Toward Zero Deaths
Maintaining a Safer Roadway Workshop

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Research Project
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The Local Road Research Board has developed a workshop on “Maintaining a Safer Roadway” that provides education to maintenance staff on how they can make our roads safer. Local Agency maintenance forces are in the best position to be the “eyes and ears” for Local Agencies when it comes to identifying situations, that when addressed, could greatly improve safety for the traveling public. This workshop addresses safety topics such as:

- Obstructions in Roadway
- Shoulder Drop-Off
- Signs and Pavement Markings
- Work Zone Safety
- Vegetation Control
- Roadside Hazards - Clear Zone
- Drainage
- Winter Maintenance

Contact the MN LTAP center for more information on when this workshop will be offered in the future. [http://www.mnltap.umn.edu/](http://www.mnltap.umn.edu/)
Toward Zero Deaths - Maintaining a Safer Roadway Workshop

Toward Zero Deaths: Maintaining a Safer Roadway

[Enter workshop location]
[Enter date]

LRRB Workshop Objectives

• Define the significance of the roadway safety problem & some MN initiatives
• Promote roadway safety through policy or procedure changes
• Recognize maintenance tasks that impact safety and various potential responses
• Overall – Better understand your role in the MN Toward Zero Deaths initiative

Presentation Outline

1. Traffic Safety as a Major Concern
2. Promotion of Safety Through Change
3. Maintenance Tasks, Safety Concerns, and Potential Responses
   • On-Road Issues
   • Off-Road Issues
   • Miscellaneous Issues
Why are we concerned about highway safety?

- A. 99 in 100 people will be involved in a crash
- B. Traffic crashes were the leading cause of death for ages 1 through 34
- C. Economic impact of traffic crashes was $230.6 billion
- D. All of the above

Highway Safety

Three aspects of improving highway safety:

Driver

Vehicle

Environment

2008 National Crash Statistics

- **In 2008**
  - 37,261 people died
  - 2.3M people injured
  - 5.8M traffic crashes were reported to DPS
  - $230.6 billion estimated economic cost to Nation (2000)

- **On an average day**
  - 102 people die
  - 6,427 people injured
  - 11,358 crashes occur
  - $631 million average daily cost to Nation
**2008 Minnesota Crash Statistics**

- **In 2008**
  - 455 people died
  - 33,379 people injured
  - 79,095 traffic crashes were reported to DPS
  - $1.5 billion estimated economic cost to Minnesota

- **On an average day**
  - 1.2 people die
  - 91 people injured
  - 216 crashes occur
  - $4.0 million average daily cost

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**Highway Safety in Minnesota**

**2008 Fatalities by County**

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**Cost of Motor Vehicle Crashes 2008 - State of Minnesota**

<table>
<thead>
<tr>
<th>Category</th>
<th>Incidence</th>
<th>Cost Per Incident</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fatal Crashes</strong></td>
<td>455</td>
<td>$1,130,000</td>
<td>$514,150,000</td>
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<tr>
<td><strong>Severe Injury Crashes</strong></td>
<td>1,553</td>
<td>$65,000</td>
<td>$100,945,000</td>
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<td><strong>Moderate Injury Crashes</strong></td>
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<td>$21,000</td>
<td>$175,014,000</td>
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<td><strong>Minor Injury Crashes</strong></td>
<td>23,492</td>
<td>$11,900</td>
<td>$279,554,800</td>
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<td><strong>Property Damage Crashes</strong></td>
<td>54,761</td>
<td>$7,500</td>
<td>$410,707,500</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>$1,480,371,300</td>
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</tbody>
</table>

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2008 Minnesota Crash Facts

<table>
<thead>
<tr>
<th>By Road Design</th>
<th>Fatalities</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two lane two way</td>
<td>289</td>
<td>12,911</td>
</tr>
<tr>
<td>Other divided highway</td>
<td>40</td>
<td>5,296</td>
</tr>
<tr>
<td>Freeway</td>
<td>77</td>
<td>4,755</td>
</tr>
</tbody>
</table>

Ongoing Local Safety Initiatives

- Minnesota Strategic Highway Safety Plan (SHSP)
- Toward Zero Deaths Campaign (TZD)
- Minnesota County Road Safety Plans
- LRRB Workshop

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Part 2 – Promotion of Safety Through Change
Presentation Outline

1. Traffic Safety as a Major Concern
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How to Implement Policy/Procedure Change

- Identify Problem/Issue
- Identify Barrier
- Work together for solution
- Understand and discuss issues

Case Study

Tall grass in ditch blocking intersection sight lines
- Policy states not to mow ditches

- Discuss merits of policy vs. safety
- Adjust policy to allow mowing near intersections

Reasons for Policy:
- Economic
- Spreads some weeds
- Inhibits native grasses

Reasons for Change:
- Blocked sightlines
Process Outcomes

- Better understand current policy
  - Often set for a variety of reasons
  - Not always black and white
  - May have secondary impacts
- Better understand suggested policy changes
  - Its initial intent
  - Impact assessment

Process Outcomes (cont.)

- Works within the system
  - Gather input from others
  - Review the possible solutions
  - Achieve consensus
- Change may or may not occur (but last option is assured if no suggestion is made)
- Can have a positive impact on safety

Toward Zero Deaths: Maintaining a Safer Roadway

Part 3 – Maintenance Tasks, Safety Concerns, and Potential Responses
Presentation Outline

1. Traffic Safety as a Major Concern
2. Promotion of Safety Through Change
3. Maintenance Tasks, Safety Concerns, and Potential Responses
   • On-Road Issues
   • Off-Road Issues
   • Miscellaneous Issues

On-Road Issues

• Obstructions in Roadway
• Pavement Condition
• Shoulder Drop-Off
• Signs and Pavement Markings
• Traffic Signals
• Work Zone Safety

Obstructions in Roadway

Discussion

• Can cause sudden evasive maneuvers
• Example safety issues to look for:
  – Loose Gravel
  – Branches
  – Mud
  – Debris
Obstructions in Roadway Action

- Remove
- Sweep if needed
- Dispose of properly
- Follow traffic control
- Report items not immediately removable

Pavement Condition Discussion

- As pavements age they begin to show distress and fail
- Pavement distress/failure leads to many common safety issues

- Example safety issues:
  - Rutting
  - Pot Holes
  - Polished Aggregate/Smooth Surface
  - Quality Repairs
If possible, repair with materials/tools in truck (temporary and/or permanent)

Place proper temporary work zone traffic control, if appropriate

www.dot.state.mn.us/trafficeng/workzone

More complicated repairs, notify supervisor of issue and location

Reference LRRB “Asphalt Pavement Maintenance Field Handbook” (2001-05)

http://www.lrrb.org/PDF/200105.pdf

Drivers over-correct and steer into oncoming traffic when shoulders fall off

- Roadway shoulder height differential
- Grading
Shoulder Drop-Offs

**Action**

- Re-grade gravel shoulder
  - Blended shoulder materials
- Pave an asphalt wedge
  - Safety Edge
  - Microsurfacing

Signs and Pavement Markings

**Discussion**

- Over time, signs and markings lose visibility and effectiveness
- Significant safety concern for regulatory and warning signs
  - Visibility
  - Proper Location
  - Missing/Damaged
  - Retroreflectivity

**Action**

- Replace or Report:
  - Damaged/missing signs
  - Low retroreflectivity signs
  - Incorrect sign locations
  - Signs with visibility issues
Traffic Signals
Discussion

- Malfunctioning traffic signals can lead to crashes
  - Power outage
  - Not working properly
  - Bulb out
- Poor traffic operations

Traffic Signals
Action

- Report outage
  - Direct traffic if appropriate
  - Report re-occurring outage to supervisor
- Replace bulb or write-up work order
- Report excessive queues

Work Zone Safety
Discussion

- Improperly marked work zones can lead to crashes
- Following local guidance or refer to:
  - MN Work Zone Field Handbook
    www.dot.state.mn.us/trafficeng/workzone
  - Traffic Safety Fundamentals Handbook (pg C-29)
    www.dot.state.mn.us/stateaid/sa_traffic_safety.html
Work Zone Safety Discussion

• View work zone from drivers perspective
  – Is it safe??
• Always follow guidelines:
  – Short, Medium, Long term
• Set-up may take longer than maintenance task… your safety is important!

Work Zone Safety Action

✓ Follow guidelines
  – Lead by example
✓ Remove temporary traffic control when no longer needed (e.g. Lunch, Weekends)
✓ For suggested work zone improvements contact: traffic.dot@state.mn.us

Maintenance Tasks, Safety Concerns, and Potential Responses

• On-Road Issues
• Off-Road Issues
• Miscellaneous Issues
Off-Road Issues

- Vegetation Control
- Roadside Hazards - Clear Zone
- Drainage
- Winter Maintenance
- Guardrail & Cable Median Barrier

Vegetation Control

Discussion

- Vegetation that obscures visibility can lead to crashes:
  - Sign Visibility
  - Intersection Sight Lines
- Consider seasonal variations
- Follow local policy (discuss with supervisor)

Vegetation Control

Action

- Trim trees/brush and mow grass that obscure:
  - Signs
  - Intersection Sight Lines
- Grade or mow shoulder edge
- Review local agreements
Vegetation Control
Action

✓ Report:
  - Trees in clear zone (Possibly Remove)
  - Tree canopy (e.g. shadows) that create icy pavement conditions
  - Vegetation creating drainage issues (re-grade as necessary)

Roadside Hazards - Clear Zone
Discussion

• Can result in a serious crash (e.g. Run-Off-Road)
• Examples of roadside hazards:
  - Non-Conforming Mailboxes
  - Non-Approved Signs & Posts
  - Head Walls/Retaining Walls
  - Culvert Ends/Driveway Cross Slopes
  - Parked Vehicles

Roadside Hazards - Clear Zone
Action

Non-conforming mailboxes:
✓ Refer to local mailbox policy
✓ Report to supervisor
Roadside Hazards - Clear Zone

**Non-approved signs:**
- Remove from ROW
- Report memorials - DO NOT remove

**Head walls/retaining walls/planters:**
- Notify supervisor of private head walls/retaining walls in the right-of-way

**Vehicles:**
- Report parked vehicles (if in violation of local ordinance)
Drainage Discussion

- Drainage issues can impact safety by erosion and flooding on/near the roadway
  - Culvert Maintenance
  - Catch Basin
  - Ditches

Drainage Action

✓ Clear debris from grate area/catch basins
✓ Report sedimentation which indicates past flooding

Winter Maintenance Discussion

- Winter weather may result in adverse driving conditions
- Potential Issues:
  - Plowing Priority
  - Clear Sight Lines
  - Drifting
  - Private Residents dumping snow in ROW
**Winter Maintenance Action**
- Keep plowing priority, clear travel lanes first
- Keep right-of-way clear of snow piles
- Avoid plowing that results in drainage issues

**Winter Maintenance Action**
- Consider snow fence locations to eliminate drift
- Be aware of where snow is pushed when plow turns
- Treat persistent icy pavement conditions (e.g. tree coverage)

**Guardrail & Cable Median Barrier Discussion**
- Be on the lookout for damaged/hit guardrails/median barriers
- Assess damage (if trained)
- Look for potential cause to ensure correcting all issues (e.g. pothole, etc. in roadway)
Guardsrail & Cable Median Barrier Action

- Report hits
- If minor damage, schedule repair with routine maintenance
- If non-functioning, report and mark appropriately
- Follow policy to repair a.s.a.p.

Maintenance Tasks, Safety Concerns, and Potential Responses

- On-Road Issues
- Off-Road Issues
- Miscellaneous Issues

Miscellaneous Issues

- Replace or report street light outages
- Note location of run-offs, skid marks (survey area to ensure vehicle is not there)
- Delineate bridge abutments
- If you maintain bike lanes/trails, follow similar maintenance guidance
LRRB Workshop Outcome

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Reference Materials

- www.dot.state.mn.us/trafficeng/workzone
- www.dot.state.mn.us/stateaid/sa_traffic_safety.html

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- www.dot.state.mn.us/stateaid/sa_traffic_safety.html
Questions?

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