



April 25, 2025

Safety in Design

2025 Roadway Design & Bridge Conference

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Every Project is a Safety Project

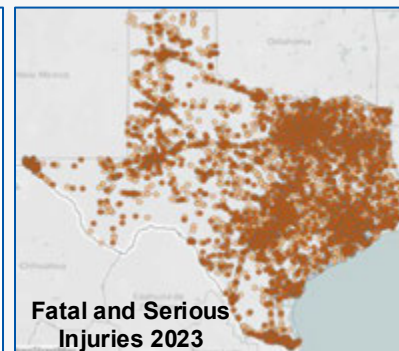
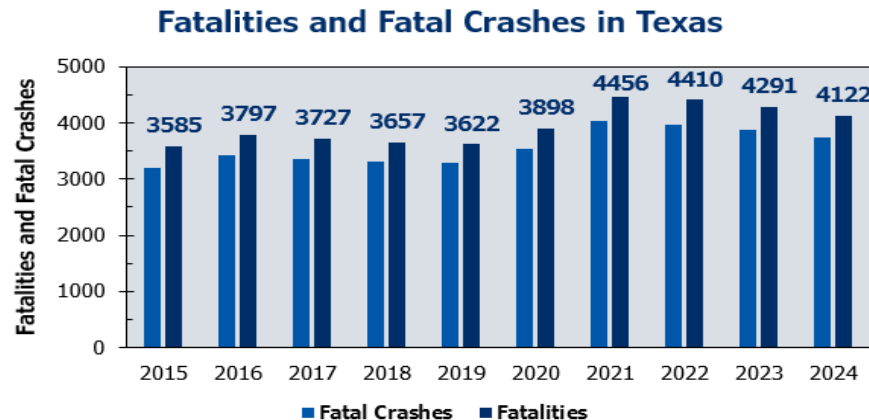
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Crash Facts and Challenges:

- **More than 90,000 lives lost since November 7, 2000**, which was the last deathless day on Texas roadways.
- 4,122 fatalities and 251,928 injuries in vehicle crashes in 2024.
- The annual vehicle miles traveled in Texas during 2023 reached 295 billion, 1.34% higher than in 2022.
- The population in Texas during 2024 reached 31.2 million, 2.29% higher than in 2023.



TxDOT's Policies and Commitments

- Texas Strategic Highway Safety Plan:
 - **Vision:** Texas envisions a future with **zero traffic fatalities and serious injuries.**
 - **Mission:** Texans will work together on the road to **zero traffic fatalities and serious injuries.**
- TxDOT Vision Zero (Road to Zero)
 - Commission adopted minute order in 2019
 - Goals to reduce fatalities:
 - By half by 2035
 - Zero by 2050
 - Created a new funding category for HSIP-funded projects, emphasizing areas with the greatest potential for reducing fatalities and injuries.



Project Development Process



Approach to Enhance Safety

To incorporate safety into project development, TxDOT has adopted various policies, programs, strategies, and guidelines:

- Safer by Design (SBD)
- Traffic and Safety Analysis Procedures (TSAP) Manual
- Highway Safety Manual (HSM) Implementation
- Intersection Control Evaluation (ICE) Process Implementation
- Roadway Safety Assessment (RSA)
- Performance-Based Practical Design (PBPD)
- Research Projects on Project Safety



Safer by Design (SBD) Tools

✓ **Goals and Objectives:**

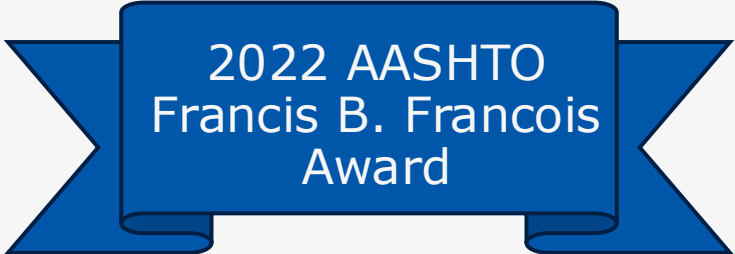
- Assistant safety-driven decisions during project development
- Understand the safety effects of design elements
- Optimize safety before the project is constructed
- Straightforward process

✓ **User-friendly Features:**

- User inputs existing & proposed design elements
- Presets standard & optimal values
- Immediate feedback
- Visual tools & representations



2021 National
Roadway Safety
Award



2022 AASHTO
Francis B. Francois
Award

Traffic and Safety Analysis Procedures (TSAP) Manual

Background

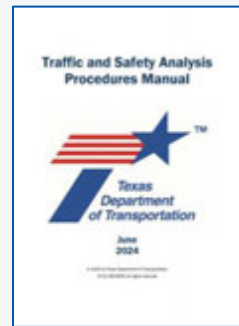
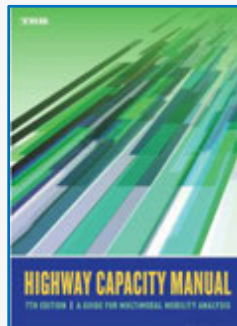
- Lack of statewide guidance
- Current practice

Purpose

- Traffic and safety analysis guidance
- Consistent and uniform direction
- Simple and easy to use
- Improve quality and implementation

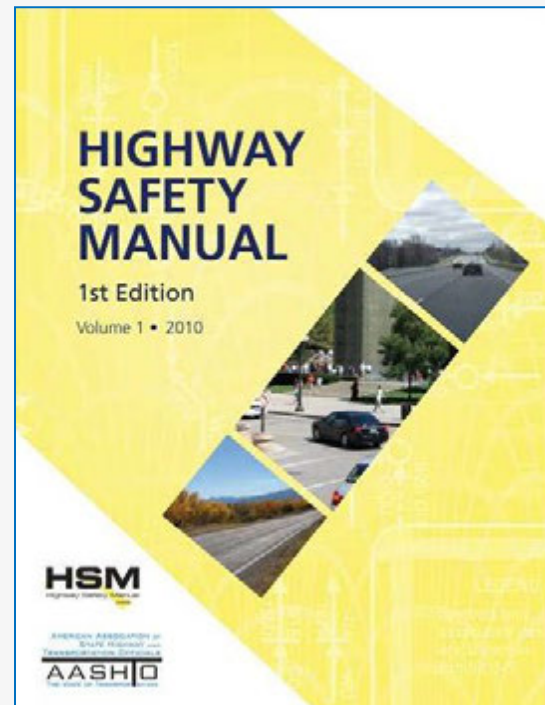
Criteria

- ✓Industry's Best Practice
- ✓HCM and FHWA Toolboxes
- ✓Supports RDM and other manuals
- ✓Incorporate AASHTO HSM

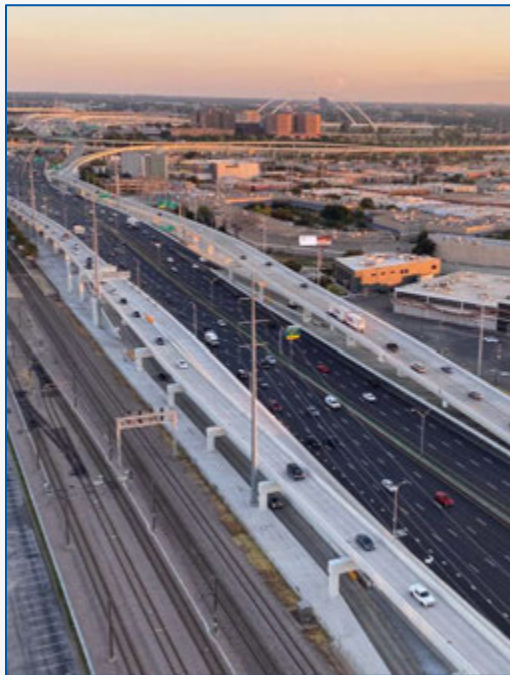


Highway Safety Manual (HSM) Implementation

- Texas models/calibration factors
- Safety analysis training & guidance
- New models to address HSM limitations
- Simple easy-to-use safety analysis tools
 - Rural Highways
 - Intersections
 - Urban Arterials
 - Freeways and Interchanges
- These tools provide predicted and expected vehicle crash frequencies by severity level for facility elements



Performance-Based Practical Design (PBPD) Approach



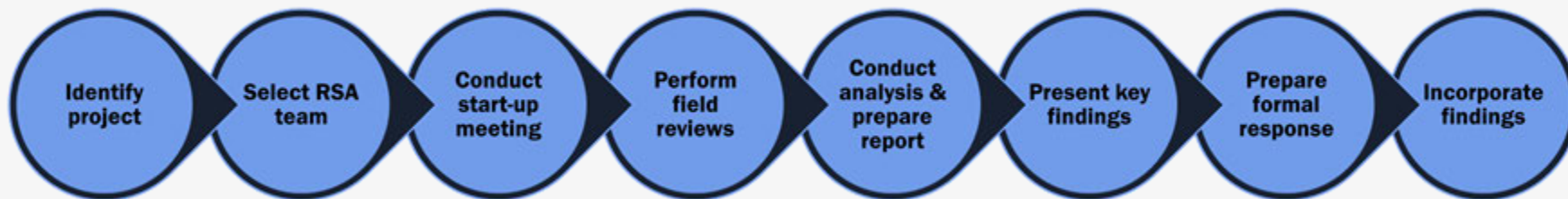
- A design approach that prioritizes system-level performance objectives when developing transportation projects, allowing engineers to “**design up**” from existing conditions to meet specific project and system needs
- A decision-making approach based on **quantitative analysis** for system performance
- TxDOT Roadway Design Manual (published in 2024) includes PBPD
- Goal: Maximize benefits while minimizing costs

Intersection Control Evaluation (ICE) Implementation Process

- One third of fatal and serious injury crashes are intersection-related
- Transparent process for the intersection control type
- Process applies to all highway and street projects for any major intersection improvement
- Guidance in the TSAP Manual
- Training opportunities



Road Safety Assessments (RSA) Strategy



- A formal safety performance examination by an independent, multidisciplinary team to identify safety risks
- Guidance, workshops, and pilot projects
- **Potential Benefits:**
 - Reduce the number and severity of crashes
 - Raise awareness of safe design practices
 - Incorporate human factors into all aspects of the design



Other Initiatives



Interstate
Access
Justification
Requests
(IAJRs) SOP



Design
Exception
Requests for
Interstate
Highways
SOP



Crash
Modification
Factors
(CMFs)
selection
guidance



Guidance for
selection of
cross-section
based on
safety &
operational
benefits

Current Research Projects & Activities



Safety scoring tools for wet surface crash reduction



Crash prediction methods for frontage roads



Crash Modification Factor for Super 2 highways



Guideline for Using Safety Tools



SBD Merger tools for combining SBD scores

#EndTheStreakTX



HELP
#EndTheStreakTX
End the streak of daily deaths on Texas roadways.



Questions?

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