Scope Development

2019 PEPS Conference

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Presentation Topics

1. Scope Introduction
2. Indefinite Deliverable vs. Specific Deliverable Scopes
3. Scope Negotiation Meetings
4. Unified Transportation Program
5. District Scoping Perspective

Scope Introduction

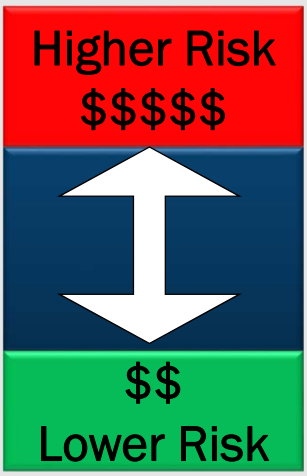
Christopher Franco, P.E.

PEPS Dallas Lead Procurement Engineer

Scope of Work

- Defines the project & expectations
- Defines TxDOT's needs
- Provides the basis for:
  - Staffing needs
  - Unit Costs
  - Other direct expenses

  } LOE
- Reflects project complexity



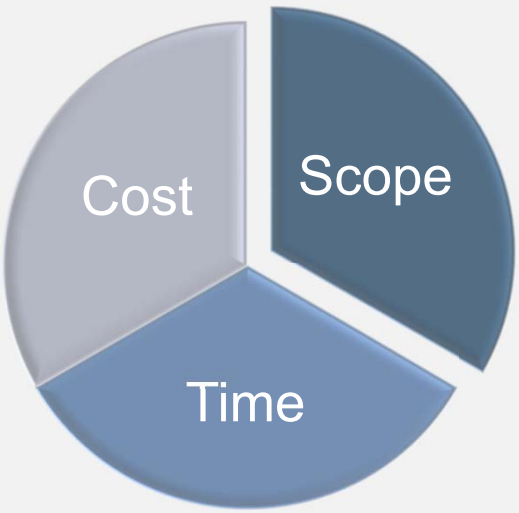
Time invested in scope development saves time, money, effort, & frustration

Scope of Work Identifies:

- Project details
- Project phasing
- Design criteria and other standards
- District SOPs and other preferences
- Full range of tasks and detailed descriptions
- Special analysis requirements
- Software requirements
- Assumptions
- Major milestones
- Deliverables
- Contract administration requirements

Work Breakdown Structure

The three project constraints

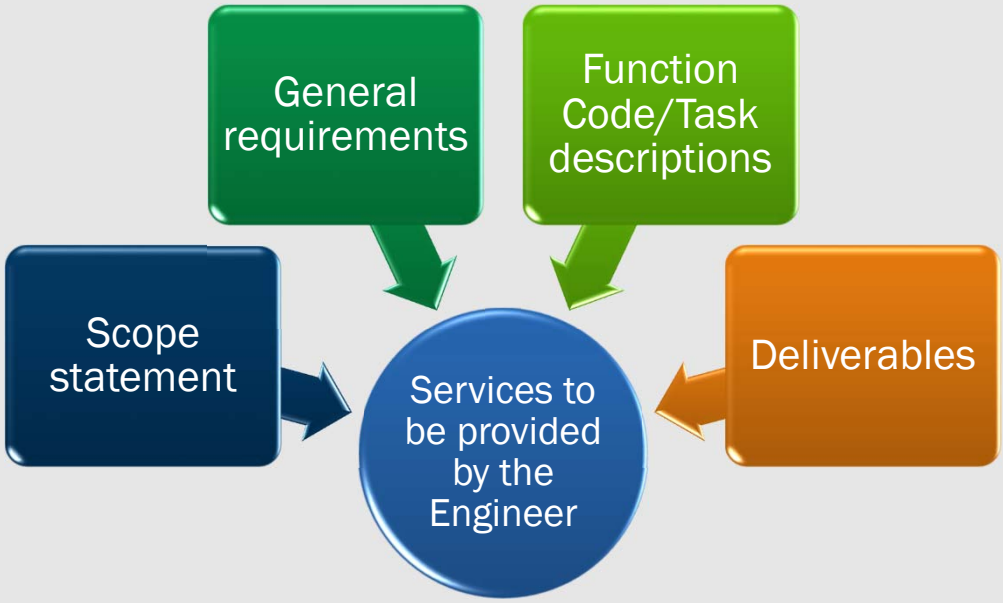


Quality

Main Components

- Contract
- Attachments
  - A: General Provisions
  - B: Services to Be Provided by the State
  - C: Services to Be Provided by the Engineer
  - D: Work Authorization & Supplemental Work Authorization
  - E: Fee Schedule
  - F: Work Schedule (Specific Deliverable only)
  - G: Computer Graphics Files (where applicable)
  - H: DBE/HUB Forms

Elements of a scope



Example: Scope Statement for PS&E

- The Engineer shall provide engineering services required for the preparation of plans, specifications, and estimates (PS&E) and related documents, for various projects in both rural and urban settings.
- These services may include, but are not limited to: preparing roadway and bridge design, hydrologic and hydraulic design, traffic signal design, survey, and geotechnical data collection, and if requested, provide design support and testify as the Engineer of Record at Right of Way hearings, and construction phase services necessary to support the design process.

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Example: General Requirements for PS&E

- Design Criteria. The Engineer shall prepare all work in accordance with the latest version of applicable State's procedures, specifications, manuals, guidelines, standard drawings, and standard specifications or previously approved special provisions and special specifications, which include: the PS&E Preparation Manual, Roadway Design Manual, Hydraulic Design Manual, the Texas Manual on Uniform Traffic Control Devices (TMUTCD), Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (latest Edition), and other State approved manuals.
- When design criteria are not identified in State manuals, the Engineer shall notify the State and refer to the American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Street, (latest Edition). In addition, the Engineer shall follow the State's District guidelines in developing the Plan, Specification, and Estimate (PS&E) package. The Engineer shall prepare each PS&E package in a form suitable for letting through the State's construction contract bidding and awarding process.

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Example FC/Task Descriptions(work breakdown) for PS&E

- 102 (110)-Route and Design Studies
- 120 (120)-Social, Economic/Environmental Studies, & Public Involvement
- 130(130)-Right of Way Data
- 145(145/164)-Project Management and Administration
- 160(150)-Field Surveying and Photogrammetry
- 160(160)-Roadway Design Controls
- 160(161)-Drainage Report
- 160(162)-Signing, Pavement Markings and Signalization
- 160(163)-Miscellaneous (Roadway)
- 160(165)-Traffic Management Systems (Permanent)
- 160(170)-Bridge Design
- 300(351)-Construction Phase Services

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Example Subtask Structure

- 160(160)-Roadway Design Controls
  - 160.1 Geometric Design
  - 160.2 Roadway Design
  - 160.3 Typical Sections
  - 160.4 Mainlane and Frontage Road Design
  - 160.5 Interchange
  - 160.6 Cross Streets
  - 160.7 Cut and Fill Quantities
  - 160.8 Plan Preparation
  - 160.9 Wetlands Information
  - 160.10 Pavement Design
  - 160.11 Pedestrian and Bicycle Facilities

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Example Subtask Description

160.11. Pedestrian and Bicycle Facilities. The Engineer shall coordinate with the State to incorporate pedestrian and bicycle facilities as required or shown on the project's schematic.

All pedestrian/bicycle facilities must be designed in accordance with the latest Americans with Disabilities Act Accessibility Guidelines (ADAAG), the Texas Accessibility Standards (TAS), and the AASHTO Guide for the Development of Bicycle Facilities.

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Example Deliverable for PS&E

30% Plans Submittal

- Eight sets of 11" x 17" plan sheets for the State District Review
- Estimate of construction cost
- Engineer's internal QA & QC markup set
- Form 1002 & Design Exceptions with existing and proposed typical sections, location map & design exception exhibits
- A preliminary 3D model, in DGN format, created using Bentley's OpenRoads and/or 3D MicroStation\Civil tools, & with detail to verify the design of the 30% plan sheets.

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Common Scoping Errors

- Scope does not align with project needs
  - ✓ Scope Creep
- Scope doesn't align with LOE
- Assuming standard scope will cover all project needs
- Repeating General Provisions in the scope

Know what the Standard Agreement says, but don't repeat it in your Scope of Services!

Contract No.

ATTACHMENT A

GENERAL PROVISIONS

ARTICLE 1. WORK AUTHORIZATIONS

A. Use. The Engineer shall not begin any work until the State and the Engineer have signed a work authorization. Costs incurred by the Engineer before a work authorization is fully executed or after the completion date specified in the work authorization are not eligible for reimbursement. All work must be completed on or before the completion date specified in the work authorization, and no work authorization completion date shall extend beyond the contract period set forth in Article 2 of the contract (Contract Period).

B. Contents. Each work authorization will include: (1) types of services to be performed; (2) a period of performance with a beginning and ending date; (3) a full description of the work to be performed; (4) a work schedule with milestones; (5) a cost not to exceed amount, (6) the basis of payment whether cost plus fixed fee, unit cost, lump sum, or specified rate; and (7) a work authorization budget calculated using fees set forth in Attachment E, Fee Schedule. The Engineer is not to include additional contract terms and conditions in the work authorization. In the event of any conflicting terms and conditions between the work authorization and the contract, the terms and conditions of the contract shall prevail and govern the work and costs incurred.

C. Work Authorization Budget. A work authorization budget shall set forth in detail (1) the computation of the estimated cost of the work as described in the work authorization, (2) the estimated time (hours/days) required to complete the work at the hourly rates established in Attachment E, Fee Schedule; (3) a work plan that includes a list of the work to be performed, (4) a stated maximum number of calendar days to complete the work, and (5) a cost-not-to-exceed-amount or unit or lump sum cost and the total cost or price of the work authorization. The State will not pay items of cost that are not included in or rates that exceed those approved in Attachment E.

D. No Guaranteed Work. Work authorizations are issued at the discretion of the State. While it is the State's intent to issue work authorizations hereunder, the Engineer shall have no cause of action conditioned upon the lack or number of work authorizations issued.

E. Incorporation into Contract. Each work authorization shall be signed by both parties and become a part of the contract. No work authorization will waive the State's or the Engineer's responsibilities and obligations

ID vs SD contracts/Scoping Meetings

Chris Henry, P.E.

PEPS Urban Assistant Service Center Manager

Indefinite Deliverable
vs
Specific Deliverable

Scope of Work: ID vs SD Contracts

Indefinite Deliverable

- Generally low in value (<$5M)
- Strict 5-year limit on contract duration

Specific Deliverable

- Generally higher in value (≥$5M)
- Any reasonable duration

Scope of Work: ID vs SD Contracts

Contract Level

- ID Contract: Uses PEPS' standard, discipline-specific scope template
- SD Contracts: Start with PEPS' standard scope templates for applicable disciplines (the "buffet") and cull/add/consolidate as needed

Work Authorization Level

- ID Work Authorization: Scope language MUST match the parent contract, but reduced to only project-specific needs
- SD Work Authorization(s): All or a portion of the scope contained in the contract (note: can vary based on payment terms or project management needs)

Resources: PEPS' Standard ID Scope Templates

Architecture	OVTI
Bridge	PS&E
Commercial Lab	Scheduling Support
Construction Engineering Inspection	Schematic/Environmental
Construction Scheduling Support	Surveying
Geotechnical Engineering	Traffic Engineering
Hydrology & Hydraulic Studies	Traffic Signal Timing
Materials Engineering	Utility Engineering

Again: used as a starting point for SD scope development

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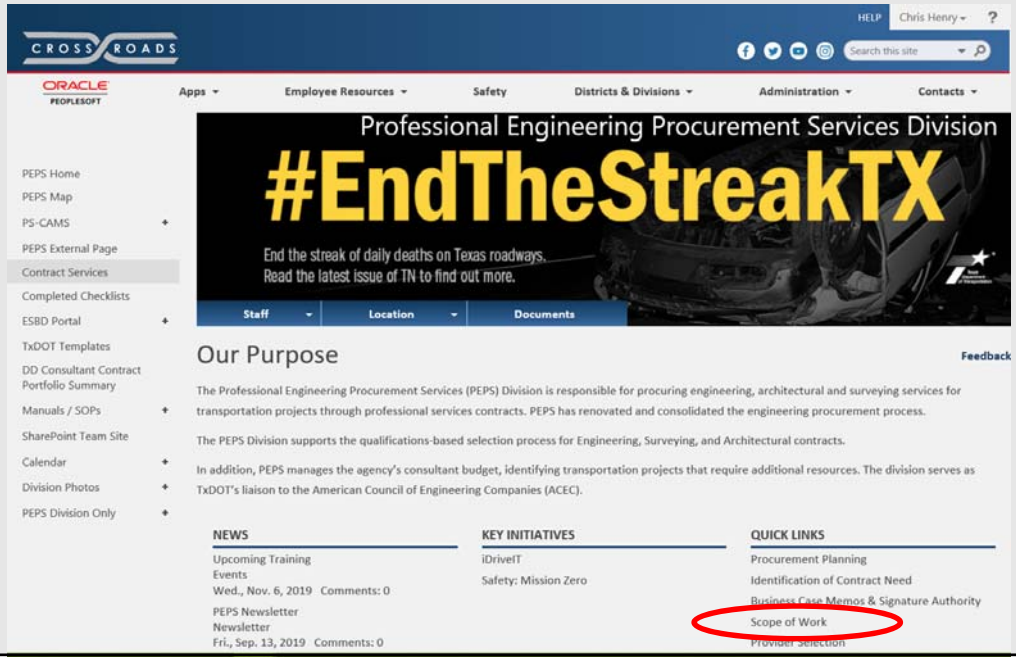
NEW PEPS Standard ID Scope Templates

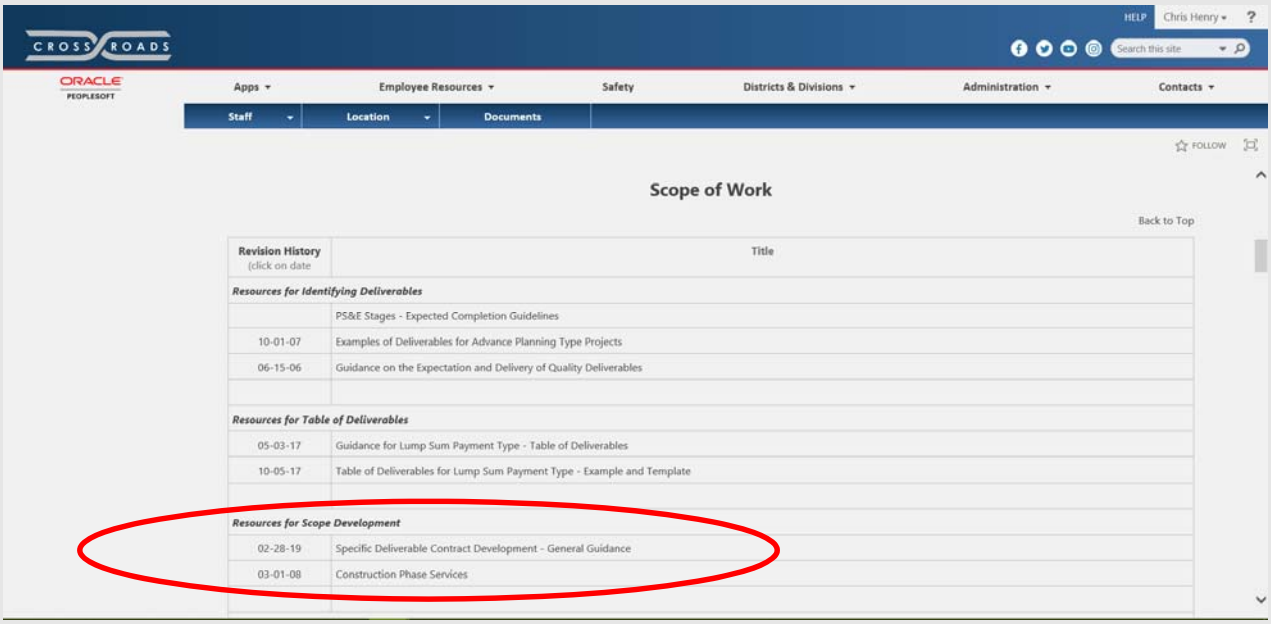
- Roadway Design
- Complex Geotechnical
- Bridge Design
- Drainage Design
- Pavement Design
- Complex Traffic Control
- Signing, Pavement Marking, and Signalization

Intentionally limited scope with 50% DBE goal

Standard Scope Templates for TxDOT Project Managers

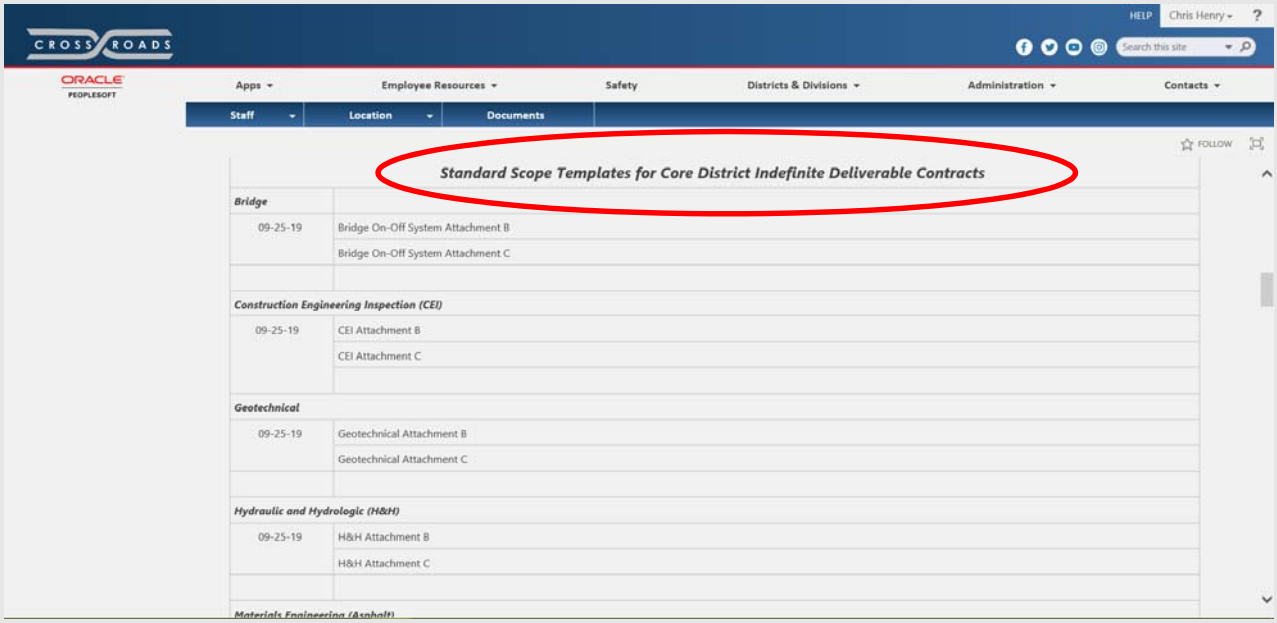


Standard Scope Templates for TxDOT Project Managers



Revision History (click on date	Title
Resources for Identifying Deliverables	
	PS&E Stages - Expected Completion Guidelines
10-01-07	Examples of Deliverables for Advance Planning Type Projects
06-15-06	Guidance on the Expectation and Delivery of Quality Deliverables
Resources for Table of Deliverables	
05-03-17	Guidance for Lump Sum Payment Type - Table of Deliverables
10-05-17	Table of Deliverables for Lump Sum Payment Type - Example and Template
Resources for Scope Development	
02-28-19	Specific Deliverable Contract Development - General Guidance
03-01-08	Construction Phase Services

Standard Scope Templates for TxDOT Project Managers



TxDOT Resources for Specific Deliverable Scope Development

- Indefinite deliverable scope templates a.k.a. “The Buffet”
- Past project scopes
- Sample scopes provided by PEPS

Work closely with PEPS and Contract Services in advance

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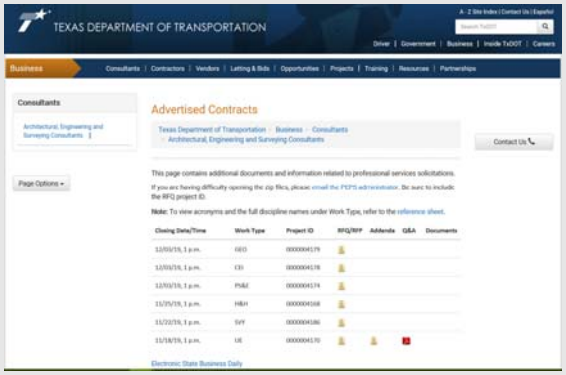
ID/SD Scope Considerations for Consultants

While it is important to have a thorough knowledge of the available, pre-approved scope documents, there are three distinct scopes the consultant Project Manager should focus on:

1. *Advertised Scope*
2. *Executed Contract Scope*
3. *Work Authorization Scope*



Scope Negotiation Meeting

Why have a scope negotiation meeting?

- Advertised scope is either:
  - a standard scope template (ID contracts)
  - a 90% complete project scope (SD Contracts)
- Scope must be discussed to refine the details
- Remember: It is implied when a provider submits that they can provide the ***entire*** scope of work

Goal #1: To establish a good project management plan, in advance

Goal #2: Ensure all parties have a clear understanding of the work and deliverables expected

- Scope and scale of work, risk factors, and other factors impact the schedule and budget… and vice versa.
- In the end, we want a quality project and profitability for the provider that provides good value to the taxpayers

Scope negotiation meeting

- Set tone for project management
- Discuss payment type
- Cover issues that affect consultant's level of effort
- Establish format requirements for fee schedule
- Clarify expectations
- Identify action plan for completing negotiations

A ***quality*** Management Plan will produce a ***quality*** project.

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Scope Negotiation Meeting Participants

TxDOT Project Manager

Provider Project Manager

PEPS Procurement Engineer

TxDOT and provider participants with decision making authority (PM or other)

Other staff as appropriate

- Discipline Specialists
- Area Engineer
- Subproviders
- Contract Administrator

Documentation

- Document all communications
  - E-mails
  - Meeting notes
  - Phone conversation notes
  - Internal notes
- Maintain documentation of all communications

UTP / District Scoping Perspective

Michael Haithcock, P.E.

Director of TP&D, Abilene District

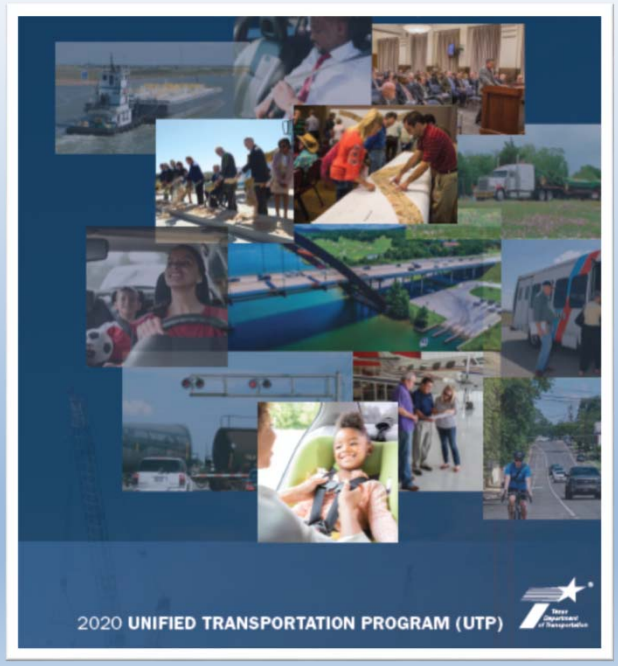
PEPS IS DOING AWESOME

- Since February of 2019, PEPS has steadily faced over 250 work authorizations coming in every month for review and approval.
- TxDOT actually executed over $1.4 Billion in work authorizations in FY 2019.
- For FY 2019, TxDOT executed a total number of 1,412 individual work authorizations for an amount totaling $1.45 Billion.
- This represents another new record for TxDOT as we far surpassed the $1.03 Billion in actual work authorizations issued in FY 2018.

BEST PRACTICES

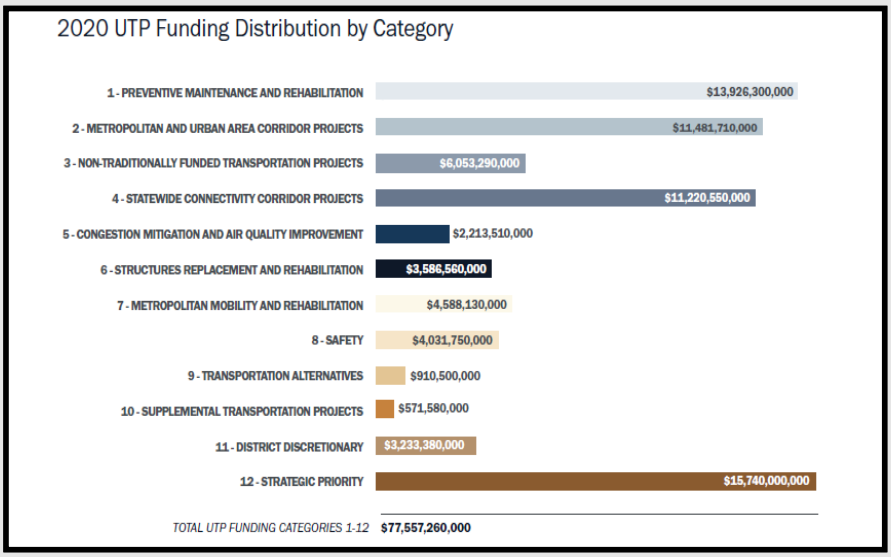
Let's start with a good understanding of TxDOT

The best reference guide is the UTP



How the UTP benefits Texans

- Transparency
- Accountability
- Financial Responsibility
- Coordination with Stakeholders
- Performance-based Decision Making
- Efficient Use of Resources



Advancing a Project Through the UTP

ADVANCING A PROJECT THROUGH THE UTP

Transportation projects are identified years in advance of their actual funding and construction, and the UTP is focused on identifying and managing the volume of projects that are to be advanced from their planning phases through detailed project development to construction. For a project to become reality, it must pass through many developmental steps, including establishing a need or problem, exploring alternatives, studying potential impacts and costs, gathering input from the public and local officials, acquiring right of way, designing structures and roadways, and awarding construction contracts. At any point along this path, TxDOT and its planning partners (MPOs and regional transportation authorities) may alter their decisions to implement projects as a result of changing conditions or expectations, or the project may evolve based on changing community needs, environmental findings, or cost considerations.

Before a mobility or connectivity project reaches construction, it proceeds through TxDOT's three major stages of project advancement: Plan Authority, Develop Authority, and Construct Authority. In each stage, a project is authorized for specific progressive steps in the development and funding process.

Plan Authority (Outside the UTP)

Plan Authority is the holding area for proposed future projects. At this stage, a project is likely only a rough concept, and no funds may be expended to develop the project other than the completion of feasibility studies. Many projects in Plan Authority will eventually enter the UTP development pipeline and be authorized for expenditures. Other proposed projects may be reconsidered or eliminated based on changing priorities.

Develop Authority (UTP Years 5-10)

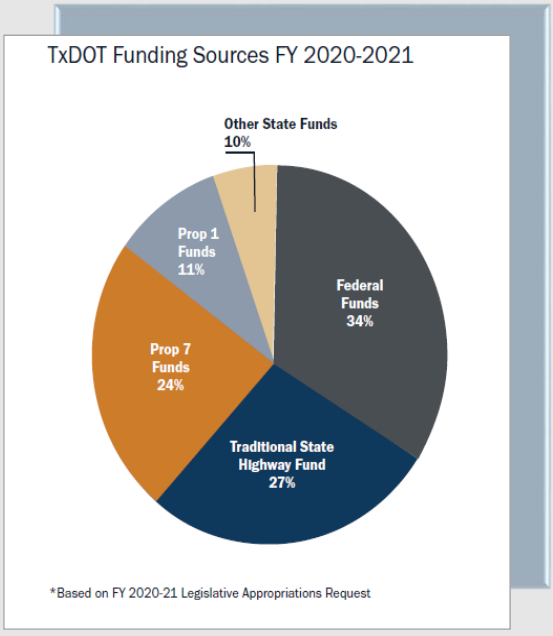
Projects in Develop Authority are authorized to begin preliminary design, environmental review, cost estimates, and other early development activities. To advance into Develop Authority, a project must rank highly among other potential projects at the regional level, and the project's estimated construction cost must fit within the 10-year planning constraints. With the authorization of the UTP, TxDOT districts determine when projects are ready to move into Develop Authority.

Construct Authority (UTP Years 1-4)

Projects in Construct Authority can proceed to the final stages of development in preparation for construction. This includes completed plans, specifications, and estimates (PS&E); right of way acquisition; utility relocation; railroad adjustments; and other local agreements. To advance to Construct Authority, a project must be on track to let for construction in UTP years 1-4 based on its development progress. The project must also be fully funded for the amount of the estimated construction cost. TxDOT Districts determine when projects are ready to move into Construct Authority.

Projects that will be ready for construction within the first two years of the UTP are listed in TxDOT's two-year Letting Schedule. Let Authority is considered a subset of Construct Authority.

FIGURE 7
A Project's Path through the UTP



Connecting UTP Funding Categories to Strategic Goals

STRATEGIC GOALS

	% OF PROGRAMMED FUNDS	PROMOTE SAFETY	PRESERVE OUR ASSETS	OPTIMIZE PERFORMANCE
CATEGORY 1 - PREVENTIVE MAINTENANCE AND REHABILITATION				
Roadway resurfacing	43%	○	●	
Roadway rehabilitation and restoration	40%	○	●	
Added passing lanes (Super 2)	5%	○		●
Signals, lighting, signs, striping, etc.	4%	●		
All other project types	8%			
CATEGORY 2 - METROPOLITAN AND URBAN CORRIDORS				
Road widening (freeway or non-freeway)	70%	○	○	●
Interchange improvements	13%	○		●
Roadway operational improvements	6%	○		●
Roadway resurfacing or rehabilitation	6%	○	●	
All other project types	5%			
CATEGORY 4 - CONNECTIVITY CORRIDORS				
Road widening (freeway or non-freeway)	66%	○	○	●
Interchange improvements	15%	○		●
New-location roadway	7%			●
Roadway operational improvements	5%	○		●
Added passing lanes (Super 2)	4%	○		●
All other project types	3%			
CATEGORY 5 - CONGESTION MITIGATION AND AIR QUALITY				
Intersection or interchange improvements	49%	○		●
Local transit, commute alternatives	18%			●
Bike and pedestrian infrastructure	17%	○		●
Traffic management technology	8%	○		●
HOV/Managed lanes	5%			●
All other project types	3%			
CATEGORY 6 - STRUCTURES (BRIDGE)				
Bridge structure replacement	84%	○	●	○
Bridge repair or maintenance	8%	○	●	
Bridge rehabilitation or widening	5%	○	●	○
Road widening (freeway or non-freeway)	2%	○	○	●

● PRIMARY GOAL ADDRESSED
○ SECONDARY GOAL ADDRESSED

STRATEGIC GOALS

	% OF PROGRAMMED FUNDS	PROMOTE SAFETY	PRESERVE OUR ASSETS	OPTIMIZE PERFORMANCE
CATEGORY 7 - METROPOLITAN MOBILITY AND REHABILITATION				
Road widening (freeway or non-freeway)	53%	○	○	●
New-location roadway	11%			●
Roadway resurfacing or rehabilitation	8%	○	●	
Interchange improvements	7%	○		●
Local transit, commute alternatives	7%			●
All other project types	14%			
CATEGORY 8 - SAFETY				
Medians, shoulders, pavement width	29%	●		○
Signals, lighting, signs, etc.	24%	●		
Guard rails and safety grates	22%	●		
Rumble strips and pavement markings	13%	●		
Grade separations and rail crossings	13%	●		○
CATEGORY 9 - TRANSPORTATION ALTERNATIVES				
Bike and pedestrian infrastructure	85%	○		●
Safety rest areas	12%	●		
All other project types	2%			
CATEGORY 10 - SUPPLEMENTAL TRANSPORTATION PROGRAMS				
Border highway infrastructure	24%	○	○	●
State park road maintenance	17%		●	
Emergency repairs	15%	●	○	
Bike and pedestrian infrastructure	13%	○		●
Ferry boats and facilities	8%			●
All other project types	24%			
CATEGORY 11 - DISTRICT DISCRETIONARY				
Roadway resurfacing or rehabilitation	59%	○	●	
Added passing lanes (super 2)	15%	○		●
Road widening (non-freeway)	10%	○	○	●
Roadway operational improvements	7%	○		●
All other project types	10%			
CATEGORY 12 - STRATEGIC PRIORITY				
Road widening (freeway or non-freeway)	76%	○	○	●
Interchange improvements	13%	○		●
New-location roadway	6%			●
All other project types	5%			

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Cat 1 – PM Projects

2020 UTP FUNDING CATEGORY DETAILS

FUNDING CATEGORY	Description	Allocation or Distribution	Project Selection Guidelines
1 Preventive Maintenance and Rehabilitation	Category 1 addresses preventive maintenance and rehabilitation of the existing state highway system, including pavement, signs, traffic signals, and other infrastructure assets. **Preventive Maintenance** Defined as work to preserve, rather than improve, the structural integrity of a pavement or structure. Examples of preventive maintenance activities include asphalt concrete pavement (ACP) overlays (two-inch thick maximum), seal coats, cleaning and sealing joints and cracks, patching concrete pavement, milling or bituminous level-up, shoulder repair, micro-surfacing, scour countermeasures, restoring drainage systems, cleaning and painting steel members to include application of other coatings, cleaning and sealing bridge joints, bridge deck protection, cleaning and resetting bearings, cleaning rebar/strand, and patching structural concrete. **Rehabilitation** Funds are intended for the repair of existing main lanes, structures, and frontage roads. Rehabilitation of an existing two-lane highway to a Super 2 highway (with passing lanes) may be funded within this category. The installation, replacement, and/or rehabilitation of signs and their appurtenances, pavement markings, thermoplastic striping, traffic signals, and illumination systems, including minor roadway modifications to improve operations, are also allowed under this category. Funds can be used to install new traffic signals as well as modernize existing signals.	Funding is allocated to each TxDOT district based on the following formulas: **Preventive Maintenance** A total allocation is calculated per district using the weighted criteria below. 98% is directed toward roadway preventive maintenance and 2% directed toward bridge preventive maintenance. • 65% - On-system lane miles • 33% - Pavement distress score factor • 2% - Square footage of on-system-bridge deck area **Rehabilitation** • 32.5% - Three-year average lane miles of pavement with distress scores <70 • 20% - Vehicle miles traveled per lane mile (on system) • 32.5% - Equivalent single-axle load miles (on and off system and interstate) • 15% - Pavement distress scores pace factor *See note at end of section*	TxDOT districts select projects using a performance-based prioritization process that assesses district-wide maintenance and rehabilitation needs. The Texas Transportation Commission allocates Category 1 funds to each district using an allocation formula.

Cat 1 – Preventative Maintenance

- Pavement Condition
- Skidding / Accident History
- Drainage
- Slope Correction
- Guardrail Upgrades / Culvert End Treatments
- Clearzone Requirements
- Ramp Length and Ramp Upgrades
- Small Sign Replacement / Large Sign Replacement
- Roadway Width / Bridge Width
- Coordinate with Area Engineer / County Maintenance Supervisor

Cat 2 – The MPO Projects

FUNDING CATEGORY	Description	Allocation or Distribution	Project Selection Guidelines
2 Metropolitan and Urban Area Corridor Projects	Category 2 addresses mobility and added capacity projects on urban corridors to mitigate traffic congestion, as well as traffic safety and roadway maintenance or rehabilitation. Projects must be located on the state highway system. The Texas Transportation Commission allocates funds to each metropolitan planning organization (MPO) in the state, by formula. MPOs select and score projects for this category. Common project types include roadway widening (both freeway and non-freeway), interchange improvements, and roadway operational improvements.	Each MPO shall receive an allocation of Category 2 based on the following formula: **Category 2 Metropolitan (2M)** Using the following formula, 87% of Category 2 funding is allocated to MPOs with populations of 200,000 or greater — known as transportation management areas (TMAs). • 30% - Total vehicle miles traveled (on and off system) • 17% - Population • 10% - Lane miles (on system) • 14% - Truck vehicle miles traveled (on system) • 7% - Percentage of census population below the federal poverty level • 15% - Based on congestion • 7% - Fatal and incapacitating crashes **Category 2 Urban (2U)** Using the following formula, 13% of Category 2 funding is allocated to non-TMA MPOs (population less than 200,000).	MPOs select projects in consultation with TxDOT districts using a performance-based prioritization process that assesses mobility needs within the MPO boundaries. Project funding must be authorized by the Texas Transportation Commission.

Cat 2 - MPO Projects

SAFETY	CONGESTION	CONNECTIVITY	PROJECT MANAGEMENT
SAFE AND EFFICENT TRAFFIC MOVEMENT	INCREASING TRAFFIC VOLUMES	WIDENING AND RELOCATION OF ROADWAYS	COMPLEX ENVIRONMENTAL DOCUMENTS RIGHT OF WAY ACQUISTION UTILITY RELOCATION

Where to Find Highway Law

Most highway law is compiled and organized (codified) into title 23, United States Code

- Program eligibilities
- Federal share
- Apportionment formulas

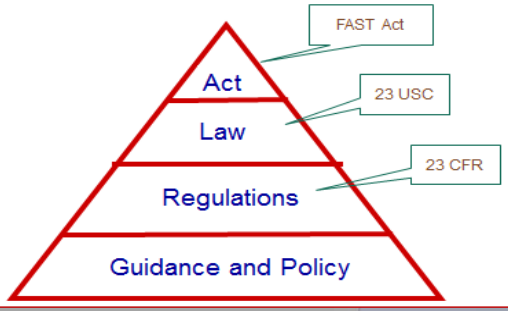
Some provisions are not codified in title 23

- Uniform Relocation Act
- Americans with Disabilities Act of 1990
- MAP-21 authorization of funds

Codified or not, the law is the law

U.S. Department of Transportation
Federal Highway Administration

Hierarchy of Laws and Regulations



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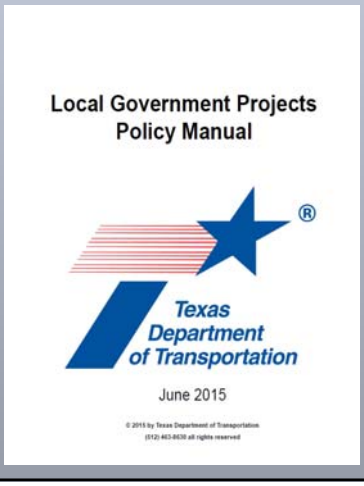
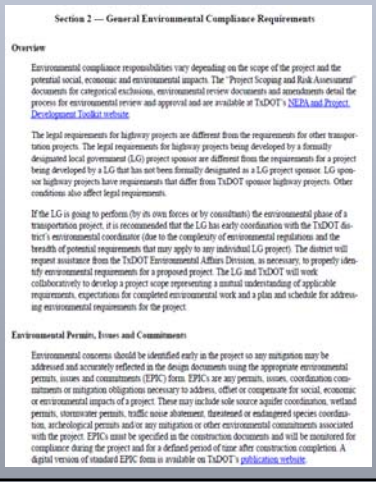
Cat 3 – Local Government Projects

3 Non-Traditionally Funded Transportation Projects			
	Category 3 is for transportation projects that qualify for funding from sources not traditionally part of the State Highway Fund, including state bond financing (such as Proposition 12 and Proposition 14), the Texas Mobility Fund, pass-through financing, regional revenue and concession funds, and local funding. Common project types include new-location roadways, roadway widening (both freeway and non-freeway), and interchange improvements.	Funding is determined by state legislation, Texas Transportation Commission-approved minute order, or local government commitments.	Projects are determined by state legislation, Texas Transportation Commission-approved minute order, or local government commitments.


Local Government Projects Policy Manual

Texas Department of Transportation

June 2015


Section 2 — General Environmental Compliance Requirements

Overview

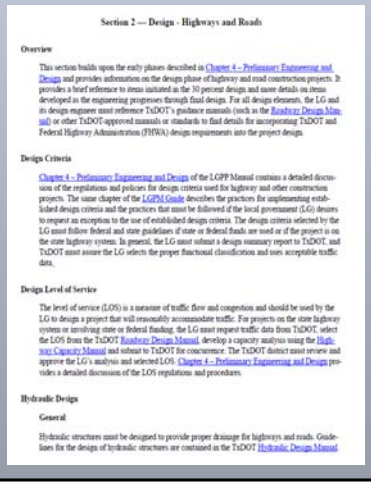
Environmental compliance responsibilities vary depending on the scope of the project and the potential social, economic and environmental impacts. The "Project Scoping and Risk Assessment" documents for categorical exclusions, environmental review documents and amendments detail the process for environmental review and approval and are available at TxDOT's NEPA and Project Development Toolkit website.

The legal requirements for highway projects are different from the requirements for other transportation projects. The legal requirements for highway projects being developed by a formally designated local government (LG) project sponsor are different from the requirements for a project being developed by a LG that has not been formally designated as a LG project sponsor. LG sponsor highway projects have requirements that differ from TxDOT sponsor highway projects. Other conditions also affect legal requirements.

If the LG is going to perform (by its own forces or by consultants) the environmental phase of a transportation project, it is recommended that the LG has early coordination with the TxDOT district's environmental coordinator (due to the complexity of environmental regulations and the breadth of potential requirements that may apply to any individual LG project). The district will request assistance from the TxDOT Environmental Affairs Division, as necessary, to properly identify environmental requirements for a proposed project. The LG and TxDOT will work collaboratively to develop a project scope representing a mutual understanding of applicable requirements, expectations for completed environmental work and a plan and schedule for addressing environmental requirements for the project.

Environmental Permits, Issues and Commitments

Environmental concerns should be identified early in the project so any mitigation may be addressed and accurately reflected in the design documents using the appropriate environmental permits, issues and commitments (EPIC) form. EPICs are any permits, issues, coordination commitments or mitigation obligations necessary to address, offset or compensate for social, economic or environmental impacts of a project. These may include sole source aquifer coordination, wetland permits, stormwater permits, traffic noise abatement, threatened or endangered species coordination, archeological permits and/or any mitigation or other environmental commitments associated with the project. EPICs must be specified in the construction documents and will be monitored for compliance during the project and for a defined period of time after construction completion. A digital version of standard EPIC form is available on TxDOT's publication website.


Section 2 — Design - Highways and Roads

Overview

This section builds upon the early phases described in Chapter 4 – Preliminary Engineering and Design and provides information on the design phase of highway and road construction projects. It provides a brief reference to items initiated in the 30 percent design and more details on items developed as the engineering progresses through final design. For all design elements, the LG and its design engineer must reference TxDOT's guidance manuals (such as the Roadway Design Manual) or other TxDOT-approved manuals or standards to find details for incorporating TxDOT and Federal Highway Administration (FHWA) design requirements into the project design.

Design Criteria

Chapter 4 – Preliminary Engineering and Design of the LGPP Manual contains a detailed discussion of the regulations and policies for design criteria used for highway and other construction projects. The same chapter of the LGPM Guide describes the practices for implementing established design criteria and the practices that must be followed if the local government (LG) desires to request an exception to the use of established design criteria. The design criteria selected by the LG must follow federal and state guidelines if state or federal funds are used or if the project is on the state highway system. In general, the LG must submit a design summary report to TxDOT, and TxDOT must assure the LG selects the proper functional classification and uses acceptable traffic data.

Design Level of Service

The level of service (LOS) is a measure of traffic flow and congestion and should be used by the LG to design a project that will reasonably accommodate traffic. For projects on the state highway system or involving state or federal funding, the LG must request traffic data from TxDOT, select the LOS from the TxDOT Roadway Design Manual, develop a capacity analysis using the Highway Capacity Manual and submit to TxDOT for concurrence. The TxDOT district must review and approve the LG's analysis and selected LOS. Chapter 4 – Preliminary Engineering and Design provides a detailed discussion of the LOS regulations and procedures.

Hydraulic Design

General

Hydraulic structures must be designed to provide proper drainage for highways and roads. Guidelines for the design of hydraulic structures are contained in the TxDOT Hydraulic Design Manual.

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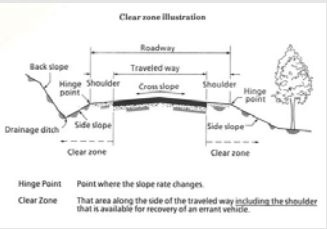
Cat 4 – Connectivity

FUNDING CATEGORY	Description	Allocation or Distribution	Project Selection Guidelines
4 Statewide Connectivity Corridor Projects	Category 4 addresses mobility on major state highway system corridors, which provide connectivity between urban areas and other statewide corridors. Projects must be located on the designated highway connectivity network that includes: • The Texas Highway Trunk System • National Highway System (NHS) • Connections to major sea ports or border crossings • National Freight Network • Hurricane evacuation routes The designated connectivity network was selected by the Texas Transportation Commission and includes three corridor types: • Mobility corridors—High-traffic routes with potential need for additional roadway capacity • Connectivity corridors—Two-lane roadways requiring upgrade to four-lane divided • Strategic corridors—Routes that provide unique statewide connectivity, such as Ports-to-Plains	**Category 4 Regional Connectivity** Funds distributed to specific projects based on performance scoring thresholds and qualitative analysis. **Category 4 Urban Connectivity** Funds distributed using the same formula as Category 2	TxDOT districts select Category 4 Regional projects in consultation with TxDOT's Transportation Planning and Programming Division using a performance-based prioritization process that assesses mobility needs on designated connectivity corridors in the district. TxDOT districts select Category 4 Urban projects in consultation with MPOs using a similar prioritization process. All Category 4 funding must be authorized by the Texas Transportation Commission.



Cat 6 – Bridge Replacement and Bridge Maintenance

6
Structures Replacement and Rehabilitation (Bridge)

Category 6 addresses bridge improvements through the following sub-programs.

Highway Bridge Program
For replacement or rehabilitation of eligible bridges on and off the state highway system that are considered functionally obsolete or structurally deficient. Bridges with a sufficiency rating below 50 are eligible for replacement. Bridges with a sufficiency rating of 80 or less are eligible for rehabilitation. A minimum of 15% of the funding must go toward replacement and rehabilitation of off-system bridges.

Railroad Grade Separation
For elimination of at-grade highway-railroad crossings through the construction of highway overpasses or railroad underpasses, and rehabilitation or replacement of deficient railroad underpasses on the state highway system.

Bridge Maintenance and Improvement Program
For rehabilitation of eligible bridges on the state highway system.

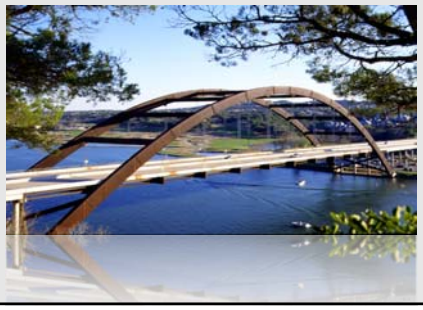
Category 6 funding is allocated to TxDOT's Bridge Division, which selects projects statewide.

TxDOT's Bridge Division selects projects using a performance-based prioritization process.

Highway Bridge projects are ranked first by deficiency categorization (e.g., structurally deficient) and then by sufficiency ratings.

Railroad Grade Separation projects are selected based on a cost-benefit analysis of factors such as vehicle and train traffic, accident rates, casualty costs, and delay costs for at-grade railroad crossings.

Projects in the **BMIP** are selected statewide based on identified bridge maintenance/improvement needs.



Cat 8 – Safety

8
Safety

Category 8 addresses highway safety improvements through the sub-programs listed below. Common Category 8 project types include new medians and shoulders; signals, lighting and signs; guard rails; and rumble strips.

Highway Safety Improvement Program (HSIP)
Safety-related projects on and off the state highway system. High Risk Rural Roads projects previously authorized remain in Category 8. Safe Routes to School projects previously authorized remain in Category 8. Future Safe Routes to School projects will be managed under Category 9.

Safety Bond Program
Allocations for the safety bond program are approved by the Texas Transportation Commission, with the program managed as an allocation program on a statewide basis.

Systemic Widening Program
Roadway widening projects on the state highway system.

Federal Railway Set-Aside
Funding set aside from HSIP for safety improvements to reduce fatalities, injuries, and crashes at public at-grade crossings.

Road to Zero (RTZ)
Funding on the state highway system dedicated to target and reduce fatalities and suspected serious injuries in the three highest contributing categories: roadway and lane departure, intersection safety, and pedestrian safety.

Category 8 funding is allocated to TxDOT's Traffic Safety Division, which selects projects statewide.

TxDOT's Traffic Safety Division evaluates, ranks, and selects projects using federally mandated safety indices.

Highway Safety Improvement Program
Projects are evaluated using three years of crash data and ranked by safety improvement index.

Safety Bond Program
Projects are evaluated using the safety improvement index, roadway safety characteristics, and anticipated time required to complete a candidate project.

Systemic Widening Program
Projects are evaluated by roadway safety features for preventable severe crash types using total risk factor weights.

Federal Railway Set-Aside
Projects are evaluated using the railroad crossing index

Road to Zero
Projects are evaluated by roadway safety factors, crash reduction factors, the safety improvement index, and time required to complete a candidate project. All evaluation factors are directly tied to the targeted top three contributing categories in fatalities and suspected serious injuries.

FUNDING CATEGORY

Cat 8 – Safety

Cat 12 – Strategic Priority

12
Strategic Priority

Category 12 addresses projects with specific importance to the state, including those that improve:

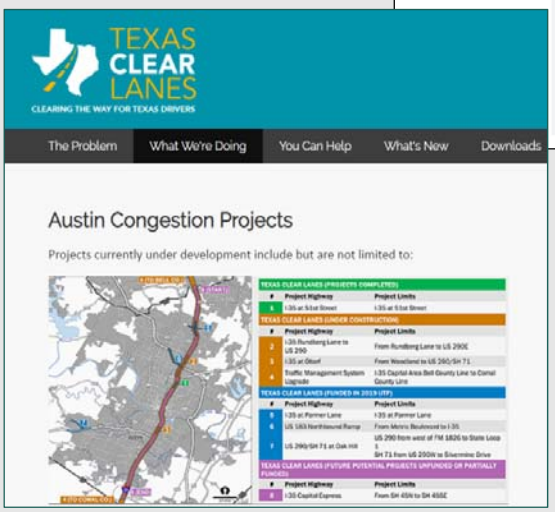
- Congestion and connectivity
- Economic opportunity
- Energy sector access
- Border and port connectivity
- Efficiency of military deployment routes or retention of military assets in response to the Federal Military Base Realignment and Closure Report
- The ability to respond to both man-made and natural emergencies

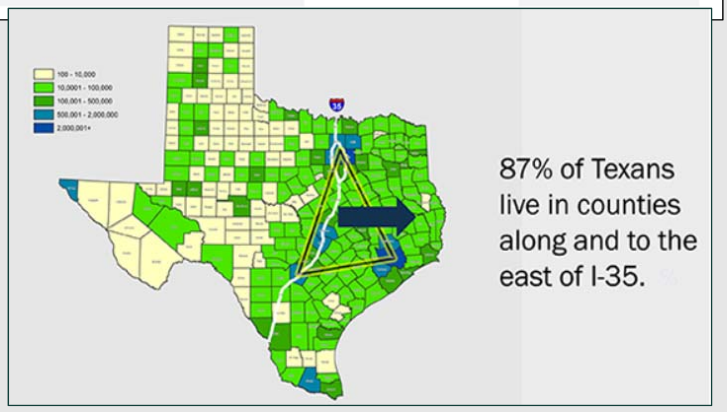
Common project types include roadway widening (both freeway and non-freeway), interchange improvements, and new-location roadways.

Funding in Category 12 is awarded to specific projects at the discretion of the Texas Transportation Commission, which selects from candidate projects nominated by TxDOT districts and MPOs.

Texas Clear Lanes
This subset of Category 12 projects is prioritized in collaboration with the MPOs in the state's five largest metro areas (Dallas, Fort Worth, Houston, San Antonio, and Austin). Projects are intended to address the top 100 most-congested segments in the state (directly and indirectly).

The Texas Transportation Commission selects projects statewide using a performance-based prioritization process.





87% of Texans live in counties along and to the east of I-35.

Learn about each TxDOT District

Abilene District

2020 Unified Transportation Program (UTP)

Using 165 miles of I-20 as a crossroads corridor, the Abilene District bridges Central and West Texas and serves as a hub for agriculture, energy, and education/medical services across 13 counties. The City of Abilene is one of the largest in West Texas and has a very active and engaging metropolitan planning organization (MPO). The district's dedicated staff of transportation professionals is committed to understanding local needs, proactively seeking input, and prioritizing projects so planning priorities align with residents' expectations.

Did You Know?

- District highways carry heavy truck traffic from the Permian Basin and Barnett Shale to their final destination.
- Numerous wind farms across the region and local farming generate a significant amount of traffic across the district.

DISTRICT HIGHLIGHTS

The Abilene District values public feedback for localized and systemic district projects. District staff stress public outreach well before any project begins and continues to seek input at all points throughout planning, design, development, and construction of projects. The district uses public meetings and social media to continually seek input from residents.

One example of this approach was the recent Vision 20/20 study, which gathered public and other stakeholder input throughout the district on the future of I-20. TxDOT hosted six public meetings, sent hundreds of mailers, and offered an online survey to understand the public's greatest needs. Nearly 600 residents provided input that will inform projects' design.

Planning and Programming

As a rural district, Abilene uses progressive and innovative techniques to develop internal talent, applying years of diverse in-house expertise to planning and programming processes. This approach allows the district to address issues from a variety of perspectives to ultimately arrive at the best solution with the greatest impact.

The Abilene District is also proactive in its approach to planning, aiming to be ahead of problems by listening to the input of district residents and businesses. The district staff does not wait for a problem to develop, but instead seeks public input as soon as possible to get ahead of an issue – planning out five to ten years of the UTP instead of just the short term.

The focus shifts to funding as the development finish line gets closer, and district staff revise plans over the course of the project to adjust for changing circumstances. This approach allows for adjusting and shifting resources as needed.

FAST FACTS

Population	More than 268,700
Square Miles	Nearly 11,800
Daily Vehicle Miles	8.2 million
Lane Miles	More than 8,400
Registered Vehicles	More than 261,000

How to Stay Involved

- Abilene TxDOT District page
- District Projects and Studies page
- TxDOT Hearings and Meetings schedule
- Abilene Metropolitan Planning Organization (click on "Public Participation" to get involved with regional transportation plans)
- Contact the district by email

Abilene District: 2020 Planning Targets by Category

Funding Category

Priorities

The Abilene District is constantly maintaining the pavement, bridges, drainage, and traffic control for 165 miles of I-20. In addition to maintenance of the system, the district has a pavement maintenance plan to account for yearly replacement, and staff monitor the overall program on a regular basis. The district is also considering several improvements, including additional lanes, reconfigured ramps, and designs to improve safety and enhance the movement of traffic. Abilene is working on a plan for widening I-20 to three lanes in each direction from the east city limits to the west city limits, and that plan is currently in the schematic and environmental phase.

The Abilene Metropolitan Planning Organization is an active and ardent advocate for transportation in the region. For many years the MPO has identified FM 89 Buffalo Gap Road from north of Winters Freeway to just past Chimney Rock Road as its top regional priority. The Abilene District is conducting the design and project management for this $25M project, and the proposed improvements will include additional lanes, traffic signals, sound walls, congestion mitigation, and access management. Specific design features include a raised median, curb and gutter, longitudinal drainage system, consolidation of driveways, sidewalks, bicycle accommodation, and various safety lighting. Other important MPO projects that the Abilene District is designing and managing include US 83 at FM 3034 Interchange and the US 83/84 Frontage Road from FM 707 to Antilley Road.

UTP statewide connectivity corridor funding and UTP strategic priority funding have also facilitated projects in the district that significantly impact safety and regional connectivity. For instance, I-20 West to US 84 North is the primary route to Lubbock and Amarillo and has an interchange that is being redesigned. Environmental and schematic phases are currently underway, and the district has made delivery of the $45M interchange of utmost importance.

Make sure to visit TxDOT's Project Tracker website to view up-to-date information transportation projects: www.txdot.gov/pt

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TxDOT FUNDING CATEGORIES

1. Preventive Maintenance and Rehabilitation
2. Metropolitan and Urban Area Corridor Projects
3. Non-Traditionally Funded Transportation Projects
4. Statewide Connectivity Corridor Projects
5. Congestion Mitigation and Air Quality Improvement
6. Structures Replacement and Rehabilitation
7. Metropolitan Mobility and Rehabilitation
8. Safety
9. Transportation Alternatives Program
10. Supplemental Transportation Projects
11. District Discretionary
12. Strategic Priority

Public meeting, Taylor County

KEY DISTRICT PROJECTS & PROGRESS

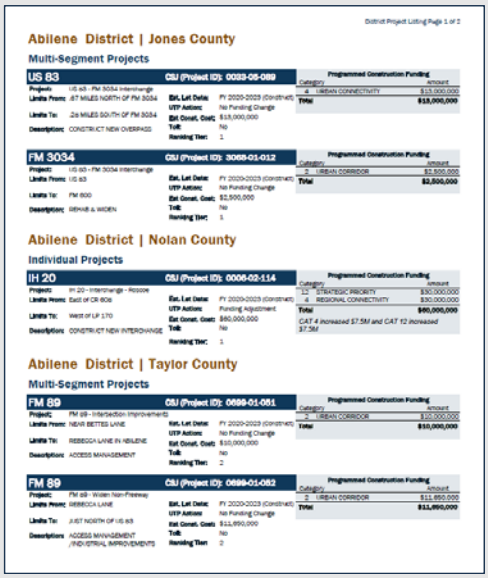
Long Term (Five or more years)

- I-20, Taylor County: widening through Abilene city limits to six lanes
- FM 707, Taylor County: widening from FM 89 to US 83 with added capacity
- US 83/84, Taylor County: interchange in south Taylor County

Short Term (Four or fewer years)

- Buffalo Gap Road, Taylor County: widening, access management, and safety improvements
- US 83/84 Frontage Road, Taylor County: addition North of E Spur 707 to north of Antilley Road
- IH 20, Nolan County: IH 20/US 84 Roscoe interchange improvements
- US 83/ FM 3034 , Jones County: overpass
- US 83, Taylor County: Super 2 South of Tuscola to Runnels County Line

Learn about other projects in each TxDOT District



District Project Listing Page 1 of 2

Abilene District | Jones County

Multi-Segment Projects

US 83 — CSJ (Project ID): 0033-05-089

Project: US 83 - FM 3034 Interchange
Limits From: .67 MILES NORTH OF FM 3034
Limits To: .26 MILES SOUTH OF FM 3034
Description: CONSTRUCT NEW OVERPASS
Est. Let Date: FY 2020-2023 (Constraint)
UTP Actions: No Funding Change
Est Const. Cost: $13,000,000
Toll: No
Ranking Tier: 1

Programmed Construction Funding

Category		Amount
4	URBAN CONNECTIVITY	$13,000,000
Total		$13,000,000

FM 3034 — CSJ (Project ID): 3068-01-012

Project: US 83 - FM 3034 Interchange
Limits From: US 83
Limits To: FM 600
Description: REHAB & WIDEN
Est. Let Date: FY 2020-2023 (Constraint)
UTP Actions: No Funding Change
Est Const. Cost: $2,500,000
Toll: No
Ranking Tier: 1

Programmed Construction Funding

Category		Amount
2	URBAN CORRIDOR	$2,500,000
Total		$2,500,000

Abilene District | Nolan County

Individual Projects

IH 20 — CSJ (Project ID): 0006-02-114

Project: IH 20 - Interchange - Roscoe
Limits From: East of CR 609
Limits To: West of LP 170
Description: CONSTRUCT NEW INTERCHANGE
Est. Let Date: FY 2020-2023 (Constraint)
UTP Actions: Funding Adjustment
Est Const. Cost: $60,000,000
Toll: No
Ranking Tier: 1

Programmed Construction Funding

Category		Amount
12	STRATEGIC PRIORITY	$30,000,000
4	REGIONAL CONNECTIVITY	$30,000,000
Total		$60,000,000

CAT 4 increased $7.5M and CAT 12 increased $7.5M

Abilene District | Taylor County

Multi-Segment Projects

FM 89 — CSJ (Project ID): 0699-01-051

Project: FM 89 - Intersection Improvements
Limits From: NEAR BETTES LANE
Limits To: REBECCA LANE IN ABILENE
Description: ACCESS MANAGEMENT
Est. Let Date: FY 2020-2023 (Constraint)
UTP Actions: No Funding Change
Est Const. Cost: $10,000,000
Toll: No
Ranking Tier: 2

Programmed Construction Funding

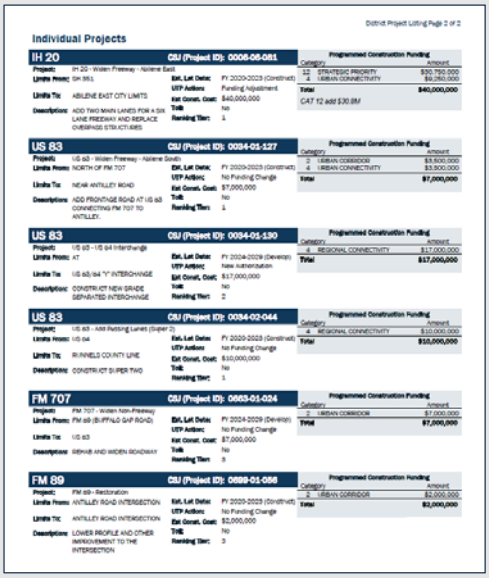
Category		Amount
2	URBAN CORRIDOR	$10,000,000
Total		$10,000,000

FM 89 — CSJ (Project ID): 0699-01-052

Project: FM 89 - Widen Non-Freeway
Limits From: REBECCA LANE
Limits To: JUST NORTH OF US 83
Description: ACCESS MANAGEMENT /INDUSTRIAL IMPROVEMENTS
Est. Let Date: FY 2020-2023 (Constraint)
UTP Action: No Funding Change
Est Const. Cost: $11,950,000
Toll: No
Ranking Tier: 2

Programmed Construction Funding

Category		Amount
2	URBAN CORRIDOR	$11,950,000
Total		$11,950,000



District Project Listing Page 2 of 2

Individual Projects

IH 20 — CSJ (Project ID): 0006-06-081

Project: IH 20 - Widen Freeway - Abilene East
Limits From: SH 351
Limits To: ABILENE EAST CITY LIMITS
Description: ADD TWO MAIN LANES FOR A SIX LANE FREEWAY AND REPLACE OVERPASS STRUCTURES
Est. Let Date: FY 2020-2023 (Constraint)
UTP Actions: Funding Adjustment
Est Const. Cost: $40,000,000
Toll: No
Ranking Tier: 1

Programmed Construction Funding

Category		Amount
12	STRATEGIC PRIORITY	$30,750,000
4	URBAN CONNECTIVITY	$9,250,000
Total		$40,000,000

CAT 12 add $30.8M

US 83 — CSJ (Project ID): 0034-01-127

Project: US 83 - Widen Freeway - Abilene South
Limits From: NORTH OF FM 707
Limits To: NEAR ANTILLEY ROAD
Description: ADD FRONTAGE ROAD AT US 83 CONNECTING FM 707 TO ANTILLEY.
Est. Let Date: FY 2020-2023 (Constraint)
UTP Actions: No Funding Change
Est Const. Cost: $7,000,000
Toll: No
Ranking Tier: 1

Programmed Construction Funding

Category		Amount
2	URBAN CORRIDOR	$3,500,000
4	URBAN CONNECTIVITY	$3,500,000
Total		$7,000,000

US 83 — CSJ (Project ID): 0034-01-130

Project: US 83 - US 84 Interchange
Limits From: AT
Limits To: US 83/84 "Y" INTERCHANGE
Description: CONSTRUCT NEW GRADE SEPARATED INTERCHANGE
Est. Let Date: FY 2024-2029 (Develop)
UTP Action: New Authorization
Est Const. Cost: $17,000,000
Toll: No
Ranking Tier: 2

Programmed Construction Funding

Category		Amount
4	REGIONAL CONNECTIVITY	$17,000,000
Total		$17,000,000

US 83 — CSJ (Project ID): 0034-02-044

Project: US 83 - Add Passing Lanes (Super 2)
Limits From: US 84
Limits To: RUNNELS COUNTY LINE
Description: CONSTRUCT SUPER TWO
Est. Let Date: FY 2020-2023 (Constraint)
UTP Action: No Funding Change
Est Const. Cost: $10,000,000
Toll: No
Ranking Tier: 1

Programmed Construction Funding

Category		Amount
4	REGIONAL CONNECTIVITY	$10,000,000
Total		$10,000,000

FM 707 — CSJ (Project ID): 0663-01-024

Project: FM 707 - Widen Non-Freeway
Limits From: FM 89 (BUFFALO GAP ROAD)
Limits To: US 83
Description: REHAB AND WIDEN ROADWAY
Est. Let Date: FY 2024-2029 (Develop)
UTP Action: No Funding Change
Est Const. Cost: $7,000,000
Toll: No
Ranking Tier: 3

Programmed Construction Funding

Category		Amount
2	URBAN CORRIDOR	$7,000,000
Total		$7,000,000

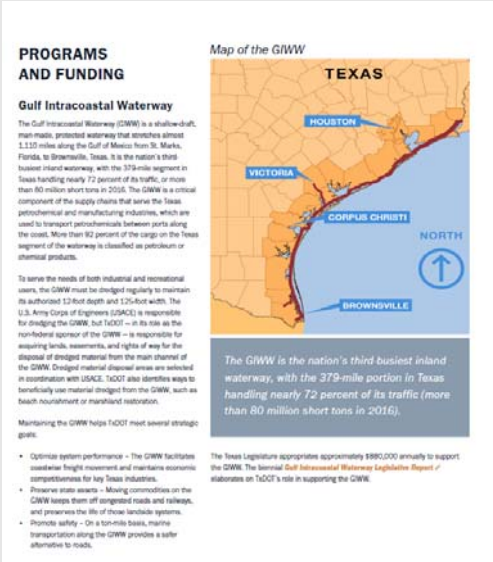
FM 89 — CSJ (Project ID): 0699-01-056

Project: FM 89 - Restoration
Limits From: ANTILLEY ROAD INTERSECTION
Limits To: ANTILLEY ROAD INTERSECTION
Description: LOWER PROFILE AND OTHER IMPROVEMENT TO THE INTERSECTION
Est. Let Date: FY 2020-2023 (Constraint)
UTP Action: No Funding Change
Est Const. Cost: $2,000,000
Toll: No
Ranking Tier: 3

Programmed Construction Funding

Category		Amount
2	URBAN CORRIDOR	$2,000,000
Total		$2,000,000

Learn about other programs on a statewide basis



PROGRAMS AND FUNDING

Gulf Intracoastal Waterway

The Gulf Intracoastal Waterway (GIWW) is a shallow-draft, man-made, protected waterway that stretches almost 1,110 miles along the Gulf of Mexico from St. Marks, Florida, to Brownsville, Texas. It is the nation's third busiest inland waterway, with the 379-mile segment in Texas handling nearly 72 percent of its traffic, or more than 80 million short tons in 2016. The GIWW is a critical component of the supply chains that serve the Texas petrochemical and manufacturing industries, which are used to transport petrochemicals between ports along the coast. More than 92 percent of the cargo on the Texas segment of the waterway is classified as petroleum or chemical products.

To serve the needs of both industrial and recreational users, the GIWW must be dredged regularly to maintain its authorized 12-foot depth and 125-foot width. The U.S. Army Corps of Engineers (USACE) is responsible for dredging the GIWW, but TxDOT — in its role as the non-federal sponsor of the GIWW — is responsible for acquiring lands, easements, and rights of way for the disposal of dredged material from the main channel of the GIWW. Dredged material disposal areas are selected in coordination with USACE. TxDOT also identifies ways to beneficially use material dredged from the GIWW, such as beach nourishment or marshland restoration.

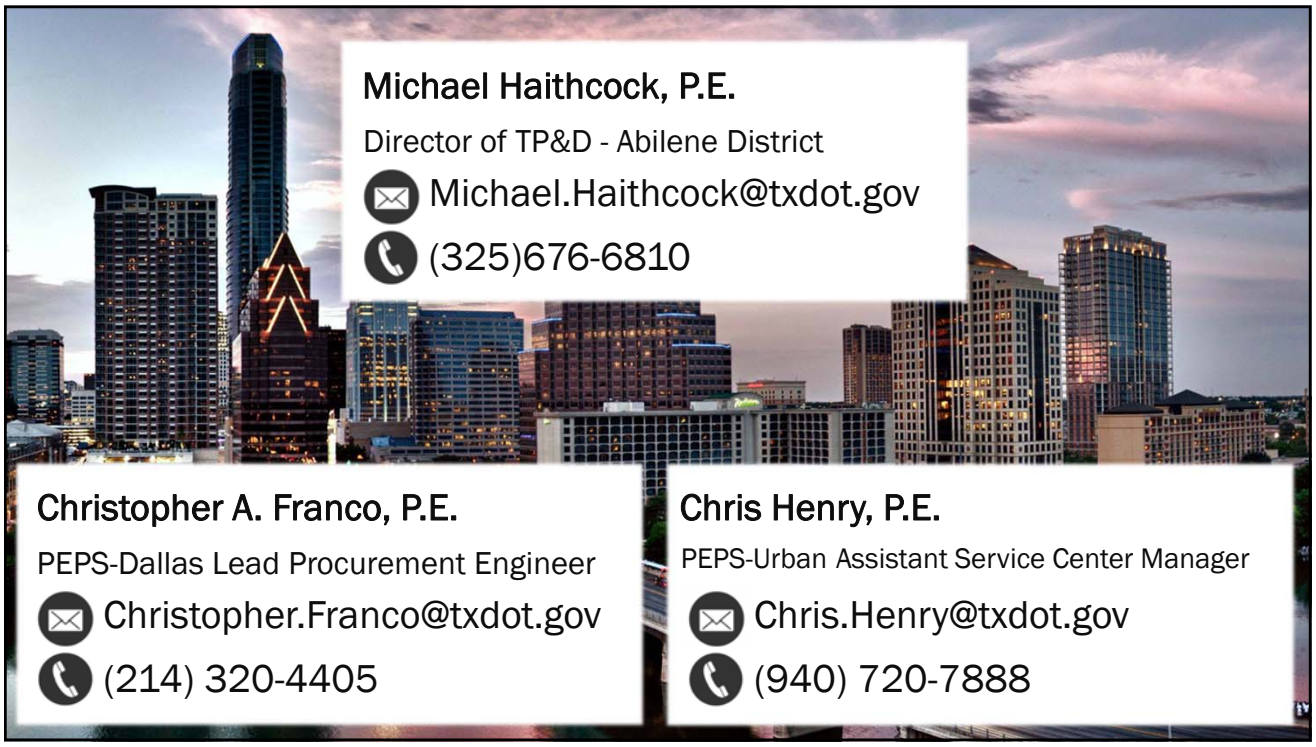
Maintaining the GIWW helps TxDOT meet several strategic goals.

- Optimize system performance – The GIWW facilitates coastwise freight movement and maintains economic competitiveness for key Texas industries.
- Preserve state assets – Moving commodities on the GIWW keeps them off congested roads and railways, and preserves the life of those landside systems.
- Promote safety – On a ton-mile basis, marine transportation along the GIWW provides a safer alternative to roads.

Map of the GIWW

The GIWW is the nation's third busiest inland waterway, with the 379-mile portion in Texas handling nearly 72 percent of its traffic (more than 80 million short tons in 2016).

The Texas Legislature appropriates approximately $880,000 annually to support the GIWW. The biennial *Gulf Intracoastal Waterway Legislative Report* elaborates on TxDOT's role in supporting the GIWW.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