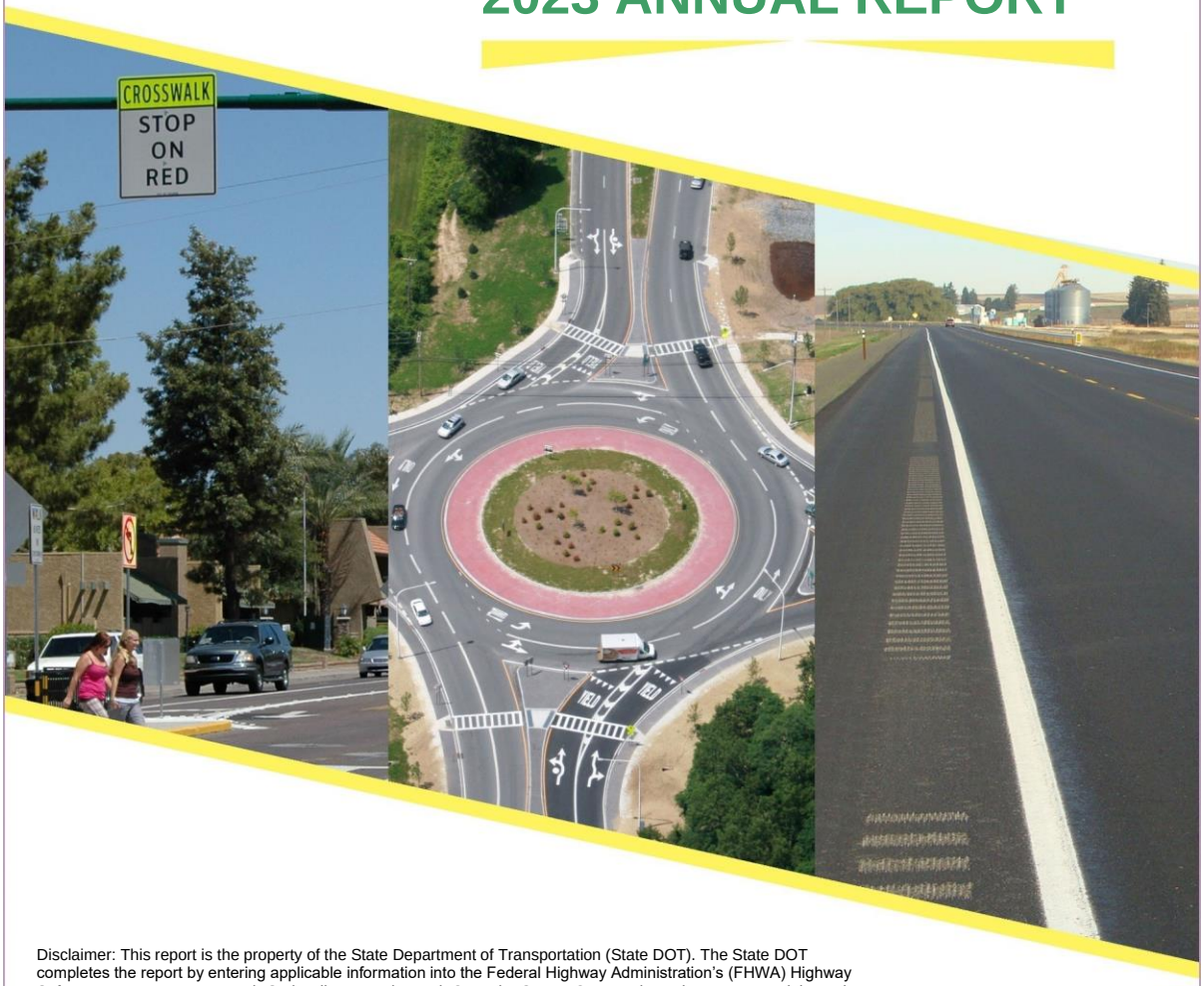
INDIANA

HIGHWAY SAFETY IMPROVEMENT PROGRAM

2023 ANNUAL REPORT



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Disclaimer

Protection of Data from Discovery Admission into Evidence

23 U.S.C. 148(h)(4) states “Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for any purpose relating to this section[HSIP], shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location identified or addressed in the reports, surveys, schedules, lists, or other data.”

23 U.S.C. 407 states “Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.”

Executive Summary

As required under 23 U.S.C. § 148(h), the following is the annual report to the Federal Highway Administration (FHWA) from the Indiana Department of Transportation (INDOT) for federal fiscal year (FFY) 2023. The content of this report combines information regarding the implementation status of the Highway Safety Improvement Program (HSIP) and associated sub-programs including the High-Risk Rural Roads Program (HRRRP) and the applicable Section 164-Hazard Elimination (164-HE) penalty Transfer funds. This HSIP report, does not include the annual Rail/Highway Crossing Safety report as required under 23 U.S.C. § 130(g). The current FHWA Online Reporting Tool (ORT) system requires that the status of the Rail/Highway Crossing Safety Program be submitted as a separate report.

The focus of the annual HSIP report centers on development and implementation of the core federal aid safety program and associated safety spending in Indiana for Federal Fiscal Year (FFY) 2023, beginning October 1, 2022, and ending on September 30, 2023. In addition to the core safety programs, this report discusses the ongoing evolution of the INDOT asset management program mechanism for setting spending priorities for all projects under INDOT jurisdiction.

Crash Performance and Methodology: The number of reported motor vehicle crash fatalities increased from 932 in calendar year 2021 to 980 in 2022, which represents an increase of 0.515% over the previous year, causing the 5-year rolling average to also increase by 1.45%. The early estimate for 2022 vehicle miles of travel indicates an increase of approximately 4.50% from 2021 to 2022, recovering all of the previous VMT prior to the Covid Pandemic. The estimated 5-year average rate of fatalities per one hundred million vehicle miles of travel (HMVMT) also increased by 1.27% in 2022.

In 2022, the count of Suspected Serious Injuries (SSI) increased to 3,923 while the SSI number for 2021 was 3,513. This indicates a one year rise of 11.67%, ending a multiyear downward trend from a high of 3,823 in 2011. The 5-year average SSI number rose by 3.18%, while the average rate per HMVMT rose by 3.07% It's noted that the rise in SSI count and rate is in part tied to a data discontinuity due to a change in SSI reporting procedures that occurred in 2020 and continued through 2022 when FHWA certified the Indiana crash records system adoption of the 7 injury nature types listed in the Model Minimum Unform Crash Criteria (MMUCC) 4th and 5th editions. The improved accuracy in SSI reporting is being realized as most Indiana police agencies have transitioned to the revised crash reporting software as described below.

The definition used for reporting traffic safety performance measures was established in the MMUCC 4th edition and is continued in the 5th Edition. The change compelled Indiana to determine a method for direct counting of SSI individuals according to the scale of "K" for Killed, "A" for SSI injury, "B" for reported injury, "C" for possible injury, and "O" for only property damage (KABCO). Starting partially in 2020, changes made in the 6th revision of the Indiana Automated Records Information Exchange System version 6 (ARIES 6), containing Indiana's electronic crash records database, herein referred to as AIRIES 6 allows INDOT to directly count officer's subjective selection of Class A injuries by counting those individuals with one of the 7 FHWA defined injury types, from a list of 15 possible injury types, herein called injury natures.

In June of 2022 FHWA certified Indiana's new method of directly counting suspected serious injuries as compliant with the reporting requirement. Between 2014 and 2019, an interim methodology for estimating SSI was in use due to a lack of injury nature data. The method utilized an adjustment factor for all injuries as a proxy for missing injury nature types as described in the response to question 30. Indiana received approval from FHWA to use the factor 7.2% of all non-fatal injuries as the interim method until changes were completed in the ARIES crash database allowing a direct count.

In the latter part of 2019 new data elements were in place in the ARIES officer's crash reporting system that would allow for a specific count of MMUCC 4th Edition compliant data. The estimation method still comprised

the first two years of data in the five-year rolling average for 2022. The revised ARIES 6 officer reporting software is still partially deployed in 2023 with 20% of smaller local police agencies continuing to be trained. Both on-line and in-person training of all sworn Indiana police officers in use of the new crash reporting tool is ongoing. It is expected that by the end of calendar 2023, a phased rollout of the officer reported injury nature data for the 5 year rolling averages will be complete.

It must be noted that conclusions regarding suspected serious injury trends are difficult to draw from the 2020 through 2022 data. Police agencies need time to change policies and required training in the new crash reporting procedure that was slowed by the COVID pandemic. As a result, the training and the change over by police agencies will continue until December 31, 2023, when the old reporting system is shut off.

The shift in crash severity witnessed in 2020 and 2021 is difficult to explain on the basis of the change in methodology alone. During the Covid pandemic in 2020 and 2021, other as yet undetermined factors associated with the pandemic had a large influence on crash and injury severity outcomes. Further research into the interaction of these factors influence on driver risk choice is needed to understand how travel conditions and driver reactions have changed.

HSIP Obligation Budget: INDOT is currently increasing efforts to obligate all available federal safety program dollars. All projects approved for funding in HSIP and the Section 164-HE are required to address at least one of the emphasis areas defined in the Indiana Strategic Highway Safety Plan (SHSP). In most of federal fiscal year (FFY) 2023, the 2022 Strategic Highway Safety Plan was in place, however the projects programmed for construction took place under the prior SHSP. The total expected obligation of federal program funds for safety infrastructure improvements, from the HSIP is $57.7 million. The planned HSIP obligation total is less than the final FFY 2023 $70.7 million apportionment of HSIP funds. It should be noted that project programming generally occurs 5 years prior to the fiscal year and the impact of the BIL could not be absorbed immediately. When obligation of all federal aid programs is calculated, excluding the annual rail-highway crossing safety program, but including $22.9 million in Section 164-HE obligation and just under $15.8 million other in non-safety program federal funds, the total federal aid obligation is expected to be about $96.4 million. With all state and local funding included the total safety program expenditure in FFY 2023 is expected to be about $144.7 million.

Indiana is also under a Section 164-HE transfer that apportioned $26,225,707 that must be obligated before the end of each fiscal year. After the 12.5% split of funds to the Indiana’s official Traffic Safety Office for alcohol programs the INDOT share of the apportionment is $22,947,494. The allowed obligation limitation is $20,164,073. Obligation of the 164-HE funds by the end of the fiscal year is a higher priority compared to normal HSIP funds. INDOT has obligated the full apportioned amount of $22,947,494 in FY 2023.

HSIP Project Funding, Selection and Prioritization: The selection and prioritization of all safety projects on roads under INDOT jurisdiction, including those funded with HSIP funds utilize the INDOT Asset Management Process. The documentation that describes INDOT’s countermeasure selection methodology originally took place in September of 2008 with the submission of the FFY 2008 HSIP/HRRRP Report. While numerous refinements to the asset management program have taken place, the underlying methodology has not changed. For roads under INDOT jurisdiction, regardless of funding program, the established selection process for safety projects prioritizes locations of highest need in terms of reducing the severity and frequency of serious crash outcomes. The goal for all safety projects is to select the most appropriate and cost-effective countermeasures available. The INDOT Office of Traffic Safety (OTS) ensures that each candidate safety project has a cost-effective choice of proposed solution, eligibility for HSIP funding is determined, and the relative priority of the candidate project need is established. All safety program projects address one or more of the emphasis areas enumerated in the Indiana SHSP.

Guiding the selection of projects on local jurisdiction roads, the document titled*Highway Safety Improvement Program Local Project Selection Guidance*, was issued on December 1, 2010, and updated on March 20, 2014. Also,*Special Rules for Eligibility of Highway Safety Improvement Projects*, issued August 1, 2013,

described the selection methodology for local HSIP projects. INDOT is currently engaging with multiple partner agencies and groups to produce Indiana's first Vulnerable Road Users (VRU) Assessment. A goal is to subsequently revise the HSIP Local Project Selection Guidance.

INDOT fiscal policy is to make one-third of its total FHWA apportionment from HSIP available to local public agencies for safety projects on local system roads. Individual Metropolitan Planning Organizations (MPO), receive annual apportionments of obligation authority and a predetermined amount of obligation authority is also set aside for the use of rural public highway agencies. The INDOT Local Project Selection Documentprovides local agencies guidance on the structure and content of applications for HSIP project funding.

In addition, the Hazard Elimination Program for Local Roads and Streets (HELPERS) program based at the Indiana LTAP is tasked with providing training and advise to local agencies and assistance to rural roadway agencies with data management, analysis, and Road Safety Assessment (RSA) facilitation. INDOT also maintains a web-based information source on the various state safety initiatives to assist users in determining the best countermeasures for deployment to achieve effective safety improvement projects. Information regarding local safety programs is also accessible at: https//www.in.gov/indot/traffic-safety-office.

In 2023 INDOT revised its listing of HSIP eligible systemic project types due to recognition that many local agencies often seek to deploy multiple countermeasures. The revision gathers countermeasures that are typically constructed together in projects for efficient eligibility findings and project approval. The list now comprises 24 individual project work type groupings as eligible for systemic HSIP funding. The Program Methodology section of this report contains a list of the safety program categories that these systemic countermeasures address.

New systemic programs are planned for deployment in calendar 2023 and beyond. These include enhanced wrong way warning systems, high friction surface treatments for loop and other short radius curved ramps, and new or upgraded linear sidewalks parallel to existing roadways. The sidewalk systemic work type was introduced as the result of the IIJA and the subsequent FHWA finding that allows HSIP eligibility.

Introduction

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. As per 23 U.S.C. 148(h) and 23 CFR 924.15, States are required to report annually on the progress being made to advance HSIP implementation and evaluation efforts. The format of this report is consistent with the HSIP Reporting Guidance dated December 29, 2016 and consists of five sections: program structure, progress in implementing highway safety improvement projects, progress in achieving safety outcomes and performance targets, effectiveness of the improvements and compliance assessment.

Program Structure

Program Administration

Describe the general structure of the HSIP in the State.

The HSIP in Indiana provides for infrastructure safety improvements on both state system roads and local roads. Each year, one third of HSIP funding is allocated for use on the local road network. However, the local HSIP program has a somewhat different structure from the state system program.

State Highway System program: The INDOT Office of Traffic Safety (OTS) is part of the Traffic engineering Division. OTS leads INDOT's coordinated efforts to identify locations with elevated safety needs, plan infrastructure improvements, manage safety assets to prioritize and program traffic safety improvement projects on the Indiana State system of highways. OTS works with each of INDOT's six district offices, as well as the divisions of Design, Technical Planning, Local Public Agency & Grant Administration, Capital Asset Management Project Finance, and the other Traffic Engineering Offices.

To facilitate identification of potential safety improvement projects, OTS conducts an annual network wide safety screening process to identify possible locations that appear to experience higher than nominal safety risk. OTS also gathers input from various internal and external groups regarding any locations of concern. The principal internal partners that provide key input are the Maintenance and Technical Services Divisions including the Traffic Engineering offices in each district. After refinement of data records, analysis of target locations leads to identification of candidate locations for safety interventions that include both spot and systemic safety improvements.

In the areas of project prioritization/programming, the Manager of the OTS acts as the chair to the INDOT Traffic Safety Asset Management (TSAM) Team tasked with an annual process prioritizing all proposed safety projects located on the INDOT system of highways. OTS and the six INDOT district traffic engineering offices act as voting members of the team. For fiscal year 2027, a new sidewalk and ADA facility program budgeted at $25 million per year was added to the INDOT safety program. To assist with coordinated programming of pedestrian safety needs, the INDOT Bicycle and Pedestrian Planning Coordinator was added as a member of the TSAM team for the sidewalk subprogram.

The Program Management Group (PMG) consists of senior division directors. The PMG provides finance coordination between INDOT's other asset teams and with executive management while the Traffic Engineering Division coordinates with the districts Technical Services Divisions regarding project programming and any significant changes to estimated project cost or scope. The TSAM Team acts to deliberate the relative need and priority of proposed traffic safety projects on INDOT managed roadways. The overall budgeting of obligation authority for safety projects on both the state and local road systems is coordinated with the Division of Budget and Project Accounting.

Project design is conducted by the INDOT's Highway Design Division, and each project is managed by an assigned project manager utilizing the Scheduling Project Management System.

Final evaluation of project safety performance is conducted by OTS in the fourth year following project construction.

Local Roads Safety Program: In the State of Indiana, Local Public Agencies (LPAs) operate and maintain all local public roads. At the inception of the INDOT safety program under SAFTEA-LU a policy was determined by the Finance Business Unit to make one third of INDOT's total annual apportionment of HSIP funding available to local public agencies for safety projects on local system roads. An annual apportionment of obligation authority is assigned to each Metropolitan Planning Organization (MPO) serving Group 1 and Group 2 urban areas. A standardized population formula is used to determine the assigned funding made available to individual MPOs. For public agencies in rural (non MPO areas) the aforementioned population formula is also used to determine the total amount of the HSIP funding allotted for projects located in rural areas. Rules have been established allowing LPAs to apply to INDOT for determination of project eligibility to utilize HSIP funds.

To assist in the selection of local HSIP projects, guidance and outreach efforts are routinely made by INDOT and the Local Technical Assistance Program (LTAP). INDOT's guidance to LPAs advocates the value of low-cost systemic safety improvements to proactively address the risk of severe crashes on their entire roadway system, along with the treatment of locations with high risk of frequent severe crashes.

INDOT sponsors an ongoing program with LTAP called the *Hazard Elimination Project for Local Roads and Streets* (HELPERS) Program. The HELPERS Program coordinates with rural planning organizations (RPOs) as well as rural counties, cities, and towns to assist them in identifying, analyzing, and prioritizing their safety improvement needs. The HELPERS Program advises LPAs regarding management of safety risks and assists rural area LPAs in submitting project level funding proposals to INDOT for determination of HSIP project eligibility.

The INDOT Office of Traffic Safety makes a determination of eligibility for all applications that seek to utilize HSIP funding. OTS reviews all safety improvement project proposals for compliance with HSIP eligibility requirements as defined in Indiana's Strategic Highway Safety Plan. Eligible local projects are recommended to the INDOT Division of LPA & Grant Administration for programming approval and inclusion in the STIP and relevant TIP document. The LPA & Grants Division develops an interagency agreement with the relevant LPA to guide each projects development. The relevant INDOT district then assigns a project manager to coordinate development of the project design.

Regarding internal coordination of local safety project design and contract preparation, technical review of local agency design plans is conducted by the Highway Design Division, while contract letting is conducted by the INDOT Construction Management Division.

In addition, OTS consults with Design and Maintenance Divisions regarding new safety improvement design practices and the Traffic Administration Office, regarding new Standards and Specifications. OTS also coordinates with the Research Division regarding the approval of safety related research efforts under the Joint Transportation Research Project (JTRP) and to plan implementation of successful research products.

Where is HSIP staff located within the State DOT?

Operations

The INDOT Office of Traffic Safety is located within the Traffic Engineering Division and is in turn part of the Transportation Systems and Operations business Unit. The primary functions of the Office of Traffic Safety are planning, prioritization and analysis in support of the HSIP in the state of Indiana.

How are HSIP funds allocated in a State?

- Central Office via Statewide Competitive Application Process
- Formula via MPOs
- SHSP Emphasis Area Data

HSIP Funds for use on state system highways are allocated statewide via INDOT's Asset Management Process as described in the response under Question 3. INDOT typically programs 50% of HSIP funds assigned for the state roadway network to program systemic safety improvement projects.

Local Roads HSIP Funds are allocated regionally to MPOs via a population formula and to rural areas by an LTAP managed assistance program.

Analysis of crash data related to SHSP Emphasis Areas informs selection and programming of various systemic safety improvement projects.

Describe how local and tribal roads are addressed as part of HSIP.

In the State of Indiana, Local Public Agencies (LPAs) operate and maintain all local public roads. There are no designated tribal roads in the state. INDOT policy is to make one third of its total annual apportionment of HSIP funding available to local public agencies for safety projects on local public roads. An annual apportionment of obligation authority is assigned to each Metropolitan Planning Organization (MPO) serving Group 1 and Group 2 urban areas. A standardized population formula is used to determine allocation of all federal aid funding made available to individual MPOs. For public agencies in rural (non MPO areas) Group 3 (incorporated cities and towns) and rural Group 4 (counties and un-incorporated towns), a predetermined amount of HSIP funds is made available for funding eligible projects. MPOs determine their preferred methods for selection of candidate projects that will be submitted to INDOT OTS for HSIP eligibility determination and to INDOT Local Public Agency (LPA) and Grants Division for funding approvals. The population formula is also used to determine the total amount of the HSIP allotted for projects located in rural areas.

Rules have been established allowing LPAs to apply to INDOT for determination of project eligibility to utilize HSIP funds. These rules are contained in the INDOT guidance document titled,*Highway Safety Improvement Program Local Project Selection Guidance*. The latest INDOT version of this guidance document was approved by INDOT’s Highway Safety Advisory Committee on December 10, 2010, with an update published in 2014. In August of 2013, a supplement document titled *FY 2014 Special Rules for HSIP Eligibility* was published, principally to expand the choices of Systemic Safety improvement types available to local agencies. Both documents are on file at the FHWA Indiana Division Office. In addition, an expanded list of systemic safety project work types was published on December 12, 2016. These documents are also posted on the INDOT web site at:http://www.in.gov/indot/2357.htm

Guidance and outreach efforts are routinely made by INDOT and the Local Technical Assistance Program (LTAP), regarding selection of HSIP projects. INDOT’s guidance to LPAs advocates the value of low-cost systemic safety improvements to proactively address the risk of severe crashes on their entire roadway system, along with the treatment of locations with a high risk of frequent severe crashes involving fatalities or suspected serious injuries. Systemic projects are gaining increasing acceptance by LPAs.

In urban areas, the MPOs that serve Group 1 and 2 urban areas are tasked to perform initial screening of proposed safety improvements and select candidate projects subject to INDOT determination of HSIP eligibility. To provide a similar level of planning support to rural public agencies, INDOT has collaborated with the Indiana Local Technical Assistance Program (LTAP). INDOT sponsors an ongoing program with LTAP called the*Hazard Elimination Project for Local Roads and Streets* (HELPERS). The HELPERS Program

coordinates with rural planning organizations (RPOs) as well as rural counties, cities, and towns to assist them in identifying, analyzing, and prioritizing their safety improvement needs in regard to reducing the occurrence and risk of severe crashes on public roadways.

The HELPERS Program advises LPAs regarding management of safety risks and assists rural area LPAs in submitting project level funding proposals to INDOT for determination of HSIP project eligibility. The INDOT Office of Traffic Safety makes a determination of eligibility for all applications to utilize HSIP or HRRRP funding.

Identify which internal partners (e.g., State departments of transportation (DOTs) Bureaus, Divisions) are involved with HSIP planning.

- Design
- Districts/Regions
- Local Aid Programs Office/Division
- Operations
- Planning
- Traffic Engineering/Safety
- Other-Research

Describe coordination with internal partners.

The INDOT Office of Traffic Safety (OTS) leads INDOT's coordinated efforts to identify locations with safety needs, plan improvements, prioritize and program traffic safety improvement projects on the Indiana State system of highways. OTS works with each of INDOT's district offices, as well as the divisions of Design, Planning, Traffic Engineering, LPA & Grant Administration, Capital Asset Management Office, and Budget Divisions.

To identify potential safety improvement projects, OTS gathers input from various internal and external groups. The principal internal partners are District Maintenance Division, Technical Services Division, and Traffic Engineering Offices that provide key input on road safety assessments.

In the areas of finance, budget and project prioritization/programming, the Manager of OTS acts as the chair to the INDOT Traffic Safety Asset Management Team to prioritize all proposed safety projects located on the INDOT system of highways. The six INDOT district traffic engineering offices along with a single member of OTS act as a seven-person voting group. The Traffic Safety Asset Management Team acts to deliberate the relative need and priority of proposed traffic safety projects on INDOT managed roadways. The approval of the recommended list of projects by fiscal year and the allocation of proposed obligation authority for all asset programs including safety is under authority of the Program Management Group. Budgeting of obligation authority for safety projects on both the state and local road systems is coordinated with the Division of Budget and Project Accounting.

For approved safety projects on the state highway system, the relevant INDOT district office is responsible for project programming and entry of the project into the State Transportation Improvement Plan (STIP) and any relevant local Transportation Improvement Plan (TIP). The six district's team members coordinate the approved list of selected projects with their respective district Funds Managers to facilitate programming. The districts also manage design, permitting and construction of projects in coordination with INDOT Design and Construction Divisions, via a project manager assigned to the project to coordinate all project development tasks.

Regarding internal coordination of local safety projects, the OTS performs review of all proposed projects for compliance with eligibility requirements as defined in Indiana's Strategic Highway Safety Plan. Eligible projects

are recommended to the INDOT Division of LPA & Grant Administration for funding approval and inclusion in the STIP and relevant TIP document. The LPA & Grants Division also develops an interagency agreement with the LPA to guide project development. The relevant INDOT district then assigns a project manager to coordinate development of the construction project.

In addition, OTS consults with Design and Maintenance Divisions regarding new safety improvement design practices and the Office of Traffic Administration, regarding new Standards and Specifications. OTS also coordinates with the Research Division regarding the approval of safety related research efforts under the Joint Transportation Research Project (JTRP) and to plan implementation of successful research products.

Identify which external partners are involved with HSIP planning.

- Academia/University
- Governors Highway Safety Office
- Local Technical Assistance Program
- Regional Planning Organizations (e.g. MPOs, RPOs, COGs)
- Other-Various County Engineers

INDOT Office of Traffic Safety (OTS) coordinates the SHSP with numerous state and local agencies, MPO Council and other stakeholders. Two primary SHSP partners are the Indiana Criminal Justice Institute which houses the Indiana State Highway Safety Office (SHSO) as well as Indiana Fatal Accident Reporting System (FARS) office. OTS also partners with the Indiana State Police and their data management vendor which manages the State's crash database.

OTS also partners with the Indiana Joint Transportation Research Program (JTRP) in the development of calibrated safety planning analysis tools for INDOT and its local partners. The Purdue University Center for Road Safety works with OTS under the JTRP structure to produce an annual Network Safety Screening Process that provides preliminary substantive versus nominal crash risk assessment of each intersection and road segment on the INDOT roadway network.

Regarding planning of local safety programs and performance target setting INDOT OTS primarily coordinates with MPOs and the Indiana LTAP program - Hazard Elimination Project for Local Roads and Streets (HELPERS). The HELPERS Program in turn coordinates with rural planning organizations (RPOs) and rural local agencies to help guide them toward developing HSIP eligible safety projects.

Describe coordination with external partners.

INDOT Office of Traffic Safety (OTS) coordinates implementation of the Indiana Strategic Highway Safety Plan (SHSP) with state and local agencies and interested stakeholders as well as the FHWA Indiana Division Office. Principal SHSP partners include the Indiana Criminal Justice Institute which houses the Indiana State Highway Safety Office, and beginning this year administers the Indiana Fatality Analysis Reporting System. The Indiana State Police houses Indiana's Electronic Vehicle Crash Records System and provides access to state and local agencies using the Automated. Records Information Exchange System (ARIES). The Indiana MPO Council has input on all relevant safety issues, but principally issues associated with vulnerable road users and equity. Other external partners include but are not limited to the Indiana Bureau of Motor-vehicles, Indiana Department of Health, Indiana Department of Education, Indiana Local Technical Assistance Program (InLTAP), and various Indiana county highway departments as well as other Indiana local agencies and groups.

Regarding planning of local safety programs and performance target setting, INDOT OTS coordinates with Indiana's 14 Metropolitan Planning Organizations through the MPO Council. To assist in coordination with rural

planning organizations (RPOs) and rural local agencies, INDOT has established the Hazard Elimination Project for Local Roads and Streets (HELPERS) within the Indiana Local Technical Assistance Program (LTAP). The HELPERS program helps guide small agencies in developing HSIP eligible safety projects.

A joint effort with LTAP and FHWA was started in FY 2019 to encourage counties to prepare Local Road Safety Plans (LRSP). Currently three counties and one MPO has approved LSRPs, and ten LSRPs are being developed under Safe Streets 4 All (SS4A) grants. Other MPOs are at various stages of safety data analysis. Presentations have been made to the Indiana County Engineer Association and the MPO Council to solicit other counties and MPOs to begin efforts to begin an LRSP process.

INDOT OTS also partners with the Indiana Joint Transportation Research Program (JTRP) in the development of Indiana-specific safety planning analysis tools and assessing safety countermeasures new to INDOT and its local partners.

INDOT OTS provides information to local agency staff and consultants regarding new technical tools and changing methodologies through presentations made at various conferences during the year such as the annual Purdue University Road School and their annual Civil Engineering Professional Development Seminar as well as other organized events.

Describe other aspects of HSIP Administration on which the State would like to elaborate.

In response to the increased HSIP apportionments under the FAST and BIL Acts, INDOT has engaged in new strategies to increase the obligation of funds to construct worthy safety improvement projects. The number of systemic improvement types has been expanded along with expanded selection of hot spot safety improvement projects. Also, a new Sidewalk Improvement Program has been created for future fiscal years. The new sidewalk program is intended to provide a means of constructing upgraded or new sidewalks as part of roadway improvements projects or as standalone projects. The program includes funding for ADA compliant ramps to pair with HSIP funded crosswalk improvements using a risk and equity scoring method to assist in selection of locations along state highways.

Indiana’s policy is to provide one third of the total percentage of HSIP funds apportionment to local agencies, resulting in more opportunity to combat severe crash risk in both urban and rural areas. In addition to long standing systemic pedestrian safety work types, INDOT has shared it’s sidewalk project selection methodology with the Indiana MPO council to encourage increased local efforts to address pedestrian safety needs.

Regarding the process used by INDOT to conduct HSIP eligibility review for proposed local safety projects; urban LPAs must first submit to their local Metropolitan Planning Organizations (MPOs) for preliminary project selection and funding prioritization. Rural group 3 and group 4 LPAs first submit their proposed projects to the LTAP HELPERS Program for compliance review, prior to INDOT determination of eligibility for HSIP funding.

INDOT OTS determines eligibility in accordance with the Indiana Strategic Highway Safety Plan's delineated Safety Emphasis Areas as well as the project work types defined in the HSIP Local Project Selection Guidance documents. When an HSIP eligible local project is approved for programming by the Division of LPA and Grant Administration, that division provides oversight of project agreements between INDOT and the LPA to govern project development. The LPA and Grant Administration Division also supports the programming of safety projects by administering inclusion of projects on Local and State Transportation Improvement Plans and authorizing funding obligation by fiscal year and monitoring progress of plan development and construction contract letting. Once a project is programmed in Active status on the INDOT Scheduling Project Management System, the INDOT district office assigns a project manager to coordinate the design and environmental documentation with the project sponsor agency, designer, and various INDOT Divisions and offices as well as monitor progress in order to bring the project to a scheduled construction contract letting.

All project plans, construction documents and estimates are reviewed by the INDOT Highway Design & Technical Support Division. Contract letting is administered by the INDOT Construction Management Division.

Program Methodology

Does the State have an HSIP manual or similar that clearly describes HSIP planning, implementation and evaluation processes?

Yes

INDOT has published documents on file with the FHWA Indiana Division Office that provide policies and guidance to staff and partner agencies including:

- Business Rules governing the conduct of the Traffic Safety Asset Management process for state system safety improvement project selection and methodology for scoring and prioritization of candidate projects including HSIP assets.
- Guidance to local public agencies regarding safety program planning and management of local safety project selection, listing of approved systemic safety improvement work types, and the process to apply for candidate project HSIP eligibility determination is posted on the INDOT website for public access.
- Local Technical Assistance Program (LTAP) management guidance document for the Indiana HSIP funded Hazard Elimination Program for Existing Roads and Streets (HELPERS).

Select the programs that are administered under the HSIP.

- Bicycle Safety
- Horizontal Curve
- Intersection
- Local Safety
- Median Barrier
- Pedestrian Safety
- Roadway Departure
- Sign Replacement And Improvement
- Other-Centerline and Edgeline Rumble Stripes
- Other-Traffic Signal Visibility Improvement

Various sub-programs are aligned to address SHSP emphasis areas but may overlap regarding target crash types that are addressed. For example, the Intersection safety subprogram encompasses all forms of intersection crash types for signalized, stop controlled and alternative design intersections while the program titled “Other, Traffic Signal Visibility” has a specific focus on replacement and adjustments to traffic signal heads to improve their visibility to drivers.

Note that Indiana was not subject to the High-Risk Road special rule in fiscal year 2023.

Program: Bicycle Safety

Date of Program Methodology:7/29/2015

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- All crashes
- Fatal and serious injury crashes only

Exposure

- Traffic
- Volume

Roadway

- Other-Roadway and/or shoulder Width potental for Road Diet

What project identification methodology was used for this program?

- Crash frequency
- Probability of specific crash types

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval. The VRU Assessment will revise local HSIP project scoring rules.

How are projects under this program advanced for implementation?

- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Ranking based on B/C:50
Available funding:50

Bicycle safety remains a safety strategy as part of Indiana's 2022 Strategic Highway Safety Plan (SHSP), under the Safe Road Users emphasis area. Pedalcyclist safety projects are identified and proposed for HSIP funding both by INDOT and by local agencies as part of their non-motorized program planning. Selection of road segments are often the result of data analysis efforts by an MPO or LTAP HELPERS. Projects proposed by INDOT are prioritized by the Office of Traffic Safety and the relevant INDOT district office during the annual asset management process. Typically bike lanes are installed as part of road diets either by reallocation of travel and auxiliary turn lanes and may be enabled by elimination of on-street parking.

Program: Horizontal Curve

Date of Program Methodology:7/29/2015

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- Fatal and serious injury crashes only

Exposure

- Traffic
- Volume

Roadway

- Other-Roadway and/or shoulder Width potental for Road Diet

What project identification methodology was used for this program?

- Crash frequency
- Probability of specific crash types

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval.

How are projects under this program advanced for implementation?

- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Rank of Priority Consideration

Ranking based on B/C:50
Available funding:50

Horizontal Curve Safety projects on the State's Highway network are primarily identified by annual network safety screening of previous crash history but may also be identified from citizen input. Typically, the curved road sections are depicted graphically on a heat map and by listing with crash risk indexes Likely candidates for improvement projects are prioritized by the relevant INDOT district office according to the risk for future lane departure crashes. Projects are identified to the Traffic Safety Asset Team under the budgeted amount for that district's systemic HSIP funding allotment.

Local agencies may identify local road curves as part of proposed systemic curve safety projects. The LTAP HELPERS Program often assists county highway agencies in determining road segments at elevated risk of crashes. Rural public agency projects are prioritized by INDOT while MPOs prioritize proposed projects within their planning areas. Counties that have a road segment identified in a Local Road Safety Plan or other action plan are given a high priority. Typically, enhanced warning devices and pavement markings are installed. Safety Edge is part of INDOT standards for new pavement and resurfacing and is recommended to local agencies. High Friction Surface Treatment may also be included where existing friction or pavement is lower than acceptable. Less frequently, new guardrail installations may be constructed to meet roadside safety standards.

Program: Intersection

Date of Program Methodology:10/1/2010

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- All crashes
- Fatal and serious injury crashes only

Exposure

- Volume

Roadway

- Other-roadway conditions and sight distance

What project identification methodology was used for this program?

- Crash frequency
- Excess proportions of specific crash types
- Probability of specific crash types
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval.

How are projects under this program advanced for implementation?

- Competitive application process
- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:50
Other-Weighted factors addressing safety need, intersection geometry and cost effectivness:50
Total Relative Weight:100

Intersection safety improvement projects may consist of either site specific “Spot” safety improvements involving addition of turn lanes or reconfiguration of an entire intersection to construct a roundabout, reduced conflict, or other innovative intersection design. However, the majority of intersections are treated with lower cost systemic safety improvements including un-signalized intersection visibility features for two-way stop-controlled intersections, increased visibility of stop signs or traffic signal heads as described below. INDOT is also engaged with Purdue University Center for Road Safety in a study to assess recently installed intersection Conflict Warning Systems (CWS) at a number of intersections. If found to be practical and effective CWS may become an approved systemic work type. Also, one county highway agency installed the first conflict warning system in Indiana.

Intersections on the State Highway network are typically identified by INDOT’s annual network safety screening process, but some intersections are identified by citizen input or known land use developments that are determined to increase exposure to crash risk. State network projects are proposed for programming by the INDOT district offices to the Traffic Safety Asset Team for prioritization according to a project scoring methodology that rates various factors including relative future crash risk, and cost effectiveness of the proposed countermeasures.

Local agencies identify intersection safety improvements for spot improvement projects. Some local agencies utilize low-cost systemic intersection safety countermeasures that can include oversize signs, special markings or flashing beacons. Rural local agency projects are prioritized by INDOT while MPOs prioritize proposed projects within their planning areas.

Program: Local Safety

Date of Program Methodology:10/1/2010

What is the justification for this program?

- Other-Designated split of HSIP Apportionment

What is the funding approach for this program?

Other-Competes with other local projects

What data types were used in the program methodology?

Crashes

- All crashes
- Fatal and serious injury crashes only

Exposure

- Volume

Roadway

- Horizontal curvature
- Roadside features
- Other-Geometric Features, marking and signs

What project identification methodology was used for this program?

- Crash frequency
- Excess proportions of specific crash types
- Probability of specific crash types
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval. State Roads are not addressed in this Sub-Program.

How are projects under this program advanced for implementation?

- Competitive application process
- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:50
Other-Weighted scoring based on safety need and cost effectivness:50
Total Relative Weight:100

All local sponsored projects are identified and proposed for HSIP funding by local agencies. The majority of local project proposals are in urban areas and are therefore most often prioritized by MPOs. The LTAP HELPERS Program (similar to a Safety Circuit Rider) typically assists rural local agencies and rural planning

agencies (RPOs) in identifying appropriate safety improvement projects and conducting road safety assessments. Local agencies submit project applications to INDOT OTS for an HSIP eligibility determination. The scheduled priority of eligible projects is determined by INDOT Local Public Agencies (LPA) and Grants Division along with the relevant INDOT district office.

Program: Median Barrier

Date of Program Methodology:10/1/2010

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• Fatal and serious injury crashes only	• Volume	• Median width • Functional classification

What project identification methodology was used for this program?

- Crash frequency
- Excess proportions of specific crash types
- Probability of specific crash types
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

No

Are local road projects identified using the same methodology as state roads?

How are projects under this program advanced for implementation?

- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:50
Other-Weighted ranking factors including safety need, roadway geometry and cost effectivness:50
Total Relative Weight:100

Median Barrier projects are conducted under this sub program to reduce the severity of cross median crashes. While available for systemic installation on local roads, the majority of projects in this sub-program are cable barrier systems that are constructed on state network highways that have depressed grass medians. Per INDOT Standards, cable barriers require adequate width to accommodate the larger deflections that can occur when struck by large commercial vehicles. Medians that are narrower than 40 feet wide may need to be treated with two faced steel guardrails.

On INDOT system highways, project identification and prioritization are conducted by INDOT Office of Traffic Safety and district traffic engineering offices. Local agencies may also use HSIP funding for construction of median barrier systemic projects, but to date this has not happened.

Program: Pedestrian Safety

Date of Program Methodology:10/1/2010

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- All crashes
- Fatal and serious injury crashes only

Exposure

- Traffic
- Volume

Roadway

- Median width
- Roadside features
- Other-Geometrics features and land use

What project identification methodology was used for this program?

- Crash frequency
- Excess proportions of specific crash types
- Probability of specific crash types
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval. The VRU Assessment will revise local HSIP project scoring rules.

How are projects under this program advanced for implementation?

- Competitive application process
- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:50
Other-Weighted factors using safety need and cost effectivness:50
Total Relative Weight:100

Pedestrian safety projects are identified and proposed for HSIP funding both by INDOT and by local agencies as part of their Vulnerable Road Users non-motorized program planning due to exposure probability and are most often prioritized by MPOs. Projects proposed by rural local agencies on INDOT roads are prioritized by the Office of Traffic Safety and the relevant INDOT district office. Typically curb ramps and connecting sidewalks, median refuge areas and/or hybrid beacons or RRFBs are installed as the primary countermeasures. INDOT also programs curb ramp projects to enhance pedestrian safety and meet ADA requirements using HSIP or other funds to systemically upgrade transportation corridors and networks for equitable pedestrian safety and accessibility.

Program: Roadway Departure

Date of Program Methodology:10/1/2010

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- All crashes
- Fatal and serious injury crashes only

Exposure

- Volume

Roadway

- Horizontal curvature
- Roadside features

What project identification methodology was used for this program?

- Crash frequency

- Excess proportions of specific crash types
- Probability of specific crash types
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval.

How are projects under this program advanced for implementation?

- Competitive application process
- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:50
Other-Weighted factors based on safety need and cost effectivness:50
Total Relative Weight:100

Roadway departure crashes result in the largest number of fatal and severe injury outcomes on most rural road systems. For this reason, the Roadway Departure program utilizes a wider set of countermeasures than most subprograms. Countermeasures can consist of aforementioned cable barrier systems installed on depressed grass medians, edgeline rumble stripes described below, enhanced pavement marking and signs, correction of curve superelevation, placement of high friction surface treatment on curves, as well as INDOT's systematic deployment of safety edge as part if it's agency wide paving program. In addition, site specific curve realignment projects may be constructed where adequate sight distance can't be achieved by other means. All of the above countermeasures are eligible for HSIP funding for both state and local agency projects.

Program: Sign Replacement And Improvement

Date of Program Methodology:10/1/2010

What is the justification for this program?

- Other-Targeted to improve local road safety

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- All crashes
- Fatal and serious injury crashes only

Exposure

- Lane miles

Roadway

- Horizontal curvature
- Roadside features
- Other-Geometric Features

What project identification methodology was used for this program?

- Crash frequency
- Other-Retroreflectivity of Existing Signs
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval. INDOT network highways are addressed under the INDOT maintenance program and are not under the safety program.

How are projects under this program advanced for implementation?

- Competitive application process
- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:100
Total Relative Weight:100

Sign Replacement projects to upgrade the condition and retroreflectivity of regulatory and warning signs are exclusively local agency sponsored safety improvements since state network roadway signs are part of the INDOT sign maintenance program. On rural road systems proposed projects are typically identified by local agencies due to deteriorated condition or lack of retroreflectivity of their regulatory and warning signs. The HELPERS program lends out retro-reflectometers by request to local agencies if testing is desired, however sign reflectance degradation is typically identified by observation.

Rural public agency projects are scheduled and administered by INDOT while MPOs prioritize proposed projects within their planning areas. Each local agency is required to conduct a geocoded inventory of their existing signs and commit to ongoing maintenance of the replaced signs.

Program: Other-Centerline and Edgeline Rumble Stripes

Date of Program Methodology:10/1/2012

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes

- All crashes
- Fatal and serious injury crashes only

Exposure

- Traffic

Roadway

- Median width
- Other-Paved Shoulder Width

What project identification methodology was used for this program?

- Crash frequency
- Excess proportions of specific crash types
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval. State INDOT network highways are addressed under the INDOT roadway asset program and are not under the safety program.

How are projects under this program advanced for implementation?

- Competitive application process
- selection committee

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must

equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:50
Other-Weighted factors using safety need and cost effectivness:50
Total Relative Weight:100

Center and Edge-line Rumble Stripe countermeasures are predominantly programed on INDOT roads, although the systemic program is available to local agencies. Projects to retrofit rumble stripes on INDOT roads are identified by annual network safety screening and are proposed to the Traffic Safety Asset Team for prioritization by INDOT districts according to relative risk for future lane departure crashes.

Center and edgeline rumble stripe safety improvement projects typically coincide with the pavement resurfacing program, but the work type is also recommended for retrofit on existing pavements when the need is determined to supersede the paving schedule. The INDOT Pavement Division is supplied with heat maps of road segments with higher incidence of road departure, head on, and sideswipe crashes. The decision to include centerline and or edgeline rumble is determined through coordination between the district paving and traffic engineers.

Local agencies may also apply for HSIP eligibly to mill rumble stripes although this option is rarely exercised on high-speed rural local roads. It's hoped that more local rumble stripe projects will result from efforts to increase the use of Local Road Safety plans.

Program: Other-Traffic Signal Visibility Improvement

Date of Program Methodology:10/1/2012

What is the justification for this program?

- Addresses SHSP priority or emphasis area

What is the funding approach for this program?

Competes with all projects

What data types were used in the program methodology?

Crashes	Exposure	Roadway
• All crashes • Fatal and serious injury crashes only	• Traffic	• Other-Signalized Intersections

What project identification methodology was used for this program?

- Crash frequency
- Excess proportions of specific crash types
- Relative severity index

Are local roads (non-state owned and operated) included or addressed in this program?

Yes

Are local road projects identified using the same methodology as state roads?

No

Describe the methodology used to identify local road projects as part of this program.

Local agencies identify project needs and submit eligibility requests to INDOT for approval.

How are projects under this program advanced for implementation?

- Competitive application process

Select the processes used to prioritize projects for implementation. For the methods selected, indicate the relative importance of each process in project prioritization. Enter either the weights or numerical rankings. If weights are entered, the sum must equal 100. If ranks are entered, indicate ties by giving both processes the same rank and skip the next highest rank (as an example: 1, 2, 2, 4).

Relative Weight in Scoring

Cost Effectiveness:50
Other-Weighted factors using safety need and cost effectivness:50
Total Relative Weight:100

Traffic Signal Visibility is a systemic improvement type. Projects are a subset of the Intersection Safety program. State highway signalized intersections are identified by annual network safety screening. The primary countermeasure is the installation of high contrast traffic signal heads with backing plates and reflective strips, however left turn lanes may also include installation of 4 section signal heads with flashing yellow arrow for permitted phasing where an engineering study has found that to be appropriate. The four section signal heads also allow the capability to program protected only and protected/permitted phases according to traffic demand and safety need by time of day or pedestrian demand.

Although not part of the title, this subprogram addresses the visibility of principally rural un-signalized intersections as well. As with signalized intersections, INDOT roads are identified by annual network screening but in the case of rural intersections the screening process is supplemented with observation of intersection sight distance deficiencies. The InLTAP HELPERS Program offers assistance to local agencies to determine and prioritize intersections that would be eligible to utilize both signalized and non-signalized visibility countermeasures.

What percentage of HSIP funds address systemic improvements?

57.5

HSIP funds are used to address which of the following systemic improvements?

- Add/Upgrade/Modify/Remove Traffic Signal
- High friction surface treatment

- Install/Improve Lighting
- Install/Improve Pavement Marking and/or Delineation
- Install/Improve Signing
- Other-Access Management and Auxiliary Lanes
- Other-Pedestrian Beacons Hybrid and RRFB
- Other-Pedestrian Ramps, Crosswalks, and Refuges
- Rumble Strips
- Upgrade Guard Rails

The total programmed in FFY 2023 for HSIP is $ 60,372,882. The total of programmed for HSIP systemic Improvements was $29,965,000.

The total expected HSIP obligations in 2023 are $57,707,653. The total HSIP systemic obligations are $33,230,065, or 57.58% of the total.

The program goal for the INDOT safety program is to obligate approximately 50% of available HSIP funds on systemic improvement work types on an annual basis. Actual obligations for systemic projects may vary year to year due to project production factors and diversion of projects for obligation under the Section 164-HE Penalty Transfer.

Note: Safety Edge has been an INDOT paving standard since 2012 but does not contribute to HSIP spending. Also, a portion of centerline and edgeline rumble stripe construction is also performed as part of INDOT's paving program, not using HSIP funds.

What process is used to identify potential countermeasures?

- Crash data analysis
- Engineering Study
- Road Safety Assessment
- Stakeholder input

A Road Safety Assessment (RSA) is typically used to determine eligibility for site specific "spot" improvement needs. An RSA report may identify either eligible "near term" improvements that may be constructed with available systemic safety funds and / or may identify more capital intense spot improvement projects that require longer term project programming and significant design effort before deployment. In some cases, both approaches are used to mitigate crash risk in the intervening time while a larger scale project is developed for contract letting.

Various means are used to identify road segments for application of systemic safety improvement types. These means include use of network safety planning software and mapping of crash types over multi-year periods to define areas in greater need for particular safety investments.

Does the State HSIP consider connected vehicles and ITS technologies?

No

At this time INDOT does not consider connected vehicle and ITS technologies in evaluation of potential HSIP project selection and eligibility. INDOT is presently partnering with Purdue University and the Joint Transportation Research Project to evaluate connected vehicle-related communications and autonomous technologies and will conduct research studies of their potential effectiveness and interactions with infrastructure, however the research studies utilize funding other than the HSIP. INDOT considers various ITS

technologies as a means to achieve higher mobility and safety performance, though funding for installations is not currently made through the HSIP.

Does the State use the Highway Safety Manual to support HSIP efforts?

No

INDOT has developed data driven analysis tools named RoadHAT and SNIP that are similar/equivalent to the HSM that supports data driven decision making under the HSIP. The INDOT process was developed prior to release of the HSM and makes extensive use of crash cost to categorize future crash risk by consideration of a crash severity index along with a crash frequency index. Indiana has a set of calibrated Crash Reduction Factors (CRFs) in RoadHAT 4.1 and Safety Performance Functions (SPFs). INDOT recommends to users of the state level software tools to consult the CMF Clearinghouse to determine appropriate CRFs for all countermeasures not currently calibrated for Indiana roadways. Indiana does not currently use the Safety Analyst software tool.

INDOT uses IHSDM for safety analysis of selected major projects and for analysis of design exceptions when appropriate. Calibration of SPFs for IHSDM and INDOT Safety analysis tools has been completed by Purdue Center for Road Safety to support IHSDM analysis.

Describe other aspects of the HSIP methodology on which the State would like to elaborate.

INDOT seeks to achieve a balance between obligations of HSIP funds towards implementation of systemic and site-specific safety improvements. The process is currently oriented toward mitigation of severe outcome crash risk at those intersections, ramps, or road segments that experience an elevated history of severe crash outcomes. Project identification methods include conducting annual network wide analysis to identify both specific locations with elevated crash risks and corridors with high potential for severe crashes that may be mitigated by deployment of a particular type of systemic improvement. Locations of concern may also be identified for analysis and possible project prioritization by other means such as public complaints filtered through the INDOT’s Customer Service system.

Candidate locations on roads under INDOT jurisdiction are subject to an initial engineering review process equivalent to a road safety assessment (RSA) to identify safety needs and appropriate cost-effective countermeasures. The INDOT Office of Traffic Safety (OTS) conducts these reviews with support of the INDOT district Technical Services Division offices.

The Asset Management process that is used to prioritize programming of traffic safety projects on INDOT system roads requires selection and prioritization of a fiscally constrained program of projects for each state fiscal year. The Traffic Safety Asset Management (TSAM) Team is chaired by the OTS manager and consists of a voting representative from OTS and the six INDOT District Traffic Engineers. Each year the TSAM team meets to deliberate the prioritization and select candidate projects for INDOT Program Management Group (PMG) approval, including both spot and systemic safety improvements. The goal is production of cost constrained lists of safety improvement projects that are programmed for construction in each year of the ongoing 5-year asset planning window.

A uniform scoring/prioritization procedure is utilized to provide proposed projects with weighted scores that consider history of crashes and their severity, traffic volume and road inventory data as well as consideration of cost effectiveness of the proposed solution. Project scoring procedures are reviewed and adjusted by TSAM committee vote each year prior to collecting and scoring candidate projects for the next asset management cycle.

Since no uniform set of criteria can fully assess the relative intensity of safety needs in every case, the candidate project prioritization process also considers un-scored factors that may influence future crash risk by way of safety asset committee deliberation. The TSAM team reviews and deliberates the relative merits of each proposed project and assigns a priority grade for a targeted fiscal year of construction. A resulting suite of proposed projects is then forwarded to an executive finance team called the Program Management Group (PMG). The PMG considers the requested funding level in context of other asset team proposals and projected revenue level for the target year. The Program Management Group then allocates an available obligation limitation level for the overall INDOT safety program for the target construction year.

A Change Management process exists for use by project design managers and program funding managers throughout each project's design/environmental development phase to provide consideration of any proposed changes to individual project intent, budget, or scheduled construction fiscal year. Beginning in FFY 2018, the OTS manager was assigned authority to concur with or deny proposed changes to safety asset project scope, cost, or construction year under INDOT's Change Management Application process along with the mangers over design and financial supervision.

Regarding programming of safety projects on the local road system, individual LPAs may propose future projects for HSIP funding through two methods that rely on the type of regional planning system existing in their area. Proposed projects located in areas within a metropolitan planning organization (MPO) must first be selected and prioritized by the relevant MPO prior to eligibility review and project approval by INDOT. Rural LPAs are asked to first work with the Indiana LTAP HELPERS Program that acts to advise the LPA and any local regional planning organization (RPO) regarding safety risk identification and safety improvement priorities for that area. The HELPERS Program staff can pre-screen applications for compliance with federal and state regulations. The HELPERS Program also provides outreach with valuable data analysis services and can advise the LPAs regarding best practices to achieve improved traffic safety. HELPERS can facilitate the conduct of appropriate RSA procedures and maintains a listing of individuals who are trained and willing to participate on local road RSA teams. The HELPERS program also provides training and outreach on best practices for safety planning and maintenance practices available to all LPAs in the state.

The INDOT OTS makes all eligibility determinations for HSIP funding. The necessary information is provided by local public agencies via RSA reports and is used by OTS to determine eligibility. A typical application for spot improvement proposals consists of a Road Safety Assessment (RSA) report, cost effectiveness analysis and a commitment to the project submitted by the relevant local officials. An exception to the aforementioned application package is an INDOT provided HSIP application form that provides the necessary eligibility information for a predetermined list of systemic safety project types. Therefore, application for eligibility to produce systemic safety improvements is streamlined to facilitate the selection of known proactive safety improvements.

Project Implementation

Funds Programmed

Reporting period for HSIP funding.

Federal Fiscal Year

Enter the programmed and obligated funding for each applicable funding category.

FUNDING CATEGORY	PROGRAMMED	OBLIGATED	% OBLIGATED/PROGRAMMED
HSIP (23 U.S.C. 148)	$60,372,882	$57,707,653	95.59%
HRRR Special Rule (23 U.S.C. 148(g)(1))	$7,076,969	$0	0%
VRU Safety Special Rule (23 U.S.C. 148(g)(3))	$0	$0	0%
Penalty Funds (23 U.S.C. 154)	$0	$0	0%
Penalty Funds (23 U.S.C. 164)	$0	$22,947,494	0%
RHCP (for HSIP purposes) (23 U.S.C. 130(e)(2))	$0	$0	0%
Other Federal-aid Funds (i.e. STBG, NHPP)	$0	$15,759,353	0%
State and Local Funds	$6,037,288	$3,587,232	59.42%
Totals	$73,487,139	$100,001,732	136.08%

Obligated program totals include planned transfers from Advance Construction (AC) to the HSIP and 164-HE programs that are comprised of projects awarded in federal fiscal 2023. Program totals for State and Local fund obligations include funds used to match obligated HSIP funds. Amounts listed in the question 23 table reflect obligated funds totals on September 12, 2023. Any project obligations or transfers from AC to HSIP that occur after September 1, 2023, and before October 1, 2023, are included in the above table.

How much funding is programmed to local (non-state owned and operated) or tribal safety projects?

22%

How much funding is obligated to local or tribal safety projects?

$13,708,685

The INDOT Allocation for local safety projects is 22% of the annual HSIP apportionment to fund local agency sponsored HSIP eligible projects totaling $15,555,744.16. INDOT is constrained to share a total not to exceed 25% of all federal aid with local agencies. The addition of two new federal programs in the IIJA, that INDOT

also shares with local agencies caused a reduction in the percentage of HSIP funds allocated for local agency use from 33% to the current 22%.

The FFY 2023 obligation of funds for to construct local projects are expected to be $13,708,685.80, or 14.25% of the total for safety program obligations.

How much funding is programmed to non-infrastructure safety projects?

$420,424

How much funding is obligated to non-infrastructure safety projects?

$511,321

HSIP funding has been obligated to fund for a period of 4 years, the operation of the Hazard Elimination Program for Existing Roads and Streets (HELPERS) Program managed by the Indiana Local Technical Assistance Program. The funding for HELPERS is programmed at $288,651 for FFY 2023. The total non-infrastructure obligation for 2023 includes $222,670 obligated for safety planning actions conducted by MPOs that are funded using HSIP funds. Approval is granted under their Uniform Annual Work Plans submitted to the FHWA division office. MPOs may utilize up to 15% of allocated HSIP funds for safety program planning activities.

Technical assistance activities conducted by the HELPERS program for rural LPAs include local agency safety planning support, data collection, systemic analysis, site specific analysis and advice including facilitating and participating in local Road Safety Assessment (RSA) teams and providing data analysis support for development of Local Road Safety Plans.

How much funding was transferred in to the HSIP from other core program areas during the reporting period under 23 U.S.C. 126?

0%

How much funding was transferred out of the HSIP to other core program areas during the reporting period under 23 U.S.C. 126?

0%

In FFY 2023 INDOT has not transferred any fund apportionments from the HSIP, per the Project Accounting and Finance Division. Projects that are in temporary inactive status, award/request amounts, and current expenditures can play into the decision to transfer funds in or out of a particular program..

Discuss impediments to obligating HSIP funds and plans to overcome this challenge in the future.

Like the previous MAP-21 and FAST surface transportation acts, the IIJA makes it clear that cost effectiveness and risk of fatal and suspected serious injuries are to be considered in project selection decisions; however, guidance has not been developed that defines the risk of future crashes for several systemic improvement types, therefore guidance that includes anticipated cost effectiveness methodologies for various systemic countermeasure types would be helpful. The determination of project eligibility to utilize HSIP funds in a cost-effective manner is typically based on history of crashes over a defined multi-year period. However, under changing traffic demand and operational conditions crash history is not always the most suitable indicator of future crash risk. In addition, the predictive functions contained in the Highway Safety Manual while helpful in this regard, are still somewhat limited in the range of specific situations that may be predicted. As a result, obligations for safety improvement project types that are seemingly promising candidates for HSIP funding

may not be prioritized above other countermeasures when strictly adhering to traditional cost effectiveness criteria. Limited guidance regarding the application of risk factors relative to cost effectiveness can have the effect of stifling innovation toward acceptance of new types of crash countermeasures. Improved guidance by FHWA regarding alternative methods for assessment of future traffic safety risk possibly by further development of the Safe Systems Approach would be a welcome feature in assessing the value of new technologies for systemic countermeasure applications.

Under the Indiana Crash Database, the definition of a Class “A” Suspected Serious Injury has replaced the older definition of “incapacitating injury” and is once again a subjective choice by the reporting officer. However, training of officers regarding this change along with a host of other revisions to the officer's reporting software is still not complete. An ongoing statewide training effort has advanced but this effort was slowed considerably by the Covid Pandemic and has not yet been completed by all law enforcement agencies. The expectation is that the training and deployment of the new crash reporting system will be complete by the end of calendar 2023.

Indiana is currently subject to a phased rollout of the ARIES 6 officer reporting system that will continue until the entire 5-year average of reported serious injury data is populated with officer collected data per the requirements of the MMUCC 4th and 5th Editions. The use of ARIES 6 reporting by all Indiana police agencies is expected and will allow complete counts of SSI outcomes by 2028. The Indiana Traffic Records Coordinating Committee (TRCC) Working Group continues to meet and discuss methods of complying with the MMUCC guidelines while maintaining the overall goal of making the officers’ tasks at a crash scene as rapid, accurate and consistent as possible. In the meantime, for the earlier years of the 5 years INDOT has to rely on the previous method of estimated annual suspected serious injury counts from the crash database. The time need for the more accurate direct SSI count data to populate the 5-year averages is an impediment to making the most accurate selection of future HSIP programmed projects.

The rural fatal crash rate rule governing the High-Risk Rural Roads Program should end. The HRRR Program has proven ineffective as a means of addressing rural road safety primarily due to the constraint on functional class. Rural local public agencies (LPAs) are far more likely to apply for HSIP funds to make safety improvements on those rural local roads with higher average daily traffic. Often these roads are functionally classified as “Other Arterials”. The requirement that ties safety improvement funds to roadway functional class is not an element that rural LPAs typically consider when developing or prioritizing proposed safety improvements; As a result, projects submitted by local agencies for HSIP and HRRP eligibility often do not qualify for HRRRP funding due to significant involvement of arterial roads in the project applications. Moreover, multiyear analysis of severe crash trends on rural roads has not indicated an increased severe crash risk on the collector or local rural road classifications or any general difference that can be directly attributed to functional class. In addition, many local roads lack adequate volume or inventory data, making an accurate comparison of crash rate averages a difficult task. The current best practice of comparing substantive to nominal crash risk has proven to be a better predictor of crash risk. Improved response to risk factors for severe crashes on rural local roads could be achieved by encouraging states to dedicate a percentage of their HSIP apportionments to the construction of safety improvements on rural medium to low volume roads found to have a higher than nominal severe crash frequency or rate regardless of their functional class.

If the HRRR Program special rule is to continue, at a minimum state DOT’s should be permitted to conduct the calculation of all current special rule requirements under processes approved by FHWA. State DOTs are more familiar with current roadway conditions, function and changing urban/rural boundaries. The current calculation conducted by NHTSA is dependent on data from the FARS system that has an inherent time lag that impedes timely response. Also, NHTSAs functional class definitions do not entirely match those held by FHWA potentially adding misperception of actual conditions.

Describe any other aspects of the State's progress in implementing HSIP projects on which the State would like to elaborate.

In 2022 Indiana revised its *Strategic Highway Safety Plan* (SHSP). The new SHSP follows the FHWA Safe System Approach, including the selection of emphasis areas:*Safe Road Users, Safe Vehicles Safe Speeds, Safe Roads, and Post-Crash Care*. The overall objective for each emphasis area is to meet the Indiana Vision, Mission, and ultimate goal of eliminating fatalities and serious injuries. Each emphasis area addresses multiple data driven strategies with subject specific objectives to reduce motor vehicle crashes resulting in fatalities and serious injuries. At the same time, INDOT feels that maintaining flexibility in the SHSP is valuable to help address any emerging technologies, countermeasures, and analysis methodologies in the coming years.

In order to measure progress, the strategies have established interim objectives that strive to meet target values by 2042 of no more than 550 fatalities and 1975 suspected serious injuries per 5 year rolling average. As a result, there are a number of action items enumerated for each strategy contained in the SHSP Appendix. The list of action items is too long to enumerate here, so the reader is directed to read the 2022 Indiana SHSP.

The SHSP steering committee member agencies and other SHSP partners will take on leadership of these tasks and attempt to meet the defined objective level by the stated target year. For most strategies, an interim objective target is set in 2026, to help measure progress during the life of the current revision.

Indiana has completed revisions to the crash record system data dictionary and officer's crash reporting manual to use the FHWA defined Injury Nature definitions and has been certified compliant by FHWA. The newer definition is expected to render a more accurate count of class "A" suspected serious injuries if officers are trained and utilize those choices judiciously.

In 2016 FHWA gave notice that the MMUCC 4th Edition guidelines requiring the term "Suspected Serious Injury" be equivalent to the "A" injury classification under the KABCO scale. In the latter half of 2019, Indiana's electronic reporting tool was redefined to classify an incapacitating injury as a subjective choice by the reporting officer from the definition of all injured persons "Transported from the Scene". This change was undertaken as part of the introduction of the FHWA mandated seven "injury nature" definitions that now classify suspected serious injuries. The revised classification rule deadline of April 15, 2019, was too short a time for the Indiana TRCC to revise the officer's electronic crash reporting software*ARIES* to accommodate new data elements into the state's electronic vehicle crash database. Therefore, Indiana was judged to be out of compliance. After changes were made to the Indiana Crash Data system manual and Data Dictionary, in June of 2022, FHWA certified that Indiana's crash reporting system is in compliance with the MMUCC 4th and 5th Editions.

The new MMUCC guidelines require officers untrained in emergency medicine to determine a level of trauma to the victim. This is accomplished by selection of an injury nature from a list of possible injuries. This is a difficult task for many officers who are not medically trained and must concentrate on managing the crash site and gathering evidence while emergency medical personnel typically manage the care and assessment of injured persons. Since injury assessment is not an officer's primary duty at a crash scene, good communication between emergency medical technicians and reporting officers as well as consistent reporting practices have become a key element of statewide officer retraining as part of the adoption of the new ARIES 6 officer reporting software.

INDOT is engaged in a phased rollout of the officer reported injury nature data over the following years until the entire 5-year average of serious injury data is populated with officer collected data per the requirements of the MMUCC 4th and 5th Editions. The Indiana TRCC Working Group will continue to meet and discuss methods of complying with the MMUCC guidelines while maintaining the overall goal of making the officers' tasks at a crash scene as rapid, accurate and consistent as possible. In the meantime, INDOT continues to use a

previously approved method to estimate annual suspected serious injury counts for the earlier portion to calculate the 5-year averages from the crash database.

INDOT administers an Asset Management program to budget and program all of INDOT's highway infrastructure capital investments. The Asset Management system provides a means to budget for a prioritized and cost constrained list of safety improvement projects that improves INDOT's ability to select and construct high value safety improvements. Candidate safety projects undergo weighted scoring that emphasizes the need to address high severity crash locations with the construction of cost-effective crash countermeasures. Budgeting for INDOT jurisdiction roadways occurs five years into the future. Spot improvement projects commonly require this amount of time for the environmental, design and land acquisition development.

Projects that construct systemic improvement types are also budgeted five years into the future, however selection of systemic projects and programing typically occurs between 30 to 18 months prior to the construction year.

Annual reservation of the HSIP allocation for INDOT Roads is made to ensure that systemic safety improvements are constructed. The safety needs analysis conducted by the Traffic Safety Asset Management Team for both spot and systemic safety project proposals serve to validate increased awareness of and priority for increased investment in traffic safety.

The primary program goal for the Traffic Safety Asset Class is the reduction in the frequency of crashes with fatal and/or suspected serious injury outcomes either by reducing the occurrence of these crashes or their relative severity. Current available analysis tools are designed to consider all incapacitating injury crashes to be serious, so crashes involving fatalities and suspected serious injuries are primarily targeted for improvement. Most road safety assessment studies conducted at specific locations also consider property damage data to reveal a complete picture of prevailing crash patterns. For sites on the INDOT system and in most local urban areas, traffic volume data is available to establish nominal and substantive crash rates that aid in prioritizing project proposals.

Most rural local roads lack accurate recent volume data, so a crash loss index was developed under a joint transportation research project with Purdue University as part of INDOT's annual Network Safety Screening effort. Socioeconomic data and road characteristics are used to develop a local expected road crash loss and crash loss density that is compared to existing crash history to prioritize relative safety need at a site or road segment. Prior to project programming a site investigation is performed for all crash studies using Road Safety Assessment (RSA) principles to determine if or how the road's design and maintenance characteristics influence crashes. The RSA also acts as an effective means to guide the selection of appropriate and effective crash countermeasures.

General Listing of Projects

List the projects obligated using HSIP funds for the reporting period.

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
1802879	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1226	Signs	$521518	$579465	HSIP (23 U.S.C. 148)	Rural	Local Road or Street	8,500	55	County Highway Agency	Systemic	Highway Sign Sheeting Upgrade	Increase Sign Visibility
2000033	Roadside	Barrier end treatments (crash cushions, terminals)	1700	Various Types of Guard Rail End Treatments	$6851760	$7050444	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Minor Arterial	8,500	55	State Highway Agency	Systemic	Roadway Departure	Guard Rail End Treatment Upgrade
1703015	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$192000	$514900	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	6,300	30	State Highway Agency	Spot	Intersections	Intersection Safety
1801420	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$1413450	$2369370	HSIP (23 U.S.C. 148)	Urban	Major Collector	15,785	40	City or Municipal Highway Agency	Spot	Intersections	Intersection Safety
1801424	Pedestrians and bicyclists	Pedestrian hybrid beacon	47	Locations	$217350	$288318	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	8,500	35	City or Municipal Highway Agency	Systemic	Pedestrians	Pedestrian Safety
1801444	Pedestrians and bicyclists	ADA curb ramps	134	Ramps	$1437750	$1839879	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	8,500	35	City or Municipal Highway Agency	Spot	Pedestrians	Pedestrian Safety
1801446	Pedestrians and bicyclists	ADA curb ramps	59	Ramps	$641185	$712428	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	8,500	35	City or Municipal Highway Agency	Spot	Pedestrians	Pedestrian Safety
1900390	Intersection traffic control	Modify traffic signal – modernization/replacement	11	Intersections	$692522	$2103101	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	8,500	45	City or Municipal Highway Agency	Spot	Intersections	Traffic Signal Modernization
1900403	Pedestrians and bicyclists	ADA curb ramps	36	Ramps	$591609	$650841	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	8,500	35	City or Municipal Highway Agency	Spot	Pedestrians	Pedestrian Safety
1901435	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Intersections	$280502	$280502	Penalty Funds (23 U.S.C. 164)	Urban	Major Collector	8,923	30	State Highway Agency	Spot	Intersections	Traffic Signal Modernization

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
1901776	Pedestrians and bicyclists	Pedestrian signal - other	5	Pedestrian HAWK Signal	$480894	$553050	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	8,500	35	City or Municipal Highway Agency	Spot	Pedestrians	Pedestrian Safety
1902779	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	2314	Signs	$843997	$1206275	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	8,500	35	City or Municipal Highway Agency	Systemic	Highway Sigh Sheeting Upgrade	Increase Sign Visibility
2002972	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	2680	Signs	$1165653	$1295170	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	8,500	35	City or Municipal Highway Agency	Systemic	Highway Sigh Sheeting Upgrade	Increase Sign Visibility
2003016	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1419	Signs	$626356	$695952	Penalty Funds (23 U.S.C. 164)	Rural	Multiple/Varies	8,500	55	County Highway Agency	Systemic	Highway Sigh Sheeting Upgrade	Increase Sign Visibility
1383615	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$36681	$5116508	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	11,748	45	State Highway Agency	Spot	Intersections	Intersection Safety
1401845	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$2691404	$3873872	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	43,000	40	State Highway Agency	Spot	Intersections	Intersection Safety
1592223	Roadway	Roadway widening - add lane(s) along segment	0.57	Miles	$4878650	$5640696	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	12,673	50	State Highway Agency	Spot	Auxillary Lane Widening	Increase capacity-safety
1592224	Roadway	Roadway widening - add lane(s) along segment	0.17	Miles	$1718644	$1898406	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	10,190	55	State Highway Agency	Spot	Auxillary Lane Widening	Increase capacity-safety
1600693	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$318672	$4392586	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	14,650	40	State Highway Agency	Spot	Intersections	Intersection Safety
1600829	Alignment	Alignment - other	1	Remove Right Turning Roadway	$214453	$1259066	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other Freeways & Expressways	1,013	45	State Highway Agency	Spot	Intersections	Increase Sight Distance
1700092	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$160000	$2169191	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	10,891	45	State Highway Agency	Spot	Intersections	Increase capacity-safety
1700151	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$871735	$1242543	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	24,412	40	State Highway Agency	Spot	Intersections	Increase capacity-safety

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
1700152	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$823676	$1345546	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	27,004	45	State Highway Agency	Spot	Intersections	Increase capacity-safety
1700153	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$3101374	$4207923	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	12,136	40	State Highway Agency	Spot	Intersections	Increase capacity-safety
1700154	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1473698	$2617081	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	32,030	45	State Highway Agency	Spot	Intersections	Increase capacity-safety
1700157	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$2709707	$3483293	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	10,566	40	State Highway Agency	Spot	Intersections	Increase capacity-safety
1700158	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$2053583	$2922304	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	19,017	40	State Highway Agency	Spot	Intersections	Increase capacity-safety
1700164	Roadway	Roadway widening - add lane(s) along segment	0.17	Miles	$406800	$602396	HSIP (23 U.S.C. 148)	Rural	Major Collector	4,257	55	State Highway Agency	Spot	Auxillary Lane Widening	Increase capacity-safety
1700209	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1843886	$2147397	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	13,940	35	State Highway Agency	Spot	Intersections	Increase capacity-safety
1700709	Pedestrians and bicyclists	ADA curb ramps	69	Ramps	$381490	$2067430	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	8,500	40	State Highway Agency	Spot	Pedestrians	Pedestrian Safety
1700717	Intersection geometry	Innovative Intersection (e.g. MUT, RCUT, QR)	1	Intersections	$1412686	$1814286	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	23,480	55	State Highway Agency	Spot	Intersections	Intersection Safety
1702286	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Intersections	$905758	$905758	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	25,000	40	State Highway Agency	Spot	Intersections	Traffic Signal Modernization
1702933	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$104259	$2328683	HSIP (23 U.S.C. 148)	Urban	Major Collector	6,821	55	State Highway Agency	Spot	Intersections	Intersection Safety
1702935	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1014139	$1257089	Penalty Funds (23 U.S.C. 164)	Urban	Major Collector	7,313	30	State Highway Agency	Spot	Intersections	Intersection Safety
1702943	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$3351374	$4248544	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	2,600	55	State Highway Agency	Spot	Intersections	Intersection Safety
1702982	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$488546	$488546	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	10,843	55	State Highway Agency	Spot	Intersections	Intersection Safety

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
1702985	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1743083	$2057559	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	4,524	45	State Highway Agency	Spot	Intersections	Intersection Safety
1800039	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$65100	$313490	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	8,500	55	State Highway Agency	Spot	Intersections	Intersection Safety
1800220	Alignment	Alignment - other	1	Remove Right Turning Roadway	$143247	$196027	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	31,695	60	State Highway Agency	Spot	Intersections	Intersection Safety
1800224	Intersection geometry	Innovative Intersection (e.g. MUT, RCUT, QR)	1	Intersections	$2256297	$2453546	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	11,600	60	State Highway Agency	Spot	Intersections	Intersection Safety
1800226	Intersection geometry	Innovative Intersection (e.g. MUT, RCUT, QR)	1	Intersections	$2564478	$2849420	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	8,318	60	State Highway Agency	Spot	Intersections	Intersection Safety
1800375	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1364105	$1364105	Penalty Funds (23 U.S.C. 164)	Urban	Major Collector	6,314	55	State Highway Agency	Spot	Intersections	Intersection Safety
1802060	Intersection geometry	Intersection geometry - other	1	Install a Passing Blister	$229325	$416060	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	12,600	55	State Highway Agency	Spot	Intersections	Intersection Safety
1802071	Intersection traffic control	Modify traffic signal – modernization/replacement	4	Intersections	$2729083	$2951842	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	8,500	45	State Highway Agency	Spot	Intersections	Traffic Signal Modernizations
1900116	Intersection geometry	Modify lane assignment	1	Intersections	$1469210	$1772023	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	17,922	40	State Highway Agency	Spot	Intersections	Intersection Safety
1901706	Intersection traffic control	Modify traffic signal – modernization/replacement	5	Locations	$546607	$607342	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Spot	Intersections	Traffic Signal Modernizations
1902019	Roadside	Barrier end treatments (crash cushions, terminals)	76	Numbers	$1591435	$1591435	Penalty Funds (23 U.S.C. 164)	Rural	Multiple/Varies	8,500	55	State Highway Agency	Systemic	Roadway Departure	Upgrade End Treatments
1902020	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	20	Intersections	$1149975	$1149975	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	13,500	45	State Highway Agency	Systemic	Intersections	Signal Visibility
1902185	Roadway delineation	Raised pavement markers	4500	Numbers	$162004	$180004	HSIP (23 U.S.C. 148)	Rural	Multiple/Varies	8,500	55	State Highway Agency	Systemic	Lane Departure	RPM Replacement

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
1902664	Pedestrians and bicyclists	ADA curb ramps	86	Ramps	$886895	$985439	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	8,500	45	State Highway Agency	Systemic	Pedestrians	ADA Ramps
1902679	Intersection geometry	Add/modify auxiliary lanes	8	Intersections	$703202	$3354155	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	16,180	60	State Highway Agency	Systemic	Intersections	Auxillary Lane Modifications
1902680	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$38534	$536036	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	3,760	55	State Highway Agency	Spot	Intersections	Intersection Safety
1902861	Intersection geometry	Add/modify auxiliary lanes	4	Intersections	$1644907	$2020474	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	10,478	60	State Highway Agency	Systemic	Intersections	Auxillary Lane Modifications
2000032	Lighting	Interchange lighting	10	Locations	$138860	$2986598	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	124,000	70	State Highway Agency	Spot	Roadway Departure	High Mast Lighting Modification
2000186	Intersection geometry	Innovative Intersection (e.g. MUT, RCUT, QR)	1	Intersections	$2829523	$3231415	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	30,200	40	State Highway Agency	Spot	Intersections	Intersection Safety
2001565	Intersection traffic control	Modify traffic signal – modernization/replacement	2	Intersections	$1998816	$1998816	Penalty Funds (23 U.S.C. 164)	Urban	Minor Arterial	6,763	35	State Highway Agency	Spot	Intersections	Traffic Signal Modernizations
2001839	Lighting	Continuous roadway lighting	92	Numbers	$1992731	$1992731	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	25,000	70	State Highway Agency	Spot	Roadway Departure	Conventional Highway Lighting
2002405	Intersection traffic control	Modify traffic signal – modernization/replacement	8	Intersections	$428092	$428092	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	50,420	45	State Highway Agency	Spot	Intersections	Traffic Signal Modernizations
2002516	Lighting	Interchange lighting	19	Interchanges	$6116862	$6116862	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Interstate	25,000	70	State Highway Agency	Spot	Roadway Departure	Highway Lighting Installation
2100129	Lighting	Interchange lighting	8	Interchanges	$215446	$4441816	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	35,000	70	State Highway Agency	Spot	Roadway Departure	High Mast Tower Lighting Improvements
2100136	Lighting	Interchange lighting	6	Interchanges	$2480548	$2480548	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	35,000	70	State Highway Agency	Spot	Roadway Departure	High Mast Tower Lighting Improvements
2100138	Pedestrians and bicyclists	ADA curb ramps	99	Ramps	$74911	$1498225	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	16,278	45	State Highway Agency	Systemic	Intersections	ADA Ramps
2100139	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$362864	$450514	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	8,500	55	State Highway Agency	Spot	Intersections	New Traffic Signal Installation

PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
2100144	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$322528	$357528	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	10,181	60	State Highway Agency	Spot	Intersections	New Traffic Signal Installation
2101143	Intersection traffic control	Modify traffic signal – add emergency vehicle preemption	26	Intersections	$401995	$437838	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,500	35	State Highway Agency	Systemic	Intersections	Emergency Vehicle Preemption
2101259	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$45612	$50680	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	7,833	45	State Highway Agency	Spot	Intersections	Auxillary Lane Modification
2101283	Access management	Change in access - close or restrict existing access	3	Locations	$481971	$708301	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	41,662	45	State Highway Agency	Systemic	Modify Center Median	Access Control
2101298	Roadway	Pavement surface – high friction surface	7	Curves	$409538	$455042	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Interstate	55,000	45	State Highway Agency	Systemic	Roadway Departure	High Friction Surface
2101624	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$333156	$702954	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	18,928	55	State Highway Agency	Spot	Intersections	New Traffic Signal Installation
2200057	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$664078	$877065	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	19,911	40	State Highway Agency	Spot	Intersections	Intersection Safety
2201134	Lighting	Interchange lighting	1	Interchanges	$1196200	$1196200	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	24,500	70	State Highway Agency	Spot	Roadway Departure	High Mast Tower Lighting Improvements
2201283	Roadway delineation	Longitudinal pavement markings - remarking	11	Miles	$999763	$999763	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	64,378	50	State Highway Agency	Systemic	Lane Departure	Pavement Marking Improvements
1401034	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$2406565	$6010191	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	4,928	30	City or Municipal Highway Agency	Spot	Intersections	Intersection Safety
1400195	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$160000	$15732709	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	44,729	50	State Highway Agency	Spot	Intersections	Intersection Safety
1800208	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$152586	$313294	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	14,785	40	State Highway Agency	Spot	Intersections	Intersection Safety
1601028	Pedestrians and bicyclists	Install sidewalk	0.06	Miles	$744911	$2043947	HSIP (23 U.S.C. 148)	Urban	Minor Collector	4,910	40	City or Municipal Highway Agency	Systemic	Pedestrians	Pedestrian Safety

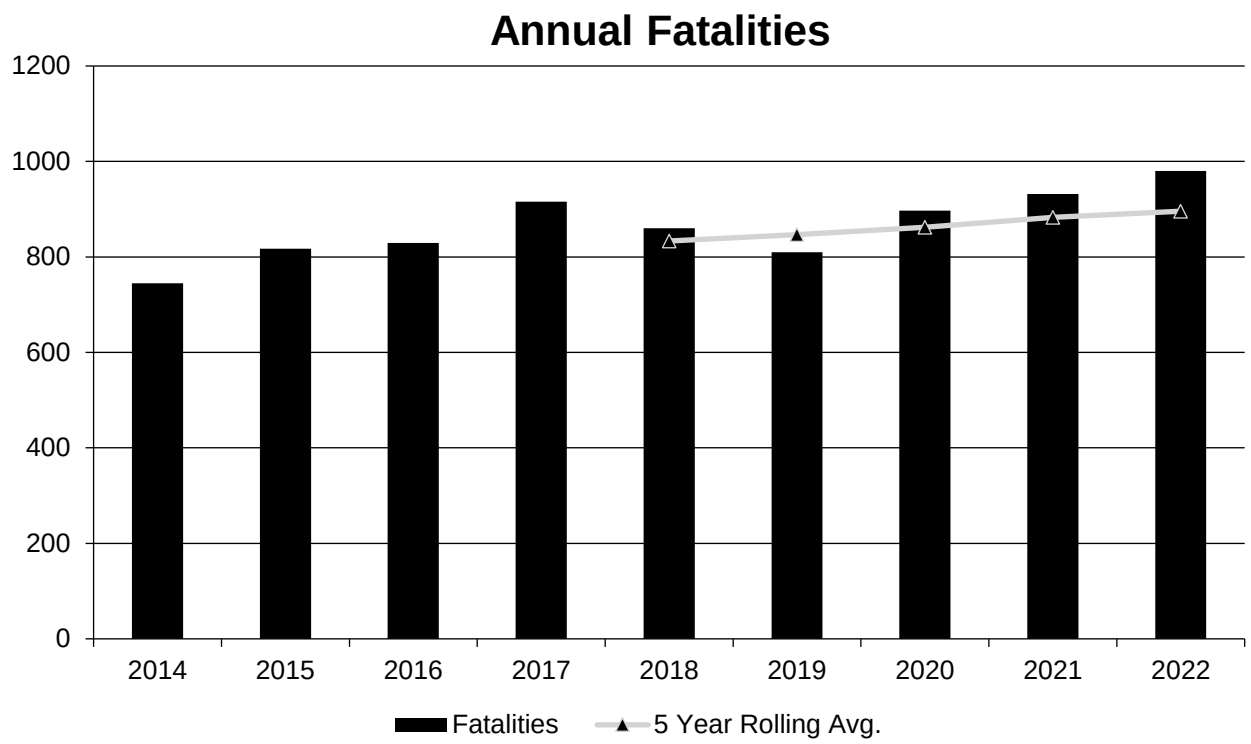
PROJECT NAME	IMPROVEMENT CATEGORY	SUBCATEGORY	OUTPUTS	OUTPUT TYPE	HSIP PROJECT COST($)	TOTAL PROJECT COST($)	FUNDING CATEGORY	LAND USE/AREA TYPE	FUNCTIONAL CLASSIFICATION	AADT	SPEED	OWNERSHIP	METHOD FOR SITE SELECTION	SHSP EMPHASIS AREA	SHSP STRATEGY
1500061	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$871484	$1267816	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	12,322	55	State Highway Agency	Spot	Intersections	Intersection Safety
1700095	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$2406536	$3124004	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	13,719	50	State Highway Agency	Spot	Intersections	Intersection Safety
1702829	Intersection geometry	Intersection realignment	1	Intersections	$793994	$882216	HSIP (23 U.S.C. 148)	Rural	Minor Collector	668	35	City or Municipal Highway Agency	Spot	Intersections	Intersection Safety
1900097	Access management	Change in access - close or restrict existing access	5	Locations	$2166881	$3773896	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	35,500	60	State Highway Agency	Systemic	Modify Center Median	Access Control
1901879	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$9898888	$3563882	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	18,760	40	State Highway Agency	Spot	Intersections	Intersection Safety
1902031	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	3322	Signs	$1681862	$1868736	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Highway Sign Sheeting Upgrade	Increase Sign Visibility

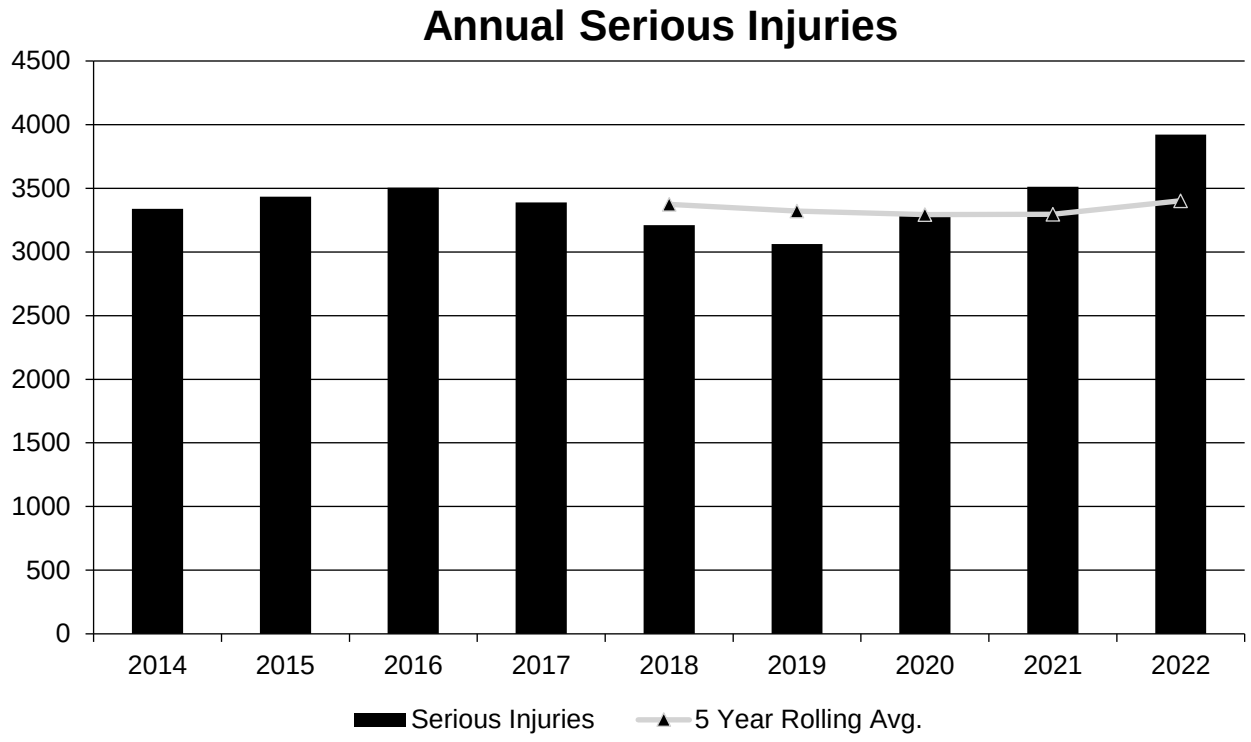
Safety Performance

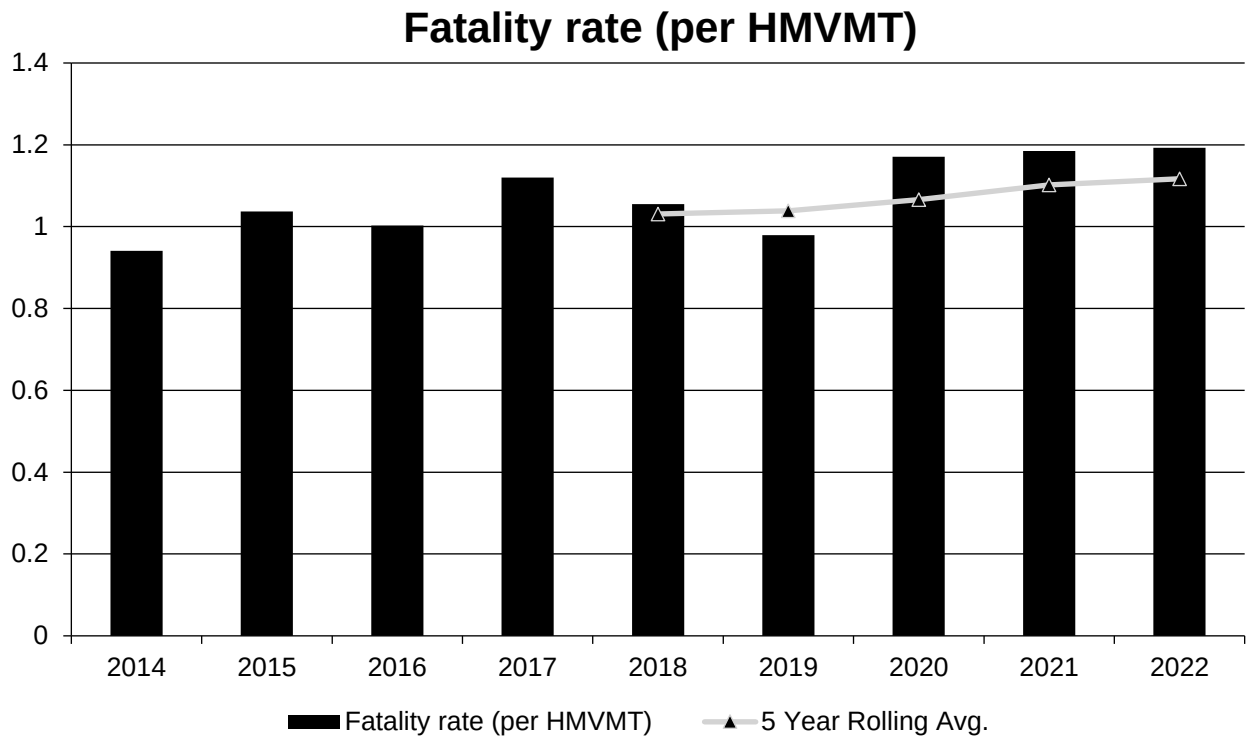
General Highway Safety Trends

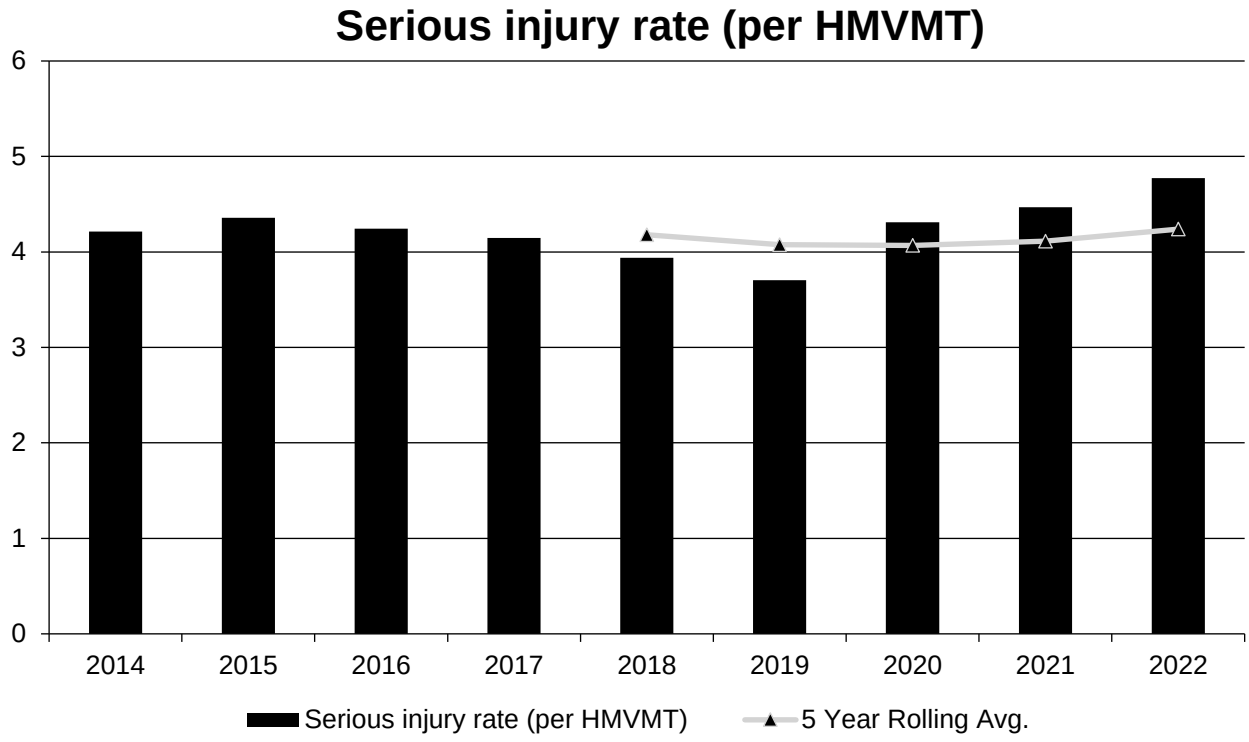
Present data showing the general highway safety trends in the State for the past five years.

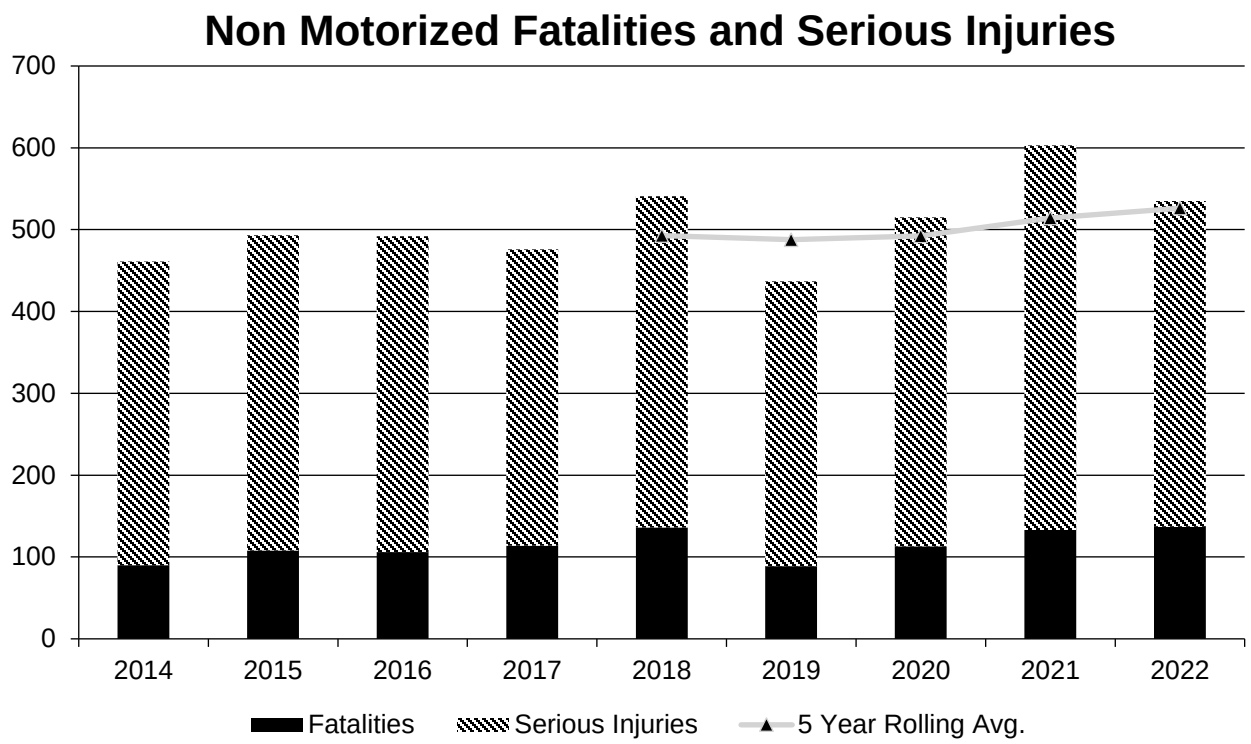
PERFORMANCE MEASURES	2014	2015	2016	2017	2018	2019	2020	2021	2022
Fatalities	745	817	829	916	860	810	897	932	980
Serious Injuries	3,338	3,434	3,505	3,388	3,210	3,062	3,302	3,513	3,923
Fatality rate (per HMVMT)	0.941	1.037	1.003	1.120	1.055	0.979	1.171	1.185	1.193
Serious injury rate (per HMVMT)	4.215	4.357	4.243	4.145	3.938	3.704	4.310	4.467	4.774
Number non-motorized fatalities	90	108	106	114	136	89	113	133	137
Number of non-motorized serious injuries	371	385	386	362	405	348	402	470	398


Annual Fatalities
1200
1000
800
600
400
200
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Fatalities
5 Year Rolling Avg.


Annual Serious Injuries
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Serious Injuries
5 Year Rolling Avg.


Fatality rate (per HMVMT)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Fatality rate (per HMVMT)
5 Year Rolling Avg.


Serious injury rate (per HMVMT)
6
5
4
3
2
1
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
Serious injury rate (per HMVMT)
5 Year Rolling Avg.



Federal regulations promulgated in 2016 by Federal Highway Administration to support the safety performance reporting requirements included a requirement that states must report Suspected Serious Injuries (SSI) using the criteria established in the MMUCC 4th Edition. Prior to this proposed rulemaking, the definition for incapacitating injury used by Indiana was an incapacitating injury determined by the officer noting that a crash victim was transported from the scene for treatment. This definition was deemed an acceptable measure to define suspected serious injuries in prior editions of the MMUCC. The linkage of a federal regulation to this advisory document's recommended definition put Indiana's current designation of incapacitating injury out of compliance.

The requirement for counting SSI established in the MMUCC 4th and 5th Edition initially compelled Indiana to determine a temporary method to approximate counting Class "A" injuries so that Indiana's crash records system could be used to calculate historic and projected traffic safety performance counts in accord with the KABCO scale.

The former methodology for identifying a person with a suspected serious injury was in use from 2014 until the end of 2019. This method utilized a proxy for missing data regarding Suspected Serious Injuries. Indiana received approval from FHWA to use a calculated factor as in interim measure until changes were completed in the ARIES crash database to directly count suspected serious injuries. INDOT continued to use the calculated factor as an estimate of non-fatal injuries to report the number of statewide "Suspected Serious Injuries" until the end of 2019 when the new data elements were in place in the officer's crash reporting system that would allow for a specific count of MMUCC 4th Edition compliant data.

Note that the 7.2% calculated share of all injuries was considered to be a valid estimate only when examining statewide crashes on all roads in Indiana. Separate percentage values to estimate SSI were established for subsets of the total count of injuries that were used for reporting sub program performance based on separate historic analysis using the same methodology to establish estimated percentage contributions in those data subsets.

The new version of the reporting tool titled ARIES 6 officer reporting system contains the corrected definitions of the FHWA compliant injury nature types in the data dictionary and the reporting software. ARIES 6 is currently in use by the Indiana State Police and a majority of local police agencies and all county sheriffs' departments. The deployment of the ARIES 6 officer reporting system is currently ongoing in 2023 and training in use of the new features will be ongoing until all Indiana law enforcement agencies have installed the new system and are using the new reporting tool. The expected change over to ARIES 6 for all Indiana police agencies is expected to occur at the end of calendar 2023.

In late 2019, the vendor that manages Indiana's crash records system (AIRES) for the Indiana State Police made changes to the officer's reporting software so that a person transported from the scene for treatment would no longer be identified as a person with a suspected serious injury. This change removed the designation Transported from the Scene as a requirement for identifying incapacitating injuries and a requirement was added that the officer select among a list of injury nature definitions for each person injured. In April of 2021 a review by FHWA found and adjusted the injury nature definitions to comply with the descriptions contained in the MMUCC 4th and 5th Editions. In June of 2022 a FHWA review of Indiana's new procedure for counting suspected serious injuries found that the Indiana Crash Data Dictionary and Officers User Manual for ARIES reporting is compliant with the injury descriptions contained in the current edition of the MMUCC. Therefore, Indiana's reporting procedure is in compliance for 2023. Prior to this review, definitions for the injury natures were in place but the descriptions of certain injury natures were determined to allow for possible misinterpretation by officers.

INDOT will use a phased rollout of the officer collected suspected serious injury type data over the following years until the entire 5 year average of serious injury data is populated with officer collected data per the requirements of the MMUCC 4th and 5th Editions. However, in order to begin reporting suspected serious injuries according to current requirements, INDOT decided to begin a direct count of suspected serious injuries in the 2020 ARIES data. It was determined by INDOT that the changes made in late 2019 were adequate to begin the transition to directly count suspected serious injuries for reporting in the 2021 HSIP report.

Describe fatality data source.

FARS

Data from the Fatal Accident Reporting System and the state crash database was utilized according to the most complete dataset for the given year as follows:

FARS Final Report File for the preceding years through 2020.
FARS Annual Report File for the year 2021and earlier Website location:
https://cdan.nhtsa.gov/SASStoredProcess/guest

Indiana State Police ARIES Crash Reporting System for the year 2022.

To the maximum extent possible, present this data by functional classification and ownership.

Year 2022

Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial (RPA) - Interstate	62.8	136.9	0.74	1.62

Functional Classification	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Rural Principal Arterial (RPA) - Other Freeways and Expressways				
Rural Principal Arterial (RPA) - Other	110.3	247.8	2.09	4.69
Rural Minor Arterial	91.6	276.3	2.96	8.92
Rural Minor Collector	30.3	122.1	1.52	6.13
Rural Major Collector	118	425.2	2.28	8.22
Rural Local Road or Street	90.4	302.8	1.71	5.72
Urban Principal Arterial (UPA) - Interstate	48.7	195.5	0.43	1.73
Urban Principal Arterial (UPA) - Other Freeways and Expressways	24.7	51.8	1.58	3.33
Urban Principal Arterial (UPA) - Other	137	643.9	1.32	6.18
Urban Minor Arterial	99.7	543.6	1.2	6.56
Urban Minor Collector				
Urban Major Collector	42.1	242.7	0.81	4.67
Urban Local Road or Street	61.2	283.4	0.41	1.91

Year 2022

Roadways	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
State Highway Agency	443.9	1,363.7	1.1	3.37
County Highway Agency	222.8	787.7	1.15	4.08
Town or Township Highway Agency				
City or Municipal Highway Agency	213.9	907.2	1.01	4.28
State Park, Forest, or Reservation Agency				
Local Park, Forest or Reservation Agency				
Other State Agency				
Other Local Agency				
Private (Other than Railroad)				
Railroad				
State Toll Authority				
Local Toll Authority				
Other Public Instrumentality (e.g. Airport, School, University)				
Indian Tribe Nation				

Data Tables for 5-year averages from 2018 through 2022 have been adjusted for FHWA approved VMT data through 2021 and state estimated VMT for 2022. The changes in the classification of Suspected Serious Injuries methodology are described in greater detail in the additional comments under Question 30.

The ARIES 6.0 Indiana Officers Crash Reporting Tool was created by a vendor working under contract to the crash database owner agency, the Indiana State Police (ISP). In late 2019, the crash database vendor added a requirement that the officer select among a list of injury nature definitions for each person injured. In April of 2021, a review by FHWA found and adjusted the injury nature definitions to comply with the descriptions contained in the MMUCC 4th and 5th Editions. In June of 2022 a further FHWA review of Indiana's new procedure for counting suspected serious injuries found that the Indiana Crash Data Dictionary and ARIES User Manual for crash reporting is in compliance with the injury descriptions contained in the current edition of

the MMUCC. Prior to this review, definitions for the injury natures were in place but the descriptions of some injury natures were determined to allow for possible misinterpretation by officers.

The ARIES 6 version of the officers reporting tool contains the corrected definitions of FHWA compliant injury nature types in the data dictionary and reporting software. ARIES 6 is in use by the Indiana State Police and multiple county sheriffs' departments. ARIES 6 is currently in the process of being deployed and training is ongoing in use of the new features. The training and deployment process will be ongoing until all Indiana law enforcement agencies have installed and are using the new reporting tool. All Indiana police agencies are expected to complete the conversion to ARIES 6 before the end of 2023.

INDOT is using a phased rollout of officer's reported subjective injury nature (type) data over the following years until the entire 5-year average of serious injury data is populated with officer collected data per the requirements of the MMUCC 4th and 5th Editions. However, in order to begin reporting suspected serious injuries according to current requirements, INDOT decided to begin a direct count of suspected serious injuries starting with the 2020 ARIES data. It was determined by INDOT that that the changes made in late 2019 were adequate to begin the transition to directly count suspected serious injuries for reporting most responses in the 2021 HSIP report. However, because the use of the FHWA mandated definitions were revised in 2022 and the full roll-out of the AIRIES 6 reporting tool won't be complete until December 31, 2023, it may prove necessary to revise reported 2020 through 2023 counts and rates of suspected serious injuries in future reporting years until 2024-2028 averaged data is reported.

Provide additional discussion related to general highway safety trends.

2023 so far has seen a significant recovery of economic activity from the downturn due to the Covid pandemic that was experienced in 2020/21. The recovery in terms of VMT appears to be complete.

The number of police reported fatalities in 2022 increased by 5.15% compared to 2021, while the increase from 2020 to 2021 was 3.90%. There has been an ongoing increasing trend in fatalities since 2019. The result for 2023 is an increase in the 5-year rolling average of 1.45% over the last year.

The 5-year average of suspected serious injuries have risen by 2.92% since 2019, but part of this change is attributable to a data discontinuity as Indiana transitioned from an estimated number to the current direct counting procedure as described in question 30.

Statewide 2022 crash data shows that Indiana experienced conditions somewhat similar to surrounding states in regard to changes in the 5 year rolling averages of Fatalities, Suspected Serious Injuries, Fatality Rate and Suspected Serious Injury Rate.

Lane departure crashes continued to be the most numerous fatal crash type in 2022. The relatively level trend of vehicle lane departure fatalities was continued in 2022, with the 5-year average of fatalities at 2.56% lower than in 2021. In comparison, the 5-year serious injury average rose by 9.52%. The most numerous of these crashes continues to be the result of single vehicles leaving the roadway.

Fatal and serious injury outcomes as a result of intersection crashes continue to make up the worst overall type of harmful event. In 2022 the 5-year average of intersection fatalities dropped by 3.89% and contributed 23.7% of all fatal crash outcomes. Severe crash outcomes dropped by 7.05%. INDOT is using HSIP funds to advance systemic improvements to increase the visibility of both signalized and un-signalized intersections and a program to modernize traffic signal control equipment. In addition, Indiana is constructing an increasing number of roundabout and reduced conflict intersections. In regard to traffic signals, INDOT is engaged in a program to replace older "5 Section" signal heads with 4 section signal heads to increase options for time-of-day control in the use of "permitted/protected" left turn traffic signal phasing. In 2020 and the first part of 2021, INDOT also deployed its first Intersection Conflict Warning Systems to a select group of rural two way stop

controlled intersections. Evaluation the operation and potential of these devices to reduce severe crash outcomes will be ongoing for 2023 and 2024.

INDOT's Traffic Engineering Division is encouraging the use of its Intersection Control Evaluation (ICE) policy by all designers and preliminary engineering staff to increase appropriate selection of innovative intersection designs to reduce traffic conflicts. Design types such as roundabouts, and reduced conflict intersection types such as R-Cut/J-Turn and other median U-Turn designs are the result of those instances when an innovative type is validated using Indiana's ICE policy. Many of the resulting designs are deployed as part of both safety and mobility enhancement projects.

Indiana is concerned with the incidence of fatalities involving vulnerable road users such as pedestrians, bicycle, and micro-mobility users. INDOT is also concerned with crashes involving Indiana's substantial Amish population of horse drawn buggy occupants. INDOT is working with our local agency partners on education efforts as well as the construction of infrastructure countermeasures such as warning devices, enhanced crosswalks, mid-block and intersection beacons, road diets and widened paved shoulders for buggies where they are deemed appropriate.

In 2022, the 5-year rolling average of pedestrian involved fatal and serious injuries crashes grew by 3.93% over the 2021 average. This continues a multi-year upward trend of pedestrian casualties. While the trend of serious injuries appears to be slightly level over multiple years, the percentage of pedestrian fatalities has grown to 12.55% of all fatalities. In response to increased fatal crash results, INDOT is reacting by working to revise preliminary engineering and design practices for all projects to enhance safety for all non-motorized road users in an equitable manner. Also, urban local agencies are asked to consider utilizing available local HSIP funding directed to systemic construction of safer pedestrian facilities such as: cross walks, signals, user activated beacons and median refuge islands where appropriate.

Construction of multi-use bike and pedestrian friendly facilities in recent years has contributed to higher numbers of bike users and pedestrians. When combined with VMT growth over the last few years, non-motorized road users have experienced more frequent conflicts with motorvehicles. Despite higher levels of exposure, a decreasing trend of serious outcome bike crashes has occurred. The 5-year average percentage of fatal and serious injury bike crashes compared to all road users in 2022 was 2.10%, in 2021 it was 1.96% and in 2020 it was 1.89%.

Safety Performance Targets

Safety Performance Targets

Calendar Year 2024 Targets *

Number of Fatalities:876.3

Describe the basis for established target, including how it supports SHSP goals.

The performance target for the "Number of Fatalities" is one of the three targets that must match Indiana Criminal Justice Institute (ICJI) Traffic Safety Office reporting to NHTSA in most years. However, for the 2024 target setting FHWA has allowed state DOTS to vary from the NHTSA reporting as FHWA's current target purporting rules are formulated.

The Indiana Department of Transportation (INDOT) is the state's planning agency for the State Strategic Highway Safety Plan (SHSP) under requirements of the FAST Act under 23 U.S.C. 402(b)(1)(f)(v). Due to the rising number of fatalities in prior years a calculated 5-year average would exceed the 2023 reported target values baseline. INDOT is in transition to a goal-based method of setting the number of fatalities target going

forward. Therefore, f or the 2024 performance targets INDOT and its partner agency the Indiana Criminal Justice Institute (ICJI) elected to tie the performance targets to the Indiana SHSP goals by setting target values at a 2% reduction.

Number of Serious Injuries:3281.1

Describe the basis for established target, including how it supports SHSP goals.

The performance target for the number of "Serious Injuries" is one of the three targets that typically must match ICJI reporting to NHTSA in most years This is due to the FAST Act (23 U.S.C. 402(b)(1)(f)(v)). However, for the 2024 target setting FHWA has allowed state DOTS to vary from the NHTSA reporting as FHWA's current target purporting rules are formulated.

For 2024 INDOT elected to set a goal of 2% reduction from the 2023 performance target for the number of Serious Injuries. This is in compliance with the Indiana SHSP stated reduction goal converted to an annual reduction.

Fatality Rate:1.072

Describe the basis for established target, including how it supports SHSP goals.

The performance target for the "Fatality Rate" per 100 million Vehicle Miles Traveled is one of the three targets that typically must match ICJI reporting to NHTSA in most years due to the FAST Act (23 U.S.C. 402(b)(1)(f)(v)). However, for the 2024 target setting FHWA has allowed state DOTS to vary from the NHTSA reporting as FHWA's current target purporting rules are formulated.

Due to the rising number of fatalities in prior years a calculated 5-year average would exceed the 2023 reported target values. For 2024 INDOT elected to set a goal of 2% reduction from the 2023 performance target for Fatality Rate. This is in compliance with the Indiana SHSP stated reduction goal converted to an annual reduction.

Serious Injury Rate:3.987

Describe the basis for established target, including how it supports SHSP goals.

The performance target for the "Serious Injury Rate" per 100 million Vehicle Miles Traveled is independent of the FAST Act matching target requirement. The same VMT was used as the fatalities rate target.

For 2024 INDOT elected to set a goal of 2% reduction from the 2023 performance target for Serious Injury Rate. This is in compliance with the Indiana SHSP stated reduction goal converted to an annual reduction.

Total Number of Non-Motorized Fatalities and Serious Injuries:391.6

Describe the basis for established target, including how it supports SHSP goals.

The performance target for the "Number of Non-Motorized Fatalities and Serious Injuries" is independent of the FAST Act matching target requirement.

For 2024 INDOT elected to set a goal of 2% reduction from the 2023 performance target for Non-Motorized Fatalities and Serious Injuries". Due to the rising number of fatalities and suspected serious injuries in 2022 a calculated 5-year average that would exceed the 2023 reported target values. INDOT is transitioning to a goal-

based method of setting the Rate of Suspected Serious Injuries target as a function of the Indiana SHSP going forward.

An additional consideration to the above described procedure is Vehicle Miles of Travel. INDOT's partner agency that contains the State Highway Safety Office, is the Indiana Criminal Justice Institute (ICJI). In all but the 2024 target year, INDOT shares responsibility with CJI to report three of the same target measures in their annual Highway Safety Plan (HSP) Report that ICJI submits to NHTSA. The timing of the HSP report to NHTSA requires that the future year targets be set before July 1st of each year. As a result, vehicle miles of travel data for the prior year are at a preliminary estimate stage and should be considered a projection along with the VMT for the current and future year.

For the 2024 target setting activity, INDOT has elected to submit different 5-year targets than those reported by ICJI. This is the result of FHWA rules that currently differ from those set for ICJI by NHTSA.

Describe efforts to coordinate with other stakeholders (e.g. MPOs, SHSO) to establish safety performance targets.

Following the promulgation of the IIJA rules requiring a goal-based method for setting the Safety Performance Measure 1 (PM1) Targets, the INDOT Office of Traffic Safety engaged with the Indiana Criminal Justice Institute (ICJI), home to the official State Highways Safety Office. The two agencies agreed that over the succeeding three years that the annual targets reported to NHTSA by ICJI in the Highway Safety Plan would reflect 2% annual decreased targets in compliance with the stated goal in the Indiana SHSP. INDOT will set annual targets to seek similar 2% reductions in the 5-year average targets when feasible. Both the annual targets for ICJI and a 5-year average was produced. Unfortunately, due to a rising trend in fatalities and smaller reductions in serious injuries experienced by Indiana over the last few years, the calculated 5-year averages target setting procedure exceed the baseline values established by the 2023 reported performance targets. Therefore, goal-based targets were set.

The IIJA established that states shall not exceed the safety performance baseline values established in the prior year (2023), therefore INDOT solicited a partnership group of Contributing/Consulting/Advisory Agencies and Organizations to coordinate setting the 5 safety performance targets for 2024. In the spring of 2023, the Traffic Safety Performance Target Setting Team held multiple meetings from April 1 through June in-order to revise the procedure for calculation of the succeeding year's required annual safety performance targets. The team ultimately agreed that the prior year's procedures could not produce 5 year rolling average values that adhere to the IIJA requirement to not exceed the prior year targets. The result is that lower safety performance targets were set and in no case do they exceed the reported 2023 baseline values.

The Indiana Traffic Safety Performance Target Setting Team consists of the following organizations:

Indiana Department of Transportation, Office of Traffic Safety

Indiana Criminal Justice Institute, Traffic Safety and Research Divisions, (SHSO), and representation of Law Enforcement and Emergency Services.

Indiana Metropolitan Planning Organization Council – Executive Director Task group

Federal Highway Administration, Indiana Division

Local Technical Assistance Program – HELPERS Program

Does the State want to report additional optional targets?

No

Indiana does not choose to report on additional optional targets at this time.

Describe progress toward meeting the State's 2022 Safety Performance Targets (based on data available at the time of reporting). For each target, include a discussion of any reasons for differences in the actual outcomes and targets.

PERFORMANCE MEASURES	TARGETS	ACTUALS
Number of Fatalities	876.0	895.8
Number of Serious Injuries	2998.2	3402.0
Fatality Rate	1.076	1.117
Serious Injury Rate	3.675	4.239
Non-Motorized Fatalities and Serious Injuries	344.5	526.2

For target year 2022, INDOT estimates that Indiana did not meet all 5 of the PM 1 Safety Performance Targets as defined per 23 CRF 490.211(c)(2). The calculation of 2022 targets took place in 2021 before data from the COVID pandemic was known to have a profound effect on travel and crash patterns.

The 2022 target values contained in this report utilized the Annual VMT data for years 2018 through 2020 from FHWA and the preliminary 2021 and 2022 values for HMVMT from the INDOT Traffic Statistics Office. The FHWA volume data for prior years was queried on the VM-2 table at: [https://www.fhwa.dot.gov/policyinformation/statistics/2018/vm2.cfm].

Counts of fatalities for prior years 2018 through 2020 are from the FARS Final counts contained on the NHTSA FARS Annual Report File (ARF) Indiana web page at:
[**https://cdan.nhtsa.gov/SASStoredProcess/guest**]

The fatality count for 2022 is from Indiana's crash records database (ARIES). The anticipated five-year average number of fatalities and the resulting rate of fatalities per one hundred million vehicle miles of travel are above the PM1 target values set for 2022. The official rate result will be dependent on the VMT values that FHWA applies in their performance target verification calculation that will be performed in 2024. The preliminary estimated outcome is that Indiana did not make significant progress toward meeting performance targets. The counts of fatalities, suspected serious injuries, rates for both counts, and counts of VRU fatalities and suspected serious injuries for 2022 is expected to be above the target values. All crash data is collected from the Indiana Crash Database.

Starting in 2020, a change was made to the count of suspected serious injuries that is a result of a direct count of the FHWA mandated injury types contained in the ARIES Injury Nature classification in the Indiana crash database. In the later months of 2019, the Indiana State Police and their database vendor added the FHWA injury types to the electronic officer reporting system ARIES 5.1 and to the new reporting system then under development ARIES 6. The addition to the reporting tool allows officers to subjectively select among 15 types of injury natures experience by a crash participant including the seven injury types deemed as a class "A", suspected serious by FHWA.

INDOT's direct count of 2022 suspected serious injuries is higher than in 2021 by 780 persons. The data discontinuity caused by the change in counting methodology reported last year is a possible contributor to the higher count, but it is also the result of an increasing trend in pedestrian crashes. The number represents about a 24.8% increase over 2021 data.

For Target year 2022, the FHWA Target Achievement Assessment per 23 CRF 490.211(c)(2), will be calculated by FHWA in 2024. These results are in part dependent on the VMT values that FHWA applies in their calculations. It should be noted that there is a history of deviation in the FHWA's final VMT compared to INDOT reported VMT, therefore these findings are preliminary.

Applicability of Special Rules

Does the VRU Safety Special Rule apply to the State for this reporting period?

No

Regarding the VRU Special Rule, based on 2020 crash data FHWA did not determine Indiana To be under the VRU Special Rule for federal fiscal year 2023.

Does the HRRR special rule apply to the State for this reporting period?

No

Regarding the HRRR Special Rule requirement for Indiana, in FFY 2022 INDOT does not fall under the HRRR Special Rule.

Provide the number of older driver and pedestrian fatalities and serious injuries 65 years of age and older for the past seven years.

PERFORMANCE MEASURES	2016	2017	2018	2019	2020	2021	2022
Number of Older Driver and Pedestrian Fatalities	115	135	122	126	111	104	140
Number of Older Driver and Pedestrian Serious Injuries	308	289	294	260	259	292	294

Under 23 U.S. C 148(g)(2), FHWA has determined that over the last years the 5-year average, (2016 – 2020), Indiana experienced an increase in the rate of older driver and pedestrian fatalities and serious injuries. INDOT will address strategies to reduce these rates in the next revision of the Indiana Strategic Highway Safety Plan. Fatality data for 2022 is from the Indiana crash database.

Evaluation

Program Effectiveness

How does the State measure effectiveness of the HSIP?

- Benefit/Cost Ratio
- Economic Effectiveness (cost per crash reduced)

Per Indiana's Strategic Highway Safety Plan, INDOT's goal is the reduction of fatalities and serious injuries on all state and local public roadways in accordance with Toward Zero Deaths. In this regard, INDOT monitors the number and rate of fatal and serious injury crash events and casualties in determining progress of the safety program and HSIP programmed obligations.

INDOT's goal is to maintain integrity of a programmed $60.4 million investment in the FFY 2023 traffic safety capital program, toward achieving an expected reduction of at least 2% per year of severe crashes on public roads through the design lives of the projects constructed in FFY 2023. Essentially the goal over time is the overall cost-effectiveness (C-E) of the program; that is, the relationship of dollars invested to expected severe crashes reduced. Thie program effectiveness is measured in two parts, program specific and general effectiveness.

First, regarding the program specific effectiveness, the average benefit/cost ration for all safety projects completed in 2019 and analyzed for MOE for this report is 2.56, indicating that the program was cost effective overall.

Second, economic effectiveness of Indiana's safety program is also measured against the change in fatal and serious injury outcomes of crashes. This measure had a negative outcome in 2022. The 5-year average rate of fatalities per one hundred million vehicle miles of travel (HMVMT) increased by 1.27% over 2021. The 5-year average frequency of suspected serious injuries rose from 3366.4 in 2021 to 3473.4 in 2022, a 3.182% rise. Changes to both fatality and SSI rates are of concern.

The means of measuring the effect of crash outcomes as economic effectiveness is described as follows. An assumed baseline value of $24,400 per severe crash outcome reduced has been established as the baseline cost effectiveness ratio for safety improvements at the start of each fiscal year. The effectiveness measure is expressed either as a reduction in the cost per severe crash outcome, indicating improved safety performance, or a rise in the same cost indicating lower cost effectiveness.

The measurement is conducted as follows: Results of the prior year's programmed spending is divided by the differential of the most recent two-yearly totals of fatalities and serious injuries, multiplied by a 20-year investment life. The result indicates either increased or decreased change in the baseline cost. This measure has been used in prior years to indicate economic effectiveness of total programmed safety investments. The 2022 programmed HSIP obligation was $64,065,434 divided by the crash outcome differential from 2021 to 2022 is a 944 increase, times 20 years totaling 18880 for 2021 and 2022 data. The change in value per crash reduction is $27,846.26.

Based on the measures of effectiveness selected previously, describe the results of the State's program level evaluations.

The number of reported motor vehicle crash fatalities increased from 932 in calendar year 2021 to 980 in 2022, which represents an increase of 5.15%. This is higher than the 3.90% increase from 2020 to 2021, but lower

than the 2019 to 2020 increase of 10.75%. At the time that this report was submitted, INDOT's early estimate for 2022 vehicle miles of travel indicates an increase of 4.50% over 2021, eliminating the large COVID related drop in the 2020 VMT and resuming a trend toward growth. As a result of the higher fatality counts for 2020 through- 2022, the 5-year average rate of fatalities per one hundred million vehicle miles of travel (HMVMT) increased by 1.27% over 2021, and 7.41 % since the start of the pandemic in 2019.

The 5-year average frequency of suspected serious injuries rose from 3366.4 in 2021 to 3473.4 in 2022, a 3.182% rise. The assumption that serious injuries was on a slow downward trend appears to have reversed, however this may also in part be a result of data discontinuity due to Indiana's suspected serious injury reporting having been converted to MMUCC compliant reporting over the same time period. It will take another 1 – to 2 years to determine the true extent of the reported rise. The current 5-year average rate of suspected serious injuries represents a 3.07% increase over the 2021 and a modest 0.12% increase since 2019.

INDOT's measure of effectiveness applies to a goal for safety improvement project cost per severe crash; those crash events resulting in at least one fatal or serious injury. This measure is intended to assure the integrity of the 2022, $57.71 million obligated HSIP investment in the traffic safety capital program, toward achieving an average reduction of at least 5,914 severe crashes on INDOT jurisdictional roads through the projects' design lives. The goal over time is to maintain the overall cost-effectiveness of the program; that is, the relationship of dollars invested to crashes reduced, or $24,400 per severe crash as the baseline ratio at the start of the fiscal year.

What other indicators of success does the State use to demonstrate effectiveness and success of the Highway Safety Improvement Program?

- # RSAs completed
- HSIP Obligations
- More systemic programs
- Other-Total Federal Safety Obligations

In fiscal year 2023, the INDOT Safety program generated a total of 61 Road Safety Assessment (RSA) reports for site specific locations on INDOT highways. INDOT seeks to obligate approximately 50% of its approved safety program budget to perform construction of site specific "spot" projects mostly using HSIP funds. The other 50% of the safety budget is reserved for the construction of HSIP eligible systemic safety improvement projects.

In addition, 20 local agency RSAs were completed in conjunction with the Local Technical Assistance Program (LTAP) Hazard Elimination Program for Roads and Streets (HELPERS) program. INDOT utilizes locally performed RSAs to assist in determining the eligibility of local project proposals for HSIP funded construction projects as part of the INDOT Traffic Safety Program. The involvement of LTAP is encouraged by INDOT prior to submitting proposed projects for HSIP eligibility determination. During the 2023 fiscal year, INDOT received 5 local HSIP eligibility applications approved for a total of $6,820,266.

In 2023 INDOT revised its listing of HSIP eligible systemic project types due to recognition that many local agencies often seek to deploy multiple countermeasures. The revision gathers countermeasures that are typically constructed together in projects for efficient eligibility findings and project approval. The list now comprises 24 individual project work type groupings as eligible for systemic HSIP funding. The Program Methodology section of this report contains a list of the safety program categories that these systemic countermeasures address. New systemic programs are planned for deployment in 2023 and beyond. These include enhanced wrong way warning systems, high friction surface treatments for loop and other short radius curved ramps, and new or upgraded linear sidewalks parallel to existing roadways. The sidewalk systemic

work type was introduced as the result of the IIJA and the subsequent FHWA finding that allows HSIP eligibility.

In federal fiscal year 2023 INDOT is on track to obligate approximately $80.6 million in federal aid highway safety funds including HSIP, Section 164-HE and other federal funds. By the end of the fiscal year 2023 INDOT also has obligated 100.0% of the 164-HE penalty transfer funds for infrastructure safety improvements. At the time of reporting, for fiscal year 2023 INDOT is expected to have obligated $22,947,494 of the infrastructure portion of Indiana's 164-HE penalty transfer. This amount is 113.8% of the obligation limitation. In addition, $15,759,323 was obligated from other federal aid program funds in the state's safety program.

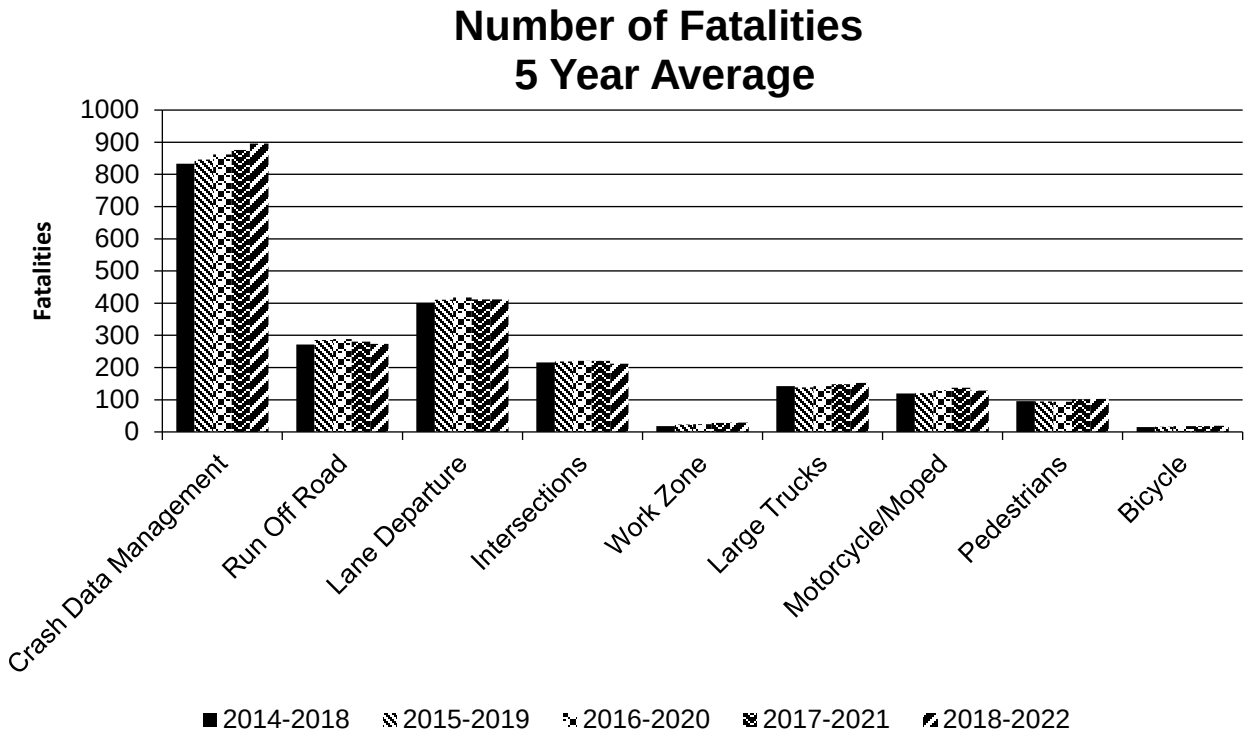
At the start of calendar 2019 INDOT Safety Office approved intersection Conflict Warning Systems (CWS) as an eligible HSIP project under the intersection safety sub-program. Construction of 16 CWS installations were completed in FY 2021. An ongoing research project, SPR-4744 *Investigation of the Safety Performance of Non-Signalized Traffic Control Strategies*, is currently being conducted by the Purdue University Center for Road Safety. This research study is evaluating the effectiveness of crash countermeasures at two-way stop-controlled intersections including the aforementioned CWS installations. The goal is to determine if further CWS deployments as a systemic safety work type is a practical and cost-effective strategy for Indiana. INDOT is committed to continue to monitor and evaluate the effectiveness and operational maintenance of these devices. The expectation is that INDOT will be able to report on this subprogram in a future HSIP report.

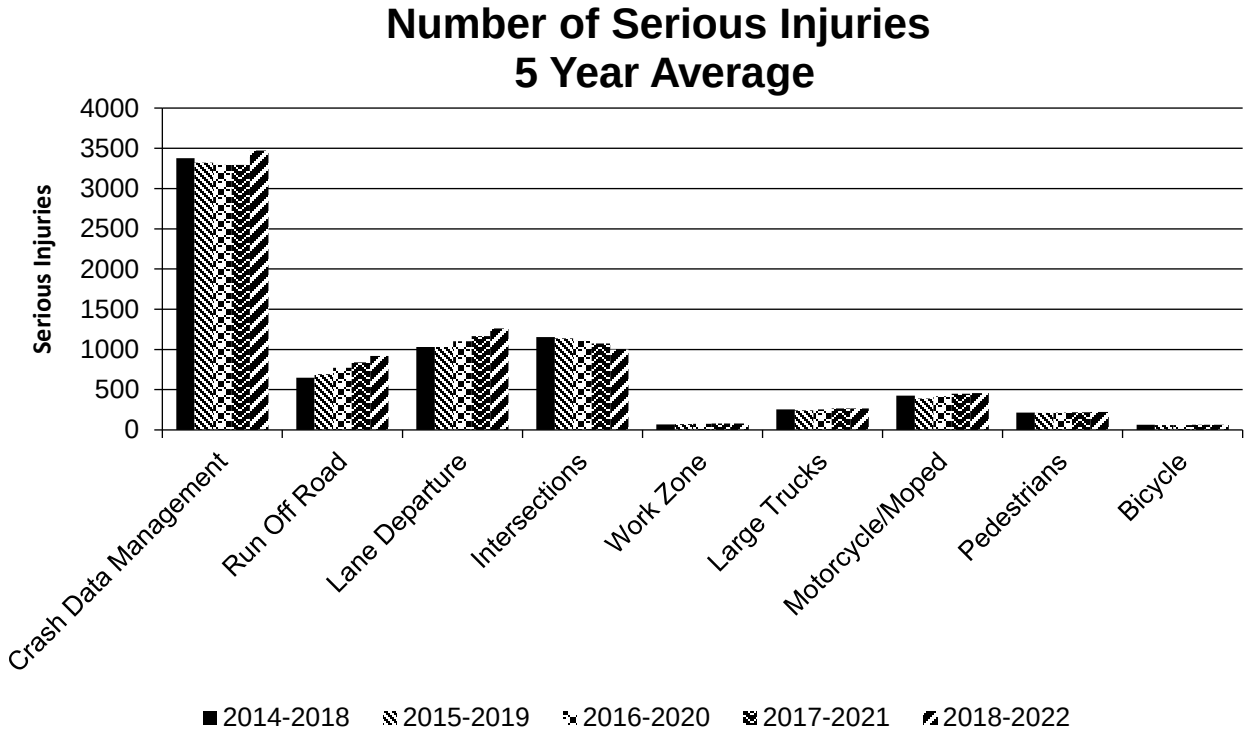
Effectiveness of Groupings or Similar Types of Improvements

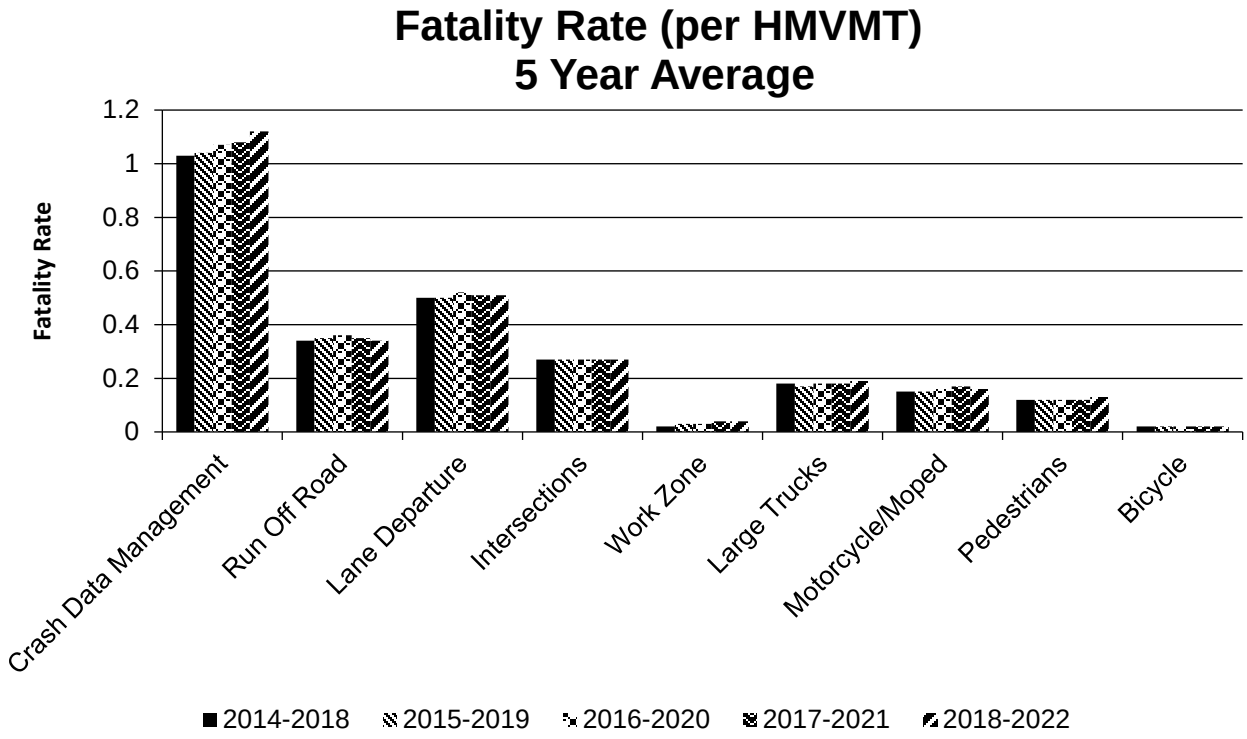
Present and describe trends in SHSP emphasis area performance measures.

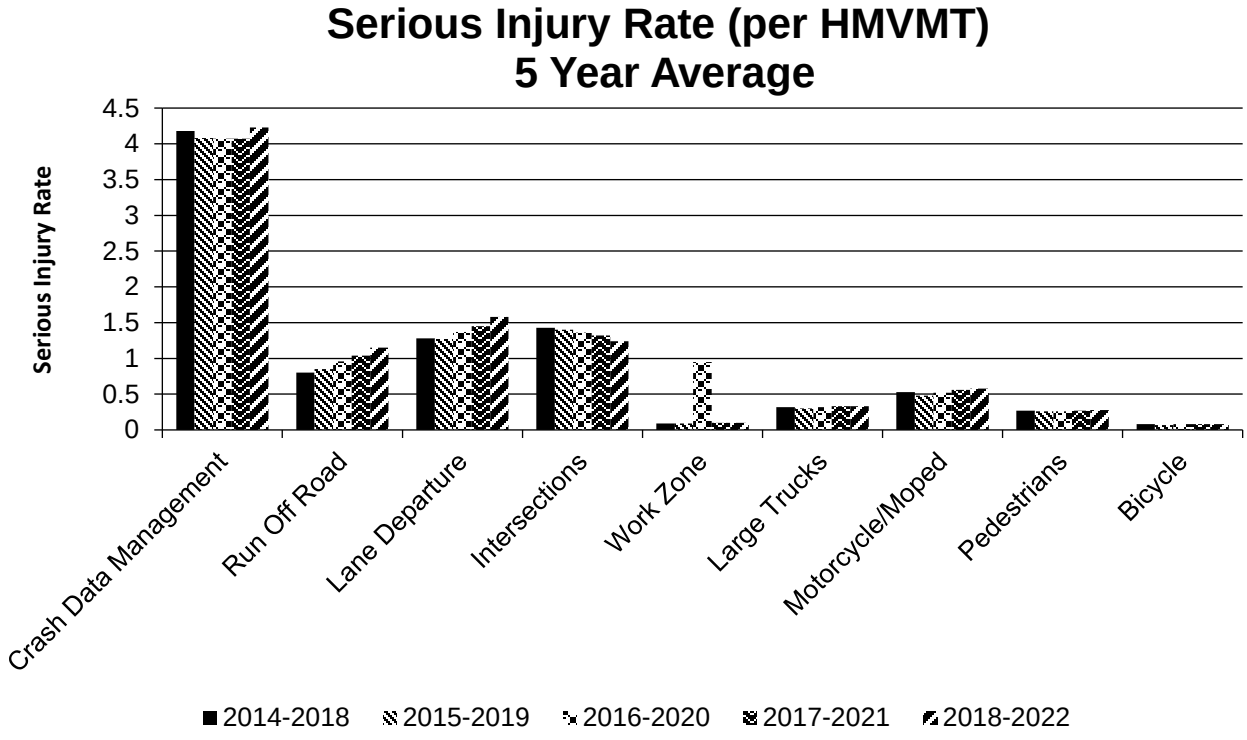
Year 2022

SHSP Emphasis Area	Targeted Crash Type	Number of Fatalities (5-yr avg)	Number of Serious Injuries (5-yr avg)	Fatality Rate (per HMVMT) (5-yr avg)	Serious Injury Rate (per HMVMT) (5-yr avg)
Crash Data Management		895.8	3,473.4	1.12	4.23
Run Off Road		273.8	918.1	0.34	1.15
Lane Departure		411.4	1,262.9	0.51	1.58
Intersections		212.2	997.3	0.27	1.24
Work Zone		28.6	80.6	0.04	0.1
Large Trucks		152.2	266.5	0.19	0.33
Motorcycle/Moped		128	459.3	0.16	0.58
Pedestrians		102.8	222.8	0.13	0.28
Bicycle		18.8	64.9	0.02	0.08


Number of Fatalities
5 Year Average
Fatalities
1000
900
800
700
600
500
400
300
200
100
0
Crash Data Management
Run Off Road
Lane Departure
Intersections
Work Zone
Large Trucks
Motorcycle/Moped
Pedestrians
Bicycle
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022


Number of Serious Injuries
5 Year Average
Serious Injuries
4000
3500
3000
2500
2000
1500
1000
500
0
Crash Data Management
Run Off Road
Lane Departure
Intersections
Work Zone
Large Trucks
Motorcycle/Moped
Pedestrians
Bicycle
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022





The strategy categories in the question 44 data table address 5-year average crash outcome and rate performance for fatality and serious injury outcomes in the Indiana SHSP Safe Roads and Safe Road Users emphasis areas. The description of trends for all of the listed strategy areas are as follows:

The crash data management strategy comprises all of the 5-year average data for all crash types. The trend of fatalities has been increasing while serious injuries were on a downward trend until the last year. Rates for both crash outcomes have been rising.

Run off road and lane departure crashes are Safe Road Strategies. Tends of fatal crash outcomes and rates have been flat for both strategies; however, serious injury outcomes and rates have been increasing.

The Intersection Safe Roads strategy as seen fatality outcomes and rates maintain a high but flat trend, while serious injury outcomes and rates a declining trend.

Work zone and large truck (commercial vehicle) strategies have experienced generally flat trends for both fatality and serious injury outcomes and rates, with a spike in the 5-year average serious injury rate in one reporting period.

Motorcycle and moped strategy crash outcome trends for fatalities and serious injuries have been on a small increasing trend. The trend in rates for fatalities and serious injuries has been flat.

Pedestrian fatalities and rates have been had an increasing trend, while the serious injury outcome and rate has been flat. The same is true for crash outcomes and rates in the bicycle strategy.

Has the State completed any countermeasure effectiveness evaluations during the reporting period?

No

Due to staffing challenges, and development of the 2024 HSIP Implementation Plan and the VRU Assessment INDOT Traffic Safety office lacked the bandwidth to conduct program level evaluations in 2023. Instead, due to the growth in pedestrian fatalities and serious injuries over the last several years, it was decided to focus resources on developmental planning actions to improve options and guidance to further improve pedal- cyclist and pedestrian safety crash countermeasures.

An assessment of 16 Conflict Warning Systems is part of an ongoing research project SPR-4744 *Investigation of the Safety Performance of Non-Signalized Traffic Control Strategies*, is currently being conducted by the Purdue University Center for Road Safety. The expectation is that INDOT will be able to report on this subprogram in a future HSIP report.

Project Effectiveness

Provide the following information for previously implemented projects that the State evaluated this reporting period.

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
1702222	Rural Minor Arterial	Roadway	Pavement surface – high friction surface	6.00				2.00				8.00		2.40
1600481	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify control – new traffic signal	8.00	9.00			4.00	3.00		1.00	12.00	13.00	1.31
1702125	Rural Minor Arterial	Lighting	Intersection lighting	6267.00	4866.00	19.00	15.00	687.00	446.00	344.00	186.00	7317.00	5513.00	1.50
1297165	Urban Local Road or Street	Intersection traffic control	Modify control – Modern Roundabout	11.00	7.00							11.00	7.00	1.30
1382818	Urban Major Collector	Intersection traffic control	Modify control – Modern Roundabout	10.00	6.00			3.00	2.00	4.00	3.00	17.00	11.00	1.52
1400816	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	432.00	414.00	7.00	6.00	110.00	85.00	52.00	38.00	601.00	543.00	1.31
1500320	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1129.00	918.00	1.00	2.00	148.00	78.00	118.00	136.00	1396.00	1134.00	1.60
1500404	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	3.00	6.00		1.00	4.00	6.00	1.00	8.00	8.00	21.00	0.51
1500421	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	61.00	37.00			8.00	3.00	13.00	3.00	82.00	43.00	2.66
1500435	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	17.00	19.00				1.00	5.00	2.00	22.00	22.00	0.91
1297948	Rural Minor Arterial	Roadway signs and traffic control	Curve-related warning signs and flashers	237.00	59.00	1.00	1.00	35.00	10.00	15.00	5.00	288.00	75.00	3.05
1383409	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	1.00		1.00		7.00	6.00	3.00	6.00	12.00	12.00	16.19
1383477	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	4.00								4.00		0.19
1400809	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	2.00	1.00	1.00		9.00	8.00	4.00	6.00	16.00	15.00	1.24
1601181	Rural Major Collector	Pedestrians and bicyclists	ADA curb ramps	324.00	262.00	4.00	4.00	32.00	7.00	15.00	5.00	375.00	278.00	2.73
1601849	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	539.00	474.00	2.00	7.00	55.00	25.00	15.00	21.00	611.00	527.00	1.60

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
1700618	Rural Minor Arterial	Roadway	Pavement surface – high friction surface	17.00	7.00			3.00	3.00	2.00		22.00	10.00	1.24
1296958	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	10.00	11.00				2.00	2.00		12.00	13.00	0.75
1298230	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	446.00	469.00	6.00	4.00	43.00	33.00	58.00	50.00	553.00	556.00	1.00
1400581	Rural Major Collector	Intersection traffic control	Modify control – Modern Roundabout	12.00	15.00		1.00	11.00	1.00	1.00	1.00	24.00	18.00	0.66
1400812	Rural Major Collector	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1327.00	2557.00	8.00	10.00	227.00	153.00	186.00	219.00	1748.00	2939.00	1.22
1401685	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	367.00	505.00	3.00	1.00	73.00	48.00	34.00	79.00	477.00	633.00	1.16
1401735	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify control – new traffic signal	37.00	62.00			1.00	9.00	9.00	3.00	47.00	74.00	0.52
1500046	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify control – new traffic signal	57.00	48.00		1.00	2.00	5.00	16.00	3.00	75.00	57.00	1.05
1500349	Rural Principal Arterial (RPA) - Interstate	Intersection traffic control	Modify control – new traffic signal	4.00	11.00			4.00	3.00	2.00	3.00	10.00	17.00	1.21
1500429	Urban Major Collector	Lighting	Intersection lighting	4.00	6.00							4.00	6.00	0.78
1500692	Urban Principal Arterial (UPA) - Other	Intersection geometry	Add/modify auxiliary lanes	35.00	47.00			4.00	5.00	10.00	7.00	49.00	59.00	1.01
1592654	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	57.00	32.00	1.00		5.00	7.00	6.00	5.00	69.00	44.00	1.06
1592655	Rural Minor Arterial	Roadway delineation	Raised pavement markers	152.00	94.00			39.00	18.00	19.00	9.00	210.00	121.00	1.89
1593090	Rural Principal Arterial (RPA) - Interstate	Roadway delineation	Raised pavement markers	204.00	172.00	3.00	1.00	22.00	11.00	17.00	12.00	246.00	196.00	4.02

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
1593094	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	42.00	52.00			10.00	14.00	4.00	6.00	56.00	72.00	0.82
1593104	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	30.00	21.00			1.00		5.00	4.00	36.00	25.00	1.00
1600022	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	38.00	10.00			3.00	2.00	4.00		45.00	12.00	2.08
1600024	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Curve-related warning signs and flashers	1812.00	1418.00	18.00	16.00	191.00	175.00	336.00	354.00	2357.00	1963.00	1.16
1600080	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	541.00	134.00	1.00		41.00	13.00	82.00	12.00	665.00	159.00	3.85
1600112	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	5757.00	6075.00		15.00	166.00	519.00	934.00	1179.00	6857.00	7788.00	0.55
1600114	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Curve-related warning signs and flashers	4602.00	5311.00	61.00	59.00	888.00	891.00	748.00	1152.00	6299.00	7413.00	1.01
1600426	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps		2.00	1.00		1.00		4.00	2.00	6.00	4.00	0.43
1600651	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	Pedestrian beacons					1.00		1.00		2.00		1.00
1600677	Rural Principal Arterial (RPA) - Other	Roadway	Rumble strips – center	11955.00	7886.00	121.00	102.00	2126.00	1036.00	1878.00	1613.00	16080.00	10637.00	1.93
1600699	Rural Major Collector	Intersection traffic control	Intersection flashers –sign-mounted or overhead	4.00	2.00							4.00	2.00	1.53
1600836	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	9.00	6.00			2.00				11.00	6.00	1.40
1601161	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	164.00	203.00	3.00	2.00	17.00	24.00	29.00	19.00	213.00	248.00	0.81

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
1601759	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	24.00	19.00			7.00	5.00	6.00	8.00	37.00	32.00	1.13
1601760	Urban Principal Arterial (UPA) - Other	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	44.00	58.00	1.00		5.00	3.00	7.00	12.00	57.00	73.00	1.06
1601762	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	66.00	43.00			6.00	1.00	8.00	5.00	80.00	49.00	2.54
1601763	Urban Principal Arterial (UPA) - Other	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	58.00	10.00	1.00		4.00	1.00	16.00	2.00	79.00	13.00	3.48
1601764	Rural Minor Arterial	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	36.00	24.00			1.00	3.00	3.00	3.00	40.00	30.00	0.62
1601765	Rural Minor Arterial	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	24.00	17.00	1.00		3.00	4.00	1.00	2.00	29.00	23.00	0.88
1601813	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	8.00	12.00			1.00		2.00	3.00	11.00	15.00	1.91
1601832	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	77.00	83.00	1.00		17.00	9.00	12.00	15.00	107.00	107.00	1.34
1601837	Rural Minor Arterial	Pedestrians and bicyclists	ADA curb ramps	65.00	76.00	1.00		10.00	6.00	1.00	5.00	77.00	87.00	0.91
1601871	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	80.00	48.00			5.00	8.00	12.00	11.00	97.00	67.00	0.82
1601882	Rural Minor Arterial	Intersection traffic control	Modify control – new traffic signal	5.00	2.00			1.00				6.00	2.00	30.21
1601926	Urban Major Collector	Intersection traffic control	Modify traffic signal – modernization/replacement	1.00							1.00	1.00	1.00	0.51
1601933	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	15.00	12.00			1.00		1.00	1.00	17.00	13.00	3.14

LOCATION	FUNCTIONAL CLASS	IMPROVEMENT CATEGORY	IMPROVEMENT TYPE	PDO BEFORE	PDO AFTER	FATALITY BEFORE	FATALITY AFTER	SERIOUS INJURY BEFORE	SERIOUS INJURY AFTER	ALL OTHER INJURY BEFORE	ALL OTHER INJURY AFTER	TOTAL BEFORE	TOTAL AFTER	EVALUATION RESULTS (BENEFIT/COST RATIO)
1602160	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	8663.00	6672.00	135.00	82.00	1439.00	1116.00	2073.00	1466.00	12310.00	9336.00	1.41
1700142	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	284.00	202.00		1.00	17.00	7.00	58.00	77.00	359.00	287.00	1.41
1700234	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	11955.00	7886.00	121.00	102.00	2126.00	1036.00	1878.00	1613.00	16080.00	10637.00	1.93
1700237	Rural Principal Arterial (RPA) - Other	Roadway	Rumble strips – center	11955.00	7886.00	121.00	102.00	2126.00	1036.00	1878.00	1613.00	16080.00	10637.00	1.93
1700318	Rural Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	15719.00	17521.00	18.00	40.00	951.00	852.00	1400.00	2733.00	18088.00	21146.00	0.97
1700390	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface – high friction surface	4602.00	5311.00	61.00	59.00	888.00	891.00	748.00	1152.00	6299.00	7413.00	1.01
1700726	Urban Major Collector	Intersection geometry	Add/modify auxiliary lanes	61.00	55.00			2.00	1.00	3.00	10.00	66.00	66.00	0.93
1701577	Urban Major Collector	Pedestrians and bicyclists	ADA curb ramps											1.00
1701578	Urban Major Collector	Pedestrians and bicyclists	ADA curb ramps											1.00
1701585	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	2.00				1.00				3.00		9.53
1702083	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	2.00		1.00						3.00		24.27
1702119	Urban Minor Arterial	Pedestrians and bicyclists	ADA curb ramps	13.00	15.00	1.00		2.00	1.00	10.00	9.00	26.00	25.00	1.65
1801832	Rural Minor Arterial	Roadside	Barrier - other	26.00	14.00			4.00	1.00	12.00		42.00	15.00	3.98

Some projects will have increased crashes in the after-construction period due to unpredicted circumstances, which is understood to be unaccounted for in this simple table. However, in general, the implementation of HSIP projects results in a reduced risk for fatalities and serious injuries due to motor vehicle crashes. The most frequently selected Measure of Effectiveness (MOE) is a comparison of estimated benefit cost ratio before construction to benefit cost ratio found after construction. However, certain systemic improvement types that principally serve vulnerable road users along with other systemic projects, cannot be calculated using before / after crash analysis due to the somewhat random location and frequency of crash events. For those cases, a safe systems approach is utilized instead that measures investment level for systemic upgrade of facilities in designated road corridors or areas. In these cases, the MOE is effective deployment of systemic units. These project improvement categories include pedestrian Hybrid Beacons, crosswalks, warning signage upgrades, and bicyclists' facilities.

Outcomes are not always apparent in the naïve cost effectiveness analysis of serious injury counts used in question 46, due to the reclassification of incapacitating injuries that took place in the 2014 – 2019 time frame. Also, official VMT values in the last few years have varied wildly due to the COVID pandemic, impacting the reliability of using trends for forecasting future rates. Due to the need to use incapacitating injuries in the cost effectiveness MOE, results tend to be skewed toward lower cost savings in the post construction period. This issue will be resolved once data from the new ARIES 6 officer reporting software fully replaces incapacitating injuries with SSI data. The transition began in 2020 and moved forward with the 2022 FHWA certification of Indiana's SSI identification process as part of the AIRES Officer Reporting system manual and ARIES 6 Data Dictionary. A full change over to the ARIES 6 reporting software is expected by the start of 2024. The full effect of the change in reporting is expected to continue until 2028.

Describe any other aspects of HSIP effectiveness on which the State would like to elaborate.

The combined efforts of Indiana's engineering, education, law enforcement, and emergency medical communities all contribute to the goal of an overall decline in serious crash outcomes. However, in recent years, national and regional trends of increased motor vehicle crashes resulting in fatal outcomes has occurred. Prior to 2020 it was thought that crash trends were strongly influenced in part by exposure between vehicles due to increasing employment driven congestion. However, after the onset of the COVID 19 pandemic, other factors have superseded employment rates as an influence toward fatal and suspected serious injury counts. The 5-year average number of fatalities has increased by 5.84% in 2022 over 2019 levels. The 5-year average number of suspected serious injuries also increased by 0.99%. This indicates that other factors are causing a greater percentage of severe crash outcomes. Research is needed on the effects of remote work arrangements and increased residential delivery of goods.

The extent of contribution by HSIP projects to overall statewide traffic safety outcomes is difficult to measure with available data sources and analysis capabilities, but it is likely that safety programs are a factor influencing the frequency of severe crash outcomes where site specific and systemic countermeasures have been deployed.

The trend of reduced numbers of fatalities and suspected serious injuries from 2017 to 2021 indicates that HSIP funded safety improvements have had some beneficial effect. The 5-year rolling average of suspected serious injuries was on a declining trend until 2022. Unfortunately, the number of SSI crash outcomes increased by 11.7% from 2021 to 2022, resulting in a 3.7% increase in the 5-year average number of SSI crashes. These results indicate that factors influencing the dynamics of serious injury crash outcomes may have now also intensified. Combined with the 10-year trend in increased pedestrian fatalities, the result is an overall more challenging environment for reduction in targeted severe outcomes.

Since 2021, the shifts in crash severity toward more fatalities is difficult to explain. Since the onset of the Covid 19 pandemic vehicle operating speeds have increased along with suspected a suspected increase in driver distraction. Factors such as increased average operational speeds and driver awareness may be areas where efforts to modify driver behavior can have some beneficial effects. INDOT seeks to influence a downward trend in fatalities by increasing the number and variety of deployed systemic safety programs applicable to both state and local roads. Also, efforts are underway to make changes in Indiana's design standards that influence operating speeds where vulnerable road users are more prevalent. Likewise, the potential benefit of vehicle to vehicle and vehicle to infrastructure connected technology should be engaged more fully at the federal level.

Compliance Assessment

What date was the State's current SHSP approved by the Governor or designated State representative?

11/22/2022

What are the years being covered by the current SHSP?

From: 2017 To: 2028

When does the State anticipate completing it's next SHSP update?

2027

The Indiana Strategic Highway Safety Plan (SHSP) is in compliance with the FHWA Safe Systems Approach and provides strategies for Education, Enforcement, Engineering, and Emergency Services. The six principals of the safe systems approach are:

Death and Serious Injuries are Unacceptable.
Humans Make Mistakes
Humans Are Vulnerable
Responsibility is Shared
Safety is Proactive
Redundancy is Crucial

The emphasis areas are Safe Roads, Safe Road Users, Safe Vehicles, Safe Speeds, and Post Crash Care.

Provide the current status (percent complete) of MIRE fundamental data elements collection efforts using the table below.

*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
ROADWAY SEGMENT	Segment Identifier (12) [12]	100							100		100
	Route Number (8) [8]	100									
	Route/Street Name (9) [9]	100									
	Federal Aid/Route Type (21) [21]	100									
	Rural/Urban Designation (20) [20]	100							100		
	Surface Type (23) [24]	100							100		
	Begin Point Segment Descriptor (10) [10]	100							100		100

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
	End Point Segment Descriptor (11) [11]	100							100		100
	Segment Length (13) [13]	100									
	Direction of Inventory (18) [18]	100									
	Functional Class (19) [19]	100							100		100
	Median Type (54) [55]	100									
	Access Control (22) [23]	100									
	One/Two Way Operations (91) [93]	100									
	Number of Through Lanes (31) [32]	100							100		
	Average Annual Daily Traffic (79) [81]	100							50		
	AADT Year (80) [82]	100									
	Type of Governmental Ownership (4) [4]	100							100		100
INTERSECTION	Unique Junction Identifier (120) [110]			100							
	Location Identifier for Road 1 Crossing Point (122) [112]			100							
	Location Identifier for Road 2 Crossing Point (123) [113]			100							
	Intersection/Junction Geometry (126) [116]			100							
	Intersection/Junction Traffic Control (131) [131]			80							

ROAD TYPE	*MIRE NAME (MIRE NO.)	NON LOCAL PAVED ROADS - SEGMENT		NON LOCAL PAVED ROADS - INTERSECTION		NON LOCAL PAVED ROADS - RAMPS		LOCAL PAVED ROADS		UNPAVED ROADS	
		STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE	STATE	NON-STATE
	AADT for Each Intersecting Road (79) [81]			100							
	AADT Year (80) [82]			100							
	Unique Approach Identifier (139) [129]			100							
INTERCHANGE/RAMP	Unique Interchange Identifier (178) [168]					100					
	Location Identifier for Roadway at Beginning of Ramp Terminal (197) [187]					100					
	Location Identifier for Roadway at Ending Ramp Terminal (201) [191]					100					
	Ramp Length (187) [177]					100					
	Roadway Type at Beginning of Ramp Terminal (195) [185]					100					
	Roadway Type at End Ramp Terminal (199) [189]					100					
	Interchange Type (182) [172]					100					
	Ramp AADT (191) [181]					100					
	Year of Ramp AADT (192) [182]					100					
	Functional Class (19) [19]					100					
	Type of Governmental Ownership (4) [4]					100					
Totals (Average Percent Complete):		**100.00**	**0.00**	**97.50**	**0.00**	**100.00**	**0.00**	**0.00**	**94.44**	**0.00**	**100.00**

*Based on Functional Classification (MIRE 1.0 Element Number) [MIRE 2.0 Element Number]

Describe actions the State will take moving forward to meet the requirement to have complete access to the MIRE fundamental data elements on all public roads by September 30, 2026.

Per 23 CFR Part 921.11 and Part 924.3, requires states to “incorporate specific quantifiable and measurable anticipated improvements for the collection of MIRE Fundamental Data Elements into their Traffic Records Strategic Plan by July 1, 2017,” and “all public Roads…including non-State-owned public roads and roads on tribal lands…by September 30, 2026.” For the Non-Local Paved Road requirements, INDOT currently maintains all MIRE Required Elements as part of the annual HPMS report. The INDOT Roadway Inventory Office reports that development of the Mire FDE data elements are on schedule and anticipated to be in place by 2026. The only remaining FDE element to be completed is collection of Average Annual Daily Traffic (AADT) on all local paved roads.

INDOT currently has the data to support ongoing collection of data elements for Intersections of Non-Local Paved Roads. The Road Inventory Group has acquired spatial analysis software that will help it meet the MIRE FDE required intersection data elements by automating management of intersection geometries.

INDOT has data to support the inventory data elements for Interchanges\Ramps on Non-Local Paved Roads. Inventory elements also use spatial analysis software tools for managing intersections with ramps. The data requirements to support the elements Functional Class and Type of Government Ownership will also be supported by the geospatial software. If there is a need for additional data that cannot be extracted using those tools, new geographic processing procedures will be created by INDOT to meet the requirements.

For the Local Paved Roads requirements, INDOT has full coverage of most required data elements with the exception of (79) Average Annual Daily Traffic. Collection of that data element is at 50%. A new funding program was created through Indiana House Bill 1002 that allocates funding to be utilized by Local Technical Assistance Program (LTAP) to create and maintain road data for Local Government Agencies. The Road Inventory Group is actively working to reach full coverage of AADT on Local Paved Roads and expects the data element to be complete by the start of 2026.

Unpaved Roads are currently not identified in INDOT’s inventory data system. However, route information such as route (12) Segment Identifier, (10) Begin Point Segment Descriptor, (11) End Point Segment Descriptor, and (19) Functional Class are present and accounted for at 100% in the current data system. Once Surface Type data from local agencies is incorporated, as described above, unpaved roads will be identified in the inventory system.

An official representative with authority to manage all MIRE FDE requirements has not yet been determined, however INDOT has created a Data Governance Committee that will establish the necessary data management lines of authority.

Optional Attachments

Program Structure:

TrafficSafety_SpecialRulesforHSIPEligibility_2013[1].pdf
Project Implementation:

ERYN FINAL 2023 Question 29 template_9-26-2023.xlsm
Safety Performance:

Evaluation:

Compliance Assessment:

Glossary

5 year rolling average: means the average of five individuals, consecutive annual points of data (e.g. annual fatality rate).

Emphasis area: means a highway safety priority in a State's SHSP, identified through a data-driven, collaborative process.

Highway safety improvement project: means strategies, activities and projects on a public road that are consistent with a State strategic highway safety plan and corrects or improves a hazardous road location or feature or addresses a highway safety problem.

HMVMT: means hundred million vehicle miles traveled.

Non-infrastructure projects: are projects that do not result in construction. Examples of non-infrastructure projects include road safety audits, transportation safety planning activities, improvements in the collection and analysis of data, education and outreach, and enforcement activities.

Older driver special rule: applies if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 in a State increases during the most recent 2-year period for which data are available, as defined in the Older Driver and Pedestrian Special Rule Interim Guidance dated February 13, 2013.

Performance measure: means indicators that enable decision-makers and other stakeholders to monitor changes in system condition and performance against established visions, goals, and objectives.

Programmed funds: mean those funds that have been programmed in the Statewide Transportation Improvement Program (STIP) to be expended on highway safety improvement projects.

Roadway Functional Classification: means the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide.

Strategic Highway Safety Plan (SHSP): means a comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.

Systematic: refers to an approach where an agency deploys countermeasures at all locations across a system.

Systemic safety improvement: means an improvement that is widely implemented based on high risk roadway features that are correlated with specific severe crash types.

Transfer: means, in accordance with provisions of 23 U.S.C. 126, a State may transfer from an apportionment under section 104(b) not to exceed 50 percent of the amount apportioned for the fiscal year to any other apportionment of the State under that section.