Regional Safety Planning
The Case for MPO Leadership

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Overview

- Why regional safety planning matters and MPOs should be taking the lead
- Quick summary of safety planning at the state and federal levels
- Crash data collection and analysis process
- Resources
The Role of MPOs in Safety Planning

- Why it matters: local roads account for over 40% of fatalities in the U.S.

- Why MPOs should take the lead
  - Integration with other plans
  - Technical expertise & resources
  - Service to member agencies
  - Venue for collaboration
  - Difficult for states to coordinate with many small jurisdictions
  - Safety is multidisciplinary

Image: Corvallis Area MPO
Coordinated Safety Planning

Metropolitan Transportation Plans

Statewide Transportation Plan (Long-Range Plan)

State Strategic Highway Safety Plan (SHSP)

Highway Safety Plan (HSP)

Commercial Vehicle Safety Plan (CVSP)

*Other State Plans (e.g., Freight Plan, Ped/Bike Plan)

Highway Safety Improvement Program (HSIP)

*These other plans within the State may not be safety plans, but include a safety element in them.

TIP (Metropolitan)

Statewide Transportation Improvement Program (STIP)

Source: Federal Highway Administration.
MAP-21 Safety Provisions

- HSIP program: $2.4B annually (nearly doubled) – third largest highway fund

- Regular updates to Strategic Highway Safety Plan
  - Must be data-driven
  - Emphasis on coordination with stakeholders (the 4Es)

- Performance Measures by 2014
  - Focus on fatalities and serious injuries
Crash Data Collection and Analysis Process

Data Standards → Crash Scene → Data Storage

Local Data Access → Analysis & Mapping → Counter-measure Development

Implementation → Evaluation
Crash Data Systems and Standards

- Model Minimum Uniform Crash Criteria (MMUCC)
- Model Inventory of Roadway Elements (MIRE)
- NHTSA National Priority Safety program
  - Improve timeliness, accuracy, completeness, uniformity, integration, and accessibility of State data
  - Incentives to incorporate best practices
Crash Data Collection – Important Considerations

- Unreported crashes
- Hit-and-run
- GPS/location accuracy
- Potential bias of reporting officer
- Reluctance to make legalistic determinations regarding driver distractions, speeding, etc.
- Limited time and resources to figure out what happened
- Missing or conflicting data

Source: Ohio Dept. of Public Safety
Data Storage and Access

- Data submitted from local police agencies to state database
- State data made available to local agencies through web interfaces or another format

Source: Ohio Dept. of Transportation
Analysis & Mapping

Location-Based Analysis

» Hotspots
  • May only tell you where volume is high
  • Can be difficult or expensive to address

» Corridors
  • May indicate systemic problem along a corridor

» Transit stops

» Curves
## High-Crash Location Lists (Regional and by Jurisdiction)

<table>
<thead>
<tr>
<th>RANK</th>
<th>LOCATION</th>
<th>JURISDICTION</th>
<th>TOTAL CRASHES (FREQ.)</th>
<th>CRASH SEVERITY</th>
<th>SEVERITY INDEX (SI)</th>
<th>AVERAGE DAILY TRAFFIC (ADT)</th>
<th>CRASH RATE (MEV RATE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cleveland Ave @ Morse Rd</td>
<td>Columbus</td>
<td>233</td>
<td>0</td>
<td>69</td>
<td>164</td>
<td>1.59</td>
</tr>
<tr>
<td>2</td>
<td>W Broad St / US 40 @ N Wilson Rd</td>
<td>ODOT</td>
<td>115</td>
<td>0</td>
<td>46</td>
<td>69</td>
<td>1.80</td>
</tr>
<tr>
<td>3</td>
<td>Innis Rd @ Westerville Rd / SR 3</td>
<td>ODOT</td>
<td>110</td>
<td>0</td>
<td>38</td>
<td>72</td>
<td>1.69</td>
</tr>
<tr>
<td>4</td>
<td>Cleveland Ave @ Oakland Park</td>
<td>Columbus</td>
<td>101</td>
<td>0</td>
<td>41</td>
<td>60</td>
<td>1.81</td>
</tr>
<tr>
<td>5</td>
<td>E Dublin Granville Rd / SR 161 @ Maple Canyon Dr</td>
<td>Columbus</td>
<td>153</td>
<td>0</td>
<td>44</td>
<td>109</td>
<td>1.58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JURISDICTION</th>
<th>RANK</th>
<th>INTERSECTION</th>
<th>2009 TO 2011</th>
<th>CRASHES BY YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEXLEY</td>
<td>1</td>
<td>E Broad St / SR 16 @ N Cassady Ave</td>
<td>Total Crashes</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fatal Crashes</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Injury Crashes</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>College Ave @ E Main St</td>
<td>Severity Index</td>
<td>1.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2009</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2010</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2011</td>
<td>14</td>
</tr>
</tbody>
</table>
Non-location based analysis

Crash Types & Risk Factors

» Tend to be more reliable predictor of fatal & serious injuries than location

Demographics – age, gender

Behavioral – alcohol, distracted driving
## Risk Factors (Pedestrian Crashes)

<table>
<thead>
<tr>
<th>Crash Severity</th>
<th>Intersection</th>
<th>Posted Speed</th>
<th>Time of Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>&lt;35</td>
</tr>
<tr>
<td>Fatal</td>
<td>39%</td>
<td>61%</td>
<td>9%</td>
</tr>
<tr>
<td>Incapacitating</td>
<td>54%</td>
<td>46%</td>
<td>19%</td>
</tr>
<tr>
<td>Non-Incapacitating</td>
<td>56%</td>
<td>44%</td>
<td>19%</td>
</tr>
<tr>
<td>Possible Injury</td>
<td>62%</td>
<td>38%</td>
<td>17%</td>
</tr>
<tr>
<td>No Injury</td>
<td>60%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>All Ped Crashes</td>
<td>57%</td>
<td>43%</td>
<td>18%</td>
</tr>
</tbody>
</table>
Crash Trends

CONTRIBUTING FACTORS & ROADWAY CONDITIONS

The factors leading up to a crash provide engineers and law enforcement officials with valuable information needed to reduce the severity and frequency of future crashes. In this region, there are behavioral aspects, along with infrastructure and environmental conditions, that must be considered. The statistics shown here refer to the contributing factor for the at-fault vehicle (the ‘Unit in Error’ as noted on the crash report).

Key Facts
- Following too closely is the most common contributing factor, accounting for around 30% of all crashes.
- Failure to control accounts for only 15% of all crashes, but 26% of fatal & serious injury crashes.
- Around 3.4% of crashes occurring under dark, until conditions result in a fatality or serious injury, compared to 1.7% during daylight conditions.
- Surprisingly, crashes that occur during wet conditions (rain, snow, or ice) are less severe compared to those occurring under normal, dry conditions.
- Speed-related crashes are more than twice as likely to result in a fatal or serious injury than other crashes.
- Almost 4% of single-car crashes result in a fatality or serious injury compared to 1.8% of crashes involving two vehicles.

ALCOHOL-RELATED FATALITIES & SERIOUS INJURIES

Alcohol is a suspected factor in many of the fatal and serious injury crashes in central Ohio. Between 2007 and 2011, approximately 38 people died each year due to alcohol-related crashes, and close to 150 more sustained serious injuries. For the purpose of this study, a fatality or serious injury is classified as ‘alcohol-related’ if the driver, pedestrian, or bicyclist of the at-fault vehicle was suspected of being under the influence of alcohol by the reporting officer.

Key Facts
- From 2007 to 2011, alcohol was a suspected factor in 37% of all fatalities and 16% of serious injuries.
- Alcohol is suspected in over half of all fatalities resulting from fixed-object crashes.
- Alcohol-related serious injuries declined by 30% between 2007 and 2011.
- Although alcohol-related fatalities increased from 2007 to 2011, there is not a clear trend evident in the data.

Table 4. Effect of Speeding and Number of Units on Severity

<table>
<thead>
<tr>
<th>Condition</th>
<th>Total Crashes</th>
<th>Speeded Related</th>
<th>Fatals, Related</th>
<th>% Fatals, Related</th>
<th>% Fatals, Alcohol-related</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Speed</td>
<td>10,611</td>
<td>205</td>
<td>1,950</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td>1 Speed</td>
<td>13,611</td>
<td>2,311</td>
<td>3,507</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>2 Speed</td>
<td>15,611</td>
<td>3,165</td>
<td>5,041</td>
<td>32%</td>
<td>32%</td>
</tr>
<tr>
<td>3 or more Speed</td>
<td>17,611</td>
<td>5,891</td>
<td>10,715</td>
<td>61%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Source: ODPS/ODOT/MORPC

Table 5. Alcohol-Related Fatalities & Serious Injuries by Crash Type

<table>
<thead>
<tr>
<th>Crashes</th>
<th>Total Fatals</th>
<th>Alcohol-Related Fatals</th>
<th>% Alcohol-Related Fatals</th>
<th>% Fatals</th>
<th>Alcohol-Related Serious Injuries</th>
<th>% Alcohol-Related Serious Injuries</th>
<th>% Fatals</th>
<th>Alcohol-Related Serious Injuries</th>
<th>% Alcohol-Related Serious Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collision</td>
<td>10,315</td>
<td>3,835</td>
<td>37%</td>
<td>42%</td>
<td>2,340,000</td>
<td>2,340,000</td>
<td>37%</td>
<td>2,340,000</td>
<td>2,340,000</td>
</tr>
<tr>
<td>Non-Collision</td>
<td>7,091</td>
<td>2,450</td>
<td>34%</td>
<td>41%</td>
<td>1,400,000</td>
<td>1,400,000</td>
<td>37%</td>
<td>1,400,000</td>
<td>1,400,000</td>
</tr>
</tbody>
</table>

Source: ODPS/ODOT/MORPC
Countermeasure Development & Implementation

- Countermeasures can address behavioral or engineering problems
- Match countermeasure to specific problem identified through data analysis
- Highway Safety Manual
- Crash Modification Factors Clearinghouse website
  - How many crashes will there be after implementing a treatment
- Evaluation
Resources


- MORPC’s Safety Program: [www.morpc.org/safety](http://www.morpc.org/safety)


- Model Minimum Uniform Crash Criteria (MMUCC) - [http://www.mmucc.us/](http://www.mmucc.us/)

- Model Inventory of Roadway Elements (MIRE) - [http://www.mireinfo.org/](http://www.mireinfo.org/)
