shortcomings that need to be urgently addressed. These shortcomings include: 1) lack of a methodology for periodically adjusting permit fees to account for changes in traffic patterns and configurations and higher inflation rates; 2) lack of accurate data and process for calculating annual vehicles-miles-travelled (VMT) by each permit type; 3) uncertainty in the identification of routes and number of trips for monthly, quarterly, or annual permits; 4) absence of a method and process to assess the damage caused by OW vehicles to the off-system bridges and highways. The objective of this research is to address these shortcomings and to develop, recommend and provide the Receiving Agency a well-established and documented step-by-step method to periodically update such method.	$ -	$ 21,130.00	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Polymer additives are used to design high PG virgin binders that meet the PG requirements to protect the mix against rutting and cracking under the climate and traffic conditions of an HMA project. When RAP is added to the mixture, the effective binder may not meet the desired grade. This project shall quantify the extent to which polymer dilution is a problem that should be addressed in the Receiving Agency's HMA specifications and if so, develop specification language to address it. This project involves evaluating binder blends and mixtures with RAP. Both lab blended and commercial PG binders shall be evaluated for continuous grade, elasticity, polymer content, and other rheological parameters. Then these binders shall be mixed with recovered RAP binders at several percentages and retested to determine the same properties. Standard mixtures(s) shall also be used with several of these binders and various RAP percentages to measure mixture performance-related properties (cracking and rutting). The Performing Agencies shall use the results from binder and mixture results on the impact of "virgin binder – RAP binder dilution" and work with the Receiving Agency to develop specification language for inclusion in the Receiving Agency's HMA specifications, as needed.	$ -	$ 81,153.71	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Traffic control devices (TCDs) are the primary means of communicating highway information to road users and play a key role in highway automation. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. In addition, vehicle technologies and the roadway infrastructure industry are rapidly evolving, spurred by technology advancements, customer demand, changes in the vehicle fleet, and changes in national and state policies. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project could represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ -	$ 285,238.81	$ 649.90	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Detecting problematic exits and places of wrong turns and identifying signal and other issues will result in improving safety on highways by reducing crashes as well as optimizing traffic flows while minimizing disruptions. This project will also provide TxDOT with data-driven justification for future highway investments. To achieve the project objectives, the research team shall: • Explore telematics data for a given set of roadways in Texas where issues have been identified by local TxDOT staff as frequent problems. These issues may include motorists missing exits or making wrong turns, traffic signals are not reliably detecting vehicles or vehicles waiting through multiple cycles at the same signal, motorists repeatedly driving outside their permitted lanes of travel while merging on highway ramps or improper merging at lane drops. • Clean and reformat; i.e, preprocess, explored data in a way that is suitable for further analysis. • Study the dataset closely to identify patterns in the data that indicate issues. • Develop rules; i.e, heuristics, or an artificial intelligence platform that can automatically detect events that indicate the issues. When applied on the entire dataset, problematic highway locations will be located and shared with TxDOT to be considered for future interventions. The expected technology readiness level (TRL) for this project is 6	$ -	$ 95,953.61	$ (9,902.32)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency has utilized dowels in bents to provide lateral restraint of prestressed concrete beams., These dowels are often misplaced, which creates various construction issues, while their presence complicates bearing pad replacement. The Performing Agency shall provide research findings to the Receiving Agency to make informed decisions on stopping the use of such dowels, the Performing Agency shall: • Perform a thorough literature review to: (i) summarize the state-of-art, state-of–the-practice and key findings, and (ii) address questions relating to unintended consequences from removal of these dowels during erection of the girders, construction of the deck, and long-term performance and stability. • Perform an investigation on the state-of-the-practice of all state Department of Transportations (DOTs) throughout the country, focusing on practices from DOTs with similar hazard exposure. • Perform a parametric finite element (FE) study on multiple the Receiving Agency bridge (and girder) designs to investigate the performance under all major load combinations and limit states (from service to ultimate conditions) over the lifetime of the bridge accounting for Texas-related exposure conditions. • Perform six (6) large-scale tests on girder-to-bent/abutment connections to quantify the contribution of dowels in the performance of the connections.	$ -	$ 110,898.13	$ 14,579.54	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Bent caps provide a critical load path between girder reactions and bent columns. Supporting considerable reactions over long spans, bent cap cross-sections grow substantial, necessitating robust cast-in-place designs that have stood the test of time. However, the considerable weight and time required for their construction present challenges that undermine their apparent simplicity. To meet these challenges, the Performing Agencies shall explore precast alternatives, particularly hollow designs in efforts to enhance traditional cast-in-place bent structures through post-tensioning. In addition to exploring precast alternatives, the research team shall first evaluate current practice, identify potential design issue in current practice and provide design recommendations to current practice. Experimental study as well as analytical and design methods shall be used toward this effort. The research team shall ask TxDOT for the use of post-tensioning in the experimental study. This innovation aims to reduce bent weights, minimize traffic disruptions and costs; enhance erection, construction efficiency, durability, and structural performance under service and ultimate load conditions. The Performing Agencies in collaboration with an industry review committee comprised of bridge designers, precasters, and erectors shall conduct a targeted full-scale structural testing campaign supported by advanced structural modeling (finite element analysis and strut-and-tie), to provide well-defined design criteria and ensure the structural performance of hollow precast rectangular and inverted tee bent caps, for both mildly reinforced and prestressed designs. The Performing Agencies initiative seeks to close the knowledge gap concerning the service and ultimate load behavior, long-term performance, and durability of hollow precast design concepts.	$ -	$ 178,988.93	$ 5,544.12	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Economic factors and environmental sustainability are driving the use of more reclaimed asphalt pavement (RAP); however, durability of those mixes has been a concern. Various approaches (e.g. limiting RAP usage, increasing lab-molded density, or balanced mix design (BMD)) have been tried to improve mix durability. All the approaches point to one essential factor for durable RAP mixes: minimum virgin binder content. Thus, the Performing Agencies shall determine the minimum virgin binder content(s) for durable RAP mixes. The Performing Agencies shall review the literature to identify critical factors affecting RAP mix durability. Considering all those critical factors, the Performing Agencies shall develop and execute a statistically sound laboratory experimental design to develop the relationships between cracking properties measured by Overlay test and Ideal cracking test and mix components (e.g. virgin binder content) and their characteristics. Furthermore, the Performing Agencies shall assess field performance of RAP mixes and delineate the correlation between field performance and laboratory mix cracking properties. Subsequently, the Performing Agencies shall recommend minimum virgin binder contents based on the relationships among field performance, mix cracking properties, and mix components and their characteristics. Based on these findings, the Performing Agencies shall develop guidelines, update specifications, and organize training sessions	$ -	$ 94,061.51	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	For pavement management and to understand the condition of its network, the Receiving Agency relies on high-speed inertial profilers to gather ride quality. However, a persistent challenge arises when assessing pavement smoothness at low speeds or under stop-and-go conditions (i.e., signalized intersections, stop-control intersections, high driveway density producing turning traffic, and congested roadways during peak-hour traffic) that compromises the accuracy of data collected by conventional profilers. For example, collecting ride quality measurements on a congested roadway with multiple driveways leads to acceleration and deceleration of the collection vehicle, potentially adding "false" dips into the measurements. If these dips are included in network-level measurements, these types of roadways could receive a poor condition score that is not indicative of the true pavement condition. Collecting data on roadways with signalized intersections and slow-moving congested traffic could have the same challenges. The Performing Agency shall explore the potential of low-speed profilers to enhance data collection accuracy in such scenarios. The Performing Agency shall evaluate the effectiveness of low-speed profilers in providing accurate pavement profile data, particularly in areas prone to low-speed or acceleration and deceleration operations. The Performing Agency shall validate the capabilities of low-speed profilers and recommend strategies for their integration into the Receiving Agency's pavement management practices, ultimately leading to a more accurate condition assessment.	$ -	$ 115,998.75	$ 1,684.04	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Pavement markings and markers are the primary means for an agency to provide longitudinal guidance to drivers. To be effective, markings and markers must be visible during all driving conditions, day, and night. A variety of pavement marking materials (binders and beads) and varying installation specifications (application type, material thickness) create a wide range of initial performance and maintained performance over a markings service life. Currently, markings are evaluated initially to ensure a minimum initial retroreflectivity performance is obtained, but that initial performance has not been well researched to determine its impact on the overall durability and performance of the marking over its service life. This project shall explore various factors that affect pavement marking performance over the service life of the marking (pavement marking materials, installation specifications, pavement surface, traffic conditions, and geographic and climatic region) to develop performance models for Texas. Performance of a variety of markings and markers shall be evaluated at various field test areas. These same marking materials shall be evaluated through lab testing to explore accelerated weathering and wear tests that correlate with the field performance. The goals of this project are to improve pavement marking testing and the ability to predict marking performance.	$ -	$ 56,290.60	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The goal of this project is to revise the Receiving Agency Pavement Management Information System (PMIS) Rater's Manual. This project shall review, analyze, and propose changes to the current distress rating definitions for flexible and concrete (jointed and continuously reinforced) pavements. The Performing Agencies shall hold collaborative workshops to gather inputs from Receiving Agency's Division and Districts on pavement condition data collection challenges using the current manual. The project will assess the impact of the rating changes to the PMIS scores and propose changes to distress utility curves if needed. In collaboration with the Receiving Agency, adjustments will be made to determine acceptable impacts. The revised manual shall be developed based on the research results and through collaboration between the research team and the Receiving Agency.	$ -	$ 64,252.49	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	While roads defined as arterials need to maintain an acceptable level of traffic capacity, there are trade-offs with respect to speed. This research will investigate the effectiveness of arterial-focused speed management countermeasures for application across Texas. It will quantify the costs and benefits of road and vehicle design, operations, enforcement, and other countermeasure types across a range of settings (for uncontrolled-access arterials under different traffic, road type/context, and land use conditions), resulting in a Texas Arterial Speed Management Toolkit and reports.	$ -	$ 113,780.19	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency is implementing a Digital Delivery initiative. Research is needed on how to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources. Research is also needed to identify software and other industry trends that might affect the Digital Delivery initiative and recommend strategies on how to anticipate and prepare for those trends. The Performing Agency shall (a) develop and test procedures to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources; (b) develop and test automated workflows for change detection, quality control, and updating of 3D models using results from repeat surveys; (c) conduct a cost-benefit analysis of data collection/processing precision, accuracy, and density against the potential cost in construction change orders from a looser tolerance in those three parameters; (d) conduct a review of software and other industry trends that might affect the Digital Delivery initiative; (e) conduct peer exchanges with stakeholders; (f) develop and recommend strategies on how to anticipate, and prepare for, software and industry trends; and (g) develop a strategic research roadmap to support the Digital Delivery initiative through 2028 and beyond.	$ -	$ 181,742.68	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The first objective of this project is to develop Safety Performance Functions (SPFs) and Crash Modification factors (CMFs) for ramp terminals and intersections of frontage roads with crossroads. The second objective of this project is to evaluate the safety impact of weaving on the frontage road versus weaving on the freeway. More specifically, the objective is to understand the difference in safety between two ramp configurations – entrance ramp followed by an exit ramp versus exit ramp followed by an entrance ramp between two interchanges. The Performing Agencies shall collect site characteristics data and develop crash predictive methods for different types of frontage road segments and intersections on frontage roads, including ramp terminals. These models shall be developed by area type (i.e., large urban, small urban, suburban/fringe, and rural), Receiving Agency's regions, and facility type (one-way and two-way). The Performing Agencies shall incorporate the crash predictive methods into spreadsheet tools to facilitate the analysis and to support project design decisions of frontage roads. The Performing Agencies shall also develop a framework for selecting an appropriate configuration for frontage roads and as well guidance for the minimum distance from ramp terminal to crossroad intersection and a need for lane additions.	$ -	$ 117,407.02	$ (533.67)	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Concrete barriers are designed and crash tested for placement on flat terrains. In-field installations of concrete barriers are sometimes placed on slopes adjacent to roadways. By placing the barrier on a slope, the effective height of the barrier that engages an errant vehicle may be reduced since the vehicle may be airborne as it contacts the barrier on a downward slope. Consequently, the barrier may not be able to safely contain and redirect the vehicle. The Performing Agency shall evaluate the performance of the Receiving Agency's 32-inch tall F-shape and 42-inch tall single slope barrier when placed on roadside or median slopes of up to 4H:1V. The Performing Agency shall develop guidance for placement of these barriers using finite element simulation analysis and full-scale crash testing. The guidance shall determine the maximum allowable slope for each barrier type and any placement offsets required from the edge of the roadway or from the bottom of the ditch. The Performing Agency shall evaluate the performance of the barriers using the impact conditions and evaluation criteria specified in the Manual for Assessing Safety Hardware (MASH) for Test Level 3 for longitudinal barriers.	$ -	$ 66,057.61	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Identifying and documenting existing utility facilities within the proposed right-of-way (ROW) is crucial for successful project delivery. There is a need to leverage data collection technology's strengths and minimize weaknesses for a more robust and reliable determination of utility locations and develop and test metrics to assess the utility investigation quality levels in ways that make sense to project design teams. Improvements shall lead to a better stakeholder understanding to communicate the quality levels commonly used by the SUE industry (D, C, B, and A), the basis for assessing utility investigation deliverable quality, and would be able to tie quality levels to quantifiable performance metrics such as positional accuracy, error, and completeness, which are common in engineering and surveying when collecting field data for a project.	$ -	$ 422,053.94	$ 21,165.60	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Innovative intersection designs (e.g., diverging diamond interchanges [DDIs], displaced left turns [DLTs], median U-turns [MUTs], and restricted crossing U-turns [RCUTs]) and modern roundabouts are increasingly used in Texas and throughout the country to remove conflict points and redistribute turning traffic from traditional intersections, improving operational efficiency and promoting increased safety. While their use is growing and their benefits have been demonstrated, Texas still has a limited number of innovative intersections, and there is a need to increase the use of these intersections throughout the state. Because many of these intersection types and their design elements are not commonly used in Texas, there is a natural tendency to be cautious about their use. Providing information to help promote these treatments for use in appropriate locations will be important to their successful adoption and implementation. The Performing Agency shall build on recent research to document the benefits of innovative intersections, develop case studies of successfully implemented intersections in Texas, and provide resources for practitioners to use in support of new implementations across the state.	$ -	$ 67,454.20	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Cracking dictates the service life of asphalt pavements. Oxidative aging of the asphalt binder renders the binder brittle and susceptible to cracking. Higher number of high temperature days further exacerbates rate of oxidation and reduction in the service life of an asphalt pavement. Recent coordinated studies by a global consortium of researchers have identified generic chemicals that can act as antioxidants to significantly reduce the oxidative aging of asphalt and increase its cracking resistance and service life. Similarly, commercial additive manufacturers are also exploring the development and deployment of antioxidant additives. In this project the Performing Agencies shall review the literature and interface with existing national and international studies to identify the most promising antioxidant(s) for use with asphalt binders as a modifier. The Performing Agencies shall conduct laboratory studies on asphalt binders and mixtures to evaluate the efficacy of these antioxidants. The Performing Agencies shall also conduct workshops with stakeholders and conduct cost-benefit analysis to develop plans for pilot test sections and facilitate the deployment of such sections with districts and industry partners. Finally, the Performing Agencies shall also present metrics that can be used for specification and quality control purposes by the Receiving Agency.	$ -	$ 29,476.32	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's "End the Streak" goal is to end all fatalities on Texas roads by 2050 as there has not been a day without a death on Texas roadways since November 7, 2000. New strategies must be implemented, such as increasing the efficacy of pavement striping and retroreflective pavement markers in several Receiving Agency districts and monitoring the crash statistics before and after pavement marking and marker improvements over time. The Performing Agency shall target pavement marking retroreflectivity and contrast and shall include the development and implementation of an experimental study design to assess their safety and economic effectiveness.	$ -	$ 104,531.44	$ 1,996.41	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Crash risks associated with permissive left turns (PLTs), vulnerable road users (VRUs), and wrong way driving (WWD) appear to be among the top attributing factors for fatal and incapacitating crashes at signalized intersections, raising alarming safety concerns. The cellular vehicle-to-everything (C-V2X) communication and innovative traffic detection technologies such as light detection and ranging (LiDAR) sensing have the potential to reduce crashes related to these factors and enhance intersection safety. The primary objective of this project is to develop, test, and demonstrate a prototype system integrating C-V2X communication and innovative traffic detection technologies to improve safety of all road users at signalized intersections. Another objective is to provide the Receiving Agency with guidelines for statewide implementation of the integrated system for intersection safety improvement. To this end, the Performing Agencies shall: (1) Review the literature on safety improvement systems utilizing C-V2X and innovative traffic detection systems; (2) Assess user needs and design a system architecture that satisfies user requirements; (3) Develop, test, demonstrate, and evaluate a prototype system that integrates C-V2X communication, LiDAR and other advanced traffic detection technologies to detect and mitigate crash risks involving PLTs, VRUs, and WWD at signalized intersections; and (4) Develop guideline documents containing implementation procedures and use case scenarios.	$ -	$ 135,493.77	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall address two gaps in scour knowledge: pressure scour for cohesive soils and cohesive soils/rocks characterization for scour analyses. Pressure scour occurs when the water reaches the bridge's low chord; this increases the scour depth. Guidelines exist for cohesionless soils but not for cohesive soils. The Performing Agency shall perform a series of Computational Fluid Dynamics (CFD) simulations and/or flume tests to generate the input necessary and expand the Scour Rate in COhesive Soils (SRICOS) method to the pressure flow situation in cohesive soils. The Performing Agency shall perform advanced testing on cohesive soils/rocks characterization for scour analyses. Advanced testing examples include the Erosion Function Apparatus (EFA) (Performing Agency) and Scour Testing devices (Federal Highway Administration (FHWA)). The Performing Agency shall determine if the Slake Durability Test (SDT) can be a reasonable surrogate for input in scour depth calculations by collecting samples at a maximum of up to 20 bridges around Texas, and by conducting parallel testing on cohesive soils/rocks such as shale, caliche, and sandstone.	$ -	$ 244,136.80	$ 330.80	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall apply the accelerated mix design procedure to real pavement designs, encouraging utilization of the new test procedure, enabling the identification of potential areas of improvement, and demonstrating the mechanistic design check. The Performing Agency shall work with a minimum of three (3) Receiving Agency Districts to conduct demonstration projects with performance monitoring. The Performing Agency shall conduct initial performance monitoring on the constructed projects. This monitoring aims to assess the effectiveness of the accelerated design, validate the stability of the designed pavement by evaluating pavement conditions, and enhance the estimated resilience modulus.	$ -	$ 82,321.29	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Premature pavement failures have occurred on several widening projects, including shoulder widenings, conversion of two-lane roadways to Super 2 sections, and other safety enhancements. Repairing these early failures is time-consuming, expensive, disrupts traffic, and poses safety hazards. Key contributing factors include poor-quality materials, poor joint construction, and inadequate drainage which could have been avoided through proper pavement condition assessment, design, and construction practices. The Performing Agency shall develop detailed guidance to document and implement better widening practices across the Receiving Agency.	$ -	$ 4,696.92	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist Receiving Agency with implementing AMAZE developed in research project 0-6674-03. The Performing Agency shall write test procedures tailored for AMAZE. Working with the Receiving Agency, the Performing Agency shall enhance the AMAZE to measure specimen dimension and handle field cores with various thickness. The Performing Agency shall then use the findings and data generated from this implementation project to develop and teach implementation workshop for the Receiving Agency.	$ -	$ 130,866.09	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency with implementing the Surface Aggregate Classification (SAC) for reclaimed asphalt pavement (RAP) developed in research project 0-7025, Develop Surface Aggregate Classification of Reclaimed Asphalt Pavement. The Performing Agency shall implement and verify the methodology of SAC-A RAP classification in a minimum of four (4) Receiving Agency Districts. In each selected Receiving Agency District, the Performing Agency shall work with lab and pavement engineers and their staff to characterize the RAP in terms of SAC, design surface mixtures with the RAP, evaluate the friction and skid resistance of mixtures, and construct and monitor the selected test sections in each Receiving Agency District. The Performing Agency shall then use the data generated in these test sections to develop and teach implementation workshops for Receiving Agency Districts.	$ -	$ 151,900.79	$ 5,720.62	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objectives of this project are to complete the design and construction of the automated test system for asphalt mixtures and asphalt binders and to deliver an automated IDEAL cracking and rutting test unit and an automated asphalt binder specific gravity and dynamic shear rheometer testing unit to the Receiving Agency's MTD lab. The automated asphalt mixture testing unit includes (1) auto-air void measurement subunit, (2) specimen conditioning subunit for both room and high temperature, (3) automation arm subunit, (4) automated IDEAL cracking test (IDEAL-CT), IDEAL rutting test (IDEAL-RT), indirect tensile (IDT) strength test subunit, and (5) waste disposal subunit. The automated asphalt binder testing unit includes (1) asphalt binder specific gravity testing subunit and dynamic shear rheometer testing subunit. The automated asphalt mixture and binder test units shall shorten test time and improve lab safety, test efficiency and accuracy.	$ -	$ 198,441.27	$ 12,647.54	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall produce Video Summary Report's (VSRs) for the Receiving Agency which summarize transportation research and implementation projects. Additionally, the Performing Agency shall also produce outreach materials for the Receiving Agency that will be transportation research related material and may include additional related subjects of interest.	$ -	$ 227,627.97	$ 6,382.38	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Emerging vehicle types are rising in sales and comprising a larger share of the total vehicle fleet. The characteristics of these emerging vehicle types pose many challenges to our transportation system moving forward. For example, their effect on roadside safety hardware has the potential to be significant based on their increased weight, lower center of gravity, and different crush stiffness. Given a set of impact conditions (i.e., impact speed and impact angle), the impact severity associated with an emerging vehicle will increase linearly with the weight of the vehicle. This raises significant concern related to vehicle compatibility with some categories of roadside hardware, such as various types of longitudinal barriers (e.g., guardrail, median barriers, portable concrete barrier, transitions, bridge rails), terminals, crash attenuators, breakaway support structures, and other devices. Many roadside safety features are optimized for the currently prescribed design impact conditions and may have little or no factor of safety for accommodating more severe impacts. The Performing Agency shall address these issues to prevent experiencing a potentially significant increase in roadway departure crash fatalities. The Performing Agency shall focus on providing a coordinated program of safety research for emerging vehicles that shall develop solutions to meet identified needs. The research findings will benefit the Participating States in numerous ways, not the least of which is enhanced safety.	$ -	$ 3,232.88	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This pooled fund study will provide a cooperative approach to conducting research to address roadside safety issues specifically related to improving motorcyclist safety. Furthermore, this program is intended to provide participating states collaborative opportunities to stay abreast of best practices, new regulatory issues, risk management strategies, and other research pertaining to roadside safety improvements for motorcyclists. The research activities will include the identification, development, and evaluation of strategies and devices for mitigating the frequency and severity of roadway departure motorcyclist crashes.	$ -	$ 61,537.40	$ (139.02)	$ -	$ -	$ -
452 - Texas Department of Licensing and Regulation	1.1.1. - Sponsored Transportation Research	Pursuant to Section 662.013, Texas Transportation Code, Texas A&M Transportation Institute (TTI) will perform the services listed on Section V, Terms and Conditions, of the Contract. TTI will perform these services in accordance with the following: 1. Program Budget. TTI will prepare an annual program budget to support the technical approach outlined below. 2. Project Plan. TTI will develop a project plan that will identify and summarize all project tasks and activities, task and activity timing, milestones and deliverables, and due dates for the contract duration. TTI will submit this project plan to TDLR for approval within three (3) weeks after execution of the Contract. Within 10 business days after submission, TDLR will review the project plan and provide comments to TTI on areas of potential revision or approve the plan as submitted. 3. Instructor Outreach. TTI will continue the conduct of the education and outreach program initiated in the prior years' contracts to recruit and retain instructors. 4. Instructor Training and Retention Program. a. Longitudinal Study Workplan. TTI will develop a workplan that will summarize all aspects of a longitudinal (i.e., long-term) study that will be used in the continued development of a program to increase instructor levels in Texas. The study will build on prior years' research. TTI will document the data collection methods, number of proposed participants, survey questions, analytical approaches, and potential application /implication of results. The survey workplan will be submitted to TDLR for approval within 35 weeks after the execution of the Contract. Within 10 business days after submission, TDLR will review the workplan and provide comments to TTI on areas of potential revision or approve the plan as submitted. b. Conduct Focus Groups with Instructors to Validate Study Methods. TTI will conduct one or more focus groups with a small number of instructors to identify study methods and materials that may need revision due to confusion, misunderstanding, etc. 5. Encouraging Motorcyclists to Take Courses. TTI will continue the conduct of the education and outreach program initiated in the prior year's contract to directly target motorcyclists and encourage course enrollment and mentorship of new motorcyclists. TTI will use the motorcyclist survey conducted in FY24 to identify further the underlying reasons why motorcyclists do not take safety courses and develop recommendations to overcoming these barriers. This task will consist of the following activities. a. Continue FY24 Outreach Program Deployment. TTI will continue to expand the outreach program across Texas and will track all outreach materials and activities (e.g., events/meetings attended, materials handed out, social media hits, etc.). 6. Motorcyclist Licensing, Instructor, and Motorcyclist Resource Website. TTI will maintain and expand the website created in the prior year's contract to include resources for instructors wanting to improve their teaching skills (e.g., instructor forums), motorcyclists seeking safety information, and a resource library including materials produced in prior years' contracts. This task will consist of the following activities. a. Routine Maintenance and Updates. TTI will update website information (e.g., scheduled training) and respond to inquiries made through the website "Contact Us" page. TTI will provide to TDLR website interaction analytics as a deliverable at 25 and 52 weeks after execution of the contract. b. Design and Test Resource Webpages. Using the database information and the conceptual model approved by TDLR in FY24, TTI will build drafts of the new webpages. Usability testing of the draft webpages will be conducted with a minimum of 6 motorcyclists, instructors, and school owners/managers to determine if the general organization and general content are usable. 7. Motorcyclist Safety Materials for Driver Education. Crashes involving a motorcyclist and another vehicle account for over 50% of motorcyclist fatalities in Texas. Given the magnitude of the motorcyclist crash problem with other vehicles and the specific factors contributing the nature of these crashes (e.g., inattentional blindness), TTI will identify opportunities to increase motorcyclist safety through enhanced education course materials for use in Texas driver education and driver safety schools. 8. Yearly Summary Report. TTI will provide to TDLR a yearly summary report of project activities within 52 weeks after execution of the Contract. The scope and project timeline of the work outlined in this Contract may need to be modified based on feedback and guidance from the TDLR Motorcycle Advisory Board. In that event, TTI will propose contract changes to TDLR.	$ -	$ 163,187.20	$ 71,415.08	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI will provide technical support and assistance to the TPP Division in developing required state-mandated reports on congestion and congestion reduction, performance measures and targets, performance–based project selection, and congestion forecasts.	$ 903,122.95	$ 1,099,136.46	$ 406,656.60	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall develop ERLTs using the MOtor Vehicle Emission Simulator (MOVES) version for specific criteria pollutants, GHG, and mobile source air toxics (MSAT). In addition, the Performing Agency shall develop GHG trend emission inventories (EIs) using the generic Texas area MOVES4 ERLT for analysis years 2020 through 2060.	$ 30,879.47	$ 108,416.49	$ 12,048.54	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency for a variety of tasks related to carrying out the Receiving Agency's Travel Demand Modeling (TDM) Data Innovations Program. A formal Notice to Proceed (NTP) will precede all Performing Agency's work on the tasks and subtasks contained herein. The NTP may only be authorized by the Receiving Agency's designated project director or higher level of authority. The NTP will include a work plan for the task(s) requested, maximum amount payable, and will specify an initiation and completion date.	$ 3,542,794.43	$ 2,859,797.87	$ 1,187,022.14	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ -	$ -	$ 57,010.33	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Traffic Safety Division (TRF) of the Receiving Agency drafted a special specification (SS) for the vertical application of a retroreflective solid stripe on concrete barriers, approximately six (6) inches below the barrier's top. During the phase of new product approval, this SS describes an application similar to three (3) locations already installed on Texas roadways in previous years. Barrier striping increases motorist awareness of the roadway's edge and the barrier itself, particularly in low-visibility conditions (i.e., heavy rain and snow). These existing implementation sites have not been formally evaluated. Furthermore, the short-term effectiveness of the treatments has not been investigated; therefore, there is a need for long-term and short-term safety effectiveness evaluation of these treatments. The Performing Agencies shall collect before-and-after collision data from Crash Record Information System (CRIS) and near-collision data from connected vehicle data vendor (e.g., Wejo) to evaluate the effectiveness of vertical application of a retroreflective solid stripe on concrete barriers. Furthermore, the Performing Agencies shall install these treatments at six (6) high crash locations with different barrier types including, but not limited to concrete barriers and metal beam guard fences to evaluate their short-term effectiveness using non-traditional safety evaluation approaches. The Performing Agencies shall utilize the findings to update the drafted SS for the future use across the state and beyond.	$ -	$ -	$ 10,957.09	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall develop modules and teach short courses for Geographic Information Systems (GIS) and the Hydrologic Engineering Center's (HEC) software programs Hydrologic Modeling System (HMS) and River Analysis System (RAS) training. The Performing Agency shall also provide technical assistance and guidance on issues related to hydrology and hydraulics. The Receiving Agency will provide support and recommendations for gathering GIS data (e.g., georeferenced road closures, accidents, and floods) as well as problems/applications deemed appropriate for GIS training.	$ 29,581.40	$ 79,894.52	$ 83,030.58	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall maintain traffic monitoring program collection and data processing guidelines, including Receiving Agency traffic data collection standards, and traffic data collection needs to support initiatives and data processing. The Performing Agency shall maintain awareness of and review current industry standards, such as the Federal Highways Administration Traffic Monitoring Guide, Highway Performance Monitoring Program (HPMS) Field Manual, and other guidance.	$ 198,284.00	$ 344,432.56	$ 298,022.62	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical assistance to the Receiving Agency for a variety of tasks related to the improvement of the Receiving Agency's Cash Forecast System.	$ 22,038.20	$ 47,215.59	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Of the various situations in which a utility relocation is eligible for reimbursement at the Receiving Agency, one of the most complex situations is when parts of the existing utility facility involve a property interest. For utility facilities that involve a private property interest, the Receiving Agency uses an eligibility ratio, which is defined as the percentage of utility facilities that are reimbursable in relation to the total amount of utility facilities being relocated. In practice, eligibility calculations can be convoluted or complex, particularly in situations where the utility facility spans multiple property interest locations. The Performing Agency shall develop and test an improved methodology to determine reimbursement eligibility and calculate utility reimbursement amounts. The Performing Agency shall document a significant sample of utility relocations and their associated reimbursement costs to develop a reliable baseline of practices throughout the state, evaluate practices in other states, develop and test an updated methodology for utility reimbursement eligibility criteria and calculations, prepare a guidebook with examples on how to determine utility reimbursement criteria and calculate reimbursement amounts, and prepare and test training materials.	$ -	$ -	$ 53,236.59	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	PURPOSE The purpose of this PGA is to develop on-road emission inventories that will be used as air quality modeling inputs for the calendar years of 2022 and 2032. For all 254 Texas counties, on-road emissions inventories will be developed based on vehicle miles traveled (VMT) activity estimates from the Highway Performance Monitoring System (HPMS) that is managed by the Texas Department of Transportation (TxDOT). BACKGROUND The TCEQ is planning for future State Implementation Plan (SIP) submissions to the U.S. Environmental Protection Agency (EPA) that will likely be required under the 2015 eight-hour ozone standard of 70 ppb. To support attainment demonstration modeling for these efforts, the TCEQ is currently developing a 2022 modeling platform. At this time, eight counties in the Houston-Galveston-Brazoria (HGB) metropolitan area, nine counties within the Dallas-Fort Worth (DFW) metropolitan area, and one county within the San Antonio (SAN) metropolitan area are expected to be reclassified as severe nonattainment for the 2015 eight-hour ozone standard with an attainment year of 2032. For the 2022 base case and the 2032 future case, on-road emissions inventories for all 254 Texas counties are needed based on HPMS activity data from TxDOT. Inventory development work under this PGA requires the use of the Motor Vehicle Emission Simulator (MOVES5) model from the U.S. EPA.	$ -	$ 12,866.73	$ 197,126.95	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide general support services to assist the Receiving Agency in monitoring and analyzing state-funded highway-rail grade crossing improvement projects on the Texas freight rail network. The Receiving Agency will provide the Performing Agency crossing data. The Performing Agency shall use state inventory data, grade crossing project allocations, grade crossing project plans and crash data from the Federal Railroad Administration's (FRA's) grade crossing inventory to provide the general support services. The Performing Agency shall maintain the web-hosted rail safety geographical information system (GIS) database created, improved, and maintained under previous interagency cooperation contracts for the use of Receiving Agency rail safety inspectors. This includes obtaining updated safety data from the FRA no less frequently than on a quarterly basis. The Performing Agency shall support the Receiving Agency in leveraging implementation and updates to regional rail operations plans in urban areas and in the implementation of the Receiving Agency's Rail Plan and Freight Plan, and in working with other regional and local governments in applying Receiving Agency planning products to possible grant applications for discretionary grants created or expanded by the Infrastructure Investment and Jobs Act of 2021. The Performing Agency shall obtain GIS shapefiles and other output produced for the Receiving Agency during the Texas Rail Plan update that identify individual railroads, Class I railroad subdivisions, and passenger rail routes. The Performing Agency shall request the rail line files from the FRA. The Performing Agency shall use these to create a new statewide rail map that can be used to print rail map posters and also create layers on an online mapping tool that all Receiving Agency Rail Division members can use. The Performing Agency shall also use these baseline electronic mapping tools to support other tasks as directed by the Receiving Agency.	$ 390,198.62	$ 553,272.58	$ 393,919.10	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to support innovation and excellence in planning, construction, operations, and maintenance in the Odessa District and to implement the Traveler Information System in the Interstate 20 (I-20) Corridor. The Performing Agency shall provide support services, including, but not limited to traveler information, planning, safety, and special short-term investigations as determined by the Receiving Agency.	$ 441,605.48	$ 878,226.45	$ 805,861.49	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall perform pavement design and materials testing expertise to assist in identifying the most cost-effective repair alternatives for candidate projects identified by the Receiving Agency. The Performing Agency shall sample and test local source materials and compare results to Receiving Agency Item 247 flexible base grade 1 and 2 properties. The Performing Agency shall develop possible use for the local materials and develop what modifications are needed if used as Item 247 grade 1 and 2 flexible base.	$ 82,368.63	$ 236,948.28	$ 198,312.23	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ -	$ -	$ 98,389.31	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This research study aims to perform a study focusing on best practices for performing pavement preparatory work in advance of preventive maintenance (PM) surfacing contracts. The study will determine the best practices for repairing a roadway before a new surface is placed. Seal coats or thin overlays are typical PM surfacing projects. The preparatory work performed by in-house maintenance forces or maintenance contracts may include crack sealing, fog seal, repairs, milling, and level-up. The preparatory work should be completed well before the PM contract. The Performing Agencies shall identify the main flexible pavement repair types and investigate best practices for performing both in-house and contracted repairs. The Performing Agency 1 shall develop a procedure to determine the limits and type of flexible pavement repair. The Performing Agency 1 shall develop an evaluation process of the repair, including its performance and effects on the PM surfacing.	$ -	$ -	$ 95,468.34	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	In 2012, the Rider 36 study indicated that damage caused to bridges and pavements by overweight (OW) vehicles surpassed the revenue collected by permit fees by approximately $200 million annually. This finding was corroborated by a recent 2022 study mandated by House Bill 2223, which quantified this gap at $168 million. Besides the revenue shortage to cover bridge and pavement maintenance and rehabilitation costs due to the damage cause by OW vehicles, the 2022 study also identified additional shortcomings that need to be urgently addressed. These shortcomings include: 1) lack of a methodology for periodically adjusting permit fees to account for changes in traffic patterns and configurations and higher inflation rates; 2) lack of accurate data and process for calculating annual vehicles-miles-travelled (VMT) by each permit type; 3) uncertainty in the identification of routes and number of trips for monthly, quarterly, or annual permits; 4) absence of a method and process to assess the damage caused by OW vehicles to the off-system bridges and highways. The objective of this research is to address these shortcomings and to develop, recommend and provide the Receiving Agency a well-established and documented step-by-step method to periodically update such method.	$ -	$ -	$ 22,626.08	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The objective of the study is to develop a set of 1990 and 1999 through 2060 on-road mobile trend emissions inventories for criteria air pollutants (CAPs), CAP precursors, and hazardous air pollutants (HAPs) to support air quality planning activities. A comprehensive set of MOtor Vehicle Emission Simulator (MOVES) model-based county database (CDB) files for all 254 Texas counties will be developed. The data needed may include: • meteorological data; • vehicle classification count data; • age distribution data; • fuel data; • Highway Performance Monitoring System (HPMS) data (from Texas Department of Transportation's [TxDOT's] Roadway Inventory Annual Reports); • vehicle registration data; • automatic traffic recorder data; • extended idling activity data; and • vehicle I/M program design data	$ -	$ 41,283.26	$ 49,106.12	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall travel to the Receiving Agency's Fort Worth District to perform full pavement forensic investigations of distressed highway sections identified by the Receiving Agency. This will include running Nondestructive tests, pavement sampling in order to validate the causes of distress, obtain samples for laboratory testing, and propose cost-effective pavement rehabilitation options. When required both routine and advanced physical and chemical materials laboratory tests will be conducted. The Performing Agency shall also develop recommendations for the modification of specifications, materials selection, construction, and design practices to avoid future occurrences.	$ 119,176.54	$ 75,986.00	$ 176,369.55	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to develop on-road emission inventories that will be used as air quality modeling inputs for the calendar years of 2022 and 2032. For the eight-county Houston-Galveston-Brazoria (HGB) metropolitan area, the twelve counties within Dallas-Fort Worth (DFW) metropolitan area, and the five counties within the San Antonio (SAN) metropolitan area, link-based on-road emissions inventories will be developed based on vehicle miles traveled (VMT) activity estimates from the respective local travel demand model (TDM).	$ -	$ 13,933.48	$ 178,313.42	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	Emissions associated with aircraft and airport activities are used in AD modeling for the SIP revisions, and to inform air quality planning decisions. Temporal profiles are applied to emissions and provide a detailed distribution of emissions throughout a period of time. In previous projects, the Texas A&M Transportation Institute (TTI) and Eastern Research Group. Inc. (ERG) have developed annual and daily airport emissions inventories. For AD modeling, annual and daily EI are currently converted to hourly emission rates using "average" temporal profiles, as well as profiles provided by the U.S. Environmental Protection Agency (EPA). Therefore, Texas-specific hourly temporal profiles will provide a greater resolution and will better capture peak emission periods that occur during the day. This improvement will ensure that TCEQ's photochemical modeling accurately captures emissions and airport activity from major Texas airports.	$ -	$ -	$ 49,903.82	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency with the implementation of the UCM approach that was developed as part of the second Strategic Highway Research Program 2 (SHRP2) Projects R15B, "Identification of Utility Conflicts and Solutions," and R15C, "Pilot Testing of the Utility Conflict Matrix." The Performing Agency shall gather information and data as it relates to the UCM approach to measure the effectiveness of the implementation including during construction.	$ -	$ 25,333.79	$ 6,419.10	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide transfer of technology and knowledge resulting from previous research findings and other analyses of transportation issues that address mobility and other transportation needs of Texas citizens. Accordingly, the Performing Agency shall provide technology and knowledge transfer to staff of the Receiving Agency and, by written authorization from the Receiving Agency, to other transportation professionals in Texas who serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, and county and local agencies. The Performing Agency shall periodically organize meetings, presentations, and workshops at the Receiving Agency's request to accomplish this Task and to convey the latest results of research that will benefit the Receiving Agency. Topics will include any of the following at the request of the Receiving Agency: transportation infrastructure real estate value capture, Transportation Reinvestment Zone (TRZ) analysis and implementation, advanced techniques	$ 57,700.83	$ 48,255.88	$ 199,526.82	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall develop a method and tool for analyzing safety-related pavement data to identify candidate pavement safety projects, such as cross-slope improvement projects and flushing treatment projects. The Performing Agencies shall assemble a dataset containing comprehensive data on the pavement, site condition, and crashes for a representative sample of on-system roadways. The Performing Agencies shall conduct a comprehensive analysis of the integrated dataset to identify critical combinations and thresholds of pavement conditions that may pose a safety hazard and use these factors to assess pavement susceptibility to crashes. The Performing Agencies shall quantify the pavement crash susceptibility based on measurable pavement characteristics such as cross-slope, geometrics, distresses (e.g., rutting, flushing), skid resistance, and roughness. Finally, the Performing Agencies shall develop a data analysis and visualization tool for assessing pavement crash susceptibility and recommending solutions to reduce crash risks. The Receiving Agency's districts will be able to use this tool to identify potential site-specific crash contributing factors and proactively select appropriate pavement safety improvement projects.	$ -	$ -	$ 99,278.05	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Shared or multiuse paths invite a wide range of users, including pedestrians, bicyclists, and other wheeled users, with a range of transportation purposes such as commuting, exercise, and recreation. Although shared use path (SUP) users are physically separated from traffic, they remain vulnerable at roadway crossings. In the absence of roadway cross-section designs for accommodating pedestrians and bicyclists, SUP crossings can present users with complex tasks including gap selection, scanning for turning vehicles, and interacting with other path users. Ensuring safe crossings for all users at these locations is essential. Pedestrian and bicycle treatments have been developed and their safety effectiveness has been assessed in several studies and practices. Although technically these designs can be applied to SUPs, it is not clear how to integrate treatments for different types of path users, road classifications, land-use contexts, and crossing geometries. With the increasing implementation practices of SUPs across Texas, there is a need to assess the potential safety concerns involving pedestrians, bicyclists, micromobility users, and people with disabilities at these locations and develop guidance for treatment selection, including for paths next to railroads. The Performing Agencies shall explore the pedestrian and bicyclist crashes at the vicinity of SUPs and develop design and planning guidance for implementation purposes.	$ -	$ -	$ 95,640.91	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Polymer additives are used to design high PG virgin binders that meet the PG requirements to protect the mix against rutting and cracking under the climate and traffic conditions of an HMA project. When RAP is added to the mixture, the effective binder may not meet the desired grade. This project shall quantify the extent to which polymer dilution is a problem that should be addressed in the Receiving Agency's HMA specifications and if so, develop specification language to address it. This project involves evaluating binder blends and mixtures with RAP. Both lab blended and commercial PG binders shall be evaluated for continuous grade, elasticity, polymer content, and other rheological parameters. Then these binders shall be mixed with recovered RAP binders at several percentages and retested to determine the same properties. Standard mixtures(s) shall also be used with several of these binders and various RAP percentages to measure mixture performance-related properties (cracking and rutting). The Performing Agencies shall use the results from binder and mixture results on the impact of "virgin binder – RAP binder dilution" and work with the Receiving Agency to develop specification language for inclusion in the Receiving Agency's HMA specifications, as needed.	$ -	$ -	$ 20,214.55	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	This project continues the Texas Low Emissions Diesel (TxLED) Study (PGA 582-23-45120-015). The Grantee shall assess and quantify nitrogen oxides (NOX) and particulate matter (PM) emissions and emissions reductions from the use of TxLED fuel in diesel engines or vehicles representative of the current on-road and non-road mobile source fleet. The Grantee shall measure engine or vehicle emissions in a controlled laboratory environment while collecting and analyzing all process and operational data necessary to quantify emissions reductions.	$ -	$ 29,128.13	$ 224,990.07	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall explore if there are refinements that could be made to the recently developed protocol for using third party data in generating suggested speed limits. The suggested speed limit probe data (SSL-Probe) protocol was developed to allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. The protocol also provides a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ -	$ -	$ 173,578.74	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to: collect and analyze statewide information regarding longterm idle activity by on-road heavy duty vehicles (HDV); collect and analyze activity information related to the use of auxiliary power units (APU) by HDVs; prepare an extended idling and APU activity database; and develop a statewide HDV extended idle and APU emissions inventory. This study will update and enhance the results of the 2019 TCEQ-TTI study performed under PGA 582-17-74308-06 to ensure the values used for extended idle and APU hours are accurate and consistent with the United States Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) model capabilities. TTI will obtain the most recent data sources available, including telematics data, to analyze these idling activities. The telematics data is collected from electronic logging devices and is transmitted by drivers who must report their working and resting hours due to hours of service (HOS) compliance regulations. This data provides a comprehensive and detailed view of idling patterns to update heavy-duty diesel hoteling and extended idling emissions estimates. Updating this information will support accurate emissions inventory development for state implementation plan (SIP) revisions.	$ -	$ 1,870.77	$ 101,790.47	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The goal of the Texas CAV Task Force is to be a single point of information and coordination for all CAV activities in Texas. The Performing Agency shall provide support to facilitate the Texas CAV Task Force in hosting industry meetings across multiple emphasis areas, creating a knowledge base for best practices and collaboration, reporting out on lessons learned, and undertaking special projects as directed by the Receiving Agency. The Performing Agency shall support the Texas CAV Task Force in developing policy opportunities that may need to be brought before the Texas Legislature and Governor.	$ 16,761.98	$ 546,640.06	$ 577,937.12	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this Proposal for Grant Activities (PGA) is to enhance the analytical proficiency of staff at the Texas Commission on Environmental Quality (TCEQ) through an in-depth, hands-on training procedure focused on the transformation and integration of the travel demand model (TDM) outputs into the U.S. Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) for on-road mobile source emissions modeling. Given that TDM outputs—such as directional, time-resolved vehicle activity data (e.g., vehicle miles traveled (VMT), vehicle hours traveled (VHT), and link-level speeds)—are not natively compatible with MOVES input requirements, the training will center on the application of a Python-based post-processing utility developed by the Texas A&M Transportation Institute (TTI) to ensure alignment with MOVES structure and logic. The TCEQ staff who participate will gain technical competence in extracting TDM outputs, implementing highway performance monitoring system (HPMS)-based VMT reconciliation techniques, modeling congestion effects through speed-flow relationships, preparing MOVES-ready input datasets, and executing MOVES run via TTI's method (e.g., the command-line interface). This training is designed to equip staff with the methodological insights required to interpret, audit, and contribute to complex emissions inventories and regulatory analyses—such as state implementation plan (SIP) development, transportation conformity determinations, and localized air quality assessments—in accordance with the federal Clean Air Act and EPA guidance.	$ -	$ -	$ 3,068.35	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines tasks in which the Performing Agency may perform work for the Receiving Agency's Houston District. Task 1. Revetment of SH 87 in Galveston, TX $250,000. There are a number of revetment failures along the highway on the coastal corridor, which is impacting the SH87 in Galveston, TX. The Performing Agency shall conduct the following tasks to address this issue: Task 1.1. Perform Detailed Site Investigation of the Revetment Failure in SH 87 Task 1.2. Collection of Soil Samples and Perform Laboratory Testing The Performing Agency shall collect soil samples and other construction materials from at least three project sites. Task 1.3. Design and Development of Nature-based Solutions. Task 1.4. Implement the Design System and Perform Field Monitoring. Task 2. Geotechnical Factor of Safety (FS) Designs $200,000. The Performing Agency shall provide technical guidance related to a number of issues related to slope failures occurring due to extreme precipitation and surficial slope failures. Task 2.1. Forensic Analyses of Recently Failed Slopes using Laboratory Studies . Task 2.2. Model the Failed Slopes in Software The Performing Agency shall develop an analytical and FE-based numerical models to simulate the failed embankment sections under consideration in Task 2.1. The Performing Agency shall develop the model to perform a coupled analysis involving the effects of changes in external environmental loads (rainfall events and fully softened conditions) and the subsequent behaviors of the soil strength and pore water pressure characteristics. The Performing Agency shall use climatic models to obtain the data for future extreme precipitation for the Houston region. The Performing Agency shall simulate soil and environmental conditions that may have resulted in slope failures in the field. The Performing Agency shall perform advanced modeling of slope failures with and without reliability values primarily used by US Army Corps of Engineers; therefore, the Performing Agency shall explore all possible scenarios for potential slope failures and document FS values for each of the scenarios. In addition, the Performing Agency shall undertake a parametric study to determine the effects of soil parameters, slopes, and different magnitudes of environmental loads on the factor of safety values of such embankments. Task 2.3. Revisit the Current Design Factor of Safety (FS) Requirements and Establish a Road Map with Recommended FS The Performing Agency shall review FS values determined from Task 2.2 and establish a roadmap for the construction of future slopes and embankments for transportation infrastructures in the Receiving Agency district. The design guidelines will be of value to the transportation professionals and designers dealing with critical slopes; the guidelines will accommodate suggestions that could be a necessary consideration during the design and rehabilitation of new earthen embankments, such that the designs could be safer and more resilient to changing climatic and storm conditions.	$ 64,153.08	$ 17,205.69	$ 17,237.47	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide a variety of quick response services, such as planning, evaluation, and technical support, to the Receiving Agency as it addresses state and federal legislative inquiries and specific requests from Receiving Agency Administration and Texas Transportation Commission (Commission). The Receiving Agency will identify each task and will issue a Notice to Proceed (NTP) to the Performing Agency. The NTP will include a work plan for the requested task, maximum amount payable, and initiation and completion dates. Tasks may vary from the development of a performance measures governance document to assistance with renewed energy sector program impact analysis and repair strategies. As required by the Receiving Agency, and identified in each NTP, the Performing Agency's staff shall travel to various locations around the state to perform its contracted activities.	$ 287,698.19	$ 761.90	$ 18,710.81	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall update and deliver seal coat training and provide general support to the Receiving Agency to address strategic maintenance and pavement preservation activities. A Notice to Proceed (NTP) is required prior to performing any work or providing any services. The Receiving Agency will authorize the NTP and deliver it to the Performing Agency in writing via electronic mail (e-mail). The Receiving Agency will contact the Performing Agency to develop a work plan and determine a maximum amount to be expended for each NTP.	$ 106,981.57	$ 68,744.83	$ 124,243.21	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall conduct an evaluation and calibration of the Receiving Agency's Friction Measurement System to ensure compliance with American Association of State Highway & Transportation Officials (AASHTO), American Standards for Testing Materials (ASTM), and Test the National Institute of Standards and Technology (NIST). The Receiving Agency will contact the Performing Agency at least 60 days in advance to coordinate the scheduling of the evaluation and calibration testing. The Receiving Agency may bring up to two (2) systems and all necessary equipment for evaluation and calibration to the Performing Agency's facility. The equipment will remain at the Performing Agency until all of the evaluations and calibrations are completed. The Performing Agency shall conduct the following tasks: Task 1: FMS Calibration – 1st System (Budget estimate: FY24 $12,391; FY25 $12,492, FY26 $12,598) The Performing Agency shall develop and conduct an evaluation and calibration of one (1) test wheel of the Receiving Agency's Friction Measurement System (FMS), in accordance with AASHTO T24-90 and ASTM Test Method E274-97 with traceability to the NIST. Task 2: FMS Calibration – 2nd System (Budget estimate: FY24 $6,195; FY25 $6,246; FY26 $6,299) The Performing Agency shall develop and conduct an unbiased correlation at three (3) speeds for the Receiving Agency's Friction Measurement System in accordance with AASHTO T24-90 and ASTM Test Method E274-97 with traceability to the NIST. Task 3: Technical Assistance and Guidance (Budget estimate: FY24 $2,065; FY25 $2,082; FY26 $2,100) The Performing Agency shall provide technical assistance and guidance to Receiving Agency personnel while the Receiving Agency's Friction Measurement System is located at the Performing Agency's Test Center and while it is in service. DELIVERABLES The Performing Agency shall provide the Receiving Agency with one (1) electronic portable document format copy, transmitted via email, of an evaluation and calibration report documenting the findings and recommendations no later than eight (8) weeks after completion of calibration.	$ 18,973.64	$ 30,464.55	$ 54,137.74	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall travel to the Receiving Agency's statewide districts to perform full pavement forensic investigations of prematurely distressed highway sections identified by the Receiving Agency to include identifying the causes of distress, conducting routine and advanced physical and chemical materials characterization testing, and recommend the most cost-effective repair alternative to resolve the issue. The Performing Agency shall also develop recommendations for the modification of specifications, materials selection, construction and design practices to avoid future occurrences.	$ 930,028.85	$ 817,263.67	$ 1,057,702.57	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency's Maintenance Division and statewide districts by providing support to fully implement the full depth reclamation (FDR) equipment procured on TxDOT Project 0-6880. In that study, two complete sets of FDR equipment and compaction rollers were purchased. The Performing Agency has transferred one set to the Receiving Agency and shall transfer the second set during this IAC. As described in the tasks below, the Performing Agency shall provide support for all aspects of FDR project development using this equipment including, but not limited to: nondestructive test (NDT) support, selecting sampling locations, performing roadway sampling, developing optimal FDR mixture designs, developing suitable pavement structural designs, training on equipment operation, project startup support at time of construction, post-construction performance monitoring, and technical recommendations for FDR workflow and/or pavement design enhancements.	$ 190,279.32	$ 240,229.64	$ 376,375.09	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall develop and update pavement design training materials for the workshops described below. The potential topics are subject to revision by the Receiving Agency's Maintenance Division. Training implemented during the workshop should include, but is not limited to, defined curriculum outcomes and training objectives designed and developed to Receiving Agency standards for adult learning that include objectives written to Mager Standards tied to Bloom's taxonomy of cognitive learning, Instructor Guides, Participant Guides, Presentation Materials, and job aids that the Receiving Agency may request to be printed for each participant at a training event or in a format suitable for virtual Instructor Led Training.	$ 71,591.34	$ 90,784.22	$ 86,931.27	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide nondestructive testing (NDT), field testing, pavement design and materials testing expertise to assist in identifying the most cost-effective pavement rehabilitation alternatives for candidate projects identified by the Receiving Agency.	$ 131,489.13	$ 192,722.94	$ 74,079.53	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Technical support to the Freight Planning Branch.	$ 2,186,134.23	$ 2,834,962.21	$ 3,211,033.52	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Texas has an extensive network of general aviation (GA) airports. Maintaining GA airports in a state of good repair helps local and regional stakeholders and economies. The Performing Agency shall annually conduct pavement inspections on approximately 90 GA airports. These inspection reports will populate an online portal that serves as the reporting mechanism. Through previous work, a preliminary version of this portal exists which the Performing Agency shall refine, maintain, and update over the life of this contract. As part of the inspection program, the Performing Agency shall collect falling-weight deflectometer (FWD) and ground penetrating radar (GPR) testing at each airport. The Performing Agency shall use the data to load rate the runways at each airport. Other GA pavement assets will be spot checked for structural strength to inform the overall structural ability of the GA airport's pavement assets. The cost to maintain pavement assets can become high if preventative maintenance is not performed. The Performing Agency shall develop "do-nothing" curves for the pavement assets to better inform all parties as to the ramifications if maintenance and rehabilitation work is not performed. The Performing Agency shall sub-contract the development of maintenance and rehabilitation plans to a consultant with aviation expertise. As part of the annual pavement inspection program, the Performing Agency shall collect profile data along the runway to analyze the smoothness. This contract includes a task for the Performing Agency to perform non-destructive and destructive testing on airports to investigate pavement distresses that require additional investigation beyond what can be identified with the FWD, GPR, and profile data. The Performing Agency shall conduct forensic work when requested by the Receiving Agency or when necessary to develop the maintenance and rehabilitation (M&R plan).	$ 1,031,768.95	$ 1,432,667.45	$ 2,049,646.76	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Skid resistance is an important pavement safety evaluation parameter. Fort Worth District has an interest in implementing an improved process to raise skid scores in the district and to enhance system safety in TxDOT. The objective of this research is to develop a Superpave mix design with improved skid resistance that can be used as a surface layer in Fort Worth District. Skid resistance in a surface layer plays a critical role in pavement safety, and Superpave mixture is mostly used in asphalt pavements for a surface course in Fort Worth District. The improvement of skid resistance in asphalt pavements with Superpave mixtures will enhance system safety in Fort Worth District as well as TxDOT.	$ 112,585.47	$ 121,720.23	$ 82,556.38	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall travel to Receiving Agency Districts and MTD to support the laboratory and construction inspector qualification program. This will include the following: 1. assist MTD with audits for two (2) Receiving Agency Districts; 2. review the previous audits to identify common issues and provide recommendations on best practices or new practices to improve the program; and 3. review policies and procedures related to District laboratories and construction materials testing for Receiving Agency employees.	$ 136,025.19	$ 120,226.85	$ 139,435.84	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide strategic planning assistance to the Receiving Agency's Planning and Modal Programs (PMP) Director and Aviation, Maritime, Public Transportation, Rail, and Transportation Planning and Programming Divisions.	$ 17,563.71	$ 97,951.37	$ 50,778.88	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency's Maintenance Division with weed management to include screening of suspected herbicide-resistant johnsongrass, Palmer amaranth, kochia, and other weed populations for survival to herbicides and identification of optimal herbicide rate for johnsongrass species at different growth stages and environmental conditions	$ 93,624.64	$ 82,107.35	$ 39,362.35	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency will build strategic partnerships to train and educate the next generation of the heavy highway workforce. This training will offer the state's diverse population an opportunity to obtain consistent and high paying employment in the heavy highway industry. Furthermore, increasing the knowledge and skills of the heavy highway workforce will result in higher quality projects that are completed on budget and on time. The Performing Agency shall perform tasks in Bryan-College Station, Texas, Brazos County, and surrounding county areas, all in accordance with the scope of services below. Task 1: Deliver ConnectU2Jobs Paving Cohorts Estimated Costs: FY24 $15,741; FY25 $69,060; FY26 $69,996 The Performing Agency shall deliver at least one (1) flexible paving cohort of the ConnectU2Jobs (CU2J) Highway Construction Workforce Partnership Program (HCWP) in Fiscal Year (FY) 2024 and at least two (2) in FYs 2025 and 2026. This cohort will take place in Brazos County, Texas, primarily at the Texas A&M University RELLIS Campus. Task 2: Submit Final Deliverables – ongoing throughout contract term (FY24 $5,200; FY25 $20,000, FY26 $20,000) The Performing Agency shall submit deliverables with invoices as completed. The deliverables will include, but are not limited to: 4.1 Work Group Plans and Schedules 4.2 Web Sites and Dashboard Performance Metrics Reports 4.3 Career Exploration Outreach Promotions 4.4 Public Relations Press Releases 4.5 Employer Recruiting Outreach Flyer 4.6 Career Days Outreach Invitations 4.7 Job Fair Placement Invitations	$ 219.50	$ 85,170.75	$ 60,183.03	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines various tasks in which the Performing Agency shall perform technology transfer and technical support services for the Receiving Agency in the area of project planning, development, and delivery. The Performing Agency shall provide transfer of technology and knowledge to staff of the Receiving Agency (or private-sector professionals under contract to the Receiving Agency), other state agencies, and county and municipal agencies at the request of the Receiving Agency's San Antonio (SAT) District. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics will include, but not limited to, project delivery management and optimization, planning and environmental linkages, utility conflict resolution and coordination management, right-of-way acquisition and coordination, access management, asset management, operations and safety impacts in energy development areas, geographic information system (GIS) techniques to support planning functions (including GIS software use and demonstration), public outreach, mobility coordination, 3D visualization and design, new methods for performing field data collection activities (e.g., turning movement counts, vehicle classification data), traffic analysis (including but not limited to the Synchro 9, CORSIM, and VISSIM software tools), safety, and construction management.	$ 27,032.71	$ 51,588.68	$ 205,457.05	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall continue to support the Receiving Agency in border-related activities in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements.	$ 267,887.96	$ 734,052.27	$ 1,113,442.01	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide quarterly economic outlook summaries on a global, national, regional, and State of Texas basis as data allows. The Performing Agency shall develop the process and framework to rebase and sustain a database of these costs to be fully analyzed. The Performing Agency shall investigate the trends in construction costs over the FY 23 and FY 24 analysis periods with the intent to document the cost trends in Texas and prepare the HCI report for use in January 2025. The Performing Agency shall provide market shed analyses that assess the change in access attained from the completion of selected corridor projects and provides the economic value of the change of that market shed as represented by factors including access to jobs or access to workforce population, business establishments, and payroll.	$ 57,183.53	$ 517,827.90	$ 98,457.71	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency (Texas A&M Transportation Institute) shall provide highway planning and operations for the Receiving Agency. Performing Agency staff will travel within the Fort Worth District to project meetings and project areas for data collection, field observation, outreach with stakeholders and businesses, and other associated activities.	$ 205,904.48	$ 610,098.70	$ 498,650.36	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency's Maintenance Division and statewide districts by providing pavement structural evaluation support using a Total Pavement Acceptance Device (TPAD), a highly modified geophysical surveying vehicle that performs dynamic loading testing to analyze road structural conditions. The Performing Agency shall provide assistance conducting TPAD surveys at approved project locations, interpreting survey results, maintaining and storing the TPAD, and making hardware and software upgrades, as needed. The Performing Agency shall provide TPAD support to the Receiving Agencies' statewide districts to include webinars, district visits, and presentations at the annual Maintenance and Construction Conferences.	$ -	$ 33,724.25	$ 19,130.34	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Performing Agency shall perform for the Receiving Agency's Austin District to support district planning and operations.	$ -	$ 267,793.51	$ 286,171.68	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI to provide technical assistance and support for Statewide Planning Branch Support of the Transportation Planning & Programming Division.	$ -	$ 326,291.02	$ 954,461.33	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines various task areas in which the Performing Agency shall perform technology transfer and technical expertise for the Receiving Agency in the area of transportation operations and maintenance.	$ -	$ 227,869.00	$ 162,640.72	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall use its nondestructive testing (NDT) capabilities and hot mix asphalt testing equipment to evaluate upcoming overlay projects and make project specific recommendations on new asphalt overlays for the Receiving Agency. These mixes will include, but are not limited to, porous friction courses, thin overlay mixes, stone mix matrix and traditional dense graded mixes with a variety of modified binders. The Performing Agency shall work closely with the Receiving Agency's project engineers to update plan notes for upcoming jobs.	$ -	$ 65,676.49	$ 9,774.14	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide transfer of technology and knowledge. The Performing Agency shall serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, counties, cities, Metropolitan Planning Organizations (MPOs), and the Regional Mobility Authorities. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics will include any of the following at the request of the Receiving Agency: 1. Project delivery management and optimization, 2. Planning and environmental linkages, 3. Utility conflict resolution and coordination management, 4. Right-of-way acquisition and coordination, 5. Access management, 6. Asset management, 7. Energy impacts, 8. GIS techniques to support planning functions, 9. Public outreach, 10. Mobility coordination, 11. 3D visualization and design, 12. Unmanned Aircraft System (UAS), photogrammetry, and spatial analysis, 13. Advancements in data collection techniques, 14. Traffic simulation and analysis, 15. Safety, and 16. Construction management.	$ -	$ 143,482.79	$ 118,560.44	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall complete a strategic plan and review of current business practices at Flight Services, the Receiving Agency, to ensure compliance with relevant state statutes and provide feedback on potential updates.	$ -	$ 83,842.37	$ 311,932.84	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall work with Receiving Agency districts to evaluate and recommend intersection designs with hot mixed asphaltic pavement options, including, but not limited to structural evaluation, materials, and mixture design recommendations. The Performing Agency shall complete four case studies per year. The Performing Agency shall work with the Receiving Agecny to develop best practices for work zone traffic control and construction methods in intersections.	$ -	$ 29,504.48	$ 137,856.86	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall support the data science team in the Strategic Initiatives and Innovation Division (STR) with data documentation, data engineering, and literature reviews. The Performing Agency shall not perform any work or incur any cost under Task 1-3 until a Notice to Proceed has been issued by the Receiving Agency for the Task(s). The project may support TxDOT's efforts in making data available to TxDOT staff, and external stakeholders such as universities, Metropolitan Planning Organizations (MPOs), state agencies, federal agencies, cities, counties, and private entities.	$ -	$ 76,487.51	$ 211,625.37	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance in support of the Receiving Agency's statewide Pavement Surface Distress Data Collection (PSDDC) project by collecting data and providing an independent audit of the Receiving Agency's contractors responsible for data collection in each of the PSDDC region. The PSDDC data is an important and compulsory factor for one of the Receiving Agency's funding sources. The Performing Agency shall also maintain and operate the Receiving Agency's FWD calibration facility used to calibrate FWD units. The Performing Agency shall perform annual calibrations on FWD units to American Association of State Highway and Transportation Officials (AASHTO) and Long-Term Pavement Performance (LTPP) standards, as specified by Federal Highway Administration (FHWA). The Performing Agency shall maintain the guidelines as set by FHWA. The Performing Agency shall use the calibration facility both as a FWD Operation training facility and as a maintenance facility for the Receiving Agency's fleet of FWD's, as set forth by one of the Receiving Agencey's funding sources.	$ -	$ -	$ 446,105.67	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Texas Department of Transportation (TxDOT) is committed to improving the transportation system's efficiency, safety, and mobility through seamless and consistent digital communication between vehicles, infrastructure, and road users. Today, much of the transportation system remains "silent" and lacks real-time, integrated messaging capabilities that could improve decision-making for both human drivers and advanced vehicle systems. Additionally, as operators of the system, TxDOT is often blind to existing conditions unless other parties report them. As digital infrastructure continues to expand and connected and automated vehicle (CAV) technologies become more widespread, ensuring accurate, timely, and standardized messaging across all user groups is critical. This project shall develop a Strategic Plan for System Messaging. The plan will catalog current and future user, system, and vehicle needs, to facilitate meaningful information transfer between vehicles, infrastructure, and road users. In addition to specifying these needs requirements, additional efforts will develop the tactical approach for comprehensively and objectively evaluating market solutions that could support these needs.	$ -	$ -	$ 59,581.60	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	As the Receiving Agency operates and maintains the existing and planned roadway network to better accommodate traffic growth and changing traffic patterns, it is critical for district area engineers and planners to know how various roadway configurations and designs could affect roadway safety. The Performing Agency will research the best practices and apply latest techniques and expertise to identify roadway safety issues, trends, and possible countermeasures. The Performing Agency will provide necessary information for the Receiving Agency to make informed decisions.	$ -	$ -	$ 26,934.98	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Work performed under this contract will build-off, and further refine, the work performed in the Quick Response Planning, Evaluation and Technical Support Contract No. 000015039 which analyzed congestion data and project parameters to estimate the economic effect of ten (10) Texas Clear Lanes projects. The Performing Agency shall use the methodology developed in the ten (10) initial major construction project corridors in the Contract No. 0000015039 for the Receiving Agency Administration to evaluate the other corridors and projects funded in the Texas Clear Lanes program, with revisions as necessary to accommodate the unique attributes of the projects. Project effects are estimated for travel speed and traffic volume changes. The Performing Agency shall convert these effects into economic effect analyses for vehicle operating cost and delay and travel time reliability cost savings. The Performing Agency shall estimate the effect of the project design on safety with crash effects and crash value. In addition, the Performing Agency shall estimate the project construction spending effects on business output and wage income.	$ 268,768.99	$ 461,291.86	$ 723,282.88	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Interstate 10 (I-10) is the main and one of a few east/west corridors through El Paso, TX. This is due to the Franklin Mountains stretching through the center of El Paso, leaving a relatively narrow sliver for travel on the south side of the city. The pavement condition of I-10 is getting worst as evident by continuous overnight pavement patching projects. TxDOT El Paso (the State) is aware of the need for a major I-10 overhaul project. At the same time, the improvement project cannot occur until an adequate alternative route is possible. This adequate alternative route is the newly constructed Border Highway West project. As this adequate route alternative was being built, the State developed a feasibility study of various preliminary scenarios for I-10 improvements through a 55 mile stretch of I-10 from the TX/NM state line to Tornillo, TX. The State hired a consultant for this task and the title of this feasibility study is “Reimagine I-10”. The consultant, separated this stretch of I-10 into four segments: • Segment 1: From TX/NM state line to Executive Blvd. • Segment 2: From Executive Blvd. to Copia St. • Segment 3: From Copia St. to Loop 375 (east El Paso) • Segment 4: From Loop 375 to FM 3380 (Tornillo, TX) The consultant performed standard traffic analysis of the scenarios. However, existing modeling methods cannot capture the temporal aspects of proposed increase in roadway capacity, new connections, or temporary work zone conditions on a localized and regional scale simultaneously. Therefore, unique modeling methods are needed to capture the delays associated with a temporary work zone or additional volumes transferred to adjacent arterials. One such approach is using integrated network modeling tools – also known as multi-resolution modeling (MRM). There are two distinct advantages to using this innovative approach over traditional methods. First, the use of the regional mesoscopic dynamic traffic assignment (DTA) model captures the diversion of vehicles outside the project limits. Existing practices that use traditional deterministic models or planning level-economic analysis models do not account for traffic that is willing to take alternate routes that extend outside the boundary limits of the model. While some microscopic models are capable of performing DTA, they are not large enough to capture diversions in a large urban area. The second advantage of using the MRM methodology is that macroscopic travel demand models are static in nature and are not capable of capturing the temporal and spatial distribution of traffic congestion at various time periods. Travel demand models can only show the total number of vehicles that switch routes when there is capacity reduction due to a work zone. They cannot shift traffic during different time periods thus severely limiting its capability to analyze delays associated with queuing and speed reductions.	$ 85,596.06	$ 823.31	$ 141,524.21	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ -	$ -	$ 145,714.53	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, “Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation” has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ -	$ 18,339.60	$ 175,670.15	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ -	$ -	$ 119,977.16	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ -	$ -	$ 55,449.42	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ -	$ -	$ 32,888.40	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency's Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ -	$ -	$ 161,203.01	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Understanding and estimating realistic production rates of major work items in a highway project are critical to determining a reasonable project contract time, evaluating the contractor's baseline schedule, monitoring progress schedules, and ultimately completing the project on time. The Performing Agency shall leverage the Receiving Agency's historical project data to obtain the as-built information of production rates of various work items, and shall develop a) an expanded version of the Receiving Agency's construction production rates table, b) an interactive tool that can generate color-coded heat maps to visualize feasible ranges of production rates of major work items across Texas, and c) implementation guidance and recommendations. An advanced and interactive production rate estimation tool could significantly help the Receiving Agency achieve the goal of completing highway projects on time. Such a decision-aid tool could significantly improve the Receiving Agency's practice in determining more accurate production rates, resulting in more accurate contract time determination, the contractor's baseline schedule evaluation, and progress schedule monitoring. Such data-driven and practical production rates may provide higher certainty and reliability than the Receiving Agency's current construction production rates table.	$ -	$ -	$ 57,565.20	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Drainage is a critical element of roadside design. Roadway drainage design often calls for the use of cross-drainage and parallel-drainage culverts. If untreated, the ends of the drainage structures can become roadside hazards that can result in serious injury when an errant vehicle leaves the roadway. The most cost-effective strategy is often to make the culvert end traversable using grates comprised of pipe runners across the culvert end. The Performing Agency shall investigate the safety performance of traversable cross-drainage and parallel-drainage culvert end treatments installed on roadside slopes. The Performing Agency shall address the various design variations of safety end treatments supported by current standards to investigate the safety performance. The Performing Agency shall develop design guidance to recommend slopes and size, length, and spacing of the pipe runners for both cross-drainage and parallel-drainage culverts that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH). The Performing Agency shall use full-scale crash testing to aid with validating the design guidance.	$ -	$ -	$ 185,052.37	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Texas continues to use cold recycling for pavement rehabilitation and performs a significant amount of full depth reclamation (FDR). While cement remains the most widely used treatment, use of asphalt emulsion and foamed asphalt continues to grow. This project shall identify and evaluate topics to strategically enhance cold recycling practices in Texas. This project shall perform a comprehensive performance analysis of recent as-built projects to identify strengths and opportunities for process enhancement. For cement, this project shall evaluate how cement type may influence mixture properties, analyze the Texas Flexible Pavement System (FPS) structural design assumptions based on current mix design and construction practices, and summarize methods to improve early trafficking. For emulsified and foamed asphalt, this project shall develop cold-in-place recycling (CIR) applications for Texas and identify, evaluate, and recommend enhanced pavement design procedures for cold recycling with asphalt binders. This project shall use all results to develop enhanced cold recycling project selection procedures, recommend updates to the Receiving Agency's specifications, and develop and perform training.	$ -	$ -	$ 320,974.63	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Hamburg Wheel Track (HWT) rutting test generally serves well as the standard rutting test for asphalt mixes in Texas; however, in the last several years, some premium mixes (i.e. stone matrix asphalt), designed with PG76-22 and low HWT rut depth, have experienced premature rutting failures under slow moving (or stop/ go) traffic in several Receiving Agency Districts. Such failures burden the Receiving Agency with extra cost. Furthermore, it was reported that the HWT test cannot accurately quantify the better rutting performance of some tougher mixes with highly modified asphalt (HiMA). Thus, the Performing Agencies shall develop the next generation of HWT test to accurately screen out asphalt mixes that are prone to rutting failures. The Performing Agencies shall review the literature, survey Districts, and other state departments of transportation (DOTs) to identify the proper rutting test(s) and asphalt mixes for addressing the rutting failure caused by the slow-moving traffic. The Performing Agencies shall further develop the next generation of HWT test and associated acceptance criteria through finite element analysis, laboratory testing, field accelerated pavement testing and survey of in-service pavement intersections, round robin test, and recommendation of specification changes.	$ -	$ -	$ 184,114.96	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Road to Zero has targeted a goal of zero deaths and serious injuries on Texas roadways. Recent trends in Texas indicate a continued increase in highway fatalities each of the past three years. In 2021, roadway departure crashes were responsible for 40 percent of all crash-related fatalities in Texas, which is the largest single category by crash type. In October 2021, Federal Highway Administration (FHWA) designated Texas as one of 16 Roadway Departure Focus States based on being over-represented on three (3) different roadway departure crash fatality metrics. Roadside safety devices are a key element of an effective roadway departure safety strategy. These safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively evaluate high priority issues related to roadside safety devices. This includes development of both new and improved safety features that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) and help minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes.	$ -	$ -	$ 601,711.60	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency cantilever overhead sign structures (COSS) and traffic signal pole structures have a socketed fillet welded connection between the column and the baseplate. While economical, this connection has a low fatigue-resistance threshold. The objectives of this research are to (1) outline fabrication practices and economic considerations that may affect proposed connection type and design, (2) develop an inventory database of COSS and traffic signal pole structures that are representative, (3) utilize structural modeling to identify from within the inventory critical cases that should be advanced to a testing program, (4) develop and execute a targeted testing program that isolates critical design parameters for the fatigue performance of both the critical cases found in the inventory and recommended connection types and designs, (5) provide recommendations for connection types and designs based on fatigue provisions, and (6) provide recommendations for identifying fatigue-critical of existing inventory.	$ -	$ -	$ 210,845.07	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Ancillary structures (AS) exist in a wide variety of applications critical to safety and daily needs of the travelling public. The long-term corrosion performance of these structures is of utmost importance to prevent deterioration and extend the structural design life and safety. While hot-dipped galvanizing provides excellent long-term behavior for corrosion control of these critical structures, over the past 20 years this process has been found to create extensive cracking of welds on base plate connections that is detrimental to the fatigue lives of these poles. Although improved details are used in new designs, thousands of High Mast Illumination Poles (HMIP), Cantilever Overhead Sign Structures (COSS), and traffic signal poles (TSP) exist in Texas with varying levels of cracking in the welds between the baseplates and pole shafts. During this research project, the Performing Agency shall identify and provide critical assessment parameters and guidance for the Receiving Agency to determine if cracks should be monitored, repaired, or the structural component replaced. The research includes a representative assessment of weld cracking in the AS inventory, the development of monitoring hardware and techniques, the development and assessment of repair techniques, and the development of certification methods/standards for inspection personnel.	$ -	$ -	$ 71,508.19	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Traffic control devices (TCDs) are the primary means of communicating highway information to road users and play a key role in highway automation. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. In addition, vehicle technologies and the roadway infrastructure industry are rapidly evolving, spurred by technology advancements, customer demand, changes in the vehicle fleet, and changes in national and state policies. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project could represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ -	$ -	$ 451,140.11	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency has utilized dowels in bents to provide lateral restraint of prestressed concrete beams., These dowels are often misplaced, which creates various construction issues, while their presence complicates bearing pad replacement. The Performing Agency shall provide research findings to the Receiving Agency to make informed decisions on stopping the use of such dowels, the Performing Agency shall: • Perform a thorough literature review to: (i) summarize the state-of-art, state-of–the-practice and key findings, and (ii) address questions relating to unintended consequences from removal of these dowels during erection of the girders, construction of the deck, and long-term performance and stability. • Perform an investigation on the state-of-the-practice of all state Department of Transportations (DOTs) throughout the country, focusing on practices from DOTs with similar hazard exposure. • Perform a parametric finite element (FE) study on multiple the Receiving Agency bridge (and girder) designs to investigate the performance under all major load combinations and limit states (from service to ultimate conditions) over the lifetime of the bridge accounting for Texas-related exposure conditions. • Perform six (6) large-scale tests on girder-to-bent/abutment connections to quantify the contribution of dowels in the performance of the connections.	$ -	$ -	$ 134,419.42	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall perform a comprehensive evaluation of adhesive anchors used in concrete pavement applications, particularly full-depth repairs. The Performing Agency shall investigate the effects of sustained and cyclic loading on long term stiffness of the bond between the concrete, the adhesive grout, and the steel anchor. The potential benefits will lie in the suitability of adhesive anchors to perform in concrete pavement applications in addition to the development of recommendations for the use of adhesive anchors to minimize premature failures and to extend pavement service life by maintaining the stiffness of a repair made using drilled adhesive anchors.	$ -	$ 180,203.21	$ 66,182.36	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall perform a comprehensive evaluation of adhesive anchors used in concrete pavement applications, particularly full-depth repairs. The Performing Agency shall investigate the effects of sustained and cyclic loading on long term stiffness of the bond between the concrete, the adhesive grout, and the steel anchor. The potential benefits will lie in the suitability of adhesive anchors to perform in concrete pavement applications in addition to the development of recommendations for the use of adhesive anchors to minimize premature failures and to extend pavement service life by maintaining the stiffness of a repair made using drilled adhesive anchors.	$ -	$ -	$ 234,105.04	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Bent caps provide a critical load path between girder reactions and bent columns. Supporting considerable reactions over long spans, bent cap cross-sections grow substantial, necessitating robust cast-in-place designs that have stood the test of time. However, the considerable weight and time required for their construction present challenges that undermine their apparent simplicity. To meet these challenges, the Performing Agencies shall explore precast alternatives, particularly hollow designs in efforts to enhance traditional cast-in-place bent structures through post-tensioning. In addition to exploring precast alternatives, the research team shall first evaluate current practice, identify potential design issue in current practice and provide design recommendations to current practice. Experimental study as well as analytical and design methods shall be used toward this effort. The research team shall ask TxDOT for the use of post-tensioning in the experimental study. This innovation aims to reduce bent weights, minimize traffic disruptions and costs; enhance erection, construction efficiency, durability, and structural performance under service and ultimate load conditions. The Performing Agencies in collaboration with an industry review committee comprised of bridge designers, precasters, and erectors shall conduct a targeted full-scale structural testing campaign supported by advanced structural modeling (finite element analysis and strut-and-tie), to provide well-defined design criteria and ensure the structural performance of hollow precast rectangular and inverted tee bent caps, for both mildly reinforced and prestressed designs. The Performing Agencies initiative seeks to close the knowledge gap concerning the service and ultimate load behavior, long-term performance, and durability of hollow precast design concepts.	$ -	$ -	$ 187,346.21	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Economic factors and environmental sustainability are driving the use of more reclaimed asphalt pavement (RAP); however, durability of those mixes has been a concern. Various approaches (e.g. limiting RAP usage, increasing lab-molded density, or balanced mix design (BMD)) have been tried to improve mix durability. All the approaches point to one essential factor for durable RAP mixes: minimum virgin binder content. Thus, the Performing Agencies shall determine the minimum virgin binder content(s) for durable RAP mixes. The Performing Agencies shall review the literature to identify critical factors affecting RAP mix durability. Considering all those critical factors, the Performing Agencies shall develop and execute a statistically sound laboratory experimental design to develop the relationships between cracking properties measured by Overlay test and Ideal cracking test and mix components (e.g. virgin binder content) and their characteristics. Furthermore, the Performing Agencies shall assess field performance of RAP mixes and delineate the correlation between field performance and laboratory mix cracking properties. Subsequently, the Performing Agencies shall recommend minimum virgin binder contents based on the relationships among field performance, mix cracking properties, and mix components and their characteristics. Based on these findings, the Performing Agencies shall develop guidelines, update specifications, and organize training sessions	$ -	$ -	$ 117,771.15	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	For pavement management and to understand the condition of its network, the Receiving Agency relies on high-speed inertial profilers to gather ride quality. However, a persistent challenge arises when assessing pavement smoothness at low speeds or under stop-and-go conditions (i.e., signalized intersections, stop-control intersections, high driveway density producing turning traffic, and congested roadways during peak-hour traffic) that compromises the accuracy of data collected by conventional profilers. For example, collecting ride quality measurements on a congested roadway with multiple driveways leads to acceleration and deceleration of the collection vehicle, potentially adding “false” dips into the measurements. If these dips are included in network-level measurements, these types of roadways could receive a poor condition score that is not indicative of the true pavement condition. Collecting data on roadways with signalized intersections and slow-moving congested traffic could have the same challenges. The Performing Agency shall explore the potential of low-speed profilers to enhance data collection accuracy in such scenarios. The Performing Agency shall evaluate the effectiveness of low-speed profilers in providing accurate pavement profile data, particularly in areas prone to low-speed or acceleration and deceleration operations. The Performing Agency shall validate the capabilities of low-speed profilers and recommend strategies for their integration into the Receiving Agency's pavement management practices, ultimately leading to a more accurate condition assessment.	$ -	$ -	$ 71,046.29	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Texas Department of Transportation (TxDOT) has been conducting research on predicting skid resistance for over five decades. This research has focused on measuring the polishing resistance of the coarse aggregate portion of mixes. This has led to the development of a surface aggregate classification (SAC) where the SAC A materials are rated as having good skid resistance properties; however, recently, it is reported that some mixes with predominantly SAC A materials have low skid resistance. In addition, some of the fine surface mixes with little coarse aggregate have been shown to have excellent skid resistance. One conclusion is that the long-term skid resistance of any surface mix is a function of many factors including, but not limited to mix type, gradation, the quality of the fines, and not simply coarse aggregate properties. The goal of this study is to develop and validate a laboratory test procedure to measure skid resistance of any proposed surface mix. This test procedure will eventually be incorporated into TxDOT's Balanced Mix Design (BMD) process.	$ -	$ -	$ 189,835.99	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Pavement markings and markers are the primary means for an agency to provide longitudinal guidance to drivers. To be effective, markings and markers must be visible during all driving conditions, day, and night. A variety of pavement marking materials (binders and beads) and varying installation specifications (application type, material thickness) create a wide range of initial performance and maintained performance over a markings service life. Currently, markings are evaluated initially to ensure a minimum initial retroreflectivity performance is obtained, but that initial performance has not been well researched to determine its impact on the overall durability and performance of the marking over its service life. This project shall explore various factors that affect pavement marking performance over the service life of the marking (pavement marking materials, installation specifications, pavement surface, traffic conditions, and geographic and climatic region) to develop performance models for Texas. Performance of a variety of markings and markers shall be evaluated at various field test areas. These same marking materials shall be evaluated through lab testing to explore accelerated weathering and wear tests that correlate with the field performance. The goals of this project are to improve pavement marking testing and the ability to predict marking performance.	$ -	$ -	$ 219,034.20	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The goal of this project is to revise the Receiving Agency Pavement Management Information System (PMIS) Rater’s Manual. This project shall review, analyze, and propose changes to the current distress rating definitions for flexible and concrete (jointed and continuously reinforced) pavements. The Performing Agencies shall hold collaborative workshops to gather inputs from Receiving Agency’s Division and Districts on pavement condition data collection challenges using the current manual. The project will assess the impact of the rating changes to the PMIS scores and propose changes to distress utility curves if needed. In collaboration with the Receiving Agency, adjustments will be made to determine acceptable impacts. The revised manual shall be developed based on the research results and through collaboration between the research team and the Receiving Agency.	$ -	$ -	$ 71,163.27	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	While roads defined as arterials need to maintain an acceptable level of traffic capacity, there are trade-offs with respect to speed. This research will investigate the effectiveness of arterial-focused speed management countermeasures for application across Texas. It will quantify the costs and benefits of road and vehicle design, operations, enforcement, and other countermeasure types across a range of settings (for uncontrolled-access arterials under different traffic, road type/context, and land use conditions), resulting in a Texas Arterial Speed Management Toolkit and reports.	$ -	$ -	$ 105,403.95	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency is implementing a Digital Delivery initiative. Research is needed on how to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources. Research is also needed to identify software and other industry trends that might affect the Digital Delivery initiative and recommend strategies on how to anticipate and prepare for those trends. The Performing Agency shall (a) develop and test procedures to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources; (b) develop and test automated workflows for change detection, quality control, and updating of 3D models using results from repeat surveys; (c) conduct a cost-benefit analysis of data collection/processing precision, accuracy, and density against the potential cost in construction change orders from a looser tolerance in those three parameters; (d) conduct a review of software and other industry trends that might affect the Digital Delivery initiative; (e) conduct peer exchanges with stakeholders; (f) develop and recommend strategies on how to anticipate, and prepare for, software and industry trends; and (g) develop a strategic research roadmap to support the Digital Delivery initiative through 2028 and beyond.	$ -	$ -	$ 157,767.39	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The first objective of this project is to develop Safety Performance Functions (SPFs) and Crash Modification factors (CMFs) for ramp terminals and intersections of frontage roads with crossroads. The second objective of this project is to evaluate the safety impact of weaving on the frontage road versus weaving on the freeway. More specifically, the objective is to understand the difference in safety between two ramp configurations – entrance ramp followed by an exit ramp versus exit ramp followed by an entrance ramp between two interchanges. The Performing Agencies shall collect site characteristics data and develop crash predictive methods for different types of frontage road segments and intersections on frontage roads, including ramp terminals. These models shall be developed by area type (i.e., large urban, small urban, suburban/fringe, and rural), Receiving Agency’s regions, and facility type (one-way and two-way). The Performing Agencies shall incorporate the crash predictive methods into spreadsheet tools to facilitate the analysis and to support project design decisions of frontage roads. The Performing Agencies shall also develop a framework for selecting an appropriate configuration for frontage roads and as well guidance for the minimum distance from ramp terminal to crossroad intersection and a need for lane additions.	$ -	$ -	$ 129,226.69	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Concrete barriers are designed and crash tested for placement on flat terrains. In-field installations of concrete barriers are sometimes placed on slopes adjacent to roadways. By placing the barrier on a slope, the effective height of the barrier that engages an errant vehicle may be reduced since the vehicle may be airborne as it contacts the barrier on a downward slope. Consequently, the barrier may not be able to safely contain and redirect the vehicle. The Performing Agency shall evaluate the performance of the Receiving Agency’s 32-inch tall F-shape and 42-inch tall single slope barrier when placed on roadside or median slopes of up to 4H:1V. The Performing Agency shall develop guidance for placement of these barriers using finite element simulation analysis and full-scale crash testing. The guidance shall determine the maximum allowable slope for each barrier type and any placement offsets required from the edge of the roadway or from the bottom of the ditch. The Performing Agency shall evaluate the performance of the barriers using the impact conditions and evaluation criteria specified in the Manual for Assessing Safety Hardware (MASH) for Test Level 3 for longitudinal barriers.	$ -	$ -	$ 295,452.89	$ -	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Identifying and documenting existing utility facilities within the proposed right-of-way (ROW) is crucial for successful project delivery. There is a need to leverage data collection technology's strengths and minimize weaknesses for a more robust and reliable determination of utility locations and develop and test metrics to assess the utility investigation quality levels in ways that make sense to project design teams. Improvements shall lead to a better stakeholder understanding to communicate the quality levels commonly used by the SUE industry (D, C, B, and A), the basis for assessing utility investigation deliverable quality, and would be able to tie quality levels to quantifiable performance metrics such as positional accuracy, error, and completeness, which are common in engineering and surveying when collecting field data for a project.	$ -	$ -	$ 253,033.75	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Innovative intersection designs (e.g., diverging diamond interchanges [DDIs], displaced left turns [DLTs], median U-turns [MUTs], and restricted crossing U-turns [RCUTs]) and modern roundabouts are increasingly used in Texas and throughout the country to remove conflict points and redistribute turning traffic from traditional intersections, improving operational efficiency and promoting increased safety. While their use is growing and their benefits have been demonstrated, Texas still has a limited number of innovative intersections, and there is a need to increase the use of these intersections throughout the state. Because many of these intersection types and their design elements are not commonly used in Texas, there is a natural tendency to be cautious about their use. Providing information to help promote these treatments for use in appropriate locations will be important to their successful adoption and implementation. The Performing Agency shall build on recent research to document the benefits of innovative intersections, develop case studies of successfully implemented intersections in Texas, and provide resources for practitioners to use in support of new implementations across the state.	$ -	$ -	$ 40,850.06	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Cracking dictates the service life of asphalt pavements. Oxidative aging of the asphalt binder renders the binder brittle and susceptible to cracking. Higher number of high temperature days further exacerbates rate of oxidation and reduction in the service life of an asphalt pavement. Recent coordinated studies by a global consortium of researchers have identified generic chemicals that can act as antioxidants to significantly reduce the oxidative aging of asphalt and increase its cracking resistance and service life. Similarly, commercial additive manufacturers are also exploring the development and deployment of antioxidant additives. In this project the Performing Agencies shall review the literature and interface with existing national and international studies to identify the most promising antioxidant(s) for use with asphalt binders as a modifier. The Performing Agencies shall conduct laboratory studies on asphalt binders and mixtures to evaluate the efficacy of these antioxidants. The Performing Agencies shall also conduct workshops with stakeholders and conduct cost-benefit analysis to develop plans for pilot test sections and facilitate the deployment of such sections with districts and industry partners. Finally, the Performing Agencies shall also present metrics that can be used for specification and quality control purposes by the Receiving Agency.	$ -	$ -	$ 93,181.87	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency's "End the Streak" goal is to end all fatalities on Texas roads by 2050 as there has not been a day without a death on Texas roadways since November 7, 2000. New strategies must be implemented, such as increasing the efficacy of pavement striping and retroreflective pavement markers in several Receiving Agency districts and monitoring the crash statistics before and after pavement marking and marker improvements over time. The Performing Agency shall target pavement marking retroreflectivity and contrast and shall include the development and implementation of an experimental study design to assess their safety and economic effectiveness.	$ -	$ -	$ 114,186.75	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Crash risks associated with permissive left turns (PLTs), vulnerable road users (VRUs), and wrong way driving (WWD) appear to be among the top attributing factors for fatal and incapacitating crashes at signalized intersections, raising alarming safety concerns. The cellular vehicle-to-everything (C-V2X) communication and innovative traffic detection technologies such as light detection and ranging (LiDAR) sensing have the potential to reduce crashes related to these factors and enhance intersection safety. The primary objective of this project is to develop, test, and demonstrate a prototype system integrating C-V2X communication and innovative traffic detection technologies to improve safety of all road users at signalized intersections. Another objective is to provide the Receiving Agency with guidelines for statewide implementation of the integrated system for intersection safety improvement. To this end, the Performing Agencies shall: (1) Review the literature on safety improvement systems utilizing C-V2X and innovative traffic detection systems; (2) Assess user needs and design a system architecture that satisfies user requirements; (3) Develop, test, demonstrate, and evaluate a prototype system that integrates C-V2X communication, LiDAR and other advanced traffic detection technologies to detect and mitigate crash risks involving PLTs, VRUs, and WWD at signalized intersections; and (4) Develop guideline documents containing implementation procedures and use case scenarios.	$ -	$ -	$ 113,613.78	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall address two gaps in scour knowledge: pressure scour for cohesive soils and cohesive soils/rocks characterization for scour analyses. Pressure scour occurs when the water reaches the bridge's low chord; this increases the scour depth. Guidelines exist for cohesionless soils but not for cohesive soils. The Performing Agency shall perform a series of Computational Fluid Dynamics (CFD) simulations and/or flume tests to generate the input necessary and expand the Scour Rate in COhesive Soils (SRICOS) method to the pressure flow situation in cohesive soils. The Performing Agency shall perform advanced testing on cohesive soils/rocks characterization for scour analyses. Advanced testing examples include the Erosion Function Apparatus (EFA) (Performing Agency) and Scour Testing devices (Federal Highway Administration (FHWA)). The Performing Agency shall determine if the Slake Durability Test (SDT) can be a reasonable surrogate for input in scour depth calculations by collecting samples at a maximum of up to 20 bridges around Texas, and by conducting parallel testing on cohesive soils/rocks such as shale, caliche, and sandstone.	$ -	$ -	$ 274,412.57	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this research project is to develop best practices for the design and construction of detours and traffic handling sections. Detours can be designed as a (i) completely new short-term pavement structure, (ii) by using the existing pavement, for example a traffic shift including the shoulder as part of travel lane, (iii) as part of stage construction, and (iv) as a combination of new, stage, and existing. Premature pavement failures continue to occur on detours during construction. The cost to repair pavement failures on detours can significantly impact the construction budget because repairs are reactionary (not planned), there is limited space to both work, and shift or move traffic within. Many of these temporary detours become integrated into the permanent structures and quite often, the final riding surface is not constructed until the main lanes are completed. It is extremely important to account for the deterioration that the temporary detour may experience during construction. Traffic estimation for the design of temporary detours can be challenging, and clear guidance needs to be developed for accurate pavement design. This research project will produce best practices for evaluation of exiting pavement used as detours, pavement design methods, and construction practices that will help designers, engineers, and inspectors make better decisions resulting in successful projects.	$ -	$ -	$ 8,670.52	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide a framework to minimize project issues through improved Constructability Reviews (CRs). The Performing Agency shall develop a cost/benefit analysis to justify CRs on projects of all scopes. The Performing Agency shall develop a Guidebook of Best Practices to help the Receiving Agency improve construction plan quality and minimize project durations and costs. In developing the Guidebook, Performing Agency shall use knowledgeable construction personnel to review, ensuring adequate time for reviewing, ensuring clear and relevant comments that designers consider and implement, and ensure that new lessons are continuously communicated back to design teams.	$ -	$ -	$ 15,206.58	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Several Districts of the Receiving Agency recently reported rutting problems greater than 2 inches at intersections, border checkpoints, and other locations where heavy truck traffic either moves very slowly or is stationary while waiting in queues, even though the best mixes (e.g., stone matrix asphalt) were used. There is an urgent need to address such premature rutting problem in those places in a timely manner. The Performing Agencies shall identify and evaluate the suitable mixes and single lift construction technique to avoid premature rutting failures at those places, resulting in major cost savings and reducing wet weather accidents. The Performing Agencies shall review literature to identify the critical factors for improving mix rutting resistance. Based on the findings from the literature, the Performing Agencies shall develop and execute an experimental design to identify the suitable mixes for the slow-moving heavy traffic and then construct field trials with those mixes in a single thick lift and follow up their field performance. In the end, the Performing Agencies shall recommend specification changes and develop guidelines for constructing single thick lift with suitable mixes at intersections, border checking points, or other places.	$ -	$ -	$ 20,486.50	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Texas needs a detailed understanding of statewide particulate matter under 2.5 microns (PM2.5) sources, as current regulatory monitoring lacks the granularity for source apportionment. Since speciated PM2.5 data is limited, the Performing Agencies shall collect and analyze samples from multiple regions nearing or exceeding the 9.0 µg/m3 threshold set by the Environmental Protection Agency (EPA). The Performing Agencies shall conduct source apportionment analysis and highlight the prominent sources of PM2.5 emissions by region. This will support future research and regulatory efforts, such as developing and implementation appropriate emission reduction strategies. The Performing Agencies shall collaborate with state and local governments, academia and other stakeholders, to acquire any existing data and ensure local regulations and best practices are met. The Performing Agencies shall collaborate with the Receiving Agency project 0-7257, “The Effects of Road Types and Construction Activities on Particulate Matter and Development of Best Practices for PM2.5 Reduction” by sharing data, resources, and coordinating efforts to enhance data collection and analysis.	$ -	$ -	$ 204,038.86	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agencies shall evaluate the impact of roads (paved and unpaved roads, and unpaved shoulders) and construction on 2.5 microns (PM2.5) emissions and develop strategies for reduction. Objectives include quantifying PM2.5 emissions from roads and construction sites, identifying high-risk areas using thematic mapping, and designing cost-effective mitigation measures like dust suppression and optimized paving practices. The Performing Agencies shall create a user-friendly decision-support toolkit to help prioritize interventions and assess emission reduction strategies. The project outcomes will provide actionable solutions for air quality planning at both project and regional levels, enabling the Receiving Agency to meet environmental regulations, improve public health, and reduce PM2.5 impacts. The Performing Agencies shall collaborate with the Receiving Agency project 0-7256 “Monitoring and Speciation of Particulate Matter Under 2.5 Microns (PM2.5) Composition across Texas Counties” to enhance data collection and analysis, ensuring effective mitigation efforts.	$ -	$ -	$ 263,692.89	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Unmanned Aerial Systems (UAS) or drones provide a unique but mostly unexploited opportunity to improve the Receiving Agency’s right-of-way management and its current practices for planning, designing, constructing, and maintaining habitat. The Performing Agencies shall develop guidance on the use of UAS to identify and manage protected species habitat and determine the efficacy of multi- and hyper-spectral imagery for identifying and mapping endangered plant populations and potential pollinator conservation areas.	$ -	$ -	$ 115,108.10	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agencies shall conduct a comprehensive assessment of the Receiving Agency’s safety scoring tools by analysing evaluation performance, identifying potential biases or limitations, and recommending improvements and adjustments to enhance their effectiveness. The Performing Agencies shall develop a guidance documentation that recommends refinement to existing tool methodologies and strengthen its ability to reduce roadway fatalities and serious injuries through more informed decision-making and targeted safety interventions.	$ -	$ -	$ 27,852.61	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Innovative intersection and interchange designs and smart technologies (e.g. adaptive traffic signal systems, connected vehicle technology, and real time traffic management) are often considered as methods to reduce congestion and promote safety. However, these designs are challenging and time-consuming to consider for a given project. This project will develop a data-driven innovative design recommendation tool to provide guidance toward feasible design selections of innovative intersections and interchanges. The tool shall be applicable in urban settings and consider factors like traffic volumes, safety enhancements, constructability, pedestrian and bicyclist accommodations, and costs. The tool will be complimented by guidance gathered from the literature and stakeholder interviews to help provide context and considerations that cannot be incorporated into the tool. This will promote a consistent solution to aid in the intersection design selection process that can be used to reduce costs for considering innovative intersections and can be presented to policymakers as a data-driven recommendation. This prototype tool shall be vetted by applying the tools to existing innovative intersection/interchange design selections within Texas to demonstrate the effectiveness of the design selection solution.	$ -	$ -	$ 26,628.85	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Innovative intersections, also referred to as alternative or unconventional intersections, are essential for enhancing traffic flow and safety. In Texas, there has been a significant increase in the construction of innovative intersection designs such as diverging diamond interchanges (DDIs), median U-turns (MUTs), and reduced conflict intersections (RCIs). However, they present notable challenges during construction. A primary concern associated with implementing these designs is maintaining traffic flow during construction to minimize disruptions and ensure safety. The geometric configurations of these intersections introduce complexities that are not addressed by previous guidelines, posing safety risks for motorists and workers. The absence of standardized specifications for work staging and risk mitigation strategies in work zones exacerbates these issues. Using a mixed-method approach, the Performing Agency shall identify safety risks intrinsic to the construction of innovative intersections and temporary traffic control (TTC) measures that can eliminate or reduce these risks. The Performing Agency shall develop comprehensive guidance for developing and implementing TTC strategies for innovative intersections. The documentation and evaluation of these strategies will establish a comprehensive framework for safely and effectively implementing innovative intersection designs in Texas, catering to the specific needs of drivers, including seniors and teenagers.	$ -	$ -	$ 9,566.05	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Median barriers are commonly used to separate opposing lanes of traffic on divided highways and to separate managed lanes from general purpose lanes. Concrete Median Barriers (CMBs) are often preferred on urban freeways with narrow medians due to their minimal deflection and low maintenance. However, long, continuous runs of CMBs limit access of emergency and maintenance vehicles to the other side of a roadway or a managed lane. Implementation of crashworthy median barrier gates at these locations can maintain the desired level of median protection for motorists while offering improved cross-median access for emergency and/or maintenance vehicles. The current Receiving Agency’s Barrier Gate (detailed on standard sheet BG-11) is 30-ft long and provides a clear opening of 27 ft between the mounting brackets. For this project, the Performing Agency shall develop a longer median barrier gate to provide a greater clear opening for larger emergency vehicles and contraflow during evacuation operations. The Performing Agency shall design the median barrier gate to operate without power and perform crash testing of the median barrier gate to verify compliance with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).	$ -	$ -	$ 18,257.42	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project will provide a practical framework for the Receiving Agency to choose between cross-sectional design alternatives to optimize operational and safety performance on rural two-lane undivided highways. This framework will incorporate variables such as traffic volume, heavy vehicle mix, speed, and access density. Texas and other states have increasingly used a narrow centerline buffer area, separated by longitudinal pavement markings, to introduce physical separation between approaching vehicles, producing operational and safety benefits on undivided roadways without widening to a traditional divided cross-section. However, providing centerline buffers require reduced lane or shoulder widths. Project 0-7035 studied this effect for four-lane roadways with positive results, but less is known about two-lane roadways; understanding the benefits of center separation, along with the effects of various lane and shoulder combinations, would be useful for making decisions on cross-sections for new and resurfaced two-lane roadway segments. The Performing Agencies shall collect and analyze data for two-lane highways with centerline buffers and compare their safety and operational performances with traditional two-lane undivided highways. Additionally, this research shall quantify differences in the performance of two-lane undivided highways compared to other cross-sectional designs. The Performing Agencies shall use observed data and simulation to achieve the project objectives.	$ -	$ -	$ 20,797.52	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objective of this project is to better understand how physical safety measures in vehicles and infrastructure are impacting crash fatalities and injuries in the development of safer roadways in the future.	$ -	$ -	$ 162,513.25	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Roadway debris like carcasses and tire fragments, can pose a hazard to traffic. It can be struck by vehicles and result in a crash or secondary crash. Advance roadway debris detection is critical for traffic operations and safety. Transportation Management Centers (TMCs) can detect debris in urban areas, but a recent study found that Waze, reported three times as many road hazards to similar TMC events on freeways. Waze detected 72% of road hazards first and nearly sixteen (16) minutes earlier. Harnessing crowd-sourced data from navigational apps or connected vehicle dashcams has become a reality with Artificial Intelligence (AI)-enabled processing. This action opens opportunities for enhanced situational awareness and expedite the appropriate responses from the Receiving Agency. The Performing Agencies shall leverage crowd-sourced third-party data and AI-enabled processing to capitalize on this opportunity.	$ -	$ -	$ 111,344.63	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This project shall leverage telematics data to proactively identify near-crash events and hotspots, enhancing transportation safety management capabilities across Texas. Specifically, the project shall develop advanced analytical methodologies in four complementary categories: trajectory-based analysis of vehicle movement patterns, event-based analysis focusing on critical driving behaviors (e.g., hard braking and abrupt maneuvers), multi-criteria analysis integrating mobility, safety, and environmental performance metrics, and data fusion techniques combining telematics data with additional datasets such as traffic sensors and historical crash records. The Performing Agencies shall implement spatial-temporal analyses and machine learning predictive models to accurately identify current and predict future near-crash hotspots. An interactive AI-powered decision-support system shall be developed, providing transportation agencies actionable insights for targeted safety interventions. Representative rural and urban case studies shall demonstrate the applicability and effectiveness of the platform, validated through comprehensive comparisons with historical crash data. Finally, an implementation roadmap shall provide clear, practical guidance for adopting the developed methodologies into agency safety management practices. This project shall deliver robust analytical tools and evidence-based recommendations, significantly enhancing proactive traffic safety measures statewide.	$ -	$ -	$ 64,168.24	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agencies shall investigate fire and blast damage to bridges to develop design and mitigation strategies to enhance structural resilience. Fires and blasts from vehicular collisions, hazardous spills, and encampments beneath bridges pose significant threats to structural integrity and serviceability. To address these significant threats, the Performing Agency 1 shall utilize their outdoor facility to conduct full-scale experimental testing, where a representative bridge, incorporating components aligned with Receiving Agency's practices (e.g., prestressed I-girders), shall be constructed. Fire testing will include controlled burns using various fuel sources (e.g., E-III, diesel, LNG) at different intensities and locations. Blast testing will expose girders to controlled detonations at varying standoff distances to evaluate structural response. The Performing Agencies shall explore mitigation strategies such as fire-resistant materials, protective coatings, and retrofitting methods to improve bridge performance.	$ -	$ -	$ 10,786.77	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall produce Video Summary Reports (VSRs) that promote technology transfer of concluding Receiving Agency research and implementation projects. The Performing Agency shall produce short videos (2 – 5 minutes) informing Receiving Agency staff and university researchers, as well as others nationwide, about the research and implementation results. The Performing Agency shall plan and produce an annual Video Summary Report (VSR) production list in cooperation with the Receiving Agency, track the detailed status of each VSR on the production list, schedule and conduct interviews (live and virtual), travel when requested and necessary to obtain B-roll for enhanced video experience, compose and create the VSRs, coordinate all reviews and approvals, and oversee the final publication and distribution of the final products. The Performing Agency shall also produce other outreach materials as requested.	$ -	$ -	$ 197,656.82	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall apply the accelerated mix design procedure to real pavement designs, encouraging utilization of the new test procedure, enabling the identification of potential areas of improvement, and demonstrating the mechanistic design check. The Performing Agency shall work with a minimum of three (3) Receiving Agency Districts to conduct demonstration projects with performance monitoring. The Performing Agency shall conduct initial performance monitoring on the constructed projects. This monitoring aims to assess the effectiveness of the accelerated design, validate the stability of the designed pavement by evaluating pavement conditions, and enhance the estimated resilience modulus.	$ -	$ -	$ 106,884.36	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Premature pavement failures have occurred on several widening projects, including shoulder widenings, conversion of two-lane roadways to Super 2 sections, and other safety enhancements. Repairing these early failures is time-consuming, expensive, disrupts traffic, and poses safety hazards. Key contributing factors include poor-quality materials, poor joint construction, and inadequate drainage which could have been avoided through proper pavement condition assessment, design, and construction practices. The Performing Agency shall develop detailed guidance to document and implement better widening practices across the Receiving Agency.	$ -	$ -	$ 52,540.08	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist Receiving Agency with implementing AMAZE developed in research project 0-6674-03. The Performing Agency shall write test procedures tailored for AMAZE. Working with the Receiving Agency, the Performing Agency shall enhance the AMAZE to measure specimen dimension and handle field cores with various thickness. The Performing Agency shall then use the findings and data generated from this implementation project to develop and teach implementation workshop for the Receiving Agency.	$ -	$ -	$ 157,472.30	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency with implementing the Surface Aggregate Classification (SAC) for reclaimed asphalt pavement (RAP) developed in research project 0-7025, Develop Surface Aggregate Classification of Reclaimed Asphalt Pavement. The Performing Agency shall implement and verify the methodology of SAC-A RAP classification in a minimum of four (4) Receiving Agency Districts. In each selected Receiving Agency District, the Performing Agency shall work with lab and pavement engineers and their staff to characterize the RAP in terms of SAC, design surface mixtures with the RAP, evaluate the friction and skid resistance of mixtures, and construct and monitor the selected test sections in each Receiving Agency District. The Performing Agency shall then use the data generated in these test sections to develop and teach implementation workshops for Receiving Agency Districts.	$ -	$ -	$ 161,087.59	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The objectives of this project are to complete the design and construction of the automated test system for asphalt mixtures and asphalt binders and to deliver an automated IDEAL cracking and rutting test unit and an automated asphalt binder specific gravity and dynamic shear rheometer testing unit to the Receiving Agency's MTD lab. The automated asphalt mixture testing unit includes (1) auto-air void measurement subunit, (2) specimen conditioning subunit for both room and high temperature, (3) automation arm subunit, (4) automated IDEAL cracking test (IDEAL-CT), IDEAL rutting test (IDEAL-RT), indirect tensile (IDT) strength test subunit, and (5) waste disposal subunit. The automated asphalt binder testing unit includes (1) asphalt binder specific gravity testing subunit and dynamic shear rheometer testing subunit. The automated asphalt mixture and binder test units shall shorten test time and improve lab safety, test efficiency and accuracy.	$ -	$ -	$ 156,304.46	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency Project 0-6992 "Traffic Safety Improvements at Low Water Crossings (LWCs)" proved how easy, low-cost countermeasures improve safety at LWCs by focusing on LWC delineation; using flood-detection sensors, and warning systems to alert travellers of flooded crossings. In addition to recommending the use of raised retroreflective pavement markers (RRPMs) to improve longitudinal markings at low-water crossings, the Performing Agency recommended experimenting with internally illuminated raised pavement markers (IRPMs) at problematic locations where drivers regularly drive through high water conditions. The Performing Agency shall improve safety and operations at LWCs by incorporating a tool which integrates the National Oceanic and Atmospheric Administration (NOAA's) Multi-Radar/Multi-Sensor (MRMS) system, which combines radar, stream gauges, and environmental data to estimate rainfall rates with 1-kilometer resolution across the United States. By leveraging virtual sensor data, the Receiving Agency will enhance the effectiveness of roadway flood warning systems, making early flood detection more robust and improving overall driver safety.	$ -	$ -	$ 68,265.25	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Emerging vehicle types are rising in sales and comprising a larger share of the total vehicle fleet. The characteristics of these emerging vehicle types pose many challenges to our transportation system moving forward. For example, their effect on roadside safety hardware has the potential to be significant based on their increased weight, lower center of gravity, and different crush stiffness. Given a set of impact conditions (i.e., impact speed and impact angle), the impact severity associated with an emerging vehicle will increase linearly with the weight of the vehicle. This raises significant concern related to vehicle compatibility with some categories of roadside hardware, such as various types of longitudinal barriers (e.g., guardrail, median barriers, portable concrete barrier, transitions, bridge rails), terminals, crash attenuators, breakaway support structures, and other devices. Many roadside safety features are optimized for the currently prescribed design impact conditions and may have little or no factor of safety for accommodating more severe impacts. The Performing Agency shall address these issues to prevent experiencing a potentially significant increase in roadway departure crash fatalities. The Performing Agency shall focus on providing a coordinated program of safety research for emerging vehicles that shall develop solutions to meet identified needs. The research findings will benefit the Participating States in numerous ways, not the least of which is enhanced safety.	$ -	$ -	$ 75,680.75	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to develop and produce on-road mobile emissions inventories necessary to support the Houston-Galveston-Brazoria (HGB)-area and Dallas-Fort Worth (DFW)-area reasonable further progress (RFP) State Implementation Plan (SIP) revision for the 2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS). Specifically, the Grantee shall develop and produce on-road mobile link-based emissions inventories for the six HGB ozone nonattainment counties and the nine DFW ozone nonattainment counties for analysis years 2017, 2023, 2026, 2029, and 2032, and contingency years 2024, 2027, 2030, and 2033. Additionally, the Grantee shall develop emissions inventories to meet the vehicle miles traveled (VMT) offset requirements for severe ozone nonattainment areas.	$ -	$ 5,571.29	$ 132,223.66	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this PGA is to update the Microsoft Excel-based emissions calculator that was developed under PGA 582-20-11051-015 to calculate road dust particulate matter (PM) with an aerodynamic diameter equal to or less than 10 microns (PM10) and equal to or less than 2.5 microns (PM2.5) for paved and unpaved roads. This calculator uses Texas-specific activity data in the form of annual vehicle miles traveled (VMT) estimates by county and road type to calculate PM10 and PM2.5 emissions. The Grantee shall incorporate updates to activity data and miles of paved roads and miles of unpaved roads per county into the calculator to improve the accuracy of PM emissions estimates. The Grantee shall also develop a refined, comprehensive PM10 and PM2.5 road dust emissions inventory for paved and unpaved roads for all 254 Texas counties for calendar year 2023.	$ -	$ 234.27	$ 33,735.17	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The work of this Interagency Cooperation Contract (IAC) is funded through a $6.09M grant awarded by the Federal Highway Administration (FHWA) to the Texas Department of Transportation (TxDOT) for the Texas Connected Freight Corridors (TCFC) project. It is a competitively awarded discretionary FHWA Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) initiative. The TCFC project will deploy connected vehicle (CV) technologies in over 1,000 trucks and agency fleet vehicles that will be able to transmit data and receive warnings from five CV applications.	$ -	$ 107,411.41	$ 88,378.54	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Part of the Performing Agency's mission is to provide transfer of technology and knowledge. It is appropriate to provide technology and knowledge transfer to staff of the Receiving Agency and other transportation professionals in Texas who serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, and county and local agencies. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics will include any of the following at the request of the Receiving Agency: planning and environmental review, energy impacts, geographic information system (GIS) techniques to support planning functions, 3D visualization and design, advancements in data collection techniques, access management, construction management, public outreach, right-of-way coordination, project delivery optimization, mobility coordination, utility conflict resolution, asset management, simulation and analysis, and safety.	$ -	$ 21,881.32	$ 27,568.54	$ 4,576.38	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Texas has a high quality network of publicly accessible airports supporting general aviation activities that are important to the economic performance of the state. Business and flight support activities at these airports generate billions of dollars in economic activity, create jobs, and improve business operating efficiencies that help Texas to attract and retain some of the nation's best companies. The Texas Department of Transportation, Aviation Division, conducted studies in 2003, 2005, 2011, and 2018 to quantify the economic impacts of general aviation and commercial service airports within the Texas Airport System Plan (TASP). An assessment of these airport's impacts on their local economies allows the Aviation Division to make strategic planning and funding decisions and provide better support and infrastructure development projects to spur economic growth across the state.	$ -	$ 811,410.58	$ 1,636,479.79	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	The purpose of this Proposal for Grant Activities (PGA) is to improve the accuracy and reliability of Texas on-road mobile source emissions estimates by developing locally calibrated speed bin distributions for use in the U.S. Environmental Protection Agency (EPA) MOtor Vehicle Emission Simulator (MOVES) Model. These speed bin distributions will be derived from probe-based traffic speed data collected from commercial data sources such as INRIX, HERE, and Replica. Current MOVES speed distributions rely on default assumptions or regional travel demand model (TDM) averages that do not capture congestion patterns, time-of-day variations, or dynamic driving behaviors. By replacing these assumptions with empirically derived, regionally representative inputs, this PGA will generate speed profiles that better reflect real-world driving conditions across Texas. These improvements will enhance the precision of emissions modeling used in regulatory air quality planning, transportation conformity analyses, State Implementation Plan (SIP) development, and other statewide environmental assessments. Using widely adopted probe-based data aligns emissions modeling with observed travel behavior and improves the accuracy of statewide emissions inventories.	$ -	$ -	$ 3,224.43	$ 806.11	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency in the areas of project planning, development, and delivery; operations; and maintenance. Strategic highways within the Receiving Agency's jurisdictional area may require unique analyses that involve non-routine specialized analytical expertise and knowledge regarding the application of recently developed methods and research results to address critical needs along those corridors. Both the Receiving and Performing Agencies understand and agree that these analyses will be conceptual in nature and will not include the development of project-specific plans, specifications, or estimates.	$ 5,144.71	$ 156,337.25	$ 153,650.12	$ -	$ -	$ -
452 - Texas Department of Licensing and Regulation	1.1.1. - Sponsored Transportation Research	1. Project Plan. TTI will develop a project plan that will identify and summarize all project tasks and activities, task and activity timing, milestones and deliverables, and due dates for the contract duration. TTI will submit this project plan to TDLR for approval within three (3) weeks after execution of the Contract. Within 10 business days after submission, TDLR will review the project plan and provide comments to TTI on areas of potential revision or approve the plan as submitted. 2. Instructor and Motorcyclist Outreach. TTI will continue the conduct of the education and outreach program initiated in the prior years' contracts to recruit and retain instructors, and to encourage motorcyclists to take safety courses. TTI will track all outreach materials and activities (e.g., events/meetings attended, materials handed out, social media hits, etc.). 3. Instructor Training and Retention Longitudinal Study. TTI will continue to recruit and interview new instructors as outlined in the study workplan developed in FY2025. As data is collected, TTI will conduct a preliminary analysis to determine if any adjustments to the structured interview guides are indicated. TTI will provide a study progress update in the Yearly Summary Report to TDLR within 52 weeks after execution of the Contract. 4. Motorcyclist Licensing, Instructor, and Motorcyclist Resource Website. TTI will maintain and expand the website created in the prior years' contract to include an ordering system of materials produced. This task will consist of the following activities. a. Routine Maintenance and Updates. TTI will update website information (e.g., scheduled training) and respond to inquiries made through the website "Contact Us" page. TTI will design, test, and deploy a materials ordering system to accommodate both pre-printed and customized outreach materials developed and displayed on the website. 5. Instructor Professional Development Workshop. TTI will consult with the TDLR licensed Motorcycle Safety Instructor Training Providers to support an instructor professional development workshop. To ensure the workshop is free of charge for all participants and maximize support instructors, TTI will fund essential costs such as venue, training bikes and insurance, food and beverage, and facilitator travel. 6. Motorcyclist Safety Materials for Driver Education. Using the Driver Education and Safety Review completed in FY2025, TTI will collaborate with the Region 6 Education Service Center and Driver Training and Traffic Safety Advisory Committee (as possible) to provide motorcycle safety materials for easy integration into current curricula. This task will consist of the following activities. a. TTI will request to present the findings of the review to the Driver Training and Traffic Safety Advisory Committee and the Region 6 Education Service Center then collect feedback from the advisory committee and Region 6 to guide the development of motorcyclist safety materials for use in Texas driver education and safety classes. b. TTI will develop and pilot test draft materials based on the review and feedback from the advisory committee and Region 6. Feedback from the pilot test will be used to finalize the materials and draft a quick user guide for providers to aid in implementing the new materials. c. The materials, quick guide, and results of the pilot test will be delivered to TDLR in a technical memo for review and comment within 35 weeks after execution of the contract. Within 10 business days after submission, TDLR will review the project plan and provide comments to TTI on areas of potential revision or approve the plan as submitted. d. TTI will collaborate with TDLR and the Region 6 Education Service Center to provide the materials and quick guide, to driver education and safety providers within 45 weeks after execution of the contract. 7. Texas Department of Transportation (TxDOT) Traffic Safety Conference. TTI will seek to present results of work funded by this project at the annual TxDOT Traffic Safety Conference. Presentation content will be approved by TDLR. As time permits, an overview of the conference will be delivered to TDLR in the Yearly Summary Report within 52 weeks after execution of the contract. NOTE: This task may be eliminated if additional funds are needed for participant compensation in the Instructor Training and Retention Longitudinal Study. 8. Yearly Summary Report. TTI will deliver a yearly summary report of project activities to TDLR within 52 weeks after execution of the Contract. The scope and project timeline of the work outlined in this Contract may need to be modified based on feedback and guidance from the TDLR Motorcycle Safety Advisory Board. In that event, TTI will propose contract changes to TDLR.	$ -	$ -	$ 10,723.25	$ 5,361.63	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical expertise to the Receiving Agency's District Traffic Operations section to aid in addressing the unique issues that occur within the jurisdictional limits of the Houston District. Specific work activities shall include and are not limited to: Scrutinize problematic traffic operation issues within the region, the results of which have statewide implications – wrong way vehicle prevention, freeway ramp metering, mid-block traffic signals on frontage roads, and others of interest to the Receiving Agency. Develop innovative construction traffic control solutions for improved project completion efficiency and public safety	$ 584,189.87	$ 1,165,480.93	$ 1,190,948.30	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall support the Receiving Agency's planning initiatives related to innovation and technology deployments at the Receiving Agency District level. The Performing Agency shall conduct state-of-the-art engagement, communication, project scoping, project assistance through subject matter experts, and planning services. The Performing Agency shall provide documentation of work performed in the form of technical memorandum/reports, task specific outreach materials, meeting handouts, status reports, and other written materials.	$ 124,803.52	$ 1,375,209.62	$ 1,019,901.33	$ 822,000.03	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Two researchers from the Performing Agency shall travel via truck to the Fort Worth District to measure and report the skid values of 17 paving projects using the skid trailer while minimizing operator factors. The Performing Agency shall take two sets of skid trailer measurements with the second set of measurements occurring a year after completing the first set of measurements. The Performing Agency shall measure and report the skid values of 17 paving projects in the Fort Worth District using the skid trailer while minimizing operator factors. The Performing Agency shall take two sets of skid trailer measurements with the second set of measurements occurring a year after completing the first set of measurements.	$ -	$ -	$ 54,206.35	$ 7,064.87	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	• Evaluate and update the current ITS Strategic Plan to reflect national best practices, stakeholder needs, and current/future technologies. • Ensure alignment with federal guidance (e.g., U.S. DOT ITS Architecture and Standards, Connected and Autonomous Vehicles [CAV] integration strategies). • Support regional consistency while promoting statewide interoperability. • Define a roadmap for phased implementation, investment prioritization, and performance monitoring. • Engage stakeholders to build consensus and coordinate strategic actions.	$ -	$ 39,904.34	$ 220,101.81	$ 175,858.74	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	In this project, TTI shall assist the Receiving Agency with the expansion of the existing system for providing roadway flood warnings to transportation operations personnel and the traveling public. TTI shall assist with system enhancements as well as provide support for scaling the physical architecture of the system to accommodate additional regions of the state.	$ 56,993.45	$ 40,891.88	$ 51,012.67	$ 76,175.15	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The George Bush Drive/Wellborn Road interchange improvement project will provide safety enhancements, congestion reduction and improve travel conditions for vehicles as well as transit, bicycle, and pedestrian users to, from and through the Texas A&M University campus as well as adjacent neighborhoods. The student, faculty and staff population of the Texas A&M main campus represents the fourth largest activity center in Texas, with even larger values on Texas A&M home football gamedays. Previous contracts determined public support for the below ground intersection improvement project, preferences for several important design elements and some concerns that require additional analysis. The Performing Agency shall assist the Receiving Agency with reviewing the design and construction phasing options. As instructed by the Receiving Agency, the Performing Agency shall engage the public on strategies for maintaining traveler safety and mobility, as well as mitigating potential neighborhood traffic effects. The Performing Agency shall collaborate with the Receiving Agency and stakeholder groups such as neighborhood leaders, Texas A&M University faculty, administrators, and staff as instructed by the Receiving Agency. The Performing Agency shall review the design and construction schedule for consistency with good design and operation practice and with the expressed interests of the stakeholders. There are a range of schedule, operating and policy strategies that will be pursued for Texas A&M campus activities that would reduce traffic around the interchange and improve safety and transportation network operations. The Performing Agency shall review the traffic management concept to ensure it will meet the community's expectations during the intersection closure. The Performing Agency shall use the findings of the previous contract as a basis for discussion with the Receiving Agency, their design consultant, other experts and other stakeholders on options for alternative construction techniques and traffic mitigation treatments. The Receiving Agency and their consultant will lead these efforts, and the Performing Agency shall assist with ensuring the appropriate stakeholders are involved, and provide suggestions on the project design and construction phasing schedule.	$ 107,406.79	$ 181,341.56	$ 112,175.69	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide continuing support to the Receiving Agency Maintenance Division (MNT) in the certification and further implementation of the Traffic Speed Deflectometer (TSD). The Performing Agency shall establish instrumented certification sites to ensure the quality of the measured pavement deflections prior to the weekly data collection effort. This project includes funds for the Performing Agency to conduct District training and support for implementation of the collected data at both the network and project levels. The Performing Agency shall select sites for instrumentation in the Receiving Agency Odessa and Dallas Districts. The Performing Agency shall give preference to flexible pavements with four lanes with two to four inches of hot mix asphalt (HMA) to minimize temperature sensitivity concerns. To expedite TSD testing, the Performing Agency shall include the instrumentation sites in a test loop of length one to three miles, containing a range of pavements with significantly different deflections. To establish the test loops, the Performing Agency shall contact the Receiving Agency senior District staff and identify candidates for evaluation. The Performing Agency will then test these candidates with ground penetrating radar (GPR) and falling weight deflectometer (FWD).	$ 5,368.01	$ 281,069.79	$ 285,822.29	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide organizational and management support, technical documentation, educational series workshops, enhancements to certification programs for seal coat inspectors and specialists, seal coat manual, forensics and listings of short term and long term topics to enhance the quality of seal coats and other pavement preservation alternatives to the Receiving Agency. The Performing Agency shall provide expertise in project selection, traffic control/safety, pre-project maintenance/repair work, asphalt binder, aggregates, seal coat design, seal coat construction and seal coat forensics as well as other pavement preservation techniques. The Receiving Agency will issue a Notice to Proceed (NTP) prior to any service being performed by the Performing Agency. The Receiving Agency will coordinate with the Performing Agency to develop and determine a work plan, deliverables, period of performance and maximum amount to be expended for each NTP. The Receiving Agency will authorize the NTP and deliver it to the Performing Agency via electronic mail (e-mail).	$ -	$ 352,049.44	$ 244,968.01	$ 420,362.50	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall use its nondestructive testing (NDT) capabilities to evaluate candidate sections proposed by the District. The Performing Agency shall review and evaluate historic plan sets, available soils information, and ground-penetrating radar (GPR) and falling weight deflectometer (FWD) results. The Performing Agency shall use a combination of auguring, coring and dynamic cone penetrometer (DCP) testing to obtain materials for lab testing and to characterize in-situ pavement materials. The Performing Agency shall measure materials' plasticity index, gradation, and recommend to the District which type(s) of stabilizer(s) will be most appropriate for the prevailing site conditions. The Performing Agency shall use its nondestructive testing capabilities, coring, lab testing, auguring equipment, and engineering analysis to diagnose the cause of pavement failures and make recommendations on both short term and long-term repair strategies.	$ -	$ 58,948.90	$ 15,004.95	$ 145,605.70	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall verify ride quality data on final pavement surfaces for projects constructed by Receiving Agency contractors that meet the requirements of: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B) and 2) Item 585, "Ride Quality for Pavement Surfaces." 23 CFR 637B requires state departments of transportation (DOTs) to verify test results determined from contractor's quality control data if the results are used for acceptance on federal-aid highway projects included in the National Highway System (NHS). The Federal Highway Administration (FHWA) guideline for state DOTs is to perform verification tests on a minimum 10 percent sample of projects. Item 585, Surface Test Type B, requires contractors to collect pavement ride quality data with a certified inertial profiler and a certified inertial profiler operator and submit test profiles to the Receiving Agency for acceptance, pay adjustments and corrective work. The Receiving Agency may perform verification testing, and disputes are settled with referee testing. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates. The Performing Agency shall perform the following tasks: Task 1: Conduct Ride Quality Verifications (Estimated Cost: FY25 $234,672; FY26 $233,466; FY27 $228,597) Using the Construction Management Information System Database (CMISD), the Performing Agency shall identify and monitor projects let with Item 585 Surface Test Type B. From among the projects where the Engineer has activated Item 585, the Performing Agency shall travel for the selected projects on which ride quality verifications shall be conducted according to the approved guidelines of the Receiving Agency's Ride Quality Verification Program. For each fiscal year of this interagency contract, the Performing Agency shall verify the ride quality assurance data on a minimum 10 percent sample of Item 585 Surface Test Type B projects. Task 2: Submit Annual Ride Quality Verification Program Report (Estimated Cost: FY25 $50,286; FY26 $50,028; FY27 $48,985) The Performing Agency shall provide an annual Ride Quality Verification Program Report, which shall cover the following items, as a minimum: 1. Identify the number of projects in the selection pool. 2. Identify the projects selected for verification. 3. Report the validation statistics. 4. As applicable, report actions taken to resolve each non-validating project. Task 3: Evaluate the Longevity of Pavement Surfaces (Estimated Cost: FY25 $50,286; FY26 $50,028; FY27 $48,985) At the end of FY 2024, the Performing Agency shall have completed eight full years of ride verifications. This consists of over 375 project verifications on various pavement surfaces with different project scopes. The Performing Agency shall: 1. Identify verification projects to evaluate for ride quality longevity (minimum of 100 projects). 2. Review the initial ride quality information from the verification process. 3. Request annual ride quality data from the Receiving Agency's network level collection. 4. Evaluate the longevity and performance (with respect to smoothness) of the initial paving project. When necessary, the Performing Agency shall collect additional ride quality data on the analysis projects. During the analysis, the Performing Agency shall attempt to identify other contributing factors that might have influenced smoothness performance.	$ -	$ 145,013.37	$ 216,577.73	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI will support TxDOT TP&P with Air Quality and Conformity Technical Support and Analysis. Provides TxDOT with a broad range of air quality and conformity support including statewide conformity support and ongoing update of conformity methods. Other activities include coordination of the Technical Working Group on Mobile Source Emissions (TWG), air quality training and information dissemination activities, ongoing updates of the Texas Guide to Accepted Mobile Source Emissions Reduction Strategies (MOSERS) and policy and technical analysis support. This includes assisting TxDOT in navigating new federal requirements in this area and supporting state and federal emissions quantification and reporting activities.	$ -	$ 819,470.57	$ 716,562.58	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall continue to support the Receiving Agency in the operations and expansion of the Border Wait Time Measurement System (BWTMS) in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements. The Performing Agency shall perform operation and maintenance of the current BWTMS, which entails collection and dissemination of wait time and crossing time data from United States (U.S.)-Mexico border crossings. The Performing Agency shall expand and improve the BWTMS by expanding, enhancing at land ports of entry (LPOEs) under renovation and expansion, and implementing the BWTMS for southbound travel. The final goal of the BWTMS D2I platform is to make real-time border-crossing operational data and insights accessible to the Receiving Agency, stakeholders, transportation agencies, researchers, and the public.	$ -	$ 804,967.78	$ 1,395,789.15	$ 1,056,770.07	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency [TxDOT's Public Transportation Division (PTN)] is responsible for planning, technical assistance, and statewide coordination of bicycle and pedestrian transportation. The collection of bicyclist and pedestrian count data helps the Receiving Agency quantify walking and bicycling activity around state highways to support transportation investment decisions that accommodate multimodal activity.	$ -	$ -	$ 612,942.30	$ 317,794.76	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical support for the development and implementation of predictive maintenance solutions, including: • Concept development, structure design, and workflow planning. • Data analysis, model development, pilot testing, deployment, and performance monitoring. • Model maintenance and ongoing technical assistance to support the Receiving Agency's operational needs.	$ -	$ -	$ 100,152.75	$ 100,274.32	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency will be available on-call and provide services at the Receiving Agency's request. Work products are delivered through the Work Order procedure: 1. The Receiving Agency identifies a Work Order for the Performing Agency to deliver and links it to a Service Area Task. 2. The Receiving Agency requests a proposal from the Performing Agency, including a scope, work products, budget, and timeline. The Performing Agency assigns a project manager in collaboration with the Receiving Agency. 3. The Receiving Agency reviews and approves the proposal, issues an NTP, and initiates the work. Upon receipt of a National Transportation Partnership (NTP) from the Receiving Agency, the Performing Agency shall conduct the Work Order, provide work products within the approved budget and timeline, and establish a schedule for progress meetings. Upon completion and delivery of the work products, the Performing Agency and the Receiving Agency will close-out the Work Order, transmitting final documents and establishing a document archive.	$ -	$ -	$ 1,521,921.51	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Receiving Agency (TxDOT's Public Transportation Division) is responsible for administering the state's program for public transportation. The scope of responsibility includes the distribution of federal and state funding for public transportation in small urban and rural areas, and state funding for eligible large urban areas. The Receiving Agency is also responsible for managing the programs for planning, technical assistance, and statewide coordination of public transportation. The Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions and advanced problem-solving capabilities.	$ -	$ -	$ 719,469.91	$ 583,281.96	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	This scope of services outlines general task areas the Performing Agency shall perform for the Receiving Agency's Waco District to support innovation and excellence in planning, construction, operations, and maintenance in the Waco District, primarily in support of the Waco I-35 corridor network.	$ -	$ -	$ 1,711,170.41	$ 1,246,564.62	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency's Rigid Pavements and Concrete Materials Section (RPCM), Materials and Tests Division, with utilizing a Real Time Profiler (RTP) devise on new concrete pavement projects. The Performing Agency shall also evaluate ride quality data from rigid pavements and identify industry best practices.	$ -	$ -	$ 6,125.77	$ 8,464.47	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide assistance to the Receiving Agency with materials non-routine testing, to include, but not limited to, concrete, aggregates and cement materials. Preforming Agency shall travel to Receiving Agency Headquarters (Austin, TX) for progress meetings as requested by the Receiving Agency.	$ -	$ -	$ 88,511.00	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical services, as directed by the Receiving Agency, to examine traffic impacts of work zones to assist the Receiving Agency in minimizing traveler delay and potential safety impacts. The Performing Agency shall identify best practices to analyze work zone performance, conduct operational analysis, and evaluate safety impacts. Key performance measures at work zones are vehicle operating speed, vehicle delay through the work zone, vehicle queue length approaching the work zone, crash experience, number of erratic maneuvers, driver understanding of traffic control devices, and public complaints. The Performing Agency shall investigate best practices for using Smart Work Zone technologies to provide guidance for pilot projects and technology implementations in the Receiving Agency's Dallas District (guidance consistent with TRF Smart Work Zone standards). The Performing Agency shall conduct independent evaluations of project implementation of promising work zone technologies (e.g., end-of-queue detection and warning, comparative travel times, etc.) to assess the effectiveness of mitigating the impacts on the traveling public.	$ -	$ -	$ 531,698.43	$ 841,384.28	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall support the Receiving Agency with database development, data analysis, data processing, data visualization, and dashboard development. Upon request from the Receiving Agency, the Performing Agency shall: • Assist with category formula percentages updates for Allocations. • Document and continuously update the UTP working file process. • Identify and analyze data issues and provide solutions to correct data issues. • Recommend working file process improvements and increased automation. • Update and maintain data in the UTP working file and suggest a centralized data structure. • Update and maintain the historical category Tableau dashboards. • Update and maintain the UTP historical allocations data. • Change order database work (creation and processing). • UTP project listing task support and modifications • Provide specific database, data analysis, and data processing support as requested. • Collect data sources used for updating UTP Tableau dashboards and process data. • Use Snowflake to directly link data to UTP processing and Tableau dashboards. • Update UTP Tableau dashboards that align with data source refresh. • Update risk Tableau dashboards and update/modify process. • Provide documentation for the processes. • Create and update UTP Data HUB • Ongoing mentoring and technical support (e.g., support for project data review during UTP pre- alignment) as needed. • Use and incorporate Artificial Intelligence, as determined to be appropriate for the work product by the Receiving Agency, into UTP functions including, but not limited to databases, funding allocations, dashboards and documentation. Recommend items that could potentially be improved with Artificial Intelligence to the Receiving Agency for staff evaluation The Performing Agency shall assist the Receiving Agency with developing the Annual Portfolio Achievement Report (APAR), document Standard Operating Procedures (SOPs) and swim lanes, provide process improvements including form development, and provide guidance for the centralization of the data used by the Receiving Agency. The Performing Agency shall also develop/modify the UTP Project Call process and create a Scenario Planning Tool to support the Receiving Agency. The Performing Agency shall work with the Receiving Agency to identify and review the data needed for inclusion in this task. The Performing Agency tasks include but are not limited to: • Update the project phase volume Transportation Planning and Programming key performance measure (KPM) quarterly data. • Develop an executive summary for the APAR. • Update the Transportation Planning & Programming Division's APAR KPM data in Tableau quarterly. • Work on Data items listed in the Deliverables section. • Update and maintain current APAR and KPM dashboards • As appropriate, move dashboards and reports towards being fully automated • As determined to be appropriate for the work product by Receiving Agency staff, incorporate the use of Artificial Intelligence into the APAR process The Performing Agency shall coordinate with the Receiving Agency to maintain a project tracking system in SharePoint that: • Collect information on project schedules. • Notates deliverable submissions from the Performing Agency. • Identifies deliverable reviews required of the Receiving Agency. • Maintains copies of deliverables, reports, progress reports, and other project communication. The Performing Agency shall provide program management services to include: • Participation in planning coordination meetings (conference calls and in-person meetings) with the Receiving Agency. • A monthly report providing a tracking of expenditures, a projection of expenditures over the life of the contract, a summary of what tasks were worked on and who worked on those tasks, and a progress update on all deliverables being worked on • A monthly meeting to review the monthly report discussed above • Weekly meetings between the Performing Agency and the Receiving Agency to discuss progress on tasks, anticipated activities in the coming week (including external activities The Performing Agency shall provide technical support and services upon request by the Receiving Agency's UTP.	$ -	$ -	$ 1,170,553.74	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall operate the Mobile Pavement Marking Retroreflectivity Verification Program which was initiated in 2015 to verify pavement marking retroreflectivity data on projects completed by the Receiving Agency's contractors. Projects included in the verification program must meet the following requirements: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B). 2) Item 666, "Retroreflectorized Pavement Markings." 23 CFR 637B requires state departments of transportation (DOTs) to verify test results determined from contractor's quality control data if the results are used for acceptance on federal-aid highway projects included in the National Highway System (NHS). The Federal Highway Administration (FHWA) guidelines for state DOTs is to perform verification tests on a minimum 10 percent sample of projects. Item 666, "Retroreflectorized Pavement Markings," covers the installation of pavement markings and requires the contractor to meet minimum initial retroreflectivity requirements for most jobs. The contractor must use a mobile retroreflectometer approved by the Receiving Agency's Materials and Tests Division and certified by the Performing Agency's Mobile Retroreflectometer Program, or a handheld retroreflectometer to evaluate the markings. Contractors are required to evaluate the markings within a certain time window after installation, depending on the type of marking and pavement surface. If markings are not accepted based on retroreflectivity requirements, the contractor must correct them at their expense. The Receiving Agency may perform verification testing to ensure accuracy of the submitted retroreflectivity data. The Performing Agency shall conduct pavement marking retroreflectivity service life evaluations. These evaluations require retroreflectivity measurements over time and conducting analyses needed to determine the pavement marking service life. This will help Receiving Agency to establish service life estimates and to help satisfy the FHWA minimum maintained retroreflectivity requirements.	$ -	$ -	$ 99,024.32	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical support for sampling and laboratory mixture designs of full-depth reclamation (FDR) using asphalt or other treatments, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division. The Performing Agency shall travel to TxDOT District's to collect representative samples, using specialized equipment that mimics expected level of pulverization, and return those samples to the laboratory for additional materials testing.	$ -	$ -	$ 49,621.03	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical support for testing soils and aggregates, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division. The Performing Agency shall review and summarize existing practices and research findings from soils and aggregates topics. This review shall include but is not necessarily limited to test procedures, methods, and past research. The Performing Agency shall identify how results from this task could enhance or streamline current practices. The Performing Agency shall recommend updates to existing practices based on the findings, and may develop outreach content to support the recommendations.	$ -	$ -	$ 5,774.72	$ 30,453.02	$ -	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide safety analysis in support of the Traffic Safety Division. Task A: Provide Technical Assistance and Support for Updating and Managing Implementation of the Texas Strategic Highway Safety Plan (SHSP) in Compliance with Federal Requirements. The Performing Agency shall: • Facilitate meetings (primarily held virtually) with the: o Traffic Engineering Section IAC management staff up to every two weeks. o Management Team (MT) up to monthly. o Executive Committee (EC) as determined by the MT, up to four times per year. o And on an ad hoc basis with particular stakeholders, as determined by the SHSP Update Plan or IAC management staff. • Facilitate at least one meeting with each Emphasis Area Team (EA) (exact number TBD based on SHSP Update Plan). Additionally, use other methods of communication which may include information posted to the Texas SHSP website, webinars to share best/promising practices, and published case studies to share projects and processes and encourage conversations about potential countermeasure and action plan updates. • Facilitate working groups as determined by the IAC management staff. • Continue to implement the stakeholder engagement plan developed in FY25. • Update or expand the crash or driver behavior analysis in a specific emphasis area(s) to target geographic areas. In FY26, the analysis will include, but not be limited to: o Facilitating the receipt of distracted driving data from Cambridge Mobile Telematics. o Facilitating conversations with IAC management staff, the MT, the EC, and EA on how to utilize the data. o Performing further analysis, if identified and feasible. o FY27 analysis will be determined based on needs identified in FY26. • Maintain the SHSP dashboard and publish it to the SHSP website. • Maintain a digital Traffic Safety Calendar on the SHSP website at least quarterly. • Maintain, update, and enhance the Texas SHSP website including updating crash trends including the improvement of the maintenance process for the website's framework. • Prepare a comprehensive plan (SHSP Update Plan) in FY26 that outlines how the Performing Agency shall update the SHSP. The plan will include activities, timelines, responsible/involved parties, and any other relevant information to ensure the SHSP process and plan update is conducted in accordance with federal requirements. • Execute the SHSP Update Plan in FY27, including providing a complete updated version of the SHSP. Task B: Provide Assistance Related to Highway Safety Improvement Program (HSIP). Estimated Costs – The Performing Agency shall: • Prepare the Crash Analysis and Visualization (CAVS) data based on the updated HSIP work code tables and provide the data to the Receiving Agency. • Conduct up to two training webinars on the use of CAVS tools for selecting the projects for HSIP. Task C: Provide Ad-Hoc Data Analysis Assistance. The Performing Agency shall: • Conduct additional analysis and safety studies as needed and as requested by the Receiving Agency, with data compiled and technical memorandums produced in a timely manner. Meetings and briefing presentations will be accommodated by appropriate Performing Agency staff as required. The Performing Agency shall provide a statement of work and budget prior to ad-hoc assistance and if requested analysis and studies are beyond the assigned budget, the Receiving Agency and Performing Agency will determine if the scope should be reduced or the budget should be increased.	$ -	$ -	$ 84,861.03	$ 243,904.56	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Texas Department of Transportation (TxDOT) has been conducting research on predicting skid resistance for over five decades. This research has focused on measuring the polishing resistance of the coarse aggregate portion of mixes. This has led to the development of a surface aggregate classification (SAC) where the SAC A materials are rated as having good skid resistance properties; however, recently, it is reported that some mixes with predominantly SAC A materials have low skid resistance. In addition, some of the fine surface mixes with little coarse aggregate have been shown to have excellent skid resistance. One conclusion is that the long-term skid resistance of any surface mix is a function of many factors including, but not limited to mix type, gradation, the quality of the fines, and not simply coarse aggregate properties. The goal of this study is to develop and validate a laboratory test procedure to measure skid resistance of any proposed surface mix. This test procedure will eventually be incorporated into TxDOT's Balanced Mix Design (BMD) process.	$ -	$ 163,488.58	$ 4,045.68	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall maintain traffic monitoring program collection and data processing guidelines, including Receiving Agency traffic data collection standards, and traffic data collection needs to support initiatives and data processing. The Performing Agency shall maintain awareness of and review current industry standards, such as the Federal Highways Administration (FHWA) Traffic Monitoring Guide (TMG), Highway Performance Monitoring Program (HPMS) Field Manual, and other guidance.	$ -	$ -	$ 89,603.43	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Several TxDOT districts have reported early top-down cracking issues linked to the use of Reclaimed Asphalt Pavement (RAP) materials, which can make the surface layer excessively stiff. Unlike bottom-up fatigue cracking—where distress originates at the bottom of the hot mix asphalt (HMA) layer—top-down cracking begins at the surface and propagates downward. This phenomenon is influenced by the stiffness ratio between the surface and lower HMA layers, as well as the high edge stresses from radial truck tires. While bottom-up fatigue cracking and the negative effects of RAP in lower asphalt layers have been well addressed, top-down cracking remains unaccounted for in Texas Mechanistic-Empirical Flexible Pavement Design System (TxME). As a result, premature top-down cracking cannot currently be predicted at the design stage. With growing economic and environmental incentives for RAP use—and current specifications allowing it in surface layers—integrating a top-down cracking model into FPS23/TxME is essential to assess its impact properly. Therefore, this study aims to 1) Evaluate and develop an appropriate mechanistic-empirical (ME) top-down cracking model, 2) Implement it in TxME, and 3) Calibrate/validate the model. The Performing Agency shall review the literature, identify the Mechanistic-Empirical (ME) model, integrate it into TxME, and collect test section data—including mixture properties, structure, and field performance—for calibration and validation.	$ -	$ -	$ 21,448.28	$ 9,708.66	$ 3,013.36	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The operational and safety benefits of modern roundabouts are well established, providing less delay and significantly reducing fatalities and serious injuries. While their use in Texas and throughout the country continues to grow, opportunities for further implementation can be limited in some locations due to their relatively high construction costs, compared to alternatives such as traditional intersections controlled by stop signs or traffic signals. The footprint of roundabouts is often larger than these traditional alternatives, increasing costs for right-of-way and pavement; while those upfront construction costs can be mitigated over the life of the intersection through reduced maintenance and operation costs, the construction costs are still a factor in the decision-making process for intersection control. This effect can be even more pronounced when attempting to build roundabouts with scarce safety, maintenance, or mobility funds, as the cost of one roundabout can account for the entire annual allotment of a district's safety funds. To maximize opportunities for roundabout implementation, research is needed to identify more cost-effective ways to address footprint and construction costs. The Performing Agencies shall review existing practices and assess the effectiveness of promising methods for reducing roundabout construction costs, providing recommendations to the Receiving Agency for future implementation.	$ -	$ -	$ 16,357.11	$ 14,153.65	$ 4,393.00	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall develop and test a simple and straightforward methodology that directly incorporates safety considerations into the roadway design process. The Performing Agency shall develop and deliver four products: (1) Integration of the current web-based Safer by Design (SBD) Tool with existing databases hosted by the Receiving Agency, allowing roadway data, when available and possible, to be automatically retrieved; (2) Enhancement of the current SBD Tool by expanding its index-based (e.g., safety score) methodology to support interstate and freeway project development and design; (3) Development of training and reference materials to assist designers in understanding how to incorporate safety considerations into design decisions for interstate and freeway segments; and (4) SBD artificial intelligence (AI) based on the SBD frequently asked questions (FAQ) and user guide, providing users an interactive chatbot that delivers consistent responses.	$ -	$ -	$ 1,357.09	$ 120,063.95	$ 46,959.00	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The purpose of this effort is to monitor and analyze statewide congestion. This effort includes the creation of the Texas Top 100 Congested Road Segments, calculation of Texas Transportation Commission's key performance measures (KPM), calculation and distribution of federal performance measures, development and maintenance of the Congestion Management Process Assessment Tool (COMPAT), Urban Mobility Report (UMR), and assessment of mobility benefits of congestion reduction projects. This agreement allows Texas A&M Transportation Institute (TTI) to provide technical support and assistance to TPP related to identifying and monitoring the Texas Top 100 Most Congested Road Segments to implement requirements and provisions of H.B. No. 1, General Appropriations Bill, Rider 14(j).	$ -	$ -	$ 527,447.15	$ 1,307,670.33	$ 1,217,741.61	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Current asphalt pavements with traditional asphalt mixes perform well under free flow traffic at regular speed. However, due to the nature of slow-moving or standing traffic, the same pavement structure with the same materials appears to severely rut at intersections. Ruts deeper than 2-inches were observed at multiple highway intersections, including those designed with premium mixes such as Stone-Matrix Asphalt, which result in serious safety concerns during wet weather conditions and costs millions of dollars annually to fix. Pavement designs specifically for slow-moving or standing traffic areas such as intersections, are rarely investigated. With the increasing frequency of extreme weather conditions and increase in truck traffic, there is an urgent need to develop long-lasting asphaltic pavement designs for intersections. The Performing Agency shall coordinate with the Receiving Agency to develop heavy duty intersection designs for different traffic levels following the same format of the heavy-duty pavement guidelines (i.e. catalogue design approach), using the Texas Mechanistic-Empirical Asphalt Concrete Pavement Design and Analysis System (TxME) with suitable asphalt mixes and other layer materials designed with the reliable laboratory testing protocols. Furthermore, the Performing Agencies shall identify and construct up to three field test sections for Validation of the new heavy duty intersection design method.	$ -	$ -	$ 19,597.38	$ 24,682.53	$ 22,985.11	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Task 1- Errors and Omissions Training The Performing Agency shall implement up to 12 Errors and Omissions training classes: 4 each in FY 2026, FY 2027, and FY 2028, all using the most current approved materials developed by the Performing Agency. Each class shall be two days long and use existing materials developed by the Performing Agency. Classes shall be delivered remotely. The Receiving Agency shall document successful implementation through collection of online class evaluations. The Receiving Agency shall coordinate scheduling and attendance. Task 2- Construction Engineering and Inspection (CEI) Training The Performing Agency shall implement up to 12 CEI training classes: 4 each in FY 2026, FY 2027, and FY2028, all using the most current approved materials developed by the Performing Agency. Each class shall be 1.5 days long and delivered remotely. Instructions shall be led by two professors. The Receiving Agency shall document successful implementation with online class evaluations provided by the Receiving Agency. The Receiving Agency shall arrange and coordinate scheduling and attendance. The Performing Agency shall train an alternative instructor to provide training flexibility and resilience. Task 3- Update – Analysis of CEI Data and Interviews The Performing Agency shall analyze data provided by the Receiving Agency for estimating the expected CEI man-hours/cost on Receiving Agency projects as well as confidence levels regarding the probability of the CEI cost not being exceeded (e.g. P50, P80). The Performing Agency shall understand what factors drive CEI cost. In addition to the bid amount/construction cost that are reported in literature, the Performing Agency shall analyze the impact of other factors including, but not limited to work type category, complexity of construction scope, estimated cost of project construction, recorded cost of engineering design, type and frequency of reported change orders, rural vs. urban locations, and project duration. The Performing Agency shall rely on data sets (e.g. Site Manager, Peoplesoft, PS-CAMS, etc.) that will be provided by the Receiving Agency. In addition, the Performing Agency shall interview individuals suggested by the Receiving agency to complement the results from the quantitative analysis. Finally, the Receiving Agency shall use the results from this task to update the existing content of the Construction Engineering and Inspection training material. Task 4 - Update – Analysis of Design Engineering Cost Data and Interviews The Performing Agency shall analyze data provided by the Receiving Agency for estimating the expected design engineering man-hours/cost on Receiving Agency projects as well as confidence levels regarding the probability of the design engineering cost not being exceeded (e.g. P50, P80). The Performing Agency shall understand what factors drive design engineering cost including consideration of different levels of design complete (e.g. 30-60-90). In addition to the bid amount/total construction cost that are reported in literature, the Performing Agency shall analyze the impact of other factors including, but not limited to work type category, complexity of design scope and iterations cycles, estimated cost of project construction, rural vs. urban locations, and other relevant factors. Furthermore, the Performing Agency shall illustrate the relationship between design engineering cost on errors and omissions and other change order types. The Performing Agency shall rely on relevant data sets (e.g. Site Manager, Peoplesoft, PS-CAMS, etc.) that will be provided by the Receiving Agency. In addition, the Performing Agency shall interview individuals suggested by the Receiving agency to complement the results from the quantitative analysis. The Receiving Agency shall use the results from this task to update the existing content of the Errors and Omissions training material. Task 5- - Refresh Teaching Materials A. The Performing Agency shall revise the existing Construction Engineering and Inspection training materials using the results from the data analysis and interviews in Task 3. B. The Performing Agency shall revise the existing Errors and Omissions training materials using the results from the data analysis and interviews in Task 4. Task 6- Project Management The Performing Agency shall provide monthly progress reports to the Project Director of the Receiving Agency. The Performing Agency shall organize the progress reports shall by scope task and include a summary of work accomplished and deliverables submitted for Tasks 1-5 for the period being reported.	$ -	$ -	$ 114,163.31	$ 269,383.65	$ 250,858.09	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide Ground Penetrating Radar (GPR) technical expertise, to include conducting surveys, validation testing, training workshops and performing analysis on data collected with non-contact GPR systems. The Performing Agency shall also assist in performing maintenance on all the non-contact GPR antenna systems and assist with semi-annual calibrations and system to system reproducibility measurements when requested by the Receiving Agency. The Performing Agency shall assist the Receiving Agency with expanding its GPR data collection fleet.	$ -	$ -	$ 90,058.14	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall assist the Receiving Agency to understand commercially available transportation data and data services and create plans for pilot deployments.	$ -	$ -	$ 1,421,342.80	$ 554,316.09	$ 516,195.67	$ -

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601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The scope of services provided by the Performing Agency is outlined in the following tasks to be performed for the Receiving Agency's Materials and Tests Division (MTD). The Performing Agency shall develop a Materials Academy Workshop training program for Receiving Agency personnel with an emphasis on highway construction materials. The Performing Agency shall travel to the Receiving Agency's facilities in Austin, TX and conduct two (2) workshops in each fiscal year. The workshop shall consist of up to two (2) weeks of preparation and webinars, two (2) weeks of in-class lecture and laboratory hands-on sessions at the Receiving Agency, and approximately one (1) week of class sessions with manufacturing plant visits at non-Receiving Agency facilities including, but not limited to the TxAPA (Texas Asphalt Pavement Association) Buda facility. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (Email) for each fiscal year prior to any service being performed by the Performing Agency. The NTP may only be authorized by the Receiving Agency's Materials and Tests Deputy Director or a higher level of authority. The NTP will include a work plan, maximum amount payable, and initiation and completion dates. Task 1. Materials Academy Management (Estimated Costs - $105,000) The Performing Agency shall manage the Materials Academy to include: • Develop the Academy outline, • Develop the agenda, • Develop the list of instructors, • Replace instructors, • Coordinate classroom management, • Organize field trips, • Coordinate travel for field trips, • Incorporate changes based on new specifications into curriculum, as needed, • Provide in-person oversight at all classes and plant tours. All Materials Academy Management is in support of conducting the training based on materials used in highway construction by the Receiving Agency. Task 2. Develop Academy Curriculum and Supporting Materials (Estimated Costs - $700,000) The Performing Agency shall modify, as needed, previously developed instructional materials to address attendee reviews, new test procedures, new specifications, and new national or Receiving Agency changes in materials, materials selection, or design. New instructors shall use baseline existing materials and make modifications to address the above and to incorporate their own teaching materials, examples, and case studies. The Performing Agency shall develop a set of questions to be answered by attendees for each materials site field trip. The Performing Agency shall provide an electronic version (e-version) of all materials including, but not limited to, webinar materials, storage devices, PowerPoint presentations, laboratory activity schedules, exercises, and field trip schedules to implement the Academy. The PowerPoint presentations will include, but not be limited to, Receiving Agency specifications, basic materials information of the topics in Task 1, hands-on laboratory sessions at the Receiving Agency's Lab, case studies, and tying lecture-lab to field experiences and problem solving. The Performing Agency shall work with the Receiving Agency to develop and administer daily workshop evaluations. Task 3. Conduct Materials Academy Workshops (Estimated Costs - $780,000) With the Receiving Agency's approval, the Performing Agency shall schedule the workshops for 25 to 30 participants each between October and May of each fiscal year (two courses per fiscal year). The Performing Agency shall conduct the in-class lecture and aid the Receiving Agency in the laboratory portion of the workshops at the Receiving Agency's facility. The Performing Agency shall initiate the classroom materials manufacturing lectures and launching point for material manufacturer's field trips at the TxAPA Buda facility. The Performing Agency shall provide group transportation to visit material manufacturing plants via bus for the first three (3) days, and the participants will provide their own transportation to the last day. The Performing Agency shall revise the agenda, topics, or laboratory sessions based on participant feedback. The Performing Agency shall submit recommended changes to the Receiving Agency for approval. Task 4. Modify Academy Curriculum and Supporting Materials (Estimated Costs - $123,020) Upon receipt of the Receiving Agency's approval, the Performing Agency shall modify the curriculum and course material based on participant evaluation feedback. The Performing Agency shall revise and submit an e-version of any modified course materials for the Academy.	$ -	$ -	$ 475,764.96	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The higher education provider will support TxDOT in the administration of the Technology Task Force. The selected higher education provider shall provide a network of transportation professionals and experts that will fulfill the legislative mandate of the Task Force by managing the Emerging Technology Portfolio, publishing white papers on critical topics, delivering strategic plans such at the Technology Utilization Plan (TUP), developing communication strategies, and conducting Task Force meetings with in-depth technical analysis: • Work with the Strategic Initiatives and Innovation Division, Innovations Section, to meet expectations of the deliverables for the contract. • Identifying emerging technologies and analyzing potential impacts and gather recommendations from consortium members related to value and implementation of emerging technologies enhancing the Texas transportation system. • Maintain a core knowledge working group and network of subject matter expertise. • Create collaboration opportunities to facilitate Texas Technology Task Force, including on-going communications between state, FHWA, regional, and local public agencies and other highway sector stakeholders. • Act as a liaison to provide a forum for presenting, discussion, and proposing solutions to critical transportation-related problems. • Serve as a catalyst for rapid deployment of nationally and state identified new technologies, strategies, and methods that have already been demonstrated to be successful in "real world" applications and would lead to improved performance and effectiveness of the transportation system within the State of Texas.	$ -	$ -	$ 207,810.67	$ 374,513.25	$ 348,757.91	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency (and implementation partners) shall provide coordination, laboratory testing and analyses, field project development and monitoring, and syntheses to support further refinement and implementation of the Special Specification to Item 344, "Superpave Mixtures - Balanced Mix Design (BMD)" (SS-BMD). As shown in Figure 1, these activities shall result in revised version(s) of SS-BMD with performance thresholds and revised test methods as needed for mix design and quality assurance (QA) to provide a practical method to engineer each unique materials combination to realize substantial economic and environmental benefits without sacrificing balanced engineering performance. Previous revised draft versions of SS-BMD were developed based on results from the 2019-2022 and 2022-2025 Interagency Cooperation Contracts (IACs).	$ -	$ -	$ 310,648.66	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide certification of the Receiving Agency's inertial profilers and profiler operators, assist with measurement of pavement surface characteristics, set up profiler verification sections, assist Districts in using profile data for pre-construction planning and programming, and provide assistance in using ride quality assurance test data to establish the scope of corrective work based on Receiving Agency ride quality projects. The Performing Agency shall conduct the Receiving Agency's profiler certifications using Receiving Agency's Test Method Tex-1001-S.	$ -	$ -	$ 126,431.00	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agency shall provide technical assistance for improving TxME as part of the Receiving Agency's flexible pavement design system. This will include software enhancement and upgrade, materials laboratory testing to assist in generating default inputs for the latest generation of paving materials, and incorporation of the latest portable weigh-in-motion (WIM) traffic load data.	$ -	$ -	$ 53,752.27	$ -	$ -	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	TTI's IAC concerning the Erosion & Sediment Control Materials Testing Program. The Performing Agency shall aid the Receiving Agency with testing and evaluating erosion and sediment control products. Assistance shall include, but not be limited to, equipment and instrument calibrations, baseline testing, erosion and sediment control product testing, reporting test results, and updating the Receiving Agency's Interactive Approved Product List (IAPL).	$ -	$ -	$ 257,755.12	$ 631,657.99	$ 588,218.76	$ -
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	The Performing Agencies shall develop recommendations and construction guidelines for using Reclaimed Asphalt Pavement (RAP) as aggregate in seal coats for pavement maintenance in Texas. Incorporating RAP in seal coats offers potential benefits, including cost savings, improved moisture resistance, and prolonged oxidation resistance. The Performing Agencies shall establish test methods, procedures and guidelines for evaluating RAP stockpiles, materials selection, material processing, application rate design, quality control and quality assurance during construction, laying the groundwork for statewide adoption. Given the lack of national guidance, a state-specific approach is essential to maximize performance and feasibility. The findings will provide the Receiving Agency with the technical basis to integrate RAP into seal coats effectively, leading to substantial cost savings and enhanced pavement sustainability.	$ -	$ -	$ 54,959.15	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	1.1.1. - Sponsored Transportation Research	Estimated future interagency contracts based on historical current and future anticipated demand for transportation related research services.	$ -	$ -	$ -	$ 946,562.29	$ 1,040,935.18	$ 1,051,764.49

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	1.1.1. - Sponsored Transportation Research	Estimated future interagency contracts based on historical current and future anticipated demand for transportation related research services.	$ -	$ -	$ -	$ 35,914,410.94	$ 43,137,611.95	$ 47,070,971.44
452 - Texas Department of Licensing and Regulation	1.1.1. - Sponsored Transportation Research	Estimated future interagency contracts based on historical current and future anticipated demand for transportation related research services.	$ -	$ -	$ -	$ 82,164.72	$ 85,041.40	$ 85,229.33
Agencies/ Municipalities In States Other Than Texas	1.1.1. - Sponsored Transportation Research	Expenditures for agencies in states other than Texas that should have been reported in MOF 666-Appropriated Receipts rather than MOF 777-Interagency Contracts.	$ 86,135.03	$ 29,482.38	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Technical Assistance and Support to the Transportation Planning and Programming Division - continuation to use leftover funds from previous agreement.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency is responsible for satisfying the federal requirements for transportation plans and programs throughout the State pursuant to 23 U.S.C. 135 and 49 U.S.C. 5304 and oversight responsibilities for transportation plans and programs developed by metropolitan planning organizations (MPOs) pursuant to 23 U.S.C. 134 and 49 U.S.C. 5303 as well as the state requirements under Texas Transportation Code 201, Subchapter H. In addition, the Receiving Agency is responsible for carrying out a continuing, cooperative, and comprehensive statewide transportation planning process, including the development of a long-range statewide transportation plan and statewide transportation improvement program and overseeing the development of the metropolitan transportation planning process. The Performing Agency shall provide technical expertise to the Receiving Agency for statewide and metropolitan transportation planning and programming and comply with the Receiving Agency's Service Request Process outlined in EXHIBIT 1.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall update and deliver seal coat training and provide general support to the Receiving Agency to address strategic maintenance and pavement preservation activities.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide a variety of quick response services, such as planning, evaluation, and technical support, to the Receiving Agency as it addresses state and federal legislative inquiries and specific requests from Receiving Agency Administration and Texas Transportation Commission (Commission). The Receiving Agency will identify each task and will issue a Notice to Proceed (NTP) to the Performing Agency. The NTP will include a work plan for the requested task, maximum amount payable, and initiation and completion dates. Tasks may vary from the development of a performance measures governance document to assistance with renewed energy sector program impact analysis and repair strategies. As required by the Receiving Agency, and identified in each NTP, the Performing Agency's staff shall travel to various locations around the state to perform its contracted activities.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency [TxDOT's Bicycle and Pedestrian Program in the Public Transportation Division (PTN)] is responsible for planning, technical assistance, and statewide coordination of bicycle and pedestrian transportation. The scope of responsibility includes coordinating the development of planning and design guidelines, providing information resources, and distributing federal and state funding for bicycle and pedestrian transportation projects. In anticipation of eventual mandatory reporting of bicycle and pedestrian counts to the federal Traffic Monitoring Analysis System, the Receiving Agency has built the foundation of a bicyclist and pedestrian count program by engaging the Performing Agency to establish a statewide database, guidance, and training through research and implementation projects. Through the further collection of bicyclist and pedestrian count data, the Receiving Agency will be better informed about how to quantify walking and bicycling activity on state highways and therefore make better transportation investment decisions about how to accommodate increased demand. The Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions, collaboration and partnerships, and advanced problem-solving capabilities. Additionally, the Receiving Agency has limited staff and technical expertise to implement and manage this new count program.	$ (376.82)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide nondestructive testing (NDT), field testing, pavement design and materials testing expertise to assist in identifying the most cost-effective pavement rehabilitation alternatives for candidate projects identified by the Receiving Agency. The Performing Agency shall perform corridor analysis evaluations for routes in Texas identified by the Receiving Agency by using pavement evaluation tools such as NDT, pavement auguring and coring, lab testing, and structural analysis. This task will be performed on an as-needed basis upon request from the Receiving Agency.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall travel to the Receiving Agency's statewide districts to perform full pavement forensic investigations of prematurely distressed highway sections identified by the Receiving Agency to include identifying the causes of distress, conducting routine and advanced physical and chemical materials characterization testing, and recommend the most cost-effective repair alternative to resolve the issue. The Performing Agency shall also develop recommendations for the modification of specifications, materials selection, construction and design practices to avoid future occurrences.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI will provide technical support and assistance to the TPP Division in developing required state-mandated reports on congestion and congestion reduction, congestion and Congestion Mitigation and Air Quality (CMAQ) performance measures and targets, performance–based project selection, and congestion forecasts.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall evaluate implementation of existing and emerging travel behavior (including origin/destination [OD]) data platforms and tools. The Performing Agency shall conduct user assessments and product reviews of the Receiving Agency and all pooled fund participant's experiences with platform tools such as Streetlight, Regional Integrated Transportation Information System (RITIS), and Moonshadow. Assessments shall include interviews, and observations of members using each platform. The Performing Agency shall document the results of this assessment in a technical memorandum. In FY22, the Performing Agency shall also develop an update to the Technical Memorandum "Tools and Best Practices for Using Passive Origin-Destination Data," which was first developed in FY19 (through this pooled fund project) and needs an update to current practices. In FY23, the Performing Agency shall work with the Receiving Agency and all pooled fund participants to develop recommendations and a needs assessment that can be shared with travel behavior platform and data providers to facilitate implementation and best practices of the Receiving Agency and all pooled participants.	$ 123.00	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency's Maintenance Division, with erosion control materials testing. Assistance shall include, equipment calibrations and baseline testing and erosion control product testing.	$ (764.79)	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines general task areas the Performing Agency shall perform for the Receiving Agency's Waco District to support the I-35 construction and operations and routes that are significant to the overall mobility and operations of I-35 around the Waco District. These tasks detail state-of-the-art traveler information and mobility coordination services. The Performing Agency shall provide documentation of work performed in the form of technical memorandum/reports, task specific outreach materials, meeting handouts, status reports, and other written materials.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services for the Performing Agency are outlined in the following tasks to be performed for the Receiving Agency's Dallas District (District). A written Notice to Proceed will be required before any of the following services can be performed. The Notice to Proceed (NTP) can only be authorized by the Receiving Agency's Dallas District by the Advance Project Development Engineer, Transportation Engineering Supervisor, or higher level of authority. Any NTP under Tasks 1,2, 4, 6, 7, or 10 must also be signed by TxDOT's Information Management Division before it is authorized to ensure compliance with State law and TxDOT policy governing hardware, software, and data. Documentation of work performed will be provided in the form of technical memorandums or reports, meeting handouts, monthly progress reports, status meetings, and other written materials as requested by the Receiving Agency. Note, any work related to hardware, software and new or external data will be coordinated with the Information Management Division (IMD), Traffic Safety Division (TRF) and/or any other Divisions as appropriate.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall perform data collection using the Receiving Agency's real-time profiler device on at least two to three concrete pavement projects per fiscal year (FY) during this contract term. The Performing Agency shall collect and analyze the Real Time Profiler (RTP) data and summarize findings for each project.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency for a variety of tasks related to carrying out the Receiving Agency's Data Analytics and Tools Program.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This Interagency Cooperation Contract outlines a comprehensive two-year program to enhance Texas freight planning, analysis, and decision-support capabilities. The primary focus is maintaining and expanding the Truck Congestion Analysis Tool (TCAT), including annual updates using TxDOT's 100 Most Congested Roadways database, quarterly truck mobility reporting, advanced interactive visualizations, origin-destination and truck flow analysis, and integration of truck crash and safety performance data. The contract also supports strategic freight planning through workshops, policy briefings, and development of innovative freight performance tools that help TxDOT better understand truck congestion, mobility, safety, and freight system operations across the state. Beyond congestion analysis, the contract advances freight fluidity, oversize/overweight (OS/OW) truck analysis, truck parking analytics, electronic logging device (ELD) data applications, freight-focused traffic management strategies, and general freight planning support. Major deliverables include development of web-based visualization tools, data dashboards, query systems, technical memoranda, planning studies, stakeholder workshops, and communication resources. Collectively, these efforts are intended to provide TxDOT with actionable data, performance measures, and analytical tools to improve freight mobility, supply chain resiliency, infrastructure planning, truck parking management, safety analysis, and freight-related decision-making throughout Texas while ensuring strong project management, reporting, and data security compliance.	$ 518.40	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide photometric and visibility measurements, forensic analysis, related technical assistance, and specification support.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide photometric and visibility measurements, forensic analysis, related technical assistance, and specification support.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Scope of Services The Receiving Agency (TxDOT's Public Transportation Division) is responsible for administering the state's program for public transportation. The scope of responsibility includes the distribution of federal and state funding for public transportation in small urban and rural areas, and state funding for eligible large urban areas. Receiving Agency is also responsible for managing the programs for planning, technical assistance, and statewide coordination of public transportation. Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions and advanced problem-solving capabilities.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall develop a guide to commercially available transportation data and data services and create plans for pilot deployments that may benefit the Receiving Agency. The Performing Agency shall, on an iterative basis, group data and data services into logical market segments. One possible approach to logical market segments is the implementing Division or District Workgroup of the Receiving Agency. This organization makes it explicit about which group within the Receiving Agency is responsible for a pilot deployment to be recommended in Task 5. A final decision on the preferred organizational approach for logical market segments will be made during conduct of this task.	$ (220.20)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Emergency response services play a vital role in saving lives and minimizing property damage when major events or incidents happen. The Dedicated Short Range Communication (DSRC) and Bluetooth Low Energy (BLE) technologies have the potential to improve the efficiency and roadway safety related to emergency management services. The primary objective of this project is to develop and test DSRC- and BLE-based prototype systems for enhancing emergency preemption and notification. Another objective is to provide the Receiving Agency with guidelines for implementing DSRC and BLE technologies for supporting emergency response services. To this end, the Performing Agency shall: (1) Identify methodologies for improving emergency vehicle signal preemption in a connected environment; (2) Develop and test prototype DSRC-based and BLE-based systems to broadcast Signal Phase and Time (SPaT) messages, Emergency Vehicle Alerts (EVAs), and other notifications to emergency vehicles and other roadway users in the vicinity; (3) Enhance signal preemption performance; (4) Assist the Receiving Agency in implementing the prototype systems at selected Houston field sites; and (5) Identify anticipated cost and benefit of the connected emergency response system. The key products of the project include DSRC and BLE prototype systems that operate with the Receiving Agency's infrastructure and guidelines for implementing the system.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ -	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The majority of bridges in Texas are constructed with girders as simple spans. A simple-span deck requires expansion joints which are sources for maintenance and durability issues. To avoid this, continuous decks are an attractive option, however cracks may develop. The Receiving Agency utilizes a detail that intentionally forms these crack, referred to as the “Texas Poor Boy” detail. Despite a four decade history of such detailing, a comprehensive evaluation of performance of this detailing has not been conducted. The Performing Agency shall conduct a multi-tiered survey to identify the performance of the current “Poor Boy” continuous bridge deck details within different environments (high ADT, high rainfall, or high deicing salt zones), as well as a literature and state-of-the practice survey to establish the detailing and expected performance of alternative connection designs. Using the results of these surveys, the Performing Agency shall develop candidate modifications to the current poor-boy details for new construction and candidate details for rehabilitation of existing bridges. The Performing Agency shall use the modeling and full-scale experimental tests to assess the performance of the recommended details. The Performing Agency shall use the results of the modeling and experimental to make final recommendations for design methodologies and details.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, “Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation” has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Stabilization of roadway or stockpile materials allows for enhancing strength and stiffness properties of pavement base layers to meet structural requirements in a cost-effective and sustainable manner. Historically, stabilization mixture design criteria relied on compressive strength results and, depending on the treatment and test method, could take nearly a month to complete. Additionally, the different treatments currently require different preparation, curing, and acceptance criteria. This project shall develop a harmonized accelerated design procedure for base materials with the objective of producing an acceptable design recommendation within seven (7) days. This project shall include stabilizer types such as cement, lime, lime-fly-ash, asphalt emulsion, and foamed asphalt, and shall focus on rapid test turnaround time, lab curing techniques to rapidly simulate cured field conditions, inclusion of moisture susceptibility in the mix design, and performance-related design criteria. This project shall develop recommended harmonized test procedures, suggested specification modifications as applicable, and perform training workshops.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project will use a phased work plan to develop a freight model within one or more urban areas of the state of Texas using the most current state of the practice methods and data sources. The Performing Agency shall produce a freight model through an interactive and iterative process by the the Performing Agency, Receiving Agency, and Metropolitan Planning Organizations (MPO) partners using the concept of first creating a “minimum viable product” as used in commercial software development. Key initial steps to this process will be investigation of similar recent freight modeling efforts in the United States (U.S.), early identification of freight model requirements for both Receiving Agency and local/regional planning efforts, selection of the type/function of model that will address those requirements, and an assessment of data availability and of any fatal flaws that might be encountered. The Performing Agency shall then work cooperatively with the selected MPO partner to build and implement a state-of-the practice model that can be iteratively improved over time as additional data or methods emerge. Training for model users and an ongoing, web-based forum for users to share insights and questions are also part of the work plan. Reporting of results and transferability to diverse MPOs are other key features of the project.	$ (846.84)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Corrosion of steel has been causing millions of dollars of loss in infrastructure to the state of Texas. The use of corrosion-resistant reinforcement in concrete structures and painting of steel elements have been the most common mitigation strategies. In addition, the use of weathering steel, metalizing on steel and concrete elements, and cathodic protection (sacrificial anode) have also been applied on the Receiving Agency bridges. The performances of different approaches vary with different bridges in different geographic areas; i.e., cold, arid, and humid districts. It is imperative for the Receiving Agency to have a decision tool to conduct effective corrosion prevention for new construction and corrosion mitigation for effective maintenance. The objectives of this project are to (1) conduct a synthesis of worldwide field investigations of the performance of corrosion mitigation, (2) perform field evaluations statewide to investigate the effectiveness of corrosion mitigation instrumented in the past, and to (3) perform lab tests, as necessary, to verify findings and to obtain a better understanding of corrosion mitigation approaches.	$ (303.88)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Roadway departure crashes are the most common type of crash in Texas. These crashes represent over 45% of all fatal crashes and 34% of all serious injury crashes. Texas data shows that there were 9,560 fatal and 30,766 serious injury roadway departure crashes from 2010-2016. Roadside safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. To improve the safety of the motoring public, there is a need to develop new or improved safety devices that accommodate a variety of site conditions, placement locations, and a changing vehicle fleet. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively address high priority issues related to roadside safety devices. The Performing Agency shall provide results in new and improved safety features that minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes. The Performing Agency shall develop roadside safety devices to meet the new American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH), to address the continuing trend of larger vehicles in the statewide vehicle fleet.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.	$ -	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Cross frames are critical for the stability of steel bridges during erection and construction and play an important role for completed bridges. Historically, the brace locations have been regions of fatigue concerns. In addition, the braces require significant handling and processing during fabrication and represent one of the most expensive components per unit weight on the bridge. Therefore, there are major benefits in terms of economics and structural performance to minimize the number of cross frames. Lean-on bracing concepts that replace full cross frames in certain bracing lines with top and bottom struts that allow a single cross frame to brace several girders is a method of minimizing the number of cross frames on a bridge. Lean-on concepts were developed in for TxDOT in the early 2000s. While the previous study developed design guidelines, recent applications of leanon bracing on two TxDOT bridge designs demonstrated the need for improved efficiency and clarity. This project consists of instrumenting the bridges with lean-on bracing during construction to better understand the behavior. The Performing Agency shall carry out parametric finite element analyses (FEA) along with the field monitoring, and develop improved guidelines to facilitate widespread use of lean-on bracing applications in Texas bridges.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Traffic control devices (TCDs) are the primary means of communicating highway information to road users. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project may represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Environmental Protection Agency (EPA) guidance document National Management Measure to Control Nonpoint Source Pollution from Urban Areas (November 2005, EPA-841-B-05-004) requires all construction site activities to reduce the amount of sediment generated (erosion control) and reduce the off-site transport of sediment and construction-related chemicals (sediment and chemical control). While there are several pollutants of concern (oils, gasoline, degreasers, paints, etc.), sediment from construction sites is by far the largest pollutant source (Canning, 1988). Eroded sediment from construction sites causes many problems, including adverse impacts on water quality as well as decreased capacity of reservoirs and streams, resulting in possible flooding. Sediment control devices (SCDs) are used on construction sites to retain sediment and prevent stormwater from adversely affecting adjacent waterways. SCDs include silt fences, wattles, sediment logs and basins, filter dams, and inlet protection devices. These products are designed to be installed for specific applications (curb inlets, drop inlets, perimeter protection, etc.) However, there is no scientifically sound, repeatable testing methodology that replicates field conditions to test and determine SCD performance. This project shall develop a formal testing protocol, test apparatus and propose thresholds for a performance-based sediment control device testing program that will assist the designer/engineer in selecting the most effective sediment control best management practice.	$ (227.95)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this research project is to determine where, when, and why a prime or cure is needed for a pavement layer. Materials such as prime coats, curing materials, seal coats, and tack coat are typically considered non-structural, but integral to the pavement structure. Some materials can be used for multiple purposes: prime, bond or help cure; however, the rates and timing of use may change depending on why the material is being used. Guidance is needed to help designers, inspectors and construction personnel understand the materials and where, when, and why to use them. This project shall develop guidelines for prime and curing through a series of laboratory and field testing and develop tests and procedures to determine the best materials for a prime, cure or a combination. These guidelines shall aid decision makers in determining whether a prime, cure or bonding material is needed, and where, when and why to design and use the appropriate materials.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Lab-molded density of asphalt mixes is a critical factor for laboratory mix design, plant production, and field performance. Current mix design and production quality control and quality assurance (QC/QA) are developed around a fixed lab-molded density of 96 percent. Adherence to a fixed lab-molded density is not only one of the main factors leading to drier, more crack susceptible mixes where low asphalt binder content is often caused by balancing high lab-molded density values at plant production, but it also impacts the implementation of the Balanced Mix Design approach. Furthermore, various field test sections designed with densities ranging from 96.5 to 98 percent were previously constructed in different areas of Texas, and they performed well in the field with no observed rutting problems. Thus, the objective of this project is to establish an acceptable range of lab-molded densities for laboratory mix design and production QC/QA testing. To achieve the objective, the Performing Agencies shall review the literature, conduct extensive laboratory performance tests, construct test sections and monitor their performance, and finally recommend an acceptable range of lab-molded density based on all the information and data collected.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this research project is to develop measurable and repeatable adjustment criteria for seal coat application rates based on pavement condition, traffic and material properties for the design method developed in research project 0-6989 Update Seal Coat Application Rate Design Method (TxDM6989).[1] Current practice requires experienced personnel to understand the adjustments needed for application rates, including changing the adjustments as conditions on the pavement change. The adjustments in the TxDM6989 combine multiple pavement conditions into one description. By measuring the conditions, a combined adjustment based upon measured parameters will remove subjectivity from the procedure. This will lead to more consistently constructed projects that meet the objectives of designing the rates so that the resulting seal will not have too much binder so that it flushes or bleeds in the summer; but there is enough binder to prevent rock loss over the winter. This research project will produce measurable methods for adjustments to the rate design procedures that will help engineers and inspectors make better decisions resulting in successful projects.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Traffic Speed Deflection Devices (TSDD) non-destructively measure structural condition while traveling at traffic speeds. Advancements in TSDD's have enabled these evaluations to be made with the benefit of reducing safety hazards associated with traditional stop and go Falling Weight Deflectometer (FWD) devices. The Receiving Agency is an active participant in the Transportation Pooled Fund TPF-5(385) "Pavement Structural Evaluation with Traffic Speed Deflection Devices". As a participant, the Receiving Agency has collected more than 1000 miles of TSDD data in several Receiving Agency Districts and is expected to continue to collect TSDD data for the next three (3) years. Recent interest from Receiving Agency Districts on using continuous structural data in network level treatment decisions has necessitated the need to verify TSDD measurements and provide guidelines and analysis methodologies to implement structural condition data for both network and project level pavement management applications. Incorporating a structural condition index into network level decisions has been a goal of the Receiving Agency's for over 30 years with the objective of providing Receiving Agency Districts a comprehensive integrated assessment of both visual and structural condition. Use of this tool shall provide Receiving Agency Districts with what level of pavement rehabilitation treatment is required as they develop their 4-year plans.	$ -	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The overall project objective is to develop a system where prefabricated steel ABC units perform continuous for live load. The system must be: easily constructible, fast to assemble, durable long-term, safe, and cost-effective. The Performing Agency shall achieve this objective by synthesizing what has been done by state departments of transportation and other agencies (through literature review) along with evaluating the behavior of related Receiving Agency bridges (through visual inspection and monitoring). Next, a system development program shall be performed utilizing this information in conjunction with expert feedback from an Industry Review Panel (IRP) workshop (including the Receiving Agency Panel). The three best system designs shall be selected for full-scale laboratory testing followed by an analytical parametric study. All the results shall be compiled and presented at an IRP meeting with the Receiving Agency, where the final system shall be selected. The Performing Agency shall develop full Microstation details and specifications along with a user-friendly design guide. The guide shall identify: • Span length capabilities for girder sizes/depths/spacings, • General details for establishing live load continuity, • Closure pour details at interior bents and how to achieve acceptable deck stresses, • Structural steel splice details and acceptable tolerances, and • Bearing layout to meet the Receiving Agency substructure details.	$ 303.88	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Minimum shear reinforcement requirements in the Association of State Highway Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications are based on tests conducted on reinforced concrete panels and beams. The extension of these requirements to prestressed concrete beams introduced significant conservatism in the current LRFD provisions for shear design. More accurate provisions are necessary to better predict the shear strength of prestressed beams. The objective of this project is to investigate the validity of the minimum shear reinforcement requirements and develop new/revised guideline specifications. The Performing Agency shall achieve this objective by: Performing literature review and outreach in order to synthesize a unique database of load tests for prestressed concrete beams, which the Performing Agency shall subsequently analyze using data driven methods to identify major design parameters and missing information that will inform an experimental program. Performing twenty (20) full scale tests on ten (10) commonly used prestressed girders combining a range of identified design parameters to comprehensively re-examine the minimum reinforcement requirements of AASHTO LRFD Bridge Design Specifications accounting for reserve strength and ductility and as well as performance under service conditions. The Performing Agency shall complement the experimental program by analytical modelling to expand its impact. Developing design guidelines for the minimum reinforcement requirements based on the synthesized comprehensive dataset complemented by the full-scale tests and analytical modeling. The Performing Agency shall also pursue integration of these guidelines in the AASHTO LRFD Bridge Design Specifications.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The American Association of State Highway and Transportation Official (AASHTO) Manual for Assessing Safety Hardware (MASH) specifies the highest impact speed for crash testing of barrier systems with passenger vehicles is 62 miles per hour (mph). This impact speed was derived from analyses of reconstructed crash data, which is nearly 20 years old. Preliminary crash data from National Cooperative Highway Research Program (NCHRP) 17-43, Long-Term Roadside Crash Data Collection Program, under which a new database of reconstructed run-off-road crashes is being developed, indicates that for highways with a posted speed limit greater than 70 mph, the 85th percentile impact speed is 67.7 mph. This means there is a need for a higher design impact speed for barriers used on these higher speed roadways. Increased impact speeds will place more demand on barrier systems. Observations of guardrail systems developing partial rail tears when tested under MASH impact conditions indicate that these systems are near their containment capacity. The Receiving Agency has over 3,500 miles of roadways with posted speeds of 75 mph or higher. The Performing Agency shall assess performance limits of identified commonly used barrier systems for higher impact speeds using engineering analysis and finite element (FE) simulations and shall provide design guidance for selection and installati	$ 90.19	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project will make improvements to the practices followed for placement of pavement markings as well as a tool to assess the current visibility of pavement markings. To achieve these objectives, the work to be performed shall include: 1. Identify the diversity of pavement surfaces in the state of Texas across different geographic regions along with the type of pavement marking. 2. For a diverse set of pavement types and markings, catalog the types of surface markings, age of these markings, their present condition, measured retroreflectivity, and measured contrast ratio using a gloss meter or other devices. 3. Investigate and estimate the visibility of these markings for both human drivers and automated vehicles and develop a model to predict this visibility as a function of the pavement type, marking type, age of the pavement, and environmental conditions. 4. Examine feasibility of using other technologies to improve pavement markings and safety as well as technologies to improve the quality of the existing pavement marking. 5. Use the findings from this study to develop recommendations for improving specifications and practices for placement of new pavement markings. 6. Provide a tool to effectively assess the visibility of existing pavement markings and make suggestions for maintenance or replacement as necessary. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research will develop user interfaces for the fast scenario analysis tool and automate the coupling of bridge and pavement conditions, economic analysis and truck traffic composition. To achieve these objectives, the work to be performed shall include: 1. Identify potential design improvements, such as the introduction of auxiliary lanes near on-ramps. 2. Determine location of optimal dedicated truck lanes; i.e., right lane versus other lanes. 3. Recommend most effective pavement hardening options. 4. Identify bridges that could benefit from upgrades or hardening. 5. Evaluate impacts of bridge height restrictions. 6. Prepare recommendations for platoon truck following distances and truck weight axle distributions. 7. Prepare for requiring wheel wander for automated truck technologies to minimize negative impacts on pavements. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ 328.44	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Mapping of buried utilities using rigorous subsurface utility engineering (SUE) quality level B (QLB), as is frequently performed or recommended, can be costly. It can also be ineffective for unknown utilities (i.e., utilities that exist but for which no information is available). This is particularly common and problematic in areas of oil and gas operations. When undiscovered until construction, these unknown utilities may cause serious scheduling disruptions as well as higher construction costs, along with safety and environmental risks. There is a need for a faster, less expensive method of scanning the right of way (ROW) for these unknown utilities. This research evaluates, selects the most appropriate, and tests the application of newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown pipelines or other utilities in the ROW. It compares the effectiveness and cost of deployment to standard QLB SUE and reports on technologies that are both technically and cost effective for identifying unknown utilities.	$ (532.16)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	High precision road maps are a crucial component to facilitating autonomous driving techniques. Autonomous vehicles (AVs) are experiencing exponential growth. According to the latest forecast from IHS Markit, over 33 million AVs will be on the road globally by 2040, posing a higher requirement to ensure AVs' driving safety. Although current AVs rely on vehicular sensing techniques (e.g., Camera, Lidar, Radar), studies have suggested that creating high-quality road maps with traffic control infrastructures (TCIs) (e.g., traffic signs, signals, intersections) precisely digitized is necessary to enhance safe-driving operations of AVs. Meanwhile, digitizing TCIs is also of great importance for road assets planning and management. However, a readily available database with precisely digitized TCIs is still missing in most areas. Traditionally, TCIs are manually digitized by conducting field studies, which is time-consuming and labor-intensive. With the advancement of data collection and processing techniques, numerous emerging data sources are becoming available, posing great potential to capture and digitize TCIs more efficiently. This project shall recommend an effective framework for the digitization, maintenance, and sharing of Receiving Agency roadway assets, especially for TCIs. The Performing Agency shall evaluate commercially available solutions and propose new approaches by leveraging emerging data sources and techniques.	$ -	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research will identify potential new legal issues that might arise from TxDOT's involvement in CAV technologies. To achieve these objectives, the work to be performed shall include: 1. Conduct a comprehensive national literature review and stakeholder interviews to identify potential liabilities and mitigation techniques. 2. Perform an analysis under Texas and federal laws (case law and statute) and provide issue spotting and mitigation recommendations. 3. Address specific questions to be answered: a. How does Texas tort limitation affect TxDOT's efforts in these areas? b. How do TxDOT and local government entities position themselves to address increased liability concerns? c. What can be learned from existing law (case law and statute) that might indicate what liability TxDOT and local jurisdictions might have? 4. Perform a legal analysis and provide recommendations to address liability concerns for up to seven specific use cases currently being explored by TxDOT, two to be defined by the project team and five to include: a. The operation of a CAV shuttle between two TxDOT campuses by TxDOT. b. A scenario in which CAVs operating on Texas roads cause damage to TxDOT assets and TxDOT seeks to recover damages. c. Digital sharing of TxDOT infrastructure information to CAVs. d. Receiving data of maintenance issues from private entities. e. A public shuttle for general use. The expectation of the project end product(s) shall attain a Technology Readiness Level of 4.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	To improve the quality and effectiveness of the Texas surface transportation system, it is important to be able to predict where and when prolonged congestion will start and how it will spread, as well as to track atypical events and estimate their evolution. Artificial intelligence (AI) approaches provide a unique opportunity to estimate precise congestion measures by utilizing data from agency-owned sensors, third-party providers, and big enterprise data. This project envisions to mitigate the current research gap by conducting two major project phases. The first phase can confirm the validity of commercial data sources for planning and operations, while the second involves understanding which AI models/ algorithm are the most suitable for addressing Receiving Agency needs based on desirable use cases and data availability. Furthermore, it is important to analyse the required data models and workflows to determine whether it is sustainable to train, test, and validate the proposed AI techniques.	$ (195.08)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Highways and streets in Texas contain a wide variety of cross-sections, with through lanes, turning lanes, medians, shoulders, parking, and bicycle lanes as common components. Providing an appropriate cross-section is important for both operational and safety performance. It is useful to periodically evaluate whether a given cross-section is the most appropriate based on expected road users and related contextual application. One alternative cross-section treatment is the “road diet”, in which existing through lanes or shoulders may be reduced and that cross-section width reassigned for other purposes. Road diet concepts have been implemented in selected locations in Texas, but there is currently no specific guidance on implementing road diets in Texas. The Performing Agency shall compile and review existing road diet guidance (on both urban/suburban and rural environments) from across the United States, along with research findings, to identify content that would be appropriate for inclusion in Texas-based guidelines for road diet treatments. The Performing Agency shall also consider the data needs for assessing a proposed road diet treatment. The Performing Agency shall use the results from these efforts to determine if existing guidance and data are sufficient to develop road diet guidelines and, if so, provide recommendations for adoption.	$ 232.92	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Outdoor advertising signs impact millions of travelers around the world every day. These signs are designed to attract driver attention thus taking it away from the driving task. Driver inattention and distraction are two of the most critical factors for road safety. Receiving Agency regulation of outdoor advertising signs must deal with changing technologies, including digital billboards, which allow for modifications to sign illumination, motion, and content. Regulations are not keeping pace with changing sign trends and must be updated to address potential impacts on road user safety. The Performing Agencies shall focus on the degree of driver distraction caused by typical and digital advertising sign contents. The Performing Agencies shall perform a comprehensive state-of-the-practice review, crash investigation, and an on road human factors evaluation, considering illumination levels and content (including motion) during daytime and nighttime travel for dry and wet-weather conditions. This Performing Agencies shall provide the Receiving Agency with tools and resources to help manage outdoor digital advertising billboards by establishing practical criteria for sign illumination and content. These resources shall allow the Receiving Agency to manage the advertising signs such that road user safety is accounted for while maintaining the ability of sign owners to develop effective means of communicating with the public.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Existing queue warning (QW) systems predominantly use infrastructure-based sensors to detect the formation of queues and use dynamic message signs (DMS) to warn drivers. These QW systems, may be inadequate where the required number or density of sensors are not available. Research has shown that crowd sourced probe and connected vehicle (CV) trajectory data used in combination with sensor data can significantly improve the accuracy and latency of queue detection. Furthermore, because of gaps between fixed location of DMSs a subset of drivers can encounter a queue without seeing any warning. Sharing queue information through third-party providers and providing vehicle-specific queue warning in CVs can ensure provision of queue warning to a broader audience in a timely manner. The Performing Agency shall: 1. Develop detailed design of an enhanced queue detection and warning system that combine point-, probe-, and vehicle trajectory data. 2. Test and fine-tune the queue detection algorithm design using computer simulation. 3. Conduct a proof of concept, prototype deployment and field evaluation of the new QW system design on a freeway segment where vehicle queues frequently form. 4. Document the systems engineering and algorithm for the QW system as a potential enhancement to the Lonestar™ advanced traffic management system software application.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Due to the complex nature of urban roadways, conventional crash prediction models are limited as these models omit operating speed, short-duration volume, and weather data. To mitigate this research gap, the following three national databases can be utilized: (1) National Performance Management Research Data Set (NPMRDS) with passenger and freight speed data, (2) Travel Monitoring Analysis System (TMAS) data with both temporary traffic counting and continuous traffic counting programs, and (3) real-time weather data from the National Oceanic and Atmospheric Administration (NOAA). The fatality rate on Texas roadways for 2020 was 1.50 deaths per hundred million vehicle miles traveled, which is an 18.94% increase from 1.26 in 2019. From 2011 to 2020, the fatalities on rural roadways increased by 19%, and this increase on urban roadways is disproportionately high (31%). Research and a supporting decision support tool are necessary to improve urban safety. The Performing Agencies shall leverage ongoing staff leadership and engagement in several national and state Department of Transportation (DOT) speed-safety projects. This research shall provide updated safety performance functions (SPFs) for urban roadways and a real-time decision support tool on risk scoring with the applicability of new data input and model updating pipeline.	$ -	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The performing agencies shall establish a method to evaluate the existing pavement structural condition and design continuously reinforced concrete pavement (CRCP) overlays, both thin and thick. The design methods will include non-destructive (NDT) pavement evaluation techniques and tools, deflection based CRCP slab thickness design procedures, and CRCP reinforcing design details.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ 388.84	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's Roadway Design Manual was updated in July 2020 and incorporates considerations for and accommodations of bicyclists and pedestrians, including preferred design order toward Shared Use Paths (SUPs) compared to bicycle lanes and shared lanes. However, the Guidance does not include specific procedures to estimate the anticipated volumes of non-motorized path users. The Receiving Agency's Bicycle Accommodation Design Guidance makes it clear that anticipated user volumes should be considered when designing facilities. The objective of this project is to develop a simple sketch planning-level demand estimation tool that provides anticipated user volumes for SUPs. The project shall also incorporate the results into the future editions of The Receiving Agency's design guidance/manuals. Given the uncertainty in resources, this project shall not use an overly complicated method or a method that requires complex data or data architecture. The project shall benefit from existing data sources, including The Receiving Agency's Texas Bicycle and Pedestrian Count Exchange and other count data resources in the State as well as other secondary and spatial data sources. The project shall develop an easy-to-use tool responding to the needs and requirements of the intended audience while incorporating advancements to improve the accuracy of the demand estimation.	$ 32.39	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Different from patching materials, hot-mix cold-laid (HMCL) asphalt mixes are often used as a blade-on/level up material in Texas. Currently, the HMCL asphalt mixes are designed with a Texas Gyratory Compactor (TGC) and checked with the Hveem stability test. The Materials and Tests Division (MTD) of the Receiving Agency is undertaking an initiative to design all asphalt mixes with the Superpave Gyratory Compactor (SGC) and officially phase out the TGC in the upcoming Standard Specifications Book update in 2024. As a result, there is an urgent need to study HMCL mix design with the SGC and replace the Hveem stability test with a new performance related test. The objective of this project is to establish a new HMCL mix design method with the SGC and new performance tests ensuring high quality and long-lasting HMCL mixes which will save millions of dollars of taxpayer money annually. To achieve this objective, the Performing Agency shall review the literature and conduct extensive laboratory TGC, SGC, and performance tests; then develop the SGC-based HMCL mix design method including performance tests and associated criteria; and finally recommend specifications changes.	$ (388.84)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ (1,015.24)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's current practice is to conduct numerous speed studies throughout the year to determine if the speed limits should be changed due to new traffic patterns, development, crash history, and other factors. These studies are driven by stakeholder requests or as part of routine annual reviews. The number of studies performed at any given time is limited by staff and consultant resources, resulting in a process that can take several months to complete. Can the increasing availability of vehicle probe data, along with other big datasets, be used to reduce the level of effort and time needed to collect speed data? If so, what data can be readily obtained from big data sources and what procedure would be needed to refine the use of probe speed information and produce speed limit recommendations that are consistent with the sound engineering practices currently used by Receiving Agency staff? This project will explore if there are more efficient methods for conducting Texas speed limit studies that would allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. Such a program would also provide a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ (48.62)	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	A scour analysis is required for all new bridges over water, including bridges through lakes and reservoirs. Wave action may be the primary driver of erosion in these lacustrine environments; however, Federal Highway Administration (FHWA) provides no guidance on predicting scour depths caused by wave action in still waters. The Receiving Agency is required to perform a scour evaluation for all bridges over water, but there is no guidance on how to do so for bridges in lakes and reservoirs. This means several bridges are currently out of compliance with the National Bridge Inspection Standards, and this synthesis will help bring them back into compliance. The Performing Agency shall review the existing literature, survey the practice of Departments of Transportation (DOTs) in the country, collect case histories of bridges subjected to wave scour, analyze all the data collected, and make practical recommendations for addressing the problem of bridge scour in lacustrine environments. These recommendations will include one or more methods for predicting the potential depth of wave scour for bridges in lakes and reservoirs and will investigate whether readily obtainable parameters like fetch, water depth, and wind speed can be used as screening criteria to determine where a wave scour analysis is not needed.	$ (330.31)	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Long-range transportation planning (LRTP) and travel demand models (TDMs) play an important role in the planning process, which assists transportation agencies with prioritizing future transportation investments. Improved LRTP and TDMs can bring direct benefits to transportation planning in the state. Effective transportation planning and investment decision making depends on timely, comprehensive, and accurate data. However, traditional data collection methods only provide a “snapshot” of the travel information, which limits the performance of conventional LRTP and TDMs. In this regard, while these sources are still used, transportation planners at the state, metropolitan, and local levels are beginning to incorporate third-party traffic data into their planning processes. Planners also start to look at the opportunities afforded through third-party data and provide guidance on how to take advantage of that data to expand and improve planning practices. This project aims to utilize probe-based data to improve the LRTP process and TDMs used by the Receiving Agency, MPOs and other planning agencies in the state. The Performing Agencies shall study and understand how probe-based and location-based data may be leveraged to facilitate the validation and calibration of existing planning models, enhance existing modeling tools, and incorporate advanced modeling techniques.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	coverage of EV charging infrastructure. While currently comprising less than one percent of all registered vehicles in Texas, projections forecast that EVs could comprise up to 55 percent of all vehicles by the year 2040. This significant industry shift will require considerable and proactive efforts to support this transition, focusing on infrastructure readiness, customer experience, interregional connectivity, and equity. Texas needs to identify optimal places where infrastructure will be needed in advance of federal and local funding that will be available to build out additional stations. Since implementation of EV charging infrastructure will occur in phases over multiple years, information will be needed at recurring intervals to determine locations of EV chargers based on a multitude of parameters and considerations to serve EV mobility. This project will develop a statewide EV charging infrastructure readiness plan that will fill an important gap and create a guidance resource for entities in determining infrastructure investment locations. By having a plan to determine needs for EV charging infrastructure other stakeholders will benefit as well. For example, utilities can ensure make-readiness and sufficient power capacity to areas considered for deployment. The statewide plan will determine and guide infrastructure investment across the state with a goal of a stable and consistent charging network. The project will also help guide future charging infrastructure funding opportunities in identifying locations of greatest need and impact, and provide guidance to most effectively and equitably distribute available funding.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency’s Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall increase the Receiving Agency’s understanding of the fundamental relationships between posted and operating speed along with providing content to support external and internal Receiving Agency dialog about speed limits and their development for all roadway environments. This project shall include three (3) workshops along with developing Spanish versions of videos on speed limit setting practices.	$ 41.00	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency Research Projects 0-7083 Develop Highway Safety Manual (HSM) Safety Performance Functions (SPFs) and Calibration Factors for Texas and 0-7067 Enhancing Freeway Safety Prediction Models developed safety prediction methods for all Texas highways. These methods are used to predict safety performance and help with the complex trade-offs between safety, operations, community impacts, and costs that are often necessary when planning and designing highway projects. These resources shall form a powerful tool for selecting Highway Safety Improvement Program projects and will support and defend safety decisions made by the Design Division and districts. The Performing Agency incorporated these methods into spreadsheet tools to implement the new models and facilitate analysis of all rural and urban roadway segments and intersections. The Performing Agency shall develop and present webinars and workshops for Receiving Agency personnel who are responsible for traffic safety analysis. The webinars and workshops will make the personnel familiarize with the safety prediction methods and the analysis tools.	$ -	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's Research and Technology Implementation (RTI) Division funded research project 0-6701 in FY 2012 to investigate potential methods of linking transportation planning in Texas with the environmental clearance process required of the National Environmental Policy Act (NEPA). The study approach and findings were documented in a research report (0-6701-1) and a guidance document entitled Texas Department of Transportation (TxDOT) Resource for Linking Planning with Project Planning in Support of NEPA (0-6701-P1). The Performing Agency shall: (1) Conduct structured interviews with the Receiving Agency's planning and environmental subject matter experts, five of the state's Metropolitan Planning Organizations (MPOs), and up to five State Departments of Transportation (DOTs) that pioneered Planning and Environmental Linkages (PEL) in FY 2012 to determine the need for updated/new PEL Guidance given that 0-6701-P1 was developed a decade ago as well as the Receiving Agency's participation in the NEPA Assignment program under 23 U.S.C. 327 and the Memorandum of Understanding with FHWA originally dated December 16, 2014 and renewed on December 9, 2019 (Phase 1) and, (2) Update 0-6701-P1 if the interviews reveal the need for updated/additional guidance (Phase 2). The structured interviews conducted in Phase 1 revealed the need for updated/additional guidance. The objective of Phase 2 is to develop a user-friendly PEL guidebook that the Performing Agency's Divisions and District staff can reference in the implementation of PELs in Texas, as well as the Texas Metropolitan Planning Organizations.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	De-icing using geothermal energy can provide the Receiving Agency with a better alternative than the existing method of using de-icing with sands and/or salts. This research project shall explore the potential for retrofitting bridges with a fluid-filled piping system and move through Technology Readiness Levels (TRL) from concept (TRL level 1) through to prototype demonstration in a relevant environment (TRL level 6).	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall produce Video Summary Report's (VSRs) for the Receiving Agency which summarize transportation research and implementation projects. Additionally, the Performing Agency shall also produce outreach materials for the Receiving Agency that will be transportation research related material and may include additional related subjects of interest.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This pooled fund study will provide a cooperative approach to conducting research to address roadside safety issues specifically related to improving motorcyclist safety. Furthermore, this program is intended to provide participating states collaborative opportunities to stay abreast of best practices, new regulatory issues, risk management strategies, and other research pertaining to roadside safety improvements for motorcyclists. The research activities will include the identification, development, and evaluation of strategies and devices for mitigating the frequency and severity of roadway departure motorcyclist crashes.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This contract will be funded, in part, from allocations to the Receiving Agency from the Federal Highway Administration (FHWA) under the 23 USC Section 130 (k) planning set-aside, which funds the compilation and analysis of data in support of the Railway-Highway Grade Crossing portion of the Highway Safety Improvement Program (HSIP), implementing safety projects with the objective to reduce the number and severity of auto-train collisions by decreasing the potential for crashes at public highway-rail grade crossings. Given this funding source, 23 USC Section 148(h)(4) mandates that data compiled or collected for this program "…shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in an action for damages arising from any occurrence at a location identified or addressed in such reports…" This information is also protected by 23 U.S.C. 409 (discovery and admission as evidence of certain reports and surveys). Deliverables produced under this contract will be prefaced by this Section 148(h)(4) disclaimer to protect the data and analysis supported by these federal funds.	$ 1,898.08	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Stabilization of roadway or stockpile materials allows for enhancing strength and stiffness properties of pavement base layers to meet structural requirements in a cost-effective and sustainable manner. Historically, stabilization mixture design criteria relied on compressive strength results and, depending on the treatment and test method, could take nearly a month to complete. Additionally, the different treatments currently require different preparation, curing, and acceptance criteria. This project shall develop a harmonized accelerated design procedure for base materials with the objective of producing an acceptable design recommendation within seven (7) days. This project shall include stabilizer types such as cement, lime, lime-fly-ash, asphalt emulsion, and foamed asphalt, and shall focus on rapid test turnaround time, lab curing techniques to rapidly simulate cured field conditions, inclusion of moisture susceptibility in the mix design, and performance-related design criteria. This project shall develop recommended harmonized test procedures, suggested specification modifications as applicable, and perform training workshops.	$ 642.91	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Roadway departure crashes are the most common type of crash in Texas. These crashes represent over 45% of all fatal crashes and 34% of all serious injury crashes. Texas data shows that there were 9,560 fatal and 30,766 serious injury roadway departure crashes from 2010-2016. Roadside safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. To improve the safety of the motoring public, there is a need to develop new or improved safety devices that accommodate a variety of site conditions, placement locations, and a changing vehicle fleet. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively address high priority issues related to roadside safety devices. The Performing Agency shall provide results in new and improved safety features that minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes. The Performing Agency shall develop roadside safety devices to meet the new American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH), to address the continuing trend of larger vehicles in the statewide vehicle fleet.	$ 1,229.20	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.Portable concrete median barriers are used in work zones and as permanent median barriers, to prevent serious cross-median crashes and vehicle penetration in work zones. These barriers are used on highways to provide positive containment of vehicles and to reduce maintenance and repair needs. When implemented in flood-prone areas, portable concrete median barriers can act as a dam for flood waters, until the damming of water causes the barrier to displace and break, as recently occurred in the Houston and Beaumont areas during severe storms. These situations required significant repair before the highways could be reopened and the level of safety for motorists restored. Any required barrier maintenance or repair increases risk to maintenance personnel and can result in significant congestion if a lane closure is required. There is a need to develop and evaluate an appropriate portable concrete median barrier in compliance with the American Association of State Highway and Transportation (AASHTO) Manual for Assessing Safety Hardware (MASH) Test Level (TL)-3 for implementation in flood-prone areas. To meet this objective, the Performing Agencies shall design such a barrier to accommodate passage of flood water, to decrease risk to motorists, and to reduce level of damage to the highway.	$ 739.12	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Corrosion of steel has been causing millions of dollars of loss in infrastructure to the state of Texas. The use of corrosion-resistant reinforcement in concrete structures and painting of steel elements have been the most common mitigation strategies. In addition, the use of weathering steel, metalizing on steel and concrete elements, and cathodic protection (sacrificial anode) have also been applied on the Receiving Agency bridges. The performances of different approaches vary with different bridges in different geographic areas; i.e., cold, arid, and humid districts. It is imperative for the Receiving Agency to have a decision tool to conduct effective corrosion prevention for new construction and corrosion mitigation for effective maintenance. The objectives of this project are to (1) conduct a synthesis of worldwide field investigations of the performance of corrosion mitigation, (2) perform field evaluations statewide to investigate the effectiveness of corrosion mitigation instrumented in the past, and to (3) perform lab tests, as necessary, to verify findings and to obtain a better understanding of corrosion mitigation approaches.	$ 963.17	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Different from patching materials, hot-mix cold-laid (HMCL) asphalt mixes are often used as a blade-on/level up material in Texas. Currently, the HMCL asphalt mixes are designed with a Texas Gyratory Compactor (TGC) and checked with the Hveem stability test. The Materials and Tests Division (MTD) of the Receiving Agency is undertaking an initiative to design all asphalt mixes with the Superpave Gyratory Compactor (SGC) and officially phase out the TGC in the upcoming Standard Specifications Book update in 2024. As a result, there is an urgent need to study HMCL mix design with the SGC and replace the Hveem stability test with a new performance related test. The objective of this project is to establish a new HMCL mix design method with the SGC and new performance tests ensuring high quality and long-lasting HMCL mixes which will save millions of dollars of taxpayer money annually. To achieve this objective, the Performing Agency shall review the literature and conduct extensive laboratory TGC, SGC, and performance tests; then develop the SGC-based HMCL mix design method including performance tests and associated criteria; and finally recommend specifications changes.	$ 3,106.45	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall continue to support the Receiving Agency in border related activities in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements.	$ 18,635.06	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency with the implementation of the UCM approach that was developed as part of the second Strategic Highway Research Program 2 (SHRP2) Projects R15B, "Identification of Utility Conflicts and Solutions," and R15C, "Pilot Testing of the Utility Conflict Matrix." The Performing Agency shall gather information and data as it relates to the UCM approach to measure the effectiveness of the implementation including during construction.	$ 4,578.92	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Emergency response services play a vital role in saving lives and minimizing property damage when major events or incidents happen. The Dedicated Short Range Communication (DSRC) and Bluetooth Low Energy (BLE) technologies have the potential to improve the efficiency and roadway safety related to emergency management services. The primary objective of this project is to develop and test DSRC- and BLE-based prototype systems for enhancing emergency preemption and notification. Another objective is to provide the Receiving Agency with guidelines for implementing DSRC and BLE technologies for supporting emergency response services. To this end, the Performing Agency shall: (1) Identify methodologies for improving emergency vehicle signal preemption in a connected environment; (2) Develop and test prototype DSRC-based and BLE-based systems to broadcast Signal Phase and Time (SPaT) messages, Emergency Vehicle Alerts (EVAs), and other notifications to emergency vehicles and other roadway users in the vicinity; (3) Enhance signal preemption performance; (4) Assist the Receiving Agency in implementing the prototype systems at selected Houston field sites; and (5) Identify anticipated cost and benefit of the connected emergency response system. The key products of the project include DSRC and BLE prototype systems that operate with the Receiving Agency's infrastructure and guidelines for implementing the system.	$ 568.49	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research will develop user interfaces for the fast scenario analysis tool and automate the coupling of bridge and pavement conditions, economic analysis and truck traffic composition. To achieve these objectives, the work to be performed shall include: 1. Identify potential design improvements, such as the introduction of auxiliary lanes near on-ramps. 2. Determine location of optimal dedicated truck lanes; i.e., right lane versus other lanes. 3. Recommend most effective pavement hardening options. 4. Identify bridges that could benefit from upgrades or hardening. 5. Evaluate impacts of bridge height restrictions. 6. Prepare recommendations for platoon truck following distances and truck weight axle distributions. 7. Prepare for requiring wheel wander for automated truck technologies to minimize negative impacts on pavements. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ 2,911.37	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Federal law establishes federally funded highway programs, including the State Planning and Research Program and the Technology and Innovation Deployment Program (TIDP) (as specified in Section 503(c) of Title 23 of the United States Code (U.S.C.)), specifically under the accelerated innovation deployment (AID) initiative. The State Transportation Innovation Council (STIC) Incentive program is one tool to address the AID requirements by providing resources to foster a culture of innovation and advance innovations into standard practices in a State Transportation Authority or other public sector STIC stakeholders. The Receiving Agency's Traffic Management Centers (TMCs) are responsible for monitoring freeways within their respective metropolitan areas for crashes, stalls, and other incident impacting traffic flow, contacting the appropriate responding agencies (police/fire/emergency medical services/tow), and tracking incident progress. Receiving Agency TMC staff predominantly use Closed Circuit television (CCTV) camera feeds to find incidents, as well as volume/speed detectors on the Receiving Agency Intelligent Transportation Systems (ITS) map, and the traffic layer on Google Maps. While these methods help to some degree, they are not always effective or efficient. CCTV tours (which show 5-10 second feeds of a freeway segment) can miss an incident if the camera is pointing in a different direction. Receiving Agency TMC staff focusing on one freeway may miss an event on another freeway. Google traffic indicators only show the level of traffic but not incidents that caused the traffic. Often, those involved in incidents immediately contact 9-1-1 for assistance. The Performing Agency shall develop a system that collects essential incident management information from 9-1-1 systems and transmits said information to regional TMCs to speed up the identification and response to an incident, and collect needed incident management data to better assess incident management programs in the region.	$ 1,304.91	$ -	$ -	$ -	$ -	$ -
754 - Texas State University	3.1.1. Staff Group Insurance Contributions	Performing Agency will perform the following services ("services"): 1. Create an empty, reusable, non-SharePoint version of the Data Collection System; 2. Optional, if funding permits: upgrades from Attachment A, selected separately, as needed; and 3. Optional, if funding permits: upgrades from Attachment B, selected separately, as needed.	$ 159.35	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Cross frames are critical for the stability of steel bridges during erection and construction and play an important role for completed bridges. Historically, the brace locations have been regions of fatigue concerns. In addition, the braces require significant handling and processing during fabrication and represent one of the most expensive components per unit weight on the bridge. Therefore, there are major benefits in terms of economics and structural performance to minimize the number of cross frames. Lean-on bracing concepts that replace full cross frames in certain bracing lines with top and bottom struts that allow a single cross frame to brace several girders is a method of minimizing the number of cross frames on a bridge. Lean-on concepts were developed in for TxDOT in the early 2000s. While the previous study developed design guidelines, recent applications of leanon bracing on two TxDOT bridge designs demonstrated the need for improved efficiency and clarity. This project consists of instrumenting the bridges with lean-on bracing during construction to better understand the behavior. The Performing Agency shall carry out parametric finite element analyses (FEA) along with the field monitoring, and develop improved guidelines to facilitate widespread use of lean-on bracing applications in Texas bridges.	$ 1,474.65	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide tools and strategies to implement the findings of the Permian Basin Freight and Energy Sector Transportation Plan and to mitigate impacts of energy and natural resources development in partnership with key stakeholders.	$ 11,564.92	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency Research Projects 0-7083 Develop Highway Safety Manual (HSM) Safety Performance Functions (SPFs) and Calibration Factors for Texas and 0-7067 Enhancing Freeway Safety Prediction Models developed safety prediction methods for all Texas highways. These methods are used to predict safety performance and help with the complex trade-offs between safety, operations, community impacts, and costs that are often necessary when planning and designing highway projects. These resources shall form a powerful tool for selecting Highway Safety Improvement Program projects and will support and defend safety decisions made by the Design Division and districts. The Performing Agency incorporated these methods into spreadsheet tools to implement the new models and facilitate analysis of all rural and urban roadway segments and intersections. The Performing Agency shall develop and present webinars and workshops for Receiving Agency personnel who are responsible for traffic safety analysis. The webinars and workshops will make the personnel familiarize with the safety prediction methods and the analysis tools.	$ 1,422.47	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall support the Receiving Agency's planning initiatives related to innovation and technology deployments at the District level. The Performing Agency shall conduct state-of-the-art engagement communication, assistance, and planning services.	$ 64,455.69	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Through the Highway Construction Workforce Partnership Grant (HCWP), TxDOT will build strategic partnerships to train and educate the next generation of the heavy highway workforce. This training will offer the state's diverse population an opportunity to obtain consistent and high paying employment in the heavy highway industry. Furthermore, increasing the knowledge and skills of the heavy highway workforce will result in higher quality projects that are completed on budget and on time. To meet the various needs of the state, TxDOT will build HCWP partnerships in two locations: Dallas County (metro region) and Brazos County (rural region). The dual approach will allow TxDOT to create a model for identifying and engaging locally sourced, effective wrap-around supportive services that target underrepresented communities, as well as develop better structured career pathways for new workforce. As a result, TxDOT will be able to scale HCWP programs faster and more efficiently across the state. The Performing Agency, Texas Transportation Institute shall perform tasks in Bryan-College Station, Texas, Brazos County, and surrounding county areas, all in accordance with the scope of services attached below. The Performing Agency shall perform the tasks in the more detailed scope of services incorporated by reference to this contract, provided in the Highway Construction Workforce Partnership (HCWP) Grant Application Supplemental Narrative, March 8, 2021.	$ 639.47	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI shall provide evaluation and technical support of Traffic Management and Planning Systems for the TxDOT Houston District.	$ 54,038.78	$ 3,873.59	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines various tasks in which the Performing Agency shall perform technology transfer and technical support services for the Receiving Agency in the area of project planning, development, and delivery.	$ 5,914.47	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Rural and small urban transit systems across the United States face fiscal challenges caused by the growing gap between the cost of providing transit service and available federal, state, and local funding. In Texas, the fiscal challenges facing rural and small urban transit systems are compounded by not only an increasing population but also revenue and ridership impacts related to COVID-19. Rural and small urban transit systems also often face high levels of staff turnover and a lack of knowledge management procedures to sustain cost management practices over time. The Performing Agency shall equip transit systems to understand, predict, and manage operational and capital costs and provide a reliable go-to-resource for cost management best practices. The Performing Agency shall develop a guidebook, workshop, and online course for rural and small urban public transit systems to better manage operational and capital costs. The research will (1) conduct a national scan of rural and small urban best practices in cost management; (2) synthesize findings into a series of best practice topically-based modules—each with supporting tools and resources; and (3) develop and test a guidebook, workshop, and online course for rural and small urban operational and capital cost management.	$ 2,447.75	$ -	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to assess and improve the development process and identify data sources for required AERR Motor Vehicle Emission Simulator (MOVES) inventory mode county databases (CDBs). This will require the TTI (Grantee) to perform a thorough review of the regulatory requirements and associated guidance documents. Additionally, the Grantee shall perform a sensitivity assessment to determine the MOVES3 activity input parameters with the greatest effect on emissions by assessing the recently completed 2020 AERR on-road modeling files and the MOVES3 trend information being developed as part of a separate PGA. This PGA will also assess the suitability of using MOVES3 default modeling parameters developed by the United States Environmental Protection Agency (EPA) in place of Texas-specific activity data. Lastly, the Grantee shall use the results from the sensitivity assessment to identify potential on-road vehicle activity data sources for use in future regulatory and State Implementation Plan (SIP) emissions inventory development.	$ 2,029.93	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency in the areas of project planning, development, and delivery; operations; and maintenance.	$ 5,764.89	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	In the past, achieving high strength was considered by the Receiving Agency as the main design criteria to formulate high performance concrete. The Receiving Agency considers mix design options 1-4 in item 421 as high performance concrete (HPC) and these options were developed for ASR mitigation and not for other durability aspects. Very little work has been done to determine if these options are adequate to provide long-term durability often needed when HPC is specified. The main objective of this study is to develop performance specification for high performance concrete in order to ensure high performance in terms of durability. The Performing Agency will conduct a combination of both field investigation and laboratory study in order to achieve this objective. The Performing Agency shall use both conventional and innovative new lab testing methods to determine the key performance characteristics (i.e., prescribing acceptable limits of permeability, shrinkage, surface resistivity, and chloride ingress - basis for developing performance specification) followed by developing specific prescriptive requirements in order to formulate wide varieties of prescriptive mixes that can meet the durability requirements matching with different exposure conditions. A combined approach of relating mix design parameters, lab based durability test results, mechanical properties, structural dimensions, climatic conditions, and / exposure conditions through suitable service life prediction model and predicting will be used to ensure long term durability (at least 75 years) for the HPCs in typical aggressive environments. This will lead to develop performance- and prescriptive-based concrete specifications for HPC. This could potentially encourage contractors to effectively use these fine-tuned prescriptive HPC mixtures without the need of conducing additional long duration testing and ensure making long lasting durable concrete and save tax payers dollars.	$ 9,115.64	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical support for planning and evaluation of operational improvements. Operational improvements are also commonly referred to as low-cost treatments, early-action projects, congestion mitigation projects and ramp reversals.	$ 38,284.19	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this study is to assess the performance of INRIX data by conducting a comparative analysis against ground truth data. In 2018, the Performing Agency carried out a study for the Receiving Agency's El Paso District, serving as a proof-of-concept for developing a methodology to compare travel time estimates from traditional sources and crowdsourced data, such as INRIX. This methodology was subsequently applied with success for a study performed by the Performing Agency for the Receiving Agency's Waco District. The previous study for the Receiving Agency's El Paso District had limitations due to the limited availability of crowdsourced data at the time. With the increased availability of such data since then, conducting a new study using the methodology developed in 2018 will provide valuable information for the Receiving Agency to determine whether crowdsourced data can be utilized to offer real-time travel time estimates to travelers. The Performing Agency will establish accurate ground truth data for the selected corridors using the test vehicle technique, adhering to the Travel Time Data Collection Handbook Guidelines provided by the Federal Highway Administration (FHWA) to ensure the desired accuracy for the analysis.	$ 3,108.73	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	As part of its efforts to take advantage of technology to be more efficient, the Receiving Agency is looking at various data sets to modernize and make more accessible to those that work with the data. One of these data sets is speed zone data. The Receiving Agency documents speed zone data in strip maps in dgn (MicroStation CAD) electronic format. This speed zone strip data is not aggregated, and it is placed in electronic folders organized by date created. This data is not catalogued. Speed zones are approved via minute orders signed by the Texas Transportation commissions. The minute orders become complementary sets of data to the strip maps. Minute order data is catalogued in a spreadsheet, but currently these data sets are not linked in any way. The objective of this task is to assist the Receiving Agency in using technology to aggregate speed zone and minute order data in one location for the El Paso District. More specifically, the Performing Agency shall: • Review speed zone and minute order data to identify all critical attributes. • Identify most appropriate GIS format (point or linear) for the various pieces of data, corresponding attributes for each layer (including any complementary file attachments), and geolocate data in GIS map. • Develop a dashboard to make data more accessible. This study was originally funded and began on 9/21/2020. Due to the Receiving Agency experiencing funding issues, the Receiving Agency requested for Performing Agency to stop work on this study on 4/9/2021, before it was completed. Out of the five original tasks, the following tasks were completed before work on the study was stopped: Task 1. Literature Review The Performing Agency shall perform a literature review to complement technology tools and processes recently developed by the Performing Agency for the Receiving Agency's El Paso District in terms of online GIS mapping. These tools include ESRI ArcGIS Online and components within this environment, specifically the map and dashboard components. The literature review should also show which functions within these components have been implemented to build a more robust asset management system. Task 2. Review Speed Zone and Minute Order Data The Performing Agency shall review all data received. The Performing Agency shall further coordinate with the Receiving Agency to identify all critical attributes for all data sets and identify all data that needs to be linked with the speed zones besides minute orders.	$ 2,197.54	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical support to the Receiving Agency for the Texas Connected Freight Corridors (TCFC) Project from grant funding with the U.S. Department of Transportation (USDOT) grant program, Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD). The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency and will end after the Receiving Agency accepts the final Deliverable. The NTP will include a work plan, the maximum amount payable, and initiation and completion dates.	$ 4,359.94	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall prepare a feasibility study for container-on-barge services along the Texas Coast. The study shall answer the following questions: • Is there enough potential traffic to justify container-on-barge service in Texas? • Which Texas ports are willing to acquire or provide the infrastructure and equipment to allow container-on-barge service to operate? • Can container-on-barge service be competitive with other available freight transportation modes in terms of cost and schedule? • Which location(s) are optimal for container-on-barge service in terms of the connection between barge and ocean traffic? The study shall include the following ports: • Port of Port Arthur • Port of Brownsville • Port Freeport • Port of Galveston • Port of Harlingen • Port of Palacios • Port of Victoria • Port of West Calhoun • Greens Port Terminal (Houston) • Port of Beaumont • Calhoun Port Authority • Port of Corpus Christi • Port of Orange	$ 4,396.88	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines general task areas the Performing Agency shall perform for the Receiving Agency to support the Texas Connected and Autonomous Vehicle (CAV) Task Force. The goal of the Texas CAV Task Force is to be a single point of information and coordination for all CAV activities in Texas. The Texas CAV Task Force will host industry meetings, create a knowledge base for best practices and collaboration, and report out on lessons learned. The Texas CAV Task Force will serve as a clearing house of information for those seeking to pursue innovative technology in Texas. The Texas CAV Task Force will be an incubating hub for any policy recommendations that may need to be brought before the Texas Legislature and Governor.	$ 38,975.72	$ -	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to update the electronic utilities titled "TTI On-Road Emissions Inventory Utilities" and the "On-Road Emissions Quality Assurance Tool" for use with the latest version of the United States Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) model, titled MOVES4. The updated methodologies are required for the development of on-road emissions inventories (EI) used in state implementation plan (SIP) revisions and related reporting requirements.	$ 3,635.33	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall use its nondestructive testing (NDT) capabilities to evaluate candidate sections proposed by the District. The Performing Agency shall review and evaluate historic plan sets, available soils information, and ground-penetrating radar (GPR) and falling weight deflectometer (FWD) results. The Performing Agency shall recommend if the proposed pavement section is a good candidate for FDR, and if so, shall recommend where and what type of samples to collect from the roadway. Pavement sections which are good candidates shall proceed to Task 2. If FDR us not viable or not necessary, the Performing Agency shall recommend other alternatives for District consideration.	$ 4,599.28	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall perform the following tasks for the Receiving Agency at the onset of receiving a Notice to Proceed (NTP) from the Receiving Agency. The Notice to Proceed will be authorized by the Receiving Agency's Director of Design. The Notice to Proceed will include a work plan for the tasks requested, maximum amount payable, and will specify an initiation and completion date. This contract includes in-state travel that will be conducted by Performing Agency staff as the Receiving Agency requests. Performing Agency staff shall participate in meetings and discussions, make presentations, and conduct site visits within the Houston District geographical area when the Receiving Agency requests. The Performing Agency shall provide the equipment needed to conduct the tasks and shall make those equipment available for this contract. The Receiving Agency will be required to provide traffic control support when low speed non-destructive testing and field sampling is performed.	$ 2,969.34	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency (Pharr District) in the areas of project planning, development, and delivery; operations; and maintenance.	$ 3,996.87	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide transfer of technology and knowledge. The Performing Agency shall serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, and county and local agencies. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics shall include, but not be limited to, any of the following at the request of the Receiving Agency: 1. traffic engineering study management and optimization, 2. processes and procedures for traffic study review, 3. access management, 4. asset management, 5. techniques to support operations analysis functions, 6. public outreach, 7. 3D visualization and design procedures, 8. advancements in data collection techniques, 9. simulation and analysis, 10. safety, 11. the production of a guide to assist the Receiving Agency in a consistent design approach and installation of traffic control devices, 12. assistance in the deployment of a hardware-in-the-loop application for modeling and demonstration purposes, 13. production of guidelines to assist the Receiving Agency in meeting sign retro reflectivity requirements, and 14. traffic engineering study guidelines for performing a variety of different field studies.	$ 15,798.57	$ 234.68	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall perform technology transfer and technical support services for the Receiving Agency in the area of project planning, development, and delivery.	$ 15,338.08	$ 234.68	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall develop and test a simple and straightforward methodology that directly incorporates safety considerations into the urban roadway design process. The Performing Agency shall develop and deliver three products: 1) a score-based methodology to incorporate safety into the urban roadway project development and design process; 2) a companion web-based tool for the methodology; and 3) a set of training or reference materials to distribute among designers to help clarify how safety can be part of the design process. The Performing Agency shall develop the reference materials oriented to designers to better frame the concept of safety enhancements in urban roadway configuration and design decisions. These materials will highlight that adding safety enhancements is not overdesigning, because of the additional value to the public when implementing treatments that improve safety above and beyond basic design criteria.	$ 11,310.53	$ (154.83)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall review and document national best practices in the processing of Functional Classification (FC) change requests. The Performing Agency will reach out to and conduct interviews with up to ten peer states, selected in conjunction with the Receiving Agency, to document FC change request processes and identify best practices in implementing FC change requests (e.g., the process) and the tools/platforms/applications used in tracking FC changes.	$ 31,149.41	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Task A Provide Technical Assistance and Support for Updating and Managing Implementation of the Texas Strategic Highway Safety Plan (SHSP) in Compliance with Federal Requirements. The Performing Agency shall: • Facilitate meetings (primarily held virtually): o With the Management Team (MT) up to quarterly o With the Executive Committee (EC) as determined by the MT (up to two times per year, e.g., midyear to address progress, get feedback and ask the EC for help where possible, and end of the year for a report on the year's progress and receive recommendations and advice from the EC). • Revise and digitally disseminate the "consumer version" of the updated SHSP to aid understanding and implementation. • Facilitate at least one meeting with each Emphasis Area Team. Additionally, use other methods of communication including, but not limited to, information posted to the Texas SHSP website, webinars to share best/promising practices, and published case studies to share projects and processes. • Expand the crash analysis in specific an emphasis area(s) to target geographic and/demographic areas. • Identify and pilot a SHSP measurement tool(s) to illustrate/communicate progress quarterly. Develop a dashboard infographic to publish progress on the SHSP website and distribute through social media. • Develop and implement a stakeholder engagement plan. o Survey the District Traffic Safety Specialists and Program Managers within the TxDOT BTS group to determine their level of knowledge of and engagement with the SHSP; develop materials; host or engage in existing meetings to ensure all the District Traffic Safety Specialists and their coalitions understand how they can assist with implementation. o Develop and pilot workshop that integrate engineering and behavioral countermeasures based on targeted areas. • Maintain a digital Traffic Safety Calendar on the SHSP website at least quarterly. • Maintain, update, and enhance the Texas SHSP website including updating crash trends. • Update the SHSP and website with the VRU assessment when it is released. Task B Provide Assistance Related to Highway Safety Improvement Program (HSIP). The Performing Agency shall: • Prepare the Crash Analysis and Visualization (CAVS) data based on the updated HSIP work code tables and provide the data to the Receiving Agency. • Conduct up to two training webinars on the use of CAVS tools for selecting the projects for HSIP.	$ -	$ (64.49)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall continue to verify ride quality data on final pavement surfaces for projects constructed by Receiving Agency contractors that meet the requirements of: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B) and 2) Item 585, "Ride Quality for Pavement Surfaces." 23 CFR 637B requires state departments of transportation (DOTs) to verify test results determined from contractor's quality control data if the results are used for acceptance on federal-aid highway projects included in the National Highway System (NHS). The Federal Highway Administration (FHWA) guideline for state DOTs is to perform verification tests on a minimum 10 percent sample of projects. Item 585, Surface Test Type B, requires contractors to collect pavement ride quality data with a certified inertial profiler and a certified inertial profiler operator and submit test profiles to the Receiving Agency's project engineer for acceptance, pay adjustments and corrective work. The Receiving Agency may perform verification testing, and disputes are settled with referee testing. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates.	$ 9,040.36	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide organizational and management support, check lists and briefing documents, technical documentation and develop several educational series units or modules to the Receiving Agency. The Performing Agency shall provide expertise in asphalt binder, aggregates, seal coat design and seal coat construction. The Performing Agency's tasks shall include the preparation of a variety of documents including check list, briefs, technical discuss of selected subject matter, educational series units and a manual. The Performing Agency shall prepare these documents based on input from the Texas Seal Coat Performance Improvement Steering Committee as well as the Educational Series Working Group. This committee and working group has a membership from the Receiving Agency, asphalt binder supplies, aggregate producers and contractors.	$ 7,137.70	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI will support district planning and operations through this Interagency Cooperation Contract.	$ 15,172.80	$ (1,467.74)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide lab and field testing support to identify the cause of poorly performing pavements in the Receiving Agency's Austin District. If required, the Performing Agency shall evaluate these projects using an array of nondestructive testing (NDT) equipment such as Rolling Deflectometers, Ground Penetrating Radar, Mobile Lidar and Falling Weight Deflectometers. Field coring and auguring equipment is available; and additional advanced laboratory testing shall be used where and when required. The Performing Agency has an array of advanced testing equipment, including but not limited to X-Ray Diffraction, Scanning Electron-microscope, tube suction test equipment, overlay tester, pull-off test for soils, base, stabilized materials, asphalts and concrete.	$ 3,598.95	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ 401.37	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, “Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation” has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ 4,178.23	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project will use a phased work plan to develop a freight model within one or more urban areas of the state of Texas using the most current state of the practice methods and data sources. The Performing Agency shall produce a freight model through an interactive and iterative process by the the Performing Agency, Receiving Agency, and Metropolitan Planning Organizations (MPO) partners using the concept of first creating a “minimum viable product” as used in commercial software development. Key initial steps to this process will be investigation of similar recent freight modeling efforts in the United States (U.S.), early identification of freight model requirements for both Receiving Agency and local/regional planning efforts, selection of the type/function of model that will address those requirements, and an assessment of data availability and of any fatal flaws that might be encountered. The Performing Agency shall then work cooperatively with the selected MPO partner to build and implement a state-of-the practice model that can be iteratively improved over time as additional data or methods emerge. Training for model users and an ongoing, web-based forum for users to share insights and questions are also part of the work plan. Reporting of results and transferability to diverse MPOs are other key features of the project.	$ 18,989.47	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency’s standard specification Item 300, Asphalts, Oils, and Emulsions, includes more than 48 different test procedures or conditioning procedures for asphalt concrete (AC) graded binders (12), cutbacks (8), emulsified binders (17), and performance-graded (PG) binders (11) used in different pavement construction and maintenance applications. This does not include testing requirements for recycling agents, crack sealants, or asphalt rubber binder. The Receiving Agency regularly performs many of these tests for quality management or quality assurance purposes. This test schedule presents a challenge for the binder lab in terms of maintaining test procedures, acquiring and maintaining test equipment, calibrating equipment, and training personnel. Some specification tests are legacy tests that once were the state-of-the-art and thought to be related to asphalt binder performance. Many of these legacy tests are not used in more recently developed specifications, as other tests are now available and may be more indicative of performance. This project seeks to review the Receiving Agency’s Item 300 binder specifications and tests for relevance; determine whether they assess safety, performance, or constructability; and take into account accuracy, efficiency, and environmental considerations. The project shall also make recommendations for changes.	$ 5,207.51	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Full depth reclamation (FDR) is a cost-effective recycling strategy that reuses both asphalt bound and unbound granular materials. FDR was implemented in Texas in the early 1990s in the Bryan and Lubbock Districts. In the past five years, the Receiving Agency has implemented FDR using either foamed asphalt or emulsions. The current specification allows for 4-inch diameter by 2-inch height specimens or 6-inch diameter by 3.75-inch height specimens to be tested, with identical acceptance criteria for both sample sizes. This practice has raised concern regarding the effect of sample size on the indirect tensile (IDT) strength because larger specimens have shown lower IDT strength compared to 4-inch diameter specimens regardless of material source, binder type, binder content, or conditioning procedure. The Performing Agency shall evaluate the strength differences between the two specimen sizes and provide acceptance criteria revisions, as appropriate. In addition, the effect of testing temperature is critical with regard to IDT strength of FDR specimens. Therefore, the Performing Agency shall evaluate the specimens at various testing temperatures and recommend a target temperature to substitute the more general test conditions currently specified. The Performing Agency shall validate the revised criteria by evaluating the performance of selected field projects.	$ 5,957.28	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this research project is to determine where, when, and why a prime or cure is needed for a pavement layer. Materials such as prime coats, curing materials, seal coats, and tack coat are typically considered non-structural, but integral to the pavement structure. Some materials can be used for multiple purposes: prime, bond or help cure; however, the rates and timing of use may change depending on why the material is being used. Guidance is needed to help designers, inspectors and construction personnel understand the materials and where, when, and why to use them. This project shall develop guidelines for prime and curing through a series of laboratory and field testing and develop tests and procedures to determine the best materials for a prime, cure or a combination. These guidelines shall aid decision makers in determining whether a prime, cure or bonding material is needed, and where, when and why to design and use the appropriate materials.	$ 10,595.16	$ 882.34	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Lab-molded density of asphalt mixes is a critical factor for laboratory mix design, plant production, and field performance. Current mix design and production quality control and quality assurance (QC/QA) are developed around a fixed lab-molded density of 96 percent. Adherence to a fixed lab-molded density is not only one of the main factors leading to drier, more crack susceptible mixes where low asphalt binder content is often caused by balancing high lab-molded density values at plant production, but it also impacts the implementation of the Balanced Mix Design approach. Furthermore, various field test sections designed with densities ranging from 96.5 to 98 percent were previously constructed in different areas of Texas, and they performed well in the field with no observed rutting problems. Thus, the objective of this project is to establish an acceptable range of lab-molded densities for laboratory mix design and production QC/QA testing. To achieve the objective, the Performing Agencies shall review the literature, conduct extensive laboratory performance tests, construct test sections and monitor their performance, and finally recommend an acceptable range of lab-molded density based on all the information and data collected.	$ 7,846.35	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this research project is to develop measurable and repeatable adjustment criteria for seal coat application rates based on pavement condition, traffic and material properties for the design method developed in research project 0-6989 Update Seal Coat Application Rate Design Method (TxDM6989).[1] Current practice requires experienced personnel to understand the adjustments needed for application rates, including changing the adjustments as conditions on the pavement change. The adjustments in the TxDM6989 combine multiple pavement conditions into one description. By measuring the conditions, a combined adjustment based upon measured parameters will remove subjectivity from the procedure. This will lead to more consistently constructed projects that meet the objectives of designing the rates so that the resulting seal will not have too much binder so that it flushes or bleeds in the summer; but there is enough binder to prevent rock loss over the winter. This research project will produce measurable methods for adjustments to the rate design procedures that will help engineers and inspectors make better decisions resulting in successful projects.	$ 5,639.51	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency invests over $250 million annually on seal coats, it is therefore critical to apply the right treatment to the right road at the right time. Projects are typically selected based on the time since the last seal coat (an average of 7 years) with little to no testing performed to ensure that the section is a good candidate for seal coat and how many seal coats to apply. The objective of this research is to determine the maximum number of seal coats that can be applied to a pavement surface before the accumulated layers of seal coats become unstable. The Performing Agencies shall evaluate the stability of existing accumulated seal coat substrate layers through a series of laboratory and field testing and develop tests and procedures to determine when an additional seal coat may not perform well. The Performing Agencies shall develop guidelines to select candidate seal coat projects with multiple seal coat layers ensuring that a new seal coat is used on a good candidate pavement will lower risk to the Receiving Agency, improve life cycle costs and lead to better performing sections of pavement.	$ 5,693.03	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Traffic Speed Deflection Devices (TSDD) non-destructively measure structural condition while traveling at traffic speeds. Advancements in TSDD's have enabled these evaluations to be made with the benefit of reducing safety hazards associated with traditional stop and go Falling Weight Deflectometer (FWD) devices. The Receiving Agency is an active participant in the Transportation Pooled Fund TPF-5(385) "Pavement Structural Evaluation with Traffic Speed Deflection Devices". As a participant, the Receiving Agency has collected more than 1000 miles of TSDD data in several Receiving Agency Districts and is expected to continue to collect TSDD data for the next three (3) years. Recent interest from Receiving Agency Districts on using continuous structural data in network level treatment decisions has necessitated the need to verify TSDD measurements and provide guidelines and analysis methodologies to implement structural condition data for both network and project level pavement management applications. Incorporating a structural condition index into network level decisions has been a goal of the Receiving Agency's for over 30 years with the objective of providing Receiving Agency Districts a comprehensive integrated assessment of both visual and structural condition. Use of this tool shall provide Receiving Agency Districts with what level of pavement rehabilitation treatment is required as they develop their 4-year plans.	$ 10,647.21	$ (263.44)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Field sands have been used in hot mix asphalt (HMA) pavements to reduce binder requirement since they are readily available and are less expensive than crushed materials. Considering their adverse effects on the performance, field sands are limited to 10% to 15% of the aggregates. The most common feature of field sand that may have a significant detrimental effect on the Asphalt Concrete (AC) performance is the presence of harmful clay particles. Understanding the impact of these clay particles on AC performance is the subject of this research. The upper limit of specific field sand, given the amount of active clay present in it, the process to determine the clay content, and how they may affect the performance of AC mixes will be evaluated. Since field sands are more round compared to the crushed aggregates, mixes containing more field sands can be compacted to a given density at lower binder contents. Given the less particle to particle interlocking of such mixes, however, they are more suspect to excessive rutting. Thus, this study will investigate the effect of clay minerals as well as	$ 1,826.08	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The overall project objective is to develop a system where prefabricated steel ABC units perform continuous for live load. The system must be: easily constructible, fast to assemble, durable long-term, safe, and cost-effective. The Performing Agency shall achieve this objective by synthesizing what has been done by state departments of transportation and other agencies (through literature review) along with evaluating the behavior of related Receiving Agency bridges (through visual inspection and monitoring). Next, a system development program shall be performed utilizing this information in conjunction with expert feedback from an Industry Review Panel (IRP) workshop (including the Receiving Agency Panel). The three best system designs shall be selected for full-scale laboratory testing followed by an analytical parametric study. All the results shall be compiled and presented at an IRP meeting with the Receiving Agency, where the final system shall be selected. The Performing Agency shall develop full Microstation details and specifications along with a user-friendly design guide. The guide shall identify: • Span length capabilities for girder sizes/depths/spacings, • General details for establishing live load continuity, • Closure pour details at interior bents and how to achieve acceptable deck stresses, • Structural steel splice details and acceptable tolerances, and • Bearing layout to meet the Receiving Agency substructure details.	$ 8,535.60	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	"Minimum shear reinforcement requirements in the Association of State Highway Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications are based on tests conducted on reinforced concrete panels and beams. The extension of these requirements to prestressed concrete beams introduced significant conservatism in the current LRFD provisions for shear design. More accurate provisions are necessary to better predict the shear strength of prestressed beams. The objective of this project is to investigate the validity of the minimum shear reinforcement requirements and develop new/revised guideline specifications. The Performing Agency shall achieve this objective by: Performing literature review and outreach in order to synthesize a unique database of load tests for prestressed concrete beams, which the Performing Agency shall subsequently analyze using data driven methods to identify major design parameters and missing information that will inform an experimental program. Performing twenty (20) full scale tests on ten (10) commonly used prestressed girders combining a range of identified design parameters to comprehensively re-examine the minimum reinforcement requirements of AASHTO LRFD Bridge Design Specifications accounting for reserve strength and ductility and as well as performance under service conditions. The Performing Agency shall complement the experimental program by analytical modelling to expand its impact. Developing design guidelines for the minimum reinforcement requirements based on the synthesized comprehensive dataset complemented by the full-scale tests and analytical modeling. The Performing Agency shall also pursue integration of these guidelines in the AASHTO LRFD Bridge Design Specifications."	$ 12,429.19	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project will make improvements to the practices followed for placement of pavement markings as well as a tool to assess the current visibility of pavement markings. To achieve these objectives, the work to be performed shall include: 1. Identify the diversity of pavement surfaces in the state of Texas across different geographic regions along with the type of pavement marking. 2. For a diverse set of pavement types and markings, catalog the types of surface markings, age of these markings, their present condition, measured retroreflectivity, and measured contrast ratio using a gloss meter or other devices. 3. Investigate and estimate the visibility of these markings for both human drivers and automated vehicles and develop a model to predict this visibility as a function of the pavement type, marking type, age of the pavement, and environmental conditions. 4. Examine feasibility of using other technologies to improve pavement markings and safety as well as technologies to improve the quality of the existing pavement marking. 5. Use the findings from this study to develop recommendations for improving specifications and practices for placement of new pavement markings. 6. Provide a tool to effectively assess the visibility of existing pavement markings and make suggestions for maintenance or replacement as necessary. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.	$ 6,358.91	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Mapping of buried utilities using rigorous subsurface utility engineering (SUE) quality level B (QLB), as is frequently performed or recommended, can be costly. It can also be ineffective for unknown utilities (i.e., utilities that exist but for which no information is available). This is particularly common and problematic in areas of oil and gas operations. When undiscovered until construction, these unknown utilities may cause serious scheduling disruptions as well as higher construction costs, along with safety and environmental risks. There is a need for a faster, less expensive method of scanning the right of way (ROW) for these unknown utilities. This research evaluates, selects the most appropriate, and tests the application of newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown pipelines or other utilities in the ROW. It compares the effectiveness and cost of deployment to standard QLB SUE and reports on technologies that are both technically and cost effective for identifying unknown utilities.	$ 8,475.68	$ 291.18	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency and its partner agencies are required to comply with the requirements of the transportation conformity requirement. Transportation conformity is an emissions control-centric process built on the assumption that that reducing emissions from transportation activities would lead to better air quality. However, the air quality observations collected since the onset of the COVID-19 pandemic shows ambient ozone and PM2.5 concentrations have a mixed response to the significant changes in traffic activities and emissions. This trend has raised questions regarding the extent of the transportation's impacts on air quality. This study will bridge the gap in the understanding of the actual extent of transportation activities' impacts on regional and near-road air quality. The study will consist of three major activities for selected case study areas: ─ Analysis of before- and during-pandemic traffic activity and air quality monitoring data. ─ Evaluate the performance of air dispersion modeling in capturing the changes of near-road PM2.5 concentrations in near-road environment resulting from traffic activity variations. ─ Evaluate the performance of photochemical modeling in capturing the changes of regional ozone in response to changes of traffic activities. The study will also result in a characterization of COVID-19 restrictions' impacts on traffic activities and air quality.	$ 7,720.21	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Outdoor advertising signs impact millions of travelers around the world every day. These signs are designed to attract driver attention thus taking it away from the driving task. Driver inattention and distraction are two of the most critical factors for road safety. Receiving Agency regulation of outdoor advertising signs must deal with changing technologies, including digital billboards, which allow for modifications to sign illumination, motion, and content. Regulations are not keeping pace with changing sign trends and must be updated to address potential impacts on road user safety. The Performing Agencies shall focus on the degree of driver distraction caused by typical and digital advertising sign contents. The Performing Agencies shall perform a comprehensive state-of-the-practice review, crash investigation, and an on road human factors evaluation, considering illumination levels and content (including motion) during daytime and nighttime travel for dry and wet-weather conditions. This Performing Agencies shall provide the Receiving Agency with tools and resources to help manage outdoor digital advertising billboards by establishing practical criteria for sign illumination and content. These resources shall allow the Receiving Agency to manage the advertising signs such that road user safety is accounted for while maintaining the ability of sign owners to develop effective means of communicating with the public.	$ 10,491.11	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Existing queue warning (QW) systems predominantly use infrastructure-based sensors to detect the formation of queues and use dynamic message signs (DMS) to warn drivers. These QW systems, may be inadequate where the required number or density of sensors are not available. Research has shown that crowd sourced probe and connected vehicle (CV) trajectory data used in combination with sensor data can significantly improve the accuracy and latency of queue detection. Furthermore, because of gaps between fixed location of DMSs a subset of drivers can encounter a queue without seeing any warning. Sharing queue information through third-party providers and providing vehicle-specific queue warning in CVs can ensure provision of queue warning to a broader audience in a timely manner. The Performing Agency shall: 1. Develop detailed design of an enhanced queue detection and warning system that combine point-, probe-, and vehicle trajectory data. 2. Test and fine-tune the queue detection algorithm design using computer simulation. 3. Conduct a proof of concept, prototype deployment and field evaluation of the new QW system design on a freeway segment where vehicle queues frequently form. 4. Document the systems engineering and algorithm for the QW system as a potential enhancement to the Lonestar™ advanced traffic management system software application.	$ 7,565.01	$ 2.97	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall develop a risk assessment procedure related to the reduction of wet weather crashes that incorporates pavement surface type and aggregate selection and will be integrated into the safety scoring tool (SST). The scoring tool developed in this project will bridge the gap between the approaches in the two current tools, the SST and Receiving Agency Form 2088. This project shall leverage the inputs and framework of the SST and the communalities with Receiving Agency Form 2088 to improve the SST and the wet surface crash reduction program (WSCRP). Integration of the SST and Receiving Agency Form 2088 will provide the benefits of streamlining the data inputs already required for the SST to avoid duplication of efforts and will effectively improve the quality of the assessment of pavement friction safety.	$ 4,349.56	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ 12,250.48	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Due to the complex nature of urban roadways, conventional crash prediction models are limited as these models omit operating speed, short-duration volume, and weather data. To mitigate this research gap, the following three national databases can be utilized: (1) National Performance Management Research Data Set (NPMRDS) with passenger and freight speed data, (2) Travel Monitoring Analysis System (TMAS) data with both temporary traffic counting and continuous traffic counting programs, and (3) real-time weather data from the National Oceanic and Atmospheric Administration (NOAA). The fatality rate on Texas roadways for 2020 was 1.50 deaths per hundred million vehicle miles traveled, which is an 18.94% increase from 1.26 in 2019. From 2011 to 2020, the fatalities on rural roadways increased by 19%, and this increase on urban roadways is disproportionately high (31%). Research and a supporting decision support tool are necessary to improve urban safety. The Performing Agencies shall leverage ongoing staff leadership and engagement in several national and state Department of Transportation (DOT) speed-safety projects. This research shall provide updated safety performance functions (SPFs) for urban roadways and a real-time decision support tool on risk scoring with the applicability of new data input and model updating pipeline.	$ 3,722.58	$ (128.35)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ 11,919.06	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The performing agencies shall establish a method to evaluate the existing pavement structural condition and design continuously reinforced concrete pavement (CRCP) overlays, both thin and thick. The design methods will include non-destructive (NDT) pavement evaluation techniques and tools, deflection based CRCP slab thickness design procedures, and CRCP reinforcing design details.	$ 3,930.71	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ 11,121.16	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's Roadway Design Manual was updated in July 2020 and incorporates considerations for and accommodations of bicyclists and pedestrians, including preferred design order toward Shared Use Paths (SUPs) compared to bicycle lanes and shared lanes. However, the Guidance does not include specific procedures to estimate the anticipated volumes of non-motorized path users. The Receiving Agency's Bicycle Accommodation Design Guidance makes it clear that anticipated user volumes should be considered when designing facilities. The objective of this project is to develop a simple sketch planning-level demand estimation tool that provides anticipated user volumes for SUPs. The project shall also incorporate the results into the future editions of The Receiving Agency's design guidance/manuals. Given the uncertainty in resources, this project shall not use an overly complicated method or a method that requires complex data or data architecture. The project shall benefit from existing data sources, including The Receiving Agency's Texas Bicycle and Pedestrian Count Exchange and other count data resources in the State as well as other secondary and spatial data sources. The project shall develop an easy-to-use tool responding to the needs and requirements of the intended audience while incorporating advancements to improve the accuracy of the demand estimation.	$ 6,699.34	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ 3,310.54	$ 447.37	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's current practice is to conduct numerous speed studies throughout the year to determine if the speed limits should be changed due to new traffic patterns, development, crash history, and other factors. These studies are driven by stakeholder requests or as part of routine annual reviews. The number of studies performed at any given time is limited by staff and consultant resources, resulting in a process that can take several months to complete. Can the increasing availability of vehicle probe data, along with other big datasets, be used to reduce the level of effort and time needed to collect speed data? If so, what data can be readily obtained from big data sources and what procedure would be needed to refine the use of probe speed information and produce speed limit recommendations that are consistent with the sound engineering practices currently used by Receiving Agency staff? This project will explore if there are more efficient methods for conducting Texas speed limit studies that would allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. Such a program would also provide a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ 10,840.90	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Unmanned aircraft systems (UASs) equipped with digital cameras, light detection and ranging (LiDAR) sensors, or both enable the collection of high spatial resolution three-dimensional (3D) quantitative geospatial data. This data can be used to support a variety of surveying and mapping activities, potentially with lower costs and greater safety than traditional survey methods. When using a camera, the technique is called Structure-from-Motion photogrammetry or UAS-SfM. In practice, there are important differences between UAS-SfM and UAS-LiDAR including measurement fidelity, operational considerations, post-processing workflows, and cost-effectiveness. With a lack of clear guidance on when UAS-SfM versus UAS-LiDAR is the best fit for a specific task, there is a need to evaluate the real-world performance capabilities and limitations of both technologies. This research shall document state of practice in UAS-SfM and UAS-LiDAR technologies; prepare a list of use cases to test relevant technologies; conduct field tests and comparative analyses to identify and document advantages, disadvantages, implementation scenarios, and costs; prepare recommended settings and operational workflows for repeatable, survey-grade data collection; prepare guidelines for quality assurance and control of UAS projects conducted with LiDAR and SfM, as well as identify project suitability for the adoption of UAS to support land surveying activities at the Receiving Agency.	$ 3,502.18	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ 11,486.33	$ 194.12	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Long-range transportation planning (LRTP) and travel demand models (TDMs) play an important role in the planning process, which assists transportation agencies with prioritizing future transportation investments. Improved LRTP and TDMs can bring direct benefits to transportation planning in the state. Effective transportation planning and investment decision making depends on timely, comprehensive, and accurate data. However, traditional data collection methods only provide a "snapshot" of the travel information, which limits the performance of conventional LRTP and TDMs. In this regard, while these sources are still used, transportation planners at the state, metropolitan, and local levels are beginning to incorporate third-party traffic data into their planning processes. Planners also start to look at the opportunities afforded through third-party data and provide guidance on how to take advantage of that data to expand and improve planning practices. This project aims to utilize probe-based data to improve the LRTP process and TDMs used by the Receiving Agency, MPOs and other planning agencies in the state. The Performing Agencies shall study and understand how probe-based and location-based data may be leveraged to facilitate the validation and calibration of existing planning models, enhance existing modeling tools, and incorporate advanced modeling techniques.	$ 5,844.57	$ (339.58)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall perform a comprehensive evaluation of concrete sealers and coatings applied to bridge substructure in the state of Texas. The Performing Agency shall investigate the need for and extent of surface preparation on both new and existing concrete surfaces including those with previously applied coatings. A focus is placed on material testing to evaluate the performance of coatings applied with various surface preparation methods and exposed to environmental conditions. The potential benefits are the development of recommendations for the level of surface preparation required for various sealer or coating systems and for the optimal coating type for the Receiving Agency's substructures with or without previously applied coatings.	$ 14,940.33	$ (389.18)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	coverage of EV charging infrastructure. While currently comprising less than one percent of all registered vehicles in Texas, projections forecast that EVs could comprise up to 55 percent of all vehicles by the year 2040. This significant industry shift will require considerable and proactive efforts to support this transition, focusing on infrastructure readiness, customer experience, interregional connectivity, and equity. Texas needs to identify optimal places where infrastructure will be needed in advance of federal and local funding that will be available to build out additional stations. Since implementation of EV charging infrastructure will occur in phases over multiple years, information will be needed at recurring intervals to determine locations of EV chargers based on a multitude of parameters and considerations to serve EV mobility. This project will develop a statewide EV charging infrastructure readiness plan that will fill an important gap and create a guidance resource for entities in determining infrastructure investment locations. By having a plan to determine needs for EV charging infrastructure other stakeholders will benefit as well. For example, utilities can ensure make-readiness and sufficient power capacity to areas considered for deployment. The statewide plan will determine and guide infrastructure investment across the state with a goal of a stable and consistent charging network. The project will also help guide future charging infrastructure funding opportunities in identifying locations of greatest need and impact, and provide guidance to most effectively and equitably distribute available funding.	$ 10,700.92	$ 194.12	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency's Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ 9,853.20	$ (814.84)	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Traffic Safety Division (TRF) of the Receiving Agency drafted a special specification (SS) for the vertical application of a retroreflective solid stripe on concrete barriers, approximately six (6) inches below the barrier's top. During the phase of new product approval, this SS describes an application similar to three (3) locations already installed on Texas roadways in previous years. Barrier striping increases motorist awareness of the roadway's edge and the barrier itself, particularly in low-visibility conditions (i.e., heavy rain and snow). These existing implementation sites have not been formally evaluated. Furthermore, the short-term effectiveness of the treatments has not been investigated; therefore, there is a need for long-term and short-term safety effectiveness evaluation of these treatments. The Performing Agencies shall collect before-and-after collision data from Crash Record Information System (CRIS) and near-collision data from connected vehicle data vendor (e.g., Wejo) to evaluate the effectiveness of vertical application of a retroreflective solid stripe on concrete barriers. Furthermore, the Performing Agencies shall install these treatments at six (6) high crash locations with different barrier types including, but not limited to concrete barriers and metal beam guard fences to evaluate their short-term effectiveness using non-traditional safety evaluation approaches. The Performing Agencies shall utilize the findings to update the drafted SS for the future use across the state and beyond.	$ 7,030.02	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Understanding and estimating realistic production rates of major work items in a highway project are critical to determining a reasonable project contract time, evaluating the contractor's baseline schedule, monitoring progress schedules, and ultimately completing the project on time. The Performing Agency shall leverage the Receiving Agency's historical project data to obtain the as-built information of production rates of various work items, and shall develop a) an expanded version of the Receiving Agency's construction production rates table, b) an interactive tool that can generate color-coded heat maps to visualize feasible ranges of production rates of major work items across Texas, and c) implementation guidance and recommendations. An advanced and interactive production rate estimation tool could significantly help the Receiving Agency achieve the goal of completing highway projects on time. Such a decision-aid tool could significantly improve the Receiving Agency's practice in determining more accurate production rates, resulting in more accurate contract time determination, the contractor's baseline schedule evaluation, and progress schedule monitoring. Such data-driven and practical production rates may provide higher certainty and reliability than the Receiving Agency's current construction production rates table.	$ 6,393.39	$ 1,082.68	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research study aims to perform a study focusing on best practices for performing pavement preparatory work in advance of preventive maintenance (PM) surfacing contracts. The study will determine the best practices for repairing a roadway before a new surface is placed. Seal coats or thin overlays are typical PM surfacing projects. The preparatory work performed by in-house maintenance forces or maintenance contracts may include crack sealing, fog seal, repairs, milling, and level-up. The preparatory work should be completed well before the PM contract. The Performing Agencies shall identify the main flexible pavement repair types and investigate best practices for performing both in-house and contracted repairs. The Performing Agency 1 shall develop a procedure to determine the limits and type of flexible pavement repair. The Performing Agency 1 shall develop an evaluation process of the repair, including its performance and effects on the PM surfacing.	$ 6,326.12	$ -	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Of the various situations in which a utility relocation is eligible for reimbursement at the Receiving Agency, one of the most complex situations is when parts of the existing utility facility involve a property interest. For utility facilities that involve a private property interest, the Receiving Agency uses an eligibility ratio, which is defined as the percentage of utility facilities that are reimbursable in relation to the total amount of utility facilities being relocated. In practice, eligibility calculations can be convoluted or complex, particularly in situations where the utility facility spans multiple property interest locations. The Performing Agency shall develop and test an improved methodology to determine reimbursement eligibility and calculate utility reimbursement amounts. The Performing Agency shall document a significant sample of utility relocations and their associated reimbursement costs to develop a reliable baseline of practices throughout the state, evaluate practices in other states, develop and test an updated methodology for utility reimbursement eligibility criteria and calculations, prepare a guidebook with examples on how to determine utility reimbursement criteria and calculate reimbursement amounts, and prepare and test training materials.	$ 9,888.07	$ 242.64	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall develop a method and tool for analyzing safety-related pavement data to identify candidate pavement safety projects, such as cross-slope improvement projects and flushing treatment projects. The Performing Agencies shall assemble a dataset containing comprehensive data on the pavement, site condition, and crashes for a representative sample of on-system roadways. The Performing Agencies shall conduct a comprehensive analysis of the integrated dataset to identify critical combinations and thresholds of pavement conditions that may pose a safety hazard and use these factors to assess pavement susceptibility to crashes. The Performing Agencies shall quantify the pavement crash susceptibility based on measurable pavement characteristics such as cross-slope, geometrics, distresses (e.g., rutting, flushing), skid resistance, and roughness. Finally, the Performing Agencies shall develop a data analysis and visualization tool for assessing pavement crash susceptibility and recommending solutions to reduce crash risks. The Receiving Agency's districts will be able to use this tool to identify potential site-specific crash contributing factors and proactively select appropriate pavement safety improvement projects.	$ 4,905.85	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Drainage is a critical element of roadside design. Roadway drainage design often calls for the use of cross-drainage and parallel-drainage culverts. If untreated, the ends of the drainage structures can become roadside hazards that can result in serious injury when an errant vehicle leaves the roadway. The most cost-effective strategy is often to make the culvert end traversable using grates comprised of pipe runners across the culvert end. The Performing Agency shall investigate the safety performance of traversable cross-drainage and parallel-drainage culvert end treatments installed on roadside slopes. The Performing Agency shall address the various design variations of safety end treatments supported by current standards to investigate the safety performance. The Performing Agency shall develop design guidance to recommend slopes and size, length, and spacing of the pipe runners for both cross-drainage and parallel-drainage culverts that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH). The Performing Agency shall use full-scale crash testing to aid with validating the design guidance.	$ 6,735.39	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Super 2 highways have been used across Texas for over 20 years, providing operational and safety benefits to rural two-lane highways at lower cost than widening to four-lane, and more are planned as the demand increases on the state highway system. Previous Super 2 research has provided insights on safety improvements, but the Receiving Agency would benefit from an updated crash modification factor (CMF) based on a rigorous review and analysis of recent crash data from the state's many Super 2 highways. This CMF would provide additional support for installing Super 2 corridors throughout the state and complement existing guidance. The Performing Agencies shall use their existing database of Super 2 highways and site characteristics, combined with additional data on traffic volumes, crashes, and other relevant factors, to develop a comprehensive Super 2 dataset for analysis and identification of relationships between crashes and other characteristics. Using the results of this analysis, the Performing Agencies shall define one (1) or more CMFs or crash modification functions (CMFunctions) that the Receiving Agency and other practitioners can use to make decisions on installing future Super 2 corridors. The Performing Agencies shall disseminate these CMFs to the Federal Highway Administration's (FHWA's) CMF Clearinghouse for inclusion in their database.	$ 5,548.82	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Texas continues to use cold recycling for pavement rehabilitation and performs a significant amount of full depth reclamation (FDR). While cement remains the most widely used treatment, use of asphalt emulsion and foamed asphalt continues to grow. This project shall identify and evaluate topics to strategically enhance cold recycling practices in Texas. This project shall perform a comprehensive performance analysis of recent as-built projects to identify strengths and opportunities for process enhancement. For cement, this project shall evaluate how cement type may influence mixture properties, analyze the Texas Flexible Pavement System (FPS) structural design assumptions based on current mix design and construction practices, and summarize methods to improve early trafficking. For emulsified and foamed asphalt, this project shall develop cold-in-place recycling (CIR) applications for Texas and identify, evaluate, and recommend enhanced pavement design procedures for cold recycling with asphalt binders. This project shall use all results to develop enhanced cold recycling project selection procedures, recommend updates to the Receiving Agency's specifications, and develop and perform training.	$ 16,916.56	$ 363.98	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Hamburg Wheel Track (HWT) rutting test generally serves well as the standard rutting test for asphalt mixes in Texas; however, in the last several years, some premium mixes (i.e. stone matrix asphalt), designed with PG76-22 and low HWT rut depth, have experienced premature rutting failures under slow moving (or stop/ go) traffic in several Receiving Agency Districts. Such failures burden the Receiving Agency with extra cost. Furthermore, it was reported that the HWT test cannot accurately quantify the better rutting performance of some tougher mixes with highly modified asphalt (HiMA). Thus, the Performing Agencies shall develop the next generation of HWT test to accurately screen out asphalt mixes that are prone to rutting failures. The Performing Agencies shall review the literature, survey Districts, and other state departments of transportation (DOTs) to identify the proper rutting test(s) and asphalt mixes for addressing the rutting failure caused by the slow-moving traffic. The Performing Agencies shall further develop the next generation of HWT test and associated acceptance criteria through finite element analysis, laboratory testing, field accelerated pavement testing and survey of in-service pavement intersections, round robin test, and recommendation of specification changes.	$ 10,513.65	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	State agencies must report vehicle miles traveled (VMT) estimates for local roads compiled in the statewide summaries dataset of the Highway Performance Monitoring System (HPMS) database. While the VMTs for higher functional class roads are the product of annual average daily traffic (AADT) with the corresponding roadway segment length (L); the states produce the VMT estimates for local roads as an aggregate measure using a variety of methods. Currently, the local road network accounts for more than two-thirds (67%) of the total roadway mileage in Texas and is the largest in the United States. Conducting short-term counts (STCs) (e.g., for a few hours up to a few weeks) on an extensive local road network to develop VMT is logistically challenging; hence, the Receiving Agency uses statistical methods to obtain aggregated VMT. Although the current methods are statistically verified, advancements in technology and available resources have been made since the methodology was developed. The Performing Agencies shall investigate and develop data-driven methods for VMT estimation that can be implemented in Texas and advance the analysis methods of the Receiving Agency. The developed methods shall also reduce any bias in the estimation of VMTs on local roads that can lead to the overestimation or underestimation of travel demand.	$ 7,945.02	$ (31.53)	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency has observed premature pavement failures on several widening projects, including shoulder widenings, conversion of two-lane roadways to Super 2 sections, and other safety enhancements. Repairing these early failures is time-consuming, expensive, disrupts traffic, and poses safety hazards. Key contributing factors include poor-quality materials, poor joint construction, inadequate drainage, differential settlement, etc. These issues could have been avoided through proper pavement condition assessment, design, and construction practices; but detailed guidance on which methods to employ, which can be project specific, is not readily available to district personnel. Therefore, there is a need to document and implement better widening practices across the Agency. The objectives of this synthesis project are to document pavement widening best practices by: • Reviewing the literature for effective widening practices. • Reviewing current widening practices employed by the Receiving Agency, including: o Pre-design pavement evaluation, o Pavement layer and cross-section design, o Material selection, o Project plans, specifications, and estimates, and o Construction practices. • Evaluating previous widening projects both in good and poor condition. • Identifying issues and practices that can lead to premature failure, and practices that should be adopted more widely. • Developing comprehensive guidelines and modifications to specifications.	$ 2,784.38	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Shared or multiuse paths invite a wide range of users, including pedestrians, bicyclists, and other wheeled users, with a range of transportation purposes such as commuting, exercise, and recreation. Although shared use path (SUP) users are physically separated from traffic, they remain vulnerable at roadway crossings. In the absence of roadway cross-section designs for accommodating pedestrians and bicyclists, SUP crossings can present users with complex tasks including gap selection, scanning for turning vehicles, and interacting with other path users. Ensuring safe crossings for all users at these locations is essential. Pedestrian and bicycle treatments have been developed and their safety effectiveness has been assessed in several studies and practices. Although technically these designs can be applied to SUPs, it is not clear how to integrate treatments for different types of path users, road classifications, land-use contexts, and crossing geometries. With the increasing implementation practices of SUPs across Texas, there is a need to assess the potential safety concerns involving pedestrians, bicyclists, micromobility users, and people with disabilities at these locations and develop guidance for treatment selection, including for paths next to railroads. The Performing Agencies shall explore the pedestrian and bicyclist crashes at the vicinity of SUPs and develop design and planning guidance for implementation purposes.	$ 10,500.37	$ 128.35	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Road to Zero has targeted a goal of zero deaths and serious injuries on Texas roadways. Recent trends in Texas indicate a continued increase in highway fatalities each of the past three years. In 2021, roadway departure crashes were responsible for 40 percent of all crash-related fatalities in Texas, which is the largest single category by crash type. In October 2021, Federal Highway Administration (FHWA) designated Texas as one of 16 Roadway Departure Focus States based on being over-represented on three (3) different roadway departure crash fatality metrics. Roadside safety devices are a key element of an effective roadway departure safety strategy. These safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively evaluate high priority issues related to roadside safety devices. This includes development of both new and improved safety features that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) and help minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes.	$ 14,134.60	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research will focus on the impact on pavements and bridges following the statewide resilience plan. Research findings will not only be used to meet federal requirements, but more importantly, the recommendations and analysis will be used to guide TxDOT's future project selection and development process in term of addressing extreme weather and resilience impacts. To achieve the project objectives, the research team shall: • Perform literature review of available state and national research projects, legislative requirements, and best practices from state DOTs and local agencies. • Identify and characterize risk factors to TxDOT's highway and bridge infrastructure both temporally and spatially, and estimate their potential intensity. • Assess the risk or likelihood of the identified factors occurring based on a thorough quantitative statistical analysis of available data. • Calculate the potential impact occurring based on the characteristics of the TxDOT managed highway/bridge network system using available relevant databases based on current condition, age, traffic, and environmental conditions. • Create an analytical decision-making framework for probabilistic scenario simulations to prioritize assets for maintenance and retrofit based on climate hazards and asset's criticality and vulnerability. • Quantify the mitigation strategies and their benefits and associated costs for the life cycle planning analysis. • Conduct scenario analysis and scenario planning to evaluate and prioritize the identified risks. • Identify proxy indicators that TxDOT can track to monitor high priority risks. • Implement probabilistic resilience economic analysis for adaptation strategies vulnerable and critical assets. The expected technology readiness level (TRL) for this project is 8.	$ 8,451.50	$ 1,096.34	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency cantilever overhead sign structures (COSS) and traffic signal pole structures have a socketed fillet welded connection between the column and the baseplate. While economical, this connection has a low fatigue-resistance threshold. The objectives of this research are to (1) outline fabrication practices and economic considerations that may affect proposed connection type and design, (2) develop an inventory database of COSS and traffic signal pole structures that are representative, (3) utilize structural modeling to identify from within the inventory critical cases that should be advanced to a testing program, (4) develop and execute a targeted testing program that isolates critical design parameters for the fatigue performance of both the critical cases found in the inventory and recommended connection types and designs, (5) provide recommendations for connection types and designs based on fatigue provisions, and (6) provide recommendations for identifying fatigue-critical of existing inventory.	$ 12,668.77	$ 331.19	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Ancillary structures (AS) exist in a wide variety of applications critical to safety and daily needs of the travelling public. The long-term corrosion performance of these structures is of utmost importance to prevent deterioration and extend the structural design life and safety. While hot-dipped galvanizing provides excellent long-term behavior for corrosion control of these critical structures, over the past 20 years this process has been found to create extensive cracking of welds on base plate connections that is detrimental to the fatigue lives of these poles. Although improved details are used in new designs, thousands of High Mast Illumination Poles (HMIP), Cantilever Overhead Sign Structures (COSS), and traffic signal poles (TSP) exist in Texas with varying levels of cracking in the welds between the baseplates and pole shafts. During this research project, the Performing Agency shall identify and provide critical assessment parameters and guidance for the Receiving Agency to determine if cracks should be monitored, repaired, or the structural component replaced. The research includes a representative assessment of weld cracking in the AS inventory, the development of monitoring hardware and techniques, the development and assessment of repair techniques, and the development of certification methods/standards for inspection personnel.	$ 5,044.58	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	In 2012, the Rider 36 study indicated that damage caused to bridges and pavements by overweight (OW) vehicles surpassed the revenue collected by permit fees by approximately $200 million annually. This finding was corroborated by a recent 2022 study mandated by House Bill 2223, which quantified this gap at $168 million. Besides the revenue shortage to cover bridge and pavement maintenance and rehabilitation costs due to the damage cause by OW vehicles, the 2022 study also identified additional shortcomings that need to be urgently addressed. These shortcomings include: 1) lack of a methodology for periodically adjusting permit fees to account for changes in traffic patterns and configurations and higher inflation rates; 2) lack of accurate data and process for calculating annual vehicles-miles-travelled (VMT) by each permit type; 3) uncertainty in the identification of routes and number of trips for monthly, quarterly, or annual permits; 4) absence of a method and process to assess the damage caused by OW vehicles to the off-system bridges and highways. The objective of this research is to address these shortcomings and to develop, recommend and provide the Receiving Agency a well-established and documented step-by-step method to periodically update such method.	$ 1,610.59	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Polymer additives are used to design high PG virgin binders that meet the PG requirements to protect the mix against rutting and cracking under the climate and traffic conditions of an HMA project. When RAP is added to the mixture, the effective binder may not meet the desired grade. This project shall quantify the extent to which polymer dilution is a problem that should be addressed in the Receiving Agency's HMA specifications and if so, develop specification language to address it. This project involves evaluating binder blends and mixtures with RAP. Both lab blended and commercial PG binders shall be evaluated for continuous grade, elasticity, polymer content, and other rheological parameters. Then these binders shall be mixed with recovered RAP binders at several percentages and retested to determine the same properties. Standard mixtures(s) shall also be used with several of these binders and various RAP percentages to measure mixture performance-related properties (cracking and rutting). The Performing Agencies shall use the results from binder and mixture results on the impact of "virgin binder – RAP binder dilution" and work with the Receiving Agency to develop specification language for inclusion in the Receiving Agency's HMA specifications, as needed.	$ 5,786.53	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Traffic control devices (TCDs) are the primary means of communicating highway information to road users and play a key role in highway automation. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. In addition, vehicle technologies and the roadway infrastructure industry are rapidly evolving, spurred by technology advancements, customer demand, changes in the vehicle fleet, and changes in national and state policies. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project could represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ 23,798.13	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The number of vehicles with automated functions continues to increase on Texas roadways. Several companies are testing or will soon deploy demonstrations of Level 4 automated vehicles or connected automated vehicles (CAV/AVs) within the state, with no notification requirements. Additionally, several automated commercial motor vehicle (ACMV) projects are testing Level 4 automation. While safety goals are aimed at minimizing the number of adverse incidents that occur, it is inevitable that a crash or other adverse operations will happen involving one (1) of these automated vehicles. The Receiving Agency's Highway Emergency Response Operator (HERO) program and other first responders are part of the front line that must be prepared to encounter a CAV/AV or ACMV during a routine interaction or adverse event/accident. This project will identify needs and strategies for first responders to understand how these vehicles operate, how to safely approach and disable these vehicles as needed during routine and adverse incident interactions and how to interact with AVs during an accident or emergency.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Detecting problematic exits and places of wrong turns and identifying signal and other issues will result in improving safety on highways by reducing crashes as well as optimizing traffic flows while minimizing disruptions. This project will also provide TxDOT with data-driven justification for future highway investments. To achieve the project objectives, the research team shall: • Explore telematics data for a given set of roadways in Texas where issues have been identified by local TxDOT staff as frequent problems. These issues may include motorists missing exits or making wrong turns, traffic signals are not reliably detecting vehicles or vehicles waiting through multiple cycles at the same signal, motorists repeatedly driving outside their permitted lanes of travel while merging on highway ramps or improper merging at lane drops. • Clean and reformat; i.e, preprocess, explored data in a way that is suitable for further analysis. • Study the dataset closely to identify patterns in the data that indicate issues. • Develop rules; i.e, heuristics, or an artificial intelligence platform that can automatically detect events that indicate the issues. When applied on the entire dataset, problematic highway locations will be located and shared with TxDOT to be considered for future interventions. The expected technology readiness level (TRL) for this project is 6	$ 8,200.05	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The United States Geological Survey (USGS) and other government entities have begun to use non-contact radar for stream gauging to collect near-real-time stream velocity, discharge, and stage. Use of these devices is limited compared to traditional stream gauge methods that are typically used by the USGS and local government agencies in Texas. At the state level, TxDOT is leading the way, through partnership with the USGS, to deploy these stream gauges and is constantly learning how they can best be deployed. Because the gauges measure stream velocity and water level, they are easier and more useful to install in tidal areas than traditional gauges. In some streams, there is a peak in velocity wave in advance of a peak in water surface elevation, potentially acting as an advance warning of flood levels. Installation of these gauges is far simpler than traditional gauges in areas where channel vegetation, slope, or size, may affect equipment that must be installed down in the channel. While these gages appear to be less expensive to operate and maintain than traditional USGS gauging approaches, it would be beneficial to learn from the experiences in other US state and federal agencies, and other countries who have used these devices for longer periods of time. The Performing Agencies shall provide a synthesis on the state of knowledge and the state of practice for non-contact radar stream gauges, including how to site gauges, e.g., multiple gauges across a wide floodplain, use in steep and flashy systems, upstream versus downstream mounting on bridges. The scope should include local governments in Texas, other state and federal agencies, including other State DOTs, and countries with longer experience.	$ 1,506.01	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency with implementing the Surface Aggregate Classification (SAC) for reclaimed asphalt pavement (RAP) developed in research project 0-7025, Develop Surface Aggregate Classification of Reclaimed Asphalt Pavement. The Performing Agency shall implement and verify the methodology of SAC-A RAP classification in a minimum of four (4) Receiving Agency Districts. In each selected Receiving Agency District, the Performing Agency shall work with lab and pavement engineers and their staff to characterize the RAP in terms of SAC, design surface mixtures with the RAP, evaluate the friction and skid resistance of mixtures, and construct and monitor the selected test sections in each Receiving Agency District. The Performing Agency shall then use the data generated in these test sections to develop and teach implementation workshops for Receiving Agency Districts.	$ 4,126.91	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall increase the Receiving Agency's understanding of the fundamental relationships between posted and operating speed along with providing content to support external and internal Receiving Agency dialog about speed limits and their development for all roadway environments. This project shall include three (3) workshops along with developing Spanish versions of videos on speed limit setting practices.	$ 1,614.93	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objectives of this project are to complete the design and construction of the automated test system for asphalt mixtures and asphalt binders and to deliver an automated IDEAL cracking and rutting test unit and an automated asphalt binder specific gravity and dynamic shear rheometer testing unit to the Receiving Agency's MTD lab. The automated asphalt mixture testing unit includes (1) auto-air void measurement subunit, (2) specimen conditioning subunit for both room and high temperature, (3) automation arm subunit, (4) automated IDEAL cracking test (IDEAL-CT), IDEAL rutting test (IDEAL-RT), indirect tensile (IDT) strength test subunit, and (5) waste disposal subunit. The automated asphalt binder testing unit includes (1) asphalt binder specific gravity testing subunit and dynamic shear rheometer testing subunit. The automated asphalt mixture and binder test units shall shorten test time and improve lab safety, test efficiency and accuracy.	$ 8,543.40	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's Research and Technology Implementation (RTI) Division funded research project 0-6701 in FY 2012 to investigate potential methods of linking transportation planning in Texas with the environmental clearance process required of the National Environmental Policy Act (NEPA). The study approach and findings were documented in a research report (0-6701-1) and a guidance document entitled Texas Department of Transportation (TxDOT) Resource for Linking Planning with Project Planning in Support of NEPA (0-6701-P1). The Performing Agency shall: (1) Conduct structured interviews with the Receiving Agency's planning and environmental subject matter experts, five of the state's Metropolitan Planning Organizations (MPOs), and up to five State Departments of Transportation (DOTs) that pioneered Planning and Environmental Linkages (PEL) in FY 2012 to determine the need for updated/new PEL Guidance given that 0-6701-P1 was developed a decade ago as well as the Receiving Agency's participation in the NEPA Assignment program under 23 U.S.C. 327 and the Memorandum of Understanding with FHWA originally dated December 16, 2014 and renewed on December 9, 2019 (Phase 1) and, (2) Update 0-6701-P1 if the interviews reveal the need for updated/additional guidance (Phase 2). The structured interviews conducted in Phase 1 revealed the need for updated/additional guidance. The objective of Phase 2 is to develop a user-friendly PEL guidebook that the Performing Agency's Divisions and District staff can reference in the implementation of PELs in Texas, as well as the Texas Metropolitan Planning Organizations.	$ 3,401.38	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	De-icing using geothermal energy can provide the Receiving Agency with a better alternative than the existing method of using de-icing with sands and/or salts. This research project shall explore the potential for retrofitting bridges with a fluid-filled piping system and move through Technology Readiness Levels (TRL) from concept (TRL level 1) through to prototype demonstration in a relevant environment (TRL level 6).	$ 7,917.69	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall produce Video Summary Report's (VSRs) for the Receiving Agency which summarize transportation research and implementation projects. Additionally, the Performing Agency shall also produce outreach materials for the Receiving Agency that will be transportation research related material and may include additional related subjects of interest.	$ 7,514.30	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This pooled fund study will provide a cooperative approach to conducting research to address roadside safety issues specifically related to improving motorcyclist safety. Furthermore, this program is intended to provide participating states collaborative opportunities to stay abreast of best practices, new regulatory issues, risk management strategies, and other research pertaining to roadside safety improvements for motorcyclists. The research activities will include the identification, development, and evaluation of strategies and devices for mitigating the frequency and severity of roadway departure motorcyclist crashes.	$ 5,309.80	$ -	$ -	$ -	$ -	$ -
575 - Texas Division of Emergency Management	3.1.1. Staff Group Insurance Contributions	The Performing Agency will provide personnel, equipment, and supplies to conduct the responsibilities, projects, and associated tasks for a program of hazardous materials (hazmat) transport emergency planning projects and activities. This Agreement will cover work to be performed during Fiscal Year 2024 in relation to three projects (respectively titled Project 2, Project 5, and Project 6). The responsibilities of both Parties are detailed in the Scopes of Work in Attachment A, which are hereby incorporated into this Contract. The Scopes of Work includes an overview of each project and specific details of the portion of the work to be performed for that project in the current fiscal year.	$ 3,420.35	$ 1,455.87	$ -	$ -	$ -	$ -
575 - Texas Division of Emergency Management	3.1.1. Staff Group Insurance Contributions	The Performing Agency will provide personnel, equipment, and supplies to conduct the responsibilities, projects, and associated tasks for a program of hazardous materials (hazmat) transport emergency planning projects and activities. This Agreement will cover work to be performed during Fiscal Year 2024 in relation to three projects (respectively titled Project 2, Project 5, and Project 6). The responsibilities of both Parties are detailed in the Scopes of Work in Attachment A, which are hereby incorporated into this Contract. The Scopes of Work includes an overview of each project and specific details of the portion of the work to be performed for that project in the current fiscal year.	$ 1,551.30	$ 564.29	$ -	$ -	$ -	$ -
575 - Texas Division of Emergency Management	3.1.1. Staff Group Insurance Contributions	The Performing Agency will provide personnel, equipment, and supplies to conduct the responsibilities, projects, and associated tasks for a program of hazardous materials (hazmat) transport emergency planning projects and activities. This Agreement will cover work to be performed during Fiscal Year 2024 in relation to three projects (respectively titled Project 2, Project 5, and Project 6). The responsibilities of both Parties are detailed in the Scopes of Work in Attachment A, which are hereby incorporated into this Contract. The Scopes of Work includes an overview of each project and specific details of the portion of the work to be performed for that project in the current fiscal year.	$ 2,847.78	$ 68.24	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	This project will develop a set of statewide emissions inventories (EI) for all locomotive and rail yard source categories in Texas. These EIs are needed to fulfill the federal Air Emissions Reporting Requirements (AERR) and to support state implementation plan (SIP) development. The Grantee shall develop annual (short tons per year) and average summer weekday (short tons per day) controlled and uncontrolled EI estimates of criteria air pollutants (CAP), CAP precursors, and hazardous air pollutants (HAPs). The Grantee shall use compiled activity data developed during the previous locomotive and rail yard activity data sourcing project, PGA 582-22-32564-007, to develop the required EIs.	$ 3,109.29	$ 497.73	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	This project will develop a set of statewide emissions inventories (EI) for all airport source categories in Texas, including aircraft, auxiliary power units (APU), and ground support equipment (GSE). These EIs are needed to fulfill the federal Air Emissions Reporting Requirements (AERR) and to support state implementation plan (SIP) development. The Grantee shall develop annual (tons per year) and average summer weekday (tons per day) controlled and uncontrolled EI estimates of criteria air pollutants (CAP), CAP precursors, and hazardous air pollutants (HAP) using the Federal Aviation Agency's (FAA) Aviation Environmental Design Tool (AEDT). The Grantee shall use compiled activity data, control strategy information, and airport facility data developed during the previous aircraft, APU, and GSE activity data collection projects PGA 582-21-10369, PGA 582-22-32383-005, PGA 582-21-11196-018, and PGA 582-22-32383-005 to develop the required modeling input files for use with AEDT and to further process and analyze the output file data as needed.	$ 3,186.38	$ 3,200.53	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to develop and produce on-road mobile emissions inventories necessary to support the ELP County RFP state implementation plan (SIP) revision for the 2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS). Specifically, the Grantee shall develop and produce on-road mobile link-based emissions inventories for the ELP County ozone nonattainment area for analysis years 2017, 2023, and 2024.	$ 4,364.49	$ 280.85	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall organize and document the air quality activities among city, state and federal agencies selected by the Receiving Agency, through the activities of the Technical Working Group for Mobile Source Emissions (TWG). The Performing Agency shall provide technical analysis of current and emerging air quality planning issues, including regulations and legislation, identified by the Receiving Agency or through TWG and other platforms. The Performing Agency shall provide assistance for on-road mobile source emissions analyses required for these areas to support conformity analysis and attainment strategy demonstrations. This will include on- demand assistance for existing non-attainment areas (Houston-Galveston, Dallas/Fort Worth, El Paso, and San Antonio), as well as for areas in Texas which are at risk of or anticipate exceeding current or anticipated emissions standards, but have not been officially designated as non-attainment areas.	$ 57,562.28	$ 7,778.73	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall perform a comprehensive evaluation of concrete sealers and coatings applied to bridge substructure in the state of Texas. The Performing Agency shall investigate the need for and extent of surface preparation on both new and existing concrete surfaces including those with previously applied coatings. A focus is placed on material testing to evaluate the performance of coatings applied with various surface preparation methods and exposed to environmental conditions. The potential benefits are the development of recommendations for the level of surface preparation required for various sealer or coating systems and for the optimal coating type for the Receiving Agency's substructures with or without previously applied coatings.	$ -	$ 1,295.70	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to provide the requisite on-road mobile source portion of the 2023 periodic year emissions inventories and county database files (CDBs) for all 254 Texas counties. The State of Texas is required to submit periodic emissions inventories and United States Environmental Protection Agency's (EPA) Motor Vehicle Emissions Simulator (MOVES) CDBs under the Air Emissions Reporting Requirements (AERR) to support the EPA's comprehensive three-year cycle National Emissions Inventory (NEI). This PGA will provide annual, summer work weekday, and winter work weekday emissions inventory estimates of criteria air pollutants (CAP), CAP precursors, and hazardous air pollutants (HAP). This PGA will also provide the requisite vehicle miles traveled (VMT) inputs for the TCEQ Texas Road Dust Calculator necessary to develop a statewide 2023 calendar year emissions inventory.	$ 1,267.75	$ 4,669.94	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this research project is to determine where, when, and why a prime or cure is needed for a pavement layer. Materials such as prime coats, curing materials, seal coats, and tack coat are typically considered non-structural, but integral to the pavement structure. Some materials can be used for multiple purposes: prime, bond or help cure; however, the rates and timing of use may change depending on why the material is being used. Guidance is needed to help designers, inspectors and construction personnel understand the materials and where, when, and why to use them. This project shall develop guidelines for prime and curing through a series of laboratory and field testing and develop tests and procedures to determine the best materials for a prime, cure or a combination. These guidelines shall aid decision makers in determining whether a prime, cure or bonding material is needed, and where, when and why to design and use the appropriate materials.	$ -	$ 671.31	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this research project is to develop measurable and repeatable adjustment criteria for seal coat application rates based on pavement condition, traffic and material properties for the design method developed in research project 0-6989 Update Seal Coat Application Rate Design Method (TxDM6989).[1] Current practice requires experienced personnel to understand the adjustments needed for application rates, including changing the adjustments as conditions on the pavement change. The adjustments in the TxDM6989 combine multiple pavement conditions into one description. By measuring the conditions, a combined adjustment based upon measured parameters will remove subjectivity from the procedure. This will lead to more consistently constructed projects that meet the objectives of designing the rates so that the resulting seal will not have too much binder so that it flushes or bleeds in the summer; but there is enough binder to prevent rock loss over the winter. This research project will produce measurable methods for adjustments to the rate design procedures that will help engineers and inspectors make better decisions resulting in successful projects.	$ -	$ 121.62	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency invests over $250 million annually on seal coats, it is therefore critical to apply the right treatment to the right road at the right time. Projects are typically selected based on the time since the last seal coat (an average of 7 years) with little to no testing performed to ensure that the section is a good candidate for seal coat and how many seal coats to apply. The objective of this research is to determine the maximum number of seal coats that can be applied to a pavement surface before the accumulated layers of seal coats become unstable. The Performing Agencies shall evaluate the stability of existing accumulated seal coat substrate layers through a series of laboratory and field testing and develop tests and procedures to determine when an additional seal coat may not perform well. The Performing Agencies shall develop guidelines to select candidate seal coat projects with multiple seal coat layers ensuring that a new seal coat is used on a good candidate pavement will lower risk to the Receiving Agency, improve life cycle costs and lead to better performing sections of pavement.	$ -	$ 56.12	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Outdoor advertising signs impact millions of travelers around the world every day. These signs are designed to attract driver attention thus taking it away from the driving task. Driver inattention and distraction are two of the most critical factors for road safety. Receiving Agency regulation of outdoor advertising signs must deal with changing technologies, including digital billboards, which allow for modifications to sign illumination, motion, and content. Regulations are not keeping pace with changing sign trends and must be updated to address potential impacts on road user safety. The Performing Agencies shall focus on the degree of driver distraction caused by typical and digital advertising sign contents. The Performing Agencies shall perform a comprehensive state-of-the-practice review, crash investigation, and an on road human factors evaluation, considering illumination levels and content (including motion) during daytime and nighttime travel for dry and wet-weather conditions. This Performing Agencies shall provide the Receiving Agency with tools and resources to help manage outdoor digital advertising billboards by establishing practical criteria for sign illumination and content. These resources shall allow the Receiving Agency to manage the advertising signs such that road user safety is accounted for while maintaining the ability of sign owners to develop effective means of communicating with the public.	$ -	$ 1,240.11	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Super 2 highways have been used across Texas for over 20 years, providing operational and safety benefits to rural two-lane highways at lower cost than widening to four-lane, and more are planned as the demand increases on the state highway system. Previous Super 2 research has provided insights on safety improvements, but the Receiving Agency would benefit from an updated crash modification factor (CMF) based on a rigorous review and analysis of recent crash data from the state's many Super 2 highways. This CMF would provide additional support for installing Super 2 corridors throughout the state and complement existing guidance. The Performing Agencies shall use their existing database of Super 2 highways and site characteristics, combined with additional data on traffic volumes, crashes, and other relevant factors, to develop a comprehensive Super 2 dataset for analysis and identification of relationships between crashes and other characteristics. Using the results of this analysis, the Performing Agencies shall define one (1) or more CMFs or crash modification functions (CMFunctions) that the Receiving Agency and other practitioners can use to make decisions on installing future Super 2 corridors. The Performing Agencies shall disseminate these CMFs to the Federal Highway Administration's (FHWA's) CMF Clearinghouse for inclusion in their database.	$ -	$ 1,058.09	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to develop on-road emission inventories that will be used as air quality modeling inputs for the calendar years of 2019 and 2026 as well as to develop activity data for 2022. For the eight-county Houston-Galveston-Brazoria (HGB) area and twelve counties within Dallas-Fort Worth (DFW) metropolitan area, link-based on-road emissions inventories will be developed based on vehicle miles traveled (VMT) activity estimates from the local travel demand model (TDM). For all 254 Texas counties, on-road emissions inventories will be developed based on VMT activity estimates from the Highway Performance Monitoring System (HPMS) that is managed by the Texas Department of Transportation (TxDOT). For all 254 Texas counties, on-road activity data will be developed based on VMT activity estimates from the HPMS to estimate forthcoming 2022 base case emissions. The TCEQ is planning for future State Implementation Plan (SIP) submissions to the U.S. Environmental Protection Agency (EPA) that will likely be required under the 2015 eight-hour ozone standard of 70 ppb. To support attainment demonstration modeling for these efforts, the TCEQ is currently developing a 2019 base case modeling episode. At this time, eight counties in the HGB area and nine counties in the DFW area are expected to be reclassified as serious nonattainment for the 2015 eight-hour ozone standard with an attainment year of 2026. For the 2019 base case and the 2026 future case, on-road emissions inventories for all 254 Texas counties are needed based on HPMS activity data from TxDOT. For the 2019 base case and 2026 future year, on-road emissions inventories are needed for the eight-county HGB area based on TDM activity data from the Houston-Galveston Area Council (HGAC), and from the North Central Texas Council of Governments (NCTCOG) for the nine-county DFW area. For all 254 Texas counties, on-road activity data based on VMT activity estimates from the HPMS for 2022 is needed to estimate 2022 emissions. The TDM network for the DFW area covers Collin, Dallas, Denton, Ellis, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise counties. Hood, Hunt and Rockwall counties are not classified as nonattainment under the 70 parts per billion (ppb) standard. They are included in work under this PGA because these counties are part of the large regional domain used by the TCEQ for air quality modeling purposes. This PGA requires the use of the Motor Vehicle Emission Simulator (MOVES) model from the U.S. EPA. At this time, MOVES4 is the latest available version of MOVES. Inventory development work under this PGA requires the use of this latest version, which will be referred to as MOVES in this PGA.	$ 5,269.52	$ 4,958.24	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The TCEQ is planning for future State Implementation Plan (SIP) revision submissions to the U.S. Environmental Protection Agency (EPA) that will likely be required under the 2015 eight-hour ozone standard of 70 ppb. Currently, Bexar County within the SAN area is classified as a moderate nonattainment area for the 2015 eight-hour ozone standard with an attainment date of September 24, 2024. At this time, Bexar County is expected to be reclassified as a serious nonattainment area for the 2015 eight-hour ozone standard with an attainment date of September 24, 2027. If reclassified, attainment demonstration analyses would need to be based on future year emissions estimates for 2026, which represents the complete ozone season prior to the required attainment date. Therefore, for the 2026 future year, on-road linked-based emission inventories for the five counties in the SAN area including Bexar, Comal, Guadalupe, Kendall, and Wilson are needed based on TDM activity data from the Alamo Area Metropolitan Planning Organization (AAMPO). This study requires the use of the latest version of the MOtor Vehicle Emission Simulator (MOVES) model from the U.S. EPA. The purpose of this study is to develop on-road emission inventories that will be used as air quality modeling inputs for the 2026 calendar year. For the five counties within the San Antonio metropolitan area (SAN), link-based on-road emission inventories will be developed based on vehicle miles traveled (VMT) and activity estimates from the local travel demand model (TDM).	$ 3,075.18	$ 1,790.70	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall continue to support the Receiving Agency in the operations and expansion of the Border Wait Time Measurement System (BWTMS) in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements.	$ 73,536.15	$ 35,461.04	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's Roadway Design Manual was updated in July 2020 and incorporates considerations for and accommodations of bicyclists and pedestrians, including preferred design order toward Shared Use Paths (SUPs) compared to bicycle lanes and shared lanes. However, the Guidance does not include specific procedures to estimate the anticipated volumes of non-motorized path users. The Receiving Agency's Bicycle Accommodation Design Guidance makes it clear that anticipated user volumes should be considered when designing facilities. The objective of this project is to develop a simple sketch planning-level demand estimation tool that provides anticipated user volumes for SUPs. The project shall also incorporate the results into the future editions of The Receiving Agency's design guidance/manuals. Given the uncertainty in resources, this project shall not use an overly complicated method or a method that requires complex data or data architecture. The project shall benefit from existing data sources, including The Receiving Agency's Texas Bicycle and Pedestrian Count Exchange and other count data resources in the State as well as other secondary and spatial data sources. The project shall develop an easy-to-use tool responding to the needs and requirements of the intended audience while incorporating advancements to improve the accuracy of the demand estimation.	$ -	$ 863.39	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Dallas County Sheriff's Courtesy Patrol program, in coordination with the Receiving Agency Dallas, is piloting a system to digitize and automate the incident reporting process. The Performing Agency shall equip each patroller, and patrol dispatchers in Daltrans, with tablets that have a commercially available application installed on it. The application will provide a centralized web and app-based incident management tool that patrollers can use to log relevant data in real-time, including auto location information, and managers can use to generate reports and performance measures. It will help mitigate crash risks by minimizing time patrollers and motorists are parked on shoulders and improve efficiency of data entry and provide insightful analytics.	$ 3,219.86	$ 659.17	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Improving CEI Contract Invoicing Validation and Efficiency	$ -	$ 4,953.05	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The overall project objective is to develop a system where prefabricated steel ABC units perform continuous for live load. The system must be: easily constructible, fast to assemble, durable long-term, safe, and cost-effective. The Performing Agency shall achieve this objective by synthesizing what has been done by state departments of transportation and other agencies (through literature review) along with evaluating the behavior of related Receiving Agency bridges (through visual inspection and monitoring). Next, a system development program shall be performed utilizing this information in conjunction with expert feedback from an Industry Review Panel (IRP) workshop (including the Receiving Agency Panel). The three best system designs shall be selected for full-scale laboratory testing followed by an analytical parametric study. All the results shall be compiled and presented at an IRP meeting with the Receiving Agency, where the final system shall be selected. The Performing Agency shall develop full Microstation details and specifications along with a user-friendly design guide. The guide shall identify: • Span length capabilities for girder sizes/depths/spacings, • General details for establishing live load continuity, • Closure pour details at interior bents and how to achieve acceptable deck stresses, • Structural steel splice details and acceptable tolerances, and • Bearing layout to meet the Receiving Agency substructure details.	$ -	$ 3,048.89	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Mapping of buried utilities using rigorous subsurface utility engineering (SUE) quality level B (QLB), as is frequently performed or recommended, can be costly. It can also be ineffective for unknown utilities (i.e., utilities that exist but for which no information is available). This is particularly common and problematic in areas of oil and gas operations. When undiscovered until construction, these unknown utilities may cause serious scheduling disruptions as well as higher construction costs, along with safety and environmental risks. There is a need for a faster, less expensive method of scanning the right of way (ROW) for these unknown utilities. This research evaluates, selects the most appropriate, and tests the application of newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown pipelines or other utilities in the ROW. It compares the effectiveness and cost of deployment to standard QLB SUE and reports on technologies that are both technically and cost effective for identifying unknown utilities.	$ -	$ 4,431.04	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Objectives The Texas Department of Transportation (Receiving Agency) was selected by the U.S. Department of Transportation (USDOT) for a Strengthening Mobility and Revolutionizing Transportation (SMART) Grant for the Smarter Intersections Pilot Project. The Texas A&M Transportation Institute (Performing Agency) assisted with the grant proposal and was identified as the sub-recipient to conduct the pilot project. The Smarter Intersections Pilot Project focuses on improving intersection safety and mobility for vulnerable road users (VRUs) such as pedestrians, including people with mobility and visual disabilities, bicyclists, and those using other mobility devices. The Performing Agency shall develop and test Cellular-Vehicle-to-Everything (C-V2X) technologies at five intersections in College Station, in tandem with on-board units on transit and emergency response vehicles or other technologies. The Performing Agency shall also potentially explore the feasibility of incorporating that vehicle information into a Smart Phone application (app) that blind/low-vision (B/LV) people can use to navigate the intersections. Further, the Performing Agency shall identify methods to communicate with automated shuttles to alert them of approaching and/or turning buses and emergency vehicles at the intersections.	$ 16,004.73	$ 20,351.76	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Lab-molded density of asphalt mixes is a critical factor for laboratory mix design, plant production, and field performance. Current mix design and production quality control and quality assurance (QC/QA) are developed around a fixed lab-molded density of 96 percent. Adherence to a fixed lab-molded density is not only one of the main factors leading to drier, more crack susceptible mixes where low asphalt binder content is often caused by balancing high lab-molded density values at plant production, but it also impacts the implementation of the Balanced Mix Design approach. Furthermore, various field test sections designed with densities ranging from 96.5 to 98 percent were previously constructed in different areas of Texas, and they performed well in the field with no observed rutting problems. Thus, the objective of this project is to establish an acceptable range of lab-molded densities for laboratory mix design and production QC/QA testing. To achieve the objective, the Performing Agencies shall review the literature, conduct extensive laboratory performance tests, construct test sections and monitor their performance, and finally recommend an acceptable range of lab-molded density based on all the information and data collected.	$ -	$ 4,849.29	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The number of vehicles with automated functions continues to increase on Texas roadways. Several companies are testing or will soon deploy demonstrations of Level 4 automated vehicles or connected automated vehicles (CAV/AVs) within the state, with no notification requirements. Additionally, several automated commercial motor vehicle (ACMV) projects are testing Level 4 automation. While safety goals are aimed at minimizing the number of adverse incidents that occur, it is inevitable that a crash or other adverse operations will happen involving one (1) of these automated vehicles. The Receiving Agency's Highway Emergency Response Operator (HERO) program and other first responders are part of the front line that must be prepared to encounter a CAV/AV or ACMV during a routine interaction or adverse event/accident. This project will identify needs and strategies for first responders to understand how these vehicles operate, how to safely approach and disable these vehicles as needed during routine and adverse incident interactions and how to interact with AVs during an accident or emergency.	$ -	$ 2,382.24	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	This project will assess and quantify nitrogen oxides (NOX) emissions reductions from the use of Texas Low Emissions Diesel (TxLED) fuel in diesel engines or vehicles representative of the current on-road mobile source fleet. The Grantee shall measure engine or vehicle emissions in a controlled laboratory environment while collecting and analyzing all process and operational data necessary to quantify emissions reductions. If resources and time permit, the scope of the project may be extended to particulate matter (PM) emissions testing and/or non-road mobile source testing.	$ 1,222.78	$ 7,925.88	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to develop and produce on-road mobile emissions inventories necessary to support the HGB-area, DFW-area, and Bexar County RFP state implementation plan (SIP) revisions for the 2008 and 2015 eight-hour ozone National Ambient Air Quality Standards (NAAQS). Specifically, for the 2015 eight-hour ozone NAAQS, the Grantee shall develop and produce on-road mobile link-based emissions inventories for the six HGB ozone nonattainment counties, the nine DFW ozone nonattainment counties, and the Bexar County ozone nonattainment area for analysis years 2017, 2023, 2024, 2026, and 2027. For the 2008 eight-hour ozone NAAQS, the Grantee shall develop on-road mobile link-based emissions inventories for the ten DFW ozone nonattainment counties for analysis years 2026 and 2027.	$ 5,662.08	$ 11,699.45	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Due to the complex nature of urban roadways, conventional crash prediction models are limited as these models omit operating speed, short-duration volume, and weather data. To mitigate this research gap, the following three national databases can be utilized: (1) National Performance Management Research Data Set (NPMRDS) with passenger and freight speed data, (2) Travel Monitoring Analysis System (TMAS) data with both temporary traffic counting and continuous traffic counting programs, and (3) real-time weather data from the National Oceanic and Atmospheric Administration (NOAA). The fatality rate on Texas roadways for 2020 was 1.50 deaths per hundred million vehicle miles traveled, which is an 18.94% increase from 1.26 in 2019. From 2011 to 2020, the fatalities on rural roadways increased by 19%, and this increase on urban roadways is disproportionately high (31%). Research and a supporting decision support tool are necessary to improve urban safety. The Performing Agencies shall leverage ongoing staff leadership and engagement in several national and state Department of Transportation (DOT) speed-safety projects. This research shall provide updated safety performance functions (SPFs) for urban roadways and a real-time decision support tool on risk scoring with the applicability of new data input and model updating pipeline.	$ -	$ 575.14	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI will provide complete support to TxDOT for the ConnectSmart project, an advanced framework integrating Transportation Systems Management and Operations (TSMO) and Active Demand Management (ADM) with multi-modal demand and mobility management.	$ 1,233.45	$ 2,140.02	$ -	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this study is to update the electronic utilities titled “TTI On-Road Emissions Inventory Utilities” and the “On-Road Emissions Quality Assurance Tool” for use with the latest version of the United States Environmental Protection Agency’s (EPA) Motor Vehicle Emission Simulator (MOVES) model, titled MOVES5 as specified in Section 10.1 - Purpose and Background of this document, informed by, and consistent with, the appropriate guidance and methods provided in the references in Section 10.4 of this document, and consultation with the TCEQ PM. Basic criteria will be used to assure that the acceptable quality of the product is met – product developers will verify that the processes and products are as stated previously, including: • The product meets the usage in the development of TCEQ mobile source emission inventories (i.e., utilities to calculate emissions and tool to QA the MOVES county input databases and output databases for all analysis years needed for SIP demonstration); • Agreed methods, models, tools, and data are used; • The required output data sets are produced in the appropriate formats; • Any deficiencies found during development and end-product quality checks are corrected; and • No installation is needed, and it can operate on TCEQ’s operating system	$ -	$ 4,016.95	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide Ground Penetrating Radar (GPR) technical expertise, to include conducting surveys, validation testing, training workshops and performing analysis on data collected with non-contact GPR systems. The Performing Agency shall also assist in performing maintenance on all the Receiving Agency’s non-contact GPR antenna systems and assist with semi-annual calibrations and system to system reproducibility measurements when requested by the Receiving Agency. All work shall adhere to applicable federal, state, and Receiving Agency regulatory security requirements and must follow TAC-202. The Performing Agency shall meet with the Receiving Agency to ensure all aspects are reviewed prior to issuance of the Notice to Proceed.	$ 6,023.14	$ 4,726.49	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide certification of the Receiving Agency's inertial profilers and profiler operators, provide assistance on measurement of pavement surface characteristics, set up profiler verification sections, and support the use of pavement condition data for highway safety management. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates.	$ 3,745.14	$ 3,115.38	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency (and implementation partners) shall provide coordination, laboratory testing and analyses, field project development and monitoring, and syntheses to support further refinement and implementation of Special Specification 3074 (SS3074) to Item 344, "Superpave Mixtures - Balanced Mix Design (BMD)". As shown in Figure 1, these activities shall result in a revised SS30YY with performance thresholds and revised test methods as needed for mix design and quality assurance (QA) to provide a practical method to engineer each unique materials combination to realize substantial economic and environmental benefits without sacrificing balanced engineering performance. The first revision of SS3074 shall be SS30XX based on results from the 2019-2022 Interagency Cooperation Contracts (IACs).	$ 30,515.35	$ 34,641.00	$ 854.17	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed may only be authorized by the Receiving Agency's Construction Section Director or a higher level of authority. The Notice to Proceed will activate all tasks associated with this contract and described within. The Notice to Proceed will identify the end date of activities. An additional Notice to Proceed will be required to continue work beyond that date. Through previous Interagency Cooperation Contracts (IACs), the Performing Agency developed curriculum for CON 511 – Basic Construction Schedule Analysis and CON 512 – Time Impact Analysis. Through these IACs, the Performing Agency has virtually delivered each of these courses several times. Through this IAC, the Performing Agency shall continue to deliver CON 511 and CON 512. As part of this IAC, the Performing Agency shall use feedback and additional construction data to improve the tools developed for CON 511 and CON 512 and refresh the curriculum of these courses to integrate the new tools. Finally, as part of this IAC, the Performing Agency shall develop a Construction Project Management training course. This course is envisioned as a one-day to one-and-a-half day introductory course to the Receiving Agency construction project management.	$ 4,865.71	$ 4,194.34	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI and Virginia Tech will perform Errors and Omissions Management Training and Construction Engineering and Inspection by Professional Services Firms Training through this IAC with TxDOT.	$ 8,371.66	$ 10,453.60	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The scope of services provided by the Performing Agency is outlined in the following tasks to be performed for the Receiving Agency's Materials and Tests Division (MTD). The Performing Agency shall develop a Materials Academy Workshop training program for Receiving Agency personnel with an emphasis on highway construction materials. The Performing Agency shall travel to the Receiving Agency's Facilities in Austin, TX and conduct five (5) week workshops according to the schedule in Task 3. The workshop shall consist of up to two (2) weeks of preparation and webinars, two (2) weeks of in-class lecture and laboratory hands-on sessions at the Receiving Agency, and one (1) week of class sessions with manufacturing plant visits at non-Receiving Agency facilities including, but not limited to the TxAPA (Texas Asphalt Pavement Association) Buda facility. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed may only be authorized by the Receiving Agency's Materials and Tests Deputy Director or a higher level of authority. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates.	$ 3,132.71	$ 6,602.96	$ (266.88)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency (TxDOT's Public Transportation Division) is responsible for administering the state's program for public transportation. The scope of responsibility includes the distribution of federal and state funding for public transportation in small urban and rural areas, and state funding for eligible large urban areas. Receiving Agency is also responsible for managing the programs for planning, technical assistance, and statewide coordination of public transportation. Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions and advanced problem-solving capabilities.	$ 43,775.42	$ 43,672.80	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide the Receiving Agency with UTP technical assistance and support, The Performing Agency shall support the Receiving Agency with database development, data analysis, data processing, data visualization, and dashboard development. The Performing Agency shall assist the Receiving Agency with developing the Annual Portfolio Achievement Report (APAR), document Standard Operating Procedures (SOPs) and swimlanes, provide process improvements including form development, and provide guidance for the centralization of the data used by the Receiving Agency. The Performing Agency shall coordinate with the Receiving Agency to maintain a project tracking system in SharePoint that: 1. Collects information on project schedules. 2. Notates deliverable submissions from the Performing Agency. 3. Identifies deliverable reviews required of the Receiving Agency. 4. Maintains copies of deliverables, reports, progress reports, and other project communication.	$ 38,493.15	$ 52,588.73	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	IAC with TxDOT Division to provide technical assistance and support and database and performance metric support	$ 2,320.84	$ 701.44	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical assistance for improving TxME as part of the Receiving Agency's flexible pavement design system. This will include software enhancement and upgrade, materials laboratory testing to assist in generating default inputs for the latest generation of paving materials, and incorporation of the latest portable weigh-in-motion (WIM) traffic load data.	$ 5,192.35	$ 2,237.88	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Support construction, planning, operations, and maintenance in the Waco District to include District-wide traveler information needs, support of construction activities, planning and operation analysis, special investigations and other initiatives as requested.	$ 62,244.41	$ 39,499.27	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency's Maintenance Division with testing and evaluating erosion and sediment control products. Assistance shall include, but not be limited to, equipment and instrument calibrations, baseline testing, erosion and sediment control product testing, reporting test results, and updating the Receiving Agency's Interactive Approved Product List (IAPL).	$ 44,618.38	$ 39,659.60	$ (180.57)	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency [TxDOT's Bicycle and Pedestrian Program in the Public Transportation Division (PTN)] is responsible for planning, technical assistance, and statewide coordination of bicycle and pedestrian transportation. The scope of responsibility includes coordinating the development of planning and design guidelines, providing information resources, and distributing federal and state funding for bicycle and pedestrian transportation projects. In anticipation of eventual mandatory reporting of bicycle and pedestrian counts to the federal Traffic Monitoring Analysis System, the Receiving Agency has built the foundation of a bicyclist and pedestrian count program by engaging the Performing Agency to establish a statewide database, guidance, and training through research and implementation projects. Through the further collection of bicyclist and pedestrian count data, the Receiving Agency will be better informed about how to quantify walking and bicycling activity on state highways and therefore make better transportation investment decisions about how to accommodate increased demand. The Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions, collaboration and partnerships, and advanced problem-solving capabilities. Additionally, the Receiving Agency has limited staff and technical expertise to implement and manage this new count program.	$ 35,781.64	$ 29,667.80	$ (113.85)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Strategic Planning for Expedited Data Innovations (SPEDI2) - The Performing Agency shall develop a guide to commercially available transportation data and data services and create plans for pilot deployments that may benefit TxDOT.	$ 66,541.63	$ 49,877.12	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency's Rigid Pavements and Concrete Materials Section (RPCM), Materials and Tests Division, with utilizing a Real Time Profiler (RTP) devise on new concrete pavement projects. The Performing Agency shall also evaluate ride quality data from rigid pavements and identify industry best practices.	$ 205.36	$ 456.80	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services for the Performing Agency are outlined in the following tasks to be performed for the Receiving Agency's Dallas District (District). A written Notice to Proceed will be required before any of the following services can be performed. The Notice to Proceed (NTP) can only be authorized by the Receiving Agency's Dallas District by the Advance Project Development Engineer, Transportation Engineering Supervisor, or higher level of authority. Any NTP under Tasks 1,2, 4, 6, 7, or 10 must also be signed by TxDOT's Information Management Division (IMD) before it is authorized to ensure compliance with State law and TxDOT policy governing hardware, software, and data. Documentation of work performed will be provided in the form of technical memorandums or reports, meeting handouts, monthly progress reports, status meetings, and other written materials as requested by the Receiving Agency. Note, any work related to hardware, software and new or external data will be coordinated with the IMD, Traffic Safety Division (TRF) and/or any other Divisions as appropriate.	$ 46,222.16	$ 47,973.63	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical support for sampling and laboratory mixture designs of full-depth reclamation (FDR) using asphalt or other treatments, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division.	$ 6,663.70	$ 4,804.17	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency with materials non-routine testing, to include, but not limited to, concrete, aggregates and cement materials. Preforming Agency shall travel to Receiving Agency Headquarters (Austin, TX) for progress meetings as requested by the Receiving Agency.	$ 5,333.61	$ 4,812.46	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall operate the Mobile Pavement Marking Retroreflectivity Verification Program which was initiated in 2015 to verify pavement marking retroreflectivity data on projects completed by the Receiving Agency's contractors. Projects included in the verification program must meet the following requirements: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B). 2) Item 666, "Retroreflectorized Pavement Markings." The Performing Agency shall also conduct pavement marking retroreflectivity service life evaluations. These evaluations require retroreflectivity measurements over time and conducting analyses needed to determine the pavement marking service life. This will help Receiving Agency to establish a tool to satisfy the FHWA minimum retroreflectivity requirements.	$ 8,652.40	$ 10,136.12	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide laboratory and field testing, and technical support for coating and traffic materials. Technical support will include, but not be limited to, forensic analysis, related technical assistance, and specification support.	$ 8,185.65	$ 4,630.49	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency in the area of transportation operations and maintenance.	$ 11,587.54	$ 12,954.38	$ 603.17	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical support for testing soils and aggregtates, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division. The Performing Agency shall review and summarize existing practices and research findings from soils and aggregates topics. This review shall include but is not necessarily limited to test procedures, methods, and past research. The Performing Agency shall identify how results from this task could enhance or streamline current practices. The Performing Agency shall recommend updates to existing practices based on the findings, and may develop outreach content to support the recommendations.	$ 893.64	$ 3,378.99	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide pavement technical support for the development of a whole-life lifecycle assessment (LCA) for the Federal Highway Administration (FHWA) Climate Challenge Program. The Performing Agency shall develop the following: A pavement materials library for the LCAPave tool software based on Receiving Agency specific bid codes. List of typical pavement structures currently used in Texas, including new construction, rehabilitation and maintenance that can be used for developing pavement information for an alternative pavement analysis.	$ 1,833.76	$ -	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency for a variety of tasks related to carrying out the Receiving Agency's Metropolitan Planning Organization (MPO) assistance program. A formal Notice to Proceed (NTP) will precede all Performing Agency's work on the tasks and subtasks contained herein. The NTP may only be authorized by the Receiving Agency's designated project director or higher level of authority. The NTP will include a work plan for the task(s) requested, maximum amount payable, and will specify an initiation and completion date. The Performing Agency shall be on-call and shall provide services at the request of the Receiving Agency. The Performing Agency shall accomplish work products related to this contract through the following Work Order procedure. 1. Request Work Order – The Receiving Agency identifies a Work Order for the Performing Agency to deliver. A link is made to the request to one of the six Service Area Tasks in this Contract. 2. Develop Proposal – The Receiving Agency will request a proposal from the Performing Agency for the Work Order containing a scope, work products, budget, and timeline. The Performing Agency shall assign a Work Order project manager in collaboration with the Receiving Agency. 3. Review and Approve Proposal – The Receiving Agency will review the Performing Agency's proposal with appropriate staff. Upon acceptance, the Receiving Agency approves the proposal and issues a NTP. 4. Conduct Work Order – The Performing Agency, upon receipt of a NTP, shall conduct the Work Order and provide the work products within the Receiving Agency's approved budget and timeline. The Performing Agency shall establish a schedule for progress meetings for conduct of the Work Order. 5. Close-out Work Order – Upon Work Order completion and following work product delivery, the Performing Agency and the Receiving Agency will close-out the Work Order with the following, but not limited to, transmittal of final documents and document archive. This contract identifies the following six Service Area Tasks from which the Receiving Agency may select and receive metropolitan transportation planning work products from the Performing Agency. As noted in the first step in the procedure, the Receiving Agency links a Work Order to the Service Area Task. The task descriptions contain a budget for each service area from which Work Order budgets will be subtracted. To reduce unnecessary travel costs, the Performing Agency shall try to combine travel from multiple Tasks where possible. Prior approval for out-of-state travel, including for Performing Agency staff based outside Texas traveling to Texas, is required when using funds under this contract. Reimbursement for travel expenses is conditioned on prior approval by the Receiving Agency upon Performing Agency submission of adequate support documentation including agenda or program, estimated travel costs, and justification related to this contract. The Receiving Agency will follow its established travel procurement procedures and consideration should be given to the necessity and reasonableness of the travel as it relates to this contract. The Performing Agency shall request approval for out-of-state travel at least five business days prior to expenditure of funds.	$ 35,174.12	$ 37,632.15	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency is assisting each Metropolitan Planning Organization (MPO) in transportation safety planning activities. Nineteen of the twenty-three Texas MPOs plan to participate in this project. The safety planning effort will be split into two phases. In Phase I, the Performing Agency shall develop information that characterizes the safety issues within the participating MPOs, review existing materials for safety planning opportunities, and identify locations with excess crashes, prioritize locations for pedestrian safety improvements, and evaluate safety performance based on national benchmarks. In Phase II, the Performing Agency shall assist the MPOs in demonstrating how countermeasures can be applied to locations, how safety can be incorporated into the project selection and development process, what programs are available to address safety focus areas identified in Phase I, and to assist with developing safety plans. Accordingly, the Performing Agency shall conduct the following tasks and activities for the 19 MPOs in fulfillment of this contract's objectives. The budget estimates for each task reflect the total cost. TASK 1: CONTRACT ADMINISTRATION AND PROJECT MANAGEMENT Estimated Budget - $75,000 The Performing Agency shall administer and manage this contract through the following formal processes: 1. Prepare and submit monthly invoices, accompanied by a single monthly progress report summarizing all work completed by subtask for the prior month. 2. Meet monthly, virtually or in-person, with the Receiving Agency's Project Director (PD) and Task Leads to review the progress on tasks and planned work efforts. 3. Track project efforts and related costs by specific MPO. 4. Establish a project tracking tool (e.g., a SharePoint site) to allow access to resources and results. PHASE I Estimated Budget - $525,000 TASK 2: IDENTIFY SAFETY ISSUES, ASSESS OVERALL SAFETY PERFORMANCE, AND IDENTIFY POTENTIAL LOCATIONS FOR SAFETY IMPROVEMENTS 2.1: Conduct Kick-Off Meetings with Participating MPOs and Key Stakeholders to Discuss Project Activities, Timelines, and Identify Known or Suspected Safety Issues. 2.2: Review and Assemble Relevant Safety Plans, Countermeasures, and Design Guidelines Developed by the Receiving Agency. The Receiving Agency has and is currently developing a number of resources that can be used by MPOs to address transportation safety issues. 2.3: Develop a Safety Profile The Performing Agency shall develop a safety profile for each MPO that will include prevalent crash types, severities, behaviors, equity issues, planned safety projects, safety emphasis areas, and roadway types through crash analytics, including a profile of crashes related to the emphasis areas in the Texas Strategic Highway Safety Plan, commercial vehicles, and vulnerable road users. 2. Summary Graphics of key safety issues identification in PowerPoint format. 2.4: Identify Locations with Excess Crashes PHASE 2 Estimated Budget - $350,000 TASK 3: ASSIST MPOS WITH DEVELOPING SAFETY PLANS AND SAFETY PLAN ELEMENTS Work conducted under Task 3 will be determined through discussions with each MPO and the approval of the Receiving Agency commensurate with budget remaining for each MPO after the completion of Phase 1. Due to the unique safety needs of each MPO, it is not expected that all subtasks will be undertaken for each MPO, unless noted on the subtask. 3.1: Assist Regional or Community-Based Working Groups Established by the MPO to Address Safety Issues The Performing Agency shall assist with the establishment of a regional or community-based working group for all eligible MPOs. This will include: 1. Identifying potential stakeholders. 2. Delivering a briefing of the issues and locations identified in Phase I. 3. Leading a workshop to develop focus areas for safety improvement. 3.2: Identify Proven Safety Roadway Countermeasures to Address Regional High Priority Safety Issues Based on the issues revealed in Phase I, the Performing Agency shall assemble lists of proven and documented safety countermeasures, including, but not limited to countermeasures for intersection crashes and pedestrian crashes. 3.3: Assemble Materials for Behavioral Safety Campaigns 3.4: Develop Processes to Integrate Safety Assessments Into Participating MPO's Project Selection Process. 3.5: Corridor Safety Assessment 3.6: Assist Eligible MPO's and Appropriate Local Stakeholders with Developing an MPO Safety Plan. The Performing Agency shall assist the eligible MPOs in developing a safety action plan that identifies projects and programs to address regional safety issues.	$ 7,876.10	$ 29,523.91	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Accurate border crossing and wait time information is crucial for planning and operating the international border. Private sector stakeholders such as shippers, carriers and bridge operators use this information for planning purposes. Public sector stakeholders that include U.S. CBP, international bridge operators, MPOs and Cities along the border use the information for operational and financial planning purposes and to estimate economic impacts. Commuters traveling on POVs also use the information to better plan cross-border trips. The Receiving Agency in coordination with the FHWA and CBP have been investing in the development, implementation, maintenance, and operation of a border wait time measurement system for over a decade. The system, BCIS, developed by the Performing Agency, measures in a systematic and consistent way CMV and POV border crossing and wait times. The system provides real time and historical crossing and wait times to all stakeholders. Two NB commercial, three NB passenger and two SB passenger crossings in the El Paso region have been equipped with the BCIS under this joint effort by federal and state agencies. The receiving agency in coordination with the City of El Paso (the City) have expressed interest in expanding the BCIS to enhance the BCIS coverage at the following crossings: - Ysleta-Zaragoza SB passenger vehicle crossing Along with the enhancements listed above, the receiving agency and the City have expressed interest in adding the following crossings to BCIS: - Ysleta-Zaragoza SB commercial vehicle crossing - BOTA SB commercial vehicle crossing - BOTA SB passenger vehicle crossing Through past research it has been inferred that the wait time accuracy at border crossings can be enhanced by using a real-time vehicle counting system. For this reason, the deployment of vehicle counting systems based on technology developed by the Performing Agency, is planned as a part of this effort: - Real-time vehicle counting system at Ysleta-Zaragoza SB commercial crossing - Real-time vehicle counting system at Ysleta-Zaragoza SB passenger crossing - Real-time vehicle counting system at BOTA SB commercial crossing - Real-time vehicle counting system at BOTA SB passenger crossing	$ 5,886.74	$ 21,054.45	$ 357.42	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Technology Transfer to Analyze Various Sources of Wrong-Way Driver (WWD) Crash and Incident Data to Propose WWD Countermeasures using Innovative Geo-Reference Analysis and Mapping Techniques Task 1. AECOM Reports Review and WWD Data Collection The Performing Agency shall review AECOM reports to familiarize with the current WWD countermeasure current technologies, guidelines, and implementation plan. The Performing Agency shall also review the AECOM ramp inventory and add any missing or erroneous data. The inventory includes the following sections: A. Interchange Details B. Signage At C. Pavement Markings and Striping D. Lighting Conditions E. Intelligent Transportation System (ITS) Infrastructure F. Geometry G. Wrong Way Driver Detection System with Detector The Performing Agency shall collect the following data for the last ten years, if possible, to identify WWD crashes and incidents and other pertinent data: • Receiving Agency Crash Records Information System (CRIS) crash data • 911 traffic incident data • Department of Public Safety (DPS) • High alcoholic beverages sales data from Texas Alcoholic Beverage Commission Task 2. WWD Crash Data Analysis and Assessment of WWD Infrastructure Needs The Performing Agency shall review and extract all WWD related crashes and incidents from the various crash data sources in Task 1. The Performing Agency shall add all WWD crashes and incidents to a geographic information system map to determine hotspots. The Performing Agency shall also add locations of high alcoholic beverage sales to the map to provide an additional perspective to hotspots or possible future hotspots. Based on the ramp inventory, the Performing Agency shall generate an assessment and summary of WWD infrastructure needs. These needs, in conjunctionwith the WWD hotspots, will provide a basis to determine the level of WWD countermeasures (WWDC) needed for each ramp. Level 1 WWDC, Enhanced Texas Manual on Uniform Traffic Control Devices (TMUTCD), is now mandatory for all existing and new ramps. Level 2 WWDC, Advanced TMUTCD, is recommended if WWD crashes have occurred in the nearby area/ramp. Level 3 WWDC, Standalone ITS or Integrated ITS, is recommended at a ramp where it is known that it was a WWD event's point of entry. Task 3. WWD Countermeasures Recommendations and Prepare Final Technical Memorandum Based on Task 2 results, the Performing Agency shall determine the level of WWDC needed for each ramp. The Performing Agency shall use the previous analysis to recommend priorities for WWDC improvements at higher risk locations. Task 4. Long-term WWD Technical Support The Performing Agency shall utilize their experience from long-term WWD analysis in the Receiving Agency's San Antonio District and experience gained in past WWD projects to assist the Recieing Agency to continue to expand and grow their WWD Program. The Performing Agency shall repeat data collection and analysis, as detailed in Tasks 1 and 2, to determine the current status of WWD incidents and crashes. This will show if any installed WWD countermeasures are being effective and provide a basis for the next set of recommend priorities for WWDC improvements at the next highest risk locations. The Performing Agency shall revise the ramp inventories as WWD countermeasures are added to reflect actual signage at updated ramp locations.	$ 596.53	$ 2,937.83	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Work performed under this contract will build-off, and further refine, the work performed in the Quick Response Planning, Evaluation and Technical Support Contract No. 000030140 which identified and analyzed preliminary data and project parameters for key connectivity corridors in the state of Texas.	$ 5,987.83	$ 2,238.55	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide safety analysis in support of the Traffic Safety Division. A written Notice to Proceed (NTP) will be required before any services can be performed for Tasks A and B. The NTP may only be authorized by the Receiving Agency's Traffic Safety Engineer or higher level of authority. The NTP will include a work plan for the tasks requested, maximum amount payable, and will specify an initiation and completion date. Task A: Provide Technical Assistance and Support for Updating and Managing Implementation of the Texas Strategic Highway Safety Plan (SHSP) in Compliance with Federal Requirements. Estimated Cost - $120,000 The Performing Agency shall: • Facilitate meetings (primarily held virtually): o With the Management Team (MT) up to quarterly o With the Executive Committee (EC) as determined by the MT (up to two times per year, e.g., midyear to address progress, get feedback and ask the EC for help where possible, and at the end of the year for a report on the year's progress and receive recommendations and advice from the EC). • Revise and digitally disseminate a "consumer version" of the updated SHSP to aid understanding and implementation. • Facilitate at least one meeting with each Emphasis Area Team. Additionally, use other methods of communication including, but not limited to, information posted to the Texas SHSP website, webinars to share best/promising practices, and published case studies to share projects and processes. • Expand the crash analysis in specific and emphasis area(s) to target geographic and/demographic areas. • Develop a dashboard infographic to publish progress on the SHSP website and distribute through social media. • Develop and implement a stakeholder engagement plan. o Communicate with the District Traffic Safety Specialists and Program Managers within the Receiving Agency Behavioral Traffic Safety group to engage them with the Emphasis Area Teams to raise awareness of the SHSP within their community. o Develop and deploy workshops/webinars to increase sharing of promising practices/initiatives in traffic safety across the state. • Maintain a digital Traffic Safety Calendar on the SHSP website at least quarterly. • Maintain, update, and enhance the Texas SHSP website including, but not limited to, updating crash trends including the improvement of the maintenance process for the website's framework. The Performing Agency shall prepare a Final Activities and Evaluation Report detailing task activities and results of any evaluations by August 23, 2025. Task B: Provide Assistance Related to Highway Safety Improvement Program (HSIP) and Provide Ad-Hoc Data Analysis Assistance. Estimated Cost - $20,000 The Performing Agency shall: • Prepare the Crash Analysis and Visualization (CAVS) data based on the updated HSIP work code tables and provide the data to the Receiving Agency. • Conduct up to two training webinars on the use of CAVS tools for selecting the projects for HSIP. • Conduct additional analysis and safety studies as needed and as requested by the Receiving Agency with data compiled and technical memorandums produced in a timely manner. Meetings and briefing presentations will be accommodated by appropriate Performing Agency staff as required. The Performing Agency shall produce and submit a Technical Memorandum detailing all task activities and the results of any evaluation by August 23, 2025.	$ -	$ 7,834.48	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall develop and test a simple and straightforward methodology that directly incorporates safety considerations into the rural roadway design process. The Performing Agency shall develop and deliver two products: (1) a web-based tool for the index-based (e.g., score) methodology to incorporate safety into the rural roadway project development and design process; and (2) a set of training or reference materials to distribute among designers to help clarify how safety can be part of the design process. The Performing Agency shall develop the reference materials oriented to designers to better frame the concept of safety enhancements in rural configuration and design decisions for rural segments and intersections. These materials will highlight that adding safety enhancements is not overdesigning, because of the additional value to the public when implementing treatments that improve safety above and beyond basic design criteria. A written Notice to Proceed (NTP) will be issued prior to any service being performed. Each NTP will be authorized by the Receiving Agency's Design Division Deputy Director or higher level of authority and will be delivered to the Performing Agency via electronic mail (e-mail). The Notice to Proceed will include a work plan, maximum amount to be expended, and a completion date for the work.	$ -	$ 11,092.15	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance in support of the Receiving Agency's statewide Pavement Surface Distress Data Collection (PSDDC) project by assisting with data collection and providing an independent audit of the Receiving Agency's contractors responsible for data collection in each of the PSDDC region.	$ 11,014.40	$ 9,874.48	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall maintain and operate the Receiving Agency's Falling Weight Deflectometer (FWD) calibration facility used to calibrate FWD units. The Performing Agency shall perform annual calibrations on FWD units to American Association of State Highway and Transportation Officials (AASHTO) and Long-Term Pavement Performance (LTPP) standards, as specified by Federal Highway Administration (FHWA). The Performing Agency shall use the calibration facility both as a FWD Operation training facility and as a maintenance facility for the Receiving Agency's fleet of FWD's.	$ 4,769.07	$ 5,795.18	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ -	$ 450.34	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, “Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation” has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ -	$ 5,336.68	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency’s standard specification Item 300, Asphalts, Oils, and Emulsions, includes more than 48 different test procedures or conditioning procedures for asphalt concrete (AC) graded binders (12), cutbacks (8), emulsified binders (17), and performance-graded (PG) binders (11) used in different pavement construction and maintenance applications. This does not include testing requirements for recycling agents, crack sealants, or asphalt rubber binder. The Receiving Agency regularly performs many of these tests for quality management or quality assurance purposes. This test schedule presents a challenge for the binder lab in terms of maintaining test procedures, acquiring and maintaining test equipment, calibrating equipment, and training personnel. Some specification tests are legacy tests that once were the state-of-the-art and thought to be related to asphalt binder performance. Many of these legacy tests are not used in more recently developed specifications, as other tests are now available and may be more indicative of performance. This project seeks to review the Receiving Agency’s Item 300 binder specifications and tests for relevance; determine whether they assess safety, performance, or constructability; and take into account accuracy, efficiency, and environmental considerations. The project shall also make recommendations for changes.	$ -	$ 8,235.58	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ -	$ 11,180.57	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ -	$ 14,483.44	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The performing agencies shall establish a method to evaluate the existing pavement structural condition and design continuously reinforced concrete pavement (CRCP) overlays, both thin and thick. The design methods will include non-destructive (NDT) pavement evaluation techniques and tools, deflection based CRCP slab thickness design procedures, and CRCP reinforcing design details.	$ -	$ 2,239.45	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ -	$ 10,373.87	$ (2,071.13)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ -	$ 863.46	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall explore if there are refinements that could be made to the recently developed protocol for using third party data in generating suggested speed limits. The suggested speed limit probe data (SSL-Probe) protocol was developed to allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. The protocol also provides a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ -	$ 6,535.51	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ -	$ 8,716.98	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency's Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ -	$ 7,434.68	$ (602.06)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Traffic Safety Division (TRF) of the Receiving Agency drafted a special specification (SS) for the vertical application of a retroreflective solid stripe on concrete barriers, approximately six (6) inches below the barrier's top. During the phase of new product approval, this SS describes an application similar to three (3) locations already installed on Texas roadways in previous years. Barrier striping increases motorist awareness of the roadway's edge and the barrier itself, particularly in low-visibility conditions (i.e., heavy rain and snow). These existing implementation sites have not been formally evaluated. Furthermore, the short-term effectiveness of the treatments has not been investigated; therefore, there is a need for long-term and short-term safety effectiveness evaluation of these treatments. The Performing Agencies shall collect before-and-after collision data from Crash Record Information System (CRIS) and near-collision data from connected vehicle data vendor (e.g., Wejo) to evaluate the effectiveness of vertical application of a retroreflective solid stripe on concrete barriers. Furthermore, the Performing Agencies shall install these treatments at six (6) high crash locations with different barrier types including, but not limited to concrete barriers and metal beam guard fences to evaluate their short-term effectiveness using non-traditional safety evaluation approaches. The Performing Agencies shall utilize the findings to update the drafted SS for the future use across the state and beyond.	$ -	$ 3,109.47	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Understanding and estimating realistic production rates of major work items in a highway project are critical to determining a reasonable project contract time, evaluating the contractor's baseline schedule, monitoring progress schedules, and ultimately completing the project on time. The Performing Agency shall leverage the Receiving Agency's historical project data to obtain the as-built information of production rates of various work items, and shall develop a) an expanded version of the Receiving Agency's construction production rates table, b) an interactive tool that can generate color-coded heat maps to visualize feasible ranges of production rates of major work items across Texas, and c) implementation guidance and recommendations. An advanced and interactive production rate estimation tool could significantly help the Receiving Agency achieve the goal of completing highway projects on time. Such a decision-aid tool could significantly improve the Receiving Agency's practice in determining more accurate production rates, resulting in more accurate contract time determination, the contractor's baseline schedule evaluation, and progress schedule monitoring. Such data-driven and practical production rates may provide higher certainty and reliability than the Receiving Agency's current construction production rates table.	$ -	$ 6,432.98	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research study aims to perform a study focusing on best practices for performing pavement preparatory work in advance of preventive maintenance (PM) surfacing contracts. The study will determine the best practices for repairing a roadway before a new surface is placed. Seal coats or thin overlays are typical PM surfacing projects. The preparatory work performed by in-house maintenance forces or maintenance contracts may include crack sealing, fog seal, repairs, milling, and level-up. The preparatory work should be completed well before the PM contract. The Performing Agencies shall identify the main flexible pavement repair types and investigate best practices for performing both in-house and contracted repairs. The Performing Agency 1 shall develop a procedure to determine the limits and type of flexible pavement repair. The Performing Agency 1 shall develop an evaluation process of the repair, including its performance and effects on the PM surfacing.	$ -	$ 11,779.86	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Of the various situations in which a utility relocation is eligible for reimbursement at the Receiving Agency, one of the most complex situations is when parts of the existing utility facility involve a property interest. For utility facilities that involve a private property interest, the Receiving Agency uses an eligibility ratio, which is defined as the percentage of utility facilities that are reimbursable in relation to the total amount of utility facilities being relocated. In practice, eligibility calculations can be convoluted or complex, particularly in situations where the utility facility spans multiple property interest locations. The Performing Agency shall develop and test an improved methodology to determine reimbursement eligibility and calculate utility reimbursement amounts. The Performing Agency shall document a significant sample of utility relocations and their associated reimbursement costs to develop a reliable baseline of practices throughout the state, evaluate practices in other states, develop and test an updated methodology for utility reimbursement eligibility criteria and calculations, prepare a guidebook with examples on how to determine utility reimbursement criteria and calculate reimbursement amounts, and prepare and test training materials.	$ -	$ 5,084.15	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall develop a method and tool for analyzing safety-related pavement data to identify candidate pavement safety projects, such as cross-slope improvement projects and flushing treatment projects. The Performing Agencies shall assemble a dataset containing comprehensive data on the pavement, site condition, and crashes for a representative sample of on-system roadways. The Performing Agencies shall conduct a comprehensive analysis of the integrated dataset to identify critical combinations and thresholds of pavement conditions that may pose a safety hazard and use these factors to assess pavement susceptibility to crashes. The Performing Agencies shall quantify the pavement crash susceptibility based on measurable pavement characteristics such as cross-slope, geometrics, distresses (e.g., rutting, flushing), skid resistance, and roughness. Finally, the Performing Agencies shall develop a data analysis and visualization tool for assessing pavement crash susceptibility and recommending solutions to reduce crash risks. The Receiving Agency's districts will be able to use this tool to identify potential site-specific crash contributing factors and proactively select appropriate pavement safety improvement projects.	$ -	$ 11,400.53	$ -	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Drainage is a critical element of roadside design. Roadway drainage design often calls for the use of cross-drainage and parallel-drainage culverts. If untreated, the ends of the drainage structures can become roadside hazards that can result in serious injury when an errant vehicle leaves the roadway. The most cost-effective strategy is often to make the culvert end traversable using grates comprised of pipe runners across the culvert end. The Performing Agency shall investigate the safety performance of traversable cross-drainage and parallel-drainage culvert end treatments installed on roadside slopes. The Performing Agency shall address the various design variations of safety end treatments supported by current standards to investigate the safety performance. The Performing Agency shall develop design guidance to recommend slopes and size, length, and spacing of the pipe runners for both cross-drainage and parallel-drainage culverts that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH). The Performing Agency shall use full-scale crash testing to aid with validating the design guidance.	$ -	$ 4,681.69	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Texas continues to use cold recycling for pavement rehabilitation and performs a significant amount of full depth reclamation (FDR). While cement remains the most widely used treatment, use of asphalt emulsion and foamed asphalt continues to grow. This project shall identify and evaluate topics to strategically enhance cold recycling practices in Texas. This project shall perform a comprehensive performance analysis of recent as-built projects to identify strengths and opportunities for process enhancement. For cement, this project shall evaluate how cement type may influence mixture properties, analyze the Texas Flexible Pavement System (FPS) structural design assumptions based on current mix design and construction practices, and summarize methods to improve early trafficking. For emulsified and foamed asphalt, this project shall develop cold-in-place recycling (CIR) applications for Texas and identify, evaluate, and recommend enhanced pavement design procedures for cold recycling with asphalt binders. This project shall use all results to develop enhanced cold recycling project selection procedures, recommend updates to the Receiving Agency's specifications, and develop and perform training.	$ -	$ 17,080.68	$ 584.76	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Hamburg Wheel Track (HWT) rutting test generally serves well as the standard rutting test for asphalt mixes in Texas; however, in the last several years, some premium mixes (i.e. stone matrix asphalt), designed with PG76-22 and low HWT rut depth, have experienced premature rutting failures under slow moving (or stop/ go) traffic in several Receiving Agency Districts. Such failures burden the Receiving Agency with extra cost. Furthermore, it was reported that the HWT test cannot accurately quantify the better rutting performance of some tougher mixes with highly modified asphalt (HiMA). Thus, the Performing Agencies shall develop the next generation of HWT test to accurately screen out asphalt mixes that are prone to rutting failures. The Performing Agencies shall review the literature, survey Districts, and other state departments of transportation (DOTs) to identify the proper rutting test(s) and asphalt mixes for addressing the rutting failure caused by the slow-moving traffic. The Performing Agencies shall further develop the next generation of HWT test and associated acceptance criteria through finite element analysis, laboratory testing, field accelerated pavement testing and survey of in-service pavement intersections, round robin test, and recommendation of specification changes.	$ -	$ 8,133.46	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	State agencies must report vehicle miles traveled (VMT) estimates for local roads compiled in the statewide summaries dataset of the Highway Performance Monitoring System (HPMS) database. While the VMTs for higher functional class roads are the product of annual average daily traffic (AADT) with the corresponding roadway segment length (L); the states produce the VMT estimates for local roads as an aggregate measure using a variety of methods. Currently, the local road network accounts for more than two-thirds (67%) of the total roadway mileage in Texas and is the largest in the United States. Conducting short-term counts (STCs) (e.g., for a few hours up to a few weeks) on an extensive local road network to develop VMT is logistically challenging; hence, the Receiving Agency uses statistical methods to obtain aggregated VMT. Although the current methods are statistically verified, advancements in technology and available resources have been made since the methodology was developed. The Performing Agencies shall investigate and develop data-driven methods for VMT estimation that can be implemented in Texas and advance the analysis methods of the Receiving Agency. The developed methods shall also reduce any bias in the estimation of VMTs on local roads that can lead to the overestimation or underestimation of travel demand.	$ -	$ 10,686.24	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Shared or multiuse paths invite a wide range of users, including pedestrians, bicyclists, and other wheeled users, with a range of transportation purposes such as commuting, exercise, and recreation. Although shared use path (SUP) users are physically separated from traffic, they remain vulnerable at roadway crossings. In the absence of roadway cross-section designs for accommodating pedestrians and bicyclists, SUP crossings can present users with complex tasks including gap selection, scanning for turning vehicles, and interacting with other path users. Ensuring safe crossings for all users at these locations is essential. Pedestrian and bicycle treatments have been developed and their safety effectiveness has been assessed in several studies and practices. Although technically these designs can be applied to SUPs, it is not clear how to integrate treatments for different types of path users, road classifications, land-use contexts, and crossing geometries. With the increasing implementation practices of SUPs across Texas, there is a need to assess the potential safety concerns involving pedestrians, bicyclists, micromobility users, and people with disabilities at these locations and develop guidance for treatment selection, including for paths next to railroads. The Performing Agencies shall explore the pedestrian and bicyclist crashes at the vicinity of SUPs and develop design and planning guidance for implementation purposes.	$ -	$ 7,011.17	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Road to Zero has targeted a goal of zero deaths and serious injuries on Texas roadways. Recent trends in Texas indicate a continued increase in highway fatalities each of the past three years. In 2021, roadway departure crashes were responsible for 40 percent of all crash-related fatalities in Texas, which is the largest single category by crash type. In October 2021, Federal Highway Administration (FHWA) designated Texas as one of 16 Roadway Departure Focus States based on being over-represented on three (3) different roadway departure crash fatality metrics. Roadside safety devices are a key element of an effective roadway departure safety strategy. These safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively evaluate high priority issues related to roadside safety devices. This includes development of both new and improved safety features that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) and help minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes.	$ -	$ 14,830.99	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research will focus on the impact on pavements and bridges following the statewide resilience plan. Research findings will not only be used to meet federal requirements, but more importantly, the recommendations and analysis will be used to guide TxDOT's future project selection and development process in term of addressing extreme weather and resilience impacts. To achieve the project objectives, the research team shall: • Perform literature review of available state and national research projects, legislative requirements, and best practices from state DOTs and local agencies. • Identify and characterize risk factors to TxDOT's highway and bridge infrastructure both temporally and spatially, and estimate their potential intensity. • Assess the risk or likelihood of the identified factors occurring based on a thorough quantitative statistical analysis of available data. • Calculate the potential impact occurring based on the characteristics of the TxDOT managed highway/bridge network system using available relevant databases based on current condition, age, traffic, and environmental conditions. • Create an analytical decision-making framework for probabilistic scenario simulations to prioritize assets for maintenance and retrofit based on climate hazards and asset's criticality and vulnerability. • Quantify the mitigation strategies and their benefits and associated costs for the life cycle planning analysis. • Conduct scenario analysis and scenario planning to evaluate and prioritize the identified risks. • Identify proxy indicators that TxDOT can track to monitor high priority risks. • Implement probabilistic resilience economic analysis for adaptation strategies vulnerable and critical assets. The expected technology readiness level (TRL) for this project is 8.	$ -	$ 8,085.15	$ 1,240.67	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency cantilever overhead sign structures (COSS) and traffic signal pole structures have a socketed fillet welded connection between the column and the baseplate. While economical, this connection has a low fatigue-resistance threshold. The objectives of this research are to (1) outline fabrication practices and economic considerations that may affect proposed connection type and design, (2) develop an inventory database of COSS and traffic signal pole structures that are representative, (3) utilize structural modeling to identify from within the inventory critical cases that should be advanced to a testing program, (4) develop and execute a targeted testing program that isolates critical design parameters for the fatigue performance of both the critical cases found in the inventory and recommended connection types and designs, (5) provide recommendations for connection types and designs based on fatigue provisions, and (6) provide recommendations for identifying fatigue-critical of existing inventory.	$ -	$ 20,827.59	$ (1,204.13)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Ancillary structures (AS) exist in a wide variety of applications critical to safety and daily needs of the travelling public. The long-term corrosion performance of these structures is of utmost importance to prevent deterioration and extend the structural design life and safety. While hot-dipped galvanizing provides excellent long-term behavior for corrosion control of these critical structures, over the past 20 years this process has been found to create extensive cracking of welds on base plate connections that is detrimental to the fatigue lives of these poles. Although improved details are used in new designs, thousands of High Mast Illumination Poles (HMIP), Cantilever Overhead Sign Structures (COSS), and traffic signal poles (TSP) exist in Texas with varying levels of cracking in the welds between the baseplates and pole shafts. During this research project, the Performing Agency shall identify and provide critical assessment parameters and guidance for the Receiving Agency to determine if cracks should be monitored, repaired, or the structural component replaced. The research includes a representative assessment of weld cracking in the AS inventory, the development of monitoring hardware and techniques, the development and assessment of repair techniques, and the development of certification methods/standards for inspection personnel.	$ -	$ 8,398.34	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	In 2012, the Rider 36 study indicated that damage caused to bridges and pavements by overweight (OW) vehicles surpassed the revenue collected by permit fees by approximately $200 million annually. This finding was corroborated by a recent 2022 study mandated by House Bill 2223, which quantified this gap at $168 million. Besides the revenue shortage to cover bridge and pavement maintenance and rehabilitation costs due to the damage cause by OW vehicles, the 2022 study also identified additional shortcomings that need to be urgently addressed. These shortcomings include: 1) lack of a methodology for periodically adjusting permit fees to account for changes in traffic patterns and configurations and higher inflation rates; 2) lack of accurate data and process for calculating annual vehicles-miles-travelled (VMT) by each permit type; 3) uncertainty in the identification of routes and number of trips for monthly, quarterly, or annual permits; 4) absence of a method and process to assess the damage caused by OW vehicles to the off-system bridges and highways. The objective of this research is to address these shortcomings and to develop, recommend and provide the Receiving Agency a well-established and documented step-by-step method to periodically update such method.	$ -	$ 1,216.32	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Polymer additives are used to design high PG virgin binders that meet the PG requirements to protect the mix against rutting and cracking under the climate and traffic conditions of an HMA project. When RAP is added to the mixture, the effective binder may not meet the desired grade. This project shall quantify the extent to which polymer dilution is a problem that should be addressed in the Receiving Agency's HMA specifications and if so, develop specification language to address it. This project involves evaluating binder blends and mixtures with RAP. Both lab blended and commercial PG binders shall be evaluated for continuous grade, elasticity, polymer content, and other rheological parameters. Then these binders shall be mixed with recovered RAP binders at several percentages and retested to determine the same properties. Standard mixtures(s) shall also be used with several of these binders and various RAP percentages to measure mixture performance-related properties (cracking and rutting). The Performing Agencies shall use the results from binder and mixture results on the impact of "virgin binder – RAP binder dilution" and work with the Receiving Agency to develop specification language for inclusion in the Receiving Agency's HMA specifications, as needed.	$ -	$ 8,702.88	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Traffic control devices (TCDs) are the primary means of communicating highway information to road users and play a key role in highway automation. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. In addition, vehicle technologies and the roadway infrastructure industry are rapidly evolving, spurred by technology advancements, customer demand, changes in the vehicle fleet, and changes in national and state policies. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project could represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ -	$ 16,525.70	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Detecting problematic exits and places of wrong turns and identifying signal and other issues will result in improving safety on highways by reducing crashes as well as optimizing traffic flows while minimizing disruptions. This project will also provide TxDOT with data-driven justification for future highway investments. To achieve the project objectives, the research team shall: • Explore telematics data for a given set of roadways in Texas where issues have been identified by local TxDOT staff as frequent problems. These issues may include motorists missing exits or making wrong turns, traffic signals are not reliably detecting vehicles or vehicles waiting through multiple cycles at the same signal, motorists repeatedly driving outside their permitted lanes of travel while merging on highway ramps or improper merging at lane drops. • Clean and reformat; i.e, preprocess, explored data in a way that is suitable for further analysis. • Study the dataset closely to identify patterns in the data that indicate issues. • Develop rules; i.e, heuristics, or an artificial intelligence platform that can automatically detect events that indicate the issues. When applied on the entire dataset, problematic highway locations will be located and shared with TxDOT to be considered for future interventions. The expected technology readiness level (TRL) for this project is 6	$ -	$ 9,041.46	$ (11.02)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency has utilized dowels in bents to provide lateral restraint of prestressed concrete beams., These dowels are often misplaced, which creates various construction issues, while their presence complicates bearing pad replacement. The Performing Agency shall provide research findings to the Receiving Agency to make informed decisions on stopping the use of such dowels, the Performing Agency shall: • Perform a thorough literature review to: (i) summarize the state-of-art, state-of–the-practice and key findings, and (ii) address questions relating to unintended consequences from removal of these dowels during erection of the girders, construction of the deck, and long-term performance and stability. • Perform an investigation on the state-of-the-practice of all state Department of Transportations (DOTs) throughout the country, focusing on practices from DOTs with similar hazard exposure. • Perform a parametric finite element (FE) study on multiple the Receiving Agency bridge (and girder) designs to investigate the performance under all major load combinations and limit states (from service to ultimate conditions) over the lifetime of the bridge accounting for Texas-related exposure conditions. • Perform six (6) large-scale tests on girder-to-bent/abutment connections to quantify the contribution of dowels in the performance of the connections.	$ -	$ 10,404.01	$ 1,152.22	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Bent caps provide a critical load path between girder reactions and bent columns. Supporting considerable reactions over long spans, bent cap cross-sections grow substantial, necessitating robust cast-in-place designs that have stood the test of time. However, the considerable weight and time required for their construction present challenges that undermine their apparent simplicity. To meet these challenges, the Performing Agencies shall explore precast alternatives, particularly hollow designs in efforts to enhance traditional cast-in-place bent structures through post-tensioning. In addition to exploring precast alternatives, the research team shall first evaluate current practice, identify potential design issue in current practice and provide design recommendations to current practice. Experimental study as well as analytical and design methods shall be used toward this effort. The research team shall ask TxDOT for the use of post-tensioning in the experimental study. This innovation aims to reduce bent weights, minimize traffic disruptions and costs; enhance erection, construction efficiency, durability, and structural performance under service and ultimate load conditions. The Performing Agencies in collaboration with an industry review committee comprised of bridge designers, precasters, and erectors shall conduct a targeted full-scale structural testing campaign supported by advanced structural modeling (finite element analysis and strut-and-tie), to provide well-defined design criteria and ensure the structural performance of hollow precast rectangular and inverted tee bent caps, for both mildly reinforced and prestressed designs. The Performing Agencies initiative seeks to close the knowledge gap concerning the service and ultimate load behavior, long-term performance, and durability of hollow precast design concepts.	$ -	$ 5,631.55	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Economic factors and environmental sustainability are driving the use of more reclaimed asphalt pavement (RAP); however, durability of those mixes has been a concern. Various approaches (e.g. limiting RAP usage, increasing lab-molded density, or balanced mix design (BMD)) have been tried to improve mix durability. All the approaches point to one essential factor for durable RAP mixes: minimum virgin binder content. Thus, the Performing Agencies shall determine the minimum virgin binder content(s) for durable RAP mixes. The Performing Agencies shall review the literature to identify critical factors affecting RAP mix durability. Considering all those critical factors, the Performing Agencies shall develop and execute a statistically sound laboratory experimental design to develop the relationships between cracking properties measured by Overlay test and Ideal cracking test and mix components (e.g. virgin binder content) and their characteristics. Furthermore, the Performing Agencies shall assess field performance of RAP mixes and delineate the correlation between field performance and laboratory mix cracking properties. Subsequently, the Performing Agencies shall recommend minimum virgin binder contents based on the relationships among field performance, mix cracking properties, and mix components and their characteristics. Based on these findings, the Performing Agencies shall develop guidelines, update specifications, and organize training sessions	$ -	$ 9,842.68	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	For pavement management and to understand the condition of its network, the Receiving Agency relies on high-speed inertial profilers to gather ride quality. However, a persistent challenge arises when assessing pavement smoothness at low speeds or under stop-and-go conditions (i.e., signalized intersections, stop-control intersections, high driveway density producing turning traffic, and congested roadways during peak-hour traffic) that compromises the accuracy of data collected by conventional profilers. For example, collecting ride quality measurements on a congested roadway with multiple driveways leads to acceleration and deceleration of the collection vehicle, potentially adding “false” dips into the measurements. If these dips are included in network-level measurements, these types of roadways could receive a poor condition score that is not indicative of the true pavement condition. Collecting data on roadways with signalized intersections and slow-moving congested traffic could have the same challenges. The Performing Agency shall explore the potential of low-speed profilers to enhance data collection accuracy in such scenarios. The Performing Agency shall evaluate the effectiveness of low-speed profilers in providing accurate pavement profile data, particularly in areas prone to low-speed or acceleration and deceleration operations. The Performing Agency shall validate the capabilities of low-speed profilers and recommend strategies for their integration into the Receiving Agency's pavement management practices, ultimately leading to a more accurate condition assessment.	$ -	$ 9,639.82	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Pavement markings and markers are the primary means for an agency to provide longitudinal guidance to drivers. To be effective, markings and markers must be visible during all driving conditions, day, and night. A variety of pavement marking materials (binders and beads) and varying installation specifications (application type, material thickness) create a wide range of initial performance and maintained performance over a markings service life. Currently, markings are evaluated initially to ensure a minimum initial retroreflectivity performance is obtained, but that initial performance has not been well researched to determine its impact on the overall durability and performance of the marking over its service life. This project shall explore various factors that affect pavement marking performance over the service life of the marking (pavement marking materials, installation specifications, pavement surface, traffic conditions, and geographic and climatic region) to develop performance models for Texas. Performance of a variety of markings and markers shall be evaluated at various field test areas. These same marking materials shall be evaluated through lab testing to explore accelerated weathering and wear tests that correlate with the field performance. The goals of this project are to improve pavement marking testing and the ability to predict marking performance.	$ -	$ 4,533.80	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The goal of this project is to revise the Receiving Agency Pavement Management Information System (PMIS) Rater’s Manual. This project shall review, analyze, and propose changes to the current distress rating definitions for flexible and concrete (jointed and continuously reinforced) pavements. The Performing Agencies shall hold collaborative workshops to gather inputs from Receiving Agency’s Division and Districts on pavement condition data collection challenges using the current manual. The project will assess the impact of the rating changes to the PMIS scores and propose changes to distress utility curves if needed. In collaboration with the Receiving Agency, adjustments will be made to determine acceptable impacts. The revised manual shall be developed based on the research results and through collaboration between the research team and the Receiving Agency.	$ -	$ 4,468.69	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	While roads defined as arterials need to maintain an acceptable level of traffic capacity, there are trade-offs with respect to speed. This research will investigate the effectiveness of arterial-focused speed management countermeasures for application across Texas. It will quantify the costs and benefits of road and vehicle design, operations, enforcement, and other countermeasure types across a range of settings (for uncontrolled-access arterials under different traffic, road type/context, and land use conditions), resulting in a Texas Arterial Speed Management Toolkit and reports.	$ -	$ 8,015.69	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency is implementing a Digital Delivery initiative. Research is needed on how to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources. Research is also needed to identify software and other industry trends that might affect the Digital Delivery initiative and recommend strategies on how to anticipate and prepare for those trends. The Performing Agency shall (a) develop and test procedures to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources; (b) develop and test automated workflows for change detection, quality control, and updating of 3D models using results from repeat surveys; (c) conduct a cost-benefit analysis of data collection/processing precision, accuracy, and density against the potential cost in construction change orders from a looser tolerance in those three parameters; (d) conduct a review of software and other industry trends that might affect the Digital Delivery initiative; (e) conduct peer exchanges with stakeholders; (f) develop and recommend strategies on how to anticipate, and prepare for, software and industry trends; and (g) develop a strategic research roadmap to support the Digital Delivery initiative through 2028 and beyond.	$ -	$ 14,495.28	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The first objective of this project is to develop Safety Performance Functions (SPFs) and Crash Modification factors (CMFs) for ramp terminals and intersections of frontage roads with crossroads. The second objective of this project is to evaluate the safety impact of weaving on the frontage road versus weaving on the freeway. More specifically, the objective is to understand the difference in safety between two ramp configurations – entrance ramp followed by an exit ramp versus exit ramp followed by an entrance ramp between two interchanges. The Performing Agencies shall collect site characteristics data and develop crash predictive methods for different types of frontage road segments and intersections on frontage roads, including ramp terminals. These models shall be developed by area type (i.e., large urban, small urban, suburban/fringe, and rural), Receiving Agency's regions, and facility type (one-way and two-way). The Performing Agencies shall incorporate the crash predictive methods into spreadsheet tools to facilitate the analysis and to support project design decisions of frontage roads. The Performing Agencies shall also develop a framework for selecting an appropriate configuration for frontage roads and as well guidance for the minimum distance from ramp terminal to crossroad intersection and a need for lane additions.	$ -	$ 9,321.72	$ (301.03)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Concrete barriers are designed and crash tested for placement on flat terrains. In-field installations of concrete barriers are sometimes placed on slopes adjacent to roadways. By placing the barrier on a slope, the effective height of the barrier that engages an errant vehicle may be reduced since the vehicle may be airborne as it contacts the barrier on a downward slope. Consequently, the barrier may not be able to safely contain and redirect the vehicle. The Performing Agency shall evaluate the performance of the Receiving Agency's 32-inch tall F-shape and 42-inch tall single slope barrier when placed on roadside or median slopes of up to 4H:1V. The Performing Agency shall develop guidance for placement of these barriers using finite element simulation analysis and full-scale crash testing. The guidance shall determine the maximum allowable slope for each barrier type and any placement offsets required from the edge of the roadway or from the bottom of the ditch. The Performing Agency shall evaluate the performance of the barriers using the impact conditions and evaluation criteria specified in the Manual for Assessing Safety Hardware (MASH) for Test Level 3 for longitudinal barriers.	$ -	$ 3,972.51	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Identifying and documenting existing utility facilities within the proposed right-of-way (ROW) is crucial for successful project delivery. There is a need to leverage data collection technology's strengths and minimize weaknesses for a more robust and reliable determination of utility locations and develop and test metrics to assess the utility investigation quality levels in ways that make sense to project design teams. Improvements shall lead to a better stakeholder understanding to communicate the quality levels commonly used by the SUE industry (D, C, B, and A), the basis for assessing utility investigation deliverable quality, and would be able to tie quality levels to quantifiable performance metrics such as positional accuracy, error, and completeness, which are common in engineering and surveying when collecting field data for a project.	$ -	$ 16,999.08	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Innovative intersection designs (e.g., diverging diamond interchanges [DDIs], displaced left turns [DLTs], median U-turns [MUTs], and restricted crossing U-turns [RCUTs]) and modern roundabouts are increasingly used in Texas and throughout the country to remove conflict points and redistribute turning traffic from traditional intersections, improving operational efficiency and promoting increased safety. While their use is growing and their benefits have been demonstrated, Texas still has a limited number of innovative intersections, and there is a need to increase the use of these intersections throughout the state. Because many of these intersection types and their design elements are not commonly used in Texas, there is a natural tendency to be cautious about their use. Providing information to help promote these treatments for use in appropriate locations will be important to their successful adoption and implementation. The Performing Agency shall build on recent research to document the benefits of innovative intersections, develop case studies of successfully implemented intersections in Texas, and provide resources for practitioners to use in support of new implementations across the state.	$ -	$ 5,206.18	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Cracking dictates the service life of asphalt pavements. Oxidative aging of the asphalt binder renders the binder brittle and susceptible to cracking. Higher number of high temperature days further exacerbates rate of oxidation and reduction in the service life of an asphalt pavement. Recent coordinated studies by a global consortium of researchers have identified generic chemicals that can act as antioxidants to significantly reduce the oxidative aging of asphalt and increase its cracking resistance and service life. Similarly, commercial additive manufacturers are also exploring the development and deployment of antioxidant additives. In this project the Performing Agencies shall review the literature and interface with existing national and international studies to identify the most promising antioxidant(s) for use with asphalt binders as a modifier. The Performing Agencies shall conduct laboratory studies on asphalt binders and mixtures to evaluate the efficacy of these antioxidants. The Performing Agencies shall also conduct workshops with stakeholders and conduct cost-benefit analysis to develop plans for pilot test sections and facilitate the deployment of such sections with districts and industry partners. Finally, the Performing Agencies shall also present metrics that can be used for specification and quality control purposes by the Receiving Agency.	$ -	$ 3,574.37	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's "End the Streak" goal is to end all fatalities on Texas roads by 2050 as there has not been a day without a death on Texas roadways since November 7, 2000. New strategies must be implemented, such as increasing the efficacy of pavement striping and retroreflective pavement markers in several Receiving Agency districts and monitoring the crash statistics before and after pavement marking and marker improvements over time. The Performing Agency shall target pavement marking retroreflectivity and contrast and shall include the development and implementation of an experimental study design to assess their safety and economic effectiveness.	$ -	$ 7,211.92	$ (301.03)	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Crash risks associated with permissive left turns (PLTs), vulnerable road users (VRUs), and wrong way driving (WWD) appear to be among the top attributing factors for fatal and incapacitating crashes at signalized intersections, raising alarming safety concerns. The cellular vehicle-to-everything (C-V2X) communication and innovative traffic detection technologies such as light detection and ranging (LiDAR) sensing have the potential to reduce crashes related to these factors and enhance intersection safety. The primary objective of this project is to develop, test, and demonstrate a prototype system integrating C-V2X communication and innovative traffic detection technologies to improve safety of all road users at signalized intersections. Another objective is to provide the Receiving Agency with guidelines for statewide implementation of the integrated system for intersection safety improvement. To this end, the Performing Agencies shall: (1) Review the literature on safety improvement systems utilizing C-V2X and innovative traffic detection systems; (2) Assess user needs and design a system architecture that satisfies user requirements; (3) Develop, test, demonstrate, and evaluate a prototype system that integrates C-V2X communication, LiDAR and other advanced traffic detection technologies to detect and mitigate crash risks involving PLTs, VRUs, and WWD at signalized intersections; and (4) Develop guideline documents containing implementation procedures and use case scenarios.	$ -	$ 7,184.77	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall address two gaps in scour knowledge: pressure scour for cohesive soils and cohesive soils/rocks characterization for scour analyses. Pressure scour occurs when the water reaches the bridge's low chord; this increases the scour depth. Guidelines exist for cohesionless soils but not for cohesive soils. The Performing Agency shall perform a series of Computational Fluid Dynamics (CFD) simulations and/or flume tests to generate the input necessary and expand the Scour Rate in COhesive Soils (SRICOS) method to the pressure flow situation in cohesive soils. The Performing Agency shall perform advanced testing on cohesive soils/rocks characterization for scour analyses. Advanced testing examples include the Erosion Function Apparatus (EFA) (Performing Agency) and Scour Testing devices (Federal Highway Administration (FHWA)). The Performing Agency shall determine if the Slake Durability Test (SDT) can be a reasonable surrogate for input in scour depth calculations by collecting samples at a maximum of up to 20 bridges around Texas, and by conducting parallel testing on cohesive soils/rocks such as shale, caliche, and sandstone.	$ -	$ 5,816.04	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall apply the accelerated mix design procedure to real pavement designs, encouraging utilization of the new test procedure, enabling the identification of potential areas of improvement, and demonstrating the mechanistic design check. The Performing Agency shall work with a minimum of three (3) Receiving Agency Districts to conduct demonstration projects with performance monitoring. The Performing Agency shall conduct initial performance monitoring on the constructed projects. This monitoring aims to assess the effectiveness of the accelerated design, validate the stability of the designed pavement by evaluating pavement conditions, and enhance the estimated resilience modulus.	$ -	$ 6,569.92	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Premature pavement failures have occurred on several widening projects, including shoulder widenings, conversion of two-lane roadways to Super 2 sections, and other safety enhancements. Repairing these early failures is time-consuming, expensive, disrupts traffic, and poses safety hazards. Key contributing factors include poor-quality materials, poor joint construction, and inadequate drainage which could have been avoided through proper pavement condition assessment, design, and construction practices. The Performing Agency shall develop detailed guidance to document and implement better widening practices across the Receiving Agency.	$ -	$ 409.83	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist Receiving Agency with implementing AMAZE developed in research project 0-6674-03. The Performing Agency shall write test procedures tailored for AMAZE. Working with the Receiving Agency, the Performing Agency shall enhance the AMAZE to measure specimen dimension and handle field cores with various thickness. The Performing Agency shall then use the findings and data generated from this implementation project to develop and teach implementation workshop for the Receiving Agency.	$ -	$ 8,879.39	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency with implementing the Surface Aggregate Classification (SAC) for reclaimed asphalt pavement (RAP) developed in research project 0-7025, Develop Surface Aggregate Classification of Reclaimed Asphalt Pavement. The Performing Agency shall implement and verify the methodology of SAC-A RAP classification in a minimum of four (4) Receiving Agency Districts. In each selected Receiving Agency District, the Performing Agency shall work with lab and pavement engineers and their staff to characterize the RAP in terms of SAC, design surface mixtures with the RAP, evaluate the friction and skid resistance of mixtures, and construct and monitor the selected test sections in each Receiving Agency District. The Performing Agency shall then use the data generated in these test sections to develop and teach implementation workshops for Receiving Agency Districts.	$ -	$ 5,030.03	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objectives of this project are to complete the design and construction of the automated test system for asphalt mixtures and asphalt binders and to deliver an automated IDEAL cracking and rutting test unit and an automated asphalt binder specific gravity and dynamic shear rheometer testing unit to the Receiving Agency's MTD lab. The automated asphalt mixture testing unit includes (1) auto-air void measurement subunit, (2) specimen conditioning subunit for both room and high temperature, (3) automation arm subunit, (4) automated IDEAL cracking test (IDEAL-CT), IDEAL rutting test (IDEAL-RT), indirect tensile (IDT) strength test subunit, and (5) waste disposal subunit. The automated asphalt binder testing unit includes (1) asphalt binder specific gravity testing subunit and dynamic shear rheometer testing subunit. The automated asphalt mixture and binder test units shall shorten test time and improve lab safety, test efficiency and accuracy.	$ -	$ 8,214.34	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall produce Video Summary Report's (VSRs) for the Receiving Agency which summarize transportation research and implementation projects. Additionally, the Performing Agency shall also produce outreach materials for the Receiving Agency that will be transportation research related material and may include additional related subjects of interest.	$ -	$ 8,891.12	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Emerging vehicle types are rising in sales and comprising a larger share of the total vehicle fleet. The characteristics of these emerging vehicle types pose many challenges to our transportation system moving forward. For example, their effect on roadside safety hardware has the potential to be significant based on their increased weight, lower center of gravity, and different crush stiffness. Given a set of impact conditions (i.e., impact speed and impact angle), the impact severity associated with an emerging vehicle will increase linearly with the weight of the vehicle. This raises significant concern related to vehicle compatibility with some categories of roadside hardware, such as various types of longitudinal barriers (e.g., guardrail, median barriers, portable concrete barrier, transitions, bridge rails), terminals, crash attenuators, breakaway support structures, and other devices. Many roadside safety features are optimized for the currently prescribed design impact conditions and may have little or no factor of safety for accommodating more severe impacts. The Performing Agency shall address these issues to prevent experiencing a potentially significant increase in roadway departure crash fatalities. The Performing Agency shall focus on providing a coordinated program of safety research for emerging vehicles that shall develop solutions to meet identified needs. The research findings will benefit the Participating States in numerous ways, not the least of which is enhanced safety.	$ -	$ 322.64	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This pooled fund study will provide a cooperative approach to conducting research to address roadside safety issues specifically related to improving motorcyclist safety. Furthermore, this program is intended to provide participating states collaborative opportunities to stay abreast of best practices, new regulatory issues, risk management strategies, and other research pertaining to roadside safety improvements for motorcyclists. The research activities will include the identification, development, and evaluation of strategies and devices for mitigating the frequency and severity of roadway departure motorcyclist crashes.	$ -	$ 4,775.66	$ -	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
452 - Texas Department of Licensing and Regulation	3.1.1. Staff Group Insurance Contributions	Pursuant to Section 662.013, Texas Transportation Code, Texas A&M Transportation Institute (TTI) will perform the services listed on Section V, Terms and Conditions, of the Contract. TTI will perform these services in accordance with the following: 1. Program Budget. TTI will prepare an annual program budget to support the technical approach outlined below. 2. Project Plan. TTI will develop a project plan that will identify and summarize all project tasks and activities, task and activity timing, milestones and deliverables, and due dates for the contract duration. TTI will submit this project plan to TDLR for approval within three (3) weeks after execution of the Contract. Within 10 business days after submission, TDLR will review the project plan and provide comments to TTI on areas of potential revision or approve the plan as submitted. 3. Instructor Outreach. TTI will continue the conduct of the education and outreach program initiated in the prior years' contracts to recruit and retain instructors. TTI will also continue the outreach program to motorcyclists across Texas and will track all outreach materials and activities (e.g., events/meetings attended, materials handed out, social media hits, etc.). TTI will deliver to TDLR outreach program tracking reports at 25 and 52 weeks after execution of the Contract. 4. Instructor Training and Retention Program. a. Longitudinal Study Workplan. TTI will develop a workplan that will summarize all aspects of a longitudinal (i.e., long-term) study that will be used in the continued development of a program to increase instructor levels in Texas. The study will build on prior years' research. TTI will document the data collection methods, number of proposed participants, survey questions, analytical approaches, and potential application /implication of results. The survey workplan will be submitted to TDLR for approval within 35 weeks after the execution of the Contract. Within 10 business days after submission, TDLR will review the workplan and provide comments to TTI on areas of potential revision or approve the plan as submitted. b. Conduct Focus Groups with Instructors to Validate Study Methods. TTI will conduct one or more focus groups with a small number of instructors to identify study methods and materials that may need revision due to confusion, misunderstanding, etc. TTI will revise the study methods and materials based on the focus groups' feedback/guidance and then document the results in a technical brief provided to TDLR within 48 weeks after contract execution 5. Encouraging Motorcyclists to Take Courses. TTI will continue the conduct of the education and outreach program initiated in the prior year's contract to directly target motorcyclists and encourage course enrollment and mentorship of new motorcyclists. TTI will use the motorcyclist survey conducted in FY24 to identify further the underlying reasons why motorcyclists do not take safety courses and develop recommendations to overcoming these barriers. 6. Motorcyclist Licensing, Instructor, and Motorcyclist Resource Website. TTI will maintain and expand the website created in the prior year's contract to include resources for instructors wanting to improve their teaching skills (e.g., instructor forums), motorcyclists seeking safety information, and a resource library including materials produced in prior years' contracts. This task will consist of the following activities. a. Routine Maintenance and Updates. TTI will update website information (e.g., scheduled training) and respond to inquiries made through the website "Contact Us" page. TTI will provide to TDLR website interaction analytics as a deliverable at 25 and 52 weeks after execution of the contract. b. Design and Test Resource Webpages. Using the database information and the conceptual model approved by TDLR in FY24, TTI will build drafts of the new webpages. 7. Motorcyclist Safety Materials for Driver Education. Crashes involving a motorcyclist and another vehicle account for over 50% of motorcyclist fatalities in Texas. Given the magnitude of the motorcyclist crash problem with other vehicles and the specific factors contributing the nature of these crashes (e.g., inattentional blindness), TTI will identify opportunities to increase motorcyclist safety through enhanced education course materials for use in Texas driver education and driver safety schools. 8. Yearly Summary Report.	$ -	$ 13,128.34	$ 4,310.54	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI will provide technical support and assistance to the TPP Division in developing required state-mandated reports on congestion and congestion reduction, performance measures and targets, performance–based project selection, and congestion forecasts.	$ 76,991.99	$ 80,426.38	$ 36,754.08	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall develop ERLTs using the MOtor Vehicle Emission Simulator (MOVES) version for specific criteria pollutants, GHG, and mobile source air toxics (MSAT). In addition, the Performing Agency shall develop GHG trend emission inventories (EIs) using the generic Texas area MOVES4 ERLT for analysis years 2020 through 2060.	$ 2,401.26	$ 9,947.75	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency for a variety of tasks related to carrying out the Receiving Agency's Travel Demand Modeling (TDM) Data Innovations Program. A formal Notice to Proceed (NTP) will precede all Performing Agency's work on the tasks and subtasks contained herein. The NTP may only be authorized by the Receiving Agency's designated project director or higher level of authority. The NTP will include a work plan for the task(s) requested, maximum amount payable, and will specify an initiation and completion date.	$ 157,844.51	$ 155,688.43	$ 75,343.44	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Full depth reclamation (FDR) using emulsified asphalt or foamed asphalt continues to grow in usage throughout Texas. To date, almost all mixtures use a cement additive in the mix design. The cement additive reportedly contributes to early strength gain which can be particularly important for projects that require daily opening to heavy traffic. However, not all construction projects require daily opening to traffic, and some materials may provide adequate performance without the cement additive. Additionally, with potential cement supply shortages, design and construction of FDR layers using only the asphalt treatments could save materials cost, reduce schedule risk, and increase daily productivity since one less step would be required in the treatment process. This project will analyze the performance of asphalt-based FDR materials with and without the cement additive and evaluate the strength and stiffness properties of those mixes in the early, intermediate, and final curing stages. This project will leverage those results to determine the operational benefits and acceptability of placing traffic on the section for traffic control and construction staging, evaluate how the long-term performance of the layer may be impacted for pavement design, and make recommendations for mix design and construction specification updates.	$ -	$ -	$ 5,594.95	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Traffic Safety Division (TRF) of the Receiving Agency drafted a special specification (SS) for the vertical application of a retroreflective solid stripe on concrete barriers, approximately six (6) inches below the barrier's top. During the phase of new product approval, this SS describes an application similar to three (3) locations already installed on Texas roadways in previous years. Barrier striping increases motorist awareness of the roadway's edge and the barrier itself, particularly in low-visibility conditions (i.e., heavy rain and snow). These existing implementation sites have not been formally evaluated. Furthermore, the short-term effectiveness of the treatments has not been investigated; therefore, there is a need for long-term and short-term safety effectiveness evaluation of these treatments. The Performing Agencies shall collect before-and-after collision data from Crash Record Information System (CRIS) and near-collision data from connected vehicle data vendor (e.g., Wejo) to evaluate the effectiveness of vertical application of a retroreflective solid stripe on concrete barriers. Furthermore, the Performing Agencies shall install these treatments at six (6) high crash locations with different barrier types including, but not limited to concrete barriers and metal beam guard fences to evaluate their short-term effectiveness using non-traditional safety evaluation approaches. The Performing Agencies shall utilize the findings to update the drafted SS for the future use across the state and beyond.	$ -	$ -	$ 1,261.57	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall develop modules and teach short courses for Geographic Information Systems (GIS) and the Hydrologic Engineering Center's (HEC) software programs Hydrologic Modeling System (HMS) and River Analysis System (RAS) training. The Performing Agency shall also provide technical assistance and guidance on issues related to hydrology and hydraulics. The Receiving Agency will provide support and recommendations for gathering GIS data (e.g., georeferenced road closures, accidents, and floods) as well as problems/applications deemed appropriate for GIS training.	$ 1,798.44	$ 4,160.05	$ 5,844.60	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall maintain traffic monitoring program collection and data processing guidelines, including Receiving Agency traffic data collection standards, and traffic data collection needs to support initiatives and data processing. The Performing Agency shall maintain awareness of and review current industry standards, such as the Federal Highways Administration Traffic Monitoring Guide, Highway Performance Monitoring Program (HPMS) Field Manual, and other guidance.	$ 13,302.60	$ 24,567.96	$ 28,207.47	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical assistance to the Receiving Agency for a variety of tasks related to the improvement of the Receiving Agency's Cash Forecast System.	$ 1,107.44	$ 4,382.43	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Of the various situations in which a utility relocation is eligible for reimbursement at the Receiving Agency, one of the most complex situations is when parts of the existing utility facility involve a property interest. For utility facilities that involve a private property interest, the Receiving Agency uses an eligibility ratio, which is defined as the percentage of utility facilities that are reimbursable in relation to the total amount of utility facilities being relocated. In practice, eligibility calculations can be convoluted or complex, particularly in situations where the utility facility spans multiple property interest locations. The Performing Agency shall develop and test an improved methodology to determine reimbursement eligibility and calculate utility reimbursement amounts. The Performing Agency shall document a significant sample of utility relocations and their associated reimbursement costs to develop a reliable baseline of practices throughout the state, evaluate practices in other states, develop and test an updated methodology for utility reimbursement eligibility criteria and calculations, prepare a guidebook with examples on how to determine utility reimbursement criteria and calculate reimbursement amounts, and prepare and test training materials.	$ -	$ -	$ 7,154.95	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	PURPOSE The purpose of this PGA is to develop on-road emission inventories that will be used as air quality modeling inputs for the calendar years of 2022 and 2032. For all 254 Texas counties, on-road emissions inventories will be developed based on vehicle miles traveled (VMT) activity estimates from the Highway Performance Monitoring System (HPMS) that is managed by the Texas Department of Transportation (TxDOT). BACKGROUND The TCEQ is planning for future State Implementation Plan (SIP) submissions to the U.S. Environmental Protection Agency (EPA) that will likely be required under the 2015 eight-hour ozone standard of 70 ppb. To support attainment demonstration modeling for these efforts, the TCEQ is currently developing a 2022 modeling platform. At this time, eight counties in the Houston-Galveston-Brazoria (HGB) metropolitan area, nine counties within the Dallas-Fort Worth (DFW) metropolitan area, and one county within the San Antonio (SAN) metropolitan area are expected to be reclassified as severe nonattainment for the 2015 eight-hour ozone standard with an attainment year of 2032. For the 2022 base case and the 2032 future case, on-road emissions inventories for all 254 Texas counties are needed based on HPMS activity data from TxDOT. Inventory development work under this PGA requires the use of the Motor Vehicle Emission Simulator (MOVES5) model from the U.S. EPA.	$ -	$ 1,255.83	$ 24,353.09	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide general support services to assist the Receiving Agency in monitoring and analyzing state-funded highway-rail grade crossing improvement projects on the Texas freight rail network. The Receiving Agency will provide the Performing Agency crossing data. The Performing Agency shall use state inventory data, grade crossing project allocations, grade crossing project plans and crash data from the Federal Railroad Administration's (FRA's) grade crossing inventory to provide the general support services. The Performing Agency shall maintain the web-hosted rail safety geographical information system (GIS) database created, improved, and maintained under previous interagency cooperation contracts for the use of Receiving Agency rail safety inspectors. This includes obtaining updated safety data from the FRA no less frequently than on a quarterly basis. The Performing Agency shall support the Receiving Agency in leveraging implementation and updates to regional rail operations plans in urban areas and in the implementation of the Receiving Agency's Rail Plan and Freight Plan, and in working with other regional and local governments in applying Receiving Agency planning products to possible grant applications for discretionary grants created or expanded by the Infrastructure Investment and Jobs Act of 2021. The Performing Agency shall obtain GIS shapefiles and other output produced for the Receiving Agency during the Texas Rail Plan update that identify individual railroads, Class I railroad subdivisions, and passenger rail routes. The Performing Agency shall request the rail line files from the FRA. The Performing Agency shall use these to create a new statewide rail map that can be used to print rail map posters and also create layers on an online mapping tool that all Receiving Agency Rail Division members can use. The Performing Agency shall also use these baseline electronic mapping tools to support other tasks as directed by the Receiving Agency.	$ 27,637.20	$ 39,061.24	$ 44,988.50	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to support innovation and excellence in planning, construction, operations, and maintenance in the Odessa District and to implement the Traveler Information System in the Interstate 20 (I-20) Corridor. The Performing Agency shall provide support services, including, but not limited to traveler information, planning, safety, and special short-term investigations as determined by the Receiving Agency.	$ 13,869.58	$ 18,652.35	$ 28,181.95	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall perform pavement design and materials testing expertise to assist in identifying the most cost-effective repair alternatives for candidate projects identified by the Receiving Agency. The Performing Agency shall sample and test local source materials and compare results to Receiving Agency Item 247 flexible base grade 1 and 2 properties. The Performing Agency shall develop possible use for the local materials and develop what modifications are needed if used as Item 247 grade 1 and 2 flexible base.	$ 2,531.88	$ 12,184.13	$ 19,296.15	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Unmanned aircraft systems (UASs) equipped with miniaturized cameras enable the collection of high resolution, three-dimensional (3D) geospatial data at lower costs than traditional techniques. New technologies also make it possible to gather pictures and video using smartphones, which can be fed to Structure from Motion (SfM) software to develop highly accurate 3D products. Operating UASs requires trained pilots and observers, but smartphones do not. There is a need to test whether construction contractor crews in the field can gather data using either of these technologies and upload the imagery and video to a server to enable inspectors to conduct inspections remotely. This research shall conduct a literature review of UAS-SfM and smartphone technologies; prepare a list of use cases and case studies to test relevant technologies; conduct field tests to document advantages, disadvantages, complementary capabilities, and potential implementation scenarios and costs; prepare recommended settings, procedures, use cases, and operational workflows to ensure repeatable data collection and processing; and prepare guidelines for quality assurance and control of inspections conducted with UAS- and smartphone-based SfM photogrammetry, as well as identify project suitability for the adoption of these technologies to support construction and utility inspection activities at the Receiving Agency.	$ -	$ -	$ 11,905.13	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This research study aims to perform a study focusing on best practices for performing pavement preparatory work in advance of preventive maintenance (PM) surfacing contracts. The study will determine the best practices for repairing a roadway before a new surface is placed. Seal coats or thin overlays are typical PM surfacing projects. The preparatory work performed by in-house maintenance forces or maintenance contracts may include crack sealing, fog seal, repairs, milling, and level-up. The preparatory work should be completed well before the PM contract. The Performing Agencies shall identify the main flexible pavement repair types and investigate best practices for performing both in-house and contracted repairs. The Performing Agency 1 shall develop a procedure to determine the limits and type of flexible pavement repair. The Performing Agency 1 shall develop an evaluation process of the repair, including its performance and effects on the PM surfacing.	$ -	$ -	$ 10,881.76	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	In 2012, the Rider 36 study indicated that damage caused to bridges and pavements by overweight (OW) vehicles surpassed the revenue collected by permit fees by approximately $200 million annually. This finding was corroborated by a recent 2022 study mandated by House Bill 2223, which quantified this gap at $168 million. Besides the revenue shortage to cover bridge and pavement maintenance and rehabilitation costs due to the damage cause by OW vehicles, the 2022 study also identified additional shortcomings that need to be urgently addressed. These shortcomings include: 1) lack of a methodology for periodically adjusting permit fees to account for changes in traffic patterns and configurations and higher inflation rates; 2) lack of accurate data and process for calculating annual vehicles-miles-travelled (VMT) by each permit type; 3) uncertainty in the identification of routes and number of trips for monthly, quarterly, or annual permits; 4) absence of a method and process to assess the damage caused by OW vehicles to the off-system bridges and highways. The objective of this research is to address these shortcomings and to develop, recommend and provide the Receiving Agency a well-established and documented step-by-step method to periodically update such method.	$ -	$ -	$ 1,570.50	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The objective of the study is to develop a set of 1990 and 1999 through 2060 on-road mobile trend emissions inventories for criteria air pollutants (CAPs), CAP precursors, and hazardous air pollutants (HAPs) to support air quality planning activities. A comprehensive set of MOtor Vehicle Emission Simulator (MOVES) model-based county database (CDB) files for all 254 Texas counties will be developed. The data needed may include: • meteorological data; • vehicle classification count data; • age distribution data; • fuel data; • Highway Performance Monitoring System (HPMS) data (from Texas Department of Transportation's [TxDOT's] Roadway Inventory Annual Reports); • vehicle registration data; • automatic traffic recorder data; • extended idling activity data; and • vehicle I/M program design data	$ -	$ 3,543.70	$ 5,425.82	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall travel to the Receiving Agency's Fort Worth District to perform full pavement forensic investigations of distressed highway sections identified by the Receiving Agency. This will include running Nondestructive tests, pavement sampling in order to validate the causes of distress, obtain samples for laboratory testing, and propose cost-effective pavement rehabilitation options. When required both routine and advanced physical and chemical materials laboratory tests will be conducted. The Performing Agency shall also develop recommendations for the modification of specifications, materials selection, construction, and design practices to avoid future occurrences.	$ 5,926.73	$ 5,834.38	$ 15,831.71	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to develop on-road emission inventories that will be used as air quality modeling inputs for the calendar years of 2022 and 2032. For the eight-county Houston-Galveston-Brazoria (HGB) metropolitan area, the twelve counties within Dallas-Fort Worth (DFW) metropolitan area, and the five counties within the San Antonio (SAN) metropolitan area, link-based on-road emissions inventories will be developed based on vehicle miles traveled (VMT) activity estimates from the respective local travel demand model (TDM).	$ -	$ 959.13	$ 22,207.00	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	Emissions associated with aircraft and airport activities are used in AD modeling for the SIP revisions, and to inform air quality planning decisions. Temporal profiles are applied to emissions and provide a detailed distribution of emissions throughout a period of time. In previous projects, the Texas A&M Transportation Institute (TTI) and Eastern Research Group. Inc. (ERG) have developed annual and daily airport emissions inventories. For AD modeling, annual and daily EI are currently converted to hourly emission rates using "average" temporal profiles, as well as profiles provided by the U.S. Environmental Protection Agency (EPA). Therefore, Texas-specific hourly temporal profiles will provide a greater resolution and will better capture peak emission periods that occur during the day. This improvement will ensure that TCEQ's photochemical modeling accurately captures emissions and airport activity from major Texas airports.	$ -	$ -	$ 5,181.06	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency with the implementation of the UCM approach that was developed as part of the second Strategic Highway Research Program 2 (SHRP2) Projects R15B, "Identification of Utility Conflicts and Solutions," and R15C, "Pilot Testing of the Utility Conflict Matrix." The Performing Agency shall gather information and data as it relates to the UCM approach to measure the effectiveness of the implementation including during construction.	$ -	$ 1,984.83	$ 464.88	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide transfer of technology and knowledge resulting from previous research findings and other analyses of transportation issues that address mobility and other transportation needs of Texas citizens. Accordingly, the Performing Agency shall provide technology and knowledge transfer to staff of the Receiving Agency and, by written authorization from the Receiving Agency, to other transportation professionals in Texas who serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, and county and local agencies. The Performing Agency shall periodically organize meetings, presentations, and workshops at the Receiving Agency's request to accomplish this Task and to convey the latest results of research that will benefit the Receiving Agency. Topics will include any of the following at the request of the Receiving Agency: transportation infrastructure real estate value capture, Transportation Reinvestment Zone (TRZ) analysis and implementation, advanced techniques	$ 4,832.91	$ 3,753.85	$ 26,025.66	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall develop a method and tool for analyzing safety-related pavement data to identify candidate pavement safety projects, such as cross-slope improvement projects and flushing treatment projects. The Performing Agencies shall assemble a dataset containing comprehensive data on the pavement, site condition, and crashes for a representative sample of on-system roadways. The Performing Agencies shall conduct a comprehensive analysis of the integrated dataset to identify critical combinations and thresholds of pavement conditions that may pose a safety hazard and use these factors to assess pavement susceptibility to crashes. The Performing Agencies shall quantify the pavement crash susceptibility based on measurable pavement characteristics such as cross-slope, geometrics, distresses (e.g., rutting, flushing), skid resistance, and roughness. Finally, the Performing Agencies shall develop a data analysis and visualization tool for assessing pavement crash susceptibility and recommending solutions to reduce crash risks. The Receiving Agency's districts will be able to use this tool to identify potential site-specific crash contributing factors and proactively select appropriate pavement safety improvement projects.	$ -	$ -	$ 10,111.39	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Shared or multiuse paths invite a wide range of users, including pedestrians, bicyclists, and other wheeled users, with a range of transportation purposes such as commuting, exercise, and recreation. Although shared use path (SUP) users are physically separated from traffic, they remain vulnerable at roadway crossings. In the absence of roadway cross-section designs for accommodating pedestrians and bicyclists, SUP crossings can present users with complex tasks including gap selection, scanning for turning vehicles, and interacting with other path users. Ensuring safe crossings for all users at these locations is essential. Pedestrian and bicycle treatments have been developed and their safety effectiveness has been assessed in several studies and practices. Although technically these designs can be applied to SUPs, it is not clear how to integrate treatments for different types of path users, road classifications, land-use contexts, and crossing geometries. With the increasing implementation practices of SUPs across Texas, there is a need to assess the potential safety concerns involving pedestrians, bicyclists, micromobility users, and people with disabilities at these locations and develop guidance for treatment selection, including for paths next to railroads. The Performing Agencies shall explore the pedestrian and bicyclist crashes at the vicinity of SUPs and develop design and planning guidance for implementation purposes.	$ -	$ -	$ 10,841.61	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Polymer additives are used to design high PG virgin binders that meet the PG requirements to protect the mix against rutting and cracking under the climate and traffic conditions of an HMA project. When RAP is added to the mixture, the effective binder may not meet the desired grade. This project shall quantify the extent to which polymer dilution is a problem that should be addressed in the Receiving Agency's HMA specifications and if so, develop specification language to address it. This project involves evaluating binder blends and mixtures with RAP. Both lab blended and commercial PG binders shall be evaluated for continuous grade, elasticity, polymer content, and other rheological parameters. Then these binders shall be mixed with recovered RAP binders at several percentages and retested to determine the same properties. Standard mixtures(s) shall also be used with several of these binders and various RAP percentages to measure mixture performance-related properties (cracking and rutting). The Performing Agencies shall use the results from binder and mixture results on the impact of "virgin binder – RAP binder dilution" and work with the Receiving Agency to develop specification language for inclusion in the Receiving Agency's HMA specifications, as needed.	$ -	$ -	$ 1,469.53	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	This project continues the Texas Low Emissions Diesel (TxLED) Study (PGA 582-23-45120-015). The Grantee shall assess and quantify nitrogen oxides (NOX) and particulate matter (PM) emissions and emissions reductions from the use of TxLED fuel in diesel engines or vehicles representative of the current on-road and non-road mobile source fleet. The Grantee shall measure engine or vehicle emissions in a controlled laboratory environment while collecting and analyzing all process and operational data necessary to quantify emissions reductions.	$ -	$ 617.14	$ 15,022.69	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall explore if there are refinements that could be made to the recently developed protocol for using third party data in generating suggested speed limits. The suggested speed limit probe data (SSL-Probe) protocol was developed to allow Receiving Agency districts to be more pro-active and responsive with their speed zone program. The protocol also provides a much safer method of collecting speed data, especially on high-speed and controlled access highways.	$ -	$ -	$ 17,491.48	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to: collect and analyze statewide information regarding longterm idle activity by on-road heavy duty vehicles (HDV); collect and analyze activity information related to the use of auxiliary power units (APU) by HDVs; prepare an extended idling and APU activity database; and develop a statewide HDV extended idle and APU emissions inventory. This study will update and enhance the results of the 2019 TCEQ-TTI study performed under PGA 582-17-74308-06 to ensure the values used for extended idle and APU hours are accurate and consistent with the United States Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) model capabilities. TTI will obtain the most recent data sources available, including telematics data, to analyze these idling activities. The telematics data is collected from electronic logging devices and is transmitted by drivers who must report their working and resting hours due to hours of service (HOS) compliance regulations. This data provides a comprehensive and detailed view of idling patterns to update heavy-duty diesel hoteling and extended idling emissions estimates. Updating this information will support accurate emissions inventory development for state implementation plan (SIP) revisions.	$ -	$ 91.27	$ 13,316.81	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The goal of the Texas CAV Task Force is to be a single point of information and coordination for all CAV activities in Texas. The Performing Agency shall provide support to facilitate the Texas CAV Task Force in hosting industry meetings across multiple emphasis areas, creating a knowledge base for best practices and collaboration, reporting out on lessons learned, and undertaking special projects as directed by the Receiving Agency. The Performing Agency shall support the Texas CAV Task Force in developing policy opportunities that may need to be brought before the Texas Legislature and Governor.	$ 1,379.80	$ 22,331.07	$ 23,227.22	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this Proposal for Grant Activities (PGA) is to enhance the analytical proficiency of staff at the Texas Commission on Environmental Quality (TCEQ) through an in-depth, hands-on training procedure focused on the transformation and integration of the travel demand model (TDM) outputs into the U.S. Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) for on-road mobile source emissions modeling. Given that TDM outputs—such as directional, time-resolved vehicle activity data (e.g., vehicle miles traveled (VMT), vehicle hours traveled (VHT), and link-level speeds)—are not natively compatible with MOVES input requirements, the training will center on the application of a Python-based post-processing utility developed by the Texas A&M Transportation Institute (TTI) to ensure alignment with MOVES structure and logic. The TCEQ staff who participate will gain technical competence in extracting TDM outputs, implementing highway performance monitoring system (HPMS)-based VMT reconciliation techniques, modeling congestion effects through speed-flow relationships, preparing MOVES-ready input datasets, and executing MOVES run via TTI's method (e.g., the command-line interface). This training is designed to equip staff with the methodological insights required to interpret, audit, and contribute to complex emissions inventories and regulatory analyses—such as state implementation plan (SIP) development, transportation conformity determinations, and localized air quality assessments—in accordance with the federal Clean Air Act and EPA guidance.	$ -	$ -	$ 170.89	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines tasks in which the Performing Agency may perform work for the Receiving Agency's Houston District. Task 1. Revetment of SH 87 in Galveston, TX $250,000 There are a number of revetment failures along the highway on the coastal corridor, which is impacting the SH87 in Galveston, TX. The Performing Agency shall conduct the following tasks to address this issue: Task 1.1. Perform Detailed Site Investigation of the Revetment Failure in SH 87 The Performing Agency shall conduct site investigations of the physical characteristics of the soils, and perform documentary studies, site surveys, and ground investigations. The Performing Agency shall conduct multiple site visits to investigate the current failure types and collect the reports/literature associated with similar types of failure. The Performing Agency shall conduct a detailed topographic survey to identify the failure zone, as well as to investigate the impact of the ground surface profile. Task 1.2. Collection of Soil Samples and Perform Laboratory Testing The Performing Agency shall collect soil samples and other construction materials from at least three project sites. The Performing Agency shall use the collected soil samples to classify the soil and determine the chemical properties, strength and stiffness based on triaxial test/direct shear tests, and repeated load triaxial tests at the Performing Agency's Center for Infrastructure Renewal (CIR) laboratories. The Performing Agency shall determine the erodibility criteria of these materials based on the erosion function test. The Performing Agency shall use advanced resilient modulus, triaxial, direct shear, and other tests for the testing. Task 1.3. Design and Development of Nature-based Solutions The Performing Agency shall provide a resilient solution based on the numerical and analytical approach. This study will consider different types of nature-based solutions including dunes, and others coupled with foundation subsoils reinforced with geosynthetic products, i.e., geotextile, geogrid, geomembrane, and geocells. The Performing Agency shall explore the current design standards and construction techniques and determine the most critical design parameters. The Performing Agency shall assess the efficiency of the solution based on the existing design approach and finite element modeling (FEM). The Performing Agency shall use the outcome of the FEM study to develop design methodology for the future. Task 1.4. Implement the Design System and Perform Field Monitoring The Performing Agency shall implement the nature-based solution with geosynthetic products to repair the revetment located in Galveston County, Texas. The Performing Agency shall provide necessary specifications and design guidelines for construction with input from the Receiving Agency. The length of the test section is 500 ft. During construction, monitoring instrumentation such as pressure cell, deflection measuring devices and moisture sensors shall be embedded in the pavement section. This instrumentation shall facilitate long-term evaluation of the pavement section. Task 2. Geotechnical Factor of Safety (FS) Designs $200,000 The Performing Agency shall provide technical guidance related to a number of issues related to slope failures occurring due to extreme precipitation and surficial slope failures.	$ 6,720.00	$ 2,605.96	$ 2,010.41	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide a variety of quick response services, such as planning, evaluation, and technical support, to the Receiving Agency as it addresses state and federal legislative inquiries and specific requests from Receiving Agency Administration and Texas Transportation Commission (Commission). The Receiving Agency will identify each task and will issue a Notice to Proceed (NTP) to the Performing Agency. The NTP will include a work plan for the requested task, maximum amount payable, and initiation and completion dates. Tasks may vary from the development of a performance measures governance document to assistance with renewed energy sector program impact analysis and repair strategies. As required by the Receiving Agency, and identified in each NTP, the Performing Agency's staff shall travel to various locations around the state to perform its contracted activities.	$ 18,380.45	$ -	$ 1,256.43	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall update and deliver seal coat training and provide general support to the Receiving Agency to address strategic maintenance and pavement preservation activities. A Notice to Proceed (NTP) is required prior to performing any work or providing any services. The Receiving Agency will authorize the NTP and deliver it to the Performing Agency in writing via electronic mail (e-mail). The Receiving Agency will contact the Performing Agency to develop a work plan and determine a maximum amount to be expended for each NTP.	$ 170.27	$ 88.33	$ 1,885.91	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall conduct an evaluation and calibration of the Receiving Agency's Friction Measurement System to ensure compliance with American Association of State Highway & Transportation Officials (AASHTO), American Standards for Testing Materials (ASTM), and Test the National Institute of Standards and Technology (NIST). The Receiving Agency will contact the Performing Agency at least 60 days in advance to coordinate the scheduling of the evaluation and calibration testing. The Receiving Agency may bring up to two (2) systems and all necessary equipment for evaluation and calibration to the Performing Agency's facility. The equipment will remain at the Performing Agency until all of the evaluations and calibrations are completed. The Performing Agency shall conduct the following tasks: Task 1: FMS Calibration – 1st System (Budget estimate: FY24 $12,391; FY25 $12,492, FY26 $12,598) The Performing Agency shall develop and conduct an evaluation and calibration of one (1) test wheel of the Receiving Agency's Friction Measurement System (FMS), in accordance with AASHTO T24-90 and ASTM Test Method E274-97 with traceability to the NIST. Task 2: FMS Calibration – 2nd System (Budget estimate: FY24 $6,195; FY25 $6,246; FY26 $6,299) The Performing Agency shall develop and conduct an unbiased correlation at three (3) speeds for the Receiving Agency's Friction Measurement System in accordance with AASHTO T24-90 and ASTM Test Method E274-97 with traceability to the NIST. Task 3: Technical Assistance and Guidance (Budget estimate: FY24 $2,065; FY25 $2,082; FY26 $2,100) The Performing Agency shall provide technical assistance and guidance to Receiving Agency personnel while the Receiving Agency's Friction Measurement System is located at the Performing Agency's Test Center and while it is in service. DELIVERABLES The Performing Agency shall provide the Receiving Agency with one (1) electronic portable document format copy, transmitted via email, of an evaluation and calibration report documenting the findings and recommendations no later than eight (8) weeks after completion of calibration.	$ 297.91	$ 106.32	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall travel to the Receiving Agency's statewide districts to perform full pavement forensic investigations of prematurely distressed highway sections identified by the Receiving Agency to include identifying the causes of distress, conducting routine and advanced physical and chemical materials characterization testing, and recommend the most cost-effective repair alternative to resolve the issue. The Performing Agency shall also develop recommendations for the modification of specifications, materials selection, construction and design practices to avoid future occurrences.	$ 34,816.18	$ 41,670.78	$ 78,433.23	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency's Maintenance Division and statewide districts by providing support to fully implement the full depth reclamation (FDR) equipment procured on TxDOT Project 0-6880. In that study, two complete sets of FDR equipment and compaction rollers were purchased. The Performing Agency has transferred one set to the Receiving Agency and shall transfer the second set during this IAC. As described in the tasks below, the Performing Agency shall provide support for all aspects of FDR project development using this equipment including, but not limited to: nondestructive test (NDT) support, selecting sampling locations, performing roadway sampling, developing optimal FDR mixture designs, developing suitable pavement structural designs, training on equipment operation, project startup support at time of construction, post-construction performance monitoring, and technical recommendations for FDR workflow and/or pavement design enhancements.	$ 15,491.10	$ 8,838.50	$ 16,336.67	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall develop and update pavement design training materials for the workshops described below. The potential topics are subject to revision by the Receiving Agency's Maintenance Division. Training implemented during the workshop should include, but is not limited to, defined curriculum outcomes and training objectives designed and developed to Receiving Agency standards for adult learning that include objectives written to Mager Standards tied to Bloom's taxonomy of cognitive learning, Instructor Guides, Participant Guides, Presentation Materials, and job aids that the Receiving Agency may request to be printed for each participant at a training event or in a format suitable for virtual Instructor Led Training.	$ 2,645.32	$ 3,375.72	$ 4,783.89	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide nondestructive testing (NDT), field testing, pavement design and materials testing expertise to assist in identifying the most cost-effective pavement rehabilitation alternatives for candidate projects identified by the Receiving Agency.	$ 10,163.17	$ 7,637.11	$ 2,743.41	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Technical support to the Freight Planning Branch.	$ 138,767.37	$ 189,714.37	$ 263,247.86	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Texas has an extensive network of general aviation (GA) airports. Maintaining GA airports in a state of good repair helps local and regional stakeholders and economies. The Performing Agency shall annually conduct pavement inspections on approximately 90 GA airports. These inspection reports will populate an online portal that serves as the reporting mechanism. Through previous work, a preliminary version of this portal exists which the Performing Agency shall refine, maintain, and update over the life of this contract. As part of the inspection program, the Performing Agency shall collect falling-weight deflectometer (FWD) and ground penetrating radar (GPR) testing at each airport. The Performing Agency shall use the data to load rate the runways at each airport. Other GA pavement assets will be spot checked for structural strength to inform the overall structural ability of the GA airport's pavement assets. The cost to maintain pavement assets can become high if preventative maintenance is not performed. The Performing Agency shall develop "do-nothing" curves for the pavement assets to better inform all parties as to the ramifications if maintenance and rehabilitation work is not performed. The Performing Agency shall sub-contract the development of maintenance and rehabilitation plans to a consultant with aviation expertise. As part of the annual pavement inspection program, the Performing Agency shall collect profile data along the runway to analyze the smoothness. This contract includes a task for the Performing Agency to perform non-destructive and destructive testing on airports to investigate pavement distresses that require additional investigation beyond what can be identified with the FWD, GPR, and profile data. The Performing Agency shall conduct forensic work when requested by the Receiving Agency or when necessary to develop the maintenance and rehabilitation (M&R plan).	$ 24,462.35	$ 33,141.31	$ 66,550.84	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Skid resistance is an important pavement safety evaluation parameter. Fort Worth District has an interest in implementing an improved process to raise skid scores in the district and to enhance system safety in TxDOT. The objective of this research is to develop a Superpave mix design with improved skid resistance that can be used as a surface layer in Fort Worth District. Skid resistance in a surface layer plays a critical role in pavement safety, and Superpave mixture is mostly used in asphalt pavements for a surface course in Fort Worth District. The improvement of skid resistance in asphalt pavements with Superpave mixtures will enhance system safety in Fort Worth District as well as TxDOT.	$ 7,713.16	$ 7,877.40	$ 8,257.66	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall travel to Receiving Agency Districts and MTD to support the laboratory and construction inspector qualification program. This will include the following: 1. assist MTD with audits for two (2) Receiving Agency Districts; 2. review the previous audits to identify common issues and provide recommendations on best practices or new practices to improve the program; and 3. review policies and procedures related to District laboratories and construction materials testing for Receiving Agency employees.	$ 102.78	$ 209.84	$ 246.22	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide strategic planning assistance to the Receiving Agency's Planning and Modal Programs (PMP) Director and Aviation, Maritime, Public Transportation, Rail, and Transportation Planning and Programming Divisions.	$ 501.05	$ 3,673.30	$ 2,412.88	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency's Maintenance Division with weed management to include screening of suspected herbicide-resistant johnsongrass, Palmer amaranth, kochia, and other weed populations for survival to herbicides and identification of optimal herbicide rate for johnsongrass species at different growth stages and environmental conditions	$ 3,200.20	$ 5,035.31	$ 10,463.93	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency will build strategic partnerships to train and educate the next generation of the heavy highway workforce. This training will offer the state's diverse population an opportunity to obtain consistent and high paying employment in the heavy highway industry. Furthermore, increasing the knowledge and skills of the heavy highway workforce will result in higher quality projects that are completed on budget and on time. The Performing Agency shall perform tasks in Bryan-College Station, Texas, Brazos County, and surrounding county areas, all in accordance with the scope of services below. Task 1: Deliver ConnectU2Jobs Paving Cohorts Estimated Costs: FY24 $15,741; FY25 $69,060; FY26 $69,996 The Performing Agency shall deliver at least one (1) flexible paving cohort of the ConnectU2Jobs (CU2J) Highway Construction Workforce Partnership Program (HCWP) in Fiscal Year (FY) 2024 and at least two (2) in FYs 2025 and 2026. This cohort will take place in Brazos County, Texas, primarily at the Texas A&M University RELLIS Campus. Task 2: Submit Final Deliverables – ongoing throughout contract term (FY24 $5,200; FY25 $20,000, FY26 $20,000) The Performing Agency shall submit deliverables with invoices as completed. The deliverables will include, but are not limited to: 4.1 Work Group Plans and Schedules 4.2 Web Sites and Dashboard Performance Metrics Reports 4.3 Career Exploration Outreach Promotions 4.4 Public Relations Press Releases 4.5 Employer Recruiting Outreach Flyer 4.6 Career Days Outreach Invitations 4.7 Job Fair Placement Invitations	$ -	$ 4,090.96	$ 4,868.77	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines various tasks in which the Performing Agency shall perform technology transfer and technical support services for the Receiving Agency in the area of project planning, development, and delivery. The Performing Agency shall provide transfer of technology and knowledge to staff of the Receiving Agency (or private-sector professionals under contract to the Receiving Agency), other state agencies, and county and municipal agencies at the request of the Receiving Agency's San Antonio (SAT) District. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics will include, but not limited to, project delivery management and optimization, planning and environmental linkages, utility conflict resolution and coordination management, right-of-way acquisition and coordination, access management, asset management, operations and safety impacts in energy development areas, geographic information system (GIS) techniques to support planning functions (including GIS software use and demonstration), public outreach, mobility coordination, 3D visualization and design, new methods for performing field data collection activities (e.g., turning movement counts, vehicle classification data), traffic analysis (including but not limited to the Synchro 9, CORSIM, and VISSIM software tools), safety, and construction management.	$ 2,179.27	$ 4,258.15	$ 23,702.85	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall continue to support the Receiving Agency in border-related activities in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements.	$ 19,903.54	$ 69,445.52	$ 127,631.23	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide quarterly economic outlook summaries on a global, national, regional, and State of Texas basis as data allows. The Performing Agency shall develop the process and framework to rebase and sustain a database of these costs to be fully analyzed. The Performing Agency shall investigate the trends in construction costs over the FY 23 and FY 24 analysis periods with the intent to document the cost trends in Texas and prepare the HCI report for use in January 2025. The Performing Agency shall provide market shed analyses that assess the change in access attained from the completion of selected corridor projects and provides the economic value of the change of that market shed as represented by factors including access to jobs or access to workforce population, business establishments, and payroll.	$ 4,021.84	$ 41,317.76	$ 9,156.09	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency (Texas A&M Transportation Institute) shall provide highway planning and operations for the Receiving Agency. Performing Agency staff will travel within the Fort Worth District to project meetings and project areas for data collection, field observation, outreach with stakeholders and businesses, and other associated activities.	$ 12,722.30	$ 38,088.22	$ 41,950.62	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency's Maintenance Division and statewide districts by providing pavement structural evaluation support using a Total Pavement Acceptance Device (TPAD), a highly modified geophysical surveying vehicle that performs dynamic loading testing to analyze road structural conditions. The Performing Agency shall provide assistance conducting TPAD surveys at approved project locations, interpreting survey results, maintaining and storing the TPAD, and making hardware and software upgrades, as needed. The Performing Agency shall provide TPAD support to the Receiving Agencies' statewide districts to include webinars, district visits, and presentations at the annual Maintenance and Construction Conferences.	$ -	$ 1,566.43	$ 1,711.46	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Performing Agency shall perform for the Receiving Agency's Austin District to support district planning and operations.	$ -	$ 18,686.15	$ 20,847.18	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI to provide technical assistance and support for Statewide Planning Branch Support of the Transportation Planning & Programming Division.	$ -	$ 19,382.35	$ 76,847.29	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines various task areas in which the Performing Agency shall perform technology transfer and technical expertise for the Receiving Agency in the area of transportation operations and maintenance.	$ -	$ 19,538.01	$ 18,514.38	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall use its nondestructive testing (NDT) capabilities and hot mix asphalt testing equipment to evaluate upcoming overlay projects and make project specific recommendations on new asphalt overlays for the Receiving Agency. These mixes will include, but are not limited to, porous friction courses, thin overlay mixes, stone mix matrix and traditional dense graded mixes with a variety of modified binders. The Performing Agency shall work closely with the Receiving Agency's project engineers to update plan notes for upcoming jobs.	$ -	$ 5,164.71	$ 1,225.38	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide transfer of technology and knowledge. The Performing Agency shall serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, counties, cities, Metropolitan Planning Organizations (MPOs), and the Regional Mobility Authorities. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics will include any of the following at the request of the Receiving Agency: 1. Project delivery management and optimization, 2. Planning and environmental linkages, 3. Utility conflict resolution and coordination management, 4. Right-of-way acquisition and coordination, 5. Access management, 6. Asset management, 7. Energy impacts, 8. GIS techniques to support planning functions, 9. Public outreach, 10. Mobility coordination, 11. 3D visualization and design, 12. Unmanned Aircraft System (UAS), photogrammetry, and spatial analysis, 13. Advancements in data collection techniques, 14. Traffic simulation and analysis, 15. Safety, and 16. Construction management.	$ -	$ 9,343.91	$ 9,874.30	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall complete a strategic plan and review of current business practices at Flight Services, the Receiving Agency, to ensure compliance with relevant state statutes and provide feedback on potential updates.	$ -	$ 6,540.90	$ 35,122.46	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall work with Receiving Agency districts to evaluate and recommend intersection designs with hot mixed asphaltic pavement options, including, but not limited to structural evaluation, materials, and mixture design recommendations. The Performing Agency shall complete four case studies per year. The Performing Agency shall work with the Receiving Agecny to develop best practices for work zone traffic control and construction methods in intersections.	$ -	$ 1,942.81	$ 11,648.22	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall support the data science team in the Strategic Initiatives and Innovation Division (STR) with data documentation, data engineering, and literature reviews. The Performing Agency shall not perform any work or incur any cost under Task 1-3 until a Notice to Proceed has been issued by the Receiving Agency for the Task(s). The project may support TxDOT's efforts in making data available to TxDOT staff, and external stakeholders such as universities, Metropolitan Planning Organizations (MPOs), state agencies, federal agencies, cities, counties, and private entities.	$ -	$ 4,920.88	$ 22,610.85	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance in support of the Receiving Agency's statewide Pavement Surface Distress Data Collection (PSDDC) project by collecting data and providing an independent audit of the Receiving Agency's contractors responsible for data collection in each of the PSDDC region. The PSDDC data is an important and compulsory factor for one of the Receiving Agency's funding sources. The Performing Agency shall also maintain and operate the Receiving Agency's FWD calibration facility used to calibrate FWD units. The Performing Agency shall perform annual calibrations on FWD units to American Association of State Highway and Transportation Officials (AASHTO) and Long-Term Pavement Performance (LTPP) standards, as specified by Federal Highway Administration (FHWA). The Performing Agency shall maintain the guidelines as set by FHWA. The Performing Agency shall use the calibration facility both as a FWD Operation training facility and as a maintenance facility for the Receiving Agency's fleet of FWD's, as set forth by one of the Receiving Agencey's funding sources.	$ -	$ -	$ 20,313.25	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Texas Department of Transportation (TxDOT) is committed to improving the transportation system's efficiency, safety, and mobility through seamless and consistent digital communication between vehicles, infrastructure, and road users. Today, much of the transportation system remains "silent" and lacks real-time, integrated messaging capabilities that could improve decision-making for both human drivers and advanced vehicle systems. Additionally, as operators of the system, TxDOT is often blind to existing conditions unless other parties report them. As digital infrastructure continues to expand and connected and automated vehicle (CAV) technologies become more widespread, ensuring accurate, timely, and standardized messaging across all user groups is critical. This project shall develop a Strategic Plan for System Messaging. The plan will catalog current and future user, system, and vehicle needs, to facilitate meaningful information transfer between vehicles, infrastructure, and road users. In addition to specifying these needs requirements, additional efforts will develop the tactical approach for comprehensively and objectively evaluating market solutions that could support these needs.	$ -	$ -	$ 8,143.96	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	As the Receiving Agency operates and maintains the existing and planned roadway network to better accommodate traffic growth and changing traffic patterns, it is critical for district area engineers and planners to know how various roadway configurations and designs could affect roadway safety. The Performing Agency will research the best practices and apply latest techniques and expertise to identify roadway safety issues, trends, and possible countermeasures. The Performing Agency will provide necessary information for the Receiving Agency to make informed decisions.	$ -	$ -	$ 2,501.20	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Work performed under this contract will build-off, and further refine, the work performed in the Quick Response Planning, Evaluation and Technical Support Contract No. 0000015039 which analyzed congestion data and project parameters to estimate the economic effect of ten (10) Texas Clear Lanes projects. The Performing Agency shall use the methodology developed in the ten (10) initial major construction project corridors in the Contract No. 0000015039 for the Receiving Agency Administration to evaluate the other corridors and projects funded in the Texas Clear Lanes program, with revisions as necessary to accommodate the unique attributes of the projects. Project effects are estimated for travel speed and traffic volume changes. The Performing Agency shall convert these effects into economic effect analyses for vehicle operating cost and delay and travel time reliability cost savings. The Performing Agency shall estimate the effect of the project design on safety with crash effects and crash value. In addition, the Performing Agency shall estimate the project construction spending effects on business output and wage income.	$ 16,231.84	$ 28,418.99	$ 61,851.76	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Interstate 10 (I-10) is the main and one of a few east/west corridors through El Paso, TX. This is due to the Franklin Mountains stretching through the center of El Paso, leaving a relatively narrow sliver for travel on the south side of the city. The pavement condition of I-10 is getting worst as evident by continuous overnight pavement patching projects. TxDOT El Paso (the State) is aware of the need for a major I-10 overhaul project. At the same time, the improvement project cannot occur until an adequate alternative route is possible. This adequate alternative route is the newly constructed Border Highway West project. As this adequate route alternative was being built, the State developed a feasibility study of various preliminary scenarios for I-10 improvements through a 55 mile stretch of I-10 from the TX/NM state line to Tornillo, TX. The State hired a consultant for this task and the title of this feasibility study is "Reimagine I-10". The consultant, separated this stretch of I-10 into four segments: • Segment 1: From TX/NM state line to Executive Blvd. • Segment 2: From Executive Blvd. to Copia St. • Segment 3: From Copia St. to Loop 375 (east El Paso) • Segment 4: From Loop 375 to FM 3380 (Tornillo, TX) The consultant performed standard traffic analysis of the scenarios. However, existing modeling methods cannot capture the temporal aspects of proposed increase in roadway capacity, new connections, or temporary work zone conditions on a localized and regional scale simultaneously. Therefore, unique modeling methods are needed to capture the delays associated with a temporary work zone or additional volumes transferred to adjacent arterials. One such approach is using integrated network modeling tools – also known as multi-resolution modeling (MRM). There are two distinct advantages to using this innovative approach over traditional methods. First, the use of the regional mesoscopic dynamic traffic assignment (DTA) model captures the diversion of vehicles outside the project limits. Existing practices that use traditional deterministic models or planning level-economic analysis models do not account for traffic that is willing to take alternate routes that extend outside the boundary limits of the model. While some microscopic models are capable of performing DTA, they are not large enough to capture diversions in a large urban area. The second advantage of using the MRM methodology is that macroscopic travel demand models are static in nature and are not capable of capturing the temporal and spatial distribution of traffic congestion at various time periods. Travel demand models can only show the total number of vehicles that switch routes when there is capacity reduction due to a work zone. They cannot shift traffic during different time periods thus severely limiting its capability to analyze delays associated with queuing and speed reductions.	$ 5,065.66	$ 118.22	$ 8,534.09	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Texas Department of Transportation, TxDOT, hereafter referred to Receiving Agency, is actively looking for alternatives to stabilize expansive soils and cement treated bases with polypropylene fiber. Polypropylene fiber, hereafter is referred to as fiber. Many areas in Texas have problems stabilizing expansive soils with traditional stabilizers (i.e. lime, cement, fly ash, or in combination) because of the high levels of sulfates in the soil. Many major pavement failures have occurred due to lime/cement induced sulfate heaves. In addition, reflection cracks from cement treated bases have been reported in numerous projects. Expansive soils have caused extensive pavement heaves, bumps and longitudinal cracks. The repetitive shrinking and swelling is responsible for the development of cracks, heaves and bumps on Texas roads. Roadway surface cracks allow water intrusion which degrades underlying pavement layers, and prematurely fails the pavement structure. Surface heaves and bumps are a driver safety issue. Cracks, heaves, and bumps are extremely expensive to repair over the life of the pavement, and it would be more economical and safer to the public to mitigate their occurrences during construction.	$ -	$ -	$ 1,031.95	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The US Fish and Wildlife Service (USFWS) supported federal listing of the monarch butterfly (Danaus plexippus) in December 2020, but listing is currently delayed due to other higher priority listing actions. Texas roadways play a critical role in the successful spring and fall migrations of the eastern monarch butterfly population. Receiving Agency project 0-7022, “Evaluating Fall Monarch Butterfly Roadkill Hotspot Incidence and Potential Roadkill Mitigation” has revealed perennial hotspots for fall monarch butterfly roadkill in Texas. Yearly roadkill can comprise up to 2.5% of the Mexican overwintering population. Spring and fall roadside milkweed and monarch-preferred nectar plant hotspots have also been identified which provide critical resources to monarchs in terms of both milkweed larval food and flower nectar for adults.	$ -	$ -	$ 15,660.45	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Asphalt binders are one of the most expensive and critical materials used in the construction of the roadways in Texas, costing taxpayers hundreds of millions of dollars annually. It has been widely recognized that asphalt binders with the same performance grade (PG) can perform very differently due to changes in crude source, refining processes used, modification technique, and other factors. Several districts recently reported early cracking issues with some mixes which had historically performed well, while other districts had mix design and quality assurance (QA) problems when the binder source was switched and/or a different recycled asphalt pavement (RAP) stockpile was used. Thus, the objective of this project is to develop rapid new tests for detecting poor quality binders and RAP materials. To achieve this objective, the Performing Agencies shall review the literature to identify candidate tests that can be used for screening binders and RAP materials. The most promising tests will be further refined using laboratory mixture performance tests as a benchmark. The Performing Agencies shall also provide a standard test method and specification limit for each of the final test methods.	$ -	$ -	$ 18,006.50	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The current design methodology for asphalt and seal coat surfaces is limited when considering safety aspects like friction and surface texture, also known as skid resistance. The only requirement for asphalt or seal coats placed on high demand areas is that they use surface aggregate classification (SAC) A coarse aggregates. This approach has several shortcomings: Does not consider the friction and texture of the final surface. Does not consider the change in skid resistance versus trafficking. SAC system is defined by the acid insolubility test, not a direct measurement of aggregate properties that mechanically generate skid resistance. SAC categories are very broad with no distinction of the best and worst performing aggregates in each class. Consequently, some recent resurfacing projects have resulted in unacceptable skid resistance shortly after construction, even when SAC A aggregates were used. As such, there is a serious need to improve the current design process for asphalt and seal coat to ensure that the surfaces will have acceptable long-term skid resistance. The goal of this research is to develop a laboratory-based system to select the pavement surface type and coarse aggregate types that will provide adequate skid resistance over the life of the pavement surface.	$ -	$ -	$ 6,085.40	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The usefulness of reinforced concrete is dependent on sufficient anchorage between concrete and reinforcing steel. Sufficient anchorage occurs when reinforcing steel is embedded into the concrete a distance referred to as the development length. When this length of embedment is achieved the reinforcing steel is expected to reach or exceed stresses beyond yield. Geometric constraints within structural members may prevent straight lengths of reinforcement from developing their yield strength, such as straight bars being terminated within a beam-column joint. In these cases, the addition of a hook or headed bar attachment provides a more efficient anchorage mechanism compared to straight bars. Both hooked and headed bars have shorter development lengths than straight bars. However, the current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications (LRFD) Bridge Design Specification (9th edition) has not developed standard details for headed reinforcement in bridge structures. In addition, current AASHTO LRFD design provisions for hooked bars are adapted from the American Concrete Institute (ACI) 318-14 Building Code Requirements for Structural Concrete. Considerable revisions to the current ACI 318-19 specification for the design of hooked reinforcement, which require increased lengths (50 to 70 percent longer) relative to previous code cycles, necessitates the Receiving Agency to revisit its current design practice for hooked reinforcement. This research seeks to provide the Receiving Agency with clear and concise design guidance for engineers to use both hooked and headed bar attachments in Receiving Agency bridge structures. The Performing Agency shall accomplish this through large-scale experimental testing of specimens with hooked and headed bars representative of Receiving Agency bridge structures and current design practice.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Bridge decks usually have a minimum service life of 50 years but many bridge decks in Texas far exceed that value and are showing concerning signs of deck soffit cracking. Deck replacement is performed to take advantage of the good existing condition of the super- and sub-structures; however, since replacement is expensive (up to 40% of the cost of a new bridge), especially over concrete girders, it is critical to have sound decision processes and appropriate design and construction methods for this work, to protect public safety and use bridge preservation funds wisely. While life-cycle cost analysis can be beneficial when assessing the overall deck condition relative to the condition of the rest of the deck, it does not address the risk of a punch through failure. The outcomes of this project will aid the Receiving Agency’s Bridge Division and districts to have accurate assessments of cast-in-place (CIP) bridge deck conditions to make sound decisions about repairs (emergency and regular), strengthening methods (including deck overlay), and deck replacement to preserve bridge assets while minimizing the risk of punch through.	$ -	$ -	$ 10,260.09	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Understanding and estimating realistic production rates of major work items in a highway project are critical to determining a reasonable project contract time, evaluating the contractor’s baseline schedule, monitoring progress schedules, and ultimately completing the project on time. The Performing Agency shall leverage the Receiving Agency’s historical project data to obtain the as-built information of production rates of various work items, and shall develop a) an expanded version of the Receiving Agency’s construction production rates table, b) an interactive tool that can generate color-coded heat maps to visualize feasible ranges of production rates of major work items across Texas, and c) implementation guidance and recommendations. An advanced and interactive production rate estimation tool could significantly help the Receiving Agency achieve the goal of completing highway projects on time. Such a decision-aid tool could significantly improve the Receiving Agency’s practice in determining more accurate production rates, resulting in more accurate contract time determination, the contractor’s baseline schedule evaluation, and progress schedule monitoring. Such data-driven and practical production rates may provide higher certainty and reliability than the Receiving Agency’s current construction production rates table.	$ -	$ -	$ 3,858.58	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Drainage is a critical element of roadside design. Roadway drainage design often calls for the use of cross-drainage and parallel-drainage culverts. If untreated, the ends of the drainage structures can become roadside hazards that can result in serious injury when an errant vehicle leaves the roadway. The most cost-effective strategy is often to make the culvert end traversable using grates comprised of pipe runners across the culvert end. The Performing Agency shall investigate the safety performance of traversable cross-drainage and parallel-drainage culvert end treatments installed on roadside slopes. The Performing Agency shall address the various design variations of safety end treatments supported by current standards to investigate the safety performance. The Performing Agency shall develop design guidance to recommend slopes and size, length, and spacing of the pipe runners for both cross-drainage and parallel-drainage culverts that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH). The Performing Agency shall use full-scale crash testing to aid with validating the design guidance.	$ -	$ -	$ 1,452.81	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Texas continues to use cold recycling for pavement rehabilitation and performs a significant amount of full depth reclamation (FDR). While cement remains the most widely used treatment, use of asphalt emulsion and foamed asphalt continues to grow. This project shall identify and evaluate topics to strategically enhance cold recycling practices in Texas. This project shall perform a comprehensive performance analysis of recent as-built projects to identify strengths and opportunities for process enhancement. For cement, this project shall evaluate how cement type may influence mixture properties, analyze the Texas Flexible Pavement System (FPS) structural design assumptions based on current mix design and construction practices, and summarize methods to improve early trafficking. For emulsified and foamed asphalt, this project shall develop cold-in-place recycling (CIR) applications for Texas and identify, evaluate, and recommend enhanced pavement design procedures for cold recycling with asphalt binders. This project shall use all results to develop enhanced cold recycling project selection procedures, recommend updates to the Receiving Agency's specifications, and develop and perform training.	$ -	$ -	$ 33,633.01	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Hamburg Wheel Track (HWT) rutting test generally serves well as the standard rutting test for asphalt mixes in Texas; however, in the last several years, some premium mixes (i.e. stone matrix asphalt), designed with PG76-22 and low HWT rut depth, have experienced premature rutting failures under slow moving (or stop/ go) traffic in several Receiving Agency Districts. Such failures burden the Receiving Agency with extra cost. Furthermore, it was reported that the HWT test cannot accurately quantify the better rutting performance of some tougher mixes with highly modified asphalt (HiMA). Thus, the Performing Agencies shall develop the next generation of HWT test to accurately screen out asphalt mixes that are prone to rutting failures. The Performing Agencies shall review the literature, survey Districts, and other state departments of transportation (DOTs) to identify the proper rutting test(s) and asphalt mixes for addressing the rutting failure caused by the slow-moving traffic. The Performing Agencies shall further develop the next generation of HWT test and associated acceptance criteria through finite element analysis, laboratory testing, field accelerated pavement testing and survey of in-service pavement intersections, round robin test, and recommendation of specification changes.	$ -	$ -	$ 23,332.34	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Road to Zero has targeted a goal of zero deaths and serious injuries on Texas roadways. Recent trends in Texas indicate a continued increase in highway fatalities each of the past three years. In 2021, roadway departure crashes were responsible for 40 percent of all crash-related fatalities in Texas, which is the largest single category by crash type. In October 2021, Federal Highway Administration (FHWA) designated Texas as one of 16 Roadway Departure Focus States based on being over-represented on three (3) different roadway departure crash fatality metrics. Roadside safety devices are a key element of an effective roadway departure safety strategy. These safety devices shield motorists from roadside hazards such as non-traversable terrain and fixed objects, thereby reducing injuries and fatalities associated with roadway departure crashes. The Performing Agency shall provide the Receiving Agency with a mechanism to quickly and effectively evaluate high priority issues related to roadside safety devices. This includes development of both new and improved safety features that comply with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) and help minimize the consequences of vehicles leaving the road and reduce injuries and fatalities associated with roadway departure crashes.	$ -	$ -	$ 26,020.88	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency cantilever overhead sign structures (COSS) and traffic signal pole structures have a socketed fillet welded connection between the column and the baseplate. While economical, this connection has a low fatigue-resistance threshold. The objectives of this research are to (1) outline fabrication practices and economic considerations that may affect proposed connection type and design, (2) develop an inventory database of COSS and traffic signal pole structures that are representative, (3) utilize structural modeling to identify from within the inventory critical cases that should be advanced to a testing program, (4) develop and execute a targeted testing program that isolates critical design parameters for the fatigue performance of both the critical cases found in the inventory and recommended connection types and designs, (5) provide recommendations for connection types and designs based on fatigue provisions, and (6) provide recommendations for identifying fatigue-critical of existing inventory.	$ -	$ -	$ 22,195.55	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Ancillary structures (AS) exist in a wide variety of applications critical to safety and daily needs of the travelling public. The long-term corrosion performance of these structures is of utmost importance to prevent deterioration and extend the structural design life and safety. While hot-dipped galvanizing provides excellent long-term behavior for corrosion control of these critical structures, over the past 20 years this process has been found to create extensive cracking of welds on base plate connections that is detrimental to the fatigue lives of these poles. Although improved details are used in new designs, thousands of High Mast Illumination Poles (HMIP), Cantilever Overhead Sign Structures (COSS), and traffic signal poles (TSP) exist in Texas with varying levels of cracking in the welds between the baseplates and pole shafts. During this research project, the Performing Agency shall identify and provide critical assessment parameters and guidance for the Receiving Agency to determine if cracks should be monitored, repaired, or the structural component replaced. The research includes a representative assessment of weld cracking in the AS inventory, the development of monitoring hardware and techniques, the development and assessment of repair techniques, and the development of certification methods/standards for inspection personnel.	$ -	$ -	$ 4,412.59	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Traffic control devices (TCDs) are the primary means of communicating highway information to road users and play a key role in highway automation. The design, application, and maintenance of TCDs is under constant transformation as new technologies, methodologies, and policies are introduced. In addition, vehicle technologies and the roadway infrastructure industry are rapidly evolving, spurred by technology advancements, customer demand, changes in the vehicle fleet, and changes in national and state policies. The Performing Agency shall provide the Receiving Agency a mechanism to quickly and effectively conduct high priority evaluations of issues related to TCDs. The TCD issues to be evaluated in this project could represent new devices or technologies, new applications of an existing device or technology, TCD material performance, changes in the Receiving Agency's practices regarding a TCD, or other TCD related needs. Examples of various evaluations include human factors, machine vision performance, safety and operational effects, visibility assessments, and cost effectiveness analyses. The activities conducted through this project shall support the development of TCD related policy, specifications, guidelines, handbooks, and training.	$ -	$ -	$ 39,968.97	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency has utilized dowels in bents to provide lateral restraint of prestressed concrete beams., These dowels are often misplaced, which creates various construction issues, while their presence complicates bearing pad replacement. The Performing Agency shall provide research findings to the Receiving Agency to make informed decisions on stopping the use of such dowels, the Performing Agency shall: • Perform a thorough literature review to: (i) summarize the state-of-art, state-of–the-practice and key findings, and (ii) address questions relating to unintended consequences from removal of these dowels during erection of the girders, construction of the deck, and long-term performance and stability. • Perform an investigation on the state-of-the-practice of all state Department of Transportations (DOTs) throughout the country, focusing on practices from DOTs with similar hazard exposure. • Perform a parametric finite element (FE) study on multiple the Receiving Agency bridge (and girder) designs to investigate the performance under all major load combinations and limit states (from service to ultimate conditions) over the lifetime of the bridge accounting for Texas-related exposure conditions. • Perform six (6) large-scale tests on girder-to-bent/abutment connections to quantify the contribution of dowels in the performance of the connections.	$ -	$ -	$ 14,384.34	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall perform a comprehensive evaluation of adhesive anchors used in concrete pavement applications, particularly full-depth repairs. The Performing Agency shall investigate the effects of sustained and cyclic loading on long term stiffness of the bond between the concrete, the adhesive grout, and the steel anchor. The potential benefits will lie in the suitability of adhesive anchors to perform in concrete pavement applications in addition to the development of recommendations for the use of adhesive anchors to minimize premature failures and to extend pavement service life by maintaining the stiffness of a repair made using drilled adhesive anchors.	$ -	$ 6,516.44	$ 2,554.68	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall perform a comprehensive evaluation of adhesive anchors used in concrete pavement applications, particularly full-depth repairs. The Performing Agency shall investigate the effects of sustained and cyclic loading on long term stiffness of the bond between the concrete, the adhesive grout, and the steel anchor. The potential benefits will lie in the suitability of adhesive anchors to perform in concrete pavement applications in addition to the development of recommendations for the use of adhesive anchors to minimize premature failures and to extend pavement service life by maintaining the stiffness of a repair made using drilled adhesive anchors.	$ -	$ -	$ 7,921.52	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Bent caps provide a critical load path between girder reactions and bent columns. Supporting considerable reactions over long spans, bent cap cross-sections grow substantial, necessitating robust cast-in-place designs that have stood the test of time. However, the considerable weight and time required for their construction present challenges that undermine their apparent simplicity. To meet these challenges, the Performing Agencies shall explore precast alternatives, particularly hollow designs in efforts to enhance traditional cast-in-place bent structures through post-tensioning. In addition to exploring precast alternatives, the research team shall first evaluate current practice, identify potential design issue in current practice and provide design recommendations to current practice. Experimental study as well as analytical and design methods shall be used toward this effort. The research team shall ask TxDOT for the use of post-tensioning in the experimental study. This innovation aims to reduce bent weights, minimize traffic disruptions and costs; enhance erection, construction efficiency, durability, and structural performance under service and ultimate load conditions. The Performing Agencies in collaboration with an industry review committee comprised of bridge designers, precasters, and erectors shall conduct a targeted full-scale structural testing campaign supported by advanced structural modeling (finite element analysis and strut-and-tie), to provide well-defined design criteria and ensure the structural performance of hollow precast rectangular and inverted tee bent caps, for both mildly reinforced and prestressed designs. The Performing Agencies initiative seeks to close the knowledge gap concerning the service and ultimate load behavior, long-term performance, and durability of hollow precast design concepts.	$ -	$ -	$ 2,727.47	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Economic factors and environmental sustainability are driving the use of more reclaimed asphalt pavement (RAP); however, durability of those mixes has been a concern. Various approaches (e.g. limiting RAP usage, increasing lab-molded density, or balanced mix design (BMD)) have been tried to improve mix durability. All the approaches point to one essential factor for durable RAP mixes: minimum virgin binder content. Thus, the Performing Agencies shall determine the minimum virgin binder content(s) for durable RAP mixes. The Performing Agencies shall review the literature to identify critical factors affecting RAP mix durability. Considering all those critical factors, the Performing Agencies shall develop and execute a statistically sound laboratory experimental design to develop the relationships between cracking properties measured by Overlay test and Ideal cracking test and mix components (e.g. virgin binder content) and their characteristics. Furthermore, the Performing Agencies shall assess field performance of RAP mixes and delineate the correlation between field performance and laboratory mix cracking properties. Subsequently, the Performing Agencies shall recommend minimum virgin binder contents based on the relationships among field performance, mix cracking properties, and mix components and their characteristics. Based on these findings, the Performing Agencies shall develop guidelines, update specifications, and organize training sessions	$ -	$ -	$ 23,355.89	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	For pavement management and to understand the condition of its network, the Receiving Agency relies on high-speed inertial profilers to gather ride quality. However, a persistent challenge arises when assessing pavement smoothness at low speeds or under stop-and-go conditions (i.e., signalized intersections, stop-control intersections, high driveway density producing turning traffic, and congested roadways during peak-hour traffic) that compromises the accuracy of data collected by conventional profilers. For example, collecting ride quality measurements on a congested roadway with multiple driveways leads to acceleration and deceleration of the collection vehicle, potentially adding “false” dips into the measurements. If these dips are included in network-level measurements, these types of roadways could receive a poor condition score that is not indicative of the true pavement condition. Collecting data on roadways with signalized intersections and slow-moving congested traffic could have the same challenges. The Performing Agency shall explore the potential of low-speed profilers to enhance data collection accuracy in such scenarios. The Performing Agency shall evaluate the effectiveness of low-speed profilers in providing accurate pavement profile data, particularly in areas prone to low-speed or acceleration and deceleration operations. The Performing Agency shall validate the capabilities of low-speed profilers and recommend strategies for their integration into the Receiving Agency's pavement management practices, ultimately leading to a more accurate condition assessment.	$ -	$ -	$ 8,761.15	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Texas Department of Transportation (TxDOT) has been conducting research on predicting skid resistance for over five decades. This research has focused on measuring the polishing resistance of the coarse aggregate portion of mixes. This has led to the development of a surface aggregate classification (SAC) where the SAC A materials are rated as having good skid resistance properties; however, recently, it is reported that some mixes with predominantly SAC A materials have low skid resistance. In addition, some of the fine surface mixes with little coarse aggregate have been shown to have excellent skid resistance. One conclusion is that the long-term skid resistance of any surface mix is a function of many factors including, but not limited to mix type, gradation, the quality of the fines, and not simply coarse aggregate properties. The goal of this study is to develop and validate a laboratory test procedure to measure skid resistance of any proposed surface mix. This test procedure will eventually be incorporated into TxDOT’s Balanced Mix Design (BMD) process.	$ -	$ -	$ 14,742.93	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Pavement markings and markers are the primary means for an agency to provide longitudinal guidance to drivers. To be effective, markings and markers must be visible during all driving conditions, day, and night. A variety of pavement marking materials (binders and beads) and varying installation specifications (application type, material thickness) create a wide range of initial performance and maintained performance over a markings service life. Currently, markings are evaluated initially to ensure a minimum initial retroreflectivity performance is obtained, but that initial performance has not been well researched to determine its impact on the overall durability and performance of the marking over its service life. This project shall explore various factors that affect pavement marking performance over the service life of the marking (pavement marking materials, installation specifications, pavement surface, traffic conditions, and geographic and climatic region) to develop performance models for Texas. Performance of a variety of markings and markers shall be evaluated at various field test areas. These same marking materials shall be evaluated through lab testing to explore accelerated weathering and wear tests that correlate with the field performance. The goals of this project are to improve pavement marking testing and the ability to predict marking performance.	$ -	$ -	$ 14,839.56	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The goal of this project is to revise the Receiving Agency Pavement Management Information System (PMIS) Rater's Manual. This project shall review, analyze, and propose changes to the current distress rating definitions for flexible and concrete (jointed and continuously reinforced) pavements. The Performing Agencies shall hold collaborative workshops to gather inputs from Receiving Agency's Division and Districts on pavement condition data collection challenges using the current manual. The project will assess the impact of the rating changes to the PMIS scores and propose changes to distress utility curves if needed. In collaboration with the Receiving Agency, adjustments will be made to determine acceptable impacts. The revised manual shall be developed based on the research results and through collaboration between the research team and the Receiving Agency.	$ -	$ -	$ 6,495.77	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	While roads defined as arterials need to maintain an acceptable level of traffic capacity, there are trade-offs with respect to speed. This research will investigate the effectiveness of arterial-focused speed management countermeasures for application across Texas. It will quantify the costs and benefits of road and vehicle design, operations, enforcement, and other countermeasure types across a range of settings (for uncontrolled-access arterials under different traffic, road type/context, and land use conditions), resulting in a Texas Arterial Speed Management Toolkit and reports.	$ -	$ -	$ 10,148.17	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency is implementing a Digital Delivery initiative. Research is needed on how to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources. Research is also needed to identify software and other industry trends that might affect the Digital Delivery initiative and recommend strategies on how to anticipate and prepare for those trends. The Performing Agency shall (a) develop and test procedures to extract cost-effective 3D models (or digital twins) efficiently from a multiplicity of data sources; (b) develop and test automated workflows for change detection, quality control, and updating of 3D models using results from repeat surveys; (c) conduct a cost-benefit analysis of data collection/processing precision, accuracy, and density against the potential cost in construction change orders from a looser tolerance in those three parameters; (d) conduct a review of software and other industry trends that might affect the Digital Delivery initiative; (e) conduct peer exchanges with stakeholders; (f) develop and recommend strategies on how to anticipate, and prepare for, software and industry trends; and (g) develop a strategic research roadmap to support the Digital Delivery initiative through 2028 and beyond.	$ -	$ -	$ 19,106.85	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The first objective of this project is to develop Safety Performance Functions (SPFs) and Crash Modification factors (CMFs) for ramp terminals and intersections of frontage roads with crossroads. The second objective of this project is to evaluate the safety impact of weaving on the frontage road versus weaving on the freeway. More specifically, the objective is to understand the difference in safety between two ramp configurations – entrance ramp followed by an exit ramp versus exit ramp followed by an entrance ramp between two interchanges. The Performing Agencies shall collect site characteristics data and develop crash predictive methods for different types of frontage road segments and intersections on frontage roads, including ramp terminals. These models shall be developed by area type (i.e., large urban, small urban, suburban/fringe, and rural), Receiving Agency's regions, and facility type (one-way and two-way). The Performing Agencies shall incorporate the crash predictive methods into spreadsheet tools to facilitate the analysis and to support project design decisions of frontage roads. The Performing Agencies shall also develop a framework for selecting an appropriate configuration for frontage roads and as well guidance for the minimum distance from ramp terminal to crossroad intersection and a need for lane additions.	$ -	$ -	$ 14,441.87	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Concrete barriers are designed and crash tested for placement on flat terrains. In-field installations of concrete barriers are sometimes placed on slopes adjacent to roadways. By placing the barrier on a slope, the effective height of the barrier that engages an errant vehicle may be reduced since the vehicle may be airborne as it contacts the barrier on a downward slope. Consequently, the barrier may not be able to safely contain and redirect the vehicle. The Performing Agency shall evaluate the performance of the Receiving Agency's 32-inch tall F-shape and 42-inch tall single slope barrier when placed on roadside or median slopes of up to 4H:1V. The Performing Agency shall develop guidance for placement of these barriers using finite element simulation analysis and full-scale crash testing. The guidance shall determine the maximum allowable slope for each barrier type and any placement offsets required from the edge of the roadway or from the bottom of the ditch. The Performing Agency shall evaluate the performance of the barriers using the impact conditions and evaluation criteria specified in the Manual for Assessing Safety Hardware (MASH) for Test Level 3 for longitudinal barriers.	$ -	$ -	$ 5,087.69	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Identifying and documenting existing utility facilities within the proposed right-of-way (ROW) is crucial for successful project delivery. There is a need to leverage data collection technology's strengths and minimize weaknesses for a more robust and reliable determination of utility locations and develop and test metrics to assess the utility investigation quality levels in ways that make sense to project design teams. Improvements shall lead to a better stakeholder understanding to communicate the quality levels commonly used by the SUE industry (D, C, B, and A), the basis for assessing utility investigation deliverable quality, and would be able to tie quality levels to quantifiable performance metrics such as positional accuracy, error, and completeness, which are common in engineering and surveying when collecting field data for a project.	$ -	$ -	$ 21,123.77	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Innovative intersection designs (e.g., diverging diamond interchanges [DDIs], displaced left turns [DLTs], median U-turns [MUTs], and restricted crossing U-turns [RCUTs]) and modern roundabouts are increasingly used in Texas and throughout the country to remove conflict points and redistribute turning traffic from traditional intersections, improving operational efficiency and promoting increased safety. While their use is growing and their benefits have been demonstrated, Texas still has a limited number of innovative intersections, and there is a need to increase the use of these intersections throughout the state. Because many of these intersection types and their design elements are not commonly used in Texas, there is a natural tendency to be cautious about their use. Providing information to help promote these treatments for use in appropriate locations will be important to their successful adoption and implementation. The Performing Agency shall build on recent research to document the benefits of innovative intersections, develop case studies of successfully implemented intersections in Texas, and provide resources for practitioners to use in support of new implementations across the state.	$ -	$ -	$ 3,876.50	$ -	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Cracking dictates the service life of asphalt pavements. Oxidative aging of the asphalt binder renders the binder brittle and susceptible to cracking. Higher number of high temperature days further exacerbates rate of oxidation and reduction in the service life of an asphalt pavement. Recent coordinated studies by a global consortium of researchers have identified generic chemicals that can act as antioxidants to significantly reduce the oxidative aging of asphalt and increase its cracking resistance and service life. Similarly, commercial additive manufacturers are also exploring the development and deployment of antioxidant additives. In this project the Performing Agencies shall review the literature and interface with existing national and international studies to identify the most promising antioxidant(s) for use with asphalt binders as a modifier. The Performing Agencies shall conduct laboratory studies on asphalt binders and mixtures to evaluate the efficacy of these antioxidants. The Performing Agencies shall also conduct workshops with stakeholders and conduct cost-benefit analysis to develop plans for pilot test sections and facilitate the deployment of such sections with districts and industry partners. Finally, the Performing Agencies shall also present metrics that can be used for specification and quality control purposes by the Receiving Agency.	$ -	$ -	$ 2,930.23	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency's "End the Streak" goal is to end all fatalities on Texas roads by 2050 as there has not been a day without a death on Texas roadways since November 7, 2000. New strategies must be implemented, such as increasing the efficacy of pavement striping and retroreflective pavement markers in several Receiving Agency districts and monitoring the crash statistics before and after pavement marking and marker improvements over time. The Performing Agency shall target pavement marking retroreflectivity and contrast and shall include the development and implementation of an experimental study design to assess their safety and economic effectiveness.	$ -	$ -	$ 10,653.39	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Crash risks associated with permissive left turns (PLTs), vulnerable road users (VRUs), and wrong way driving (WWD) appear to be among the top attributing factors for fatal and incapacitating crashes at signalized intersections, raising alarming safety concerns. The cellular vehicle-to-everything (C-V2X) communication and innovative traffic detection technologies such as light detection and ranging (LiDAR) sensing have the potential to reduce crashes related to these factors and enhance intersection safety. The primary objective of this project is to develop, test, and demonstrate a prototype system integrating C-V2X communication and innovative traffic detection technologies to improve safety of all road users at signalized intersections. Another objective is to provide the Receiving Agency with guidelines for statewide implementation of the integrated system for intersection safety improvement. To this end, the Performing Agencies shall: (1) Review the literature on safety improvement systems utilizing C-V2X and innovative traffic detection systems; (2) Assess user needs and design a system architecture that satisfies user requirements; (3) Develop, test, demonstrate, and evaluate a prototype system that integrates C-V2X communication, LiDAR and other advanced traffic detection technologies to detect and mitigate crash risks involving PLTs, VRUs, and WWD at signalized intersections; and (4) Develop guideline documents containing implementation procedures and use case scenarios.	$ -	$ -	$ 4,958.72	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall address two gaps in scour knowledge: pressure scour for cohesive soils and cohesive soils/rocks characterization for scour analyses. Pressure scour occurs when the water reaches the bridge's low chord; this increases the scour depth. Guidelines exist for cohesionless soils but not for cohesive soils. The Performing Agency shall perform a series of Computational Fluid Dynamics (CFD) simulations and/or flume tests to generate the input necessary and expand the Scour Rate in COhesive Soils (SRICOS) method to the pressure flow situation in cohesive soils. The Performing Agency shall perform advanced testing on cohesive soils/rocks characterization for scour analyses. Advanced testing examples include the Erosion Function Apparatus (EFA) (Performing Agency) and Scour Testing devices (Federal Highway Administration (FHWA)). The Performing Agency shall determine if the Slake Durability Test (SDT) can be a reasonable surrogate for input in scour depth calculations by collecting samples at a maximum of up to 20 bridges around Texas, and by conducting parallel testing on cohesive soils/rocks such as shale, caliche, and sandstone.	$ -	$ -	$ 3,612.39	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this research project is to develop best practices for the design and construction of detours and traffic handling sections. Detours can be designed as a (i) completely new short-term pavement structure, (ii) by using the existing pavement, for example a traffic shift including the shoulder as part of travel lane, (iii) as part of stage construction, and (iv) as a combination of new, stage, and existing. Premature pavement failures continue to occur on detours during construction. The cost to repair pavement failures on detours can significantly impact the construction budget because repairs are reactionary (not planned), there is limited space to both work, and shift or move traffic within. Many of these temporary detours become integrated into the permanent structures and quite often, the final riding surface is not constructed until the main lanes are completed. It is extremely important to account for the deterioration that the temporary detour may experience during construction. Traffic estimation for the design of temporary detours can be challenging, and clear guidance needs to be developed for accurate pavement design. This research project will produce best practices for evaluation of exiting pavement used as detours, pavement design methods, and construction practices that will help designers, engineers, and inspectors make better decisions resulting in successful projects.	$ -	$ -	$ 738.66	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide a framework to minimize project issues through improved Constructability Reviews (CRs). The Performing Agency shall develop a cost/benefit analysis to justify CRs on projects of all scopes. The Performing Agency shall develop a Guidebook of Best Practices to help the Receiving Agency improve construction plan quality and minimize project durations and costs. In developing the Guidebook, Performing Agency shall use knowledgeable construction personnel to review, ensuring adequate time for reviewing, ensuring clear and relevant comments that designers consider and implement, and ensure that new lessons are continuously communicated back to design teams.	$ -	$ -	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Several Districts of the Receiving Agency recently reported rutting problems greater than 2 inches at intersections, border checkpoints, and other locations where heavy truck traffic either moves very slowly or is stationary while waiting in queues, even though the best mixes (e.g., stone matrix asphalt) were used. There is an urgent need to address such premature rutting problem in those places in a timely manner. The Performing Agencies shall identify and evaluate the suitable mixes and single lift construction technique to avoid premature rutting failures at those places, resulting in major cost savings and reducing wet weather accidents. The Performing Agencies shall review literature to identify the critical factors for improving mix rutting resistance. Based on the findings from the literature, the Performing Agencies shall develop and execute an experimental design to identify the suitable mixes for the slow-moving heavy traffic and then construct field trials with those mixes in a single thick lift and follow up their field performance. In the end, the Performing Agencies shall recommend specification changes and develop guidelines for constructing single thick lift with suitable mixes at intersections, border checking points, or other places.	$ -	$ -	$ 2,256.32	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Texas needs a detailed understanding of statewide particulate matter under 2.5 microns (PM2.5) sources, as current regulatory monitoring lacks the granularity for source apportionment. Since speciated PM2.5 data is limited, the Performing Agencies shall collect and analyze samples from multiple regions nearing or exceeding the 9.0 µg/m3 threshold set by the Environmental Protection Agency (EPA). The Performing Agencies shall conduct source apportionment analysis and highlight the prominent sources of PM2.5 emissions by region. This will support future research and regulatory efforts, such as developing and implementation appropriate emission reduction strategies. The Performing Agencies shall collaborate with state and local governments, academia and other stakeholders, to acquire any existing data and ensure local regulations and best practices are met. The Performing Agencies shall collaborate with the Receiving Agency project 0-7257, "The Effects of Road Types and Construction Activities on Particulate Matter and Development of Best Practices for PM2.5 Reduction" by sharing data, resources, and coordinating efforts to enhance data collection and analysis.	$ -	$ -	$ 12,298.50	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agencies shall evaluate the impact of roads (paved and unpaved roads, and unpaved shoulders) and construction on 2.5 microns (PM2.5) emissions and develop strategies for reduction. Objectives include quantifying PM2.5 emissions from roads and construction sites, identifying high-risk areas using thematic mapping, and designing cost-effective mitigation measures like dust suppression and optimized paving practices. The Performing Agencies shall create a user-friendly decision-support toolkit to help prioritize interventions and assess emission reduction strategies. The project outcomes will provide actionable solutions for air quality planning at both project and regional levels, enabling the Receiving Agency to meet environmental regulations, improve public health, and reduce PM2.5 impacts. The Performing Agencies shall collaborate with the Receiving Agency project 0-7256 “Monitoring and Speciation of Particulate Matter Under 2.5 Microns (PM2.5) Composition across Texas Counties” to enhance data collection and analysis, ensuring effective mitigation efforts.	$ -	$ -	$ 14,518.61	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Unmanned Aerial Systems (UAS) or drones provide a unique but mostly unexploited opportunity to improve the Receiving Agency’s right-of-way management and its current practices for planning, designing, constructing, and maintaining habitat. The Performing Agencies shall develop guidance on the use of UAS to identify and manage protected species habitat and determine the efficacy of multi- and hyper-spectral imagery for identifying and mapping endangered plant populations and potential pollinator conservation areas.	$ -	$ -	$ 13,239.50	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agencies shall conduct a comprehensive assessment of the Receiving Agency’s safety scoring tools by analysing evaluation performance, identifying potential biases or limitations, and recommending improvements and adjustments to enhance their effectiveness. The Performing Agencies shall develop a guidance documentation that recommends refinement to existing tool methodologies and strengthen its ability to reduce roadway fatalities and serious injuries through more informed decision-making and targeted safety interventions.	$ -	$ -	$ 3,934.95	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Innovative intersection and interchange designs and smart technologies (e.g. adaptive traffic signal systems, connected vehicle technology, and real time traffic management) are often considered as methods to reduce congestion and promote safety. However, these designs are challenging and time-consuming to consider for a given project. This project will develop a data-driven innovative design recommendation tool to provide guidance toward feasible design selections of innovative intersections and interchanges. The tool shall be applicable in urban settings and consider factors like traffic volumes, safety enhancements, constructability, pedestrian and bicyclist accommodations, and costs. The tool will be complimented by guidance gathered from the literature and stakeholder interviews to help provide context and considerations that cannot be incorporated into the tool. This will promote a consistent solution to aid in the intersection design selection process that can be used to reduce costs for considering innovative intersections and can be presented to policymakers as a data-driven recommendation. This prototype tool shall be vetted by applying the tools to existing innovative intersection/interchange design selections within Texas to demonstrate the effectiveness of the design selection solution.	$ -	$ -	$ 1,811.21	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Innovative intersections, also referred to as alternative or unconventional intersections, are essential for enhancing traffic flow and safety. In Texas, there has been a significant increase in the construction of innovative intersection designs such as diverging diamond interchanges (DDIs), median U-turns (MUTs), and reduced conflict intersections (RCIs). However, they present notable challenges during construction. A primary concern associated with implementing these designs is maintaining traffic flow during construction to minimize disruptions and ensure safety. The geometric configurations of these intersections introduce complexities that are not addressed by previous guidelines, posing safety risks for motorists and workers. The absence of standardized specifications for work staging and risk mitigation strategies in work zones exacerbates these issues. Using a mixed-method approach, the Performing Agency shall identify safety risks intrinsic to the construction of innovative intersections and temporary traffic control (TTC) measures that can eliminate or reduce these risks. The Performing Agency shall develop comprehensive guidance for developing and implementing TTC strategies for innovative intersections. The documentation and evaluation of these strategies will establish a comprehensive framework for safely and effectively implementing innovative intersection designs in Texas, catering to the specific needs of drivers, including seniors and teenagers.	$ -	$ -	$ 1,321.45	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Median barriers are commonly used to separate opposing lanes of traffic on divided highways and to separate managed lanes from general purpose lanes. Concrete Median Barriers (CMBs) are often preferred on urban freeways with narrow medians due to their minimal deflection and low maintenance. However, long, continuous runs of CMBs limit access of emergency and maintenance vehicles to the other side of a roadway or a managed lane. Implementation of crashworthy median barrier gates at these locations can maintain the desired level of median protection for motorists while offering improved cross-median access for emergency and/or maintenance vehicles. The current Receiving Agency’s Barrier Gate (detailed on standard sheet BG-11) is 30-ft long and provides a clear opening of 27 ft between the mounting brackets. For this project, the Performing Agency shall develop a longer median barrier gate to provide a greater clear opening for larger emergency vehicles and contraflow during evacuation operations. The Performing Agency shall design the median barrier gate to operate without power and perform crash testing of the median barrier gate to verify compliance with the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).	$ -	$ -	$ 1,791.46	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project will provide a practical framework for the Receiving Agency to choose between cross-sectional design alternatives to optimize operational and safety performance on rural two-lane undivided highways. This framework will incorporate variables such as traffic volume, heavy vehicle mix, speed, and access density. Texas and other states have increasingly used a narrow centerline buffer area, separated by longitudinal pavement markings, to introduce physical separation between approaching vehicles, producing operational and safety benefits on undivided roadways without widening to a traditional divided cross-section. However, providing centerline buffers require reduced lane or shoulder widths. Project 0-7035 studied this effect for four-lane roadways with positive results, but less is known about two-lane roadways; understanding the benefits of center separation, along with the effects of various lane and shoulder combinations, would be useful for making decisions on cross-sections for new and resurfaced two-lane roadway segments. The Performing Agencies shall collect and analyze data for two-lane highways with centerline buffers and compare their safety and operational performances with traditional two-lane undivided highways. Additionally, this research shall quantify differences in the performance of two-lane undivided highways compared to other cross-sectional designs. The Performing Agencies shall use observed data and simulation to achieve the project objectives.	$ -	$ -	$ 1,898.84	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objective of this project is to better understand how physical safety measures in vehicles and infrastructure are impacting crash fatalities and injuries in the development of safer roadways in the future.	$ -	$ -	$ 14,754.25	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Roadway debris like carcasses and tire fragments, can pose a hazard to traffic. It can be struck by vehicles and result in a crash or secondary crash. Advance roadway debris detection is critical for traffic operations and safety. Transportation Management Centers (TMCs) can detect debris in urban areas, but a recent study found that Waze, reported three times as many road hazards to similar TMC events on freeways. Waze detected 72% of road hazards first and nearly sixteen (16) minutes earlier. Harnessing crowd-sourced data from navigational apps or connected vehicle dashcams has become a reality with Artificial Intelligence (AI)-enabled processing. This action opens opportunities for enhanced situational awareness and expedite the appropriate responses from the Receiving Agency. The Performing Agencies shall leverage crowd-sourced third-party data and AI-enabled processing to capitalize on this opportunity.	$ -	$ -	$ 5,567.93	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This project shall leverage telematics data to proactively identify near-crash events and hotspots, enhancing transportation safety management capabilities across Texas. Specifically, the project shall develop advanced analytical methodologies in four complementary categories: trajectory-based analysis of vehicle movement patterns, event-based analysis focusing on critical driving behaviors (e.g., hard braking and abrupt maneuvers), multi-criteria analysis integrating mobility, safety, and environmental performance metrics, and data fusion techniques combining telematics data with additional datasets such as traffic sensors and historical crash records. The Performing Agencies shall implement spatial-temporal analyses and machine learning predictive models to accurately identify current and predict future near-crash hotspots. An interactive AI-powered decision-support system shall be developed, providing transportation agencies actionable insights for targeted safety interventions. Representative rural and urban case studies shall demonstrate the applicability and effectiveness of the platform, validated through comprehensive comparisons with historical crash data. Finally, an implementation roadmap shall provide clear, practical guidance for adopting the developed methodologies into agency safety management practices. This project shall deliver robust analytical tools and evidence-based recommendations, significantly enhancing proactive traffic safety measures statewide.	$ -	$ -	$ 7,597.48	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agencies shall investigate fire and blast damage to bridges to develop design and mitigation strategies to enhance structural resilience. Fires and blasts from vehicular collisions, hazardous spills, and encampments beneath bridges pose significant threats to structural integrity and serviceability. To address these significant threats, the Performing Agency 1 shall utilize their outdoor facility to conduct full-scale experimental testing, where a representative bridge, incorporating components aligned with Receiving Agency's practices (e.g., prestressed I-girders), shall be constructed. Fire testing will include controlled burns using various fuel sources (e.g., E-III, diesel, LNG) at different intensities and locations. Blast testing will expose girders to controlled detonations at varying standoff distances to evaluate structural response. The Performing Agencies shall explore mitigation strategies such as fire-resistant materials, protective coatings, and retrofitting methods to improve bridge performance.	$ -	$ -	$ 1,696.57	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall produce Video Summary Reports (VSRs) that promote technology transfer of concluding Receiving Agency research and implementation projects. The Performing Agency shall produce short videos (2 – 5 minutes) informing Receiving Agency staff and university researchers, as well as others nationwide, about the research and implementation results. The Performing Agency shall plan and produce an annual Video Summary Report (VSR) production list in cooperation with the Receiving Agency, track the detailed status of each VSR on the production list, schedule and conduct interviews (live and virtual), travel when requested and necessary to obtain B-roll for enhanced video experience, compose and create the VSRs, coordinate all reviews and approvals, and oversee the final publication and distribution of the final products. The Performing Agency shall also produce other outreach materials as requested.	$ -	$ -	$ 8,182.94	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall apply the accelerated mix design procedure to real pavement designs, encouraging utilization of the new test procedure, enabling the identification of potential areas of improvement, and demonstrating the mechanistic design check. The Performing Agency shall work with a minimum of three (3) Receiving Agency Districts to conduct demonstration projects with performance monitoring. The Performing Agency shall conduct initial performance monitoring on the constructed projects. This monitoring aims to assess the effectiveness of the accelerated design, validate the stability of the designed pavement by evaluating pavement conditions, and enhance the estimated resilience modulus.	$ -	$ -	$ 11,256.44	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Premature pavement failures have occurred on several widening projects, including shoulder widenings, conversion of two-lane roadways to Super 2 sections, and other safety enhancements. Repairing these early failures is time-consuming, expensive, disrupts traffic, and poses safety hazards. Key contributing factors include poor-quality materials, poor joint construction, and inadequate drainage which could have been avoided through proper pavement condition assessment, design, and construction practices. The Performing Agency shall develop detailed guidance to document and implement better widening practices across the Receiving Agency.	$ -	$ -	$ 5,864.98	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist Receiving Agency with implementing AMAZE developed in research project 0-6674-03. The Performing Agency shall write test procedures tailored for AMAZE. Working with the Receiving Agency, the Performing Agency shall enhance the AMAZE to measure specimen dimension and handle field cores with various thickness. The Performing Agency shall then use the findings and data generated from this implementation project to develop and teach implementation workshop for the Receiving Agency.	$ -	$ -	$ 16,023.94	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency with implementing the Surface Aggregate Classification (SAC) for reclaimed asphalt pavement (RAP) developed in research project 0-7025, Develop Surface Aggregate Classification of Reclaimed Asphalt Pavement. The Performing Agency shall implement and verify the methodology of SAC-A RAP classification in a minimum of four (4) Receiving Agency Districts. In each selected Receiving Agency District, the Performing Agency shall work with lab and pavement engineers and their staff to characterize the RAP in terms of SAC, design surface mixtures with the RAP, evaluate the friction and skid resistance of mixtures, and construct and monitor the selected test sections in each Receiving Agency District. The Performing Agency shall then use the data generated in these test sections to develop and teach implementation workshops for Receiving Agency Districts.	$ -	$ -	$ 16,063.83	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The objectives of this project are to complete the design and construction of the automated test system for asphalt mixtures and asphalt binders and to deliver an automated IDEAL cracking and rutting test unit and an automated asphalt binder specific gravity and dynamic shear rheometer testing unit to the Receiving Agency's MTD lab. The automated asphalt mixture testing unit includes (1) auto-air void measurement subunit, (2) specimen conditioning subunit for both room and high temperature, (3) automation arm subunit, (4) automated IDEAL cracking test (IDEAL-CT), IDEAL rutting test (IDEAL-RT), indirect tensile (IDT) strength test subunit, and (5) waste disposal subunit. The automated asphalt binder testing unit includes (1) asphalt binder specific gravity testing subunit and dynamic shear rheometer testing subunit. The automated asphalt mixture and binder test units shall shorten test time and improve lab safety, test efficiency and accuracy.	$ -	$ -	$ 16,297.04	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency Project 0-6992 "Traffic Safety Improvements at Low Water Crossings (LWCs)" proved how easy, low-cost countermeasures improve safety at LWCs by focusing on LWC delineation; using flood-detection sensors, and warning systems to alert travellers of flooded crossings. In addition to recommending the use of raised retroreflective pavement markers (RRPMs) to improve longitudinal markings at low-water crossings, the Performing Agency recommended experimenting with internally illuminated raised pavement markers (IRPMs) at problematic locations where drivers regularly drive through high water conditions. The Performing Agency shall improve safety and operations at LWCs by incorporating a tool which integrates the National Oceanic and Atmospheric Administration (NOAA's) Multi-Radar/Multi-Sensor (MRMS) system, which combines radar, stream gauges, and environmental data to estimate rainfall rates with 1-kilometer resolution across the United States. By leveraging virtual sensor data, the Receiving Agency will enhance the effectiveness of roadway flood warning systems, making early flood detection more robust and improving overall driver safety.	$ -	$ -	$ 7,976.75	$ -	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Emerging vehicle types are rising in sales and comprising a larger share of the total vehicle fleet. The characteristics of these emerging vehicle types pose many challenges to our transportation system moving forward. For example, their effect on roadside safety hardware has the potential to be significant based on their increased weight, lower center of gravity, and different crush stiffness. Given a set of impact conditions (i.e., impact speed and impact angle), the impact severity associated with an emerging vehicle will increase linearly with the weight of the vehicle. This raises significant concern related to vehicle compatibility with some categories of roadside hardware, such as various types of longitudinal barriers (e.g., guardrail, median barriers, portable concrete barrier, transitions, bridge rails), terminals, crash attenuators, breakaway support structures, and other devices. Many roadside safety features are optimized for the currently prescribed design impact conditions and may have little or no factor of safety for accommodating more severe impacts. The Performing Agency shall address these issues to prevent experiencing a potentially significant increase in roadway departure crash fatalities. The Performing Agency shall focus on providing a coordinated program of safety research for emerging vehicles that shall develop solutions to meet identified needs. The research findings will benefit the Participating States in numerous ways, not the least of which is enhanced safety.	$ -	$ -	$ 4,738.15	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to develop and produce on-road mobile emissions inventories necessary to support the Houston-Galveston-Brazoria (HGB)-area and Dallas-Fort Worth (DFW)-area reasonable further progress (RFP) State Implementation Plan (SIP) revision for the 2015 eight-hour ozone National Ambient Air Quality Standard (NAAQS). Specifically, the Grantee shall develop and produce on-road mobile link-based emissions inventories for the six HGB ozone nonattainment counties and the nine DFW ozone nonattainment counties for analysis years 2017, 2023, 2026, 2029, and 2032, and contingency years 2024, 2027, 2030, and 2033. Additionally, the Grantee shall develop emissions inventories to meet the vehicle miles traveled (VMT) offset requirements for severe ozone nonattainment areas.	$ -	$ 481.71	$ 13,471.34	$ -	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this PGA is to update the Microsoft Excel-based emissions calculator that was developed under PGA 582-20-11051-015 to calculate road dust particulate matter (PM) with an aerodynamic diameter equal to or less than 10 microns (PM10) and equal to or less than 2.5 microns (PM2.5) for paved and unpaved roads. This calculator uses Texas-specific activity data in the form of annual vehicle miles traveled (VMT) estimates by county and road type to calculate PM10 and PM2.5 emissions. The Grantee shall incorporate updates to activity data and miles of paved roads and miles of unpaved roads per county into the calculator to improve the accuracy of PM emissions estimates. The Grantee shall also develop a refined, comprehensive PM10 and PM2.5 road dust emissions inventory for paved and unpaved roads for all 254 Texas counties for calendar year 2023.	$ -	$ 13.66	$ 4,106.09	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The work of this Interagency Cooperation Contract (IAC) is funded through a $6.09M grant awarded by the Federal Highway Administration (FHWA) to the Texas Department of Transportation (TxDOT) for the Texas Connected Freight Corridors (TCFC) project. It is a competitively awarded discretionary FHWA Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) initiative. The TCFC project will deploy connected vehicle (CV) technologies in over 1,000 trucks and agency fleet vehicles that will be able to transmit data and receive warnings from five CV applications.	$ -	$ 6,753.93	$ 6,880.44	$ 566.10	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Part of the Performing Agency's mission is to provide transfer of technology and knowledge. It is appropriate to provide technology and knowledge transfer to staff of the Receiving Agency and other transportation professionals in Texas who serve the Receiving Agency in a consulting capacity or provide coordination among the Receiving Agency, other state agencies, and county and local agencies. The Performing Agency shall organize meetings, demonstrations, and workshops at the Receiving Agency's request to accomplish this goal and to convey the latest results of research that will benefit the Receiving Agency. Topics will include any of the following at the request of the Receiving Agency: planning and environmental review, energy impacts, geographic information system (GIS) techniques to support planning functions, 3D visualization and design, advancements in data collection techniques, access management, construction management, public outreach, right-of-way coordination, project delivery optimization, mobility coordination, utility conflict resolution, asset management, simulation and analysis, and safety.	$ -	$ 1,672.79	$ 2,423.64	$ 199.41	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Texas has a high quality network of publicly accessible airports supporting general aviation activities that are important to the economic performance of the state. Business and flight support activities at these airports generate billions of dollars in economic activity, create jobs, and improve business operating efficiencies that help Texas to attract and retain some of the nation's best companies. The Texas Department of Transportation, Aviation Division, conducted studies in 2003, 2005, 2011, and 2018 to quantify the economic impacts of general aviation and commercial service airports within the Texas Airport System Plan (TASP). An assessment of these airport's impacts on their local economies allows the Aviation Division to make strategic planning and funding decisions and provide better support and infrastructure development projects to spur economic growth across the state.	$ -	$ 986.81	$ 4,509.27	$ 371.01	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	The purpose of this Proposal for Grant Activities (PGA) is to improve the accuracy and reliability of Texas on-road mobile source emissions estimates by developing locally calibrated speed bin distributions for use in the U.S. Environmental Protection Agency (EPA) MOtor Vehicle Emission Simulator (MOVES) Model. These speed bin distributions will be derived from probe-based traffic speed data collected from commercial data sources such as INRIX, HERE, and Replica. Current MOVES speed distributions rely on default assumptions or regional travel demand model (TDM) averages that do not capture congestion patterns, time-of-day variations, or dynamic driving behaviors. By replacing these assumptions with empirically derived, regionally representative inputs, this PGA will generate speed profiles that better reflect real-world driving conditions across Texas. These improvements will enhance the precision of emissions modeling used in regulatory air quality planning, transportation conformity analyses, State Implementation Plan (SIP) development, and other statewide environmental assessments. Using widely adopted probe-based data aligns emissions modeling with observed travel behavior and improves the accuracy of statewide emissions inventories.	$ -	$ -	$ 328.17	$ 27.00	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines various task areas in which the Performing Agency will perform technology transfer and technical support services for the Receiving Agency in the areas of project planning, development, and delivery; operations; and maintenance. Strategic highways within the Receiving Agency's jurisdictional area may require unique analyses that involve non-routine specialized analytical expertise and knowledge regarding the application of recently developed methods and research results to address critical needs along those corridors. Both the Receiving and Performing Agencies understand and agree that these analyses will be conceptual in nature and will not include the development of project-specific plans, specifications, or estimates.	$ 461.97	$ 13,480.27	$ 17,679.98	$ 1,454.64	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
452 - Texas Department of Licensing and Regulation	3.1.1. Staff Group Insurance Contributions	Program Budget. TTI prepared Attachment B – Annual Budget to support the technical approach outlined below. 1. Project Plan. TTI will develop a project plan that will identify and summarize all project tasks and activities, task and activity timing, milestones and deliverables, and due dates for the contract duration. TTI will submit this project plan to TDLR for approval within three (3) weeks after execution of the Contract. Within 10 business days after submission, TDLR will review the project plan and provide comments to TTI on areas of potential revision or approve the plan as submitted. 2. Instructor and Motorcyclist Outreach. TTI will continue the conduct of the education and outreach program initiated in the prior years' contracts to recruit and retain instructors, and to encourage motorcyclists to take safety courses. TTI will track all outreach materials and activities (e.g., events/meetings attended, materials handed out, social media hits, etc.). TTI will deliver to TDLR outreach program tracking reports within 25 weeks after the execution of the contract and in the Yearly Summary Report within 52 weeks after execution of the Contract. 3. Instructor Training and Retention Longitudinal Study. TTI will continue to recruit and interview new instructors as outlined in the study workplan developed in FY2025. As data is collected, TTI will conduct a preliminary analysis to determine if any adjustments to the structured interview guides are indicated. TTI will provide a study progress update in the Yearly Summary Report to TDLR within 52 weeks after execution of the Contract. 4. Motorcyclist Licensing, Instructor, and Motorcyclist Resource Website. TTI will maintain and expand the website created in the prior years' contract to include an ordering system of materials produced. 5. Instructor Professional Development Workshop. TTI will consult with the TDLR licensed Motorcycle Safety Instructor Training Providers to support an instructor professional development workshop. To ensure the workshop is free of charge for all participants and maximize support instructors, TTI will fund essential costs such as venue, training bikes and insurance, food and beverage, and facilitator travel. TTI will deliver to TDLR an overview of the workshop in the Yearly Summary Report within 52 weeks after execution of the contract. 6. Motorcyclist Safety Materials for Driver Education. Using the Driver Education and Safety Review completed in FY2025, TTI will collaborate with the Region 6 Education Service Center and Driver Training and Traffic Safety Advisory Committee (as possible) to provide motorcycle safety materials for easy integration into current curricula. 7. Texas Department of Transportation (TxDOT) Traffic Safety Conference. TTI will seek to present results of work funded by this project at the annual TxDOT Traffic Safety Conference. Presentation content will be approved by TDLR. As time permits, an overview of the conference will be delivered to TDLR in the Yearly Summary Report within 52 weeks after execution of the contract. NOTE: This task may be eliminated if additional funds are needed for participant compensation in the Instructor Training and Retention Longitudinal Study. 8. Yearly Summary Report. TTI will deliver a yearly summary report of project activities to TDLR within 52 weeks after execution of the Contract. The scope and project timeline of the work outlined in this Contract may need to be modified based on feedback and guidance from the TDLR Motorcycle Safety Advisory Board. In that event, TTI will propose contract changes to TDLR.	$ -	$ -	$ 1,326.61	$ 109.15	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical expertise to the Receiving Agency's District Traffic Operations section to aid in addressing the unique issues that occur within the jurisdictional limits of the Houston District. Specific work activities shall include and are not limited to: Scrutinize problematic traffic operation issues within the region, the results of which have statewide implications – wrong way vehicle prevention, freeway ramp metering, mid-block traffic signals on frontage roads, and others of interest to the Receiving Agency. Develop innovative construction traffic control solutions for improved project completion efficiency and public safety	$ 46,691.04	$ 90,682.13	$ 114,622.28	$ 9,430.69	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall support the Receiving Agency's planning initiatives related to innovation and technology deployments at the Receiving Agency District level. The Performing Agency shall conduct state-of-the-art engagement, communication, project scoping, project assistance through subject matter experts, and planning services. The Performing Agency shall provide documentation of work performed in the form of technical memorandum/reports, task specific outreach materials, meeting handouts, status reports, and other written materials.	$ 6,958.65	$ 71,550.49	$ 66,258.93	$ 5,451.54	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Two researchers from the Performing Agency shall travel via truck to the Fort Worth District to measure and report the skid values of 17 paving projects using the skid trailer while minimizing operator factors. The Performing Agency shall take two sets of skid trailer measurements with the second set of measurements occurring a year after completing the first set of measurements. The Performing Agency shall measure and report the skid values of 17 paving projects in the Fort Worth District using the skid trailer while minimizing operator factors. The Performing Agency shall take two sets of skid trailer measurements with the second set of measurements occurring a year after completing the first set of measurements.	$ -	$ -	$ 3,773.75	$ 310.49	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	• Evaluate and update the current ITS Strategic Plan to reflect national best practices, stakeholder needs, and current/future technologies. • Ensure alignment with federal guidance (e.g., U.S. DOT ITS Architecture and Standards, Connected and Autonomous Vehicles [CAV] integration strategies). • Support regional consistency while promoting statewide interoperability. • Define a roadmap for phased implementation, investment prioritization, and performance monitoring. • Engage stakeholders to build consensus and coordinate strategic actions.	$ -	$ 2,827.62	$ 14,540.85	$ 1,196.37	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	In this project, TTI shall assist the Receiving Agency with the expansion of the existing system for providing roadway flood warnings to transportation operations personnel and the traveling public. TTI shall assist with system enhancements as well as provide support for scaling the physical architecture of the system to accommodate additional regions of the state.	$ 3,619.22	$ 2,581.07	$ 3,920.99	$ 322.60	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The George Bush Drive/Wellborn Road interchange improvement project will provide safety enhancements, congestion reduction and improve travel conditions for vehicles as well as transit, bicycle, and pedestrian users to, from and through the Texas A&M University campus as well as adjacent neighborhoods. The student, faculty and staff population of the Texas A&M main campus represents the fourth largest activity center in Texas, with even larger values on Texas A&M home football gamedays. Previous contracts determined public support for the below ground intersection improvement project, preferences for several important design elements and some concerns that require additional analysis. The Performing Agency shall assist the Receiving Agency with reviewing the design and construction phasing options. As instructed by the Receiving Agency, the Performing Agency shall engage the public on strategies for maintaining traveler safety and mobility, as well as mitigating potential neighborhood traffic effects. The Performing Agency shall collaborate with the Receiving Agency and stakeholder groups such as neighborhood leaders, Texas A&M University faculty, administrators, and staff as instructed by the Receiving Agency. The Performing Agency shall review the design and construction schedule for consistency with good design and operation practice and with the expressed interests of the stakeholders. There are a range of schedule, operating and policy strategies that will be pursued for Texas A&M campus activities that would reduce traffic around the interchange and improve safety and transportation network operations. The Performing Agency shall review the traffic management concept to ensure it will meet the community's expectations during the intersection closure. The Performing Agency shall use the findings of the previous contract as a basis for discussion with the Receiving Agency, their design consultant, other experts and other stakeholders on options for alternative construction techniques and traffic mitigation treatments. The Receiving Agency and their consultant will lead these efforts, and the Performing Agency shall assist with ensuring the appropriate stakeholders are involved, and provide suggestions on the project design and construction phasing schedule.	$ 5,383.43	$ 9,027.44	$ 8,607.81	$ 708.22	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide continuing support to the Receiving Agency Maintenance Division (MNT) in the certification and further implementation of the Traffic Speed Deflectometer (TSD). The Performing Agency shall establish instrumented certification sites to ensure the quality of the measured pavement deflections prior to the weekly data collection effort. This project includes funds for the Performing Agency to conduct District training and support for implementation of the collected data at both the network and project levels. The Performing Agency shall select sites for instrumentation in the Receiving Agency Odessa and Dallas Districts. The Performing Agency shall give preference to flexible pavements with four lanes with two to four inches of hot mix asphalt (HMA) to minimize temperature sensitivity concerns. To expedite TSD testing, the Performing Agency shall include the instrumentation sites in a test loop of length one to three miles, containing a range of pavements with significantly different deflections. To establish the test loops, the Performing Agency shall contact the Receiving Agency senior District staff and identify candidates for evaluation. The Performing Agency will then test these candidates with ground penetrating radar (GPR) and falling weight deflectometer (FWD).	$ 920.59	$ 14,720.78	$ 22,403.21	$ 1,843.25	$ -	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide organizational and management support, technical documentation, educational series workshops, enhancements to certification programs for seal coat inspectors and specialists, seal coat manual, forensics and listings of short term and long term topics to enhance the quality of seal coats and other pavement preservation alternatives to the Receiving Agency. The Performing Agency shall provide expertise in project selection, traffic control/safety, pre-project maintenance/repair work, asphalt binder, aggregates, seal coat design, seal coat construction and seal coat forensics as well as other pavement preservation techniques. The Receiving Agency will issue a Notice to Proceed (NTP) prior to any service being performed by the Performing Agency. The Receiving Agency will coordinate with the Performing Agency to develop and determine a work plan, deliverables, period of performance and maximum amount to be expended for each NTP. The Receiving Agency will authorize the NTP and deliver it to the Performing Agency via electronic mail (e-mail).	$ -	$ 6,998.20	$ 7,263.23	$ 597.59	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall use its nondestructive testing (NDT) capabilities to evaluate candidate sections proposed by the District. The Performing Agency shall review and evaluate historic plan sets, available soils information, and ground-penetrating radar (GPR) and falling weight deflectometer (FWD) results. The Performing Agency shall use a combination of auguring, coring and dynamic cone penetrometer (DCP) testing to obtain materials for lab testing and to characterize in-situ pavement materials. The Performing Agency shall measure materials' plasticity index, gradation, and recommend to the District which type(s) of stabilizer(s) will be most appropriate for the prevailing site conditions. The Performing Agency shall use its nondestructive testing capabilities, coring, lab testing, auguring equipment, and engineering analysis to diagnose the cause of pavement failures and make recommendations on both short term and long-term repair strategies.	$ -	$ 4,899.87	$ 1,147.11	$ 94.38	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall verify ride quality data on final pavement surfaces for projects constructed by Receiving Agency contractors that meet the requirements of: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B) and 2) Item 585, "Ride Quality for Pavement Surfaces." 23 CFR 637B requires state departments of transportation (DOTs) to verify test results determined from contractor's quality control data if the results are used for acceptance on federal-aid highway projects included in the National Highway System (NHS). The Federal Highway Administration (FHWA) guideline for state DOTs is to perform verification tests on a minimum 10 percent sample of projects. Item 585, Surface Test Type B, requires contractors to collect pavement ride quality data with a certified inertial profiler and a certified inertial profiler operator and submit test profiles to the Receiving Agency for acceptance, pay adjustments and corrective work. The Receiving Agency may perform verification testing, and disputes are settled with referee testing. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (email) prior to any service being performed by the Performing Agency. The Notice to Proceed will include a work plan, maximum amount payable, and initiation and completion dates. The Performing Agency shall perform the following tasks: Task 1: Conduct Ride Quality Verifications (Estimated Cost: FY25 $234,672; FY26 $233,466; FY27 $228,597) Using the Construction Management Information System Database (CMISD), the Performing Agency shall identify and monitor projects let with Item 585 Surface Test Type B. From among the projects where the Engineer has activated Item 585, the Performing Agency shall travel for the selected projects on which ride quality verifications shall be conducted according to the approved guidelines of the Receiving Agency's Ride Quality Verification Program. For each fiscal year of this interagency contract, the Performing Agency shall verify the ride quality assurance data on a minimum 10 percent sample of Item 585 Surface Test Type B projects. Task 1 Deliverables: The Performing Agency shall coordinate with the Receiving Agency and State contractors for independent ride quality verification testing. The Performing Agency shall notify the Receiving Agency of the test results, request referee testing as needed, and verify State contractor test results. Using the Receiving Agency's Site Manager software program, the Performing Agency shall submit summary reports, for inclusion into the project records, to the Receiving Agency before August 31, 2027 or by the date specified in the NTP. Task 2: Submit Annual Ride Quality Verification Program Report (Estimated Cost: FY25 $50,286; FY26 $50,028; FY27 $48,985) The Performing Agency shall provide an annual Ride Quality Verification Program Report, which shall cover the following items, as a minimum: 1. Identify the number of projects in the selection pool. 2. Identify the projects selected for verification. 3. Report the validation statistics. 4. As applicable, report actions taken to resolve each non-validating project. Task 2 Deliverables: The Performing Agency shall provide the annual Ride Quality Verification Program Report to the Receiving Agency by October 1 for Fiscal Years 2025 and 2026, and by August 31st for Fiscal Year 2027. Task 3: Evaluate the Longevity of Pavement Surfaces (Estimated Cost: FY25 $50,286; FY26 $50,028; FY27 $48,985) At the end of FY 2024, the Performing Agency shall have completed eight full years of ride verifications. This consists of over 375 project verifications on various pavement surfaces with different project scopes. The Performing Agency shall: 1. Identify verification projects to evaluate for ride quality longevity (minimum of 100 projects). 2. Review the initial ride quality information from the verification process. 3. Request annual ride quality data from the Receiving Agency's network level collection. 4. Evaluate the longevity and performance (with respect to smoothness) of the initial paving project. When necessary, the Performing Agency shall collect additional ride quality data on the analysis projects. During the analysis, the Performing Agency shall attempt to identify other contributing factors that might have influenced smoothness performance. Task 3 Deliverables: The Performing Agency shall include a status update of this analysis within each annual report as described in Task 3. The final annual report submitted by August 31st for Fiscal Year 2027 will include the complete summary of the longevity analysis.	$ -	$ 8,454.26	$ 19,418.43	$ 1,597.68	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI will support TxDOT TP&P with Air Quality and Conformity Technical Support and Analysis. Provides TxDOT with a broad range of air quality and conformity support including statewide conformity support and ongoing update of conformity methods. Other activities include coordination of the Technical Working Group on Mobile Source Emissions (TWG), air quality training and information dissemination activities, ongoing updates of the Texas Guide to Accepted Mobile Source Emissions Reduction Strategies (MOSERS) and policy and technical analysis support. This includes assisting TxDOT in navigating new federal requirements in this area and supporting state and federal emissions quantification and reporting activities.	$ -	$ 74,144.31	$ 75,013.42	$ 6,171.82	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall continue to support the Receiving Agency in the operations and expansion of the Border Wait Time Measurement System (BWTMS) in support of the Receiving Agency's ongoing border planning efforts and to comply with Legislative reporting requirements. The Performing Agency shall perform operation and maintenance of the current BWTMS, which entails collection and dissemination of wait time and crossing time data from United States (U.S.)-Mexico border crossings. The Performing Agency shall expand and improve the BWTMS by expanding, enhancing at land ports of entry (LPOEs) under renovation and expansion, and implementing the BWTMS for southbound travel. The final goal of the BWTMS D2I platform is to make real-time border-crossing operational data and insights accessible to the Receiving Agency, stakeholders, transportation agencies, researchers, and the public.	$ -	$ 66,388.90	$ 168,166.17	$ 13,836.05	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency [TxDOT's Public Transportation Division (PTN)] is responsible for planning, technical assistance, and statewide coordination of bicycle and pedestrian transportation. The collection of bicyclist and pedestrian count data helps the Receiving Agency quantify walking and bicycling activity around state highways to support transportation investment decisions that accommodate multimodal activity.	$ -	$ -	$ 48,286.20	$ 3,972.81	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical support for the development and implementation of predictive maintenance solutions, including: • Concept development, structure design, and workflow planning. • Data analysis, model development, pilot testing, deployment, and performance monitoring. • Model maintenance and ongoing technical assistance to support the Receiving Agency's operational needs.	$ -	$ -	$ 9,777.57	$ 804.46	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency will be available on-call and provide services at the Receiving Agency's request. Work products are delivered through the Work Order procedure: 1. The Receiving Agency identifies a Work Order for the Performing Agency to deliver and links it to a Service Area Task. 2. The Receiving Agency requests a proposal from the Performing Agency, including a scope, work products, budget, and timeline. The Performing Agency assigns a project manager in collaboration with the Receiving Agency. 3. The Receiving Agency reviews and approves the proposal, issues an NTP, and initiates the work. Upon receipt of a National Transportation Partnership (NTP) from the Receiving Agency, the Performing Agency shall conduct the Work Order, provide work products within the approved budget and timeline, and establish a schedule for progress meetings. Upon completion and delivery of the work products, the Performing Agency and the Receiving Agency will close-out the Work Order, transmitting final documents and establishing a document archive.	$ -	$ -	$ 118,354.38	$ 9,737.79	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Receiving Agency (TxDOT's Public Transportation Division) is responsible for administering the state's program for public transportation. The scope of responsibility includes the distribution of federal and state funding for public transportation in small urban and rural areas, and state funding for eligible large urban areas. The Receiving Agency is also responsible for managing the programs for planning, technical assistance, and statewide coordination of public transportation. The Receiving Agency faces numerous challenges within the department's broad scope of responsibility. These challenges often include complex problems that benefit from innovative solutions and advanced problem-solving capabilities.	$ -	$ -	$ 78,721.73	$ 6,476.93	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	This scope of services outlines general task areas the Performing Agency shall perform for the Receiving Agency's Waco District to support innovation and excellence in planning, construction, operations, and maintenance in the Waco District, primarily in support of the Waco I-35 corridor network.	$ -	$ -	$ 80,982.65	$ 6,662.95	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency's Rigid Pavements and Concrete Materials Section (RPCM), Materials and Tests Division, with utilizing a Real Time Profiler (RTP) devise on new concrete pavement projects. The Performing Agency shall also evaluate ride quality data from rigid pavements and identify industry best practices.	$ -	$ -	$ 293.39	$ 24.14	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide assistance to the Receiving Agency with materials non-routine testing, to include, but not limited to, concrete, aggregates and cement materials. Preforming Agency shall travel to Receiving Agency Headquarters (Austin, TX) for progress meetings as requested by the Receiving Agency.	$ -	$ -	$ 7,474.20	$ 614.95	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical services, as directed by the Receiving Agency, to examine traffic impacts of work zones to assist the Receiving Agency in minimizing traveler delay and potential safety impacts. The Performing Agency shall identify best practices to analyze work zone performance, conduct operational analysis, and evaluate safety impacts. Key performance measures at work zones are vehicle operating speed, vehicle delay through the work zone, vehicle queue length approaching the work zone, crash experience, number of erratic maneuvers, driver understanding of traffic control devices, and public complaints. The Performing Agency shall investigate best practices for using Smart Work Zone technologies to provide guidance for pilot projects and technology implementations in the Receiving Agency's Dallas District (guidance consistent with TRF Smart Work Zone standards). The Performing Agency shall conduct independent evaluations of project implementation of promising work zone technologies (e.g., end-of-queue detection and warning, comparative travel times, etc.) to assess the effectiveness of mitigating the impacts on the traveling public.	$ -	$ -	$ 58,486.33	$ 4,812.04	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall support the Receiving Agency with database development, data analysis, data processing, data visualization, and dashboard development. Upon request from the Receiving Agency, the Performing Agency shall: • Assist with category formula percentages updates for Allocations. • Document and continuously update the UTP working file process. • Identify and analyze data issues and provide solutions to correct data issues. • Recommend working file process improvements and increased automation. • Update and maintain data in the UTP working file and suggest a centralized data structure. • Update and maintain the historical category Tableau dashboards. • Update and maintain the UTP historical allocations data. • Change order database work (creation and processing). • UTP project listing task support and modifications • Provide specific database, data analysis, and data processing support as requested. • Collect data sources used for updating UTP Tableau dashboards and process data. • Use Snowflake to directly link data to UTP processing and Tableau dashboards. • Update UTP Tableau dashboards that align with data source refresh. • Update risk Tableau dashboards and update/modify process. • Provide documentation for the processes. • Create and update UTP Data HUB • Ongoing mentoring and technical support (e.g., support for project data review during UTP pre- alignment) as needed. • Use and incorporate Artificial Intelligence, as determined to be appropriate for the work product by the Receiving Agency, into UTP functions including, but not limited to databases, funding allocations, dashboards and documentation. Recommend items that could potentially be improved with Artificial Intelligence to the Receiving Agency for staff evaluation The Performing Agency shall assist the Receiving Agency with developing the Annual Portfolio Achievement Report (APAR), document Standard Operating Procedures (SOPs) and swim lanes, provide process improvements including form development, and provide guidance for the centralization of the data used by the Receiving Agency. The Performing Agency shall also develop/modify the UTP Project Call process and create a Scenario Planning Tool to support the Receiving Agency. The Performing Agency shall work with the Receiving Agency to identify and review the data needed for inclusion in this task. The Performing Agency shall develop a scope of services and budget for the requested technical support using rates and staff for the applicable fiscal year.	$ -	$ -	$ 116,981.30	$ 9,624.78	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall operate the Mobile Pavement Marking Retroreflectivity Verification Program which was initiated in 2015 to verify pavement marking retroreflectivity data on projects completed by the Receiving Agency's contractors. Projects included in the verification program must meet the following requirements: 1) Title 23 Code of Federal Regulations Part 637 Subpart B (23 CFR 637B). 2) Item 666, "Retroreflectorized Pavement Markings." 23 CFR 637B requires state departments of transportation (DOTs) to verify test results determined from contractor's quality control data if the results are used for acceptance on federal-aid highway projects included in the National Highway System (NHS). The Federal Highway Administration (FHWA) guidelines for state DOTs is to perform verification tests on a minimum 10 percent sample of projects. Item 666, "Retroreflectorized Pavement Markings," covers the installation of pavement markings and requires the contractor to meet minimum initial retroreflectivity requirements for most jobs. The contractor must use a mobile retroreflectometer approved by the Receiving Agency's Materials and Tests Division and certified by the Performing Agency's Mobile Retroreflectometer Program, or a handheld retroreflectometer to evaluate the markings. Contractors are required to evaluate the markings within a certain time window after installation, depending on the type of marking and pavement surface. If markings are not accepted based on retroreflectivity requirements, the contractor must correct them at their expense. The Receiving Agency may perform verification testing to ensure accuracy of the submitted retroreflectivity data. The Performing Agency shall conduct pavement marking retroreflectivity service life evaluations. These evaluations require retroreflectivity measurements over time and conducting analyses needed to determine the pavement marking service life. This will help Receiving Agency to establish service life estimates and to help satisfy the FHWA minimum maintained retroreflectivity requirements.	$ -	$ -	$ 9,813.44	$ 807.41	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical support for sampling and laboratory mixture designs of full-depth reclamation (FDR) using asphalt or other treatments, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division. The Performing Agency shall travel to TxDOT District's to collect representative samples, using specialized equipment that mimics expected level of pulverization, and return those samples to the laboratory for additional materials testing.	$ -	$ -	$ 5,717.01	$ 470.37	$ -	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical support for testing soils and aggregates, through the use of specialized laboratory testing equipment, to the Receiving Agency's Soils & Aggregates Section, Materials & Tests Division. The Performing Agency shall review and summarize existing practices and research findings from soils and aggregates topics. This review shall include but is not necessarily limited to test procedures, methods, and past research. The Performing Agency shall identify how results from this task could enhance or streamline current practices. The Performing Agency shall recommend updates to existing practices based on the findings, and may develop outreach content to support the recommendations.	$ -	$ -	$ 392.92	$ 32.33	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide safety analysis in support of the Traffic Safety Division. Task A: Provide Technical Assistance and Support for Updating and Managing Implementation of the Texas Strategic Highway Safety Plan (SHSP) in Compliance with Federal Requirements. The Performing Agency shall: • Facilitate meetings (primarily held virtually) with the: o Traffic Engineering Section IAC management staff up to every two weeks. o Management Team (MT) up to monthly. o Executive Committee (EC) as determined by the MT, up to four times per year. o And on an ad hoc basis with particular stakeholders, as determined by the SHSP Update Plan or IAC management staff. • Facilitate at least one meeting with each Emphasis Area Team (EA) (exact number TBD based on SHSP Update Plan). Additionally, use other methods of communication which may include information posted to the Texas SHSP website, webinars to share best/promising practices, and published case studies to share projects and processes and encourage conversations about potential countermeasure and action plan updates. • Facilitate working groups as determined by the IAC management staff. • Continue to implement the stakeholder engagement plan developed in FY25. • Update or expand the crash or driver behavior analysis in a specific emphasis area(s) to target geographic areas. In FY26, the analysis will include, but not be limited to: o Facilitating the receipt of distracted driving data from Cambridge Mobile Telematics. o Facilitating conversations with IAC management staff, the MT, the EC, and EA on how to utilize the data. o Performing further analysis, if identified and feasible. o FY27 analysis will be determined based on needs identified in FY26. • Maintain the SHSP dashboard and publish it to the SHSP website. • Maintain a digital Traffic Safety Calendar on the SHSP website at least quarterly. • Maintain, update, and enhance the Texas SHSP website including updating crash trends including the improvement of the maintenance process for the website's framework. • Prepare a comprehensive plan (SHSP Update Plan) in FY26 that outlines how the Performing Agency shall update the SHSP. The plan will include activities, timelines, responsible/involved parties, and any other relevant information to ensure the SHSP process and plan update is conducted in accordance with federal requirements. • Execute the SHSP Update Plan in FY27, including providing a complete updated version of the SHSP. Task B: Provide Assistance Related to Highway Safety Improvement Program (HSIP). Estimated Costs – The Performing Agency shall: • Prepare the Crash Analysis and Visualization (CAVS) data based on the updated HSIP work code tables and provide the data to the Receiving Agency. • Conduct up to two training webinars on the use of CAVS tools for selecting the projects for HSIP. Task C: Provide Ad-Hoc Data Analysis Assistance. The Performing Agency shall: • Conduct additional analysis and safety studies as needed and as requested by the Receiving Agency, with data compiled and technical memorandums produced in a timely manner. Meetings and briefing presentations will be accommodated by appropriate Performing Agency staff as required. The Performing Agency shall provide a statement of work and budget prior to ad-hoc assistance and if requested analysis and studies are beyond the assigned budget, the Receiving Agency and Performing Agency will determine if the scope should be reduced or the budget should be increased.	$ -	$ -	$ 10,950.65	$ 900.98	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Texas Department of Transportation (TxDOT) has been conducting research on predicting skid resistance for over five decades. This research has focused on measuring the polishing resistance of the coarse aggregate portion of mixes. This has led to the development of a surface aggregate classification (SAC) where the SAC A materials are rated as having good skid resistance properties; however, recently, it is reported that some mixes with predominantly SAC A materials have low skid resistance. In addition, some of the fine surface mixes with little coarse aggregate have been shown to have excellent skid resistance. One conclusion is that the long-term skid resistance of any surface mix is a function of many factors including, but not limited to mix type, gradation, the quality of the fines, and not simply coarse aggregate properties. The goal of this study is to develop and validate a laboratory test procedure to measure skid resistance of any proposed surface mix. This test procedure will eventually be incorporated into TxDOT's Balanced Mix Design (BMD) process.	$ -	$ 8,944.75	$ -	$ -	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall maintain traffic monitoring program collection and data processing guidelines, including Receiving Agency traffic data collection standards, and traffic data collection needs to support initiatives and data processing. The Performing Agency shall maintain awareness of and review current industry standards, such as the Federal Highways Administration (FHWA) Traffic Monitoring Guide (TMG), Highway Performance Monitoring Program (HPMS) Field Manual, and other guidance.	$ -	$ -	$ 7,627.01	$ 627.52	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Several TxDOT districts have reported early top-down cracking issues linked to the use of Reclaimed Asphalt Pavement (RAP) materials, which can make the surface layer excessively stiff. Unlike bottom-up fatigue cracking—where distress originates at the bottom of the hot mix asphalt (HMA) layer—top-down cracking begins at the surface and propagates downward. This phenomenon is influenced by the stiffness ratio between the surface and lower HMA layers, as well as the high edge stresses from radial truck tires. While bottom-up fatigue cracking and the negative effects of RAP in lower asphalt layers have been well addressed, top-down cracking remains unaccounted for in Texas Mechanistic-Empirical Flexible Pavement Design System (TxME). As a result, premature top-down cracking cannot currently be predicted at the design stage. With growing economic and environmental incentives for RAP use—and current specifications allowing it in surface layers—integrating a top-down cracking model into FPS23/TxME is essential to assess its impact properly. Therefore, this study aims to 1) Evaluate and develop an appropriate mechanistic-empirical (ME) top-down cracking model, 2) Implement it in TxME, and 3) Calibrate/validate the model. The Performing Agency shall review the literature, identify the Mechanistic-Empirical (ME) model, integrate it into TxME, and collect test section data—including mixture properties, structure, and field performance—for calibration and validation.	$ -	$ -	$ 1,354.12	$ 111.41	$ 222.53	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The operational and safety benefits of modern roundabouts are well established, providing less delay and significantly reducing fatalities and serious injuries. While their use in Texas and throughout the country continues to grow, opportunities for further implementation can be limited in some locations due to their relatively high construction costs, compared to alternatives such as traditional intersections controlled by stop signs or traffic signals. The footprint of roundabouts is often larger than these traditional alternatives, increasing costs for right-of-way and pavement; while those upfront construction costs can be mitigated over the life of the intersection through reduced maintenance and operation costs, the construction costs are still a factor in the decision-making process for intersection control. This effect can be even more pronounced when attempting to build roundabouts with scarce safety, maintenance, or mobility funds, as the cost of one roundabout can account for the entire annual allotment of a district's safety funds. To maximize opportunities for roundabout implementation, research is needed to identify more cost-effective ways to address footprint and construction costs. The Performing Agencies shall review existing practices and assess the effectiveness of promising methods for reducing roundabout construction costs, providing recommendations to the Receiving Agency for future implementation.	$ -	$ -	$ 1,560.49	$ 128.39	$ 324.42	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall develop and test a simple and straightforward methodology that directly incorporates safety considerations into the roadway design process. The Performing Agency shall develop and deliver four products: (1) Integration of the current web-based Safer by Design (SBD) Tool with existing databases hosted by the Receiving Agency, allowing roadway data, when available and possible, to be automatically retrieved; (2) Enhancement of the current SBD Tool by expanding its index-based (e.g., safety score) methodology to support interstate and freeway project development and design; (3) Development of training and reference materials to assist designers in understanding how to incorporate safety considerations into design decisions for interstate and freeway segments; and (4) SBD artificial intelligence (AI) based on the SBD frequently asked questions (FAQ) and user guide, providing users an interactive chatbot that delivers consistent responses.	$ -	$ -	$ 170.89	$ 14.06	$ 3,467.86	$ -

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601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The purpose of this effort is to monitor and analyze statewide congestion. This effort includes the creation of the Texas Top 100 Congested Road Segments, calculation of Texas Transportation Commission's key performance measures (KPM), calculation and distribution of federal performance measures, development and maintenance of the Congestion Management Process Assessment Tool (COMPAT), Urban Mobility Report (UMR), and assessment of mobility benefits of congestion reduction projects. This agreement allows Texas A&M Transportation Institute (TTI) to provide technical support and assistance to TPP related to identifying and monitoring the Texas Top 100 Most Congested Road Segments to implement requirements and provisions of H.B. No. 1, General Appropriations Bill, Rider 14(j).	$ -	$ -	$ 45,204.51	$ 3,719.26	$ 89,928.72	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Current asphalt pavements with traditional asphalt mixes perform well under free flow traffic at regular speed. However, due to the nature of slow-moving or standing traffic, the same pavement structure with the same materials appears to severely rut at intersections. Ruts deeper than 2-inches were observed at multiple highway intersections, including those designed with premium mixes such as Stone-Matrix Asphalt, which result in serious safety concerns during wet weather conditions and costs millions of dollars annually to fix. Pavement designs specifically for slow-moving or standing traffic areas such as intersections, are rarely investigated. With the increasing frequency of extreme weather conditions and increase in truck traffic, there is an urgent need to develop long-lasting asphaltic pavement designs for intersections. The Performing Agency shall coordinate with the Receiving Agency to develop heavy duty intersection designs for different traffic levels following the same format of the heavy-duty pavement guidelines (i.e. catalogue design approach), using the Texas Mechanistic-Empirical Asphalt Concrete Pavement Design and Analysis System (TxME) with suitable asphalt mixes and other layer materials designed with the reliable laboratory testing protocols. Furthermore, the Performing Agencies shall identify and construct up to three field test sections for Validation of the new heavy duty intersection design method.	$ -	$ -	$ 1,592.46	$ 131.02	$ 1,697.42	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Task 1- Errors and Omissions Training The Performing Agency shall implement up to 12 Errors and Omissions training classes: 4 each in FY 2026, FY 2027, and FY 2028, all using the most current approved materials developed by the Performing Agency. Each class shall be two days long and use existing materials developed by the Performing Agency. Classes shall be delivered remotely. The Receiving Agency shall document successful implementation through collection of online class evaluations. The Receiving Agency shall coordinate scheduling and attendance. Task 2- Construction Engineering and Inspection (CEI) Training The Performing Agency shall implement up to 12 CEI training classes: 4 each in FY 2026, FY 2027, and FY2028, all using the most current approved materials developed by the Performing Agency. Each class shall be 1.5 days long and delivered remotely. Instructions shall be led by two professors. The Receiving Agency shall document successful implementation with online class evaluations provided by the Receiving Agency. The Receiving Agency shall arrange and coordinate scheduling and attendance. The Performing Agency shall train an alternative instructor to provide training flexibility and resilience. Task 3- Update – Analysis of CEI Data and Interviews The Performing Agency shall analyze data provided by the Receiving Agency for estimating the expected CEI man-hours/cost on Receiving Agency projects as well as confidence levels regarding the probability of the CEI cost not being exceeded (e.g. P50, P80). The Performing Agency shall understand what factors drive CEI cost. In addition to the bid amount/construction cost that are reported in literature, the Performing Agency shall analyze the impact of other factors including, but not limited to work type category, complexity of construction scope, estimated cost of project construction, recorded cost of engineering design, type and frequency of reported change orders, rural vs. urban locations, and project duration. The Performing Agency shall rely on data sets (e.g. Site Manager, Peoplesoft, PS-CAMS, etc.) that will be provided by the Receiving Agency. In addition, the Performing Agency shall interview individuals suggested by the Receiving agency to complement the results from the quantitative analysis. Finally, the Receiving Agency shall use the results from this task to update the existing content of the Construction Engineering and Inspection training material. Task 4 - Update – Analysis of Design Engineering Cost Data and Interviews The Performing Agency shall analyze data provided by the Receiving Agency for estimating the expected design engineering man-hours/cost on Receiving Agency projects as well as confidence levels regarding the probability of the design engineering cost not being exceeded (e.g. P50, P80). The Performing Agency shall understand what factors drive design engineering cost including consideration of different levels of design complete (e.g. 30-60-90). In addition to the bid amount/total construction cost that are reported in literature, the Performing Agency shall analyze the impact of other factors including, but not limited to work type category, complexity of design scope and iterations cycles, estimated cost of project construction, rural vs. urban locations, and other relevant factors. Furthermore, the Performing Agency shall illustrate the relationship between design engineering cost on errors and omissions and other change order types. The Performing Agency shall rely on relevant data sets (e.g. Site Manager, Peoplesoft, PS-CAMS, etc.) that will be provided by the Receiving Agency. In addition, the Performing Agency shall interview individuals suggested by the Receiving agency to complement the results from the quantitative analysis. The Receiving Agency shall use the results from this task to update the existing content of the Errors and Omissions training material. Task 5 - Refresh Teaching Materials A. The Performing Agency shall revise the existing Construction Engineering and Inspection training materials using the results from the data analysis and interviews in Task 3. B. The Performing Agency shall revise the existing Errors and Omissions training materials using the results from the data analysis and interviews in Task 4. Task 6- Project Management The Performing Agency shall provide monthly progress reports to the Project Director of the Receiving Agency.	$ -	$ -	$ 9,472.55	$ 779.37	$ 18,525.56	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide Ground Penetrating Radar (GPR) technical expertise, to include conducting surveys, validation testing, training workshops and performing analysis on data collected with non-contact GPR systems. The Performing Agency shall also assist in performing maintenance on all the non-contact GPR antenna systems and assist with semi-annual calibrations and system to system reproducibility measurements when requested by the Receiving Agency. The Performing Agency shall assist the Receiving Agency with expanding its GPR data collection fleet.	$ -	$ -	$ 6,057.46	$ 498.39	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall assist the Receiving Agency to understand commercially available transportation data and data services and create plans for pilot deployments.	$ -	$ -	$ 70,834.48	$ 5,828.00	$ 38,120.42	$ -

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The scope of services provided by the Performing Agency is outlined in the following tasks to be performed for the Receiving Agency's Materials and Tests Division (MTD). The Performing Agency shall develop a Materials Academy Workshop training program for Receiving Agency personnel with an emphasis on highway construction materials. The Performing Agency shall travel to the Receiving Agency's facilities in Austin, TX and conduct two (2) workshops in each fiscal year. The workshop shall consist of up to two (2) weeks of preparation and webinars, two (2) weeks of in-class lecture and laboratory hands-on sessions at the Receiving Agency, and approximately one (1) week of class sessions with manufacturing plant visits at non-Receiving Agency facilities including, but not limited to the TxAPA (Texas Asphalt Pavement Association) Buda facility. The Receiving Agency will issue a written Notice to Proceed (NTP) to the Performing Agency via electronic mail (Email) for each fiscal year prior to any service being performed by the Performing Agency. The NTP may only be authorized by the Receiving Agency's Materials and Tests Deputy Director or a higher level of authority. The NTP will include a work plan, maximum amount payable, and initiation and completion dates. Task 1. Materials Academy Management (Estimated Costs - $105,000) The Performing Agency shall manage the Materials Academy to include: • Develop the Academy outline, • Develop the agenda, • Develop the list of instructors, • Replace instructors, • Coordinate classroom management, • Organize field trips, • Coordinate travel for field trips, • Incorporate changes based on new specifications into curriculum, as needed, • Provide in-person oversight at all classes and plant tours. All Materials Academy Management is in support of conducting the training based on materials used in highway construction by the Receiving Agency. Task 2. Develop Academy Curriculum and Supporting Materials (Estimated Costs - $700,000) The Performing Agency shall modify, as needed, previously developed instructional materials to address attendee reviews, new test procedures, new specifications, and new national or Receiving Agency changes in materials, materials selection, or design. New instructors shall use baseline existing materials and make modifications to address the above and to incorporate their own teaching materials, examples, and case studies. The Performing Agency shall develop a set of questions to be answered by attendees for each materials site field trip. The Performing Agency shall provide an electronic version (e-version) of all materials including, but not limited to, webinar materials, storage devices, PowerPoint presentations, laboratory activity schedules, exercises, and field trip schedules to implement the Academy. The PowerPoint presentations will include, but not be limited to, Receiving Agency specifications, basic materials information of the topics in Task 1, hands-on laboratory sessions at the Receiving Agency's Lab, case studies, and tying lecture-lab to field experiences and problem solving. Task 3. Conduct Materials Academy Workshops (Estimated Costs - $780,000) With the Receiving Agency's approval, the Performing Agency shall schedule the workshops for 25 to 30 participants each between October and May of each fiscal year (two courses per fiscal year). The Performing Agency shall conduct the in-class lecture and aid the Receiving Agency in the laboratory portion of the workshops at the Receiving Agency's facility. The Performing Agency shall initiate the classroom materials manufacturing lectures and launching point for material manufacturer's field trips at the TxAPA Buda facility. The Performing Agency shall provide group transportation to visit material manufacturing plants via bus for the first three (3) days, and the participants will provide their own transportation to the last day. The Performing Agency shall revise the agenda, topics, or laboratory sessions based on participant feedback. Task 4. Modify Academy Curriculum and Supporting Materials (Estimated Costs - $123,020) Upon receipt of the Receiving Agency's approval, the Performing Agency shall modify the curriculum and course material based on participant evaluation feedback. The Performing Agency shall revise and submit an e-version of any modified course materials for the Academy.	$ -	$ -	$ 12,463.90	$ 1,025.48	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The higher education provider will support TxDOT in the administration of the Technology Task Force. The selected higher education provider shall provide a network of transportation professionals and experts that will fulfill the legislative mandate of the Task Force by managing the Emerging Technology Portfolio, publishing white papers on critical topics, delivering strategic plans such at the Technology Utilization Plan (TUP), developing communication strategies, and conducting Task Force meetings with in-depth technical analysis: • Work with the Strategic Initiatives and Innovation Division, Innovations Section, to meet expectations of the deliverables for the contract. • Identifying emerging technologies and analyzing potential impacts and gather recommendations from consortium members related to value and implementation of emerging technologies enhancing the Texas transportation system. • Maintain a core knowledge working group and network of subject matter expertise. • Create collaboration opportunities to facilitate Texas Technology Task Force, including on-going communications between state, FHWA, regional, and local public agencies and other highway sector stakeholders. • Act as a liaison to provide a forum for presenting, discussion, and proposing solutions to critical transportation-related problems. • Serve as a catalyst for rapid deployment of nationally and state identified new technologies, strategies, and methods that have already been demonstrated to be successful in "real world" applications and would lead to improved performance and effectiveness of the transportation system within the State of Texas.	$ -	$ -	$ 14,469.27	$ 1,190.48	$ 25,755.34	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency (and implementation partners) shall provide coordination, laboratory testing and analyses, field project development and monitoring, and syntheses to support further refinement and implementation of the Special Specification to Item 344, "Superpave Mixtures - Balanced Mix Design (BMD)" (SS-BMD). As shown in Figure 1, these activities shall result in revised version(s) of SS-BMD with performance thresholds and revised test methods as needed for mix design and quality assurance (QA) to provide a practical method to engineer each unique materials combination to realize substantial economic and environmental benefits without sacrificing balanced engineering performance. Previous revised draft versions of SS-BMD were developed based on results from the 2019-2022 and 2022-2025 Interagency Cooperation Contracts (IACs).	$ -	$ -	$ 30,357.24	$ 2,497.68	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide certification of the Receiving Agency's inertial profilers and profiler operators, assist with measurement of pavement surface characteristics, set up profiler verification sections, assist Districts in using profile data for pre-construction planning and programming, and provide assistance in using ride quality assurance test data to establish the scope of corrective work based on Receiving Agency ride quality projects. The Performing Agency shall conduct the Receiving Agency's profiler certifications using Receiving Agency's Test Method Tex-1001-S.	$ -	$ -	$ 8,001.92	$ 658.37	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agency shall provide technical assistance for improving TxME as part of the Receiving Agency's flexible pavement design system. This will include software enhancement and upgrade, materials laboratory testing to assist in generating default inputs for the latest generation of paving materials, and incorporation of the latest portable weigh-in-motion (WIM) traffic load data.	$ -	$ -	$ 7,311.03	$ 601.52	$ -	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	TTI's IAC concerning the Erosion & Sediment Control Materials Testing Program. The Performing Agency shall aid the Receiving Agency with testing and evaluating erosion and sediment control products. Assistance shall include, but not be limited to, equipment and instrument calibrations, baseline testing, erosion and sediment control product testing, reporting test results, and updating the Receiving Agency's Interactive Approved Product List (IAPL).	$ -	$ -	$ 31,977.18	$ 2,630.96	$ 43,439.23	$ -
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	The Performing Agencies shall develop recommendations and construction guidelines for using Reclaimed Asphalt Pavement (RAP) as aggregate in seal coats for pavement maintenance in Texas. Incorporating RAP in seal coats offers potential benefits, including cost savings, improved moisture resistance, and prolonged oxidation resistance. The Performing Agencies shall establish test methods, procedures and guidelines for evaluating RAP stockpiles, materials selection, material processing, application rate design, quality control and quality assurance during construction, laying the groundwork for statewide adoption. Given the lack of national guidance, a state-specific approach is essential to maximize performance and feasibility. The findings will provide the Receiving Agency with the technical basis to integrate RAP into seal coats effectively, leading to substantial cost savings and enhanced pavement sustainability.	$ -	$ -	$ 5,469.99	$ 450.05	$ -	$ -
582 - Texas Commission On Environmental Quality	3.1.1. Staff Group Insurance Contributions	Estimated future interagency contracts based on historical current and future anticipated demand for transportation related research services.	$ -	$ -	$ -	$ 84,861.69	$ 76,871.78	$ 91,225.93

Part 6.L. Interagency Contracts
90th Regular Session, Agency Submission

Funding Agency	Recipient Strategy	Description of Service Provided	Expended FY 2024	Expended FY 2025	Estimated FY 2026	Budgeted FY 2027	Requested FY 2028	Requested FY 2029
601 - Texas Department of Transportation	3.1.1. Staff Group Insurance Contributions	Estimated future interagency contracts based on historical current and future anticipated demand for transportation related research services.	$ -	$ -	$ -	$ 3,219,506.10	$ 3,185,659.59	$ 3,460,954.29
452 - Texas Department of Licensing and Regulation	3.1.1. Staff Group Insurance Contributions	Estimated future interagency contracts based on historical current and future anticipated demand for transportation related research services.	$ -	$ -	$ -	$ 7,366.27	$ 6,280.20	$ 7,918.71
Agencies/ Municipalities In States Other Than Texas	3.1.1. Staff Group Insurance Contributions	Expenditures for agencies in states other than Texas that should have been reported in MOF 666-Appropriated Receipts rather than MOF 777-Interagency Contracts.	$ 8,793.54	$ 1,968.05	$ -	$ -	$ -	$ -
			$ 41,956,649.88	**$ 45,552,475.05**	**$ 48,782,203.51**	**$ 49,757,847.17**	**$ 50,753,004.11**	**$ 51,768,064.19**

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		E&G Enrollment	GR Enrollment	GR-D/OEGI Enrollment	Total E&G (Check)	Local Non-E&G
GR & GR-D Percentages						
GR %	100.00%					
GR-D/Other %	0.00%					
Total Percentage	100.00%					
FULL TIME ACTIVES						
1a Employee Only		51	51	0	51	183
2a Employee and Children		19	19	0	19	57
3a Employee and Spouse		9	9	0	9	34
4a Employee and Family		17	17	0	17	81
5a Eligible, Opt Out		0	0	0	0	14
6a Eligible, Not Enrolled		1	1	0	1	14
Total for This Section		**97**	**97**	**0**	**97**	**383**
PART TIME ACTIVES						
1b Employee Only		2	2	0	2	46
2b Employee and Children		0	0	0	0	0
3b Employee and Spouse		0	0	0	0	0
4b Employee and Family		1	1	0	1	2
5b Eligble, Opt Out		0	0	0	0	11
6b Eligible, Not Enrolled		0	0	0	0	2
Total for This Section		**3**	**3**	**0**	**3**	**61**
Total Active Enrollment		**100**	**100**	**0**	**100**	**444**

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	E&G Enrollment	GR Enrollment	GR-D/OEGI Enrollment	Total E&G (Check)	Local Non-E&G
FULL TIME RETIREES by ERS					
1c Employee Only	106	106	0	106	0
2c Employee and Children	10	10	0	10	0
3c Employee and Spouse	67	67	0	67	0
4c Employee and Family	10	10	0	10	0
5c Eligble, Opt Out	0	0	0	0	0
6c Eligible, Not Enrolled	0	0	0	0	0
Total for This Section	**193**	**193**	**0**	**193**	**0**
PART TIME RETIREES by ERS					
1d Employee Only	0	0	0	0	0
2d Employee and Children	0	0	0	0	0
3d Employee and Spouse	0	0	0	0	0
4d Employee and Family	0	0	0	0	0
5d Eligble, Opt Out	0	0	0	0	0
6d Eligible, Not Enrolled	0	0	0	0	0
Total for This Section	**0**	**0**	**0**	**0**	**0**
Total Retirees Enrollment	**193**	**193**	**0**	**193**	**0**
TOTAL FULL TIME ENROLLMENT					
1e Employee Only	157	157	0	157	183
2e Employee and Children	29	29	0	29	57
3e Employee and Spouse	76	76	0	76	34
4e Employee and Family	27	27	0	27	81
5e Eligble, Opt Out	0	0	0	0	14
6e Eligible, Not Enrolled	1	1	0	1	14
Total for This Section	**290**	**290**	**0**	**290**	**383**

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	E&G Enrollment	GR Enrollment	GR-D/OEGI Enrollment	Total E&G (Check)	Local Non-E&G
TOTAL ENROLLMENT					
1f Employee Only	159	159	0	159	229
2f Employee and Children	29	29	0	29	57
3f Employee and Spouse	76	76	0	76	34
4f Employee and Family	28	28	0	28	83
5f Eligble, Opt Out	0	0	0	0	25
6f Eligible, Not Enrolled	1	1	0	1	16
Total for This Section	**293**	**293**	**0**	**293**	**444**

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Higher Education Schedule 4: Computation of OASI
90th Regular Session, Agency Submission, Version 1
Automated Budget and Evaluation System of Texas (ABEST)

Agency 727 Texas A&M Transportation Institute

Proportionality Percentage Based on Comptroller Accounting Policy Statement #011, Exhibit 2	2025		2026		2027		2028		2029	
	% to Total	**Allocation of OASI**	**% to Total**	**Allocation of OASI**	**% to Total**	**Allocation of OASI**	**% to Total**	**Allocation of OASI**	**% to Total**	**Allocation of OASI**
General Revenue (% to Total)	100.0000	$738,267	100.0000	$760,415	100.0000	$783,228	100.0000	$798,892	100.0000	$814,870
Other Educational and General Funds (% to Total)	0.0000	$0	0.0000	$0	0.0000	$0	0.0000	$0	0.0000	$0
Health-Related Institutions Patient Income (% to Total)	0.0000	$0	0.0000	$0	0.0000	$0	0.0000	$0	0.0000	$0
Grand Total, OASI (100%)	100.0000	**$738,267**	100.0000	**$760,415**	100.0000	**$783,228**	100.0000	**$798,892**	100.0000	**$814,870**

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Higher Education Schedule 5: Calculation of Retirement Proportionality and ORP Differential
90th Regular Session, Agency Submission, Version 1

Automated Budget and Evaluation System of Texas (ABEST)

727 Texas A&M Transportation Institute

Description	Act 2025	Act 2026	Bud 2027	Est 2028	Est 2029
Proportionality Amounts					
Gross Educational and General Payroll - Subject To TRS Retirement	29,434,675	30,317,715	31,227,246	31,851,791	32,488,827
Employer Contribution to TRS Retirement Programs	2,428,361	2,501,211	2,576,248	2,627,773	2,680,328
Gross Educational and General Payroll - Subject To ORP Retirement	19,154,580	19,729,217	20,321,094	20,727,516	21,142,066
Employer Contribution to ORP Retirement Programs	1,264,202	1,302,128	1,341,192	1,368,016	1,395,376
Proportionality Percentage					
General Revenue	100.0000 %	100.0000 %	100.0000 %	100.0000 %	100.0000 %
Other Educational and General Income	0.0000 %	0.0000 %	0.0000 %	0.0000 %	0.0000 %
Health-related Institutions Patient Income	0.0000 %	0.0000 %	0.0000 %	0.0000 %	0.0000 %
Proportional Contribution					
Other Educational and General Proportional Contribution (Other E&G percentage x Total Employer Contribution to Retirement Programs)	0	0	0	0	0
HRI Patient Income Proportional Contribution (HRI Patient Income percentage x Total Employer Contribution To Retirement Programs)	0	0	0	0	0
Differential					
Differential Percentage	1.9000 %	1.9000 %	1.9000 %	1.9000 %	1.9000 %
Gross Payroll Subject to Differential - Optional Retirement Program	4,187,056	4,312,667	4,442,048	4,530,888	4,621,506
Total Differential	79,554	81,941	84,399	86,087	87,809

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Activity	Act 2025	Act 2026	Bud 2027	Est 2028	Est 2029
A. PUF Bond Proceeds Allocation	10,300,000	2,500,000	2,500,000	0	0
Project Allocation					
Library Acquisitions	0	0	0	0	0
Construction, Repairs and Renovations	0	0	0	0	0
Furnishings & Equipment	0	0	0	0	0
Computer Equipment & Infrastructure	0	0	0	0	0
Reserve for Future Consideration	0	0	0	0	0
Other (Itemize)					
PUF Bond Proceeds					
Equipment/Minor Renovation Projects	10,300,000	2,500,000	2,500,000	0	0
B. HEF General Revenue Allocation	0	0	0	0	0
Project Allocation					
Library Acquisitions	0	0	0	0	0
Construction, Repairs and Renovations	0	0	0	0	0
Furnishings & Equipment	0	0	0	0	0
Computer Equipment & Infrastructure	0	0	0	0	0
Reserve for Future Consideration	0	0	0	0	0
HEF for Debt Service	0	0	0	0	0
Other (Itemize)					
C. TSTC Endowment Allocation	0	0	0	0	0
Project Allocation					
Library Acquisitions	0	0	0	0	0
Construction, Repairs and Renovations	0	0	0	0	0
Furnishings & Equipment	0	0	0	0	0
Computer Equipment & Infrastructure	0	0	0	0	0
Reserve for Future Consideration	0	0	0	0	0
Debt Service	0	0	0	0	0
Other (Itemize)					

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Agency code: **727** Agency name: **Texas A&M Transportation Institute**

	Actual 2025	Actual 2026	Budgeted 2027	Estimated 2028	Estimated 2029
Part A.					
FTE Postions					
Directly Appropriated Funds (Bill Pattern)					
Educational and General Funds Non-Faculty Employees	497.8	498.0	498.0	498.0	498.0
Subtotal, Directly Appropriated Funds	**497.8**	**498.0**	**498.0**	**498.0**	**498.0**
Non Appropriated Funds Employees	56.9	46.6	46.6	46.6	46.6
Subtotal, Other Funds & Non-Appropriated	**56.9**	**46.6**	**46.6**	**46.6**	**46.6**
GRAND TOTAL	**554.7**	**544.6**	**544.6**	**544.6**	**544.6**