Minnesota Tailgating Pilot Project

a NHTSA-sponsored project

Report and Summary

2006

Department of Public Safety
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Full report available for download at:
http://www.dot.state.mn.us/trafficeng/tailgating/index.html

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Project Summary

In 2006, the Minnesota Departments of Transportation and Public Safety partnered with the Wright County Highway Department and the Safe Communities Coalition of Wright County to pilot a Tailgating Treatment Program similar to a Pennsylvania project honored with a 2001 National Highway Safety Award. The Minnesota project was viewed as a tool to educate motorists on how to identify and maintain a minimum safe following distance, and ultimately to reduce rear end crashes.

The primary components of the project were:

Roadway: A section of State Highway 55 in Wright County was used to paint 94 elliptical dots, spaced 225 feet apart, along a two-mile segment of the rural, single-lane, 55 mile-per-hour roadway. The dots were painted within a section of Highway 55 that was previously designated a "Toward Zero Deaths" corridor. The study corridor had an estimated average travel rate of 16,000 vehicles per day, no dedicated left turn lanes, minimal grade differences, and no congestion issues. In addition to the dots, a series of four different signs directing motorists to maintain at least two dots between them and the vehicle ahead were placed along the corridor.

Following Distance: To maintain consistency with information currently provided through driver training and other safe driving programs, the project used the three-second minimum safe following distance strategy.

Law Enforcement Activity: The project did not include an enhanced enforcement component. This provided an opportunity to evaluate the engineering and public information components in modifying driver behavior independent of an enhanced enforcement deterrent.

Public Information Campaign: The public was informed of the project through the distribution of informational handouts at area businesses, local mailings, and a June 22 press event. The project received television, radio and print coverage throughout the state, as well as national coverage by the New York Times and other publications outside Minnesota.

Evaluation Criteria: Vehicle headway data was collected for 48 hours prior to and after installation of the pavement marking dots and signs. Traffic counting tubes were set one-mile prior to the beginning of the marking location, at the mid-point of the marking location, and one-mile after the marking location, in both east and west bound lanes. The raw data was filtered to exclude vehicles following at seven-seconds or more, vehicles traveling under 45 mph, and vehicles with more than two axles.

Outcome: The combination of all data collection points showed an increased average gap from 2.35 to 2.52 seconds, or 14.1 feet. The greatest average increase occurred at the mid-point location, where the average gap increased from 2.36 to 2.62 seconds, or 22.9 feet. The average gap increased from 2.49 to 2.64 seconds, or 12.9 feet at the points placed one-mile after the marking locations.

When excluding the data from collection points set one-mile prior to the marking location, the overall average gap increased by 17.9 feet. This more accurately reflects the projects impact as behavioral changes should not be expected prior to the application site.

In addition to collecting headway data, the tubes also recorded speed data along the posted 55 mph corridor. Speeds at all points along the study corridor showed an overall average reduction from 58.6 to 57.9 mph, or -0.6 mph. Average speeds one-mile prior to the marking location decreased from 58.8 to 56.8 mph, or -2.0 mph. Average speeds decreased from 59.7 to 58.6 mph, or -1.1 mph at both points one-mile into the marking location, and at points one-mile after the marking locations the average speed increased from 56.9 to 58.4 mph, or +1.5 mph. (Speeds are rounded to one decimal point.)

Funding and Costs: The Minnesota Department of Public Safety, Office of Traffic Safety (OTS) contracted with the Minnesota Department of Transportation Office of Traffic Security and Operations (MN/DOT) to provide labor, materials, printing and equipment needed to create a template, paint dots, fabricate signs, and to produce public information pieces. The OTS receives funding from the National Highway Traffic Safety Administration (NHTSA), under the State and Community Highway Safety Program (Public Law 89-564) to address highway safety problems in Minnesota. The total cost expended on the project was $14,865.74. Additionally, numerous staff hours from Wright County, MN/DOT, and OTS were provided “in-kind.”

Additional project details can be found in the following pages of this report.

The Tailgating Problem in Minnesota:

- In 2002 there were 22,206 rear-end crashes resulting in 21 deaths. Rear end crashes accounted for 23.3% of the total crashes and 3.1% of the total traffic fatalities in the state.
- 2003 saw an increase in fatal rear-end crashes resulting in 28 fatal crashes killing 30 people. This accounted for 4.8% of the total fatal crashes and 4.5% of the total traffic fatalities in the state.[1]
- In 2004 rear end crashes increased to 25,621, accounting for 27.6% of the total crashes. Rear end crashes killed 19 people, representing 3.3% of the total traffic fatalities in the state in 2004.
- In comparison to 2004, rear end crashes dropped to 24,820 in 2005, yet remained higher than 2002. In 2005 rear end crashes represented a higher percentage of all crashes 28.2%, fatal crashes, 21, and fatalities, 22 when compared to 2004 statistics.

Year	Total Rear-end Crashes	Total Crash %	Total fatal Rear-end Crashes	Total Rear-end Crash Fatalities	Total Fatality %
2002	22,206	23.3%	20	21	3.1%
2003	Not available	Not available	28	30	4.5%
2004	25,621	27.6%	19	19	3.3%
2005	24,820	28.2%	21	22	3.9%
Total or Average		**26.36%**	**88**	**92**	**3.7%**

Given the fact that the number of vehicles with anti-lock braking systems has increased each year, this relatively new technology is not causing any consistent downward trend in rear-end crashes. This indicates that the problem lies with driver behavior, not vehicle deficiency.

Minnesota's Dot Tailgating Pilot Project:

Given the successes, relatively low implementation cost, and the measurable benefits of a Pennsylvania dot program honored with a 2001 National Highway Safety Award, Minnesota piloted a similar project in 2006. The project was viewed primarily as a tool to help educate motorists on how to identify and maintain safe minimum following distances, with the hope that drivers will apply the same learned behavior on other roadways.

Minnesota used similar engineering elements from the Pennsylvania program. Use of elliptical pavement dots, informational signs, and a strong public information campaign were the main elements used from the Pennsylvania project. The primary exceptions to the Pennsylvania project included the use of a rural single-lane 55 mile per hour roadway, a three-second safe following distance criteria, no additional law enforcement activity, and non-crash related evaluation criteria. Greater detail of each of these elements is explained later in this report.

[1] 2003 Minnesota Motor Vehicle Crash Facts

Project Partners:

- Wright County Highway Department
- Safe Communities Coalition of Wright County
- Wright County Sheriff's Office
- Minnesota Department of Transportation
- Minnesota Department of Public Safety, Office of Traffic Safety
- Minnesota State Patrol
- National Highway Traffic Safety Administration
- Buffalo Police Department

Contact information can be found at the end of this report.

Timelines:

- October 2005: Project planning began.
- April 2006: FHWA approval to experiment granted.
- June 6 through June 8, 2006: 48 hours of pre-project weekday headway data collected.
- June 19: Signs placed and pavement marking dots painted.
- June 22: Kick-Off/Press Event held.
- July 25 through July 27, 2006: After-data collected in the same manner and same weekdays as the pre-project data.

Public Information, Education and Media:

The primary role of the Safe Communities Coalition of Wright County was to coordinate all public information, education and media efforts for the project. Executive Director Patricia Hackman was instrumental in the development and distribution of the public information piece, press releases, and coordination of the press conference announcing the project to the public.

On June 22 a press conference was held at the Wright County Government Center in Buffalo, Minnesota. A press release from the Minnesota Department of Public Safety was coordinated with the media event. Project information was aired on all of the major metropolitan network television news programs: WCCO Channel 4, KSTP Channel 5, KMSP Fox 9, and KARE Channel 11.

Radio interviews were aired on the following stations:

Station	Area	Interviewed
KTLK-FM Fox News Talk	Twin Cities	Dan Brannan, Mn/DOT
WCCO-AM News Radio	Twin Cities & statewide	Pat Hackman, Wright Co.
MNN Radio Network	Statewide	Pat Hackman, Wright Co.
MN Public Radio	Statewide	Kathy Swanson, Director, Office of Traffic Safety
KCLD-FM Top 40 Pop	St. Cloud	Pat Hackman, Wright Co.
KNSI-AM News Radio	St. Cloud	Pat Hackman, Wright Co.
Landline Now XM Trucker Radio	Missouri/National	Gordy Pehrson, Mn/DPS

Mn/DOT's Office of Traffic, Security and Operations created a Tailgating Project Web site; www.dot.state.mn.us/trafficeng/tailgating that featured public information and a list of frequently asked questions (FAQ's).

The DPS Office of Traffic Safety (OTS), and the DPS Communications Office acted in an advisory capacity with public relations and information efforts. Print and web articles included:

- Minneapolis Star Tribune, June 23.
- Delano Eagle, June 26.
- Annandale Advocate, June 28.
- Wright County Journal Press, June 30.
- Officeroutlook.com, June, 2006.
- Stateline.org, July 7.
- Politicalgateway.com, July 7
- The New York Times, July 21
- The Urban Transportation Monitor, July 21.

The Buffalo Allina Hospital's Healthy Communities Magazine featured the project in their Fall 2006 publication. The magazine is distributed to about 60,000 homes and businesses in the Wright County area.

A sample of some print media pieces can be found at the end of this report.

Main differences from the Pennsylvania project:

- Three-seconds was used as the safe following distance criteria as opposed to two-seconds used in the Pennsylvania study.
- A rural, single-lane, 55 mile per hour roadway was used for the study corridor.
- Additional law enforcement activity was not requested.
- Following distance measurements were used for evaluation criteria as opposed to crash statistics used in the Pennsylvania study.

Three-second following distance:

The two main causes of rear-end crashes are driver inattention and following too closely.[2]

For several years, safe driving literature, text books, and driver educators used the two-second following distance strategy as the minimum safe following distance under ideal conditions. More recently this strategy was revised to three-seconds.[3] To support this strategy, three-seconds was used as the minimum safe following distance under ideal conditions for purposes of this pilot project.

[2] "Front end Analysis of Rear end Crashes," FHWA, May 1992
[3] Alliance for Safe Driving, "License to Drive," 2000, Page 28-31

Site Selection:

A two-mile segment of east and west bound lanes of State Highway 55 in Wright County was selected using the following criteria:

- Rural driving environment.
- Single lane 55 mph corridor.
- Average Daily Traffic (ADT) rate of approximately 16,000 vehicles.
- Absence of multiple intersections, dedicated left turn lanes, significant grade differences, and traffic congestion.
- Presence of an active Safe Communities Coalition with a Toward Zero Deaths (TZD) Corridor

The specific 2-mile section of State Highway 55, between County State Aid Highway 14 on the west and Deadrick Avenue to the east, was identified as the preferred site due to the 16,000 vehicle ADT, and the absence of multiple intersections, dedicated left turn lanes, significant grade differences, and traffic congestion. Two county roads intersect with the study corridor. The absence of multiple intersections within the study area assured that a significant majority of drivers were exposed to the entire treatment site. This provided a manageable control for the evaluation of the projects effectiveness in changing driver behavior. The decision to use a rural, single-lane, 55 mph corridor was made because this type of roadway was not included in the Pennsylvania study, and rural, single-lane, 55 mph roads are the most prevalent type of roadway in Minnesota. More than 50% of the fatal crashes in Minnesota occur on rural, single-lane, 55 mph roads. Therefore innovative, low-cost safety solutions have the greatest potential for success.

Law Enforcement:

Involvement with the Wright County Sheriff's Office, Buffalo Police Department, and the Minnesota State Patrol, played an important role in the project. Law enforcement was requested to help educate motorists through the distribution of an informational handout given to motorists during routine traffic stops and public meetings in the Wright County area. Officers were not asked to modify current enforcement activities along the corridor. The working group believes the exclusion of enhanced enforcement activities along the corridor during the pilot aided in obtaining a clearer evaluation of the project's effectiveness in modifying driver behavior.

Pavement Dots:

A total of 94 equally spaced elliptical dots (47 in each direction), spaced 225 feet apart, were painted in the center of east and west bound travel lanes by Traffic Marking Services Inc. using a template and latex paint. The dots provided motorists with a physical reference reinforcing safe following distances between vehicles. The dots were spaced 225 feet apart, so two dots were visible to motorists following others with three-seconds between them, when traveling at 55 miles per hour - the posted speed limit on the corridor. In accordance with MUTCD standards for oblong pavement markings, the width to height ratio is 1:3. (2.5 ft by 7.5 ft.) for each dot. The dots were considered experimental and went through the approval process by FHWA.

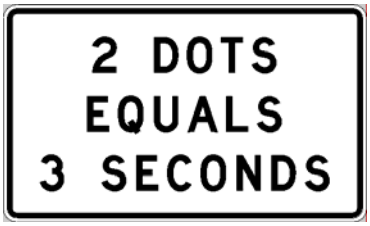
Signs:

In accordance with the 2003 Manual on Uniform Traffic Control Devices (MUTCD), a formal request to experiment using signs that were not included in the MUTCD was submitted with the Federal Highway Administration (FHWA) Office of Transportation Operations. FHWA granted approval on April 6, 2006.

Mn/DOT engineers designed the signs and determined their placement along the study corridor to maximize their effectiveness. The signs were posted for both east and west bound traffic and were limited to four specific messages:

Posted prior to the treatment site.

Posted within the treatment site. The symbol promoted conveyance of the basic message to motorists that may have difficulty reading the entire sign.



Posted within the treatment site.

Posted after the treatment site.

Evaluation Methodology:

The use of rear-end crash data for project evaluation would require data to be collected over several years. Therefore, specific gap measurements were used as the primary evaluation criteria. This data collection method also provided speed measurement data. Therefore, speed measurements are included as a secondary project evaluation tool.

Vehicle headway data was collected for 48 hours beginning Tuesday, June 6 through Thursday, June 8, 2006, prior to the installation of the signs and pavement marking dots. Traffic counting tubes were set for each direction of travel approximately one mile prior to the beginning of the pavement marking location, one mile into the planned markings, and one mile after the planned marking location.

The pavement marking dots were painted June 19th, 2006 and "after data" was collected in the same manner and same weekdays from July 25 through the 27.

The data was collected with TimeMark's, Lambda counting machine with two tubes set in each location spaced 16 feet apart. Layout number 52 of the Lambda machine was used to format the data and export into an Excel database.

The volume of raw data totaled 88,738 vehicles. The raw data was filtered to exclude vehicles following at seven-seconds or greater and vehicles with more than two axles. Additionally, vehicles traveling at abnormally low speeds, less than 45 miles per hour, were excluded from the data, as it was likely that they were farm implement or permitted special use vehicles.

Outcomes:

The combination of all data collection points showed an increased average gap from 2.35 to 2.52 seconds, or 14.1 feet. The greatest average increase occurred at the mid-point location, where the average gap increased from 2.36 to 2.62 seconds, or 22.9 feet. The average gap increased from 2.49 to 2.64 seconds, or 12.9 feet at the points placed one-mile after the marking locations.

When excluding data from collection points set one-mile prior to the marking location the overall average gap increased by 17.9 feet. This more accurately reflects the projects impact as behavioral changes should not be expected prior to the application site.

In addition to collecting headway data, the tubes also recorded speed data along the posted 55 mph corridor. Speeds at all points along the study corridor showed an overall average reduction from 58.6 to 57.9 mph, or -0.6 mph. Average speeds one-mile prior to the marking location decreased from 58.8 to 56.8 mph, or -2.0 mph. Average speeds decreased from 59.7 to 58.6 mph, or -1.1 mph at both points one-mile into the marking location, and at points one-mile after the marking locations the average speed increased from 56.9 to 58.4 mph, or +1.5 mph. (Speeds are rounded to one decimal point.)

Outcome Data

Data Collection Points; east and west bound lanes:

- Site A: Approximately one-mile prior to the beginning of the marking location.
- Site B: Mid-point of the dots marking location.
- Site C: One-mile after the marking location, in both east and west bound lanes.

COLLECTION POINTS		AVERAGE GAP (Seconds)	AVERAGE GAP INCREASE (Seconds)	AVERAGE SPEED (MPH)	AVERAGE GAP INCREASE (Feet)
All:	*Before*	2.35			
	After	2.51	0.16	58.26	14.08
All East:	*Before*	2.33			
	After	2.49	0.15	59.13	13.73
All West:	*Before*	2.36			
	After	2.54	0.17	57.50	14.36
Site A East & West:	*Before*	2.22			
	After	2.28	0.06	57.84	5.20
Site $\bar{B}$ East & West:	*Before*	2.36			
	After	2.62	0.26	59.15	22.86
Site $\bar{C}$ East & West:	*Before*	2.49			
	After	2.64	0.15	57.66	12.92

All Collection Sites

N= Sample Volume P= Probability of change

	Pre-Project	During Project	Change	P
N	56,648	55,922		
Gap	2.35	2.51	+0.16	<.0001
Speed	58.58	57.95	-0.62	<.0001

All East Bound Collection Sites

	Pre-Project	During Project	Change	P
N	26,498	25,989		
Gap	2.33	2.49	+0.15	<.0001
Speed	59.98	58.27	-1.70	<.0001

All West Bound Collection Sites

	Pre-Project	During Project	Change	P
N	30,150	29,933		
Gap	2.36	2.54	+0.17	<.0001
Speed	57.34	57.67	+0.32	<.0001

East and West (Site A)

	Pre-Project	During Project	Change	P
N	19,050	18,535		
Gap	2.22	2.28	+0.06	<.0001
Speed	58.84	56.81	-2.03	<.0001

East and West Mid-Point (Site B)

	Pre-Project	During Project	Change	P
N	20,885	20,213		
Gap	2.36	2.62	+0.26	<.0001
Speed	59.68	58.60	-1.08	<.0001

East and West Mid-Point (SiteC)

	Pre-Project	During Project	Change	P
N	16,713	17,174		
Gap	2.49	2.64	+0.15	<.0001
Speed	56.89	58.42	+1.52	<.0001

Funding and Costs:

The Minnesota Department of Public Safety, Office of Traffic Safety (OTS) initially set aside $25,000 for a contract with the Minnesota Department of Transportation Office of Traffic Security and Operations (MN/DOT) to provide labor, materials, printing and equipment needed to create a template, paint dots, fabricate signs, and to produce public information pieces. The OTS funding is apportioned by the National Highway Traffic Safety Administration (NHTSA), under the State and Community Highway Safety Program (Public Law 89-564) to address highway safety problems in Minnesota. The total cost for the project was $14,865.74. Additionally, numerous staff hours from Wright County, MN/DOT, and OTS were provided "in-kind."

Test Location Restoration, Abatement, or Expansion Considerations:

In the spring of 2007, Mn/DOT officials will consider restoration or abatement of the existing dots and signs along the study corridor and explore the feasibility of expanding the project to roadways in other parts of the state. Restoration would require repainting each of the 94 dots and could include a re-evaluation component. Abatement would require the removal of eight signs and painting over the remnants of the 94 dot markings.

Lessons Learned:

In July, 2006 the Minnesota Motorcycle Safety Advisory Committee (MMSAC) expressed concern over potential traction issues for motorcyclists traversing the painted dots. This issue was discussed by the planning committee at the beginning of the project planning process. It was agreed that motorcycle traction issues were not a concern as the pilot roadway did not include sharp turns and the size and placement of the dots provided motorcyclists adequate space to safely ride on either side of the dots.

If the decision is made to expand the project beyond the pilot corridor the OTS Coordinator agreed that the MMSAC should be consulted, and if their safety concerns are justifiable, alternative paint designs could be explored.

As a result of the Wright County Tailgating project, Senator Amy Koch expressed interest in updating MN laws that address tailgating. She had senate researchers' review legislation throughout the country. The researchers found specific wording that may make it easier for officers to cite tailgating behavior if added to Minnesota laws. Senator Koch is working on this issue with Buffalo Police Chief Mitch Weinzetl. It is possible that Senator Koch will submit a proposal to the upcoming legislative session.

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Media Sample #1: **Sun Newspapers, January 17, 2006; By John Holler**

Wright County to try experimental program to stop roadway tailgating;

Project to focus on Hwy. 55 between Buffalo and Rockford

With the growth of Wright County, the roadways used to get people from one place to another – whether a commute to work or a quick run to the grocery store – have become much more congested. As a result, there has been more tailgating, as people in a hurry still look for the chance to get from Point A to Point B as quickly as possible.

At the Tuesday, Jan. 10, meeting of the Wright County Board, the commissioners were informed of a pilot project that will combine information and enforcement in order to prevent accidents by keeping tailgating to a minimum. Wright County Highway Engineer Wayne Fingalson told the board of a project from the Minnesota Department of Public Safety that is designed to teach about tailgating as well as prevent it.

"We've been given a $25,000 grant from the state to implement the program on Hwy. 55 between Buffalo and Rockford," Fingalson said. "It keeps with the theories that have been taught about tailgating – whether it's the 3-second rule in between cars or the one car length for every 10 miles an hour rule. Under this system, a series of dots will be painted on the road and drivers will have a visual to see how close is too close."

The project, which began with a pilot program in Pennsylvania, will have signage explaining that drivers must remain two of the road-painted dots behind the vehicle in front of them. In the Pennsylvania study, it was determined that crashes were reduced by 55% on the roads in which the system was implemented and it is hoped that Hwy. 55, which is a heavily congested and well-traveled roadway, will do the same. But Fingalson said enforcement will be the key.

"The state patrol is run by the Department of Public Safety, so additional enforcement will be provided," Fingalson said. "The intent isn't to give out more tickets, but to remind drivers how dangerous tailgating can be."

The project is expected to be undertaken in June.

Media Sample #2: **Stateline.org, July 7, 2006; By John Gramlich**

Friday, July 07, 2006
State DOTs hope drivers see dots By John Gramlich, Special to Stateline.org

For drivers who get anxious when cars grow bigger and bigger in their rear-view mirrors, cheap and easy help may be on the way – oval-shaped dots painted on the highway or hot-pink panels along the side of the road.

Test programs in Maryland, Minnesota and Pennsylvania aim to curb tailgating by using road markers that alert motorists to distances between vehicles. The markers serve as a tangible reminder of commonly taught driving guidelines such as the "two-second rule," which urges drivers to stay at least two seconds behind the car ahead.

Unlike the two-second rule, however, the road markers provide motorists with accurate, measured following distances.

The Minnesota Department of Transportation announced June 22 that a two-mile stretch of state Highway 55 about 40 miles northwest of Minneapolis has been painted with 94 white, oval-shaped "distance dots." Spaced 225 feet apart in a zone with a 55-mph speed limit, the dots are accompanied by signs reading "Keep Minimum 2 Dots Apart" and "2 Dots = 3 Seconds" – the latter being true if motorists stick to the speed limit.

Image courtesy of Minnesota Department of Transportation

Along Minnesota's state Highway 55, two dots equal three seconds of following time at 55 mph.

Minnesota recently began recommending three seconds between cars, though it has recommended two seconds in the past, said Gordy Pehrson of the Department of Public Safety, which has worked with the transportation department on the project.

"Partially due to the aging population and faster, heavier traffic, three seconds is the best way to go," Pehrson said.

Image courtesy of Maryland Transportation Authority

Motorists heading east on the Chesapeake Bay Bridge will notice this sign beginning in July.

In Maryland, the state's Transportation Authority announced May 19 that an eastbound section of the Chesapeake Bay Bridge, about 40 miles east of Washington, D.C., would use technology similar to Minnesota's "distance dots." But its plan, called "Keep Your Cool and Pace Your Space," will exchange the dots for hot-pink panels along the side of the road.

The "Pace Your Space" program will use panels because they can be mounted at drivers' eye level and are easier to maintain than dots on the road, according to transportation spokeswoman Teri Moss. The panels were to be installed starting July 10, she said.

Accidents are the main cause of congestion on the Chesapeake Bay Bridge, a popular gateway to Maryland's Atlantic coast, especially during summer. Rear-end collisions accounted for 58 percent of

crashes on the bridge between 2002 and 2004, with 70 percent occurring in eastbound lanes, Moss said.

The Maryland and Minnesota programs owe allegiance to Pennsylvania, which first used anti-tailgating road markers in 2000 on a rural stretch of U.S. Route 11 near the town of Bloomsburg, about 100 miles northwest of Philadelphia – with eye-opening results.

Like Minnesota's project, the Pennsylvania test site used white dots painted on a two-lane road. Pennsylvania, however, still recommends the two-second rule, and the dots on Route 11 are spaced 115 feet apart – or two seconds, if motorists follow the road's 45-mph speed limit.

The program resulted in a 65-percent drop in accidents from November 2000 to March 2001 compared with the previous year, according to the Pennsylvania Department of Transportation. That earned the program a National Highway Safety Award in 2001 from the Federal Highway Administration (FHA).

In 2003, the FHA separately listed the program as a "Low-Cost Traffic Engineering Improvement" that other states could replicate. Officials in Maryland and Minnesota developed their programs based on Pennsylvania's success.

According to the FHA's 2003 listing of the Pennsylvania program, installing one test site costs $1,892, including equipment, signs and labor. The recently unveiled site in Minnesota used a $25,000 federal grant to pay for the installation and a public information campaign. Maryland has not disclosed the cost of its Chesapeake Bay Bridge plan.

Since its initial success in 2000, Pennsylvania has experimented with the dots on a handful of other sites, including on Interstates 80 and 81, according to Steve Chizmar, a state transportation spokesman.

But success has been greater on two-lane roads than on interstates and depends heavily on police enforcement of proper following distance, Chizmar said. South Centre Township, Pa., police, who monitor the test site on Route 11, have issued about 15 citations a month for aggressive driving since the dots arrived, according to Chief of Police William Richendrfer.

"It comes down to enforcement," Chizmar said. "You have these hard-nosed, aggressive drivers who feel they're above the law. They're going to ignore warnings."

Unlike Pennsylvania, Maryland and Minnesota will begin their test programs without specifically instructing police to enforce safe following distances. Instead, Minnesota transportation officials will monitor compliance on Highway 55 to determine whether the dots and signs are effective on their own, according to Pehrson.

Send your comments on this story to letters@stateline.org. Selected reader feedback will be posted in the Letters to the editor section.

Contact John Gramlich at jgramlich@stateline.org.

Media Sample #3: **New York Times, July 21, 2006: By Gretchen Ruethling**

Minnesota Has a Warning for Tailgaters, Every 225 Feet

BUFFALO, Minn. — Even after a collision five years ago resulted in surgery and left her with limited mobility in her neck, Missy Weberg said she continued the dangerous habit that caused the accident: tailgating.

But a new Minnesota initiative using big white dots painted on a state highway is helping Ms. Weberg back away from cars in front of her, she said.

The dots, 94 of them painted on a two-mile stretch of a rural highway about 35 miles northwest of Minneapolis, were unveiled last month in a pilot project that officials hope will teach drivers about safe following distances.

"If they had more dots, I'd probably tailgate a lot less," Ms. Weberg, 36, said. "I'm guessing it will save a lot of accidents and lives."

Maryland started a similar project this month on the eastbound span of the Chesapeake Bay Bridge in Annapolis using hot pink panels. Pennsylvania began experimenting with distance dots in 2000, but stopped adding them to roads in 2003 because transportation officials said they were not deterring the worst offenders.

Although many drivers might see tailgating as nothing more than an annoyance, it is a significant factor in many accidents, safety officials said. In Minnesota, rear-end collisions accounted for 28 percent of all crashes last year and resulted in 22 deaths, according to the State Office of Traffic Safety. And the number of rear-end crashes in the state increased to 24,820 last year, from 22,206 in 2002.

"It's truly dangerous," said Pat Hackman, executive director of Safe Communities of Wright County, a nonprofit traffic safety organization. "And some people might say, 'Don't we have bigger problems than this?' And we certainly do. But I don't think you quite understand how this is contributing to the bigger problems that we have."

The idea of the dots on the highway here, explained on roadside signs, is for drivers to keep a distance of two dots between vehicles. The 225 feet between dots represents a driving interval of three seconds at the speed limit of 55 miles per hour.

Gordy Pehrson, traffic safety coordinator in the Office of Traffic Safety, said he hoped the dots would have a "halo effect," with drivers taking the lesson to other roads as well.

"This is not intended to be the cure-all for all the tailgating problems," Mr. Pehrson said. "Obviously we're not going to paint dots on every road in the state."

Some area residents said they thought that few drivers would pay attention to the dots without more police enforcement and complained that the $25,000 federal grant to start the program was a waste of money.

Luke Zumbusch, 18, of Buffalo, said he thought some drivers would ignore the dots. Mr. Zumbusch said he would continue trailing as close as a half car length behind slow drivers to try to push them to go faster.

"I think they mean good by it," he said of transportation officials, "but it's just going to be pointless."

State officials chose the stretch of road here that cuts through farms and rolling fields because it has an accident rate that is higher than average. Almost 80 percent of crashes at intersections on the highway are rear-end collisions, officials said.

They recorded speed and following distances before the project began and will continue to do so in its three-month run to measure the effect of the dots, which make the black paved road resemble a long domino.

Mr. Pehrson said state officials were encouraged by the early success in Pennsylvania. The Pennsylvania project won a National Highway Safety Award in 2001 after a study found that tailgating dropped 60 percent on one dotted stretch of highway.

But a Pennsylvania Department of Transportation spokesman, Rich Kirkpatrick, said the state discontinued the program after a longer-term study showed that although safe drivers increased their following distance, the dots had little effect on aggressive drivers.

"They seemed to just ignore the dots and the safety signs ," Mr. Kirkpatrick said.

Some drivers here, though, remain enthusiastic about the Minnesota experiment. Matt Graunke, 28, of Buffalo, said people might not realize the difference the dots were making.

"I find myself, when I'm on that section of road, counting them whether I like it or not," Mr. Graunke said. "If it's going to keep one person from getting killed, it sounds fine to me."

Riding in the car has become a lot more fun for Lauren Stenlund's 4-year-old daughter, Taylor, who loves counting the dots and catching her mother when she is not keeping a proper distance.

"We try to turn it into a game," said Ms. Stenlund, 25, of Greenfield. "It's kind of fun for kids because they can tell you if you're doing it right or wrong."

And as for Ms. Weberg, who had trouble changing her habits, the dots are a reminder to stay vigilant.

"I'm just an impatient driver," she said.

Media Sample #4: **Allina's Healthy Communities Magazine, Fall, 2006**

Minding your DOTS

NEARLY 80 PERCENT of crashes at Highway 55 intersections in Wright County are rear-end collisions, typically caused by driver inattention or by following vehicles too closely.

To reduce crashes caused by motorists following too closely, a series of large dots have been painted along Highway 55 just east of Buffalo along with signs directing drivers to keep at least two dots between them and the car ahead.

"The dots are designed to educate motorists on how to identify and maintain a safe minimum following distance," says Wayne Fingalson, Wright County Highway engineer. "A similar effort was used in Pennsylvania, combined with law enforcement, and crashes dropped 55 percent one year after implementation."

"Tailgating is one of the most common poor-driving habits," says Pat Hackman, executive director of Safe Communities of Wright County. "While the impact of the DOTS project won't be known for several months, we know we're educating drivers about what a safe following distance is and hope they'll apply this to their driving habits on all roads."

Maintaining a proper following distance is more than just being a polite driver, it's the law. The DOTS pilot project is part of the Toward Zero Deaths initiative, sponsored by Safe Communities of Wright County, the Minnesota Departments of Public Safety and Transportation, Wright County Highway Department and you. Buffalo Hospital is one of the founding partners of Safe Communities.

Visit www.dot.state.mn.us/trafficeng/tailgating or call 763-241-9888 for more information.

Easy as 1-2-3

Follow the three-second rule. When the back end of a vehicle ahead passes a stationary object, such as a sign along the road, count how long it takes to pass the same object: "one Minnesota, two Minnesota, three Minnesota."

BE SAFE – BACK OFF

Two dots could mean the difference between life and death.