

Systemic application of proven safety countermeasures on rural roads helps keep vehicles in their travel lanes and reduce the incidence and severity of roadway departure crashes.

Reducing fatalities on rural roads remains a major challenge in the United States. In 2016, 18,590 lives were lost on rural roads—more than half of all traffic deaths—even though only 19 percent of the U.S. population lives in rural areas. Two-thirds of these rural fatalities involved a roadway departure, where a vehicle crosses a center line, an edge line, or otherwise leaves its travel lane.

Substantial safety improvements on rural roads can be difficult to make due to the size of the rural road network, which accounts for approximately 70 percent of public road mileage. Additionally, these roads are often operated by local agencies with limited resources and technical expertise in safety analysis or planning. With so many miles of rural roads, it can be difficult to decide where to apply roadway departure countermeasures in order to reduce injuries and fatalities as much as possible with available resources.

Data-driven systemic analysis can help agencies prioritize the locations and countermeasures that will be most effective in keeping vehicles in their travel lanes, reducing the potential for crashes when vehicles do leave the roadway, and the severity of



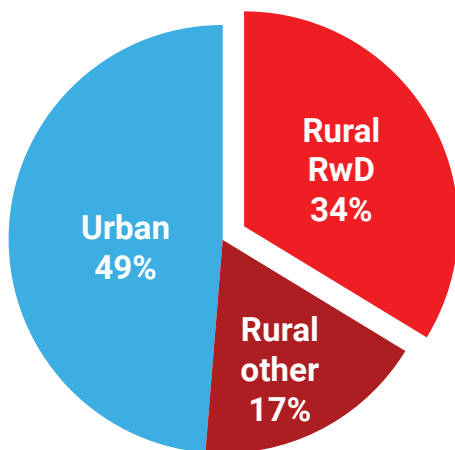
Curves are over-represented in roadway departure crashes and therefore are good locations for systemic improvements.

those crashes that do occur. The systemic approach takes a broad view to evaluate risks across an entire roadway system. It can be used to proactively implement countermeasures where crashes are likely to happen, even for locations where no crashes have been recorded.

Agencies can employ already available data to analyze their systems using either sophisticated tools or more simple approaches. The results can spur creative solutions for systemic application of low-cost countermeasures using existing resources and may justify additional resources based on the expected results. Every agency can identify areas on their network at highest risk for roadway departures and systemically apply safety treatments that are in sync with their State's Strategic Highway Safety Plan (SHSP).

Roadway departure countermeasures that can be applied systemically include:

- ▶ Signage and markings that delineate lane edges and alignment changes and help drivers navigate.
- ▶ Rumble strips that alert drowsy and distracted drivers drifting from their lane.



Rural roadway departures (RwD) account for approximately one-third of all traffic fatalities.



Roadway departure countermeasures applied at this curve include lane separation to prevent head-on collisions, raised pavement markers for visibility, widened shoulders, and a guardrail.

- ▶ Friction treatments at curves or other important locations to reduce loss of control.
- ▶ Shoulders, SafetyEdgeSM, and clear zones to provide opportunities for a safe recovery when drivers leave the roadway.
- ▶ Roadside hardware that can reduce the severity of roadway departure crashes.

BENEFITS

- ▶ **Safer Roads.** Practitioners can systemically apply safety treatments that mitigate roadway departure crashes at areas diagnosed as high risk.
- ▶ **Quick Deployment.** Various pilot efforts have shown it is possible to implement a streamlined process to address the problem on more roads owned by more agencies, even with limited data, using existing crash modification factors and standards.
- ▶ **Flexibility.** A wide range of analysis, diagnostic, and countermeasure selection tools and processes are possible to fit the data availability and technical expertise of the agency, while considering the SHSP goals of the State.

STATE OF THE PRACTICE

Roadway departure countermeasures are regularly used on roads with higher functional classifications and are proven methods for reducing crashes and improving the safety of the transportation system. Crash modification factors have been developed and promoted for several of these countermeasures, and they can be applied more broadly using existing tools and processes.

Minnesota has developed viable safety implementation plans for each of its counties, made funding readily available, and promoted partnerships for efficient construction management. North Dakota has also developed plans for all its counties, while Iowa, Nebraska, and Kansas are working on a similar effort. Nearly all of Washington's counties have also developed plans. FHWA is working with more than a dozen State departments of transportation and Local Technical Assistance Program Centers to pilot the development of Local Safety Implementation Plans. In addition, approximately 350 Tribal Safety Plans have been developed or are in progress.

RESOURCES

FHWA EDC-5 Reducing Rural Roadway Departures
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/roadway_departures.cfm

FHWA Roadway Departure Crash Emphasis Areas
https://safety.fhwa.dot.gov/roadway_dept/strat_approach/brochure

FHWA Roadway Departure Safety
https://safety.fhwa.dot.gov/roadway_dept

FHWA Office of Safety: Proven Safety Countermeasures
<https://safety.fhwa.dot.gov/provencountermeasures>



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