Integrated
Highway Safety Management

Thomas M. Welch, P.E.
State Highway Safety Engineer
Office of Traffic and Safety
Iowa Department of Transportation
515 239-1267
tom.welch@dot.iowa.gov

January 2005
WORLD HEALTH ORGANIZATION

1.2 million people will die as a result of road crashes this year – more than 3200 deaths each day

ROAD SAFETY IS NO ACCIDENT
World Health Organization (WHO)
Prediction:

Road crashes will be the third highest cause of disease and injury by 2020

- 1.18 million road crash deaths per year
- 20-50 million road crash injuries per year
- $ 518 billion cost of road crashes per year (1997)
- 3rd among all causes of premature death or disability (2020 estimate after ranking 9th in 1990)
<table>
<thead>
<tr>
<th>RANK</th>
<th>Under 1</th>
<th>1-3</th>
<th>4-7</th>
<th>8-15</th>
<th>16-20</th>
<th>21-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-64</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perinatal Period</td>
<td>Congenital Anomalies</td>
<td><strong>MV Traffic Crashes</strong></td>
<td><strong>MV Traffic Crashes</strong></td>
<td><strong>MV Traffic Crashes</strong></td>
<td><strong>MV Traffic Crashes</strong></td>
<td>Malignant Neoplasms</td>
<td>Malignant Neoplasms</td>
<td>Malignant Neoplasms</td>
</tr>
<tr>
<td>2</td>
<td>Congenital Anomalies</td>
<td><strong>MV Traffic Crashes</strong></td>
<td>Malignant Neoplasms</td>
<td>Malignant Neoplasms</td>
<td>Homicide</td>
<td>Homicide</td>
<td>Homicide</td>
<td>Heart Disease</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Heart Disease</td>
<td>Accidental Drowning</td>
<td>Exposure to Smoke/Fire</td>
<td>Suicide</td>
<td>Suicide</td>
<td>Suicide</td>
<td>Suicide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Homicide</td>
<td>Homicide</td>
<td>Congenital Anomalies</td>
<td>Homicide</td>
<td>Malignant Neoplasms</td>
<td>Accidental Poison</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Septicemia</td>
<td>Malignant Neoplasms</td>
<td>Accidental Drowning</td>
<td>Congenital Anomalies</td>
<td>Accidental Poison</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Influenza/Pneumonia</td>
<td>Heart Disease</td>
<td>Homicide</td>
<td>Accidental Drowning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>MV Traffic Crashes</td>
<td>Exposure to Smoke/Fire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crashes are No. 1 Cause of Deaths in U.S. in 2001 for ages 4 through 33**
## Battlefield and Highway Casualties
*(Deaths and Major Injuries)*

<table>
<thead>
<tr>
<th>War</th>
<th>Battle Casualties</th>
<th>Equiv Hwy Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revolution</td>
<td>10,623</td>
<td>1 day, 5 hrs</td>
</tr>
<tr>
<td>1812</td>
<td>6,765</td>
<td>18 hrs</td>
</tr>
<tr>
<td>Mexican</td>
<td>5,885</td>
<td>16 hrs</td>
</tr>
<tr>
<td>Civil War</td>
<td>422,295</td>
<td>47 days, 20 hrs</td>
</tr>
<tr>
<td>Spanish-American</td>
<td>2,831</td>
<td>8 hrs</td>
</tr>
<tr>
<td>WW I</td>
<td>257,404</td>
<td>29 days, 4 hrs</td>
</tr>
<tr>
<td>WW II</td>
<td>962,403</td>
<td>109 days, 0 hrs</td>
</tr>
<tr>
<td>Korean</td>
<td>136,913</td>
<td>15 days, 12 hrs</td>
</tr>
<tr>
<td>Vietnam</td>
<td>200,685</td>
<td>22 days, 18 hrs</td>
</tr>
<tr>
<td>Persian Gulf (Part I)</td>
<td>606</td>
<td>2 hrs</td>
</tr>
<tr>
<td>Persian Gulf (Part II)</td>
<td>1756</td>
<td>5 hrs</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,008,166</strong></td>
<td><strong>227 days, 12 hrs</strong></td>
</tr>
</tbody>
</table>
Iowa Crime Clock

2000

1 murder every 7.9 days
1 aggravated assault every 87 minutes
1 violent crime every 70 minutes
1 property crime every 6 minutes
1 crime every 5.5 minutes

1 fatality every 19 hours
1 injury every 15 minutes
1 property damage every 10 minutes
1 crash every 8 minutes
The loss of one life is tragic.

As a physician who practiced in a trauma center for 20 years, I can tell you that every trip down the hall to the family room to talk to parents, to tell them their teenager is not going to come home, or a child that their dad or mom is not going to come home, is the most gut wrenching exercise you can go through, except to experience the loss yourself.
This happens in the US over 42,000 times a year, and when you consider it happens 1.2 million times worldwide it is a tragedy that is almost beyond comprehension.’

‘We talk a lot about numbers, but really we are talking about lives. And those are just the fatalities that are relatively easy to count.
Mary Peters, FHWA Administrator:

“...it appears that we also have grown accustomed to more than 41,000 highway related fatalities and greater than 3 million highway related injuries each year—”
Mary Peters, FHWA Administrator:

“This is a terrible toll and should not be viewed as the ‘price we have to pay’ for mobility. These statistics point to a national safety crisis.”

“Highway Safety – Everyone’s Responsibility”

*Public Roads, January 3, 2003*
Jerry Garcia (Grateful Dead)
Speaking for All Baby Boomers...

“Somebody’s gotta do somethin’; it’s just incredibly pathetic its gotta be us!”
Epidemic Proportions

What would the public reaction be if 40,000 Americans died from the flu in 2005?
American Public’s Likely Reaction

- OUTRAGE
- Demands to prevent it from ever happening again
- Acceptance of a large increase in funding to address the problem
Government’s Likely Reaction

Multi-Discipline Efforts:

- Increased research
- Increased vaccine production
- Improve inspection of foreign supplies
- Increase public education
- Develop alternative treatments
Mary Peters, FHWA Administrator:

“FHWA views improving safety as one of its most vital goals and has decided consciously to concentrate on saving lives.”

“Highway Safety – Everyone’s Responsibility”
Public Roads, January 3, 2003
Federal Highway Safety Goal

1.0 Fatalities
per 100M VMT by 2008
(33% Reduction)

U.S. Department of Transportation
National Highway Traffic Safety Administration

U.S. Department of Transportation
Federal Highway Administration

U.S. Department of Transportation
Federal Motor Carrier Safety Administration
US DOT Goal of 1.0 Fatality Rate by 2008

- Year 2001: Fatalities ~ 42,000, Rate = 1.51
- US DOT Goal: Fatality Rate = 1.0
- Maintain 2001 Rate: ~50,000
- ~33,000
Highway Safety is Complex

- Driver behavior
- Roadway
- Enforcement
- Emergency response
- Medical treatment
- Vehicle design
- Driver education
Highway Safety History

Working in silos
☐ Engineering
☐ Enforcement
☐ Education
☒ Emergency response services
The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) required each state to develop and implement a Safety Management System (SMS) by October 6, 1996.

February 1995 the Iowa SMS organized

The National Highway System Designation Act of 1995 removed the mandate for the states to implement the management systems. States could elect to adopt the systems in whole or in part.

By 1997, the Iowa Management System Policy Committee determined that Iowa will continue to implement the management systems, including the SMS.
AASHTO
Strategic Highway Safety Plan

- Origin of the Highway Safety Plan
  In the late 1990s significant gains in highway safety appeared stalled. Experts declared “the low hanging fruit” had been picked. More innovative strategies would be needed.

- Core Elements
  The Plan is organized around six key elements, each encompassing multiple strategies for reducing fatalities, injuries, and related costs in a manner acceptable to a significant majority of the public.
NCHRP Guides

Implementation guides currently in print include:

- Run-Off-Road Collisions
- Head-On Collisions
- Collisions with Trees in Hazardous Locations
- Un-signalized Intersection Collisions
- Collisions Involving Unlicensed Drivers and Drivers with Suspended or Revoked Licenses
- Aggressive Driving Collisions
- Older Drivers
- Safety Belts
- Heavy Trucks
- Pedestrians
- Utility Poles
- Signalized Intersections
- Horizontal Curves
NCHRP Guides
To be produced in 2005

- Motorcycles
- Work Zones
- Rural Emergency Management Services
- Distracted/Fatigued Drivers
- Head-on Crashes on Freeways
- Alcohol
- Bicyclists

Printed copies of the guides may be ordered from NCHRP or electronic copies may be accessed and downloaded at: http://safety.transportation.org
AASHTO Lead State Initiative

- States develop and implement plans to address specific highway safety issues
Iowa’s Highway Safety Management

Governor

Department of Transportation
Office of Traffic and Safety

Safety Management System & Statewide Traffic Records Committee
Cities, Counties, Other State Agencies, Universities & Private Sector Groups

Department of Public Safety
Governor’s Traffic Safety Bureau (GTSB)
GTSB Programs

Main emphasis areas:

- Section 157 incentive seat belt
- Section 405a occupant protection
- Section 410 alcohol impaired driving prevention
- Section 411 traffic records data improvement
- Section 2003b child passenger safety education
- Section 402 highway safety funds
GTSA 402 Funds

Main emphasis areas:
- alcohol
- occupant protection
- police traffic services
- emergency medical services
- traffic records
- engineering
- motorcycles
- pedestrian/bicycle safety
DOT and GTSB Partnerships

- Safety Management System (SMS)
- Section 411, State Traffic Records Advisory Committee (STRAC)
- Local Multidisciplinary Highway Safety Teams
- Section 157, Seat Belt Incentive Funds
- Section 402, Highway Safety Program
Iowa DOT Safety Programs Collaboration

- SMS – Iowa Safety Management System State
- Federal Hazard Elimination Safety Program (HES)
- Safety Data Products
  - Crash Data Analysis Tools
  - Iowa Traffic Safety Data Services (ITSDS)
- Traffic Engineering Assistance Program (TEAP)
- Traffic Safety Improvement Programs (TSIP)
- Safety Conscious Planning
- Traffic & Safety Engineering Forum
- Safety Research Program
- “Proactive” Highway Safety Program
- Roadway Safety Audits
Iowa SMS is:
A diverse partnership of highway safety practitioners in engineering, enforcement, education, and emergency services dedicated to reducing the number and severity of crashes on Iowa's roadways.

www.IowaSMS.org
Working Together—Across Agencies and Disciplines
What (or Who) is SMS?

- Enforcement
- Engineering
- Emergency Response
- Education
- Everyone Else

- Communication
- Cooperation
- Coordination
SMS Membership

State Agencies

- Department of Education
- Department of Elder Affairs
- Department of Public Health
- Department of Public Safety
  - Governor’s Traffic Safety Bureau
  - Iowa State Patrol
  - Fire Safety Institute
- Department of Transportation

Education

- Iowa State University
  - Center for Transportation Research & Education
SMS Membership

**Federal Agencies**
- FHWA - Federal Highway Administration
- FMCSA - Federal Motor Carrier Administration
- NHTSA - National Highway Traffic Safety Administration

**Associations and Local Government**
- American Public Works Association
- Iowa County Engineer’s Association
- Iowa State Sheriff’s and Deputy’s Association
- Iowa Traffic Control and Safety Association

**Private Sector**
- AAA Iowa / Minnesota
- AARP Iowa
- Union Pacific Railroad
- Iowa Motor Truck Association
- State Farm Insurance
SMS Roles

- Be a “Resource”
  - Legislature
  - State and Local Agencies
  - Communities
- Stimulate collaboration
- Identify Alternatives
- Provide Data
- Fill gaps
- No Recommendations
The SMS Toolbox Charter

Signed by:

- Iowa’s Governor & Lt. Governor
- 6 Department Directors
- 3 Federal Administrators
2002 Iowa SMS
Toolbox of Highway Safety Strategies

28 Key Emphasis
Subjects in 5 Areas:

- Drivers
- Special Users
- Highways
- Emergency Response
- Management Systems
Emphasis Areas

Drivers
1. Increasing Driver Safety Awareness
2. Increasing Safety Belt and Child Restraint Usage
3. Preventing Drowsy and Distracted Driving
4. Curbing High-Risk Driving Behaviors
5. Ensuring Drivers are Fully Licensed, Competent, and Insured
6. Education and Licensing for Young Drivers
7. Graduated Licensing for Young Drivers
8. Sustaining Proficiency in Older Drivers

Special (Other) Users
9. Making Walking and Street Crossing Safer
10. Ensuring Safer Bicycle Travel
11. Making School Bus Travel Safer
12. Making Public Transit Travel Safer
13. Improving Motorcycle Safety and Increasing Motorcycle Awareness
14. Making Truck Travel Safer
15. Reducing Farm Vehicle Crashes
Emphasis Areas

**Highways**
16. Improving the Design and Operation of Highway Intersections
17. Keeping Vehicles on the Roadway and Minimizing the Consequences of Leaving the Road
18. Reducing Head-On and Across-Median Crashes
19. Improving Work Zone Safety
20. Accommodating Older Drivers
21. Reducing Train-Vehicle Crashes
22. Reducing Deer-Vehicle Crashes
23. Implementing Road Safety Audits

**Emergency Response**
24. Enhancing Emergency Response Capabilities to Increase Survivability

**Management Systems**
25. Improving Information and Decision Support Systems
26. Using Intelligent Transportation Systems (ITS) to Improve Highway safety
27. Creating More Effective Processes and Safety Management Systems Designing Safer Work Zones
28. Developing and Encouraging Multidisciplinary Safety Teams
TOOLBOX Products

300+ page Toolbox

20 page Executive Summary

CD Version

View @ www.IowaSMS.org
2001-2002 Toolbox Strategy Implementation

- Funded young driver (GDL) “Heads Up” video developed by Office of Driver Services

- Funded a pilot project with stop arm video cameras to document improper school bus passing. (Department of Education, school districts, and law enforcement)
2001-2002 Toolbox Strategy Implementation

- Piloted “Safe Wheeler” classroom curriculum. Revised materials were sent to all Iowa elementary PE instructors as part of a broader collaborative bicycle safety program.

- Funded upgrades for Iowa Road Conditions web site and 511 voice recognition phone access (DOT’s ITS and DPS project)
2001-2002 Toolbox Strategy Implementation

- Crash data retrieval “black box” pilot project.

- UNI analysis of older driver crash characteristics and locations
2001-2002 Toolbox Strategy Implementation

Supported local Multi-Disciplinary Safety Team (MDTS) projects and development

- Sponsored a statewide MDST peer exchange
- Provided incident management training
- Helped fund local incident management planning handbooks
- Helped fund local team crash investigation software tools
- Helped fund local “Heat” safety awareness project
2002 Toolbox
Strategy Implementation

- Funded older driver video “Choices Not Chances” developed by the Office of Driver Services

- Sponsored the Iowa Safe Mobility Decisions for Older Drivers Forum
State Older Driver Forum

Collaborated with:
- Department of Elder Affairs
- DOT- Engineering, licensing, transit
- FHWA
- Department of Public Safety
- Medical Staff of University of Iowa
- University of Iowa Center on Aging
- Iowa State University Extension Services
- AAA, AARP, 3M, Vehicle Modifiers
- Area Agencies on Aging
State Older Driver Forum

Invited:
- Senior citizens
- State legislators
- Policy-makers
- Media
- Senior advocacy groups
- National activity reports
Older Iowans:

• Open Microphone
• Video Critique
• Discussion of Priorities
• Medical and Engineering
• Breakout Discussions
Regional Older Driver Forums

- State Licensing Officials - “Choice Not Chances” video
- Media
- Local senior services stakeholders
  - Area Agency on Aging
  - Senior advocacy groups
  - Caretakers / caseworkers
  - Hospitals / community nursing
  - Meal sites
  - Senior housing
- Occupational Therapy
- Transit and other transportation
- Municipal and county officials
- State legislators
- Local Traffic Safety Teams
- MPO / RPA
- Law enforcement
- Local medical providers
Forum Attendees’ Potential Strategies for Implementation

- **Roadways and Engineering** (summarized)
  - Provide larger and brighter signs and pavement markings
  - Improve signals and lighting
  - Install more paved shoulders and rumble strips
  - Improve intersections with turn lanes or other solutions
  - Ensure roadways are planned or improved with aging population in mind.
Recent SMS Toolbox Implementation

- Assisted in data analysis and communication for “Don’t Veer for Deer” campaign with DPS, DNR, and other stakeholders.

- Jointly hosted a November 2003 Motorcycle Safety Forum with DPS, GTSB, SMS, and other stakeholders and produced a Stay Alert- Stay Alive brochure for and distributed 25,000 for the 2004 Motorcycle Safety Awareness Month- and in Motorcycle safety and driving classrooms.
## Iowa Motorcycle Forum

### November 2003 Stakeholders Invited:
- Department of Public Safety
- GTSB
- Iowa DOT Driver Services
  - Licensing
  - Safety Program
  - Data analysts
- Iowa SMS membership
- AARP Safe Driving Program
- Iowa ABATE representative
- Iowa Goldwing Association Representative
- State and local motorcycle law enforcement officers

### March 2005 Groups Added:
- Motorcycle riders (ABATE, Goldwing, and other clubs)
- Motorcycle Rider Coaches
- Iowa Motorcycle Dealers Association
- Iowa Trauma Nurses
- Injury prevention Practitioners
- 2-Wheel trauma trainers
- Community College site coordinators
- Harley Davidson Riders’ Edge Program
- Iowa Safety Educators Association
Partnership in Excellence Award, November 1999

“It is my pleasure to honor you as one of the first recipients of the Federal Highway Administration’s (FWHA) Partnership in Excellence Award. This award honors the partnership efforts of State and Local Governments, private industry, other federal agencies and FHWA working together to help insure the best possible transportation system for the traveling public.”

Bobby W. Blackmon, Division Director, FHWA
“Back to the Basics”
Safety Presentation Emphasis

- Emphasis on reducing
  
  **FATAL** and
  
  **MAJOR INJURY** crashes
Iowa Crash Deaths Associated with Key Emphasis Areas

(produced by Iowa Dept. of Transportation - Office of Traffic and Safety on January 25, 2004)

(note that 2004 data remains preliminary due to submission, entry, and edit lag)
“Back to the Basics”
Safety Investment Emphasis

☐ 52% of Iowa’s fatalities are related to “lane departure crashes.”

☐ Candidate projects focus on lane departure and identified high crash locations or conditions.
Candidate Safety Projects

1. Paved shoulders
2. Milled in shoulder rumble strips
3. 2-lane shoulder widening
4. High crash curves
5. Centerline rumble strips
6. Cross-Median head-on crashes
7. High severity crash 2-lane roads
8. High severity crash intersections
9. Expressway intersections
Optimizing Safety Funds

- Using data to define problem areas
- Targeting improvements
- Targeting enforcement
- Using low-cost solutions where possible
Two Lane Safety Corridors

Rural Two-Lane Primary Road Fatalities and Major Injuries (District 6 1998-2000)

Disclaimer: The Center for Transportation Research and Education presents these data as preliminary.

25 unlocated injury severities not represented. (2 Fatal, 23 Major Injuries)
Target Corridors with high numbers of Single-Vehicle, Run-off-the-Road Crashes on 2-Lane Highways (example District 5)
Cross-Median Interstate Crashes

Des Moines Fatal Cross-Median
Primary Highway High-Crash Curves

- Statewide curve average = 1.1 crashes / MVM
- Top 30 average = 11.7 crashes / MVM
- Worst Curve = 78 crashes / MVM
- 5% of crashes occur at top 30 locations (1% of curves)
- 11% of fatal crashes occur at top 30 locations
Curves

- Super elevation: add or correct
- Pave shoulders: outside & inside
- Shoulder rumble strips
- Flatten outside slope
- Remove objects outside curve
- Delineate, chevron, RPM’s, ball bank advisory
Without Large Chevron Signs

US 6, Johnson County
Bigger and Brighter Curve and Chevron Signs

US 6, Johnson County
Multidiscipline Local Emphasis
Engaging MPO’s RPAS local and county engineers
Timely accessible crash data is CRITICAL to making wise safety investments.
Crash Data Collection Collaboration

- >65% of Iowa’s crash data is reported electronically
- Electronic data collection software
  - Iowa “National Model” with FHWA is the “TraCS” (Traffic and Criminal System)
- “Smart Map” location tool enables consistent, automated capture of event location on all reports statewide.
Incident Location Tool

- Integrated into TraCS
- Intuitive, visual, map interface
- Provides consistent locations for GIS-based analysis
- Led to development of IMAT and CMAT - Simple analysis tools available free to local agencies
Crash Data Analysis
Collaboration

- Iowa DOT compiles and refines crash data
  - Office of Driver Services
  - Office of Traffic and Safety
- Data is made available on CD to state and local entities for their analysis use.
- Iowa’s data analysis “tools” software is available to state and local entities
- Technical support and training is made available as needed
CMAT

- User-friendly tool
- Available free to local agencies for quick analysis of limited data sets
- Can be used with Iowa crash data or other data
Iowa State University, CTRE

Sponsors:

• Office of Traffic and Safety, DOT

• Governor’s Traffic Safety Bureau, DPS
US 61 HEAT Analysis

US 61 Heat 2004
Crash Severity on Rural Roads
(2003)

HEAT:
Highway Enforcement
Action Team
Targeted Enforcement
1995-1999 Rural Alcohol-Related Crashes

Corridors ranked by Frequency
City of Des Moines
1995 to 1999
Ages 5 to 19
August 15 to June 15
Monday to Friday
7:00 a.m. to 5:00 p.m.

Schools Data Use

Middle Schools

Pedestrian Injuries
- Age 5-11 (Major)
- Age 5-11 (Minor)
- Age 5-11 (Possible, Unknown)
- Age 12-14 (Major)
- Age 12-14 (Minor)
- Age 12-14 (Possible, Unknown)
- Age 15-19 (Major)
- Age 15-19 (Minor)
- Age 15-19 (Possible, Unknown)

MPO Data Use

LEGEND

Crash Severities

- Fatal (41)
- Major Injury (589)

Primary Roads

County Roads

Lakes

County Boundaries

Disclaimer: The Center for Transportation Research and Education presents these data as preliminary.
Using data—“The Sky is the limit”
Aerial photo integration
ERIS  GIS-based  Emergency Response Information System

- Fire districts
- First Responder
- Emergency management
- Hazmat response areas
- Ambulance (and crashes)
- Census
- Hospitals / trauma facilities
- Statewide data: roads, rivers, lakes, rails, etc.
Sample of High Crash Locations
Polk County sites listed with state ranking

<table>
<thead>
<tr>
<th></th>
<th>Polk</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Polk</td>
<td>IA 415</td>
<td>2nd Ave &amp; NW 54th Ave</td>
</tr>
<tr>
<td>7</td>
<td>Polk</td>
<td>IA 415</td>
<td>2nd Ave &amp; Aurora Ave</td>
</tr>
<tr>
<td>11</td>
<td>Polk Des Moines</td>
<td>IA 415</td>
<td>9th St &amp; Clark St</td>
</tr>
<tr>
<td>12</td>
<td>Polk Des Moines</td>
<td></td>
<td>2nd Ave &amp; Holcomb Ave</td>
</tr>
<tr>
<td>14</td>
<td>Polk Ankeny</td>
<td>IA 415</td>
<td>IA 415 &amp; NW 16th St</td>
</tr>
<tr>
<td>16</td>
<td>Polk Des Moines</td>
<td></td>
<td>SW 9th St &amp; Porter Ave</td>
</tr>
<tr>
<td>23</td>
<td>Polk Des Moines</td>
<td>US 69</td>
<td>E15th St At I-235 WB Ramps/Maple</td>
</tr>
<tr>
<td>28</td>
<td>Polk Des Moines</td>
<td></td>
<td>NW Meredith Dr &amp; Westside Frontage Road To IA 28/Merle Hay Road</td>
</tr>
<tr>
<td>42</td>
<td>Polk Des Moines</td>
<td>US 6</td>
<td>50th St &amp; Douglas Ave</td>
</tr>
<tr>
<td>53</td>
<td>Polk</td>
<td></td>
<td>WB Rmp At US 6 Conn To US 65</td>
</tr>
<tr>
<td>54</td>
<td>Polk Altoona</td>
<td>US 6</td>
<td>NB US 65 Rp At US 6</td>
</tr>
<tr>
<td>55</td>
<td>Polk Des Moines</td>
<td>I-235</td>
<td>Br EBi-235 At W End Des Moin Riv</td>
</tr>
<tr>
<td>57</td>
<td>Polk Des Moines</td>
<td></td>
<td>Clark St &amp; W 19th St</td>
</tr>
<tr>
<td>82</td>
<td>Polk Des Moines</td>
<td></td>
<td>33rd St E &amp; Hubbell Ave</td>
</tr>
<tr>
<td>86</td>
<td>Polk Des Moines</td>
<td></td>
<td>6th Ave &amp; Grand Ave</td>
</tr>
<tr>
<td>88</td>
<td>Polk Des Moines</td>
<td></td>
<td>35th St &amp; University Ave</td>
</tr>
<tr>
<td>91</td>
<td>Polk</td>
<td></td>
<td>NE 29th St &amp; NE 62nd Ave</td>
</tr>
<tr>
<td>98</td>
<td>Polk</td>
<td>IA 415</td>
<td>2nd Ave &amp; NW 60th Ave</td>
</tr>
</tbody>
</table>
Traffic Engineering Assistance Program (TEAP)

- $100,000 per year from Federal 402 (GTSB)
- $100,000 per year from Iowa DOT Engineering Services budget
- 3 On-call Consultants
Traffic Engineering Assistance Program (TEAP)

- Identifies solutions to existing problems
  - On or off state highway system
  - Intersections, corridors, school routes, railroad crossings, etc.
- Free to smaller cities and all counties
- Up to 100 hours of consultant analysis
- A study report
Local MDST’s

- Des Moines Metro “CITSTF”
- Davenport “CARS”
- Council Bluffs “SWIFT”
- Dubuque
- Sioux City

- November 2004 - Clinton
- 2005 Waterloo and Cedar Rapids next?
November 5-6, 2002

3R Safety Workshop

Roadway Resurfacing Safety Workshops

Sponsored by the Office of Traffic and Safety

Iowa Department of Transportation
University Collaboration

- Iowa State University
- University of Iowa
- University of Northern Iowa
- Pooled studies with other states
University Collaboration

- Traffic/Safety Research Forum
- Safety research ($300,000-$400,000 / yr)
- SMS
- Data Support
- Training
Examples of University Safety Research for Iowa DOT

- Expressway intersection Crash Analysis
- Small Town Entrance Traffic Calming
- Diagonal Parking
- High Speed Traffic Signals
- Using Crash Costs in Safety Analysis
- 4 to 3 Lane Conversions
- Pavement Marking Management Program
- Older Driver Crash Analysis
- Left Turn Signal Phasing for Older and Younger Drivers
- Access Management Research and Awareness Program
Annual Iowa Traffic and Safety Engineering Forum

- Local Peer exchange
- Policy / standards update
- Safety research /pilot studies
Return on Investment?

Iowa Highway Fatalities
Five Year Average

- 1995 - 1999: 480
- 2000 - 2004*: 420

* Preliminary
Ten-Year Change in Average Fatality Rates
(2001-02 Avg. vs 1991-92 Avg.)

Ten-Year Change in US Average Fatality Rate = -17.7%
# Safety Solutions Matrix

## “The Seven E’s”

<table>
<thead>
<tr>
<th></th>
<th>Humans</th>
<th>Vehicle</th>
<th>Roadway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engineering</strong></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enforcement</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Effective Laws</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Emerg. Med. Serv.</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Exemplary Leaders</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>