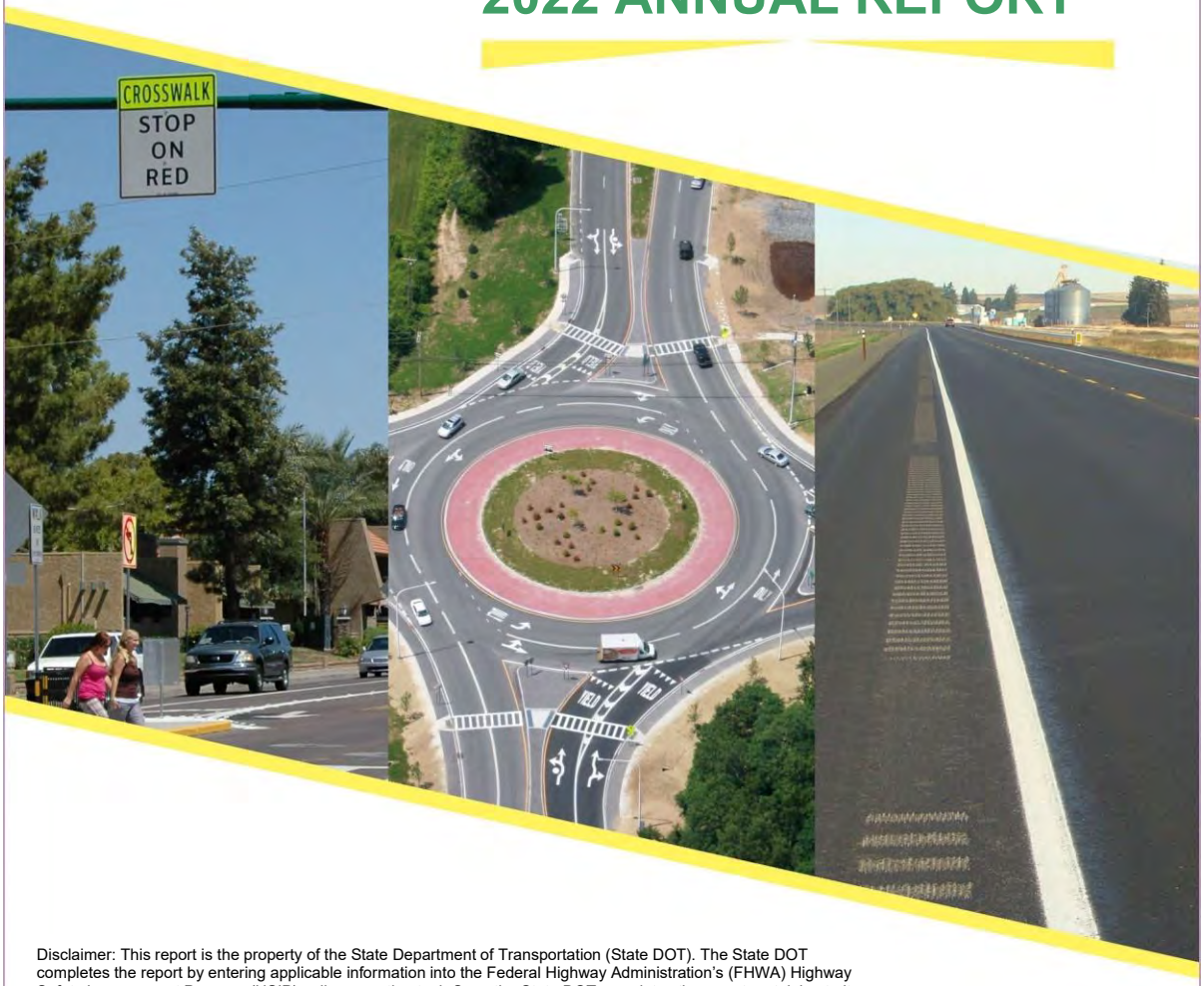
INDIANA

HIGHWAY SAFETY IMPROVEMENT PROGRAM

2022 ANNUAL REPORT



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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) 2022. 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). 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 format of the annual HSIP report is in accordance with the Online Reporting Tool. The focus of the report centers on development and implementation of the core federal aid safety program and associated safety spending in Indiana for FFY 2022, beginning October 1, 2021, and ending on September 30, 2022. 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.

The number of reported motor vehicle crash fatalities increased from 897 in calendar year 2020 to 898 in 2021, which represents an increase of 0.11% over the previous year, causing the 5 year rolling average to also increase by 1.60%. The early estimate for 2021 vehicle miles of travel indicates an increase of approximately 7.79% from 2020 to 2021, recovering much of the previous VMT prior to the Covid Pandemic. The estimated rate of fatalities per one hundred million vehicle miles of travel (HMVMT) also increased by 1.59% for the 5 year average.

In 2021, the count of Suspected Serious Injuries (SSI) was 3,515, while the SSI number for 2020 was 3,302. This indicates a one year rise of 6.45%, apparently interrupting a multiyear downward trend from a high of 3,505 in 2016. The rise is in-part tied to a data discontinuity due to a change in SSI reporting procedures that occurred in 2020 and continued through 2022. The improved accuracy in reporting of the 7 injury nature types listed in the MMUCC 4th and 5th editions is being realized as more police agencies transition to the new crash reporting software. The 2021 rise in SSI interrupted the downward trend in the 5 year average with an increase of 0.06% compared to the previous 5 year average.

It must be noted that conclusions regarding suspected serious injury trends are difficult to draw from the 2021 and 2020 data. 2020 is the first year that a new method of directly counting suspected serious injuries was employed. Changes to the Indiana electronic crash records database, herein referred to as AIRIES 6 now allows INDOT to directly count officer's subjective selection of the FHWA defined Class A injury types for each person, (referred to herein as injury natures). The result is a discontinuity in the data due to the shift to a new permanent counting procedure.

The definition used to set the new regulation for reporting traffic safety performance measures was established in the MMUCC 4th and is continued in the 5th Edition. This compelled Indiana to determine a method to approximate the counting of Suspected Serious Injuries so that Indiana's crash records system could be used to calculate historic and projected traffic safety performance counts in accord with "A" injuries on the KABCO scale. Starting in 2020 INDOT began direct counts of suspected serious injuries using the MMUCC defined injury natures descriptions that FHWA defined as suspected serious injuries even though the new reporting software was still partially deployed and local police agencies were being trained.

Due to the lack of injury nature data in the prior version of the Indiana crash database, and in order to continue reporting suspected serious injuries in the interim between the issuance of the SSI rule and changes to the Indiana Crash database, a temporary methodology for estimating a count of persons with suspected serious injuries was in use from 2014 until the end of 2019. 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 three years of data in the five year rolling average for 2021.

A new Indiana Officers Crash Reporting Tool was created by the crash database vendor working under contract with the owner agency of the crash database, the Indiana State Police. In the third quarter of 2019 the same vendor included the required injury types in both the existing and new crash reporting tools. In spring of 2021 a compliance review by FHWA resulted in corrected definitions for the seven suspected serious injury nature descriptions being updated in the new reporting tool data dictionary, the new officers reporting software and officer training procedures. However, it wasn't until June of 2022 that FHWA certified Indiana's new method of directly counting suspected serious injuries as compliant with the reporting requirement. Training of all sworn Indiana police officers in use of the new crash reporting tool is ongoing with the crash database vendor estimating completion by the end of 2022. It is expected that by the end of 2024, a phased rollout of the officer reported injury nature data for the 5 year rolling averages will be complete.

The shift in crash severity witnessed in 2020 and 2021 is difficult to explain on the basis of the change in methodology alone. In past years employment rate was a factor influencing driver risk avoidance behavior and crash outcomes, however this factor became less relevant in 2020. 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, and if these changes are permanent or will return to a more recognizable pattern.

FHWA should consider Indiana's described reporting methodology as part of any review of Indiana Crash data and Performance Target setting. The projections produced by this methodology represent a mathematical baseline before further adjustments to reflect consideration of non-highway influences that affect highway travel and traveler risk-taking. These influences would include, but are not limited to, the Covid pandemic, economic change, technology proliferation, and weather.

HSIP Budget Obligation.
All projects approved for funding in HSIP, HRRRP 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 federal fiscal year (FFY) 2022, the total expected obligation of federal program funds for safety infrastructure improvements, from all programs (excluding the annual rail-highway crossing safety program) is expected to be about $63.4 million. The planned federal obligation total is less than the final FFY 2022 $68.9 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 act could not be absorbed immediately.

Indiana is also under a Section 164-HE transfer that must be obligated before the end of the fiscal year, therefore obligation of these funds during the year are a higher priority compared to HSIP funds. Under the Obligation Limitation for federal fiscal year 2022, the minimum Section 164-HE obligation is $20.6 million. INDOT plans to obligate $22.9 million of Section 164-HE in FY 2022. INDOT is currently increasing efforts to obligate all available federal dollars.

The selection and prioritization of all safety projects on roads under INDOT jurisdiction, including those funded with HSIP and HRRRP 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/HRRRPReport*. 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 crashes. 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 revise the Indiana's current SHSP and will 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 and HRRRP project funding.

In addition, the HELPERS program based at the Indiana LTAP is tasked with providing advice and assistance to rural roadway agencies with data management, analysis, and 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,http://www.in.gov/indot/2357.htm.

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 in the conduct of road safety assessments 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. In 2022, 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 Finance Group provides 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 Mangement 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 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 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 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.

Where is HSIP staff located within the State DOT?

Planning

The INDOT Office of Traffic Safety is located within the Traffic Engineering Division and is in turn part of the Traffic Engineering Division in the Operations – Strategic Planning 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.

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 are made available for funding eligible projects. 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 and HRRRP 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 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 and Technical Services Divisions and Traffic Engineering Offices that provide key input in the conduct of 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) and the Indiana State Police which manages the State's crash database as well as FARS office.

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. The Indiana MPO Council has input on urban safety issues associated with vulnerable road users and equity issues. Other external partners include but are not limited to the Indiana Bureau of Motorvehicles, Department of Health, Department of Education, Local Technical Assistance Program (LTAP), and various county highway departments as well as other 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 have approved plans, and three other counties and one MPO are at various stages of achieving a draft plan, 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. In addition, a Safety Planning Workshop was held virtually in June 2020 to educate numerous local agencies in safety planning strategies and data analysis.

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 or HRRRP 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 process to apply for candidate project HSIP eligibility determination are 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 2022.

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?

Yes

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

Most Bicycle safety projects are identified and proposed for HSIP funding both by INDOT and by local agencies as part of their non-motorized program planning due to concern that exposure to motorvehicles increases probability of bike involved crashes. 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/or 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?

Yes

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 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?

Yes

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 roundabout, reduced conflict, or other innovative designs. 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 in the early stages of assessing newly 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 about 5 years ago.

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, enhances 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.

State Roads are not addressed in this SubProgram

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 then submit applications for candidate projects to receive HSIP funding eligibility that is determined by the INDOT Office of Traffic Safety. Priority for setting the contract fiscal year is determined by the INDOT Division of Local Public Agencies and Grants 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?

Yes

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 non-motorized program planning due to exposure probability and are most often prioritized by MPOs. Projects proposed by rural local agencies or by INDOT 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 road corridors or on local systems areas 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?

Yes

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 project construction.

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.

State 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 prioritized 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

Exposure

- Traffic

Roadway

- Median width

- Fatal and serious injury crashes only
- 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?

Yes

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 Edgeline Rumble Stripe projects are predominantly programed by INDOT although the systemic program is available to local agencies. Projects on the State's Highway network 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 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 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

- All crashes
- Fatal and serious injury crashes only

Exposure

- Traffic

Roadway

- 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?

Yes

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 also addresses the visibility of principally rural un-signalized intersections as well. As with signalized intersections, identification is by annual network screening but in the case of rural intersections the screening process is supplemented with observation of intersection sight distance deficiencies. Local agencies may also utilize both signalized and non-signalized visibility countermeasures.

What percentage of HSIP funds address systemic improvements?

57.6

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

- Add/Upgrade/Modify/Remove Traffic Signal
- Cable Median Barriers
- High friction surface treatment
- Horizontal curve signs
- Install/Improve Lighting
- Install/Improve Signing
- Other-Emergency Vehicle Preemption
- Other-Pedestrian Beacons and Control Devices
- Other-Pedestrian Curb Ramps and Crosswalks
- Rumble Strips
- Traffic Control Device Rehabilitation
- Upgrade Guard Rails

The Total Programmed for FFY 2022 HSIP Obligations $62,719,762. The resulting Total programmed for Systemic HSIP projects was $37,054,203. The FFY2022 systemic project obligation was $36,088,486

The program goal for the INDOT safety program is to obligate approximately 50% of available HSIP funds on systemic improvement work types on a per year 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 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 analogous 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 for selection of candidate projects 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 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 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 out-reach with valuable data analysis services and can advise the LPAs regarding best practices to achieve improved traffic safety, 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 and HRRRP funding. The necessary information is provided by local public agencies via RSA reports and is used by OTS to determine eligibility for HSIP/HRRRP funding. 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)	$62,718,762	$38,978,704	62.15%
HRRR Special Rule (23 U.S.C. 148(g)(1))	$0	$0	0%
Penalty Funds (23 U.S.C. 154)	$0	$0	0%
Penalty Funds (23 U.S.C. 164)	$0	$22,497,542	0%
RHCP (for HSIP purposes) (23 U.S.C. 130(e)(2))	$0	$0	0%
Other Federal-aid Funds (i.e. STBG, NHPP)	$0	$1,907,277	0%
State and Local Funds	$2,345,672	$30,104,480	1283.41%
Totals	$65,064,434	$93,488,003	143.69%

Obligated program totals include planned transfers from Advance Construction (AC) to the HSIP, HRRRP and 164-HE programs that were projects awarded in federal fiscal 2022. Program totals for State and Local fund obligations include funds used to match obligated HSIP funds, State funded safety projects and $20,677,461 of Indiana Toll Road Lease Proceeds that were obligated to projects in the northern tier of Indiana counites previously identified for use of HSIP funds. Amounts listed in the question 23 table reflect obligated funds totals at the time of reporting. If transfers of project obligations from AC to HSIP do not occur before October 1, 2022, the funds may continue to appear as un-obligated. In that case, changes in the obligation totals from AC to the HSIP program may occur after the October 1 date.

With the addition of the Section 164 Penalty Fund requirement, in federal fiscal year 2022 the total year obligation of state, local, and HSIP eligible funds is estimated to be $93,488,003 or 143.68% of the total amount programmed for HSIP project obligation.

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

27%

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

23%

INDOT Allocation for local safety projects is normally 33% of the annual HSIP apportionment to fund local agency sponsored HSIP eligible projects. Due to timing of BIL allocations, the planned HSIP allocation to local agencies for FFY 2022 remained at the 2021 amount $18,355,886.

In FFY 2022 the projected total obligation of funds to construct local safety projects is expected to be $4,182,944 This amount is 6.03% of the total federal apportionment or 22.8% of local agency HSIP allocation.

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

$420,424

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

$501,488

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 2022. The total non-infrastructure obligation for 2022 includes safety planning actions conducted by MPOs that are funded using HSIP funds under their Uniform Annual Work Plans submitted to the FHWA division office for approval.

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.

MPOs may utilize up to 15% of allocated HSIP funds for safety program planning activities. In FFY 2021 MPOs programmed $224,000.00 for non-infrastructure safety planning actions in their Uniform Annual Work 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?

$35,550,000

In FFY 2022 INDOT transferred about $35.5 million from the 2022 HSIP apportionment. Per the Project Accounting and Finance Division, in order to spend all federal funding under the obligation limitation in 2022, it was deemed necessary to shift funding between to different pots in order to accomplish that. Projects that are in temporary inactive status, award/request amounts, and current expenditures can play into that decision.

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

MAP-21, FAST, and BIL Acts make it clear that cost effectiveness and risk of fatal and suspected serious injuries are to be considered in project selection decisions; however, guidance is currently unclear as to how the risk of future crashes for several systemic improvement types are to be accommodated under current cost effectiveness methodologies. 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, proposed safety improvement projects that are seemingly promising candidates for HSIP funding may not be prioritized for obligation due to an inability to meet 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 utilizing changing conditions such as geometry, land use, emergency response and travel demand in a prioritization methodology based on Risk Management theory.

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 officers reporting software is still under an ongoing statewide training effort. While this effort was slowed considerably by the Covid Pandemic, the expectation is that the training and deployment of the new crash reporting system will be complete by the end of calendar 2022. 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” to be equivalent to the “A” injury classification under the KABCO scale. In the latter half of 2019, Indiana’s electronic reporting tool redefined the classification an incapacitating injury back to a subjective choice by the reporting officer. This change was part of the introduction of the FHWA mandated seven injury “nature” definitions that will classify suspected serious injuries. The revised classification rule starting April 15, 2019, was too short a time for the Indiana TRCC to revise the officer’s electronic crash reporting software ARIES to change the data elements that are available in the state’s electronic vehicle crash data base therefore Indiana was judged to be out of compliance. In June of 2022, FHWA certified that Indiana’s crash reporting system is in compliance with the MMUCC 4th and 5th Editions.

The new guidelines require officers untrained in emergency medicine to determine a level of trauma to the victim 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 information 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 will use a phased rollout of the officer reported 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. 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 has proposed a method to estimate annual suspected serious injury counts from the crash database.

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 a 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 for timely calculations. 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 moving toward Zero Fatalities and Serious Injuries. Each emphasis area addresses multiple data driven strategies with subject specific objectives to reduce motorvehicle 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 reach to defined objective levels by the stated target years. For most strategies, an interim objective target is set 5 years out in 2026, to help measure progress during the life of the current revision.

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 reservations of a budget allocation for systemic safety improvements to be constructed in the same future years are prioritized. 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
1701466	Roadway delineation	Raised pavement markers	4790	Raised Pavement Markers	$192112	$192112	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Lane Departure	Preventing Lane Crossings
1702757	Roadside	Barrier end treatments (crash cushions, terminals)	25	Locations	$502722	$578750	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Major Collector	7,500	55	County Highway Agency	Spot	Roadway Departure	Preventing Roadway Departures
1702829	Intersection geometry	Intersection geometry - other	1	Intersections	$793994	$882216	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Minor Collector	830	35	County Highway Agency	Spot	Intersections	Improve sight distance
1902031	Roadway signs and traffic control	Curve-related warning signs and flashers	29902	Square Feet of Signs	$1100353	$1222614	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Principal Arterial-Other	7,500	55	State Highway Agency	Systemic	Roadway Departure	Improving sign visibility
1902742	Pedestrians and bicyclists	ADA curb ramps	52	Ramps	$766387	$886310	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Minor Arterial	1,855	55	State Highway Agency	Spot	Pedestrians	ADA Ramps
2100069	Roadway	Pavement surface – high friction surface	17391	Square Yards of Treatment Area	$262993	$292214	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Principal Arterial-Other	6,500	55	State Highway Agency	Spot	Roadway Departure	Improve Roadway Friction
2100090	Roadway delineation	Raised pavement markers	25317	Raised Pavement Markers	$687446	$687446	HRRR Special Rule (23 U.S.C. 148(g)(1))	Rural	Principal Arterial-Other	7,900	55	State Highway Agency	Systemic	Lane Departure	Preventing Lane Crossings
1383631	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$42766	$3954237	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	9,350	45	State Highway Agency	Spot	Intersections	Construct a roundabout
1400195	Intersection geometry	Innovative Intersection (e.g. MUT, RCUT, QR)	1	Intersections	$199157	$6825	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other Freeways & Expressways	43,850	55	State Highway Agency	Spot	Intersections	Quadrant Roadway
1500060	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$0	$230560	State and Local Funds	Urban	Principal Arterial-Other Freeways & Expressways	20,000	55	State Highway Agency	Spot	Intersections	Construct Turning Lanes
1500061	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$0	$289500	State and Local Funds	Urban	Principal Arterial-Other Freeways & Expressways	20,000	55	State Highway Agency	Spot	Intersections	Construct Turning Lanes

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1600518	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$0	$656797	State and Local Funds	Urban	Principal Arterial-Other	14,000	45	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1600623	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$2687019	$2695019	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	13,500	55	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1600625	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$3117633	$3568103	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	6,200	55	State Highway Agency	Spot	Intersections	Construct a roundabout
1700020	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$0	$794530	State and Local Funds	Urban	Principal Arterial-Other	31,000	35	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1700021	Intersection geometry	Add/modify auxiliary lanes	2	Intersections	$295428	$666901	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	19,500	55	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1700050	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1528251	$1704645	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	14,200	55	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1700089	Intersection geometry	Innovative Intersection (e.g. MUT, RCUT, QR)	1	Intersections	$3394292	$3771436	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	16,700	55	State Highway Agency	Spot	Intersections	Construct RCI Intersection
1700095	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$2181576	$2874048	Penalty Funds (23 U.S.C. 164)	Urban	Minor Arterial	16,000	50	State Highway Agency	Spot	Intersections	New Traffic Signal
1700129	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$0	$2354372	State and Local Funds	Urban	Principal Arterial-Other	14,000	45	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1700136	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$445660	$445660	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	6,500	45	State Highway Agency	Spot	Intersections	New Traffic Signal
1700179	Roadway	Roadway widening - add lane(s) along segment	0.1	Miles	$0	$10876384	State and Local Funds	Urban	Major Collector	10,500	40	State Highway Agency	Spot	Improving Access	TWLTL
1700188	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$337046	$530515	HSIP (23 U.S.C. 148)	Rural	Minor Collector	5,500	45	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1700189	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$451462	$669894	HSIP (23 U.S.C. 148)	Rural	Minor Collector	5,500	45	State Highway Agency	Spot	Intersections	Construct Auxilary Lane
1701598	Intersection traffic control	Modify traffic signal – modernization/replacement	9	Intersections	$2560120	$2715520	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	770	45	State Highway Agency	Spot	Intersections	Modernize Traffic Signals

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1702100	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Intersections	$455971	$457471	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	9,500	45	State Highway Agency	Spot	Intersections	Modernize Traffic Signals
1702286	Pedestrians and bicyclists	Pedestrians and bicyclists – other	1	Improve Ped Crossing and Signal Changes at Single Point Diamond	$393902	$393902	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	15,500	45	State Highway Agency	Spot	Pedestrians	Improving Ped Safety
1800173	Pedestrians and bicyclists	ADA curb ramps	42	Ramps	$0	$1276024	State and Local Funds	Urban	Principal Arterial-Other	18,000	45	State Highway Agency	Spot	Pedestrians	ADA Ramps
1801581	Roadside	Barrier- metal	1.9	Miles	$49679	$55199	HSIP (23 U.S.C. 148)	Rural	Major Collector	5,500	55	State Highway Agency	Spot	Roadway Departure	New Guardrail Installation
1801582	Roadside	Barrier- metal	1.96	Miles	$37890	$42100	HSIP (23 U.S.C. 148)	Rural	Local Road or Street	3,500	45	County Highway Agency	Spot	Roadway Departure	New Guardrail Installation
1802055	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	6607	Square Feet of Signs	$360000	$360000	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	8,500	500	State Highway Agency	Systemic	Intersections	Increasing Stop Sign Visibility
1802058	Roadway	Roadway widening - add lane(s) along segment	0.47	Miles	$919447	$1006752	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	6,300	55	State Highway Agency	Spot	Congestion Management	Adding Capacity
1802062	Lighting	Interchange lighting	2	Interchanges	$571353	$571353	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Interstate	35,000	70	State Highway Agency	Spot	Increasing Nighttime Visibility	Lighting Upgrades
1802063	Roadside	Barrier end treatments (crash cushions, terminals)	150	Locations	$1089071	$1089071	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	5,600	55	State Highway Agency	Systemic	Roadway Departure	Preventing Roadway Departures
1802064	Intersection traffic control	Modify traffic signal –other	1	Signal Visibility w/Lane Realignments	$90448	$122020	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	7,500	45	State Highway Agency	Spot	Intersections	Signal Visibility
1802065	Pedestrians and bicyclists	ADA curb ramps	49	Ramps	$151646	$168495	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	8,300	30	State Highway Agency	Systemic	Pedestrians	ADA Ramps
1802067	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	1	Intersections	$34455	$38283	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Spot	Intersections	Signal Visibility
1802068	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	1	Intersections	$17240	$19156	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Spot	Intersections	Signal Visibility

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1802070	Intersection traffic control	Modify traffic signal – modernization/replacement	9	Intersections	$1357188	$1357188	Penalty Funds (23 U.S.C. 164)	Urban	Major Collector	25,000	45	State Highway Agency	Spot	Intersections	Modernize Traffic Signal
1802071	Intersection traffic control	Modify traffic signal – modernization/replacement	4	Intersections	$2706973	$2912933	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	15,400	55	State Highway Agency	Spot	Intersections	Modernize Traffic Signal
1901625	Intersection traffic control	Modify traffic signal – modernization/replacement	4	Intersections	$566546	$566546	Penalty Funds (23 U.S.C. 164)	Urban	Major Collector	8,500	45	State Highway Agency	Spot	Intersections	Modernize Traffic Signals
1901673	Intersection traffic control	Modify traffic signal – add emergency vehicle preemption	18	Intersections	$534506	$593896	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	25,000	50	State Highway Agency	Systemic	Intersections	Emergency Vehicle Pre-Emption
1901966	Roadside	Barrier- metal	1.5	Miles	$207041	$207041	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	11,100	55	State Highway Agency	Spot	Roadway Departure	New Guardrail Installation
1901967	Roadside	Barrier end treatments (crash cushions, terminals)	43	Locations	$707464	$707464	Penalty Funds (23 U.S.C. 164)	Urban	Multiple/Varies	12,500	55	State Highway Agency	Systemic	Roadway Departure	Qupgrade GR End Treatments
1901968	Roadside	Barrier – cable	28	Miles	$4662000	$4662000	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Interstate	35,000	70	State Highway Agency	Systemic	Roadway Departure	Cable Guardrail Installation
1901969	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	18	Intersections	$795425	$882695	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	10,500	55	State Highway Agency	Systemic	Intersections	Signal Visibility
1901970	Roadway delineation	Longitudinal pavement markings – new	0.83	Miles	$506700	$878235	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	16,800	35	State Highway Agency	Systemic	Lane Departure	New Pavement Markings
1901972	Intersection traffic control	Modify traffic signal – modernization/replacement	5	Intersections	$1646150	$1646150	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	12,500	55	State Highway Agency	Spot	Intersections	Modernize Traffic Signal
1902037	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	27	Intersections	$547301	$547301	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	13,500	55	State Highway Agency	Systemic	Intersections	Signal Visibility
1902038	Intersection traffic control	Intersection traffic control - other	28	Install Battery Backup Unit	$332485	$332485	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Systemic	Intersections	Battery Back Up Units
1902040	Intersection traffic control	Modify traffic signal – modernization/replacement	10	Intersections	$1724549	$1724549	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	8,500	55	State Highway Agency	Spot	Intersections	Modernize Traffic Signal
1902041	Roadway delineation	Longitudinal pavement markings - remarking	1.53	Miles	$620947	$689941	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	9,500	45	State Highway Agency	Spot	Lane Departure	Upgrade Pavement Markings

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1902164	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$314265	$436665	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	49,200	45	State Highway Agency	Spot	Intersections	New Traffic Signal
1902632	Lighting	Lighting - other	1004	Replace HPS with LED Lamps	$1385403	$1385403	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	140,000	70	State Highway Agency	Systemic	Increasing Nighttime Visibility	Lighting Upgrades
1902653	Roadside	Barrier- metal	5	Miles	$916254	$1016945	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Roadway Departure	New Guardrail Installation
1902680	Intersection geometry	Add/modify auxiliary lanes	7	Intersections	$10963	$505401	HSIP (23 U.S.C. 148)	Multiple/Varies	Multiple/Varies	9,500	45	State Highway Agency	Spot	Intersections	Slotted Left Turn Lanes
1902695	Pedestrians and bicyclists	ADA curb ramps	94	Ramps	$334235	$335230	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	10,960	35	State Highway Agency	Systemic	Intersections	ADA Ramps
1902710	Roadway delineation	Longitudinal pavement markings - remarking	19	Miles	$418991	$1074770	Penalty Funds (23 U.S.C. 164)	Urban	Minor Arterial	17,280	50	State Highway Agency	Spot	Lane Departure	Upgrade Pavement Markings
1902897	Roadside	Barrier end treatments (crash cushions, terminals)	109	Guard Rail End Treatments	$891837	$1123537	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	25,000	55	State Highway Agency	Systemic	Roadway Departure	Guard Rail End Treatments
2001178	Intersection traffic control	Modify traffic signal – modernization/replacement	4	Intersections	$514341	$514966	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	19,900	40	State Highway Agency	Spot	Intersections	Modernize Traffic Signals
2001534	Intersection geometry	Add/modify auxiliary lanes	13	Intersections	$87750	$344200	Penalty Funds (23 U.S.C. 164)	Multiple/Varies	Multiple/Varies	25,000	55	State Highway Agency	Systemic	Intersections	Slotted Left Turn Lanes
2001536	Roadway delineation	Raised pavement markers	35946	Numbers	$653102	$653102	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	35,000	70	State Highway Agency	Systemic	Lane Departure	Upgrade RPMs
2001537	Intersection traffic control	Modify traffic signal –other	71	Install Battery Backup Unit	$0	$55193	State and Local Funds	Rural	Multiple/Varies	10,500	55	State Highway Agency	Systemic	Intersections	Battery Back Up Units
2001602	Lighting	Interchange lighting	1	Interchanges	$1680149	$1842118	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Interstate	9,000	70	State Highway Agency	Spot	Increase Nighttime Visibility	New Lighting System
2001679	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$461561	$572894	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	17,500	40	State Highway Agency	Spot	Intersections	New Traffic Signal Install
2001798	Intersection traffic control	Modify traffic signal – modernization/replacement	3	Intersections	$546753	$546753	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	15,500	40	State Highway Agency	Spot	Intersections	Modernize Traffic Signals

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
2002393	Roadside	Barrier- metal	0.46	Miles	$751267	$755130	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Interstate	35,200	70	State Highway Agency	Spot	Roadway Departure	New Guard Rail
2002396	Roadway	Rumble strips – center	29	Miles	$321632	$321632	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Lane Departure	Centerline and Edgeline Rumble Strips
2002529	Roadway delineation	Raised pavement markers	142.41	Miles	$828763	$828763	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Interstate	85,000	70	State Highway Agency	Systemic	Lane Departure	Upgrade RPMs
2002531	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	21	Intersections	$433611	$482290	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	15,500	40	State Highway Agency	Systemic	Intersections	Signal Visibility
2002532	Advanced technology and ITS	Intersection Conflict Warning System (ICWS)	4	Intersections	$0	$288502	State and Local Funds	Rural	Principal Arterial-Other	6,500	55	State Highway Agency	Spot	Intersections	ICWS Installation
2002534	Access management	Raised island - install new	0.67	Miles	$0	$1111984	State and Local Funds	Urban	Principal Arterial-Other	14,500	45	State Highway Agency	Spot	Intersections	Center Medians
2100287	Railroad grade crossings	Railroad grade crossings - other	1	Developing the Statewide Highway/Rail Grade Crossing Safety Action Plan	$89710	$99678	HSIP (23 U.S.C. 148)	N/A	N/A	100	30	State Highway Agency	Systemic	Developing a Plan	Action Plan
2101204	Intersection traffic control	Modify control – new traffic signal	1	Intersections	$185029	$185029	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Spot	Intersections	New Traffic Signal Installation
2101636	Intersection traffic control	Intersection traffic control - other	10	Replace Syns Pucks with Loops	$0	$632422	State and Local Funds	Urban	Principal Arterial-Other	17,500	60	State Highway Agency	Systemic	Intersections	Signal Detection Upgrade
1401034	Intersection geometry	Add/modify auxiliary lanes	1	Intersections	$1119159	$2060010	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	40,000	45	State Highway Agency	Spot	Intersections	Added Left Turn Lanes
1700976	Pedestrians and bicyclists	ADA curb ramps	19	Ramps	$541255	$687543	HSIP (23 U.S.C. 148)	Urban	Minor Collector	9,500	35	City or Municipal Highway Agency	Systemic	Intersections	ADA Ramps
1801240	Pedestrians and bicyclists	Pedestrian hybrid beacon	100	Locations	$1100196	$1108133	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	8,500	35	City or Municipal Highway Agency	Systemic	Pedestrians	Solar Powered Flashing Beacons

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
1801445	Pedestrians and bicyclists	ADA curb ramps	107	Ramps	$1777500	$2010468	HSIP (23 U.S.C. 148)	Urban	Major Collector	9,500	35	City or Municipal Highway Agency	Systemic	Intersections	ADA Ramps
1801452	Intersection traffic control	Modify control – Modern Roundabout	1	Intersections	$50000	$2147556	HSIP (23 U.S.C. 148)	Urban	Major Collector	12,330	45	City or Municipal Highway Agency	Spot	Intersections	Install Roundabout
1802795	Intersection traffic control	Modify traffic signal – modernization/replacement	12	Intersections	$176762	$220953	HSIP (23 U.S.C. 148)	Urban	Major Collector	12,500	35	City or Municipal Highway Agency	Spot	Intersections	Modernize Traffic Signal
1802904	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	3858.5	Square Feet of Signs	$82800	$92000	HSIP (23 U.S.C. 148)	Rural	Multiple/Varies	6,500	55	County Highway Agency	Systemic	Increase Sign Visibility	Upgrade Sheet Signs
1901777	Pedestrians and bicyclists	Medians and pedestrian refuge areas	1	Locations	$66630	$79702	HSIP (23 U.S.C. 148)	Urban	Major Collector	9,500	40	City or Municipal Highway Agency	Spot	Pedestrians	Median Pedestrian Refuge Island
1902197	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	6924	Square Feet of Signs	$385074	$420402	HSIP (23 U.S.C. 148)	Multiple/Varies	Multiple/Varies	9,500	55	County Highway Agency	Systemic	Increase Sign Visibility	Upgrade Sheet Signs
1902791	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	3558.34	Square Feet of Signs	$89910	$99900	HSIP (23 U.S.C. 148)	Rural	Multiple/Varies	7,500	55	County Highway Agency	Systemic	Increase Sign Visibility	Upgrade Sheet Signs

Depending on contract award date some of the listed projects may be under Advance Construction (AC). All of these projects are identified for transfer to HSIP status on or before October 1, 2022.

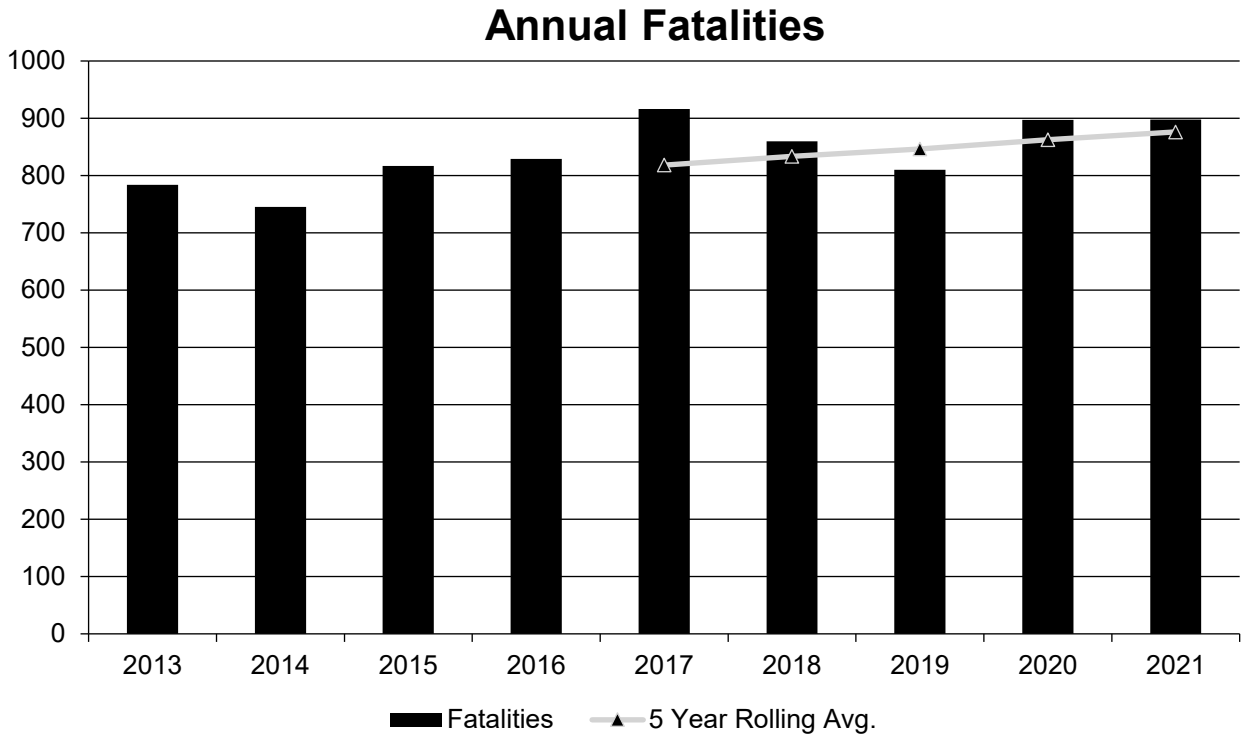
Projects with the Improvement Category of Non-infrastructure consist of improvements to traffic safety data systems or traffic safety planning efforts. Metropolitan planning organizations undertake safety planning as part of their annual Unified Planning Work Programs. HSIP funding is also used for non-infrastructure safety planning in rural areas by funding the operations of the Hazard Elimination Program for Existing Roads and Streets (HELPERS) Program managed by the Indiana Local Technical Assistance Program.

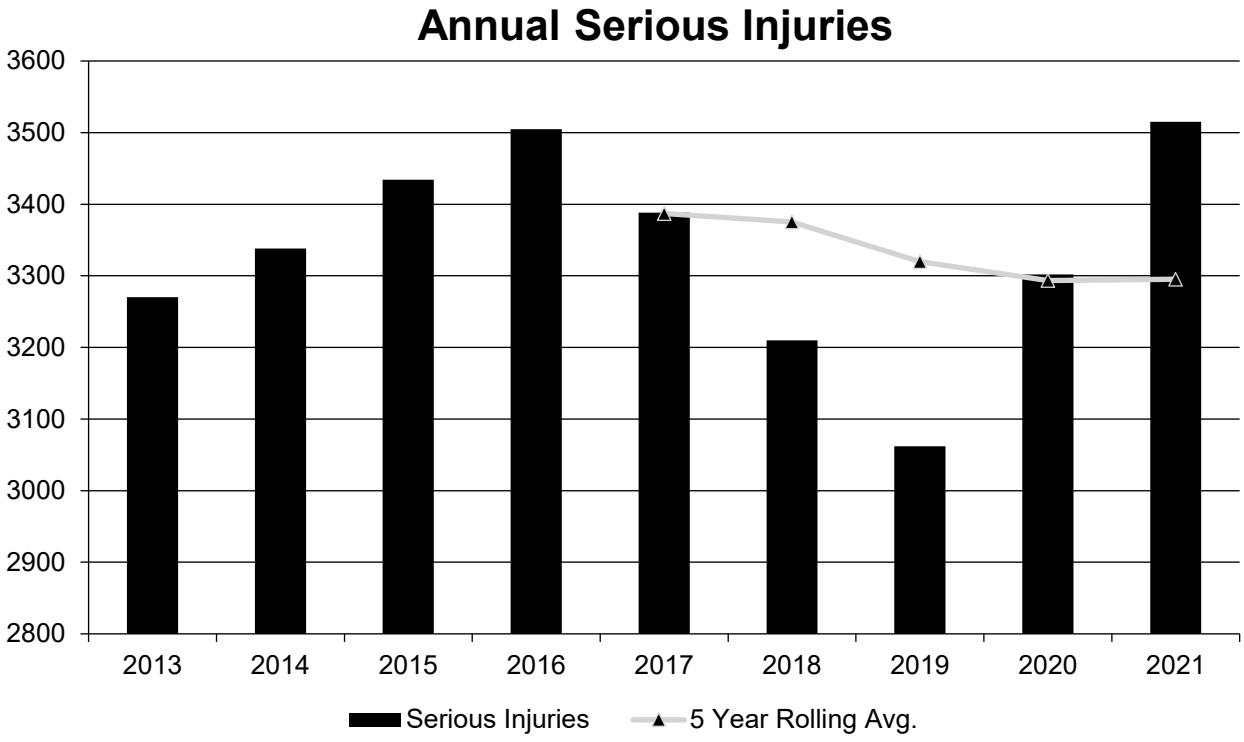
Safety Performance

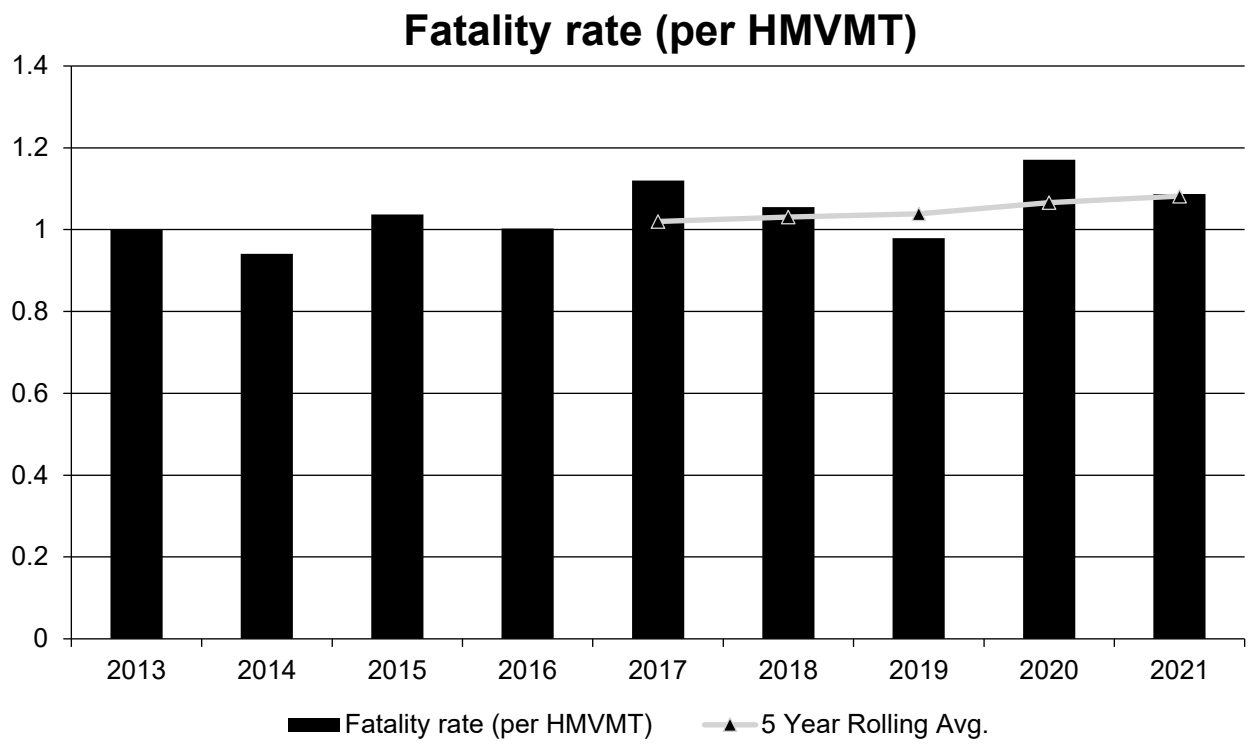
General Highway Safety Trends

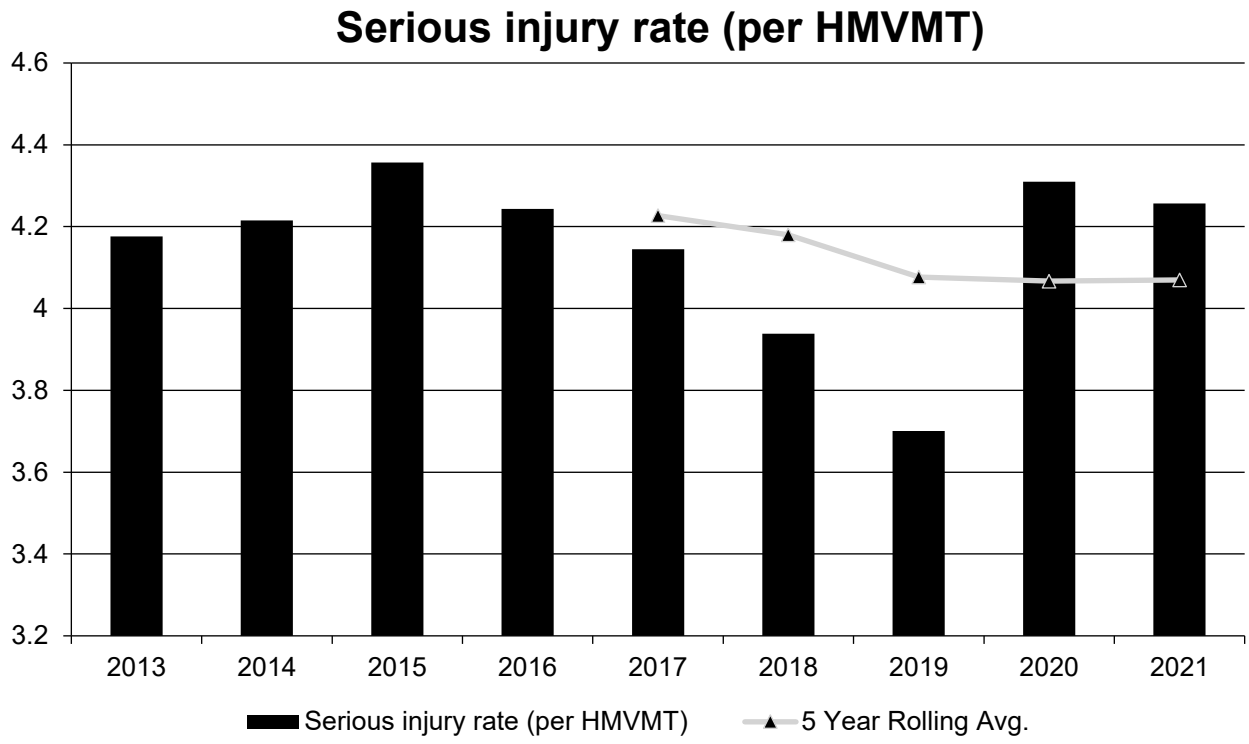
Present data showing the general highway safety trends in the State for the past five years.

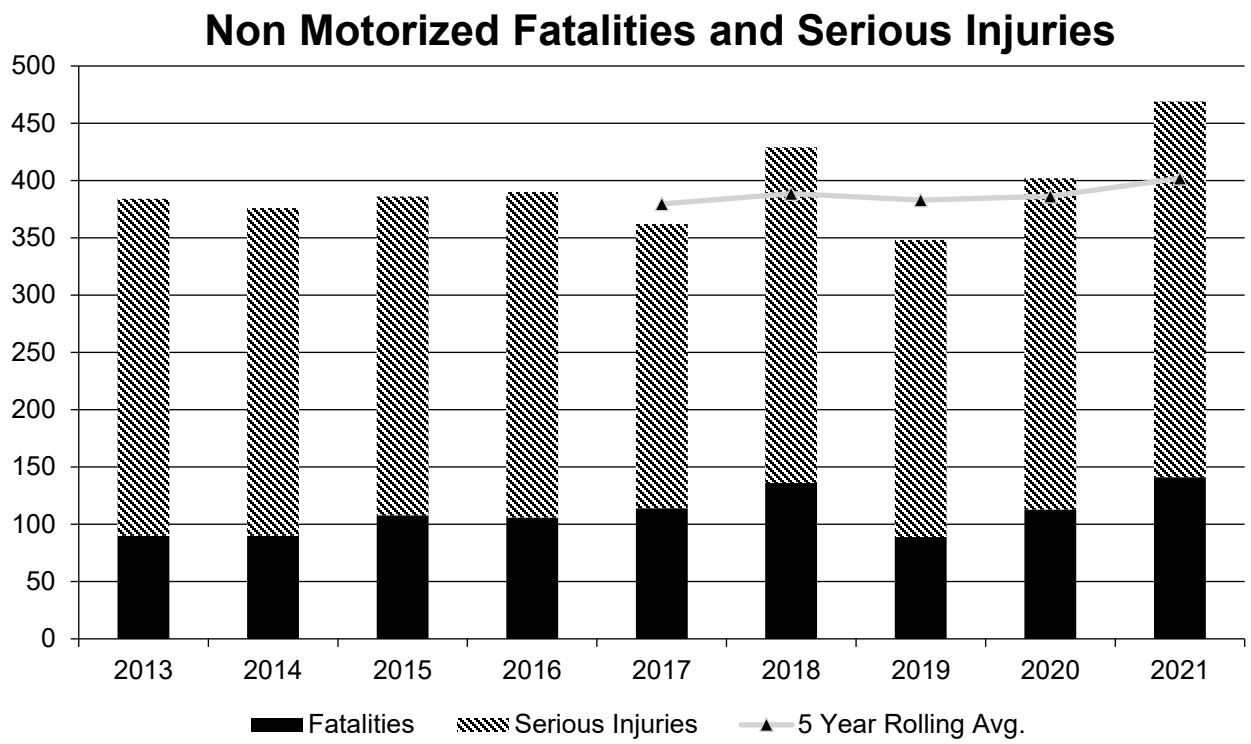
PERFORMANCE MEASURES	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fatalities	784	745	817	829	916	860	810	897	898
Serious Injuries	3,270	3,338	3,434	3,505	3,388	3,210	3,062	3,302	3,515
Fatality rate (per HMVMT)	1.001	0.941	1.037	1.003	1.120	1.055	0.979	1.171	1.087
Serious injury rate (per HMVMT)	4.176	4.215	4.357	4.243	4.145	3.938	3.701	4.310	4.257
Number non-motorized fatalities	90	90	108	106	114	136	89	113	141
Number of non-motorized serious injuries	294	286	278	284	248	293	259	289	328


Annual Fatalities
1000
900
800
700
600
500
400
300
200
100
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
Fatalities
5 Year Rolling Avg.


Annual Serious Injuries
3600
3500
3400
3300
3200
3100
3000
2900
2800
2013
2014
2015
2016
2017
2018
2019
2020
2021
Serious Injuries
5 Year Rolling Avg.


Fatality rate (per HMVMT)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
Fatality rate (per HMVMT)
5 Year Rolling Avg.


Serious injury rate (per HMVMT)
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
2013
2014
2015
2016
2017
2018
2019
2020
2021
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 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 Suspected Serious Injuries 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 Suspected Serious Injuries 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 2022 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 in calendar 2022.

In late 2019, the vendor that manages Indiana's crash records system (ARIES) 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 2022. 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. Review of the direct count of 2020 serious injury data shows an increase of 7.8% above the 2019 estimate and an increase of 6.45% from 2021 to 2022. Therefore, the discontinuity in the counting procedure should be considered when evaluating the apparent large increase in suspected serious injury counts from 2019 to 2021. The actual difference in serious injuries is likely a smaller percentage growth. To be clear, the changes made in 2021 and 2022 to bring Indiana's SSI definitions into full compliance with the MMUCC 4th and 5th editions created a discontinuity in the count of suspected serious injuries and it will take another two years of data collection to achieve a reliable trend of suspected serious injuries over time.

An additional consideration to the above described procedure is used to answer question 34. INDOT's partner agency that contains the State Highway Safety Office is the Indiana Criminal Justice Institute (CJI). INDOT shares responsibility with CJI to report three of the same target measures in their annual Highway Safety Plan (HSP) Report that they submit to NHTSA. The timing of the HSP report 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 is at a preliminary estimate stage and should be considered a projection along with the VMT for the current and future year.

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 2019,
FARS Annual Report File for the year 2020 and earlier Website location:
https://cdan.nhtsa.gov/SASStoredProcess/guest

Indiana State Police ARIES Crash Reporting System for the year 2021

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

Year 2021

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	57.5	108	0.67	1.26
Rural Principal Arterial (RPA) - Other Freeways and Expressways				
Rural Principal Arterial (RPA) - Other	94.1	174.6	1.77	3.28
Rural Minor Arterial	86.6	232.7	2.79	7.5
Rural Minor Collector	28.8	117.2	1.54	6.24
Rural Major Collector	103.2	375	2.01	7.29
Rural Local Road or Street	115.1	289.1	2.25	5.65
Urban Principal Arterial (UPA) - Interstate	42.2	168.9	0.35	1.39
Urban Principal Arterial (UPA) - Other Freeways and Expressways	20.9	36.2	1.33	2.31
Urban Principal Arterial (UPA) - Other	113.9	649.7	1.09	6.2
Urban Minor Arterial	93.2	563.8	1.12	6.8
Urban Minor Collector				
Urban Major Collector	37.2	258.5	0.73	5.05
Urban Local Road or Street	82	301.8	0.57	2.1

Year 2020

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	441.48	1,231.37	1.06	2.95
County Highway Agency	202.02	716.27	1.05	3.72
Town or Township Highway Agency				
City or Municipal Highway Agency	210.99	947.57	1	4.49
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 2017 through 2021 have been adjusted for approved and estimated VMT data and changes in the classification of Suspected Serious Injuries per the methodology described under Question 30 - Additional Information.

The new 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 Officers User Manual for ARIES 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 some misinterpretation by officers.

The new version of the officers reporting tool titled ARIES 6 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 2022.

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 have recently been revised and the full roll-out of the AIRIES 6 reporting tool isn't yet complete. It may prove necessary to revise reported 2020 and 2021 counts and rates of suspected serious injuries in future reporting years until 2023-2027 averaged data is reported.

Provide additional discussion related to general highway safety trends.

2022 so far has seen a significant recovery of economic activity from the downturn due to the Covid 19 pandemic that was experienced in 2020. The recovery in terms of VMT appears to be complete. 2022 travel activity is estimated to have increased by 9.65% over the estimated Vehicle Miles of Travel (VMT) for 2020. The early estimate of VMT for 2020 indicates that a reduction of 8.1% occurred compared to 2019. In contrast, an estimated VMT increase of 1.01% is estimated to have occurred from 2018 to 2019.

The number of police reported fatalities in 2022 increased by 0.11% compared to 2021, however the increase from 2019 to 2020 was 10.74%. The unexpected increase in fatalities after 2019 resulted in an increase in the 5 year rolling average of 3.52% over the last two years.

Suspected serious injuries have risen by 14.79% since 2019, but due to a previous declining trend the 5 year average is 0.73% lower than in 2019. This higher serious injury count is partially the result of a data discontinuity resulting from the previously described change in procedure for counting suspected serious injuries.

Statewide 2021 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 2020. The relatively level trend of vehicle lane departure fatalities was continued in 2021, with the 5-year average of fatalities at 1.43% lower than in 2020. In comparison the 5-year serious injury average rose by 5.78%. 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 continues to make up the worst overall type of harmful event. In 2021 the 5-year average of intersection fatalities and serious injuries contributed 38.12% of all severe crash outcomes. In 2019 the same comparison to casualties at the same severity was 34.61%. In response to intersection crashes, 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 control in the use of “permitted/protected” left turn traffic signal phasing. The MUTCD approved 4-section heads use a flashing yellow arrow to allow for more flexible control of permissive left turn phasing schemes. 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 the next three years.

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. In 2014, INDOT produced its ICE guideline document, and capacity analysis methods have subsequently been developed to assist design type decision making. Many of the resulting designs are deployed as part of both safety and mobility enhancement projects.

Indiana is also concerned with the incidence of fatalities involving vulnerable road users such as pedestrians, bicycle and 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 2021, the 5-year rolling average of pedestrian involved fatal and serious injuries crashes grew by 4.09% over the 2020 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 fatal pedestrian fatalities has grown to 11.43% 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 a 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 nearly unchanged 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 2021 was 1.96%. In 2020 it was 1.89%, in 2019 it was 1.82%.

Safety Performance Targets

Safety Performance Targets

Calendar Year 2023 Targets *

Number of Fatalities:894.2

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

The performance target for traffic fatalities is one of the three targets that must match Indiana Criminal Justice Institute (ICJI) Traffic Safety Office reporting to NHTSA with the Indiana Department of Transportation (INDOT) as the state's planning agency for the State Strategic Highway Safety Plan under requirements of the FAST

Act under 23 U.S.C. 402(b)(1)(f)(v). INDOT calculates this performance target by using analysis of crash trends, employment predictions and a model that uses employment data to predict fatalities.

It was determined that analysis methods used during the previous year will be continued for this submittal. Use of a simple linear regression model was chosen to predict fatalities. To predict the number of fatalities, this model would use the previous 5 years of data. The excel functions of SLOPE () and INTERCEPT () were used to generate the predictive equation. The predictive equation is of the form FATALITIES=YEAR*SLOPE () +INTERCEPT (). This predicted total was then adjusted upwards by 5% to account for any unexpected variances. The target creates a baseline for measurement of objectives established in the revised Indiana SHSP.

Number of Serious Injuries:3348.1

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 must match ICJI and INDOT due to the FAST Act (23 U.S.C. 402(b)(1)(f)(v)).

The Indiana Crash database recently underwent a change that now allows a direct count of the 7 types of injuries defined by the MMUCC 4th edition. The change by Indiana in crash reporting recently confirmed by FHWA as compliant with the establish rule. Starting with 2020, INDOT directly counts suspected serious injuries from the 7 injury types. In the prior years, 2017- 2019 the former interim method used an estimate 7.2% of all injuries. The result of the count was a discontinuity in the previously established downward trend line. The change was deemed minor, so the previous Slope and Intercept trend line was extended to calculate the 5-year target value in a similar manner to what was described for the number of fatalities. The target creates a baseline for measurement of objectives established in the revised Indiana SHSP.

Fatality Rate:1.088

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

The performance target for the rate of traffic fatalities per 100 Million Vehicle Miles Traveled is one of the three targets that must match ICJI and INDOT reporting due to the FAST Act (23 U.S.C. 402(b)(1)(f)(v)). The predicted annual Vehicle Miles Traveled (VMT) for each of the most recent five years is estimated to vary from past slow growth patterns due to the 2020 economic shutdown, largely due to the COVID-19 Pandemic and subsequent rebound. As a result, projected VMT for 2020 was predicted to reduce by 7.20% from the 2019 VMT then grew by 9.65% in 2021. The target creates a baseline for measurement of objectives established in the revised Indiana SHSP.

Serious Injury Rate:4.068

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

The performance target for the rate of suspected serious injuries per 100 Million Vehicle Miles Traveled is independent of the FAST Act matching target requirement. The same VMT was used as the Traffic Fatalities target and a similar Slope and Intercept trend line was employed. The same suspected serious injury counts for 2017 through 2021 were also used. The target creates a baseline for measurement of objectives established in the revised Indiana SHSP.

Total Number of Non-Motorized Fatalities and Serious Injuries:399.6

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

A linear regression model using the previous 5 years data was also employed to predict non-motorized road users fatalities and suspected serious injuries. The excel functions of SLOPE () and INTERCEPT () were used to generate the predictive equation. The target creates a baseline for measurement of objectives established in the revised Indiana SHSP.

An additional consideration to the above described procedure involves Vehicle Miles of travel. INDOT's partner agency that contains the State Highway Safety Office, is the Indiana Criminal Justice Institute (ICJI). INDOT shares responsibility with CJI to report three of the same target measures in their annual Highway Safety Plan (HSP) Report that they submit to NHTSA. The timing of the HSP report 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 is at a preliminary estimate stage and should be considered a projection along with the VMT for the current and future year.

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

Added Information: Following the promulgation of the new rule, in the fourth quarter of 2016 INDOT Office of Traffic Safety solicited a partnership group of Contributing/Consulting/Advisory Agencies and Organizations to coordinate setting the 5 safety performance targets. In 2022, 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 in relation to known data. The traffic safety Performance Target Setting Team deliberated and ultimately agreed upon both the methodology that was used to establish the traffic safety performance targets and the calendar 2023 targets.

Using similar procedures, INDOT has calculated safety performance targets for calendar years 2019 through 2023. A final agreement on each target for 2023 was reached on May 21, 2022.

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

The task group completed their deliberations in time to allow the Indiana Criminal Justice Institute (SHSO) to report the three overlapping performance targets in their 2021 Highway Safety Plan Report to NHTSA before their June 1, 2021, deadline.

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 2021 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	817.3	876.2
Number of Serious Injuries	3311.4	3295.4
Fatality Rate	1.006	1.082
Serious Injury Rate	4.088	4.070
Non-Motorized Fatalities and Serious Injuries	393.6	402.0

For target year 2021, INDOT estimates that Indiana did not meet 3 of the PM 1 Safety Performance Targets as defined per 23 CRF 490.211(c)(2). The calculation of 2021 targets took place in 2020 before the COVID pandemic profoundly changed travel and crash patterns. Indiana utilized a revised projection estimation method established to consider lessons learned from the projection efforts made in 2018 and 2019 to project target values in 2020.

The assessment of 2021 target values contained in this report utilized the Annual VMT data for years 2016 through 2019 from FHWA and the preliminary 2020 values for HMVMT from the INDOT Traffic Statistics Office. The 2020 VMT estimate was made before the effects of the pandemic became apparent. 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 2016 through 2019 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 2021 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 below the PM1 target values set for 2020. The official result will be dependent on the VMT values that FHWA applies in their performance target verification calculation that will be performed in 2023. The preliminary estimated outcome is that the target for fatality count and fatality rate will not be met. Also, the target for the number of non-motorized fatalities and suspected serious injuries is not expected to be met. The counts of suspected serious injuries and suspected serious injury rate for 2021 is expected to be below 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 2021 suspected serious injuries is higher than in 2020 by 213 people. The data discontinuity caused by the change in counting methodology is likely a contributor to the higher count, but it

may also be the result of an increasing trend in pedestrian crashes. The number represents about a 6.4% increase over 2020 data. The calculated 2021 five-year average of suspected serious injuries is 3295.5. This number remains below the 2021 target value of 3311.4. Also, the five-year average rate of suspected serious injuries is estimated to be 4.070, which is lower than the 2021 target value of 4.088.

For Target year 2021, the FHWA Target Achievement Assessment per 23 CRF 490.211(c)(2), will be calculated by FHWA in 2023. 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 between the FHWA annual official VMTs and those reported to FHWA by INDOT, therefore these findings are preliminary.

In 2020 an unexpected spike of 896 fatalities occurred. This spike is compared to the preliminary 2019 FARS count of fatalities at 809 and the FARS count in 2018 of 860. The reasons for the 2020 increase can in part be attributed to a change in reporting of all-terrain vehicle (ATV) fatalities and serious injuries on local rural roads. It was found that in past years some local police agencies may have reported multiple crash events to the Department of Natural Resources rather than to the Indian State Police ARIES Crash database. This reporting discrepancy was unknown in 2019 and played a role in the 2021 target setting process. Also, the number of motorcycle/moped related fatalities was 112 in 2019 followed by 141 in 2020, resulting in a 26% increase.

Applicability of Special Rules

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	2015	2016	2017	2018	2019	2020	2021
Number of Older Driver and Pedestrian Fatalities	112	115	135	122	126	111	104
Number of Older Driver and Pedestrian Serious Injuries	275	308	289	294	260	259	292

Under 23 U.S. C 148(g)(2), FHWA has determined that over the last year 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 2021 is from the Indiana crash database

Evaluation

Program Effectiveness

How does the State measure effectiveness of the HSIP?

- Change in fatalities and serious injuries
- Economic Effectiveness (cost per crash reduced)

Per commitment under Indiana's Strategic Highway Safety Plan to move Towards Zero Deaths, INDOT's goal and primary measure of effectiveness is the reduction of fatalities and serious injuries on all state and local public roadways. In this regard, INDOT monitors the number and rate of fatal and serious injury crash events and casualties in determining progress Toward Zero Deaths.

INDOT's additional goal during fiscal year 2022 was to maintain integrity of a planned $62.6 million investments in the FFY 2022 traffic safety capital program, toward achieving an expected reduction of at least 5,914 severe crashes on INDOT jurisdictional roads through the projects' design lives. 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. A baseline of $24,400 per severe crash to be reduced has been established as the baseline ratio at the start of each fiscal year.

This is a summary of results relative to the federal fiscal year 2021 goal. The safety programaffected a slightly negative change in C-E, compared to the baseline. The C-E for 2021 increased to an estimated about $24,161 or slightly more than the $23,840 estimate from fiscal year 2020. Overall, the fiscal year 2021 performance expectation was met.

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 897 in calendar year 2020 to 898 in 2021, which represents an increase of 0.11%. This is lower than the 2019 to 2020 increase of 10.75%. At the time that this report was submitted, INDOT's early estimate for 2021 vehicle miles of travel indicates an increase of 7.79% over 2020, essentially eliminating the COVID related drop in 2020's VMT. As a result of the higher fatality counts for 2020 and 2021, the estimated rate of fatalities per one hundred million vehicle miles of travel (HMVMT) increased by 11.03% from 0.978 in 2019 to an estimated 1.087 in 2021. The five year average fatality rate rose by 4.23%.

The frequency of suspected serious injuries in 2019 was 3,062 compared to 3,302 in 2020 and 3,515 in 2021. The assumption that serious injuries was on a slow downward trend appears to have reversed with a rise of 14.79%, however this may also be the 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 incidence for suspected serious injury rate represents a modest 0.07% increase over the 2020 value and a 0.17% decrease compared to the 2019 5-year average.

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 2021 $38.98 million obligated HSIP investment in the traffic safety capital program, toward achieving an expected 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 2022, the Office of Traffic Safety (OTS) completed 45 Road Safety Assessment (RSA) reports for site specific locations on highways under INDOT Jurisdiction. In addition, INDOT completed 2 RSAs on roadway corridors that included 37 signalized intersections and multiple un-signalized intersections. The corridor studies also encompassed 9.4 miles of urban highways. INDOT utilizes RSAs to program HSIP funded construction projects as the part of the INDOT Traffic Safety Program. INDOT seeks to obligate approximately 50% of its approved safety asset 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.

The Local Technical Assistance Program (LTAP), and some local public agencies also conduct RSAs prior to submitting proposed projects to OTS for HSIP eligibility determination. During the fiscal year, there were 14 local safety assistance RSAs conducted. INDOT received 4 RSAs for HSIP eligibility evaluation.

INDOT currently maintains 25 individual work types 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 slotted left turn lanes on wide median divided roadways.

By the end of federal fiscal year 2022 INDOT intends to obligate 100.0% of the 164-HE penalty transfer funds for infrastructure safety improvements. At the time of reporting, for fiscal year 2022 INDOT has obligated $16,986.546 of the infrastructure portion of Indiana’s 164-HE penalty transfer. This amount is 82.7% of the total expected obligations.

At the start of calendar 2019 INDOT approved intersection Conflict Warning Systems (CWS) as an eligible systemic safety project work type in our intersection safety sub-program. Construction of 16 CWS installations were completed in FY 2021. INDOT continues to monitor and evaluate the effectiveness and operational maintenance of these device.

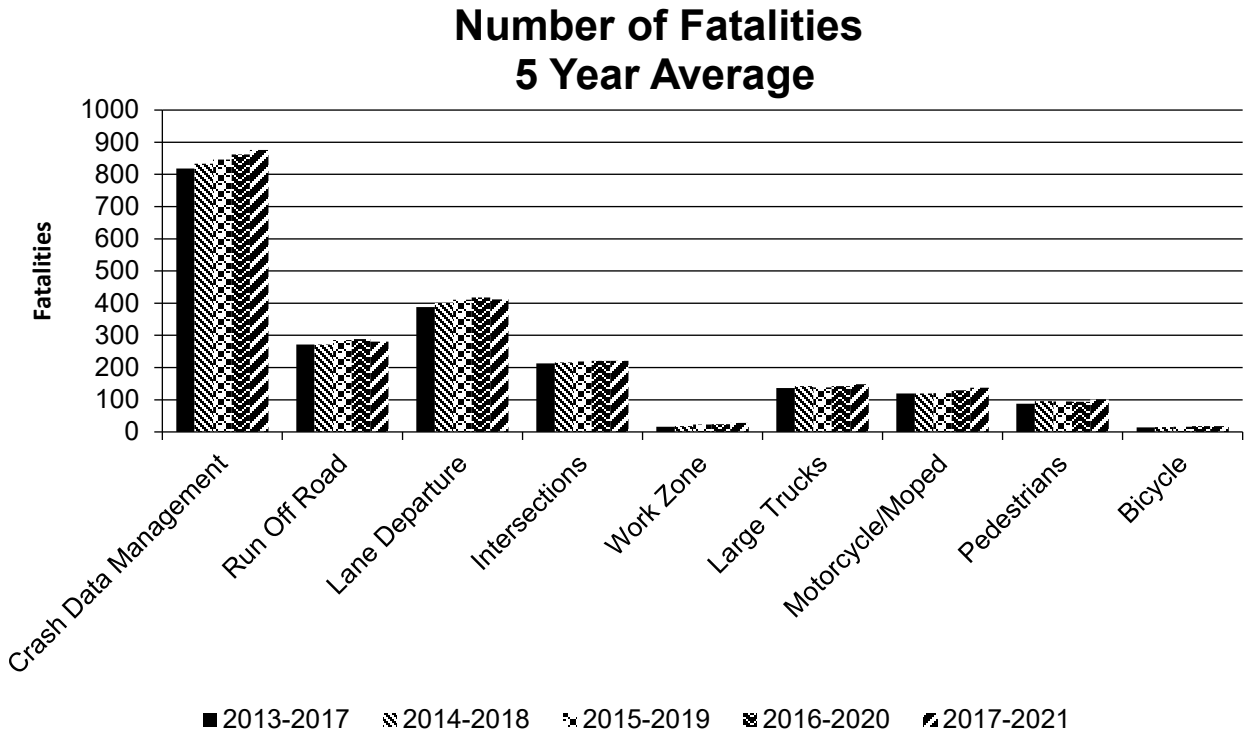
In federal fiscal year 2022 INDOT is on track to obligate approximately $63.4 million in federal aid highway safety funds including HSIP, HRRRP, Section 164-HE and other federal funds prior to the end of the federal fiscal year.

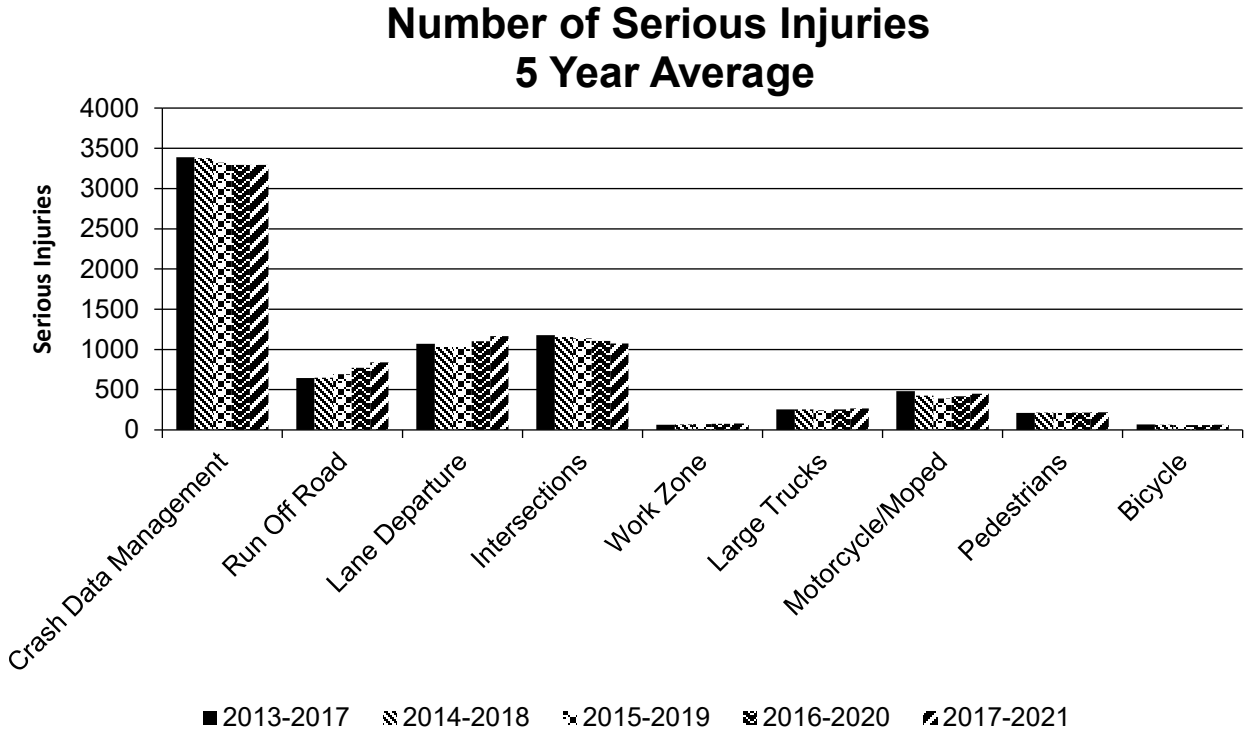
Effectiveness of Groupings or Similar Types of Improvements

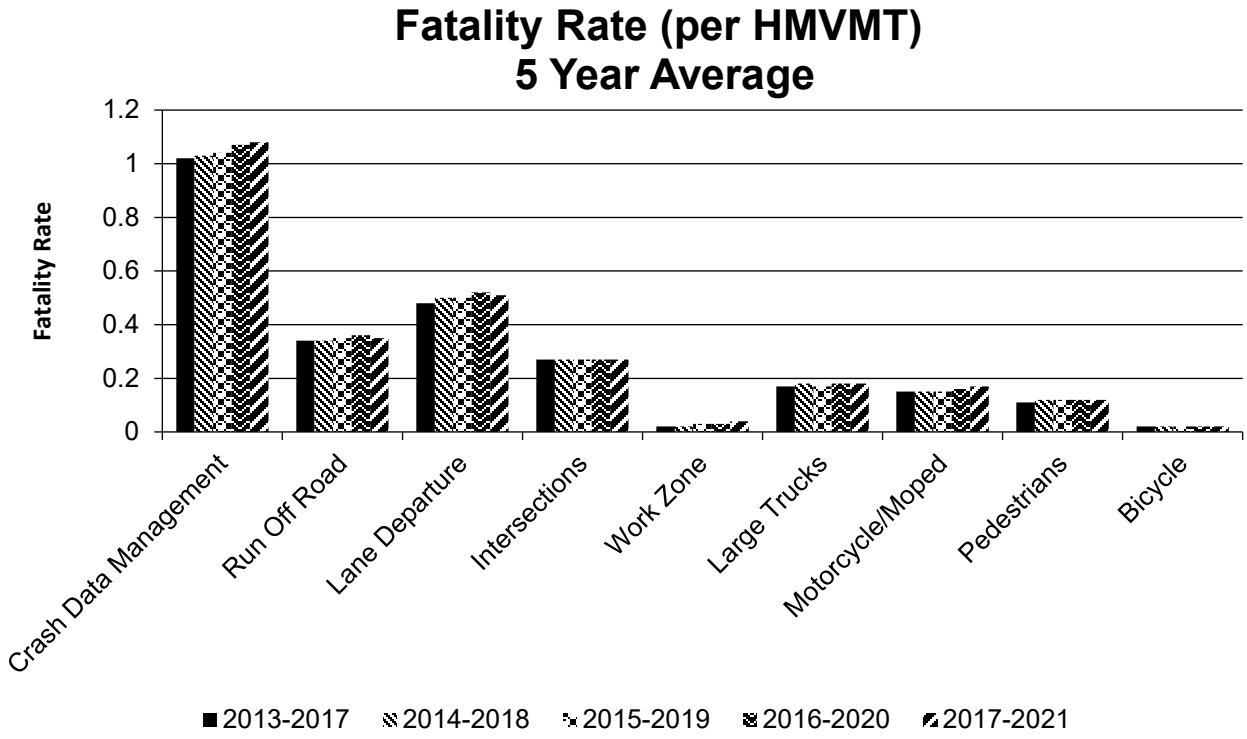
Present and describe trends in SHSP emphasis area performance measures.

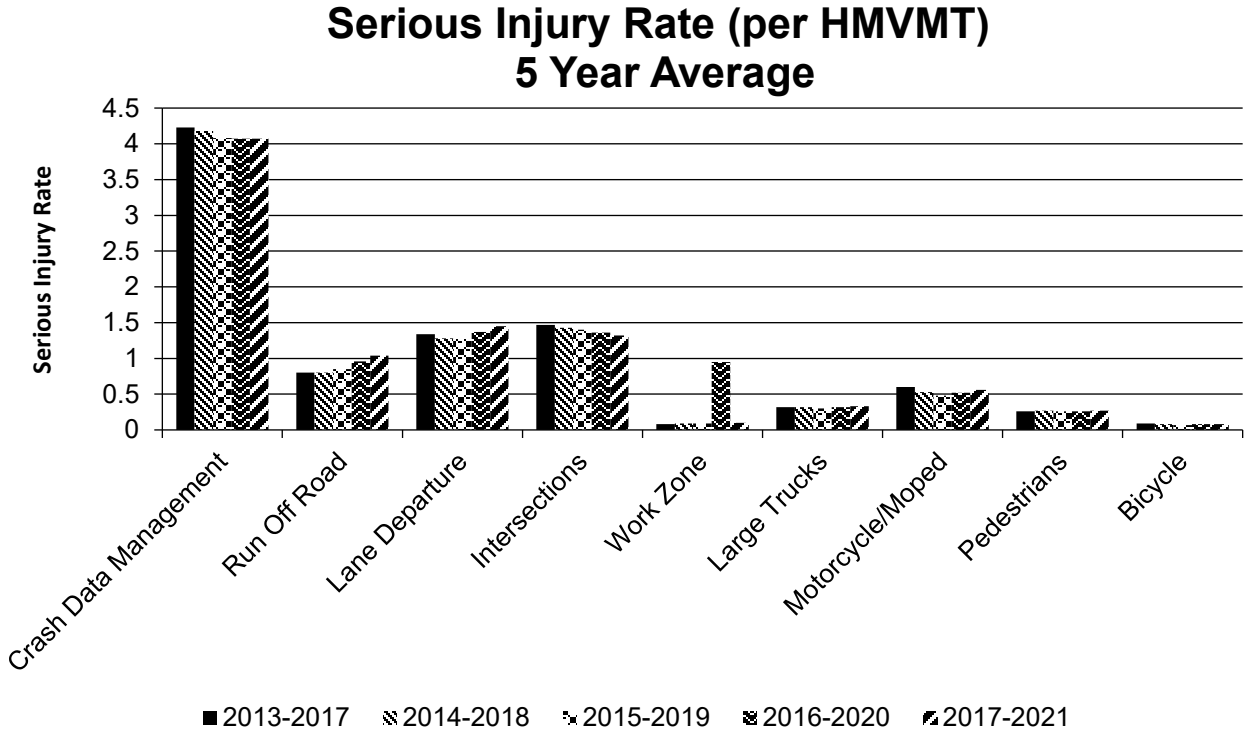
Year 2021

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		876.2	3,295.4	1.08	4.07
Run Off Road		281	838.3	0.35	1.04
Lane Departure		412	1,166.7	0.51	1.45
Intersections		220.8	1,072.9	0.27	1.32
Work Zone		28.2	80.2	0.04	0.1
Large Trucks		148.8	268.3	0.18	0.33
Motorcycle/Moped		137.6	451.8	0.17	0.56
Pedestrians		100.2	219.8	0.12	0.27
Bicycle		18.4	63.6	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
2013-2017
2014-2018
2015-2019
2016-2020
2017-2021


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
2013-2017
2014-2018
2015-2019
2016-2020
2017-2021





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

No

Due to staffing challenges, and development of the revised Strategic Highway Safety Plan there was no opportunity to conduct program level evaluations in 2022. Instead, due to the growth in pedestrian fatalities and serious injuries over the last several years, it was decided to focus resources on developmental research to improve options and guidance to further employ pedestrian safety crash countermeasures.

A research study project was conducted with Purdue University under Indiana's Joint Transportation Research Program SPR-4337,*Effective Design and Operation of Pedestrian Crossings.* This study reviewed INDOT's current state of pedestrian safety deployments and develop crash probability and severity models to estimate the risk of pedestrian crashes around urban intersections in Indiana. The goal of the study was to provide detailed guidance regarding the effectiveness of multiple pedestrian crash countermeasures in high risk urban environments. Countermeasures such as: marked crosswalks, raised crosswalks, offset crosswalks, refuge islands, curb extensions, road diets, curb radius reduction, LED border warning signs, hybrid beacons and rectangular rapid flashing beacons were evaluated. Additional proposed countermeasures such as pedestrian illumination, smart lighting, leading pedestrian interval, and exclusive pedestrian signal (also called scramble) were included with guidance on potential deployment considerations.

The study conclusions determined CMFs for multiple pedestrian safety devices. This study also supports INDOTs commitment to increase safety spending on equitable deployment of vulnerable user infrastructure improvements.

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)
1500321	Various	Intersection traffic control	Modify traffic signal – modernization/replacement		1.00								1.00	0.95
1592420	Various	Intersection traffic control	Modify traffic signal – modernization/replacement	9.00	9.00		1.00			2.00		11.00	10.00	0.67
1601926	Rural Major Collector	Intersection traffic control	Modify control – new traffic signal								1.00		1.00	1
1601933	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	17.00	18.00				1.00	1.00	1.00	18.00	20.00	0.39
1700387	Various	Intersection traffic control	Modify traffic signal – modernization/replacement	188.00	129.00			29.00	19.00	18.00	14.00	235.00	162.00	1.53
1702082	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	16.00	12.00			5.00	6.00	6.00		27.00	18.00	1.02
1800876	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	11.00	4.00					2.00		13.00	4.00	4.39
1800877	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	17.00	15.00			2.00	1.00		1.00	19.00	17.00	1.3
1800879	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	13.00	15.00			2.00	1.00			15.00	16.00	1.13
1800880	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	6.00	2.00			1.00		1.00		8.00	2.00	16.8
1601832	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	157.00	178.00	1.00		29.00	14.00	27.00	17.00	214.00	209.00	1.93
1601871	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	101.00	74.00			6.00	9.00	19.00	15.00	126.00	98.00	1.03
1700712	Rural Minor Arterial	Roadway	Rumble strips –other	24.00	19.00	3.00	1.00	12.00	6.00	2.00	2.00	41.00	28.00	2.24

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)
1702083	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	3.00	5.00	1.00		2.00	2.00	1.00	1.00	7.00	8.00	1.34
1500337	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify control – new traffic signal	4.00	14.00				1.00	1.00	3.00	5.00	18.00	0.26
1383683	Urban Principal Arterial (UPA) - Other	Roadway	Pavement surface - other	111.00	89.00			7.00	4.00	10.00	18.00	128.00	111.00	1.17
1401648	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify control – Modern Roundabout	21.00	15.00			4.00				25.00	15.00	7.91
1401706	Urban Principal Arterial (UPA) - Other	Intersection geometry	Add/modify auxiliary lanes	44.00	16.00			2.00	3.00	3.00		49.00	19.00	1.41
1601444	Rural Principal Arterial (RPA) - Other	Intersection geometry	Add/modify auxiliary lanes	14.00	9.00			1.00		1.00	3.00	16.00	12.00	2.41
1601813	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	14.00	6.00			1.00		2.00	1.00	17.00	7.00	3.57
1006624	Rural Principal Arterial (RPA) - Other	Intersection geometry	Intersection geometry - other	83.00	78.00			12.00	9.00	7.00	4.00	102.00	91.00	1.26
1172175	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	362.00	382.00	1.00		24.00	26.00	22.00	32.00	409.00	440.00	0.94
1296847	Rural Minor Arterial	Intersection traffic control	Modify control – Modern Roundabout	15.00	24.00			3.00	3.00			18.00	27.00	0.92
1296911	Urban Principal Arterial (UPA) - Other	Intersection geometry	Add/modify auxiliary lanes	273.00	218.00		1.00	11.00	6.00	21.00	11.00	305.00	236.00	1.56
1297947	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	732.00	617.00	8.00	4.00	71.00	75.00	55.00	42.00	866.00	738.00	1.06

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)
1298309	Rural Principal Arterial (RPA) - Other	Intersection geometry	Add/modify auxiliary lanes	165.00	115.00			19.00	9.00	19.00	9.00	203.00	133.00	2.03
1298316	Rural Minor Arterial	Intersection geometry	Add/modify auxiliary lanes	24.00	22.00			5.00	2.00	2.00		31.00	24.00	2.01
1400581	Rural Minor Arterial	Intersection traffic control	Modify control – Modern Roundabout	11.00	18.00		1.00		2.00	1.00		12.00	21.00	0.3
1401030	Rural Major Collector	Intersection geometry	Add/modify auxiliary lanes	3.00						1.00		4.00		0.21
1401164	Urban Principal Arterial (UPA) - Other Freeways and Expressways	Roadside	Barrier – concrete	29.00	18.00			5.00	3.00			34.00	21.00	1.49
1401735	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify control – new traffic signal	19.00	18.00			1.00	3.00	7.00	1.00	27.00	22.00	1.19
1500046	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify control – new traffic signal	25.00	34.00				4.00	10.00	6.00	35.00	44.00	0.6
1500429	Urban Local Road or Street	Lighting	Intersection lighting	377.00	545.00	1.00	1.00	16.00	29.00	18.00	11.00	412.00	586.00	0.72
1500692	Rural Principal Arterial (RPA) - Other	Miscellaneous	Miscellaneous - other	25.00	29.00			10.00	2.00	3.00	3.00	38.00	34.00	2.48
1592152	Urban Principal Arterial (UPA) - Other	Intersection geometry	Intersection geometry - other	104.00	19.00			9.00		18.00		131.00	19.00	19.72
1592620	Rural Minor Arterial	Intersection geometry	Add/modify auxiliary lanes	21.00	16.00			4.00	1.00	1.00		26.00	17.00	2.69
1600699	Rural Major Collector	Intersection traffic control	Intersection flashers –sign-mounted or overhead	6.00	3.00			1.00				7.00	3.00	6.95
1600836	Rural Principal Arterial (RPA) - Interstate	Roadside	Barrier – cable	21.00	32.00		1.00	8.00	1.00	3.00	2.00	32.00	36.00	2.91
1601381	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify control – new traffic signal	10.00	4.00			2.00		1.00	2.00	13.00	6.00	2.99

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)
1601788	Rural Minor Arterial	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	1944.00	1686.00	12.00	11.00	242.00	209.00	126.00	119.00	2324.00	2025.00	1.22
1601834	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	184.00	194.00			2.00	17.00	63.00	22.00	249.00	233.00	1.11
1601835	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	164.00	175.00			2.00	14.00	51.00	17.00	217.00	206.00	1
1500431	Rural Local Road or Street	Roadside	Barrier end treatments (crash cushions, terminals)	2.00								2.00		0.09
1500432	Rural Local Road or Street	Miscellaneous	Miscellaneous - other	2.00								2.00		0.5
1500434	Rural Local Road or Street	Miscellaneous	Miscellaneous - other	15.00	17.00			1.00		3.00	1.00	19.00	18.00	1.99
1500438	Rural Local Road or Street	Miscellaneous	Miscellaneous - other	26.00	10.00					3.00	2.00	29.00	12.00	2.09
1702292	Rural Minor Arterial	Intersection traffic control	Modify control – new traffic signal	18.00	7.00	1.00				1.00	1.00	20.00	8.00	3.21
1601882	Rural Minor Arterial	Intersection traffic control	Modify control – new traffic signal	6.00	2.00				1.00			6.00	3.00	5.14
1700406	Rural Principal Arterial (RPA) - Interstate	Interchange design	Interchange improvements	546.00	268.00	2.00		46.00	20.00	14.00	6.00	608.00	294.00	4.75
1700726	Urban Principal Arterial (UPA) - Other	Intersection geometry	Add/modify auxiliary lanes	72.00	111.00	1.00	1.00		8.00	15.00	10.00	88.00	130.00	1.19
1701063	Urban Minor Arterial	Pedestrians and bicyclists	Pedestrian beacons	3.00	3.00	9.00	4.00	29.00	35.00	13.00	26.00	54.00	68.00	0.94
1601774	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	ADA curb ramps	3.00	3.00	4.00		6.00	3.00	1.00	2.00	14.00	8.00	9.21
1701577	Urban Major Collector	Pedestrians and bicyclists	ADA curb ramps	2.00	2.00	1.00	1.00	9.00	9.00	6.00	1.00	18.00	13.00	1.08
1701578	Urban Major Collector	Pedestrians and bicyclists	ADA curb ramps	3.00	3.00	1.00	1.00	9.00	9.00	6.00	1.00	19.00	14.00	1.08

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)
1702854	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	ADA curb ramps	1.00				5.00	4.00	1.00		7.00	4.00	5
1400735	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps				1.00	3.00	6.00	3.00	6.00	6.00	13.00	0.49
1700618	Rural Major Collector	Roadway	Pavement surface – high friction surface	8.00	2.00			4.00	1.00			12.00	3.00	3.57
1297948	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Curve-related warning signs and flashers	23.00	15.00			3.00	2.00	1.00	1.00	27.00	18.00	1.43
1592654	Rural Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	102.00	71.00	1.00		12.00	10.00	3.00	1.00	118.00	82.00	1.46
1592656	Rural Minor Arterial	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	267.00	225.00	3.00	3.00	47.00	44.00	17.00	14.00	334.00	286.00	1.12
1592655	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	53.00	19.00	1.00		10.00	8.00	3.00		67.00	27.00	1.49
1593090	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	131.00	49.00	5.00	1.00	15.00	17.00	20.00	1.00	171.00	68.00	1.4
1600080	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	3898.00	2994.00	4.00	5.00	390.00	219.00	436.00	300.00	4728.00	3518.00	1.53
1600677	Rural Minor Arterial	Roadway signs and traffic control	Curve-related warning signs and flashers	23015.00	20231.00	268.00	232.00	3229.00	3363.00	4216.00	2855.00	30728.00	26681.00	1
1400714	Rural Minor Arterial	Railroad grade crossings	Active grade crossing equipment installation/upgrade						1.00				1.00	1
0400495	Rural Major Collector	Alignment	Horizontal curve realignment	7.00	8.00		1.00	1.00				8.00	9.00	0.4
0710463	Rural Minor Arterial	Alignment	Horizontal curve realignment	7.00	2.00	1.00		2.00	2.00			10.00	4.00	5.75
1601759	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	25.00	16.00			3.00	6.00	9.00	4.00	37.00	26.00	1.36
1500481	Urban Principal	Pedestrians and bicyclists	Pedestrians and bicyclists – other	1.00	1.00			1.00		2.00	2.00	4.00	3.00	1.6

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)
	Arterial (UPA) - Other													
1382818	Rural Major Collector	Intersection traffic control	Modify control – Modern Roundabout	219.00	99.00			16.00	3.00	106.00	8.00	341.00	110.00	6.76
1400816	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	2.00	5.00		1.00			3.00	2.00	5.00	8.00	0.51
1500421	Urban Minor Arterial	Pedestrians and bicyclists	ADA curb ramps	3.00	5.00						2.00	3.00	7.00	1.05
1600024	Rural Minor Arterial	Roadway signs and traffic control	Curve-related warning signs and flashers	5.00		149.00	161.00	2477.00	2103.00	1475.00	1313.00	4106.00	3577.00	1
1600426	Urban Major Collector	Pedestrians and bicyclists	ADA curb ramps					5.00	1.00	2.00	1.00	7.00	2.00	1
1601164	Urban Major Collector	Pedestrians and bicyclists	Pedestrian hybrid beacon							1.00		1.00		1
1601183	Urban Major Collector	Pedestrians and bicyclists	ADA curb ramps	1.00						1.00	1.00	2.00	1.00	1
1601205	Urban Minor Arterial	Pedestrians and bicyclists	ADA curb ramps	2.00				9.00	8.00	2.00	3.00	13.00	11.00	1
1601837	Urban Minor Arterial	Pedestrians and bicyclists	ADA curb ramps					1.00				1.00		1

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 MOE is a comparison of estimated benefit cost ratio before construction to benefit cost ratio found after construction. However, certain systemic improvement types that serve vulnerable road users 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 pedestrians and bicyclists beacons, crosswalks, and warning signage additions and upgrades.

Outcomes are not always apparent in the naïve cost effectiveness analysis of serious injury counts due to the reclassification of incapacitating injuries that took place in the 2014 – 2019 time frame. Official VMT values in the interim years is a variable, limiting the ability to evaluate trends in 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 resolve once data from the new ARIES 6.0 officer reporting software replaces incapacitating injuries with type “A” suspected serious injury data starting in 2020 and moving forward. Also, a new release of the RoadHAT software revised and modernized the average crash costs used by INDOT in benefit cost ratio analysis.

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 overall decline in serious crash outcomes. However, in recent years, national and regional trends of increased motorvehicle crashes involving fatal outcomes have 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. As a result, numbers of fatalities increased by 10.86% in 2021 from 2019 levels. Even though the total number of crashes in 2020 were lower by 19.16% compared to 2019, all crashes rebounded to previous levels in 2021. The number of suspected serious injuries also increased even given the known data discontinuity due to bringing the Indiana crash data system into compliance with the MMUCC 4th and 5th Edition standard. This indicates that other factors are causing greater percentage of severe crash outcomes.

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 suspected serious injuries from 2016 forward indicate that HSIP funded safety improvements have had some beneficial effect. The 5 year rolling average of suspected serious injuries has declined year by year resulting in a decline of 4.7% since the high mark in 2014. At the same time the 5 year average of fatalities has varied year by year with a change of 10.7 % higher from the lowest average recorded in 2013. These results indicate that factors influencing the dynamics of serious crashes have 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.

The shift in crash severity toward more fatalities while suspected serious injuries remain relatively stable is difficult to explain since the onset of the Covid 19 pandemic. Factors such as increased average operational speeds and driver awareness may be an area 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. 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?

03/01/2016

What are the years being covered by the current SHSP?

From: 2017 To: 2021

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

2022

The Covid pandemic has caused some delays in completing crash data trend analysis and stakeholder outreach activities to support the Strategic Highway Safety Plan revision. However, the revised document is in final review and it is anticipated to be completed in calendar year 2022.

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
	End Point Segment Descriptor (11) [11]	100							100		100
	Segment Length (13) [13]	100									
	Direction of Inventory (18) [18]	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
	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							
	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					

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
	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.

For the Non-Local Paved Road requirements, INDOT currently maintains all MIRE Required Elements as part of the annual HPMS report.

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. The data element (131) Intersection/Junction Control is subject to review of data maintained in other INDOT traffic management inventories using the INDOT Work Management System. Determination of needed data collection will be made once the review is complete.

INDOT has data to support the inventory data elements for Interchanges\Ramps on Non-Local Paved Roads. Inventory elements will 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%. Data collection for (23) Surface Type and (31) Number of Through Lanes is now at 100%. 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.

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:

Updated Question 29 template - For 2022 HSIP Report.xlsm
Safety Performance:

Evaluation:

FINAL Question 46 template.xlsm
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.