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**Highway Safety Improvement Program**  
**Implementation Plan**

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January 2010

## Table of Contents

1		
2	<b>OVERVIEW.....</b>	<b>5</b>
3		
4	<b>PLANNING (23 CFR 924.9).....</b>	<b>6</b>
5	Data Collection.....	6
6	Data Analysis.....	7
7	Highway Safety Improvement Program (924.9.a.3.i).....	8
8	Annual Listings.....	8
9	Simplified HSIP Annual Timeline.....	9
10	Location Identification.....	10
11	Critical Crash Rate Locations.....	10
12	Rural Intersection High Crash Locations.....	12
13	High Risk Rural Roads Locations.....	12
14	3yr Urban High Crash Locations.....	13
15	1yr Urban High Crash Locations.....	14
16	Crash Information Compilation and Distribution.....	14
17	Location Reviews, Recommendations, Concurrence, and Cost Estimates.....	15
18	Road Safety Reviews (RSR).....	16
19	Final Reports.....	18
20	Other Methods of Project Identification.....	20
21	Annual Solicitation of Projects.....	20
22	Projects to Address Employee, Partner, and Public Safety Concerns.....	20
23	System-Wide Countermeasures for Fatal and Injury Crash Types.....	22
24	Installation of Centerline and Shoulder/Edgeline Rumble Strips.....	22
25	Installation of Left and Right Turn Lanes.....	23
26	Installation of Recovery Approaches at T-Intersections.....	25
27	Projects Identified by the Fatal Crash Review Team.....	26
28	Flex Remaining HSIP Safety Funds.....	27
29	Strategic Highway Safety Plan (924.9.a.3.ii).....	28
30	High Risk Rural Roads Program (924.9.a.3.iii).....	29
31	Railway-Highway Grade Crossing Program (924.9.a.3.iv).....	30
32	Establish Project Priorities.....	31
33	4-Year Program of Projects.....	33
34		
35	<b>IMPLEMENTATION (23 CFR 924.11).....</b>	<b>34</b>
36	Funding.....	34
37	Non-Construction Implementation.....	34
38	Construction Implementation.....	34
39	Major Safety Improvement Projects.....	34
40	Small Scale Safety Improvement Projects.....	35
41		
42	<b>EVALUATION (23 CFR 924.13) &amp; REPORTING (23 CFR 924.15).....</b>	<b>37</b>
43	Annual Progress & Evaluation Report (924.15.a.1 and 924.15.a.2).....	37
44	Transparency Report (5% Report) (924.15.a.3).....	38
45		
46		
47		

1 **List of Tables**  
2 Table 1 – Simplified HSIP Annual Timeline.....9  
3 Table 2 – Final Report Content for Annual Listings.....19  
4

5 **List of Appendices**  
6 Appendix A – HSIP 23 CFR 924 Final Rule  
7 Appendix B – SSP Documents  
8 Appendix C – Weighting Factor Information  
9 Appendix D – Technical Information for Preparing Annual Listings  
10 Appendix E – FHWA Safety Memo (July 2008)  
11 Appendix F – NDDOT Rumble Strip Documents  
12 Appendix G – Fatal Crash Review Team Memo  
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1	<b>List of Acronyms and Short Names</b>	
2	4Es	Engineering, education, enforcement, and emergency medical services. The 4 areas
3		necessary for improving safety.
4	AA DT	Average Annual Daily Traffic
5	CFR	Code of Federal Regulations
6	CMC	County Major Collector roadway
7	COG	Council of Governments (ex, FMCOG)
8	EMS	Emergency Medical Services
9	FHWA	Federal Highway Administration
10	FMCSA	Federal Motor Carrier Safety Administration
11	FRA	Federal Railroad Administration
12	GIS	Geographic Information Systems
13	Grapevine	NDDOT's internal newsletter
14	HCL	High Crash Locations
15	HPCS	NDDOT's State Highway Performance Classification System
16	HRRR	High Risk Rural Roads Program (part of 23 CFR 924)
17	HSIP	The overall Highway Safety Improvement Program rule (23 CFR 924)
18	HSIP	The more specific Highway Safety Improvement Program (23 CFR 924.a.3.i)
19	ITS	Intelligent Transportation Systems
20	MPO	Metropolitan Planning Organization
21	MUTCD	Manual on Uniform Traffic Control Devices
22	MyDOT	NDDOT's internal website for employees
23	ND	North Dakota
24	NDCC	North Dakota Century Code
25	NDDOT	North Dakota Department of Transportation
26	OnRamp	NDDOT's GIS web program. It enables people to view aerial photos, roadway
27		inventory items, photos along the roadway, etc.
28	Planning & Programming	NDDOT's Planning & Programming Division
29	RSA	Road Safety Audit (NDDOT uses the term Road Safety Review (RSR))
30	RSR	Road Safety Review (NDDOT's term for a Road Safety Audit (RSA))
31	RSR Team	The Road Safety Review Team, which will conduct RSRs at identified locations.
32	Serious Injury	An incapacitating injury or any injury, other than a fatal injury, which prevents the
33		injured person from walking, driving, or normally continuing the activities the person
34		was capable of performing before the injury occurred.
35	SHSP	Strategic Highway Safety Plan (part of 23 CFR 924)
36	SSP	Statewide Safety Program
37	SSS	Small Scale Safety Improvement Projects (less than \$20,000)
38	STIP	Statewide Transportation Improvement Program
39	T.O.	Traffic Operations
40	Traffic Operations	Traffic Operations Section, in the Planning & Programming Division
41	USC	United States Code
42	13 Major Cities	More than 5,000 population: 1 Fargo, 2 Grand Forks, 3 Bismarck, 4 Minot, 5
43		Jamestown, 6 Dickinson, 7 Williston, 8 Mandan, 9 Valley City, 10 Devils Lake, 11
44		Wahpeton, 12 Grafton, and 13 West Fargo.
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1 **OVERVIEW**

2 The previous HSIP (Highway Safety Improvement Program) Implementation Plan was published in 2000.  
3 Due to regulation/requirement changes, the 2000 HSIP Implementation Plan was in need of updating.  
4

5 Some of the more major changes include the following:

- 6 -In August 2005 the SAFETEA-LU legislation (Safe, Accountable, Flexible, Efficient Transportation  
7 Equity Act: A Legacy for Users) was signed into law. This law established the overall HSIP program as  
8 a core Federal-Aid program.
- 9 -States are now required to develop an SHSP (Strategic Highway Safety Plan), in consultation with  
10 other key State and local highway safety stakeholders.
- 11 -Reporting requirements have changed.

12  
13 Overall Purpose

14 The purpose of the overall HSIP program is to achieve a significant reduction in traffic fatalities and  
15 serious injuries on all public roads through the implementation of infrastructure-related highway safety  
16 improvements.  
17

18 Relation to the Strategic Highway Safety Plan

19 If North Dakota’s SHSP (Strategic Highway Safety Plan) experiences major revisions, this HSIP  
20 Implementation Plan document should also be revised. Refer to page 28 for more information.  
21

22 Federal Documents

23 The overall Highway Safety Improvement Program rule (which includes the Highway Safety  
24 Improvement Program, the Strategic Highway Safety Plan, the High Risk Rural Roads Program, and the  
25 Railway-Highway Grade Crossing Program) is discussed in:  
26 Section 1401 of SAFETEA-LU, 23 USC 130, 23 USC 148, and 23 CFR 924  
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# 1 PLANNING (23 CFR 924.9)

## 2 *Data Collection*

### 3 4 *Crash Data*

5 Law enforcement officers throughout the state collect crash data. Under North Dakota Century  
6 Code, data is collected when a crash involves a fatality, injury, or at least \$1,000 in property damage  
7 on any public road. Crash reports are forwarded to the NDDOT Safety Division for central collection.  
8 The Safety Division reviews the crash reports and enters the information into the Crash Reporting  
9 System database.

10  
11 Certain crash data is also acquired from the State Toxicologist, the North Dakota Highway Patrol,  
12 and the North Dakota Department of Health, Division of Emergency Medical Services.

### 13 14 15 *Other Data*

16 Other data is also used when identifying possible safety projects. Planning & Programming (the  
17 Planning & Programming Division) collects and maintains state roadway inventory data, traffic  
18 volume data, and railway-highway grade crossing inventory data. The Maintenance Division collects  
19 and maintains ITS (Intelligent Transportation System) data. In addition, some Tribal, County, and  
20 City agencies collect and maintain infrastructure inventory data also.

### 21 22 23 *Improving Data Collection and Quality*

#### 24 Traffic Records Strategic Plan

25 A Traffic Records Strategic Plan has been prepared by the Traffic Records Coordinating Committee, a  
26 multi-disciplinary, multi-agency group. The plan communicates how each of the agencies'  
27 respective data can be integrated into a single virtual system that provides the broadest information  
28 scope to the widest range of users. The plan establishes goals and initiatives for six different data  
29 systems:

- 30 1) Crash Reporting System (CRS)
- 31 2) Driver System
- 32 3) Vehicle System
- 33 4) Adjudication and Court System
- 34 5) Roadway Information Management System (RIMS)
- 35 6) Injury Surveillance System (EMS)

36  
37 The plan also identifies priorities for future projects to improve the timeliness, accuracy,  
38 completeness, uniformity, integration, and accessibility of data.

#### 39 40 Conversion from Nodes to Latitude-Longitude Coordinates

41 Crash locations were previously identified using highway reference points or using nodes (a unique  
42 node number was assigned to every major city intersection and at key points on county roadways).  
43 NDDOT is currently transitioning to latitude-longitude coordinates. When the transition is complete  
44 there should be different methods available for analyzing the data and it should be easier to visually  
45 display the data.

1 **23 U.S.C. Section 409 Designation**

2 State and local transportation agencies routinely collect a variety of data for identifying, planning,  
3 and evaluating roadway safety projects and programs. This data may take many different forms  
4 including crash summaries, crash diagrams, cost/benefit analyses, exposure indices, and traffic  
5 volume forecasts.  
6

7 The collection of data creates a dilemma within transportation agencies. A safer roadway network  
8 can best be achieved in an atmosphere that encourages open and frank discussion of potential  
9 improvements. Data contained in reports, lists, surveys, and other documents, unfortunately, may  
10 be viewed as increasing a transportation agency's exposure to liability.  
11

12 Recognizing this concern, Congress provided transportation agencies protection under 23 U.S.C.  
13 Section 409. Notwithstanding any other provision of law, reports, surveys, and data collected to  
14 identify, evaluate, or plan safety improvements are not subject to discovery or admissible as  
15 evidence in Federal or State court proceedings.  
16

17 Pursuant to 23 U.S.C. Sections 148 (Highway Safety Improvement Program) and 130 (Railway  
18 Highway Crossing Program), portions of, or complete data files, generated and referenced in these  
19 documents are subject to the protection contained in 23 U.S.C. Section 409.  
20

21 Please refer to state policy ITDRM1-01 (23 U.S.C. Section 409 Designation) for instructions on when  
22 and how to use the 23 U.S.C. Section 409 designation.  
23  
24

25 **Data Analysis**

26  
27 According to the overall Highway Safety Improvement Program rule (23 CFR 924, Appendix A), crash  
28 data is to be analyzed as part of four main programs/plans:

- 29 924.9.a.3.i Highway Safety Improvement Program (HSIP)
  - 30 924.9.a.3.ii Strategic Highway Safety Plan (SHSP)
  - 31 924.9.a.3.iii High Risk Rural Roads Program (HRRR)
  - 32 924.9.a.3.iv Railway-Highway Grade Crossing Program
- 33

34 Each program/plan is discussed in detail below.  
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1 **Highway Safety Improvement Program (HSIP) – 924.9.a.3.i**

2  
3 **Background**

4 Through 2009, safety projects were identified through High Crash Locations (Interstate Highway,  
5 Non-Interstate Highway, Urban 3yr, and Urban 1yr), District Requests, and Public Requests. In 2007  
6 NDDOT also experimented with using Critical Crash Rates for rural highway segments.

7  
8 In 2007 a Crash Triggers committee was assembled. The task of the committee was to develop  
9 triggers (or criteria) which would initiate studies after a certain type and number of crashes were  
10 obtained. The committee did develop crash triggers for rural highways, but it was discovered that  
11 North Dakota crashes are typically of a type and random location so as to limit the number of safety  
12 projects that could be identified, rather than generate more safety projects.

13  
14 Because the Crash Triggers idea was unsuccessful, another committee, called the SSP (Statewide  
15 Safety Program) committee, was assembled in 2008. The task of the SSP committee was to develop  
16 a policy-driven approach to programming safety projects.

17  
18 On 12/8/2008 the NDDOT Director (Francis G. Ziegler) signed a simplified version of the SSP Decision  
19 Document (Appendix B), which contained a statement that the Office Holders would be requested  
20 to develop an implementation plan using the document prepared by the SSP committee (also in  
21 Appendix B) as guidance. This document is the implementation plan that was directed.

22  
23 The HSIP information is discussed below, and is broken into two parts – “Annual Listings” and “Other  
24 Methods of Project Identification”.

25  
26 **How the HSIP Relates to the SHSP**

27 Refer to page 28 for discussion of how the HSIP and the SHSP are related.

28  
29  
30 ***Annual Listings***

31 Certain listings are prepared annually to identify locations that may be candidates for safety  
32 improvements. After analyzing the locations, recommendations are made, concurrence is obtained,  
33 and cost estimates are prepared. The annual listings are discussed as follows:

- 34  
35       Simplified HSIP Annual Timeline  
36       Location Identification  
37             Critical Crash Rate Locations  
38             Rural Intersection High Crash Locations  
39             High Risk Rural Road Locations  
40             3yr Urban High Crash Locations  
41             1yr Urban High Crash Locations  
42       Crash Information Compilation and Distribution  
43       Location Reviews for Ice/Snow Locations and Animal Locations  
44       Road Safety Reviews (RSR)  
45       Recommendations and Concurrence  
46       Cost Estimates  
47       Final Reports

**Simplified HSIP Annual Timeline**

Table 1 is a simplified timeline of annual HSIP activities.

<b>Table 1 - Simplified HSIP Annual Timeline*</b>		
<b>Months</b>	<b># of Months</b>	<b>Description</b>
March	1	-Prepare annual listings**.
April-July	4	-Prepare crash summary sheets and identify trends. -Prepare Transparency Report (5% Report). -Prepare Annual Progress and Evaluation Report.
August	1	-Submit Transparency Report (5% Report) to FHWA. -Submit Annual Progress and Evaluation Report to FHWA. -Send out preliminary annual listings reports to Districts/Local Agencies. -Solicit Districts/Local Agencies for safety projects not identified on annual listings. -Begin planning road safety reviews.
Sept-Nov	3	-Conduct road safety reviews and develop recommendations. -If necessary, perform additional analysis. -Obtain concurrence from Local Agency (if applicable), District, and Traffic Operations. -Prepare cost estimates.
Dec-January	2	-Obtain Local Agency (if applicable) and District recommendations for Ice/Snow locations. -Obtain concurrence from Local Agency (if applicable), District, and Traffic Operations. -Prepare cost estimates. -Have NDDOT Safety Division review draft HSIP 4-Year Program of Projects.
February	1	-Submit HSIP 4-Year Program of Projects for FHWA approval. -Submit HSIP 4-Year Program of Projects for inclusion in draft STIP. -Distribute final annual listings reports.
March-Aug	6	-Review and revise the draft STIP (which shall include the HSIP 4-Year Program of Projects). -Allocate HSIP safety funds for Education, Enforcement, and/or EMS Activities (after certification, if there are unallocated HSIP safety funds for the applicable year).
<p>Notes: *This timeline is for annual activities. There is also Non-Annual Identification of Projects (such as system-wide projects, Fatal Crash Review Team projects, and public requests). The Non-Annual projects will be reviewed as they are received, so there is not a specific timeline.</p> <p>**Critical Crash Rate Locations, Rural Intersection Locations, Urban 3yr Locations, Urban 1yr Locations, and High Risk Rural Road Locations.</p>		

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1 **Location Identification**

2  
3 **Critical Crash Rate Locations**

4 Background

5 The Critical Crash Rate Location listing replaces two previous listings: the Interstate High Crash  
6 Location Listing and the Non-Interstate Highway High Crash Location Listing.

7  
8 The Critical Crash Rate Location listing is a new method NDDOT has started using to identify  
9 segment locations. Using the RIMS segment information, segments are broken up according to  
10 HPCS (Highway Performance Classification System) class, and the critical crash rates are  
11 calculated for each HPCS class. Using this method, individual segments with crash rates higher  
12 than the critical crash rate may be in need of safety improvements. However, for the purposes  
13 of the annual listings, in-depth reviews will be limited to the top 20% of locations in each HPCS  
14 class, due to workload considerations.

15  
16 The crash rates are calculated using weighting factors for different crash severities. The  
17 following weighting factors apply at the present time:

- 18 Fatal (Fat) Crash = 12
- 19 Injury (Inj) Crash = 3
- 20 Property Damage Only (PDO) Crash = 1

21  
22 Beginning in 2009, crash reports were expanded from 3 crash severity categories (listed above)  
23 to 5 crash severity categories (listed below). The new weighting factors, for 5 crash severity  
24 categories, should start being used once all the data is 2009 or newer. Appendix C contains the  
25 background information used to determine the weighting factors.

26  
27 The following weighting factors apply when all the data is 2009 or newer:

- 28 Fatal (Fat) Crash = 12
- 29 Incapacitating Injury (InjA) Crash = 9
- 30 Non-Incapacitating Injury (InjB) Crash= 3
- 31 Possible Injury (InjC) Crash = 2
- 32 Property Damage Only (PDO) Crash = 1

33  
34 Relation to SHSP

35 This identification method is related to emphasis area 5 (Improvements to Address Lane  
36 Departure Crashes) of the 2007 SHSP.

37  
38 Roadways Analyzed

- 39 -Rural state-system highway segments, outside of the 13 major cities.
- 40 \*exception, the Interstate/Freeway locations will include both rural and urban state-system  
41 segments with full-control of access points (including I-194 and part of ND 810).

1 Base Criteria

2 -3yrs of data is used.

3 -Animal crashes are excluded. In the past it has been found that when Animal crashes are  
4 included they are the predominant crash type for most locations and preclude non-Animal  
5 locations from being identified.

6 -Construction crashes are excluded. Construction crashes are typically not representative of  
7 normal operating conditions before or after construction. Work zone crashes are  
8 presently being studied as part of NDDOT's 2008-2013 Strategic Business Plan, objective  
9 3.1 - Improve Work Zone Safety.

10 -A minimum of 6 crashes are needed for a location to appear on the top 20% list.  
11

12 Location Identification

13 The Safety Division will calculate critical crash rates annually for each HPCS class, see Appendix D  
14 for technical instructions. For each HPCS class, a list will be compiled containing the top 20% of  
15 highway segments with crash rates above the critical crash rate (sorted by crash rate).  
16

17 *Special Situations*

18 1. If a segment does not have at least 6 crashes, but its crash rate would otherwise have  
19 placed it onto the top 20% listing, the segment will be added to a separate list. If this  
20 segment has a crash rate above the critical crash rate for 3 of 5 reporting periods, the  
21 segment should be added to the top 20% list during the 3<sup>rd</sup> period identified and 5yrs of  
22 crash data should be used for this segment (rather than 3yrs).  
23

24 2. If a segment does not have at least 6 crashes, but there was a fatality within the segment  
25 and the crash rate would otherwise have placed it onto the top 20% listing, the segment  
26 will be analyzed as part of the top 20% list.  
27

28 3. If a segment has a length of less than 1.0 mile, it should be treated as a spot location (i.e.  
29 segment length = 1.0 mile)  
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1 **Rural Intersection High Crash Locations**

2 Background

3 Previously, some rural intersections were identified through the Non-Interstate High Crash  
4 Location listing (which is being replaced by the Critical Crash Rate Location Listing). However,  
5 the Non-Interstate listing considered crashes throughout a one mile segment and was not  
6 specifically designed to identify intersections. In order to better identify specific intersections,  
7 this Rural Intersection High Crash Location listing has been added.

8  
9 NDDOT receives political requests for improvements at specific intersections. This Rural  
10 Intersection listing could possibly be a tool to compare intersections with political requests to  
11 intersections on the listing.

12  
13 When figuring the weighted total for a location, refer to page 10 for appropriate factors.

14  
15 Relation to SHSP

16 This identification method is related to emphasis area 7 (Improve Intersection Safety) of the  
17 2007 SHSP.

18  
19 Roadways Analyzed

20 -Intersections on all rural public roads, outside of the 13 major cities.

21  
22 Base Criteria

23 -5yrs of data is used.

24 -Animal crashes are excluded. In the past it has been found with other listings that when  
25 Animal crashes are included they are the predominant crash type for most locations and  
26 preclude non-Animal locations from being identified.

27 -A minimum of 4 crashes are needed for a location to appear on this list.

28  
29 Location Identification

30 Traffic Operations will identify 15 Rural Intersection High Crash Locations annually, see Appendix  
31 D for technical instructions. Locations will be ranked according to weighted total and crash rate.  
32 For each individual location these two rankings will be added together to form a cumulative rank  
33 (cumulative rank = weighted total rank + crash rate rank). The cumulative rank will then be used  
34 for the overall ranking of locations.

35  
36  
37 **High Risk Rural Road Locations**

38 Refer to page 29 for discussion of High Risk Rural Roads.

1 **3yr Urban High Crash Locations**

2 Background

3 At least as early as 1975, "High Accident Locations in the Four Major Areas" and "High Accident  
4 Locations in the Nine Minor Urban Areas" listings were prepared. Together, these listings  
5 identified locations within the 13 major cities (cities with population greater than 5,000). The  
6 process used for these listings has had minimal changes since 1975. The only notable changes  
7 are that presently all thirteen major cities are included on one list (instead of two separate lists),  
8 separate lists are prepared using 3yrs of data and 1yr of data, and the listing names have  
9 changed.

10  
11 A benefit of the Urban High Crash Location process is that the number of crashes, the severity of  
12 crashes, and the rate of crashes are all taken into account when determining the overall rank.

13  
14 When figuring the weighted total for a location, refer to page 10 for appropriate factors.

15  
16 Relation to SHSP

17 This identification method is related to emphasis area 7 (Improve Intersection Safety) of the  
18 2007 SHSP.

19  
20 Roadways Analyzed

21 -Urban intersections and links, within the 13 major cities.

22  
23 Base Criteria

24 -3yrs of data are used.

25 -A minimum of 15 crashes are needed for a location to appear on this listing.

26 \*Note, for the 2006-2008 Urban 3yr listing, a minimum of 10 crashes was used, but the  
27 first location to have less than 15 crashes was location #82. Since only the top 50  
28 locations are included on the final listing, increasing the minimum number of crashes from  
29 10 to 15 should not affect the final listing but should decrease the amount of work needed  
30 to develop the listing. This is how the minimum of 15 crashes was developed.

31  
32 Location Identification

33 Traffic Operations will identify 50 3yr Urban High Crash Locations annually, see Appendix D for  
34 technical instructions. Locations will be ranked according to weighted total and crash rate. For  
35 each individual location these two rankings will be added together to form a cumulative rank  
36 (cumulative rank = weighted total rank + crash rate rank). The cumulative rank will then be used  
37 for the overall ranking of locations.

1 **1yr Urban High Crash Locations**

2 Background

3 The “background” for 3yr Urban High Crash Locations (above) applies to 1yr Urban High Crash  
4 Locations as well.

6 Relation to SHSP

7 This identification method is related to emphasis area 7 (Improve Intersection Safety) of the  
8 2007 SHSP.

10 Roadways Analyzed

11 -Urban intersections and links, within the 13 major cities.

13 Base Criteria

14 -1yr of data is used.

15 -A minimum of 7 crashes are needed for a location to appear on this listing.

16 \*Note, for the 2008 Urban 1yr listing, a minimum of 5 crashes was used, but the first  
17 location to have less than 7 crashes was location #49 (and then #95). Since only the top  
18 25 locations are included on the final listing, increasing the minimum number of crashes  
19 from 5 to 7 should not affect the final listing but should decrease the amount of work  
20 needed to develop the listing. This is how the minimum of 7 crashes was developed.

22 Location Identification

23 Traffic Operations will identify 25 1yr Urban High Crash Locations annually, see Appendix D for  
24 technical instructions. Locations will be ranked according to weighted total and crash rate. For  
25 each individual location these two rankings will be added together to form a cumulative rank  
26 (cumulative rank = weighted total rank + crash rate rank). The cumulative rank will then be used  
27 for the overall ranking of locations.

30 **Crash Information Compilation and Distribution**

31 Traffic Operations will prepare crash summary sheets and identify trends (if any) for all locations on  
32 the annual listings (discussed above). Traffic Operations will then prepare preliminary reports (with  
33 “blank” recommendations columns) for each listing.

35 As appropriate, Traffic Operations will distribute the preliminary reports to the Districts, Road Safety  
36 Review Team, and Local Agencies. Crash summary sheets should be attached to the preliminary  
37 reports for each appropriate person.

1 **Location Reviews, Recommendations, Concurrence, and Cost Estimates**  
2

3 **For Locations with Ice/Snow Trends:**

4 The responsible District or Local Agency should review the locations for potential operational or  
5 project improvements, using a multi-functional team (identified by the District Engineer or Local  
6 Agency). If there are no recommendations, the District or Local Agency should notify Traffic  
7 Operations that there are none. If a recommendation is provided and the Local Agency (if  
8 applicable), the responsible District, and Traffic Operations all concur, the recommendation will  
9 be included on the final report.

10  
11  
12 **For Locations on the State-System (except locations with no trends or only ice/snow trends):**

13 An RSR (Road Safety Review) should be conducted. Refer to "Where to Conduct RSRs" and  
14 "When to Conduct RSRs" on page 16, and also refer to the scenarios discussed below.

15  
16 *For locations where an RSR will not be conducted during the present year:*

17 The responsible District and Traffic Operations will review the crash data for any  
18 obvious safety improvements. If a recommendation is provided and both the  
19 District and Traffic Operations concur, the recommendation will be included on the  
20 final report.

21  
22 *For locations where an RSR is conducted during the present year:*

23 An RSR should be conducted as discussed on page 16. If the RSR Team provides a  
24 recommendation and both the responsible District and Traffic Operations concur,  
25 the recommendation will be included on the final report.

26  
27  
28 **For locations off the state-system (except locations with no trends or only ice/snow trends):**

29 Local Agencies will be notified. They may request to have an RSR conducted; however, an RSR is  
30 optional (not mandatory) for Local Agencies. Various scenarios are discussed below.

31  
32 *For locations where an RSR will not be conducted during the present year:*

33 The Local Agency, responsible District, and/or Traffic Operations should review the  
34 crash data for possible safety improvements. If a recommendation is provided and  
35 the Local Agency, the responsible District, and Traffic Operations all concur, the  
36 recommendation will be included on the final report.

37  
38 *For locations where an RSR is conducted during the present year:*

39 An RSR should be conducted as discussed on page 16. If the RSR Team provides a  
40 recommendation and the Local Agency, the responsible District, and Traffic  
41 Operations all concur, the recommendation will be included on the final report.

42  
43  
44 **Special Reasons not to Proceed with a Recommendation**

45 If there is a special reason not to proceed with a recommendation (for any of the locations),  
46 Traffic Operations will note and keep track of the special reason.

1 Additional Analysis

2 As needed; Local Agencies, Districts, or the RSR Team may request additional analysis from  
3 Traffic Operations. Additional analysis may consist of, but is not limited to: signal warrant  
4 analysis, all-way stop analysis, capacity analysis, sight distance analysis, speed study, etc.  
5

6 However, it should be noted that it is difficult to obtain traffic counts or conduct speed studies  
7 when there is ice/snow on the ground. Therefore, some additional analysis may need to be  
8 postponed until the weather improves.  
9

10 Recommendation to "Monitor"

11 On the reports, "Monitor" should not be recommended for locations with identified trends,  
12 except in the case of ice/snow trends or if there was a recent or upcoming construction project.  
13

14 Cost Estimates

15 When recommendations are concurred on, Traffic Operations and the Scoping Section (in  
16 Planning & Programming) should prepare preliminary cost estimates.  
17  
18

19 **Road Safety Reviews (RSR)**

20 Definition of Road Safety Review

21 An RSR (Road Safety Review) is a review of a roadway or intersection by a multi-disciplinary  
22 team in order to identify changes that may improve safety. An RSR includes a site visit. The RSR  
23 Team is multi-disciplinary so that the section of road or intersection can be studied from a  
24 variety of perspectives.  
25  
26

27 Where to Conduct RSRs

28 The RSR Team (Road Safety Review Team) should not typically review locations with only  
29 ice/snow trends, unless requested by the responsible agency. An RSR should be performed by  
30 the RSR Team for all other identified locations on the state-system. For identified locations off  
31 the state-system, an RSR is optional (not mandatory) – local agencies may request them if  
32 desired.  
33

34 When to Conduct RSRs

35 During the 1<sup>st</sup> year after this implementation plan is initiated, due to time constraints, RSRs will  
36 not be conducted for every location. It is anticipated at least 10-15 RSRs will be performed per  
37 year, until caught up. Once caught up, only new locations should need an RSR.  
38

39 Recurring Locations

40 A second RSR should not be needed for recurring locations, unless traffic patterns or field  
41 conditions change. However, for recurring locations, crash data will still be reviewed each year,  
42 even if a site visit is not conducted.  
43  
44  
45  
46  
47  
48

1        Preparation for RSR

2        Appropriate law enforcement should be invited to attend the RSR. If law enforcement is unable  
3        to attend, the appropriate Local Agency or the responsible District (if no Local Agency is  
4        involved) should still obtain any safety suggestions law enforcement may have. These  
5        suggestions should be considered by the RSR Team when developing recommendations.  
6

7        Traffic Operations should distribute crash information to the RSR Team prior to conducting an  
8        RSR. This should help familiarize team members with the historical crash trends at the location.  
9

10       During the RSR Site Visit

11       The RSR Team should consider bringing all roadway characteristics and maintenance operations  
12       to current standards. Once current standards are considered, reasonable enhancements  
13       (beyond current standards) likely to reduce the historical crash numbers or severity should be  
14       considered.  
15

16       During or shortly after the RSR site visit, the RSR Team should compile observations/suggestions  
17       and develop recommendations. If additional analysis is needed, recommendations should not  
18       be developed until after the additional analysis is complete.  
19

20       If the RSR Team does not identify any recommendations, this fact should be noted on the  
21       report.  
22

23       Road Safety Review Team (RSR Team)

24       The RSR Team should consist of the following members:

- 25            Chair = Planning & Programming Division, Traffic Operations Section
  - 26            Responsible District, Maintenance
  - 27            Responsible District, Construction
  - 28            Design Division, Traffic Safety Design Section
  - 29            Design Division, Roadway Design Section
  - 30            Safety Division (site visit is optional)
  - 31            FHWA, Safety Engineer (as available)
  - 32            Local Agency Personnel (as appropriate)
  - 33            Law Enforcement (as available, see "Preparation for RSR" above)
- 34

35       Each of the above Divisions and all Districts should identify two positions from each listed area  
36       to serve as a member and back-up member of the RSR team. The desire is to have consistent  
37       membership on the team in each District.  
38

39       District personnel are not required to, but may (upon invitation of the host District Engineer or  
40       Local Agency) review roadways outside of their District.  
41  
42  
43  
44  
45  
46  
47

1 **Final Reports**

2 Traffic Operations will prepare and distribute Final Reports (with the “Recommendations” columns  
3 filled in) for the annual listings (as shown below). Desirably, the final reports should be distributed  
4 together. The distribution list and content requirements are shown below.

5  
6 **Final Report Distribution List**

- 7 Executive Office (Director, Deputy Directors, and Office Holders)
- 8 All Engineering Divisions and Districts
- 9 Safety Division
- 10 Communications Division
- 11 Information Technology Division (for inclusion on OnRamp)
- 12 Roadway Safety Review Team Members
- 13 Strategic Highway Safety Plan Work Team (only the members not listed previously are below):
- 14 FHWA Safety Engineer
- 15 ND Highway Patrol (also send to ND Highway Patrol Colonel)
- 16 ND Department of Health – Division of Emergency Medical Services
- 17 Upper Great Plains Transportation Institute
- 18 Federal Motor Carrier Safety Administration (FMCSA)
- 19 Local Agency Personnel (as appropriate):
- 20 City Engineer
- 21 Traffic Engineer
- 22 Public Works/Street Dept } City
- 23 MPO / COG
- 24 Police
- 25
- 26 Highway Engineer
- 27 Highway Superintendent } County
- 28 Sheriff
- 29
- 30 Appropriate Tribal representative

31  
32  
33 **Final Report Content for Annual Listings**

34 Table 2 shows what content should be included in the Final Reports for each of the Annual  
35 Listings.

36  
37 The annual listings will be sorted as follows:

- 38 Critical Crash Rate =sorted by HPCS classification and segment crash rate
- 39 Rural Intersection HCL = sorted by cumulative rank
- 40 High Risk Rural Roads = sorted by crashes/mile
- 41 Urban 3yr = sorted by cumulative rank
- 42 Urban 1yr = sorted by cumulative rank

**Table 2 - Final Report Content for Annual Listings**

Items to Include in Final Report	Annual Listings					
	Critical Crash Rate Locations	Rural Intersections	High Risk Rural Roads	Urban 3yr	Urban 1yr	
Map Identifying Locations	X	X	X	X	X	
Highway Number and Reference Points	X	X	X			
Location Description	X	X	X	X	X	
Segment Length	X		X			
Number and Severity of Crashes	X	X	X	X	X	
Total Crashes	X	X	X	X	X	
Total Crashes Rank						
Weighted Total		X		X	X	
Weighted Total Rank		X		X	X	
Traffic Volumes (AADT)	X	X		X	X	
Crash Rate	X	X		X	X	
Crash Rate Rank		X		X	X	
Critical Crash Rate for HPCS Class	X					
Crashes Per Mile			X			
Crashes Per Mile Statewide Avg for Functional Class			X			
Cumulative Total		X		X	X	
Cumulative Rank		X		X	X	
5yr Rank		X				
Previous 5yr Rank		X				
3yr Rank	X			X	X	
Previous 3yr Rank	X			X	X	
1yr Rank				X	X	
Previous 1yr Rank				X	X	
Comments / Crash Patterns Identified	X	X		X	X	
Recent or Upcoming Construction Projects	X	X		X	X	
Recommendations	X	X		X	X	

1 **Other Methods of Project Identification**

2 **Annual Solicitation of Projects (for locations not on the annual listings)**

3 Background

4 Safety project requests from Districts and Local Agencies can be valuable because the annual  
5 listings do not identify all locations with valid safety concerns or emerging issues. By soliciting  
6 officials who are familiar with the area, NDDOT can acquire valuable insights and identify  
7 locations that may be candidates for safety improvements.

8  
9 Eligible Roadways

10 -All public roads

11  
12 Location and Identification

13 Annually (around August), when the preliminary annual listing reports are sent out, Traffic  
14 Operations should also solicit Districts and Local Agencies for safety project requests (for  
15 locations that are not on the annual listings).

16 \*Districts and Local Agencies are encouraged to contact, visit with, and obtain input from  
17 law enforcement prior to submitting safety project requests.

18  
19 When the Districts or Local Agencies submit safety project requests, Traffic Operations will  
20 review and evaluate the requests (as appropriate). If after evaluation, Traffic Operations, the  
21 District, and the Local Agency (if applicable) all concur with a project, it may be included in the  
22 HSIP 4-year Program of Projects.

23  
24 The Districts or Local Agencies may request to have an RSR (Road Safety Review) conducted at  
25 the potential safety project location, but RSRs are optional (not mandatory) for these locations.

26  
27 Information to Include in Safety Project Requests

28 Safety project requests should include the below information:

- 29 -Location description
- 30 -What the proposed improvements are
- 31 -Explanation of project need (why is it needed)
- 32 -Explanation of how the proposed project should improve safety
- 33 -Project cost estimate (if available)

34  
35  
36 **Projects to Address Employee, Partner, and Public Safety Concerns**

37 Background

38 Safety input from employees, partners, and the public can be valuable because the annual  
39 listings do not identify all locations with potential safety concerns or emerging issues. By  
40 allowing people who travel the roads every day to share their comments and concerns, NDDOT  
41 can acquire valuable insights and identify locations that may be candidates for safety  
42 improvement.

43  
44 To encourage comments from people with safety concerns, NDDOT plans to add a safety-  
45 specific comment link to the NDDOT website. This safety comment link can be especially useful  
46 to the maintenance employee or daily commuter who has safety concerns but does not know  
47 who to contact.

1  
2 Roadways Analyzed

3 -All public roads  
4

5 Base Criteria

6 -3yrs of data will be used to analyze requests, unless directed otherwise.  
7

8 Request for Website Additions

9 Planning & Programming along with the Communications Division should submit a work request  
10 to the NDDOT Web Development Team to add a safety comment link to the NDDOT website.  
11

12 Website Development

13 The Web Development Team should develop the preliminary web pages so they are inviting and  
14 user friendly. When the web pages are ready for testing, the Districts should test them and  
15 suggest changes or improvements to enhance or streamline the process. After District  
16 suggestions are incorporated, the buttons and web pages should be made accessible to  
17 employees, partners, and the public.  
18

19 Website Form Requesting Information

20 When the safety comment link is selected, it should direct users to a fillable form identifying the  
21 purpose of the webpage as assisting the NDDOT in identifying potential traffic safety hazards  
22 that will be evaluated. Such projects may include, but are not limited to:

- 23 -Enhancements to signing and pavement markings
- 24 -Enhancements to turn lane lengths /markings
- 25 -Approach widening to facilitate turning movements
- 26 -Enhancements to intersection visibility
- 27 -High water hazards, such as rip rap within the clear zone
- 28 -Snow and ice accumulation areas  
29

30 The form should request the following information (\* is a required field):

- 31 -Roadway number or name\* (i.e. Hwy 2, Hwy 83, Washington St, Main Ave, etc.)
- 32 -Type of roadway (state highway, county highway, city street, etc.)
- 33 -Highway reference point
- 34 -Location description\* (i.e. 3 miles north of Bismarck, intersection of 13<sup>th</sup> Ave S & 44<sup>th</sup> St,  
35 from Minot to Surrey, etc.)
- 36 -Separate fields for County Name, City Name, and Indian Reservation Name (select and fill  
37 all that apply)
- 38 -Description of the concern\*
- 39 -Contact information, if the person would like a response  
40

41 District or Local Agency Follow-Up

42 Public comments received on the website should be directed to the Communications Division  
43 for distribution to the appropriate NDDOT District and/or Local Agency. As appropriate, the  
44 responsible District and/or Local Agency should then review and respond to the requests and  
45 request any needed construction projects.

46 -As needed, Districts or Local Agencies may request assistance from Traffic Operations, in  
47 order to fully respond to and/or evaluate comments.  
48

1 **System-Wide Countermeasures for Fatal and Injury Crash Types**

2 Background

3 For the rural state highway system, crash locations tend to be random but crash types tend to  
4 be predictable. For this reason, the Statewide Safety Program Committee (in 2008)  
5 recommended some system-wide countermeasures be installed, including:

- 6 -Centerline and Edgeline Rumble Strips
  - 7 -Left and Right Turn Lanes
  - 8 -T-Intersection Recovery Approaches.
- 9

10 The recommendation was made after learning about the Missouri DOT's plan to install more  
11 than 1,000 miles of centerline and edgeline rumble strips, to decrease the number of lane  
12 departure crashes. Also, in the summer of 2008 FHWA distributed a memo (Appendix E)  
13 encouraging states to incorporate certain safety practices. Below is an excerpt from that memo:

14 *While there is still much work to do on determining the precise effectiveness of some*  
15 *safety countermeasures, we are highly confident that certain processes, infrastructure*  
16 *design techniques, and highway features are effective and should be encouraged*  
17 *whenever Federal funds are used.*

18

19 Two of the items encouraged in the FHWA memo were "Rumble Strips" and "Left and Right Turn  
20 Lanes at Stop-Controlled Intersections", which are directly related to the first two system-wide  
21 countermeasures discussed. The third system-wide countermeasure, T-Intersection Recovery  
22 Approaches, was recommended due to it being in the North Dakota Century Code (Section 24-  
23 01-49).

24 Future Identification of System-Wide Countermeasures

25 For this HSIP implementation plan, the system-wide countermeasures were identified by the  
26 specially-assembled SSP (Statewide Safety Program) Committee. However, in the future,  
27 system-wide countermeasures should be identified through the Strategic Highway Safety Plan.  
28 See page 28 for discussion of how the SHSP and HSIP are related.

29  
30  
31

32 **Installation of Centerline and Shoulder/Edgeline Rumble Strips**

33 Background

34 Rumble strips are raised or grooved patterns on the roadway that provide both an audible  
35 warning (rumbling sound) and a physical vibration to alert drivers that they are leaving the  
36 driving lane. They may be installed on the roadway shoulder or on the centerline of undivided  
37 highways. If the edgeline pavement markings are placed over the top of a rumble strip, the  
38 devices are referred to as edgeline rumble strips, rather than shoulder rumble strips.

39

40 Centerline rumble strips have been found to reduce Head-On and Sideswipe-Opposite-Direction  
41 crashes. Shoulder/edgeline rumble strips have been found to reduce Run-Off-The-Road crashes.

42

43 Relation to SHSP

44 This system-wide countermeasure is related to emphasis area 5 (Improvements to Address Lane  
45 Departure Crashes) of the 2007 SHSP.

46

47 Roadways Analyzed

- 48 -state highways

1 Where to Install Rumble Strips

2 Centerline and shoulder/edgeline rumble strips should be installed as directed in the memo  
3 titled "Design Criteria for the Installation of Rumble Strips" and the "Implementation Plan for  
4 Rumble Strips" (Appendix F).

5 \*The attached memos also direct the system-wide installation of transverse (aka  
6 intersection or saw slot) rumble strips, which is related to emphasis area 7 (Improve  
7 Intersection Safety) of the 2007 SHSP.  
8  
9

10 **Installation of Left and Right Turn Lanes**

11 Background

12 Turn lanes provide a separation between turning traffic and through traffic at intersection  
13 approaches, reducing conflicts and improving intersection safety. Large same direction speed  
14 differentials between turning and through traffic are difficult for drivers to detect in time to  
15 avoid Rear End crashes.  
16

17 However, there are some drawbacks to turn lanes. With right turn lanes, right-turning traffic  
18 may block the view of traffic waiting on the minor approach leg. With left turn lanes on  
19 undivided roadways, the weaving motion necessary to remain in the through lane (rather than  
20 entering the turn lane) may pose a hazard.  
21

22 Based on engineering judgment the below warrants were selected for when to install turn lanes.  
23 When the warrants are satisfied, it is expected a turn lane should not pose a greater hazard than  
24 slowing-traffic (without a turn lane).  
25

26 Relation to SHSP

27 This system-wide countermeasure is related to emphasis area 7 (Improve Intersection Safety) of  
28 the 2007 SHSP.  
29

30 Roadways Analyzed

31 -state highways  
32

33 Base Criteria

34 -Turn lanes are for the uncontrolled legs at two-way stop-controlled intersections.  
35 -The major roadway speed limit is 50mph or greater  
36

37 Guidelines for Turn Lanes

38 *Right Turn Lanes*

39 Installation of right turn lanes should be considered at intersections meeting one of the  
40 following warrants:

- 41 -Major corridor AADT (two-way traffic) exceeds 750 vehicles per day and the right turn  
42 movement (single direction) exceeds 125 vehicles per day, or
- 43 -There have been 3 Rear End crashes in 3yrs, or
- 44 -A turn lane is recommended based on engineering judgment as part of a Traffic  
45 Operations study.  
46

47 If the minor corridor AADT exceeds 500 vehicles per day, an offset right turn lane should be  
48 considered.

1 *Left Turn Lanes*

2 Installation of left turn lanes should be considered at intersections meeting one of the  
3 following warrants:

- 4 -The major corridor AADT (two-way traffic) exceeds 750 vehicles per day and the left  
5 turn movement (single direction) exceeds 125 vehicles per day, or
- 6 -The major corridor AADT (two-way traffic) exceeds 750 vehicles per day and left turn  
7 movements (single direction, minimum of 50 left-turning vehicles per day) account for  
8 10% or more of the approach traffic volumes, or
- 9 -The peak hour left-turn delay exceeds 15 seconds, or
- 10 -There have been a total of 3 crashes (Rear End + Left Turn) in 3yrs, or
- 11 -A turn lane is recommended based on engineering judgment as part of a Traffic  
12 Operations study.

13  
14 When left turn lanes are installed for opposing directions (i.e. NB and SB) and both  
15 directions have a fair amount of left turn movements (based on engineering judgment), the  
16 left turn lanes should be installed with zero-offset, and positive-offset if feasible.

17  
18 If a turn lane would generate an unexpected condition for drivers or if it would not meet the  
19 design standards in NDDOT's "Left and Right Turn Lane Criteria for Design of Non-Controlled  
20 Intersections" a design exception shall be prepared.

21  
22 Process

23 For each non-Interstate highway (in order by HPCS class), where the speed limit is 50mph or  
24 greater, Planning & Programming will develop a list of intersections with paved roads, with CMC  
25 (County Major Collector) routes, and where existing turn lanes are present.

26  
27 For identified intersections with existing traffic counts, the existing traffic counts should be  
28 used. For identified intersections without existing traffic counts, the Districts will be contacted.  
29 If the District is confident an intersection has less traffic volumes than a nearby intersection  
30 (with existing counts) and the nearby intersection did not satisfy any turn lane warrants, the  
31 intersection under study should be eliminated from the list. If it is possible an intersection may  
32 have enough volume, the intersection should be counted during the next soonest 3yr count  
33 cycle by the Roadway Data Section. Districts may also suggest additional intersections to study  
34 that were not included on the original list.

35  
36 After traffic counts are obtained, Traffic Operations will look at the traffic volumes for each  
37 intersection to see which intersections satisfy the volume warrants. If an intersection does not  
38 satisfy the volume warrants, crashes should be analyzed.

39  
40 If any of the warrants are satisfied at an intersection, the intersection should remain on the list.  
41 If none of the warrants are satisfied at an intersection, the intersection will be eliminated from  
42 the list, unless the District Engineer knows of a special reason to install a turn lane.

43  
44 If the District Engineer knows of a special reason to install a turn lane at a certain intersection,  
45 Traffic Operations will note and keep track of the special reason and a Traffic Operations study  
46 should be conducted.

1 If an intersection has existing turn lanes, the turn lanes will be reviewed. Based on engineering  
2 judgment, if the existing turn lane lengths are not close to the recommended lengths in  
3 NDDOT's "Left and Right Turn Lane Criteria for Design of Non-Controlled Intersections" the turn  
4 lane should remain on the list for updating. If the lengths are adequate, then the intersection  
5 should be eliminated from the list.

6  
7 Using the intersection lists, Traffic Operations should plan large-scale projects, to install or  
8 update turn lanes at multiple intersections.

9  
10 The tentative project locations will be given to the Districts for their review. Each District should  
11 respond back with their concurrence, any comments, or suggested changes.

### 12 Design Considerations

13 New and modified turn lanes will be designed according to NDDOT's "Left and Right Turn Lane  
14 Criteria for Design of Non-Controlled Intersections". If a new or modified turn lane cannot be  
15 designed according to the guidelines, a design exception shall be prepared.  
16

### 17 18 19 **Installation of Recovery Approaches at T-intersections**

#### 20 Background

21 The installation of recovery approaches at T-intersections is included in the NDCC (North Dakota  
22 Century Code) Section 24-01-49. This section states:  
23

24 **Approach or escape road to be built at all dead end roads or intersections of county and**  
25 **state highways.** Whenever any highway on the state or county highway system has an  
26 intersection or dead end, there must be constructed, whenever feasible, an approach or  
27 escape road, and when not feasible, other protective devices such as warning signs, rumble  
28 strips, or barricades. This section applies to new road construction and reconstruction after  
29 July 1, 1975.

30  
31 NDDOT standard drawing D-203-7 deals with recovery approaches at T-intersections.

#### 32 33 Relation to SHSP

34 This system-wide countermeasure is related to emphasis area 7 (Improve Intersection Safety) of  
35 the 2007 SHSP.

#### 36 37 Roadways Analyzed

38 -All public roads

#### 39 40 Process

41 Traffic Operations should verify with the Districts that the previous t-intersection projects (on  
42 state highways) have been completed. If there are locations that were originally deemed  
43 feasible but recovery approaches have not yet been installed, those locations will be put on a  
44 list.

45  
46 The Local Government Division should solicit Local Agencies for locations of t-intersections  
47 meeting the criteria in the NDCC.  
48

1 For locations where it is unfeasible to install a recovery approach, the responsible District / Local  
2 Agency should include a brief statement why the locations are unfeasible. Traffic Operations  
3 will note and keep track of the unfeasible conditions.  
4

5 After locations are submitted, Traffic Operations should plan large-scale projects, with multiple  
6 locations included in one project. Large-scale projects should result in better unit prices.  
7

8 The tentative project locations will be given to the Districts and Local Agencies for their review,  
9 concurrence, comments, or suggested changes.  
10

## 11 **Projects Identified by the Fatal Crash Review Team**

### 12 Background

13 In 2009 a Fatal Crash Review Team was assembled (see Appendix G). The purpose of the team  
14 is to review fatal crashes, find possible patterns, and propose solutions.  
15

### 16 Roadways Analyzed

17 -All public roads  
18

### 19 Process

20 Projects identified by the Fatal Crash Review Team will be reviewed as they are received, so  
21 there is not a specific timeline.  
22

23  
24 If the Fatal Crash Review Team identifies a spot improvement to be performed and the Local  
25 Agency (if applicable), the responsible District, and Traffic Operations all concur with the  
26 improvement, the project will be added to the next HSIP 4-Year Program of Projects.  
27

28 If the Fatal Crash Review Team identifies a new systemic improvement or a standard practice  
29 change, both Planning & Programming and the Design Division should be notified. If both  
30 divisions concur with the recommendation (after conducting appropriate studies or analyses),  
31 Planning & Programming should add the systemic improvement to the "System-Wide  
32 Countermeasures for Fatal and Injury Crash Types" section above and/or the Design Division  
33 should incorporate the standard practice change into future projects.  
34  
35  
36  
37  
38  
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40  
41  
42  
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44  
45  
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47  
48

1 **Flex Remaining HSIP Safety Funds to Education, Enforcement, and/or EMS Safety Projects**

2 Background

3 This item is included due to the historical trend of fatal crashes in North Dakota. Approximately  
4 60% are unbelted and approximately 60% are alcohol related (based on 2007 data). Therefore,  
5 significantly reducing fatal crashes in the state cannot be achieved through infrastructure  
6 projects alone.

7  
8 Process

9 If the previous HSIP methods, the HRRR Program (924.9.a.3.iii), and the Railway-Highway Grade  
10 Crossing Program (924.9.a.3.iv) have been funded to the maximum practical amount for a given  
11 year and there are still HSIP safety funds available, Planning & Programming and the Safety  
12 Division should discuss flexing HSIP safety funds for education, enforcement, and/or EMS safety  
13 projects. Funds should be tentatively planned in the lesser amount of:

- 14 -the statutory maximum percentage of HSIP safety funds allocated to North Dakota (10%),
- 15 -the unobligated HSIP safety funds remaining for the given year, or
- 16 -an amount to be determined jointly by Planning & Programming and the Safety Division.

17  
18 When a tentative amount is decided upon, the Deputy Director for Engineering and the Deputy  
19 Director for Driver & Vehicle Services should be informed. The two deputies should then make a  
20 recommendation to the NDDOT Director.

21  
22 If a decision is made to transfer funds, the NDDOT Director should submit a written request to  
23 FHWA certifying North Dakota's infrastructure safety needs have been met for the given year  
24 and request to flex HSIP safety funds.

25  
26 The written request shall describe:

- 27 • How the certification was made,
- 28 • The activities that will be funded,
- 29 • How the activities are consistent with the SHSP, and
- 30 • The estimated dollar amount.

31  
32 If funds are flexed, they still remain HSIP safety funds, but they can be used for non-  
33 infrastructure projects. Projects utilizing flexed funds still need to be accounted for in the HSIP  
34 4-Year Program of Projects (with the other HSIP projects) and the STIP.

1 **Strategic Highway Safety Plan (SHSP) – 924.9.a.3.ii**

2 The SHSP is a data-driven, four to five year comprehensive plan that integrates the 4Es – engineering,  
3 education, enforcement, and emergency medical services. The purpose of the SHSP is to identify North  
4 Dakota’s key safety problems/needs and guide investment decisions to achieve significant reductions in  
5 highway fatalities and serious injuries on all public roads.

6  
7 The SHSP identifies key safety issues within North Dakota, strategies to address the issues, and  
8 suggested action plans for critical strategies. The goal of the plan is to coordinate efforts statewide to  
9 save lives and reduce injuries occurring on roadways.

10  
11 North Dakota’s first SHSP was published in 2006. The emphasis areas identified were:

- 12 1. Reduce Alcohol Impaired Driving
- 13 2. Increase the Use of Safety Restraints for all Occupants
- 14 3. Younger Driver / Older Driver Safety
- 15 4. Curb Aggressive Driving
- 16 5. Improvements to Address Lane Departure Crashes
- 17 6. Enhancing Emergency Medical Capabilities to Increase Survivability
- 18 7. Improve Intersection Safety

19  
20 How the SHSP is Related to the HSIP

21 Based on statewide data, the SHSP identifies general emphasis areas. For each emphasis area,  
22 strategies are identified and action plans are developed for certain critical strategies. However, the  
23 SHSP does not identify specific locations.

24  
25 The HSIP uses annual analyses (based on the SHSP emphasis areas) to identify specific locations for  
26 where to apply the SHSP strategies. The crash data and locations are analyzed and appropriate  
27 countermeasures are recommended and concurred on. Based on the recommendations,  
28 construction projects are prioritized and planned.

29  
30 The HSIP also uses the SHSP action plans (for critical SHSP strategies) to plan system-wide  
31 construction projects. The HSIP system-wide countermeasures discussed above (page 22) are  
32 related to the following SHSP emphasis areas:

- 33 Installation of rumble strips – 5. Improvements to address lane departure crashes
- 34 Installation of turn lanes – 7. Improve intersection safety
- 35 Installation of recovery approaches at T-intersections – 7. Improve intersection safety

36  
37 As the SHSP emphasis areas are updated or revised, the HSIP annual analyses and HSIP system-wide  
38 countermeasures should also be updated or revised accordingly, in order to be consistent with the  
39 current SHSP emphasis areas.

1 **High Risk Rural Roads (HRRR) Program – 924.9.a.3.iii**

2 **Definition**

3 A High Risk Rural Road is any roadway functionally classified as a rural major or minor collector or a  
4 rural local road:

- 5 1. On which the crash rate for fatalities and incapacitating injuries exceeds the statewide  
6 average for those functional classes of roadway; or  
7
- 8 2. That will likely have increases in traffic volume that are likely to create a crash rate for  
9 fatalities and incapacitating injuries that exceeds the statewide average for those functional  
10 classes of roadway.

11  
12 **Relation to SHSP**

13 This identification method is related to emphasis area 5 (Improvements to Address Lane Departure  
14 Crashes) and emphasis area 7 (Improve Intersection Safety) of the 2007 SHSP.

15  
16 **Roadways Analyzed**

17 -All public roads outside cities; with a functional classification of rural major collector, rural minor  
18 collector, or rural local road.

19  
20 **Base Criteria**

- 21 -5yrs of data is used.
- 22 -Only Fatal and Injury crashes (outside of cities) are included.
- 23 -The crashes per mile exceeds the statewide average for those functional classes of roadway.

24  
25 **Location Identification**

26 Due to a lack of volume data on county roadways, Planning & Programming will calculate statewide  
27 averages using crashes/mile for rural major collectors, rural minor collectors, and rural local roads.  
28 The statewide averages will be calculated using only Fatal and Injury crash data.

29  
30 Using logical termini, Planning & Programming will prepare lists of segments exceeding the  
31 statewide averages. The lists of segments eligible for HRRR funding will then be distributed to the  
32 applicable Districts/Local Agencies for possible safety project requests. If requested HRRR projects  
33 are so numerous that there is not enough funding, projects should be prioritized based on  
34 crashes/mile.

35  
36 **Information to Include in Safety Project Requests**

- 37 Safety project requests should include the below information:
- 38 -Location description
- 39 -What the proposed improvements are
- 40 -Explanation of project need (why is it needed)
- 41 -Explanation of how the proposed project should improve safety
- 42 -Project cost estimate (if available)

43  
44 When the Districts or Local Agencies submit safety project requests, Traffic Operations will review  
45 and evaluate the requests (as appropriate). If after evaluation, Traffic Operations, the District, and  
46 the Local Agency (if applicable) all concur with a project, it may be included in the HSIP 4-year  
47 Program of Projects.  
48

1 The Districts or Local Agencies may request to have an RSR (Road Safety Review) conducted at the  
2 potential safety project location, but RSRs are optional (not mandatory) for these locations.

3  
4 Refer to page 19 for information to include in the HRRR annual report.  
5  
6

### 7 **Railway-Highway Grade Crossing Program – 924.9.a.3.iv**

8 The identification, development, and project implementation of crossing improvements in North Dakota  
9 enables NDDOT, in cooperation with the railroad companies, to improve safety at many railway-highway  
10 grade crossings. This program is part of a nationwide attempt to reduce serious crashes and costly  
11 delays at crossings. Of primary concern is the loss of life, serious injuries, and the tremendous amount  
12 of property damage that result from vehicle-train collisions at railway-highway grade crossings.  
13

14 The NDCC requires public crossings to have cross bucks and advance warning signs installed in  
15 accordance with the MUTCD (Manual on Uniform Traffic Control Devices). State law assigns  
16 responsibility for the cross bucks to the railroad and for the advance warning signs to the road authority.  
17 NDCC Sections 24-09-02 through 24-09-04.  
18

19 Responsibility for developing and coordinating the railway-highway program lies primarily with Planning  
20 & Programming. The responsibilities consist of the following:  
21

- 22 1. Determine the type of warning devices necessary at individual crossings.
  - 23 2. Develop a priority schedule of crossing improvements based on the following criteria:
    - 24 a. Mainline or branchline crossing.
    - 25 b. Ranking according to FRA's current predictor index.
    - 26 c. On-site inspection.
    - 27 d. Crash history.
    - 28 e. People factors. Such as school bus use of crossing.
    - 29 f. Hazardous material factors.
    - 30 g. Input from other government agencies, other road authorities, railroad companies, and the  
31 public.
    - 32 h. Train counts and track speed.
    - 33 i. Traffic volumes and speed.
- 34

35 Coordinating this program involves maintaining contact with all affected governmental agencies, the  
36 railroad companies, equipment suppliers, and the general public. Planning & Programming determines  
37 program priorities and the work to be performed and coordinates with the concerned railroad.  
38

39 Planning & Programming is responsible for matching available resources with planned improvements.  
40 Planned improvements will be included in the HSIP 4-Year Program of Projects for FHWA approval. See  
41 page 33 below for more discussion on the HSIP 4-Year Program of Projects.  
42  
43  
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47

# 1 **Establish Project Priorities**

## 2 3 **Eligible Projects**

4 Based on the definition of “Highway Safety Improvement Program” in 23 CFR 924.3, eligible safety  
5 projects include, but are not limited to, the following:  
6

- 7 • An intersection safety improvement
- 8 • Pavement and shoulder widening (including addition of a passing lane to remedy an unsafe  
9 condition).
- 10 • Installation of rumble strips or other warning devices, if the rumble strips or other warning  
11 devices do not adversely affect the safety or mobility of bicyclists, pedestrians and persons  
12 with disabilities.
- 13 • Installation of a skid-resistant surface at an intersection or other location with a high  
14 frequency of crashes.
- 15 • An improvement for pedestrian or bicyclist safety or for the safety of persons with disabilities.
- 16 • Construction of any project for the elimination of hazards at a railway-highway crossing that is  
17 eligible for funding under 23 U.S.C. 130, including the separation or protection of grades at  
18 railway-highway crossings.
- 19 • Construction of a railway-highway crossing safety feature, including installation of highway-  
20 rail grade crossing protective devices.
- 21 • The conduct of an effective traffic enforcement activity at a railway-highway crossing.
- 22 • Construction of a traffic calming feature.
- 23 • Elimination of a roadside obstacle or roadside hazard.
- 24 • Improvement of highway signage and pavement markings.
- 25 • Installation of a priority control system for emergency vehicles at signalized intersections.
- 26 • Installation of a traffic control or other warning device at a location with high crash potential.
- 27 • Transportation safety planning.
- 28 • Improvement in the collection and analysis of safety data.
- 29 • Planning integrated interoperable emergency communications equipment, operational  
30 activities, or traffic enforcement activities (including law enforcement assistance) relating to  
31 work zone safety.
- 32 • Installation of guardrails, barriers (including barriers between construction work zones and  
33 traffic lanes for the safety of road users and workers), and crash attenuators.
- 34 • The addition or retrofitting of structures or other measures to eliminate or reduce crashes  
35 involving vehicles and wildlife.
- 36 • Installation and maintenance of signs (including fluorescent yellow-green signs) at pedestrian-  
37 bicycle crossings and in school zones.
- 38 • Construction and operational improvements on high risk rural roads.
- 39 • Conducting road safety audits.
- 40
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1 **Prioritizing Projects**

2 When the total estimated costs for proposed HSIP safety projects exceed available funding, the  
3 following priority ranking should generally be used. However, the Traffic Operations Engineer may  
4 use engineering judgment to place specific projects higher on the priority list. Also, if there are two  
5 projects - one that falls into an SHSP emphasis area and one that does not - the project that does fall  
6 into an SHSP emphasis area should be given priority.  
7

- 8 1. Fatal Crash Review Team Projects
  - 9 2. Railway-Highway Grade Crossing Projects
  - 10 3. Critical Crash Rate Location Projects
  - 11 4. Rural Intersection High Crash Location Projects
  - 12 5. Urban 3yr and Urban 1yr High Crash Location Projects
  - 13 6. High Risk Rural Road Projects
  - 14 7. Annual Solicitation Projects
  - 15 8. Public Comment Projects
  - 16 9. System-Wide Countermeasure Projects
  - 17 10. Flex Remaining HSIP Safety Funds to Education, Enforcement, and/or EMS Safety Projects
- 18

19 Three main questions were considered when developing the priority listing:

- 20 -What is the potential for severe crashes?
  - 21 -How in-depth was the crash data analyzed?
  - 22 -Was the location identified based on objective data or personal opinion?
- 23

24 Item 9, System-Wide Countermeasure Projects, has a large potential to reduce crashes, but it was  
25 placed towards the bottom of the list because it was felt that if it was placed higher on the list it  
26 could potentially exhaust the HSIP safety funds rather quickly, leaving all projects with a lower  
27 priority unfunded.  
28

29 Item 10, which is for non-infrastructure projects, was placed at the bottom because the overall HSIP  
30 program is primarily intended for infrastructure projects.  
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# 1 **HSIP 4-Year Program of Projects**

## 2 3 **Review by Safety Division**

4 When the draft HSIP 4-Year Program of Projects is prepared it should be given to the NDDOT Safety  
5 Division for review and comment. This should be performed prior to sending the draft to FHWA for  
6 approval.  
7

## 8 **Submittal to FHWA**

9 By February 28<sup>th</sup> of each year, Planning & Programming should submit an HSIP 4-Year Program of  
10 Projects to FHWA for approval. The 4-Year Program is a change from previous years, which had an  
11 Annual Program of Projects.  
12

13 For each proposed project, the HSIP 4-Year Program of Projects should contain:

- 14 1. The project location description
- 15 2. The method used to identify the project (critical crash rate, animal high crash location, etc.)
- 16 3. How the project relates to an SHSP emphasis area
- 17 4. The work to be performed
- 18 5. The preliminary cost estimate and funding splits
- 19 6. The agency having jurisdiction over the roadway  
20

21 The HSIP 4-Year Program of Projects will be included in the draft STIP. A single line item should be  
22 included in the STIP for SSS (Small Scale Safety) projects. Then as SSS projects are identified, they  
23 can be implemented as soon as practical. For more information on SSS Projects, see page 35.  
24

## 25 **Addenda**

26 An addendum to the HSIP 4-Year Program of Projects should be submitted for FHWA approval if:

- 27 -A new project is added to the HSIP 4-Year Program of Projects
- 28 -A project moves from PE to Construction or vice versa.
- 29 -A project scope change occurs, such that the investment strategy Work Type changes. Some  
30 examples would be:
  - 31 ➤ A signing project becomes a curve modification/grading project.
  - 32 ➤ A flashing beacon project becomes an intersection reconstruction.
  - 33 ➤ A clear zone establishment becomes a grade raise.  
34  
35

## 36 **After Approval and After the Draft STIP Review**

37 After FHWA approves the 4-Year Program of Projects and after the draft STIP review is completed,  
38 the approved safety projects will be given project numbers and will begin the project development  
39 process, utilizing the same process as all other STIP projects.  
40  
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1 **IMPLEMENTATION (23 CFR 924.11)**

2 This section covers funding, non-construction implementation, and construction implementation.

3  
4 **Funding**

5 Safety funds are distributed to the State through the appropriations act passed by congress.

6  
7  
8 **Non-Construction Implementation**

9 Non-Construction activities cover areas such as identifying high crash locations, conducting road safety  
10 reviews, performing analyses, compiling reports, paying for software, etc.

11  
12  
13 **Construction Implementation**

14 Construction covers such areas as changes to roadway geometry, traffic control devices, delineation,  
15 barriers, pedestrian/bicycle facilities, etc.

16  
17 If a safety project is identified in an area where a Minor Rehabilitation (or higher) project is already  
18 scheduled, the safety project should be incorporated into the other project (using the most appropriate  
19 funding, as determine by Planning & Programming). However, any safety items that would normally  
20 have been addressed by a project of the type previously scheduled should be funded by regular federal  
21 aid other than HSIP safety funds.

22  
23 If a safety project is identified in an area where a Preventive Maintenance project is already scheduled,  
24 the safety project should be performed concurrently with the Preventive Maintenance project, but HSIP  
25 safety funds should be used for the safety portion of the project.

26  
27 **Major Safety Improvement Projects**

28 Construction projects costing more than \$20,000 are considered Major. Major safety improvement  
29 projects should follow the regular project development cycles.

1 **Small Scale Safety (SSS) Improvement Projects**

2 Construction projects costing less than \$20,000 are considered Small Scale. Each year, at least  
3 \$200,000 of HSIP safety funding is set aside to do Small Scale Safety (SSS) improvement projects.

4 Examples of SSS projects may include, but are not limited to:

- 5 • Correct minor channelization problems.
- 6 • Minor adjustments or improvements at traffic signal locations.
- 7 • Small pavement widening projects, such as an intersection flare in a rural area.
- 8 • Spot shoulder improvements.
- 9 • Spot skid treatment.
- 10 • Minor flattening or clearing of side slopes.
- 11 • Remove hazardous obstacles from roadside.
- 12 • Spot signing and marking.
- 13 • Remove culvert head wall.
- 14 • Spot guardrail installation.
- 15 • Provide a crash cushion at an immovable obstacle.
- 16 • Remove trees to improve sight distance and maintain clear zone (spot by spot basis).
- 17 • Install rumble strips.
- 18 • Install recovery approach (small scale).
- 19 • Spot delineation.
- 20 • Spot pavement marking improvements.
- 21 • Install flashing beacon.
- 22 • Traffic calming.
- 23 • Pedestrian and bicycle facilities.
- 24 • Intelligent transportation systems (ITS) improvements.
- 25 • Minor re-grading at railway-highway grade crossings.
- 26 • Incidental lighting.

27  
28 NOTE: Most of the above SSS improvements could be done with maintenance or local agency  
29 forces.

30  
31 Although there are typically many individual SSS projects, there should be only one overall SSS  
32 project number in the STIP (the project number is updated annually). The overall SSS project  
33 number will cover the period from October 1 to September 30.

34  
35 Individual SSS projects will be implemented through a streamlined project development process,  
36 consisting of the following steps:

- 37 1) Identify a location and improvement (NDDOT or a Local Agency).
- 38 2) The Local Agency (if applicable), the responsible District, and Traffic Operations should all  
39 concur on the improvement.
- 40 3) Any necessary environmental clearance and permits shall be obtained.
- 41 4) FHWA concurrence shall be obtained by Traffic Operations for each SSS project.
- 42 5) For concurred SSS projects, work orders should be initiated by the responsible agency,  
43 through one of the following methods:
  - 44 • Force account – using agency forces.
  - 45 • Local forces, equipment, or material.
  - 46 • Contractor, by agreement within limits of state law. Must be in accordance with  
47 Sections 24-02-17 and 24-02-19 of the ND Century Code.

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- 6) The Traffic Operations Engineer should provide assistance in developing contract agreements and monitoring projects.
  - Cost participation agreements should be reached with the Local Agency.
  - Agreements should be signed with any contractor or supplier hired.
- 7) The responsible agency should keep adequate records to document safety improvements. Records should consist of the following:
  - Type of work
  - Location
  - Contract Agreement
  - Who is doing the work
  - Status during work
  - Completion
  - Quantities
  - Costs
- 8) Vouchering (billing statements) should follow the normal procedures established by NDDOT. An estimate should be made out by the responsible District and submitted to the Construction Services Division for payment.
- 9) **Upon project completion, the responsible agency shall notify the Traffic Operations Engineer in writing or by email.**
- 10) The final voucher should be submitted by January 1.

The safety improvement program should be flexible. Any funds remaining in the Small Scale Safety area at the end of the fiscal year should be redistributed into the overall HSIP program or be carried over to be programmed for use in the next year's Small Scale Safety project for contract or force account work.

# EVALUATION & REPORTING (23 CFR 924.13 – 924.15)

By August 31<sup>st</sup> of each year, Traffic Operations will prepare two main evaluation reports for FHWA, as discussed below. If desired, these reports may be combined into one larger report.

## **Annual Progress & Evaluation Report (924.15.a.1 & 924.15.a.2)**

This report will consist of 4 parts, as described below:

### **1. Progress in Implementing HSIP Projects**

- Discuss the amount of HSIP safety funding available at the beginning of the state fiscal year (7/1/XX – 6/30/XX).
- Provide a general listing (sorted by project category) of HSIP safety projects that were initiated during the previous state fiscal year. The listing will be structured to identify how the projects relate to the SHSP or other State safety goals and objectives.
- Provide a clear description of the project selection process.

### **2. Effectiveness of the HSIP Improvements**

- Provide a demonstration of the overall effectiveness of the HSIP.
- Include figures showing the general highway safety trends in the State by number and by rate.
- Describe the extent to which improvements contributed to performance goals (including reducing the number of roadway crashes leading to fatalities and serious injuries).

### **3. The High Risk Rural Roads (HRRR) Program**

- Provide basic program implementation information.
- Describe the methods used to identify High Risk Rural Roads.
- Assess the HRRR projects, by:
  - Describing how each project reduced the crash potential of that roadway.
  - Providing a summary of the overall effectiveness of the HRRR program, by:
    - Comparing the current and previous years' statewide averages (crashes/mile).

### **4. Progress Implementing Railway-Highway Grade Crossing Improvements**

- Provide a general listing of Railway-Highway Grade Crossing improvement projects that were initiated during the previous state fiscal year.
- Describe the effectiveness of the Railway-Highway Grade Crossing improvement projects.

1 **Transparency Report (5% Report) (924.15.a.3)**

2 This report will describe not less than 5% of the State’s roadway locations exhibiting the most severe  
3 safety needs. Therefore, the report should include the top 5% of locations identified through each of  
4 the following annual methods:

- 5 • Interstate/Freeway Critical Crash Rate Locations
- 6 • Interregional Critical Crash Rate Locations
- 7 • State Corridor Critical Crash Rate Locations
- 8 • District Corridor Critical Crash Rate Locations
- 9 • District Collector Critical Crash Rate Locations
- 10
- 11 • Rural Intersection High Crash Locations
- 12 • Urban 3yr High Crash Locations
- 13

14 The report will:

- 15 • Identify potential remedies to the hazardous locations, estimate costs for the remedies, and  
16 describe impediments to implementation (other than remedy costs).
- 17 • Emphasize fatality and serious injury data by using weighting factors.
- 18 • At a minimum, use the most recent 3 to 5 years of crash data.
- 19 • Identify the data years used and describe the extent of coverage of all public roads included in the  
20 data analysis.
- 21 • Identify the methodology used to determine how the locations were selected.
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## **Appendix A – HSIP 23 CFR 924 Final Rule**

Summary of Final Rule Comments.....	A1-A7
Final Rule.....	A7-A11

Administration (NARA)", insert the words "available for inspection".

[FR Doc. E8-30840 Filed 12-23-08; 8:45 am]  
BILLING CODE 1505-01-D

## DEPARTMENT OF TRANSPORTATION

### Federal Highway Administration

#### 23 CFR Part 924

[FHWA Docket No. FHWA-2008-0009]

RIN 2125-AF25

#### Highway Safety Improvement Program

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule.

**SUMMARY:** The purpose of this final rule is to revise Part 924 to incorporate changes to the Highway Safety Improvement Program (HSIP) that resulted from the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), as well as to reflect changes in the overall program that have evolved since the FHWA originally published 23 CFR Part 924.

**DATES:** *Effective Date:* This final rule is effective January 23, 2009.

**FOR FURTHER INFORMATION CONTACT:** Ms. Erin Kenley, Office of Safety, (202) 366-8556; or Raymond Cuprill, Office of the Chief Counsel, (202) 366-0791, Federal Highway Administration, 1200 New Jersey Ave., SE., Washington, DC 20590. Office hours are from 7:45 a.m. to 4:15 p.m., *e.t.*, Monday through Friday, except Federal holidays.

#### SUPPLEMENTARY INFORMATION:

##### Electronic Access and Filing

This document, the notice of proposed rulemaking (NPRM), and all comments received may be viewed online through <http://www.regulations.gov>. Electronic submission and retrieval help and guidelines are available on the Web site. It is available 24 hours each day, 365 days each year. An electronic copy of this document may also be downloaded from the Office of the Federal Register's home page at: <http://www.archives.gov> and the Government Printing Office's Web page at: <http://www.access.gpo.gov/nara>.

##### Background

On April 24, 2008, at 73 FR 22092, the FHWA published a NPRM proposing to revise the regulations in 23 CFR Part 924 Highway Safety Improvement Program. The NPRM was published to

incorporate the new statutory requirements of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and to provide State and local safety partners with information on the purpose, definitions, policy, program structure, planning, implementation, evaluation, and reporting of HSIP.

##### Summary of Comments

The FHWA received 15 letters submitted to the docket containing approximately 100 individual comments. Comments were received from State departments of transportation (DOTs), a county department of public works, private industry, and the American Automobile Association (AAA). The FHWA has reviewed and analyzed all the comments received. The significant comments and summaries of the FHWA's analyses and determinations are discussed below.

##### Section 924.1 Purpose

The FHWA received one comment from the Arkansas State Highway Commission requesting clarification of FHWA's proposal to add evaluation to the list of components of a comprehensive HSIP, since evaluation already exists under the current HSIP. While evaluation has always been a requirement of the HSIP, the FHWA includes this change to emphasize that evaluation is a critical element of the program. The FHWA believes that explicitly adding evaluation to section 924.1 makes this section consistent with the rest of the regulation and corrects an omission of the word "evaluation" from the existing regulation.

##### Section 924.3 Definitions

The FHWA received 14 comments from State DOTs and the AAA regarding some of the proposed definitions in this section. In particular, the Michigan and North Dakota State DOTs, as well as the Maryland State Highway Administration (SHA), expressed concern with the definition of "highway safety improvement project," because they believed the definition required Strategic Highway Safety Plans (SHSP) to include specific projects. It is not the FHWA's intent for SHSPs to be project specific; therefore, FHWA revises the definition in the final rule to indicate that a highway safety improvement project is "consistent with" the State SHSP, rather than "described in" the SHSP. In addition, the Illinois, Minnesota, and Arizona DOTs and the AAA commented about the list of example projects included within the definition of "highway safety improvement project." Because the

project list is consistent with 23 U.S.C. 148, and the intent is to keep the definition of eligible projects broad, rather than imply that it is an exhaustive list, the FHWA retains the list of projects as proposed in the NPRM. However, the FHWA does incorporate a minor revision to the definition of "highway safety improvement project," project type 10, elimination of a roadside obstacle, to also include roadside hazards. This addresses comments by the Arizona DOT, who suggested that improvement of roadside slopes be included in this project type. The FHWA believes that "roadside hazards" is more general and addresses Arizona DOT's comment, while also being broad enough to cover other hazards. In addition, the FHWA removes the word "installation" from project type 21 in the final rule to be consistent with the language used in 23 U.S.C. 148. The AAA suggested that the term "crash rate," as described in the definition of "high risk rural roads," should include vehicle miles traveled, and a reference to fatalities and serious injuries, for consistency with the serious injury definition in the statutory language. The FHWA recognizes that not all crash rates are recorded with respect to vehicle miles travelled, and FHWA's desire is to allow States flexibility with how crash rates are defined. The definition for "high risk rural roads" is consistent with the 23 U.S.C. 148 definition in its reference to fatalities and incapacitating injuries. The Illinois DOT agreed with FHWA's proposed definition of "high risk rural roads" and suggested expanding the definition to include "locations on such roads that display similar roadway characteristics to warrant systematic safety improvements." The FHWA is adopting the proposed definition without the suggested expansion because it is more consistent with the requirements of 23 U.S.C. 148, and the suggested expansion of the definition would extend the application of the rule beyond its statutory authority. This would need to be addressed in future legislation. The definitions for "high risk rural roads," "highway safety improvement program," "safety projects under any other section," and "strategic highway safety plan," which are based on the definitions in 23 U.S.C. 148(a), remain unchanged in the final rule. The definition of "highway safety improvement project" in the final rule reflects a slight editorial change as discussed above.

The FHWA incorporates a minor editorial revision to the definition for "road safety audit" in the final rule to

clarify that the audit teams that perform road safety audits are multidisciplinary teams. The FHWA also incorporates minor editorial changes in the final rule definition for "safety data" to correspond with similar changes in section 924.9. In the NPRM, the FHWA proposed including case or citation adjudication and injury data to the list of types of safety data; however, several State DOTs, including Arkansas, Michigan, and Oregon indicated that they currently do not have access to all of that data. While the FHWA believes that case or citation adjudication and injury data are elements of an ideal safety data system, the FHWA removes those items in order to prevent the list of safety data from appearing exhaustive.

The FHWA incorporates the definitions for the following terms into the final rule, unchanged from what was proposed in the NPRM: "Highway-rail grade crossing protective devices," "integrated interoperable emergency communication equipment," "interoperable emergency communications system," "operational improvements," "public road," "hazard index formula," "public grade crossing," "safety stakeholder," "serious injury," and "transparency report." These terms are used in the text of the regulations. The AAA suggested that the definition for "hazard index formula" was overly broad; however, the FHWA believes that the proposed definition provides sufficient Federal level regulatory requirements while also allowing States the appropriate flexibility to incorporate States' methodologies. The Minnesota DOT agreed with the definition of "public grade crossing," commenting that it provided a clearer definition than was previously available.

The Illinois DOT suggested removing pedestrian and bicycle facilities from the existing definition of "highway" in Part 924; however, the FHWA leaves the definition unchanged because these types of facilities are eligible for HSIP funding and therefore must be included in the definition. The Arizona DOT suggested adding a definition for the word "safety"; however, the FHWA believes that the definitions and other provisions of the final rule provide sufficient information on the safety projects it covers and therefore a definition of "safety" is not necessary.

#### Section 924.5 Policy

While the Washington State DOT and the San Diego County Department of Public Works agreed with the proposed revisions to the policy statement in section 924.5(a), the Oregon and North

Dakota DOTs submitted comments about the specific wording. The North Dakota DOT requested clarification of the phrase "evaluate on a continuing basis" and suggested the phrase "all public roads" would include roads outside of the State's authority. The Oregon DOT commented that the proposed objective of "decreasing the potential for crashes" is not specifically addressed in SAFETEA-LU and that the overall objective of significantly reducing fatalities and serious injuries should be emphasized. As a result of these comments, the FHWA revises the text in section 924.5(a) of the final rule to indicate that States shall " \* \* \* evaluate on an annual basis a HSIP that has the overall objective of significantly reducing the occurrence of and the potential for fatalities and serious injuries resulting from crashes on all public roads." The FHWA believes that this policy complements the systematic improvement characteristics of the SHSP and supports States in implementing safety countermeasures that target crash types rather than just high crash locations. The FHWA encourages States to fund projects that will have the largest impact on safety regardless of who owns and maintains the road.

In the NPRM, the FHWA proposed adding two additional paragraphs (b) and (c) to this section to provide information about highway safety improvement project eligibility, and to encourage agencies to use HSIP funding for projects that maximize opportunities to advance safety, and to indicate the period of availability for the funds. While the Washington State DOT supported the proposed language in section 924.5(b) emphasizing that States consider safety projects that maximize opportunities to advance safety by addressing locations and treatments with the highest potential for future crash reduction, Michigan and Illinois DOT and Maryland SHA expressed concern with the proposed language. Michigan DOT suggested that, in practice, it is very difficult to implement low cost treatment projects (as suggested in the NPRM) using Federal funding because of the requirement that such projects be competitively bid. The Maryland SHA also commented that these projects would be difficult to fund due to the policy requirement that the activity address locations and treatments with the highest potential for future crash reduction. The FHWA understands these concerns, and as a result, removes the phrase, " \* \* \* by addressing locations and treatments with the highest potential for crash

reduction" from the statement in the final rule. In response to Illinois DOT's concern that the proposed language in section 924.5(b) suggests prioritization of projects, the FHWA clarifies that this statement does not require prioritization, rather the intent is that the program should fund projects that are considered priority projects, which are projects with maximum lifesaving potential.

Paragraph (b) reiterates that safety projects under any other section are eligible activities only when a State meets the requirements of 23 U.S.C. 148(e) to use or flex 10 percent of the amount apportioned under 23 U.S.C. 104(b)(5) for a fiscal year. This excludes minor activities that are incidental to a specific highway safety improvement project. The FHWA received a comment from the Maryland SHA stating that flexing the 10 percent of the funds apportioned under 23 U.S.C. 104(b)(5) into behavioral programs should be made easier for the States and the FHWA division offices. The FHWA believes that this regulation provides States with the maximum flexibility allowed under current law for implementing the 10 percent flexibility provision and that granting additional flexibility would exceed statutory authority, and therefore, it is outside of the scope of this rulemaking.

The FHWA received comments from the Illinois, Minnesota, and Oregon DOTs supporting the addition of paragraph (c) to this section. The paragraph clarifies that improvements to safety features that are routinely provided as part of broader Federal-aid projects should be funded by the same source as the broader project. The Florida, Michigan, and North Dakota DOTs commented that the proposed language would limit their abilities to dual-fund or split-fund projects. The FHWA emphasizes that this statement does not prohibit dual or split funding, rather it encourages use of other funding sources for safety improvements. States should consider safety in all infrastructure improvements and funding those improvements through all sources possible, not just through dedicated safety funding. States also should consider using HSIP funds for cost effective, high-impact projects in order to use available funding as efficiently and effectively as possible.

Finally, the FHWA adds a new paragraph (d) to this section to explain that eligibility for Federal funding of projects for traffic control devices under this Part is subject to a State and/or local jurisdiction's substantial conformance with the National Manual on Uniform Traffic Control Devices

(MUTCD) or FHWA-approved State MUTCDs and supplements in accordance with Part 655, Subpart F, of this title. While the FHWA neglected to include this in the NPRM, the FHWA adds this paragraph in the final rule to clarify that traffic control devices that are installed using HSIP funding must be MUTCD compliant. This is not a new requirement.

The purpose of this policy section is to support States in implementing safety countermeasures that target crash types rather than just high crash locations.

#### Section 924.7 Program Structure

The FHWA received comments from Maryland SHA and Michigan DOT agreeing with the addition of paragraph (a), which requires that the HSIP in each State include a data-driven SHSP and resulting implementation through all roadway improvement projects, in addition to highway safety improvement projects. The language requires that the HSIP include projects for construction and operational improvements on high risk rural roads and the elimination of hazards at railway-highway grade crossings.

The FHWA received comments from Maryland SHA and the North Dakota DOT opposed to proposed modifications of the existing language that require that each State's HSIP include processes for the evaluation of the SHSP, HSIP, and highway safety improvement projects. Both suggested that evaluation on a programmatic level, rather than project specific level, be allowed. The FHWA agrees that evaluation should be based on a programmatic level, and removes the requirement in paragraph (a) for each State to have a process for evaluating highway safety improvement projects as a process requirement from this section, as well as from other related sections in the regulation.

The FHWA received comments from the South Dakota DOT opposing the language that requires FHWA approval of the State's processes for the planning, implementation, and evaluation of the HSIP and SHSP, as well as the requirement for States to develop the processes cooperatively with officials of the various units of local governments. In both cases, South Dakota suggested revising the language to read "in consultation with." In the first instance, the FHWA agrees with the suggested change and has revised the language to read, "These processes shall be developed by the States in consultation with the FHWA Division Administrator in accordance with this section." However, in the second instance, because the role of various units of local governments is different from the role of

the FHWA the word "cooperatively" was not changed to "in consultation."

#### Section 924.9 Planning

The FHWA revises this section in order to provide more information to States regarding the planning process for HSIPs. The FHWA reorganizes this section and adds more detail regarding individual elements of the planning process from what appears in the existing regulation.

The five main elements that the planning process of the HSIP States shall incorporate are:

- (1) A process for collecting and maintaining a record of crash, roadway, traffic, and vehicle data on all public roads, including the characteristics of both highway and train traffic for railway-highway grade crossings;
- (2) A process for advancing the State's capabilities for safety data collection and analysis;
- (3) A process for analyzing available safety data;
- (4) A process for conducting engineering studies (such as road safety audits and other safety assessments or reviews) of hazardous locations, sections, and elements to develop highway safety improvement projects; and
- (5) A process for establishing priorities for implementing highway safety improvement projects.

Maryland SHA agreed that each State should have a procedure to monitor crashes on State and local highway systems such as to identify those locations having extraordinary frequencies; however, they were concerned that the requirements of this section would be interpreted as requiring that there be a single process or system in the State to identify, analyze, and prioritize crash locations. The FHWA believes that local jurisdictions may have and use data systems of their choice and does not require that a single process or system be used. However, the capabilities of the processes or systems that are used by the State must adhere to the requirements in 23 U.S.C. 148.

While the first of the five elements resembles the first planning component in existing Part 924, the final rule includes collecting and maintaining a record of crash, roadway, traffic, and vehicle data on all public roads. In the NPRM, the FHWA proposed including case or citation adjudication and injury data to the list of items to be collected and maintained; however, several State DOTs, including Arkansas, Michigan, and Oregon, indicated that they currently do not have access to all of that data. While the FHWA believes that

case or citation adjudication and injury data are elements of an ideal safety data system, the FHWA removes the requirement for those data sources in order to prevent the list of safety data from appearing exhaustive. The FHWA incorporates this change to bring additional data sources into the planning process and to encourage States to make their databases more comprehensive. The requirement for comprehensive databases is also consistent with 23 U.S.C. 148 and 408.

The FHWA proposed paragraph (2) to advance States' improvement of capabilities for data collection and analysis, including the improvement of the timeliness, accuracy, completeness, uniformity, integration, and accessibility of safety data or traffic records. The Arizona DOT suggested adding comprehensiveness, efficiency, and consistency to the safety data qualifiers, with "consistency" replacing "uniformity." However, FHWA's desire is to be consistent with 23 U.S.C. 148 and 408 and list the desirable qualities of data, and, therefore, declines to incorporate the suggested change.

The FHWA expands paragraph (3) [formerly paragraph (2) of the existing regulation] to provide more detailed information regarding the processes involved in developing a data-driven program. The revision to this section also provides four paragraphs with additional information on the components of a data-driven program that States must develop. These components include:

- (i) Developing a HSIP in accordance with 23 U.S.C. 148(c)(2) that identifies highway safety improvement projects on the basis of crash experience, crash potential, or other data supported means as identified by the State and establishes the relative severity of those locations, considers the relative hazard of public railway-highway grade crossings based on a hazard index formula; and that analyzes the results achieved by highway safety improvement projects in setting priorities for future projects. The FHWA revises the wording in the final rule based on comments from North Dakota and Colorado DOTs, as well as the Maryland SHA. The North Dakota DOT and Maryland SHA suggested that identifying safety improvement projects on the basis of crash experience is not broad enough and addressing a common system crash type should be allowed. As a result, the FHWA revises section (a)(3)(i)(A) to include "other data supported means as identified by the State." The FHWA includes this item to require that the States develop a data-driven program where projects and priorities are based on crash data, crash

severity, and other relevant safety information. In section 924.9(a)(3)(i)(B), the Maryland SHA questioned whether the use of a hazard index formula for public railway-highway grade crossings would have an impact on safety. The FHWA believes that some means of ranking and prioritizing railway-highway crossing locations for improvements continues to be needed, and required by 23 U.S.C. 130, and a hazard index formula serves this purpose. The FHWA reminds agencies that FHWA provides guidance and technical support to States including recommendations on hazard index formulas and best practices. States have the flexibility to use the DOT formula or a State-developed and validated formula. As a result, States have the ability to develop a hazard index formula that has a positive impact on safety. Section 924.9(a)(3)(i)(C) requires that States use information from their evaluation processes to set priorities for future projects. The Colorado and North Dakota DOT, as well as the Maryland SHA, had comments regarding the interpretation of the proposed language. As a result, the FHWA revises the wording in the final rule to indicate that the information from the evaluation process is to be used where appropriate in setting priorities for future projects. It is the FHWA's intent for evaluation information to be considered, but not as the sole source for data. In addition, the FHWA desires evaluation on a programmatic level and revises the language in the final rule by replacing the term "highway safety improvement project" with "highway safety improvement program." Finally, the FHWA emphasizes that the evaluation process does not require States to create accident modification factors or crash reduction factors; rather, States must establish an evaluation process and use the information as another source of data for future project prioritization. Such information can be very useful in helping the State determine the effectiveness of countermeasures.

(ii) Developing and maintaining a data-driven SHSP in consultation with safety stakeholders that makes effective use of crash data, addresses engineering, management, operation, education, enforcement, and emergency services, and considers safety needs on all public roads. In addition, the SHSP should identify key emphasis areas, adopt performance-based goals, priorities for implementation and a process for evaluation, and obtain approval by the Governor of the State, or a responsible State agency that is delegated by the Governor of the State. The process by

which the State develops the SHSP shall be approved by the FHWA Division Administrator. The elements in this section implement the statutory requirements of 23 U.S.C. 148. The Maryland SHA and the Oregon and South Dakota DOTs each submitted comments about interpreting some of the language in this portion of the regulation. In particular, Maryland SHA and Oregon DOT thought that the proposed language in item (F) implied that the program of HSIP projects had to be listed in the SHSP. The FHWA reiterates that item (F) does not require that the program of HSIP projects be listed in the SHSP, rather the SHSP is to describe a program of projects, technologies, or strategies. Maryland SHA commented that item (G), related to performance-based goals, needed to be cognizant of the work being done by National Highway Traffic Safety Administration (NHTSA) on performance measures and that this regulation should not require States to use specific measures until there is a national consensus on such measures. The FHWA reiterates that item (G) does not require specific measures be used, only that the measures that are used be consistent among other types of safety plans in the State. The consistency of performance measures is an existing requirement of 23 U.S.C. 148. Further, FHWA believes that NHTSA's report on "Traffic Safety Performance Measures for States and Federal Agencies"<sup>1</sup> will not adversely affect this regulation because performance measures described in the report cover the major areas common to many State SHSPs, and States will set the specific goals for the core outcome measures. To clarify the term "low cost," the FHWA replaces the term with the word "cost effective" in item (H). Items (M) and (N) involve approvals by the Governor of a State and the FHWA Division Administrator, respectively. Consistent with stewardship and oversight responsibilities, and with 23 U.S.C. 315, FHWA has the authority to approve the processes that a State uses to administer a federally funded program. While the FHWA revises the reference to process approval in Section 924.7(b) to be "in consultation with," process approval for the SHSP development still remains a requirement.

(iii) Developing a High Risk Rural Roads program using safety data that

<sup>1</sup> NHTSA's report, "Traffic Safety Performance Measures for States and Federal Agencies" can be viewed at the following Web site: [http://www.nhtsa.dot.gov/portal/nhtsa\\_static\\_file\\_downloader.jsp?file=/staticfiles/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/811025.pdf](http://www.nhtsa.dot.gov/portal/nhtsa_static_file_downloader.jsp?file=/staticfiles/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/811025.pdf).

identifies eligible locations on State and non-State owned roads, and analyzes the highway safety problem to diagnose safety concerns, identify potential countermeasures, make project selections, and prioritize high risk rural roads projects. The elements in this section also implement the statutory requirements of 23 U.S.C. 148. While the San Diego County Department of Public Works agreed with this section, the Illinois DOT suggested that this requirement may require additional staffing and funding for their agency. Since this is already a statutory requirement under 23 U.S.C. 148, FHWA does not make any revisions to the language in the final rule.

(iv) Developing a Railway-Highway Grade Crossing Program. This item is contained in existing Part 924; however, the FHWA incorporates minor edits to clarify the content. Similar to their comment on Section 924.9(a)(3)(i)(B), the Maryland SHA suggested that the use of a hazard index formula for public railway-highway grade crossings would not be valid in their State. As stated above in Section 924.9(a)(3)(i)(B), the FHWA believes that some means of ranking and prioritizing railway-highway crossing locations for improvements is necessary (and required by 23 U.S.C. 130), and a hazard index formula serves this purpose.

The final rule expands paragraph (4) [formerly paragraph (3)] to include road safety audits and other safety assessments or reviews of hazardous locations as processes that may be used to develop highway safety improvement projects. The FHWA incorporates this change because road safety audits and other types of assessments and reviews, as suggested in comments by Minnesota and North Dakota DOTs, are valuable tools that have been developed to aid practitioners in enhancing highway/road safety.

The FHWA expands paragraph (5) [formerly paragraph (4)] to include additional language on the process for establishing priorities for implementing highway safety improvement projects to include consideration of the strategies in the SHSP, correction and prevention of hazardous conditions, and integration of safety in the transportation planning process in 23 CFR 450, including the statewide, and metropolitan where applicable, long-range plans, the Statewide Transportation Planning Improvement Program and the Metropolitan Transportation Improvement Program, where applicable. This additional information incorporates more key elements into the planning process and is designed to tie transportation systems planning to the

SHSP. Referencing 23 U.S.C. 134 and 135 reinforces the link between transportation planning and safety. This safety requirement was introduced in the Transportation Equity Act for the 21st Century (TEA-21) and is included in 23 U.S.C. 135(c)(1)(B). The Maryland SHA expressed concern over the selection of safety projects based solely or primarily on the potential reduction in fatalities and serious injuries; however, the FHWA emphasizes that the regulation does not dictate that projects be selected solely or primarily on the potential to reduce fatalities and serious injuries. This is just one of the six factors to be considered. The FHWA also relocates the last three sentences of former paragraph (4) in the existing regulation to subparagraph (3)(iv), because the sentences relate to Railway-Highway Grade Crossings.

The FHWA also relocates existing paragraph (b) regarding Railway-Highway grade crossings to subparagraph (a)(3)(iv)(D) in order to place all Railway-Highway Grade Crossing planning items in one area.

The FHWA expands paragraph (b) [formerly paragraph (c)] to include references to 23 U.S.C. 130, 133, 148, and 505. As part of this change, the final rule clarifies that funds made available through 23 U.S.C. 104(f) may be used to fund safety planning in metropolitan areas. While the Minnesota DOT suggested adding language about financing of safety planning to include rural areas, the FHWA retains the language in the final rule as proposed. The funding already includes rural areas, since outside of the metropolitan area specification, all other areas, including rural, are eligible for these funding resources.

The FHWA adds a new paragraph (c) to specify that highway safety improvement projects shall be carried out as part of the Statewide and Metropolitan Transportation Improvement Planning Processes consistent with the requirements of 23 U.S.C. 134 and 135 and 23 CFR part 450. The FHWA includes this item to incorporate the statutory requirements of section 148 and to link safety to the transportation planning process.

#### Section 924.11 Implementation

In the NPRM, the FHWA proposed to incorporate an editorial change to paragraph (a) and to relocate the reference to procedures set forth in 23 CFR Part 630, Subpart A to be a new paragraph (i). The Maryland SHA expressed concern that the scheduling requirement in paragraph (a) impedes the implementation of low-cost improvement projects and other safety

projects that can or should be undertaken quickly and simply. The Maryland SHA also suggested that this paragraph (a) and the last paragraph (i), along with the scheduling requirements under section 924.9 and other requirements in the rule make the HSIP more complex and burdensome than it should be. The FHWA believes that the scheduling components do not impede implementation of low-cost improvement projects. However, FHWA clarifies paragraph (a) by simplifying it to state that the HSIP shall be implemented in accordance with the requirements of section 924.9 of this part. In response to the comments, the FHWA also deletes the reference to scheduling in paragraph (i). The FHWA also corrects the reference in paragraph (i) to 23 CFR part 630 Subpart A to include its correct title: Preconstruction Procedures: Project Authorization and Agreements.

The FHWA modifies paragraph (d) [formerly paragraph (c)] to clarify the requirements for the use of funds set aside pursuant to 23 U.S.C. 130(e) for railway-highway grade crossings. The FHWA includes the reference to 23 U.S.C. 130(f) for funds that must be made available for the installation of grade crossing protective devices. The FHWA also includes reference to the special rule described in 23 U.S.C. 130(c)(2) because of the amendments made by section 101(1) of the SAFETEA-LU Technical Corrections Act of 2008 (Pub. L. 110-244, 122 Stat. 1572, 1575). In addition, the FHWA includes a reference to 23 U.S.C. 130(k), which specifies that no more than 2 percent of these apportioned funds may be used by the State for compilation and analysis of safety data in support of the annual report to the FHWA Division Administrator required by section 924.15(a)(2) of this part. The Minnesota DOT supports the reference to 23 U.S.C. 130(k) in this paragraph.

Paragraph (h) describes that the Federal share of the cost for most highway safety improvement projects carried out with funds apportioned to a State under 23 U.S.C. 104(b)(5) shall be a maximum of 90 percent. The insertion of the word "maximum" in the final rule is in response to a comment from the North Dakota DOT suggesting that projects using the funding should be allowed to use "up to 90 percent," rather than "shall be 90 percent." In accordance with 23 U.S.C. 120(a) or (b), the Federal share may be increased to a maximum of 95 percent by the sliding scale rates for States with a large percentage of Federal lands. Projects such as roundabouts, traffic control signalization, safety rest areas,

pavement markings, or installation of traffic signs, traffic lights, guardrails, impact attenuators, concrete barrier end treatments, breakaway utility poles, or priority control systems for emergency vehicles or transit vehicles at signalized intersections may be funded at up to a 100 percent Federal share, except not more than 10 percent of the sums apportioned under 23 U.S.C. 104 for any fiscal year shall be used at this Federal share rate. In addition, for railway-highway grade crossings, the Federal share may amount up to 100 percent for projects for signing, pavement markings, active warning devices and crossing closures, subject to the 10 percent limitation for funds apportioned under 23 U.S.C. 104 in a fiscal year. The Illinois and Minnesota DOTs agreed with the proposed changes, particularly enabling States to use Federal funds up to 100 percent on certain items. The FHWA advises States that this is not a new provision, rather it reiterates existing language in 23 U.S.C. 120(c).

#### Section 924.13 Evaluation

The FHWA revises this section to clearly describe the evaluation process of the HSIP, the information that is to be used, and the mechanisms to be used for financing evaluations. The Maryland SHA provided comments that apply to this section, as well as others in the NPRM, expressing concern over the need to evaluate the effectiveness of HSIP projects in addition to the overall HSIP and SHSP. As in the other sections, FHWA revises the final rule language in this section, deleting the requirement to evaluate the effectiveness of individual highway safety improvement projects. The regulation does require an overall program evaluation. The intent is to determine if the process produces effective projects and an effective program. The Maryland SHA indicated that its comments related to developing accident modification factors, performance factors, and implementing low-cost safety improvements in section 924.9(a)(3)(i)(C) applied to this section as well. Those comments are discussed in that section.

In paragraph (a) regarding the evaluation process, the FHWA proposed to require the States to evaluate the overall HSIP and the SHSP. Within paragraph (a), the FHWA restructured the existing paragraphs (a)(1) through (a)(3) into two paragraphs. Paragraph (a)(1) requires that the evaluation include a process to analyze and assess the results achieved by the HSIP in reducing the number of crashes, fatalities and serious injuries, or potential crashes, and in reaching the

performance goals identified in section 924.9(a)(3)(ii)(G). In the NPRM, the FHWA proposed to provide more specifics about the evaluation process, especially as it related to individual projects. However, the FHWA removes that language (paragraphs (i) through (iii)) in the final rule based on comments from the Illinois, North Dakota, and Colorado DOTs stating that the specifications were too specific for programmatic reviews. The FHWA also includes a new subparagraph (a)(2) in the final rule to require that States have a process to evaluate the overall SHSP on a regular basis as determined by each State and in consultation with the FHWA to: (i) Ensure the accuracy and currency of the safety data; (ii) identify factors that affect the priority of emphasis areas, strategies, and proposed improvements; and (iii) identify issues that demonstrate a need to revise or otherwise update the SHSP. The FHWA includes this evaluation of the SHSP because the strategies in the SHSP must be periodically assessed to ensure continued progress in reducing fatalities and serious injuries. In addition, evaluation of the SHSP is a requirement in 23 U.S.C. 148(c). The San Diego County Department of Public Works expressed support for this language; however, the AAA felt that the criteria should be expanded to require more sophisticated evaluation analysis. The FHWA believes that the States should have the flexibility to choose their analysis methods.

#### Section 924.15 Reporting

The FHWA expands paragraph (a) of this section in order to specify the requirements for States to submit annual reports. The language in the final rule reflects comments regarding this section, as well as revisions related to other sections in the regulation. Specifically, in paragraph (a), the FHWA had proposed in the NPRM that the reporting period would be the previous July 1 through June 30. However, the Arkansas, Illinois, Michigan, Minnesota, and Oregon DOTs, as well as Maryland SHA, expressed concern over the dates of the reporting period, primarily due to the time needed to gather the appropriate data from various sources. As a result, the FHWA revises the reporting period in the final rule to be "for the period of the previous year," thereby allowing States to use the most recent reporting year that best suits their needs, while still submitting reports to the FHWA Division Administrator by August 31. These reports include: (1) A report with a defined reporting period describing the progress being made to implement

the State HSIP; (2) a report describing progress being made to implement railway-highway grade crossing improvements and assess their effectiveness; and (3) a transparency report describing not less than 5 percent of a State's highway locations exhibiting the most severe safety needs. Based on comments from the Oregon, Illinois, and North Dakota DOTs, the FHWA revises the language in the final rule related to the HSIP report to clarify what is needed to describe the progress in implementing projects and evaluating the effectiveness of the improvements. As part of these changes in the final rule, the FHWA deletes the language proposed in section 924.15(a)(1)(iii) in the NPRM because it applied to the previous detailed requirements for project evaluation in section 924.13(a)(1)(i)-(iii), which have also been deleted. The FHWA received comments from Colorado DOT and Maryland SHA opposed to the transparency report, or at least requesting that the requirements of the report be minimized to reduce the effort needed for States to prepare the report. However, because the 5 percent transparency report is required by 23 U.S.C. 148, the FHWA keeps the requirements in this section. As suggested by Oregon DOT, the transparency report should also include potential remedies to those hazardous locations identified, as well as estimates of costs associated with the remedies and impediments to implementation. The FHWA adds this information to the language in the final rule in order to incorporate all of the requirements from 23 U.S.C. 148 regarding the transparency report in this regulation. The Illinois DOT noted that making the transparency report compatible with the requirements of 29 U.S.C. 794(d), Section 508 of the Rehabilitation Act may be an added cost. The FHWA believes that States will be able to provide the reports without incurring significant additional costs. The FHWA requires that the States submit their transparency reports in a manner that is Section 508 complaint so that such reports are accessible to all members of the public, including persons with disabilities. The AAA supported making the transparency report available to the public and even recommended that all of the annual HSIP reports be made public. However, at this time, the existing statute only requires that the transparency report be made available in a format accessible by the public.

#### Rulemaking Analysis and Notices

##### *Executive Order 12866 (Regulatory Planning and Review) and U.S. DOT Regulatory Policies and Procedures*

The FHWA has determined that this action will not be a significant regulatory action within the meaning of Executive Order 12866 or significant within the meaning of U.S. Department of Transportation regulatory policies and procedures. These changes are not anticipated to adversely affect, in any material way, any sector of the economy. The changes in Part 924 incorporate provisions outlined in 23 U.S.C. 148 and provide additional information regarding the purpose, definitions, policy, program structure, planning, implementation, evaluation, and reporting of HSIPs. The FHWA believes that this policy for the development, implementation, and evaluation of a comprehensive HSIP in each State will greatly improve roadway safety. These changes will not create a serious inconsistency with any other agency's action or materially alter the budgetary impact of any entitlements, grants, user fees, or loan programs. Therefore, a full regulatory evaluation is not required.

##### *Regulatory Flexibility Act*

In compliance with the Regulatory Flexibility Act (Pub. L. 96-354, 5 U.S.C. 601-612), the FHWA has evaluated the effects of these changes on small entities and has determined that this action will not have a significant economic impact on a substantial number of small entities.

##### *Unfunded Mandates Reform Act of 1995*

This final rule will not impose unfunded mandates as defined by the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4, 109 Stat. 48, March 22, 1995). To the extent the revisions will require expenditures by the State and local governments for the planning, implementation, evaluation, and reporting of the HSIPs and Federal-aid projects, these activities will not be Unfunded Mandates because these activities are reimbursable. This action will not result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$128.1 million or more in any one year (2 U.S.C. 1532) period to comply with these changes.

##### *Executive Order 13132 (Federalism)*

This action has been analyzed in accordance with the principles and criteria contained in Executive Order 13132 dated August 4, 1999, and the FHWA has determined that this action

will not have sufficient federalism implications to warrant the preparation of a federalism assessment. The FHWA has also determined that this rulemaking will not preempt any State law or State regulation or affect the States' ability to discharge traditional State governmental functions.

*Executive Order 13175 (Tribal Consultation)*

The FHWA has analyzed this action under Executive Order 13175, dated November 6, 2000, and believes that it will not have substantial direct effects on one or more Indian tribes; would not impose substantial direct compliance costs on Indian tribal governments; and would not preempt tribal law. Therefore, a tribal summary impact statement is not required.

*Executive Order 13211 (Energy Effects)*

The FHWA has analyzed this action under Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use. The FHWA has determined that it is not a significant energy action under that order because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Therefore, a Statement of Energy Effects under Executive Order 13211 is not required.

*Executive Order 12372 (Intergovernmental Review)*

Catalog of Federal Domestic Assistance program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.

*Paperwork Reduction Act*

Under the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501, *et seq.*), Federal agencies must obtain approval from the Office of Management and Budget (OMB) for each collection of information they conduct, sponsor, or require through regulations. Since this action does require States to write reports, the FHWA requested approval from OMB under the provisions of the PRA. The FHWA received approval from OMB through March 31, 2010. The OMB control number is 2125-0025.

*Executive Order 12988 (Civil Justice Reform)*

This action meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation,

eliminate ambiguity, and reduce burden.

*Executive Order 13045 (Protection of Children)*

The FHWA has analyzed this action under Executive Order 13045, Protection of Children From Environmental Health Risks and Safety Risks. The FHWA certifies that this action would not concern an environmental risk to health or safety that may disproportionately affect children.

*Executive Order 12630 (Taking of Private Property)*

The FHWA does not anticipate that this action would affect a taking of private property or otherwise have taking implications under Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights.

*National Environmental Policy Act*

The FHWA has analyzed this action for the purpose of the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and has determined that it would not have any effect on the quality of the environment.

*Regulation Identification Number*

A regulation identification number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN contained in the heading of this document can be used to cross reference this action with the Unified Agenda.

**List of Subjects in 23 CFR Part 924**

Highway safety, Highways and roads, Motor vehicles, Railroads, Railroad safety, Safety, Transportation.

Issued on: December 11, 2008.

Thomas J. Madison, Jr.,  
Federal Highways Administrator.

■ *In consideration of the foregoing, the FHWA revises part 924 to read as follows:*

**PART 924—HIGHWAY SAFETY IMPROVEMENT PROGRAM**

- Sec.  
924.1 Purpose.  
924.3 Definitions.  
924.5 Policy.  
924.7 Program structure.  
924.9 Planning.  
924.11 Implementation.  
924.13 Evaluation.  
924.15 Reporting.

**Authority:** 23 U.S.C. 104(b)(5), 130, 148, 315, and 402; 49 CFR 1.48(b).

**§ 924.1 Purpose.**

The purpose of this regulation is to set forth policy for the development, implementation, and evaluation of a comprehensive highway safety improvement program (HSIP) in each State.

**§ 924.3 Definitions.**

Unless otherwise specified in this part, the definitions in 23 U.S.C. 101(a) are applicable to this part. In addition, the following definitions apply:

*Hazard index formula* means any safety or crash prediction formula used for determining the relative likelihood of hazardous conditions at railway-highway grade crossings, taking into consideration weighted factors, and severity of crashes.

*High risk rural road* means any roadway functionally classified as a rural major or minor collector or a rural local road—

(1) On which the crash rate for fatalities and incapacitating injuries exceeds the statewide average for those functional classes of roadway; or

(2) That will likely have increases in traffic volume that are likely to create a crash rate for fatalities and incapacitating injuries that exceeds the statewide average for those functional classes of roadway.

*Highway* means,

(1) A road, street, and parkway;

(2) A right-of-way, bridge, railroad-highway crossing, tunnel, drainage structure, sign, guardrail, and protective structure, in connection with a highway; and

(3) A portion of any interstate or international bridge or tunnel and the approaches thereto, the cost of which is assumed by a State transportation department, including such facilities as may be required by the United States Customs and Immigration Services in connection with the operation of an international bridge or tunnel; and

(4) Those facilities specifically provided for the accommodation and protection of pedestrians and bicyclists.

*Highway-rail grade crossing protective devices* means those traffic control devices in the Manual on Uniform Traffic Control Devices specified for use at such crossings; and system components associated with such traffic control devices, such as track circuit improvements and interconnections with highway traffic signals.

*Highway safety improvement program* means the program carried out under 23 U.S.C. 130 and 148.

*Highway safety improvement project* means a project consistent with the State strategic highway safety plan (SHSP) that corrects or improves a

hazardous road location or feature, or addresses a highway safety problem. Projects include, but are not limited to, the following:

- (1) An intersection safety improvement.
- (2) Pavement and shoulder widening (including addition of a passing lane to remedy an unsafe condition).
- (3) Installation of rumble strips or other warning devices, if the rumble strips or other warning devices do not adversely affect the safety or mobility of bicyclists, pedestrians and persons with disabilities.
- (4) Installation of a skid-resistant surface at an intersection or other location with a high frequency of crashes.
- (5) An improvement for pedestrian or bicyclist safety or for the safety of persons with disabilities.
- (6) Construction of any project for the elimination of hazards at a railway-highway crossing that is eligible for funding under 23 U.S.C. 130, including the separation or protection of grades at railway-highway crossings.
- (7) Construction of a railway-highway crossing safety feature, including installation of highway-rail grade crossing protective devices.
- (8) The conduct of an effective traffic enforcement activity at a railway-highway crossing.
- (9) Construction of a traffic calming feature.
- (10) Elimination of a roadside obstacle or roadside hazard.
- (11) Improvement of highway signage and pavement markings.
- (12) Installation of a priority control system for emergency vehicles at signalized intersections.
- (13) Installation of a traffic control or other warning device at a location with high crash potential.
- (14) Transportation safety planning.
- (15) Improvement in the collection and analysis of safety data.
- (16) Planning integrated interoperable emergency communications equipment, operational activities, or traffic enforcement activities (including law enforcement assistance) relating to work zone safety.
- (17) Installation of guardrails, barriers (including barriers between construction work zones and traffic lanes for the safety of road users and workers), and crash attenuators.
- (18) The addition or retrofitting of structures or other measures to eliminate or reduce crashes involving vehicles and wildlife.
- (19) Installation and maintenance of signs (including fluorescent yellow-green signs) at pedestrian-bicycle crossings and in school zones.

- (21) Construction and operational improvements on high risk rural roads.
- (22) Conducting road safety audits.

*Integrated interoperable emergency communication equipment* means equipment that supports an interoperable emergency communications system.

*Interoperable emergency communications system* means a network of hardware and software that allows emergency response providers and relevant Federal, State, and local government agencies to communicate with each other as necessary through a dedicated public safety network utilizing information technology systems and radio communications systems, and to exchange voice, data, or video with one another on demand, in real time, as necessary.

*Operational improvements* means a capital improvement for installation of traffic surveillance and control equipment; computerized signal systems; motorist information systems; integrated traffic control systems; incident management programs; transportation demand management facilities, strategies, and programs; and such other capital improvements to public roads as the Secretary may designate by regulation.

*Public grade crossing* means a railway-highway grade crossing where the roadway is under the jurisdiction of and maintained by a public authority and open to public travel. All roadway approaches must be under the jurisdiction of the public roadway authority, and no roadway approach may be on private property.

*Public road* means any highway, road, or street under the jurisdiction of and maintained by a public authority and open to public travel.

*Road Safety Audit* means a formal safety performance examination of an existing or future road or intersection by an independent multidisciplinary audit team.

*Safety data* includes, but is not limited to, crash, roadway, traffic, and vehicle data on all public roads including, for railway-highway grade crossings, the characteristics of both highway and train traffic.

*Safety projects under any other section* means safety projects eligible for funding under Title 23, United States Code, including projects to promote safety awareness, public education, and projects to enforce highway safety laws.

*Safety stakeholder* means

- (1) A highway safety representative of the Governor of the State;
- (2) Regional transportation planning organizations and metropolitan planning organizations, if any;

(3) Representatives of major modes of transportation;

(4) State and local traffic enforcement officials;

(5) Persons responsible for administering section 130 at the State level;

(6) Representatives conducting Operation Lifesaver;

(7) Representatives conducting a motor carrier safety program under section 31102, 31106, or 31309 of title 49;

(8) Motor vehicle administration agencies; and

(9) Includes, but is not limited to, local, State, and Federal transportation agencies and tribal governments.

*Serious injury* means an incapacitating injury or any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before the injury occurred.

*State* means any one of the 50 States and the District of Columbia.

*Strategic highway safety plan* means a comprehensive, data-driven safety plan developed, implemented, and evaluated in accordance with 23 U.S.C. 148.

*Transparency report* means the report submitted to the Secretary annually under 23 U.S.C. 148(c)(1)(D) and in accordance with § 924.15 of this part that describes, in a clearly understandable fashion, not less than 5 percent of locations determined by the State as exhibiting the most severe safety needs; and contains an assessment of potential remedies to hazardous locations identified; estimated costs associated with those remedies; and impediments to implementation other than cost associated with those remedies.

#### § 924.5 Policy.

(a) Each State shall develop, implement, and evaluate on an annual basis a HSIP that has the overall objective of significantly reducing the occurrence of and the potential for fatalities and serious injuries resulting from crashes on all public roads.

(b) Under 23 U.S.C. 148(a)(3), a variety of highway safety improvement projects are eligible for funding through the HSIP. In order for an eligible improvement to be funded with HSIP funds, States shall first consider whether the activity maximizes opportunities to advance safety. States shall fund safety projects or activities that are most likely to reduce the number of, or potential for, fatalities and serious injuries. Safety projects under any other section, and funded with 23 U.S.C. 148 funds, are only eligible

activities when a State is eligible to use up to 10 percent of the amount apportioned under 23 U.S.C. 104(b)(5) for a fiscal year in accordance with 23 U.S.C. 148(e). This excludes minor activities that are incidental to a specific highway safety improvement project.

(c) Other Federal-aid funds are eligible to support and leverage the safety program. Improvements to safety features that are routinely provided as part of a broader Federal-aid project should be funded from the same source as the broader project. States should address the full scope of their safety needs and opportunities on all roadway categories by using other funding sources such as Interstate Maintenance (IM), Surface Transportation Program (STP), National Highway System (NHS), and Equity Bonus (EB) funds in addition to HSIP funds.

(d) Eligibility for Federal funding of projects for traffic control devices under this Part is subject to a State and/or local jurisdiction's substantial conformance with National MUTCD or FHWA approved State MUTCDs and supplements in accordance with part 655, Subpart F, of this title.

#### § 924.7 Program structure.

(a) The HSIP shall include a data-driven SHSP and the resulting implementation through highway safety improvement projects. The HSIP includes construction and operational improvements on high risk rural roads, and elimination of hazards at railway-highway grade crossings.

(b) The HSIP shall include processes for the planning, implementation, and evaluation of the HSIP and SHSP. These processes shall be developed by the States in consultation with the FHWA Division Administrator in accordance with this section. Where appropriate, the processes shall be developed cooperatively with officials of the various units of local and tribal governments. The processes may incorporate a range of procedures appropriate for the administration of an effective HSIP on individual highway systems, portions of highway systems, and in local political subdivisions, and when combined, shall cover all public roads in the State.

#### § 924.9 Planning.

(a) The HSIP planning process shall incorporate:

(1) A process for collecting and maintaining a record of crash, roadway, traffic and vehicle data on all public roads including for railway-highway grade crossings inventory data that includes, but is not limited to, the

characteristics of both highway and train traffic.

(2) A process for advancing the State's capabilities for safety data collection and analysis by improving the timeliness, accuracy, completeness, uniformity, integration, and accessibility of the State's safety data or traffic records.

(3) A process for analyzing available safety data to:

(i) Develop a HSIP in accordance with 23 U.S.C. 148(c)(2) that:

(A) Identifies highway safety improvement projects on the basis of crash experience, crash potential, or other data supported means as identified by the State, and establishes the relative severity of those locations;

(B) Considers the relative hazard of public railway-highway grade crossings based on a hazard index formula; and

(C) Establishes an evaluation process to analyze and assess results achieved by the HSIP and uses this information, where appropriate, in setting priorities for future projects.

(ii) Develop and maintain a data-driven SHSP that:

(A) Is developed after consultation with safety stakeholders;

(B) Makes effective use of State, regional, and local crash data and determines priorities through crash data analysis;

(C) Addresses engineering, management, operation, education, enforcement, and emergency services;

(D) Considers safety needs of all public roads;

(E) Adopts a strategic safety goal;

(F) Identifies key emphasis areas and describes a program of projects, technologies, or strategies to reduce or eliminate highway safety hazards;

(G) Adopts performance-based goals, coordinated with other State highway safety programs, that address behavioral and infrastructure safety problems and opportunities on all public roads and all users, and focuses resources on areas of greatest need and the potential for the highest rate of return on the investment of HSIP funds;

(H) Identifies strategies, technologies, and countermeasures that significantly reduce highway fatalities and serious injuries in the key emphasis areas giving high priority to cost effective and proven countermeasures;

(I) Determines priorities for implementation;

(J) Is consistent, as appropriate, with safety-related goals, priorities, and projects in the long-range statewide transportation plan and the statewide transportation improvement program and the relevant metropolitan long-range transportation plans and

transportation improvement programs that are developed as specified in 23 U.S.C. 134, 135 and 402; and 23 CFR part 450;

(K) Documents the process used to develop the plan;

(L) Proposes a process for implementation and evaluation of the plan;

(M) Is approved by the Governor of the State or a responsible State agency official that is delegated by the Governor of the State; and

(N) Has been developed using a process approved by the FHWA Division Administrator.

(iii) Develop a High Risk Rural Roads program using safety data that identifies eligible locations on State and non-State owned roads as defined in § 924.3, and analyzes the highway safety problem to identify safety concerns, identify potential countermeasures, select projects, and prioritize high risk rural roads projects on all public roads.

(iv) Develop a Railway-Highway Grade Crossing program that:

(A) Considers the relative hazard of public railway-highway grade crossings based on a hazard index formula;

(B) Includes onsite inspection of public grade crossings;

(C) Considers the potential danger to large numbers of people at public grade crossings used on a regular basis by passenger trains, school buses, transit buses, pedestrians, bicyclists, or by trains and/or motor vehicles carrying hazardous materials; and

(D) Results in a program of safety improvement projects at railway-highway grade crossings giving special emphasis to the statutory requirement that all public crossings be provided with standard signing and markings.

(4) A process for conducting engineering studies (such as roadway safety audits and other safety assessments or reviews) of hazardous locations, sections, and elements to develop highway safety improvement projects.

(5) A process for establishing priorities for implementing highway safety improvement projects considering:

(i) The potential reduction in the number of fatalities and serious injuries;

(ii) The cost effectiveness of the projects and the resources available;

(iii) The priorities in the SHSP;

(iv) The correction and prevention of hazardous conditions;

(v) Other safety data-driven criteria as appropriate in each State; and

(vi) Integration with the statewide transportation planning process and statewide transportation improvement program, and metropolitan

transportation planning process and transportation improvement program where applicable, in 23 CFR part 450.

(b) The planning process of the HSIP may be financed with funds made available through 23 U.S.C. 130, 133, 148, 402, and 505 and, where applicable in metropolitan planning areas, through 23 U.S.C. 104(f).

(c) Highway safety improvement projects shall be carried out as part of the Statewide and Metropolitan Transportation Planning Process consistent with the requirements of 23 U.S.C. 134 and 135, and 23 CFR part 450.

#### § 924.11 Implementation.

(a) The HSIP shall be implemented in accordance with the requirements of § 924.9 of this part.

(b) A State is eligible to use up to 10 percent of the amount apportioned under 23 U.S.C. 104(b)(5) for each fiscal year to carry out safety projects under any other section, consistent with the SHSP and as defined in 23 U.S.C. 148(a)(4), if the State can certify that it has met infrastructure safety needs relating to railway-highway grade crossings and highway safety improvement projects for a given fiscal year. In order for a State to obtain approval:

(1) A State must submit a written request for approval to the FHWA Division Administrator for each year that a State certifies that the requirements have been met before a State may use these funds to carry out safety projects under any other section; and

(2) A State must submit a written request that describes how the certification was made, the activities that will be funded, how the activities are consistent with the SHSP, and the dollar amount the State estimates will be used.

(c) If a State has funds set aside from 23 U.S.C. 104(b)(5) for construction and operational improvements on high risk rural roads, in accordance with 23 U.S.C. 148(a)(1), such funds:

(1) Shall be used for safety projects that address priority high risk rural roads as determined by the State.

(2) Shall only be used for construction and operational improvements on high risk rural roads and the planning, preliminary engineering, and roadway safety audits related to specific high risk rural roads improvements.

(3) May also be used for other highway safety improvement projects if the State certifies that it has met all infrastructure safety needs for construction and operational

improvements on high risk rural roads for a given fiscal year.

(d) Funds set aside pursuant to 23 U.S.C. 148 for apportionment under the 23 U.S.C. 130(f) Railway-Highway Grade Crossing Program, are to be used to implement railway-highway grade crossing safety projects on any public road. At least 50 percent of the funds apportioned under 23 U.S.C. 130(f) must be made available for the installation of highway-rail grade crossing protective devices. The railroad share, if any, of the cost of grade crossing improvements shall be determined in accordance with 23 CFR part 646, Subpart B (Railroad-Highway Projects). If a State demonstrates to the satisfaction of the FHWA Division Administrator that the State has met its needs for installation of protective devices at railway-highway grade crossings the State may use funds made available under 23 U.S.C. 130 for highway safety improvement program purposes. In addition, up to 2 percent of the section 130 funds apportioned to a State may be used for compilation and analysis of safety data for the annual report to the FHWA Division Administrator required under § 924.15(a)(2) on the progress being made to implement the railway-highway grade crossing program.

(e) Highway safety improvement projects may also be implemented with other funds apportioned under 23 U.S.C. 104(b) subject to the eligibility requirements applicable to each program.

(f) Award of contracts for highway safety improvement projects shall be in accordance with 23 CFR part 635 and part 636, where applicable, for highway construction projects, 23 CFR part 172 for engineering and design services contracts related to highway construction projects, or 49 CFR part 18 for non-highway construction projects.

(g) All safety projects funded under 23 U.S.C. 104(b)(5), including safety projects under any other section, shall be accounted for in the statewide transportation improvement program and reported on annually in accordance with § 924.15.

(h) The Federal share of the cost for most highway safety improvement projects carried out with funds apportioned to a State under 23 U.S.C. 104(b)(5) shall be a maximum of 90 percent. In accordance with 23 U.S.C. 120(a) or (b), the Federal share may be increased to a maximum of 95 percent by the sliding scale rates for States with a large percentage of Federal lands. In accordance with 23 U.S.C. 120(c), projects such as roundabouts, traffic control signalization, safety rest areas, pavement markings, or installation of

traffic signs, traffic lights, guardrails, impact attenuators, concrete barrier end treatments, breakaway utility poles, or priority control systems for emergency vehicles or transit vehicles at signalized intersections may be funded at up to 100 percent Federal share, except not more than 10 percent of the sums apportioned under 23 U.S.C. 104 for any fiscal year shall be used at this Federal share rate. In addition, for railway-highway grade crossings, the Federal share may amount up to 100 percent for projects for signing, pavement markings, active warning devices, and crossing closures, subject to the 10 percent limitation for funds apportioned under 23 U.S.C. 104 in a fiscal year.

(i) The implementation of the HSIP in each State shall include a process for implementing highway safety improvement projects in accordance with the procedures set forth in 23 CFR part 630, Subpart A (Preconstruction Procedures: Project Authorization and Agreements).

#### § 924.13 Evaluation.

(a) The HSIP evaluation process shall include the evaluation of the overall HSIP and the SHSP. It shall:

(1) Include a process to analyze and assess the results achieved by the HSIP in reducing the number of crashes, fatalities and serious injuries, or potential crashes, and in reaching the performance goals identified in § 924.9(a)(3)(ii)(G).

(2) Include a process to evaluate the overall SHSP on a regular basis as determined by the State and in consultation with the FHWA to:

(i) Ensure the accuracy and currency of the safety data;

(ii) Identify factors that affect the priority of emphasis areas, strategies, and proposed improvements; and

(iii) Identify issues that demonstrate a need to revise or otherwise update the SHSP.

(b) The information resulting from the process developed in § 924.13(a)(1) shall be used:

(1) For developing basic source data in the planning process in accordance with § 924.9(a)(1);

(2) For setting priorities for highway safety improvement projects;

(3) For assessing the overall effectiveness of the HSIP; and

(4) For reporting required by § 924.15.

(c) The evaluation process may be financed with funds made available under 23 U.S.C. 104(b)(1), (3), and (5), 105, 402, and 505, and for metropolitan planning areas, 23 U.S.C. 104(f).

#### § 924.15 Reporting.

(a) For the period of the previous year, each State shall submit to the FHWA

Division Administrator no later than August 31 of each year the following reports related to the HSIP in accordance with 23 U.S.C. 148(g):

(1) A report with a defined one year reporting period describing the progress being made to implement the State HSIP that:

(i) Describes the progress in implementing the projects, including the funds available, and the number and general listing of the types of projects initiated. The general listing of the projects initiated shall be structured to identify how the projects relate to the State SHSP and to the State's safety goals and objectives. The report shall also provide a clear description of the project selection process;

(ii) Assesses the effectiveness of the improvements. This section shall: Provide a demonstration of the overall effectiveness of the HSIP; include figures showing the general highway safety trends in the State by number and by rate; and describe the extent to which improvements contributed to performance goals, including reducing the number of roadway crashes leading to fatalities and serious injuries.

(iii) Describes the High Risk Rural Roads program, providing basic program implementation information, methods used to identify high risk rural roads, information assessing the High Risk Rural Roads program projects, and a summary of the overall High Risk Rural Roads program effectiveness.

(2) A report describing progress being made to implement railway-highway grade crossing improvements in accordance with 23 U.S.C. 130(g), and the effectiveness of these improvements.

(3) A transparency report describing not less than 5 percent of a State's highway locations exhibiting the most severe safety needs that:

(i) Identifies potential remedies to those hazardous locations; estimates costs associated with the remedies; and identifies impediments to implementation other than cost associated with those remedies;

(ii) Emphasizes fatality and serious injury data;

(iii) At a minimum, uses the most recent three to five years of crash data;

(iv) Identifies the data years used and describes the extent of coverage of all public roads included in the data analysis;

(v) Identifies the methodology used to determine how the locations were selected; and

(vi) Is compatible with the requirements of 29 U.S.C. 794(d), Section 508 of the Rehabilitation Act.

(b) The preparation of the State's annual reports may be financed with

funds made available through 23 U.S.C. 104(b)(1), (3), and (5), 105, 402, and 505, and for metropolitan planning areas, 23 U.S.C. 104(f).

[FR Doc. E8-30168 Filed 12-23-08; 8:45 am]  
BILLING CODE 4910-22-P

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## DEPARTMENT OF THE TREASURY

### Internal Revenue Service

#### 26 CFR Part 1

[TD 9434]

RIN 1545-BC88

#### Creditor Continuity of Interest; Correction

AGENCY: Internal Revenue Service (IRS), Treasury.

ACTION: Correcting amendment.

**SUMMARY:** This document contains a correction to final regulations (TD 9434) that were published in the *Federal Register* on Friday, December 12, 2008 (73 FR 75566) providing guidance regarding when and to what extent creditors of a corporation will be treated as proprietors of the corporation in determining whether continuity of interest ("COI") is preserved in a potential reorganization. These final regulations are necessary to provide clarity to parties engaging in reorganizations of insolvent corporations, both inside and outside of bankruptcy. These final regulations affect corporations, their creditors, and their shareholders.

**DATES:** *Effective Date:* This correction is effective December 24, 2008 and is applicable on December 12, 2008.

**FOR FURTHER INFORMATION CONTACT:** Jean Brenner (202) 622-7790, Douglas Bates (202) 622-7550, or Bruce Decker (202) 622-7550 (not toll-free numbers).

#### SUPPLEMENTARY INFORMATION:

##### Background

The final regulations that are the subject of this document are under section 368 of the Internal Revenue Code.

##### Need for Correction

As published, final regulations (TD 9434) contains an error that may prove to be misleading and is in need of clarification.

##### List of Subjects in 26 CFR Part 1

Income taxes, Reporting and recordkeeping requirements.

#### Correction of Publication

■ Accordingly, 26 CFR part 1 is corrected by making the following correcting amendment:

#### PART 1—INCOME TAXES

■ Paragraph 1. The authority citation for part 1 continues to read, in part, as follows:

Authority: 26 U.S.C. 7805 \* \* \*.

■ Par. 2. Section 1.368-1(e)(6)(ii)(A) is amended by revising the last sentence as follows:

#### § 1.368-1 Purpose and scope of exception to reorganization exchanges.

(e) \* \* \*

(6) \* \* \*

(ii) \* \* \*

(A) \* \* \* When only one class (or one set of equal classes) of creditors receives issuing corporation stock in exchange for a creditor's proprietary interest in the target corporation, such stock will be counted for measuring continuity of interest provided that the stock issued by the issuing corporation is not de minimis in relation to the total consideration received by the insolvent target corporation, its shareholders, and its creditors.

\* \* \* \* \*

LaNita Van Dyke,

Chief, Publications and Regulations Branch,  
Legal Processing Division, Associate Chief  
Counsel, (Procedure and Administration).

[FR Doc. E8-30716 Filed 12-23-08; 8:45 am]  
BILLING CODE 4830-01-P

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## DEPARTMENT OF THE TREASURY

### Internal Revenue Service

#### 26 CFR Part 1

[TD 9434]

RIN 1545-BC88

#### Creditor Continuity of Interest; Correction

AGENCY: Internal Revenue Service (IRS), Treasury.

ACTION: Correction to final regulations.

**SUMMARY:** This document contains a correction to final regulations (TD 9434) that were published in the *Federal Register* on Friday, December 12, 2008 (73 FR 75566) providing guidance regarding when and to what extent creditors of a corporation will be treated as proprietors of the corporation in determining whether continuity of interest ("COI") is preserved in a potential reorganization. These final

## **Appendix B – SSP Documents**

SSP Document (simplified version signed by Director).....	B1-B2
SSP Document (committee version plus comments).....	B3-B17
SSP Comments (Safety Liaison and Office of Project Development) .....	B18-20



MEMO TO: Francis G. Ziegler, P.E.  
Director

FROM: Grant Levi, P.E.  
Deputy Director for Engineering

Handwritten signature of Grant Levi in black ink, written over the typed name and title.

Linda Butts  
Deputy Director for Driver and Vehicle Services

Handwritten signature of Linda Butts in black ink, written over the typed name and title.

DATE: December 3, 2008

SUBJECT: Statewide Safety Program

Attached is a decision document developed by Scott Zainhofsky requesting concurrence on a Statewide Safety Program that would be used to program safety projects. The decision document recommends seven methods to be used to select safety projects that would use the highway safety dollars. With this memo, we are requesting your concurrence to proceed with the programming of projects or developing of safety programs using the following methods:

1. The crash data will be used to complete a critical crash analysis of NDDOT's rural state system. The top 20 percent of the segments in each of the Highway Performance Classification System (HPCS) categories will be analyzed. Each year, by October 31, Planning and Programming Division (P&PD) will report on the outcome of the analysis.
2. A rural high crash location analysis will be completed by October 31 of each year.
3. An urban high crash location analysis will be completed by October 31 of each year.
4. The state system animal crashes will be reviewed and effective counter measures will be recommended.
5. Public comments will be collected and analyzed to recommend possible safety projects. It should be noted they are recommending adding a safety comment button to our website to encourage the public to comment on safety issues.
6. System-wide countermeasure projects such as rumble strips, turn lanes, advance warning signs, and T-intersections will be implemented.
7. A portion of the HSIP funds will be used to fund traditional Traffic Safety Office projects such as education, law enforcement, etc. The intent is to use a portion of the HSIP funds if funding is available after items 1-6 have been funded to a practical limit for each year. The Planning and Programming Engineer, working with the Drivers License Division Director will recommend the amount of funds to be used for Office of Traffic Safety projects. The final decision on the amount of funds to be transferred will be made by the Director with a recommendation from the Deputy Director for Engineering and Deputy Director for Driver and Vehicle Services.

In addition to the seven methods recommended, it is our recommendation that every fatal crash that occurs in the state of North Dakota be reviewed by a review team. The review should consist of a crash report review, and if necessary a field review should be conducted. Initially, the critical crash review team should develop a four year fatality map. This four year fatality map should help the team determine clusters of crashes and their cause. With the cause identified, the critical crash review

Statewide Safety Program

Page 2

December 3, 2008

team should work on solutions for those crash types. In addition to the cluster review, a recommended action should be made for every fatal crash report. The team should work with the District Engineer (DE) if the fatality is on the state system and the DE and local jurisdiction if off the state system. As with all engineering reports, do nothing is an option if there is no practical engineering or behavior strategy that could be implemented. The review team will be established by the Deputy Director for Driver and Vehicle Services and the Deputy Director for Engineering. The Safety Liaison will take the lead for the implementation of this method.

Using the methods outlined in this document P&PD will present to the executive office as part of the STIP process the list of safety projects to be programmed.

With your concurrence of the methods outlined above, we will request the office holders to develop an implementation plan using the attached decision document as guidance for the development plan.

01/gl/lb/lmm

Enclosure

I concur with the recommended methods outlined in this document:

YES

NO

Comments:

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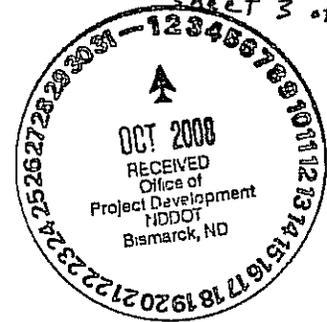
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Francis G. Ziegler, P.E.  
Director

  
Date



# MEMO

**To:** Grant N. Levi, PE  
**From:** Scott D. Zainhofsky, PE  
**Date:** September 19, 2008  
**Subject:** Decision Document - Statewide Safety Program

## Background:

Planning and Programming's Traffic Operations staff was tasked with developing a Statewide Safety Program (SSP) to logically program safety projects, using crash triggers (considering both behavior and roadway-safety caused crashes). To that end, a multi-disciplinary team, including Design, Traffic-Safety, and Federal Highway Administration (FHWA) staff, was assembled. However, through the process of developing crash triggers it was discovered that the North Dakota crashes are typically of a type and random location so as to limit the number of safety projects that could be programmed, not develop additional projects beyond those developed using the previous methods of reviewing high-crash locations and soliciting the Districts and public for suggested projects. Therefore, the Department has decided to implement a policy-driven approach to programming safety projects.

Planning and Programming Division (P&PD) established a new multi-disciplinary team consisting of Scott D. Zainhofsky (P&PD – Chair), Garrett Hartl (Design), Dennis Hermanson (Construction Services), Kirk Hoff (Bismarck District), Chris Holzer (P&PD), Chad Ihla (P&PD), Blaine Johanneson (Design – Traffic), Mike Kisse (Maintenance), Lyle Landstrom (Fargo District), Billie Jo Lorus (Communications), Karin Mongeon (Traffic Safety), and Tim Schwagler (Bridge). This team developed the following decision document as a proposal for the policy-driven approach for programming safety projects to positively influence fatal and injury crash numbers in North Dakota. The responses to all comments were prepared by P&PD, none were reviewed by the committee.

## Proposed SSP Policy:

The North Dakota Department of Transportation (NDDOT) will program safety projects to continue to enhance safety through the implementation of the following priority order methods:

1. Projects developed by review of the rural state-system critical-crash analyses, as follows.
  - a. Because of the workload involved with reviewing every critical-crash segment in the state, the NDDOT will target the preparation of the critical-crash analyses to the top 20% of segments in each of the Highway Performance Classification System (HPCS) categories on the state system and will not analyze local-government systems for the critical crash analysis.
  - b. P&PD will develop a list of "critical-crash segments", whose crash rate per million vehicles is greater than the critical-crash rate for that HPCS roadway type.
  - c. P&PD will analyze the top 20% of each of these critical crash segments, as defined below, to determine if patterns of crashes can be identified.

- i. The top 20% will consist of the highway segments in each rural HPCS classification with the highest crash rates above the critical crash rate (including weather, but excluding animal and work zone related crashes) and a minimum of six (6) crashes in a 3-year review period.
  1. If a segment is in the top 20% and experienced less than six (6) crashes in a 3-year period, it will be excluded from the report and the next highest crash rate segment experiencing more than six (6) crashes will take its place.
  2. A list of these excluded segments will be maintained.
  3. If an excluded segment is identified in 3 of 5 reporting periods, it will be included in the report for the third period it is identified. A 5-year crash period will be used to determine crash patterns in such cases.
  4. If any excluded segments experienced a fatal crash during the review period, the committee will review that segment in addition to the top 20% noted in item 1.c.i.1, above.
- ii. Annually, by September 1, P&PD will submit, to the critical-crash evaluation team members, a preliminary report of critical-crash segments, consisting of all information for the final report, except the "recommendations".
- d. For all critical-crash segments with identified patterns (excluding weather and animal related patterns), a team consisting of the following members will review each segment for potential improvements. The team may review all listed segments or it may choose to limit the number reviewed to no less than 20, if the listed number exceeds that amount.
  - i. P&PD Traffic Operations - Chair
  - ii. Responsible District, both maintenance and construction personnel
  - iii. Design, both traffic and project personnel
  - iv. Each of the above Divisions and all Districts will identify two positions from each listed area to serve as a member and back-up member of this team. The desire is to have consistent membership on the team in each District. District personnel will not be required to (but may, upon invitation of the host DE) review highways outside of their District.
  - v. Team reviews will first consider bringing all roadway characteristics and maintenance operations to current standards. In the event that current standards are met, reasonable enhancements (beyond current standards) likely to reduce the historical crash numbers or severity should be considered.
  - vi. The central office team members will include the Office of Traffic Safety in the meetings to discuss the recommendations portion of the critical-crash report.
- e. For all critical-crash segments with identified weather related patterns, the responsible District will review the segment for potential operational or project improvements, using a multi-functional team identified by the District Engineer.
  - i. Prior to October 15 of each year, the Districts will submit their teams' recommendations to P&PD for inclusion in the final critical-crash report.
- f. Annually, P&PD will submit a report of the critical-crash segments to the following personnel by October 31:
  - i. Executive Office (including the Director, Deputy Directors, and Office Holders)
  - ii. All engineering divisions (including Districts)
  - iii. Office of Traffic Safety
  - iv. Communications Division for publication in MyDOT and/or the Grapevine
  - v. IT Division for inclusion in OnRamp
  - vi. FHWA Safety Engineer
  - vii. Highway Patrol Colonel

- g. The annual critical-crash report will be a table consisting of the following information and a map identifying the locations:
    - i. Segment description (location and HPCS classification)
      1. Listed in descending order of crash rate
    - ii. Segment crash rate
    - iii. Corresponding HPCS classification critical crash rate
    - iv. Crash patterns identified or the lack there of (including weather related patterns)
    - v. Recommendations developed by the teams
      1. "Monitor" will not be used for critical-crash segments with identified patterns
2. Projects developed by review of the state-system high-crash location analyses (including weather related crashes). This policy is not intended to change the number of sites listed in the high-crash location analyses, just the method for determining the recommended actions. Therefore, high-crash location analyses will continue per current procedures, except as follows:
    - a. Annually, by September 1, P&PD will submit preliminary reports of high-crash locations (Rural and Urban Interstate and Rural Other) to the high-crash evaluation team members (same as identified for the critical-crash report). The preliminary reports will consist of all information for the final reports, except the "recommendations". Additionally, these preliminary reports will contain at least three (3) more sites, each, than the final reports, to allow the committee to eliminate sites that have known factors skewing the crash numbers.
    - b. For all high-crash locations with identified patterns (excluding animal related patterns, but including weather related patterns), the teams will prepare the "Recommendations" section for all locations listed in the high-crash location reports.
      - i. For urban locations on the state system, the previously identified team will consult the appropriate local agency officials, as well.
        1. The Local Government Division will be notified of such occurrences.
      - ii. The high-crash location reports will include notations of driver-behavior patterns, as well as roadway safety patterns observed.
      - iii. "Monitor" will not be used for high-crash locations with identified patterns (except in the case of weather related patterns).
      - iv. Team reviews will first consider bringing all roadway characteristics and maintenance operations to current standards. In the event that current standards are met, any reasonable action likely to reduce the historical crash numbers or severity should be considered.
      - v. The central office team members will include the Office of Traffic Safety in the in-office meetings to discuss the recommendations portion of the high-crash location reports.
    - c. Annually, P&PD will submit reports and maps of the high-crash locations to the following personnel by October 31:
      - i. Executive Office (including the Director, Deputy Directors, and Office Holders)
      - ii. All engineering divisions (including Districts)
      - iii. Office of Traffic Safety
      - iv. Communications Division for publication in MyDOT and/or the Grapevine
      - v. IT Division for inclusion in OnRamp
      - vi. FHWA Safety Engineer
      - vii. Highway Patrol Colonel
3. Projects developed by review of the urban high-crash location analyses.

- a. Urban high-crash analyses will be developed per current procedures.
4. Projects developed by review of the state-system animal-crash report.
    - a. The animal-crash report will consist of the 15 highest crash locations (by severity rank, excluding crash rate) for animal-related crashes only. This report will consist of the following information and be submitted with the high-crash and critical-crash reports.
      - i. Location description.
      - ii. Animal-related crash numbers for property damage, personal injury, and fatalities.
      - iii. Weighted crash severity (including number of crashes and crash types, only)
      - iv. Any recommendations developed by the team or requested by the District.
    - b. For all locations in the animal-crash report, the responsible District will review the location for potential improvements.
      - i. Prior to October 15 of each year, the Districts will submit their recommendations, if any, to P&PD for inclusion in the final report.
      - ii. If the Districts have no recommendations for improvements, they will notify P&PD by October 15 of each year.
    - c. Annually, P&PD will determine if recent developments allow for effective countermeasures to animal crashes. If such developments have occurred, the reports identified in Sections 1 and 2, above, will be modified to include animal crashes. Until effective countermeasures are identified, the responsible District may request specific countermeasures to identified locations on the animal-crash report. P&PD will evaluate such requests on a case-by-case basis.
  5. Projects to address partner, public, and employee safety concerns, if such projects are deemed beneficial based on engineering judgment.
    - a. A safety comment button will be added to MyDOT and the external website. When selected, this button will direct users to a fillable form identifying the purpose of the webpage as assisting the NDDOT in identifying potential safety hazards that will be evaluated. Such projects may include (but are not limited to):
      - i. enhancements to turn-lane lengths and/or markings.
      - ii. approach widening to facilitate turning movements.
      - iii. enhancements to intersection visibility.
      - iv. high water hazards, such as rip rap in the clear zone.
      - v. snow and ice accumulation areas.
    - b. The form will request the following information:
      - i. Roadway system of the concern (i.e. Federal/state, county/township, city, BIA – user to select, if known)
      - ii. County, city, reservation of concern (user to select, if known)
      - iii. Roadway number/name
      - iv. Reference Point, if known
      - v. Text description of the location, if RP is unknown
      - vi. Description of the concern
      - vii. Contact information, if the commenter would like a response (not required fields).
    - c. Comments received from this website will be directed to the appropriate District Engineer for review, response, and project request – all as needed.
      - i. The District Engineer may request assistance from central office divisions, as needed, to fully respond to and/or evaluate comments.

6. Projects to install system-wide countermeasures for fatal and injury crash types based on potential hazards, as follows in recommended priority order:
  - a. Installation of edge-line and centerline rumble stripes (i.e. rumble strips with pavement markings painted over the top) or widened edgelines to address lane departures.
    - i. Rumble stripes will be installed on state-system highways outside of urbanized areas (i.e. the city/town limits of any incorporated city/town), in HPCS and AADT priority order.
    - ii. Rumble stripes will not be installed on the interstate system, except during construction projects, because right and left shoulder rumble strips should already exist on this system.
    - iii. Edgeline & centerline rumble stripes will continue through field approaches
    - iv. Edgeline & centerline rumble stripes will be broken for all intersections of improved roadways.
    - v. Edgeline rumble stripes will be broken for all private driveways to commercial or residential buildings.
    - vi. Widened edgelines are intended for use on "narrow" roadways, where rumble stripes cannot be installed because of insufficient shoulder and lane width.
    - vii. The NDDOT considers lane-departure crashes to be a potential hazard on the entire federal, state, and local rural system, based on the historical percentages of fatal crashes involving lane departure.
  - b. Installation of right-turn lanes will be considered at all rural intersections meeting the following criteria (uncontrolled legs only):
    - i. right-turn movements account for 5% or more of the approach-traffic volumes for either mainline approach or
    - ii. major corridor AADT exceeds 750 vehicles per day and right-turn movements exceed an average of 50 vehicles per day and
    - iii. the minor corridor AADT does not exceed 500 vehicles per day (if AADT is

- v. such installation will meet all AASHTO geometric standards or a design exception shall be prepared.
  - vi. In lieu of criteria i-iii, engineering judgment based on a traffic operations study may be used as justification for installation of left-turn lanes at any rural intersection. However, in all cases, criteria 6.c.iv and 6.c.v will be met or a design exception shall be prepared.
  - vii. The NDDOT considers traffic slowing for left turns on uncontrolled legs of high-speed roadways to be potential hazards on the entire federal, state, and local rural system, based on the professional judgment that large same-direction speed differentials are difficult for drivers to detect in time to react to avoid rear-end collisions. However, this determination is limited to the above criteria based on the further professional judgment that the weaving motion necessary to remain in the through lane at intersections with left-turn lanes also poses a hazard. Therefore, the NDDOT's judgment is that under the above criteria the installed left-turn lane does not pose a greater hazard than the slowing traffic.
  - d. Installation of rumble strips and advanced warning signs at the end of paved roadways transitioning to unpaved surfacing, if the local road authority agrees to the installation and maintenance of the improvements.
    - i. The NDDOT considers the transition from paved to unpaved surfaces to be a potential hazard on the entire federal, state, and local rural highway system, based on the professional judgment that an unaware driver may have difficulty maintaining vehicular control under the combined conditions of transition bumps and reduced traction of the gravel surface.
  - e. Installation of approach or escape roads (as describe in NDCC Sec. 24-01-49) at T-Intersections.
    - i. The NDDOT considers T-intersections to be a potential hazard on the entire federal, state, and local rural highway system, based on the statutory authority of the North Dakota Century Code.
  - f. Any project on a "High Risk Rural Road", as defined by SAFETEA-LU.
7. Annually, fund education, law-enforcement, or other Office of Traffic Safety projects, in the lesser amount of:
- a. The statutory maximum percentage of the HSIP funds allocated to North Dakota,
  - b. The unobligated HSIP funds remaining after all of the above items have been funded to the practical limit for the year, or
  - c. An amount determined jointly by the Office of Traffic Safety and the Planning & Programming Division.
  - d. This program is instituted in recognition of the fact that the historical trend of fatal crashes in North Dakota is that approximately 75% are unbelted and approximately 50% are alcohol related. Therefore, significantly reducing the fatal and injury crashes in the state will be very difficult through infrastructure projects, alone. Driver behavior must be modified, as well. Therefore, the NDDOT may certify its infrastructure safety needs have been met, in a given year, once items 1-6 (above) have been addressed to the practical limit for that year.

**Comments:**

**Planning & Programming (Scott D. Zainhofsky, PE):**

*The Division recommends Option #1 –Implement the proposed policy. P&PD believes this policy to be an appropriate mix of high-crash location, critical-crash corridor, public request, and system-wide countermeasures that should positively affect the fatal and injury crash numbers on North Dakota's federal, state, and local roadway systems.*

**Materials & Research (Ron Horner, PE):**

*Good report the only comment I have is would lane widths and effects of narrow driving lanes be worthwhile to study or investigate with the safety program.*

Response: Thank you for the compliment. The lane width issue is a good thought. It is addressed in the Design Guidelines Performance Measures policy. However, P&PD would strongly support adding that piece to this document, to provide consistency between the policies. Currently, the two policies require different critical crash analyses to be produced, an item that was discussed with the SSP Committee. The committee decided that the analysis in this document was a more appropriate method for determining safety projects.

No change made, pending executive staff direction to add an item that would overturn the previous decision.

**Grand Forks District (Les Noehre, PE):**

*I agree with your recommendation of Option #1. I think the key is getting an overall process developed and approved. From there, if Option #1 is perfect, great. If later you discover that modifications will be better, you can make changes. Again, the key is having a starting point.*

Response: Thank you for the comment. P&PD agrees.

**Fargo District (Bob Walton, PE):**

1. *In the document the term corridors is used, but not defined. Since this word has different interpretations with regard to length, please explain what dictates a corridor's length.*

Response: P&PD agrees; the document has been changed to indicate "segment" instead of "corridor". This change does mean that some engineering judgment of "reasonable" projects for continuity will be needed. For example, it may be necessary to address three contiguous segments, when only the outer two segments meet the critical-crash criteria.

2. *In paragraph 5.c. it is proposed that public and employee comments be sent to the appropriate District Engineer, I believe there should be a Central Office point of contact where DE's can coordinate responses for uniformity. This would also assist in determining if a corrective action would be federal aid eligible.*

Response: The SSP Committee discussed this issue during the original formation of the document. The committee felt the central office contact might vary depending on the issue. Therefore, the committee settled on adding item 5.c.i, indicating the DE may request central office assistance, as needed. P&PD offers that in the

absence of an obvious other contact, the Division will assist wherever possible.  
No change made.

3. *Many crashes and run-off-the-road non-reportable incidents are related to rutted pavement or rough bridge approaches. Often times tying these pavement irregularities to crashes is difficult as speed or snow/ice control is often identified as the cause. I believe further consideration should be given to mitigating these potential pavement problems. The pavement data can average pavement irregularities and minimize or hide real problems. District maintenance can correct some of this, but our history shows once these problems start it will expand with time, and our budget have a hard time keeping up. Reacting quickly to problems with federal aid is difficult due to the processes involved in obtaining a federal aid safety project greater than \$20,000.*

Response: P&PD agrees. However, the Division believes this proposed policy addresses the issue through the team-review approach and the employee comment item. The review team must address the cited concern on a case-by-case basis. No change made.

4. *A concern with rumble stripes is the impact of cutting these in and then performing plowing. Most of the time we end up removing chips at the centerline from normal plowing due to wheel ruts. Plowing action alone can lead to deterioration of the asphalt seam. Pavement condition should be considered before determining if a highway is proposed for rumble stripes.*

Response: Again, P&PD agrees this can be a concern. However, the Division believes this proposed policy addresses the issue through the team-review approach. The review team must address the cited concern on a case-by-case basis, keeping in mind that safety is the #1 concern. No change made.

Fargo District (Lyle Landstrom, PE – Committee Member):

*First page, first paragraph, Start of 3rd sentence. The word "Unfortunately" should be reconsidered to "However" or "But" The word unfortunately, has a negative connotation. Just my opinion.*

Response: Change made.

*Second paragraph, end of first sentence, "the" should be added before Fargo District.*

Response: Changed all of these to the committee member names.

*Page 2. Item 3, "in" should be added just before the period in the first sentence.*

Response: P&PD, respectfully, disagrees; no change made.

*Page 4. Item 5.b.i. Does the public always know the roadway system? If they fill out item ii. shouldn't it be up to the NDDOT to figure out who's road it is?*

Response: P&PD agrees. However, the general public often cites roadways in the form of "number 2"; is that US 2, Cass County 2, or BIA 2 (on which reservation)? The Decision Document has been revised to indicate the roadway system will be a non-required field. Additionally, another field for county, city, reservation of concern was added as a non-required field.

*Page 5 Item 6.vii. Should this be moved to the top? We are stating the possible solution to a condition before stating the reasoning? Just my thought.*

*Same comment for all the other conditions in Item 6.*

Response: The committee discussed this issue during the original development of the document and decided to leave it in this format; no change made.

Devils Lake District (Wayde Swenson, PE):

*The only comment here in Devils Lake is on part 6 d/e.*

*Consideration should be given for the installation of rumble strips at the intersections of paved roads and at T-intersections.*

Response: P&PD agrees. However, the Division is preparing a separate rumble strip policy, because of the complexity of the maintenance and noise issues. The review teams could recommend the noted rumble strips as potential countermeasures, on a case-by-case basis; no change made.

Federal Highway Administration (FHWA – Steve Busek, PE):

*I appreciate the opportunity to comment on the Draft Statewide Safety Program Decision Document. Overall, I found the Draft to be a very good summary of processes and methods that can lead to effective prioritization of safety improvement strategies. I have several general comments and some specific comments that can be considered as NDDOT moves forward with this Decision Document and any implementing instructions that might be necessary. I realize that since this is a Decision Document there may not be an immediate need to drill down to too much detail, but I will try to point out some areas that might need fleshing out as the Program is implemented. Here are my general comments:*

- 1. There should be some timelines identified for all analysis periods including inputs and outputs from the analysis periods. There are a number of deadline or target dates identified, but to be complete and provide process and work flow mapping the key inputs and input dates for each of the 7 methods should be identified along with the output target dates.*

Response: P&PD agrees. However, these timelines should be addressed through the implementation process; no change made.

- 2. The Program should be mindful of the annual reporting requirements to FHWA concerning progress of the Highway Safety Improvement Program (HSIP) and the "5% Report". Those reports are due to FHWA annually by August 31 and are intended to represent progress measures and evaluation of effectiveness under the HSIP.*

Response: P&PD is aware of the Evaluation Report and 5% Report submission dates. This SSP decision document should have no impact on the submission of these reports, because the evaluation looks back a minimum of three years to establish a crash pattern at previous project locations and the 5% Report is a subset of the High-Crash Location report that "feeds" the SSP process noted in this decision document.

The timelines indicated in this decision document contemplated a revised HSIP Implementation Process document that would generate a multi-year HSIP from the various reports and evaluations indicated in the decision document. The noted timelines provide the best opportunity for both district maintenance and construction personnel to participate in the evaluation teams, at the same time. No change made.

3. *It is not clear what the process and timeline will be for reaching a decision point on the Annual Program of Projects under the HSIP. There should be some timelines and work flows established that show how and when the decisions coming from the analysis of the 7 methods will ultimately lead to an Annual Program of Projects.*

Response: P&PD agrees. However, these timelines should be addressed through the implementation process; no change made.

4. *The processes seem somewhat state-highway centric so it is not clear how an allocation of safety funds to non-state highways will come about. Having a prioritization hierarchy that starts with consideration of state highway corridors and works its way down to high crash locations and systemwide strategies gives the impression that non-state highways will not be in a strong position to receive an allocation of resources. The sort of systemwide countermeasures discussed under Method 6 lean heavily to having warranting conditions that are most likely to occur on the state highway system.*

Response: P&PD, respectfully, disagrees; no change made. Items #3 and 6.d are specifically directed to non-state roadways. Additionally, item #5 could address any level of roadway. Even if one were to dispute the Division's previous assertion that items 3, 6.d, and 5 constitute reasonable consideration of the local roadway system, because the state has no authority over projects on the local roadway system, it is neither practical nor legal for the NDDOT to place requirements for safety project implementation on the local road authority. The Department may place requirements on the local road authority once that authority has chosen to accept state or federal funding for a project, but certainly cannot dictate that a specific project be done without the concurrence of the local authority.

*Here are some specific comments tied to the Draft Document:*

1. *Method 1.d - The nature of the team review of candidate corridors should be clarified. Is this intended to be a formal field review process similar to an in-service Road Safety Audit?*

Response: No change made. During the original development of this document, the committee chose to leave the specific nature of these reviews somewhat ambiguous to allow flexibility in the implementation process. However, the committee's desire was that most reviews be semi-formal field evaluations similar to road safety audits, but not nearly as intense or formal. P&PD is, also, the chair of the review teams. Therefore, the nature of these reviews will be biased toward field evaluations.

2. *Method 1.d.v. - Having the team review initially concentrate on comparing all roadway characteristics to current (nominal) standards might be somewhat limiting in getting to the true nature of the safety deficiency. While consideration of nominal standards can certainly*

*be part of the process it would be preferable to concentrate on countermeasures that are targeted toward the crash types or patterns (also known as the substantive approach to safety improvement).*

Response: No change made. This document is a compromise position between those that wanted the "substantive" approach, only, and those that felt the "nominal" approach was sufficient. Therefore, the intent of item 1.d.v is to give the review team the freedom to suggest "substantive" strategies, once the team has verified the "nominal" standards have been met.

3. *Method 1.f - It is unclear what the anticipated outcome from submitting the critical crash corridor report will be in terms of potential allocation of resources.*

Response: The intent of item 1.f is informative in nature, to allow receiving personnel to incorporate the information into routine decisions and provide additional insight, both as appropriate. The allocation of resources is determined through the STIP and HSIP processes. No change made.

4. *Method 2.a - Who will be part of the high crash evaluation team? Will it consist of the same representatives as the critical crash corridor team?*

Response: The document has been revised to move the team makeup from item 2.b into 2.a.

5. *Method 2.b.iv - The nature of the team review of high crash locations should be clarified. Is this intended to be a formal field review process similar to an in-service Road Safety Audit?*

Response: No change made. During the original development of this document, the committee chose to leave the specific nature of these reviews somewhat ambiguous to allow flexibility in the implementation process. However, the committee's desire was that most reviews be semi-formal field evaluations similar to road safety audits, but not nearly as intense or formal. P&PD is, also, the chair of the review teams. Therefore, the nature of these reviews will be biased toward field evaluations.

6. *Method 2.b.iv - Similar to the comment above on Method 1.d.v, there should be consideration of the substantive safety approach in addition to the nominal approach.*

Response: No change made. This document is a compromise position between those that wanted the "substantive" approach, only, and those that felt the "nominal" approach was sufficient. Therefore, the intent of item 2.b.iv is to give the review team the freedom to suggest "substantive" strategies, once the team has verified the "nominal" standards have been met.

7. *Method 2.c - Will the content of this report be similar to the report described in Method 1.g? What is the anticipated outcome from submitting the high crash locations report in terms of potential allocation of resources?*

Response: The content of the reports will be the same as the current reports (see the main Item #2).

The intent of item 2.c is informative in nature, to allow receiving personnel to

incorporate the information into routine decisions and provide additional insight, both as appropriate. The allocation of resources is determined through the STIP and HSIP processes. No changes made, because of either comment.

8. *Method 4.a - What is the target date for preparation of the animal crash report, what team will prepare it and who will receive it?*

Response: No change made. The intent was that this report would be similar to the High-Crash Location report, except intense team review would only occur at the request of the District Engineer or in the event effective animal countermeasures are discovered. The timeline is covered in 4.a.

9. *Method 5 - Should there be a similar input process for "official sourced" inquiries or voicing of concerns from entities/partners/stakeholders such as law enforcement, local governments, and tribal governments?*

Response: The word "partner" has been added.

10. *Method 5.c - Input coming through this method should also be furnished to Planning and Programming Division to see if locations identified correspond to critical rate corridors, high crash locations, or locations of interest under systemwide improvement strategies.*

Response: P&PD, respectfully, disagrees; no change made. The District Engineers should be aware of the high-crash and critical-crash locations in their districts, too. That is the point of sending the reports to them. Additionally, the committee determined that issues raised through this method are likely to be in too varied a range of division responsibilities to direct the comments to one central office division. The DE is encouraged to request assistance with these comments, as appropriate.

11. *Methods 6.b.v and 6.c.v - These sections both refer to attaining full AASHTO geometric standards at systemwide (turn lane) type improvements. There may be times when a safety countermeasure cannot meet full AASHTO geometric standards but yet might provide enough of an incremental safety improvement to be considered worth pursuing. Certainly full (nominal) standards are a valued target. However, having a choice between only do nothing (leave a safety deficiency unaddressed) and full standards might be self limiting versus having some substantively derived intermediate ground between do nothing and nominal standards that could be justifiable.*

Response: P&PD agrees; this was the intent of the committee (see items 6.b.vi and 6.c.vi). Items 6.b.v and 6.c.v were modified to require a design exception if full AASHTO standards cannot be met.

Drivers License, Traffic Safety (Karin Mongeon – Committee Member):

*Good work, Scott. I have no suggested changes.*

*I do hope that if Grant agrees to allow for the flex spending to occur that a collaborative approach to identifying the projects for funding is used. I really thought the SSP group that you established was an effective group. I'd love to work with them to determine behavior projects for funding were the flex spending to occur.*

Thanks for the opportunity to participate in this effort. I learned a great deal.

Response: Thank you for the compliment. P&PD agrees; no changes requested.

Dickinson District (Larry Gangl, PE):  
*I have no comments.*

Minot District (Jim Redding, PE):  
*The Minot District has no specific comments for the decision document.*

Williston District (Walt Peterson, PE):  
*No comment.*

**Recommendations:**

Office of Transportation Programs:

*Ensure we get the new safety liaison involved in this process*

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Robert Fode  
Robert A. Fode, PE – Director, Office of  
Transportation Programs

29 Sept 08  
Date

Office of Operations:

*The policy looks good. I recommend option #1.*

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Darcy R. Rosendahl  
Darcy Rosendahl, PE – Director, Office of Operations

01 Oct 2008  
Date

Office of Project Development:

Please see attached comments.

*Ronald Henke*

Ronald Henke, PE - Director, Office of  
Project Development

10/6/08

Date

Decision:

- 1. Implement the proposed policy.
- 2. Implement the proposed policy with modification.
- 3. Do not implement the proposed policy; rather implement another method of programming safety projects.

Deputy Director for Engineering:

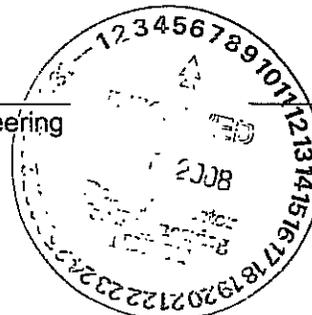
Please see the attached Dec. 3 memo to  
Francis Ziegler

*Grant N. Levi*

Grant N. Levi, PE - Deputy Director for Engineering

12/31/08

Date



Comments for Statewide Safety Program:

I think that items 6a, 6b, 6c and 6d should not be part of this policy as written. Recommend that these sections be rewritten as an overall area of focus but the details of each should not be part of this document and that maybe the details should be part of the design guidelines. (see below for details)

Recommend that item 6a be modified to only 6a vii. The actual detail identified in Roman Numerals i – vi may require a Registered Engineers seal and signature associated with those details. I also recommend that we allow “rumble stripes” and “rumble strips” until NDDOT has more experience, to determine if “rumble stripes” work for NDDOT.

I agree that criteria should be established for determining when turn lanes are considered. Recommend that these two items (6b and 6c) be simplified to 6b vii and 6c vii. The criteria should be part of the design guidelines and should be modified slightly. The current criteria for items 6b and 6c would require the NDDOT to consider the installation of turn lanes at private drives in certain situations.

Recommend that item 6d be revised to be 6d i. Recommend that the mitigation details be part of the design guidelines. I feel we should look closely as to the recommendation to install rumble strips in these areas.

I also recommend that FHWA be approached to see if the costs to reinstall these safety features if impacted by another improvement project are eligible for safety funds.

OFFICE OF PROJECT DEVELOPMENT COMMENTS.

# MEMO

**To:** Grant N. Levi, PE  
**From:** Scott D. Zainhofsky, PE   
**Date:** November 7, 2008  
**Subject:** Decision Document - Statewide Safety Program  
Safety Liaison & Office of Project Development Comments

Unlike the other Division comments, Ms. Lembke's comments were not available at the time of the final draft of the SSP Decision Document. Therefore, no changes have been made to the SSP document because of her comments. However, P&PD supports several of her comments (as noted below) and recommends the Deputy Director indicate, in his decision, that

1. the review teams include the Safety Liaison and
2. the High-Crash and Critical-Crash reports be distributed to the ND Department of Health, in addition to the included list.

## Safety Liaison Comments (Marsha Lembke):

*The draft gives a good summary of process and methods that can lead to effective prioritization of safety improvement strategies. However, the document states that it is Proposed SSP Policy. If the intent is for this to be a policy driven approach to programming safety projects, shouldn't detailed methods be implemented as written procedures? For example, use number 1 -7 as the policy document and most of the other information (a.i through f) as written procedures.*

Response: Thank you for the compliment. P&PD agrees it would be ideal to make this decision document simply items 1-7 and leave the detail for the implementation. However, that would likely entail more delay (i.e. further committee meetings, with potential decisions crossing multiple divisions/districts and one division director telling another what to do). Additionally, the SSP committee felt some detail was needed, here, to avoid the natural tendency of people not involved in the full discussion that generated this document to fall into the routine of "what has always been done". The committee felt a dramatic change in direction was needed to have a real impact on fatal and injury crash numbers; providing some detail in the SSP document facilitates that dramatic change.

*Whatever format the final document takes, here are some other suggestions:*

*From the research I have been able to gather so far, it is important that the Safety Liaison be included as follows:*

*On page 2b of the document I would suggest adding Safety Liaison as part of the team.*

Response: P&PD agrees this policy should be modified to include the Safety Liaison on the High-Crash and Critical-Crash evaluation teams (items 1.d.iv and 2.a).

2c add viii *Emergency Management Systems, a division of ND Health Department, and ix Safety Liaison as ix.*

Response: P&PD agrees this policy should be modified to add the Safety Liaison and Department of Health to the distribution lists for both the High-Crash and Critical-Crash reports (items 1.f and 2.c).

*On page 6 # 7a. – is there reference somewhere else in the document to a HSIP evaluation being done? Missouri uses this evaluation to leverage funding for roadway and safety programs.*

Response: P&PD is unsure to what this comment is referring. Every state is required to submit an annual evaluation of its HSIP program. The Division's experience is that the need to show project effectiveness in this evaluation tends to limit safety project selection. However, it is the Division's desire to be able to use the system-wide countermeasures in the SSP policy to justify a system-based evaluation. For example, the Division could compare the number of statewide fatal and injury crashes from one time period to the next to evaluate the HSIP, rather than look at specific project crash numbers. Some other system-based evaluation may be more appropriate, but the listed example could be one form of this type of evaluation.

*It appears that our primary outcome will need to be the combination of both engineering and intervention/education/risk to reach a comprehensive program. Therefore, is it possible to include some verbiage such as speed management and the "one safety message" that leverages implementation of both roadway and behavior safety? Thanks for the opportunity to comment.*

Response: P&PD agrees that a combination of both engineering and Office of Traffic Safety activities is needed to have a real impact on fatal and injury crash numbers in North Dakota. However, the specific details of what that combination entails seems best suited for determination, when and if HSIP funding can be made available to the Office of Traffic Safety.

If the Deputy Director desires, P&PD would have no problem adding another system-wide countermeasure specific to speed management and/or "one safety message". However, the details of exactly how to implement those items would need to be developed with significant input from other divisions. P&PD sees potential benefit in such items but is not certain what "projects" could be part of the HSIP to implement these items, aside from the Office of Traffic Safety funding item.

#### **Responses to Office of Project Development Comments (Ron Henke):**

Response: In general, P&PD's responses to Ms. Lembke's comments regarding the amount of detail in the document apply to Mr. Henke's comments, as well.

Response: Mr. Henke indicated in his comments that the criteria for installation of right and left turn lanes, as detailed in the Decision Document, would require consideration of such installations at private drives in certain circumstances. P&PD disagrees because one would have to define private drives as "rural intersections" in order for Mr. Henke's

assertion to be correct. The Decision Document specifically indicates, "...right-turn lanes will be considered at all rural intersections meeting the following criteria..." It further indicates, "...left-turn lanes...at intersections improved under item #6.b {the right-turn lane item} will be considered if..." (emphasis added). With the left-turn lane item referring back to the right-turn lane item, the "rural intersection" description applies to both types of turn lanes.

Even if one were to discount P&PD's first interpretation, consideration of such turn lanes is not that big of an issue. It is very conceivable that the Deputy Director could indicate in a scoping report decision that turn lanes won't be installed at a particular intersection (even one meeting the criteria) for any number of reasons (e.g. monetary, environmental or social impacts resulting from the associated widening, constructability, sight-distance issues, site conditions precluding the ability to meet AASHTO standards, and many others). Such decision by the Deputy Director should be prima facie evidence that consideration was given.

Response: Mr. Henke did not raise the following issue in his formal comments. However, during a discussion with the Division, while preparing his comments, Mr. Henke asked if the system-wide countermeasures would need to be installed with all project types. For example, would turn lanes need to be installed on thin lift overlays? P&PD discussed this issue with Mr. Steve Busek of FHWA. Mr. Busek's interpretation of all of the system-wide countermeasure items was that they would have to be considered on all projects. He further agreed that if the decision associated with the SSP policy were that crash history be checked to determine if a large number of crashes susceptible to correction by the statewide countermeasure had occurred at the specific location in question, such a check would meet the intent of the federal regulations. Therefore, P&PD recommends the Deputy Director indicate in his decision that crash-history criteria be developed for items 6.b and 6.c in association with all project classifications (i.e. preventative maintenance, minor rehab., structural improvement, major rehab., etc.). The risk associated with this recommendation is, of course, that turn lanes meeting the crash criteria may delay a needed preventative maintenance project. P&PD further recommends that the Deputy Director allow the other statewide countermeasures to be considered on all project types, because they are either very inexpensive with a high return (rumble stripes), typically do not apply to the state system (pavement-to-gravel transitions), or are mandated by statute (escape approaches). In the case of both recommendations, such installations associated with regular projects would not be eligible for safety funds under the current FHWA Division interpretation. However, other states and at least one FHWA document recommend that mixed funding (i.e. multiple federal fund types on a single project) be used to further the safety goal (see "Good Practices: Incorporating Safety into Resurfacing and Restoration Projects"; FHWA; December 2006; pages 23 and 24).

## **Appendix C – Weighting Factor Information**

Weighting Factor Information in Table Format.....	C1
NSC’s “Estimating the Costs of Unintentional Injuries” publication.....	C2-C5

Information Used to Develop Weighting Factors				
Crash Severity	Average Economic Crash Costs*	Actual Ratio	Rounded Ratio	Weighting Factor
Fatal (Fat)	\$1,130,000	150.7	151	12**
Incapacitating Injury (InjA)	\$65,000	8.7	9	9
Non-Incapacitating Injury (InjB)	\$21,000	2.8	3	3
Possible / Claimed Injury (InjC)	\$11,900	1.6	2	2
Property Damage Only (PDO)	\$7,500	1.0	1	1

\*Costs are from the National Safety Council publication "Estimating the Costs of Unintentional Injuries - Making Our World Safer", which is included behind this sheet. Crash costs from the NSC publication are used in the annual NDDOT Crash Summary document, produced by the Safety Division.

\*\*A weighting factor of 151 seemed unrealistic, so our previous weighting factor of 12 was retained for fatal crashes.

*Appendix C  
sheet 1 of 5*

Appendix C  
sheet 2 of 5

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Educate and influence people to prevent accidental injury and death

2007 crash cost data  
will be in the 2008  
Crash Summary document  
as 2008 values.

Resources > Statistics > Estimating the Costs of Unintentional Injuries, 2007



## Estimating the Costs of Unintentional Injuries, 2007

The National Safety Council makes estimates of the average costs of fatal and nonfatal unintentional injuries to illustrate their impact on the nation's economy. The costs are a measure of the dollars spent and income not received due to accidents, injuries, and fatalities. It is another way to measure the importance of prevention work.

This bulletin illustrates how costs can be estimated for a community or state. The figures should be used to estimate the actual costs to society of deaths and injuries. The comprehensive cost figures (discussed below) should be used for cost benefit analyses.

Cost estimation is not exact -- it can only be approximated. The estimates depend on many factors. Any cost estimates derived from information provided herein should be rounded to indicate that they are only approximations, not exact figures. The recommended rule is: for estimates less than \$3,000,000, round to the nearest \$100,000; for estimates between \$3,000,000 and \$10,000,000, round to the nearest \$500,000; for estimates between \$10,000,000 and \$30,000,000, round to the nearest \$1,000,000; and for estimates greater than \$30,000,000, round to the nearest \$5,000,000.

### Costs of Motor Vehicle Injuries

The calculable costs of motor-vehicle crashes are wage and productivity losses, medical expenses, administrative expenses, motor vehicle damage, and employers' uninsured costs. (See the definitions on the reverse for a description of what is included in each component.) The costs of all these items for each death (not each fatal crash), injury (not each injury crash), and property damage crash were:

#### Average Economic Cost per Death, Injury, or Crash, 2007

	actual	rounded
Death	\$1,130,000	150.7
Nonfatal Disabling Injury	\$61,600	151
Property Damage Crash (including nondisabling injuries)	\$7,500	1

→ see next page for injury costs

To estimate the costs of motor-vehicle crashes that occur while on the job, see Costs of Other Injuries below.

Expressed on a *per death* basis, the cost of all motor vehicle crashes— i.e. fatal, nonfatal injury, and property damage—was \$5,960,000. This includes the cost of one death, 53 nonfatal disabling injuries, and 209 property damage crashes (including minor injuries). This average may be used to estimate the motor-vehicle crash costs for a

Appendix C  
sheet 3 of 5

state provided that there are at least 10 deaths and only one or two occurred in each fatal crash. If fewer than 10 deaths, estimate the costs of deaths, nonfatal disabling injuries, and property damage crashes separately.

Motor vehicle injuries by severity. Estimates are given here of the costs by severity of injuries, as defined in sections 2.3.4 through 2.3.6 of the Manual on Classification of Motor Vehicle Traffic Accidents (7th Edition) ANSI Standard D16.1-2007. These injury severity designations are sometimes referred to as class "A," "B," and "C."

Average Economic Cost by Injury Severity, 2007	actual	rounded
Incapacitating injury (A)	\$65,000	8.7
Nonincapacitating evident injury (B)	\$21,000	2.8
Possible injury (C)	\$11,900	1.6

These estimates may be helpful for cities and states that do not use the concept of "disabling injury" (see definitions). Estimates used for deaths or property damage crashes are not changed by using these estimates.

**Cost-benefit analysis.** The figures above are appropriate for measuring the economic loss to a community resulting from past motor-vehicle crashes. They should not be used, however, in computing the dollar value of future benefits due to traffic safety measures because they do not include the value of a person's natural desire to live longer or to protect the quality of one's life. That is, the economic loss estimates do not include what people are willing to pay for improved safety. Work has been done to create the necessary theoretical groundwork and empirical valuation of injury costs under the "willingness to pay" or comprehensive cost concept. Estimates in the following section are based on the comprehensive cost concept and should be used for cost-benefit analyses wherever feasible.

**Comprehensive costs of motor-vehicle crashes.** In addition to the economic cost components listed above, the following comprehensive costs also include a measure of the value of lost quality of life which was obtained through empirical studies of what people actually pay to reduce their safety and health risks. The average comprehensive costs on a *per injured person* basis were:

**Average Comprehensive Cost by Injury Severity, 2007**

Death	\$4,100,000
Incapacitating injury	\$208,500
Nonincapacitating evident injury	\$53,200
Possible injury	\$25,300
No injury	\$2,300

Since the lost quality of life figures, which are included in the above comprehensive costs calculations, do not represent real income not received nor expenses incurred, they should not be used to determine the pure economic impact of past crashes.

**Costs of Other Injuries**

Because obtaining information on the number and severity of nonfatal injuries for home, public nonmotor-vehicle, and work is difficult, the best approach is to estimate total costs on the per death basis using the following averages. These averages are based on their respective injury/death ratio:

**Average Economic Cost of Fatal and Nonfatal Injuries by Class of Injury, 2007**

Home injuries (fatal and nonfatal) per death	\$3,380,000
Public nonmotor-vehicle injuries (fatal and nonfatal) per death	\$3,240,000
Work injuries (fatal and nonfatal) per death,	
without employers' uninsured costs	\$30,350,000
with employers' uninsured costs	\$33,350,000

Multiplying the number of deaths by these average costs provides an estimate of the economic loss due to *both* deaths and injuries in these categories.

Appendix C  
sheet 4 of 5

The work injury figure with employers' uninsured costs includes the monetary value of time lost by uninjured workers who were directly or indirectly involved in injuries. Losses due to fire are the only property damage costs included in the work, home and public figures. No satisfactory estimates of other property damage costs are available.

While multiple-fatality incidents, such as those discussed for motor-vehicle crashes, are not common, one fire, explosion, or other disaster may account for most of a small community's annual unintentional fatality total. When this occurs, estimate the costs by: (1) counting only one death for the disaster using the cost from the above figures; and (2) adding to this figure the cost for other disaster deaths using the economic cost per death from the motor vehicle section.

Even though a community generally will not be able to estimate the number of disabling injuries that occur in work, home, and public non motor-vehicle injuries, it may be useful to know the approximate economic loss per death and per disabling injury in these three classes of accidents. The table below shows the per case average cost of wage and productivity losses, medical expenses, and administrative expenses.

**Average Economic Cost by Class and Severity, 2007**

	Death	Disabling Injury
Home injuries	\$1,000,000	\$9,900
Public injuries	\$1,000,000	\$6,700
Work injuries		
without employer costs	\$1,260,000	\$39,000
with employer costs	\$1,270,000	\$43,000

These figures do not include any estimate of property damage or nondisabling injury costs and should not be used to estimate the total economic loss to a community from these kinds of injuries.

To estimate the cost of a work-related, motor-vehicle crash (motor-vehicle crash while on the job), use work injury costs, including uninsured employer costs, if there is reason to believe that uninsured costs resulted from the injury. If no uninsured costs occurred, use figures for either motor-vehicle crashes or work injuries excluding employer costs.

NOTE: A description of the National Safety Council's current cost estimating procedures may be found in the Technical Appendix of Injury Facts®. Effective with the 1993 bulletin, the Council extensively revised its cost estimating procedures. New components were added, new benchmarks and inflation factors adopted, and a new discount rate of 4% was assumed. Some further revisions were made for the 2004 bulletin. For this reason, the cost estimates shown here are not comparable to those published in earlier bulletins.

**DEFINITIONS**

**Wage and productivity losses** include the total of wages and fringe benefits together with an estimate of the replacement-cost value of household services. Also includes travel delay for motor-vehicle crashes.

**Medical expenses** include doctor fees, hospital charges, the cost of medicines, future medical costs, and ambulance, helicopter, and other emergency medical services.

**Administrative expenses** include the administrative cost of public and private insurance, and police and legal costs. Private insurance administrative costs are the difference between premiums paid to insurance companies and claims paid out by them. It is their cost of doing business and is part of the cost total. Claims paid out by insurance companies are not identified separately, as every claim is compensation for losses such as wages, medical expenses, property damage, etc.

**Motor-vehicle damage** includes the value of property damage to vehicles from motor-vehicle crashes. The cost of normal wear and tear to vehicles is not included.

Appendix C  
sheet 5 of 5

employers and represents the money value of time lost by uninjured workers. It includes time spent investigating and reporting injuries, giving first aid, production slowdowns, training of replacement workers, and extra cost of overtime for uninjured workers.

**Disabling injury** is one which results in death, some degree of permanent impairment, or renders the injured person unable to effectively perform his or her regular duties for a full day beyond the day of injury.

Source: Statistics Department, National Safety Council, and Children's Safety Network, Economics and Insurance Resource Center, Pacific Institute for Research and Evaluation.

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## **Appendix D – Technical Information for Preparing Annual Listings**

Critical Crash Rate Locations.....	D1
Rural Intersection High Crash Locations.....	D1-D2
High Risk Rural Roads Locations.....	D2-D3
Urban 3yr and Urban 1yr High Crash Locations.....	D4-D5

## Technical Information for Preparing Annual Listings

Below are possible procedures to prepare the annual listings. If better or more efficient methods are learned, then those methods should be used.

### Critical Crash Rate Locations

The NDDOT Research Analyst (presently in the Safety Division) calculates the critical crash rate and prepares the Critical Crash Rate listings and maps.

### Rural Intersection High Crash Locations

#### ArcMap Program

-In ArcMap filter the crash layer so:

```
CRASH_TYPE_DESCR = 'Traffic' AND  
LATITUDE >0 AND  
CRASH_DATE >= beginning study date AND  
CRASH_DATE <= ending study date AND  
NOT RELATION_TO_JUNCTI_DESCR = 'Non-Junction' AND  
NOT RELATION_TO_JUNCTI_DESCR = 'Bridge' AND  
CITY > 13
```

OR

```
CRASH_TYPE_DESCR = 'Traffic' AND  
LATITUDE >0 AND  
CRASH_DATE >= beginning study date AND  
CRASH_DATE <= ending study date AND  
NOT RELATION_TO_JUNCTI_DESCR = 'Non-Junction' AND  
NOT RELATION_TO_JUNCTI_DESCR = 'Bridge' AND  
CITY IS NULL
```

-Use the buffer tool in the ArcToolbox (Analysis Tools, Proximity, Buffer) to buffer the crash layer.  
Distance = 300ft (yields a 300ft radius or 600ft diameter circle around each crash).

-After the buffer is created, join the newly created buffer and the crash layer by right clicking on the buffer layer and selecting "join":

\*What do you want to join to this layer = join data from another layer based on spatial location

\*1. Choose the layer to join to this layer = crash layer

-Delete unnecessary columns and delete rows with total number of crashes less than 3 (after go through and verify that a 4<sup>th</sup> crash didn't happen just outside buffer boundary you may delete locations with only 3 crashes), this will minimize file size.

-Delete duplicate rows from "join" layer (because multiple join circles typically overlap at one location).

-Add new columns for:

Location Description (such as "US 2 & ND 8", etc.)

Fatal, INJ, PDO columns (until all data is 2009 or newer)

Fatal, InjA, InjB, InjC, PDO columns (when all data is 2009 or newer)

-For each location enter the number of crashes for each severity into the attribute table (using the editor). This is currently performed by zooming in to a location, highlighting the crashes and manually counting the number of each severity. When get close to finished it is nice to highlight a row on the attribute table (one that has not yet been filled in), right click, and select "zoom to highlighted".

-When all locations have number and severity of crashes entered, click "options" in the attribute table and "export" as a text file.

### **Excel Program**

-Open the text file from the previous step (may need to change "files of type" from "Excel Files" to "all files"). When opening text file, say it is "delimited" and then on the next page choose "comma" as the delimiter.

-Delete or hide the unnecessary columns. Add a column for AADT Entering Intersection and enter values from the "AADT Database" excel file (stored in F:\PLANNING\TRAFOPR\Crash and Safety Information\Annual Listings, the table should be updated as needed).

-Add remaining columns so table looks like normal report table and then add formulas:

- Total Crashes = Fatal + Inj + PDO
- Weighted Total = 12\*Fatal + 3\*Injury + 1\*PDO (until all data is 2009 or newer)
- Weighted Total = 12\*Fatal + 9\*InjA + 3\*InjB + 2\*InjC + 1\*PDO (when all data is 2009 or newer)
- For ranking columns, use the "RANK" formula in Excel (put \$ signs in front of the range values, so that they will remain fixed and not change when drag formula down to rest of cells).
- Crash Rate = (Number of crashes \* 1,000,000)/(365\*Number of Years in Study Period\*AADT Entering Intersection).
- Cumulative Rank = Weighted Total Rank + Crash Rate Rank

-Manually add "Other Rankings".

### **High Risk Rural Roads Locations**

-In ArcMap filter the crash layer so:

```
CRASH_TYPE_DESCR = 'Traffic' AND  
CRASH_DATE >= beginning study date AND  
CRASH_DATE <= ending study date AND  
NOT CRASH_SEVERITY_DESCR = 'PDO' AND  
NOT CRASH_SEVERITY_DESCR = 'Possible Injury' AND  
CITY IS NULL
```

-Perform process separately for:

-State System Rural Major Collectors and State System Rural Local Roads

-County Major Collectors. There should already be a shapefile for CMCs that has roads segmented according to logical termini, stored in F:\PLANNING\TRAFOPR\Crash and Safety Information\Annual Listings\ArcMap Items.

-Rural Local Roads (non-state-system). Using the "select by location" tool, select all local roads within corporate boundaries, then "switch selection" (so only roads outside boundaries are selected), export the layer, then should be ready to perform buffer.

- In ArcMap filter the road layer so only the desired functional class(es) show up.
- Use the buffer tool in the ArcToolbox (Analysis Tools, Proximity, Buffer) to buffer the road layer.  
Distance = 100ft (creates a bubble around the road layer).
- After the buffer is created, join the newly created buffer and the crash layer by right clicking on the buffer layer and selecting "join":
  - \*What do you want to join to this layer = join data from another layer based on spatial location
  - \*1. Choose the layer to join to this layer = crash layer
- Add new columns for:
  - \*Adjusted Segment Length. Use the "select by attributes" tool to select segments greater than 1 mile and set the adjusted segment length equal to these values. Then use "select by attributes" to select segments less than 1 mile and set the adjusted segment length equal to 1 mile (1 mile = 1609.34 meters).
  - \*Crashes per Mile. Set this column equal to:
    - If Length is in miles, CrashesPerMile = crash count/ segment length
    - If Length is in meters, CrashesPerMile = crash count\*1609.34/segment length
- click "options" in the attribute table and "export" as a text file.

#### **Excel Program**

- Open the text file from the previous step (may need to change "files of type" from "Excel Files" to "all files"). When opening text file, say it is "delimited" and then on the next page choose "comma" as the delimiter.
- Delete or hide the unnecessary columns.
- Repeat the above steps and break apart or combine data in Excel so there are separate spreadsheets for each functional class (Rural Major Collectors, Rural Local Roads).
- In the spreadsheets each location should have a crashes/mile. Calculate the average value for this column, which will be the Statewide Average Crashes/Mile (perform for each functional class).
- Return to ArcMap and filter the "join" layer so only locations with crashes/mile above the statewide average are shown.

## 3yr Urban or 1yr Urban High Crash Locations

### ArcMap Program

-In ArcMap filter the crash layer so:

CRASH\_TYPE\_DESCR = 'Traffic'  
CRASH\_DATE >= beginning study date  
CRASH\_DATE <= ending study date  
CITY <=13  
LATITUDE >0

-Use the buffer tool in the ArcToolbox (Analysis Tools, Proximity, Buffer) to buffer the crash layer.  
Distance = 150ft (yields a 150ft radius or 300ft diameter circle around each crash).

-After the buffer is created, join the newly created buffer and the crash layer by right clicking on the buffer layer and selecting "join":

\*What do you want to join to this layer = join data from another layer based on spatial location  
\*1. Choose the layer to join to this layer = crash layer

-Delete unnecessary columns and delete rows with total number of crashes less than 15 (for 3yr Urban) or 7 (for 1yr Urban), this will minimize file size.

-Delete duplicate rows from "join" layer (because multiple join circles typically overlap at one location).

-Add new columns for:

Location Description (such as "State St & Capitol Ave", etc.)  
Fatal, INJ, PDO columns (until all data is 2009 or newer)  
Fatal, InjA, InjB, InjC, PDO columns (when all data is 2009 or newer)

-For each location enter the number of crashes for each severity into the attribute table (using the editor). This is currently performed by zooming in to a location, highlighting the crashes and manually counting the number of each severity. When get close to finished it is nice to highlight a row on the attribute table (one that has not yet been filled in), right click, and select "zoom to highlighted".

-When all locations have number and severity of crashes entered, click "options" in the attribute table and "export" as a text file.

### Excel Program

-Open the text file from the previous step (may need to change "files of type" from "Excel Files" to "all files"). When opening text file, say it is "delimited" and then on the next page choose "comma" as the delimiter.

-Delete or hide the unnecessary columns. Add a column for AADT and enter values from the "AADT Database" excel file (stored in F:\PLANNING\TRAFOPR\Crash and Safety Information\Annual Listings, the table should be updated as needed).

-Add remaining columns so table looks like normal report table and then add formulas:

- Total Crashes = Fatal + Inj + PDO
- Weighted Total = 12\*Fatal + 3\*Injury + 1\*PDO (until all data is 2009 or newer)
- Weighted Total = 12\*Fatal + 9\*InjA + 3\*InjB + 2\*InjC + 1\*PDO (when all data is 2009 or newer)

- For ranking columns, use the "RANK" formula in Excel (put \$ signs in front of the range values, so that they will remain fixed and not change when drag formula down to rest of cells).
- Crash Rate = (Number of crashes \* 1,000,000)/(365\*Number of Years in Study Period\*AADT).
- Cumulative Rank = Weighted Total Rank + Crash Rate Rank

-Manually add "Other Rankings".

-The table should now be ready to fill out the Comments and Recommendations (after first preparing crash summary sheets, performing any needed analysis, etc.)

**Appendix E – FHWA Safety Memo (July 2008)**

FHWA Safety Memo (July 2008)..... E1-E11



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

# Memorandum

Subject: **ACTION:** Consideration and Implementation of Proven  
Safety Countermeasures

Date: July 10, 2008

  
From: Jeffrey A. Lindley  
Associate Administrator for Safety

In Reply Refer To: HSSI

To: Division Administrators  
Federal Lands Highway Division Engineers

Improving safety is a top priority of the US Department of Transportation, and FHWA remains strongly committed to reducing highway fatalities and serious injuries on our Nation's highways. We know that a comprehensive mix of strategies is required—including stronger policies to support system-wide and sustainable improvements. We believe our area of greatest potential influence is how Federal funds are used and targeted to implement improvements that will have a positive impact on safety.

In our stewardship and oversight role for federally funded highway programs, we have the opportunity to strongly encourage Federal, State, local agencies, and tribal governments to include safety in their investment decision-making process. While there is still much work to do on determining the precise effectiveness of some safety countermeasures, we are highly confident that certain processes, infrastructure design techniques, and highway features are effective and should be encouraged whenever Federal funds are used. Safety should be considered at every stage of the project development process. Every investment decision should consider the impact on safety and every federally funded project should include appropriate safety enhancement features.

This guidance memorandum highlights when and where we believe certain processes, design techniques, or safety countermeasures should be used. This document also includes countermeasure descriptions and background on the proven effectiveness and benefits; a statement on when the countermeasure or process should be applied; links to reference documents; and current FHWA technical contacts for each topic. This guidance was developed based on effectiveness data for various crash types compiled from a variety of sources. It reflects the types of circumstances and situations that we are confident will yield high pay-offs and be cost beneficial for all projects.

**MOVING THE  
AMERICAN  
ECONOMY**



We need your leadership to encourage our partners to apply this guidance as they make investment decisions and develop projects. I am requesting that all Federal-aid and Federal Lands Division Offices review this guidance and meet with officials in their State and with tribal governments, as well as Federal partners, to determine how and when they can consider these measures to improve safety when federally funded investments are pursued. In discussing this guidance with your safety partners, it will be particularly important to address the need for comprehensive high quality safety data as a foundational element for facilitating project and program decisions. Data systems should be continually improved to help foster better decision-making.

The Office of Safety believes that widespread implementation of these safety countermeasures can serve to accelerate the achievement of local, State and national safety goals. We are currently considering whether to advance one or more elements of this guidance through a formal rulemaking process. As your office works with your State, tribal governments, and Federal partners in implementing your State's Strategic Highway Safety Plan and providing stewardship and oversight of federally funded investments, we would appreciate feedback on your experiences in using this guidance. We also invite your input on other potential safety guidance needs.

List of guidance documents included herein:

1. Road Safety Audits
2. Rumble Strips and Rumble Stripes
3. Median Barriers
4. Safety Edge
5. Roundabouts
6. Left and Right Turn Lanes at Stop-Controlled Intersections
7. Yellow Change Intervals
8. Medians and Pedestrian Refuge Areas in Urban and Suburban Areas
9. Walkways

Attachment

cc: Associate Administrators  
Directors of Field Services  
Resource Center Manager

**1. Road Safety Audits  
(Rev. 6/05/08)**

**Description:**

A Road Safety Audit is a very effective tool to reduce injuries and fatalities on our Nation's roadways. A road safety audit (RSA) is a formal safety performance examination of an existing or future road or intersection by an independent and multi-disciplinary team. It estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users.

**Background:**

Section 625.2 of 23 CFR states that plans and specifications for proposed NHS projects shall adequately serve the existing and planned future traffic of the highway in a manner that is conducive to safety, durability, and economy of maintenance. While numerous requirements and analytical methods have been developed to support Federal-aid project decision-making, few requirements or analytical tools have been applied that relate to safety. The use of Road Safety Audits for this purpose would result in significant reductions in the numbers of fatalities and injuries.

The use of RSAs is increasing across the United States, in part due to crash reductions of up to 60 percent in locations where they have been applied. The relative low-cost nature of RSAs and implementation is another factor. RSAs may be conducted at every stage in the lifecycle of a transportation facility including pre-construction, construction, and post-construction as discussed in the FHWA Road Safety Audit Guidelines, FHWA-SA-06-06. Highway agencies should consider conducting a Road Safety Audit at the earliest stage possible (planning or preliminary design) when all roadway design options and alternatives are being explored.

**Guidance Statement/Application:**

Each State Department of Transportation (DOT) should develop an RSA policy which will establish criteria for conducting RSAs on highway projects. The policy should cover Federal-aid highway projects, as a minimum, and preferably all highway projects under jurisdiction of the State DOT. The policy should identify which projects will have RSAs conducted and when (at what project stage). Consideration for types of projects, project cost thresholds and the likelihood of producing significant, beneficial safety recommendations for implementation should be included. The policy should cover who will conduct the RSA and how it will be funded. The policy may list the project types or categories considered to have the highest potential benefit from application of an RSA. The policy may contain a list of project types or categories which may be exempt from the RSA process.

The State's RSA policy should contain procedures for prompt reviews of RSA recommendations, and procedures for implementing accepted RSA recommendations. The State's RSA policy should be coordinated with the FHWA Division Office and may be incorporated or referenced in the Stewardship and Oversight agreement.

Federal and local agencies and tribal governments administering highway projects using Federal funds should also be encouraged to adopt a RSA policy for these projects.

**Reference Documents and Guidelines:**

*FHWA Road Safety Audit Guidelines*, February 2005, <http://safety.fhwa.dot.gov/rsa/rsaguidelines/html/index.htm>  
 FHWA Road Safety Audit Webpage: <http://safety.fhwa.dot.gov/rsa>  
 FHWA Priority Technologies and Innovations 2008 List: <http://www.fhwa.dot.gov/crt/lifecycle/ptisafety.cfm>  
*FHWA SA-07-007, Pedestrian Road Safety Audit Guidelines and Prompt Lists*, FHWA SA-07-007, 2007.  
<http://drusilla.hsrc.unc.edu/cms/downloads/PedRSA.reduced.pdf>

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**2. Rumble Strips and Rumble Stripes**  
(Rev. 6/05/08)

**Description:**

Rumble strips are raised or grooved patterns on the roadway that provide both an audible warning (rumbling sound) and a physical vibration to alert drivers that they are leaving the driving lane. They may be installed on the roadway shoulder or on the centerline of undivided highways. If the placement of rumble strips coincides with centerline or edgeline striping, the devices are referred to as rumble stripes.

**Background:**

Centerline Rumble Strips and Rumble Stripes: The 2005 NCHRP Synthesis 339 (data from the Insurance Institute for Highway Safety study on centerline rumble strips in September 2003) found that head-on and opposite direction sideswipe injury crashes were reduced by an estimated 25% at sites treated with centerline rumble strips or stripes. Centerline rumble strips/stripes have been shown to provide a crash reduction factor of 14% of all crashes and 15% of injury crashes on rural two-lane roads.

Shoulder Rumble Strips and Rumble Stripes: Continuous shoulder rumble strips (CSRS) can be applied on many miles of rural roads in a cost-effective manner. Studies have documented the following crash reduction benefits:

- Overall crash reduction of 13% and injury reduction of 18% on rural two-lane highways.
- Overall crash reduction of 16% and injury reduction of 17% on rural multi-lane divided highways.
- Reduction in run-off-road crashes of 38% on freeways.

Shoulder rumble stripes have not been studied to the same extent; however, they show great potential for reducing run-off-the-road crashes in addition to improving night-time visibility.

**Guidance Statement/Application:**

Rumble Strips or Rumble Stripes should be provided on all new rural freeways and on all new rural two-lane highways with travel speeds of 50 mph or greater. In addition, State 3R and 4R policies should consider:

- Installation of centerline rumble strips (or stripes) on rural 2-lane road projects where the lane plus shoulder width beyond the rumble strip will be at least 13' wide; particularly roadways with higher traffic volumes, poor geometrics, or a history of head-on and opposite-direction sideswipe crashes.
- Installation of continuous shoulder rumble strips on all rural freeways and on all rural two-lane highways with travel speeds of 50 mph or above (or as agreed to by the Division and the State) and/or a history of roadway departure crashes, where the remaining shoulder width beyond the rumble strip will be 4 feet or greater, paved or unpaved.

Federal and local agencies and tribal governments administering highway projects using Federal funds should also be encouraged to adopt similar policies for providing rumble strips or rumble stripes.

**Reference Documents and Guidelines:**

NCHRP Project 17-32, *Guidance for the Design and Application of Shoulder and Centerline Rumble Strips* (projected release date of August 2008) <http://www.trb.org/trbnet/projectdisplay.asp?projectid=458>

Technical Advisory 5040.35, *Roadway Shoulder Rumble Strips*

<http://www.fhwa.dot.gov/legsregs/directives/techadv/t504035.htm>

NCHRP Synthesis 339, *Centerline Rumble Strips* [http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp\\_syn\\_339.pdf](http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_syn_339.pdf)

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**3. Median Barriers**  
 (Rev. 6/05/08)

**Description:**

Median barriers are longitudinal barriers used to separate opposing traffic on a divided highway. They are designed to redirect vehicles striking either side of the barrier. Median barriers can significantly reduce the occurrence of cross-median crashes and the overall severity of median-related crashes.

**Background:**

Crashes resulting from errant vehicles crossing the median and colliding with traffic on the opposing roadway often result in severe injuries and fatalities. The fact that these crashes involve innocent motorists is another compelling reason for highway agencies to take action.

In the past, median barriers were not typically used with medians that were more than 30 feet wide. In the 1980's and 1990's, however, a number of States experienced a large number of cross median fatal crashes. This led them to review their design policies and begin installing barriers in medians wider than the 30 feet originally called for in the AASHTO Roadside Design Guide (RDG). The 2006 RDG revision encourages consideration of barriers in medians up to 50 feet wide.

A recent review of cross median fatality data shows many States experiencing crashes involving vehicles traversing medians well in excess of 30 feet. Although W-beam guardrail has typically been used to prevent medians crossovers, more recently many States have demonstrated that cable median barriers are a very cost-effective means of reducing the severity of median encroachments. Although a small number of high-profile crashes involving vehicles going over or under cable barrier systems has caught the public's attention, the failure rate of cable systems is comparable to, or may even be lower than, that for W-beam median barriers. Cable systems are a highly cost-effective way to impact cross-median crashes by reducing the number and severity of such crashes, and the FHWA has been actively urging each State to install cable median barrier, where feasible, on highway segments.

**Guidance Statement/Application:**

- Each State should update its median barrier policy to be consistent with the 2006 Roadside Design Guide Chapter 6 revision.
- Where median barriers are determined to be needed, States should give strong consideration to cable median barrier, based on its performance history.

**Reference Documents and Guidelines:**

AASHTO Roadside Design Guide, 3<sup>rd</sup> Edition, 2006  
[https://bookstore.transportation.org/item\\_details.aspx?ID=148](https://bookstore.transportation.org/item_details.aspx?ID=148)  
 NCHRP Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."  
[http://safety.fhwa.dot.gov/roadway\\_dept/road\\_hardware/nchrp\\_350.htm](http://safety.fhwa.dot.gov/roadway_dept/road_hardware/nchrp_350.htm)

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**4. Safety Edge  
(Rev. 6/05/08)**

**Description:**

The Safety Edge is a specific asphalt paving technique where the interface between the roadway and graded shoulder is paved at an optimal angle to minimize vertical drop-off and provide a safer roadway edge. A Safety Edge shape can be readily attained by fitting resurfacing equipment with a device that extrudes and compacts the shape of the pavement edge as the paver passes. This mitigates shoulder pavement edge drop-offs immediately during the construction process and over the life of the pavement. This technique is not an extra procedure but merely a slight change in the paving equipment that has a minimal impact on the project cost. In addition, the Safety Edge improves the compaction of the pavement near the edge. Shoulders should still be pulled up flush with the pavement.

**Background:**

New and resurfaced pavements improve ride quality but can be a detriment to safety if the edges are left near vertical. Drivers trying to regain control after inadvertently dropping a tire over the edge frequently have difficulty with a steep vertical edge and may lose control of the vehicle, possibly resulting in severe crashes. Making the adjacent non-paved surface flush with the paved surface alleviates this problem, but a vertical edge may appear due to erosion or wheel encroachment, especially along curves. Installing the Safety Edge during a paving project provides a surface that can be more safely traversed.

Recent studies have shown that crashes involving pavement edge drop-offs greater than 2.5 inches are more severe and twice as likely to be fatal than other roadway departure crashes. An effective countermeasure is to implement a pavement wedge as referenced in the AASHTO Roadside Design Guide, Chapter 9. Research in the early 1980's found a 45 degree pavement wedge effective in mitigating the severity of crashes involving pavement edge drop-offs. During the Georgia DOT Demonstration project, evaluation of wedge paving techniques found it beneficial to flatten the wedge to a 30 to 35 degree angle that resulted in a pavement edge referred to as the Safety Edge. Subsequent research has shown this design to be 50% more effective than the original 45 degree wedge.

**Guidance Statement/Application:**

Each State should implement policies and procedures to incorporate the Safety Edge where pavement and non-pavement surfaces interface on all Federal-aid new paving and resurfacing projects with surface differentials of 2.5 inches or more. The differentials should be measured from the pavement surface to the adjacent non-pavement surface, accounting for grading along the pavement edge during construction and including existing drop-offs.

In addition, Divisions should work with Federal, State and local agencies and tribal governments to determine how the Safety Edge can be installed on all routes with pavement edge drop-offs (i.e., surface differentials of 2.5 inches or greater) during resurfacing over time, based on highest priority by traffic volume, lack of paved shoulders, and historical presence of edge rutting or pavement edge drop-offs.

**Reference Documents and Guidelines:**

AAA Foundation for Traffic Safety, *Safety Impacts of Pavement Edge Drop-offs*  
[http://www.aaafoundation.org/pdf/pedo\\_report.pdf](http://www.aaafoundation.org/pdf/pedo_report.pdf)  
*The Safety Edge: Pavement Edge Treatment*, FHWA-SA-05-003:  
[http://safety.fhwa.dot.gov/roadway\\_dept/docs/sa05003.htm](http://safety.fhwa.dot.gov/roadway_dept/docs/sa05003.htm)

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**5. Roundabouts  
(Rev. 6/05/08)**

**Description:**

The modern roundabout is a type of circular intersection defined by the basic operational principle of entering traffic yielding to vehicles on the circulatory roadway and certain key design principles to achieve deflection of entering traffic by channelization at the entrance and deflection around a center island. Modern roundabouts have geometric features providing a reduced speed environment that offers substantial safety advantages and excellent operational performance.

**Background:**

Roundabouts have demonstrated substantial safety and operational benefits compared to other forms of intersection control, with reductions in fatal and injury crashes of from 60–87 percent. The benefits apply to roundabouts in urban and rural areas and freeway interchange ramp terminals under a wide range of traffic conditions. Although the safety of all-way stop control is comparable to roundabouts, roundabouts provide much greater capacity and operational benefits. Roundabouts can be an effective tool for managing speed and transitioning traffic from a high speed to a low speed environment. Proper site selection and channelization for motorists, bicyclists, and pedestrians are essential to making roundabouts accessible to all users. In particular, it is important to ensure safe accommodation of bicyclists at higher speed roundabouts and for pedestrians with visual or cognitive impairments.

**Guidance Statement/Application:**

Roundabouts are the preferred safety alternative for a wide range of intersections. Although they may not be appropriate in all circumstances, they should be considered as an alternative for all proposed new intersections on Federally-funded highway projects, particularly those with major road volumes less than 90 percent of the total entering volume. Roundabouts should also be considered for all existing intersections that have been identified as needing major safety or operational improvements. This would include freeway interchange ramp terminals and rural intersections.

**Reference Documents and Guidelines:**

1. *Roundabouts: An Informational Guide* (Report No. FHWA-RD-00-067) <http://www.tfhrc.gov/safety/00068.htm>
2. *Public Rights-of-Way Access Advisory* <http://www.fhwa.dot.gov/environment/bikeped/prwaa.htm>
3. *Pedestrian Access to Modern Roundabouts: Design and Operational Issues for Pedestrians who are Blind* <http://www.access-board.gov/research/roundabouts/bulletin.htm#CROSSING%20AT%20ROUNDAABOUTS>
4. *NCHRP Project 03-78A, Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities* <http://www.trb.org/TRBNet/ProjectDisplay.asp?ProjectID=834>
5. *Desktop Reference for Crash Reduction Factors, FHWA-SA-07-015, 2007* <http://www.transportation.org/sites/safetymanagement/docs/Desktop%20Reference%20Complete.pdf>
6. *NCHRP Report 572: Roundabouts in the United States* [onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_572.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_572.pdf)
7. *Guide for the Planning, Design, and Operation of Pedestrian Facilities, American Association of State Highway and Transportation Officials, 2004.*

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**6. Left and Right-Turn Lanes at Stop-Controlled Intersections**  
(Rev. 6/05/08)

**Description:** Left-turn lanes are auxiliary lanes for storage or speed change of left-turning vehicles. Installation of left-turn lanes reduces crash potential and motorist inconvenience, and improves operational efficiency. Right-turn lanes provide a separation between right-turning traffic and adjacent through traffic at intersection approaches, reducing conflicts and improving intersection safety.

**Background:** The AASHTO Green Book recommends that left-turning traffic be removed from the through lanes whenever practical, and that left-turn lanes should be provided at street intersections along major arterials and collector roads wherever left turns are permitted. Consideration of left turn lanes has traditionally been based on such factors as the number of through lanes, speeds, left turn volumes, opposing through volumes, and/or left-turning crashes. Providing left-turn lanes on the major road approaches has proven safety benefits at rural and urban 3 and 4-leg, two-way stop-controlled intersections. Studies have shown total crash reductions ranging from 28-44% and fatal/injury crash reductions of 35-55% for providing a left-turn lane on one major road approach, and 48% for providing left-turn lanes on both major road approaches, at rural intersections with traffic volumes ranging from 1,600-32,400 vehicles per day (vpd) on the major road and 50-11,800 on the minor road.

For urban intersections, total crash reductions of 27-33% and fatal/injury crash reduction of 29% have been experienced after providing a left-turn lane on one major road approach, and 47% for providing left-turn lanes on two major road approaches, intersections with traffic volumes from 1,520-40,600 vpd on the major road and 200-8,000 vpd on the minor road.

Providing right-turn lanes on major road approaches has been shown to reduce total crashes at two-way stop-controlled intersections by 14% and fatal/injury crashes by 23% when providing a right-turn lane on one major road approach, and a total crash reduction of 26% for right-turn lanes on both approaches, at 3 and 4-leg urban and rural intersections with traffic volumes ranging from 1,520-40,600 vpd on the major road and from 25-26,000 vpd on the minor road.

**Guidance Statement/Application:**

Installing left-turn lanes and right-turn lanes should be considered for the major road approaches for improving safety at 3 and 4-leg intersections with two-way stop control on the minor road, where significant turning volumes exist or where there is a history of turn-related crashes. Safe accommodation of pedestrians and bicyclists at these intersections should be considered as well.

**Reference Documents and Guidelines:**

*Desktop Reference for Crash Reduction Factors, FHWA, SA-07-015, 2007*  
<http://www.transportation.org/sites/safetymanagement/docs/Desktop%20Reference%20Complete.pdf>  
*NCHRP Project 17-27, Highway Safety Manual, Parts I and II*  
*NCHRP Report 500, Volume 5, A Guide for Addressing Unsignalized Intersection Collisions*  
[http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp\\_rpt\\_500v5.pdf](http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_500v5.pdf)  
*Safety Effectiveness of Intersection Left- and Right Turn Lanes (FHWA-RD-02-089)*  
<http://www.tfhrc.gov/safety/pubs/02089/index.htm>  
*NCHRP Project 03-91, Left-Turn Accommodations at Unsignalized Intersections (underway)*  
*Guide for the Planning, Design, and Operation of Pedestrian Facilities. American Association of State Highway and Transportation Officials. 2004. [Available for purchase from AASHTO. ]*

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**7. Yellow Change Intervals  
(Rev. 6/05/08)**

**Description:**

The yellow change interval is the interval following a green signal indication during which the yellow signal indication is displayed to warn drivers of the impending change in right of way assignment. Yellow change intervals that are not consistent with normal operating speeds create a dilemma zone in which drivers can neither stop safely nor reach the intersection before the signal turns red.

**Background:**

Red-light running is one of the most common causes of intersection crashes. Research shows that yellow interval duration is a significant factor affecting the frequency of red-light running and that increasing yellow time to meet the needs of traffic can dramatically reduce red light running. Bonneson and Son (2003) and Zador et al.(1985) found that longer yellow interval durations consistent with the ITE Proposed Recommended Practice(1985) using 85th percentile approach speeds are associated with fewer red-light violations, all other factors being equal. Bonneson and Zimmerman (2004) found that increasing yellow time in accordance with the ITE guideline or longer reduced red light violations more than 50%. Van Der Host found that red light violations were reduced by 50% one year after yellow intervals were increased by 1 second. Retting et al (2007) found increasing yellow time in accordance with the guideline reduced red-light violations on average 36%. Retting, Chapline & Williams (2002) found that adjusting the yellow change interval in accordance with the ITE guidelines reduced total crashes by 8%, reduced right angle crashes by 4%, and pedestrian and bicycle crashes by 37%. Both Kentucky and Missouri report a 15% reduction in all crashes and a 30% reduction in right-angle crashes after increasing the yellow interval.

**Guidance Statement/Application:**

The length of the yellow change interval should be increased at any intersection where the existing yellow change interval time is less than the time needed for a motorist traveling at the prevailing speed of traffic to reach the intersection and stop comfortably before the signal turns red. The minimum length of yellow should be determined using the kinematics formula in the 1985 ITE proposed practice assuming an average deceleration of 10 ft/sec or less, a reaction time of 1 sec or more, and an 85<sup>th</sup> percentile approach speed. If approach speed is not known, the posted speed limit plus 10 mph may be used. An additional 0.5 sec of yellow time should be considered for locations with significant truck traffic, significant population of older drivers, or more than 3 percent of the traffic is entering on red.

**Reference Documents and Guidelines:**

*Desktop Reference for Crash Reduction Factors, FHWA-SA-07-015, 2007*

<http://www.transportation.org/sites/safetymanagement/docs/Desktop%20Reference%20Complete.pdf>

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**8. Medians and Pedestrian Refuge Areas in Urban and Suburban Areas  
(Rev. 6/05/08)**

**Description:**

The *Median* is the area between opposing lanes of traffic, excluding turn lanes. Medians can either be open (pavement markings only) or they can be channelized (raised medians or islands) to separate various road users.

*Pedestrian Refuge Areas* (or crossing islands)—also known as center islands, refuge islands, pedestrian islands, or median slow points—are raised islands placed in the street at intersection or midblock locations to separate crossing pedestrians from motor vehicles.

**Background:**

Providing raised medians or pedestrian refuge areas at pedestrian crossings at marked crosswalks has demonstrated a 46% reduction in pedestrian crashes. Installing such raised channelization on approaches to multi-lane intersections has been shown to be particularly effective. At unmarked crosswalk locations, medians have demonstrated a 39% reduction in pedestrian crashes. Medians are especially important in areas where pedestrians access a transit stop or other clear origin/destinations across from each other.

**Guidance Statement/Application:**

Raised medians (or refuge areas) should be considered in curbed sections of multi-lane roadways in urban and suburban areas, particularly in areas where there are mixtures of a significant number of pedestrians, high volumes of traffic (more than 12,000 ADT) and intermediate or high travel speeds. Medians/refuge islands should be at least 4 feet wide (preferably 8 feet wide for accommodation of pedestrian comfort and safety) and of adequate length to allow the anticipated number of pedestrians to stand and wait for gaps in traffic before crossing the second half of the street.

**Reference Documents and Guidelines:**

*A Review of Pedestrian Safety Research in the United States and Abroad*, pp 85-86  
<http://www.walkinginfo.org/library/details.cfm?id=13>

*Pedestrian Facility User's Guide: Providing Safety and Mobility*, p. 56  
[http://drusilla.hsrc.unc.edu/cms/downloads/PedFacility\\_UserGuide2002.pdf](http://drusilla.hsrc.unc.edu/cms/downloads/PedFacility_UserGuide2002.pdf)

*Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations*, p. 55  
<http://www.walkinginfo.org/library/details.cfm?id=54>

*Guide for the Planning, Design, and Operation of Pedestrian Facilities, American Association of State Highway and Transportation officials, 2004* [Available for purchase from AASHTO.]

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**9. Walkways  
(Rev. 6/05/08)**

**Description:**

Several types of pedestrian\* walkways have been defined:

- **Pedestrian Walkway (Walkway):** A continuous way designated for pedestrians and separated from motor vehicle traffic by a space or barrier.
- **Shared Use Path:** A bikeway or pedestrian walkway physically separated from motorized vehicular traffic by an open space or barrier—either within a highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other nonmotorized users. Shared use paths also may be referred to as “trails” or “multiple-use trails.
- **Sidewalks:** Walkways that are paved and separated from the street, generally by curb and gutter.
- **Roadway Shoulder:** In rural or suburban areas where sidewalks and pathways are not feasible, gravel or paved highway shoulders provide an area for pedestrians to walk next to the roadway.

\***Pedestrian:** Any person traveling by foot, and any mobility impaired person using a wheelchair.

**Background:**

USDOT policy calls for bicycling and walking facilities to be incorporated into all transportation projects unless exceptional circumstances exist (<http://www.fhwa.dot.gov/environment/bikeped/design.htm#d4>)

The presence of a sidewalk or pathway on both sides of the street corresponds to approximately an 88 % reduction in “walking along road” pedestrian crashes. Providing paved, widened shoulders (minimum of 4 feet) on roadways that do not have sidewalks corresponds to approximately a 71% reduction in “walking along the road” pedestrian crashes. “Walking along road” pedestrian crashes typically are around 7.5% of all pedestrian crashes (with about 37% of the 7.5% being fatal and serious injury crashes).

A number of studies have also shown that widening shoulders reduces all types and all severity of crashes in rural areas. Reductions of 29% for paved and 25% for unpaved shoulders have been found on 2-lane rural roads where the shoulder was widened by 4 feet. In addition, shoulder widening and paving provides space for rumble strips.

**Guidance Statement/Application:**

Accessible sidewalks or pathways should be provided and maintained along both sides of streets and highways in urban areas, particularly near school zones and transit locations, and where there is frequent pedestrian activity. Walkable shoulders (minimum of 4 feet stabilized or paved surface) should be provided along both sides of rural highways routinely used by pedestrians.

**Reference Documents and Guidelines:**

1. *A Review of Pedestrian Safety Research in the United States and Abroad*, pp 113-114.  
<http://www.walkinginfo.org/library/details.cfm?id=13>
2. *An Analysis of Factors Contributing to 'Walking Along Roadway' Crashes: Research Study and Guidelines for Sidewalks and Walkways*. <http://www.walkinginfo.org/library/details.cfm?id=51>
3. *Pedestrian Facility User's Guide: Providing Safety and Mobility*, p. 56  
[http://drusilla.hsra.unc.edu/cms/downloads/PedFacility\\_UserGuide2002.pdf](http://drusilla.hsra.unc.edu/cms/downloads/PedFacility_UserGuide2002.pdf)
4. *A US DOT Policy Statement Integrating Bicycling and Walking into Transportation Infrastructure*  
<http://www.fhwa.dot.gov/environment/bikeped/design.htm>
5. *Guide for the Planning, Design, and Operation of Pedestrian Facilities, American Association of State Highway and Transportation Officials, 2004*. [Available for purchase from AASHTO]

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## **Appendix F – NDDOT Rumble Strip Documents**

Design Criteria for the Installation of Rumble Strips (October 2009)..... F1-F5

Implementation Plan for Rumble Strips (October 2009)..... F6-F7

MEMORANDUM

To: Grant Levi  
Deputy Director for Engineering

From: Ron Henke   
Office of Project Development, Director

Date: October 6, 2009

DESIGN CRITERIA FOR THE INSTALLATION OF RUMBLE STRIP/STRIPES

The purpose of this document is to establish the design criteria for the installation of the rumble strips/stripes to implement the Directors rumble strip/stripes program outlined in the attached document.

RUMBLE STRIP DETAILS:

SHOULDER RUMBLE STRIPS

1. Where to install:
  - a. Install on Divided Highways, both shoulders as a best practice approach to safety regardless of the traffic volumes.
  - b. Install on undivided highways where there is a four foot paved shoulder or more. Installation should be on all Highway Performance Classification System roadways as a best practice approach to safety regardless of the traffic volumes.
  - c. Install on undivided highways where the posted speed limit is greater than 45 mph. (see exclusions that may apply)
2. Installation Method: Milled rumble strips
3. Lateral Width: 12 inches
4. Longitudinal Milling Pattern: 6 ½" groove, ½ deep ± 1/8", 5 ½" flat

5. Offset and Alignment: Offset the rumble strip so the inside edge is typically 6" from the 12 foot driving lane in all applications. The Offset distance may be less or more when needed.
6. Breaks: Discontinue rumble strips through all urban areas where there is curb and gutter, highway posted speed is 45 mph or less, across bridge decks and approach slabs, adjacent to guardrail, through ramps and turn lanes, and at intersection with highways, county roads, or private drives.
7. Setbacks: Terminate rumble strips 100' before the exit ramp taper begins and turn lane tapers.
8. Exclusions: Do not install shoulder rumble strips:
  - a. on roads with speed limits of 45 mph or lower and ½ mile on either side
  - b. through all urban areas where there is curb and gutter and ½ mile on either side
  - c. between and through lanes, ramp tapers and turn lanes
  - d. on bridge decks, approach slabs, adjacent to guardrail, at intersection with highways, county roads or private drives
  - e. divided highways that travel thru or near an urban area. Installation limits will be determined during the project development phase.

## EDGE LINE RUMBLE STRIP

1. Where to install:
  - a. Install on undivided and divided highways where there is less than a four foot paved shoulder on all Highway Performance Classification System roadways as a best practice approach to safety regardless of the traffic volumes. Installations should not be made where the Edgeline Rumble Strip will intrude into the driving lane, unless a need is identified to address a safety concern. Lanes generally will not be narrowed to facilitate the installation of edgeline rumble strips.
  - b. Install on undivided highways where the posted speed limit is greater than 45 mph.
2. Installation Method: Milled rumble strips
3. Lateral Width: 6 inches, 8 inches or 12 inches, with 12 inches being desirable
4. Longitudinal Milling Pattern: 6 ½" groove, ½ deep ± 1/8", 5 ½" flat
5. Offset and Alignment: Rumble strip should be placed so the inside edge is at the inside edge of the pavement marking.
6. Breaks: Discontinue rumble strips through all urban areas where there is curb and gutter, highway posted speed is 45 mph or less, across bridge decks and approach slabs, adjacent to guardrail, through ramps and turn lanes, and at intersection with highways, county roads, or private drives.
7. Setbacks: Terminate rumble strips 100' before the exit ramp taper begins and turn lane tapers.
8. Exclusions: Do not install edgeline rumble strips:
  - a. on roads with speed limits of 45 mph or lower and ½ mile on either side
  - b. through all urban areas where there is curb and gutter and ½ mile on either side
  - c. between and through lanes, ramp tapers and turn lanes
  - d. on bridge decks, approach slabs, adjacent to guardrail, at intersection with highways, county roads or private drives
  - e. when the edgeline rumble strip intrudes into the driving lane unless a need is identified to address a safety concerns.

## CENTERLINE RUMBLE STRIPS

1. Where to install:
  - a. Should be installed on all two lane highways
2. Installation Method: Milled rumble strips
3. Lateral Width: 6 inches, 8 inches or 12 inches, depending on Roadway Geometry
4. Longitudinal Milling Pattern: 6 ½" groove, ½ deep ± 1/8", 5 ½" flat
5. Breaks: Centerline rumbles strips should be broken at all intersection with highways where there is an ADT greater than 100 vehicles per day.
6. Setbacks: Terminate rumble strips 100' in each direction from the center of the intersecting highway where there is an ADT greater than 100 vehicles per day.
7. Exclusions: Do not install center rumble strips:
  - a. on roads with speed limits of 45 mph or lower
  - b. on bridge decks, approach slabs, or at intersections with highways where there is an ADT greater than 100 vehicles per day
  - c. on divided highways
  - d. thru urban areas and ½ mile on either side

SAW SLOTTED RUMBLE STRIPS AT INTERSECTIONS

1. Where to install:
  - a. Should be installed at T-intersection where a crash problem has been identified or where one currently exists.
  - b. at a T-intersection of two state highways.
  - c. at all STOP conditions of two state highways.
2. Installation Method: Milled rumble strips
3. Lateral Width: Lane Width
4. Longitudinal Milling Pattern: 4" groove, 1/2 deep ± 1/8", 8" flat
5. Alignment: Install according to the attached drawing.

Do you concur with the proposed design criteria?

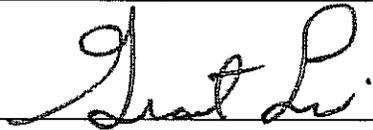
Yes       No

Comments:

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Grant Levi, P.E. – Deputy Director for Engineering

10/19/09  
Date

MEMORANDUM

To: Francis Ziegler  
NDDOT Director

From: Linda Butts *LB*  
Deputy Director for Driver and Vehicle Services  
Grant Levi  
Deputy Director for Engineering *GL*

Date: October 12, 2009

IMPLEMENTATION PLAN FOR RUMBLE STRIPS / STRIPES

The purpose of rumble strips/stripes is to save lives by reducing head-on and run off the road (ROR) crashes. Rumble strips/stripes are used to effectively reduce shallow angle ROR crashes. These types of crashes are usually caused by distracted, drowsy, or fatigued driving. The noise and vibrations caused by driving on rumble strips/stripes alert the driver of a near lane departure allowing time to make corrections. Rumble strips are not effective for ROR crashes caused by excessive speed, loss of control, sudden turns to avoid on-road collisions, or high-angle encroachments.

Given the number of head-on and run off the road (ROR) crashes that are occurring in the state we are recommending implementing a rumble strip program. The program will consist of installing rumble strips/stripes on the entire system as a programmatic approach to enhancing the safety of the transportation system. The state receives approximately \$8 million dollars each year in safety funds. Based on today's cost we estimate it would cost us approximately \$25 -30 million to install rumble strips/stripes on the system. Because of funding limitations we recommend phasing the construction as follows:

- Proceed with the installation of rumble strips/stripes using the states Highway Performance Classification system priorities. The focus would be to install rumble strips/stripes on the Interstate system, Interregional, State corridor, District corridor and District Collector in priority order. Two exceptions to following priority order should occur. The first exception would be to install rumble strips/stripes on roadways that had an identified crash history that could be mitigated with the installation of rumble strips/stripes. On these roadways rumble strips/stripes would be placed ahead of the roadways HPCS designation schedule. The second exception would be to install rumble strip/stripes as part of every preventative maintenance, minor rehabilitation, major rehabilitation, reconstruction and new roadway paving project.

- Edge line or Shoulder rumble strips will be placed where possible on all roadways. The decision to use edge line or shoulder rumble strips will depend on the shoulder width available.
- Centerline rumble stripes will be installed on all two lane highways except on roadways with speeds less than 45 mph, on bridge decks, approach slabs, or intersections with highways where the ADT is greater than 100 vehicles per day and thru urban areas and ½ mile on either side.
- Because we are also experiencing numerous crashes as a result of drivers not stopping at intersection. We recommend installing saw slotted rumble strips at the following locations:
  - a. T-intersection where a crash problem has been identified or where one currently exists.
  - b. T-intersection of two state highways.
  - c. All STOP conditions of two state highways.
- Planning and Programming will be instructed to work with the Safety Office to develop a four year plan that would ensure the rumble strips/stripes and saw slotted rumble strips are placed as outlined above. The program will start in 2010 and finish in 2013. The plan will be approved by the Deputy Director for Driver and Vehicle Services and Deputy Director for Engineering and included in the upcoming STIP. Please note the rumble strip/stripes program will have to be funded with a combination of state, federal safety and other federal funds.
- A public relations plan will be developed by communication to inform the public of the purpose and benefits of the rumble strip/stripe program.

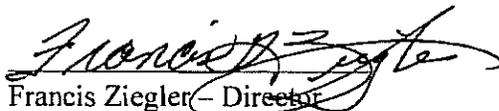
We are seeking your concurrence to proceed with the recommendation outlined above.

Do you concur with the recommendations?

YES

NO

Comments:

  
Francis Ziegler - Director

10/19/09  
Date

**Appendix G – Fatal Crash Review Team Memo (February 2009)**

Fatal Crash Review Team Memo (February 2009)..... G1

MEMO

**TO:** Chris Holzer, Planning and Programming  
Derek Pfeiffer, Design  
Lyle Landstrom, Fargo District  
Karen Mongeon, Traffic Safety Office  
Billie Jo Lorius, Communications

**FROM:** Grant Levi, P.E. - Deputy Director for Engineering  
Tim Horner, Deputy Director – Office of Business  
Linda Butts, Deputy Director for Driver & Vehicle Services

**DATE:** February 2, 2009

**SUBJECT:** Fatal Crash Review Team Assignment

*Grant Levi*  
*Tim Horner*  
*Linda Butts*

Safety is first priority for all projects and programs initiated by the North Dakota Department of Transportation (NDDOT). It is the goal of the Safety Liaison to acquire and increase collaboration of crash data. To accomplish this goal, a Fatal Crash Review Team has been formed. You have been selected as a member of the Fatal Crash Review Team. Marsha Lembke, Safety Liaison will chair the team.

This team will review fatal crashes that have happened throughout the review periods. They will establish a baseline to find possible patterns that contribute to fatal crashes and propose solutions, if they exist, that are in one of the 4E areas. The Team may recommend improvement of safety practices that could be applied on a statewide basis. All recommendations will be submitted to the Deputy Director for Engineering and will require the 409 stamp.

An organizational meeting is scheduled for February 10, 2009, at 1:15 to 2:30 at BND. If you have any questions or ideas, please contact Marsha Lembke at 328-4559.

c: Darcy Rosendahl, Director – Office of Operations  
Bob Fode, Director – Office of Transportation Programs  
Peggy Anderson - Communications  
Glenn Jackson, Motor Vehicle  
Roger Weigel, Design  
Scott Zainhofsky, Planning & Programming



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

1471 Interstate Loop  
Bismarck, North Dakota 58503-0567

February 26, 2010

Mr. Dave Leftwich  
Interim Director of Transportation Programs  
North Dakota Department of Transportation  
608 East Boulevard Avenue  
Bismarck, North Dakota 58505-0700

Attention: Mr. Scott Zainhofsky, Planning and Programming Engineer

Dear Mr. Leftwich:

Subject: Implementation Plan for the Highway Safety Improvement Program (HSIP)

This is in reply to Mr. Scott Zainhofsky's letter dated February 22 which submitted your proposed update to NDDOT's HSIP implementation plan. We concur that the proposed implementation plan will provide the necessary components of planning, implementation, and evaluation fundamental to the Section 148 Highway Safety Improvement Program. We also concur that the implementation plan was developed in consultation with FHWA as per 23 CFR 924.7(b).

We appreciate the considerable effort which has gone into developing the updated plan. We look forward to working cooperatively to assist you in accomplishing your purpose for the program of implementing safety improvements which have the potential to save lives and prevent serious injuries on all public roads.

Sincerely yours,

Steven M. Busek  
Safety/Traffic Operations/ITS Engineer

