



# Innovative Pavement Marking Project on Trunk Highway 52

by the Mn/DOT Office of Traffic, Security, and Operations

## Location and Background

TH 52 has been targeted by the TOWARD ZERO DEATHS program as a high crash corridor. The four lane divided highway stretches from the Twin Cities to Rochester with a speed limit of 65 MPH and an AADT of 16,600 in the rural area. Hader is located approximately 1 hour south of St. Paul with an at grade crossing of Trunk Highway 57/County Road 8. This intersection has nearly double the crash rate for similar intersections. This location was picked for the site of an experimental treatment that may have the potential to reduce crashes through increased awareness of the intersection.



## Proposed Experimental Treatment

At the 3M test facility, different experimental pavement tape widths, pattern cycle lengths and total treatment lengths were reviewed by Central Office and District personnel. Based on these field observations, it was decided to accent the intersection by installing a white 8-inch center skip tape with black 1 1/2 -inch contrast edges on a traditional skip pattern cycle in advance of an intersection. 3M partnered in this innovative safety concept and donated all materials to facilitate both the testing pattern and field research. On Sept.9 2003, the tape was applied on the bituminous surface in a permanent installation process, inlaying the tape in a milled groove to protect the tape from snowplowing abrasion. The treatment started at the intersection and extended 500 feet north, for southbound traffic approaching the intersection. On the south side, it extended 750 feet south of the intersection, for the northbound traffic approaching the intersection. The reason for the different

distance was because the northbound roadway had a horizontal curve before the intersection.



## Measures of Performance and Results

The intent of the project was to create awareness of an approaching intersection. Speed measurements could provide immediate assessment but not necessarily measure all the impacts of driving behavior. A before and after speed study was conducted to measure any speed reduction associated with this safety treatment. As indicated on the following tables, the 85<sup>th</sup> percentile speed and other speed measures showed no significant difference between before and after data. One noteworthy observation is that speeds at the intersection are slightly slower than the advance speeds in both the before/after conditions. This indicates that drivers do react to the intersection. Anecdotally, Mn/DOT personnel who drove the project at the speed limit reported that there was something different, but it was too short to make any driving analysis of what was different.

A long term measure of performance would be a reduction in crashes. Mn/DOT will continue to monitor this intersection for crashes. This intersection, along with other county road crossings on TH 52, has been scheduled to receive overhead street lights.





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Daytime		Before Tape		After Tape	
		Advance	Crossover	Advance	Crossover
Northbound	85th Percentile	74	71	74	71
	50th Percentile	71	69	71	69
	Mean Speed	71	68	70	68
	10 M.P.H. Pace	66-75	62-71	66-75	62-71
	Percent in Pace	80%	86%	80%	84%
	Percent above 65 M.P.H.	91%	76%	90%	77%
	Percent above 75 M.P.H.	11%	4%	11%	4%
Southbound	85th Percentile	74	77	74	77
	50th Percentile	71	71	71	71
	Mean Speed	71	72	70	72
	10 M.P.H. Pace	66-75	69-78	66-75	69-78
	Percent in Pace	77%	80%	77%	79%
	Percent above 65 M.P.H.	90%	94%	90%	93%
	Percent above 75 M.P.H.	13%	17%	12%	16%

Nighttime		Before Tape		After Tape	
		Advance	Crossover	Advance	Crossover
Northbound	85th Percentile	74	71	74	71
	50th Percentile	69	66	69	66
	Mean Speed	70	67	69	67
	10 M.P.H. Pace	66-75	62-71	66-75	62-71
	Percent in Pace	80%	87%	77%	85%
	Percent above 65 M.P.H.	87%	67%	85%	69%
	Percent above 75 M.P.H.	8%	2%	8%	3%
Southbound	85th Percentile	74	74	74	74
	50th Percentile	69	71	69	71
	Mean Speed	69	70	69	70
	10 M.P.H. Pace	66-75	66-75	62-71	66-75
	Percent in Pace	78%	81%	78%	81%
	Percent above 65 M.P.H.	83%	90%	82%	90%
	Percent above 75 M.P.H.	5%	8%	7%	9%

A total of 115,010 vehicles were counted and their speeds recorded by automated tube-type collectors. The "Before Tape" column represents vehicle data collected between 10:00 A.M. on 9-3-2003 and 11:00 A.M. on 9-5-2003. The innovative pavement marking tape was installed on 9-9-2003. The "After Tape" column represents vehicle data collected between 9:00 A.M. on 9-24-2003 and 10:00 A.M. on 9-26-2003. "Daytime" and "Nighttime" are defined by a half-hour before sunrise and a half-hour after sunset, respectively. "Advance" and "Crossover" are defined by a point approximately 1200 feet in advance and approximately 80 feet in advance of the intersection centerline crossing, respectively. All data was collected under clear weather and dry pavement conditions. Vehicles traveling under 50 miles per hour were assumed to be in turn lanes and were removed from the sample. For more information please contact Daniel Brannan by phone (651) 284-3463 or by e-mail [daniel.brannan@dot.state.mn.us](mailto:daniel.brannan@dot.state.mn.us). This report is available online at <http://www.dot.state.mn.us/trafficeng/safety>.