



A REPORT  
TO THE  
MONTANA  
LEGISLATURE

PERFORMANCE AUDIT

# *The Highway Safety Improvement Program*

*Montana Department of  
Transportation*

OCTOBER 2012

LEGISLATIVE AUDIT  
DIVISION

12P-07

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Performance audits conducted by the Legislative Audit Division are designed to assess state government operations. From the audit work, a determination is made as to whether agencies and programs are accomplishing their purposes, and whether they can do so with greater efficiency and economy.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Members of the performance audit staff hold degrees in disciplines appropriate to the audit process.

Performance audits are performed at the request of the Legislative Audit Committee which is a bicameral and bipartisan standing committee of the Montana Legislature. The committee consists of six members of the Senate and six members of the House of Representatives.

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October 2012

The Legislative Audit Committee  
of the Montana State Legislature:

This is our performance audit of the Highway Safety Improvement Program. This report includes recommendations for the program, including evaluating the results achieved by the program in reducing fatalities and injuries on public roads; and improving internal controls for tracking program projects to ensure they are completed as planned and in compliance with applicable laws and regulations. A written response from the Montana Department of Transportation is included at the end of the report.

We wish to express our appreciation to department officials and staff for their cooperation and assistance throughout the audit.

Respectfully submitted,

*/s/ Tori Hunthausen*

Tori Hunthausen, CPA  
Legislative Auditor



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	Diann Seymour-Winterburn	2013
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## MONTANA LEGISLATIVE AUDIT DIVISION

## PERFORMANCE AUDIT

The Highway Safety Improvement Program  
Montana Department of Transportation

OCTOBER 2012

12P-07

REPORT SUMMARY

The Montana Department of Transportation (department) should evaluate the Highway Safety Improvement Program to ensure the \$80 million in state and federal funds obligated to safety projects results in a reduction in traffic fatalities and serious injuries on public roads in Montana.

## Context

The Highway Safety Improvement Program (HSIP) is a federal-aid program of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, which is a 2005 federal funding and authorization bill that governs U.S. federal surface transportation spending. On an annual basis, the department identifies locations on Montana's public roads where public safety could be increased through the installation of a safety improvement, such as lighting, chevrons, guardrails, and rumble strips. While the scale of projects is generally small, larger projects such as the installation of a roundabout may also be considered for an HSIP project. Since inception of the program, the department has approved 304 HSIP projects. Since 2005, over \$80 million in state and federal funding has been obligated by the program.

Audit work examined how the department implements the HSIP and assesses if the program results in reductions in fatalities and serious injuries on public roads. Audit work identified the need for the department to evaluate the HSIP in order to ensure that the program is achieving intended results and project investments are reducing fatalities and serious injuries.

As part of audit work, we also determined that internal controls for the program could be improved. Information on the status or completion of HSIP projects is not readily available. At present, the department does

not track the status of HSIP projects in order to demonstrate that projects are completed as planned. For example, of the 66 projects the department prioritized for completion in 2005, information on the status or a date of completion for 79 percent of those projects was not documented.

## Results

Audit recommendations address the need for the department to evaluate the HSIP and strengthen internal controls for the program. Recommendations include:

- ◆ Comply with federal regulations by analyzing and assessing how the program reduces the number of crashes, fatalities and serious injuries, or potential crashes on public roads in Montana; and
- ◆ Strengthen internal controls for the program to track and document the status and completion of HSIP projects.

Recommendation Concurrence	
Concur	2
Partially Concur	0
Do Not Concur	0
<b>Source: Agency audit response included in final report.</b>	

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# Chapter I – Introduction

## Introduction

Improving highway safety is about achieving a reduction in the number and severity of traffic crash injuries and fatalities on highways and other public roadways. The Montana Department of Transportation (department) plays a key role in highway traffic safety in Montana. Generally, the department identifies and addresses known safety concerns on roadways as part of any major construction project. In addition, the department identifies and addresses known safety issues as part of the Highway Safety Improvement Program (HSIP). The HSIP is located within the department's Highways and Engineering Division. The Legislative Audit Committee prioritized a performance audit of the department's HSIP activities.

## Audit Objectives, Scope, and Methodologies

Based on assessment work, we developed two objectives for examining the HSIP:

- ◆ Does the department have an evaluation process in place to determine if HSIP projects result in a reduction in fatalities and serious injuries on public roads?
- ◆ Does the department implement HSIP projects based on identified safety priorities?

Program processes for the HSIP are broken into three main components—namely planning, implementation, and evaluation—within applicable federal regulations. During our assessment work, we determined that the planning processes associated with the HSIP at the department represented a low program risk. The process by which the program identifies potential HSIP projects is well-defined and represents a program strength. However, during assessment work, we determined there were risks associated with how the department implements and evaluates HSIP projects. Overall, our audit examined department processes for HSIP implementation and evaluation to determine how the department implements HSIP projects and assesses if projects result in reductions in fatalities and serious injuries on public roads. To accomplish these objectives, we completed the following methodologies:

- ◆ Reviewed applicable state laws and program policies;
- ◆ Reviewed Montana's Comprehensive Highway Safety Plan;
- ◆ Reviewed federal law, regulations, and program guidance regarding planning, implementing, and evaluating the HSIP;
- ◆ Interviewed a representative of the Federal Highway Administration;
- ◆ Reviewed department policies for implementing and evaluating other types of maintenance and construction activities;

- ◆ Reviewed data used by the department to track HSIP projects;
- ◆ Reviewed hardcopy files for HSIP projects identified, reviewed, and prioritized for implementation in 2005, for a total of 66 HSIP projects;
- ◆ Interviewed department staff, both in Helena and in two of the department's five regional district offices; and
- ◆ Obtained and reviewed information for the HSIP in other states, including Colorado, North Dakota, Utah, and Wyoming.

## The Highway Safety Improvement Program

The HSIP is a core federal-aid program of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which is a 2005 federal funding and authorization bill that governs U.S. federal surface transportation spending. Program activities at the department began in fiscal year 2005. States administer the HSIP with federal oversight from the Federal Highway Administration (FHWA). The department section responsible for the activities of the HSIP is comprised of nine full-time employees (FTE). These staff are primarily responsible for the activities of the program, but also perform other safety-related functions within the department. While the program is administratively located in Helena, staff in each of the department's five regional districts are also involved in the review and selection of potential HSIP projects. Each district has a central administrative office, namely Missoula, Butte, Great Falls, Billings, and Glendive.

### **HSIP Funding**

HSIP projects are funded via a combination of state and federal funds, with federal funds representing 90 percent of project funding. Federal funds are apportioned to states based on a number of factors, such as miles of highways in each state. In Montana, state funding for the program is derived from the state gasoline tax. Since state fiscal year 2005, over \$80 million in state and federal funding has been obligated for HSIP projects in Montana. Individual HSIP projects can range from under \$1,000 to over \$1,000,000. Table 1 represents total state and federal HSIP project funds obligated by the program in Montana from state fiscal year 2005 through 2012.

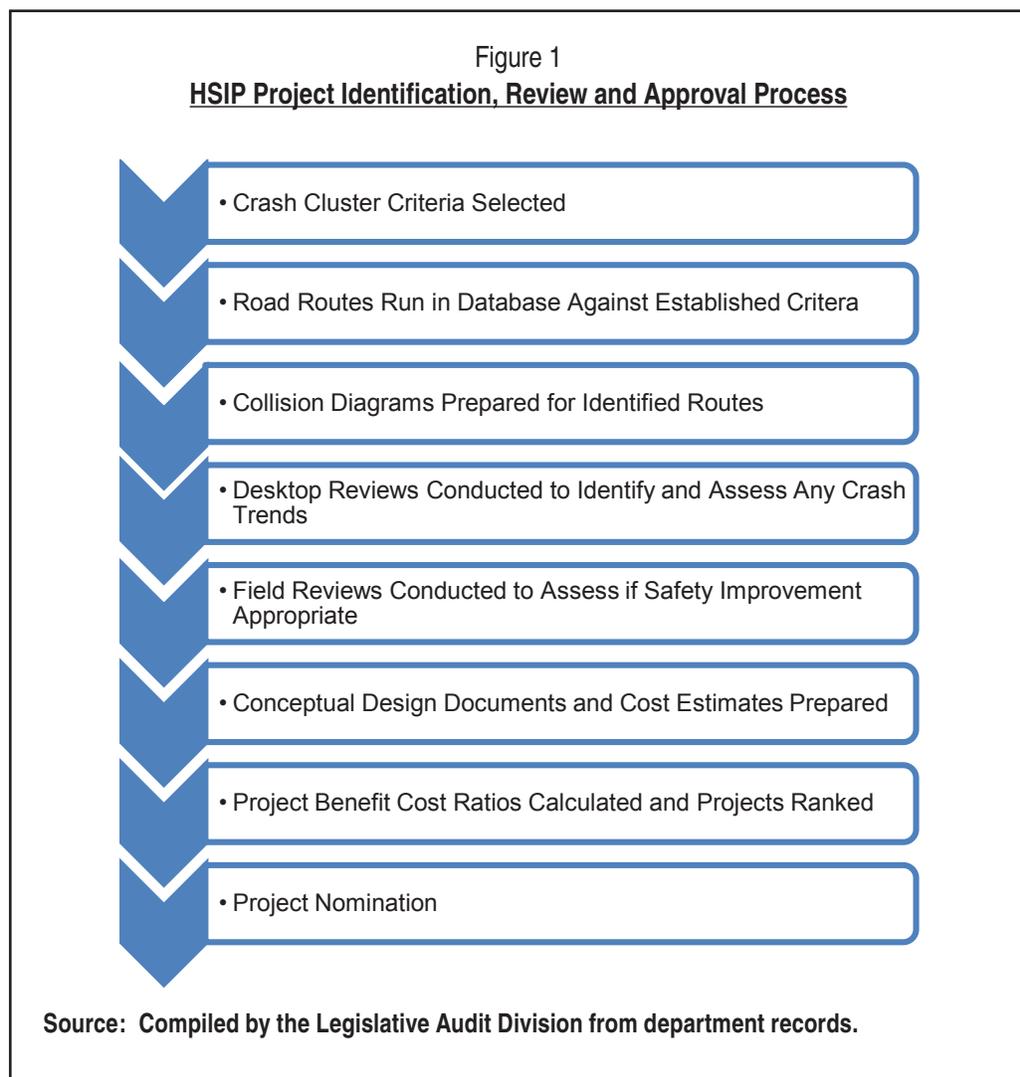
Table 1  
**Highway Safety Improvement Program Project State  
and Federal Obligations**  
State Fiscal Years 2005 through 2012

State Fiscal Year	State	Federal	Total
2005	\$770,489	\$6,934,400	\$7,704,889
2006	\$566,467	\$5,098,201	\$5,664,668
2007	\$644,045	\$5,796,404	\$6,440,449
2008	\$1,427,031	\$12,843,279	\$14,270,310
2009	\$1,120,270	\$10,082,430	\$11,202,700
2010	\$1,078,563	\$9,707,067	\$10,785,630
2011	\$1,177,253	\$10,595,275	\$11,772,528
2012	\$1,218,083	\$10,962,742	\$12,180,825
<b>Total</b>	<b>\$8,002,201</b>	<b>\$72,019,798</b>	<b>\$80,021,999</b>

**Source: Compiled by the Legislative Audit Division from department records.**

## HSIP Project Identification, Review, and Implementation

HSIP projects are prioritized through the use of crash data. The department obtains crash data from the Montana Highway Patrol. On an annual basis, the department establishes numerous crash cluster criteria to identify potential project locations. For example, in 2005, three or more fatalities within a .5 mile segment of road would identify a location for additional review. Identified locations are reviewed and selected through a number of successive steps, beginning with identifying crash cluster criteria and ending with obtaining project approval from the department's Transportation Commission. Figure 1 illustrates the steps in the identification and review process for a potential HSIP project until project nomination and approval.

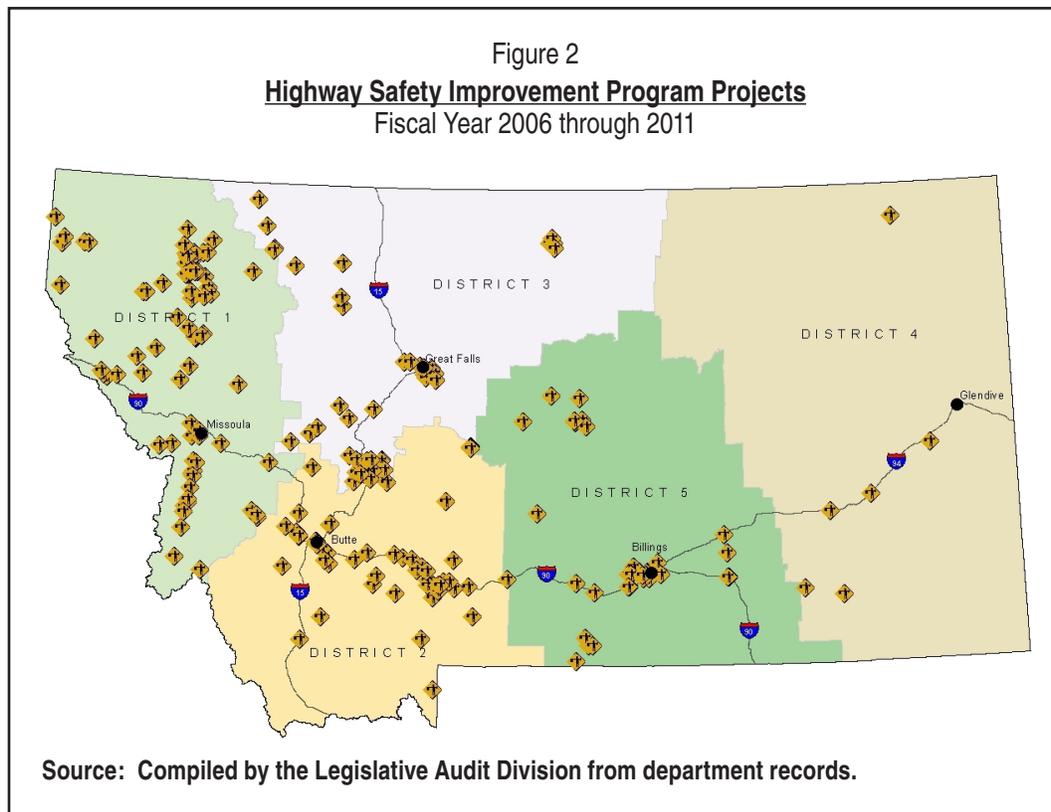


While an HSIP project may be identified and approved in one year, it may not be implemented until a number of years later. All approved projects will be completed, but there may be other factors to consider, such as funding, coordination, or

right-of-way acquisition, which impact the timing of a project's implementation. Depending on scale, a project may be completed by the department's maintenance staff or be let to contract. Examples of improvements suggested by the program include safety countermeasures such as lighting, chevrons, guardrails, and rumble strips. While the scale of projects is generally small, larger projects such as the installation of a roundabout may also be considered for an HSIP project.

## Highway Safety Improvement Projects

As noted, the program identifies, reviews, and nominates for approval potential HSIP projects on an annual basis. From fiscal year 2006 through 2011, the department approved 304 HSIP projects for completion. These projects represent both those which will be completed by the department's maintenance staff and those which will be let to contract. The following map illustrates the 304 HSIP projects approved by the department in each of the department's five regional districts. As illustrated by Figure 2, the majority of HSIP projects which have been scheduled for completion are in the western part of the state where traffic volume rates are higher.



## **Montana Has a Defined Process in Place to Identify HSIP Projects**

Identifying high-risk corridors, road segments, or locations based on established criteria is an integral part of the HSIP. One of our audit objectives examined if the department implements HSIP projects based on identified safety priorities. During our audit work, we concluded that the department has a well-established process in place for identifying HSIP projects for completion based on established safety priorities. However, we also determined that the department could strengthen its internal controls for tracking and documenting HSIP projects to ensure that projects are completed as planned. This issue will be discussed further in Chapter III.

### **Report Contents**

The remainder of this report includes chapters detailing our findings, conclusions, and recommendations in the following areas:

- ◆ Chapter II addresses how the department should evaluate the results of the HSIP.
- ◆ Chapter III presents information on how the department should strengthen internal controls for the program.



## CHAPTER II – Program Evaluation

### **Introduction**

Our first audit objective examined the Montana Department of Transportation's (department) process for evaluating the Highway Safety Improvement Program (HSIP). Program evaluation focuses on whether a program is working as intended and if there are ways in which a program could be improved. According to the Code of Federal Regulations 924.13(a)(1), each state's HSIP processes shall include a process to analyze and assess the results achieved by the HSIP in reducing the number of crashes, fatalities and serious injuries, and in reaching the performance goals of the state's Strategic Highway Safety Plan, referred to in Montana as the Comprehensive Highway Safety Plan (CHSP). The CHSP is a statewide safety plan facilitated by the department that provides a framework for reducing highway fatalities and serious injuries on all public roads. The Montana CHSP establishes statewide goals, objectives, and key emphasis areas developed in consultation with tribal, federal, state, local, and private sector safety stakeholders. The CHSP is a federal requirement for states to receive HSIP funding.

### **The Department Does Not Evaluate the HSIP**

At the present time, the department does not evaluate the HSIP. According to department staff, the HSIP is just one safety activity relative to the overall goal of the CHSP, to "reduce fatalities and incapacitating injuries in the state of Montana by half in two decades, from 1,704 in 2007 to 852 by 2030." Consequently, the department has not established a process to single out and evaluate the impact of the HSIP. Progress toward meeting the overall goal of the CHSP is measured through the use of statewide safety data. The activities of the HSIP are considered to be part of the department's many activities toward meeting the overall goal of the CHSP. The plan includes a number of activities to improve highway safety, including both engineer-based improvements such as the HSIP, as well as public service campaigns to educate drivers about high-risk behaviors such as drinking and driving.

### **Is the HSIP Achieving Intended Results?**

As part of our audit work, we reviewed project files for the 66 locations prioritized for completion by the department in 2005. We selected 2005 with the expectation that the majority of projects identified and prioritized in that year would be completed with a minimum of three years of crash data available for analysis. For those 66 project files we reviewed, none of these project files contained documentation of an evaluation. Without an evaluation process to analyze and assess the results achieved by the HSIP, it is unknown if the program is achieving a reduction in traffic fatalities and serious

injuries on all public roads. According to department data, the total number of fatalities and serious injuries on Montana roadways has decreased from 1,704 in 2007, to 1,162 in 2011. While this is a positive trend on the part of highway safety in Montana, it is generally unknown what impact the activities of the HSIP have had relative to this progress.

For example, as part of the 2005 HSIP project identification and review process, the department prioritized for completion a \$453,000 highway fencing project near Browning designed to keep livestock from entering onto a public roadway. Livestock fencing is typically installed to act as physical barrier between livestock and a roadway. According to department data, for the ten-year period from January 1995 to December of 2004, there were 73 total accidents on the affected roads. While not all of these accidents were related to livestock, over the course of its project identification and review analysis, the department determined that a trend existed relative to crashes resulting from livestock on the roadway. The department determined that livestock fencing was an appropriate safety countermeasure to reduce accidents. However, without an evaluation process for the HSIP, it is unknown if this safety improvement achieved its intended result.

### **HSIP Evaluation Could Improve Future Program Planning**

An evaluation process for the HSIP could help the department improve future program planning, in terms of targeting the most effective safety improvements for completion. An important component for evaluation is to identify which safety measures are not as effective as originally expected and decide not to use them in the future. For example, the department frequently approves the installation of improved signing, lighting, and road boundary delineators as part of the HSIP. Typically these types of improvements represent a low cost to the program with the expected benefit far outweighing the cost of the improvement. Some of these projects represent a cost of less than \$1,000 for the program. According to department staff, based on national safety studies they understand that these types of measures improve highway safety. While it likely would not be cost effective to evaluate each one of these types of improvements, the department could evaluate these lower cost improvements in a group as part of the program's overall strategy in order to determine which safety measures are not as effective as originally expected and use this information as part of future program planning. Or the department could establish a threshold for program evaluation, only evaluating HSIP projects which exceed a defined funding target. Department staff may determine what would be most meaningful for them to evaluate, while still complying with federal law and regulations.

## **The Department Has Not Emphasized HSIP Evaluation**

According to department staff, their primary goal for the HSIP is to obligate federal funding and avoid a situation where the department reverts funds to the federal government. Consequently, staff have been primarily focused on identifying HSIP projects for completion to leverage federal funding. Evaluation for effectiveness has not been emphasized. According to department staff, the safety improvements which are being completed as part of the program have been nationally proven by study to reduce the number and severity of crashes. However, department staff also indicate that these studies do not necessarily pertain to rural states like Montana. In addition, department staff indicate that a location where a safety improvement has been completed is complex, with incidents of crashes influenced by a number of nonengineering based factors, such as weather, traffic volume, and driver behavior. Due to these other factors, staff express concerns that evaluation of an HSIP location may not completely relate to an HSIP safety improvement. As a result, they have not defined a process to evaluate the HSIP.

## **Federal Guidance Emphasizes HSIP Evaluation**

The Federal Highway Administration developed an HSIP manual which provides guidance to states for administering the HSIP. This manual provides an overview of the HSIP and outlines procedures and tools to assist transportation professionals with the planning, implementation and evaluation phases of the HSIP. The manual stresses the importance for states to evaluate the HSIP to achieve results. According to the manual, “evaluation is critical to determine if a specific project or group of projects is achieving the desired results and to ensure the investments have been worthwhile.” The Moving Ahead for Progress in the 21st Century Act (MAP-21) surface transportation bill for fiscal years 2013 and 2014 was recently signed into law. MAP-21 is the first long-term highway authorization enacted since 2005. This law continues the HSIP, doubling funding for the program. MAP-21 states that each state shall: “establish an evaluation process to analyze and assess results achieved by highway safety improvement projects.”

## **Other State’s Department Programs More Clearly Define Evaluation**

As is the case in Montana, the HSIP in other states are also defined and guided by federal law and regulations. Similar to Montana most other states have limited evaluation processes in place for the HSIP. However, all HSIP projects are evaluated independently in Utah. According to Utah’s HSIP Manual, three years following construction of a given HSIP project, the crash history for the three-year post construction period is analyzed. Utah compares before and after crash histories to assess each project’s impact on safety.

Like the HSIP, the department's Montana Rail-Highway Safety Program is required by federal law and regulations to conduct evaluation. As part of the program's annual reporting requirements, the program is required to include project-specific metrics that support the effectiveness of funded projects. As part of those metrics, federal reporting requires the program include a minimum of three years before and three years after project completion crash data to demonstrate the effectiveness of projects from prior years. In practice, the department evaluates program projects on a ten-year basis, due to the low volume of rail-highway crossing collisions in Montana.

### **Additional Evaluation Would Strengthen the HSIP**

Evaluation of the HSIP is important to determine if a specific project or group of projects is achieving the desired results and to ensure the investments have been worthwhile. Considering that the HSIP has obligated over \$80 million of state and federal funding through fiscal year 2012 on safety projects, it is important for the department to be able to evaluate program activities to make the best use of state and federal resources, incorporate lessons learned for the future, and improve highway safety in Montana.

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#### ***RECOMMENDATION #1***

*We recommend the Montana Department of Transportation comply with federal regulations by analyzing and assessing how the Highway Safety Improvement Program reduces the number of crashes, fatalities and serious injuries, or potential crashes on public roads in Montana.*

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## CHAPTER III – Internal Controls

### Introduction

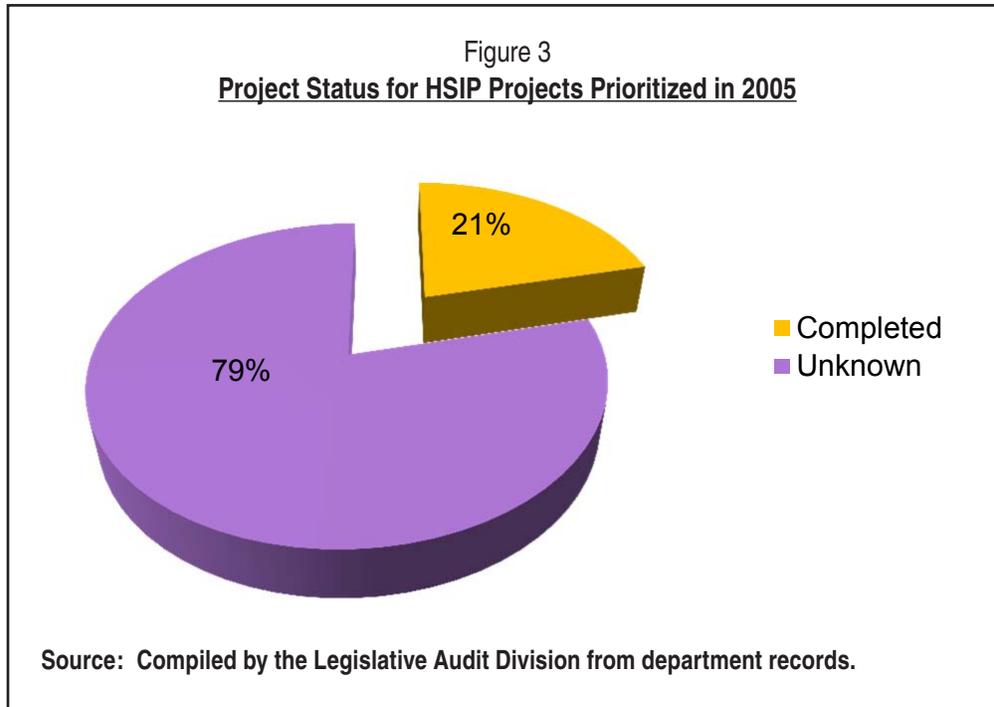
Internal controls are defined as a coordinated set of policies and procedures used to ensure agencies, programs, or functions operate efficiently and effectively, and in conformance with applicable laws and regulations. These controls promote accountability within an organization and provide a reasonable assurance that what is expected to happen will actually happen. Over the course of our audit work, the department was not able to provide the status or a date of completion for all HSIP projects approved since the program's inception in 2005. The remainder of this chapter discusses this issue further.

### HSIP Project Completion Not Tracked

As noted earlier, once an HSIP project is approved, it is scheduled for completion in coordination with other Montana Department of Transportation (department) construction and maintenance activities. As a result, an HSIP project becomes part of numerous other department processes for tracking construction or maintenance activities. Presently, the department does not track HSIP projects in order to demonstrate that projects are completed as planned. For example, according to department data, 119 approved HSIP projects were placed on the department construction schedule plan in 2006. The following bullets represent examples of limited data for those 119 HSIP projects scheduled in 2006:

- ◆ Fourteen of these projects were either to be completed by department maintenance staff or another party, such as local government, through a work agreement with the department. The status or a completion date for these projects was not documented.
- ◆ Similarly, for projects let to contract, the status or a completion date is frequently not documented. Sixty-four projects were let to contract in 2010 or earlier and the status of twenty-three of those projects was not documented in the information we reviewed.

To examine this further, we also reviewed information for the 66 HSIP projects prioritized in 2005. We noted that 79 percent of project information did not document a date of completion or the status of the project. Twenty-one percent of project information documented a date of completion or the status of the project. Figure 3 illustrates the 66 HSIP projects prioritized in 2005 and the status of those projects.



### **Are HSIP Projects Completed as Planned?**

Due to limited information and to further assess if HSIP projects are completed as planned, we traveled to two of the five department's regional districts in order to understand the role of district staff in the identification and completion of HSIP projects. We selected two HSIP projects in each district approved in 2006 in order to determine if projects were being completed as planned. In each district, we selected one project completed by the department's maintenance staff and one project let to contract. We discussed these projects with district staff and visited project locations to verify project completion. District staff confirmed the completion of an HSIP project primarily through their professional knowledge of maintenance and construction projects in their district.

For example, in one district, we verified that an HSIP project was completed as planned by the department's maintenance staff. The project included the installation of road signing around a series of curves. While the project was approved in 2006, it was not complete until 2009. District staff indicated it was not likely completed until 2009 due to funding limitations. In another district, we verified that an HSIP project was let to contract and completed as planned. This project involved the realignment of a public road intersection. Specifically, the intersection was narrowed where pedestrians cross, in order to slow traffic and shorten the distance where pedestrians cross. Intersection crossing markings were also added to the area. The project was approved in 2006, let

to contract in 2010, and completed in 2011. For sites we visited, we found that HSIP projects are completed as planned; however, that information is not readily available. Program staff are generally unaware of the completion status of HSIP projects. The Figure 4 illustrates the above HSIP project safety improvements.

Figure 4  
**2006 HSIP Maintenance Project: Curve Signing**



**2006 HSIP Construction Project: Intersection Realignment**



Source: Compiled by the Legislative Audit Division.

According to Federal Highway Administration (FHWA) staff, the department is doing a good job of completing HSIP projects in Montana. Due to the complicated nature of engineering projects, including factors such as environmental concerns or condemnation, FHWA staff report it is appropriate that a project can get shuffled and not completed in the year in which it was approved. Once an HSIP project is approved for completion, it leaves the program and becomes part of larger departmental scheduling process, including planning, programming, preconstruction, construction, and maintenance. However, FHWA staff indicated that the process should be better documented to track the status and completion of HSIP projects.

### **The Department Has Not Established Guidelines for Documenting Project Completion**

Department staff contend that while there is not a single process in place for tracking HSIP projects to completion, information on the status of these projects is available. For example, all projects which are designed and planned by the department's preconstruction program are assigned a numerical identifier and tracked in that program's database. Larger HSIP projects which are let to contract are tracked within the department's database used by the construction program. This database is able to obtain information on the status and completion of any project let to contract. Likewise, smaller projects which are implemented by the department's maintenance staff are similarly tracked via another database used by the maintenance program. However, these various databases do not share information with each other, with each system assigning a different numerical identifier for each HSIP project. Department staff report that HSIP projects may also be coordinated with other types of projects or completed by local government via a work agreement which can complicate tracking project outcomes.

Department staff emphasize that HSIP projects are completed as planned; however, due to the fact that an HSIP project may take one of several different paths to completion, information on project completion status is not readily available. In addition, department staff report they have not defined a process for reporting back to the HSIP to notify the program of a project's completion. Department staff indicate this is an area of improvement for the HSIP. Department management report they are currently in the process of designating a staff person within the program with the responsibility of tracking the status and completion of HSIP projects. This is a positive step toward strengthening internal controls for the program. It will be important for the department to have ready access to information on the completion of HSIP projects in order to effectively evaluate the program and increase public safety in Montana.

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**RECOMMENDATION #2**

*We recommend the Montana Department of Transportation strengthen internal controls to track and document the status of Highway Safety Improvement Program projects, including reporting back to the program upon project completion.*

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MONTANA DEPARTMENT  
OF TRANSPORTATION

DEPARTMENT RESPONSE





Montana Department of Transportation

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A-1

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Brian Schweitzer, Governor

October 5, 2012

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LEGISLATIVE AUDIT DIV.

Subject: The Highway Safety Improvement Program

Dear Tori,

Thank you for giving the Montana Department of Transportation (MDT) an opportunity to respond to the performance audit performed by your office for the Highway Safety Improvement Program use in Montana.

We have attached our response including a management action plan. I appreciate your staff's effort, cooperation, and professionalism during this audit. MDT is committed to complying with state and federal laws, and implementing and maintaining effective accounting controls.

If you have any questions or comments regarding this audit, please feel free to contact me.

Sincerely,



Tim Reardon  
Director

Attachments

Copies: Vickie Murphy, Internal Auditor  
Dwane Kailey, Acting Engineering Division Administrator  
Lynn Zanto, Transportation Planning Division Administrator



November 12, 2009

Corrective Action Plan  
The Highway Safety Improvement Program  
October-12

Audit Recommendation	Does this affect Internal Operations?	Management View	Responsible Area	Target Date
<p><b>Recommendation #1</b> We recommend the Montana Department of Transportation comply with federal regulations by analyzing and assessing how the Highway Safety Improvement Program reduces the number of crashes, fatalities and serious injuries, or potential crashes on public roads in Montana.</p>	<p>Yes</p>	<p>Concur</p>	<p>Engineering Division</p>	<p>7/1/2013</p>
<p><b>Recommendation #2</b> We recommend the Montana Department of Transportation strengthen internal controls to track and document the status of Highway Safety Improvement Program projects, including reporting back to the program upon project completion.</p>	<p>Yes</p>	<p>Concur</p>	<p>Engineering Division</p>	<p>12/31/2012  12/31/2013</p>