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16. Abstract  This case study demonstrates the application of the Systemic Safety Project Selection Tool by the New York State Department of Transportation. The NYSDOT used the Tool to determine that the focus of their systemic safety planning efforts should be severe lane departure crashes that occur on rural, undivided, two-lane highways with posted speeds of 55 miles per hour. Three characteristics identified as overrepresented by this analysis process were selected as risk factors: traffic volume between 3,000 and 5,999 annual average daily traffic, curve radii between 100 and 300 feet, and shoulder width between 1 and 3 feet. NYSDOT tallied the total mileage of the segments that had one risk factor present and the mileage for those that had multiple risk factors present for each of the 11 NYSDOT regions.			
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# New York State Department of Transportation Applies Systemic Planning Process to Lane Departure Crashes on State Highway System

The New York State Department of Transportation (NYSDOT) used the *Systemic Safety Project Selection Tool* (Tool)<sup>1</sup> to identify sites where safety could be improved by deploying low-cost countermeasures on roadways with a high crash risk rather than just focusing on specific sites with a history of severe crashes.

## Process and Results

NYSDOT started their systemic planning process by stratifying statewide crash data for the years 2007 through 2011 into emphasis areas consistent with their *2010 New York State Strategic Highway Safety Plan*<sup>2</sup> and according to roadway jurisdiction. The data indicated that the two most common types of crashes statewide are road departure and intersection related. Given that most of the intersection-related crashes are on the local system, for which the data available for analysis are more limited, NYSDOT decided to select lane departure crashes (the most prevalent type of crash on the State's system) as the focus crash type.

To identify the focus facility type, NYSDOT merged crash data with roadway inventory data to assess rural vs. urban, number of lanes, a divided or undivided indicator, and posted speed limit. The analysis results were documented in a crash tree diagram that indicates that most serious lane departure crashes occurred on two-lane, rural State highways with posted speed limits of 55 miles per hour.

NYSDOT then used the crash and roadway inventory data to select risk factors. The process compared the proportion of locations where the location characteristics existed with the percentage of severe crashes that occurred at similar locations. Figure 1 shows the results of analyzing curve radius as a risk factor. Three characteristics identified as overrepresented by this analysis process were selected as risk factors: traffic volume between 3,000 and 5,999 annual average daily traffic, curve radii between 100 and 300 feet, and shoulder width between 1 and 3 feet. Next, NYSDOT tallied the total mileage of the segments that had one risk factor present and the mileage for those that had multiple risk factors present for each of the 11 NYSDOT regions. NYSDOT then assembled an initial, comprehensive list of countermeasures relative to lane departure crashes from the National Cooperative Highway Research Program 500 Guides<sup>3</sup>;

**Focus crash type: roadway departure crashes**

**Focus facility type: two-lane, undivided rural state highway with posted speed limit equal to or greater than 55 miles per hour**

**Identified risk factors:**

- ✓ Traffic volume of 3,000 to 5,999 annual average daily traffic
- ✓ Curve radius between 100 and 300 feet
- ✓ Shoulder width between 1 and 3 feet

**Risk assessment results:**

- ✓ 28 percent of the road mileage has the volume risk factor present
- ✓ 4 percent of the road mileage has the curve radii risk factor present
- ✓ 15 percent of the road mileage has the shoulder risk factor present
- ✓ Between 1 and 3 percent of the road mileage has two risk factors present
- ✓ Less than 1 percent of the road mileage has all three risk factors present

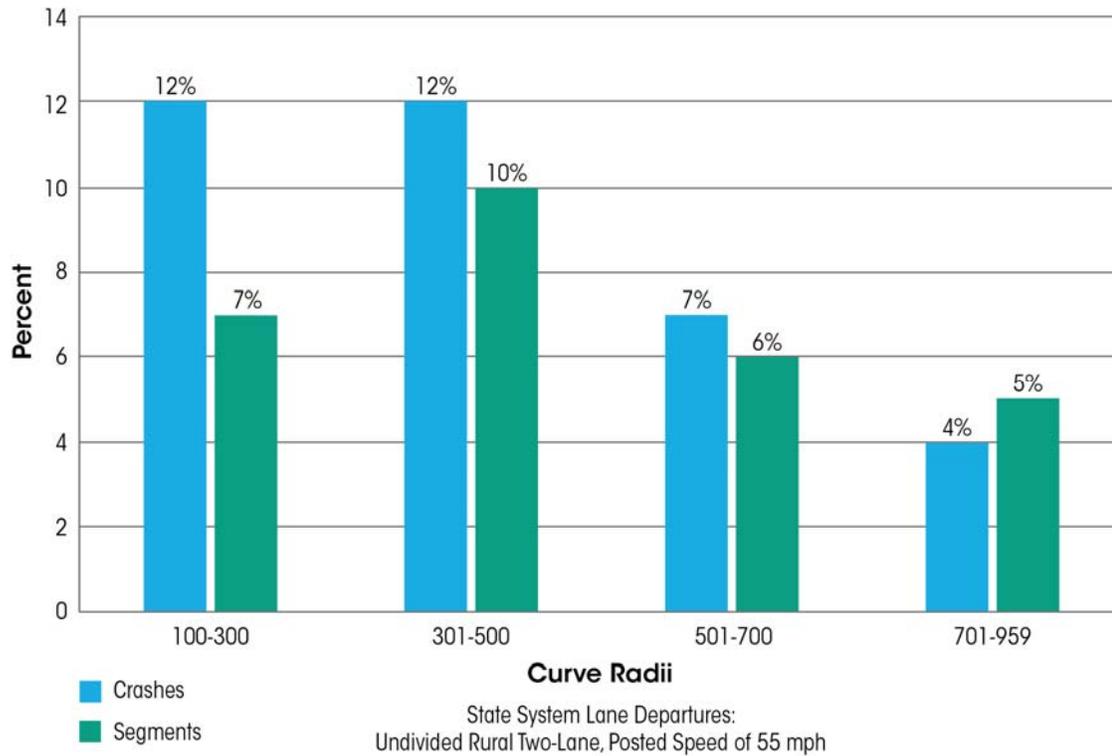
<sup>1</sup> FHWA. 2013. *Systemic Safety Project Selection Tool*. U. S. Department of Transportation. Federal Highway Administration. <http://safety.fhwa.dot.gov/systemic/>.

<sup>2</sup> NYSDOT. 2010. *2010 New York State Strategic Highway Safety Plan*. <https://www.dot.ny.gov/divisions/operating/osss/highway/strategic-plan>. New York State Department of Transportation, Albany, New York.

<sup>3</sup> NCHRP. 2011. *NCHRP Report 500: Guidance for Implementation of the AASHTO Strategic Highway Safety Plan Transportation Research*. <http://www.trb.org/Main/Blurbs/152868.aspx>. Transportation Research Board, National Cooperative Highway Research Program.

and several relative to departures on curves (enhanced delineation, true wet reflective pavement markings, and high-friction surface treatments).

**Figure 1. NYSDOT Severe Lane Departure Crashes by Curve Radius Comparison for Risk Factor Selection**



*Note: 12 percent of severe crashes occurred in curves with radii less than 300 feet, while only 7 percent of all reviewed curves have radii less than 300 feet. Since the proportion of crashes was greater than the proportion of all locations with these radii, a curve radius less than 300 feet was selected as a risk factor.*

Source: New York State DOT.

## Benefits

The Tool is beneficial because it provides a process to identify locations that would benefit from safety-related improvements that would not otherwise be identified through the traditional site-specific analysis process. The Tool also is flexible enough to be applied by NYSDOT staff in a central location and disseminated to region staff or to be applied by region staff at the local level. The countermeasures identified during the pilot along with the documentation of segment mileages with risk factors present will be useful tools in future systemic safety program development.

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