

Highway Safety Improvement Program Implementation Plan

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Introduction

On April 21, 2022, the Minnesota Department of Transportation (MnDOT) was notified by the Federal Highway Administration (FHWA) that the assessment of the 2020 Safety Performance Targets has indicated that the State of Minnesota has failed to meet the targets or make significant progress. This was based on the targeted crash type performance of Calendar Year (CY) 2020 benchmarked against the five-year average from CY 2014 to CY 2018. The metrics and the established rates are shown in Table 1.

Table 1: FHWA 2020 Safety Performance Target Assessment (04/21/2022)

Minnesota CY 2020 Safety Performance Target Assessment

PERFORMANCE MEASURE	2016-2020 TARGET	2016-2020 ACTUAL	2014-2018 BASELINE	MET TARGET?	BETTER THAN BASELINE?	MET OR MADE SIGNIFICANT PROGRESS?
Number of Fatalities	375.4	377.8	380.6	No	Yes	NO
Rate of Fatalities	0.626	0.650	0.648	No	No	
Number of Serious Injuries	1,714.2	1,718.0	1,534.4	No	No	
Rate of Serious Injuries	2.854	2.948	2.596	No	No	
Number of Non-Motorized Fatalities & Serious Injuries	317.0	294.4	261.8	Yes	N/A	

Based on this assessment, the State of Minnesota must comply with the provisions set forth in 23 U.S.C. 148(i) for the subsequent fiscal year. The State of Minnesota must:

1. use obligation authority equal to the HSIP apportionment for the year prior to the year for which the targets were not met or significant progress was not made, only for HSIP projects; and
2. submit an annual HSIP Implementation Plan that describes actions the State will take to meet or make significant progress toward meeting its subsequent targets.

Minnesota plans to continue to meet the first condition of the provisions. The second provision is for the State Transportation Department to submit an annual HSIP Implementation Plan. This document is intended to meet that second provision. In accordance with these rules, to be compliant under 23 U.S.C. 148(i), the HSIP Implementation Plan must:

- Identify roadway features that constitute a hazard to road users
- Identify highway safety improvement projects on the basis of crash experience, crash potential, or other data-supported means
- Describe how HSIP funds will be allocated, including projects, activities, and strategies to be implemented
- Describe how the proposed projects, activities, and strategies funded under the State HSIP will allow the State to make progress toward achieving the safety performance targets; and
- Describe the actions the State will undertake to achieve the performance targets.

This plan is intended to meet these requirements and will be submitted to the FHWA upon completion.

I. Identifying Roadway features that constitutes a hazard

Minnesota recognizes safety projects must address an existing sustained crash location or proactively address a site that has the risk for severe crash outcomes. MnDOT uses a State Highway Screening Toolkit to identify sustained crash locations using a statistical analysis (i.e., critical crash rates). MnDOT also uses systemic analysis to develop proactive safety plans that identify intersections and segments with risk characteristics associated with fatal and serious injury crashes. This suite of tools provides the backbone of network screening for Minnesota's safety program.

Trunk Highway Crash History Screening (Toolkit)

The Trunk Highway Crash Screening Toolkit is a database of all the intersections, segments, and interchanges on the Trunk Highway Network, with attributes assigned to each category. Each category is then given a summary of crash frequency and severities. Based on traffic volume, each category is given a crash rate, fatal and serious injury rate, and a crash index. These metrics and summaries are used to understand average rates for facility types on the Trunk Highway. This can be used to see how a facility type is performing overall and performing in comparison to similar facilities and against established averages.

The Toolkit is for network screening and is the starting point for system monitoring. An automated process is used to develop the Toolkit and individual sites can be screened by Statewide Central Office and District Traffic Engineers for further understanding and selection of safety improvements. With the completed Linear Referencing System (LRS) and defined attributes, MnDOT can now screen nearly 20,000 intersections, over 700

interchanges, and almost 12,000 miles of roadways to identify candidate locations for safety improvements. This process has become an integral step for identifying locations with greater safety needs.

Safety Planning Processes

While the State Highway Crash History Screen Toolkit works well for identifying high crash locations, it is inherently a reactive tool by only looking at those sites with a crash history. MnDOT and other agencies have learned that most fatal and serious injury crashes occur at location that *do not* have a severe crash history in a typical review period. Based on these facts, Minnesota has moved to identify locations that are more likely to have fatal and serious injury crashes proactively based on surrogate crash measures (systemic safety analysis), and to address and mitigate those risks with proven, low-cost, widely deployable countermeasures to reduce the risk of these crashes before they occur.

Minnesota has done several and ongoing iterations to expand, improve, and adjust this planning process through the years. The section below discusses these past, current, and future plans.

County Road Safety Plan, 2009-2013. All 87 Counties.

The first major initiative among County safety stakeholders and MnDOT to reduce fatalities and serious injuries on local roadways was the development of County Roadway Safety Plans (known as CRSP 1), which began in 2009 and was completed in 2014. Counties began implementing the CRSP 1 recommended safety projects as early as 2010 and have made significant progress in implementation. A new emphases on local roadways has become integral to the statewide safety program. MnDOT Highway Safety Improvement Program (HSIP) managers indicated local agency participation in the HSIP program has specifically increased due to CRSP 1 development and resulting safety projects as well as technical assistance provided by the Plans. The following tasks were completed in developing this first round of County Road Safety Plans:

- Review of all county road segments, curves, and intersections
- Data-driven review of crashes on county roadways
- Summary of safety focus areas and priority crash types
- List of recommended high priority safety strategies
- Prioritized list of locations that are most at-risk for severe crashes
- Prioritized list of recommended safety projects with:
 - specific strategies
 - specific locations
 - planning level costs
 - project information sheet for HSIP Submission

Metro District Safety Plan, 2012.

The Metro District Safety Plan was developed from 2010 to 2012. The plan identified key focus areas for the crash types of severe crashes on the Metro District Trunk Highway Network, as well as establishing potential risk factors, crash histories, and proposed strategies to mitigate these severe crash types. Highlights included:

- Identification of High-Tension Cable Barrier and Reduced Conflict Intersection Corridors
- Active Transportation Safety Needs on a corridor basis.

- Low-cost strategies that may be under-utilized for greater deployment

The final plan was finalized and published in May 2012.

Greater Minnesota District Safety Plans, 2014-2016.

The updated and comprehensive analysis of the Greater Minnesota Trunk Highway system incorporated the lessons learned from the preparation of the County Roadway Safety Plans and the analytical effort involved a four-level prioritization exercise that identified:

- The focus crash types that are the kinds of crashes with the highest number of occurrences and the roadway and traffic characteristics common to the locations with the focus crash types. These were used in the systemic risk assessment.
- The prioritization of highway segments, curves and intersections based on a designation of either sustained high crash or high risk locations. Sustained high crash locations were identified as having a crash rate statistically significantly higher than for similar facilities PLUS the presence of a severe crash and high-risk locations were observed to have multiple of the adopted risk factors present. The sustained high crash and high-risk locations are considered high priority candidates for safety investment.
- A prioritized list of safety strategies that were considered to be proven effective at reducing the focus crash types.
- Suggested safety projects for a specific safety strategy at the specific locations identified as being high priority candidates for safety investment.

The final plans were published in 2016.

County Safety Road Plans Update. 2017-Present. 31 Counties completed or underway.

In 2016, County engineers and MnDOT initiated an update of the County Road Safety Plans (known as CRSP 2) to further reduce fatalities and serious injuries on Minnesota local roadways. CRSP 2 is more collaborative, utilizes the most current safety data, and provides an updated list of HSIP eligible safety projects. The CRSP 2 process is very similar to that of CRSP 1 and follows a comprehensive safety analysis that uses crash data and roadway characteristics to identify the most crucial County transportation safety planning needs and associated safety treatments to reduce fatal and serious injury related crashes. CRSP 2 development followed the same set of tasks to be completed that were discussed above for development of CRSP 1.

A CRSP 2 improvement included the expansion on many Greater Minnesota Counties (counties outside the 7 County Minneapolis-Saint Paul Metropolitan Area) and including an analysis in urban areas, which was not included in CRSP 1.

Currently, over 85% of counties are participating in HSIP Solicitations from 2016-2026.

District Safety Plan Update. Currently Scoped and underway.

With the identified need for updated District Safety Plans, MnDOT has been working on setting up the next project to complete these updates. The continued desired emphasis will still be on reducing fatal and serious injury crashes on Trunk Highways. Based on the 2020-2024 Strategic Highway Safety Plan, 29% of fatal and serious injury crashes in Minnesota are still on the trunk highway network. The traffic safety plans will plan to

use a risk based and crash data-driven approach to identify safety projects for specific at-risk segments, curves, and intersections within each district.

The emphasis of this process will be to focus on the reduction of fatal and serious injury crashes that have occurred on State owned roadways (Interstate, US Routes, and MN Trunk Highways). The process will use crash data from 2016-2020 (or longer depending on district and location), or more recent data when it becomes available.

The current scoping process has identified over 25 specific traffic safety related tasks that have been tailored to each Districts identified needs, and what they foresee as being the most valuable analyses'. Two consultants have been selected, with the option to extend the contract up to 5 total years.

II. Identifying HSIP Projects and the Current Process

Solicitation and Selection Process

MnDOT administers four regular solicitations for safety projects. Each solicitation requires a standardized application along with any supplemental analysis necessary for a selection committee to score the projects. Both proactive and reactive projects are accepted; scores are calculated to ensure that both types of projects are on an even footing.

Table 2: Regular HSIP Solicitations in Minnesota

Target Agencies	Target Area	Frequency	Applications Due	Estimated Federal Funds Available
Local agencies	Greater Minnesota	Annually	November	\$15.3M
Local agencies	Metro District/ Met Council Boundaries	Bi-annually	June	\$14.5M
MnDOT Districts	Greater Minnesota	Annually	November	\$12.9M
MnDOT Districts	Metro District	Bi-annually	June	\$6.3M

While the point thresholds for each solicitation vary, the scoring is designed to prioritize:

- Benefit-cost ratio greater than 1.00 (when considering impact of countermeasure on crashes only)
- Sustained fatal and serious injury crash location or location with proactive risk factors associated with fatal and serious injury crashes
- Planning and prior safety analysis conducted
- Partnership with other agencies
- High impact (e.g., sustained crash location or widespread deployment of strategy)

Specifics on trunk highway projects are published online in the MnDOT Project Selection Policy at www.mndot.gov/projectselection.

III. Describing future HSIP allocations

Minnesota historically programs about 50% of federal HSIP funds on MnDOT infrastructure, and about 5% on non-infrastructure projects (e.g., Toward Zero Deaths initiative, planning, evaluations, data systems).

Table 3: Federal Funds Programmed to HSIP Projects Historically

Year	Infrastructure (MnDOT)	Infrastructure (Local)	Non-infrastructure	Total
2016	16,630,000	45,750,000	2,820,000	65,200,000
2017	34,240,000	19,410,000	2,740,000	56,390,000
2018	20,850,000	15,760,000	960,000	37,570,000
2019	29,630,000	13,860,000	1,660,000	45,150,000
2020	18,950,000	15,960,000	3,150,000	38,050,000
2021	27,580,000	21,270,000	3,470,000	52,310,000
Total	147,880,000	132,010,000	14,800,000	294,670,000
Percent	50%	45%	5%	100%

In 2016, Minnesota implemented an improved electronic crash reporting system (i.e., MNCrash). In addition to improving data quality, the new system migrated to the “Suspected Serious Injury (A)” definition. Statewide, there was a near doubling of Serious Injury crashes—with a larger proportion reported on the local system. In comparing Table 3 and Table 4, we see that HSIP funds are no longer aligning with severe crash outcomes.

Table 4: Fatal and Serious Injury Crashes by Roadway Jurisdiction

Year	Trunk Highway (MnDOT)	Other Roadway (Local)	Non-infrastructure	Total
2016	622	1,437	N/A	2,059
2017	562	1,340	N/A	1,902
2018	471	1,219	N/A	1,690
2019	503	1,127	N/A	1,630
2020	485	1,194	N/A	1,679
2021	581	1,333	N/A	1,914
Total	3,224	7,650	N/A	10,874
Percent	30%	70%	N/A	100%

HSIP Target Distribution

Minnesota distributes HSIP funds both geographically (i.e., by district) and by jurisdiction (i.e., state and local agencies). This distribution is based on the percent of fatal and serious injury crashes. First, the total HSIP federal funds are distributed to each District based on the percent of fatal and serious injuries on all public roads

that occurred in that region. Then, those District funds are split between MnDOT and local agencies based on the percent of crashes in that region that occur on the state versus local system.

MnDOT OTE analyzed the MNCRASH reporting changes and proposed updating the HSIP Target Distribution to reflect the new crash numbers. While the distribution calculations are identical, the underlying crash data has been updated to reflect data quality improvements. See Table 5 for changes in distribution.

Table 5: Change in HSIP Target Distribution, Prior (2021-2025 average) vs. Revision (2026)

Year	HSIP Funds (Prior)	Percent Local (Prior)	HSIP Funds (Revision)	Percent Local (Revision)
District 1	3,800,000	53%	4,100,000	63%
District 2	1,900,000	50%	1,900,000	68%
District 3	7,200,000	58%	7,200,000	71%
District 4	2,700,000	59%	2,900,000	72%
District 6	4,800,000	57%	5,100,000	71%
District 7	3,300,000	52%	3,300,000	73%
District 8	2,800,000	47%	2,400,000	67%
Metro	19,300,000	70%	23,700,000	71%
Statewide	45,800,000	61%	50,600,000	70%

With the considerable increases in funding with the new Infrastructure Investment and Jobs Act (IIJA), MnDOT has been exploring the best and most efficient ways to ensure that the HSIP funding is invested wisely and timely to maximize a reduction in fatal and serious injury crashes. MnDOT is working to ensure that project cost increases are covered to ensure existing projects continue to move forward and stay on track, while also moving money into future years to ensure no transfers or net losses are incurred across the program over the timeframe of the current law.

Obligation and Fund Transfers

Minnesota has made strides in improving the obligation rate of HSIP projects (i.e., amount obligated as a percent of amount apportioned). During SAFETEA-LU, Minnesota consistently obligated 50% to 60% of apportionment. After analysis and programmatic changes, Minnesota is obligating 70% to 90% of apportionment over the FAST Act.

While some money may be transferred out of safety related/adjacent funding, the Office of Transportation System Management (OTSM) has been working to ensure these funds will continue to be available for safety-related infrastructure projects and other related traffic safety needs. Transfers do need to occur at times to ensure Minnesota is optimizing the overall federal program. See (Figure 1 to Figure 3) for more details of the program. OTE is making an effort to ensure these obligation rates will stay above 90%, and push to higher amounts when the opportunities arise.

Figure 1: Minnesota HSIP Obligation Rate during FAST Act and Extension (Federal Fiscal Years 2016 to 2021)

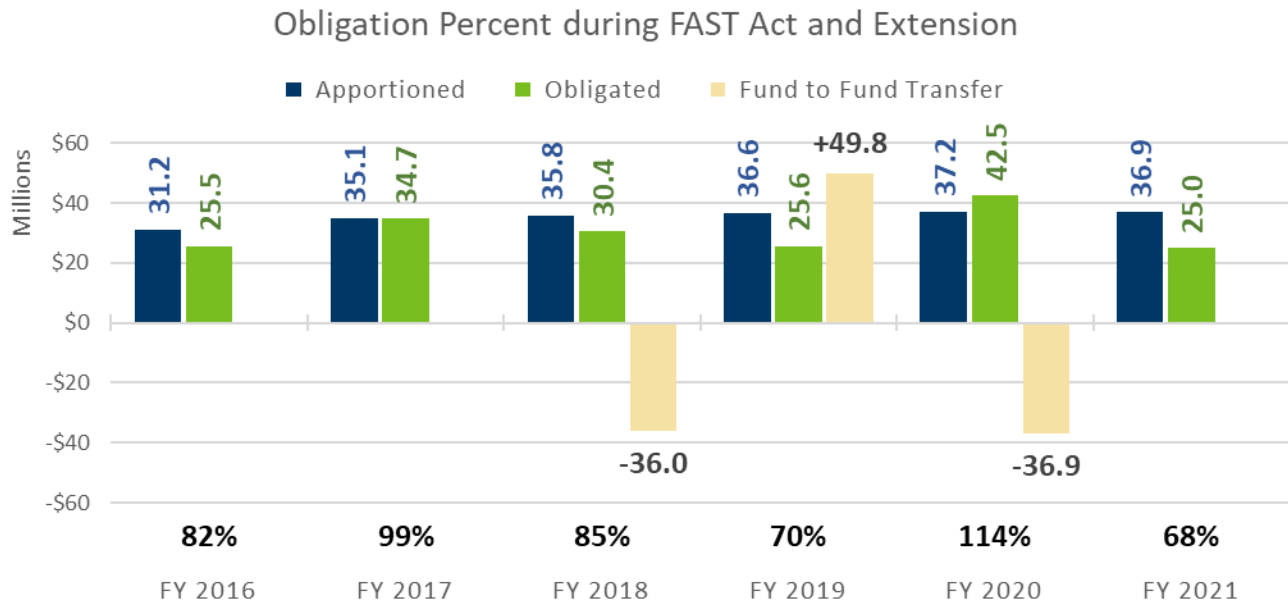


Figure 2: Minnesota HSIP Obligation Rate during MAP-21 Act and Extension (Federal Fiscal Years 2013 to 2015)

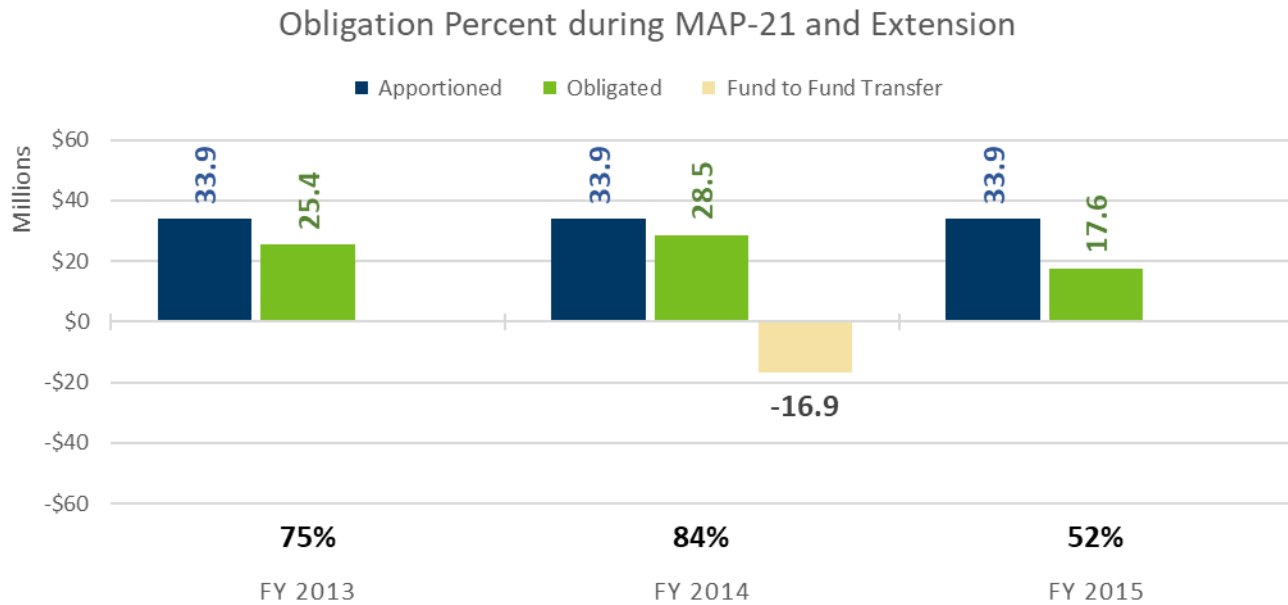


Figure 3: Minnesota HSIP Obligation Rate during SAFETEA-LU and Extensions (Federal Fiscal Years 2006 to 2012)

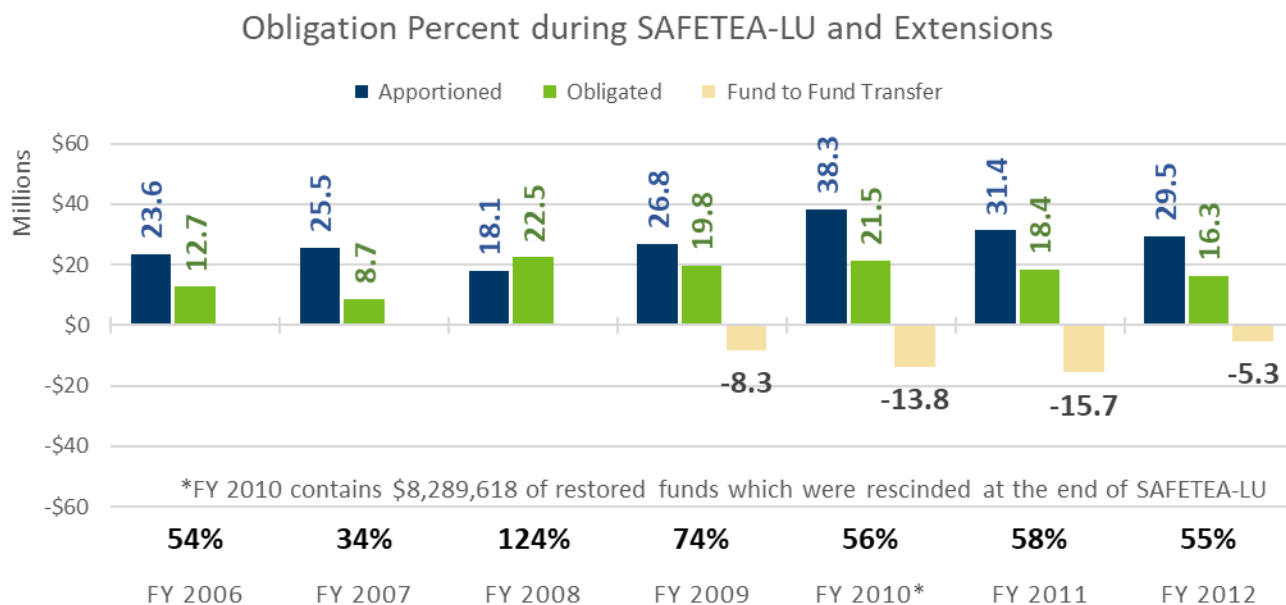
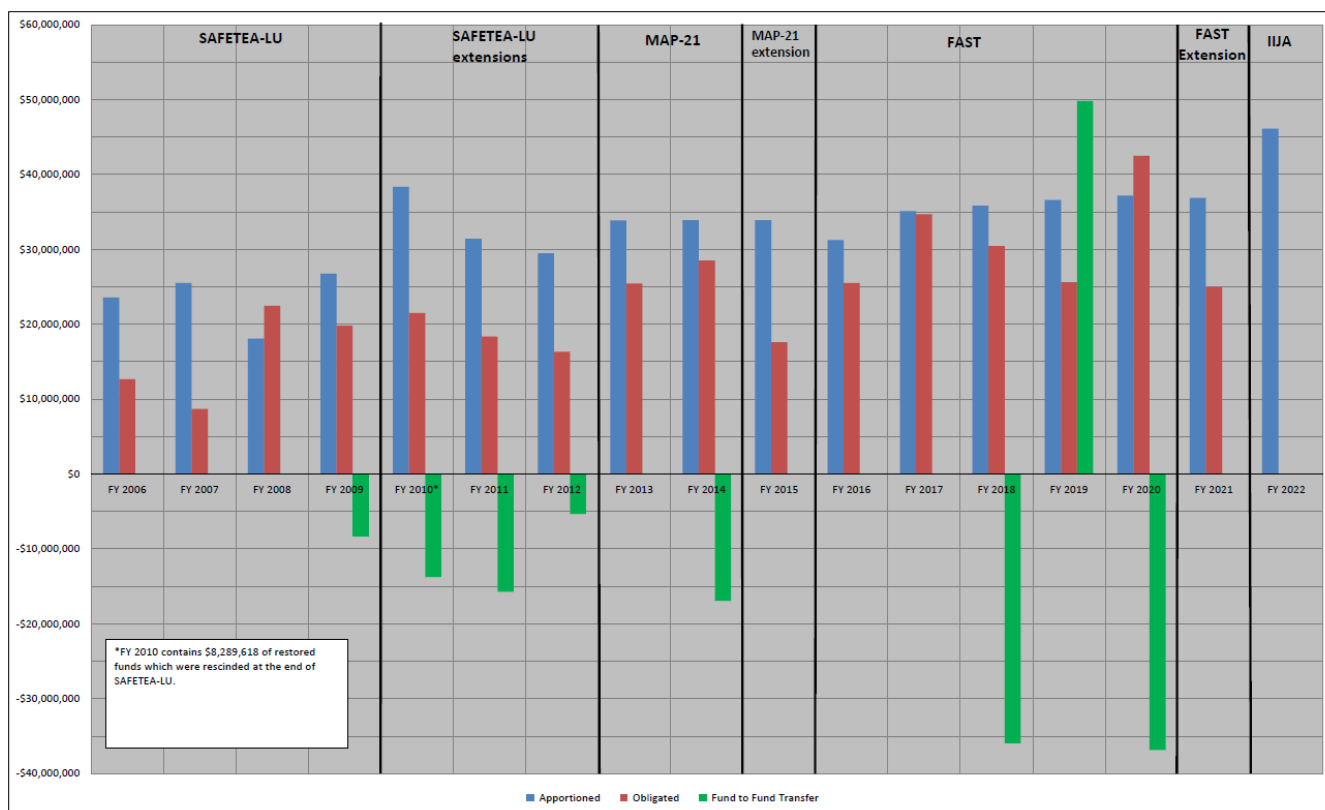


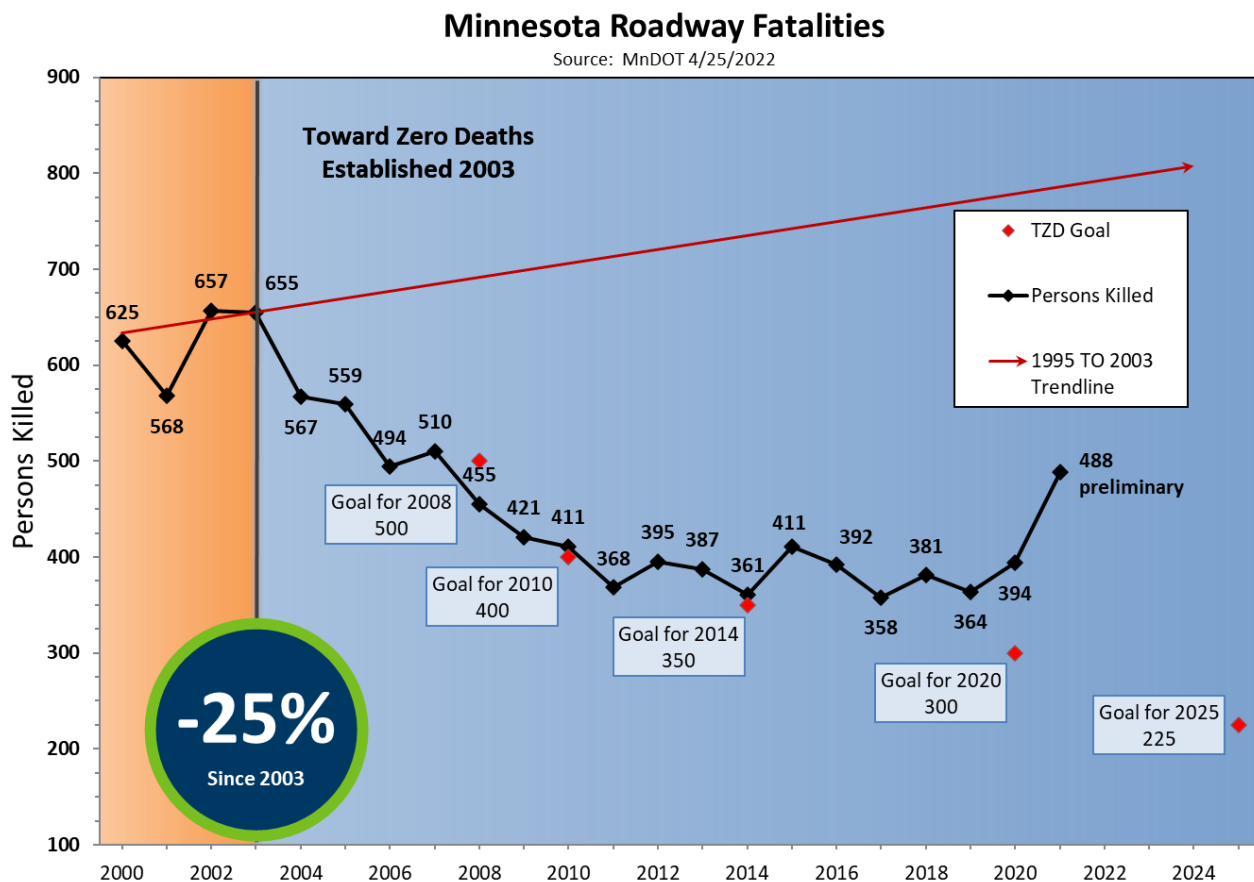
Figure 4: HSIP AppORTioned, Obligated and Fund Transfers. Federal Fiscal Year 2006-2021.



IV. Connecting future HSIP allocations towards achieving safety performance targets

Minnesota has had great success reducing fatalities since the 2003 implementation of Toward Zero Deaths; however, in recent years we have been concerned about a potential “plateau” as reductions have decreased (See Figure 5). With the changes in culture and behavior of 2020—and expected continuation in 2021—we see further shrinking of annual reductions (see Table 6).

Figure 5: Minnesota Roadway Fatalities. 2000-2021.



As part of this plateau planning, Minnesota is committed to both sustaining the Core Focus Areas (see SHSP www.mndot.gov/trafficeng/safety/shsp/index.html) that make up the traffic safety program as well as re-evaluating to ensure the structure is in place for future successes.

Table 6: Annual Change in Performance Measures

Performance Measure	Prior 5-Year Trend (2015-2019)*	Current 5-Year Trend (2016-2020)
Number of fatalities	-2.7% / year	+0.3% / year
Rate of fatalities	-3.8% / year	+2.8% / year
Number of serious injuries	-8.8% / year	-6.5% / year
Rate of serious injuries	-9.7% / year	-4.1% / year
Number of non-motorized fatalities and serious injuries	-10.6% / year	-8.4% / year

NOTE: serious injury trends exclude 2015

Current Selected HSIP Projects, 2022-2026

Minnesota has not programmed all federal HSIP funds at this time; Table 7 to Table 9 describes the currently selected projects and distribution of awarded funding.

Table 7: Programmed Future HSIP Infrastructure Projects by Project Type (2022-2026)

Focus Area	Countermeasure	Output	Units	Federal Funds
Run-off-road	Enhanced edgelines	8,476	Miles	18,230,000
Run-off-road	Shoulder rumble stripe	666	Miles	5,240,000
Run-off-road	Curve delineation	162	Curves	850,000
Run-off-road	Paved shoulder + rumble stripe	111	Miles	5,280,000
Run-off-road	Clear zone maintenance	55	Miles	1,020,000
Run-off-road	Widen shoulders	34	Miles	840,000
Run-off-road	Widen shoulders	18	Curves	320,000
Run-off-road	High friction surface treatment	18	Curves	1,300,000
Head-on	Centerline rumble strips	156	Miles	800,000
Head-on	High tension cable barrier	98	Miles	15,190,000
Intersections	Upgrade signs and markings	285	Intersections	560,000
Intersections	Intersection lighting	182	Intersections	3,100,000
Intersections	Reduced conflict intersection	38	Intersections	27,110,000
Intersections	Roundabout	36	Intersections	47,770,000
Intersections	Turn lanes	31	Intersections	12,500,000
Intersections	Revised geometrics	18	Intersections	3,060,000
Intersections	Access management	8	Miles	940,000
Intersections	Interchange lighting	7	Sites	810,000
Intersections	Signal revisions	6	Intersections	1,940,000

Focus Area	Countermeasure	Output	Units	Federal Funds
Non-motorist	Countdown timers	37	Intersections	4,120,000
Non-motorist	Curb Extensions	4	Intersections	2,580,000
Non-motorist	RRFB	1	Intersections	60,000
Non-motorist	Road diet	1	Miles	2,210,000
Non-motorist	Multi-use trail	1	Miles	40,000

As seen in Table 7, Minnesota has a balanced program of larger reactive intersection type projects (roundabouts), systemic intersection projects identified by crash and risk history (reduced conflict intersections), and local systemically identified and selected type projects (edgeline striping, rumble strips, etc). This balance is intentional to ensure MnDOT is improving locations with known crash histories and proactively addressing locations and crash types before they occur.

Table 8: Federal Funds Programmed to Future HSIP Projects

Year	Infrastructure (MnDOT)	Infrastructure Local)	Non-infrastructure	Total
2022	23,920,000	19,880,000	45,400,000	45,400,000
2023	20,790,000	22,410,000	45,550,000	45,550,000
2024	22,490,000	11,750,000	36,590,000	36,590,000
2025	13,420,000	9,770,000	25,540,000	25,540,000
2026	8,460,000	3,540,000	14,350,000	14,350,000
Total	89,080,000	67,350,000	11,000,000	167,430,000
Percent	53%	40%	7%	100%

Table 8 highlights that the upcoming 5 years of selected projects are currently going to MnDOT owned infrastructure. However, as the local agencies start to submit more 2026 projects, this split should shift more to projects submitted by local agencies. Table 5 shows that moving forward, nearly 70% of HSIP funding will be targeted to local agencies to complete safety infrastructure projects.

Table 9: Federal Funds Programmed to Future HSIP Projects by SHSP Focus Area

Year	Single Vehicle ROR	Head-on	Intersection	Non-motorist	Planning	Data Systems
2022	5,230,000	1,410,000	31,570,000	5,590,000	1,150,000	450,000
2023	12,170,000	9,690,000	18,400,000	2,940,000	1,900,000	450,000
2024	5,440,000	1,820,000	26,940,000	40,000	1,900,000	450,000
2025	7,330,000	1,640,000	13,780,000	440,000	1,900,000	450,000
2026	3,490,000	1,430,000	7,080,000	0	1,900,000	450,000
Total	33,660,000	15,990,000	97,770,000	9,010,000	8,750,000	2,250,000
Percent	20%	10%	58%	5%	5%	1%

One noticeable gap within Table 9 is the programmed funds selected towards non-motorist type crashes. As Minnesota experiences the increasing trend of non-motorist fatal and serious injury crashes with the rest of the nation, the State is trying to identify and select more projects that could mitigate these crash types.

Current Metro District/Met Council Solicitation Projects, 2022-2027

The Metro District/Met Council Regional HSIP Solicitation closed on June 1, 2022. The solicitation received 59 applications totaling over \$90 Million in requests. Applications are still being sorted and organized at the time of this writing, but some basic information is highlighted below.

Of the 59 Applications Submitted and Received:

31 Projects are described as being reactive totaling \$44.6 Million. This includes 11 Roundabouts.

28 are described as proactive and total \$45.6 Million. This includes 13 Roundabouts.

33 Applications are from a County Agency; 15 Applications are from a City; 11 Applications were submitted by MnDOT.

MnDOT Metro District and Met Council plan to have projects selected and notifications sent near the end of August 2022.

V. The Minnesota Plan to achieve the Performance Targets

Minnesota has started several initiatives since before and during the COVID-19 Pandemic to continue to try to bring about safer roads for all users.

Existing Projects and Programs

A. Active Transportation Scoping Field Walks

As part of the MnDOT Active Transportation Scoping program, the Office of Traffic Engineering staff undertake field work that includes an on-site field walk with the scoping team and a virtual field walk in coordination with MnDOT drone staff, District teams, and local stakeholders for approximately 30 projects on the trunk highway network throughout the State of Minnesota.

The goal of this work is the selection of active transportation project needs in coordination with each District based on location, Suitability for Pedestrian and Cyclist Environment (SPACE) scores, and type of work identified for each project in the Capital Highway Improvement Plan (CHIP). Active Transportation needs and elements are identified for each project and include integration of best practices for bicycle and pedestrian planning, design, safety enhancements, and engineering to achieve a Safe System and complete street on MnDOT projects.

The field walks, recommendations, and final report are completed before the scoping of the proposed pavement project. This allows these needs to be specifically evaluated, considered, and incorporated into the final project Scope and Budget before the project enters the Statewide Transportation Improvement Plan (STIP).

The SPACE Tool was developed internally at Office of Traffic Engineering using 19 different factors to better understand latent demand for non-motorized users. The 19 factors include data from the US Census, other state data layers (Schools, Trails, Urban, Traffic, Tribal, etc), known bus/transit locations, and the Economic Research

Service Food Access/Food Desert layers. Many of these factors strive to reach priority populations identified in the Minnesota Walks Plan and areas in need of environmental justice.

B. County Road Safety Plan Update

Based on prior crash data statistics, roughly 77% of fatal crashes in Minnesota are in rural areas. Because of this overrepresentation of fatal and serious injury crashes in rural areas, specifically on the local roadway system, a statewide initiative was initially developed in 2009 to create County Road Safety Plans for all 87 counties within the state. These traffic safety plans used a risk-based approach to identify low-cost safety projects for specific at-risk segments, curves, and intersections within each county.

MnDOT is now in the process of updating these traffic safety plans in order to incorporate new practices, crash data and lessons learned with the objective of further reducing fatal and serious injury crashes in Minnesota. The current County Road Safety Plan Update involves a comprehensive evaluation of 17 county roadway networks within the State of Minnesota. The desired emphasis will be on reducing fatal and serious injury crashes on county roadways. The counties included as part of this project are Blue Earth, Carver, Clay, Crow Wing, Dodge, Itasca, Kandiyohi, Lac qui Parle, Lyon, Polk, Redwood, Rice, Roseau, Scott, Sherburne, Wadena, and Washington. The counties listed above were part of an initial effort to provide an updated traffic safety plan to each county.

Due to unforeseen issues, the plans were only partially completed from early 2018 to mid-2019. The third phase of County Road Safety Plan Updates, involving 10-15 counties in need of updated plans, is currently expected to begin in spring 2023.

C. Coverage of Engineering Services for Local Partnerships and HSIP Projects

As part of the 2021 Local HSIP Solicitation, MnDOT piloted a program to cover professional and construction engineering services for local agencies to assist with implementation on systemic, multi-County projects. Counties had expressed in past years that they were discouraged from taking the lead on multi-County projects due to the increased demands on staff time. This pilot program covered engineering services, provided by a consultant, at a 90%/10% federal-local cost share, with the option for 100% federal coverage at the discretion of the State Traffic Safety Engineer.

To date, only one set of counties have had this service approved. OTE does intend to continue to offer this option going forward to encourage large multi-countywide “batch” projects.

D. Evaluation of Traffic Safety Strategies and Countermeasures

MnDOT is in the fourth year of a Traffic Safety Evaluation contract with a consultant with the focus of continuously evaluating the safety performance of our roadways and traffic devices. As part of this contract, the following topics have been evaluated for safety performance:

- Flashing yellow arrow signal heads
- Changing speed limits from 55 mph to 60 mph
- High tension median cable barrier (evaluation in progress)
- Urban cross sections (evaluation in progress)
- Rectangular rumble strips

- A review of a rural intersection conflict warning system evaluation

In addition to the safety evaluations conducted as part of the contract with a consultant, in-house safety evaluations are also continuously happening. The following topics have been evaluated for safety by MnDOT staff in the last few years:

- Auxiliary buffer lanes for interchanges
- Pedestrian safety
- Reduced conflict intersections
- Rural intersection conflict warning systems
- Roundabouts
- Pedestrians and bicycles at roundabouts (evaluation in progress)
- Rectangular Rapid Flashing Beacons (evaluation in progress)
- Median acceleration lanes

All the reports from these evaluations are published online at the MnDOT Office of Traffic Engineering website: www.mndot.gov/trafficeng/safety/reportspubl.html. This is an on-going contract, so future evaluations will also be conducted as part of this. OTE has identified potential evaluations as well (see below)

E. Adoption of Safety Edge and Rumbles into Traffic Engineering Manual (TEM) and Facility Design Guide (FDG)

The Minnesota Department of Transportation Office of Traffic Engineering and Office of Project Management and Technical Support have both worked to incorporate proven traffic safety countermeasures into our standard project development process. Traffic Safety features including rumble strips (centerline and edgeline) and the Safety Edge are now required features within Chapter 11 of the Traffic Engineering Manual and are being explained in further detail within the Facility Design Guide, Chapter 4. The adoption of these two proven safety measures ensure that these enhancements are now systematically incorporated into every project that meets the requirements.

E. Implementing High Priority Pedestrian Safety Improvements Project

The finding from MnDOT's Statewide Pedestrian System Plan highlights both the need for action in areas designated as high-priority (Tier 1) for investment by the plan, and the immense benefit that investments focused on pedestrian safety can have. This project will apply guidance from the Statewide Pedestrian System Plan that connects land use context and recommended pedestrian safety improvements to specific intersections and corridors on the MnDOT system for near-term investment. Identified improvements may be constructed through the MnDOT construction program, as part of quick-build demonstration projects, or through grant opportunities including HSIP. This project is being managed and led by the Office of Transit and Active Transportation (OTAT).

New and Proposed Projects and Programs

A. Six-inch Edgeline Standards on Trunk Highways

Research has indicated a significant safety benefit of using wider edge lines; as indicated on FHWA's Proven Safety Countermeasure resource, wide edgelines have a 25:1 benefit-cost ratio for life changing crashes on two-lane rural roads. In lieu of these safety benefits, MnDOT has changed the standard for edge line width to 6 inches, effective the beginning of 2022. As of this year, both construction and maintenance striping will install 6-inch edge lines for all applications on the State Highway system. MnDOT expects this to have a positive reduction in life changing crashes in the State of Minnesota.

B. Request for Proposal for a new Software Crash Mapping Application

MnDOT is in the process of proposing and obtaining a new software crash mapping application to house our crash data and allow for improved crash data analysis. MnDOT has worked collaboratively with the Department of Public Safety (DPS) – Office of Traffic Safety (OTS) to split the implementation and ongoing licensing costs of this software at a 50%/50% share. MnDOT and DPS have been jointly working through the steps to complete this process. Implementation is expected in calendar year 2022 or 2023. Desired benefits of moving to this new system would include:

- Automated countermeasures and treatments for improved analysis capabilities
- Direct integration with CMF Clearinghouse and HSM metrics for improved analysis
- In-app crash editing which will improve the quality of our data
- Direct linking to other agency data including State Patrol, MnDOT asset management, Department of Health, Bureau of Criminal Apprehension, and more for deeper analysis and cross-agency collaboration
- Expanded data access for Minnesota cities, counties, and planning organizations
- With intended expansion of report generating capabilities, District Traffic Offices should be able to explore and justify incorporating safety components into scoping projects on non-HSIP projects. This should be attainable with the greater ease of the software.

C. Hiring an Assistant Active Transportation Safety Engineer

MnDOT is continuing to expand and lead by providing technical support in the identified growing need of Active Transportation, both on trunk highways and to local units of government. The Office of Traffic Engineering is showing this commitment by reallocating an existing position into the Assistant Active Transportation Safety Engineer to provide assistance and an expanded role for the current Active Transportation Safety Engineer.

D. Future Traffic Safety Evaluations

Future evaluations with MnDOT's Traffic Safety Evaluation contract include the following proposed topics:

- Sinusoidal rumble stripes evaluation
- Re-examine speed limit increases on trunk highways raised to 60 MPH (especially after the COVID-19 Pandemic and associated societal impacts)
- Local Road Safety Improvements, select review of certain countermeasures.

E. Follow-up Traffic Safety Culture Study with Montana State University

MnDOT hired Montana State University Center for Health and Safety Culture in 2014-2017 to develop and measure the traffic safety culture within Minnesota and to set a baseline for future years. Since the completion of this project, and a related pilot project involving Park Rapids, Minnesota needs to re-evaluate and better understand our current traffic safety culture. This project could identify gaps and needs for improving traffic safety culture, and the topics that may be most effective to improve. This project could also help to develop meaningful marketing and messaging campaigns using positive social norming to maximize public service announcements.

F. District Safety Plan Updates

MnDOT OTE is currently completing a comprehensive review and identification of traffic safety needs for each of the eight MnDOT Districts. These needs were explained in a Request for Proposal and recently two consultants have been selected to assist in completing these plans for each district. MnDOT is committed to providing the ongoing resources and funding to ensure each district has identified priorities, needs, and ongoing network level screening tools to identify systemwide risks and facility needs. The Office of Traffic Engineering has committed \$1.2 Million for the development of these plans and has structured the contract to extend up to 5 years to provide continuous traffic safety needs as they are identified.

G. Safe System Approach Adoption

MnDOT intends to integrate the Safe System Approach into the project development process interweaving with Complete Streets, Performance Based Practical Design, Context Sensitive Solutions and other related efforts. This may occur with the development of a Technical Memorandum or by adding it to existing manuals and best practices. MnDOT Office of Traffic Engineering has been awarded funding from the State's non-State Road Construction budget allocation. The funding of \$200,000 allows MnDOT to hire a consultant who can help to write, review, organize, and promote the implementation of the Safe System Approach into a policy or technical memorandum for the whole Minnesota Department of Transportation.

H. TZD 2.0 Implementation

MnDOT and Department of Public Safety set out in 2019 to determine if the existing Toward Zero Death program could benefit from a change in the way it is currently setup. By 2021, the consultant hired to conduct this project (HDR), came forward with numerous recommendations to improve the organization and how it functions. The main recommendations for a new "TZD 2.0" included:

1. A refocus of TZD to:
 - Traffic Safety Culture
 - Adoption of the Safe System Approach
2. Secure partnership commitments with new agencies and the Governor's Office
3. Hire an Executive Director to oversee the TZD Efforts
4. Hire statewide staff to assist the Executive Director
5. House TZD staff external from any agency
6. Secure additional State funding for the TZD program
 - Ongoing flexible State funding for TZD
 - One-time, near-term infusion of State funding to speed up culture building focus

I. TZD Coordinators

Minnesota set out to establish a Toward Zero Death Regional Coordinator for every MnDOT District/Area Transportation Partnership (ATP) in 2010. Though this has taken nearly a decade to setup, fund, and implement. However, despite these challenges, Minnesota now has nine regional coordinators and the Statewide Coordinator, ensuring all parts of the state have a person dedicated to building partnerships, breaking down barriers, and being an advocate for all the E's in every region of the State. Minnesota Office of Traffic Engineering continues and plans to support the financial need to support these positions with a mix of funding from Federal and State sources, and from various agency budgets.

J. Tribal Safety Plan – White Earth Nation and other opportunities

MnDOT OTE and District 4 are currently in discussion with White Earth Nation to assist in the development of a Tribal Transportation Safety Plan. MnDOT would provide technical assistance, funding, and project management support while engaging with the Tribe and Tribal Leadership.

MnDOT has also been working with more engagement with Tribal Nations. Red Lake was recently awarded a rural intersection lighting grant through the Tribal Traffic Safety Program (TTSP).

K. Local County and City Engineering Peer Exchanges (2023 Potentially)

MnDOT OTE, State Aid, in partnership with the Minnesota County Engineers Association (MCEA) is currently in the early planning phases of more comprehensive and technical outreach to Minnesota's 87 Counties and interested cities. While MnDOT would continue to support the ongoing need of updated County Road Safety Plans, MCEA has expressed the need for a revised educational effort for County Engineers to better understand the ongoing crash issues, strategies that work, funding options and availability, and how to implement these projects. MCEA members have expressed there has been significant turnover in the County public works engineering workforce since this was last done approximately 15 years ago.

L. Complete Streets Policy

MnDOT has adopted a Complete Streets Policy with the goal of improving the transportation system's safety and functionality for all users. The policy was adopted in 2016 (www.mndot.gov/policy/operations/op004.html) and is nearing completion of a major revision and update to the Complete Streets User Manual. This should be completed and published at approximately the same time as this Implementation Plan is completed.

M. 100% HSIP Coverage on Various Project Types

For the most recent local HSIP solicitation, MnDOT made up to \$2 million available for 100% Federal-share coverage of the following safety treatments and accepted applications at high-priority locations as defined in a County Road Safety Plan:

- Curve/Chevron signing
- Rumble strips—sinusoidal or traditional
- Enhanced edgelines (must be in combination with rumble strips)

For the treatments listed above, multi-county projects received preference over single-county projects, though both are eligible for 100% funding. Multi-county projects can still apply for professional engineering services, but the cost share will remain 90% Federal/10% local.

Future solicitations may focus on rumble stripes, clear zone improvements, and/or pedestrian infrastructure.

Conclusion

Based on this submitted Plan, the State of Minnesota should now be in compliance with the provisions set forth in 23 U.S.C. 148(i) for the subsequent fiscal year. The State of Minnesota will continue to: 1) use obligation authority equal to the HSIP apportionment for the year prior to the year for which the targets were not met or significant progress was not made, only for HSIP projects; and has 2) submitted an annual HSIP Implementation Plan (this document) that describes the actions the State plans to take to meet or make significant progress toward meeting its subsequent targets. Per 23 U.S.C. 148(i), this HSIP Implementation Plan has:

- Described the process for identifying roadway features that constitute a hazard to road users
- Described the process to identify highway safety improvement projects on the basis of crash experience, crash potential, or other data-supported means
- Described how HSIP funds will be allocated, including projects, activities, and strategies to be implemented
- Described how the proposed projects, activities, and strategies funded under the State HSIP will allow the State to make progress toward achieving the safety performance targets; and
- Described the actions the State will undertake to achieve the performance targets.

This plan should meet the requirements and has been submitted to the FHWA on June 30, 2022.

Appendix

References

MnDOT Local Solicitation for HSIP Funding. Greater Minnesota, 2023-2026. September 2021.

www.mndot.gov/stateaid/trafficsafety/hsip/hsip-2023-2026-guidebook-greater-mn.pdf

Highway Safety Improvement Program for State Fiscal Years 2026 and 2027. Metro District Program Criteria.

MnDOT Metro District Traffic Engineering. February 2022.

<https://metro council.org/Transportation/Planning-2/Transportation-Funding/Regional-Solicitation-NEW/Sample-Regional-Solicitation-Applications/SampleApplicationWordDocs2022/2022-HSIP-Application.aspx>

MnDOT Traffic Engineering Reports and Publications.

<http://www.dot.state.mn.us/trafficeng/safety/reportspubl.html>