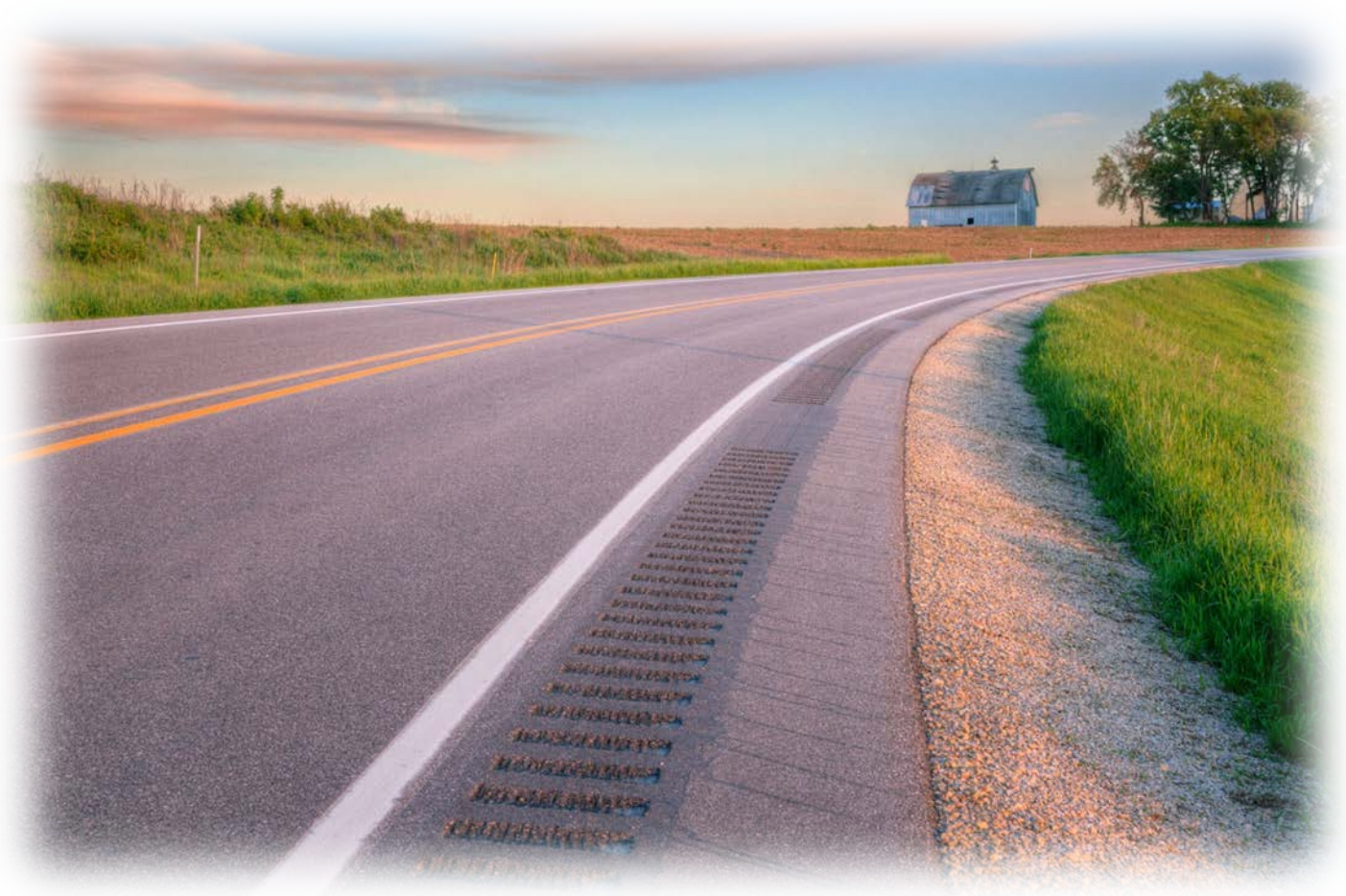


# FY 2014

State of Iowa

Highway Safety Improvement Program

Annual Report



## Table of Contents

|   |    |
|---|----|
| Introduction .....                                  | 3  |
| A. HSIP Program Structure .....                     | 3  |
| i. Program Administration.....                      | 3  |
| ii. Program Methodology .....                       | 4  |
| B. HSIP Project Implementation Progress .....       | 5  |
| i. HSIP Funding .....                               | 5  |
| ii. General Listing of Projects .....               | 6  |
| C. HSIP Program Effectiveness .....                 | 8  |
| i. Iowa’s Highway Safety Trends .....               | 8  |
| ii. Overall HSIP Effectiveness .....                | 9  |
| D. High Risk Rural Roads Program Report.....        | 11 |
| i. Methodology Used to Identify HRRR Projects ..... | 11 |
| ii. Program Effectiveness .....                     | 11 |
| iii. Project Evaluation .....                       | 11 |
| iv. HRRRP Funding.....                              | 11 |
| v. General Listing of Projects .....                | 12 |
| Appendix A .....                                    | 15 |

### **Protection of Data from Discovery & Admission into Evidence**

Section 148(g)(4) of 23 USC stipulates that data compiled or collected for the preparation of the HSIP Report “...shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in an action for damages arising from any occurrence at a location identified or addressed in such reports...” This information is also protected by 23 USC 409 (discovery and admission as evidence of certain reports and surveys).

## Introduction

This is a report on the Iowa Highway Safety Improvement Program for State Fiscal Year 2014. The time period covered by this report is from July 1, 2013 to June 30, 2014.

The Highway Safety Improvement Program (HSIP) is a Federal Highway Administration (FHWA) core program created under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). It is established as section 148 of Title 23, United States Code (23 U.S.C. 148) and regulated under 23 CFR 924. These regulations also created the High Risk Rural Roads Program (HRRRP) as a component of the HSIP, and continued a separate Rail Highway Grade Crossing Program (RHGCP). In 2012, the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) directed states to maintain HSIP, update their SHSP, and discontinue HRRRP.

The federal regulations also require strategic plans and annual reports. Here is a list of the documents that Iowa maintains in accordance with the regulations:

- Strategic Highway Safety Plan (SHSP) – Iowa wrote a Comprehensive Highway Safety Plan (CHSP) in 2006 and completed writing a new SHSP in 2013 that covers 2013-2016.
- Transparency (5%) Report – Annually updated until 2012, discontinued in 2013
- HSIP Report – Annually updated
- RHGCP Report – Annually updated
- SHSP Report – Annually updated

Included herein is information regarding the Iowa HSIP, including the final year of HRRRP. In this report, the HSIP is the focus of Parts A, B, and C. Part D is reserved for the HRRRP.

At the Iowa DOT, two offices are responsible for different components of the HSIP. The Office of Local Systems administers the HRRRP, and the Office of Traffic and Safety administers the remainder of the HSIP. Each office has contributed to this report on the basis of their administrative responsibilities.

## A. HSIP Program Structure

### i. Program Administration

#### *Program Administrators*

The Iowa HSIP program is administered by the Iowa DOT Office of Traffic and Safety. It is a centrally-run program.

#### *Funding Allocation*

Available HSIP funding is generally allocated to the Primary Road System (state-owned roadways) in Iowa.

Funding for safety initiatives on county- and city-owned roads, the Secondary Road System and Local Road System respectively, has historically come from two different programs.

The HRRRP was used exclusively for projects on the Secondary Road System. However, that

program has been discontinued. In its place, Iowa has established an HSIP-Secondary Roads program. This program allocates \$2 million in HSIP funds each year toward projects on the Secondary Road System. The focus of this program is on the installation of systemic, low-cost safety improvements.

The other program is a state based safety program known as the Traffic Safety Improvement Program (TSIP). In 1987, the Iowa Legislature enacted a state law requiring that one-half of one percent of the state's gas tax revenues be used to fund traffic safety projects. The TSIP is administered on a competitive application basis, and all road systems are eligible for funding. Historically, cities and counties receive the greatest portion of these funds. Projects completed with this program are not included in this report.

### *Project Selection*

In Iowa, we aspire to select HSIP projects that emerge from the SHSP and the Safety Improvement Candidate Lists.

In the development of the SHSP, it was revealed that Iowa highway safety issues can be segregated into one of two engineering-based categories: intersections or lane departure.

In preparation of the Safety Improvement Candidate Lists, we look further at the data and the highway systems in Iowa (Primary, Secondary, and Local Road systems). The goal is to identify locations or corridors with a history of crashes. Mapping is the preferred choice to communicate the areas of concern, and the following maps were developed in 2010:

- Intersections
- Lane Departure
- Run off the road right
- Cross Median
- Cross Centerline
- Curves

These maps show locations with the greatest number of crashes in Iowa. Please note the maps **are not** trying to convey that these roads are hazardous, but that these roads experience a greater number of crashes than other like roads in Iowa.

While the maps described above have not been updated recently, Iowa is in the process of developing an updated network screening tool to produce new maps. Visual representation will continue to be used in project selection.

## ii. Program Methodology

The Iowa HSIP Project Identification Process was established in 2003, and remains current today.

Here are some brief highlights of this process:

- Selected projects are aligned with the SHSP categories: intersections or lane departure.
- Locations identified in the Safety Improvement Candidate Lists are based on the number of fatal and major injury crashes over a ten year period.
- Prioritization of potential HSIP projects is first made on a benefit versus cost basis. By this, we are indicating that we try to implement projects and treatments that will provide the greatest

reduction in crashes for a minimal cost.

However, actual project selection is affected by factors such as leveraging other program funding, maximizing statewide impact, and other programmed improvements. It is preferred to complete more small- or moderate-cost projects, in lieu of one or two high-cost projects.

## B. HSIP Project Implementation Progress

### i. HSIP Funding

The following table shows the total HSIP funding obligated in State Fiscal Year 2014.

| <b>HSIP Project Funding</b>                         |                   |                         |                      |
|---|-------------------|-------------------------|----------------------|
| <i>Estimates based on anticipated letting costs</i> |                   |                         |                      |
| State Fiscal Year:                                  |                   | 2014                    |                      |
| Period:   |                   | 07/01/13 to 06/30/14    |                      |
| <u>Funding Category</u>                             |                   | <u>Obligated</u>        | <u>Notes</u>         |
| HSIP  | Section 148       | \$51,304,744.77         |                      |
| HES   | Section 152       |                         |                      |
| Optional Safety                                     |                   |                         |                      |
| Penalty Transfer                                    | Section 154 & 164 |                         |                      |
| Seat Belt Performance                               | Section 406       |                         |                      |
| Incentive Grants                                    | Section 157 & 163 |                         |                      |
| Other Federal-Aid Funds                             | STP, ARRA         |                         |                      |
| State and Local Funds                               |                   | \$10,885,889.23         | <i>match to HSIP</i> |
| <b>Total</b>  |                   | <b>\$ 62,190,634.00</b> |                      |

For State Fiscal Year 2014, these funds were obligated across the following SHSP categories:

|                        |                  |
|------------------------|------------------|
| Intersections          | \$ 2,299,549.00  |
| Lane Departure         |                  |
| Run off the road right | \$ 52,640,171.00 |
| Cross median           | \$ 6,342,122.00  |
| Cross centerline       | \$ 908,792.00    |
| Total                  | \$ 62,190,634.00 |

ii. General Listing of Projects

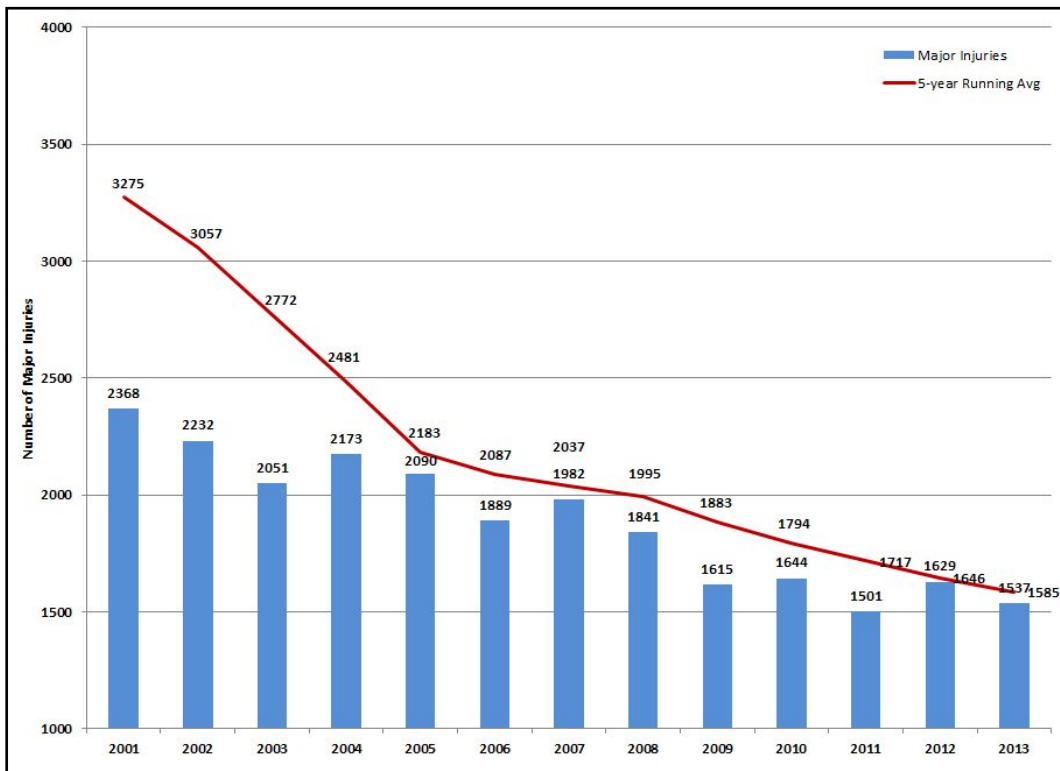
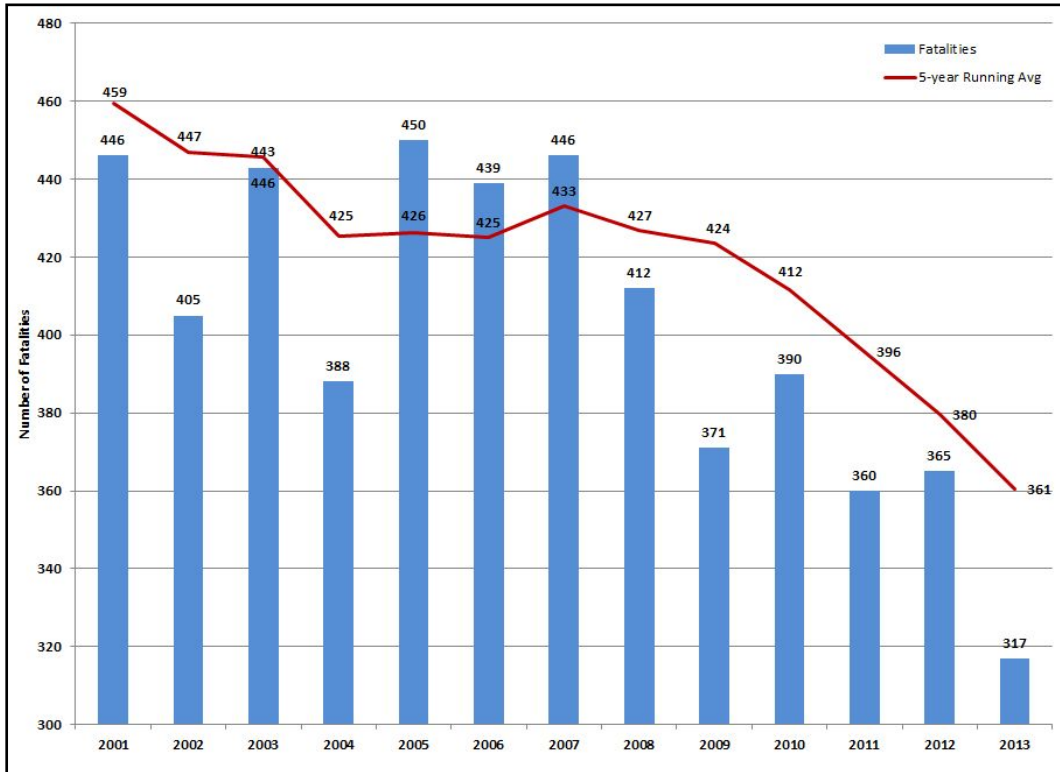
| Project Number          | County                   | Route     | Roadway Description                                     | Improvement Category (Source: 23 CFR 924) | Project Estimate at FHWA Authorization | Federal Share (Obligation Amount) | Emphasis Area  | Strategy           |
|-------------------------|--------------------------|-----------|---|---|--|-----------------------------------|----------------|--------------------|
| HSIP-1945(789)--8X-77   | Polk                     | SW 9th St | Des Moines - SW 9th St at Kenyon Ave                    | Intersection improvement                  | \$<br>2,299,549.00                     | \$<br>1,722,965.60                | Intersection   |                    |
| HSIPX-000-S(736)--3L-00 | various                  | various   | various routes in District 3                            | Installation of Rumble Strips             | \$<br>401,903.00                       | \$<br>361,712.70                  | Lane Departure | Cross centerline   |
| HSIPX-001-5(103)--3L-52 | Johnson, Linn            | Ia 1      | Solon to US 30  | Pavement and Shoulder Widening            | \$<br>2,756,380.00                     | \$<br>2,459,124.90                | Lane Departure | Run off road right |
| HSIPX-001-6(31)--3L-57  | Linn, Jones              | Ia 1      | From UPRR in Mt Vernon to US 151                        | Pavement and Shoulder Widening            | \$<br>3,286,998.00                     | \$<br>2,946,367.80                | Lane Departure | Run off road right |
| HSIPX-017-3(36)--3L-40  | Hamilton                 | Ia 17     | South of S. Jct. of Iowa 175 to U.S. 20 in Webster City | Pavement and Shoulder Widening            | \$<br>4,662,740.00                     | \$<br>1,037,072.70                | Lane Departure | Run off road right |
| HSIPX-018-2(110)--3L-21 | Clay                     | US 18     | O'Brien Co Line to N Jct US 71                          | Pavement and Shoulder Widening            | \$<br>2,565,558.00                     | \$<br>2,309,002.20                | Lane Departure | Run off road right |
| HSIPX-022-4(75)--3L-70  | Muscatine                | IA 22     | Near ECL of Nichols to W of Muscatine                   | Installation of Rumble Strips             | \$<br>143,529.00                       | \$<br>129,176.10                  | Lane Departure | Cross centerline   |
| HSIPX-034-2(57)--3L-69  | Montgomery, Adams, Union | US 34     | W of US 71 to Corning                                   | Pavement and Shoulder Widening            | \$<br>7,298,372.00                     | \$<br>6,005,364.20                | Lane Departure | Run off road right |
| HSIPX-034-5(24)--3L-20  | Clarke                   | US 34     | ECL Osceola to Lucas County Line                        | Pavement and Shoulder Widening            | \$<br>1,801,800.00                     | \$<br>1,617,612.30                | Lane Departure | Run off road right |
| HSIPX-034-6(84)--3L-59  | Lucas, Monroe            | US 34     | From 2.7 mi W of county line to 2.5 mi E of county line | Pavement and Shoulder Widening            | \$<br>1,018,603.00                     | \$<br>913,340.70                  | Lane Departure | Run off road right |
| HSIPX-034-6(85)--3L-68  | Monroe                   | US 34     | Jct Ia 5 to Wapello County Line                         | Pavement and Shoulder Widening            | \$<br>1,205,352.00                     | \$<br>1,081,225.80                | Lane Departure | Run off road right |
| HSIPX-034-6(86)--3L-59  | Lucas                    | US 34     | Jct US 65 to Co Rd S-23                                 | Pavement and Shoulder Widening            | \$<br>1,095,507.00                     | \$<br>981,948.60                  | Lane Departure | Run off road right |
| HSIPX-034-9(211)--3L-29 | Des Moines               | US 34     | In Burlington, Mt Pleasant St to Main St                | Pavement and Shoulder Widening            | \$<br>4,238,285.00                     | \$<br>3,572,945.60                | Lane Departure | Run off road right |
| HSIPX-061-3(75)--3L-58  | Louisa                   | US 61     | Near NCL of Wapello to 2 miles S of IA 92               | Installation of Rumble Strips             | \$<br>363,360.00                       | \$<br>327,024.00                  | Lane Departure | Cross centerline   |

|                            |                          |         |  |                                |                  |                  |                |                    |
|----------------------------|--------------------------|---------|--|--------------------------------|------------------|------------------|----------------|--------------------|
| HSIPX-061-4(110)--3L-70    | Muscatine                | US 61   | Muscatine Bypass, Ia 92 to Ia 38                               | Pavement and Shoulder Widening | \$ 2,113,139.00  | \$ 1,730,553.67  | Lane Departure | Run off road right |
| HSIPX-071-1(32)--3L-73     | Page, Montgomery         | US 71   | Border to US 34  | Pavement and Shoulder Widening | \$ 3,939,575.00  | \$ 3,545,617.50  | Lane Departure | Run off road right |
| HSIPX-071-2(46)--3L-69     | Montgomery, Cass         | US 71   | US 34 to Atlantic  | Pavement and Shoulder Widening | \$ 1,210,036.00  | \$ 1,089,032.40  | Lane Departure | Run off road right |
| HSIPX-071-6(49)--3L-81     | Sac, Buena Vista         | US 71   | SCL Early to S Jct Ia 7  | Pavement and Shoulder Widening | \$ 2,070,539.00  | \$ 1,863,485.10  | Lane Departure | Run off road right |
| HSIPX-071-7(54)--3L-11     | Buena Vista              | US 71   | S Jct Ia 7 to Ia 3   | Pavement and Shoulder Widening | \$ 1,626,821.00  | \$ 1,454,688.90  | Lane Departure | Run off road right |
| HSIPX-141-6(72)--3L-25     | Dallas, Polk             | Ia 141  | Granger to Grimes  | Pavement and Shoulder Widening | \$ 2,454,842.00  | \$ 2,083,938.20  | Lane Departure | Run off road right |
| HSIPX-151-4(125)--3L-53    | Jones, Dubuque           | US 151  | Monticello to US 61  | Pavement and Shoulder Widening | \$ 4,810,882.00  | \$ 4,323,934.80  | Lane Departure | Run off road right |
| HSIPX-218-8(129)--3L-09    | Bremer, Chickasaw, Floyd | US 218  | Waverly to Charles City  | Pavement and Shoulder Widening | \$ 4,393,248.00  | \$ 3,949,207.20  | Lane Departure | Run off road right |
| IHSIPX-035-2(404)33--08-20 | Clarke, Warren           | I-35    | Osceola to Warren Co Line                                      | Installation of Guardrail      | \$ 1,888,207.00  | \$ 1,699,386.30  | Lane Departure | Cross median       |
| IHSIPX-080-2(231)73--08-01 | Adair                    | I-80    | Cass Co Line to 1.75 miles east of Co Rd N-77                  | Installation of Guardrail      | \$ 2,095,977.00  | \$ 1,886,379.30  | Lane Departure | Cross median       |
| IHSIPX-080-2(232)83--08-01 | Adair                    | I-80    | 1.75 miles east of Co Rd N-77 to 2.25 miles east of Co Rd P-28 | Installation of Guardrail      | \$ 1,551,164.00  | \$ 1,396,047.60  | Lane Departure | Cross median       |
| IHSIPX-080-2(233)96--08-01 | Adair, Madison, Dallas   | I-80    | 2.25 miles east of Co Rd P-28 to 0.75 miles east of Co Rd P-53 | Installation of Guardrail      | \$ 806,774.00    | \$ 726,096.60    | Lane Departure | Cross median       |
| SBPG-C025(94)--6C-25       | Dallas                   | various | various county routes  | Installation of Rumble Strips  | \$ 91,494.00     | \$ 91,494.00     | Lane Departure | Run off road right |
| Totals:                    |                          |         |  |                                | \$ 62,190,634.00 | \$ 51,304,744.77 |                |                    |

## C. HSIP Program Effectiveness

### i. Iowa's Highway Safety Trends

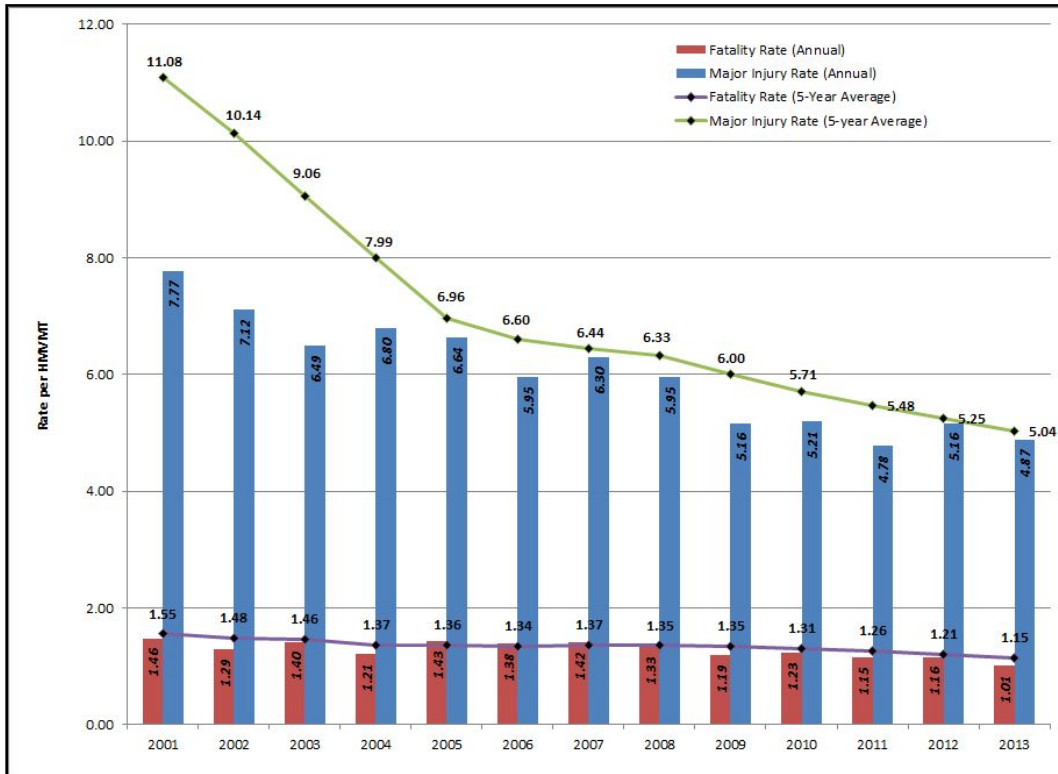
The following charts show the recent fatality and major injury trends in Iowa.





The charts show year by year fluctuation in fatalities and major injuries, but the general trend has been downward.

Another indicator is rate. This is figured as the number of occurrences per hundred million vehicle miles traveled (HMVMT).



In Iowa, we have seen a slow, steady decline in the fatality rate over a long period of time. We are also seeing a more significant decline in the major injury rate.

ii. Overall HSIP Effectiveness

At the onset of the HSIP program in Iowa, funding was generally targeted towards urban intersections. Over the years, HSIP expenditures have been focused on the emphasis areas defined in the SHSP, in particular lane departure.

As the HSIP program began to focus on lane departure projects, a parallel initiative to change design policies was initiated. This policy change was to address lane departure crashes, and the following table provides a brief summary of the changes.

## **Paved Shoulder Policy**

Originally issued in January 2004, and revised in June 2008. The policy was created to address run off the road crashes.

### Original policy highlights

All Interstates are to get full-width paved shoulders.

All NHS routes and non-NHS routes with 3000 or more ADT are to get four-foot paved shoulders. The remaining shoulder width is granular.

Non-NHS routes with less than 3000 ADT can have four-foot paved shoulders if conditional warrants are met.

### Policy revision

Added six-foot paved shoulder conditions and additional conditions that merit a full-width paved shoulder.

## **Milled Rumble Policy**

Originally issued in January 2004 as a complement to the Paved Shoulder Policy, and revised in June 2010. The policy was created to address run off the road crashes.

### Original policy highlights

Milled rumble strips become the standard with asphalt shoulders. Concrete pavement and shoulders still rely on stamped rumbles.

### Policy revision

Added centerline rumbles to the policy. Centerline rumbles are now standard on undivided, rural highways. Shoulder rumbles are standard for asphalt and concrete. Shoulder rumbles are expected on all paved shoulders with exceptions for residential and urban areas.

## **Safety Edge Policy**

Issued in April 2010 and is supplemental to the Paved Shoulder Policy. This policy was created to address run off the road crashes.

### Original policy highlights

Safety edge becomes the standard pavement edge treatment when paved shoulders are not included or are less than 4 feet wide. This policy completes a series of treatments to address run off the road crashes.

The effect of these policies is far reaching, and difficult to measure. These policies embed safety features within projects outside the HSIP, and broaden the reach of HSIP safety initiatives. They represent a systemic implementation of safety features, albeit a slow delivery process. Now, even regular capacity and infrastructure projects are incorporating safety features that help reduce crashes.

Included in Appendix A is a simple before/after evaluation of previously completed HSIP projects. For projects old enough, either a 3, 4, or 5 year before/after is provided.

## D. High Risk Rural Roads Program Report

This section of the document shall be considered the High Risk Rural Roads Program (HRRRP) report for Federal Fiscal Year 2014.

i. Methodology Used to Identify HRRR Projects

The Iowa DOT has traffic data and crash data on all state and local routes. Paved routes classified as rural major collectors, rural minor collectors, and rural local routes with crash rates above the statewide average for fatal and major injury accidents define the eligible routes. Counties are provided maps showing all the eligible high risk rural roads in their respective counties. We utilize both a crash rate per 100M VMT and crashes per mile (crash density) to locate road segments that are in the top 15% of each category. Maps are also provided to counties showing them their top 15% locations. We use this information, along with a Benefit/Cost Ratio to rate county applications for HRRR funding. The Iowa DOT also provides detailed crash information free to counties to assist them in analyzing their crash histories.

ii. Program Effectiveness

It is too early in the program to analyze “after” accident data to measure program effectiveness. A 5-year accident history prior to the improvements will be compared to a 5-year accident history following the improvements.

iii. Project Evaluation

The evaluation of individual projects will be accomplished when the 5-year accident history following the improvements is available.

iv. HRRRP Funding

| <b>HRRRP Project Funding</b>                      |                     |                     |
|---|---------------------|---------------------|
| <b>Reporting Period: 10/01/2013 to 09/30/2014</b> |                     |                     |
| <b>Funding Category</b>                           | <b>Programmed</b>   | <b>Obligated</b>    |
| HRRRP   | \$370,000.00        | \$323,520.00        |
| Other Federal-Aid Funds                           | \$0.00              | \$0.00              |
| State and Local Funds                             | \$40,000.00         | \$35,947.00         |
|   |                     |                     |
|   |                     |                     |
| <b>Total</b>                                      | <b>\$410,000.00</b> | <b>\$359,467.00</b> |

v. General Listing of Projects

**General Listing of Obligated Projects In FFY 2014**

| Project               | Improvement Category | Output     | Cost         | Relationship to SHSP |                  |
|-----------------------|----------------------|------------|--------------|----------------------|------------------|
|                       |                      |            |              | Emphasis Area        | Strategy         |
| HRRR-CO33(100)--5R-33 | 10                   | 0.06 miles | \$359,467.00 | Roadway Departure    | Remove obstacles |

**General Listing of Obligated Projects In FFY 2013**

| Project               | Improvement Category | Output       | Cost           | Relationship to SHSP        |   |
|-----------------------|----------------------|--------------|----------------|-----------------------------|---|
|                       |                      |              |                | Emphasis Area               | Strategy  |
| HRRR-CO91(88)--5R-91  | 2                    | 2.83 miles   | \$293,384.60   | Roadway Departure           | Paved Shoulders   |
|                       |                      |              |                |                             |   |
| HRRR-CO10(81)--5R-10  | 2                    | 6.71 miles   | \$2,230,018.08 | Roadway Departure           | Paved Shoulders   |
|                       |                      |              |                |                             |   |
| HRRR-CO06(76)--5R-06  | 1                    | Intersection | \$410,412.00   | Intersection crash severity | vertical realignment to alleviate sight distance issues |
|                       |                      |              |                |                             |   |
| HRRR-CO77(165)--5R-77 | 1                    | Intersection | \$25,375.00    | Intersection crash severity | oversize stop signs with flashing beacon                |

**General Listing of Obligated Projects In FFY 2012**

| Project              | Improvement<br>Category | Output       | Cost         | Relationship to SHSP        |                     |
|----------------------|-------------------------|--------------|--------------|-----------------------------|---------------------|
|                      |                         |              |              | Emphasis Area               | Strategy            |
| HRRR-C010(69)--5R-10 | 1                       | Intersection | \$631,470.00 | Intersection crash severity | Roundabout          |
|                      |                         |              |              |                             |                     |
| HRRR-C091(83)--5R-91 | 2                       | 5.91 miles   | \$591,682.00 | Roadway Departure           | Paved Shoulders     |
|                      |                         |              |              |                             |                     |
| HRRR-C022(67)--5R-22 | 17                      | 0.65 miles   | \$150,127.00 | Roadway Departure           | Guardrail in Curves |

**General Listing of Obligated Projects In FFY 2011**

| Project               | Improvement<br>Category | Output       | Cost         | Relationship to SHSP |                                 |
|-----------------------|-------------------------|--------------|--------------|----------------------|---------------------------------|
|                       |                         |              |              | Emphasis Area        | Strategy                        |
| HRRR-C077(159)--7W-77 | 1                       | Intersection | \$777,042.00 | Roadway Departure    | Grade improvements, new bridge  |
|                       |                         |              |              |                      |                                 |
| HRRR-C050(90)--5R-50  | 2                       | 0.2 miles    | \$385,999.00 | Roadway Departure    | Paved Shoulders, flatten curves |

**General Listing of Obligated Projects In FFY 2010**

| Project              | Improvement<br>Category | Output       | Cost           | Relationship to SHSP |                                     |
|----------------------|-------------------------|--------------|----------------|----------------------|-------------------------------------|
|                      |                         |              |                | Emphasis Area        | Strategy                            |
| HRRR-C063(88)--5R-63 | 2                       | 1.65 miles   | \$2,191,000.00 | Roadway Departure    | Widen Shoulders &<br>Realign Curves |
|                      |                         |              |                |                      |                                     |
| HRRR-C010(61)--5R-10 | 2                       | 7 miles      | \$1,086,000.00 | Roadway Departure    | Paved Shoulders                     |
|                      |                         |              |                |                      |                                     |
| HRRR-C010(69)--5R-10 | 1                       | intersection | \$91,764.00    | Crash Severity       | Construct<br>Roundabout             |

**General Listing of Obligated Projects In FFY 2009**

| Project              | Improvement<br>Category | Output    | Cost         | Relationship to SHSP |   |
|----------------------|-------------------------|-----------|--------------|----------------------|---|
|                      |                         |           |              | Emphasis Area        | Strategy                                  |
| HRRR-C091(77)--5R-91 | 2                       | 3.8 Miles | \$268,217.69 | Roadway Departure    | Paved Shoulders                           |
|                      |                         |           |              |                      |   |
| HRRR-C057(87)--5R-57 | 1                       | 0.5 Miles | \$298,213.34 | Intersections        | Improve sight distance                    |
|                      |                         |           |              |                      |   |
| HRRR-C025(73)--5R-25 | 2                       | 3 Miles   | \$293,508.91 | Roadway Departure    | Widen Shoulders and<br>Flatten Foreslopes |

# Appendix A

Before and After Crash Analysis of Past HSIP Projects





Rayway-Highway Crossings Project Metrics  
 23 USC 130  
 STATE OF IOWA  
 Projects Completed July 1, 2010 thru June 30, 2014

| Project Number   | Location (County/Municipality, Highway) | USDOT Crossing Number | FHWA Roadway Functional Classification | Project Type and Description                         | Crossing Protection<br>Prior to<br>Improvement<br>(active, passive) | Crossing Type (vehicle, pedestrian, etc.) | Completion Year | Total Project Cost<br>(see Note 1) | Funding Type | Before Crash Data (3 years) |          |                | After Crash Data (3 years)<br>(see Note 2) |          |                | Effectiveness (see Note 3)                      |
|------------------|---|-----------------------|--|--|---|---|-----------------|------------------------------------|--------------|-----------------------------|----------|----------------|--|----------|----------------|---|
|                  |   |                       |  |  |   |   |                 |                                    |              | Fatal                       | Severity | Other Inj/Prop | Fatal                                      | Severity | Other Inj/Prop |   |
| RRP-RR008-8A-00  | Cross-Crossing (STATE/STENDES)          |                       |  | Crossing Warning Sign                                | Passive   | Vehicle                                   | 2010            | \$72,884.28                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Systemic Approach (Shawnee)                  |
| RRP-RR008-8A-07  | CEDAR FALLS                             | 917786J               | Urban Minor Arterial                   | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2010            | \$41,277.00                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR104-8A-00  | WORTH                                   | 999989R               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$16,014.90                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR104-8A-00  | CERRO GORDO                             | 980019W               | Rural Minor Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$28,227.19                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR104-8A-00  | CERRO GORDO                             | 976206X               | Rural Minor Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$17,030.27                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR009-8A-34  | CLINTON                                 | 980897R               | Rural Major Collector                  | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$36,201.00                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR009-8A-23  | CLOYD                                   | 976028X               | Rural Major Collector                  | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$108,736.00                       | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR140-8A-00  | WORTH                                   | 999989R               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2010            | \$20,924.75                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR101-8A-46  | MITCHELL                                | 990012D               | Rural Major Collector                  | Surface Repair                                       | Passive   | Vehicle                                   | 2010            | \$39,971.86                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR009-8A-00  | CEDAR RAPIDS                            | 990012D               | Rural Major Collector                  | Surface Repair                                       | Passive   | Vehicle                                   | 2010            | \$51,788.00                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR140-8A-00  | WORTH                                   | 999989R               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2010            | \$158,135.30                       | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-00  | BELLEVUE                                | 976033P               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Removal of Crossing                          |
| RRP-RR100-8A-00  | CORTLAND                                | 976033P               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR114-8A-00  | WRIGHT                                  | 976033P               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$39,529.63                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR009-8A-00  | BELLEVUE                                | 976033P               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Removal of Crossing                          |
| RRP-RR100-8A-00  | BELLEVUE                                | 976033P               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-00  | FORT DOUGLASS                           | 976033P               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2010            | \$29,460.80                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR009-8A-31  | FARLEY                                  | 999989R               | Rural Major Collector                  | Surface Repair                                       | Active  | Vehicle                                   | 2011            | \$123,003.00                       | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR009-8A-31  | DUBUQUE                                 | 917786J               | Rural Major Collector                  | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$109,210.20                       | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR104-8A-00  | HUMBOLDT                                | 976033P               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$123,003.00                       | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR009-8A-00  | MILLS                                   | 952762C               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2010            | \$32,324.10                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR104-8A-00  | WEBSTER                                 | 976033P               | Rural Minor Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2010            | \$16,203.30                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR104-8A-00  | MERRILL                                 | 976033P               | Rural Minor Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2010            | \$19,644.34                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-SF002-8A-23  | CLINTON                                 | 976033P               | Urban Minor Arterial                   | Surface Repair                                       | Passive   | Vehicle                                   | 2010            | \$7,374.40                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF002-8A-23  | CLINTON                                 | 976033P               | Urban Minor Arterial                   | Surface Repair                                       | Passive   | Vehicle                                   | 2010            | \$23,817.40                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF009-8A-07  | CEDAR RAPIDS                            | 910444T               | Urban Local                            | Surface Repair                                       | Passive   | Vehicle                                   | 2010            | \$7,542.73                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF002-8A-06  | VINTON                                  | 907440T               | Rural Major Collector                  | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$69,442.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF002-8A-00  | WORTH                                   | 907440T               | Rural Major Collector                  | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$17,724.73                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF007-8A-07  | WATERLOO                                | 907902W               | Urban Local                            | Surface Repair                                       | Passive   | Vehicle                                   | 2010            | \$64,322.86                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF009-8A-07  | CEDAR FALLS                             | 908020C               | Urban Local                            | Surface Repair                                       | Passive   | Vehicle                                   | 2010            | \$11,277.30                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF009-8A-00  | WEBSTER                                 | 907440T               | Urban Local                            | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$75,302.64                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR100-8A-00  | BELLEVUE                                | 976033P               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Removal of Crossing                          |
| RRP-RR100-8A-00  | CORTLAND                                | 976033P               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-07  | CEDAR RAPIDS                            | 990012D               | Rural Local                            | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$99,520.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR100-8A-00  | CLINTON                                 | 990012D               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$21,240.88                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR140-8A-00  | CEDAR FALLS                             | 907440T               | Urban Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2010            | \$123,367.71                       | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR140-8A-00  | FRANKLIN                                | 976163X               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$32,077.70                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR140-8A-00  | LAKE MILLS                              | 976163X               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$17,079.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR144-8A-00  | BOONE                                   | 976589K               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$11,889.90                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR104-8A-00  | DESS MONIES                             | 908020C               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$35,581.77                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF007-8A-07  | LA PORTE CITY                           | 907923T               | Rural Major Collector                  | Surface Repair                                       | Active  | Vehicle                                   | 2010            | \$24,828.48                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR140-8A-00  | WORTH                                   | 907923T               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$17,079.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR140-8A-00  | WORTH                                   | 917556C               | Rural Local                            | Crossing Closure                                     | Passive   | Vehicle                                   | 2010            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Removal of Crossing                          |
| RRP-RR140-8A-00  | HARRISON                                | 917556C               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$13,016.00                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR140-8A-00  | WORTH                                   | 917556C               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$18,526.90                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-00  | BELLEVUE                                | 976033P               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Removal of Crossing                          |
| RRP-SF1002-8A-04 | NEW HAVEN                               | 916924T               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$17,079.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR100-8A-00  | TIFFIN                                  | 908020C               | Urban Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$14,776.58                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-SF10158A-01  | HAWYER                                  | 908020C               | Rural Local                            | Surface Repair                                       | Passive   | Vehicle                                   | 2011            | \$17,079.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR009-8A-00  | MONONA                                  | 912377T               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$162,000.00                       | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-SF1011-8A-00 | MUSCATINE                               | 907218A               | Urban Local                            | Surface Repair                                       | Active  | Vehicle                                   | 2011            | \$11,524.40                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR100-8A-00  | CEDAR FALLS                             | 907218A               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$14,776.58                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-00  | SALIU                                   | 912380V               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$16,234.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-00  | SKOOL CITY                              | 912380V               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$16,234.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR009-8A-00  | FAIRFIELD                               | 903299W               | Urban Local                            | Crossing Closure                                     | Passive   | Vehicle                                   | 2012            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Removal of Crossing                          |
| RRP-RR100-8A-00  | COUNCIL BLUFFS                          | 978423J               | Urban Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$25,488.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-00  | LEE                                     | 907179H               | Rural Local                            | Surface Repair                                       | Passive   | Vehicle                                   | 2011            | \$17,079.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-SF009-8A-06  | LEE                                     | 978414X               | Rural Minor Collector                  | Surface Repair                                       | Passive   | Vehicle                                   | 2011            | \$38,038.20                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR140-8A-00  | KARLELLA                                | 976163X               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$16,234.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR154-8A-00  | RYANOUTH                                | 966045C               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$16,655.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR154-8A-00  | CERRO GORDO                             | 976163X               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$11,567,000.00                    | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR113-8A-17  | CERRO GORDO                             | 907711G               | Rural Local                            | Surface Repair                                       | Passive   | Vehicle                                   | 2011            | \$42,240.00                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR161-8A-00  | GREENE                                  | 910622K               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2012            | \$14,168.66                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR154-8A-00  | WAYNESBORO                              | 904262Z               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$11,832.00                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-SF002-8A-09  | DESS MONIES                             | 978061J               | Rural Local                            | Surface Repair                                       | Passive   | Vehicle                                   | 2011            | \$51,116.40                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Improve vehicle movement and driver behavior |
| RRP-RR154-8A-00  | GOLD BELLS                              | 917022R               | Rural Major Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   | 2011            | \$24,700.00                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR140-8A-00  | RYANOUTH                                | 907072Y               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$17,079.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR100-8A-00  | LIVERTINE                               | 978061J               | Rural Local                            | Crossing Closure                                     | Passive   | Vehicle                                   | 2011            | \$7,500.00                         | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | ** Removal of Crossing                          |
| RRP-RR100-8A-00  | MONONA                                  | 908020C               | Rural Local                            | Active Grade Crossing Equipment Installation/Upgrade | Passive   | Vehicle                                   | 2011            | \$16,234.60                        | Section 130  | 0                           | 0        | 0              | 0  | 0        | 0              | Reduction in Predicted Accidents                |
| RRP-RR009-8A-00  | SIOLA                                   | 967456C               | Rural Minor Collector                  | Active Grade Crossing Equipment Installation/Upgrade | Active  | Vehicle                                   |                 |                                    |              |                             |          |                |  |          |                |   |