



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

Safety Engineering Policy Memorandum

SAFETY 1-06

Highway Safety Improvement Program (HSIP)

Effective November 1, 2006

INTRODUCTION

This policy supersedes Traffic policies, TRA-15 and TRA-16.

The federal bill reauthorizing surface transportation funding, titled "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA – LU) has authorized a new core federal-aid funding program entitled "Highway Safety Improvement Program" (HSIP) beginning in federal FY 2006 with the purpose of achieving a significant reduction in traffic fatalities and serious injuries on all public roads. (References: SAFETEA – LU Sections: 1101(a) (6) and 1401 and 23 USC Sections: 148 and 130).

This policy outlines Departmental roles, responsibilities and activities necessary to implement the HSIP to meet the requirements and intent of the legislation.

OVERVIEW

Illinois' HSIP is intended to be consistent with Federal Highway Administration's (FHWA) safety requirements. Those requirements are to produce a measurable and significant reduction in fatalities and serious injuries resulting from crashes on the highway system. The highway system includes all roadways under the jurisdiction of the Illinois Department of Transportation (IDOT) as well as those owned and maintained by local units of government. It includes at-grade highway-railway crossings.

SAFETEA-LU requires each State to develop and implement a State Strategic Highway Safety Plan (SHSP) in order to obligate funds for 23 USC 148 eligible activities. This SHSP is a statewide, coordinated, integrated safety plan that provides a comprehensive framework (4E's: Engineering, Enforcement, Education, and Emergency Medical Services) for reducing highway fatalities and serious injuries and establishes statewide goals, objectives, and key emphasis areas. Illinois has developed a Comprehensive Highway Safety Plan (ICHSP) (<http://www.dot.il.gov/illinoisCHSP/default.html>) and has set a goal to reduce traffic-related deaths to 1,000 or fewer by 2008. The ICHSP

describes specific areas of emphasis based on a statewide evaluation of highway safety problems and also outlines successful past strategies and proposed new strategies considered appropriate for Illinois to address these problems. The ICHSP will be re-evaluated and updated on a regular basis to reflect advances in knowledge, progress toward accomplishing individual emphasis area objectives, and to address emerging safety concerns within Illinois. The ICHSP should therefore be used as a guide in the development of each District's and Local agency's safety program and the overall state safety program.

SAFETEA-LU requires annual evaluation reporting to the USDOT, Secretary of Transportation through the FHWA Division Office. The purpose of this reporting is to demonstrate the effectiveness of the Illinois HSIP in meeting the federal requirements – the reduction in fatalities and serious injuries. SAFETEA-LU also requires regular reporting identifying the top 5 percent of locations exhibiting the most severe safety needs based on crashes, injuries, deaths, traffic volume levels, and other relevant data as determined by Illinois, as well as an assessment of potential remedies, estimated costs associated with those remedies, and impediments to implementation other than cost with respect to these locations. Furthermore, FHWA intends to make Illinois' report available to the public through the U.S. DOT website. For these reasons, funds designated for use under the HSIP are intended solely for the use of addressing known safety problems contributing to fatalities and severe injuries (severe crashes).

It is recognized that many projects or portions of projects and many actions taken by the Department have a safety focus. Most highway projects incorporate one or more design features or elements that relate to highway safety. Examples include incorporation of guardrail in a design, intersection channelization, signing and pavement markings or other similar elements. Many projects involve reconstruction of a highway or portion thereof to current design standards. While one rationale for such projects or improvements is a general acknowledgement or enhancement of safety, such improvements are to be funded by other programs and not the HSIP. Appropriate use of HSIP funds is only for locations or corridors where a known, 'substantive safety' problem exists as indicated by location-specific data on fatalities and serious injuries, and where it is determined that the specific project action can with confidence produce a measurable and significant reduction in such fatalities or serious injuries. To achieve the maximum benefit, the focus of the program is on cost effective use of the funds allocated for safety improvements. Priority will be given to projects having higher total number of fatalities and serious injuries affected.

ALLOCATION OF FEDERAL HSIP FUNDS

Appendix A illustrates the funding allocation process for the Federal HSIP program. Federal HSIP funds are to be apportioned to the State of Illinois with two programs having set-aside funding. The first set-aside of the HSIP

funding is the Highway - Railway Crossing fund. This fund is distributed into components for the State and Local programs. The second set-aside is the High Risk Rural Roads (HRRR) program targeted to rural collector and local roads. HSIP funds remaining after the set-asides will be distributed between State and Local roads for highway safety improvements.

HIGHWAY - RAILWAY CROSSING FUND

This program is a set-aside of the federal HSIP funds to reduce the number of fatalities and serious injuries at public highway-railway crossings through the elimination of hazards and/or the installation/upgrade of protective devices at crossings.

Illinois is required to conduct and systematically maintain an inventory of all highway- railway crossings that may require separation, relocation, or protective devices, and to establish and implement a schedule of projects for this purpose. At a minimum, this schedule is to provide signs for all highway-railway crossings. (Reference: 23USC130 (b)-(c))

It is required that at least 50 percent of the HSIP – Highway -Railway Crossing funds apportioned be used for the installation of protective devices at highway-railway grade crossings. In addition, up to 2 percent of the funds apportioned may be used for compilation and analysis of data for the required annual report to the U. S. Secretary of Transportation on the progress being made to implement the HSIP – Rail Program. Also, a railroad participating in an HSIP - Rail project is responsible for compensating the department for the net benefit to the railroad of the project. The net benefit to the railroad is determined by the U.S. Secretary of Transportation and may not exceed 10 percent of the project cost.

The department has decided to allocate 40 percent of the HSIP –Highway-Railway Crossing funds to projects on the State system and 60 percent to projects on the Local system. This allocation is subject to change based on system needs. The Federal share for this program is 90 percent. (References: SAFETEA-LU Section 1401 and 23 USC Section 130). IDOT's Bureau of Local Roads and Streets (BLRS) in conjunction with the Bureau of Safety Engineering (BSE) will administer the local HSIP-Rail program funds. IDOT's Bureau of Design and Environment (BDE) in conjunction with the Districts and the BSE will administer the state HSIP-Rail program funds.

HIGH-RISK RURAL ROADS PROGRAM (HRRR)

This program is a set-aside of federal HSIP funds intended for construction and operational safety improvements on high risk rural roads. High risk rural roads are defined as roadways functionally classified as rural major or minor collectors or rural local roads with a fatal or serious/A-injury crash rate above the statewide average for those functional classes of roadways; or likely to experience an increase in traffic volume that leads to a crash rate in excess of the statewide average rate. The Department allocates 100 percent of the

funds set aside for this program to the HSIP - Local Road Program. The BLRS in conjunction with the BSE will administer these program funds. (References: SAFETEA – LU Section 1401 and 23 USC Section 148)

HSIP – ROAD

The Department has determined that the total HSIP – Road apportionment to Illinois will be split 80 percent to the HSIP – State Road Program and 20 percent to the HSIP – Local Road Program.

Road funds for the HSIP – State Road Program will have a portion allocated as statewide line items for project-related engineering, construction and operational safety improvements to be administered by the BSE. The remaining State funds will be allocated to each district using a 5-year average of fatal crashes on the State system as the basis for proportioning.

The Local Road Program component of HSIP – Road funds is a combination of the HRRR set-aside and Local HSIP funds. These funds will be administered by the BLRS in conjunction with the BSE.

DATA MANAGEMENT

Implementation of Illinois' CHSP and HSIP requires the assembly, review and use of data describing the safety performance of the highway system in the state. On the approximately 113,000 miles of roadway in Illinois, over 450,000 crashes resulting in about 1,450 fatalities occur annually. Data from various sources have to be compiled and linked to identify high severity crash locations or corridors of interest in order to develop projects that will be addressed by the HSIP. Five years of historic crash data should be used to identify crash patterns and safety project locations.

IDOT's Division of Traffic Safety (DTS) collects, maintains and distributes crash data that is compiled from crash reports on a continuous basis. The crash data is housed within two data systems: General Accident Information (GAI) for years 1999 to 2003 and Crash Information System (CIS) for 2004 to present. Historically, the safety program was generated through locations identified by the High Accident Location Identification System (HALIS). The HALIS system was designed to take data from GAI and is not supported by CIS; therefore is obsolete. The last years supported for identification of High Accident Locations (HAL's) and Wet Pavement Cluster/Segments are 2001-2003. These lists are outdated and do not meet new program objectives and shall not be used to support future HSIP project identification and selection.

IDOT's Office of Planning and Programming (OPP) maintains the Illinois Roadway Inventory System (IRIS) database, which provides detailed roadway information on all roadway segments, spot locations, and highway-railway

crossings. The crash database in conjunction with the IRIS data is the underlying information used to identify projects for the HSIP. GAI, CIS, and IRIS are pulled together through a Safety Data Mart to provide users preformatted reports and the ability to perform ad-hoc reporting.

IDOT's BLRS and BDE maintain an inventory of Local highway-railway crossings and State-maintained railroad crossings, respectively, that will be used to identify high risk highway-railway crossing locations.

Developing an effective statewide program will be a collaborative and integrated effort. The BSE is responsible for developing, implementing, and maintaining the ICHSP, guiding the efforts of the ICHSP into the HSIP. Both at the State and Local level, the engineering communities are encouraged to work with their law enforcement partners to identify locations and contributing factors of severe crashes.

In lieu of the HAL and Wet Pavement Cluster sites, the BSE has used data from the DTS to develop two new products. The first is a Geographic Information System (GIS) map of the top 5% public roadways with the most severe safety needs in the state. For this year, this 5% Severe Location map represents locations on the state system only.

This map has been forwarded to the Safety Committee in each district. It is expected to serve a similar purpose as the HAL locations had in the past. These locations will be posted on the USDOT public website. Another new resource developed by BSE is the GIS mapping of fatal and severe injury (A-injury) crashes in each district on the State system. This mapping is based on five years of crash data, sorted by crash type, and overlaid with the department's multi-year program. It has also been provided to the Safety Committee in each district. The intent of this mapping is to enable programmers, planners, and designers to visually review severe crash patterns and filter the data for crash or location parameters. This resource should be useful in starting to analyze the 5% severe locations, and to look for patterns or occurrences at other locations that provide opportunities for safety improvement. Both of these new products focus on fatal and severe injury crashes. This is according to the provisions of the HSIP from the Federal SAFETEA-LU highway reauthorization, and the ICHSP.

Efforts are underway to provide crash location data for historic local system crashes. BSE will assist the BLRS and local agencies in this effort. Completing this effort will allow local agencies to access five years of crash data through the Safety Data Mart. Until this data becomes available, local agencies should work with their local law enforcement to obtain and compile crash information, identify systematic problems or locations of severe crashes, determine contributing factors to the severe crash locations or system, and identify integrated strategies to address fatal and severe injury crashes that occur on the local roadway system.

BSE is also responsible for compiling the HSIP for Illinois based on input from Districts and local governments.

PROGRAM PLANNING AND SELECTION OF HSIP CANDIDATE PROJECTS

In order to achieve the requirements set forth by SAFETEA-LU and the ICHSP, opportunities to produce a measurable and significant reduction in fatalities and serious injuries resulting from crashes on the highway system need to be incorporated into the program planning process. The 5% Severe Location maps and the Fatal and Serious Injury maps will assist in this effort.

BSE will assist the Districts in identifying problem areas, and developing cost-effective strategies to implement at problem area locations. Such assistance will include development and distribution of the 5% Location maps and the Fatal and Serious/A- Injury maps. BSE will also provide lists and summaries of effective engineering countermeasures and methods for evaluating the cost-effectiveness of countermeasures. In addition, BSE will also provide consultation to assist in interpretation of data and information in the District's efforts. Districts are responsible for development of their recommended projects eligible for HSIP funding according to these guidelines. BSE will also identify system-wide safety improvements for certain ICHSP emphasis areas to be implemented by Districts for State highways.

The HSIP will be assembled from a planning process conducted by each of the Districts and local units of government. Each District shall establish and maintain a District Safety Committee comprising the following District positions or equivalent persons: Programming Engineer, Studies and Plans Engineer, Geometrics Engineer, Operations Design Engineer, and Traffic Engineer. The District Safety Committee is encouraged to coordinate with the law enforcement community (state and local) on a regular basis to identify severe crash locations, behavioral and engineering related contributing factors, and opportunities to provide integrated solutions to address the severe crash location.

Selected candidate projects shall be data driven and developed from:

- Materials (maps, data, screening lists) provided by BSE and/or the DTS,
- District documentation of existing high severity crash conditions, and Corridor/system wide crash trends.

Projects to be considered for funding under the Local Road Program component of HSIP – Road funds will be submitted through a solicitation of candidate projects by the BLRS and the BSE. Local agencies applying for HRRR funds under the HSIP shall provide documentation that the project location has an annual fatal crash rate or serious/A-injury rate that exceeds the values listed in the following table.

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Functional Class	State Average Fatal Crashes per Year* (Fatal Crashes per 100 Centerline Miles)	State Average Serious/A-Injury Crashes per Year* (A-Injury Crashes per 100 Centerline Miles)
Rural Collector	2.7	4.4
Rural Local Road	0.5	6.2

*BASED ON A MINIMUM OF 5 MOST RECENT YEARS OF CRASH DATA; MINIMUM SEGMENT LENGTH OF 0.1 MILES.

The minimum length of a segment for calculating crash rates is 0.1 mile. For an intersection project, for the purposes of calculating segment lengths for comparison with threshold values above, a candidate intersection project should be assigned a segment length of 0.1 mile.

Spot locations with multiple fatalities or serious injuries will have a rate that significantly exceeds the statewide average rate for the respective functional class. To optimize the use of the HRRR funds, the threshold for project consideration will be a minimum of 1.0 fatal or 2 serious/A-injury crashes within the project limits.

Appendix B describes the project selection process to be used by both Districts and local governments. Each district and local agency submitting projects for HSIP funding, will establish priorities for HSIP project selection based on optimizing the reduction in fatal and serious injury crashes and the potential to reduce crash severity and/or frequency of severe crashes. The Central Safety Committee comprised of representatives from BSE, BDE, BLRS, and FHWA will review and approve submitted HSIP projects.

The keys to success in HSIP project selection will be 1) employing a data-driven project selection process that focuses on traffic fatalities and serious injuries; 2) studying the site and crash records for problem identification and contributing factors; 3) applying a full range of countermeasures proven effective in reducing crashes and tailored to specific highway types or conditions, and 4) focusing on lower cost solutions that will enable more sites and/or mileage that can be treated with the available funds. Highway safety improvement projects may include (but are not necessarily limited to one or more of the following:

- Improvement of highway signage and pavement markings
- Elimination of roadside obstacles
- Installation of guardrails, barriers, and crash attenuators
- Pavement and shoulder widening to remedy an unsafe condition

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- Installation of rumble strips or other warning devices
- Realignment or reconstruction, lane additions
- Intersection safety improvements
- Installation of a skid-resistant surface (de-slick) at locations with a high frequency of severe crashes related to friction deficiency
- Improvement for pedestrian or bicyclist safety
- Construction of traffic calming features
- Improvement of crash data systems
- Installation of a traffic control or other warning device at a severe crash location

Appendix C contains a list of relevant technical literature providing background on appropriate engineering improvement countermeasures.

Districts should use data and information provided by the BSE and DTS to initiate project selection. Districts are encouraged to supplement these data with more recent crash data, GIS technology capabilities, and other severe crash information not provided by BSE or the Division of Traffic Safety. Districts shall maintain a focus on addressing fatal and serious injury crashes in the use of supplementary data or information.

Systematic improvements demarcated as a Low Cost Safety Improvement (LCSI) in the Guidelines to Counter Measure Effectiveness and Crash Reduction Factors (Appendix E) may be proposed.

Districts will analyze candidate HSIP projects to determine the appropriateness of an engineering solution. Site-specific knowledge of conditions and engineering feasibility are critical elements of this analysis. Fatalities and serious injuries are infrequent compared to all other crashes; therefore five years of crash data should be used for the analysis in order to better understand the crash trends and assure that selected sites are truly high risk locations.

Several additional tools are available for district analyses and engineering studies including, but not limited to, field visits, crash report evaluations, road safety analyses, police narrative analyses, crash reconstruction reports, CRS video logs, and Road Safety Assessments (RSA).

Local governments should use a process similar to that used by the Districts. Information (maps, data, etc.) will be made available by the BSE for use by local governments, which will be responsible for supplementing the information with their own data or field studies to provide the necessary knowledge base to perform all needed studies. The Safety Data Mart is planned to be accessible to local agencies.

BSE compiles the overall state program and reports to FHWA on overall program costs and effectiveness.

DOCUMENTATION AND REPORTING

The primary method for determining cost-effective site selection and treatment will be a benefit-to-cost estimation procedure. Applications for funding under the HSIP program must include a complete benefit-to-cost calculation according to the methodology described by BSE (Appendix D). This methodology includes recording of site-specific crash information, fatality and injury data, application of countermeasure effectiveness (Appendix E), and countermeasure service life (Appendix F).

All candidate project submittals and the appropriate documentation should be on the attached HSIP Candidate form (Appendix G). The Department has performed several RSAs for state and local projects. Training has been provided in three districts, and further training is planned as part of the Program Development Technical Training Program. RSA's will become the preferred tool for analysis of HSIP project locations, and should be considered suitable for any project. It is recommended that an RSA be completed for each site, segment, or systematic improvement proposed. The RSA shall include identification and rating of risks within the project limits and justification for each that will or will not be addressed by the proposed work. Documentation of crashes, existing conditions contributing to the crashes and relation of the proposed countermeasures to the identified crash risks will be critical to the approval of all projects. A sample submittal package is attached in Appendix H. RSAs will be required for HSIP projects on the State highway system entering into the FY09 program.

IMPLEMENTATION

Prioritized State HSIP project candidates shall be submitted to the State Safety Engineer, BSE, by February 28.

Prioritized Local HSIP project candidates shall be submitted to the BLRS which, upon review and approval for completeness per this policy, will submit them to the State Safety Engineer, BSE, by March 15. The BLRS will input data for listing of local HSIP projects.

Prioritized HSIP – Rail project candidates for the state system shall be submitted to the State Safety Engineer, BSE, by March 30. Prioritized project candidates for the Local system shall be submitted to the BLRS which, upon acceptable review, will submit them to the State Safety Engineer, BSE, by April 1.

Prioritized HRRR project candidates shall be submitted to the BLRS which, upon acceptable review, will submit them to the State Safety Engineer, BSE, by March 15. The BLRS will input data for listing of HRRR projects.

The BSE will compile a list of all projects submitted under the HSIP. A Central HSIP Committee, chaired by the State Safety Engineer, BSE, with members from the BSE Safety Implementation Section, FHWA Mobility and Safety Team, the appropriate field engineers from the BDE and FHWA, and BLRS (for local roads projects) will review and approve or disapprove all HSIP, HSIP – Rail, and HRRR projects submitted under the HSIP.

To meet the requirements set forth by the ICHSP and SAFETEA-LU, HSIP funds need to be directed to locations and improvements that can achieve the greatest impact towards reducing severe crashes. It is anticipated that applications from Districts and local agencies with supporting Benefit-to-Cost (B/C) calculations will exceed available funds. Approval of projects and their inclusion in the Illinois HSIP will be on the basis of those projects with the highest B/C ratio. Only projects having a B/C ratio greater than one may be selected, but not all projects with a B/C ratio of greater than one will be selected. Projects that are disapproved will be returned to the submitting agency with an explanation for their exclusion from the program. This may entail lack of sufficient information, or a note that other projects considered more worthy (per their B/C determination) required use of the fiscal year's HSIP allocation. Projects disapproved in one fiscal year may be re-submitted in subsequent years, but with the understanding that data and analyses should be updated.

Approved projects will be forwarded to OPP to be included in the annual program. OPP will code approved projects so they are identifiable as an HSIP projects.

PROGRAM EVALUATION

HSIP project evaluation will be performed according to the requirements outlined in the Code of Federal Regulations, Title 23, Volume 1, Section 924.13. The BSE will coordinate with each District Safety Committee to track project locations, safety improvements performed, and level of effectiveness of the improvement with respect to reducing fatalities and severe injuries.

REPORTING TO FHWA

A report covering the HSIP during the previous July 1 through June 30 period shall be submitted to the Illinois FHWA Division Administrator no later than August 31 each year. It shall report on the progress made in implementing the HSIP – Road program and the HSIP – Rail program, and shall evaluate the effectiveness of completed highway safety improvement projects in these programs. This report shall describe the extent to which the improvements funded under this program contribute to the goals of reducing the number of roadway-related injuries and fatalities and the occurrences of roadway-related

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crashes, mitigating the consequences of roadway-related crashes, and reducing the occurrences of crashes at highway-railway crossings. This information shall be made available to the public through the department's website. The BSE will coordinate with each District Safety Committee, BLRS, and BDE and prepare the annual report.

APPENDIX

- A. Allocation of Federal HSIP Funds Flow Chart
- B. Project Selection Process
- C. Peer Groups & References on Counter Measures
- D. Benefit-to-Cost Methodology
- E. Guidelines to Counter Measure Effectiveness & Crash Reduction Factor
- F. Guidelines to Counter Measure Service Life
- G. HSIP Candidate Form
- H. Example of Submittal Package

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