Table of Contents

Wrong-Way Crash Study, Calendar Year 2012 .................................................................1

List of Figures

Figure 1. Minimum required signs and markings from the MUTCD .................................2
Figure 2. Map of Wrong-Way Crash Locations in Calendar Year 2012 ..............................3

List of Tables

Table 1. Summary of Wrong-Way Crash Analysis in Calendar Year 2012 ........................2
Table 2. Wrong-Way Crashes 2010-2012 ........................................................................4
Table 3. List of Wrong-Way Crashes on Interstates and Other Freeways in Calendar Year 2012 .........................................................................................................................5

List of Appendices

Appendix A  Act 641

Appendix B  Minute Order 2009-035

Appendix C  Crash Location Maps, Photos of Interchanges and Crash Reports
Wrong-Way Crash Study  
Calendar Year 2012

Act 641 of the 87th Arkansas General Assembly requires the Arkansas State Highway and Transportation Department (AHTD) to analyze all wrong-way crashes on the Interstates and other freeways with full control of access and to prepare an annual report. Furthermore, the Act requires that based on the findings in the report, the AHTD to implement appropriate countermeasures when warranted to reduce the possibility of wrong-way crashes. Accordingly, Minute Order 2009-035 was adopted by the Arkansas State Highway Commission on February 25, 2009. This Minute Order authorized an annual analysis of wrong-way crashes on these routes to determine if additional traffic control devices are warranted. Copies of Act 641 and Minute Order 2009-035 are shown in Appendices A and B respectively.

An annual analysis of wrong-way crashes identifies the locations to be investigated. The investigation consists of reviewing the signing and striping for compliance with the minimum requirements of the Manual of Uniform Traffic Control Devices (MUTCD) as well as compliance with current AHTD signing practices. The minimum requirements as specified in Section 2B.41 of the MUTCD 2009 Edition include the following:

1. At least one “ONE WAY” sign for each direction of travel on the crossroad shall be placed where the exit ramp intersects the crossroad.
2. At least one “DO NOT ENTER” sign shall be conspicuously placed near the downstream end of the exit ramp in positions appropriate for full view of a road user starting to enter wrongly from the crossroad.
3. At least one “WRONG WAY” sign shall be placed on the exit ramp facing a road user traveling in the wrong direction.

Current AHTD practice is to install the minimum required signs and markings from the MUTCD plus additional optional signs and markings (see Figure 1). Current AHTD practice also includes the installation of oversized signs as shown in Table 2B-1 in the MUTCD. This practice enhances the conspicuity of the signage and provides added protection to ensure that the minimum required signage is in place should one of the sign assemblies be damaged or destroyed.

The crash analysis of 2012 crash data showed that ten wrong-way crashes occurred on the Interstates and other freeways with full control of access in 2012 (see Figure 2). The crash analysis was conducted on only those crashes that involved a vehicle entering or traveling in the wrong direction on the controlled access facility. Crossover crashes were not included. These crashes are summarized in Table 1 whereas Table 2 shows a comparison of the 2012 wrong-way crashes with 2010 and 2011.

Following the crash analysis, an investigation of the locations where the wrong-way crashes occurred was completed in June 2014.
Figure 1. Minimum required signs and markings from the MUTCD (Source: Manual on Uniform traffic Control Devices for Streets and Highways (MUTCD) 2009 Edition)

TABLE 1. Summary of Wrong-Way Crash Analysis in Calendar Year 2012

<table>
<thead>
<tr>
<th>Crash Severity</th>
<th>Crash Type</th>
<th>Light Conditions</th>
<th>Road Surface Condition</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Fatal Crashes (2 fatalities)</td>
<td>Head On</td>
<td>Dark</td>
<td>Dry</td>
<td>Alcohol</td>
</tr>
<tr>
<td>7 Nonfatal Injury Crashes that include:</td>
<td>Sideswipe</td>
<td>Dark but Lighted</td>
<td>Wet</td>
<td>Drugs</td>
</tr>
<tr>
<td>5 Incapacitating Injury Crashes</td>
<td></td>
<td></td>
<td></td>
<td>*None</td>
</tr>
<tr>
<td>1 Non-Incapacitating Injury Crash</td>
<td></td>
<td></td>
<td></td>
<td>**Unknown</td>
</tr>
<tr>
<td>1 Possible Injury Crash</td>
<td></td>
<td></td>
<td></td>
<td>Illness</td>
</tr>
<tr>
<td>2 Property Damage Only Crashes (PDO)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Driver was not impaired
**Not determined if driver was impaired
Figure 2. Location of the wrong-way crashes occurred on Interstate and other freeways with full control access in 2012
TABLE 2: Wrong-Way Crashes 2010-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Wrong Way Crashes</th>
<th>Fatal Crashes</th>
<th>Fatalities</th>
<th>Serious Injury Crashes</th>
<th>Number of Dark Crashes</th>
<th>Driver Impaired Drugs or Alcohol</th>
<th>Fatal Crashes Driver Impaired on Drugs or Alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>14</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>2011</td>
<td>16</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>11</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>2012</td>
<td>10</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

Consequently, a total of nine interchange off-ramps were reviewed that resulted in the following findings:

1. Eight off-ramps were in compliance with the MUTCD minimum requirements. The MUTCD compliance of the signage at the I-630 intersection with Shackleford Road at the time of the crashes is unknown because crashes happened at this location during construction. This area is encompassed by an active construction zone where the traffic patterns and corresponding signage have been revised numerous times since the occurrence of the crashes. The signage at this location at the time of investigation did not meet the minimum requirements of MUTCD but immediate installation of “ONE WAY” and “WRONG WAY” signs brought it into compliance with the MUTCD.

2. Four of the ramps were in compliance with the MUTCD minimum requirements, but were not in compliance with the current AHTD signing practices. All of the sign corrections are scheduled to be implemented by statewide signing crews as soon as possible.

Findings of this investigation are also summarized in Table 3. Crash location maps, along with diagrams of the interchanges, investigation reports and crash reports are included in Appendix C.
### TABLE 3. List of Wrong-Way Crashes on Interstates and Other Freeways in Calendar Year 2012

<table>
<thead>
<tr>
<th>Crash #</th>
<th>County</th>
<th>Rte</th>
<th>Sec</th>
<th>LM</th>
<th>Sev.</th>
<th>Fat.</th>
<th>Inj.</th>
<th>Type</th>
<th>Date</th>
<th>Time</th>
<th>Urban/Rural</th>
<th>Light Condition</th>
<th>Surf. Cond.</th>
<th>Impaired</th>
<th>System</th>
<th>Exit Number</th>
<th><strong>MUTCD</strong></th>
<th>*<strong>AHTD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>201268805</td>
<td>Pulaski</td>
<td>630</td>
<td>21</td>
<td>6.80</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>Head On</td>
<td>8/5/2012</td>
<td>1:02 AM</td>
<td>Urban</td>
<td>Dark</td>
<td>Dry</td>
<td>Alcohol</td>
<td>Interstate</td>
<td>Shackleford Rd. Intersection</td>
<td>U</td>
<td>N</td>
</tr>
<tr>
<td>201264812</td>
<td>Pulaski</td>
<td>630</td>
<td>21</td>
<td>7.33</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>Head On</td>
<td>5/7/2012</td>
<td>9:15 PM</td>
<td>Urban</td>
<td>Dark</td>
<td>Dry</td>
<td>Alcohol</td>
<td>Interstate</td>
<td>140</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>201274539</td>
<td>Pulaski</td>
<td>30</td>
<td>23</td>
<td>139.4</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>Head On</td>
<td>12/21/2012</td>
<td>12:01 AM</td>
<td>Urban</td>
<td>Dark but Lighted</td>
<td>Dry</td>
<td>Alcohol</td>
<td>Interstate</td>
<td>14</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>201261544</td>
<td>Crittenden</td>
<td>55</td>
<td>11</td>
<td>11.60</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>Head On</td>
<td>2/15/2012</td>
<td>9:33 PM</td>
<td>Urban</td>
<td>Dark</td>
<td>Wet</td>
<td>None</td>
<td>Interstate</td>
<td>3B</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>201260516</td>
<td>Crittenden</td>
<td>55</td>
<td>11</td>
<td>3.0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>Head On</td>
<td>1/19/2012</td>
<td>6:15 PM</td>
<td>Urban</td>
<td>Dark but Lighted</td>
<td>Dry</td>
<td>Alcohol</td>
<td>Interstate</td>
<td>4</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>201268475</td>
<td>Crittenden</td>
<td>40</td>
<td>52</td>
<td>284.40</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>Head On</td>
<td>8/12/2012</td>
<td>5:05 AM</td>
<td>Urban</td>
<td>Dark</td>
<td>Dry</td>
<td>Alcohol</td>
<td>Interstate</td>
<td>1</td>
<td>Y</td>
<td>NA*</td>
</tr>
<tr>
<td>201267694</td>
<td>Benton</td>
<td>540</td>
<td>(49)</td>
<td>5</td>
<td>84.79</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>Sideswipe Opp. Direction</td>
<td>7/19/2012</td>
<td>8:10 AM</td>
<td>Urban</td>
<td>Daylight</td>
<td>Dry</td>
<td>None</td>
<td>Interstate</td>
<td>85</td>
<td>Y</td>
</tr>
<tr>
<td>201269131</td>
<td>Pulaski</td>
<td>630</td>
<td>21</td>
<td>4.25</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>Head On</td>
<td>8/25/2012</td>
<td>9:24 PM</td>
<td>Urban</td>
<td>Dark but Lighted</td>
<td>Dry</td>
<td>Alcohol</td>
<td>Interstate</td>
<td>4</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>201261621+</td>
<td>Lonoke</td>
<td>67</td>
<td>11</td>
<td>1.59</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>Sideswipe Opp. Direction</td>
<td>2/16/2012</td>
<td>11:47 PM</td>
<td>Urban</td>
<td>Dark</td>
<td>Wet</td>
<td>Alcohol</td>
<td>U.S. Highway</td>
<td>11</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>201261677+</td>
<td>Lonoke</td>
<td>67</td>
<td>11</td>
<td>0.04</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>Head On</td>
<td>2/19/2012</td>
<td>11:48 PM</td>
<td>Urban</td>
<td>Dark</td>
<td>Dry</td>
<td>Alcohol</td>
<td>U.S. Highway</td>
<td>11</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

+Same driver involved in both of these crashes at the same exit on different days
* Ramp is in Memphis TN
**Meets MUTCD Standard, Y=Yes or N=No or U=Unknown
***Meets AHTD Standard, Y=Yes or N=No
****Crash Severity = 1-fatal crash; 2-incapacitating injury crash; 3-non-incapacitating injury crash; 4-possible injury crash; and 5-property damage only.
APPENDIX A

Act 641
Stricken language would be deleted from and underlined language would be added to the law as it existed prior to this session of the General Assembly.

Act 641 of the Regular Session

A Bill

HOUSE BILL 1961

By: Representative Pyle

For An Act To Be Entitled

AN ACT TO REQUIRE THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT TO ANALYZE WRONG-WAY CRASHES ON INTERSTATES AND OTHER FREEWAYS THAT ARE A PART OF THE STATE HIGHWAY SYSTEM; TO IMPLEMENT WARRANTED AND FEASIBLE COUNTERMEASURES THAT MAY REDUCE THE POSSIBILITY OF WRONG-WAY CRASHES; AND FOR OTHER PURPOSES.

Subtitle

TO REQUIRE THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT TO ANALYZE WRONG-WAY CRASHES ON INTERSTATES AND OTHER FREEWAYS THAT ARE A PART OF THE STATE HIGHWAY SYSTEM.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF ARKANSAS:

SECTION 1. Arkansas Code Title 27, Chapter 65, Subchapter 1 is amended to add an additional section to read as follows:

27-65-144. Additional annual reporting.

(a) The Arkansas State Highway and Transportation Department shall analyze all reported wrong-way crashes on interstate highways and other freeways that are a part of the state highway system to determine whether the installation of additional traffic control devices is warranted and feasible in order to reduce the possibility of future wrong-way crashes.

(b) Any additional traffic control devices installed under subsection
(a) of this section shall conform to the Manual on Uniform Traffic Control
Devices for Streets and Highways, approved by the Federal Highway
Administration as the national standard in accordance with 23 U.S.C. 109(d),
C.F.R. 655, and 49 C.F.R. 1.48(b)(8), 1.48(b)(33) and 1.48(c)(2), and is the
manual adopted by the State Highway Commission under § 27-52-104.

(c) A person may not file a legal action as a result of the
implementation of any recommendations made from studies conducted under this
section.

SECTION 2. DO NOT CODIFY. This act shall begin with a reporting
period in 2009 and annually thereafter.

APPROVED: 3/27/2009
APPENDIX B

Minute Order 2009-035
MINUTE ORDER

District: Statewide
County: Statewide
Category: Commission Policy

WHEREAS, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users of 2005 (SAFETEA-LU) requires each state to develop and implement a Strategic Highway Safety Plan (SHSP) that involves a comprehensive and collaborative approach to highway safety; and

WHEREAS, Minute Order 2007-091 adopted Arkansas’ SHSP as a planning guide for improving highway safety in the State; and

WHEREAS, one emphasis area identified in Arkansas’ SHSP is to reduce the number of head-on crashes; and

WHEREAS, head-on crashes occur from time to time on Interstates and other freeways as a result of wrong-way travel on these fully access controlled routes.

NOW THEREFORE, the Director is authorized to conduct an annual analysis, beginning with the 2009 reporting period, of all reported wrong-way crashes on Interstate highways and other freeways that are a part of the state highway system to determine whether the installation of additional traffic control devices is warranted and feasible to reduce the possibility of future wrong-way crashes.

FURTHERMORE, any additional traffic control devices installed as a result of the annual analysis will conform to the Manual on Uniform Traffic Control Devices for Street and Highways, which is approved by the Federal Highway Administrator as the National Standard in accordance with Title 23 U.S. Code, Sections 109(d), 114(a), 217, 315, and 402(s), 23 CFR 655, and 49 CFR 1.48(b)(8), 1.48(b)(33), and 1.48(c)(2), and is the manual adopted by the Arkansas Highway Commission pursuant to Arkansas Code Annotated Section 27-52-104.

Approved: [Signature]
Chairman

[Signature]
Vice-Chairman

[Signature]
Member

[Signature]
Member

[Signature]
Member

Submitted By: [Signature]
Assistant Chief Engineer - [Position]

[Signature]
Assistant Chief Engineer - [Position]

Minute Order No. 2009 035

Date Passed FeB 25 2009

ACE-P

Form 19-456
Rev. 08/01/2007
APPENDIX C

Crash Location Maps,
Photos of Interchanges, and Crash Reports
**Maintenance Review**

The driver accessed I-630 at the Shackleford Rd. intersection and traveled east in the westbound lanes of traffic. The driver was involved in a head on serious injury crash in Pulaski County at Log Mile 6.80.

**Maintenance Review Results**

This intersection is a major work zone where traffic patterns have changed numerous times since this crash. The signs at this intersection currently do not comply with MUTCD or AHTD standards due to the construction and some of the warning signs are not in place. These will be installed as soon as possible by the statewide forces as the construction schedule permits.
Interstate 630, Shackleford Rd. Intersection in Pulaski County

Maintenance Review
The driver accessed I-630 at the Shackleford Rd. intersection and traveled east in the westbound lanes of traffic. The driver was involved in a head on serious injury crash in Pulaski County at Log Mile 7.33.

Maintenance Review Results
This intersection is a major work zone where traffic patterns have changed numerous times since this crash. The signs at this intersection currently do not comply with MUTCD or AHTD standards due to the construction and some of the warning signs are not in place. These will be installed as soon as possible by statewide forces as the construction schedule permits.
Maintenance Review
The driver accessed I-30 at the 6th/9th Street exit and traveled west in the eastbound lanes of traffic. The driver was involved in a sideswipe serious injury crash in Pulaski County at Log Mile 139.4.

Maintenance Review Results
The interchange at exit 140 was reviewed. Pavement markings and signs were in place and in conformance with MUTCD standards. However, the 36"x36" Do Not Enter signs at 9th Street will be replaced with 48"x48". The 54"x18" One Way signs aremissing on the east side of the road and will be installed. Also, on the access road, the Wrong Way signs prior to 9th street and 12th street will be replaced to be consistent with current AHTD standards on sizes and the Wrong Way signs prior to 10th street are missing and will be installed. These modifications will be implemented by statewide forces as soon as possible.
Maintenance Review
The driver accessed I-55 at exit 14 (Jericho) and traveled south in the northbound lanes of traffic. The driver was involved in a head on fatal crash in Crittenden County at Log Mile 11.60.

Maintenance Review Results
The interchange at exit 14 was reviewed. All pavement markings and signs were in place and in conformance with MUTCD and AHTD standards. However, some additional signs will be added to the median to be consistent with the southbound off ramp section of this interchange. These modifications will be implemented by statewide forces as soon as possible.
Maintenance Review
The driver possibly accessed I-55 at exit 4 (MLK Dr.) or exit 3B (Hwy. 70-Broadway) and traveled south in the northbound lanes of traffic. The driver was involved in a head on crash in Crittenden County at Log Mile 3.0.

Maintenance Review Results
The interchanges at exit 4 and 3B were reviewed. All pavement markings and signs were in place and in conformance with MUTCD and AHTD standards. However, some of the signs needed to be straightened or replaced. These modifications will be implemented by statewide forces as soon as possible.
Crash # 201260516
Interstate 55, Section 11, Log Mile 3.00, Crittenden County

Wrong-Way Crash Study 2012
Appendix C-43
Maintenance Review
The driver accessed I-40 possibly at exit 1 in Memphis, Tennessee and traveled west in the east lanes of traffic. The driver was involved in a head on serious injury crash in Crittenden County at Log Mile 284.4.

Maintenance Review Results
The interchange at exit 1 in Memphis, TN was reviewed. All pavement markings and signs were in place and in conformance with MUTCD and AHTD standards. No recommendations were made for modifications.
Crash # 201268475  Interstate 40, Section 52, Log Mile 284.40, Crittenden County
Maintenance Review
The driver accessed I-540 (49) at exit 85 and traveled north in the southbound lanes of traffic. The driver was involved in a sideswipe crash in Benton County at Log Mile 84.79.

Maintenance Review Results
The interchange at exit 85 was reviewed. Pavement markings along with Yield, Do Not Enter and Wrong Way signs were in place and in conformance with MUTCD as well as AHTD standards. However, the 15x84 One-Way signs were missing on the east approach while the One-Way signs on the west side of the off-ramp need to be repositioned. These modifications will be made by statewide forces as soon as possible.
Crash # 201267694  
Interstate 540 (49), Section 5, Log Mile 84.79, Benton County
Maintenance Review
The driver accessed I-630 at Exit 4 eastbound off ramp and traveled west in the eastbound lanes of traffic. The driver was involved in a head on serious injury crash in Pulaski County at Log Mile 4.25.

Maintenance Review Results
The interchange at Exit 4 was reviewed. All pavement markings and signs were in place and in conformance with MUTCD standards. However, the Wrong Way signs and the Yield signs will be replaced with larger signs to be consistent with AHTD standards. These modifications will be made by statewide forces as soon as possible.
Crash # 201269131 Interstate 630, Section 21, Log Mile 4.25, Pulaski County

Wrong-Way Crash Study 2012 Appendix C-72
U.S. Highway 67, Exit 11 in Pulaski County

Maintenance Review
The driver accessed U.S. 67 at Exit 11 in Pulaski County and traveled north in the southbound lanes of traffic. The driver was involved in a non-incapacitating injury sideswipe opposite direction crash in Lonoke County at Log Mile 1.59. Three days later this same driver did the exact same thing again and was involved in a possible injury head on crash at log mile 0.04 in Lonoke County.

Maintenance Review Results
The interchange at Exit 11 was reviewed. Pavement markings along with One Way and Do Not Enter signs were in place and in conformance with MUTCD and AHTD standards. However, the 30"x30" Do Not Enter sign and the 48" Yield sign were missing on the east approach of the channelized intersection. Also, on the off ramp, the Wrong Way sign on the west side of the ramp will be replaced to be consistent with current AHTD standards on size. The Wrong Way sign on the east side of the ramp is missing. These modifications will be implemented by statewide forces as soon as possible.
Crash # 201261621 & 201261677 U.S. Highway 67, Section 11, Log Miles 1.59 & 0.04, Lonoke County