

# Highway Safety Improvement Program 2014 National Summary Report



## FHWA Safety Program



U.S. Department of Transportation  
**Federal Highway Administration**



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## Executive Summary

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose to achieve a significant reduction in fatalities and serious injuries on all public roads. Under the Moving Ahead for Progress in the 21<sup>st</sup> Century Act, Congress authorized approximately \$2.4 billion per year for States to achieve this goal through the implementation of highway safety improvement projects, which is nearly double the amount that was authorized under the previous legislative act. The States not only met this challenge, but far exceeded it obligating nearly \$3 billion for over 3,200 highway safety improvement projects in 2014.

These highway safety improvement projects come in all shapes and sizes. Some HSIP projects are much bigger in scope than others, while other projects include countermeasure installations across multiple sites. The 2014 HSIP National Summary Report provides an aggregate summary of the type and cost of projects across all States. Highlights of the States' 2014 HSIP implementation efforts are provided below.

- A majority (roughly two-thirds) of HSIP projects cost less than \$500,000 each, with one-third of all projects costing less than \$100,000.
- About 25% of HSIP projects would be considered high cost, coming in at over \$1 million each. These projects often include widening shoulders, installing rumble strips, adding auxiliary lanes, improving intersection geometry or modifying traffic signals.
- Projects associated with a functional class were most often categorized as rural major collector or other urban principal arterial.
- Projects on urban principal arterial interstates had the highest average total cost per project of \$2.73 million; whereas projects on rural local roads or streets had the lowest average total cost per project of \$220,000.
- There are fewer urban projects than rural projects but the average total cost per project of the urban projects is greater than the average total cost per project of the rural projects.
- Sixty percent (60%) of highway safety improvement projects occur on roads owned by the State Highway Agency.
- Projects on roads owned by the State Highway Agency had the highest average total cost per project of just over \$1.0 million, while projects on roads owned by county highway agencies cost just under \$500,000 on average.
- A majority (70%) of highway safety improvement projects falls into the following categories: roadway, intersection traffic control, intersection geometry, roadside and shoulder treatments.
- Interchange design, advanced technology and ITS and shoulder treatment projects have the highest average cost per project; whereas roadway signs and traffic control, work zone and speed management projects have the lowest average cost per project.
- States use HSIP funds to address the predominant infrastructure-related crash types – roadway departure, intersection and pedestrian crashes.

While the number and cost of HSIP projects slightly decreased in 2014 from 2013, the number of HSIP projects under MAP-21 (2013-2014) has increased substantially as compared to 2010-2012. Over the past six years, States obligated \$12.6 billion for more than 15,000 highway safety improvement projects.

## Background

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the objective to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of highway safety improvement projects. The HSIP, similar to other Federal-aid programs, is a federally-funded, state administered program. The FHWA establishes the HSIP requirements via 23 CFR 924, and the States develop and administer a program to best meet their needs.

The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. To obligate HSIP funds, each State shall:

- Develop, implement, and update a State strategic highway safety plan;
- Produce a program of projects or strategies to reduce identified safety problems; and
- Evaluate the SHSP on a regularly recurring basis.

States are also required to submit a report that describes the progress being made to implement highway safety improvement projects and the effectiveness of those improvements. The [HSIP MAP-21 Reporting Guidance](#) outlines the content and schedule for the annual HSIP report. The HSIP report should include, at a minimum, a discussion of each State's:

- Program Structure
- Progress in Implementing the HSIP projects
- Progress in Achieving Safety Performance Targets
- Assessment of the Effectiveness of the Improvements (Program Evaluation)

The HSIP 2014 National Summary Report compiles and summarizes aggregate information related to the States progress in implementing HSIP projects during the 2014 reporting cycle. Progress in implementing HSIP projects is described based on the amount of HSIP funds available and the number and general listing of projects obligated as documented in the [2014 HSIP reports](#). The HSIP 2014 National Summary Report is not intended to compare states; rather to illustrate how the states are collectively implementing the HSIP to reduce fatalities and serious injuries on all public roads across the nation.

A summary of available funding and the number and general listing of projects from prior years is available in the [HSIP National Summary Baseline Report: 2009 -2012](#) and [HSIP 2013 National Summary Report](#).

## HSIP Funding Approach

Prior to MAP-21, each apportioned program had its own formula for distribution, and the total amount of Federal assistance a State received was the sum of the amounts it received for each program. MAP-21 instead provides a total apportionment for each State and then divides that apportionment amount among individual apportioned programs.

MAP-21 authorizes a total combined amount (\$37.5 billion in FY13 and \$37.8 billion in FY14) in contract authority to fund five formula programs (including certain set-asides within the programs described below):

- National Highway Performance Program (NHPP);

- Surface Transportation Program (STP);
- **Highway Safety Improvement Program (HSIP);**
- Congestion Mitigation and Air Quality Improvement Program (CMAQ); and
- Metropolitan Planning Program.

Figure 1 illustrates the distribution of funds across program under MAP-21.

MAP-21 Annual Program Apportionments  
(\$ billions)

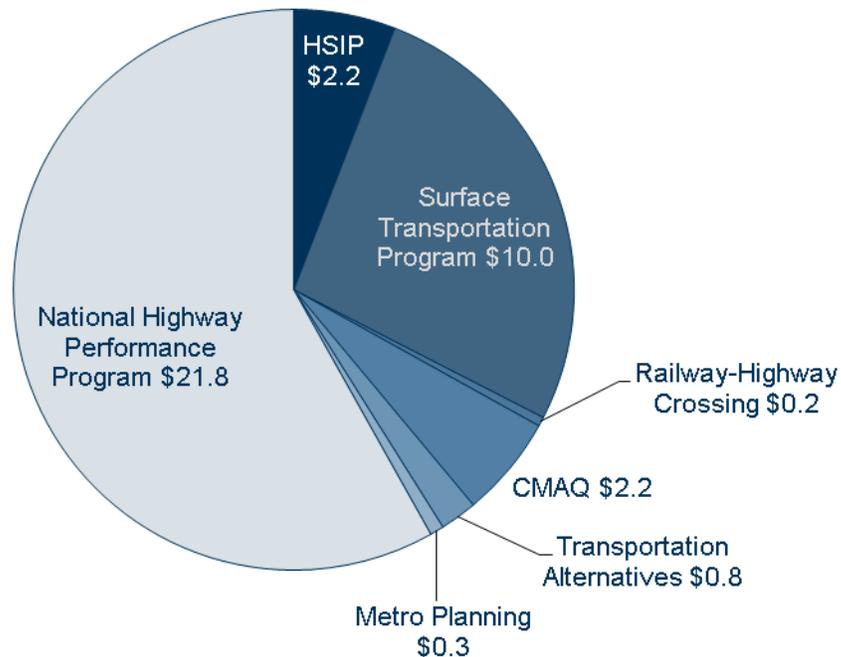


Figure 1: MAP-21 Program Apportionments

HSIP receives 7% of the States apportionment remaining after allocations to CMAQ and Metropolitan Planning, which amounts to approximately \$2.4 billion each year, nearly double the amount apportioned to HSIP under SAFETEA-LU. The following sums are set-aside from the State's HSIP apportionment:

- Railway-highway crossings -- \$220 million;
- A proportionate share of funds for the State's Transportation Alternatives (TA) program; and
- 2% for State Planning and Research (SPR).

In addition, if the High Risk Rural Roads Special rule applies to a State, then in the next fiscal year the State must obligate an amount at least equal to 200% of its FY 2009 HRRR set-aside for high risk rural roads.

The final HSIP apportionment represents the amount of funding available to States for the advancement of highway safety improvement projects.

## HSIP Projects Overview

States provide project specific information for all projects obligated with HSIP funds during the reporting period in their annual HSIP reports. The reporting period is defined by the State and can be calendar year, state fiscal year or federal fiscal year. For 2014, the States obligated \$2.96B for 3,214 total projects. These obligations utilized funds apportioned during the 2014 fiscal year as well as HSIP funds available from previous years' apportionments.

As per the HSIP MAP-21 Reporting Guidance, project specific information includes:

- Improvement Category and Sub Category (see Appendix A for complete descriptions)
- Project output (e.g., miles of rumble strips)
- Project cost (both HSIP cost and total cost)
- Funding category
- Functional classification
- AADT
- Posted speed limit
- Roadway ownership
- Relationship to the State's strategic highway safety plan (SHSP) (i.e. emphasis area, strategy)

The following sections present various summaries of the nationwide HSIP project obligations for the 2014 reporting cycle. It should be noted that limited analysis of the project information can be done because not all states have included all of the above information for each project in their annual HSIP reports. Full use of the HSIP online reporting tool and compliance with the most recent HSIP reporting guidance will enable more complete and accurate reporting of national HSIP project data. In addition, HSIP projects come in all shapes and sizes. For example, some HSIP projects may be much bigger in scope than others, countermeasure installations across multiple sites, or non-infrastructure projects (i.e. transportation safety planning, data improvements). Nonetheless, the summaries in the following sections provide a broad scale analysis of HSIP spending in 2014.

## Project Cost

The cost per HSIP project in 2014 ranged widely. Some projects were small in scope and cost, such as replacing signs on a particular route. Others were higher cost projects, such as widening a highway or reconfiguring an intersection. Figure 2 shows the breakdown by project cost, grouped into general categories with breakpoints at \$100,000, \$500,000, and \$1,000,000.

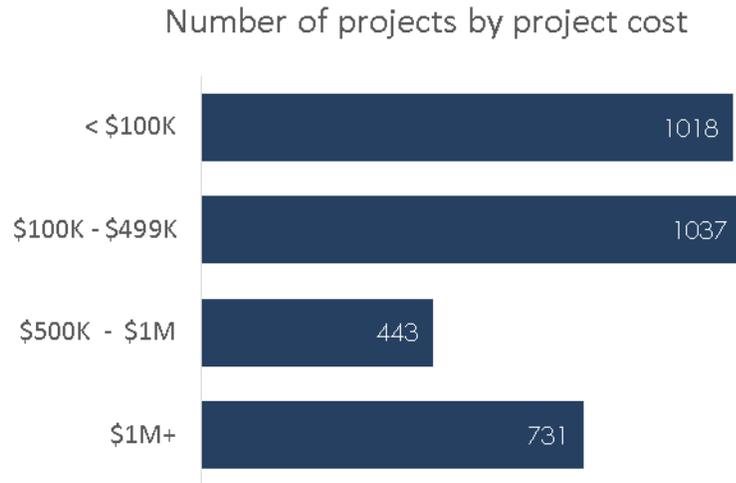


Figure 2: Number of Projects by Project Cost

Roughly two-thirds of the projects had costs less than \$500K. A small percentage (14 percent) fell into the \$500K - \$1M category. The remaining 23 percent were high cost projects totaling \$1M or more. The top five sub categories selected for these high cost projects are:

- Widen shoulder – paved or other (89 projects ranging from 0.5 to 27 miles treated)
- Rumble strips – edge or shoulder (45 projects ranging from 1 to 189 miles treated)
- Auxiliary lanes – add left-turn lane (30 projects)
- Intersection geometry – other (26 projects)
- Modify traffic signal – modernization/replacement (25 projects)

In 2013, the breakdown was similar. Sixty-eight percent of projects had costs less than \$500K, 12 percent fell into the \$500K - \$1M category, and the remaining 20 percent were more than \$1M.

## Functional Class and Ownership

Figure 3 through Figure 7 illustrate the distribution of projects by the types of roads on which they were conducted. Figure 3 shows number of projects by functional class, following the HPMS classification scheme; Figure 4 shows average total cost of projects by functional class; Figure 5 shows the number and average total cost of projects by urban/rural designation; Figure 6 shows projects by the agency who owns the road; and Figure 7 shows average total cost of projects by the agency who owns the road. If the functional class or road ownership was not indicated, the project is counted under the “unknown” category. Examples of classifications in the “other” category include multiple functional classes, state or citywide implementation, or non-infrastructure projects.

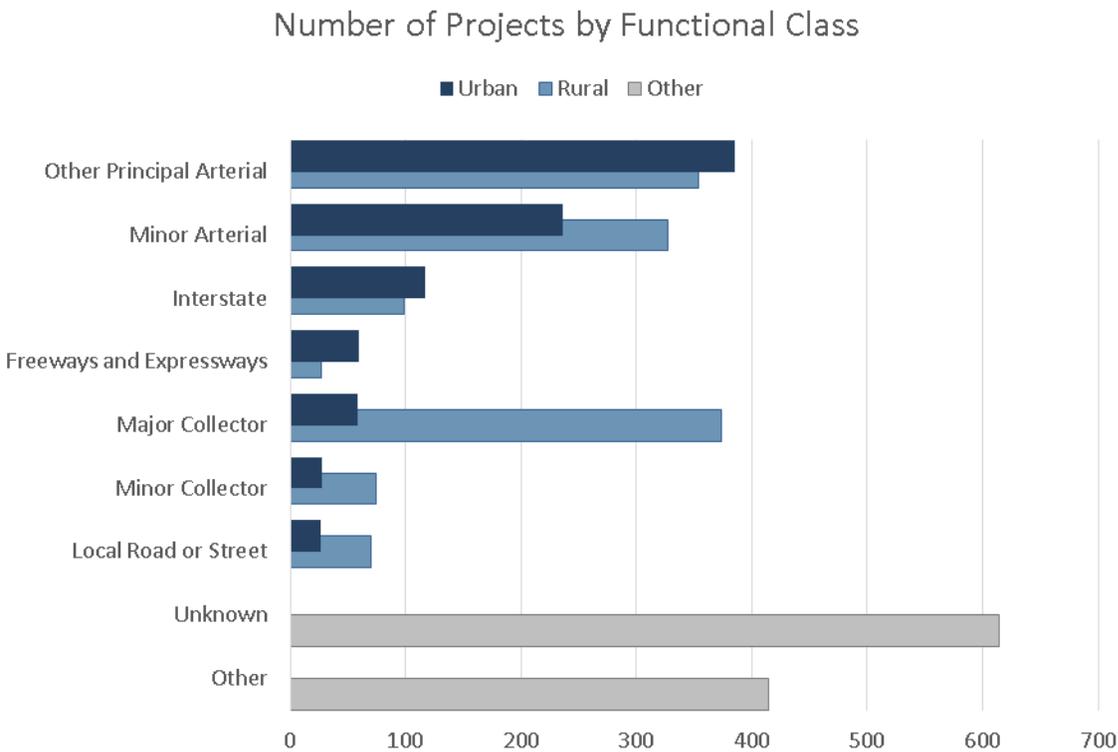


Figure 3. Number of Projects by Functional Class

Most projects were categorized as “Unknown” indicating that the State did not associate a functional class for a particular project. Projects that were associated with a functional class were most often categorized as “Rural Major Collector” or “Urban Principal Arterial – Other”. There were 415 projects categorized as “Other” and of those, roughly 295 were categorized as multiple classes or systemic. Roughly another 30 were categorized as “n/a” due to the fact that they were non-infrastructure projects.

## Average Cost of Projects by Functional Class

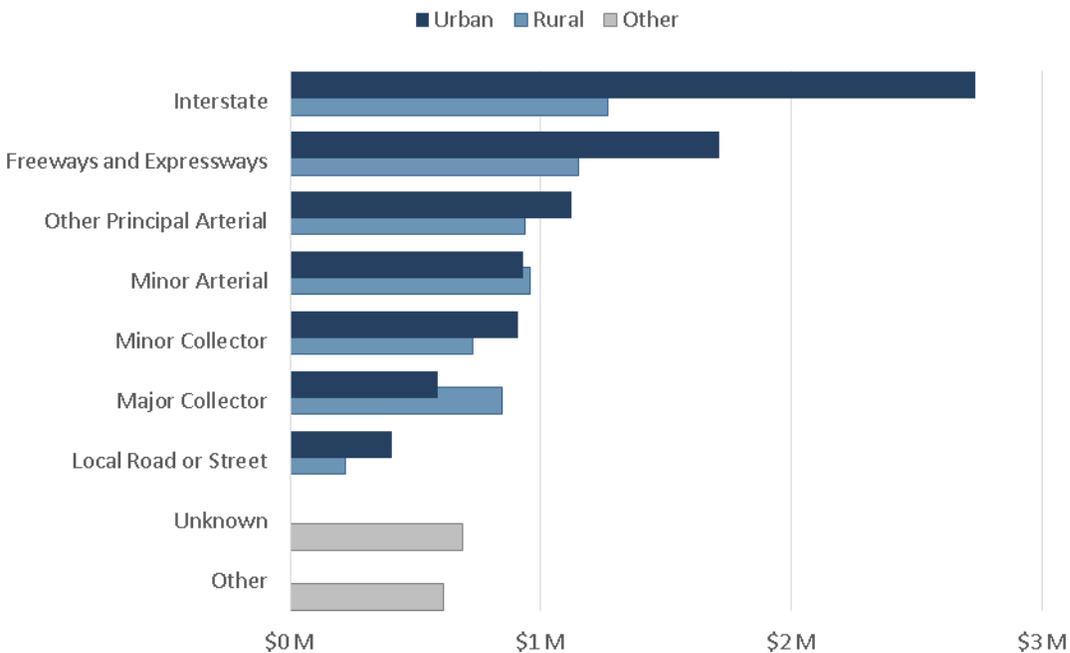


Figure 4. Average Total Cost of Projects by Functional Class

Figure 4 shows the average total cost of projects by functional class. It is important to note that not every project had an associated cost so the average is based on the number of projects which had cost information available. Projects categorized as “Urban Principal Arterial – Interstate” had the highest average total cost per project of \$2.73 million and projects categorized as “Rural Local Road or Street” had the lowest average total cost per project of \$220,000.

### Number and Average Total Cost of Projects by Urban/Rural Designation

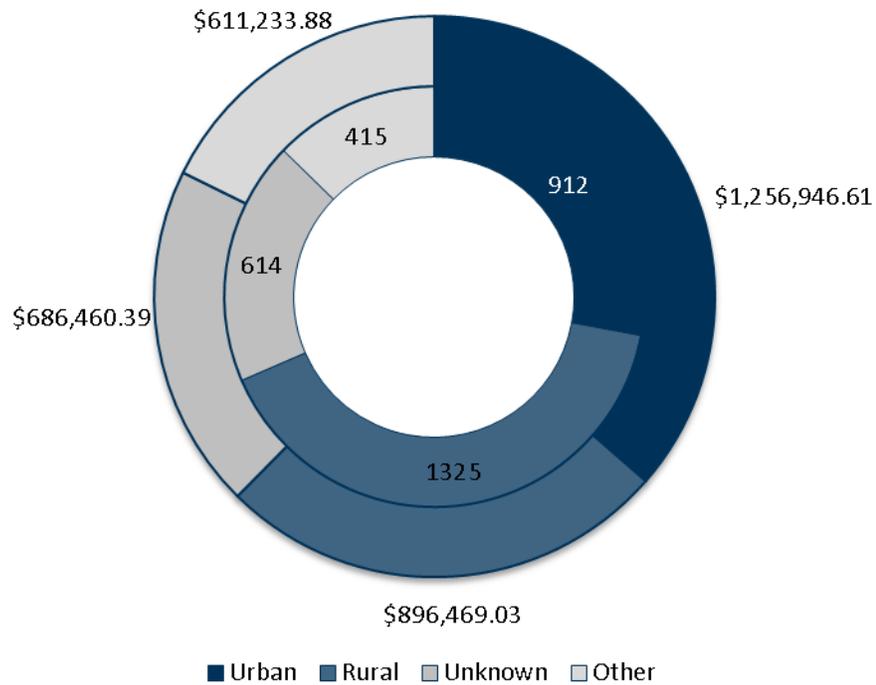
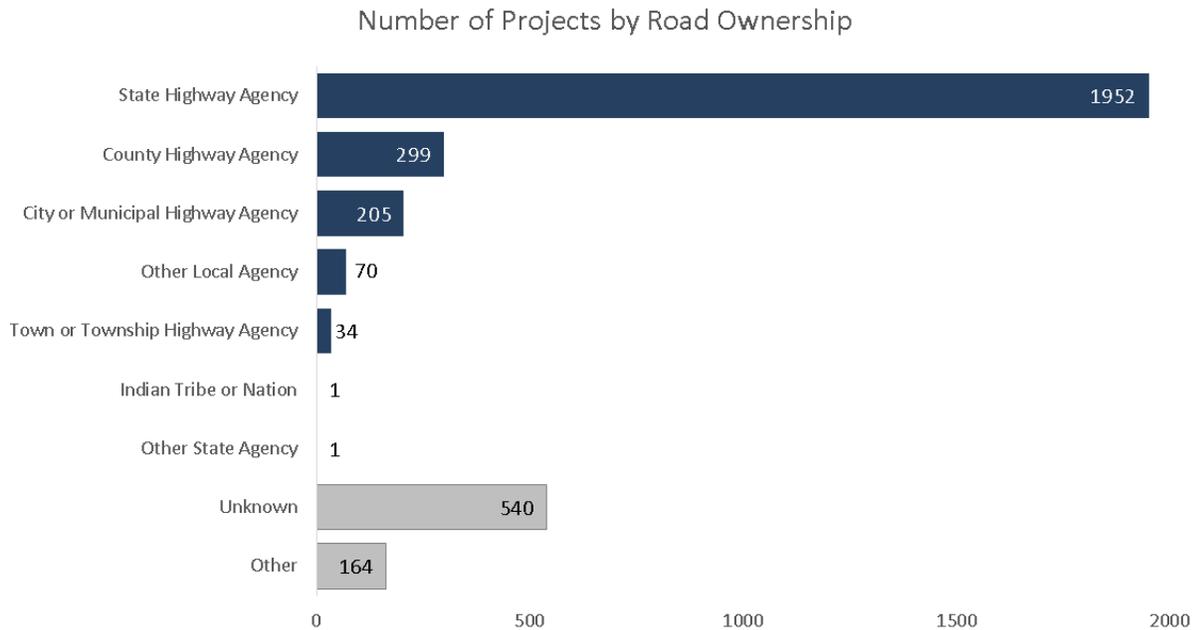


Figure 5. Number and Average Total Cost of Projects by Urban/Rural Designation

Figure 5 illustrates the number and average total cost of projects by urban/rural designation. There are fewer total urban projects than rural projects but the average total cost of the urban projects is greater than the average total cost of the rural projects.



**Figure 6. Number of Projects by Road Ownership**

States implement most projects on roads owned by a “State Highway Agency” or “Unknown” (indicating that the State did not indicate road ownership for a particular project). There were 164 projects categorized as “Other” and of those, roughly 90 were categorized in state-defined ownership categories. No projects were categorized for the following ownerships:

- State Park, Forest, or Reservation Agency
- Local Park, Forest, or Reservation Agency
- Private (Other than Railroad)
- Railroad
- State Toll Authority
- Local Toll Authority
- Other Public Instrumentality

### Average Cost of Projects by Road Ownership

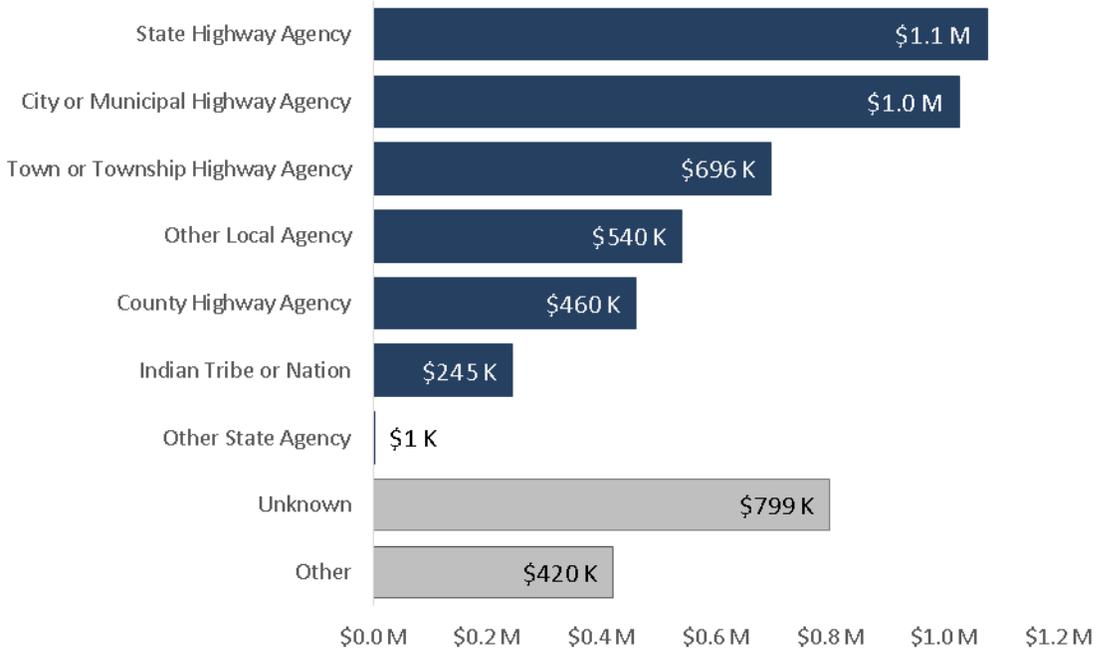


Figure 7. Average Total Cost of Projects by Road Ownership

Figure 7 shows the average total cost of projects by road ownership. It is important to note that not every project had an associated cost so the average is based on the number of projects which had cost information available. Projects categorized as “State Highway Agency” had the highest average total cost per project of \$1.07 million and projects categorized as “Other State Agency” had the lowest average total cost per project of \$1,000.

## Improvement Categories and Subcategories

Under the HSIP MAP-21 reporting guidance, each project should be assigned a general improvement category and a subcategory under that general category. While a single project may consist of multiple project types, FHWA directs States to assign each project to only one category. The category chosen should align with the primary purpose of the project. Figure 8 and Figure 9 show the distribution of the number of projects by general improvement category. Figure 10 and Figure 11 combined show the distribution of the total cost of projects by general improvement category. Projects categorized as “Unknown” indicate that there was no general improvement category assigned by the State. Figure 12 through Figure 16 show the breakdown of the number of projects by subcategory for five improvement categories: Intersection geometry, Intersection traffic control, Pedestrians and bicyclists, Roadway, and Non-infrastructure. More detailed tables with the cost spent in each subcategory are available in Appendix B. For ease of reporting, similar sub categories were grouped together. For example, in Figure 12 below, “Auxiliary lanes – other” combines adding acceleration lanes, adding auxiliary through lanes, adding two way left turn lanes, and several other related subcategories.

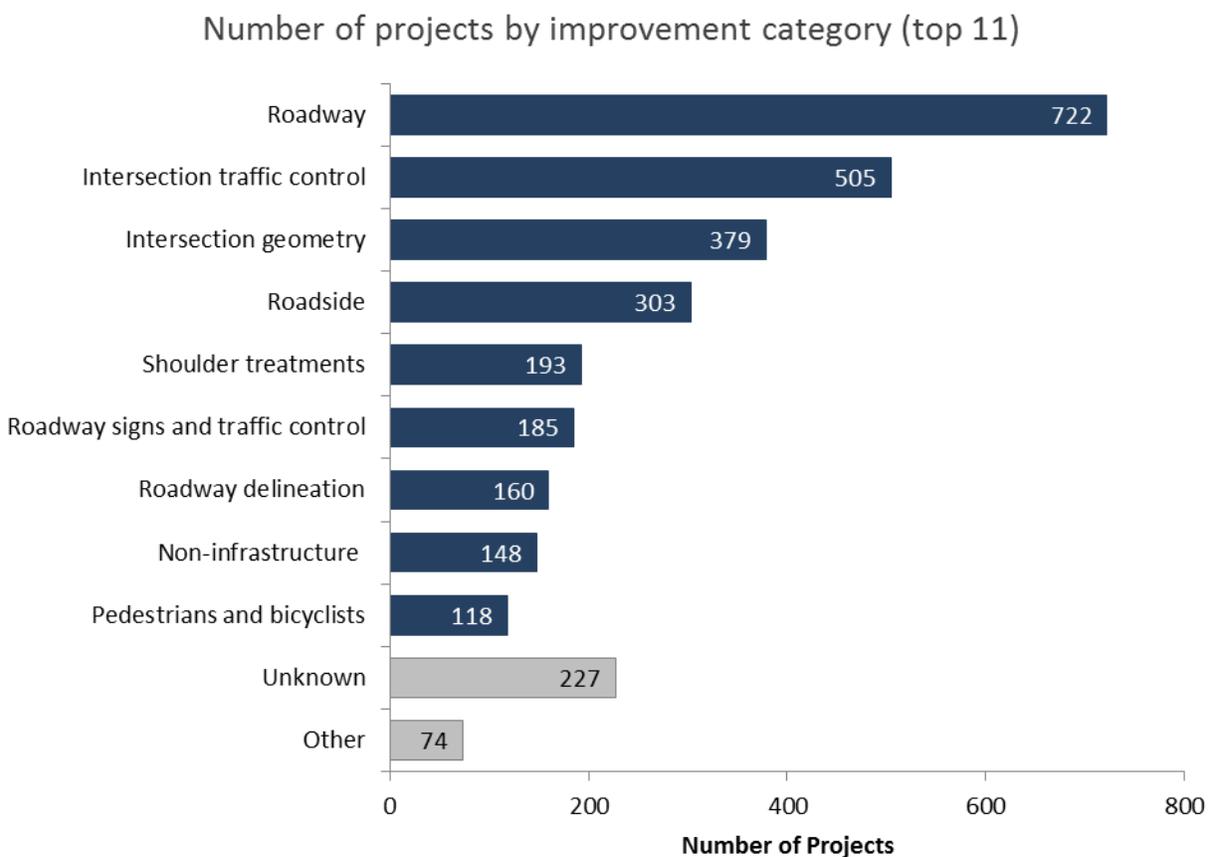


Figure 8. Number of Projects by Improvement Category (Top 11)

Figure 8 shows the number of projects by improvement category (top 11) as classified in the HSIP MAP-21 Reporting Guidance. Based on the project information reported by the States, the top five improvement categories are roadway, intersection traffic control, intersection geometry, roadside, and shoulder treatments. In 2013, the top five improvement categories were the same and the number of projects classified in each were similar.

### Number of projects by improvement category (bottom 11)

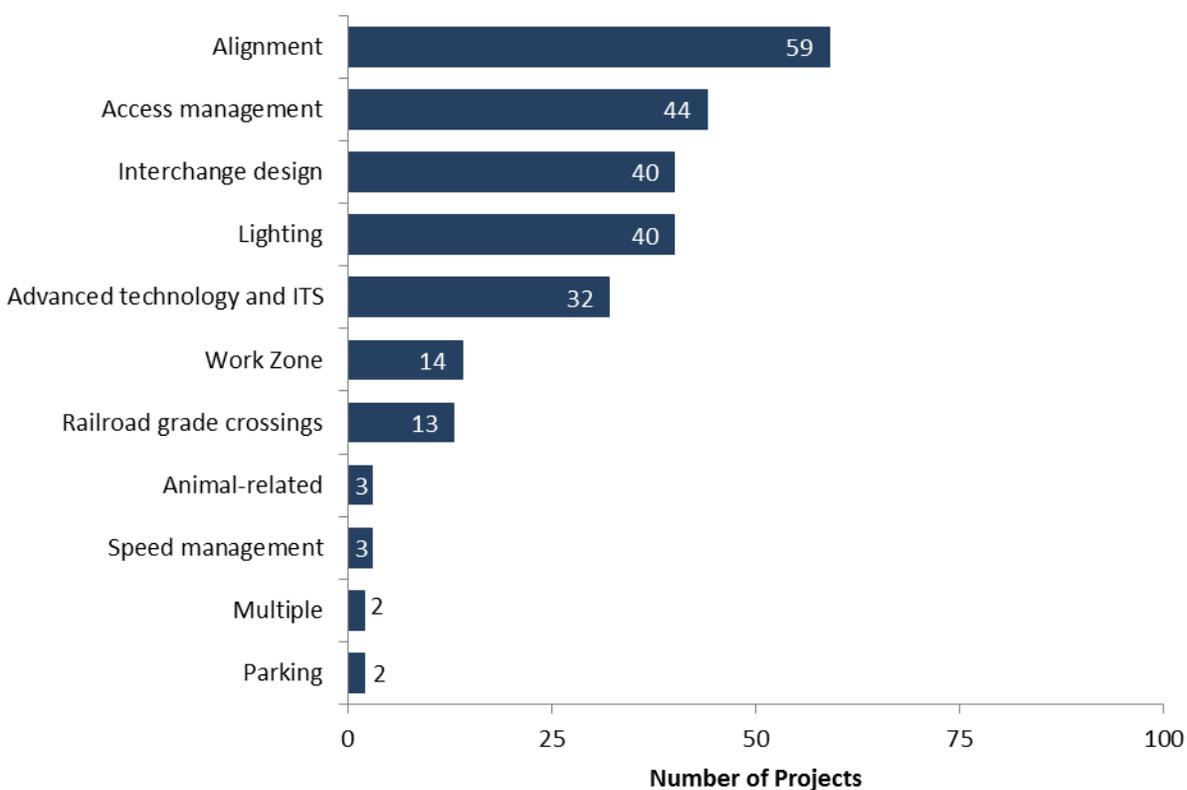


Figure 9. Number of Projects by Improvement Category (Bottom 11)

Figure 9 shows the number of projects by improvement category (bottom 11) as classified in the HSIP MAP-21 Reporting Guidance. In 2014, there were half as many projects categorized as “Interchange design” as in 2013. Also in 2014, there were 14 projects categorized as “Work zone” compared to just one project in 2013. The ranking of the remaining project categories was similar in both years.

### Average cost of projects by improvement category (top 11)

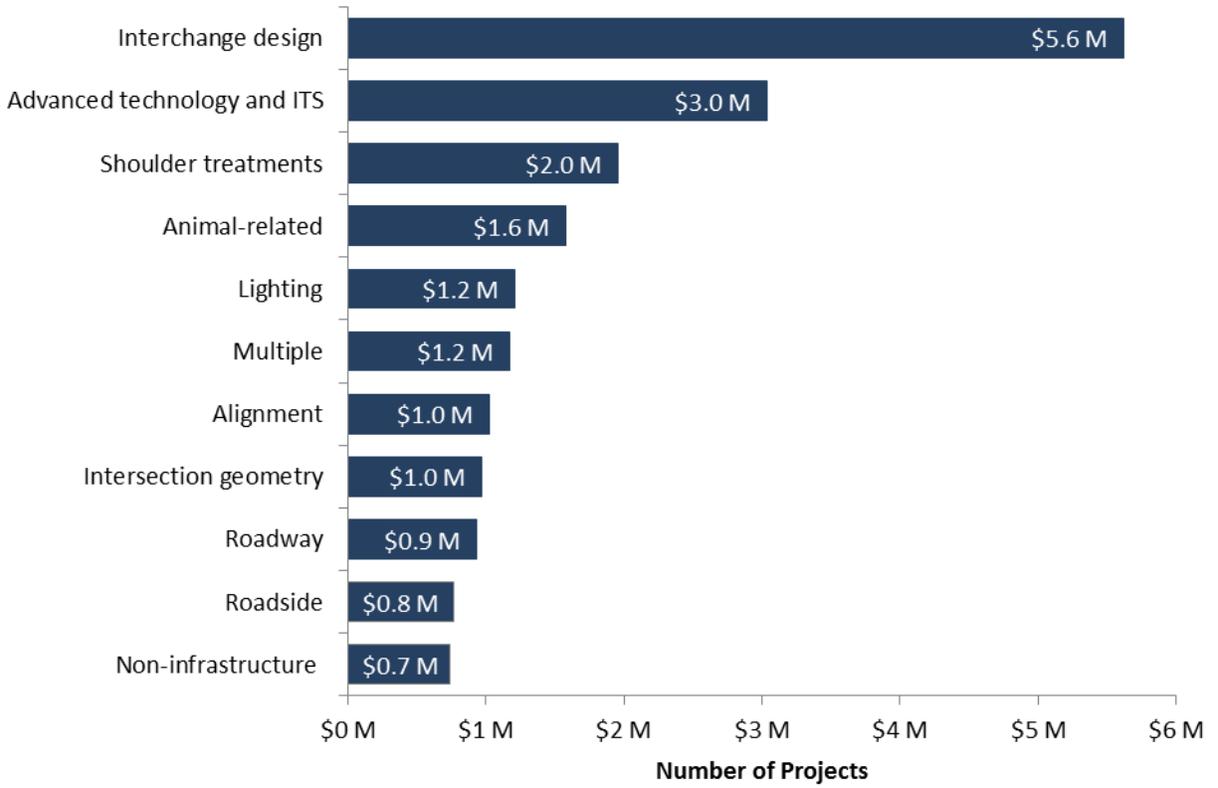


Figure 10. Average Total Cost of Projects by Improvement Category (top 11)

Figure 10 shows the average total cost of projects by improvement category (top 11). Again, it is important to note that not every project had an associated cost so the average is based on the number of projects with cost available.

### Average cost of projects by improvement category (bottom 11)

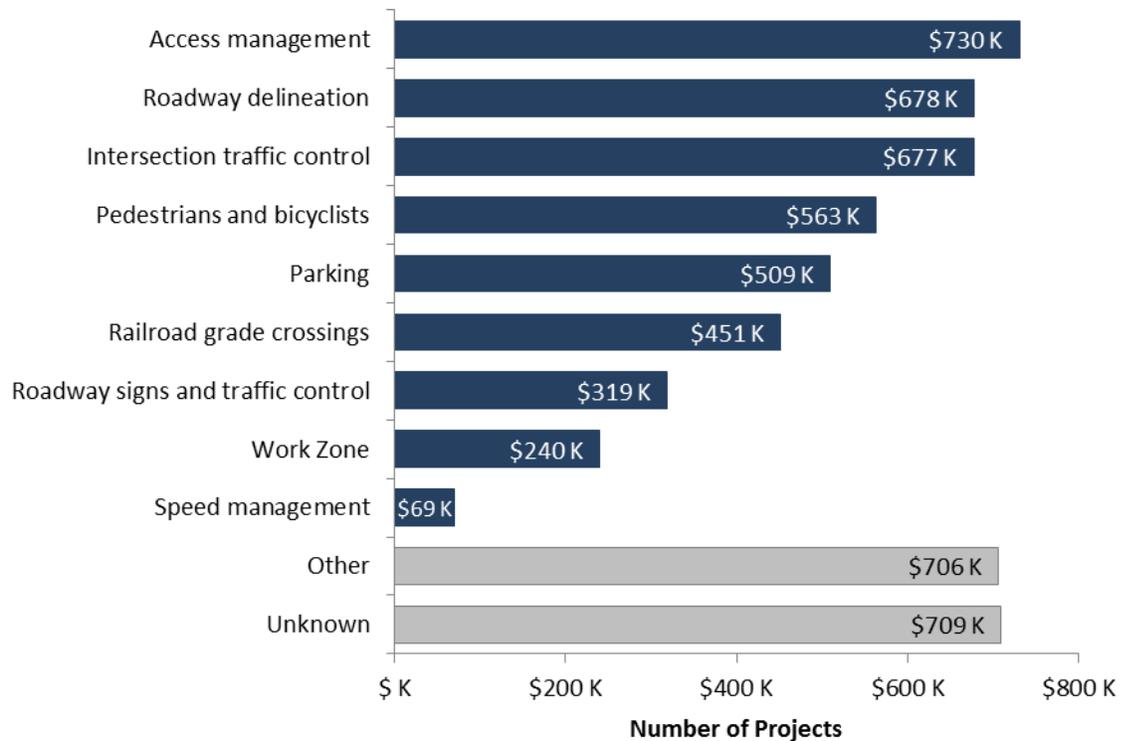


Figure 11. Average Total Cost of Projects by Improvement Category (bottom 11)

Based on project information reported by the States, the lowest average HSIP cost projects are in the following categories:

- Speed management; 3 projects with HSIP cost information
- Work zone; 14 projects with HSIP cost information
- Roadway signs and traffic control; 185 projects with HSIP cost information
- Railroad grade crossings; 13 projects with HSIP cost information
- Parking; 2 projects with HSIP cost information

## Intersection Geometry Project Subcategories

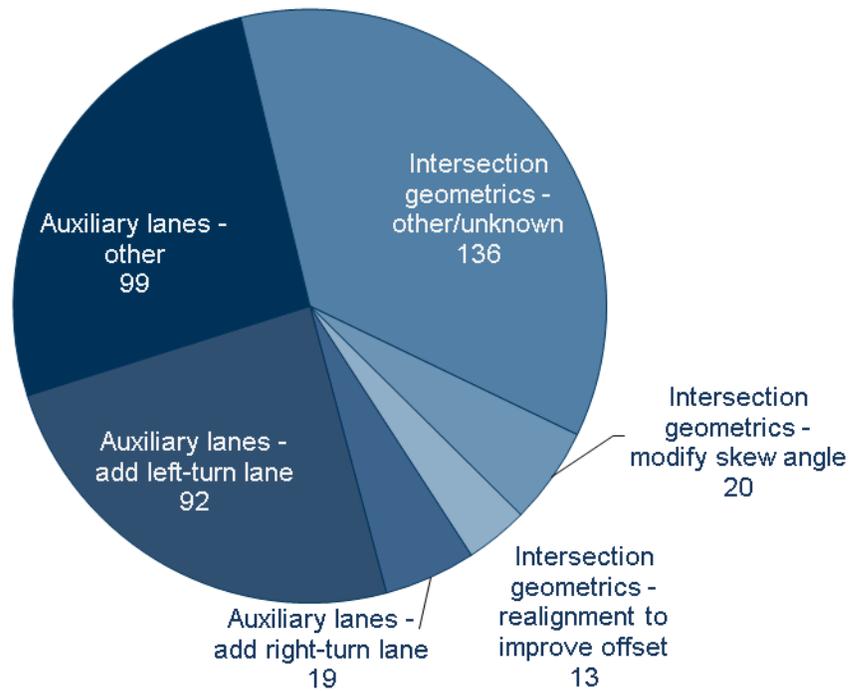


Figure 12: Number of Intersection Geometry Projects by Subcategory

For the Intersection geometry category, most projects were sub categorized as “Intersection geometrics – other/unknown” (136 of 379 projects), “Auxiliary lanes – other” (99 of 379 projects), and “Auxiliary lanes – add left-turn lane” (92 of 379 projects). Examples of projects in the “Intersection geometrics – other/unknown” subcategory include widen/resurface to construct J turns and general intersection safety improvement projects. The “Intersection geometrics – other/unknown” subcategory was predominately used without any project description, therefore, no other information is available for these projects.

## Intersection Traffic Control Project Subcategories

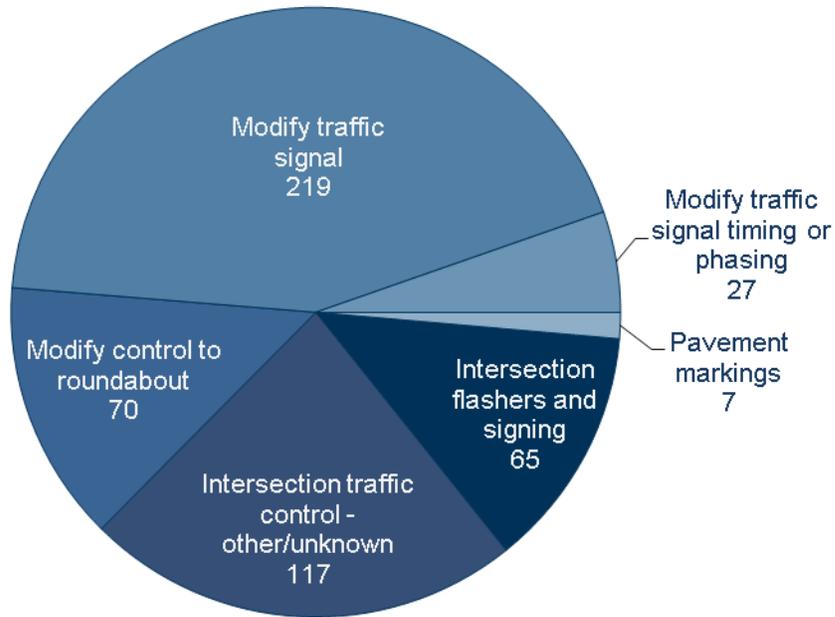


Figure 13: Number of Traffic Control Projects by Subcategory

For the Intersection traffic control category, most projects were subcategorized as “Modify traffic signal” (219 of 505 projects) which includes signal replacement/modernization, addition of new signals, flashing yellow arrow, and vehicle preemption. Examples of projects in the “Intersection traffic control – other/unknown” sub category include projects described as general intersection safety improvement projects. The “Intersection traffic control – other/unknown” subcategory was predominately used without any project description, therefore, no other information is available for these projects.

## Pedestrian and Bicycle Project Subcategories

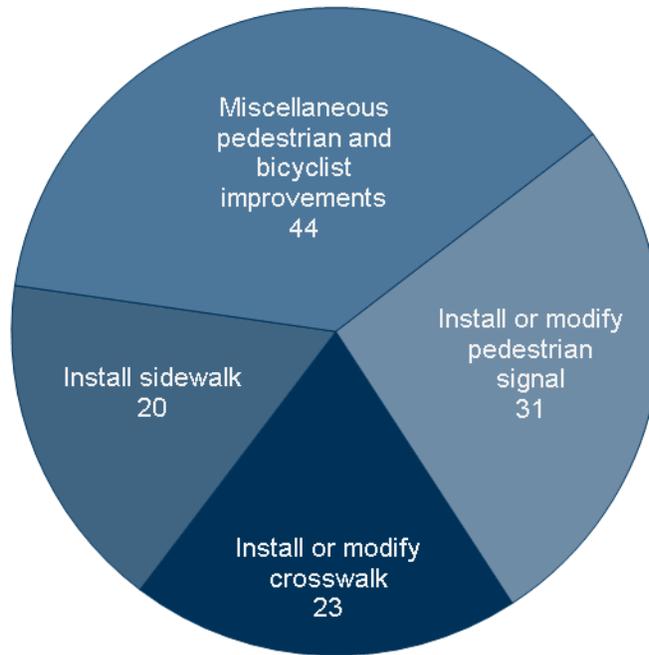


Figure 14: Number of Pedestrian and Bicyclist Projects by Subcategory

For the Pedestrians and bicyclists category, most projects were subcategorized as “Miscellaneous pedestrian and bicyclist improvements” (44 of 118 projects) and “Install or modify pedestrian signal” (31 of 188 projects). Many of the projects in the “Miscellaneous pedestrian and bicyclist improvements” subcategory are Safe Routes to School activities.

## Roadway Project Subcategories

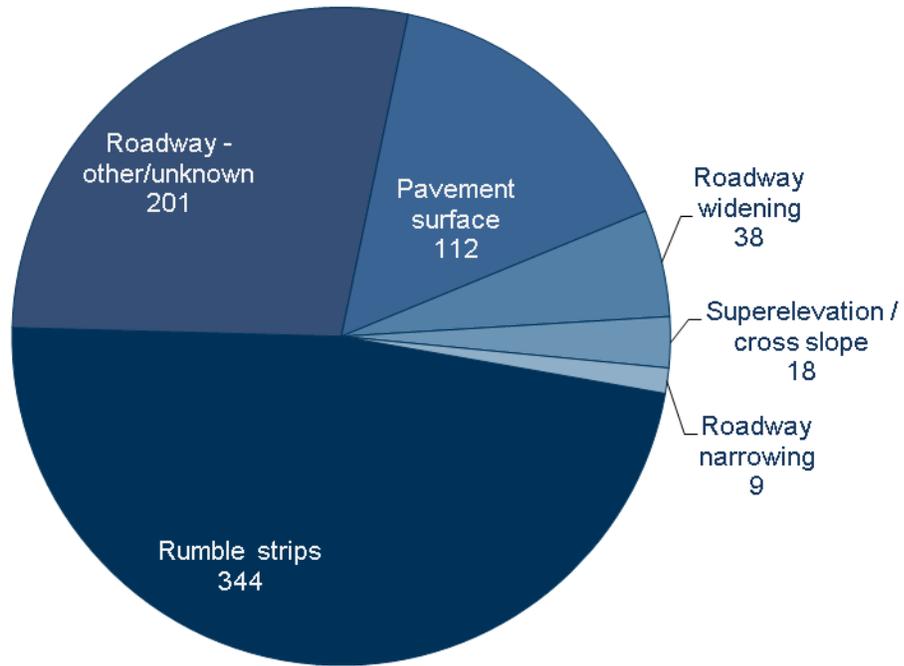


Figure 15: Number of Roadway Projects by Subcategory

For the Roadway category, most projects were subcategorized as “Rumble strips” (344 of 722 projects) and “Roadway – other/unknown” (201 of 722 projects). Examples of projects in the “Roadway – other/unknown” subcategory were combinations projects such as “repair pavement structure, replace guardrail, and pavement markers” and “sight distance-superelevation-shoulder widening”.

### Non-infrastructure Project Subcategories

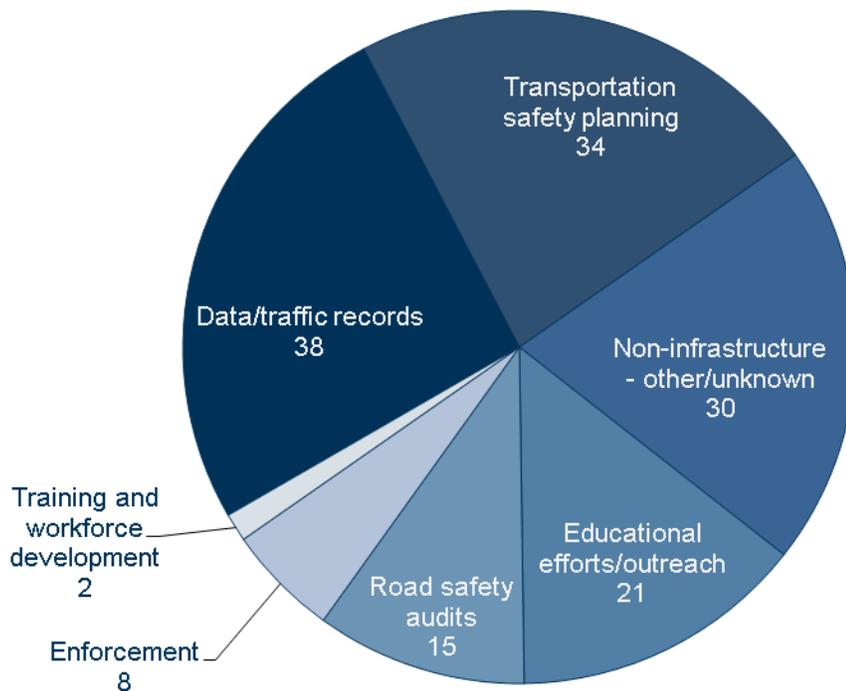


Figure 16: Number of Non-Infrastructure Projects by Subcategory

For the Non-infrastructure category, most projects were subcategorized as “Data/traffic records” (38 of 148 projects), “Transportation safety planning” (34 of 148 projects), and “Non-infrastructure – other/unknown” (30 of 148 projects). Projects in the “Non-infrastructure – other/unknown” subcategory are largely undescribed. A few examples include calibrating state specific Highway Safety Manual safety performance functions, development of statewide safety planning tools, and development of HSIP/safety operations manuals.

## SHSP Emphasis Areas

Based on a review of State SHSPs, FHWA identified the eight SHSP emphasis areas common across most States. These emphasis areas are used in the HSIP online reporting tool for categorizing HSIP projects. Figure 17 presents the number of HSIP projects categorized by SHSP emphasis area. For consistency and national reporting purposes, state-defined SHSP emphasis areas were assigned to these emphasis areas, where possible. Please note that States sometimes categorize a single project by several SHSP Emphasis Areas. Therefore, for the purpose of Figure 17, a single project may be counted more than once. For example, the State recently completed an intersection improvement project that enhanced safety for pedestrians. This project could be categorized as “Intersections” as well “Pedestrians” and is therefore counted once in each category.

About one-third of the projects were categorized as “Roadway Departure”, one-quarter were categorized as “Intersections”, and one-quarter categorized as “Unknown/Other”. Examples of other categories used by the States include: “Driver Behavior & Awareness”, “Educational Efforts”, and “Non-Infrastructure”.

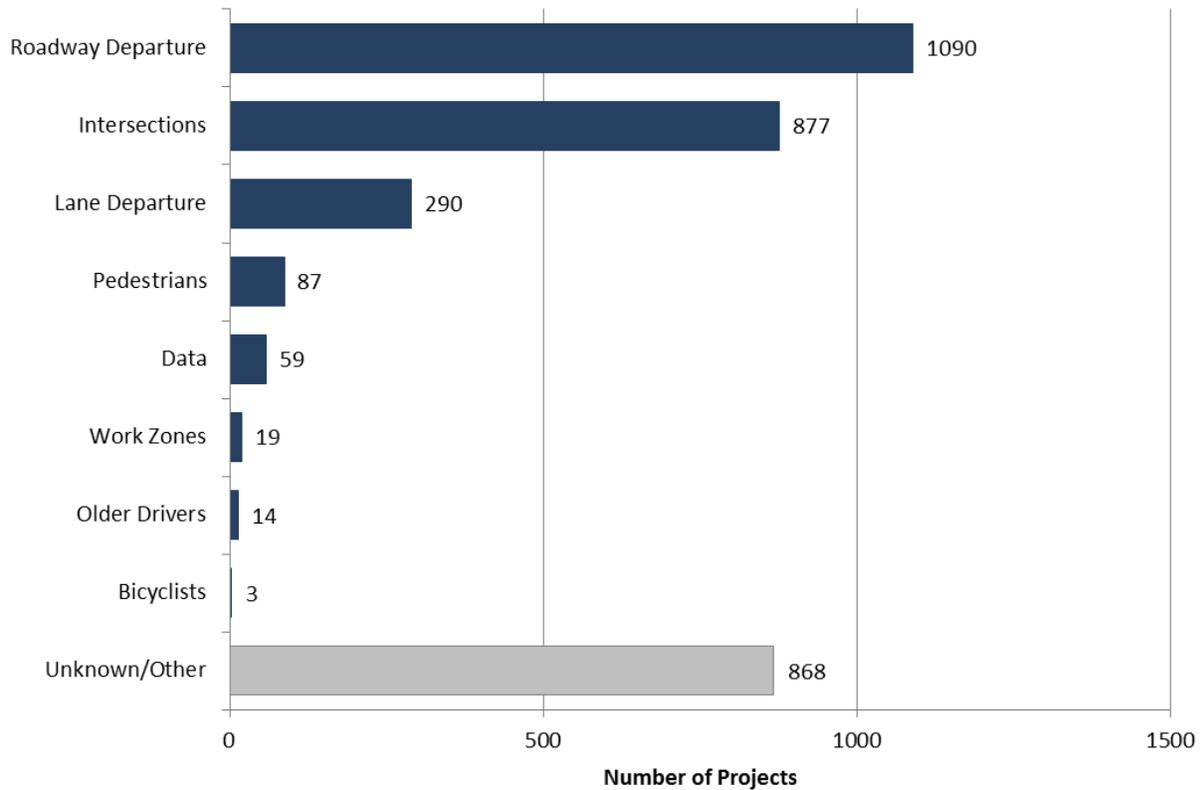


Figure 17: Number of Projects by SHSP Emphasis Area

## 2013-2014 Comparison

Most states prepared their 2013 and 2014 HSIP reports in accordance with the MAP-21 HSIP Reporting Guidance; therefore FHWA can make a direct comparison of information related to the 2013 and 2014 highway safety improvement projects. As can be seen in Table 3 below, the total number of projects and cost of projects did not change much from 2013 to 2014. The breakdown in project costs for various breakpoints was also similar.

Table 1. Total number of projects and project cost breakdown, 2013-2014

Year	2013	Percentage	2014	Percentage
<b>Number of projects</b>	3292		3266	
<b>Num. of projects (with cost info.)*</b>	3253		3257	
<b>Cost of projects</b>	\$3.09B		\$2.99B	
<b>Average cost per project</b>	\$950,840		\$921,072	
<b>Number of projects &lt;\$100K</b>	1176	37%	1018	31%
<b>Number of projects \$100K - \$499K</b>	985	31%	1037	32%
<b>Number of projects \$500K-\$1M</b>	401	13%	443	14%
<b>Number of projects \$1M+</b>	631	20%	731	23%

Table 2 shows the comparison between 2013 and 2014 of the number of projects and average total cost of projects for various project types highlighted in this report. Overall, number and cost of projects has remained roughly the same.

Table 2. Number of projects and average total project cost for various project types, 2013-2014

Project Type	Num Projects 2013	Avg Cost 2013	Num Projects 2014	Avg Cost 2014
<b>Urban projects</b>	826	\$1.4M	912	\$1.3M
<b>Rural projects</b>	1244	\$896K	1325	\$686K
<b>Roadway projects</b>	854	\$635K	722	\$935K
<b>Intersection traffic control projects</b>	420	\$667K	505	\$677K
<b>Intersection geometry projects</b>	376	\$1.2M	379	\$972K
<b>Ped/bike projects</b>	103	\$528K	118	\$485K
<b>Non-infrastructure projects</b>	109	\$444K	148	\$563K

## Comparison to Previous Years

The HSIP National Summary Baseline Report 2009-2012 reported project and cost information for HSIP reports submitted by the States for years 2009-2012. The information from the baseline report is summarized below with the purpose of comparing basic cost and project information to the 2013 and 2014 reports. Table 3 below shows that States obligated \$12.6B for more than 15,000 projects over the six-year period. These obligations include not only HSIP funds apportioned during the reporting period (2009-2014), but also HSIP funds available from previous years' apportionments.

Table 3: Total Number and Cost of Projects by Year

Year	2009	2010	2011	2012	2013	2014	Total
<b>Number of Projects</b>	1684	2386	2523	2429	3292	3266	15580
<b>Number of Projects (with cost info.)*</b>	1609	2348	2449	2374	3253	3257	15290
<b>Cost of projects</b>	\$1.61B	\$1.46B	\$1.78B	\$1.65B	\$3.09B	\$2.99B	\$12.6B
<b>Avg. Cost Per Project</b>	\$1.00M	\$620,684	\$725,550	\$695,721	\$950,840	\$921,072	\$823,593

\*Not all states provided cost data for all projects.

## Summary

The HSIP is a strategic program that uses data and analysis to target safety resources. This HSIP 2014 National Summary Report shows that in 2014, States directed HSIP funds to address the predominant infrastructure-related crash types - roadway departure, intersection and pedestrian crashes. This is similar to the 2009-2012 HSIP National Summary Baseline Report and the HSIP 2013 National Summary Report. The number and cost of HSIP projects slightly decreased in 2014 from 2013. However, overall, the number of HSIP projects has increased from approximately 2,300 projects per year (2010-2012) to 3,200 projects per year in 2013 and 2014. In addition, HSIP project obligations slightly decreased from approximately \$3.09B in 2013 to \$2.99B in 2014.

## References

FHWA, MAP-21 Apportionment Fact Sheet

<http://www.fhwa.dot.gov/map21/factsheets/apportionment.cfm>

FHWA, HSIP Apportionment Notices

<http://www.fhwa.dot.gov/legsregs/directives/notices/>

FHWA, HSIP MAP-21 Fact Sheet

<http://www.fhwa.dot.gov/map21/factsheets/hsip.cfm>

FHWA, HSIP MAP-21 Reporting Guidance, February 13, 2013

<http://www.fhwa.dot.gov/map21/guidance/guidehsipreport.cfm>

FHWA, HSIP Online Reporting Tool

<http://safety.fhwa.dot.gov/hsip/resources/onrpttool/>

FHWA, HSIP National Summary Baseline Report 2009-2012

[http://safety.fhwa.dot.gov/hsip/reports/nsbrpt\\_2009\\_2012.cfm](http://safety.fhwa.dot.gov/hsip/reports/nsbrpt_2009_2012.cfm)

FHWA, HSIP 2013 National Summary Report

<http://safety.fhwa.dot.gov/hsip/reports/nsbrpt2013.cfm>

2014 State HSIP Reports

<http://safety.fhwa.dot.gov/hsip/reports/>

## Appendix A: Full Description of HSIP Improvement Categories and Sub Categories for 2013 HSIP Reporting Guidance

Category	Sub-category
<b>Access management</b>	Access management - other
	Change in access – close or restrict existing access
	Change in access – miscellaneous/unspecified
	Grassed median - extend existing
	Median crossover - close crossover
	Median crossover - directional crossover
	Median crossover - relocate existing
	Median crossover - unspecified
	Raised island - install new
	Raised island - modify existing
	Raised island - remove existing
	Raised island – unspecified
<b>Advanced technology and ITS</b>	Advanced technology and ITS - other
	Congestion detection / traffic monitoring system
	Dynamic message signs
	Over height vehicle detection
<b>Alignment</b>	Alignment - other
	Horizontal curve realignment
	Horizontal and vertical alignment
	Vertical alignment or elevation change
<b>Animal-related</b>	Animal related
<b>Interchange design</b>	Acceleration / deceleration / merge lane
	Convert at-grade intersection to interchange
	Extend existing lane on ramp
	Improve intersection radius at ramp terminus
	Installation of new lane on ramp
	Interchange design - other
	Ramp closure
	Ramp metering
<b>Intersection geometry</b>	Auxiliary lanes – add acceleration lane
	Auxiliary lanes – add auxiliary through lane
	Auxiliary lanes – add left-turn lane
	Auxiliary lanes – add right-turn lane
	Auxiliary lanes – add right-turn lane (free-flow)
	Auxiliary lanes – add slip lane
	Auxiliary lanes – add two-way left-turn lane
	Auxiliary lanes – extend acceleration/deceleration lane
	Auxiliary lanes – extend existing left-turn lane
	Auxiliary lanes – extend existing right-turn lane
	Auxiliary lanes – miscellaneous/other/unspecified

	Auxiliary lanes – modify acceleration lane
	Auxiliary lanes – modify auxiliary through lane
	Auxiliary lanes – modify free-flow turn lane
	Auxiliary lanes – modify left-turn lane offset
	Auxiliary lanes – modify right-turn lane offset
	Auxiliary lanes – modify turn lane storage
	Auxiliary lanes – modify turn lane taper
	Auxiliary lanes – modify two-way left-turn lane
	Intersection geometrics – miscellaneous/other/unspecified
	Intersection geometrics – modify intersection corner radius
	Intersection geometrics – modify skew angle
	Intersection geometrics – realignment to align offset cross streets
	Intersection geometrics – realignment to increase cross street offset
	Intersection geometrics – re-assign existing lane use
	Intersection geometry - other
	Splitter island – install on one or more approaches
	Splitter island – remove from one or more approaches
	Splitter island – unspecified
	Through lanes – add additional through lane
<b>Intersection traffic control</b>	Intersection flashers – add “when flashing” warning sign-mounted
	Intersection flashers – add advance emergency vehicle warning sign-mounted
	Intersection flashers – add advance heavy vehicle warning sign-mounted
	Intersection flashers – add advance intersection warning sign-mounted
	Intersection flashers – add miscellaneous/other/unspecified
	Intersection flashers – add overhead (actuated)
	Intersection flashers – add overhead (continuous)
	Intersection flashers – add stop sign-mounted
	Intersection flashers – modify existing
	Intersection flashers – remove existing
	Intersection signing – add basic advance warning
	Intersection signing – add enhanced advance warning (double-up and/or oversize)
	Intersection signing – add enhanced regulatory sign (double-up and/or oversize)
	Intersection signing – miscellaneous/other/unspecified
	Intersection signing – relocate existing regulatory sign
	Intersection traffic control - other
	Modify control – all-way stop to roundabout
	Modify control – modifications to roundabout
	Modify control – no control to roundabout
	Modify control – no control to two-way stop
	Modify control – remove right-turn yield

	Modify control – reverse priority of stop condition
	Modify control – traffic signal to roundabout
	Modify control – two-way stop to all-way stop
	Modify control – two-way stop to roundabout
	Modify control – two-way yield to two-way stop
	Pavement Markings – add advance signal ahead
	Pavement markings – add advance stop ahead
	Pavement markings – add dashed edge line along mainline
	Pavement markings – add lane use symbols
	Pavement markings – add stop line
	Pavement markings – add yield line
	Pavement markings – miscellaneous/other/unspecified
	Pavement markings – refresh existing pavement markings
	Modify traffic signal – add additional signal heads
	Modify traffic signal – add backplates
	Modify traffic signal – add backplates with retroreflective borders
	Modify traffic signal – add closed loop system
	Modify traffic signal – add emergency vehicle preemption
	Modify traffic signal – add flashing yellow arrow
	Modify traffic signal – add long vehicle detection
	Modify traffic signal – add railroad preemption
	Modify traffic signal – add wireless system
	Modify traffic signal – miscellaneous/other/unspecified
	Modify traffic signal – modernization/replacement
	Modify traffic signal – modify signal mounting (spanwire to mast arm)
	Modify traffic signal – remove existing signal
	Modify traffic signal – replace existing indications (incandescent-to-LED and/or 8-to-12 inch dia.)
	Modify traffic signal timing – left-turn phasing (permissive to protected/permissive)
	Modify traffic signal timing – left-turn phasing (permissive to protected-only)
	Modify traffic signal timing – adjust clearance interval (yellow change and/or all-red)
	Modify traffic signal timing – general retiming
	Modify traffic signal timing – signal coordination
	Systemic improvements – signal-controlled
	Systemic improvements – stop-controlled
<b>Lighting</b>	Continuous roadway lighting
	Intersection lighting
	Lighting - other
	Site lighting – horizontal curve
	Site lighting – intersection
	Site lighting – interchange

	Site lighting – pedestrian crosswalk
<b>Miscellaneous</b>	Miscellaneous
<b>Non-infrastructure</b>	Educational efforts
	Enforcement
	Data/traffic records
	Non-infrastructure - other
	Outreach
	Road safety audits
	Training and workforce development
	Transportation safety planning
<b>Parking</b>	Modify parking
	Parking - other
	Remove parking
	Restrict parking
	Truck parking facilities
<b>Pedestrians and bicyclists</b>	Crosswalk
	Install new "smart" crosswalk
	Install new crosswalk
	Install sidewalk
	Medians and pedestrian refuge areas
	Miscellaneous pedestrians and bicyclists
	Modify existing crosswalk
	Pedestrian beacons
	Pedestrian bridge
	Pedestrian signal
	Pedestrian signal - audible device
	Pedestrian signal – Pedestrian Hybrid Beacon
	Pedestrian signal - install new at intersection
	Pedestrian signal - install new at non-intersection location
	Pedestrian signal - modify existing
	Pedestrian signal - remove existing
	Pedestrian warning signs - add/modify flashers
	Pedestrian warning signs – overhead
<b>Railroad grade crossings</b>	Grade separation
	Model enforcement activity
	Protective devices
	Railroad grade crossing gates
	Railroad grade crossing signing
	Railroad grade crossings - other
	Surface treatment
	Upgrade railroad crossing signal
	Widen crossing for additional lane
<b>Roadside</b>	Barrier end treatments (crash cushions, terminals)
	Barrier transitions

	Barrier - cable
	Barrier - concrete
	Barrier- metal
	Barrier - other
	Barrier - removal
	Curb or curb and gutter
	Drainage improvements
	Fencing
	Removal of roadside objects (trees, poles, etc.)
	Roadside grading
	Roadside - other
<b>Roadway</b>	Install / remove / modify passing zone
	Pavement surface – high friction surface
	Pavement surface - miscellaneous
	Roadway narrowing (road diet, roadway reconfiguration)
	Roadway - other
	Roadway - restripe to revise separation between opposing lanes and/or shoulder widths
	Roadway widening - add lane(s) along segment
	Roadway widening - curve
	Roadway widening - travel lanes
	Rumble strips - center
	Rumble strips – edge or shoulder
	Rumble strips - transverse
	Rumble strips – unspecified or other
	Superelevation / cross slope
<b>Roadway delineation</b>	Improve retroreflectivity
	Longitudinal pavement markings - new
	Longitudinal pavement markings - remarking
	Delineators post-mounted or on barrier
	Raised pavement markers
	Roadway delineation - other
<b>Roadway signs and traffic control</b>	Curve-related warning signs and flashers
	Sign sheeting – upgrade or replacement
	Roadway signs and traffic control - other
	Roadway signs (including post) – new or updated
<b>Shoulder treatments</b>	Widen shoulder – paved or other
	Pave existing shoulders
	Shoulder grading
	Shoulder treatments - other
<b>Speed management</b>	Modify speed limit
	Radar speed signs
	Speed detection system / truck warning
	Speed management - other

	Traffic calming feature
<b>Work Zone</b>	Work zone

## Appendix B. Detailed Tables of Project Costs Summaries

Table 4: Number and Cost of 2014 Projects by Improvement Category

Improvement Category	Number of Projects	Total Cost of Projects*	Average Total Cost*	Total HSIP Cost of Projects*	Average HSIP Cost*
Access management	44	\$32,141,704.64	\$730,493.29	\$15,956,142.85	\$469,298.32
Advanced technology and ITS	32	\$97,248,822.63	\$3,039,025.71	\$21,541,018.47	\$742,793.74
Alignment	59	\$60,497,797.52	\$1,025,386.40	\$40,080,788.75	\$703,171.73
Animal-related	3	\$4,734,751.00	\$1,578,250.33	\$3,657,000.00	\$1,219,000.00
Interchange design	40	\$224,660,024.70	\$5,616,500.62	\$39,537,728.17	\$1,129,649.38
Intersection geometry	379	\$368,313,376.72	\$971,803.10	\$244,373,603.90	\$655,157.12
Intersection traffic control	505	\$339,054,528.95	\$676,755.55	\$254,780,379.68	\$516,795.90
Lighting	40	\$48,448,386.46	\$1,211,209.66	\$25,203,935.82	\$630,098.40
Miscellaneous	74	\$52,228,356.64	\$705,788.60	\$43,862,898.71	\$609,206.93
Multiple	2	\$2,349,200.00	\$1,174,600.00		
Non-infrastructure	148	\$83,350,652.89	\$563,180.09	\$74,068,505.79	\$510,817.28
Parking	2	\$1,017,607.00	\$508,803.50	\$925,456.00	\$462,728.00
Pedestrians and bicyclists	118	\$57,247,653.74	\$485,149.61	\$47,472,978.18	\$402,313.37
Railroad grade crossings	13	\$5,869,460.99	\$451,497.00	\$4,952,235.72	\$380,941.21
Roadside	303	\$231,469,904.15	\$763,927.08	\$190,975,246.19	\$647,373.72
Roadway	722	\$672,907,191.64	\$934,593.32	\$359,546,430.98	\$502,862.14
Roadway delineation	160	\$117,859,258.55	\$736,620.37	\$87,687,250.88	\$548,045.32
Roadway signs and traffic control	185	\$58,007,161.69	\$318,720.67	\$56,629,838.53	\$307,770.86
Shoulder treatments	193	\$377,927,662.76	\$1,958,174.42	\$213,551,495.45	\$1,106,484.43
Speed management	3	\$208,139.00	\$69,379.67	\$193,139.00	\$64,379.67
Work Zone	14	\$3,360,560.30	\$240,040.02	\$2,928,060.04	\$209,147.15
Unknown	227	\$161,027,919.77	\$709,374.10	\$28,641,673.00	\$201,701.92
<b>Total</b>	<b>3266</b>	<b>\$2,999,930,121.74</b>	<b>\$921,071.58</b>	<b>\$1,756,565,806.11</b>	<b>\$563,001.86</b>

\* Not all states provided cost data for all projects in a given improvement category.

Table 5: Number and Cost of Projects by Subcategory for Intersection Geometry

Subcategory	Number of Projects	Total Cost
<b>Auxiliary lanes - add left-turn lane</b>	92	\$98,150,952
<b>Auxiliary lanes - add right-turn lane</b>	19	\$19,872,036
<b>Auxiliary lanes - other</b>	99	\$76,545,136
<b>Intersection geometrics – modify skew angle</b>	20	\$10,303,433
<b>Intersection geometrics – other/unknown</b>	136	\$153,260,723
<b>Intersection geometrics – realignment to improve offset</b>	13	\$10,181,097
<b>Total</b>	<b>379</b>	<b>\$368,313,377</b>

Table 6: Number and Cost of Projects by Subcategory for Intersection Traffic Control

Subcategory	Number of Projects	Total Cost
<b>Intersection flashers and signing</b>	65	\$9,448,113
<b>Intersection traffic control - other/unknown</b>	117	\$57,210,865
<b>Modify control to roundabout</b>	70	\$95,532,287
<b>Modify traffic signal</b>	219	\$152,114,801
<b>Modify traffic signal timing or phasing</b>	27	\$22,653,219
<b>Pavement markings</b>	7	\$2,095,244
<b>Total</b>	<b>505</b>	<b>\$339,054,529</b>

Table 7: Number and Cost of Projects by Subcategory for Pedestrians and Bicyclists

Subcategory	Number of Projects	Total Cost
<b>Install or modify crosswalk</b>	23	\$11,820,499
<b>Install or modify pedestrian signal</b>	31	\$13,852,377
<b>Install sidewalk</b>	20	\$9,097,960
<b>Miscellaneous pedestrian and bicyclist improvements</b>	44	\$22,476,818
<b>Total</b>	<b>118</b>	<b>\$57,247,654</b>

Table 8: Number and Cost of Projects by Subcategory for Roadway

Subcategory	Number of Projects	Total Cost
Pavement surface	112	\$122,611,934
Roadway - other/unknown	201	\$178,355,380
Roadway narrowing (road diet, roadway reconfiguration)	9	\$5,429,806
Roadway widening	38	\$160,398,356
Rumble strips	344	\$200,617,348
Superelevation / cross slope	18	\$5,494,367
<b>Total</b>	<b>722</b>	<b>\$672,907,192</b>

Table 9: Number and Cost of Projects by Subcategory for Non-Infrastructure

Subcategory	Number of Projects	Total Cost
Data/traffic records	38	\$8,918,041
Educational efforts/outreach	21	\$12,449,466
Enforcement	8	\$8,855,806
Non-infrastructure - other/unknown	30	\$15,477,797
Road safety audits	15	\$2,299,779
Training and workforce development	2	\$848,098
Transportation safety planning	34	\$34,501,667
<b>Total</b>	<b>148</b>	<b>\$83,350,653</b>

**For More Information:**

Visit <http://safety.fhwa.dot.gov/hsip>

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