



Toward Zero Deaths Maintaining a Safer Roadway Workshop

Minnesota
Department of
Transportation

**RESEARCH
SERVICES**

Office of
Policy Analysis,
Research &
Innovation

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June 2010

Research Project
Final Report #2010RIC03



Your Destination... Our Priority



Technical Report Documentation Page


1. Report No. MN/RC - 2010RIC03	2.	3. Recipients Accession No.	
4. Title and Subtitle Toward Zero Deaths – Maintaining a Safer Roadway Workshop		5. Report Date April 2010	
		6.	
7. Author(s) Michael Marti, Renae Kuehl		8. Performing Organization Report No.	
9. Performing Organization Name and Address SRF Consulting Group, Inc. One Carlson Parkway North, Suite 150 Minneapolis, MN 55477-4443		10. Project/Task/Work Unit No.	
		11. Contract (C) or Grant (G) No. RIC Task 3	
12. Sponsoring Organization Name and Address Minnesota Department of Transportation Research Services Section 395 John Ireland Boulevard Mail Stop 330 St. Paul, Minnesota 55155		13. Type of Report and Period Covered Final Workshop PP Handout	
		14. Sponsoring Agency Code	
15. Supplementary Notes http://www.lrrb.org/pdf/2010RIC03.pdf			
16. Abstract (Limit: 200 words) 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: <ul style="list-style-type: none"> • Obstructions in Roadway • Shoulder Drop-Off • Signs and Pavement Markings • Work Zone Safety • Vegetation Control • Roadside Hazards - Clear Zone • Drainage • Winter Maintenance <p>Contact the MN LTAP center for more information on when this workshop will be offered in the future. http://www.mnltap.umn.edu/</p>			
17. Document Analysis/Descriptors Maintenance safety Maintenance staff Roadway safety Traffic Safety Obstructions in Roadway Shoulder Drop-Off Signs and Pavement		18. Availability Statement No restrictions. Document available from: National Technical Information Services, Springfield, Virginia 22161	
19. Security Class (this report) Unclassified	20. Security Class (this page) Unclassified	21. No. of Pages 22	22. Price

Toward Zero Deaths - Maintaining a Safer Roadway Workshop

 **Toward Zero Deaths:
Maintaining a Safer Roadway**



[Enter workshop location]
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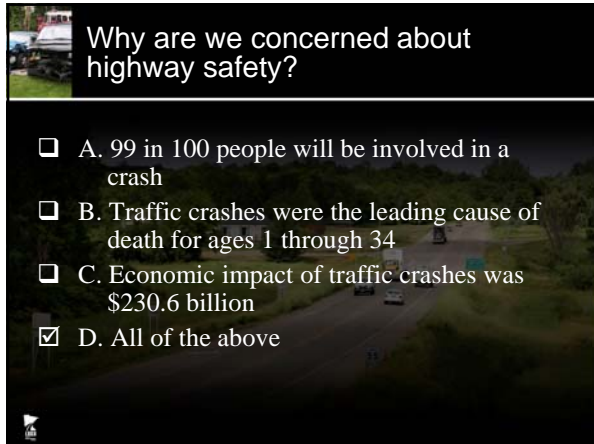
 **LRRB Workshop Objectives**

- 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

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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

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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

Highway Safety in Minnesota 2008 Fatalities by County

Fatalities (All Crashes)

Fatalities

0	1-5	6-15	16-25
26-35	36-45	46-55	56+

Cost of Motor Vehicle Crashes 2008 - State of Minnesota

Category	Incidence	Cost Per Incident	Total Cost
Fatal Crashes	455	\$1,130,000	\$514,150,000
Severe Injury Crashes	1,553	\$65,000	\$100,945,000
Moderate Injury Crashes	8,334	\$21,000	\$175,014,000
Minor Injury Crashes	23,492	\$11,900	\$279,554,800
Property Damage Crashes	54,761	\$7,500	\$410,707,500
Total			\$1,480,371,300

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2008 Minnesota Crash Facts

By Road Design

	Fatalities	Injuries
Two lane two way	289	12,911
Other divided highway	40	5,296
Freeway	77	4,755

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

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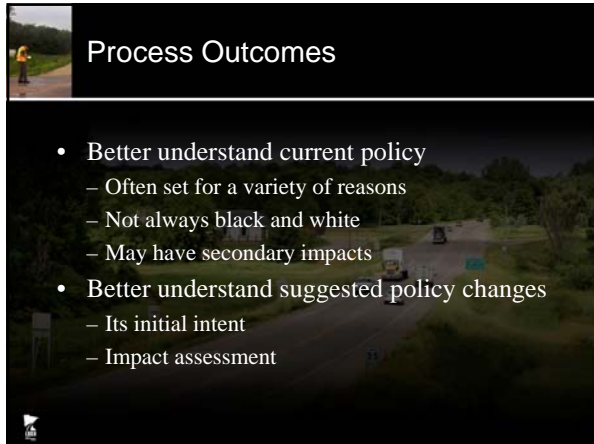
How to Implement Policy/Procedure Change

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

Case Study

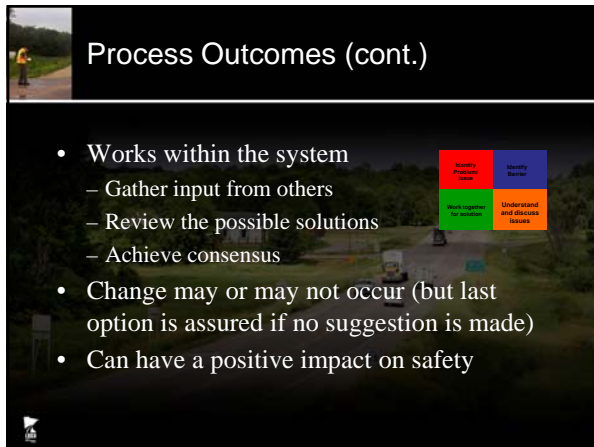
Identify Problem/ Issue	Identify Barrier	Tall grass in ditch blocking intersection sight lines	Policy states not to mow ditches
Work together for solution	Understand and discuss issues		
Discuss merits of policy vs. safety Adjust policy to allow mowing near intersections		Reasons for Policy: Economic Spreads some weeds Inhibits native grasses	Reasons for Change: Blocked sightlines

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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

Identify Problem/Issue	Identify Solution
Work together for solution	Understand and discuss the pros/cons

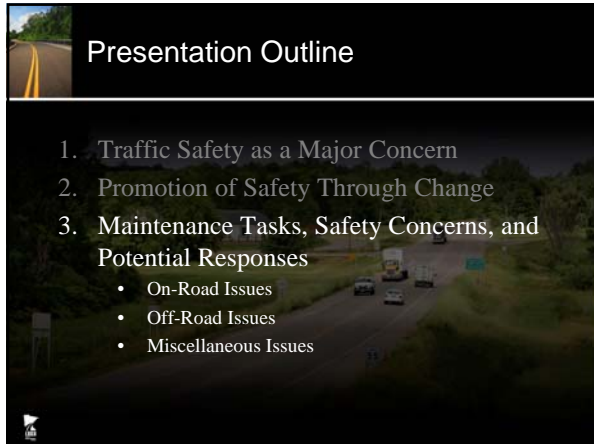


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Part 3 – Maintenance Tasks, Safety Concerns, and Potential Responses

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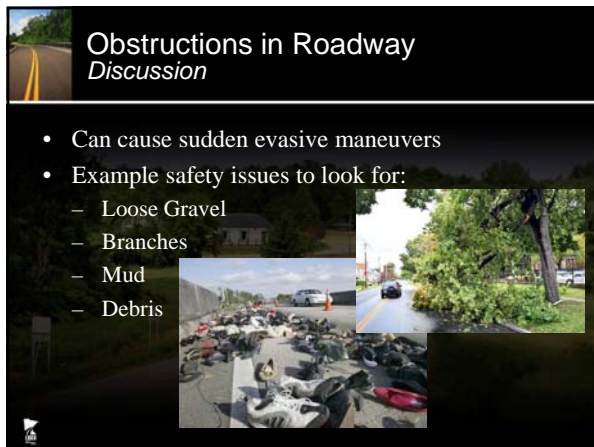
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On-Road Issues



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



Obstructions in Roadway

Discussion

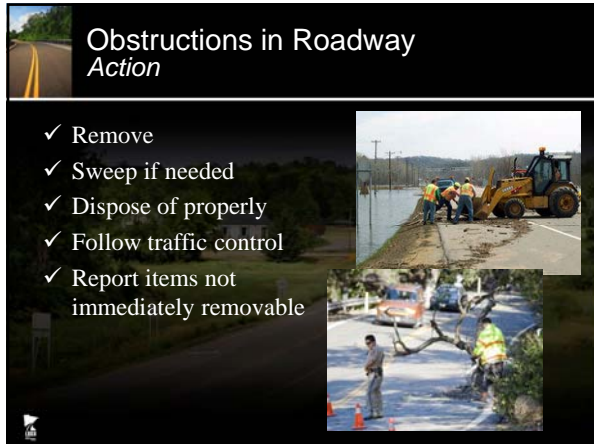
- Can cause sudden evasive maneuvers
- Example safety issues to look for:
 - Loose Gravel
 - Branches
 - Mud
 - Debris



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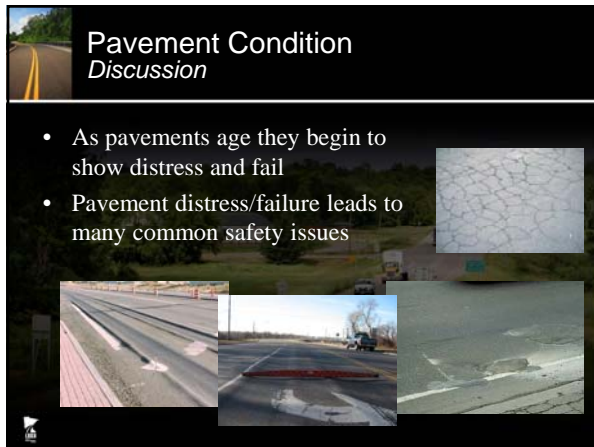
Obstructions in Roadway
Action

- ✓ 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



Pavement Condition
Discussion

- Example safety issues:
 - Rutting
 - Pot Holes
 - Polished Aggregate/Smooth Surface
 - Quality Repairs



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Pavement Condition
Action

- ✓ 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



Pavement Condition
Action


- ✓ 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>



Shoulder Drop-Offs
Discussion

- Drivers over-correct and steer into oncoming traffic when shoulders fall off
 - Roadway shoulder height differential
 - Grading



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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



Signs and Pavement Markings *Action*

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



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Traffic Signals

Discussion


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



Traffic Signals

Action

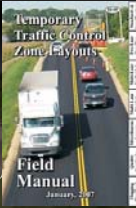
- ✓ Report outage
 - Direct traffic if appropriate
 - Report re-occurring outage to supervisor
- ✓ Replace bulb or write-up work order
- ✓ Report excessive queues



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



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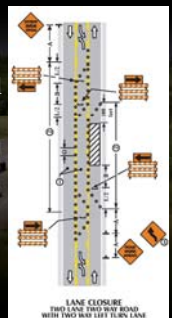
Work Zone Safety Discussion

- 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



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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



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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



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Roadside Hazards - Clear Zone
Action

Non-approved signs:

- ✓ Remove from ROW
- ✓ Report memorials - DO NOT remove



Roadside Hazards - Clear Zone
Action

Head walls/retaining walls/planters:

- ✓ Notify supervisor of private head walls/retaining walls in the right-of-way



Roadside Hazards - Clear Zone
Action

Vehicles:

- ✓ Report parked vehicles (if in violation of local ordinance)



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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



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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)



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 **Guardrail & 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.



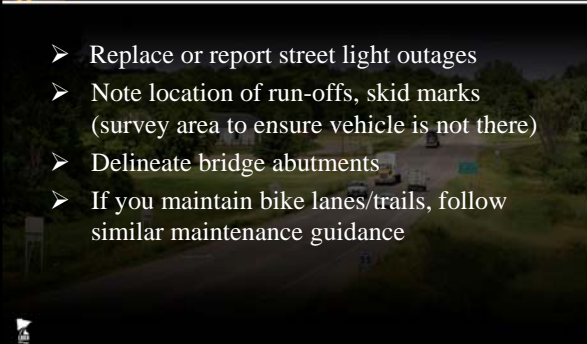
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 **Miscellaneous Issues**

- 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




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LRRB Workshop Outcome


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- Overall – Better understand your role in the MN Toward Zero Deaths initiative

Reference Materials



<http://www.lrrb.org/PDF/200004.pdf>
www.dot.state.mn.us/trafficeng/workzone
www.dot.state.mn.us/stateaid/sa_traffic_safety.html

Reference Materials



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Questions?





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