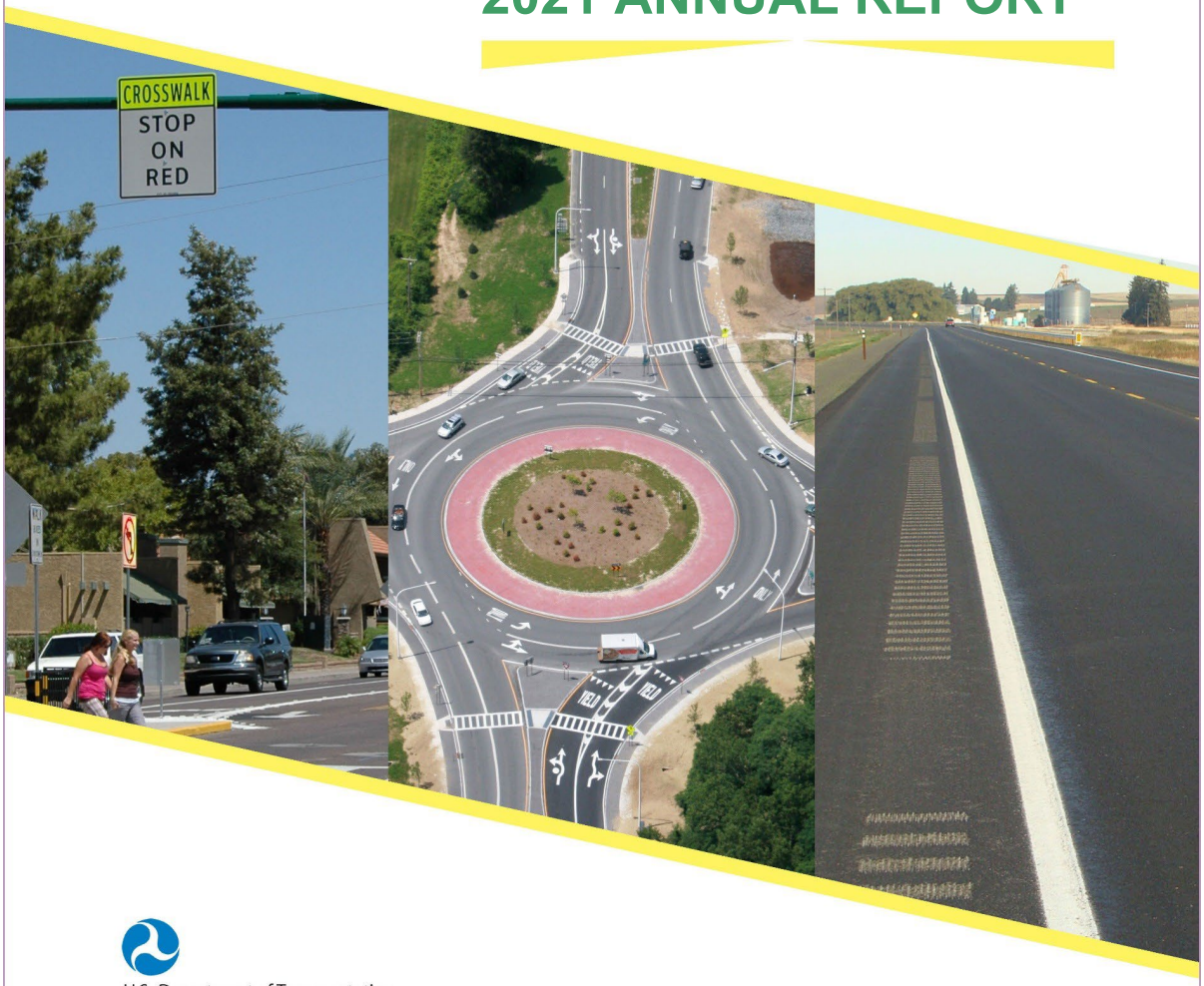
INDIANA

HIGHWAY SAFETY IMPROVEMENT PROGRAM

2021 ANNUAL REPORT



U.S. Department of Transportation
Federal Highway Administration

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Disclaimer

Protection of Data from Discovery Admission into Evidence

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

23 U.S.C. 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. 409 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) 2021. 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 2021, beginning October 1, 2020, and ending on September 30, 2021. 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 809 in calendar year 2019 to 896 in 2020, which represents an increase of 10.75% over the previous year causing the 5 year rolling average to also increase by 1.87%. The early estimate for 2020 vehicle miles of travel indicates a decrease of approximately 7.01% from 2019 to 2020. As a result, the estimated rate of fatalities per one hundred million vehicle miles of travel (HMVMT) also increased by 19.12% for the year and 2.51% for the 5 year average.

In 2020, the count of Suspected Serious Injuries (SSI) was 3,302, while the SSI number for 2019 was 3,062. This indicates a one year rise of 7.83%, apparently interrupting a multiyear downward trend from a high of 3,505 in 2016. However, the 2020 rise in SSI does not interrupt the downward trend in the 5 year average with a decrease of 0.8% compared to the previous 5 year average.

It must be noted that conclusions regarding suspected serious injury trends shouldn’t be drawn from the 2020 data for two reasons. First the unusually low VMT due to the Covid pandemic resulted in unusual travel patterns that may have been a contributing factor that led to more fatal and serious injury outcomes versus all injury outcomes for much of 2020. Also, 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 allowed 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 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. In order to continue to report suspected serious injuries in the interim, 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 an interim method until changes were completed in the ARIES crash database allowing a direct count of the MMUCC defined injury natures descriptions that FHWA defined as suspected serious injuries. 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.

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. 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 2021. However, starting with 2020 INDOT has begun reporting suspected serious injuries according to current MMUCC 4th and 5th Edition requirements. INDOT decided to count persons identified by the suspected serious injury nature descriptions in order to complete by the end of 2024, a phased rollout of the officer reported injury nature data for the 5 year rolling averages so that suspected serious injury reporting may commence populated with officer collected data.

The shift in crash severity witnessed in 2020 is difficult to explain on the basis of employment rate which experienced a decline in 2020. In prior years, employment rate had been found to be a major factor influencing serious crash outcomes. However, in 2020 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 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 the 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.

In federal fiscal year (FFY) 2021, 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 $73.3 million. The planned federal obligation total exceeds the $55.6 million apportionment of HSIP funds. In addition, $21.5 million was obligated to safety projects from other federal aid programs. 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).

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 2021, the minimum Section 164-HE obligation is $16.6 million. To date, INDOT has obligated $18.8 million of Section 164-HE in FY 2021. INDOT is currently increasing efforts to obligate all available federal safety 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, the eligibility for federal safety program funding is determined and the relative priority of the candidate project's needs 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. In FFY 2020 the set aside for locally sponsored safety projects was approximately $19.04 million. 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*Highway Safety Improvement Program Local Project Selection Guidance*, provides 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 finance, budget and project prioritization/programming, the Manager of the OTS acts as the chair to the INDOT Traffic Safety Asset Management 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. 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 Traffic Safety Asset Management 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?

Operations

The INDOT Office of Traffic Safety is located within the Traffic Engineering Divison 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 LTAP 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.

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 Act, 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. One third of the total percentage of HSIP funds is made available to local agencies, resulting in more opportunity to combat severe crash risk in both urban and rural areas.

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 and project work types defined in the HSIP Local Project Selection Guidance documents. If 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?

No

At present INDOT does not have a combined HSIP manual, although there are INDOT 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 2021.

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
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

Proposed 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	Exposure	Roadway

- All crashes
- Fatal and serious injury crashes only
- Volume
- 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 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 3 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	Exposure	Roadway
• All crashes • Fatal and serious injury crashes only	• Volume	• 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

- Fatal and serious injury crashes only

Exposure

- Volume

Roadway

- 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 roadways with depressed grass medians of adequate width to accommodate the larger deflections that can occur with cable barriers. 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 in conjunction with INDOT's six district traffic engineering officess. Local agencies are also afforded the ability to apply for HSIP project eligibility for 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 the aforementioned cable barrier installed on depressed grass medians, edgeline rumble stripes described below, enhanced pavement marking and signs, correction to 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
- Fatal and serious injury crashes only

Exposure

- Traffic

Roadway

- Median width
- Other-Paved Shoulder Width

What project identification methodology was used for this program?

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

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

Yes

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

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

What project identification methodology was used for this program?

- Crash frequency

- Excess proportions of specific crash types
- Relative severity index

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

Yes

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

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?

68

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

- Add/Upgrade/Modify/Remove Traffic Signal
- Cable Median Barriers
- Horizontal curve signs
- Install/Improve Pavement Marking and/or Delineation

- Other-Pedestrian Curb Ramps and Crosswalks
- Rumble Strips
- Traffic Control Device Rehabilitation
- Upgrade Guard Rails

The Total Programmed HSIP Obligations for FFY 2021 was $54,415,523. The resulting Total Systemic HSIP Obligations are expected to be $37,054,203.

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 a 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.

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)	$49,989,177	$54,415,523	108.85%
HRRR Special Rule (23 U.S.C. 148(g)(1))	$0	$86,118	0%
Penalty Funds (23 U.S.C. 154)	$0	$0	0%
Penalty Funds (23 U.S.C. 164)	$0	$18,847,191	0%
RHCP (for HSIP purposes) (23 U.S.C. 130(e)(2))	$0	$0	0%
Other Federal-aid Funds (i.e. STBG, NHPP)	$0	$29,217	0%
State and Local Funds	$4,998,912	$5,190,722	103.84%
Totals	$54,988,089	$78,568,771	142.88%

Obligated program totals include planned transfers from Advance Construction (AC) to the HSIP, HRRRP and 164-HE programs that were awarded in federal fiscal 2021. Program total for State and Local fund obligations include funds used to match obligated HSIP funds State funded safety projects and $2,387,579 of Indiana Toll Road Lease Proceeds that were obligated to projects in the northern tier of Indiana counties 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, 2020, the funds may continue to appear as un-obligated until the end of the federal fiscal year. 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 fiscal year 2021 the total obligation of HSIP eligible funds is estimated to be $78,568,771 or 144.39% 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?

33%

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

24%

INDOT Allocates 33% of the annual HSIP apportionment to fund local agency sponsored HSIP eligible projects. The planned HSIP allocation to local agencies for FFY 2021 is $18,355,886.

In FFY 2021 the projected total obligation of funds to construct local safety projects is expected to be $13,494,208. This amount is 24.26% of the total federal apportionment or 73.5% of local agency HSIP allocation.

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

$288,651

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

$511,031

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 2021. The total non-infrastructure obligation for 2021 includes safety planning actions conducted by MPOs that are funded using HSIP finds 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 $222,380.00 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?

$17,376,389

In FFY 2021 INDOT transferred about $17.4 million from the 2021 HSIP apportionment. In federal fiscal 2021, INDOT transferred an additional $25.6 million in fiscal 2020 apportionment. Additionally, after last year's report was submitted INDOT transferred $10 million from the fiscal 2019 apportionment. Per the Project Accounting and Finance Division, in order to spend all federal funding under the obligation limitation in 2021, 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 and the FAST Act 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 also have the effect of stifling innovation toward acceptance of new types of crash countermeasures. Improved guidance by FHWA regarding 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 current Indiana Crash Database, the definition of an “incapacitating injury” 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 that was slowed considerably by the Covid Pandemic. As a result, some officers persist in classifying any injury that is subject to transport from the scene for medical treatment as incapacitating and possibly a Class “A” injury. The planned change to a subjective selection of FHWA defined Injury Nature definitions may render a more accurate count of possible Class “A” injuries if officers can be trained to utilize those choices judiciously.

The definition deployed by the Indiana Traffic Records Coordinating Committee (TRCC) in late 2014, declared an injury to be “Incapacitating”; when a crash participant is transported from the scene by first responder for treatment at an emergency room or trauma center. This definition was previously acceptable under the MMUUCC Third Edition and was previously used by Indiana to classify injury severity for crash events and casualties. 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.

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. 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. The new guidelines require officers untrained in emergency medicine to determine a level of trauma to the victim from a list of possible injuries. Not only is this a difficult task for most officers who are not medically trained but 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.

In 2016, the Indiana State Police (ISP) and members of the TRCC began working on the new version of the Electronic Indiana Crash Reporting Tool for Officers. In 2019, the new officer reporting tool titled ARIES 6.0 was completed, passed beta-testing and began deployment. ARIES 6.0 has been deployed to the Indiana State Police and many of Indiana’s County Sheriff agencies. A comprehensive retraining and deployment process is on-going to all local law enforcement officers. Once that process is complete all older versions of the reporting software will be turned off. 2020 is the first full year where all crashes with reported injuries will include the FHWA mandated serious injury types, however it should be noted that the ongoing deployment of training on the new system may include subjective choices by officers not yet trained that could cause non-uniform selection of injury nature.

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 HRRRP 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 the current Indiana SHSP reliance on language calling for specific countermeasures is generally avoided, in favor of broad national “Toward Zero Deaths” strategies. Indiana feels that making the SHSP as flexible as possible provides an advantage in terms of addressing emerging technologies, countermeasures, and analysis methodologies in the coming years.

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 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 serves 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 fatal and suspected serious injury crashes 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
1600958	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1000	Signs	$29520	$36900	HSIP (23 U.S.C. 148)	Rural	Local Road or Street	8,500	55	County Highway Agency	Systemic	Roadway Departure	Sign Visibility Upgrade
1601027	Intersection traffic control	Modify control – new traffic signal	1	Locations	$39104.02	$587512.02	Penalty Funds (23 U.S.C. 164)	Urban	Minor Arterial	11,573	35	State Highway Agency	Spot	Intersections	Traffic Signal Installation
1602141	Intersection traffic control	Modify traffic signal – modernization/replacement	9	Locations	$939716.7	$1005304.03	State and Local Funds	Urban	Principal Arterial-Other	15,000	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1700901	Pedestrians and bicyclists	ADA curb ramps	60	Ramps	$670660	$745177.78	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	13,450	35	City or Municipal Highway Agency	Systemic	Pedestrians	Pedestrian Safety
1700902	Pedestrians and bicyclists	ADA curb ramps	144	Ramps	$443115	$972000	Penalty Funds (23 U.S.C. 164)	Urban	Local Road or Street	8,900	35	City or Municipal Highway Agency	Systemic	Pedestrians	Pedestrian Safety
1700903	Pedestrians and bicyclists	Modify existing crosswalk	0.22	Miles	$1293326.27	$1437029.19	HSIP (23 U.S.C. 148)	Urban	Local Road or Street	8,500	35	City or Municipal Highway Agency	Systemic	Pedestrians	Pedestrian Safety
1700936	Pedestrians and bicyclists	ADA curb ramps	104	Ramps	$2875500	$4393125		Urban	Local Road or Street	7,500	35	City or Municipal Highway Agency	Systemic	Pedestrians	Pedestrian Safety
1702090	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$136102.37	$137486.81	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	87,828	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702093	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$94239.04	$95623.04	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Interstate	87,828	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702758	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1340	Signs	$37080	$41200	Other Federal-aid Funds (i.e. STBG, NHPP)	Rural	Local Road or Street	8,500	55	County Highway Agency	Systemic	Roadway Departure	Sign Visibility Upgrade
1702855	Roadway signs and traffic control	Curve-related warning signs and flashers	578	Signs	$151681.05	$201634.5	HSIP (23 U.S.C. 148)	Rural	Local Road or Street	4,234	35	City or Municipal Highway Agency	Systemic	Curve and Warning Signs Visibility	Sign Visibility Upgrade

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
1702087	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$160747.25	$589347.25	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	7,250	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702088	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$128903.5	$128903.5	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	7,250	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702089	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$198832.19	$198832.19	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,240	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702091	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$113304.8	$113304.8	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,240	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702090	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$106442.01	$106442.01	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	6,480	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702094	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$164373.59	$164373.59	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	6,480	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702095	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$159776.97	$159776.97	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	10,125	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702096	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$163442.87	$163442.87	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	10,125	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702097	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$137446.86	$137446.86	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,500	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702098	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$104797.81	$104797.81	HSIP (23 U.S.C. 148)	Urban	Principal Arterial-Other	8,500	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1702101	Intersection traffic control	Modify traffic signal –other	8	Traffic signal visibility project	$359119.33	$359119.33	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	13,000	55	State Highway Agency	Systemic	Intersections	Traffic Signal Visibility
1800941	Intersection traffic control	Modify traffic signal –other	40	Traffic signal visibility project	$529380	$529380	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	12,500	55	State Highway Agency	Systemic	Intersections	Traffic Signal Visibility
1800942	Intersection traffic control	Modify traffic signal – modernization/replacement	15	Locations	$3941087.06	$3993797.06	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	13,000	55	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1800943	Intersection geometry	Intersection geometry - other	7	Modify center medians	$718961.76	$762941.76	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	14,500	55	State Highway Agency	Spot	Intersections	Congestion Mitigation

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
1801310	Intersection traffic control	Modify traffic signal – modernization/replacement	7	Locations	$2336715.41	$2336715.41	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	11,500	55	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1801312	Roadway signs and traffic control	Curve-related warning signs and flashers	789	Signs	$158005.49	$158005.49	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	7,500	55	State Highway Agency	Systemic	Curve and Warning Signs Visibility	Sign Visibility Upgrade
1801318	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	15	Locations	$467729.93	$467729.93	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Systemic	Roadway Departure	Sign Visibility Upgrade
1801319	Roadway signs and traffic control	Roadway signs and traffic control - other	7	Highway sign and Pavement marking visibility upgrade	$126103.92	$126103.92	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	8,950	55	State Highway Agency	Systemic	Roadway Departure	Sign and Marking Visibility
1801399	Intersection traffic control	Modify traffic signal –other	15	Traffic signal visibility project	$411485.34	$411485.34	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	7,885	55	State Highway Agency	Systemic	Intersections	Traffic Signal Visibility
1801401	Intersection traffic control	Modify traffic signal –other	19	Install UPS Battery Back-Up	$113007.23	$124991.03	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	9,300	55	State Highway Agency	Systemic	Intersections	UPS Battery Back-Up
1801403	Intersection traffic control	Modify traffic signal –other	13	Traffic signal visibility project	$324960.4	$324960.4	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Intersections	Traffic Signal Visibility
1801404	Intersection traffic control	Modify traffic signal – modernization/replacement	5	Locations	$715620.56	$1070320.56	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1801405	Roadway	Rumble strips – center	80.95	Miles	$750367.53	$750367.53	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	10,000	55	State Highway Agency	Systemic	Roadway Departure	Centerline and Edgeline Rumble Stripes
1801406	Roadway delineation	Raised pavement markers	181.68	Miles	$343034.15	$343034.15	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	9,500	55	State Highway Agency	Systemic	Roadway Departure	RPM Refurbishment
1801407	Intersection traffic control	Modify traffic signal –other	14	Install UPS Battery Back-Up	$87107.19	$87107.19	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	7,800	55	State Highway Agency	Systemic	Intersections	UPS Battery Back-Up
1801411	Lighting	Interchange lighting	1	Locations	$2025387.94	$2263269.94	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Interstate	14,250	70	State Highway Agency	Spot	Interchange Highway Lighting	Install Lighting

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
1801412	Roadway delineation	Raised pavement markers	6742	Numbers	$248836.02	$248836.02	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	7,850	55	State Highway Agency	Systemic	Roadway Departure	RPM Refurbishment
1801443	Pedestrians and bicyclists	ADA curb ramps	38	Ramps	$634500	$898875	HSIP (23 U.S.C. 148)	Urban	Local Road or Street	8,500	35	City or Municipal Highway Agency	Spot	Pedestrians	Pedestrian Safety
1801453	Roadway signs and traffic control	Roadway signs and traffic control - other	171	Highway Sign Visibility Improvements	$88831.06	$88831.06	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	7,900	55	State Highway Agency	Systemic	Sign Visibility Improvement Project	Sign Visibility Upgrade
1801592	Pedestrians and bicyclists	Pedestrian beacons	16	Install Pedestrian Flashing Beacons	$402168	$562190	HSIP (23 U.S.C. 148)	Urban	Local Road or Street	7,250	35	City or Municipal Highway Agency	Spot	Pedestrians	Install Pedestrian Flashers
1801682	Roadway delineation	Raised pavement markers	41.68	Miles	$371576.05	$371576.05	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Roadway Departure	RPM Refurbishment
1801969	Advanced technology and ITS	Adaptive Signal Control System	248	Intersections	$2982820.04	$2982820.04	HSIP (23 U.S.C. 148)	Urban	Multiple/Varies	7,500	35	City or Municipal Highway Agency	Systemic	GPS Driven Emergeney Vehicle Pre-Emption System Installation	Pre-emption system
1802056	Roadway signs and traffic control	Curve-related warning signs and flashers	33.58	Miles	$74000	$74000	HSIP (23 U.S.C. 148)	Rural	Minor Arterial	8,186	55	State Highway Agency	Systemic	Roadway Departure	Install Curve Warning Signs
1802057	Roadway signs and traffic control	Curve-related warning signs and flashers	60	Signs	$17252.69	$17252.69	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	7,193	55	State Highway Agency	Systemic	Roadway Departure	Sign Visibility Upgrade
1802061	Pedestrians and bicyclists	Pedestrian signal	43	Locations	$290000	$290000	HSIP (23 U.S.C. 148)	Urban	Local Road or Street	8,500	35	City or Municipal Highway Agency	Systemic	Pedestrians	Pedestrian Crossing Enhancements
1802066	Intersection traffic control	Modify traffic signal –other	1	Traffic signal visibility project	$27162.54	$27162.54	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	11,162	55	State Highway Agency	Spot	Intersections	Traffic Signal Visibility
1802793	Intersection traffic control	Modify traffic signal – modernization/replacement	2	Locations	$334409.4	$419511.75	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	10,500	45	City or Municipal Highway Agency	Spot	Intersections	Traffic Signal Mods
1802798	Intersection traffic control	Modify traffic signal – modernization/replacement	6	Locations	$765597.84	$956788.97	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	9,200	45	City or Municipal Highway Agency	Spot	Intersections	Traffic Signal Mods

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
1802798	Intersection traffic control	Modify traffic signal – modernization/replacement	7	Locations	$765597.84	$956788.97	HSIP (23 U.S.C. 148)	Urban	Minor Arterial	10,500	45	City or Municipal Highway Agency	Spot	Intersections	Traffic Signal Mods
1802914	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	759	Signs	$209807.67	$233119.63	HSIP (23 U.S.C. 148)	Rural	Local Road or Street	5,500	35	City or Municipal Highway Agency	Systemic	Roadway Departure	Sign Visibility Upgrade
1802915	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	909	Signs	$247030	$274478.3	HSIP (23 U.S.C. 148)	Rural	Local Road or Street	5,500	35	City or Municipal Highway Agency	Systemic	Roadway Departure	Sign Visibility Upgrade
1900459	Lighting	Lighting - other	2308	Replace HPS with LED bulbs	$1573081.51	$1573081.51	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	8,900	55	State Highway Agency	Systemic	HPS to LED Change Out	Lighting Upgrade
1901392	Intersection traffic control	Modify traffic signal – modernization/replacement	2	Locations	$321509.7	$321509.7	Penalty Funds (23 U.S.C. 164)	Rural	Minor Arterial	8,748	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1902018	Roadway delineation	Raised pavement markers	26092	Numbers	$450000	$450000	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	9,200	55	State Highway Agency	Systemic	Roadway Departure	RPM Refurbishment
1902036	Roadway delineation	Raised pavement markers	6468	Numbers	$534459	$534459	HSIP (23 U.S.C. 148)	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Roadway Departure	RPM Refurbishment
1902122	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$134585.44	$134585.44	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	14,591	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
1902727	Intersection traffic control	Modify traffic signal – modernization/replacement	1	Locations	$207472.37	$339075.67	Penalty Funds (23 U.S.C. 164)	Urban	Minor Arterial	9,322	45	State Highway Agency	Spot	Intersections	Traffic Signal Mods
2001564	Pedestrians and bicyclists	ADA curb ramps	114	Ramps	$17252.69	$17252.69	Penalty Funds (23 U.S.C. 164)	Urban	Principal Arterial-Other	10,042	45	State Highway Agency	Systemic	Intersections	Pedestrian Safety
2001636	Roadway delineation	Raised pavement markers	34048	Numbers	$411400.72	$411400.72	Penalty Funds (23 U.S.C. 164)	Rural	Principal Arterial-Other	8,500	55	State Highway Agency	Systemic	Roadway Departure	RPM Refurbishment
2002585	Roadway	Rumble strips – center	6	Miles	$93059.03	$93059.03	HSIP (23 U.S.C. 148)	Rural	Major Collector	4,682	55	State Highway Agency	Systemic	Lane Departure	Centerline and Edgeline Rumble Stripes

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, 2021.

2021 Indiana Highway Safety Improvement Program

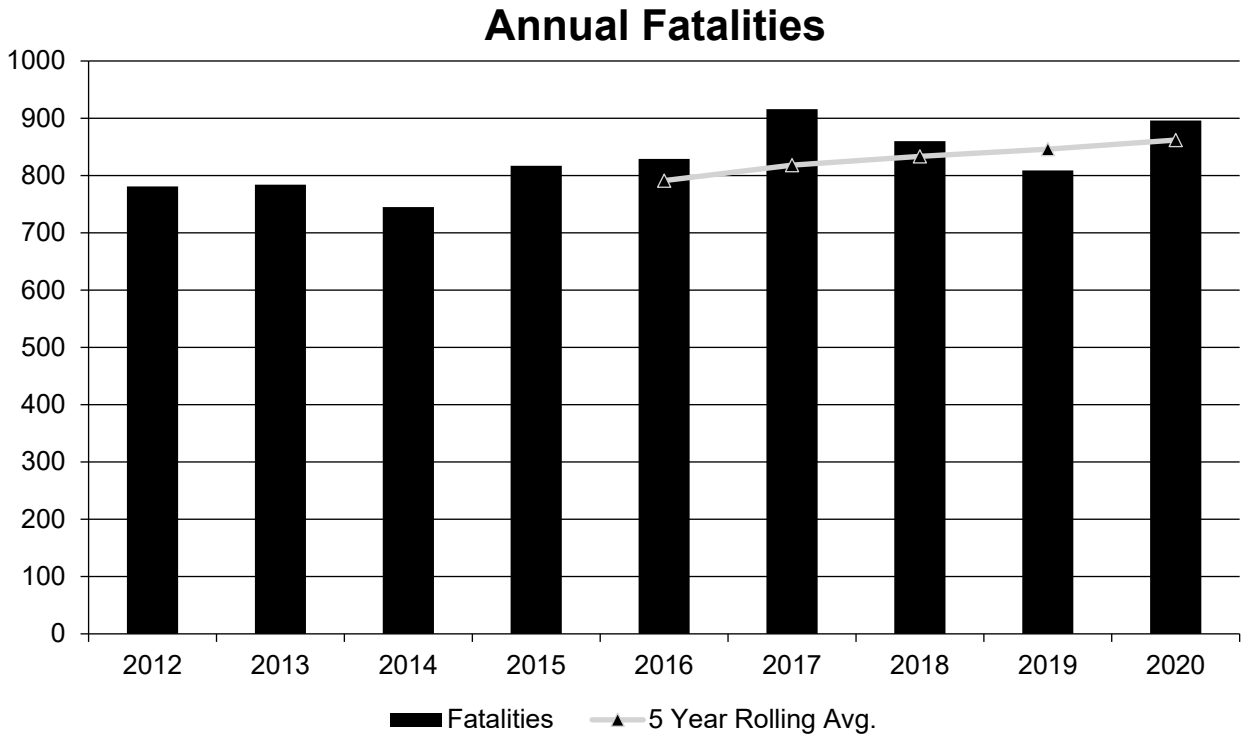
Projects with the Improvement Category of Non-infrastructure consist of improvements to traffic safety data systems or traffic safety planning efforts. Metropolitan planning organizations undertake safety planning as part of their annual Unified Planning Work Programs. HSIP funding is also used for non-infrastructure 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	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fatalities	781	784	745	817	829	916	860	809	896
Serious Injuries	3,823	3,453	3,338	3,434	3,505	3,388	3,210	3,062	3,302
Fatality rate (per HMVMT)	0.990	1.000	0.940	1.037	0.997	1.120	1.055	0.978	1.165
Serious injury rate (per HMVMT)	4.844	4.409	4.215	4.357	4.214	4.145	3.937	3.701	4.293
Number non-motorized fatalities	84	87	94	109	97	118	140	91	125
Number of non-motorized serious injuries	321	295	277	276	280	248	254	234	299


Annual Fatalities
1000
900
800
700
600
500
400
300
200
100
0
2012
2013
2014
2015
2016
2017
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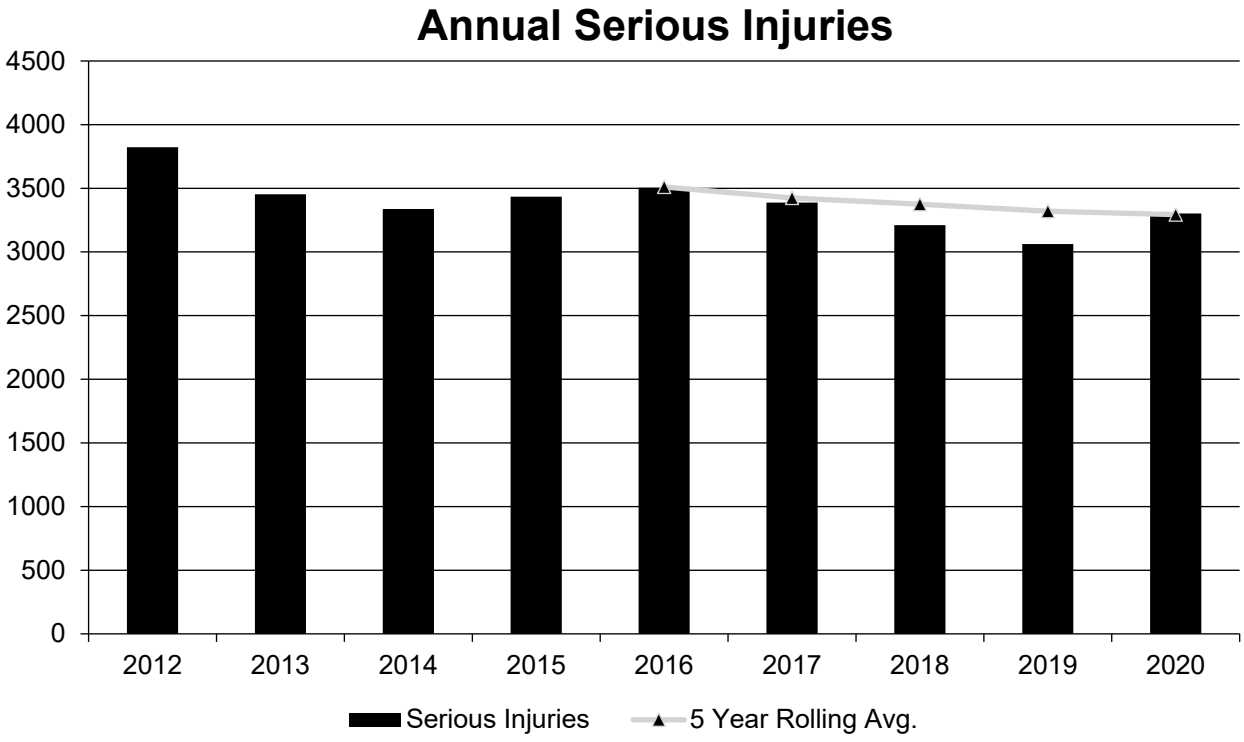
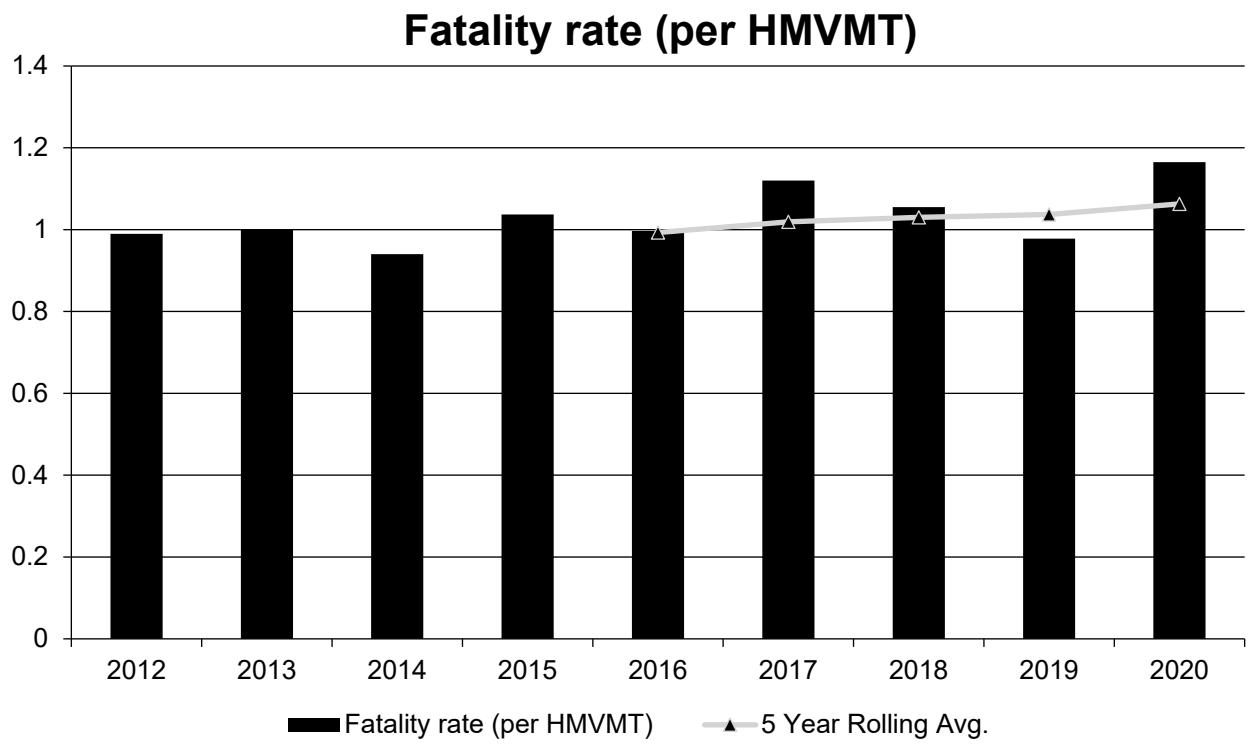
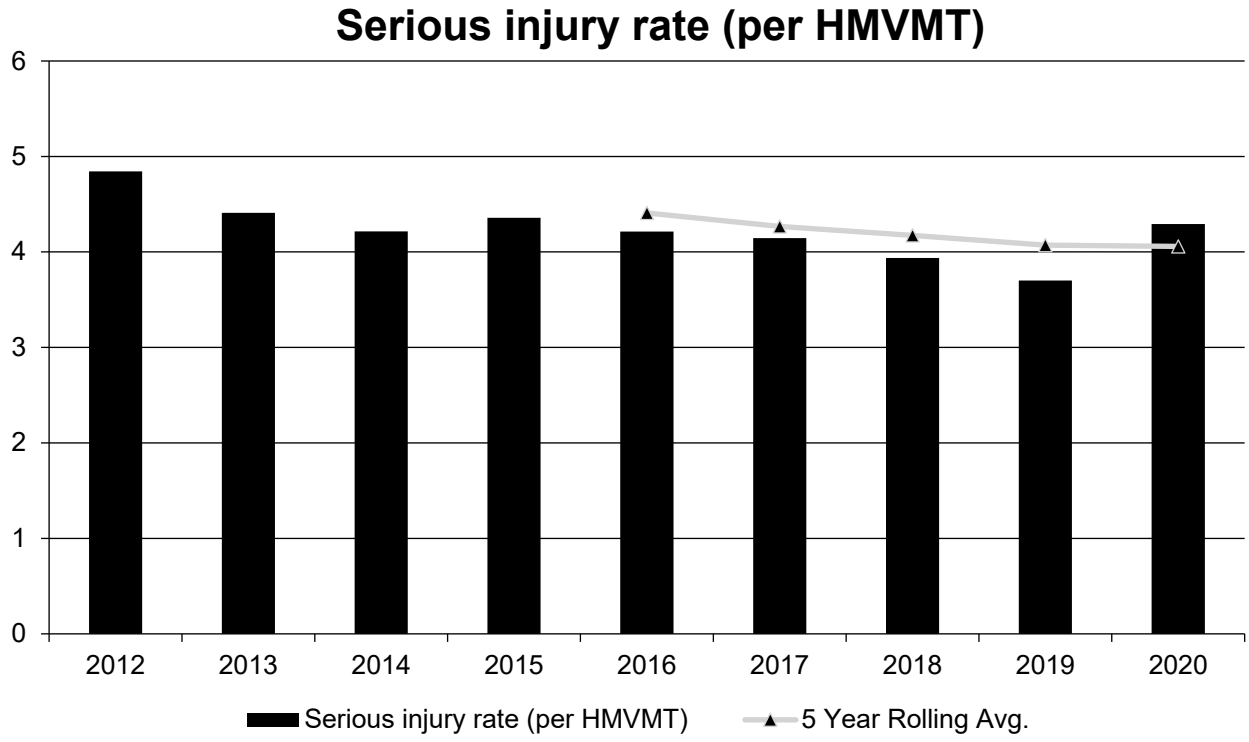
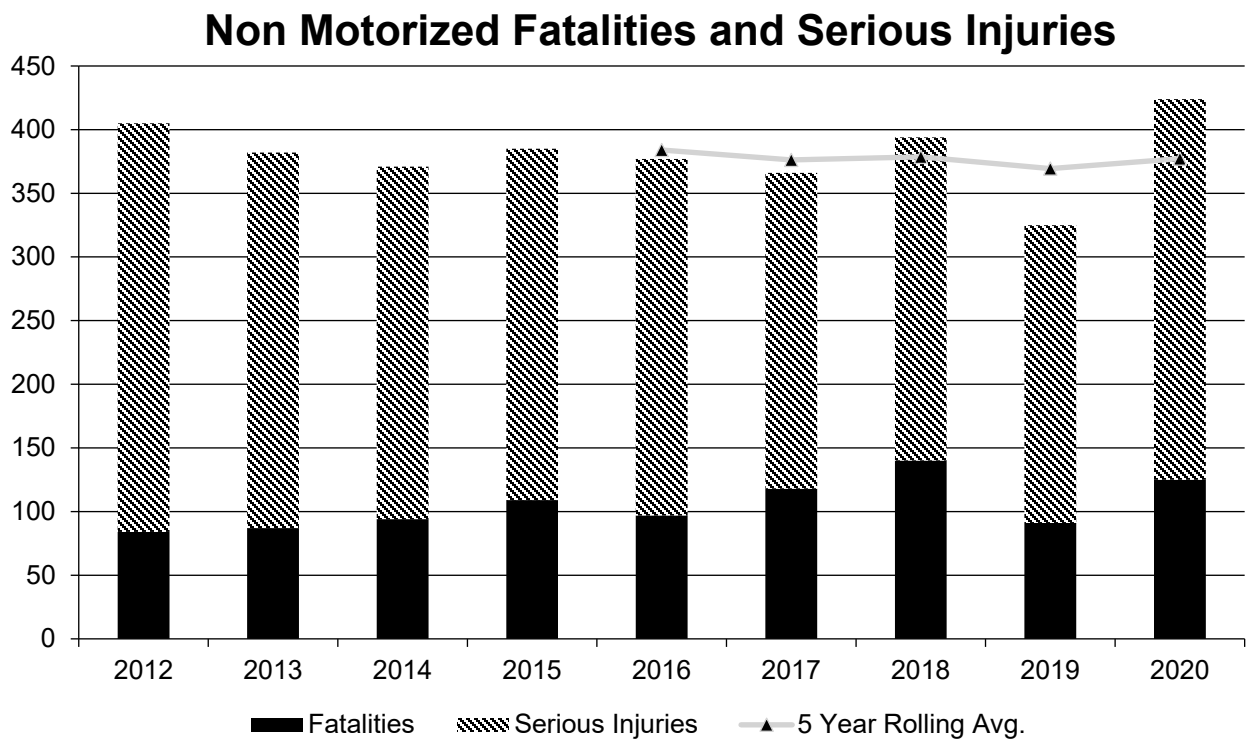
2019
2020
Fatalities
5 Year Rolling Avg.


Annual Serious Injuries
4500
4000
3500
3000
2500
2000
1500
1000
500
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Serious Injuries
5 Year Rolling Avg.


Fatality rate (per HMVMT)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
Fatality rate (per HMVMT)
5 Year Rolling Avg.


Serious injury rate (per HMVMT)
6
5
4
3
2
1
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
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 determined by a crash victim transported from the scene for treatment. This definition was 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 new regulation for setting and reporting traffic safety performance measures established in the MMUCC 4th Edition compelled Indiana to determine a method to approximate 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.

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 analyzed statewide incapacitating injury counts across the 10 years prior to the Indiana TRCC reclassification that began in November 2014. Crash data records for the years 2004 to 2013 were analyzed to determine a percentage of the total number of non-fatal incapacitating injuries that were recorded each of these years. The incapacitating injury counts from these years are assumed to equate to the current definition of suspected serious injuries and were evaluated to establish the average percentage of non-fatal suspected serious injuries that contribute to total injury counts. The annual average percent contribution of suspected serious injuries prior to the 2014 Indiana TRCC definition change was calculated and weighted to the most recent years before 2014, resulting in a factor established to be 7.2% of all injuries. Indiana received approval from FHWA to use this 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 7.2% 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% share of all injuries was considered to be valid only when examining statewide crashes on all roads in Indiana. Separate percentage values of Suspected Serious Injuries were established for subsets of the data that are used for reporting sub program performance based on separate historic analysis using the same methodology to establish estimated percentage contributions in those data subsets.

In late 2019, the vendor that manages Indiana's crash records system (AIRES) for the Indiana State Police made changes to the officer's reporting software so that a person transported from the scene for treatment would no longer be identified as a person with a suspected serious injury. This change removed the designation Transported from the Scene as a requirement for identifying incapacitating injuries and a requirement was added that the officer select among a list of injury nature definitions for each person injured. In April of 2021 a review by FHWA found and adjusted the injury nature definitions to comply with the descriptions contained in the MMUCC 4th and 5th Editions. 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 subsequently determined that the 2020 count of suspected serious injuries resulted in a 7.8% increase over the 2019 count using the prior interim procedure.

The new version of the officers 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 multiple county sheriffs' departments. The deployment of the ARIES 6 officer reporting system is currently ongoing in 2021 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.

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 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. To be clear, the changes made in 2021 to bring Indiana's SSI definitions into full compliance with the MMUCC 4th and 5th editions are not likely to result in a discontinuity in the count of suspected serious injuries. Review of the direct count of 2020 injury data shows an increase of 7.8% above the 2019 estimate. When consideration of the unusual nature of data in 2020 is considered, the actual difference in these counts is relatively minor, therefore the old (2014 to 2019) temporary estimation procedure is found to be reasonably accurate.

The one exception to the above described procedure is used in question 34. A different procedure is used to set the mandated PM 1 safety performance targets for calendar year 2022. 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. CJI felt that the data from 2020 consisted of unusual variables that could have an unhelpful influence for target setting. It was decided that a single year of direct data collected at the height of the Covid pandemic would not be a reliable source to use for trend analysis or to project future year target values for either count of fatalities or for the count of suspected serious injury targets.

It was agreed that at least one more year of data from 2021 would need to be collected and incorporated in order to extrapolate projected values for the 2023 PM1 performance targets. INDOT agreed with this assessment, therefore the use of direct suspected injury counts will wait at least until the target setting process for 2023 commences.

Describe fatality data source.

FARS

FARS Final Report File for the preceding years through 2019,
FARS Annual Report File for the year 2018 and earlier Website location:
https://cdan.nhtsa.gov/SASStoredProcess/guest

Indiana State Police ARIES Crash Reporting System for the year 2020

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

Year 2020

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	59	93	0.68	1.07
Rural Principal Arterial (RPA) - Other Freeways and Expressways				
Rural Principal Arterial (RPA) - Other	92	172	1.76	3.29
Rural Minor Arterial	82	223	2.51	6.8
Rural Minor Collector	27	118	1.38	6.04
Rural Major Collector	99	373	1.89	7.11
Rural Local Road or Street	136	257	2.6	4.93
Urban Principal Arterial (UPA) - Interstate	39	175	0.33	1.47
Urban Principal Arterial (UPA) - Other Freeways and Expressways	21	38	1.33	2.48
Urban Principal Arterial (UPA) - Other	100	714	0.94	6.69
Urban Minor Arterial	78	593	0.91	6.91
Urban Minor Collector	4	11	0	
Urban Major Collector	27	258	0.52	4.95

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)
Urban Local Road or Street	102	268	0.71	1.84

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 2016 through 2020 have been adjusted for approved and estimated VMT data and changes in the interim 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. 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 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.

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 in 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 counts and rates of suspected serious injuries in future reporting years.

Provide additional discussion related to general highway safety trends.

2021 so far has seen a significant recovery of economic activity from the downturn due to the Covid 19 pandemic that was experienced in 2020. Although the recovery isn't complete, travel activity has caused an increase of 7.62% in the estimated Vehicle Miles of Travel (VMT) for 2021. 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 2020 increased by 10.75% compared to 2019. The unexpected 2020 spike in fatalities resulted in an increase of 1.87% in the 5 year rolling average. Suspected serious injuries increased by 7.84%, however this change is possibly the result of a data discontinuity resulting from the previously described change in procedure for counting suspected serious injuries and the general downward trend in total injuries and total crash events in 2020 provides evidence that the trend in the most severe outcomes runs counter to other crash trends.

Statewide 2020 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 harmful events in 2020. The long-term ongoing risk of roadway departure crashes has resulted in the development of several systemic improvement types aimed at reducing the incidence of lane departures. Widespread deployment of multiple countermeasures such as cable barrier, rumble stripes, safety edge, curve marking and high friction surface treatments has resulted in a moderate downward trend in crashes resulting from travel lane vehicle departures, including roadway departure, head-on and opposite direction sideswipe crashes. The slow downward trend of vehicle lane departure fatalities was continued in 2020. The 5-year average of lane departure fatalities and serious injuries was 36.60% of all crashes of the same severity. In comparison the 5-year averages were 38.7% of the total in 2019, and 40.6% in 2018. The most numerous of these crashes continues to be the result of single vehicles leaving the roadway, although in 2020 there was also a slight increase in the number of cross median head on crashes on two lane two way roadways.

Fatal and serious injury outcomes as a result of intersection crashes continues to make up the second worst type of harmful event. In 2020 the 5-year average of intersection fatal and serious injury crashes contributed 31.8% of all crashes of the same severity. In 2019 the same comparison to all crashes of the same severity was 32.5%. 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 along with a program

to modernize traffic signal control equipment. 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 prevalent design types that result from those instances when an innovative type is validated. All intersection improvement design choices made using HSIP funds must first be 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 horse drawn buggy riders. 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 wide paved shoulders for buggies where they are deemed appropriate.

In 2020, the 5-year rolling average of pedestrian involved fatal and serious injury crashes grew to 7.5% of all serious crashes compared to 4.7% in 2019, 5.3 % in 2018, 5.8% in 2017, and 6.3% in 2016. While the trend of suspected serious injuries appears to be downward in terms, the percentage of fatal pedestrian fatalities has grown to 11.4% 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 in an equitable manner. 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 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, an unchanged trend of serious outcome bike crashes has occurred. The 5-year average percentage of serious bike crashes of this type compared to all serious injury crashes in 2020 was 1.8%, compared to 1.7% in 2019 and 1.8 percent in 2018.

Safety Performance Targets

Safety Performance Targets

Calendar Year 2022 Targets *

Number of Fatalities:876.0

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

Data Source: Fatality Analysis Reporting System

2018 FARS Final File Count

2019 FARS Annual Report File

2020 Indiana State Police ARIES Database

Safety performance targets result from analysis of trends in crashes of the stated severity rather than goals themselves. The information on expected performance acts as a benchmark to measure progress or indicate where changes are needed to improve program effectiveness going forward. The safety targets therefore do not represent goals but rather expected results due to current conditions.

For the purpose of comparison to the SHSO's annual HSP report to NHTSA, the 5 year average performance target listed above is based on a projected calendar **2022 value of (920.4)** as described in the following methodology.

INDOT calculates this performance target by using a linear regression model based on the number of fatalities in previous years to predict fatalities.

It was determined that analysis methods used during the previous year would not be as effective for this submission due to the unexpected events of 2020. Therefore, a return to a simple linear regression model was chosen to predict fatalities.

In order to predict the number of fatalities, this model would use the previous 5 years of data. However, the 2020 data was determined to be an outlier so that year was excluded from the calculation. 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.

Number of Serious Injuries:2998.2

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

Data Source: Automated Reporting Information Exchange System (ARIES)

2004 - 2013 As reported count of "Incapacitating Injuries"

2014 - 2019 Estimated count amounting to 7.2% of all non-fatal injuries

2020 Direct count of Suspected Serious Injuries from ARIES Database

Safety performance targets result from analysis of trends in crashes of the stated severity rather than goals themselves. The information on expected performance acts as a benchmark to measure progress or indicate where changes are needed to improve program effectiveness going forward. The safety targets therefore do not represent goals but rather expected results due to current conditions.

For the purpose of comparison to the SHSO's annual HSP report to NHTSA, the 5-year average performance target for Number of Serious Injuries listed above is based on a projected calendar **2022 value of (3019.0)** as described in the following methodology.

Baseline projections are calculated using all injury counts and applying the 7.2% adjustment to calculate yearly Suspected Serious Injury counts for years 2016 – 2019. An equation is used to generate predictive values for 2021 and 2022.

In order to predict the number of serious injuries, this model would use the previous 5 years of data. However, the 2020 data was determined to be an outlier so that year was excluded from the calculation. The excel functions of SLOPE () and INTERCEPT () were used to generate the predictive equation. The predictive equation is of the form SERIOIUS_INJ=YEAR*SLOPE()+INTERCEPT(). This predicted total was then adjusted upwards by 5% to account for any unexpected variances.

Fatality Rate:1.076

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

Data Source: Fatality Analysis Reporting System (FARS)

The NHTSA calculated and reported FARS values 2016 through 2019.

2020 - Indiana State Police ARIES Database

FHWA reported VMT values for 2016 - 2019

INDOT estimated VMT values for 2020 and 2021

Safety performance targets result from analysis of trends in crashes of the stated severity rather than goals themselves. The information on expected performance acts as a benchmark to measure progress or indicate where changes are needed to improve program effectiveness going forward. The safety targets therefore do not represent goals but rather expected results due to current conditions.

For the purpose of comparison to the SHSO annual report, the 5-year average performance target listed above is based on a projected calendar **2022 value of (1.110)** as described in the following methodology.

Estimated/Predicted values for 2017-2021: The FHWA approved VMT for 2018 was significantly lower than the INDOT reported value therefore an adjustment was made to the projection of annual Vehicle Miles Traveled (VMT) growth rate estimates. For 2018 a growth of 1.0% was used however for 2020 a reduction of 7.4% is assumed due to effects of the Covid 19 pandemic. For 2021 the assumed VMT was estimated to be 1% below 2019 with the assumed growth rate at 1.0%.

INDOT's Technical Planning Support & Programming Division estimates VMT by averaging the last 5 years of Annual Growth Rates for each of five factor groups and then averaging them. The Office of Traffic Safety uses those predicted annual estimates along with estimated fatalities then evaluated with the projected VMTs for their respective future years to produce predicted fatality rates per 100-million VMT.

Serious Injury Rate:3.675

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

Data Source: Automated Reporting Information Exchange System (ARIES)

2004 – 2013 ARIES As reported count of "Incapacitating Injuries"

2014 – 2020 ARIES Estimated incapacitating injuries count per approved process per VMT values FHWA VMT for 2014-2018 and INDOT values for 2019.

FHWA reported VMT values for 2016 - 2019

INDOT estimated VMT values for 2020 and 2021

Safety performance targets result from analysis of trends in crashes of the stated severity rather than goals themselves. The information on expected performance acts as a benchmark to measure progress or indicate where changes are needed to improve program effectiveness going forward. The safety targets therefore do not represent goals but rather expected results due to current conditions.

The 5-year average performance target listed above is based on a projected calendar **2022 value of (3.630)** as described in the following methodology.

Estimated/Predicted values for 2017-2021: The FHWA approved VMT for 2018 was significantly lower than the INDOT reported value therefore an adjustment was made to the projection of annual Vehicle Miles Traveled (VMT) growth rate estimates. For 2018 a growth of 1.0% was used however for 2020 a reduction of 7.4% is assumed due to effects of the Covid 19 pandemic. For 2021 the assumed VMT was estimated to be 1% below 2019 with the assumed growth rate at 1.0%.

INDOT's Technical Planning Support & Programming Division estimates VMT by averaging the last 5 years of Annual Growth Rates for each of five factor groups and then averaging them. The Office of Traffic Safety uses those predicted annual estimates for suspected serious injuries along with the projected VMTs for their respective future years to produce predicted fatality rates per 100 million VMT.

Total Number of Non-Motorized Fatalities and Serious Injuries:344.5

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

Data Source: Fatality Analysis Reporting System (Non-motorist persons)

2009-2014 FARS Final File Count

2016-2019 FARS Annual Report File

2020 Indiana State Police ARIES database

Data Source: Suspected Serious Injury Automated Reporting Information Exchange System (ARIES) (Non-motorist persons)*

2009-2013 As reported count of "Incapacitating Injuries"

2014-2018 Estimated count amounting to 13% of all non-fatal injuries

Safety performance targets result from analysis of trends in crashes of the stated severity rather than goals themselves. The information on expected performance acts as a benchmark to measure progress or indicate where changes are needed to improve program effectiveness going forward. The safety targets therefore do not represent goals but rather expected results due to current conditions.

The 5-year average performance target listed above is based on a projected calendar **2022 value of (366)** as described in the following methodology.

In order to predict the number of non-motorized fatalities, this model would use the previous 5 years of data. However, the 2020 data was determined to be an outlier so that year was excluded from the calculation. 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.

*In addition to persons classified as pedestrians or pedal-cyclists, persons classified as animal drawn vehicle operators are included in the calculation. This is due to the significant number of crashes involving these vehicles across Indiana.

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

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. The Traffic Safety Performance Target Setting Team held seven meetings from July of 2016 through June of 2017 in-order to establish a procedure for calculation of the required annual safety performance targets. 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 2018 targets.

Using similar procedures, INDOT has calculated safety performance targets for calendar years 2019, 2020, 2021 and 2022. A final agreement on each target for 2022 was reached on May 21, 2021. The Traffic Safety Performance Target Setting Team included INDOT, LTAP, Indiana Criminal Justice Institute (which hosts Indiana's State Highway Safety Office) and the Indiana Metropolitan Planning Organization Council.

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 2020 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	907.7	862.0
Number of Serious Injuries	3467.4	3293.4
Fatality Rate	1.100	1.063
Serious Injury Rate	4.178	4.058
Non-Motorized Fatalities and Serious Injuries	405.9	377.2

For target year 2020, INDOT estimates that Indiana met all of the PM 1 Safety Performance Targets as defined per 23 CRF 490.211(c)(2). The calculation of 2020 targets utilized a revised projection estimate method established to consider lessons learned from the 2018 effort to project target values for 2019.

The assessment of 2020 target values contained in this report utilized the Annual VMT data for years 2016 through 2019 from FHWA and the latest known preliminary 2020 values for HMVMT from the INDOT Traffic Statistics Office. The FHWA volume data on the VM-2 table was queried 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 2020 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 2022. The preliminary estimated outcome is that the target for fatality count and fatality rate will be met. The unknown element that may cause one or more of the target rates to fail is the effect of the Covid 19 pandemic on travel patterns, in particular, the VMT estimation that will be determined by FHWA at the time of their review. If FHWA determines that the 2020 VMT is lower than the INDOT early estimate, the result could be a failure to meet the target rate for fatalities and/or suspected serious injuries.

The counts of suspected serious injuries, non-motorized fatalities and suspected serious injury counts for all years are also from the Indiana Crash Database. 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 2020 suspected serious injuries higher than in 2019 by 240 people. The data discontinuity caused by the change in counting methodology is relatively small as it represents about a 7.8% increase over the former counting methodology used for 2014 through 2019. The former method used a calculation for estimating suspected serious injuries based on an assumed percentage of all injuries.

The calculated 2020 five-year average of suspected serious injuries is 3293.5. This number remains below the 2020 target value of 3467.4. Also, the five-year average rate of suspected serious injuries is estimated to be 4.058, which is lower than the 2020 target value of 4.178.

Likewise, the expectation is that Indiana will meet the target for non-motorized fatalities and suspected serious injuries. All classes of non-fatal injuries in Indiana have been on a gradual multiyear downward trend starting in 2004 and excepting short term spikes, the trend has continued through 2019.

The official results to be calculated by FHWA in 2022 is 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, however the expectation is that the rate dependent performance targets of fatalities and suspected serious injuries will be met.

For Target year 2019, the FHWA Target Achievement Assessment per 23 CRF 490.211(c)(2), found that Indiana met or made significant progress towards meeting its PM 1 Safety Performance Targets. The 5-year average target for number of fatalities was not met but the other 4 targets were met.

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 are not yet clear but it was noticed that average travel speed data indicated increased speeds on rural interstate highways and increased speeds may have also occurred on numerous urban and rural roads as well. During the worst of the pandemic some law enforcement agencies saw a reduction in the number of traffic stops and citations issued. This may also have been a factor in driver behavior. In addition, motorcycle fatalities increased significantly in 2020. Good summer weather is presumed to have contributed to an increase in the number of motorcycle/moped related fatalities. 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 2021 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	2014	2015	2016	2017	2018	2019	2020
Number of Older Driver and Pedestrian Fatalities	99	112	115	135	122	126	88
Number of Older Driver and Pedestrian Serious Injuries	255	275	308	289	294	260	227

Under 23 U.S. C 148(g)(2), FHWA has determined that over the last year the 5 year average, (2015 – 2019), 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. The 2020 fatality data 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 2021 was to maintain integrity of a planned $54.9 million investments in the 2021 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 to be maintained 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 positive change in C-E, compared to the baseline. However, the C-E achieved increased to about $23,840 or slightly more than the $23,775 estimate from fiscal year 2020. year. Overall, the fiscal year 2020 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 809 in calendar year 2019 to 896 in 2020, which represents an increase of 10.75%. At the time that this report was submitted, INDOT's early estimate for 2020 vehicle miles of travel indicates a decrease of 7.01% from 2019. As a result, the estimated rate of fatalities per one hundred million vehicle miles of travel (HMVMT) was increased by 19.12% from 0.978 in 2019 to an estimated 1.165 in 2020.

The frequency of suspected serious injuries in 2018 was 3,210 compared to 3,062 in 2019 and 3,302 in 2020. The assumption that serious injuries also rose in 2020 must be tempered by the fact that a new process was used in 2020 to directly count these casualties and a data discontinuity accounts for part of the change. The current 5-year average incidence for suspected serious injuries represents a modest 0.32% decrease compared to the prior 5-year average.

Economic Effectiveness (cost per crash reduced):

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 2020 $66.7 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 $24,000 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 2021, the Office of Traffic Safety (OTS) completed 44 Road Safety Assessment (RSA) reports for site specific locations on highways under INDOT Jurisdiction. In addition, INDOT completed 4 RSAs on roadway corridors that encompass 13.5 miles of urban highways and approximately 47 intersections. 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 local public agencies also conduct numerous RSAs prior to submitting proposed projects to Office of Traffic Safety for HSIP eligibility determination. During the fiscal year, INDOT received 12 Local RSA reports for 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..

In federal fiscal year 2021 INDOT obligated 113.3% of the 164-HE penalty transfer funds for infrastructure safety improvements. At the time of reporting, for fiscal year 2021 INDOT has obligated 97.29% of the infrastructure portion of Indiana’s 164-HE penalty transfer. This amount is 105.5% of the required obligation total.

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.

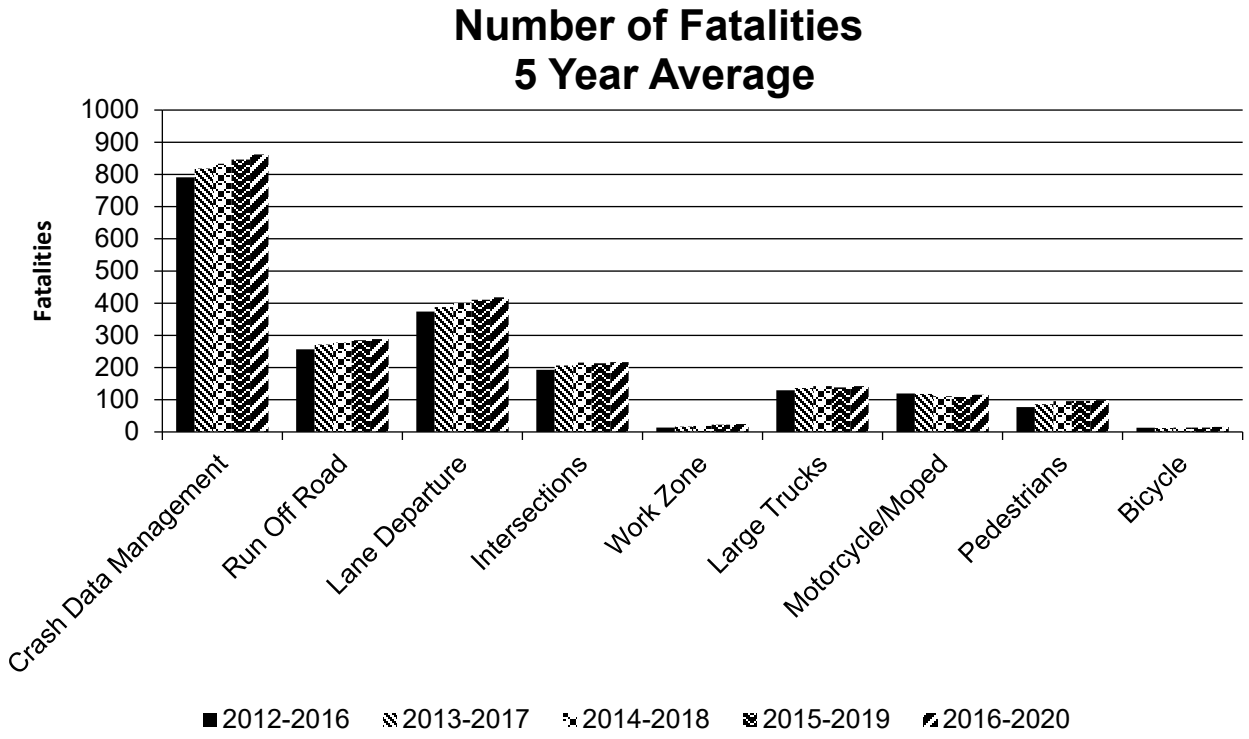
In federal fiscal year 2021 INDOT is on track to obligate approximately $73.4 million in federal aid highway safety funds including HSIP, HRRRP, Section 164-HE and other federal funds prior to the end of the federal fiscal year.

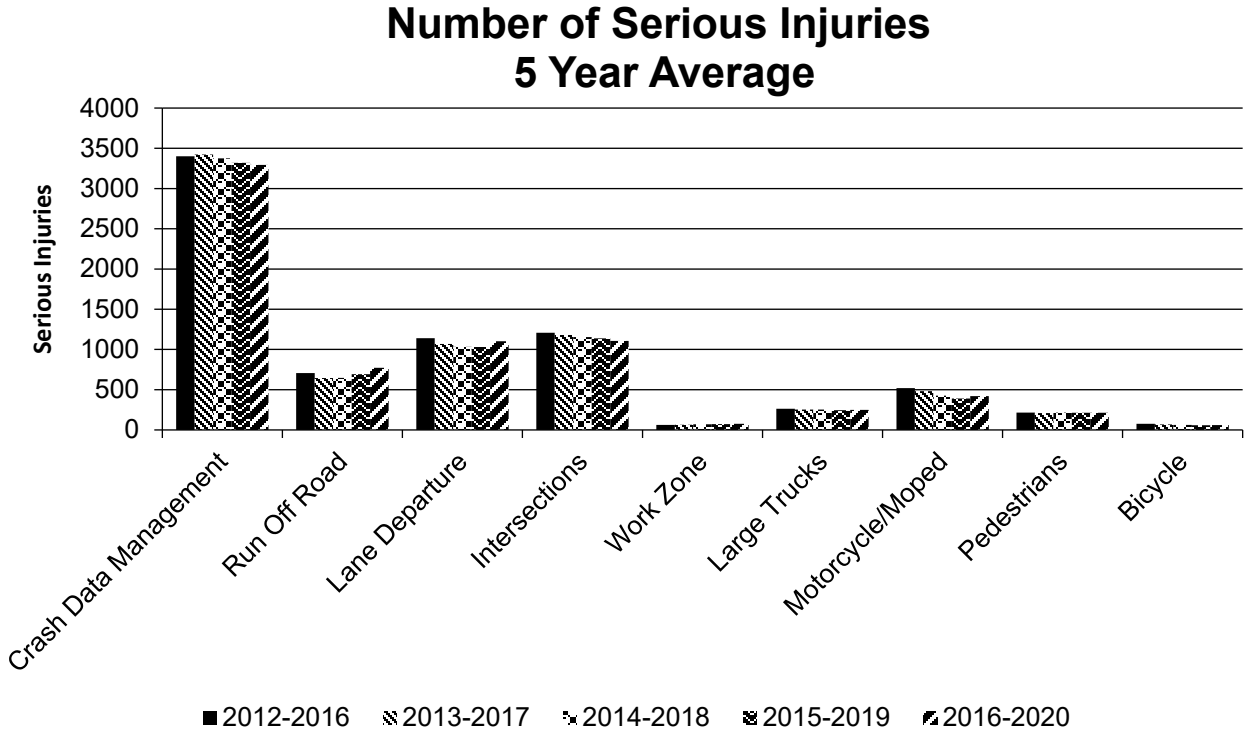
Effectiveness of Groupings or Similar Types of Improvements

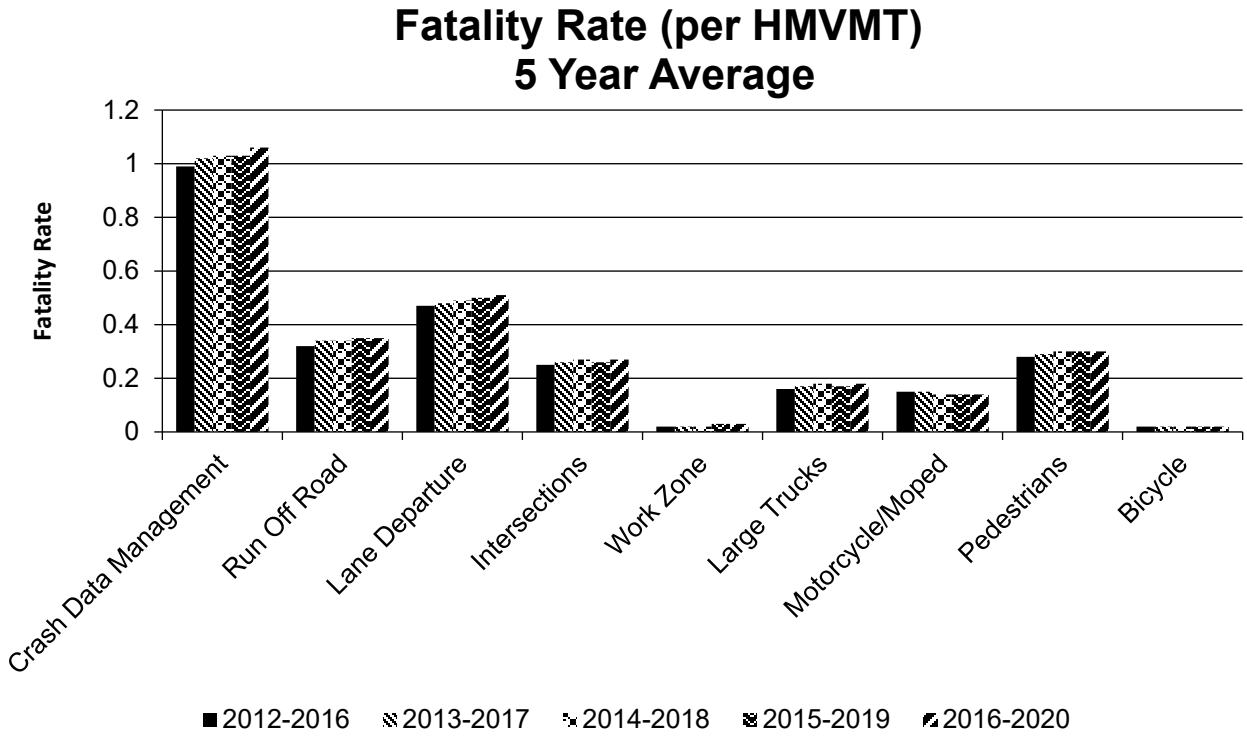
Present and describe trends in SHSP emphasis area performance measures.

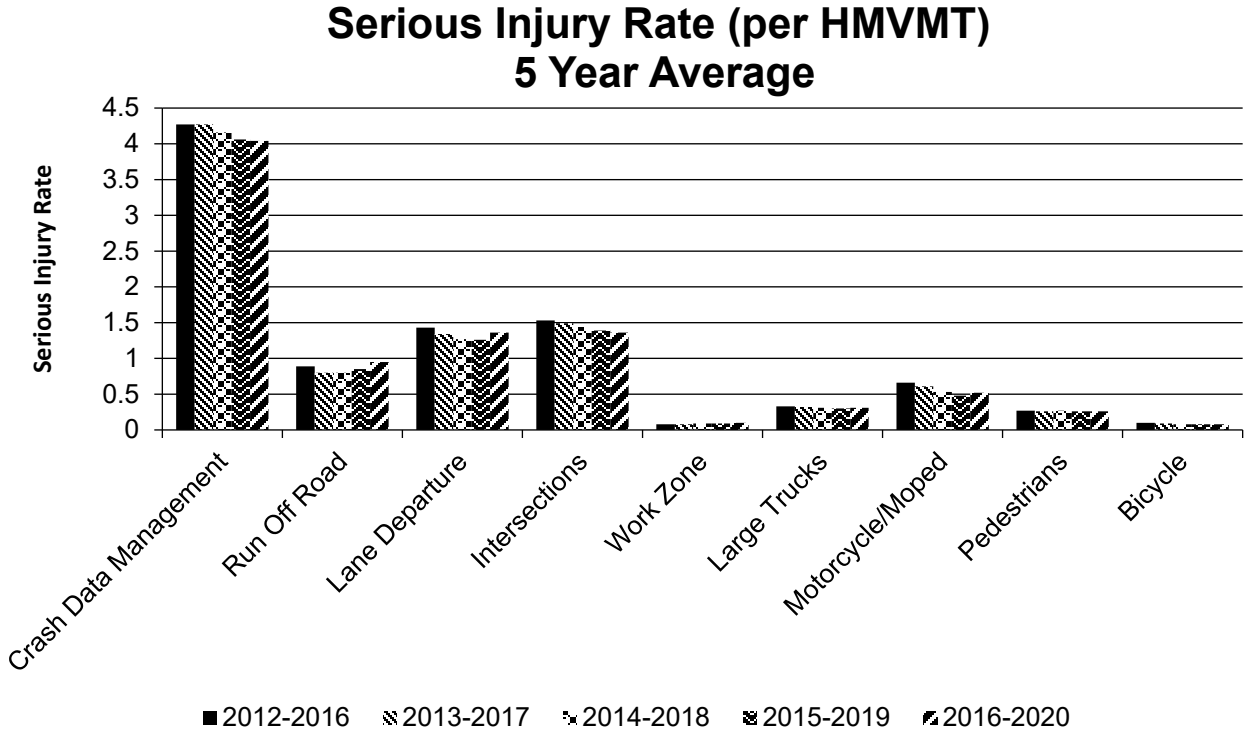
Year 2020

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		862	3,293.4	1.06	4.04
Run Off Road		288.4	773	0.35	0.95
Lane Departure		418	1,103	0.51	1.36
Intersections		217	1,105.6	0.27	1.36
Work Zone		24.4	76.8	0.03	0.1
Large Trucks		142.4	249.9	0.18	0.31
Motorcycle/Moped		115.4	420.4	0.14	0.52
Pedestrians		98.6	213.8	0.3	0.26
Bicycle		15.8	60.6	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
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020


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
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020





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

Yes

Please provide the following summary information for each countermeasure effectiveness evaluation.

CounterMeasures:	High Friction Surface Treatment
Description:	A research study project was conducted with Purdue University under Indiana's Joint Transportation Research Program that reviewed INDOT's first deployment of High Friction Surface Treatments under study project SPR-4300. The study is titled, Investigation of Durability and Performance of High Friction Surface Treatment. This study was completed in FY 2021. The aims of the study encompassed both crash performance and durability of the deployed friction treatments.
Target Crash Type:	Run-off-road
Number of Installations:	21
Number of Installations:	21
Miles Treated:	
Years Before:	2
Years After:	2
Methodology:	Before/after using empirical Bayes or Full Bayes
Results:	The study conclusions determined a CMF of 0.71 in regard to placement of HFST treatments on 21 highway curves. This result closely compares with the CMF of 0.697 found in the CMF Clearing House.

File Name: Hyperlink

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)
1383409	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps					1.00				1.00		136.0
1383477	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	1.00	2.00		1.00					1.00	3.00	11.46
1400849	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	3.00	4.00							3.00	4.00	2.24
1400858	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps		1.00								1.00	1.30
1601181	Urban Major Collector	Pedestrians and bicyclists	ADA curb ramps	3.00	8.00			1.00	1.00			4.00	9.00	1.16
1601134	Rural Major Collector	Pedestrians and bicyclists	ADA curb ramps		1.00								1.00	0.513
1601135	Rural Major Collector	Pedestrians and bicyclists	ADA curb ramps	7.00	3.00		2.00	1.00				8.00	5.00	23.54
1500435	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	ADA curb ramps	108.00	94.00	1.00		4.00	4.00			113.00	98.00	33.07
1500439	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	ADA curb ramps	108.00	94.00	1.00		4.00	4.00			113.00	98.00	68.62
1500440	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	ADA curb ramps	108.00	94.00	1.00		4.00	4.00			113.00	98.00	65.01
1500441	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	ADA curb ramps	108.00	94.00	1.00		4.00	4.00			113.00	98.00	112.76
1400569	Urban Minor Arterial	Intersection geometry	Add/modify auxiliary lanes	48.00	33.00	3.00	5.00					51.00	38.00	5.21
1400809	Urban Local Road or Street	Pedestrians and bicyclists	Pedestrians and bicyclists – other											1.79
1500437	Urban Minor Arterial	Roadside	Barrier end treatments (crash cushions, terminals)	2731.00	3077.00	30.00	56.00	192.00	517.00			2953.00	3650.00	0.54

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)
1500443	Rural Minor Arterial	Roadside	Barrier end treatments (crash cushions, terminals)	429.00	473.00	3.00	4.00	100.00	121.00			532.00	598.00	0.31
1401687	Rural Major Collector	Intersection geometry	Add/modify auxiliary lanes	19.00	9.00			5.00	1.00			24.00	10.00	3.13
1296298	Urban Principal Arterial (UPA) - Other	Intersection geometry	Add/modify auxiliary lanes	102.00	70.00			6.00	8.00			108.00	78.00	5.23
1400709	Urban Minor Collector	Intersection geometry	Add/modify auxiliary lanes	63.00	46.00	1.00		8.00	6.00			72.00	52.00	2.35
1382614	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	22.00	10.00			2.00				24.00	10.00	2.19
1400279	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	31.00	13.00				1.00			31.00	14.00	9.4
1005755	Urban Major Collector	Lighting	Intersection lighting	5.00	4.00							5.00	4.00	12.08
1400963	Urban Principal Arterial (UPA) - Other	Alignment	Vertical alignment or elevation change	171.00	159.00			6.00	4.00			177.00	163.00	13.22
1296299	Urban Principal Arterial (UPA) - Other	Intersection geometry	Add/modify auxiliary lanes	125.00	78.00			9.00	6.00			134.00	84.00	55.37
1500404	Urban Local Road or Street	Intersection geometry	Add/modify auxiliary lanes	2.00	2.00		1.00	1.00	1.00			3.00	4.00	1.26
1296422	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	6441.00	4443.00	91.00	85.00	104.50	105.80			6636.50	4633.80	15.70
1296843	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	6428.00	5241.00	102.00	96.00	1315.00	1585.00			7845.00	6922.00	41.58
1296914	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	5522.00	4036.00	79.00	65.00	106.60	109.00			5707.60	4210.00	31.31
1593072	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	7188.00	5030.00	147.00	132.00	162.60	167.60			7497.60	5329.60	73.24

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)
1600113	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	4559.00	3141.00	99.00	67.00	95.40	93.30			4753.40	3301.30	24.49
1600125	Rural Principal Arterial (RPA) - Other	Roadway delineation	Raised pavement markers	7188.00	5030.00	14.00	13.20	162.60	167.60			7364.60	5210.80	56.36
0810280	Urban Principal Arterial (UPA) - Other	Roadway	Roadway widening - add lane(s) along segment	246.00	150.00	1.00		42.00	18.00			289.00	168.00	20.52
1400166	Urban Local Road or Street	Pedestrians and bicyclists	ADA curb ramps	121.00	65.00			6.00	2.00			127.00	67.00	24.92
1383351	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	146.00	147.00	3.00	3.00	8.00	3.00			157.00	153.00	30.32
1400720	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	47.00	51.00	1.00		2.00	4.00			50.00	55.00	12.16
1400810	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	57.00	82.00			9.00	5.00			66.00	87.00	91.25
1592418	Urban Minor Collector	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	3380.00	3347.00	6.00	4.00	86.00	48.00			3472.00	3399.00	95.49
1592419	Urban Minor Collector	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1259.00	1274.00	11.00	5.00	111.00	117.00			1381.00	1396.00	19.07
1297755	Urban Minor Arterial	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	4428.00	3789.00	38.00	35.00	587.00	451.00			5053.00	4275.00	37.73
1601762	Urban Principal Arterial (UPA) - Other	Intersection geometry	Intersection geometry - other	74.00	58.00	1.00		6.00	5.00			81.00	63.00	8.02
1601763	Urban Principal Arterial (UPA) - Other	Intersection geometry	Intersection geometry - other	42.00	22.00			10.00	6.00			52.00	28.00	3.27
1601764	Urban Minor Arterial	Intersection geometry	Intersection geometry - other	19.00	31.00			4.00			1.00	23.00	32.00	9.62

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)
1601765	Rural Minor Arterial	Intersection geometry	Intersection geometry - other	43.00	30.00		1.00	2.00	2.00			45.00	33.00	0.18
1500442	Rural Principal Arterial (RPA) - Other	Pedestrians and bicyclists	Pedestrian signal - other	24.00	21.00			2.00	1.00		2.00	26.00	24.00	44.64
1297756	Rural Minor Arterial	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	4913.00	4391.00	43.00	39.00	623.00	428.00			5579.00	4858.00	84.66
1401347	Rural Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	12549.00	10574.00	37.00	34.00	971.00	830.00			13557.00	11438.00	108.47
1401349	Rural Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	5434.00	4314.00	10.00	6.00	470.00	353.00			5914.00	4673.00	167.12
1401685	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	531.00	617.00	3.00	1.00	53.00	24.00			587.00	642.00	31.66
1401042	Rural Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	4715.00	4116.00	21.00	17.00	341.00	203.00			5077.00	4336.00	143.66
1401046	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	4278.00	4070.00	12.00	7.00	414.00	403.00			4704.00	4480.00	84.63
1500320	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	1087.00	1012.00		3.00	106.00	124.00			1193.00	1139.00	199.5
1592417	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	311.00	434.00	1.00	4.00	67.00	32.00			379.00	470.00	7.41
1383434	Urban Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	153.00	135.00	2.00		1.00	3.00	33.00	6.00	189.00	144.00	130.21
1006029	Rural Local Road or Street	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	17386.00	14492.00	45.00	37.00	35.00	48.00	200.00	1120.00	17666.00	15697.00	180.48
1006030	Urban Minor Collector	Roadway signs and traffic control	Sign sheeting - upgrade or replacement	2617.00	2334.00	2.00	1.00	54.00	27.00			2673.00	2362.00	87.34
1296261	Urban Principal	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	346.00	306.00	4.00	1.00	2.00	2.00	24.00	27.00	376.00	336.00	5.88

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													
1296917	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	90.00	76.00			1.00	4.00	11.00	9.00	102.00	89.00	15.15
1296961	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	179.00	167.00	4.00	2.00	21.00	12.00	36.00	25.00	240.00	206.00	17.95
1296966	Rural Minor Arterial	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	115.00	115.00			7.00	9.00			122.00	124.00	47.54
1296971	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	461.00	483.00	6.00	1.00	13.00	8.00	33.00	50.00	513.00	542.00	105.93
1500423	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – add backplates with retroreflective borders	2220.00	2351.00	10.00	17.00	13.00	17.00	123.00	116.00	2366.00	2501.00	0.33
1600069	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	35.00	32.00			5.00	2.00			40.00	34.00	12.34
1172207	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	181.00	148.00		4.00	5.00	2.00	20.00	31.00	206.00	185.00	0.52
1296424	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	30738.00	30196.00	84.00	87.00	122.00	112.00	2015.00	2319.00	32959.00	32714.00	0.34
1297111	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	113.00	127.00	1.00		7.00	2.00	10.00	18.00	131.00	147.00	55.79
1500613	Urban Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	3986.00	4428.00	6.00	1.00	44.00	73.00	356.00	513.00	4392.00	5015.00	74.16
1296849	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Roadway signs and traffic control - other	34.00	46.00	1.00		10.00	14.00	214.00	109.00	259.00	169.00	33.03
1296972	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Roadway signs and traffic control - other	725.00	524.00	3.00	2.00	10.00	9.00	86.00	78.00	824.00	613.00	35.06
1600465	Rural Minor Arterial	Roadway signs and traffic control	Roadway signs and traffic control - other	7.00	9.00	1.00		4.00	9.00			12.00	18.00	0.748

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)
1400714	Urban Minor Arterial	Railroad grade crossings	Crossing warning signs and pavement marking improvements						1.00				1.00	0.838
0400495	Rural Minor Arterial	Alignment	Horizontal curve realignment	7.00	8.00		1.00	1.00				8.00	9.00	0.06
0710463	Rural Principal Arterial (RPA) - Other	Alignment	Horizontal curve realignment	7.00	2.00	1.00		2.00	2.00			10.00	4.00	16.53
1601759	Rural Principal Arterial (RPA) - Other	Intersection traffic control	Intersection traffic control - other	25.00	16.00			3.00	6.00			28.00	22.00	0.54
1601760	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Intersection traffic control - other	61.00	53.00			2.00	1.00	8.00	6.00	71.00	60.00	1.35
1600079	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	30.00	13.00				1.00			30.00	14.00	0.95
1600084	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	34.00	48.00			1.00	3.00			35.00	51.00	0.25
1600085	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	26.00	8.00				2.00			26.00	10.00	0.82
1600086	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	2.00	2.00							2.00	2.00	1.04
1600087	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	13.00	6.00			1.00				14.00	6.00	4.02
1600088	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	8.00	5.00							8.00	5.00	1.01
1600089	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	29.00	85.00			1.00			2.00	30.00	87.00	0.87

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)
1600090	Urban Principal Arterial (UPA) - Other	Intersection traffic control	Modify traffic signal – modernization/replacement	33.00	14.00							33.00	14.00	3.15
1296846	Rural Minor Arterial	Intersection traffic control	Modify traffic signal – modernization/replacement	9.00	8.00				1.00	6.00	2.00	15.00	11.00	0.24
1500321	Urban Minor Arterial	Pedestrians and bicyclists	Pedestrian beacons											2.00
1401032	Urban Principal Arterial (UPA) - Other	Pedestrians and bicyclists	Install new crosswalk	1.00				3.00	2.00			4.00	2.00	2.26
1500428	Urban Minor Collector	Pedestrians and bicyclists	ADA curb ramps	2.00	2.00			11.00	8.00			13.00	10.00	154.85
1296920	Rural Principal Arterial (RPA) - Other	Roadway	Rumble strips –other	3706.00	2798.00	49.00	36.00	506.00	509.00			4261.00	3343.00	132.51
1600118	Rural Principal Arterial (RPA) - Other	Roadway	Rumble strips –other	3207.00	2559.00	43.00	28.00	514.00	491.00			3764.00	3078.00	140.99
1298317	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Curve-related warning signs and flashers	28494.00	25177.00	11.00	5.00	72.00	43.00	307.00	390.00	28884.00	25615.00	90.05
1296428	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Curve-related warning signs and flashers	22218.00	17712.00	8.00	12.00	49.00	88.00	2019.00	2135.00	24294.00	19947.00	0.04
1600099	Rural Principal Arterial (RPA) - Other	Roadway signs and traffic control	Curve-related warning signs and flashers	2839.00	2319.00	37.00	48.00	343.00	383.00			3219.00	2750.00	0.04

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 as data from the new ARIES 6.0 officer reporting software replaces incapacitating injuries with type “A” serious injury crash data. 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 motor vehicle 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 may have superseded employment rates to influence fatal and suspected serious injury counts. As a result, numbers of fatalities increased by 10.79% in 2020 even though the total number of crashes were lower by 19.16% compared to 2019. The number of suspected serious injuries were close to usual when adjusted for the new counting methodology started in 2020. This indicates that other factors are causing greater percentage of fatal crash outcomes.

The extent of contribution by HSIP projects to overall statewide traffic safety outcomes is difficult to quantify 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 has some beneficial effect. The 5 year rolling average of suspected serious injuries has declined year by year resulting in a decline of 4.9% since 2015. At the same time the 5 year average of fatalities has varied year by year with a change of 11.1 % higher from 2015 through 2020. 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 both targeted severe outcomes.

The shift in crash severity toward more fatalities while suspected serious injuries remain relatively stable or decrease is difficult to explain on the basis of employment rate alone which remained strong until the onset of the Covid 19 pandemic. Factors such as increased average operational speeds may be an area where efforts to modify driver behavior may have some beneficial effects. While recent decreases in serious injuries are encouraging, INDOT seeks to influence a similar downward trend in fatalities by increasing the number and variety of systemic safety programs applicable to both state and local roads.

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 Strategid Highway Safety Plan plan revision, however it is anticipated to be completed by the first quarter of 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							20		
	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							20		
	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]										
	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**	**87.50**	**0.00**	**100.00**	**0.00**	**0.00**	**76.67**	**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 the 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. Also, an investigation will look into the creation of the data element Junction Traffic Control using the INDOT Work Management System once it has been integrated with the ESRI Roads and Highways software.

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 elements with the exception of Surface Type and in some cases Lane Count. 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 Surface Type on Local Roads. At present this work is approximately 30% complete, anticipate completion by mid-year 2022.

Unpaved Roads are currently not identified in INDOT's inventory data system. However, route information such as Route Identifier, Beginning Measure, End Measure, Functional Class and Type of Government Ownership are present and accounted for 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:

Project Implementation:

Safety Performance:

Evaluation:

SPR-4300 Final Report.pdf
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.