Engineering Your Community Safe

Andi Bill

Transportation Information Center thanks its partners for their support and assistance
National Traffic Safety Goal

- Reasonable goal?
- Who’s Involved?
- What can you do?
- How are we doing?
The Crossroads HIGHWAY SAFETY CLOCK graphically portrays the gap between the goal of ZERO deaths in Wisconsin and current crash statistics from WisDOT. As the clock ticks, it depicts crash incidents by type and frequency.
Wisconsin Fatal Crashes by Road System

- State Highway, 41%
- Local Street/Road, 30%
- Interstate, 6%
- County Highway, 23%

Source: Wisconsin DOT
How to reduce the driver’s risk?

• Follow standards and good practices -- MUTCD, FDM, Best Practices, Road Safety Audit

• Keep your own eyes open for problems

• Train others to do the same 24/7/365

• Investigate resident complaints

• Pay attention to crashes and crash data

• Be active in your Traffic Safety Commission

• Create a Local Road Safety Plan
Strategic Highway Safety Plan

• 3-year plan that articulates strategies for Wisconsin to address highway safety challenges
• Identifies:
  – the foremost highway safety problems in the state
  – opportunities and processes to address those problems
  – determines the appropriate approaches and countermeasures
• Requires the coordination of:
  – Local governments and state agencies
  – The private sector, community organizations, and individual citizens

Local implementation of this plan is a major priority.
Top 10 Issue Areas

• Reduce Driver Distraction/Improve Driver Alertness
• Reduce Alcohol & Drug-Impaired Driving
• Reduce the Incidence and Severity of Motorcycle Crashes
• Improve Driver Performance (Teens, Older, Competent)
• Improve Non Motorist Safety
• Improve Safety of Intersections
• Increase Occupant Protection
• Curb Aggressive Driving/Reduce Speed-Related Crashes
• Reduce Lane Departure Crashes
• Improve Safety Culture, Safety Data, Safety Technology
Traffic Safety Commission Wisconsin
Statute 83.013

• Every county is “required” to have a TSC, however..

• Opportunity to create grassroots traffic safety initiatives that can directly impact what is happening on roadways.

• Vital component and stakeholder in the creation and implementation of the Strategic Highway Safety Plan.

• DOT/BOTS is committed to providing support and resources towards the effectiveness of the TSC’s.
Primary Role of the TSC

• The review of crashes (fatal, serious injury, and even frequent crash areas) is a foundational component of the TSC.

• One of the purposes of having stakeholders from a multitude of disciplines around the table is for them all to weigh-in on the prior quarter’s crash review from their individual area of expertise and/or personal knowledge.

• The review of crashes should include looking at local data – trying to identify problem areas, or trends that can possibly be mitigated before they become a “targeted area”.

• This is can easily be done through Community Maps.
Traffic Safety Partners – Who Are They?

**Community Stakeholders**
- Medical, Health Services, Human Services, Community Programs

**Government Stakeholders**
- Local / Regional / State / Federal
County Profiles
Local Road Safety Plans: Your Map To Safer Roadways

No matter what your resources, a Local Road Safety Plan will guide you to data-driven solutions and safer roads.


These signs reduce egoe crashes by 27%.

Choose Proven Solutions
- Clearview
- Roundabouts
- Targeted Enforcement
- Communities

Use Safety Data
- Crashes
- Maintenance Log
- Safety Audits
- Safety Innovations

Implement Solutions
- Education & Outreach
- Capital Projects
- Informational Signs

Identify Stakeholders
- Law Enforcement
- Public Health
- PRIDE

More than 75% of all crashes are maintained by local agencies.

Local Road Safety Plans Help Get People Home Safely

In 2017, over 60% of fatalities occurred on rural roads, but just 11% of Americans live in rural areas.
Where’s the data??
Welcome to the WisTransPortal

**Data Services**
WisTransPortal data requests and login account information.

**Data Products**
Traffic operations and engineering datasets and related resources.

**Web Applications**
WisTransPortal data retrieval and analysis tools, other applications.

**Documentation**
Database documentation, project architecture, and other documentation.

**WisDOT Traffic Video**
LINK video sharing and public safety information service.

**Developer Resources**
Resources for TOPS and WisTransPortal system development.

Last Modified on Thu, 02 Feb 2012, 11:06:32 AM. Please send comments to transportal@topslab.wisc.edu.

Copyright © 2013, Wisconsin Traffic Operations and Safety Laboratory.
WisTransPortal Data Hub

User Account Request Form

For assistance, see the account services page or email transportal@topslab.wisc.edu.

Step 1: To request a WisTransPortal login account, complete the information below and press Next. Required fields are marked with asterisks. Press Cancel to return to the account services page without completing your request.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td></td>
</tr>
<tr>
<td>*First Name:</td>
<td></td>
</tr>
<tr>
<td>*Last Name:</td>
<td></td>
</tr>
<tr>
<td>Desired User ID:</td>
<td>Ex: bbadger. See note below.</td>
</tr>
<tr>
<td>*Email Address:</td>
<td></td>
</tr>
<tr>
<td>*Confirm Email:</td>
<td></td>
</tr>
<tr>
<td>*Job Title:</td>
<td></td>
</tr>
<tr>
<td>*Organization:</td>
<td></td>
</tr>
<tr>
<td>*Phone:</td>
<td>Ex: 555-555-5555</td>
</tr>
<tr>
<td>*Resources:</td>
<td></td>
</tr>
<tr>
<td>Comments:</td>
<td>Identify what you want here</td>
</tr>
</tbody>
</table>

Note: WisTransPortal User IDs are case-sensitive. For example, "BBadger" and "bbadger" are treated as two
Wisconsin Traffic Operations and Safety Laboratory

The WisTransPortal Project

The WisTransPortal Project serves the computing and data management needs of the Wisconsin Traffic Operations and Safety (TOPS) Laboratory. The project scope includes support for ITS data archiving, real-time traffic information services, transportation operations applications, and transportation research. Learn more.

Home > Documentation

WisTransPortal Documentation

This page contains links to technical documentation and project overviews related to the WisTransPortal system. Resources containing system details are password protected.

Database Documentation
WisTransPortal database documentation, data dictionaries, and related information. Password protected.

Handouts and Presentations
Handouts and slide presentations on key WisTransPortal operational areas. Password protected.

WisTransPortal ITS Project Architecture
WisTransPortal ITS project architecture generated from Turbo. Public access.

WisTransPortal System Metrics
WisTransPortal system statistics and performance measure reports. Public access.

Last Modified on Sat, 07 May 2011, 02:09:40 PM. Please send comments to transportal@topslab.wisc.edu.

Copyright © 2013, Wisconsin Traffic Operations and Safety Laboratory.
Public Search Interface: 2018 Fatality and Serious Injury Crashes.
Search Interface: Satellite View.
Advanced Interface: Eau Claire County Motorcycle Crashes, KABC Injury Levels, Last 5 Years. Crash Points (Left) vs. Density Plot (Right)
Advanced Interface: Route Based Search
Advanced Interface: Pedestrian crashes with MPA overlay.
Analyze Interface: Statewide CMV Crashes for the Last 3 years, KAB Injury Levels
<table>
<thead>
<tr>
<th>Area</th>
<th>Wisconsin-Statewide</th>
<th>Columbia County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisdiction</td>
<td>All Roads</td>
<td>County Highway</td>
</tr>
<tr>
<td></td>
<td>All Roads</td>
<td>County Highway</td>
</tr>
<tr>
<td>Total (All Severities)</td>
<td>598039</td>
<td>64665</td>
</tr>
<tr>
<td>Intersections</td>
<td>226338</td>
<td>13772</td>
</tr>
<tr>
<td>Speed/Aggressive</td>
<td>95697</td>
<td>12027</td>
</tr>
<tr>
<td>Lane Departure</td>
<td>151978</td>
<td>20477</td>
</tr>
<tr>
<td>Ped/Bike</td>
<td>11209</td>
<td>261</td>
</tr>
<tr>
<td>Impaired</td>
<td>28934</td>
<td>3949</td>
</tr>
<tr>
<td>Distracted</td>
<td>115151</td>
<td>8152</td>
</tr>
<tr>
<td>Unbelted</td>
<td>130332</td>
<td>28609</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>11352</td>
<td>2126</td>
</tr>
<tr>
<td>Deer/Animal</td>
<td>95934</td>
<td>25664</td>
</tr>
<tr>
<td>Large Trucks</td>
<td>32263</td>
<td>1758</td>
</tr>
<tr>
<td>Older Drivers</td>
<td>82066</td>
<td>6868</td>
</tr>
<tr>
<td>Teen Drivers</td>
<td>93013</td>
<td>9671</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>Wisconsin-Statewide</td>
<td>Columbia County</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>All Roads</td>
<td>County Highway</td>
</tr>
<tr>
<td>Severe (K&amp;A Crashes)</td>
<td>15541</td>
<td>2819</td>
</tr>
<tr>
<td>Intersections</td>
<td>5782</td>
<td>798</td>
</tr>
<tr>
<td>Speed/Aggressive</td>
<td>3954</td>
<td>793</td>
</tr>
<tr>
<td>Lane Departure</td>
<td>6215</td>
<td>1439</td>
</tr>
<tr>
<td>Ped/Bike</td>
<td>1767</td>
<td>83</td>
</tr>
<tr>
<td>Impaired</td>
<td>3537</td>
<td>772</td>
</tr>
<tr>
<td>Distracted</td>
<td>3439</td>
<td>772</td>
</tr>
<tr>
<td>Unbelted</td>
<td>5907</td>
<td>1084</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>2830</td>
<td>684</td>
</tr>
<tr>
<td>Deer/Animal</td>
<td>365</td>
<td>144</td>
</tr>
<tr>
<td>Large Trucks</td>
<td>1111</td>
<td>113</td>
</tr>
<tr>
<td>Older Drivers</td>
<td>2531</td>
<td>386</td>
</tr>
<tr>
<td>Teen Drivers</td>
<td>2100</td>
<td>394</td>
</tr>
</tbody>
</table>
Why focus on roadway departure crashes

Road Departure Resource
FHWA Office of Safety
Link to website
http://safety.fhwa.dot.gov/roadwaydept/
How can we reduce roadway departure crashes and crash severity?

- Keep the driver on the road
  - improve signs, delineators, markings
  - eliminate shoulder edge drop-offs
  - rumble strips, geometric changes and other improvements
  - educate drivers about the dangers of driving distractions
How can we reduce roadway departure crashes and crash severity?

• Reduce hazards for the driver who runs off the road
  – remove or redesign fixed objects
  – make objects breakaway
  – protect with guard rail

Where on the roadway should we focus these efforts? THE CLEAR ZONE
Clear Zone

• the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles.
• may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area.
• Minimum width depends on traffic volume and speed and the roadside geometry.

Clear zone is an unobstructed, relatively flat area beyond the edge of the pavement that allows a driver to stop safely or regain control of a vehicle that leaves the pavement

Source: https://www.fhwa.dot.gov/programadmin/clearzone.cfm
Clear zone illustration

- Back slope
- Hinge point
- Shoulder
- Cross slope
- Side slope
- Drainage ditch
- Clear zone
- Roadway
- Traveled way
- Shoulder
- Hinge point
- Clear zone
- Side slope

Hinge Point  Point where the slope rate changes.

Clear Zone  A traversable area that starts at the edge of the traffic lane, includes the shoulder, and extends laterally a sufficient distance to allow a driver to stop or return to the road before encountering a hazard or overturning.
Clear Zone

AASHTO - A Policy on Geometric Design of Highways and Streets (Green Book):

- For local roads and streets, a minimum clear zone of 7 to 10 feet is considered desirable on sections without curb.
- For collector streets without curbs, a 10-foot minimum clear zone is recommended.
- A clear zone of 10 ft. for low-speed rural collectors and rural local roads should be provided.

Source: FHWA  https://www.fhwa.dot.gov/programadmin/clearzone.cfm
We will use the speed limit in our example (but speed limit does not necessarily equal design speed).

Table 16-2. Clear Zone Distances from Edge of Traveled Way (Roadside Design Guide, Table 3.1) (74).

<table>
<thead>
<tr>
<th>DESIGN SPEED</th>
<th>DESIGN ADT</th>
<th>FORESLOPES</th>
<th>BACKSLOPES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1V:6H or flatter</td>
<td>1V:5H TO 1V:4H</td>
</tr>
<tr>
<td>40 mph or less</td>
<td>UNDER 750</td>
<td>7 – 10</td>
<td>7 – 10</td>
</tr>
<tr>
<td></td>
<td>750 – 1500</td>
<td>10 – 12</td>
<td>12 – 14</td>
</tr>
<tr>
<td></td>
<td>1500 – 6000</td>
<td>12 – 14</td>
<td>14 – 17</td>
</tr>
<tr>
<td></td>
<td>OVER 6000</td>
<td>14 – 17</td>
<td>16 – 18</td>
</tr>
<tr>
<td>45–50 mph</td>
<td>UNDER 750</td>
<td>10 – 12</td>
<td>12 – 14</td>
</tr>
<tr>
<td></td>
<td>750 – 1500</td>
<td>14 – 16</td>
<td>16 – 20</td>
</tr>
<tr>
<td></td>
<td>1500 – 6000</td>
<td>16 – 18</td>
<td>20 – 26</td>
</tr>
<tr>
<td></td>
<td>OVER 6000</td>
<td>20 – 22</td>
<td>24 – 28</td>
</tr>
<tr>
<td>55 mph</td>
<td>UNDER 750</td>
<td>12 – 14</td>
<td>14 – 18</td>
</tr>
<tr>
<td></td>
<td>750 – 1500</td>
<td>16 – 18</td>
<td>20 – 24</td>
</tr>
<tr>
<td></td>
<td>1500 – 6000</td>
<td>20 – 22</td>
<td>24 – 30</td>
</tr>
<tr>
<td></td>
<td>OVER 6000</td>
<td>22 – 24</td>
<td>26 – 32</td>
</tr>
<tr>
<td>60 mph</td>
<td>UNDER 750</td>
<td>16 – 18</td>
<td>20 – 24</td>
</tr>
<tr>
<td></td>
<td>750 – 1500</td>
<td>20 – 24</td>
<td>26 – 32</td>
</tr>
<tr>
<td></td>
<td>1500 – 6000</td>
<td>26 – 30</td>
<td>32 – 40</td>
</tr>
<tr>
<td></td>
<td>OVER 6000</td>
<td>30 – 32</td>
<td>36 – 44</td>
</tr>
<tr>
<td>65–70 mph</td>
<td>UNDER 750</td>
<td>18 – 20</td>
<td>20 – 26</td>
</tr>
<tr>
<td></td>
<td>1500 – 6000</td>
<td>28 – 32</td>
<td>34 – 42</td>
</tr>
<tr>
<td></td>
<td>OVER 6000</td>
<td>30 – 34</td>
<td>38 – 46</td>
</tr>
</tbody>
</table>
Clear Zone Exercise 1:

- Based on the information presented in the previous slides, what would you recommend the clear zone be for the following road?

  - Birch Ridge Road
    - Town Road
    - 22’ Wide (2 -11 ft. lanes ) Asphalt with 2 ft. gravel shoulders
    - 800 vehicles per day (800 ADT)
    - 55 mph speed limit
An additional clear zone consideration -- adjustment factor for the outside of curves

Clear Zone Exercise 2:

- Based on the information presented in the previous slides, what would you recommend the clear zone be for the following road?

  - Red Pine Drive
    - Town Road
    - 22’ Wide (2 -11 ft. lanes ) Asphalt
      - with 3 ft. gravel shoulders
    - 400 vehicles per day (400 ADT)
    - 45 mph speed limit
    - 600 ft. radius curve
FHWA Clear Zones Resources

https://safety.fhwa.dot.gov/roadway_dept/countermeasures/safe_recovery/clear_zones
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issues:
• Narrow roadway
• Pavement markings
• Poor stopping sight distance
• Steep side slopes
• Gravel and stones on the roadway
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issues:
- Water on roadway
- No shoulder/edgeline
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issues:
- Trees in clear zone
- Limited sight distance
- Lack of signs and delineation
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issues:
- Bleeding pavement
- Lack of delineation
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issues:
- Fixed objects in clear zone
- Unrecoverable steep side slopes
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issue:
• Bridge structure is a fixed object
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issue:
• Pavement edge drop-off
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issues:
• Faded pavement markings
• Concrete fixed object
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issue:
- Deteriorated sign retroreflectivity
WHAT ARE POTENTIAL SAFETY ISSUES?

Safety Issue:
- Fence blocks sidewalk path
Safety for All Road Users
TIC Resources

One day training sessions around the state
  Road Maintenance
  Highway safety
  PASER and WISLR training
  Work zone traffic control
Webinars on special topics from time to time

PASER Manuals
  (Asphalt, Concrete, Gravel, Sealcoat over Gravel, Earth, Brick, Drainage)

Work Zone and Flagger pocket guide books

SAFER Manual, 23 fact sheets

WISLR information links
Transportation Information Center thanks its partners for their support and assistance.

Ben Jordan
(608) 265-4478
bjordan@wisc.edu

Andi Bill
(608) 890-3425
bill@wisc.edu

Steve Pudloski
608) 262-8707
pudloski@wisc.edu

432 N. Lake Street
Madison, Wisconsin 53706
Toll Free: (800) 442-4615
TIC Email: tic@epd.wisc.edu
TIC Website: http://epd.wisc.edu/tic