

HSIP FUNDS SAFE SYSTEM SOLUTIONS

THE SAFE SYSTEM ROADWAY DESIGN HIERARCHY

The Safe System Roadway Design Hierarchy characterizes engineering and infrastructure-based countermeasures and strategies relative to their alignment with the Safe System Approach. The Safe System Approach aims to design infrastructure that is forgiving to human mistakes and reduces crash severity if a crash occurs. The Safe System Roadway Design Hierarchy includes four tiers that are arranged from most to least aligned with the Safe System principles: (1) remove severe conflicts, (2) reduce vehicle speeds, (3) manage conflicts in time, and (4) increase attentiveness and awareness. Many HSIP projects directly align with one or more of these tiers.

The data below presents HSIP projects mapped onto the four Safe System Roadway Design hierarchy tiers based on improvement subcategory. Projects that aligned with one or more tiers were assigned to the higher tier. Note that because they are all HSIP projects, the projects counted here are safety projects, meaning they aim to improve safety or reduce crashes.

For more information, check out the Safe System Roadway Design Hierarchy at: <https://highways.dot.gov/safety/zero-deaths/safe-system-roadway-design-hierarchy>.

TIER 1: REMOVE SEVERE CONFLICTS

Strategies in this tier address specific high-risk conditions by separating road users traveling at different speeds or in different directions in space to eliminate or minimize conflicts with other users of the transportation system. This tier includes strategies that remove fixed objects alongside the roadside, railway-highway crossings, and intersection crossing conflicts, such as bicycle-vehicle left-turn conflicts. Tier 1 strategies may also include providing physical separation or varying degrees of buffered separation between motorized and non-motorized users.

Tier 1 HSIP Projects in 2023

NUMBER OF PROJECTS	AVERAGE PROJECT COST	TOTAL FUNDS OBLIGATED	STATES WITH TIER 1 PROJECTS
904 (33% OF TIERED PROJECTS)	\$1.6 MILLION	\$928 MILLION (28% OF TOTAL HSIP COST)	43

Key Project Types (and Count)

- Roadside safety improvements, including barrier installation, fixed object removal, and clear zone increases (287)
- Installing modern roundabouts or mini-roundabouts (238)
- Roadway improvements, including high friction surface treatments, superelevation, and curve improvements (166)
- Pedestrian and bicyclist safety improvements, including sidewalks, bicycle lanes, and curb ramps (106)
- Access management, including median crossovers raised islands and roadway narrowing (56)
- Innovative intersections, such as median U-turn, restricted U-turn, and quadrant roadway intersections (36)

TIER 2: REDUCE VEHICLE SPEEDS

Strategies in this tier use roadway and roadside design features to reduce vehicle speeds, thereby reducing the kinetic energy involved in a crash, should one occur. Tier 2 strategies support appropriate speed-limit setting. This tier includes strategies such as self-enforcing roadways, which use features and design elements such as narrow lanes, intersection channelization, and horizontal and vertical deflection to encourage lower vehicle speeds. Tier 2 also includes elements for other users of the transportation system—such as median islands, raised crosswalks, and buffered bicycle lanes—that reduce vehicle speeds where pedestrians and bicyclists come into conflict with drivers. Many of these projects were captured under Tier 1 since they also remove severe conflicts for these users.

In rural conditions, the goal is to align driver expectations with the built environment and reduce crashes' kinetic energy. Improvements such as paving shoulders or improving roadside slopes help match desired operating speed and driver expectations.

Tier 2 HSIP Projects in 2023

NUMBER OF PROJECTS	AVERAGE PROJECT COST	TOTAL FUNDS OBLIGATED	STATES WITH TIER 2 PROJECTS
187 (7% OF TIERED PROJECTS)	\$2.3 MILLION	\$324 MILLION (10% OF TOTAL HSIP COST)	31

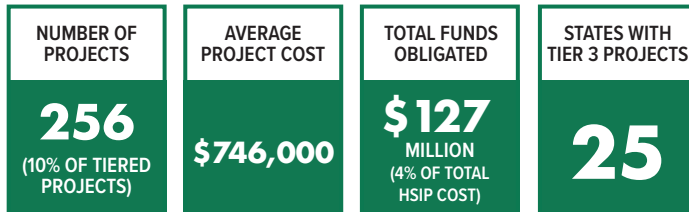
Key Project Types (and Count)

- Shoulder enhancements, including adding or paving shoulders (132)
- Horizontal and vertical alignment changes (34)
- Roadside slope and grading improvements (13)
- Interchange design changes and ramp improvements (8)

TIER 3: MANAGE CONFLICTS IN TIME

Strategies in this tier separate users in time using traffic control devices, such as signals or pedestrian hybrid beacons, to reduce how often and how long different roadway users come into conflict with one another. Tier 3 strategies can help improve the comfort and convenience of travel for people traveling on foot, by bike, or via another non-motorized means.

Tier 3 HSIP Projects in 2023



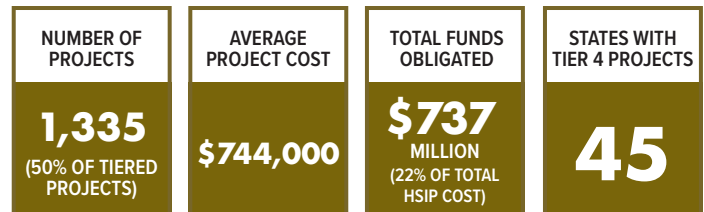
Key Project Types (and Count)

- Adding new traffic signals or converting two-way stops to all-way stops (115)
- Modifying traffic signals by adding a flashing yellow arrow, adjusting a clearance interval, retiming, adding left-turn phasing, or coordinating signals (77)
- Installing or modifying pedestrian signals, pedestrian hybrid beacons, or leading pedestrian intervals (63)

TIER 4: INCREASE ATTENTIVENESS AND AWARENESS

Strategies in this tier help alert roadway users to different types of conflicts so that they can take appropriate action, such as yielding to a pedestrian or bicyclist. Tier 4 strategies include signing and pavement marking enhancements, lighting, backplates with retroreflective borders, and rumble strips and stripes.

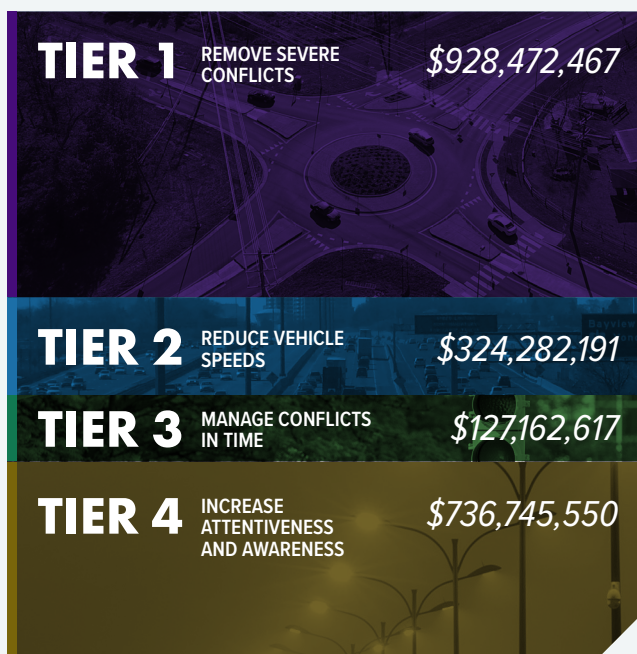
Tier 4 HSIP Projects in 2023



Key Project Types (and Count)

- Roadway signs, curve-related warning signs, and sign sheeting upgrades (306)
- Roadway delineation treatments, including delineators, wider edge lines, raised pavement markers, and retroreflectivity enhancements (296)
- Intersection traffic control enhancements, including flashers, signing, marking, and traffic signal visibility enhancements (243)
- Installing rumble strips in the center, edge, or shoulder (176)
- Lighting improvements at intersections, interchanges, and horizontal curves (102)
- Pedestrian and bicyclist visibility improvements, including crosswalk installations, rectangular rapid flashing beacons, and warning signs (86)
- Railroad-highway crossing improvements through active equipment installation and approach improvements (68)
- Advanced technology, ITS, and speed management treatments, including dynamic message signs, wrong-way driving detection, speed feedback signs, and intersection conflict warning systems (47)
- Intersection geometry improvements and realignment (31)

HSIP INVESTMENT BY TIER



This information comes from 2023 State HSIP reports and the Safe System Roadway Design Hierarchy. Only projects that were assigned to a tier were included in these calculations. For individual reports, visit <https://highways.dot.gov/safety/hsip/reporting>.

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

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

FHWA-SA-24-059



U.S. Department of Transportation
Federal Highway Administration

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

Except for the statutes and regulations cited, the contents of this document do not have the force and effect of law and are not meant to bind the States or the public in any way. This document is intended only to provide information regarding existing requirements under the law or agency policies.

The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this document only because they are considered essential to the objective of the document. They are included for informational purposes only and are not intended to reflect a preference, approval, or endorsement of any one product or entity.