Integrating Safety into Transportation Planning

Research and Results from NCHRP Report 811

TRB Webinar

December 7, 2016
Presentation Overview

» Integrating safety into Performance-Based Planning and Programming

» Background on NCHRP 811 research

» Seven principles for safety integration
Performance Based Planning and Programming

Source: Performance Based Planning and Programming Guidebook, FHWA.
Transportation Safety Integration

Planning Tasks

- Public involvement and outreach
- Multidisciplinary coordination and input
- Development of a vision, goals, and objective
- Identification of performance measures and targets
- Data analysis
- Project prioritization and programming
- Monitoring and evaluation
Importance of Addressing Safety in Transportation Planning

- Connection to decision-makers
- Support local jurisdictions
- Analytic skills and tools
- Holistic perspective of the transportation network
- Identify regional and local transportation safety investments
Transportation Safety Research
Phase 1


- Literature review, practitioner outreach surveys, 48 interviews
- Identified successful transportation safety planning practices, but no evidence of institutionalization
- Outcome – Transportation Safety Planning (TSP) Framework, which defined institutionalization as seven principles
<table>
<thead>
<tr>
<th></th>
<th>Seven Transportation Safety Principles</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Include the results of safety analysis and discuss safety in public and stakeholder engagement activities</td>
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<tr>
<td>2</td>
<td>Discuss safety at committee meeting or identify opportunities to engage safety stakeholders in transportation plans</td>
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<tr>
<td>3</td>
<td>Collect and analyze crash and roadway data to inform transportation safety plans, policies, programs, and/or projects</td>
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<tr>
<td>4</td>
<td>Utilize public and stakeholder input, results of data analysis, and information in other plans to develop safety goals and objectives in planning documents</td>
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<tr>
<td>5</td>
<td>Develop safety performance measures and targets to track progress towards the safety goals and objectives</td>
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<td>6</td>
<td>Establish safety as a decision factor for the selection of transportation projects</td>
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<td>7</td>
<td>Routinely track and monitor safety performance and evaluate safety programs and policies</td>
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Transportation Safety Research Phase 2

» Research Question: Does the TSP Framework work in “real world” settings?

» Conducted transportation safety planning workshops in Florida, Maine, Arkansas, Louisiana, Nevada, Oregon, and Vermont
  • Participants included FHWA Division staff, State DOT headquarters and division staff, MPOs, and RTPOs
  • Reviewed TSP Framework
  • Confirmed value of seven principles
  • Identified how the principles could be systematically implemented by a planning agency

Describes opportunities to implement the seven principles during any transportation planning process (LRTP, corridor plan, modal plan)
Seven Principles and Strategies
1. Public Involvement

**Planning Task**  
Safety Integration

**Public Involvement and Outreach**  
*Solicit input to inform planning decisions*

Utilize available public involvement tools/methods to collect information on transportation safety issues and needs
Public Involvement Strategies

» Surveys and comment cards

» Open house materials

» Safety summits

» Outreach materials
  • Webpages
  • Newsletters
  • Social media

» Mapping/input tool
2. Multidisciplinary Coordination

Using committees to inform planning decisions

Discuss safety with committees or engage safety stakeholders in transportation plans
Multidisciplinary Coordination Strategies

» Discuss safety with established committees

» Create a safety committee for plan development or update

» Institutionalize safety committee

» Engage safety stakeholders in committee meetings
3. Data Collection and Analysis

**Planning Task**

*Data Collection and Analysis*

*Identify regional trends and issues*

**Safety Integration**

*Collect and analyze safety data (crash, volume, roadway) to identify goals, objectives, and project/program priorities*
Data Collection Strategies

» Identify where data are available
  - State database, local law enforcement
  - Identify what data are available
  - Crash, roadway, volumes

» Identify how to obtain data
  - Generated report, custom report, raw data, other
Understand what data are available and identify the analysis questions your agency wants to answer

<table>
<thead>
<tr>
<th>Analysis Category</th>
<th>Analysis Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmarking</td>
<td>How many fatalities and injuries are occurring in my State?</td>
</tr>
</tbody>
</table>
| Identify Trends/Contributing Factors | Who is involved in crashes?  
When are the crashes occurring? |
| Identify/Evaluate Focus Crash Types | What are most common factors?  
What are most common crash types? |
| Network Screening                 | What locations (intersections/segments show most potential for safety improvements? |
4. Goals and Objectives

**Planning Task** Safety Integration

**Goals and Objectives**

*Desired transportation outcomes and methods for achievement*

Utilize public and stakeholder input, results of data analysis, and information in other plans to develop safety goals and objectives in planning documents.
Goals and Objectives

Strategies

» Include safety as a Federally required planning factor
» Use feedback from stakeholders and the public
» Draw upon goals and objectives from other plans
» Use available data

<table>
<thead>
<tr>
<th>GOAL</th>
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<tbody>
<tr>
<td>Reduce severe crashes on the transportation system</td>
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<table>
<thead>
<tr>
<th>OBJECTIVE</th>
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<tbody>
<tr>
<td>Identify solutions to address the overrepresentation of pedestrian and motorcycle crashes</td>
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</table>
5. Performance Measures and Targets

Planning Task  Safety Integration

Performance Measures and Targets

Tool to track and evaluate progress towards transportation goals

Identify safety performance measures and targets for tracking progress toward safety goals and objectives
Performance Measures and Targets

Strategies

» Obtain baseline data for performance tracking and target setting

» Coordinate with state, regional, and local transportation planners

» Identify and test approaches to set targets

<table>
<thead>
<tr>
<th>Performance Measures</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatalities</td>
<td>Number of fatalities by X year</td>
</tr>
<tr>
<td>Serious Injuries</td>
<td>Number of serious injuries by X year</td>
</tr>
<tr>
<td>Fatality Rate</td>
<td>Fatality rate by X year</td>
</tr>
<tr>
<td>Serious Injury Rate</td>
<td>Serious injury rate by X year</td>
</tr>
<tr>
<td>Bicycle and Pedestrian Fatalities and Serious Injuries</td>
<td>Number of bicycle and pedestrian fatalities and serious injuries by X year</td>
</tr>
</tbody>
</table>
6. Project Prioritization and Programming

Project Prioritization and Programming

Processes used to select and prioritize transportation projects

Safety Integration Planning Task

Incorporate safety into transportation project prioritization and programming processes
Incorporating Safety into All Transportation Projects

» Incorporate safety into project prioritization process for all transportation projects
  • Policy Considerations – Does the project meet the goals outlined in the plan?
  • Technical Considerations – Does the project address a data-driven safety need? What is the anticipated safety impact of the project?

» Consider how to improve safety in programmed transportation projects
  • Maintenance projects
  • ITS solutions
7. Monitoring and Evaluation

Planning Task: Monitoring and Evaluation

Process to determine effectiveness of transportation programs/projects

Safety Integration: Routinely monitor and track safety performance to evaluate progress on performance measures and targets
Monitoring and Evaluation Strategies

- Develop a monitoring and evaluation plan
- Develop performance measures and targets
- Develop a tracking tool
- Interpret the data
- Share the results
Contact Information

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Pennsylvania
Transportation Safety Planning

Kristin Mulkerin
Gene Heyman

December 7, 2016
Agenda
- Planning in Pennsylvania
- Safety Planning
- Safety Data Sharing
Planning in Pennsylvania

- 2,562 Municipalities
- 67 Counties
- 11 Engineering Districts
Planning in Pennsylvania

- 24 Planning Partners
  - 19 MPOs
  - 4 RPOs
  - 1 Independent County
Planning in Pennsylvania

- 39,756 miles of roadway
  PennDOT owned
Planning in Pennsylvania

- 78,186 miles of roadway locally owned
Planning in Pennsylvania

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  - locally owned

Pennsylvania’s Challenge!
Safety Planning
• Strategic Highway Safety Plan
Safety Planning

• 2014 Transportation Safety Planning workshops
Safety Planning
• Safety Planning Work Group

WORK GROUP
• Strategic Highway Safety Plan update
• Performance Measures and Target Setting
• Safety Project Approval
• Safety Set Aside
• Safety Data Sharing
Safety Data Sharing

- Reportable Crash

PA Title 75 §3746.

Immediate notice of accident to police department.

An accident involving:

- injury to or death of any person; or
- vehicular damage to the extent that it requires towing.
Safety Data Sharing

- Accident Investigation

PA Title 75 §3754.

Accident prevention investigations.

- General rule – The Department may conduct investigations to determine accident causes, and the improvements which may help prevent them.
- Confidentiality of reports – investigations, records and reports shall not be discoverable in any legal action or other proceeding.
Pennsylvania Transportation Safety Planning

Safety Data Sharing

- Locations
- Statewide High Crash Locations
- MPO/RPO High Crash Locations
- Intersection Safety Implementation Plan
- Roadway Departure Safety Implementation Plan
- Cable Median Barrier
- High Friction Surfacing
- Wrong Way Driver
- Potential Roundabout
Safety Data Sharing

- Open Data
Safety Data Sharing

- Open Data
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Links

PennDOT Safety
http://www.penndot.gov/TravelInPA/Safety/Pages/default.aspx

PennDOT Planning – State Transportation Commission
http://www.talkpatransportation.com/

Open Data
http://data.pennshare.opendata.arcgis.com/

Highway Statistics
http://www.dot.state.pa.us/public/pubsforms/Publications/PUB_600.pdf
Louisiana: An Explicit Consideration of Safety within Transportation Planning
A Regional Approach
Planner’s Role

- Connection to decision-makers
- Analytic skills and tools
- Commitment to the public good
- Holistic perspective of the transportation network
- Ability to prioritize and program regional transportation investments
Engineer’s Role

- HSIP
- ID of Sites with Promise
- Data Collection
- Analytical Resources
- Linking to the SHSP
Safety Management Process

STAGE 0

Data Collection

Network screening

Problem Identification

Countermeasure Selection & Alternatives Analysis

Economic Evaluation

Project Selection & Prioritization

Implementation

Evaluation

LRSP APPLICATION
Network Screening
Network Screening Options

- Crash Frequency
- Crash Rate
- EPDO
- Relative Severity Index
- Critical Rate
- Calibrated HSM Models (Safety Analyst)
- Regression Modeling (SPF/LOSS)
- Excess Proportion of Specific Crash Types
- Systemic Approach
Level of Service of Safety

Figure 1 Urban 4-lane Undivided SPF - All Crashes
Long Range Bike Map

Bicycle Long Range Plan

Network Analysis
- 1 - Poor and High Demand
- 2 - Poor and Modest Demand
- 3 - Poor and Low Demand
- 4 - Avg and Low Demand
- 5 - Good and Low Demand
- No Bikes
- Pontchartrain Causeway Ridge
- Interstate
- Other Non-Bicycle Route

Route Markers
- Interstate
- US Highway
- Louisiana Highway

Points of Interest
- Preservation Area, Historic Site, Ferry
- State Park
- National Park

MILES

0 10 20 40 60

KILOMETERS

0 12.5 25 50 75 100
Long Range Bike Map

Bicycle Long Range Plan

Recommended Bike Facility
- Green: Shared Lane (no special provisions)
- Marked Shared Lane
- Marked Shared Lane or Shoulder
- Paved Shoulder
- Bike Lane or Suffered Bike Lane
- Buffered or Separated Bike Lane
- Red: Separated Bike Lane
- Black: No Bikes
- Dark Gray: Pontchartrain Causeway Bridge
- Medium Gray: Interstate
- Light Gray: Other Non-Bicycle Route

Route Markers
- Interstate
- US Highway
- Louisiana Highway

Points of Interest
- Preservation Area, Historic Site, Ferry
- State Park
- National Park

MILES
0 10 20 30 40 50 60

KILOMETERS
0 12.5 25 50 75 100
2016 Target Cities: Baton Rouge
2016 Target Cities: New Orleans
## Local Road Safety Program – Parish Safety Plans

### Road and Crash Categories

<table>
<thead>
<tr>
<th>Severity</th>
<th>Emphasis Area</th>
<th>Collision Type</th>
<th>Basic Countermeasure</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-Purpose</td>
<td>Deer</td>
<td>Run-off Road</td>
<td>Street Lighting</td>
</tr>
<tr>
<td>Commercial</td>
<td>Pedestrians</td>
<td>Run-off Road, Dark</td>
<td>Street Lighting</td>
</tr>
<tr>
<td>Residential</td>
<td>Bicyclists</td>
<td>Run-off Road, Wet</td>
<td>Street Lighting</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>High Severity, Run-off Road</td>
<td>Edge Rumble, Guard Rail</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Run-off Road, Culverts</td>
<td>Culvert Safety Ends</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Run-off Road, Median</td>
<td>Safety Malls</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Run-off Road, Trees</td>
<td>Trees</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Straight - High Severity, Run-off Road</td>
<td>Clear Trees</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Straight - Urban</td>
<td>Optical Speed Bars</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Intersections - Wet</td>
<td>Your Speed Signs</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Intersections (Unsignalized), Crashes</td>
<td>Friction Treatment</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Intersections (Unsignalized)</td>
<td>Street Lighting</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Intersections (Signalized)</td>
<td>Street Lighting</td>
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<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Intersections (Signalized)</td>
<td>Headlights, Back Plates</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>Intersections (Signalized)</td>
<td>Pedestrian</td>
</tr>
<tr>
<td>Others</td>
<td>Unrestrained</td>
<td>PeDESTrian</td>
<td>Upgrade Crossing</td>
</tr>
</tbody>
</table>

### Crash Profile

- Overrepresented Crashes: Alcohol, non-Intersection, Lighting
- Severity: 5
- Wet: 2
- Non-Intersection Crash: Run-off Road
- Head On: X
- Side Swipe (OD): X

### Possible Problem

- Speed, Visibility, Speeding

### Improvement Type

- Pedestrian Improvements
  - Pedestrian Improvement Projects
  - Pedestrian Improvement Projects at this location.

### Recommended Improvements

1. Pavement Marking – Center line and Raised Pavement Markers
2. Speed Limit Sign at 3/4 mile spacing
3. Check Intersection sight distances at crossroads

### User Information

- User: M. Adams
- Date: 7/8/2016
Regional Safety Coalitions

[Map of Louisiana SHSP Regional Coalitions]
Long Term Goals

• Explicit consideration of safety
• Safety to be considered across all programs and projects, not only the HSIP
• More strategic investments of limited resources
• Transparent and data-driven decisions
Questions?

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