FHWA-SA-22-022

Implementing Systemic Safety Improvements with HSIP—2020

Saving Lives by Proactively Identifying Risks and Implementing Low-Cost Improvements

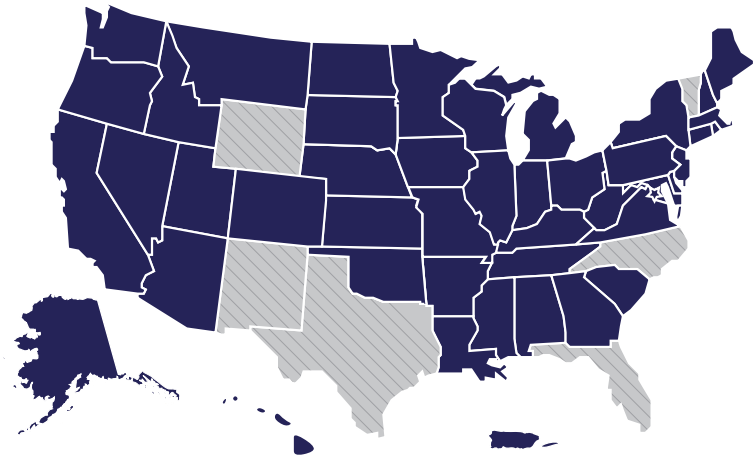
The traditional approach to safety looks for individual locations or corridors that see a high number or rate of fatal or serious-injury crashes. In alignment with the Safe System principle "Safety is Proactive," the systemic approach to safety asks why crashes happen and where they may happen in the future. This approach examines different crash types and looks for infrastructure risk factors—curves or narrow medians, for example.

Agencies use the results of a systemic safety analysis to identify and apply countermeasures to mitigate those risks. By looking at the whole system, this approach helps areas currently experiencing problems as well as areas with similar characteristics that have the potential for future crashes. Because systemic safety improvements are typically lower in cost, they help maximize safety benefits over an entire community or network.[1]

In 2020, States obligated 38 percent of HSIP funds to systemic safety projects.

HSIP in 2020

HSIP funded 1,858 systemic safety projects in 46 States.



States with systemic safety projects

For systemic safety projects, shoulder treatments and advanced technology or ITS projects—including dynamic message signs and traffic monitoring systems—had the highest average cost ($1.0 million–$1.3 million).

Railroad crossings, intersection geometry, speed management projects, curve delineation, signing, pavement markings, and rumble strips had the lowest average cost ($186,000–$255,000).

One-third of systemic safety projects cost less than $100,000.

This information comes from 2020 State HSIP reports. For individual reports, visit https://safety.fhwa.dot.gov/hsip/reports/.

SYSTEMIC SAFETY ANALYSIS

Identify focus areas by crash and facility type.

Look for locations with similar risk factors.

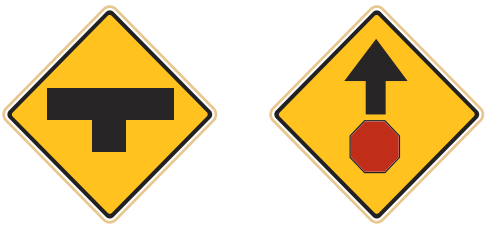
Implement low-cost countermeasures widely across the network.

For more information about the systemic approach to safety, visit https://safety.fhwa.dot.gov/systemic/index.cfm.

[1] FHWA, "A Systemic Approach to Safety – Using Risk to Drive Action" (April 2021), https://safety.fhwa.dot.gov/systemic/index.cfm.

2020 HSIP-FUNDED SYSTEMIC SAFETY IMPROVEMENTS

- Add/upgrade/modify/remove traffic signal
- Barriers—concrete, cable median, roadside
- Clear zone improvements
- High friction surface treatment
- Lighting
- Pavement/shoulder widening and safety edge
- Pedestrian and traffic calming improvements
- Retroreflectivity
- Rumble strips
- Signing, pavement marking, and delineation
- Traffic signals—retiming, backplates, flashing yellow arrow
- Wrong-way driving treatments



Proven Safety Countermeasure

Low-Cost Countermeasures for Stop-Controlled Intersections

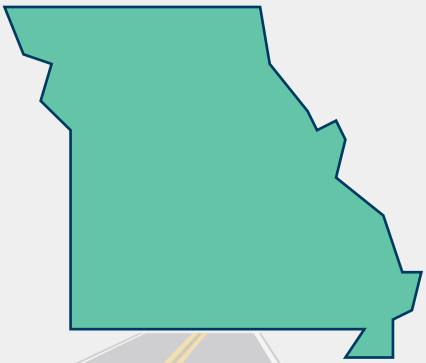
Deploying low-cost countermeasures—such as enlarged signs or enhanced pavement markings—at multiple intersections can increase driver awareness and decrease conflicts over a wide geographic area. At stop-controlled intersections, these improvements can have a 12:1 benefit/cost ratio. At rural stop-controlled intersections, they can reduce fatal and injury crashes by as much as 27 percent.

For more information on stop-controlled intersection countermeasures, visit https://safety.fhwa.dot.gov/provencountermeasures/syst_stop_control.cfm.

HSIP in Action

Missouri

Before 2008, the Missouri Department of Transportation (MoDOT) did not paint edge line stripes on routes with daily traffic volume less than 1,000 vehicles. In 2008, MoDOT conducted a systemic safety analysis on all State-owned roadways without a painted edge line and found that more than two-thirds of severe crashes occurred on roadways carrying 400–1,000 in daily traffic volume. To proactively prevent crashes, MoDOT added edge lines to more than 7,500 miles of roads within this range.



MoDOT then used its Countermeasure Evaluation Tool to compare 570 miles of rural two-lane State highway before and after the edge striping. The analysis revealed that the new edge lines had decreased total crashes for all crash types by 15.2 percent (statistically significant at a 95 percent confidence interval). The edge lines also reduced fatal and injury crashes by 19.3 percent.

This HSIP-funded project was especially effective at reducing crashes on low-volume roads with low crash frequency and density because it spread out relatively low-cost improvements over a large geographic area.

For more on the project, visit https://safety.fhwa.dot.gov/rsdp/ddsa_resources/case_study_mo_oct2014.pdf.

To find out how HSIP can help save lives in your community, contact your State DOT:

https://www.fhwa.dot.gov/about/webstate.cfm

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

U.S.Department of Transportation
Federal Highway Administration

Have an HSIP success story? Share your projects on Facebook, Twitter, and Instagram with #HSIPSavesLives.