# Applying the Systemic Safety Approach on Local Roads

## Introduction

Local and rural road owners rely upon crash data to identify and treat safety problems.
The traditional "spot location" approach is focused on treating a specific location based on crash history. The "systemic approach" acknowledges that crash frequency or rates at specific locations alone are not always sufficient to determine which countermeasures to implement and where to implement them. This is often true on low-volume local and rural roadways where crash frequencies are lower and crash data are sometimes sparse or incomplete. Systemic implementation of safety countermeasures helps to address the most serious crash types on the entire road system, not just at specific high-crash spot locations.

The systemic safety approach is a two-pronged effort to reduce crashes and serious injuries on the roadways. This approach offers a means to: (1) identify crash types (e.g. intersection, roadway departure, pedestrians) and the location-related factors that contribute to the highest number of fatal and serious injury crashes of each type, and (2) widely implement low-cost countermeasures over several locations with similar crash characteristics and/or similar roadway features. Typically, systemic safety improvements are low-cost, require little maintenance, have documented crash reductions, and address specific crash types or crash risk factors (e.g., narrow shoulders).

## Benefits of Systemic Safety Approach

The application of the systemic safety approach offers the following benefits:

- Systemic safety improvements can reduce overall fatal and severe crashes of certain types within a jurisdiction more effectively than applying safety improvements at a small number of spot locations.
- The approach allows an agency to adapt for all levels of data availability and can help prioritize data collection needs.
- Countermeasures implemented systemically are typically low-cost improvements.
- Systemic safety improvements help agencies broaden their safety efforts and consider other risk factors in addition to crash history when identifying locations for potential safety improvement.
- Systemic safety improvements can be incorporated into planning, design, and maintenance policies, defended in tort liability cases, and used to develop a multi-year program of projects.
- The approach can bolster public confidence because it allows the agency to implement a proactive safety program.

Systemic safety improvements can be promoted for future use in written policy, implemented through explicit roadway safety improvement projects, and included in capital projects and ongoing maintenance activities.

## Case Study: Thurston County (Washington) Public Works Applies the Systemic Safety Model

Thurston County Public Works selected roadway departures in horizontal curves as their focus crash type based on a review of severe crash data, with 81 percent of the severe curve crashes occurring on arterial and collector roadways. Thurston County identified run-off-road type crashes on horizontal curves for systemic improvement and selected signing improvements on currently signed curves as the most effective countermeasure.

After reviewing crash data linked with roadway characteristics, the county identified the following risk factors to screen and prioritize candidate locations for systemic improvements:

1. Roadway class of major rural collector
2. Presence of an intersection
3. Traffic volume of 3,000 to 7,500 annual average daily traffic
4. Edge clearance rating of 3 (on a scale of 1 to 3)
5. Paved shoulders equal to or greater than 4 feet in width
6. Presence of a vertical curve
7. Consecutive horizontal curves (windy roads)
8. Speed differential between posted approach speed and curve advisory speed of 0, 5, and 10 miles per hour
9. Presence of a visual trap (a minor road on the tangent extended)

Using a weighted scoring process, the county prioritized 270 signed curves for potential low-cost, low-maintenance safety investments with documented crash reductions, including: chevron and large arrow signs, larger signs, rumble strips, barrier delineation, and extension lines.

Upon conclusion of the systemic analysis, Thurston County applied for Highway Safety Improvement Program (HSIP) grant funding using the results as documentation for the request. The Washington State DOT approved the grant and the County is moving forward with implementing the countermeasures identified through this systemic analysis.

## Resources

The Systemic Approach to Safety website (http://safety.fhwa.dot.gov/systemic/) provides a variety of resources to support implementation of the systemic approach to safety, including but not limited to:

- The Systemic Safety Project Selection Tool – this tool presents a step-by-step process to conduct systemic safety analysis, considerations for balancing safety investments between spot and systemic safety improvements, and techniques for evaluating the success of systemic safety projects and programs.
- Case Studies – several case studies highlight how other agencies have successfully improved safety through systemic implementations.
- Fact Sheet - this fact sheet provides a brief overview of the systemic safety approach along with the benefits and how it can be used.
- Narrated Presentation – this presentation covers the same materials as the overview flyer and can be presented at public meetings or in meetings with DOT and MPO officials as well as elected officials.

For systemic training and technical assistance, submit a request through the safety peer-to-peer program at http://rspcb.safety.fhwa.dot.gov/p2p/p2p_app.aspx.

*Scan the code at left to go directly to the Systemic Approach to Safety website!*