



Highway Safety Improvement Program (HSIP)

Funding Guide

August 2015

Table of Contents

MAP-21 Funding Overview	5
Typical Solicitation Timeline for Greater MN (Local and District) Projects.....	6
HSIP Project Priority	7
Policy	8
Acronym Definitions	9
HSIP – Detailed Timeline for Greater MN Solicitations.....	11
Greater MN Local.....	13
Greater MN District	31
Metro.....	49
Rail-Highway Crossing Set Aside	67
Appendix A: Sample HSIP Worksheet.....	69
Appendix B: A Planners Guide to Sustained Crash Location Selection and Critical Crash Rates	71
Appendix C: Recommended Service Life	83
Appendix D: Delegated Contract Process.....	85
Appendix E: HSIP and Signals Greater Minnesota.....	87
Appendix F: HSIP and Signals Metro	89
Appendix G: Narrow Shoulder Paving Guidelines.....	91
Appendix H: MnDOT Metro District Traffic Engineer Contacts.....	93
Appendix I: Met Council Solicitation Timeline	95
Appendix J: Metro Crash Rate Calculations.....	97

Highway Safety Improvement Program Funding Guide

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program. The goal of the program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. HSIP requires a data-driven, strategic approach to improve highway safety. HSIP goals for each district and ATP are determined by fatal and serious injury crashes. HSIP funds are managed at the Statewide level by the Office of Traffic, Safety and Technology (OTST) and by the Office of Transportation System Management (OTSM). Unspent funds will be returned to the statewide program for redistribution.

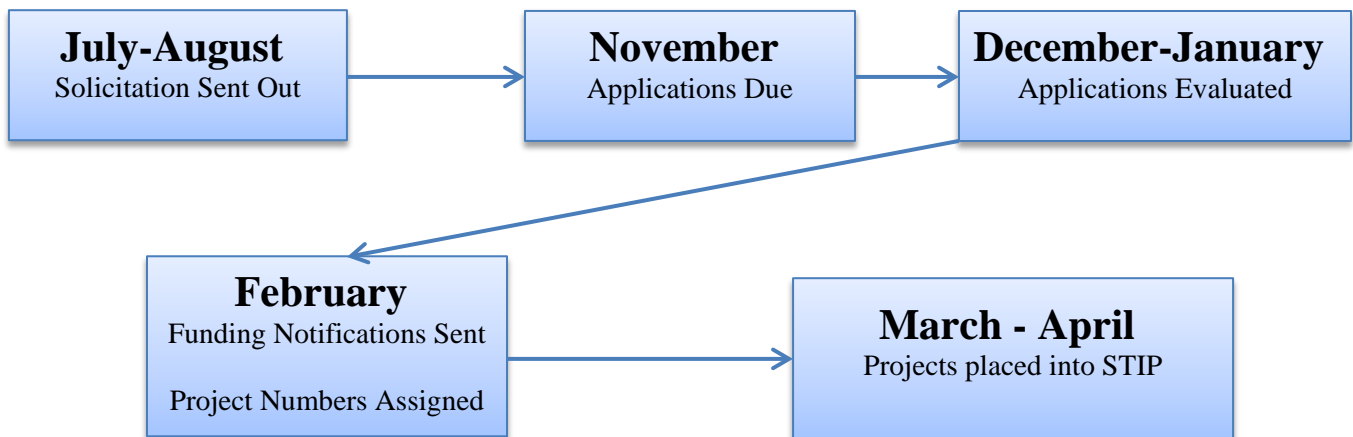
This document explains the requirements and gives guidance to applicants desiring to obtain HSIP funds under the Federal MAP-21 legislation. Projects submitted should have the greatest potential of achieving the object of reducing fatal and serious injury crashes on all roads.

MAP-21 Funding Overview

	2015	2016	2017	2018	2019	2020
a. HSIP						
i. Greater MN Local	9.6	9.8	10.4	10.4	10.4	10.4
ii. Greater MN District	6.9	7.0	7.8	7.8	7.8	7.8
iii. Metro	12.0	12.2	11.7	11.7	11.7	11.7
Subtotal HSIP	28.5	29.0	29.9	29.9	29.9	29.9
b. 164 Sanction/MS32 (estimated)	6.9	6.9	6.9	6.9	6.9	6.9
c. District C HSIP	1.5	1.5				
d. Rail-Hwy Crossing Set-aside	5.0	5.0	5.4	5.4	5.4	5.4
Total	41.9	42.4	42.2	42.2	42.2	42.2

- a. **HSIP:** OTST conducts two solicitations to request and approve applications for HSIP. One process is for the Greater Minnesota local agencies and the other is for MnDOT district projects. Met Council facilitates a Metro ATP solicitation for both local and district projects.
- b. **164 Sanction Funds/MS32:** Due to a weak repeat DWI offender law, federal dollars are sanctioned from MnDOT's overall program and are required to be spent on HSIP projects or alcohol projects. \$1.5M or more of these funds will continue to be used for behavior, extraordinary enforcement, education and TZD regional efforts as identified in the updated SHSP. \$5.0M or less will be used for statewide priorities. If these funds are not identified in the STIP by July 1 of the FFY, these funds will be made available to all ATPs and distributed through a quick solicitation or by advancing projects.
- c. **District C HSIP:** District C HSIP funds are used for statewide safety initiatives, initially for cable median barrier and most recently to fund behavioral strategies such as TZD Regional Coordinator positions, extra enforcement of speed, and education projects for speed and work zones. Currently, no HSIP funds are allocated to District C HSIP.
- d. **Rail-Hwy Crossing Set-aside:** MAP – 21 requires a \$5.4M annual set-aside for rail crossings.

Typical Solicitation Timeline for Greater MN (Local & District) Projects



HSIP Project Priority

HSIP projects must address a fatal and serious injury crash history or location specific risk factors associated with the occurrence of fatal and serious injury crashes. The critical crash rate will be used to determine if a significant crash history either fatal, serious or a combination of both exists at a particular location. Five years of crash data should be used for this calculation; however, 3 or 10 years may be considered on a case by case basis in consultation with OTST. Additionally, low cost, high impact improvements identified through a risk analysis (similar to the district and county road safety plans) will also be considered for HSIP funding. It is anticipated that a balance of risk mitigation and historical crash consideration will be part of HSIP in the foreseeable future.

Repair, replacement and rehabilitation of existing safety elements are not considered a Traveler Safety investment, but are existing infrastructure work categorized as Roadside Infrastructure Condition investment.

Sustained crash locations are areas where, statistically, there are higher number of crashes associated with a particular location when compared to other similar locations throughout the state. Sustained crash locations greatly exceed statewide averages and can be determined by using a critical crash rate to establish if a location has a sustained crash problem. Multiple critical crash rates (total crash rate, fatal crash rate, and fatal plus serious injury crash rate) are available to measure if a roadway segment and intersection meets the requirements of a sustained crash location. If a location has a crash rate that exceeds the associated critical crash rate, a benefit cost ratio should be completed to determine the amount of safety impact that can be considered at this particular location compared to the safety investment under consideration.

See Appendix B for more information regarding sustained crash locations and critical crash rates.

HSIP Goals beginning in 2017

ATP	% F + A Injury Crashes by ATP (2009-2011)	HSIP/HRRR setaside per ATP	*District HSIP dollars	*Local HSIP dollars
1	8.3%	\$ 2,485,050.45	\$ 1,195,510.76	\$ 1,289,539.69
2	4.9%	\$ 1,476,739.25	\$ 643,242.25	\$ 833,497.00
3	14.6%	\$ 4,374,641.53	\$ 1,808,385.26	\$ 2,566,256.27
4	6.7%	\$ 1,992,804.04	\$ 889,097.19	\$ 1,103,706.85
6	11.7%	\$ 3,509,240.57	\$ 1,371,515.42	\$ 2,137,725.15
7	7.9%	\$ 2,358,019.12	\$ 998,778.80	\$ 1,359,240.32
8	6.9%	\$ 2,048,380.24	\$ 949,056.48	\$ 1,099,323.76
M	39.0%	\$ 11,655,124.80	\$ 3,601,260.28	\$ 8,053,864.52
TOTAL	100.0%	\$ 29,900,000.00	\$ 11,456,846.44	\$ 18,443,153.56

*HSIP Goals based on 2009-2011 data

Policy

Incidental Safety Improvements

HSIP is not the only source of funding for safety projects and improvements. Districts should be spending an additional amount, from their general program funds, equal to or greater than their HSIP goal each year on safety improvements. These types of minor safety improvements shall be installed on each project undertaken on the trunk highway network. The intention of these projects is that they are incidental to the overall scope of the project. In some instances, they are required by a standard or policy in place for the Department. No HSIP funding will be used to offset the costs of these incidental improvements. Some examples of incidental improvements are:

- Pavement markings
- Sign installation, upgrades and removals
- Pavement Messages
- Rumble strips or stripes
- Upgrade safety hardware (guardrail, terminals, attenuators)
- Safety Edge
- Add or extend turn lanes that do not require substantial grading or right of way
- Install bypass lanes at T-intersections where substantial grading or right of way is not required
- Clear zone management (remove or guard areas in the clear zone)
- Chevrons at high risk curves
- Destination lighting at high risk intersections

Programming

HSIP projects should be programmed 4 years in advance. Future years will not be funded until the current year is programmed. If a District is unable to meet this requirement, unprogrammed HSIP funds may be reallocated to another district.

OTST will approve State and local Greater Minnesota HSIP projects. A letter confirming project selection will be sent to the Office of Capital Programs and Performance Measures. Project numbers for local projects will be generated by State Aid for Local Transportation (SALT). For State projects, this number will be generated within the district. Once there is a project number, the project can be placed in the STIP. In Metro district, Met Council will continue to hold a separate HSIP solicitation for all roads and OTST staff will participate in their project selections.

Acronym Definitions

ATP

Area Transportation Partnership

CO

Change Order

CRSP

County Road Safety Plan

DE

District Engineer

DSAE

District State Aid Engineer

DTE

District Traffic Engineer

FMIS

Fiscal Management Information System
(Contact: John Lindemer)

FHWA

Federal Highway Administration
(Contact: Will Stein)

HRRR

High Risk Rural Road

HSIP

Highway Safety Improvement Program
(Contact: Julie Whitcher)

LGU

Local Government Unit

MPO

Metropolitan Planning Commission

NPDES

National Pollution Discharge Elimination System

OTST

Office of Traffic, Safety and Technology
(Contact: Julie Whitcher)

OTSM

Office of Transportation System Management
(Contact: Trang Chu and Kai Vang)

OFM

Office of Financial Management
(Contact: John Lindemer and Pat Elness)

OPMTS

Office of Project Management Technical Support
(Contact: Brad Skow)

PUMA

Project Unification Management Application – Software program to report the cost of one project or a group of projects.

PPMS

Program and Project Management System - Manuals, procedures and more for tracking project development

P6

Resources related to the Primavera P6 schedule management tool for project managers and functional groups

SA

Supplemental Agreement

SALT

State Aid for Local Transportation
(Contact: Mark Vizecky and Sulmaan Khan)

STIP

State Transportation Improvement Plan – Identifies the schedule and funding of transportation projects.

TAB

Transportation Advisory Board

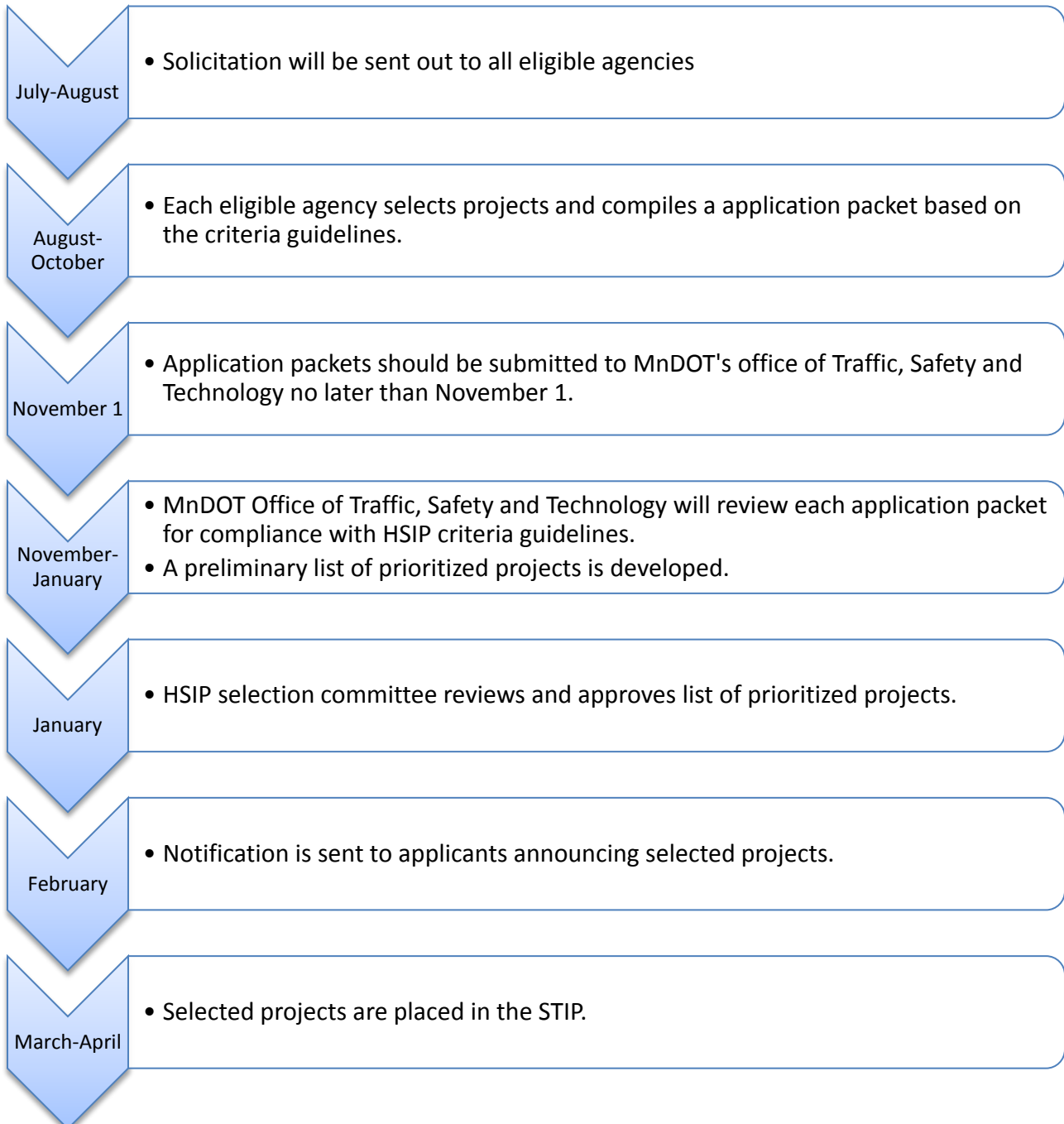
TAC

Technical Advisory Committee

HSIP

Minnesota applies the MAP-21 priorities described in this document consistently across the state; however, there are three distinct solicitations: Greater Minnesota Local Solicitation, Greater Minnesota District Solicitation and Metro Solicitation. The subsequent sections detail those solicitations.

Both Greater Minnesota solicitations adhere to the following schedule. The Metro solicitation schedule differs slightly and is included in that section.



Greater MN - Local



Greater MN - Local

1. **OTSM/OFM & OTST agree on funding levels (OTSM, OFM, OTST)**
The OTSM, OFM, and OTST communicate and agree on the funding levels that are either left over or what is expected to be received in the current year.
2. **OTST confirms budget authority (OTST, OFM)**
With notification from the OTST Safety Section, OTST will work with OFM to make sure there is budget authority for the MS32 funds.
3. **OTST prepares solicitation package (OTST)**
OTST prepares the solicitation package.
4. **OTST sends solicitation package to State Aid, DE's, DTE's, MPO's, Planners, Tribal Governments & OTSM (OTST)**
OTST distributes the solicitation package to State Aid, DE's, DTE's, MPO's Planners, RDC's, Tribal Governments and OTSM.
5. **State Aid sends solicitation to LGU's and DSAE's (State Aid)**
State Aid sends the solicitation package to the LGU's and DSAE's.
6. **OTST / State Aid answers questions/assists in developing projects (State Aid/OTST)**
OTST and State Aid answers questions and assists the LGUs, Tribal Governments and Districts in developing the projects.
7. **LGUs and Tribal Governments submit projects to OTST (LGU)**
Individual LGU's and Tribal Governments submit projects directly to OTST.
8. **HSIP selection committee selects projects & identifies funding source (HSIP Selection Committee (OTST))**
The selection committee meets and selects projects to include the funding decisions on the type of funding to be used and the amount of funding.
9. **OTST provides project list to State Aid (OTST)**
OTST develops a project list and sends it to State Aid.
10. **State Aid assigns state project numbers to the projects (State Aid)**
State Aid assigns State Project Numbers to the projects using PUMA.
11. **State Aid sends project numbers to OTST (State Aid)**
State Aid sends the list of project/state project numbers to OTST.
12. **OTST notifies LGU, Tribal Governments, State Aid Engineer, DE, DTE, MPS, ATP's Planners OTSM of projects (OTST)**
OTST notifies the LGU, Tribal Governments, State Aid Engineer, DE's, DTE's, MPO's, ATP's Planners, and OTSM of the list of projects to include State Project Numbers.
13. **District place projects in the STIP (Districts)**
District submits the projects into the STIP.
14. **OTSM / OFM adjusts set asides as needed (OTSM/OFM)**
OTSM / OFM makes the necessary adjustments to the set asides in the STIP as needed.
15. **DSAE processes projects with LGU and Tribal Governments (DSAE)**
The District State Aid Engineer works with the LGU and Tribal Governments to process the projects.

16. **SALT requests environmental and Historical Clearance – Minor impacts only (Salt)**
The State Aid for Local Transportation requests the environmental and historical clearance documents (for minor impacts only).
17. **LGU and Tribal Governments submit plan sets to SALT for review (LGU)**
The LGU's and Tribal Governments submit plan sets to State Aid for Local Transportation for their review.
18. **SALT submits project to OFM for FHWA authorization (SALT)**
State Aid for Local Transportation submits the project to OFM for FHWA's federal funding authorization.
19. **Project is authorized by FHWA for construction (OFM, FHWA)**
OFM enters the Federal Authorization Request Form into FMIS for approval by FHWA.
20. **LGU and Tribal Governments advertises and opens bids for project (LGU)**
The LGU's and Tribal Governments advertise the project, receive bids and open bids for the project.
21. **Project is awarded to low bidder and construction begins (LGU/Contractor)**
The LGU awards the bid to the low bidder and construction begins by the contractor.
22. **LGU submits payment requests to DSAE (LGU)**
The LGU submits payment requests to the District State Aid Engineer.
23. Is this the Final Payment Request?
24. **DSAE reviews and approves payment (DSAE)**
The District State Aid Engineer reviews and approves the payment request.
25. **State Aid finance processes payment request (State Aid Finance)**
State Aid Finance processes the payment request.
26. **Payment to LGU or Tribal Government (State Aid Finance)**
State Aid Finance sends payment to the LGU or Tribal Government.
27. **DSAE reviews, conducts field inspections and approves final payment (DSAE)**
The District State Aid Engineer reviews, conducts field inspections and approves the final payment request.
28. **State Aid finance processes final payment request (State Aid Finance)**
State Aid Finance processes the final payment request.
29. **Project is sent to audit (State Aid/Audit)**
State Aid Audit sends the project/final payment request to Audit.
30. **Payment to LGU or Tribal Government (OFM)**
After the audit is complete, OFM pays the LGU or Tribal Government.
31. **Project Completed and Closed Out (District)**
District completes and closes out project.
32. **OTST reconciles STIP and FMIS each SFY for Annual HSIP Report (OTST)**
OTST will reconcile the STIP and FMIS each state fiscal year for the Annual HSIP report for FHWA.



HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

Greater Minnesota Solicitation for Local Projects

SAMPLE SOLICITATION

GUIDEBOOK & APPLICATION FORM

HSIP

SAMPLE

INTRODUCTION

The Office of Traffic, Safety and Technology (OTST) in partnership with State Aid for Solicitation (SALT) is soliciting for a minimum of \$31 million over three years of local projects for the Highway Safety Improvement Program (HSIP).

Local Projects			
District	Year 1	Year 2	Year 3
1	\$ 1,287,801	\$ 1,287,801	\$ 1,287,801
2	\$ 826,928	\$ 826,928	\$ 826,928
3	\$ 2,560,835	\$ 2,560,835	\$ 2,560,835
4	\$ 1,109,520	\$ 1,109,520	\$ 1,109,520
6	\$ 2,131,060	\$ 2,131,060	\$ 2,131,060
7	\$ 1,361,593	\$ 1,361,593	\$ 1,361,593
8	\$ 1,107,224	\$ 1,107,224	\$ 1,107,224
TOTAL	\$10,384,960	\$10,384,960	\$10,384,960

\$ 31,154,881

*based on 2009-2011 Crash data

**based on \$29.9M total annual distribution

OTST strongly encourages submitting more projects than the minimum targets listed above as more dollars may become available for quality projects. If Year 1 and Year 2 funds are left unallocated after this solicitation, then those funds will go to a project outside of this solicitation that can be delivered in the necessary timeframe.

REQUIREMENTS

The Highway Safety Improvement Plan (HSIP) selection committee will evaluate each application, prioritize and determine the best funding source for each. **Independent of the source from which funding will be secured; certain requirements must be met to receive funding.**

1. Applications must be received on or before **November 1** of each year a solicitation is conducted.
2. **The County Road Safety Plan should be the starting point for selecting projects for this solicitation.**
3. Projects must focus on fatal and serious injury crashes. Plans can be a resource to help identify locations or methodology. Additional information on how to analyze locations is available in Appendix A and B.

NOTE: For projects not listed in a road safety plan agencies should consult Julie Whitcher (651-234-7019).

4. Only stand-alone projects will be considered. It is recognized that portions of larger projects have elements that improve the safety of an intersection or section of roadway. Safety features, such as guardrail, that are routinely provided as part of a broader project should be funded from the same source as the broader project. Proposals should be limited to those that can be considered legitimate stand-alone safety projects. In some instances, narrow shoulder paving in conjunction with resurfacing projects may be allowed. See [Appendix G](#) for these exceptions.
5. Applicants submitting systemic lane departure or intersection projects identified in a County Road Safety Plan, need only fill out page 1 of the application and attach the appropriate pages from that **plan**. Reactive projects and projects not identified in the County Road Safety Plan need to attach additional documentation as indicated on the application. Page 4 of the application applies only to Reactive/Spot location projects.
6. Applicants are strongly encouraged to coordinate with other jurisdictions and agencies affected by the project. A letter from each of these agencies is required stating that they are aware of the project and have no objections. These letters do not imply participation in funding. Any projects proposed on or adjacent to state roads should be discussed with the MnDOT District Traffic Engineer before the project is submitted.
7. Projects must indicate the roadway and specify both a beginning and an ending reference point. This is to expedite the environmental review and historical site evaluation process.
8. Applicants must agree to maintain any selected projects for the life of the project. (See [Appendix C](#) for FHWA Recommended Service Life Criteria.)
9. Projects **NOT** eligible for funding:

- overlays
 - guardrail updates
 - sign upgrades
 - “Force account” work -all projects must be done by a qualified contractor through the design-bid-build process
 - Maintenance
10. Edgeline restriping projects will be considered for 6” edgelines only. These projects will be selected based on risk as identified in the County Road Safety Plans.
11. New or reconstructed signals will be considered if they meet the criteria contained in [Appendix E](#).
12. Maximum Federal Funding is 90% of eligible total project costs up to:
- \$350,000 for individual systemic projects.
 - \$1,000,000 or as much as available by ATP for reactive projects.
 - Agencies are **encouraged** to submit multiple applications in the event that additional funding is available.

NOTE: There is a minimum 10% local match required. The match must be made in non-federal “hard dollars”. Soft matches (i.e. volunteer labor, donated materials, professional services) will not be included in the match.

13. Funds are not “capped.” Additional funds may be approved based on bid prices or other unforeseen circumstances. The selection committee must approve any increases in funding.
14. Funding for the project will be eliminated from the program if it does not meet the deadlines described in [Appendix D](#). **The deadline is April 15 of the year that it is programmed.**
15. **Before and after summaries and data collection forms must be completed prior to final payment.** (examples for both are available on State Aid for Local Transportation’s (SALT) traffic safety page)
http://www.dot.state.mn.us/stateaid/sa_traffic_safety.html

ELIGIBILITY

The Federal funds listed in the table on the first page of this solicitation are available to Tribal Governments, Greater Minnesota counties, and agencies within those counties with the ability to receive State Aid. Non-State Aid agencies must be sponsored by their county.

CRITERIA FOR SYSTEMIC PROJECT FUNDING

A **minimum** of 70% of the HSIP dollars that are awarded to each ATP will be systemic. The criteria that will be used to select these projects are detailed in this section of the document.

Proposed projects qualify for the **Systemic** Program by the following criteria:

- Agency agrees to maintain for the life of the project – see [Appendix C](#)
- Letter from other agencies involved in the project
 - E.g. Otter Tail County submits an application for County-wide lighting improvements at CSAH/TH intersections. They need to include a letter from MnDOT District 4, stating that the District is aware of the project and has no objections.

PRIORITIZATION

Projects will be prioritized using the following criteria:

- Part of a longer range plan (Road Safety Plan or Road Safety Audit Recommendations) – include an excerpt from the existing plan
 - **Higher priority projects from the Road Safety Plan will receive more points during the selection process than lower priority projects.**
- Cost/mile or Cost/intersection

CRITERIA FOR REACTIVE PROJECT FUNDING

A **maximum** of 30% of the projects awarded to each ATP will be reactive. Reactive projects must have a B/C greater than 1 to be considered for funding. The criteria that will be used to select these projects are detailed in this section of the document.

Proposed projects qualify for the **Reactive** Program by the following criteria:

- Locations must have a significant crash history that includes a fatal or serious injury crashes. Significant crash history can be determined in a number of ways, it is suggested that critical crash rates be used to assess significance. Details on calculating critical rates can be found in [APPENDIX B](#). Contact OTST regarding the average crash rate by intersection type (see also [Traffic Safety Fundamentals Handbook](#) page B-8). Contact OTST if you are going to consider using another metric to address/quantify significant crash history

http://www.dot.state.mn.us/trafficeng/publ/fundamentals/MnDOT_Safety_Handbook_FINAL.pdf

- Must have a benefit/cost (B/C) ratio of 1.0 or greater.* (Note: The B/C ratio shall exclude right-of-way costs.)

***Only crashes contained within the Minnesota Department of Transportation database can be used to determine the B/C for project submittals. If it is found that crashes have been omitted from MnDOT's database, you will need to provide the crash report to have those crashes entered into the system.**

- Agency agrees to maintain for the life of the project – see [Appendix C](#).

REQUIRED MATERIAL & SPECIAL INSTRUCTIONS FOR REACTIVE PROJECTS

Following, is a list of material required to submit a project. Failure to provide this information will exclude the submission from consideration:

- Project plan or preliminary layout/scope of work proposed
- Calculations demonstrating a significant crash history (see [Appendix B](#))
- HSIP Worksheet – A sample worksheet is included in [Appendix A](#). An Excel version of the HSIP Worksheet is available at:
<http://www.dot.state.mn.us/trafficeng/safety/index.html>
- Crash data; include all crashes from the three most recently completed calendar years. Only crashes contained within the Minnesota Department of Transportation's database can be shown. This is to insure that all project proposals can be equally compared. All crash data must be obtained from MnCMAT.

Each submission should also include the following:

- Cover Letter – include submitting agency, project manager, description of project, Federal funds requested, local match and source.
- Location map.
- Letter from other entities involved in the project stating their awareness of the project and that they have no objections.

SUBMITTAL INSTRUCTIONS

Applications should be submitted **electronically** to the OTST office. Applications must be received in the office no later than the specified deadline.

Applications for **all ATP's** are due in the OTST office on or before **November 1** each year.

An electronic version of this application can be found at:

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

Electronic submittals must be in a pdf formatted document and be formatted to print no larger than 11x17. Each completed application and its supporting documents should be in **ONE** pdf file.

IE: If you are submitting three applications, you will have 3 pdf files.

Email electronic submittals to: Julie.Whitcher@state.mn.us

If electronic submittal is not possible, then applicants may submit a paper application: Paper applications should be mailed or delivered to the following address on or before the application deadline:

Julie Whitcher
MnDOT
1500 West County Road B2, MS 725
Roseville, MN 55113

It is not necessary to submit both an electronic and printed version of the same application.

Contacts

Applicants having questions or requiring assistance with this application should contact:

Julie Whitcher, OTST
651-234-7019
Julie.Whitcher@state.mn.us

Brad Estochen, OTST
651-234-7011
Bradley.Estochen@state.mn.us

Mark Vizecky, State Aid
651-366-3839
Mark.Vizecky@state.mn.us

Sulmaan Khan, State Aid
651-366-3829
Sulmaan.Khan@state.mn.us



**Greater Minnesota
JOINT APPLICATION FOR FEDERAL FUNDS**

Minnesota Department of Transportation
Office of Traffic, Safety and Technology
in partnership with State Aid for Transportation

Due Date: November 1

Project Name

Agency Contact: name, address, phone number, and e-mail (you will receive an electronic confirmation that your application was received):

ATP County of

Municipality of Township of Other

Requested Year of Funding (State Fiscal Year): Must be Year 1 Must be Year 2 Must be Year 3 Must be Year 4 Any Year* *Projects will be assigned a funding year by OTST

If this project is funded, do you agree to maintain it for the life of the project? (See Appendix C* for FHWA Recommended Service Life Criteria) Yes

Roadway type: CSAH MSAH County Road City Street Other

Road Number or Street Name:

Attach detailed project description and map

Is this a single or multiple agency application? Single Agency Multiple Agencies

Lead Agency Other Agency (Agencies) Involved

Funding Source	Estimated Cost
Federal Funds	<input type="text"/>
State Aid Funds	<input type="text"/>
Local Match (10% of Total project cost required)	<input type="text"/>
Local labor, materials and equipment	<input type="text"/>
Total Project Cost	<input type="text"/>

Applicants are advised that local labor, materials, and equipment are NOT reimbursable with Federal funds, or to be included in the local match, but may be used in the total project cost.

Systemic Project Identified in Road Safety Plan (ATTACH PROJECT SHEET FROM SAFETY PLAN TO THIS SHEET AND SUBMIT)

Systemic Project NOT in Road Safety Plan (GO TO PAGE 2)

Reactive Project (B/C > 1) (GO TO PAGE 4)

QUALIFYING INFORMATION

Systemic Projects

- Type of Project: Lane Departure (**COMPLETE PAGE 2**)
 Systematic Intersection Improvements (**COMPLETE PAGE 3**)
 Other (Please specify) Contact Julie Whitcher before submitting a project in this category

Lane Departure Projects

Required Attachments:

- Attach Location sheet
- Attach spreadsheet listing the following for each segment:**
- Proposed Strategy
 - Abbreviated verbal description of segment (IE: Mississippi River to Main Street)
 - Beginning and ending reference points
 - ADT (list source of data)
 - Miles to be upgraded
 - Fatal and A injury crashes (10 most recent, completed calendar years)
 - K+A Crashes per mile

Summary Information

Enter the following **TOTALS** from the spreadsheet described above:

Total Miles to be upgraded	<input type="text"/>				
Fatal Crashes	<input type="text"/>	A Injury Crashes	<input type="text"/>	K+A crashes per mile	<input type="text"/>

Cost per Mile Amount should include federal funding only
(not total project cost)

- Proposed project is a recommendation from a Road Safety Plan or a Road Safety Audit
(must provide excerpt from existing plan)

E-mail application and attachments in **ONE PDF** formatted document to:
Julie.Whitcher@state.mn.us
(must print at 11x17 or smaller)

SYSTEMIC LANE DEPARTURE PRIORITIZING INFORMATION

Systemic Projects

Intersection Projects

Required Attachments:

- Attach Location sheet
- Attach spreadsheet listing the following for each intersection:**
 - Verbal description of intersection
 - ADT for each leg of the intersection (list source of data)
 - Fatal and A injury crashes (10 most recent, completed calendar years) Include only crashes within 500 feet on either side of the intersection or that are coded "intersection related."
 - K+A Crashes per intersection

Summary Information

Enter the following **TOTALS** from the spreadsheet described above:

Total number of intersections to be upgraded

Fatal Crashes A Injury Crashes K+A crashes per intersection

Cost per Intersection

Additional Considerations

- Proposed project is a recommendation from a Road Safety Plan or a Road Safety Audit (must provide link to or excerpt from existing plan)

E-mail application and attachments in **ONE (1)** PDF formatted document to:
Julie.Whitcher@state.mn.us
(must print at 11x17 or smaller)

SYSTEMIC INTERSECTION PRIORITIZING INFORMATION

Reactive Projects

Required Attachments:

- Attach Location sheet
- Verbal description of project
- Plan sheets
- All crashes (3 most recent, complete calendar years)
- Attach critical crash rate calculations
- Attach HSIP Worksheet B/C Ratio

Summary Information

- Attach a discussion of the rationale used in the selection of Crash Reduction factors
- Service Life

REACTIVE PRIORITIZING INFORMATION

E-mail application and attachments in **ONE (1)** PDF formatted document to:
Julie.Whitcher@state.mn.us
(must print at 11x17 or smaller)

Greater MN District

Greater MN District



- 1. OTSM/OFM & OTST agree on funding level (OTSM/OFM, OTST)**
OTSM, OFM, and OTST communicate and agree on the funding levels that are either left over or what is expected to be received in the current year.
- 2. OTST confirms that MnDOT has Budget Authority (OTST, OFM).**
With notification from the OTST Safety Section, OTST will work with OFM to make sure there is budget authority for the funds.
- 3. OTST prepares and distributes solicitation package (OTST).**
OTST prepares the solicitation package and distributes the package to the current DE, DTE and PMG mailing list.
- 4. Districts submit projects to OTST (Districts).**
The Districts propose their projects to OTST by the deadline posted in the solicitation.
- 5. OTST establishes selection committee (OTST).**
OTST establishes their selection committee for this solicitation.
- 6. Selection committee selects projects (Selection Committee).**
The selection committee meets, reviews proposals and selects projects to include the funding decisions on the type of funding to be used and the amount of funding.
- 7. OTST notifies (awards) Districts of selected projects. (OTST)**
After the project selection is made, OTST notifies the Districts of the selected projects.
- 8. Districts assign State Project (SP) numbers using PUMA (Districts)**
Each District will assign a state project number for each of their approved projects using PUMA.
- 9. District sends State Project numbers and letting dates to OTST (Districts)**
Each of the Districts will send a list of the projects, to include the State Project numbers and the letting dates to OTST.
- 10. District creates PPMS Header Screen and adds project to P6 (Districts)**
The Districts will create the PPMS Header Screen and add the project to P6 for each approved project.
- 11. District Requests OTSM to create PPMS Funding Screen. (Districts, OTSM)**
Each District will request OTSM to create a PPMS Funding Screen.
- 12. Projects are added to STIP either by amendment or as a new project in normal STIP development cycle by: April 15th (Districts)**
Districts will work with OTSM to either add or amend projects into the STIP no later than April 15th of the current year.
- 13. Construction Plans, Specifications, and Estimates (Districts)**
Districts will work on construction plans, specifications and estimates.
- 14. Projects submitted to OPMTS for plan review and pre-letting process (Districts, OPMTS)**
Districts will submit projects to OPMTS for plan review and pre-letting process.

- 15. OPMTS sends Federal Authorization Request Form to OFM, OFM enters it into FMIS. (OPMTS, OFM)**
OPMTS sends the Federal Authorization Request form to OFM, OFM enters the Federal Authorization Request form into FMIS for approval by FHWA.
- 16. Project Authorized by FHWA, FHWA signs form and sends to OFM Project Authorization (FHWA)**
FHWA approves (signs) the Federal Authorization Request form and enters approval/signature back into FMIS.
- 17. Federal Authorization Request Form sent from OFM-Project Authorization to OPMTS Project Delivery (OFM-Project Authorization (John Lindemer))**
OFM sends the approved/signed Federal Authorization Request form back to OPMTS.
- 18. OFM-Project Authorization updates their Tracking spreadsheet based on Authorization (OFM)**
OFM will update the Tracking spreadsheet and send the updated spreadsheet to OTST.
- 19. Project Advertised (OPMTS Project Delivery)**
OPMTS Project Delivery advertises the project.
- 20. Project Letting (OPMTS)**
Project is let.
- 21. PPMS Funding Screen is updated with Let Amount (OTSM)**
OTSM updates the PPMS Funding Screen when project is let.
- 22. Project is Encumbered (PPMS Funding Screen updated with Encumbered Amount) (OFM)**
OFM encumbers the funding for the project and updates the PPMS funding screen.
- 23. Funds are Encumbered in SWIFT (OFM-Financial Ops Section)**
OFM Financial Ops Section encumbers the funds in SWIFT.
- 24. Project is awarded (Contract Administration)**
Contract Administration awards project.
 - a. **Program savings identified.** At this point OTSM and OTST should communicate to see if there were program savings identified after the award.
 - b. **Determine funds to hold for SAs and Cos.** OTSM and OTST consideration is made to hold funds for SA's and CO's. (Only necessary for Sanction dollars)
 - c. **Determine funds to fund additional projects.** OTSM and OTST consideration is made to fund/add additional projects.
- 25. OFM-Project Authorization updates spreadsheet based on Award Mod (OFM)**
OFM updates their Tracking spreadsheet based on Award Mod and sends an update to OTST.
- 26. Project is Constructed (Contractor)**
Contractor constructs project.

27. Contractor Bills Percent Complete (District Project Manager)

Contractor bills percent complete and the District project manager approves the invoice.

28. Contractor Paid (OFM)

Contractor is paid by OFM.

29. Supplemental Agreements (SA) / Change order (CO) approved by District PM (District PM)

If there is a supplemental agreement or change order, the contractor will work with the District project manager to get it approved.

30. SA/CO encumbered in SWIFT and FMIS is modified (OFM – Program Accounting)

The Office of Financial Management Program Accounting will modify the funding in FMIS and encumber the funds in SWIFT for the supplemental agreement or change order. (The SA or CO uses the same federal funds as the project.)

31. OFM-Project Authorization updates their Tracking spreadsheet based on SA/CO (OFM)

OFM will update their Tracking spreadsheet based on the supplemental agreement or the change order.

32. Project Completed and Closed Out (District) – The District will complete and close out the project.

- a. **FMIS Updated – Apportionment returned to Obligation Limit used elsewhere (OFM).** OFM will complete paperwork to return unused apportionment to the appropriate fund.
- b. **If the project is closed out in the same FFY as it is authorized, there may be an opportunity to reprogram any savings. (OTSM, OTST).** OTSM and OTST will discuss the opportunity to reprogram any unused funding if it becomes available in the same fiscal year.
- c. **OFM – Project Authorization updates their Tracking spreadsheet based on Close Out (OFM).** OFM will update the tracking spreadsheet to show the closeout of the project.

33. OTST reconciles STIP and FMIS each State Fiscal Year for Annual HSIP Report (OTST)

OTST will reconcile the STIP and FMIS each state fiscal year for the Annual HSIP report for FHWA.

Note 1: The Districts should contact OTST with project funding information and/or change in project funding information throughout the course of the project

Note 2: For sanction dollars, the actual funding level may not be known until late in the federal fiscal year, therefore an estimated funding level is identified with a District C buffer. Some sanction dollar projects should be held for letting late in the federal fiscal year to act as “bubble” projects.



HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

Greater Minnesota
Solicitation for District Projects

SAMPLE SOLICITATION

GUIDEBOOK & APPLICATION FORM

HSIP

INTRODUCTION

The Office of Traffic, Safety and Technology (OTST) is soliciting for a minimum of \$23 million over three years of State projects for the Highway Safety Improvement Program (HSIP).

District Projects

District	Year 1	Year 2	Year 3	
1	\$ 1,193,899	\$ 1,193,899	\$ 1,193,899	
2	\$ 638,172	\$ 638,172	\$ 638,172	
3	\$ 1,804,565	\$ 1,804,565	\$ 1,804,565	
4	\$ 893,780	\$ 893,780	\$ 893,780	
6	\$ 1,367,240	\$ 1,367,240	\$ 1,367,240	
7	\$ 1,000,507	\$ 1,000,507	\$ 1,000,507	
8	\$ 955,876	\$ 955,876	\$ 955,876	
TOTAL	\$ 7,854,040	\$ 7,854,040	\$ 7,854,040	\$ 23,562,119

*based on 2009-2011 Crash data

**based on \$29.9M total annual distribution

OTST strongly encourages submitting more projects than the minimum targets listed above as more dollars may become available for quality projects. If Year 1 and Year 2 funds are left unallocated after this solicitation, then those funds will go to a project outside of this solicitation that can be delivered in the necessary timeframe.

REQUIREMENTS

The Highway Safety Improvement Plan (HSIP) selection committee will evaluate each application, prioritize and determine the best funding source for each. **Independent of the source from which funding will be secured; certain requirements must be met to receive funding.**

1. Applications must be received on or before **November 1** of each year a solicitation is conducted.
2. **The District Safety Plan should be the starting point for selecting projects for this solicitation.**
3. Projects that originate from a road safety plan will be given priority. The higher priority given to the project in the safety plan, the more points that project will receive during the selection process.

NOTE: For projects not listed in a road safety plan agencies should consult Julie Whitcher (651-234-7019).

4. Only stand-alone projects will be considered. It is recognized that portions of larger projects have elements that improve the safety of an intersection or section of roadway. Safety features, such as guardrail, that are routinely provided as part of a broader project should be funded from the same source as the broader project. Proposals should be limited to those that can be considered legitimate stand-alone safety projects. In some instances, narrow shoulder paving in conjunction with resurfacing projects may be allowed. See [Appendix G](#) for these exceptions.

5. Applicants submitting systemic lane departure or intersection projects identified in a Safety Plan, **need only fill out page 1 of the application and attach the appropriate pages from that plan.** Reactive projects and projects not identified in the Safety Plan need to attach additional documentation as indicated on the application. Page 4 of the application applies only to Reactive/Spot location projects.
6. Applicants are strongly encouraged to coordinate with other jurisdictions and agencies affected by the project. A letter from each of these agencies is required stating that they are aware of the project and have no objections. These letters do not imply participation in funding. Any projects proposed on or adjacent to state roads should be discussed with the MnDOT District Traffic Engineer before the project is submitted.
7. Projects must indicate the roadway and specify both a beginning and an ending reference point. This is to expedite the environmental review and historical site evaluation process.
8. Applicants must agree to maintain any selected projects for the life of the project. (See [Appendix C](#) for FHWA Recommended Service Life Criteria.)
9. Projects **NOT** eligible for funding:
 - road safety audits
 - overlays
 - guardrail updates
 - sign upgrades
 - “Force account” work -all projects must be done by a qualified contractor through the design-bid-build process
 - Maintenance
10. Edgeline restriping projects will be considered for 6” edgelines only. These projects will be selected based on risk as identified in the Safety Plans.
11. New or reconstructed signals will be considered if they meet the criteria contained in [Appendix E](#).
12. Maximum Federal Funding is 90% of eligible total project costs. There is a minimum 10% match required. The match must be made in non-federal “hard dollars”. Soft matches (i.e. volunteer labor, donated materials, professional services) will not be included in the match.
13. Funds are not “capped.” Additional funds may be approved based on bid prices or other unforeseen circumstances. The selection committee must approve any increases in funding.

CRITERIA FOR SYSTEMIC PROJECT FUNDING

A **minimum** of 70% of the HSIP dollars that are awarded to each District will be systemic. The criteria that will be used to select these projects are detailed in this section of the document.

Proposed projects qualify for the **Systemic** Program by the following criteria:

- District agrees to maintain for the life of the project – see [Appendix C](#)

PRIORITIZATION

Projects will be prioritized using the following criteria:

- Part of a longer range plan (Road Safety Plan or Road Safety Audit Recommendations) – include an excerpt from the existing plan
 - **Higher priority projects from the Road Safety Plan will receive more points during the selection process than lower priority projects.**
- Cost/mile or Cost/intersection

CRITERIA FOR REACTIVE PROJECT FUNDING

A **maximum** of 30% of the projects awarded to each District will be reactive. Reactive projects must have a B/C greater than 1 to be considered for funding. The criteria that will be used to select these projects are detailed in this section of the document.

Proposed projects qualify for the **Reactive** Program by the following criteria:

- Locations must have a significant crash history that includes a fatal or serious injury crashes. Significant crash history can be determined in a number of ways, it is suggested that critical crash rates be used to assess significance. Details on calculating critical rates can be found in [APPENDIX B](#). Contact OTST regarding the average crash rate by intersection type (see also [Traffic Safety Fundamentals Handbook](#) page B-8). Contact OTST if you are going to consider using another metric to address/quantify significant crash history

http://www.dot.state.mn.us/trafficeng/publ/fundamentals/MnDOT_Safety_Handbook_FINAL.pdf

- Must have a benefit/cost (B/C) ratio of 1.0 or greater.* (Note: The B/C ratio shall exclude right-of-way costs.)

***Only crashes contained within the Minnesota Department of Transportation database can be used to determine the B/C for project submittals. If it is found that crashes have been omitted from MnDOT's database, you will need to provide the crash report to have those crashes entered into the system.**

- Agency agrees to maintain for the life of the project – see [Appendix C](#).

REQUIRED MATERIAL & SPECIAL INSTRUCTIONS FOR REACTIVE PROJECTS

Following, is a list of material required to submit a project. Failure to provide this information will exclude the submission from consideration:

- Project plan or preliminary layout/scope of work proposed
- Calculations demonstrating a significant crash history (see [Appendix B](#))
- HSIP Worksheet – A sample worksheet is included in [Appendix A](#). An Excel version of the HSIP Worksheet is available at: <http://www.dot.state.mn.us/trafficeng/safety/index.html>
- Crash data; include all crashes from the three most recently completed calendar years. Only crashes contained within the Minnesota Department of Transportation's database can be shown. This is to insure that all project proposals can be equally compared. All crash data must be obtained from MnCMAT.

Each submission should also include the following:

- Cover Letter – include submitting agency, project manager, description of project, Federal funds requested, local match and source.
- Location map.
- Letter from other entities involved in the project stating their awareness of the project and that they have no objections.

SUBMITTAL INSTRUCTIONS

Applications should be submitted **electronically** to the OTST office. Applications must be received in the office no later than the specified deadline.

Applications for **all Districts** are due in the OTST office on or before **November 1** each year.

An electronic version of this application can be found at:

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

Electronic submittals must be in a pdf formatted document and be formatted to print no larger than 11x17. Each completed application and its supporting documents should be in **ONE** pdf file.

IE: If you are submitting three applications/projects, you will have 3 pdf files.

Email electronic submittals to: Julie.Whitcher@state.mn.us

Contacts

Applicants having questions or requiring assistance with this application should contact:

Julie Whitcher, OTST
651-234-7019
Julie.Whitcher@state.mn.us

Brad Estochen, OTST
651-234-7011
Bradley.Estochen@state.mn.us



Greater Minnesota
District APPLICATION FOR FEDERAL FUNDS
 Minnesota Department of Transportation
 Office of Traffic, Safety and Technology

Due Date: November 1

QUALIFYING INFORMATION

Project Number (if assigned):

Brief Project Description:

District:

Requested Year of Funding (State Fiscal Year):
 Must be Year 1 Must be Year 3 Any Year*
 Must be Year 2 Must be Year 4

*Projects will be assigned a funding year by OTST

If this project is funded, do you agree to maintain it for the life of the project?
 (See Appendix C* for FHWA Recommended Service Life Criteria) Yes

Roadway type: Interstate
 Trunk Highway
 Other

Road Number or Street Name:

Attach detailed project description and map

Is this a joint project with a city or county? Yes No

Other Agency (Agencies) Involved:

Is the city or county also requesting HSIP funds for this project? Yes No

Both the district and the local agency must submit their own HSIP application on joint projects.

Funding Source	Estimated Cost
Federal Funds	<input style="width: 100%;" type="text"/>
Matching State Funds (10% of total project cost required)	<input style="width: 100%;" type="text"/>
Local Match	<input style="width: 100%;" type="text"/>
Total Project Cost	<input style="width: 100%;" type="text"/>

<input type="checkbox"/> Systemic Project Identified in Road Safety Plan (ATTACH PROJECT SHEET FROM SAFETY PLAN TO THIS SHEET AND SUBMIT)	<input type="checkbox"/> Systemic Project NOT in Road Safety Plan (GO TO PAGE 2)	<input type="checkbox"/> Reactive Project (B/C > 1) (GO TO PAGE 4)
--	--	---

Systemic Projects

Type of Project: Lane Departure (**COMPLETE PAGE 2**)
 Systematic Intersection Improvements (**COMPLETE PAGE 3**)
 Other (Please specify) Contact Julie Witcher before submitting a project in this category

Lane Departure Projects

Required Attachments:

- Attach Location sheet
- Attach spreadsheet listing the following for each segment:**
 - Proposed Strategy
 - Abbreviated verbal description of segment (IE: Mississippi River to Main Street)
 - Beginning and ending reference points
 - ADT (list source of data)
 - Miles to be upgraded
 - Fatal and A injury crashes (10 years most recent, complete calendar years)
 - K+A Crashes per mile

Summary Information

Enter the following **TOTALS** from the spreadsheet described above:

Total Miles to be upgraded					
Fatal Crashes		A Injury Crashes		K+A crashes per mile	
Cost per Mile		Amount should include federal funding only (not total project cost)			
<input type="checkbox"/> Proposed project is a recommendation from a Road Safety Plan or a Road Safety Audit (must provide excerpt from existing plan)					

SYSTEMIC LANE DEPARTURE PRIORITIZING INFORMATION

E-mail application and attachments in **ONE** PDF formatted document to:
Julie.Witcher@state.mn.us
(must print at 11x17 or smaller)

Systemic Projects

Intersection Projects

Required Attachments:

- Attach Location sheet
- Attach spreadsheet listing the following for each intersection:**
 - Verbal description of intersection
 - ADT for each leg of the intersection (list source of data)
 - Fatal and A injury crashes (10 most recent, completed calendar years) Include only crashes within 500 feet on either side of the intersection or that are coded "intersection related."
 - K+A Crashes per intersection

Summary Information

Enter the following **TOTALS** from the spreadsheet described above:

Total number of intersections to be upgraded

Fatal Crashes A Injury Crashes K+A crashes per intersection

Cost per Intersection

Additional Considerations

- Proposed project is a recommendation from a Road Safety Plan or a Road Safety Audit (must provide link to or excerpt from existing plan)

SYSTEMIC INTERSECTION PRIORITIZING INFORMATION

E-mail application and attachments in **ONE (1)** PDF formatted document to:
Julie.Whitcher@state.mn.us
(must print at 11x17 or smaller)

Reactive Projects

Required Attachments:

- Attach Location sheet
- Verbal description of project
- Plan sheets
- All crashes (3 most recent, complete calendar years)
- Attach critical crash rate calculations
- Attach HSIP Worksheet B/C Ratio

Summary Information

- Attach a discussion of the rationale used in the selection of Crash Reduction factors
- Service Life

REACTIVE PRIORITIZING INFORMATION

E-mail application and attachments in **ONE (1)** PDF formatted document to:
Julie.Whitcher@state.mn.us
(must print at 11x17 or smaller)

Metro

HSIP

Metro District

The **Met Council** is responsible for the Metro area regional transportation planning. The Met Council's, **Transportation Advisory Board (TAB)** was created by the state legislature in 1974 to serve as the certified Metropolitan Planning Organization (MPO) in compliance with federal law and rules, to qualify the region for federal transportation funding. The TAB is made up of local elected officials, who then appoint a **Technical Advisory Committee (TAC)** made up of County and City engineers and planners, who advise the TAB on transportation issues, and carry out the daily operational tasks.

The TAB/TAC are responsible to solicit and evaluate project applications for federal funding programs which include: STP Urban Guarantee, Congestion Mitigation Air Quality (CMAQ), Transportation Enhancements, Bridge Improvement and Replacement Program, the Rail Highway Crossing Safety Program, and the Highway Safety Improvement Program (HSIP).

The TAB/TAC delegate the development of the HSIP criteria and the solicitation package to MnDOT.

The MnDOT Metro Traffic Section writes a draft HSIP solicitation package in the fall of each even numbered year. Metro Traffic presents the draft to the TAC Funding and Programming Committee (F&P). This can take from one to three meetings until the TAC F&P approves the draft solicitation.

The TAC F&P committee will then recommend approval of the draft to the full TAC.

The TAC will then hold a public meeting with past and prospective applicants to explain and discuss the new solicitation criteria and process. Verbal, written, and emailed comments are accepted.

The TAC F&P reviews the list of comments, and if necessary, make changes to the program criteria and process, then recommends adoption of the final HSIP program to the full TAC.

After their approval, the TAC then forwards the final HSIP program to the TAB for approval.

The TAB then forwards it to the Met Council for adoption.

After this, MnDOT Metro District will send a letter of notification to all eligible Metro agencies.

Submitting agencies send project proposals directly to MnDOT Metro Traffic.

All submitting agencies are required to include collision diagrams or crash data for 3 years provided by MnDOT Metro Traffic. This practice insures only crashes in the Mn/DPS crash data base are used for project comparison purposes.

All proposals must include a B/C worksheet, using crash reduction factors (CRF) from the MnDOT chart, the FHWA CMF Clearinghouse, or only if needed, the Kentucky report.

MnDOT Metro Traffic carefully reviews all submittals for compliance with the HSIP program criteria, including the B/C worksheet and what was used for the CRF. MnDOT Metro Traffic work with any submitting agency whose submittal needs to be revised until it is within compliance.

MnDOT Metro Traffic then compiles the list of projects into a preliminary ranked list based on scoring criteria in the HSIP program.

This preliminary list then goes to the HSIP selection committee, made up of: 2 Metro Traffic employees, 2 City Engineers and 2 County Engineers picked by the TAC and a representative from the OTST Safety Office. The HSIP selection committee will meet once or twice to review and discuss the projects. The committee develops a final ranked list of projects to be funded, and makes a recommendation to the TAC for approval.

HSIP

Highway Safety Improvement Program

Metro District Program Criteria & Solicitation

Minnesota Department of Transportation
Metro District Traffic Engineering

SAMPLE

Introduction

This document explains the requirements, and gives guidance for the Highway Safety Improvement Program (HSIP) to applicants desiring to obtain federal funds under the Federal MAP-21 legislation. In MAP-21, the purpose of HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Projects submitted should have the greatest potential of achieving this objective.

General Policies:

1. HSIP funds are available to MnDOT; the counties of Anoka, Carver, Chisago, Dakota, Hennepin, Ramsey, Scott, and Washington; and the state aid eligible Cities and Towns within those Counties. Other local or special governmental agencies that do not have the ability to receive and administer federal funds must work with these specified governmental units to develop and submit eligible projects.
2. This solicitation is for projects with a total cost up to \$2,000,000, with a cap of \$1,800,000 federal funds. A minimum local match of 10% of the total project cost is required. After a project is selected for federal HSIP funding, if the project costs go above \$2,000,000 the additional costs are the responsibility of the submitting agency. The match must be in “hard dollars”. Soft matches (i.e.; volunteer labor, donated materials, professional services) cannot be included in the match.
3. The biannual solicitation is for both “Proactive” and “Reactive” projects for the next three State fiscal years.
4. Funding is for roadway construction and reconstruction projects designed to decrease the frequency and/or severity of vehicular crashes. These crashes can involve pedestrians, bicycles, and other non-motorized vehicles. The specifics of the improvement must be related to reducing historical vehicular crashes. The project must be a permanent improvement. Right-of-Way (R/W) costs are not fundable and shall not be included in the project cost.

Please refer to: <http://safety.fhwa.dot.gov/hsip/>

5. All public roadways are eligible for funding.
6. The amount of federal funds awarded is based upon the original submission. Any increase in scope or costs will be the responsibility of the applicant.

HSIP is a federally funded traffic safety program. The amount of funding available for varies for each solicitation and dependent upon availability of funds from the FHWA.

The funding will be split up evenly between the three years. 70% of the funding will be awarded to “Reactive” projects, with the remaining 30% awarded to “Proactive” projects.

The project selection committee may elect to award a larger percent of total funds to either the “Reactive” or “Proactive” projects, depending on the number of projects or quality of the projects submitted in each category.

The object of the HSIP program is to identify, implement, and evaluate cost effective safety projects focused on reducing fatal and serious injury crashes.

Qualifying Criteria

The objective of the Highway Safety Improvement Program (HSIP) is to identify, implement, and evaluate cost effective construction safety projects with a primary goal of reducing fatal and serious injury crashes on all public roads.

Typically, only stand-alone projects will be considered. It is recognized that portions of larger projects have elements that improve the safety of an intersection or section of roadway. Safety features, such as guardrail, that are routinely provided as part of a broader project should be funded from the same source as the broader project. Proposals should be limited to those that can be considered legitimate stand-alone safety projects. In some instances, narrow shoulder paving in conjunction with resurfacing projects may be allowed. See Appendix G for this exception.

FOR PROACTIVE PROJECTS:

For MnDOT Metro District and the Metro Counties, their Road Safety Plans should be the starting point for selecting projects for this solicitation. For State and County roads, projects that originate from a Road Safety Plan will be given priority. For City streets, Cities may propose strategies similar to what is in their County Safety Plan if applicable or the following crash data is provided to assist Cities in focusing on the types of projects to submit.

In the Metro District on local roads (MSAS and City Streets) over the last 3 years (2011-2013) there have been 288 fatal and serious injury crashes:

- x 80 (28%) involved two or more vehicles colliding
- x 65 (23%) involved a pedestrian
- x 35 (12%) involved a bicyclist
- x 30 (10%) involved hitting a tree or shrub

Seventy-three percent of the fatal and serious injury crashes fall into these four categories listed above, so the focus should be on low cost solutions that are geared toward impacting those types of crashes.

Priority will be given to applications that are making impacts throughout the network (at multiple locations) or a corridor based approach.

Cities are encouraged to provide other levels of support to make their case on why the project is justified. For example, they could cite the high pedestrian volumes or a generator of a high number of non-motorized traffic if they are requesting funds for an improvement in that area.

Signalized intersections in urban areas tend to involve more risk than other types of intersections. A focus on signalized intersections, such as countdown timers, signal retiming, enforcement lights, curb extensions, etc. would have an impact at these target crashes.

The following is a list of example projects that would be considered for funding with this program:

Rumble strips Rumble stripEs
Wider striping (6")
Embedded wet reflective striping
Delineation for sharp curves (chevrons)
Cable median barrier
Active intersection warning systems
Intersection Lighting
Curb extensions
Sight distance improvements Remove
hazards in clear zones Pedestrian
countdown timers

Construct ped refuge islands & raised medians
Enforcement lights on signals
Turn lanes
Reduced Conflict Intersections (RCI's) New
guardrail (not replacement) Frontage roads (with
access removals) Sidewalks
Bypass lanes
Narrow shoulder paving (see Appendix G) Signal
coordination (interconnect) Pavement messages
Stop Bars

FOR REACTIVE PROJECTS:

For this solicitation, proposed projects qualify for the HSIP program by meeting the following criteria:

1. Must have Benefit/Cost (B/C) ratio of 1.0 or greater*. (Note: The B/C ratio shall exclude right-of-way costs. The cost should be the total project cost not the amount HSIP \$ asking for.)

*Only crashes contained within the Minnesota Department of Public Safety's database can be used to determine the B/C for project submittals. MnDOT Metro District Traffic Office can provide a crash listing, upon request. (See Appendix H)

Prioritization Criteria

The HSIP committee listed below will determine if the submitted projects have met the intent of the qualifying criteria and HSIP.

FOR REACTIVE PROJECTS:

As in the past solicitations, the Reactive projects will be prioritized using the B/C ratio.

FOR PROACTIVE PROJECTS:

For Proactive projects, priority will be given to projects identified in Road Safety Plans, and projects that have the highest possibility of reducing the chance of fatal and serious injury crashes. The following criteria will be used in ranking Proactive projects:

- x Connection to the Minnesota Strategic Highway Safety Plan (SHSP). This Plan can be found at the following link: <http://www.dot.state.mn.us/trafficeng/safety/shsp/>
- x Cost/mile or Cost/intersection
- x Is strategy a wide deployment vs a single spot location
- x Average Daily Traffic (ADT)
- x Fatal (K) & serious (A) injury crashes (10 years)
- x Crash Reduction Factor for the specific strategy
- x Part of a plan (Safety Plan or Road Safety Audit Recommendations) –include a link to or an excerpt from the existing plan

EVALUATION PROCESS:

Project proposals will be reviewed by MnDOT's Metro District Traffic Engineering unit initially to determine if they meet the qualifying criteria. The HSIP committee will use their engineering judgment to finalize a prioritized list of projects to be funded.

The HSIP committee will consist of:

- x MnDOT Metro District Traffic Engineer - Program Support
- x MnDOT Metro District Traffic Safety Engineer
- x Four County/City Engineers who will be determined by the Met Council Technical Advisory Committee (TAC)

Required Material and Special Instructions

Following, is a list of materials required to submit per project. Failure to provide this information may exclude the submission from consideration:

- x HSIP application (Form 1) (See page 56 for Form 1)
- x Project information sheet (Form 2) (See page 57 for Form 2)
- x Location map
- x Project plan or preliminary layout/scope of work proposed.
- x Provide the ADT or an average ADT for your project area.
- x Collision diagrams for intersection projects.

FOR PROACTIVE PROJECTS:

- x Provide total miles of strategy deployment.
- x Provide a reasonable Crash Reduction Factor (CRF) from the FHWA's CMF Clearinghouse (MUST include a printout of the page CRF was taken from) <http://www.cmfclearinghouse.org/>
- x Number of fatal and serious ("A") injuries in the past 10 years that have occurred where you propose to implement a HSIP project. (Projects may be eligible for HSIP even if no fatal or A injuries have occurred in your implementation area.)
- x MnDOT and Counties, please attach copy of appropriate page from Highway Safety Plan for projects in Plan submitted.

FOR REACTIVE PROJECTS:

- x Crash Data - The crash data shall include crashes from the three most recent calendar years 2011. Only crashes contained within the Minnesota Department of Public Safety's database can be shown. This is to insure that all project proposals can be equally compared. A crash listing can be obtained from MnDOT upon request (see Appendix H for contact information).

If an individual crash is not in the DPS crash database, it cannot be included in the analysis or the submittal, unless the agency provides acceptable proof of the existence of the crash. Acceptable proof is a copy of the police or citizen accident report. If a crash report was not written, the crash may not be included. If the crash had no injuries and the minimum dollar amount was not met ("N" in the "\$min" box on a police report), the crash cannot be included.

Crash data requests to MnDOT should be made before October 31st of the solicitation year (see Appendix I for solicitation time line). Requests made after October 31st may be significantly delayed due to limited resources.

- x HSIP B/C Worksheet - A sample HSIP B/C worksheet is included in Appendix A. An Excel version of the HSIP B/C worksheet is available by contacting one of the MnDOT contacts listed in Appendix H.

Must send 2 paper copy project submittals to: MnDOT, Traffic Engineering
Lars Impola
1500 West County Road B2
Roseville, MN 55113

OR

Must send an electronic submittal to: Lars.Impola@state.mn.us

Crash Reduction Factors

A Crash Reduction Factor (CRF) is the percentage crash reduction that may be expected after implementing a given countermeasure. A CRF should be regarded as a generic estimate of the effectiveness of a countermeasure. The estimate is a useful guide, but it remains necessary to apply engineering judgment and to consider site-specific environmental, traffic volume, traffic mix, geometric, and operational conditions which will affect the safety impact of a countermeasure.

The proposal should reference the FHWA Crash Modification Factors Clearinghouse which can be found at the following website:

x <http://www.cmfclearinghouse.org>

In the FHWA reference, there are a number of CRFs to choose from for each countermeasure. The project proposer must use a CRF in **bold** if available, and clearly explain why they chose the CRF they did.

$$CMF = 1 - (CRF/100)$$

For all applications, the applicant is required to write a brief logical explanation on why they chose to use what they did for a CRF.

In lieu of relying on crash reduction tables, proposals may contain an estimate of crash reductions based upon logical assumptions. The proposal will have to thoroughly demonstrate in a logical fashion how each improvement will impact each type of crash. The HSIP Committee will review the documentation for accuracy and concurrence with logic.

Some examples of acceptable estimates are listed below:

Example 1: A project is proposing closure of a median at an intersection. Logically, all left turning and cross street right angle crashes will be eliminated. (100% reduction in these types of crashes).

Example 2: A project is proposing a traffic signal revision including creating a protected left turning phase for the minor leg of the intersection. This project should reduce the amount of minor leg left turn crashes significantly (90% reduction). Additionally, any significant improvement in capacity would reduce rear end collisions slightly (10% reduction for minor capacity improvements, 20% for significant improvements).

Example 3: A project is proposing a traffic signal revision including adding left and right turn lanes. Adding turn lanes should reduce rear end collisions and some turning collisions depending on proposed versus existing phasing. (20% reduction in impacted rear end collisions is reasonable).

In most cases, the project initiator should contact a member of the MnDOT review team (see Appendix H), to discuss crash reduction assumptions for each improvement project prior to submittal.

If only one improvement is included in the proposed project, the crash reduction factors from the FHWA CMF Clearinghouse, or a percentage reduction based on an estimated procedure described above, can be entered directly into the HSIP worksheet. If two or more improvements are included in the proposed project,

the overall crash reduction should be determined using the “Dual Safety Improvement Crash Reduction Formula” described below. If there are more than two improvements for the proposed project, the two improvements which have the greatest impact on safety (whether positive or negative) should be used. If there are two or more improvements, but only one major improvement as represented by cost and scope, use the crash reduction factor for that improvement only.

Dual Safety Improvement Crash Reduction Formula:

$$CR = 1 - (1 - CR1) \times (1 - CR2)$$

CR equals the overall crash rate reduction expressed as a decimal

CR1 equals the crash rate reduction for the first improvement expressed as a decimal

CR2 equals the crash rate reduction for the second improvement expressed as a decimal

For calculation purposes CR, CR1 and CR2 are decimal equivalents so % change in crash values with the sign changed (a value of -50 from the table is expressed as .50 and a value of +75 from the table is expressed as -.75). A positive CR value would result in an overall crash reduction; while a negative CR value would increase crashes. To input into the HSIP worksheet the CR value should be reconverted to numerical format of the “% change in crashes” by multiplying by 100 and changing the sign.

Use of Fatal Crashes

Type of Crash	Crash Severity	Cost per Crash
Fatal (F)	K	\$10,600,000
Personal Injury (PI)	A Incapacitating	\$570,000
Personal Injury (PI)	B Non-Incapacitating	\$170,000
Personal Injury (PI)	C Possible	\$83,000
Property Damage (PD)	N	\$7,600

Since fatal crashes are often randomly located, there is considerable debate as to whether they should be treated as personal injury crashes or as fatalities. Furthermore, the value assigned is subject to many considerations. With the above in mind, the following criteria shall be used when computing expected crash reduction benefits:

1. Cost benefits assigned to a fatal crash may be used if there are two or more “correctable” fatal crashes within a three-year period (correctable is defined as the type of crash that the improvement is designed to correct).

OR

2. The cost benefit per fatal crash may be used when there is at least one correctable fatal crash **and** two or more type “A” injury crashes within a three-year period.

If the above criteria are not satisfied, the correctable fatal crash shall be treated as two type “A” personal injury crashes ($K = 2 \times A$) when computing the benefit-cost ratio. To do this, enter the correctable fatal crash as two type “A” personal injury crashes in the “A” category on the HSIP B/C worksheet.

Federal HSIP Funding Application (Form 1)

INSTRUCTIONS: Complete and return completed application to Lars Impola, MnDOT, Metro District, 1500 West County Road B2, Roseville, Minnesota 55113. (651) 234-7820. **Applications must be received by 4:30 PM or postmarked on January 7.** *Be sure to complete and attach the Project Information form. (Form 2)

Office Use
Only

I. GENERAL INFORMATION

1. APPLICANT:

2. JURISDICTIONAL AGENCY (IF DIFFERENT):

3. MAILING ADDRESS:

CITY:

STATE:

ZIP CODE:

4. COUNTY:

5. CONTACT PERSON:

TITLE:

PHONE NO.
()

CONTACT E-MAIL ADDRESS:

II. PROJECT INFORMATION

6. PROJECT NAME:

7. BRIEF PROJECT DESCRIPTION (Include location, road name, type of improvement, etc... A more complete description can be submitted separately):

8. HSIP PROJECT CATEGORY – Circle which project grouping in which you wish your project to be scored.

Proactive

Reactive

III. PROJECT FUNDING

9. Are you applying or have you applied for funds from another source(s) to implement this project?
Yes No If yes, please identify the source(s):

10. FEDERAL AMOUNT: \$

13. MATCH % OF PROJECT TOTAL:

11. MATCH AMOUNT: \$

14. SOURCE OF MATCH FUNDS:

12. PROJECT TOTAL: \$

15. REQUESTED PROGRAM YEAR(S) :

Year 1 Year 2 Year 3 Any year

16. SIGNATURE:

17. TITLE:

PROJECT INFORMATION (Form 2)

(To be used to assign State Project Number after project is selected)

Please fill in the following information as it pertains to your proposed project. Items that do not apply to your project, please label N/A. **Do not send this form to the State Aid Office. For project solicitation package only.**

COUNTY, CITY, or LEAD AGENCY _____

FUNCTIONAL CLASS OF ROAD _____

ROAD SYSTEM _____ (TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET)

NAME OF ROAD _____ (Example: 1st Street, Main Avenue)

ZIP CODE WHERE MAJORITY OF WORK IS BEING PERFORMED _____

APPROXIMATE BEGIN CONSTRUCTION DATE (MO/YR) _____

APPROXIMATE END CONSTRUCTION DATE (MO/YR) _____

LOCATION: From: _____

To: _____

(DO NOT INCLUDE LEGAL DESCRIPTION)

TYPE OF WORK _____

(Examples: GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER, STORM SEWER, SIGNALS, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, BRIDGE, PARK AND RIDE, ETC)

Rail–Highway Crossing Set-Aside

MnDOT Rail Office Contact

Mike Pretel

Michael.Pretel@state.mn.us

651-366-3696

Appendix A – Greater MN Local and District Solicitations

Sample HSIP Worksheet

HSIP worksheet		Control Section	T.H. / Roadway	Location			Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
			I-494	Portland Ave to Nicollet Ave			3+00.848	4+00.357	Hennepin Co.	1/1/2012	12/31/2014
		Description of Proposed Work Construct Westbound auxiliary lane between Portland and Nicollet									
Accident Diagram Codes		1 Rear End	2 Sideswipe Same Direction	3 Left Turn Main Line	5 Right Angle	4,7 Ran off Road	8,9 Head On/ Sideswipe - Opposite Direction		6,90,99		
										Pedestrian	Other
Study Period: Number of Crashes	Fatal	F									
	Personal Injury (PI)	A									
		B									
		C	5								5
Property Damage	PD	7	3							10	
% Change in Crashes	Fatal	F									
	PI	A									
		B									
		C	-25%								
Property Damage	PD	-25%	-25%								
Change in Crashes <small>= No. of crashes X % change in crashes</small>	Fatal	F									
	PI	A									
		B									
		C	-1.25								-1.25
Property Damage	PD	-1.75	-0.75							-2.50	
Year (Safety Improvement Construction)			2018								
Project Cost (exclude Right of Way)			\$ 600,000	Type of Crash	Study Period: Change in Crashes	Annual Change in Crashes	Cost per Crash	Annual Benefit	<div style="border: 1px solid black; padding: 5px; display: inline-block;">B/C= 1.66</div> <i>Using present worth values,</i> B= \$ 998,370 C= \$ 600,000 <i>See "Calculations" sheet for amortization.</i>		
Right of Way Costs (optional)				F			\$ 1,140,000				
Traffic Growth Factor			0.5%	A			\$ 570,000				
Capital Recovery				B			\$ 170,000				
1. Discount Rate			2%	C	-1.25	-0.42	\$ 83,000	\$ 34,583			
2. Project Service Life (n)			30	PD	-2.50	-0.83	\$ 7,600	\$ 6,333			
				Total			\$ 40,917		Office of Traffic, Safety and Technology August 2015		

Data for Calculating Benefit/Cost Ratio

The Recommended % Change in Crashes should be taken from the FHWA's Crash Reduction Factors Clearinghouse. The clearinghouse can be located at: <http://www.cmfclearinghouse.org/>

Include documentation on how the appropriate crash reduction factor was determined.

The proposal will have to demonstrate in logical fashion how each improvement will impact each type of crash. The MnDOT Selection Committee will review the documentation and estimates for accuracy. Some examples of acceptable estimates are listed below:

Example 1: A project is proposing closure of a median at an intersection. Logically, all left turning and cross street right angle crashes will be eliminated (100% reduction in these types of crashes).

Example 2: A project is proposing adding right turn lanes at a signal on two approaches. The clearinghouse <http://www.cmfclearinghouse.org/> shows a 9% reduction (empirical Bayes analysis) in all crashes. 9% should be used.

The applicant can contact Julie Whitcher, 651-234-7019, to discuss crash reduction assumptions for each improvement project prior to submittal.

The most beneficial improvement included in the proposed project should be used to determine the crash reduction factor and the recommended service life ([Appendix C](#)).

In the interest of standardizing the calculation of an annual cost associated with a given type of highway safety improvement, the following inputs are used in all calculations for HSIP submissions:

- ✓ Discount = 2%
- ✓ Traffic Growth = 0.5% (The default value of 0.5% is a conservative statewide average. The use can input a different value with documentation.)
- ✓ Salvage Value of Right of Way and change in maintenance costs are negligible.

Type of Crash	Crash Severity	Cost per Crash
Fatal	K	\$ 1,140,000
Personal Injury	A Incapacitating	\$ 570,000
	B Non-Incapacitating	\$ 170,000
	C Possible	\$ 83,000
Property Damage	PDO or N	\$ 7,600

Source: MnDOT Office of Transportation System Management
(July 2015)

Appendix B - A Planners Guide to Sustained Crash Location Selection and Critical Crash Rates - Greater MN Local and District Solicitations

Every year in Minnesota, there are around 75,000 crashes involving motor vehicles. The vast majorities of these crashes (98%) are minor injury or only result in property damage. When looking at all crashes, there is rarely a location or segment that has not had some kind of crash within a given window of time (typically 3, 5 or 10 years of data). Knowing this, it has been difficult to assign where an at-risk location is using solely crash data. Since nearly all segments and intersections have some crashes, it has been possible to establish average crash rates for a given type of intersection or segment. Due to the random nature of crashes, OTST has decided to use a statistical evaluation to determine which locations are below the average crash rate, performing near the average crash rate, those that are above the average crash rate, and those that are statistically significant (i.e. critical) above the crash rate. Using a critical crash helps to ensure that locations being selected are actually having something significant happening, and are not just a result of the random nature of crashes. The Critical Crash Rate helps to filter out areas with low Average Daily Traffic, or evaluated over a short time period.

Calculating the Critical Crash Rate

The Office of Traffic, Safety, and Technology (OTST) evaluates crash data on a routine basis to help monitor trends, track crashes, and establish average crash rates. This data is collected, organized and released in the yearly Toolkit. A new feature to the 2011 Toolkit is the use of the critical crash rate index.

This index is calculated by taking the existing crash rate, and dividing it by the critical crash rate. Any index with a number greater than 1.0 will be considered as having a critical crash rate.

Critical Rate Equation:

$$R_c = R_a + K * (R_a/m)^{1/2} + .5/m$$

R_c = Critical Crash Rate

R_a = System Wide Average Crash Rate

K = Confidence Interval; 99.5% $K=2.756$, 95% $K= 1.645$, 90% $K= 1.282$

OTST has established the following confidence intervals for each type of crash rate

Crash Rate will be 99.5% Confidence; $K = 2.756$

Fatal Rate will be 90% Confidence; $K = 1.282$

Fatal and Serious (A) Rate will be 90% Confidence; $K = 1.282$

m = Vehicle Exposure (for sections this is Vehicle Miles Traveled (VMT), for intersections this is Entering Vehicles)

To understand the toolkit, we have included two examples to understand the process OTST will use for location selection and project evaluation. These examples were developed using the 2011 Toolkit. The most current toolkit can be found at: http://ihub/trafficeng/crash_data.html

Example 1

Minnesota Trunk Highway 66 is a four lane expressway in rural Minnesota that has a need to be evaluated by the District Engineer. Here are the facts:

Segment Length = 10.5 miles

Average Daily Traffic = 33,711

Crash History (3 years) = 93 crashes total; 1 Fatal, 2 A Injury, 7 B Injury, 20 C Injury, and 63 Property Damage

Calculating the Rates

Crash Rate = (total crashes) * 1,000,000 / (Length * ADT * Years * 365 Days/ Year)

Crash Rate = $93 * 1,000,000 / 10.5 \text{ miles} * 33,711, * 3 \text{ years} * 365 \text{ Days / Year}$

Crash Rate = 0.24

Severity Rate is a weighted number, which gives more severe crashes a higher score.

K=5 points, A = 4 points, B = 3 points, C = 2 points, PDO = 1 point

Severity Rate = $(5 * K + 4 * A + 3 * B + 2 * C + PDO) * 1,000,000 / (\text{Length} * \text{ADT} * \text{Years} * 365)$

Severity Rate = $(5 * 1 + 4 * 2 + 3 * 7 + 2 * 20 + 63) * 1,000,000 / (10.5 * 33,371 * 3 * 365)$

Severity Rate = 0.35

Fatal Rate looks only at fatal crashes.

Fatal Rate = $K * 100,000,000 / (\text{Length} * \text{ADT} * \text{Years} * 365)$

Fatal Rate = $1 * 100,000,000 / (10.5 * 33,711 * 3 * 365)$

Fatal Rate = 0.26

FA Rate is a rate looking only at Fatal and Serious (A) Injury Crashes. This is the current performance measure that OTST uses.

FA Rate = $(K + A) * 100,000,000 / (\text{Length} * \text{ADT} * \text{Years} * 365)$

FA Rate = $(1 + 2) * 100,000,000 / (10.5 * 33,711 * 3 * 365)$

FA Rate = 0.77

We will need the average crash rates for each of the categories. This is available from the 2011 section toolkit.

For a 4-Lane Rural Expressway, the average rates are:

Crash Rate = 0.34

Severity Rate = 0.51

Fatal Rate = 0.33

FA Rate = 0.74

Looking at our calculated rates on Page 2, we can see that Crash Rate (0.25), Severity Rate (0.37), and Fatal (0.27) are all below the average rate. This segment of roadway is performing safely compared to similar types of segments.

The FA rate, however, is above the average and will need some evaluation.

Calculating the FA Rate

$$R_c = R_a + K * (R_a/m)^{1/2} + .5/m$$

R_c = Critical Crash Rate

R_a = System Wide Average Crash Rate (FA Rate = 0.74, from 2011 Toolkit)

K = Confidence Interval; 90% K = 1.282

Fatal and Serious (A) Rate will be 90% Confidence; K = 1.282

m = Vehicle Exposure (10.5 miles*33,711 ADT *3 years *365 days/year) = 387.6 Million Vehicle Miles

$$R_c = 0.74 + 1.282 * (0.74/387.6)^{1/2} + .5/387.6$$

R_c = 0.80 (critical) > 0.77 (actual)

FA Index = Actual / Critical = 0.77/0.80 = 0.96

This segment does not meet the critical crash rate criteria.

Example 2

An intersection on US TH 202 (a divided expressway) has need for review. Here are the facts:

Three Legged intersection with MN TH 93 - Unsignalized

Entering/Approach Volume = 12,300

Crash History (10 years) = 67 crashes total; 4 Fatal, 5 A Injury, 11 B Injury, 12 C Injury, and 35 Property Damage

Calculating the Rates

Crash Rate = (total crashes) * 1,000,000 / (Entering ADT * Years * 365 Days/ Year)

Crash Rate = $67 * 1,000,000 / 12,300 * 10 \text{ years} * 365 \text{ Days / Year}$

Crash Rate = 1.49

Severity Rate is a weighted number, which gives more severe crashes a higher score.

K=5 points, A = 4 points, B = 3 points, C = 2 points, PDO = 1 point

Severity Rate = $(5 * K + 4 * A + 3 * B + 2 * C + PDO) * 1,000,000 / (\text{Entering ADT} * \text{Years} * 365)$

Severity Rate = $(5 * 4 + 4 * 5 + 3 * 11 + 2 * 12 + 35) * 1,000,000 / (12,300 * 10 * 365)$

Severity Rate = 2.94

Fatal Rate looks only at fatal crashes.

Fatal Rate = $K * 100,000,000 / (\text{Entering ADT} * \text{Years} * 365)$

Fatal Rate = $4 * 100,000,000 / (12,300 * 10 * 365)$

Fatal Rate = 8.91

FA Rate is a rate looking only at Fatal and Serious (A) Injury Crashes.

FA Rate = $(K + A) * 100,000,000 / (\text{Entering ADT} * \text{Years} * 365)$

FA Rate = $(4 + 5) * 100,000,000 / (12,300 * 3 * 365)$

FA Rate = 20.1

We will need the average crash rates for each of the categories. This is available from the 2011 section toolkit.

For an unsignalized rural thru-stop, the average rates are:

Crash Rate = 0.29

Severity Rate = 0.48

Fatal Rate = 0.50

FA Rate = 1.38

All of our calculated rates are above the average crash rate. We will use the critical crash equation to find if they are statistically significant.

$$R_c = R_a + K * (R_a/m)^{1/2} + .5/m$$

R_c = Critical Crash Rate

R_a = System Wide Average Crash Rate

K = Confidence Interval;

OTST has established the following confidence intervals for each type of crash rate

Crash Rate will be 99.5% Confidence; $K = 2.756$

Severity Rate will be 99.5% Confidence; $K = 1.645$

Fatal Rate will be 90% Confidence; $K = 1.282$

Fatal and Serious (A)Rate will be 90% Confidence; $K = 1.282$

m = Vehicle Exposure (12,300 ADT *10 years*365 days/year) = 44.90 Million Entering Vehicles (MEV)

Crash Rate

$$R_c = 0.29 + 2.756 * (0.29/44.90)^{1/2} + .5/44.90$$

$$R_c = 0.52 \text{ (critical)} > 1.49 \text{ (actual)}$$

$$\text{Crash Rate Index} = \text{Actual} / \text{Critical} = 1.49 / 0.52 = 2.9$$

This segment meets the critical crash rate criteria.

Severity Rate

$$R_c = 0.48 + 2.756 * (0.48/44.90)^{1/2} + .5/44.90$$

$$R_c = 0.78 \text{ (critical)} > 2.94 \text{ (actual)}$$

$$\text{Severity Index} = 2.94 / 0.78 = 3.8$$

This segment meets the critical severity crash rate criteria.

Fatal Rate

$$R_c = 0.50 + 1.282 * (0.50/44.90)^{1/2} + .5/44.90$$

$$R_c = 0.65 \text{ (critical)} > 8.91 \text{ (actual)}$$

$$\text{Fatal Index} = 8.91 / 0.65 = 13.7$$

This segment meets the critical severity crash rate criteria.

Fatal and Serious Rate

$$R_c = 1.38 + 1.282 * (1.38/44.90)^{1/2} + .5/44.90$$

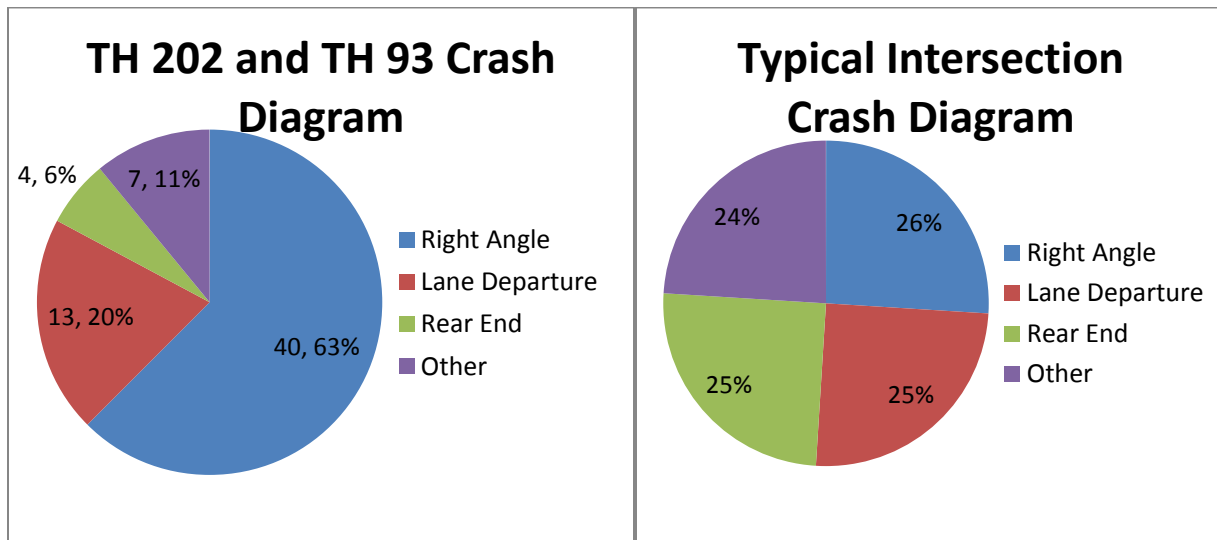
$$R_c = 1.62 \text{ (critical)} > 20.1 \text{ (actual)}$$

$$\text{Fatal and Serious Index} = 20.1 / 1.62 = 12.4$$

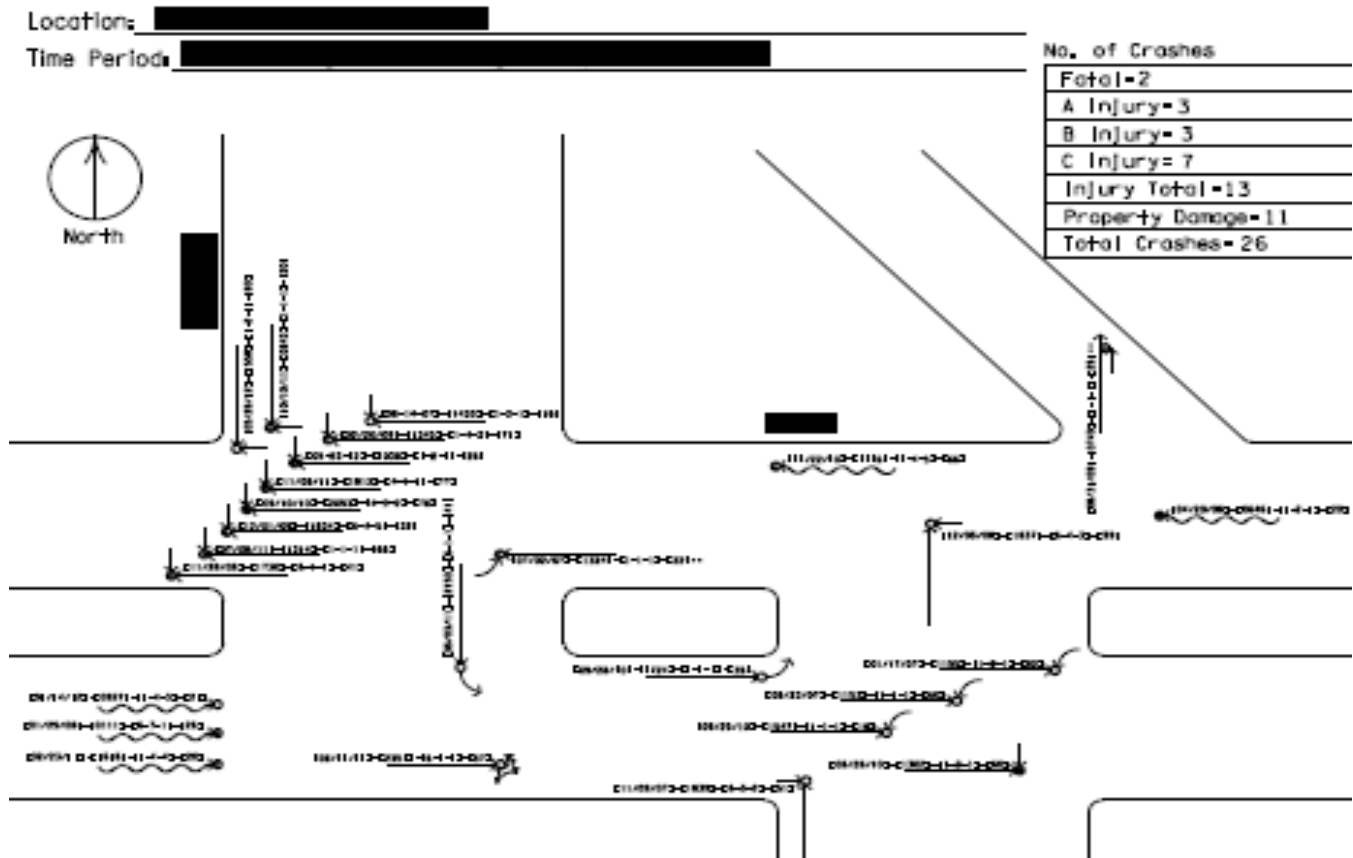
This segment meets the critical severity crash rate criteria.

Understanding the Crashes

After having run the critical rate calculations, we can see there is clearly a sustained crash problem at this location. There is also a problem with fatal and serious injury type crashes.



Comparing this intersection to other intersections in Minnesota, it appears that right angle crashes are over represented at TH 202 and TH 93. When possible, obtaining intersection collision diagrams can also be insightful into understanding the problem.



The collision diagram for this intersection shows a large number of crashes (and especially severe crashes) are occurring on the near side of the intersection. If the goal is to make this intersection safer, this crash type should be our target to eliminate.

Eliminating the Target Crash Type

The crash diagram is suggesting that people heading south are pulling out while attempting to turn left, and getting hit by vehicles on the US 202 mainline heading west. Basically, we need to make drivers aware of approaching vehicles, control the intersection and assign right of way, eliminate the ability for people to pull out, or separate the existing conflict points.

The projects that we could implement are the following:

1. Install a Traffic Signal (control the intersection)
2. Install a Reduced Conflict Intersection (RCI) (eliminate the ability to pull out)
3. Construct a grade separated interchange (separate existing conflict points)

Each of the options have pro's and con's. The table below shows a simple look at some of these concerns.

Description	Time to implement	Cost	Safety Benefits
Install a Traffic Signal	Medium	Medium	Signals tend to lower severe crashes moderately, but other crash types typically increase (ie Rear End)
Reduced Conflict Intersection	Short to Medium	Medium	Medium to High
Grade Separated Interchange	Long	Long	High

The crash costs that are currently used to establish a benefit/ cost ratio are:

Fatal = \$840,000

A injury = \$420,000

B Injury = \$138,000

C Injury = \$92,000

PDO = \$12,000

Installing a Traffic Signal

Estimated Cost: \$300,000

Project Life: 20 years

Typical Crash Reductions:

Fatal and Severe: -30%

Minor Injury: -30%

Property Damage: + 60%

Crash Severity	Number of Crashes	Crash Cost	Crash Reduction	Crash Cost Savings/Year
Fatal and Serious	9	\$5,460,000	-30%	\$163,800
Minor Injury	23	\$2,622,000	-30%	\$78,660
Property Damage	35	\$420,000	+60%	-\$25,200
			Total Yearly Savings	\$217,260

Crash Benefit = \$217,260 * 20 years = \$4,345,200

Projects Costs + Operations and Maintenance = \$300,000 + 10% per year (\$30,000*20 year)

Cost = \$900,000

Benefit/ Cost = \$4,345,200 / \$900,000 = **4.8**

Installing a Reduced Conflict Intersection

Estimated Cost: \$750,000

Project Life: 35 years

Typical Crash Reductions:

Fatal and Severe: -70%

Minor Injury: -40%

Property Damage: - 35%

Crash Severity	Number of Crashes	Crash Cost	Crash Reduction	Crash Cost Savings/ Year
Fatal and Serious	9	\$5,460,000	-70%	\$382,200
Minor Injury	23	\$2,622,000	-40%	\$104,880
Property Damage	35	\$420,000	-35%	\$14,700
			Total Yearly Savings	\$501,780

Crash Benefit = \$501,780 * 35 years = \$17,562,300

Projects Costs + Operations and Maintenance = \$750,000 + 5% per year (\$37,500*35 year)

Cost = \$2,062,500

Benefit/ Cost = \$17,562,300/ \$2,062,500= **8.5**

Constructing a Grade Separated Interchange

Estimated Cost: \$5,000,000

Project Life: 50 years

Typical Crash Reductions:

Fatal and Severe: -75%

Minor Injury: -60%

Property Damage: - 35%

Crash Severity	Number of Crashes	Crash Cost	Crash Reduction	Crash Cost Savings/ Year
Fatal and Serious	9	\$5,460,000	-90%	\$491,400
Minor Injury	23	\$2,622,000	-60%	\$157,320
Property Damage	35	\$420,000	-35%	\$14,700
			Total Yearly Savings	\$581,520

Crash Benefit = \$663,420 * 50 years = \$33,171,000

Projects Costs + Operations and Maintenance = \$5,000,000 + 2% per year (\$100,000*50 year)

Cost = \$10,000,000

Benefit/ Cost = \$33,171,000 / \$10,000,000 = **3.3**

Benefit/ Cost Analysis

After reviewing the three alternatives, it appears that the reduced conflict intersection gives us the best return on investment, with a BC of 8.5. However, the interchange gives us the most crash savings over the life of the project, but at the highest level of investment.

It is important to remember that many factors go into selecting a project. Cost is one consideration, but one of several. Other factors to remember are mobility, capacity, right of way acquisition, current funds, access management, public feedback, political, social, demographic, and others.

For investments on intersections, an Intersection Control Evaluation (ICE) should be conducted, especially for larger projects.

Appendix C- All Solicitations

Recommended Service Life Criteria

<u>Description</u>	<u>Service Life</u>	<u>Description</u>	<u>Service Life (years)</u>	<u>(years)</u>
<u>Intersection & Traffic Control</u>		<u>Roadway & Roadside</u>		
Construct Turning Lanes	20	Widen Traveled Way (no lanes added)		20
Provide Traffic Channelization	20	Add Lane(s) to Traveled Way		20
Improve Sight Distance	20	Construct Median for Traffic Separation		20
Install Traffic Signs	10	Wide or Improve Shoulder		20
Install Pavement Marking	2	Realign Roadway (except at railroads)		20
Install Delineators	10	Overlay for Skid Treatment		10
Install Illumination	20	Groove Pavement for Skid Treatment		10
Upgrade Traffic Signals	20	Install Breakaway Sign Supports		10
Install New Traffic Signals	20	Install Breakaway Utility Poles		10
Retime Coordinated System	5	Relocate Utility Poles		20
Construct Roundabout	20	Install Guardrail End Treatment		10
		Upgrade Guardrail		10
		Upgrade or Install Concrete Median Barrier		20
		Upgrade or Install Cable Median Barrier		10
		Install Impact Attenuators		10
		Flatten or Re-grade Side Slopes		20
		Install Bridge Approach Guardrail Transition		10
		Remove Obstacles		20
		Install Edge Treatments		7
		Install Centerline Rumble Strips		7
<u>Pedestrian & Bicycle Safety</u>				
Construct sidewalk	20			
Construct Pedestrian & Bicycle				
Overpass/Underpass	30			
Install Fencing & Pedestrian Barrier	10			
Construct Bikeway	20			
<u>Structures</u>				
Widen or Modify Bridge for Safety	20			
Replace Bridge for Safety	30			
Construct New Bridge for Safety	30			
Replace/Improve Minor Structure for Safety	20			
Upgrade Bridge Rail	20			

Source: Federal Highway Administration (FHWA)

Appendix D –Greater MN Local Solicitation

A brief overview of the Delegated Contract Process (DCP) has been provided below. The outlined criteria must be completed to meet the April 15th deadline requirement for all selected projects:

1. Environmental document prepared by sponsoring agency and **approved** by DSAE and SALT.
2. Right of way certificate approved or condemnation proceedings have been formally initiated*.
3. District State Aid Engineer (DSAE) approval of plans and a satisfactory review by State Aid that project plans are complete and reflect the project that was selected.
4. Engineer's Estimate and working days estimate including how working days were computed*.
5. Special provision information*.
6. Utility relocation certificate*.
7. Request for Lab Services form*.
8. Permits received or NPDES permit application filled out by sponsoring agency*.
9. SALT requests DBE goal.
10. Plans reviewed and approved by SALT.
11. SALT requests authorization for HSIP or HRRRP projects.
12. Bid opening can be set after authorization by SALT and sponsoring agency.
13. Sponsoring agency prepares proposal, sells project documents and advertises per State Statute (required ad language provided by SALT).
14. Bid opening should be within 90 days of authorization.
15. DBE clearance must be given by MnDOT Office of Civil Rights before project is awarded by sponsoring agency (if applicable).
16. Submit above information for all projects that will be included in the construction contract. Above Federal requirements will apply to all work included in the construction contract.

*These items are all submitted to SALT along with DSAE approved plan set.

Additional Resources:

For detailed information about the FEDERAL (DCP) process, please visit our website:
www.dot.state.mn.us/stateaid/projectdelivery/pdp/dcp/dcp-checklist.pdf

If you have any questions about the Federal Aid process, please contact your DSAE or Merry Daher with SALT at Merry.Daher@state.mn.us or (651) 366-3821.

Appendix E: HSIP and Signals—Greater MN Local and District Solicitation

(Revised 10/10/2012)

In most cases, traffic signals are not safety control devices. They assign right of way for vehicles and are necessary for operational purposes. However, in some cases they can improve safety. The objective of the Highway Safety Improvement Program (HSIP) is to “reduce the occurrence of and the potential for fatalities and serious injuries resulting from crashes on all public roads” (23 CRF 924.5). Signal projects will be considered for funding provided they meet the following criteria.

1. New Signals

- Warrant 7, Crash Experience from the MMUTCD must be met. Specifically, “Five or more reported crashes, of the types susceptible to correction by a traffic control signal, have occurred within a 12-month period”. Exceptions to meeting this warrant may be made if an adequate case is made on how the new signal will reduce the number of, or potential for, fatalities and serious injuries.

Section 4 of the Minnesota Manual on Uniform Traffic Control Devices can be found at the link below:

<http://www.dot.state.mn.us/trafficeng/publ/mutcd/mnmutcd2014/mnmutcd-4.pdf>

- All new signals shall meet current MnDOT design standards. If exceptions to incorporating these standards are necessary due to site specific conditions, explanation should be included with the application.
- Installation of red light running (enforcement) lights is strongly encouraged. Installation costs are low when installed with new signals and they provide the benefit of red light running enforcement to be accomplished by one law enforcement officer, instead of two.
- Documentation should be provided confirming that other intersection types were considered but are not feasible. Those considered should include intersection types that reduce the probability of severe right-angle crashes. Roundabouts restricted crossing u-turn (RCUT) intersections, and some other alternative intersection types fall into this category.

2. Existing Signals

- Rebuilding an existing signal system is only eligible for HSIP funding if it is necessary for implementation of a geometric improvement (constructing new lanes). The signal system is incidental to the primary safety improvement on these projects, which is geometric.

3. Retiming of signal systems

- The development and implementation of new signal timing plans for a series of signals, a corridor or the entire system is eligible.

Appendix F – Metro Solicitation

Traffic Signals:

In most cases, traffic signals are not safety control devices. They assign right of way for vehicles and are necessary for operational purposes. However, in some cases they can improve safety. The objective for the Highway Safety Improvement Program is to “reduce the occurrence of and the potential for fatalities and serious injuries resulting from crashes on all public roads” (23 CRF 924.5). Signal projects will be considered for funding provided they meet the following criteria.

1. New Signals:

- Warrant 7, Crash Experience from the MMUTCD must be met. Specifically, “5 or more reported crashes, of the types susceptible to correction by a traffic control signal, have occurred within a 12-month period.” Exceptions to meeting this warrant may be made if an adequate case is made on how the new signal will “reduce the number of, or potential for, fatalities and serious injuries” as required by MAP-21.
- All new signals shall meet current MnDOT design standards. If exceptions to incorporating these standards are necessary due to site specific conditions, explanation should be included with the application.
- Installation of red light running (enforcement) lights is strongly encouraged. Installation costs are low when installed with new signals and they provide the benefit of red light running enforcement to be accomplished by one law enforcement officer, instead of two.
- Documentation should be provided confirming that other intersection types were considered but are not feasible. Those considered should include intersection types that reduce the probability of severe right-angle crashes. Roundabouts, Reduce Conflict Intersections (RCI) and some alternative intersection types fall into this category.

2. Existing Signals:

- Rebuilding an existing signal system may be eligible for HSIP funding if it is necessary for implementation of a geometric improvement, where the signal system cost is incidental to the primary geometric safety improvement on the project.
- Rebuilding an existing signal system without geometric improvements may be eligible for HSIP funding if additional safety devices are included, such as: adding mast arms, adding signal heads, interconnect with other signals, etc.

3. Retiming of Signal Systems:

- The development and implementation of new signal timing plans for a series of signals, a corridor or the entire system is eligible.

Appendix G – Greater MN Local and District Solicitation

Guidelines for HSIP-funded narrow shoulder paving in conjunction with county resurfacing projects

Under certain circumstances it makes sense to pave narrow shoulders in conjunction with a resurfacing project, rather than as a separate, stand-alone project.

The County Road Safety Plans (CRSPs) have identified **6 miles per county per year** for narrow shoulder paving. This work involves the paving of existing aggregate or turf shoulders with 1 to 2 feet of pavement and the addition of a safety edge and a shoulder rumble strip or edge line rumble stripe. The following guidelines are proposed for the selection of future HSIP projects on the local system:

- Narrow shoulder paving can be done in conjunction with resurfacing if the project is along one of the segments specifically identified in the CRSP for this type of work.
- The project can be at a different location than those identified in the CRSP if it is along a higher-risk segment, as identified in the CRSP. The CRSP assigns a risk rating to highway segments based on the following criteria: traffic volume, rate and density of road departure crashes, curve density and edge assessment. The risk rating ranges from 0 (lower risk) to 5 (higher risk). **If the proposed project is along a highway segment with a rating of 4 or 5, then it can be done in conjunction with a resurfacing project.** This process ensures that narrow shoulder paving is being done at locations of higher risk rather than being driven by the schedule of pavement rehabilitation projects.
- The shoulder paving must include a safety edge and either shoulder or edge line rumble strips.
- The Applicant should use regular construction dollars to upgrade guardrail and other safety hardware as part of the resurfacing project.

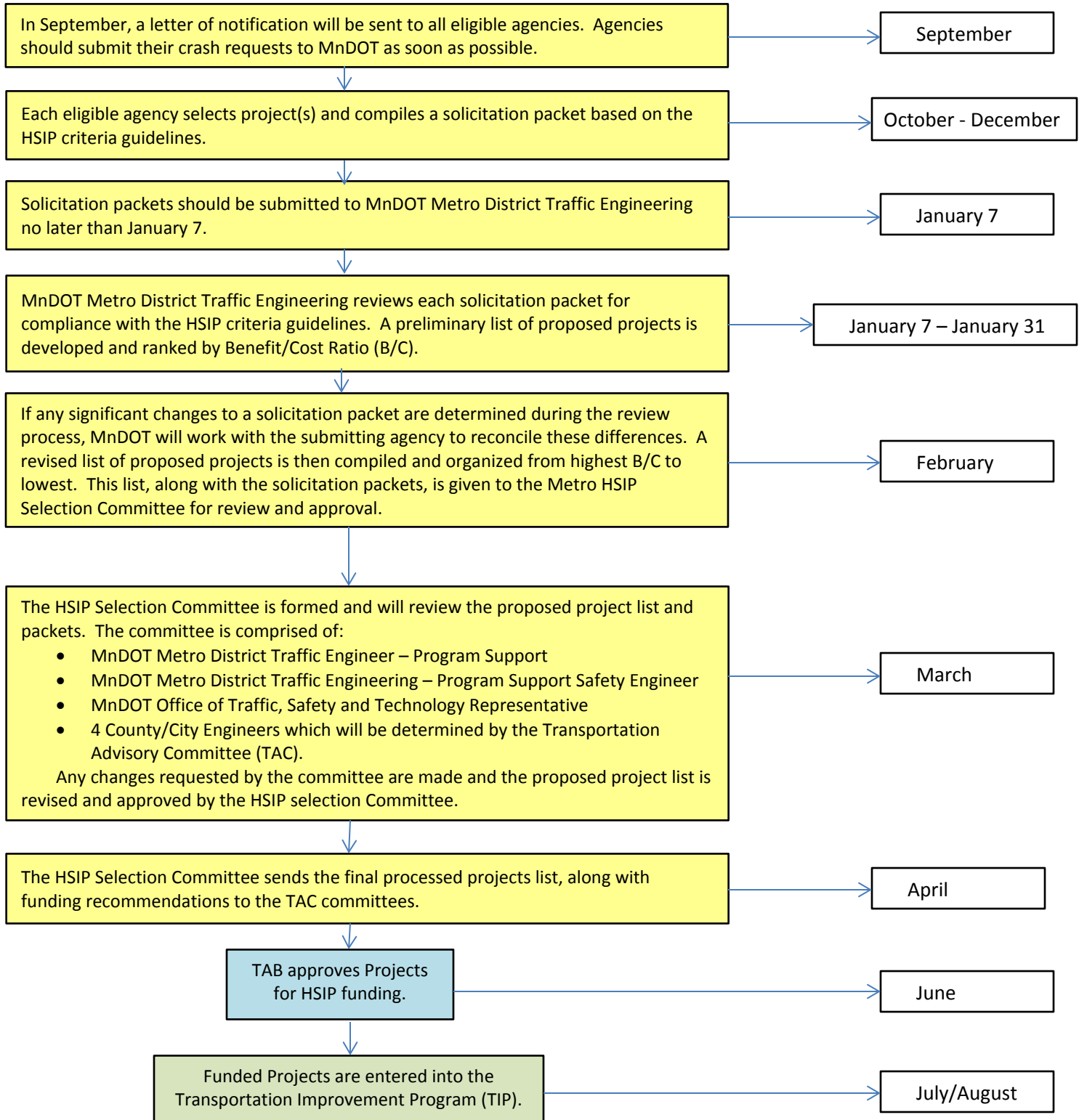
Appendix H – Metro Solicitation

MnDOT Metro District Traffic Engineering Program Support Contacts

<u>Information</u>	<u>Contact</u>	<u>E-Mail</u>	<u>Phone Number</u>
Proposal Content	Gayle Gedstad	gayle.gedstad@state.mn.us	651/234-7815
Proposal Content	Lars Impola	lars.impola@state.mn.us	651/234-7820
Crash Information	Chad Erickson	chad.erickson@state.mn.us	651/234-7806

Appendix I – Metro Solicitation

Metro District Process Timeline



Appendix J – Metro Solicitation

Crash Rate

The formula to compute actual crash rates for locations where there were clusters of crashes during the study period:

$$\text{Section:} \quad \frac{1,000,000 \times \text{CRASHES ADT} \times}{\text{Length} \times \text{DAYS}}$$

$$\text{Intersection/Spots:} \quad \frac{1,000,000 \times \text{CRASHES ADT} \times}{\text{DAYS}}$$

CRASHES = Total Number of crashes
DAYS = Number of days for the study
ADT = Average Daily Traffic
Length = Length of Section of road

Severity Rate

The severity rate is calculated as:

$$\text{Section:} \quad \frac{1,000,000 \times 5(\text{FAT})+4(\text{A})+3(\text{B})+2(\text{C})+\text{N ADT} \times \text{Length} \times}{\text{DAYS}}$$

$$\text{Intersection/Spots:} \quad \frac{1,000,000 \times 5(\text{FAT})+4(\text{A})+3(\text{B})+2(\text{C})+\text{N ADT} \times \text{DAYS}}{\text{DAYS}}$$

FAT = Number of Fatal crashes
A = Number of A injury crashes
B = Number of B injury crashes
C = Number of C injury crashes
N = Number of property damage only crashes
DAYS = Number of days for the study
ADT = Average Daily Traffic
Length = Length of Section of road