



MINNESOTA'S SAFETY PROGRAM

From “Black Spot” to Systematic

May 20, 2009

Rural Transportation Safety Conference

Past Practice

- Decentralized process based on reactive strategies
- Each district selected projects for their ATIP (Area Transportation Improvement Program)

Needed Changes

- Mainly reactive black spot treatments
- Project selection was not based solely on safety needs
- Projects were already in the program and then designated to have a “safety component”
- Selection should be “data-driven” and directed towards the areas with the greatest number of fatal and serious injury crashes
- Set a goal of selecting projects in a data driven way by FY 2009

New Process

- Development of a Strategic Highway Safety Plan (2007)
- Project selection process became centralized
- Low cost, systematic, proactive projects prioritized over black spot treatments
- Set a goals for proactive projects
 - At least 70% in Greater MN
 - At least 30% in Metro

Fatalities (2001-2005)

Total Fatalities 3,008

Total Vehicle Occupant Fatalities 2,429

Driver Behavior Based Emphasis Areas

Unbelted (Based on Veh. Occ. Fatalities)	1,271	(52%)	1
Alcohol-Related	1,068	(36%)	2
Speeding-Related	850	(28%)	5
Involved Drivers Under 21	718	(24%)	6

Infrastructure Based Emphasis Areas

Single Vehicle ROR	965	(32%)	4
Intersection	1,004	(33%)	3
Head-On and Sideswipe	611	(20%)	7

Funding Sources

- HSIP
 - State Projects
 - Local Projects
- Central Safety Fund
 - Metro Proactive Program
 - Cable Median Barrier
 - Pavement Marking Study

Project Selection

- Ability to meet the intent of the SHSP
- Fatal & A injury crashes per intersection or per mile
- SHSP (critical emphasis areas)
- Cost per intersection or cost per mile
- ADT
- Recommendation of a previous safety audit
- Inclusion on the HRRR list or Top 5% list

State HSIP Projects

STATE-WIDE HSIP STATE PROJECT SUMMARY					
Yearly HSIP Target	\$ 12,979,411				
Yearly Proactive Target	\$ 6,643,235				
Project Type	2009	2010	2011	2012	4-YEAR TOTAL
Turn lanes	\$ 270,000	\$ 450,000	\$ 477,000	\$ -	\$ 1,197,000
Lighting	\$ 820,900	\$ 750,700	\$ -	\$ -	\$ 1,571,600
Rumble Strips	\$ -	\$ -	\$ -	\$ -	\$ -
Rumble StripEs	\$ 1,088,006	\$ 548,822	\$ -	\$ -	\$ 1,636,828
Shoulder widening	\$ 535,500	\$ -	\$ -	\$ -	\$ 535,500
Other	\$ 369,000	\$ 2,115,000	\$ 2,621,000	\$ 2,943,000	\$ 8,048,000
Reactive	\$ 9,174,350	\$ 7,691,230	\$ 3,296,160	\$ 5,352,480	\$ 25,514,220
Project Subtotal	\$ 12,257,756	\$ 11,555,752	\$ 6,394,160	\$ 8,295,480	\$ 38,503,148
Set Aside	\$ 1,120,588	\$ 1,651,880	\$ 4,526,469	\$ 4,526,469	\$ 11,825,406
TOTAL	\$ 13,378,344	\$ 13,207,632	\$ 10,920,629	\$ 12,821,949	\$ 50,328,554
Proactive	\$ 3,083,406	\$ 3,864,522	\$ 3,098,000	\$ 2,943,000	\$ 12,988,928
Reactive	\$ 9,174,350	\$ 7,691,230	\$ 3,296,160	\$ 5,352,480	\$ 25,514,220
% of Proactive goal	46%	58%	47%	44%	49%

Greater MN LOCAL projects

STATEWIDE Summary		
	2 year funding available	\$ 13,041,176.00
Project type	HSIP Funding Awarded	Central Safety Funds Awarded
Advanced Warning Systems	\$ -	\$ 129,600.00
Lighting	\$ 628,800.00	\$ -
Rumble StripEs/Strips	\$ 1,491,938.00	\$ 288,900.00
Wider markings	\$ 3,518,292.00	\$ 266,181.00
Guardrail	\$ 427,320.00	\$ -
Geometric	\$ 567,000.00	\$ -
Striping	\$ 1,960,411.00	\$ 833,550.00
Signing	\$ 759,174.00	\$ -
Safety Plan	\$ 95,000.00	\$ -
TOTAL	\$ 9,447,935.00	\$ 1,518,231.00
Proactive	\$ 10,399,166.00	95%
Reactive	\$ 567,000.00	5%

Edge Treatments

- HSIP
 - Local
 - \$1.9M in Enhanced Striping funded in 2009/2010
 - \$3.5M in 6" Wide Pavement Markings funded in 2009/2010
 - \$1.5M in Rumble StripEs/Strips funded in 2009/2010
 - State
 - \$1.6M planned in Rumble StripEs in 2009/2010
 - Pavement Marking Study
 - Over 800 miles of roadways treated
 - Rumble StripEs, 6" wide markings, Wet Reflective markings



Edge Treatments

- Horizontal Curves
 - Lane departure crashes more frequent
 - Potential countermeasures
 - Chevrons/delineation
 - Rumble Strips
 - Wider markings
 - Dynamic Feedback Signs
- Safety Edge
 - Proven strategy
- Cable Median Barrier
 - 139 Miles installed
 - 96 Miles planned for 2009-2011
 - First before/after study is very promising



I-94 in Maple Grove

CSAH 13



SE MN ~ Enhancing Your Curves



CSAH 22



SE MN ~ Enhancing Your Curves



Intersections

- Rural Lighting
- Improved signage systems
- Active warning systems
- Sight Distance improvements
- “Black spot” improvements
 - J-turns
 - Roundabouts

Signing for minor leg of intersection

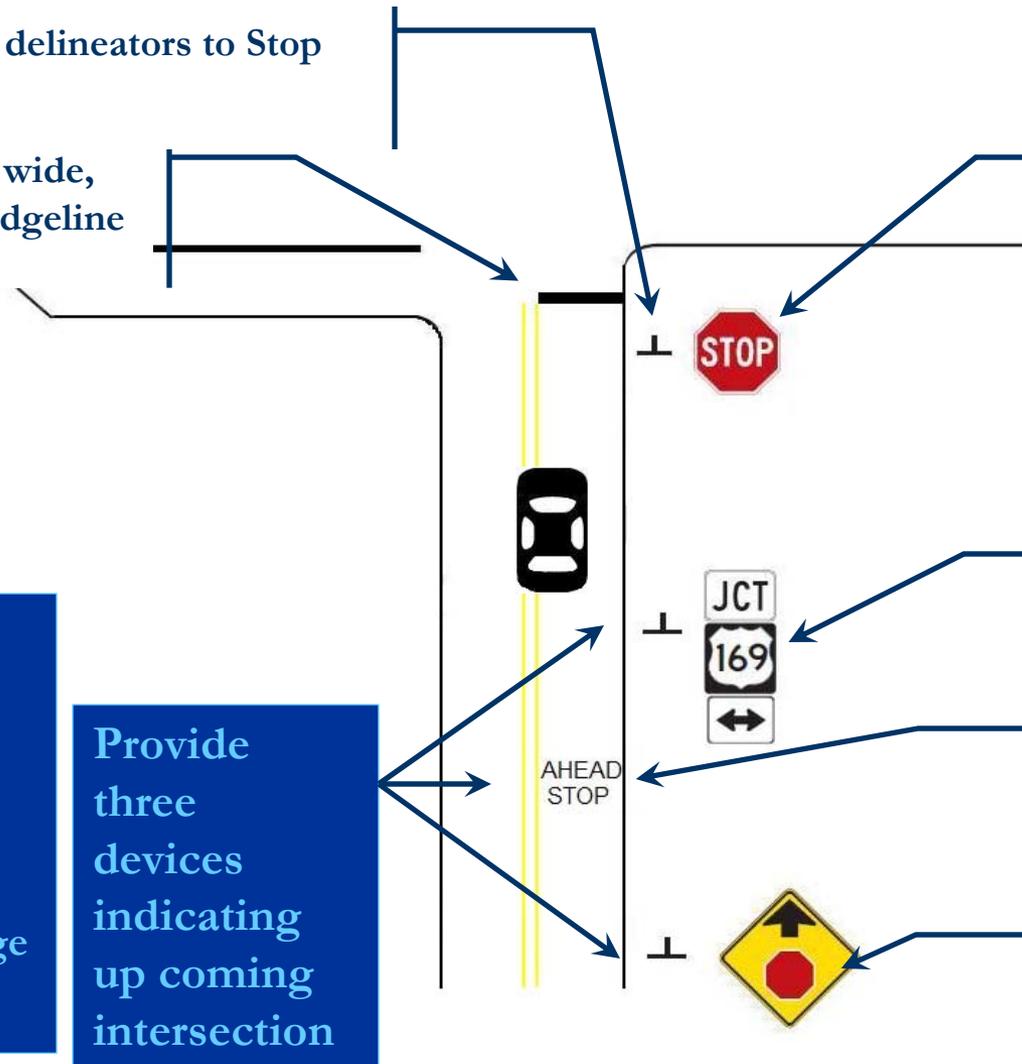
Add can delineators to Stop sign

Stop Bar, 12" to 24" wide, 8' to 12' back from edgeline

Prioritized/Phasing

1. Stop bar
2. Stop sign
3. Junction sign
4. Stop Ahead Message
5. Stop Ahead Sign

Provide three devices indicating up coming intersection



36", reserve 48" for intersections with documented deficiency and where there are RR grade crossings on the CH approach

1/2 distance between Stop Ahead and Stop

1/2 distance between Stop Ahead and Junction sign

450' (min.) to 750' back, 1 size larger than Stop (up to 48")

Reactive & Proactive Safety Countermeasures

Example Safety Improvements

Reactive



Proactive

Goal For
Metro District

50 / 50

Goal For
Out State Districts

High Cost Improvements

* Interchanges



* Roundabouts



* Road Re-Construction



Moderate Cost
Intersection Improvements

* Improve Traffic
Signal Operations
* Accel / Decel Lanes

* Indirect Turns



* Improve Sight Distance



Corridor Management and
Technology Improvements

* Employ ITS Technologies
* Elec. Speed Enforcement
in School Zones

* Access Mgmt.



* Road Safety Audit



Low - Cost
Intersection Improvements

* Red Light Enforcement
* Turn Lane Modifications



* Channelization



* Street Lights



* Enhance Traffic Signs
& Markings



* Curb Extensions



Road Departure Improvements

* Edge Treatments



* Enhanced Del. of curves



* Paved Shoulders
Rumble Strips / Stripes



* Cable Median Barrier



* Upgrade Roadside Hardware



Figure 6.2 of MN SHSP

SAFETY PROJECT SPECTRUM

STATE PLAN (POLICY AREA 1 – SAFE TRAVEL)

Category A

- Edge Treatment (rumble strips, enhanced pavement markings, improved signage)
- Centerline Rumble Strips
- Rural Intersection Enhancements (lighting, improved signage)
- Turn Lanes (Left + Right that meet warrants)

Category B

- Cable Median Barrier
- Full Standard Shoulders (with edge treatments)
- Geometric Intersection Changes (reduce access, ITS solutions)
- Intersection Control Revisions (new traffic control)
- Passing Lanes (meet ADT warrants)

Category C

- 2-4 Lane Expansion (meet ADT warrants)
- Design Continuity 2-4 Lane Expansion (eliminate gaps)
- Grade Separation (construct overpass and interchanges)

More Systematic

More Black Spot Oriented

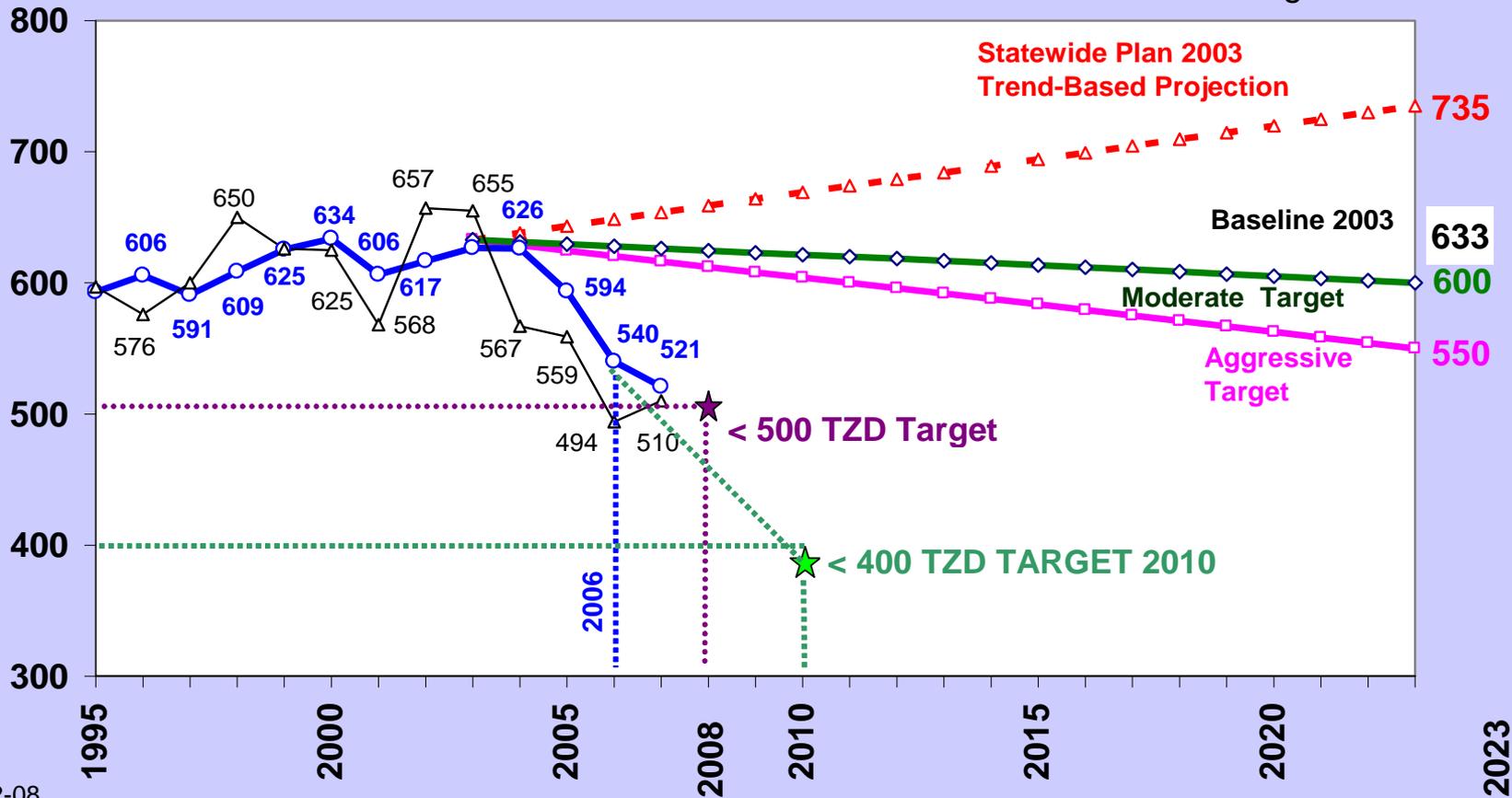
Low Unit Cost

High Unit Cost

NOTE: The Safety Spectrum is not all inclusive of all safety strategies. Additional strategies may be appropriate for some roadways.

Minnesota Roadway Fatalities - All State & Local Roads

Results vs. 2003 Statewide Plan and CHSP Targets



10-02-08

3-Year Moving Average Ends With Year Shown

3-Year Average Annual Fatalities

Minnesota Links

- MN Office of Traffic, Safety, and Technology (OTST)
 - <http://www.dot.state.mn.us/otso/>
- SHSP
 - <http://www.dot.state.mn.us/trafficeng/safety/shsp/Minnesota-SHSP-2007.pdf>
- 2008 HSIP Final Report
 - <http://www.dot.state.mn.us/trafficeng/safety/hes>
- District Engineer's Report
 - <http://www.dot.state.mn.us/trafficeng/safety/DE2008.pdf>
- Top 5% Report
 - <http://www.dot.state.mn.us/trafficeng/safety/hes/Top5percentlist.pdf>
- HSIP Worksheet
 - <http://www.dot.state.mn.us/trafficeng/safety/hes/HSIP%20worksheet.xls>
- Solicitations
 - Greater MN & Metro Announcements & Applications
 - <http://www.dot.state.mn.us/trafficeng/safety/hes/index.html>

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