Local Road Safety: Reducing Fatalities and Serious Injuries on County Roads Workshop
Brian Roberts, PE
NACE Executive Director

Brian Keierleber, PE
Buchanan County, IA
County Engineer
Topics

• Trends in Highway Fatalities
• Toward Zero Deaths (TZD)
• Strategic Highway Safety Plans
• Local Road Safety Plans
• Examples
2015 BROUGHT BIGGEST PERCENT INCREASE IN U.S. TRAFFIC DEATHS IN 50 YEARS

32,675 → 35,200
Figure 2: Percentage Change in Estimated Fatalities in 2015 From Reported 2014 Fatality Counts, by NHTSA Region
Figure 3: Percentage Change in Fatalities From 2014 to 2015, by Person Type

- Driver: 6%
- Passenger: 7%
- Motorcyclist: 9%
- Pedestrian: 10%
- Pedalcyclist: 13%

*Stranger Counties. Stronger America.*
Figure 4: Percentage Change in Fatalities From 2014 to 2015, by Crash Type (not mutually exclusive)

- Involving a Large Truck: 4%
- Involving a Young Driver: 10%
- In PV Rollovers: 5%
<table>
<thead>
<tr>
<th>State</th>
<th>Rural Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>57%</td>
</tr>
<tr>
<td>AK</td>
<td>64%</td>
</tr>
<tr>
<td>AZ</td>
<td>46%</td>
</tr>
<tr>
<td>AR</td>
<td>77%</td>
</tr>
<tr>
<td>CA</td>
<td>42%</td>
</tr>
<tr>
<td>CO</td>
<td>51%</td>
</tr>
<tr>
<td>CT</td>
<td>17%</td>
</tr>
<tr>
<td>DE</td>
<td>59%</td>
</tr>
<tr>
<td>FL</td>
<td>40%</td>
</tr>
<tr>
<td>GA</td>
<td>57%</td>
</tr>
<tr>
<td>HI</td>
<td>42%</td>
</tr>
<tr>
<td>ID</td>
<td>81%</td>
</tr>
<tr>
<td>IL</td>
<td>43%</td>
</tr>
<tr>
<td>IN</td>
<td>64%</td>
</tr>
<tr>
<td>IA</td>
<td>83%</td>
</tr>
<tr>
<td>KS</td>
<td>81%</td>
</tr>
<tr>
<td>KY</td>
<td>78%</td>
</tr>
<tr>
<td>LA</td>
<td>52%</td>
</tr>
<tr>
<td>ME</td>
<td>99%</td>
</tr>
<tr>
<td>MD</td>
<td>35%</td>
</tr>
<tr>
<td>MA</td>
<td>13%</td>
</tr>
<tr>
<td>MI</td>
<td>45%</td>
</tr>
<tr>
<td>MN</td>
<td>67%</td>
</tr>
<tr>
<td>MI</td>
<td>81%</td>
</tr>
<tr>
<td>MO</td>
<td>63%</td>
</tr>
<tr>
<td>MT</td>
<td>86%</td>
</tr>
<tr>
<td>NE</td>
<td>76%</td>
</tr>
<tr>
<td>NV</td>
<td>44%</td>
</tr>
<tr>
<td>NH</td>
<td>71%</td>
</tr>
<tr>
<td>NJ</td>
<td>14%</td>
</tr>
<tr>
<td>NM</td>
<td>78%</td>
</tr>
<tr>
<td>NY</td>
<td>46%</td>
</tr>
<tr>
<td>NC</td>
<td>68%</td>
</tr>
<tr>
<td>ND</td>
<td>89%</td>
</tr>
<tr>
<td>OH</td>
<td>65%</td>
</tr>
<tr>
<td>OK</td>
<td>71%</td>
</tr>
<tr>
<td>OR</td>
<td>66%</td>
</tr>
<tr>
<td>PA</td>
<td>50%</td>
</tr>
<tr>
<td>RI</td>
<td>11%</td>
</tr>
<tr>
<td>SC</td>
<td>84%</td>
</tr>
<tr>
<td>SD</td>
<td>86%</td>
</tr>
<tr>
<td>TN</td>
<td>60%</td>
</tr>
<tr>
<td>TX</td>
<td>48%</td>
</tr>
<tr>
<td>UT</td>
<td>48%</td>
</tr>
<tr>
<td>VA</td>
<td>53%</td>
</tr>
<tr>
<td>WA</td>
<td>60%</td>
</tr>
<tr>
<td>WV</td>
<td>71%</td>
</tr>
<tr>
<td>WI</td>
<td>65%</td>
</tr>
<tr>
<td>WY</td>
<td>72%</td>
</tr>
<tr>
<td>PR</td>
<td>54%</td>
</tr>
</tbody>
</table>

% Fatalities on Rural Roads (FARS 2011)
<table>
<thead>
<tr>
<th></th>
<th>2012 Fatalities</th>
<th>Percent of 2012 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway departure</td>
<td>18,887</td>
<td>56%</td>
</tr>
<tr>
<td>Unrestrained occupants</td>
<td>11,189</td>
<td>33%</td>
</tr>
<tr>
<td>Alcohol-impaired</td>
<td>10,322</td>
<td>31%</td>
</tr>
<tr>
<td>Speeding*</td>
<td>9,944</td>
<td>31%</td>
</tr>
<tr>
<td>Intersections</td>
<td>8,766</td>
<td>26%</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>4,957</td>
<td>15%</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>4,743</td>
<td>14%</td>
</tr>
<tr>
<td>Large trucks</td>
<td>3,921</td>
<td>12%</td>
</tr>
<tr>
<td>Distraction</td>
<td>3,328</td>
<td>10%</td>
</tr>
<tr>
<td>Bicyclists</td>
<td>726</td>
<td>2%</td>
</tr>
</tbody>
</table>

* 2011

Table 1. Sample of crash contributing factors (44, 36)
Vision: A highway system free of fatalities, changing the nation’s culture to the point where even one traffic-related death is unacceptable

A commitment to a comprehensive, multidisciplinary, aggressive, and proactive approach to improving highway safety
Stakeholders
TZD Emphasis Areas

Drivers and Passengers

Vulnerable Users

Vehicles

Infrastructure

Emergency Medical Services

Data Processes
APPENDIX

DETAILED LIST OF STRATEGIES

This list of strategies includes the key strategies presented in Section 3, as well as additional strategies effective in reducing risk of fatalities and serious injuries. When appropriate, strategies presented in Section 3 are expanded to provide more detail. As with the key areas, there is overlap between these lists. This list was developed with input from National Cooperative Highway Research Program project 17-51(4), which developed input to the T20 National Strategy, and information from many highway safety stakeholders.

SAFER DRIVERS

Occupant Protection
- Enact and enforce primary seatbelt laws
- Implement high-visibility restraint enforcement, including nighttime and child restraint use
- Implement advanced seat belt reminder systems, including those for rear-seat occupants
- Strengthen state child safety seat legislation to support federally approved child restraint use
- Implement parent education programs on topics related to child restraints and child occupant safety practices
- Implement programs to provide approved child safety seats to parents and caregivers needing financial assistance
- Implement driver restraint monitoring systems
- Increase fines for violating seatbelt and child restraint legislation
- Speeding and Aggressive Driving
- Enact targeted enforcement for speeding-related offenses
- Enact legislation and implement automated traffic enforcement—including pervasive automated speed enforcement and applications for school and work zones
- Implement rigorous aggressive driving and speeding-related enforcement programs
- Implement real-time speed-feedback warning systems: on roadides
- Set appropriate speed limits and deploy other speed management techniques

Impaired Driving
- Enact legislation and implement high-visibility sobriety checkpoints.
- Implement appropriate penalties and DWI/DUI courts
- Enact legislation and standardize ignition interlock programs for offenders
- Improve alcohol and drug detection technology
- Implement ignition interlock systems
- Implement Screening and Brief Intervention (SBI) for repeat DUI offenders
- Coordinate with private sector establishments serving alcohol
- Implement policies that prevent excessive consumption of alcohol, e.g., binge drinking
- Implement policies (incompliance checks, responsible beverage server training, etc.) that prevent access to alcohol by persons under the age of 21
- Increase fines and penalties associated with impaired driving

Distracted Driving
- Enact and enforce legislation to address distracted driving—including texting bans
- Implement technologies to prohibit or limit cell phones and electronic equipment while vehicle is in motion
- Implement and enforce employer policies to eliminate distracted driving

Teen Drivers
- Strengthen GDL legislation and enforce graduated driver licensing laws
- Improve driver education by standardizing materials and laws requiring driver education across the nation
- Implement teenage driver oriented technologies that adjust stereo volume, increase seat belt warning signals and react to signs of distraction
- Implement public education campaigns and enforcement of safe driving practices in proximity of commercial vehicles—with an emphasis on targeting teen drivers
- Implement parent education programs
- Implement driver-monitoring systems for teen drivers

Older Drivers
- Improve older driver licensing policies and screening of older drivers, including potentially tailoring licensing to specific needs such as daylight driving only
- Educate older drivers about driver rehabilitation
- Implement safe driving courses for older drivers
- Implement Medical Advisory Boards (MABs) that independently review older driver capabilities
- Implement vehicle enhancements for older drivers
- Increase involvement of family-practice and internal medicine physicians who are in regular contact with older drivers in the decision about driving and licensing

Unlicensed Drivers and Drivers with Suspended or Revoked Licenses
- Implement One Driver, One Record
- Enact legislation for non-driving violations

Work Zones
- Educate drivers on safer driving practices in work zones
Vulnerable Users

• Pedestrians and Bicyclists
  • Increased fatalities in 2011, 2012 and 2015

• Motorcyclists
  • 4.9M in 2001 to 8.4M in 2011 Registered

• Highway Workers
  • 609 Fatalities in 2012
EMS

Of the drivers who died while being transported to the hospital, 75% were rural drivers compared to 25% for urban drivers.
Automated Vehicles (AV)

- Enable Communication with Other Vehicles and the Roadway (V2V)
- Vehicle-to-infrastructure (V2I) technologies
- V2X
Safety Culture

Safety culture is more than public information campaigns.

Safety must be a factor in every transportation decision.
TZD > The National Strategy vision is a highway system free of fatalities.

Read the TZD National Strategy

TZD > Communication Plan
A variety of communication tools for the Toward Zero Deaths program are provided. In addition, the Communication Plan includes suggested audiences and stakeholders, goals, objectives, tactics, timelines, milestones and measurement metrics.

TZD > Become a Participant
Actively engage your state, organization or company in the Toward Zero Deaths (TZD) vision. Sign up to receive TZD updates and download the TZD logo.

Moving Toward Zero Deaths
Zero is not an impossible goal, but it will take all of us to get there. See how all of our efforts are helping us on our way Toward Zero Deaths.
Implementation Plan for Counties/Locals

- Formal Adoption
- Establishment of Inter-Departmental and/or Inter-Agency work group
- Review and consideration of all identified strategies (high impact, time frame, etc)
- Commitment to data collection and analysis
- Participation with State SHSPs
- Development of Local Road Safety Plans
- Continuing Education
Strategic Highway Safety Plans (SHSP)

- Developed by each state DOT in cooperation with other officials & stakeholders
- Data-driven multi-year, comprehensive plan
- Establishes statewide goals, objectives, & key emphasis areas
- Updated every five years
- **Local programs must be included in the SHSP or no HSIP (federal) funds can be used!**
- And your county officials should be at the table!
Local Road Safety Plans

• County-wide safety plans
• Data driven and systemic
• Have been developed by States and Counties
• Should be referenced in SHSPs

• The key to obtaining HSIP funds
• Huge successes in WA, MN
• More states moving in this direction
BUCHANAN COUNTY IOWA

BUCHANAN CO.

SECONDARY ROADS

- 963 miles of roads
- 201 miles of Paved roads
- 35 miles of Dirt Roads
- 259 Bridges
- 21093 people
- 12 fatalities in 10 years
Many of our bridges are old.
PLACE THE EMPHASIS WHERE THE PROBLEMS EXIST
What is a Local Road Safety Plan?

• An LRSP is a document that provides a basis for systemic safety improvements along local roads

• Focus on all the five E’s of safety:
  – Engineering
  – Emergency response
  – Education
  – Enforcement
  – Everyone
No School Busses
A different Culture
Safety Issues are created
Different cultures have different risks
Iowa Statistics

- Driver-Related
- Speed-related (48% of fatal and serious injury crashes)
- Unprotected persons (38% of fatal and serious injury crashes)
- Younger drivers (37% of fatal and serious injury crashes)
- Impaired driving (18% of fatal and serious injury crashes)
- Older drivers (16% of fatal and serious injury crashes)
- Inattentive/distracted drivers (5% of fatal and serious injury crashes)
- Traffic safety culture (n/a)

- Roadway/Infrastructure
- Lane departure (53% of fatal and serious injury crashes)
- Local roads (52% of fatal and serious injury crashes)
- Intersections (30% of fatal and serious injury crashes)
Both Methods are Needed

CMAT is Reactive

LOCAL ROAD SAFETY PLANS are Systemic
LRSP Recommendations

• Driver Related Countermeasures
• Speed-related
• Unprotected persons
• Younger drivers
• Impaired driving
• Inattentive/distracted driving
• Older drivers
LRSP Speed Related

- Conduct speed enforcement.
- Dynamic speed signs have been used to record speeds at various locations throughout the day. The Sheriff’s department then passes this information to the deputies to let them know what time of day the speeding occurs (for directed enforcement).
- County has eight contracted cities for Sheriff/law enforcement services, so speed enforcement is part of these contracts. (Underway/Ongoing)
LRSP Sheriffs and Schools on Speed Issues

• Implement rigorous aggressive driving and speeding-related enforcement programs.

• Education campaigns relative to locations with high-risk of speed-related crashes, potentially in schools.
LRSP Unprotected
Individual Seatbelts

- Conduct publicized enforcement campaigns (Underway/Ongoing)
- Conduct instructions in proper child restraint use in community locations (Underway/Ongoing)
- Conduct high-profile “child restraint inspection and/or installation” events at community locations
- Sheriff Department currently holds a yearly safety fair to provide training for proper child seat installation (Underway/Ongoing)
- Train law enforcement to check for proper child restraint use in all motorist encounters (Underway/Ongoing)
- Education campaigns in grade schools (Underway/Ongoing)
LRSP YOUNGER DRIVERS

• School districts no longer teach Drivers Education (D.E.) during the school year, so this is no longer a built-in opportunity for school-based strategies.
• Improve content and delivery of driver education/training
• Review transportation plans for new/expanded/existing high school sites
• Conduct additional training in schools ("drunk goggles"; "don't veer for deer"; what to do when on an edge drop-off; training in health class; etc.)
  – The sheriff’s department uses “drunk goggles” in local D.E. programs for a hands-on demonstration of the effects of drunk driving. (Underway/Ongoing)
  – The County Sheriff’s department currently participates in some in school training. They go whenever asked. (Underway/Ongoing)
• "Operation Prom" mock disaster
  – Mock crash events (every 4 years) have been used by the Sheriff’s department to more effectively present the messages of don’t text/drive, obey the speed limits, and don’t drink/drive. (Underway/Ongoing)
• Prosecute and impose sanctions on drivers not obeying school bus stop bars
YOUNGER DRIVERS

• My Answer is Enforce Graduated Drivers License

Instruction Permit
  Drive with parent, etc. and no cell phones

Minor School License
  Restricted Hours
  *** passenger restrictions
  ** No Cell Phones

Intermediate License
  ** NO Cell Phones
LRSP Impaired Drivers

• Conduct regular well-publicized safety checkpoints
• Proactively conduct OWI enforcement
• Conduct regular well-publicized compliance checks of alcohol retailers to reduce sales to underage drivers
• Prosecute, impose sanctions on, and treat operating while intoxicated (OWI) offenders
LRSP Older Drivers

• Establish resource centers within communities to promote safe mobility choices
• Paratransit for older drivers
• Recommend re-testing of older drivers involved in crashes and citations
• Larger Signs and wider pavement markings
LRSP Engineering Countermeasures

- Intersections 15 $312,000
- Curves 16 $385,000
- Segments 23 $8,156,000
- Total Improvement Costs 54 $8,853,000
LRSP UNPAVED ROADS

• Upgrade Signs
• Realign Intersection
• Improve/Increase Shoulder/Lane Width
• Delineate Roadside Hazards with Retroreflective Tape
• Curve Chevrons
• Advance Curve Warning Signs and Speed Advisory Plaques
• Maintenance of Gravel
• Clear and Grub
• Winter Maintenance
Poor Curve Design
REMOVE THE EMOTIONS FROM THE DECISIONS
HOW ARE the LOCATIONS IDENTIFIED?
CMAT (Crash Mapping Analysis Tool)

- Free
- 2003–2012 crash data
- Limited data fields
- Maps, reports, & crash details

- Developed & maintained for DOT by Dan Gieseman, CTRE
## Major Cause Summary

### Analysis Years:
- 2001 [4]
- 2003 [2]
- 2004 [2]
- 2005 [2]
- 2006 [2]

### Crash Summary:
- Fatal: 1
- Major Injury: 3
- Minor Injury: 3
- Possible/Unknown: 3
- PDO: 9
- **Total Crashes:** 16

### Injury Summary:
- Fatal: 1
- Major Injury: 2
- Minor Injury: 3
- Possible: 5
- Unknown: 0
- **Total Injuries:** 10

### Surface Condition Summary:
- Dry: 13
- Wet: 1
- Ice: 2
- Snow: 0
- Slush: 0
- Sand/Dirt/Oil/Gravel: 0
- Water: 0
- Other: 0
- Unknown: 0
- Not Reported: 0
- **Total Crashes:** 16

### Property Damage:
- **TOT Property Damage:** $102,827
- **AVG Property Damage:** $6,427

*(Top Half)*
## Major Cause Summary

<table>
<thead>
<tr>
<th>Major Cause Summary:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal</td>
</tr>
<tr>
<td>Ran Traffic Signal</td>
</tr>
<tr>
<td>Ran Stop Sign</td>
</tr>
<tr>
<td>Crossed Centerline</td>
</tr>
<tr>
<td>FTYROW: At Uncontrolled Intersection</td>
</tr>
<tr>
<td>FTYROW: Making Right Turn on Red Signal</td>
</tr>
<tr>
<td>FTYROW: From Stop Sign</td>
</tr>
<tr>
<td>FTYROW: From Yield Sign</td>
</tr>
<tr>
<td>3 FTYROW: Making Left Turn</td>
</tr>
<tr>
<td>FTYROW: From Driveway</td>
</tr>
<tr>
<td>FTYROW: From Parked Position</td>
</tr>
<tr>
<td>FTYROW: To Pedestrian</td>
</tr>
<tr>
<td>1 FTYROW: Other (explain in narrative)</td>
</tr>
<tr>
<td>Traveling Wrong Way or on Wrong Side of Rd</td>
</tr>
<tr>
<td>1 Driving Too Fast for Conditions</td>
</tr>
<tr>
<td>Exceeded Authorized Speed</td>
</tr>
<tr>
<td>1 Made Improper Turn</td>
</tr>
<tr>
<td>Improper Lane Change</td>
</tr>
<tr>
<td>Followed Too Close</td>
</tr>
<tr>
<td>Disregarded Railroad Signal</td>
</tr>
<tr>
<td>Disregarded Warning Sign</td>
</tr>
<tr>
<td>Operating Vehicle in Reckless/Aggressive Manner</td>
</tr>
<tr>
<td>Improper Backing</td>
</tr>
<tr>
<td>Illegally Parked/Unattended</td>
</tr>
<tr>
<td>3 Swerving/Evasive Action</td>
</tr>
<tr>
<td>Over-Correcting/Over-Steering</td>
</tr>
<tr>
<td>Downhill Runaway</td>
</tr>
<tr>
<td>Equipment Failure</td>
</tr>
<tr>
<td>Separation of Units</td>
</tr>
<tr>
<td>Ran Off Road - Right</td>
</tr>
<tr>
<td>Ran Off Road - Straight</td>
</tr>
<tr>
<td>Ran Off Road - Left</td>
</tr>
<tr>
<td>Lost Control</td>
</tr>
<tr>
<td>Inattentive/Distracted By: Passenger</td>
</tr>
<tr>
<td>Inattentive/Distracted By: Use of Phone or Other</td>
</tr>
<tr>
<td>Inattentive/Distracted By: Fallen Object</td>
</tr>
<tr>
<td>Inattentive/Distracted By: Fatigued/Asleep</td>
</tr>
<tr>
<td>1 Other: Vision Obstructed</td>
</tr>
<tr>
<td>Oversized Load/ Oversized Vehicle</td>
</tr>
<tr>
<td>Cargo/Equipment Loss or Shift</td>
</tr>
<tr>
<td>Other: Other Improper Action</td>
</tr>
<tr>
<td>1 Unknown</td>
</tr>
<tr>
<td>Other: No Improper Action</td>
</tr>
<tr>
<td>None Indicated</td>
</tr>
</tbody>
</table>
### Driver and Time Summary

<table>
<thead>
<tr>
<th>Crash Time of Day Summary:</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>00:00</td>
<td>02:00</td>
<td>04:00</td>
<td>06:00</td>
<td>08:00</td>
<td>10:00</td>
<td>12:00</td>
<td>14:00</td>
<td>16:00</td>
<td>18:00</td>
<td>20:00</td>
<td>22:00</td>
<td>NR</td>
<td>Total</td>
</tr>
<tr>
<td>SUN</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>MON</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>TUE</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>WED</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>THU</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>FRI</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>SAT</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Tot.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>%</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>19</td>
<td>6</td>
<td>12</td>
<td>25</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
## Driver & Time Summary

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>NR</th>
<th>Drivers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;14</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>17</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>19</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21 to 24</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>25 to 29</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>30 to 34</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>35 to 39</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>40 to 44</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>45 to 49</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>50 to 54</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>55 to 59</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>60 to 64</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>65 to 69</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>70 to 74</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>75 to 79</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>80 to 84</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>85 to 89</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>90 to 94</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>95 plus</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NR</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Drivers</td>
<td>17</td>
<td>14</td>
<td>1</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

### Total Crashes

| None Indicated | 16 | 100 |

### Fixed Object Struck Summary:

<table>
<thead>
<tr>
<th>Fixed Object Struck</th>
<th>Vehs.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge/Bridge rail/Overpass</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Underpass/Structure Support</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Culvert</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ditch/Embankment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curb/Island/Raised Median</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guardrail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Barrier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pole - Utility/Light/Etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sign Post</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mailbox</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact Attenuator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Fixed Object</td>
<td>28</td>
<td>88</td>
</tr>
<tr>
<td>None</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>
Individual Crash Details
## Crash Detail Report

### 2001081968

**Date:** 01/24/2001 16:09  
**Location:** On SR/WB NW 114TH ST and NW/EB UNIVERSITY AVE and 50TH ST  
**County:** ? County?  
**City:** ? City?  

**Major Cause:** I-80

**Roadway Type:** Intersection: Four-way intersection

**Severity:** No/Dom  
**Manner of Crash:** Broadside  
**Fatality:** 0  
**Surface Conditions:** Dry  
**Major Injuries:** 0  
**Light Conditions:** Clear  
**Minor Injuries:** 0  
**Weather Conditions:** Clear  
**Possible Injuries:** 0  
**Drug/Alc Involved:** None indicated  
**Unknown Injuries:** 0  
**Property Damage:** $6000  
**Number of Vehicles:** 4  

### Line 1

- **Dir:** East  
- **Veh Action:** Essentially Straight  
- **Configuration:** Van or mini-van  
- **Driver Age:** 67  
- **Driver Gender:** F  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Dan traffic signal  
- **Driver Cont 2:** Not reported  
- **Fixed Object:** None  

### Line 2

- **Dir:** South  
- **Veh Action:** Essentially Straight  
- **Configuration:** Passenger car  
- **Driver Age:** 38  
- **Driver Gender:** M  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported  

### Line 3

- **Dir:** South  
- **Veh Action:** Essentially Straight  
- **Configuration:** Passenger car  
- **Driver Age:** 38  
- **Driver Gender:** M  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported

---

## Crash Detail Report

### 200129520

**Date:** 06/20/2001 10:30  
**Location:** On SR/WB NW 114TH ST and UNIVERSITY AVE and 50TH ST  
**County:** ? County?  
**City:** ? City?  

**Major Cause:** I-80

**Roadway Type:** Intersection: Four-way intersection

**Severity:** No/Dom  
**Manner of Crash:** Broadside  
**Fatality:** 0  
**Surface Conditions:** Dry  
**Major Injuries:** 0  
**Light Conditions:** Daylight  
**Minor Injuries:** 0  
**Weather Conditions:** Fairly cloudy  
**Possible Injuries:** 0  
**Drug/Alc Involved:** None indicated  
**Unknown Injuries:** 0  
**Property Damage:** $2000  
**Number of Vehicles:** 2  

### Line 1

- **Dir:** Not reported  
- **Veh Action:** Stop for sign/signal  
- **Configuration:** Passenger car  
- **Driver Age:** 67  
- **Driver Gender:** M  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported  
- **Fixed Object:** None  

### Line 2

- **Dir:** Not reported  
- **Veh Action:** Not reported  
- **Configuration:** Passenger car  
- **Driver Age:** 67  
- **Driver Gender:** M  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported  

### Line 3

- **Dir:** Not reported  
- **Veh Action:** Not reported  
- **Configuration:** Passenger car  
- **Driver Age:** 67  
- **Driver Gender:** M  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported

---

## Crash Detail Report

### 200129427

**Date:** 05/21/2001 07:18  
**Location:** On SR/WB NW 114TH ST and UNIVERSITY AVE and 50TH ST  
**County:** ? County?  
**City:** ? City?  

**Major Cause:** I-80

**Roadway Type:** Intersection: Four-way intersection

**Severity:** No/Dom  
**Manner of Crash:** Broadside  
**Fatality:** 0  
**Surface Conditions:** Dry  
**Major Injuries:** 0  
**Light Conditions:** Daylight  
**Minor Injuries:** 0  
**Weather Conditions:** Clear  
**Possible Injuries:** 0  
**Drug/Alc Involved:** None indicated  
**Unknown Injuries:** 0  
**Property Damage:** $6000  
**Number of Vehicles:** 2  

### Line 1

- **Dir:** East  
- **Veh Action:** Essentially Straight  
- **Configuration:** Passenger car  
- **Driver Age:** 61  
- **Driver Gender:** F  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported  
- **Fixed Object:** None  

### Line 2

- **Dir:** North  
- **Veh Action:** Essentially Straight  
- **Configuration:** Passenger car  
- **Driver Age:** 61  
- **Driver Gender:** F  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported  

### Line 3

- **Dir:** North  
- **Veh Action:** Not reported  
- **Configuration:** Passenger car  
- **Driver Age:** 61  
- **Driver Gender:** F  
- **Driver Cond:** Normal  
- **Driver Cont 1:** Not reported  
- **Driver Cont 2:** Not reported
All Secondary Road Crashes in Buchanan County, Iowa 2003–2012

Crash Severity
- Fatal (21)
- Major Injury (61)
- Minor Injury (177)
- Possible/Unknown (179)
- PDO (694)

Disclaimer:
The information contained in this report was derived from the August 19, 2013 Iowa Department of Transportation crash database. If errors or omissions are found, please communicate the case number or send a printed crash report to Michael Pavlovich, Iowa DOT, Office of Traffic and Safety, (Michael.Pavlovich@dot.iowa.gov, 515-239-1428). Since the database is actively being updated, edited, and reviewed, some of the fatality totals may differ from the Fatality Analysis Reporting System (FARS).
Safety data on the WWW

• Iowa’s 5% Safety Report
• Iowa’s Strategic Highway Safety Plan (SHSP)
• Safety Improvement Candidate Locations (SICL)
• Comparables
• County Profiles/City Profiles

http://www.iowadot.gov/crashanalysis/data.htm
Intersection & Corridor
Comparable Rates

Comparables
Office of Traffic & Safety
P: (515) 239-1557
F: (515) 239-1891

Crash and Crash Rate Comparables:

- Crash Rates and Crash Densities in Iowa by Road System 2002-2005 (pdf, 150KB, 17pg)
- Average Intersection Crash Rates (from 1989) (pdf, 13KB, 1pg)
CTRE
Iowa State University

- Complex, Unique or Custom data requests
- All Disciplines
- Funded by:
  - Federal Traffic Records funds
  - Iowa DOT
  - Governor’s Traffic Safety Bureau, DPS
Help is available

**Qualitative Analysis**

Field Assessments

- **Informal Assessment**
  - Generally performed by an in-house team.

- **Road Safety Audit (RSA)**
  - Performed by an independent, multidisciplinary team.
DEVELOP A SOLUTION

Best Practices
for Low-Cost Safety Improvements on Iowa's Local Roads

December 2008

LTAP
Local Technical Assistance Program

CTRE
Center for Transportation Research and Education

U.S. Department of Transportation
Federal Highway Administration

Iowa Department of Transportation

IOWA STATE UNIVERSITY
Minnesota's Sign Manual


Including Insight on How to Remove Unnecessary and Ineffective Signage

REPORT NO. 2010RIC10
VERSION 1.1
October 2010

Mn/DOT Research Services Section
MS 330, 395 John Ireland Blvd.
St. Paul, Minnesota 55155
Phone: 651-366-3780
Fax: 651-366-3789
E-mail: research.dot@state.mn.us

The University of Minnesota is an equal opportunity educator and employer.
Avoid Counterproductive Signs

Sign Effectiveness Summary

<table>
<thead>
<tr>
<th>Regulatory</th>
<th>Signs that ARE proven to be effective</th>
<th>Signs that have not been tested for effectiveness</th>
<th>Signs that appear to be ineffective</th>
<th>Signs that are proven ineffective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LEFT LANE MUST TURN LEFT</td>
<td>SPEED LIMIT 50</td>
<td>STOP</td>
<td></td>
</tr>
<tr>
<td>Warning</td>
<td>SLOWER TRAFFIC KEEP RIGHT</td>
<td>CAUTION CHILDREN AT PLAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. MAIN ST 44 COUNTY</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- OK, which signs have been proven effective at either reducing crashes or changing driver behavior?
  - A search of the traffic safety literature found that the only types of signs that have been proven effective are the Horizontal Alignment Series (but only in a fairly narrow range of curve radii).
  - Research published by NCHRP found that pedestrian warning signs in combination with marked crosswalks at uncontrolled intersections in fact resulted in greater numbers of pedestrian crashes.
  - Guide Signs have been found to only have a minimal effect on intersection crashes but are assumed to improve way finding and navigation.
  - Bottom line – if your decision to install a sign is based on an expectation of effectiveness – either reducing crashes or changing driver behavior – the literature in support is virtually non-existent.
  - It appears that most signs fall into a category of hope - hope they do some good and an expectation that at least they don't do any harm.
Limit Your expenses when possible

Sign Removal – Which Signs Are Candidates? (2/2)

- Static signs that warn drivers of hazardous conditions they rarely encounter quickly lose credibility and become part of the background noise that drivers tune out.

- Mn/DOT is removing DEER CROSSING Warning signs because they have not proven to be effective at reducing deer/vehicle collisions. (They also determined that the signs had proven ineffective at training the deer where to cross the highways.)

- Advance curve warning signs were found to be effective in only a fairly narrow range of curve radii – curves with radii between 1,000 feet and 1,800 feet. There was no safety effect in larger radius curves and in shorter radius curves it was found that a combination of Advance Curve Warning PLUS Chevrons was required to produce a crash reduction. Try to achieve consistency across your system. If you have curve warning signs in advance of long radius curves, those could be candidates for removal based on system wide considerations.

- A number of studies have found that marked pedestrian crosswalks and their advance warning signs are NOT safety devices when used at uncontrolled locations. Pedestrian crash rates are actually higher at marked locations.

- There is no evidence that special warning signs of this type either change driver behavior (reduce travel speed) or improve safety.
In 5 Counties in Minnesota 80% severe crashes on curves with Radius 500-1500 ft.
CHEVRONS
ADVANCED WARNING ON CURVE
FLASHING LIGHT ABOVE STOP SIGN
LED Stop Signs in Blackhawk Co.
Double STOP AHEAD
DOUBLE STOP SIGNS
What the report includes on intersections
Portable Solar powered speed sign
Solar Powered LED Speed Signs
Speed Display Signs
Texting While Driving Is:

• About 6 times more likely to cause an accident than driving intoxicated.
• The same as driving after 4 beers – National Hwy Transportation Safety Admin.
• The number one driving distraction reported by teen drivers.
The LRSP on Segments

Local Road Safety Plan
Project Description for Segment Improvements

Risk Factor Points: 10

Project Name: OTTERVILLE BLVD between FAIRBANK AMISH BLVD and JAMESTOWN AVE
Agency Name: Buchanan County
Contact Name: Keiserlober, Brian
E-mail: engineer@co.buchanan.la.us

Location Description
Paved Road: OTTERVILLE BLVD
Length (mi): 0.22

Project Location

Segment Information and Systematic Ranking Summary

<table>
<thead>
<tr>
<th>Segment Information</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Daily Traffic (ADT)</td>
<td>622</td>
</tr>
<tr>
<td>Percent and Number of Intersections</td>
<td>33.0</td>
</tr>
<tr>
<td>Number of Driveways/Intersections per Mile</td>
<td>1.18</td>
</tr>
<tr>
<td>Lane Departure Crash Rate per VMT</td>
<td>0.00069</td>
</tr>
<tr>
<td>Lane X Failure Risk Factors (12/19)</td>
<td>10.05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opinion of Probable Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Crashes</td>
</tr>
<tr>
<td>Fatal and Injury Crashes</td>
</tr>
</tbody>
</table>

Opinion of Probable Construction Cost Disclaimer:
The recommended improvements contained in this project description form were developed through a Geographic Information System (GIS) database risk assessment and project decision tree selection process, as specifically stated in our scope of services. kimley-horn has no control over the accuracy of the GIS database nor the suitability of the specific improvements for the location, and has provided recommended improvements for consideration by the County Engineer. The County Engineer may use the project description form to aid in the selection and development of projects, but the project description form should not be used as the sole basis for the County Engineer's decision making process. We endeavor to research issues and constraints to the extent practical given the scope, budget, and schedule agreed to with the Client. Our assessment is based in large part on information provided to us by others (DOT, county staff, etc.) and therefore is only as accurate and complete as the information provided to us. This project description form is based on our knowledge of August 2016.

Project Location Map Sources:
Erdas, Delorme, NAVTEQ, USGS, Internap, IPC, NR Can, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013, GoogleEarth, GeoEye, i-cubed, USDA, AEX, Getmapping, Aerogrid, IGN, IGN, swisstopo, and the GIS User Community

End of Project Description
34 miles of widened shoulders
Centerline Rumbles
Wider Shoulders and Flatter slopes save lives
Paved shoulders with safety edge
Paved Shoulders with a safety edge
RUMBLE STRIPS
Rumble Stripes
RUMBLE STRIPES
Friction Courses on Curves we are working on this yet.
Epoxy Friction on Bridge
PROVIDE TRAINING
TRAIN THE APPROPRIATE PEOPLE
It works at Jesup
Safety Edge on Concrete
$14:$1 return Safety Saves not Costs
Friendly for ALL Users
Some complaints on snow issues.
Possibly designed out.
Look at things from a different perspective.
Some ideas will take a while to be implemented
USE YOUR IMAGINATION WITH SOUND ENGINEERING
I thought you might ask.
THANK YOU