Applying Safety Data and Analysis to Performance-Based Transportation Planning

TRB Tools of the Trade 2016

September 13, 2016

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Transportation Safety Planning (TSP)

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Download:

e-Guidebook Overview

This e-guidebook provides State departments of transportation (DOT) and metropolitan planning organization (MPO) planners with a framework for navigating the fundamentals and advanced methods of safety data collection and analysis. It also demonstrates how the results of that analysis can be applied to the performance-based transportation planning process to develop safety goals, objectives, performance measures, and targets; identify and prioritize projects; and evaluate progress towards safety priorities.

Use the tool bar to the left to navigate to different chapters of the e-guidebook. The e-guidebook includes guidance on institutional considerations, data needs, and analysis methods. The e-guidebook also provides examples from States and MPOs around the country to demonstrate "real-world" examples. It also includes some technical topics in the appendices for those interested in more details.

Overall, this guidebook provides a step-by-step approach for incorporating the results of safety data and analysis into performance-based transportation planning and programming processes.

Organization of Guidebook

- **Chapter 1: *Introduction***
- **Chapter 2: *Audience & Purpose***
- **Chapter 3: *Performance-Based Planning Processes***
- **Chapter 4: *Data Collection***
- **Chapter 5: *Using Safety Analysis for Planning***
- **Chapter 6: *Applying Safety Data and Analysis to Inform Decisionmaking***

Chapter 2: Audience & Purpose

- **Who: DOT and MPO Transportation Planners**
- **Why: Guide helps answer these questions**

Chapter 2: Purpose of the Guide

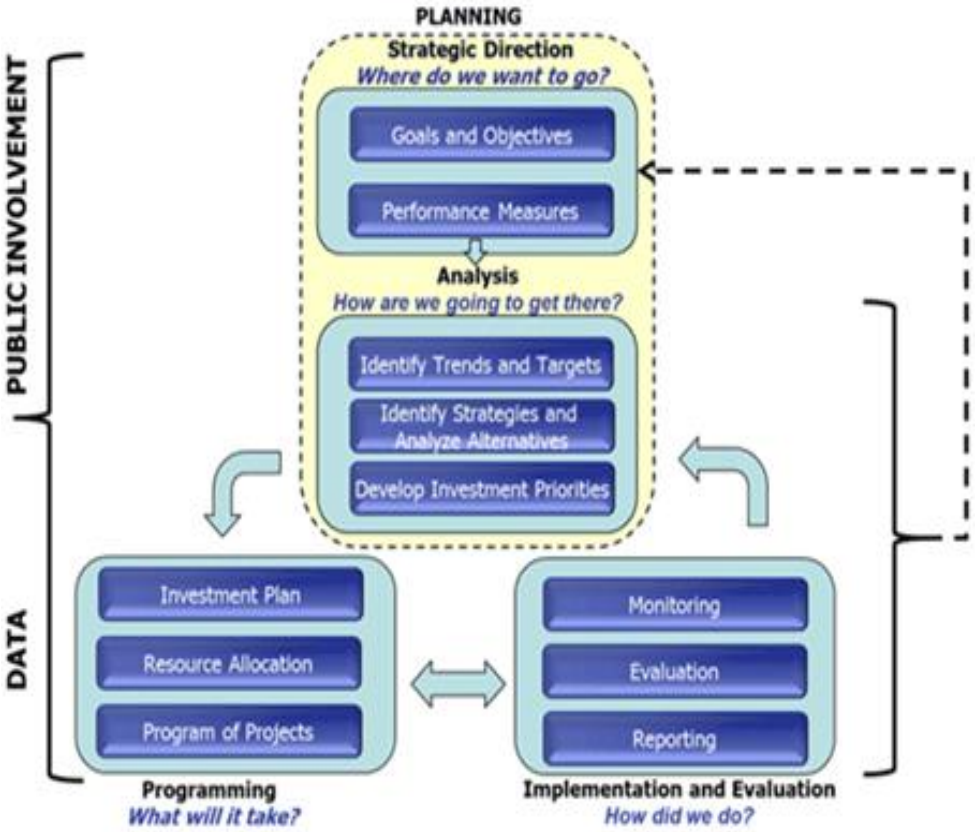
Overall,

- **Enhance Performance-based Planning Processes**
- **Create Focus on Data Driven Safety Analysis**
- **Introduce Safety Analysis Tools to Planners**

Chapter 3: Performance Based Planning - Transportation Planning

Overview of Transportation Planning Process

- **Core planning tasks**
- **Products – Plans and Programs**

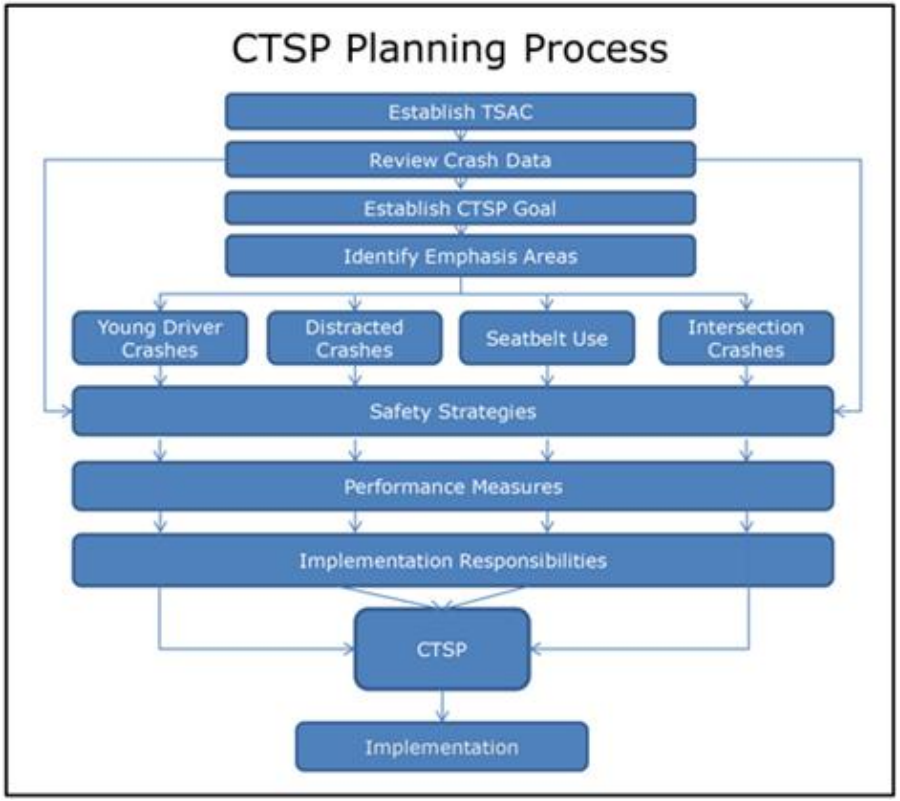


Chapter 3: Performance Based Planning - Safety Planning

Overview of State Safety Planning Process

- Process
- Partners
- Product (SHSP) and contents
- Funding
- Coordination with other plans

Example



Chapter 3: Performance Based Planning – Integrating Safety into Transportation Planning Process

- **Why: to meet safety goals and work toward reducing fatalities and serious injuries**
- **Examples: opportunities to integrate safety in each step of the planning process**

Transportation Planning Process—Key Planning Task	Safety Integration into Key Planning Task	Examples
Data Collection and Analysis	Obtain safety data, which can include crash data, roadway characteristic data, traffic volume data, and safety information from public/stakeholder input. Conduct safety analysis, which can range from basic analysis like identifying crash frequencies to more sophisticated approaches, such as network screening.	In Ohio, crash and roadway data are obtained through the Ohio DOT. VMT estimates also are available for State and regional agencies. Ohio DOT has developed user-friendly tools, such as the Geographic Information System (GIS) Crash Analysis Tool (GCAT), which automate the analysis. In New Mexico, State and regional agencies can access safety data through the University of New Mexico (UNM) Division of Government Research (DGR) Web siteto access published reports, or they can submit a request to New Mexico DOT via email to the Crash Records reporting office (crash.records2state.nm.us) to request specific records and/or generated reports.

Chapter 4: Getting Started with Transportation Safety Planning – Data Collection

- **Institutional considerations**
- **Types of safety data for planning**
- **Data quality**
- **Sources and formats of data**

Chapter 5: Using Safety Analysis for Planning

- **Basic safety analysis categories and tools**
- **Applications to transportation planning**
- **Examples**

Chapter 5: Using Safety Analysis for Planning - Analysis Categories

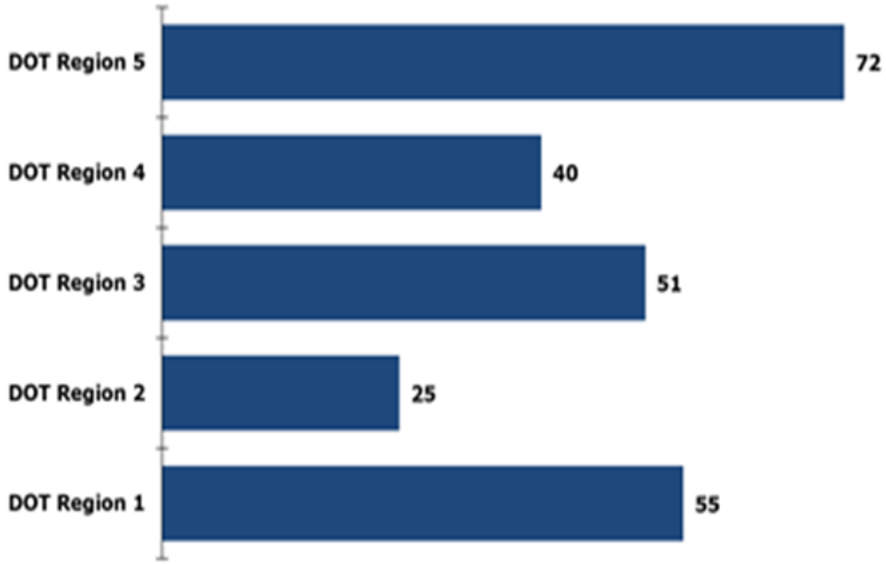
Analysis Category	Analysis Question
Benchmarking	• How many fatalities and serious injuries are occurring in my area? • How does this compare to other areas or my State?
Identify Crash Trends and Contributing Factors	• Who is involved in crashes? • When are the crashes occurring? • What are the major contributing factors to crashes?
Identify and Evaluate Focus Crash Types	• What are the most common crash types? • What are the most common contributing factors? • What are the characteristics of the over representation?
Network Screening—Identify Sites for Safety Improvement	• What locations (intersections or segments) show the most potential for safety improvements?
Systemic Analysis—Identify Safety Risk Factors	• What are the common characteristics of locations with crashes? • What are the countermeasures to address these characteristics? • How should we prioritize system wide implementation?
Corridor and Intersection Planning Safety Analysis	• What are the safety effects of alternative roadway or intersection cross sections?

Chapter 5: Using Safety Analysis for Planning - Appendix B

Analysis Category	Safety Analysis Question	What tools are available?	Data Needs
Benchmarking	How many fatalities and serious injuries are occurring in my area? How does this compare to other areas or my State?	Descriptive Statistics FARS data	Total crashes Total fatalities and serious injuries High-level roadway data—roadway ownership, functional classification Agency geographic boundary information
Network Screening—Identify Sites for Safety Improvement	What locations (intersections or segments) show the most potential for safety improvements?	AASHTO HSM Part B Network Screening—Includes descriptive and predictive methods AASHTOWare Safety Analyst™ GIS Heat Mapping	Crash severity Crash location Roadway and roadside characteristics—intersection control, number of lanes, presence and type of shoulder, presence and type of median, posted speed, horizontal and vertical alignment, etc. Traffic volume data—intersection total entering traffic volume, roadway segment volume per million vehicle miles Calibrated safety performance functions, if predictive methods are used

Chapter 5: Using Safety Analysis for Planning - Examples

Example: Chart – Comparison of fatalities by region (Benchmarking category)



Example: Heat Map – density of crashes per unit area (Network Screening category)

Chapter 6: Applying Safety Data and Analysis to Inform Decisionmaking

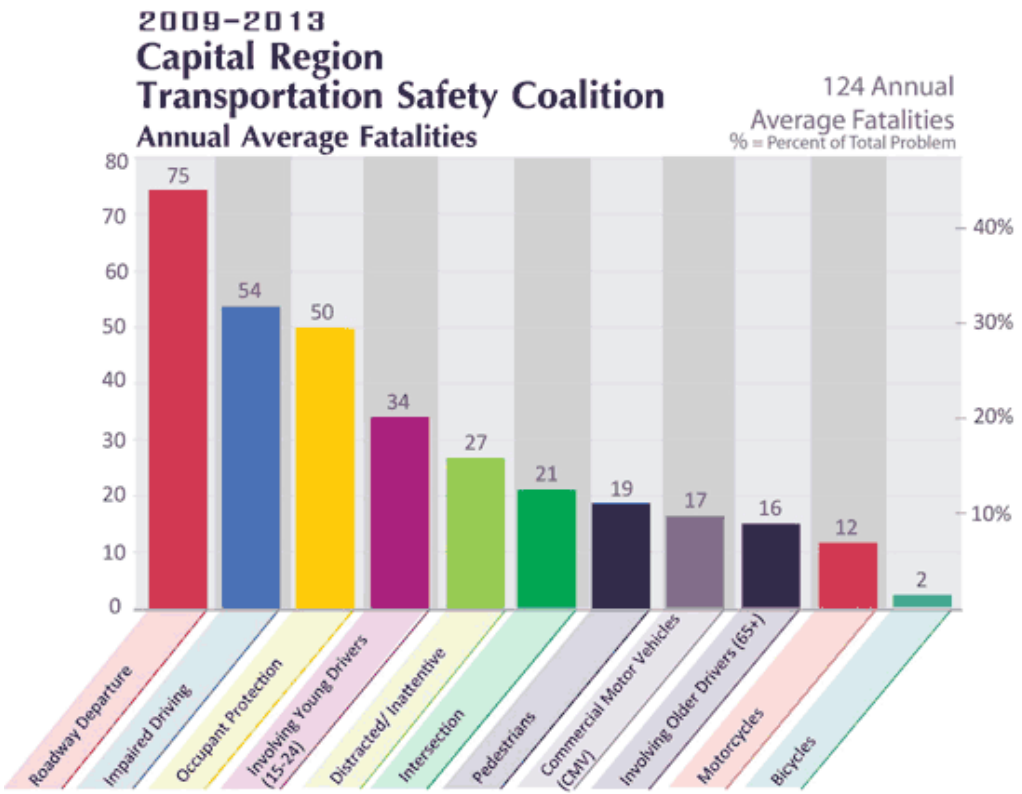
How to use data and analysis to:

- **Develop goals, objectives, performance measures**
- **Identify and prioritize safety programs and projects**

Chapter 6: Applying Safety Data and Analysis to Inform Decisionmaking

Example: Goal Setting by crash contributing factors

Goal: Reduce fatalities related to roadway departure, impaired driving, occupants, and young drivers.



Source: Louisiana Highway Safety Research Group, Capital Region Transportation Safety Coalition Level II Data

Summary

- **Safety analysis helps:**
  - **Review past, current, and future (if possible) safety trends—where are we now?**
  - **Develop safety goals, objectives, measures, and targets—where do we want to go?**
  - **Identify transportation safety programs and projects to achieve results—how do we get there?**
  - **Monitor and evaluate—how are we doing?**

- **Link to Guidebook**

http://safety.fhwa.dot.gov/tsp/fhwasa15089/

Resources

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Transportation Safety Planning websites

http://safety.fhwa.dot.gov/tsp/

http://www.fhwa.dot.gov/planning/transportation_safety_planning/