THE HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) 2022

Preventing Roadway Departure Crashes with HSIP

Funding to Keep Vehicles on the Road

According to the most recent National Highway Traffic Safety Administration data, more than 19,000 fatal vehicle crashes involved a roadway departure in 2021. That's nearly half of all fatal crashes in the United States.[1] In a roadway departure crash, a vehicle crosses the edge line or centerline, leaving the desired travel way. This type of crash often has higher impact speeds, involves fixed objects like trees or utility poles, results in head-on collisions, or produces rollovers.[2]

The HSIP can help support a Safe System and keep all road users safe by funding improvements for all public roadways that help vehicles stay on the roadway and in their travel lane. These projects can help avoid a roadway departure crash by keeping vehicles on the road with improvements like rumble strips and high-friction surface treatments. In the event a vehicle does leave the travel lane, agencies can help minimize the severity of roadway departure crashes with improvements such as guardrails and cable barriers.

In 2022, States obligated $1.1 billion, more than 30% of total HSIP funds, for projects that help prevent roadway departure crashes.

HSIP in 2022—Roadway Departure Prevention

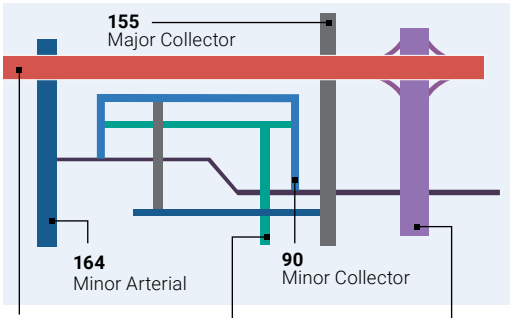
More than 36% of HSIP-funded projects addressed lane and roadway departure crashes.

HSIP funds helped prevent roadway departure crashes at more than 20,000 locations nationwide.

With 193 projects, Ohio had the highest number of projects dedicated to preventing roadway departure crashes.

HSIP-funded projects improved more than 2,744 miles of U.S. roadway to prevent roadway departure crashes—that's nearly the driving distance from New York to Los Angeles!

What Functional Classifications Were Roadway Departure Projects On?*



What Are the Top 10 Roadway Departure Project Types and Average Cost Per Project?**

1. **GENERAL BARRIER**
   122 projects
   $1.7 million cost
2. **EDGE OR SHOULDER RUMBLE STRIPS**
   107 projects
   $2.6 million cost
3. **HIGH-FRICTION SURFACE TREATMENT**
   49 projects
   $4.6 million cost
4. **CABLE BARRIER**
   48 projects | $2.4 million
5. **SHOULDER WIDENED OR ADDED**
   44 projects | $3.1 million
6. **ROADWAY WIDENED**
   41 projects | $2.0 million
7. **ROADWAY WIDENED ALONG CURVE**
   25 projects | $390,000
8. **BARRIER AND TREATMENTS**
   19 projects | $690,000
9. **CENTER LINE RUMBLE STRIPS**
   10 projects | $1.4 million
10. **FIXED OBJECT REMOVAL**
    10 projects | $500,000

**Includes only those with specific reported project types. Improvements designed to help prevent or mitigate roadway departure crashes may also appear in other project categories. For example, rumble strip projects may be included in projects coded as "pavement surface."

*Includes only projects with reported classifications.

This information comes from 2022 State HSIP reports. For individual reports, visit https://highways.dot.gov/safety/hsip/reporting.

1 Fatality Analysis Reporting System report generated August 28, 2023, https://cdan.dot.gov/query.

2 Federal Highway Administration, Roadway Departure Crashes, Local and Rural Road Safety Briefing Sheets, FHWA-SA-14-092 (2014), https://safety.fhwa.dot.gov/local_rural/training/fhwasa14092/road_dep.pdf.

Countermeasures for Roadway Departure Crashes

Countermeasures such as rumble strips, signage, delineation, lighting, and high-friction surface treatments can help keep vehicles on the roadway and in their travel lane. Installing shoulders, widening the separation between opposing lanes, removing fixed objects, and flattening slopes can help prevent crashes. If a crash does occur, barriers like guard or guide rails can help minimize its severity. Speed management is key, too, since a large percentage of roadway departure crashes are speed related.[3] The HSIP can fund the following low-cost countermeasures that, when applied systemically, can help reduce roadway departure crashes and crash severity:

COUNTERMEASURES	BENEFITS
Enhanced delineation for horizontal curves	Increases driver awareness of curves
Centerline and edge line pavement marking	Helps drivers maintain their position in the lane
Wider edge lines	Enhances the visibility of travel lane boundaries
Centerline rumble strips	Reduces head-on and opposing-direction sideswipe crashes
Longitudinal rumble strips and stripes on two-lane roads	Reduces single-vehicle roadway departure crashes
Centerline buffer areas	Separates opposing directions of traffic to reduce head-on crashes
Lighting	Aids guidance through curves, improves visibility, and supports early detection of people or objects in the roadway and support early detection of people or objects at crossings and to those traveling along the roadway
SafetyEdge[SM] treatment on pavement edges	Reduces abrupt drop-offs at edge of pavement
High-friction surface treatment	Helps drivers maintain control through sharp curves, especially during wet pavement conditions
Speed feedback signs	Helps drivers maintain a safe speed
Fixed-object (especially tree and utility pole) removal	Increases roadway clear zone

HSIP in Action

Preventing Lane Departure Crashes with Pennsylvania Department of Transportation (PennDOT)

In Pennsylvania, lane departure crashes produce more fatalities and serious injuries than any other type of crash. In 2021, lane-departure crash fatalities accounted for nearly half of the State's total highway fatalities.[4] In response, PennDOT implemented high-tension cable median barriers (HTCMBs). Cable median barriers, a Proven Safety Countermeasure, prevent cross-median departures and replace a rigid, fixed object with one that absorbs and redirects a vehicle's kinetic energy.

On a 2-mile stretch of I-95 in Delaware County, HTCMBs reduced fatal and serious injury crashes by 100%.[5] Additionally, statewide usage of HTCMB has reduced cross-median crashes by almost 80% and fatal and serious injury crashes by over 30%.[6]

3 Federal Highway Administration, Roadway Departure Crashes, Local and Rural Road Safety Briefing Sheets, FHWA-SA-14-092 (2014), https://safety.fhwa.dot.gov/local_rural/training/fhwasa14092/road_dep.pdf.

4 "Roadway deaths increase in 2021: PennDOT," NorthcentralPA.com, (May 2022) https://www.northcentralpa.com/news/roads/roadway-deaths-increase-in-2021-penndot/article_ec7e3ac8-d14f-11ec-a513-7b713aad0828.html.

5 PennDOT, "How to Reduce Lane Departure Crashes: A FoRRRwD Thinking Approach," (July 2023), https://www.penndot.pa.gov/PennDOTWay/Pages/Article.aspx?post=651.

6 Paul Vigna, "Cable median barrier project to begin on multiple central Pa. routes: PennDOT," Patriot News Penn Live, August 20, 2023, https://www.pennlive.com/news/2023/08/cable-median-barrier-project-to-begin-on-multiple-central-pa-routes-penndot.html.

To find out how HSIP can help save lives in your community, contact your State DOT: https://www.fhwa.dot.gov/about/webstate.cfm

U.S.Department of Transportation
Federal Highway Administration

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE

FHWA-SA-23-023