Toward Zero Deaths Conference

October 7–8, 2008

Mayo Civic Center, Rochester, Minnesota

TOWARD ZERO DEATHS

A SUMMARY REPORT

The Minnesota Toward Zero Deaths (TZD) program is a multiagency partnership that includes representatives from the Minnesota Departments of Transportation, Public Safety, and Health, Minnesota State Patrol, Federal Highway Administration, and the Center for Transportation Studies at the University of Minnesota. The ambitious goal of this program is to move toward zero deaths on Minnesota roads, using each of the "four Es" of traffic safety: education, enforcement, engineering, and emergency services. Using these strategies, TZD partners are working to raise awareness of traffic safety issues and to develop tools to reduce the number of deaths and injuries resulting from traffic crashes on Minnesota roads.

 The annual TZD conference provides a forum for reporting progress, sharing best practices in the areas of the four Es, and charting the course for a future with fewer traffic fatalities and life-changing injuries.

Sponsored by:
Minnesota Department of Public Safety
Minnesota Department of Transportation
Minnesota Toward Zero Deaths Program

Hosted by:
Center for Transportation Studies, University of Minnesota

Michael Campion

Tom Sorel

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>
> *—Tom Sorel*

Welcome and Opening Remarks

Cheri Marti, Minnesota TZD Program Co-Chair and Director, Office of Traffic Safety, Minnesota Department of Public Safety
Commissioner Michael Campion, Minnesota Department of Public Safety
Commissioner Tom Sorel, Minnesota Department of Transportation
Sue Groth, Minnesota TZD Program Co-Chair and Director, Office of Traffic, Safety, and Technology, Minnesota Department of Transportation

Is the goal of zero deaths due to traffic crashes realistic? The answer, according to Cheri Marti, is yes. "Every fatality counts and every fatality is one too many," Marti said, opening the 2008 TZD Conference in Rochester, Minnesota, with the good news that this year's conference drew a record number of participants—almost 600.

TZD, Marti said, is the state's cornerstone initiative to reduce injuries and deaths due to traffic crashes through the "Four Es": education, enforcement, engineering, and emergency services. She called the program a success, citing a 22 percent decline in traffic fatalities from 2005 to 2007, important data considering that 1,500 people died on Minnesota roads during that three-year period. Of several statewide TZD goals, Marti put particular emphasis on identifying and promoting traffic safety as a key element of Minnesota culture. "We seem to have an attitude that crashes will happen and it's just a part of life when instead we need to be outraged about the number of Minnesotans that are killed on roads here

each year," she said. "We need to shift the culture to intolerance of preventable injuries and deaths."

Michael Campion voiced equal enthusiasm for the TZD effort: "We've had the lowest traffic fatality rate since World War II and I'm proud to be part of this effort." However, the "elephant in the room" is the inability to get the primary seat belt law passed. In Minnesota in the last two years, seat belt use has been as high as 87 percent—"phenomenal compliance," he said—but high-visibility roadside seat belt awareness programs are a continued necessity until seat belt legislation passes.

The collapse of the I-35W bridge sent an emotional shock through both the transportation and public communities, said Tom Sorel. "We're on a journey to re-establish public trust and confidence in Mn/DOT, and the TZD initiatives are part of that journey." As a model of safety, innovation, and transparency, he said TZD "is a way of helping us work together to sustain public trust."

Plenary Session: Case Study of the Bethany Pearson Family

Bethany and **Sharon Pearson**
Lieutenant Matt Langer, Minnesota State Patrol
Tracy Larsen, Regions Hospital

In December 2005, 16-year-old Bethany Pearson lost control of the car she was driving on an icy road and spun into the path of an oncoming truck. She and a friend sustained serious injuries and barely survived, while another passenger in the car, her sister, died. Bethany and her mother shared their accounts of the crash and recovery process, as did the State

Sharon and Bethany Pearson

Patrol trooper who first responded and the critical care nurse who was part of the hospital response team.

Lieutenant Matt Langer opened the session by showing a video focused on teen drivers that includes Pearson's story. He said the video is shown and used to share four simple rules that will save lives: Pay attention; drive the speed limit; never drink and drive; and wear your seat belt. Langer said the video "frames why we're here today."

Pearson shared details of the life-changing crash.

"Words cannot express what it's like to lose a best friend—my sister," Pearson said. Her face was shattered, resulting in paralysis of the left side, an inability to smell, and significant damage to one eye. She also sustained brain injury that forced her to "re-learn everything." She spent two weeks in the ICU and two months in rehabilitation. "Life is short and not guaranteed," Pearson concluded. "We need to make positive choices so we live to drive another day."

Pearson's mother, Sharon, provided a parental perspective both of losing a child and getting one back. She said that Bethany's first vehicle was a pick-up truck and "Bethany used to joke that she 'could hit a tree and walk away.'" But she had bought a sporty, small car just before the crash.

Sharon Pearson, a critical care nurse herself, said, "The care team and responders did an awesome

job." She closed her talk by telling the audience, "Hopefully we can impact more kids because saying goodbye is hard to do—we don't want to see them go to heaven too soon."

Tracy Larsen, critical care nurse at Regions Hospital, showed a video about trauma team activation. The hospital team is alerted the minute a trauma patient comes in to Regions, she said, adding that it's important to get trauma patients to the appropriate level trauma center. Larsen, who followed much of Pearson's care and recovery process, said Pearson will deal with many aspects of the car crash the rest of her life. "Once a trauma patient, always a trauma patient," Larsen concluded.

"We need to make positive choices so we live to drive another day."

—Bethany Pearson

Medical Helicopter Safety Concerns and Innovations

Tim Held, Minnesota Department of Health
Meghan Lamp and **Neil Wienk,** Mayo One

National news media are reporting on a greater number of medical helicopter crashes and are questioning the safety of their use, both to crews and patients. For the most seriously sick and injured people in rural Minnesota, however, these medical flights to definitive care mean the difference between life and death. Tim Held introduced this session, which explored these issues and various technologies being used to improve safety, including lighted tail rotor guard vests, traffic collision-avoidance systems, terrain-awareness systems, real-time/satellite weather radar, non-precision GPS helicopter approaches into area helipads, and night vision goggles.

Meghan Lamp and Neil Wienk both work for Mayo One and are often on the same team responding to medical helicopter missions. Lamp is a flight nurse and flight RN EMS director for Mayo One; Wienk is a pilot for Mayo One.

Lamp provided background on some case studies of medical helicopter collisions, including a mid-air crash near Flagstaff that involved two helicopters, each carrying a patient, in clear conditions. Many such collisions involve miscommunication, limited day or night vision, limited peripheral vision, limited information about terrain, delayed information about current weather conditions, and other factors that, singly or in combination, can jeopardize the safety of medical helicopter transport.

According to Wienk, the goal at Mayo is to increase safety and decrease risk for helicopter transportation. He said that approximately 750 EMS helicopters operate in the United States today, which represents rapid growth. Most crashes occur because pilots lose contact and orientation with the ground, which can happen for a variety of reasons. "We need to strengthen operational control, increase pilot skill in adverse weather, and apply risk assessment in flight decisions," he said. Other areas for improvement include collaboration and decision making between ground and flight personnel and development of a safety culture that starts at the top and trickles down to the crews.

The National Transportation Safety Board (NTSB) and the Federal Aviation Administration (FAA) have made several recommendations to improve EMS helicopter safety. These recommendations include improved weather resources such as onboard weather radar and night vision goggles. Improvements are also available to help pilots remain oriented with the ground and with other air traffic, including the Traffic Collision Awareness System, radar altimeter, and the Terrain Warning Awareness System. Risk assessment programs and operation control centers, along with air medical resources management, help pilots make safe flight decisions. Safety should also be maintained through an emphasis on helicopter EMS inspections when FAA inspectors check helicopters "from top to bottom," according to Wienk.

Mayo has implemented safety standards in several ways, including acquisition of new helicopters with better safety features. These helicopters have the Terrain Awareness Warning System, Traffic Information System, and Skywatch Traffic Advisory System. In addition, pilots have available real-time weather radar, night vision systems, and a satellite phone for both pilot and medical crew use. Wienk said the new helicopters also have instrument flight rules capability so they can fly in clouds.

Signs and Stripes for Safety Sake

Jon Jackels, Minnesota Department of Transportation
Mike Weiss, Minnesota Department of Transportation
Moderator: **Brad Estochen**, Minnesota Department of Transportation

> "We are our own worst enemy. We put glass beads on highways, then scrape them with steel [plow blades]."
>
> *—Jon Jackels*

Seeing is believing, but drivers—especially older ones—may be unable to see important pavement markings and road signs at night or in the rain.

This is a growing concern, Jon Jackels said, especially as the nation's population ages. Older drivers need more light to see and read a sign than younger drivers do—in fact, as the eye ages, the need for light doubles every 13 years. Older drivers also need more reaction time.

The U.S. nighttime crash rate is four times higher than the daytime rate. Pavement markings are key to roadway navigation but they lose brightness over time, so what's visible during the day may not be at night. Markings also aren't durable. "We are our own worst enemy," Jackels said. "We put glass beads on highways, then scrape them with steel [plow blades]."

Painting wider lines is one possible solution, as the extra paint reflects more light regardless of brightness level. Many states have switched to 6-inch-wide lines, he said, and Mn/DOT is doing a before-and-after crash analysis of 300 miles of county roads.

Rain compounds the visibility problem, since drivers are three times more likely to be involved in a crash during rainy or wet pavement conditions. In dry conditions, Jackels explained, light enters the paint bead and is returned to the driver. In wet conditions, however, most of the light hits the film of water on the bead surface and undergoes mirror reflection. A small amount of light can penetrate to the bead, but it is inefficiently scattered and not retroreflected back to the driver; instead, it just creates glare.

To solve the problem, the pavement marking industry is developing products (made with ceramics) that bend light more effectively. These products reflect light in the rain but don't work well in dry conditions, Jackels said. "For performance in all weather, one type of bead can't do it all, so users need to mix and match materials on the line…and find a balance between different materials."

Rumble stripes are another option for improving nighttime visibility and wet weather performance, he said. By painting over a rumble strip—creating a rumble *stripe*—the paint is on an elevated surface, which helps shed water and thus provide better visibility.

Like pavement markings, road signs also age and as a result may look different at night or drop out of view entirely, said Mike Weiss. For example, red fades to pink and then white, eventually making it impossible to read some signs. The FHWA's signage manual calls for road authorities to perform nighttime sign inspection. "It's critical for drivers to see the same things day and night," he said.

According to recent University of Minnesota studies, increasing the conspicuity of traffic signs using bigger, brighter, or additional signs appears to lower the frequency of "ran-the-STOP" crashes at controlled rural intersections. But bigger signs require bigger sign structures, and brighter signs mean higher-grade sheeting materials, both of which are costly, Weiss said

Two factors are lending some urgency to the need for more effective sign-sheeting materials. The first is the aging population; the second is a migration to variable optical attenuators (VOAs) as a new international standard for headlights, Weiss said. VOAs shine better on pavement markings but cast light at a lower height, so some higher signs drop out of view. In this country, with a vehicle mix ranging from SUVs to subcompacts, this could be an issue.

In 2005 Mn/DOT switched to 3M's DG3 prismatic retroreflective sheeting—the most efficient sheeting in the world—primarily to meet the growing needs of older drivers, Weiss said. Retroreflective material provides greater conspicuity and increases legibility. The FHWA has issued minimum retroreflectivity values for signs, he noted, and will publish them in its 2009 manual.

All You Need to Know About Teen Drivers

Don Hoechst, Minnesota Department of Public Safety
Trooper Denis Lindahl, Minnesota State Patrol
Michael Manser, HumanFIRST Program, University of MInnesota

Recent changes to Minnesota's graduated driver's license law (GDL) will help reduce teen drivers' exposure to two high-risk situations: driving late at night and carrying multiple teen passengers. Don Hoechst opened this session with an overview of Minnesota's GDL law, which requires a provisional license stage for young drivers. The purpose is to help teenagers improve their driving skills during their first year of licensure while easing them into the driving environment.

The original GDL was passed in 1991. Among the changes that went into effect in August 2008 are that during the first six months of licensure, driving is prohibited from midnight to 5 a.m. Exceptions are made for driving that is accompanied by a licensed driver over 25; driving between home and a place of employment; driving to or from home and a school event for which the school has not provided transportation; and driving for employment purposes, Hoechst explained.

New limits for passengers during the first six months of licensure prohibit more than one passenger under the age of 20, unless accompanied by a parent or guardian. For the second six months, no more than three passengers under the age of 20 are permitted, unless accompanied by a parent or guardian. An exemption is made for passengers under age 20 who are members of the driver's immediate family.

Next, Sergeant Denis Lindahl talked about a program he initiated to encourage safe driving among students attending the local high school. Lindahl said the program is an attempt to "keep kids thinking when they are driving to school," in addition to giving them positive contact with law enforcement.

Students qualify for the Lac qui Parle Valley High School Driver Awards Program—and monthly prize drawings—by submitting their name and driver's license number. They are disqualified if, during the year, they receive a moving violation ticket, seat belt ticket, or chemical violation, or are found at fault or partially at fault in a vehicle crash.

The program had the support of his agency, local businesses (who were willing to donate prizes such as gift certificates and gas cards), and the school guidance counselor, who served as the home base within the school, Lindahl said.

Last year's grand prize, awarded at the end of the school year, was a 19-inch LCD flat screen television. The winner was someone who had previous violations but had managed to keep a clean record over the course of the program. "In my opinion, that accomplishes something," Lindahl said.

Next, Mike Manser, director of the HumanFIRST Program at the University of Minnesota, talked about a University study (conducted with the University of Iowa) that is using video feedback as a coaching tool for teen drivers during the first 6 to 12 months after they receive their license.

Manser showed a sample video clip, taken by a camera mounted inside a vehicle, of a teen driver who hit a guardrail while talking on a cell phone.

"Could you, as a parent, use this information to help your teenager become a better driver?" Manser asked the audience. "This is really at the center of this study."

For the study, a forward- and rear-facing camera is mounted inside a vehicle to record both what the driver is doing and what's happening outside the vehicle. Data from the camera are saved only when an unsafe driving event is detected—anything that causes the g-force to exceed 0.5, such as sudden braking, abrupt acceleration, sharp turning, "and of course, hitting guardrails," Manser said.

Manser explained that the system provides feedback in two ways. First, a blinking light indicates when an event trigger has been detected and recorded, giving the driver immediate feedback. Second, the video recorded during the episode is sent to parents to allow for a parent-teen coaching session. The video data make it possible to understand the context of the unsafe event and the task occupying the driver at the time, such as distraction or risky behaviors with passengers.

"The unique feature is that it involves the parents in the process," Manser said. Along with the recorded events, parents receive a narrative explaining what they're seeing. "It's hoped that the parent will then sit down with the teen and talk about not only the bad events but the good things, too—like avoiding a crash by doing the right thing," Manser said.

The findings so far have shown that this technology can not only improve teen driving in the short term but also have lasting effects on driving behavior. In general, Manser said, the system yields a positive effect on teen driving behavior, especially for high-risk drivers.

The teen drivers themselves have been accepting of the system and overwhelmingly felt the camera changed the way they drove, he concluded.

Don Hoechst

Luncheon Presentation: Rural Safety, Health, and Emergency Response

Jeanne Danaher, Minnesota Department of Health
Gina Baas, Center for Transportation Studies, University of Minnesota
Tom Horan, Center for Excellence in Rural Safety, University of Minnesota
Dr. Scott Zietlow, Mayo Clinic

"Seventy percent of crashes occur in the city but 72 percent of the fatalities occur on rural roadways."

—*Tom Horan*

Many efforts focus on preventing traffic crashes, but when they do happen, how can emerging trauma care advances help ensure better outcomes for the people involved?

"Traffic accidents are a leading cause of death in Minnesota, so motor vehicle crashes are one of the measurements the Minnesota Department of Health (MDH) uses to assess public health status in the state," said Jeanne Danaher, deputy commissioner of health. To improve outcomes, the Minnesota Statewide Trauma System is working to designate Levels II, III, and IV trauma centers. The goal is to help treatment, triage, and transfer of victims and to support emergency medical responders by helping them get patients to appropriate hospitals. "We've been successful in Minnesota because of our partnerships—MDH is proud to be part of the TZD effort," Danaher said.

Researchers at the Center for Excellence in Rural Safety (CERS) are focusing on technological developments that affect rural safety and the issues surrounding the deployment of mobile emergency treatment. Gina Baas introduced Tom Horan and Scott Zietlow, members of the research team who collaborated to analyze emergency processes and data as well as the flow of information. That flow involves understanding system performance across providers such as OnStar, 911, medical dispatch, emergency responder, and trauma center organizations. The goal of the research project is to develop an information framework that is the "gold standard" for information sharing and performance assessment in rural areas across the United States.

According to Horan, "Seventy percent of crashes occur in the city but 72 percent of the fatalities occur on rural roadways." To better understand the negative outcomes of rural crashes, the project focused on emergency medical services (EMS) and intelligent transportation systems (ITS) as a means of reducing response time. The idea was to reduce the average rural response time of 52 minutes to 30 minutes, because survivability significantly increases when response time is 30 minutes or less, Horan said.

The typical emergency response begins with a 911 call, from which initial information is acquired. Next, the dispatcher responds, which leads to definitive care. The project looked at how patient information is exchanged, how treatment happens, and how the information exchange and response can be "pushed up the chain to happen earlier," said Horan. Findings resulted in several principles of high-performing response, including:

- Complete patient information
- No pre–hospital-to-hospital gap
- Optimal use of data standards
- High end-to-end awareness
- Performance feedback
- High degree of team interaction
- High degree of stakeholder involvement
- Effective use of contracts
- High non-contract information sharing

Horan said that researchers worked with the Mayo Clinic to walk through what happens when a call comes in and information is shared. In cases of trauma, they learned more about what kind of information is needed to expedite care and response, such as a photo of the crash.

When the patient arrives at the emergency room, there is often a gap in care response time as patient information is taken (sometimes a second time after initial information-gathering at the scene). Researchers found that three databases now exist and none of them provide overall patient information. Project data also revealed three key issues:

- Response time—75 percent of travel time is greater than 30 minutes.
- Length of stay for trauma patients—as long as 84 days.
- Patient age and trauma outcome—the older the patient, the longer the stay.

Horan said the last point, regarding older patients, is important because greater Minnesota has an aging population, and thus unique issues of quality of care. "The older group takes longer to heal, and response and travel time is longer in rural areas," said Horan, "and we know that greater travel time decreases success of care and response."

Zeitlow, providing the trauma surgeon's perspective, said that for rural crash victims, "The time/distance

Gina Baas, Jeanne Danaher, Tom Horan, and Scott Zietlow

factors are real, because we know that 50 percent of these patients die on the way to the hospital."

In Minnesota, crashes cause approximately 500 deaths and 35,000 injuries at a cost of $1.6 billion annually. Zeitlow said the future vision is "an end-to-end emergency response process." Probability of survival increases with having more information, knowing what resources are needed, and knowing where the most appropriate level of care is available. The bad news, however, is that the infrastructure for such a seamless process is not yet in place. The good news is that proof of concept in a small model shows that "we *can* push up response time," Zeitlow said.

According to Zeitlow, one area of information flow that needs to be sorted out is how to "pull in lots of information but then separate out what's important." Other questions include how to handle patient confidentiality and where to store electronic medical records.

Zeitlow summed up the presentation by saying his goal is injury prevention—"to not have to treat these patients at all."

St. Mary's Hospital–Mayo Clinic Crash Case Presentation

Tim Held, Minnesota Department of Health
Carol Immermann, St. Mary's Hospital, Mayo Medical Transport
Dr. Scott Zietlow, Mayo Clinic
Dr. Lisa-Ann Wuermser, St. Mary's Hospital

What's the best way to get an inside view of how critically injured patients are cared for, from EMS through the emergency department, surgery, and discharge? Tim Held introduced this presentation, which provided an up-close view and firsthand narration of St. Mary's Hospital in Rochester, a Level I Trauma Center serving the southeast region of Minnesota. "An amazing chain of events has to happen when someone is critically injured in order to bring about the best outcome," Held said.

The trauma system is an organized approach to caring for patients who are acutely injured. "Optimal injury care starts at the scene, so the goal is to get the person from the scene to the highest level of care in as expedited a manner as possible, to bring care to the patient if possible," Carol Immermann said.

Immermann and Dr. Scott Zietlow described a case study of a critically injured patient, Brad, who was driving a grain truck that was struck by a train in May 2007. The patient was first transported by ambulance, which was then intercepted by a medical helicopter because criteria are in place for a dispatcher to send a helicopter based on the mechanism of injury, Zeitlow said. During ambulance transport, responders had also called ahead to activate trauma care. "Like a relay race," Immermann said, "the ambulance handed off to the helicopter EMS crew, and when they were done they were ready to pass the patient on to the trauma team."

"Trauma is like a team sport; it requires a group effort," added Zeitlow, who cared for Brad from his initial surgeries through the rehabilitation process. He said that Brad wouldn't have survived transport by ground only. "Brad is one in a million in terms of survival chances," Zeitlow said. Brad had a significant open pelvic wound and loss of blood, a brain hemorrhage, and damage to organ systems;

he underwent 60 to 70 operations and remained in a deep coma. Ten days after the accident, his kidneys began to fail.

Amazingly, after three weeks, Brad spoke, something Zietlow described as "an astonishing change." At two months, Brad was transferred to a floor, and at three months he was moved toward the rehabilitation phase that leads to going home.

"Rehabilitation is slow," said Dr. Lisa-Ann Wuermser, Brad's physiatrist at St. Mary's. Rehabilitation started before the transfer to the rehab unit; it begins in the intensive care unit to facilitate movement of limbs and signs of conversation. And three months of complete bed rest leads to a cascade of problems. "I consider myself an injury prevention specialist," Wuermser said. "This life was saved and my job is to get it back fully."

Brad had physical, occupational, and speech therapy daily. Brad and his family also received services from the hospital social worker from the first day. The social worker helped them adjust, hope, and plan for the future. Social services determined what resources were needed and what the next step was, then worked closely with the whole medical team to help Brad live as fully as possible.

After Brad finally went home, he continued with home therapy, receiving speech, physical, and occupational therapy three times a week. Dr. Wuermser said it only takes two weeks to lose range of motion. "Always think in the long-term," she said. "Everything done in the short-term has a long-term effect." Added Zeitlow: "Brad is a living example of how trauma systems can save lives."

Scott Zietlow

"Trauma is like a team sport; it requires a group effort."

The Building Blocks of Community Coalitions

Robyn Litke, Safe Communities Coalition of the Red River Valley
Nelrae Succio, Minnesota Department of Transportation
Captain Randy Slinger, Minnesota State Patrol
Moderator: **Amy Roggenbuck,** Minnesota Department of Public Safety

Building a local community coalition can be difficult and time consuming, but it can reap great rewards. Community coalitions can provide the momentum needed to start and sustain a variety of safety and law enforcement programs—efforts that law enforcement agencies often do not have the personnel or budget to take on.

Amy Roggenbuck provided an overview of the impressive number of coalitions working in Minnesota—22, all funded through the state by the Office of Traffic Safety. "These efforts are centered on the goal of preventing deaths and injury," Roggenbuck said. She introduced Robyn Litke, of the Safe Communities Coalition of the Red River Valley, who provided a look at the structure and vitality of the coalition.

Litke outlined some of the basic principles for coordinating successful activities hosted by the community coalition, including

- Show a need and support it by data;
- Make decisions by involving the coalition as a group;
- Do what works for your unique community;
- Use partnerships to save time, money, and resources;
- Start small, choosing one or two activities, and then branch out; and
- Evaluate before, during, and after.

Litke also suggested that coalitions choose self-sufficient activities, duplicate other good ideas, and involve the media.

The list of examples of her coalition-sponsored activities was long and impressive. She described law enforcement appreciation events and training; Click-It or Ticket, an event using local celebrities to promote seat belt use; Car Seat Crush, an event inviting parents to turn in unsafe car seats for a certificate to get a safe one; Buckle Up with Bucky, a grade school curriculum; and a Labor Day crackdown. These events and others sponsored by the coalition included media invitations and traffic safety messages.

"If you do what you've always done, you'll get what you've always gotten," Litke said. "Go out on a limb, do something different, and you may be surprised."

Nelrae Succio explored some of the basic principles for building a coalition by describing what the Southeast Minnesota TZD group did to get up and running. She said that coalition building is more of an art than a science. "You need to tap into people who have a passion for the activity, and the effort must be a grassroots, bottom-up approach so you're certain to develop activities that are appropriate to your community," she said.

The southeast Minnesota TZD coalition reaches across 11 counties. It identified possible partners from the four Es—enforcement, engineering, education/outreach, and emergency medical services, then held a workship in June of 2005 to look for answers to some critical questions: Who was being killed in these crashes? When were most of these crashes happening? What were some common causes?

Data showed that young male drivers in the 15- to 29-year-old age range represented the most fatalities. The cause most often was running off the road. And the timing of many of these fatal accidents was in December from 3 p.m. to 7 p.m., after school or work. The coalition coined the phrase, "Dying to get home," to describe the key problem. A steering committee developed a teen project to address the problem, since the target data showed that teens were over-represented among those being killed in these crashes, Succio said.

Captain Randy Slinger described the project that began to take shape in the form of a Teen Traffic Safety Toolkit, which was made available in December (rather than waiting for the spring "prom months," he said). The goal was to educate high school students by focusing on seat belt use, distracted drivers, and "not a drop." In addition to the toolkit, a number of other simultaneous efforts, including PSAs, banners, and posters for schools and messages in school announcements, helped get the word out.

A number of successes have occurred in southeast Minnesota as a result of these efforts. The Dying to Get Home education and enforcement campaign was established, ticketed drivers were sentenced to driver improvement classes rather than just paying a fine, and a $1 million Comprehensive Highway Safety Plan grant was secured. "To succeed, you need commitment, connections, collaboration, coordination, and continuation," Succio concluded.

> "The effort must be a grassroots, bottom-up approach so you're certain to develop activities that are appropriate to your community."
>
> *Nelrae Succio*

Motivating Yourself and Other Law Enforcement Officials

Officer Darlene Ford, Minnetonka Police Department
Sergeant Scott Steffen, Maplewood Police/Ramsey County Sheriff's Office
Major Mike Asleson, Minnesota State Patrol
Moderator: **Bob O'Brien,** Minnesota Department of Public Safety

When it comes to motivating law enforcement officers, "the key is to find your carrots," said Officer Darlene Ford. There are many obstacles to getting officers to write more traffic tickets—personalities, weather, standard operating procedures, laziness—so Ford said her department had to work hard on selling the idea and providing incentives. The department also solicited help from fellow officers. "If we could identify one officer on a shift who was willing to work with us, we promoted the heck out of it."

Ford's department uses incentives that include training, equipment, and free lunch—some of which are offered because of partnering with local businesses. Other suggestions for motivating officers are assigning them to new areas (to combat boredom) or targeting specific statutes. And consider inviting the media on ride-alongs to try to get positive press, Ford added.

Sergeant Scott Steffan said officers are often told that calls are the priority and that traffic violations can wait, but the "big call" may not happen. Routine traffic stops are often when more serious violations are discovered, he said.

Motivated departments begin with the management modeling motivation—at the department and individual level. Steffan said he had one chief who would go out on calls with officers. "That's highly motivating… He'd be out there, he'd be moving."

Steffan offered some tips for being a motivational leader: be open to new challenges, be creative, allow individual growth, provide positive rewards (e.g., time off, overtime, a floating schedule), and show motivation.

One example is to create a competition for the number of tickets written, either for individuals or between departments. Ways to encourage individual growth are to provide opportunities for officers to attend training or work with other agencies (where they can pick up knowledge and bring it back).

When it comes to motivation, "thanks goes a long ways," Steffan said. Other ways to show appreciation are through public recognition, introductions, field files, or at roll call. The profession is not known for talking positively to each other, he added.

Finally, Mike Asleson offered some practical ideas that have worked for him.

"Some argue that only the individual can motivate themselves," he said. "I really do reject that. The style and the environment that the boss creates really does make a difference."

Asleson said that what a leader pays attention to will be perceived as a priority. He cited the emphasis State Patrol Colonel Mark Dunaski has put on seat belt enforcement, which as a result has increased the Patrol's efforts in this area.

Asleson said people will rise or fall to the level of your expectation. "As a supervisor, you determine where to set the bar—and this consistently works."

It's also helpful to provide a purpose, he said. He tells his support staff that they are as important in the DWI process as those making the arrests. He has also brought in people from Mothers Against Drunk Drivers and Minnesotans for Safe Driving to talk to officers to provide that purpose. Hearing from victims communicates why their job is important—to change driver behavior and keep people from dying so they don't have to make the death notification visits, Asleson said. "We need to communicate that what we do is vital to public safety," he said.

Finally, he added, when the "carrot" doesn't work, a supervisor must hold people accountable, and those who don't contribute need to change—or seek other employment.

Mike Asleson

> "Some argue that only the individual can motivate themselves. I really do reject that. The style and the environment that the boss creates really does make a difference."

Update on Safety Strategies

Howard Preston, CH2M Hill
Julie Whitcher, Minnesota Department of Transportation
Moderator: **Dave Engstrom,** Minnesota Department of Transportation

"Focus on the things that are killing people in your jurisdiction." This was the gist of Howard Preston's update on Minnesota's Strategic Highway Safety Plan (SHSP).

The SHSP, published in 2007, is a data-driven document that addresses all four safety Es for all types of roads, he said. It identifies a new safety performance measurement—fatal and life-changing injury crashes—and recommends focusing safety investments on rural areas and local systems to achieve a goal of 400 or fewer fatalities by 2010. (See **www.dot.state.mn.us/trafficeng/safety/shsp/index.html**.)

For the past 30 years, Preston explained, most safety programs focused on identifying locations with a high

> "Focus on the things that are killing people in your jurisdiction."
>
> —*Howard Preston*

frequency or rate of crashes—known as black spots—and then reactively implementing safety improvement strategies. This meant that safety improvements were largely aimed at suburban signalized intersections, which have the highest number of crashes but account for only 10 percent of state fatalities.

The SHSP offers a more comprehensive approach to safety programming, Preston said. It still focuses on black spots in urban areas, but it uses a systems-based approach in rural areas for which the total number of severe crashes is high but the actual number of crashes at any given location is very low.

Using the SHSP, Mn/DOT developed implementation guidelines for its districts. The goal in greater Minnesota is to have a safety program focused on proactively deploying (relatively) low-cost safety strategies across systems of rural two-lane roads and freeways. The goal for the metro district is to base its safety program on deploying generally higher-cost safety strategies at black-spot locations.

Local agencies have an integral role in meeting the targets set forth in the SHSP. Three to four years ago, Preston said, virtually no state safety funding went to local agencies, but now about 40 percent is reserved for local projects. Local agencies can compete for safety funds available through the Highway Safety Improvement Program, High Risk Rural Roads Program, and Minnesota Central Safety Funds.

An example of safety planning at the local level is the work done by Freeborn County. Using the Minnesota Crash Mapping Analysis Tool (MnCMAT), the county analyzed its crash data and identified its highest safety priorities: lane departure crashes along rural segments on the county system and angle crashes at rural intersections.

The county then chose strategies proven in the SHSP to address those needs. For example, Preston said, one key strategy for keeping vehicles in their lane is to improve curve delineation. A number of safety studies in Minnesota have found that 40 to 50 percent of road departure crashes occur at horizontal curves, although curves account for less than 10 percent of the system.

Adding chevrons to delineate curves costs about $1,000 per site. Even with a tight budget, a county might be able to afford chevron installation on a piece of its system, perhaps starting with 50 curves. "That's the type of project Mn/DOT expects to fund," Preston said.

Preston also touched on other effective strategies in the SHSP, such as edge treatments, roundabouts, and red-light enforcement.

Julie Whitcher expanded on changes to Mn/DOT's safety planning process under the Highway Safety Improvement Program. The process had been decentralized—each district selected projects for its Area Transportation Improvement Program—and focused on reactive strategies. Now, project selection is centralized and funds are directed toward the greatest needs. "The goal was to be data-driven by 2009, which we did this year," she said. She also reviewed the application process and a number of projects that have been selected for funding.

Alternatives to Driving While Impaired

Tom Kummrow, Minnesota Department of Public Safety
Amy Roggenbuck, Minnesota Department of Public Safety
Don Walski, Winona State University
Bill Shaffer, Minnesota Department of Public Safety
Robert Bollenbeck, Isanti County

In Minnesota, 35,000 to 40,000 drivers are tagged each year for impaired driving, and impaired drivers account for approximately 160 vehicle fatalities each year. Tom Kummrow and Amy Roggenbuck introduced this session as a showcase for alternative programs to help keep impaired drivers off the road.

Don Walski, director of security at Winona State University, described problems with student drinking that are unique to the city of Winona, which has two universities and many college and neighborhood bars. "We had students drinking in town and causing damage and disruption on the way back to campus," Walski said.

Because both colleges wanted to get students back to campus safely, Walski said, the two colleges agreed to pay for a program jointly. The Safe Ride Program offers free rides from 6 p.m to 2 a.m. at designated downtown and campus stops—so students are not allowed to get on and off just anywhere. With students no longer walking back to campus, the incidents of damage and disruption dropped dramatically. "At first, only 20 to 30 students used the service, but now we serve 400 to 600 students on a weekend," Walski said.

A program developed to take impaired motorcyclists off the road, Motorcycle Dial Ride, was described by Bill Shaffer. The program is a statewide service that gives a rider and his or her cycle a ride home or to a place of safety when the driver is impaired. The service, operating weekends from April through October, is free and anonymous.

The Dial Ride program was the result of collaboration

with several organizations, including the Minnesota Motorcycle Safety Program. The service and the phone number to call are printed on bar napkins, which are widely distributed throughout the state.

Dial Ride is operated by volunteers—motorcyclists who provide the rides and also work to get fellow riders to intervene when a cyclist is too impaired to drive. Intervention is also promoted through a poster that allows bartenders and law enforcement personnel to record when they've intervened successfully with an impaired cyclist. The poster program is a way to reward proactive bars that are willing to intervene, Shaffer said.

Finally, Bob Bollenbeck described two more examples of successful impaired driving alternatives: the bar partnership/Safe Cab program and the liquor tracking study developed by the Isanti County TZD program. Informal tracking was initially started by Judge James Dehn of the First District Court. Judge Dehn tracked every DWI plea in court for the last 11 years to find out where offenders were drinking, including at which bar. When he had more than six years' worth of data, he connected with the Isanti County TZD, which analyzed his statistics and found that for 62 percent of the offenders, the last place they drank was at a bar. The average blood alcohol level was 0.171 percent, and even higher for repeat offenders.

These unique data led to development of a unique approach. The TZD group set up a meeting and invited bar owners with a letter stating: "Judge Dehn has tracked the number of DWIs coming out of your bar." The result? "All of them attended," Bob Bollenbeck said. Bar owners and wait staff received training, and police began walk-throughs to establish strong relationships with bar owners. After tracking results for four years, the Isanti TZD saw a 7 percent decrease in bar-related DWIs and a 15 percent decrease in bar-related blood alcohol levels.

Another service offered in Isanti County is the Safe Cab program, which gives impaired drivers free rides. The ride cost up to the first $15 is split between the county, city, and a local beer distributor (the average cost is $11). According to Bollenbeck, results of four years of tracking this program showed a 42 percent reduction in county-wide DWIs and a 65 percent reduction in DWIs from bars using the Safe Cab service.

Judge Dehn uses every opportunity he can to let people know about the Safe Cab service, Bollenbeck said, and ridership has increased by 30 to 40 percent since its inception.

LRRB Rural Road Safety

Michael Marti, SRF Consulting
Dave Kopacz, Federal Highway Administration
Wayne Fingalson, Wright County
Moderator: **John Brunkhorst,** McLeod County

This session gave an update on the Minnesota Local Road Research Board (LRRB) Research Implementation Committee's rural road safety training. The "train the trainer" workshops, held in the eight Mn/DOT districts in 2008, were designed to teach city and county engineers how to develop a safety culture and instill it in their employees and communities, Michael Marti said.

The free workshops were funded by the LRRB with work-in-kind support from the FHWA and Mn/DOT. Speakers from the FHWA, Mn/DOT, counties, and consulting firms provided "a great balance," Marti said. "The partnership made it achievable, at low cost."

The workshops were divided into four sections: introducing the issues, understanding the problem, tools and techniques, and putting safety into practice. Participants also learned about various options to secure funding for safety initiatives, Marti said.

Dave Kopacz reviewed some of the background material presented in the first two sections of the workshop, including statistics intended to motivate attendees into action. For example, traffic crashes in 2006 cost Minnesota an estimated $3.8 billion. On an average day, 1.4 people die on state roads and 96 are injured.

Wayne Fingalson described some of the tools and techniques presented in the training. One tool is the Minnesota Crash Mapping Analysis Tool (MnCMAT).
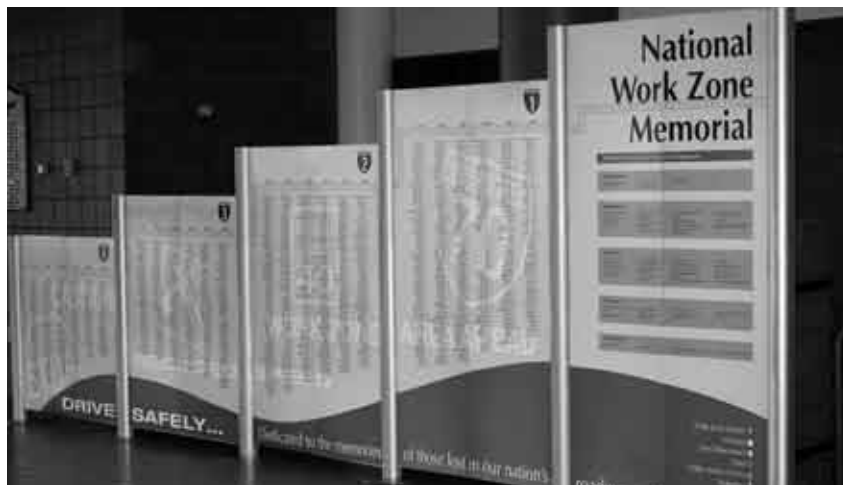
The National Work Zone Memorial exhibit, which was displayed at the conference, pays tribute to people who have died in work zone accidents. The memorial travels across the country to raise public awareness of the need to stay safe in American's roadway work zones.

Developed by the LRRB, MnCMAT enables users to analyze crash data based on a number of attributes, including county, city, and accident case number. Agencies can use the data to identify the major safety problems in their areas. (The tool is online at www.dot.state.mn.us/stateaid/sa_crashmap.html.) "It's a great tool," he said. Other helpful tools include road safety audits and road safety plans, the Strategic Highway Safety Plan (see related article on page 9), and Safe Communities coalitions.

The workshop then moved to techniques to address safety problems. Options include rumble strips and rumble stripes, Fingalson said, as well as intelligent transportation systems such as dynamic speed display signs, dynamic curve warning signs, and animal detection systems.

The focus was on putting safety into practice, Fingalson stressed. "A fifth E should probably be added—E for everybody."

Future offerings of the training are under consideration, including a modified version for maintenance staff and a new workshop as part of the Minnesota Local Technical Assistance Program (LTAP) curriculum.

For more about the LRRB, please see www.lrrb.org.

Communicating Traffic Safety Information to Non-English-Speaking Populations

Gail Weinholzer, AAA Minnesota/Iowa
Lydia McDonald, Emergency, Community, and Health Outreach (ECHO)
Moderator: **Skawdin Mohamed**, Minnesota Department of Public Safety

Gail Weinholzer

"In some cases, they may have never owned a car, or driven on an interstate—never used a seat belt let alone a car seat or booster seat."

About 100 languages and dialects are spoken in Minnesota—just one reason why communicating traffic safety information to non-English-speakers is challenging, said Gail Weinholzer. The cultures and perspectives of these populations vary greatly as well. "It's such a wide array that you can't pigeonhole a particular group," she said.

Immigrants settling in Minnesota often come from areas that lack our complex transportation systems, Weinholzer said, and their top priorities once here generally revolve around economics, such as where to live, how to make a living, how the government works, and where to educate their children, rather than traffic safety. "In some cases, they may have never owned a car, or driven on an interstate—never used a seat belt let alone a car seat or booster seat," she added.

When thinking of how to communicate traffic safety to these non-English-speaking populations, consider that if they've come from a developing country, they may distrust law enforcement officers, Weinholzer said—"Sending a bunch of uniformed officers to talk to them may not be the best approach." Also, some immigrants may speak their language but be unable to read or write it, thus making written materials ineffective.

Rather than watch mainstream television news or read the major dailies, recent immigrants tend to look to leaders within their own communities (for example, a local mosque) for means of assimilation and to "learn the ropes," Weinholzer said. She suggested seeking out community leaders to partner with, and speak through, to reach target populations.

Other ways to reach non-English speakers are through community events such as Cinco de Mayo and Hmong New Year and local targeted media (e.g., alternative-language newspapers, radio stations)—but be aware that these media change frequently (often due to funding) and cover a limited area, Weinholzer added.

Next, Lydia McDonald described how ECHO—Emergency, Community, and Health Outreach—develops and communicates educational and emergency information to populations with limited English proficiency. ECHO's outlets include the Web and e-mail, television, the telephone, and community partners.

About 18,000 immigrants who don't speak English as their primary language arrive in Minnesota every year, and ECHO reaches about 85 percent of them, McDonald said.

ECHO partners with public health, safety, and other government agencies, ethnic advisory organizations, and private and nonprofit organizations to disseminate safety-related messages from these groups, translating the messages for the appropriate language and culture as needed.

An event such as the I-35W bridge collapse, which affected many non-English speakers, emphasized the need to get information to these populations during a crisis. ECHO was among those called upon to help. "These cultures often don't have PDAs or Web access, but they may have cell phones," McDonald noted.

In a local emergency, ECHO Phone, Fax, and Web will provide details about the type of emergency and what individuals should do to protect themselves and their families. Examples of local emergencies include the accidental release of dangerous chemicals or multiple illnesses linked to a home, school, or business. In a statewide emergency, ECHO TV will also broadcast live.

The last two Saturdays of every month ECHO airs health education programming on ECHO TV. ECHO Phone (1-888-883-8831) provides non-emergency health advice through recorded advisories in 10 languages.

ECHO e-mail sends health and safety information to dozens of community organizations that have agreed to serve as ECHO partners. These partners, considered trusted sources of information, pass the messages along to people in their communities. In an emergency, ECHO E-mail will send emergency bulletins and update those partners as the situation changes.

By tailoring messages to fit particular cultures, ECHO is able to help bridge the gap between "officials" and "cultures." "It takes a government message and puts a face on it," McDonald said. "In this context it makes it much more believable."

Intersection Collision Prevention Overview

Ginny Crowson, Minnesota Department of Transportation (Mn/DOT)
Dennis Foderberg, Short Elliott Hendrickson (SEH)
Max Donath, ITS Institute, University of Minnesota
Moderator: **Dave Kopacz**, Federal Highway Administration (FHWA)

Thanks to TZD and other programs, state traffic fatalities are trending downward—except at intersections. Speakers in this session gave updates on several projects under way to improve intersection safety.

Ginny Crowson framed the problem with some grim statistics. In 2006, 163 out of 494 state fatalities were intersection related, and 56 of those occurred at rural through stops. From 2002 to 2006, 340 people were killed at rural through-stop intersections, accounting for 36 percent of all intersection-related fatalities and 12 percent of all fatalities.

Mn/DOT has been involved in several intersection-safety projects, Crowson said, including the ones covered by the other two speakers in the session. Another Mn/DOT project is an analysis of intersection crashes on state and county roads, due for completion in April 2009. The project will identify candidate intersections for enhancements such as changing lighting, adding stop signs, or applying technology, she said. In addition, Mn/DOT District 3 activated an advance warning sign in September 2008 at the junction of U.S. 169 (an expressway) and C.R. 11 (a through stop).

Dennis Foderberg described a project to develop an off-the-shelf, low-cost, low-maintenance, readily deployable system for use at non-signalized intersections on low-volume roads. For the work, SEH partnered with Network Transportation Technologies "in the belief that we can be better at saving lives by efficient utilization of technology," he said. The project team includes Mn/DOT, the FHWA, and Olmsted and Hennepin Counties.

The solar-powered system, deployed at a test site in Hennepin County in late summer 2008, brings together many of the products in the rural ITS toolbox—wireless communications, low-power sensors, solar power, and intelligent roadside controllers, Foderberg said. The system detects vehicles on the mainline and determines their speed. When drivers on the minor road approach the T-shaped intersection, they see a sign across the mainline that flashes "look for traffic" when the system is triggered. A field operational test is scheduled to run through April 2009.

Max Donath provided an update on University of Minnesota research. In 2002, the ITS Institute began an ambitious effort to develop infrastructure-based technologies capable of reducing driver error at unsignalized rural highway intersections where a high-speed rural expressway intersects a low-speed, low-volume rural road. Historically, installing a traffic signal was seen as the only recourse in locations with high crash rates, but research has indicated that adding a traffic signal to rural highway intersections often brings a new set of safety problems and disrupts high-speed express traffic.

The Institute's Intersection Decision Support (IDS) research focused on giving drivers stopped on secondary roads better information about traffic approaching on the main road. Researchers designed a sensor network that can track approaching vehicles and determine if gaps between them will be sufficient for a stopped vehicle to safely enter or cross the highway. The technology was tested on an intersection with a high crash rate (U.S. Hwy. 52 at County Hwy. 9 in Goodhue County). Other researchers developed and evaluated electronic signage that effectively communicates critical information to motorists, Donath said. (Reports are online at www.its.umn.edu /Publications/ResearchReports.)

The ITS Institute has also taken the IDS concept to seven other states through the Cooperative Intersection Collision Avoidance Systems—Stop Sign Assist (CICAS-SSA) pooled-fund effort led by the U.S. Department of Transportation. Researchers gathered and analyzed data from intersections in each state to discern any regional differences in crash causes, Donath said.

What they learned is that running the stop sign is not a primary causal factor for this type of intersection. "Making intersections more conspicuous doesn't make a whit of difference," he said. They also learned that crashes are insensitive to road and weather conditions, nor does gap selection vary by type of vehicle. The data also indicate that the gap-rejection threshold is independent of time of day, time waiting, and average available gap. These are important findings, Donath explained, because future deployments won't need added technology to account for such variables. "This makes the technology less expensive," he said.

Max Donath

"Making intersections more conspicuous doesn't make a whit of difference."

Cycles, Cameras, and Cops: Passenger Car Enforcement around Big Trucks

John Hausladen, Minnesota Trucking Association
Lieutenant Eddie Carroll, Minnesota State Patrol
Trooper Robert Zak, Minnesota State Patrol

"When cars and trucks crash, 75 percent of the time, [it] happened because of something the car driver did to start the chain of events," began John Hausladen. "And, when a car and a truck crash, you know which one usually gets the worst of it." Hausladen outlined an innovative enforcement program to reduce car-truck crashes. The program, developed by the Minnesota State Patrol in partnership with trucking firms, uses truck-mounted video cameras and patrol officers on motorcycles to enforce traffic laws around big trucks.

A 2006 summary of commercial vehicle (CMV) crashes showed that of 57 fatal crashes, 9 were the fault of CMV drivers, one was caused by a pedestrian, and the remaining 47 were the fault of passenger car drivers. Lieutenant Eddie Carroll and Trooper Robert Zak of the Minnesota State Patrol explained that contributing factors to these crashes included unsafe lane changes, crossing solid white lines, and cutting in front of trucks on highways. "Semi's can't stop on a dime," Carroll said. "Truck drivers keep space in front of them to allow braking room, but cars often cut into that space and then hit the brakes."

The incidence of fatal car-truck crashes is on the rise. The 57 fatal crashes in 2006 were exceeded in 2007 with a total of 80 fatalities. During this two-year period, none of the fatalities were due to mechanical issues. "It's driver error, so that's why we're concentrating on driver behavior," Carroll said.

The resulting CMV outreach program, a partnership between the Minnesota State Patrol and the motor carrier industry, focuses on four areas: unsafe driving acts of motorists while in the vicinity of trucks; driver fatigue; enforcement in high-volume areas; and a public awareness campaign. Traffic enforcement efforts include officers on motorcycles and in unmarked SUVs. The State Patrol officers pair up with vehicle inspectors, too, to improve enforcement. Airplanes are sometimes used to monitor traffic violations: Pilots pick out passenger cars in violation and enforcement officers on the ground stop the cars and issue tickets. Unmarked cars equipped with radar and cameras are often used in high-volume traffic areas. Officers on motorcycles are equipped with radar, cameras, computers, printers, and GPS.

Trooper Robert Zak explained that targeted violations include speeding, ignoring stop signs and semaphores, careless driving, tailgating, and making unsafe lane changes. "These are the five violations that we can almost guarantee will be the cause of a crash." Motorcycles work well for enforcement because, according to Zak, they are agile moving through traffic, can go off-road, and get high gas mileage.

The next addition to the CMV outreach program is to put troopers in passenger seats of trucks so they can observe violations and report them to enforcement officers, who will then stop the vehicles and issue citations. Zak would like to see signs placed on trucks to make drivers aware that "the next truck [they] pass may have a trooper in it."

The Minnesota Trucking Association will also help get the word out to the public. "We're a safety organization because our members know you have to deliver the goods safely," Hausladen said.

The DART truck driving simulator gave conference attendees the chance find out what it's like to share the roads from a truck driver's perspective.

Deer Collision-Avoidance Systems

Robert Weinholzer, Minnesota Department of Transportation
Keith Knapp, Center for Excellence in Rural Safety, University of Minnesota
Moderator: **Sue Groth**, Minnesota Department of Transportation

"We have a bigger deer population now than we did when the pilgrims arrived," said Keith Knapp, giving the big picture of why deer-vehicle collisions (DVCs) are an increasing problem.

Robert Weinholzer began the session with some specifics. There are more than one million DVCs each year in the United States, resulting in more than 200 deaths, 29,000 injuries, and $1.2 billion in property damage. In Minnesota, between 3 to 11 people are killed each year in DVCs and about 475 are injured. State officials put the number of DVCs at 4,500 per year, but State Farm estimates the total at about 35,000. Increasing numbers of these collisions involve motorcycles, he added, as more motorcyclists are on the road, many of whom are aging baby boomers with slower reflexes.

Several factors explain the increase in DVCs, Weinholzer said. The deer herd in Minnesota—at roughly 1.3 million—is up from 750,000 less than 10 years ago. At the same time, vehicle-miles traveled (VMT) and semirural exurban development are also increasing. Suburban areas, some with large tracts of woods, lakes, and flower and vegetable gardens, are attractive places for deer to nest down during the day, he said, and provide a "virtual buffet" when they come out at night to feed.

The downward trend in hunting is also a factor. So far in Minnesota, the drop-off has not had a large impact, Weinholzer said, because a huge increase in bow hunters has balanced the loss of gun hunters. Eastern states, however, have only about a third as many hunters as they did 30 years ago.

Faced with these facts, agencies are exploring how to reduce DVCs, Weinholzer said. Studies have shown that several approaches—such as standard deer crossing signs (drivers ignore them), roadside reflectors, and vehicle whistles—don't work.

Fencing is extremely effective—at 95 to 99 percent—but it must be at least eight feet tall and be placed along lengthy stretches with no intersections, driveways, or other openings. It also requires frequent maintenance, he said, because deer will crawl underneath eroded areas at the fence base.

Wildlife crossings—either bridges above or tunnels below roads—have been shown to be very effective, but they require fencing to corral deer into them. Herd reduction is effective only if applied over a large area; a kill in a small area may work temporarily, but over time deer simply move in from neighboring regions. Planting roadside vegetation that is less pleasing to the deer palate is an option under study.

A promising device being tested in Minnesota is a motion-detector light-beam system, Weinholzer said. The original system, installed in 2001 at a test site near Marshall, was powered by batteries that were supposed to last two to three weeks, but the number of deer crossings drained them in two to three days; as a result, the test was shut down after two months. Funding became available in 2006 to modify the system with solar panels and less-power-hungry LED beacons, and the redesigned system was activated on April 27, 2007.

A one-year evaluation showed a 57 percent drop in the deer carcass count compared to the previous year, Weinholzer said. The technology works in pouring rain or snow, although results show a major problem in heavy fog or numerous consecutive cloudy days. As a result, he said, new detection devices, larger solar panels, and more powerful batteries will replace present equipment. Monitoring is continuing through December 2008, and if the system proves effective it may be installed in other areas. The system costs about $15,000 per mile, but costs are expected to drop significantly if it moves into mass production.

Knapp then took the podium to review recent activities of the Deer-Vehicle Crash Information Clearinghouse (DVCIC), housed at the Texas Transportation Institute. The DVCIC, established at the University of Wisconsin in 2001, is now funded by and is part of the Deer-Vehicle Crash Information and Research (DVCIR) Center.

DVCIR Center members currently include the departments of transportation from Connecticut, Iowa, Maryland, Minnesota, New York, Ohio, Texas, and Wisconsin. The lead agency is the Federal Highway Administration Office of Natural and Human Environment.

Knapp shared highlights from the inaugural DVCIR Center pooled-fund technical advisory committee meeting, held at the Minnesota Department of Transportation in January 2007, and from the DVC toolbox. This detailed summary and evaluation of DVC countermeasure information is located at www.deercrash.com.

Keith Knapp

"We have a bigger deer population now than we did when the pilgrims arrived."

Building Teams to Conduct High-Visibility Enforcement

Richard Smith, Minnesota Department of Public Safety
Lieutenant Amy Statfield, Minnesota State Patrol
Lieutenant Scott McConkey, Minnesota State Patrol
Officer Adam Gray, Mankato Department of Public Safety
Sergeant Chad Paulson, Crow Wing County Sheriff's Office
Deputy Tom Coulter, Blue Earth County Sheriff's Office
Lieutenant Paul VanVoorhis, Minnesota State Patrol
Sergeant Bill Hammes, Lino Lakes Police Department
Sergeant Tim Holmes, Nisswa Police Department

"We show courtesy to nondrinkers, educate them, and tell them what we're doing—but we're hard on the impaired drivers."

—Lt. Scott McConkey

Richard Smith moderated an information-packed discussion that explored how departments can work together to conduct impaired-driving saturations. Effective DWI (driving while impaired) saturations have some common elements: saturations are done every weekend; probable cause/reasonable suspicion is used to educate people about traffic stops as well as to issue citations; signs are posted and are very visible; and as many as 20 squads are available.

Sergeant Chad Paulson described efforts in Crow Wing County involving its police department and State Patrol troopers. He emphasized the need for joint powers (a state statute) so that law enforcement has authority to arrest or issue citations outside of one's jurisdiction. The joint powers agreement covers liability, damage to equipment, and worker's compensation as well as joint exercise of police powers.

Crow Wing County is among the top 15 deadliest Minnesota counties for traffic fatalities. It decided to join 13 of these counties that conduct high-visibility saturations. Sergeant Paulson emphasized the need for communication with stakeholders in the county before conducting DWI saturations. "We met with area chiefs in Crow Wing County to get their buy-in and understand their expectations. They all wanted to participate," Paulson said. Nine agencies participate, and each has a coordinator responsible for processing paperwork and assigning shifts. Saturation patrols are staffed by the agencies closest to the saturation point.

Lieutenant Amy Statfield of the Minnesota State Patrol, who participated in the Crow Wing County saturations, said crash data and traffic volumes were used to determine where saturations should be set up. Mn/DOT provided both static and changeable signs. Dispatch centers and jails were notified so they could prepare with extra staffing. Before each saturation, a briefing was held to review the process and expectations with the team.

Blue Earth County succeeded in getting agreement from all the parties involved in its saturations. This team—Lieutenant Scott McConkey of the Minnesota State Patrol, Officer Adam Gray of the Mankato Department of Public Safety, and Deputy Tom Coulter of the Blue Earth County Sheriff's Office—discussed goals and core values. "Before you have a plan you need buy-in, and before buy-in you have to have a passion," McConkey said.

The Blue Earth saturation efforts, too, were preceded by clear communication with stakeholders. They invited department leaders to meetings, asked department heads to participate in the saturations to get a feel for what happens, worked on teamwork and unity, and enjoyed "friendly competition." And during saturations, McConkey said, "We show courtesy to nondrinkers, educate them, and tell them what we're doing—but we're hard on the impaired drivers."

Anoka County is in the middle of a three-year saturation project. Lieutenant Paul VanVoorhis of the Minnesota State Patrol and Sergeant Bill Hammes of the Lino Lakes Police Department said that at the end of a saturation, they issue press releases to the media giving credit to all involved "no matter the shape of the badge." They believe that the higher the visibility, the better the deterrence, so high-visibility signs are used and officers explain what they're doing when they stop drivers. Hammes said that a recent survey of Anoka County residents showed that 80 percent of the public supported the saturation.

An added dimension of the Anoka saturation program is the involvement of Alcohol, Gambling, and Enforcement (AGE) agents, who have state jurisdiction. VanVoorhis explained that AGE agents want to know what zones will have saturations so they can look for bars over-serving or serving underage drinkers. For DWI arrests that test 0.17 or higher, AGE agents may go back to the bars involved to warn or fine them. AGE also trains bartenders and uses citizen investigators to check alcohol contents.

High-visibility enforcement is most successful when departments work together to conduct impaired-driving saturations. By communicating with stakeholders and the public, deterrence can make a big difference in keeping impaired drivers off the road.

Fatal Reviews: Crashes That Claim Lives

Amy Roggenbuck, Minnesota Department of Public Safety
Curt Mowers, Minnesota State Patrol
Dan DeSmet, North Memorial Ambulance
John Karger, Otter Tail County Sheriff's Office
Jake Grabow, Otter Tail County Sheriff's Office
Steve Kubista, Lac qui Parle and Chippewa Counties

In this session, panelists conducted a mock fatal crash review using details of an actual crash, illustrating what typically happens during such a review, how one can be organized, and why it's important to conduct one.

"Fatal reviews are really a critical component to our Safe Communities," said moderator Amy Roggenbuck, a community health liaison who works with Safe Community coalitions across Minnesota. She said that all Safe Community coalitions that receive grant dollars from the Office of Traffic Safety are required to convene a fatal review committee. Its purpose, Roggenbuck explained, is to discover what most likely caused the crash and identify any trends that can be addressed to prevent similar types of crashes. During the review, the committee looks at the "who, what, where, when, and why" of the crash.

A fatal review committee is made up individuals who bring a particular perspective and knowledge to the process. Committee members should include, at a minimum, representatives from law enforcement, health, and education, county and district state traffic engineers, and the Safe Community coordinator. All agencies that responded to the fatal crash, such as the ambulance service, medical services, fire department, county or city attorney, and government officials should be invited as well. Committees should not, however, include family members of the victim or anyone involved with the victim, Roggenbuck cautioned. The committee should make sure to obtain an actual copy of the accident/investigation report from law enforcement to bring to the review.

For this mock review, the crash under examination occurred on County Highway 40 in Otter Tail County, Minn., and resulted in a male being seriously injured and a female dying from internal injuries.

John Karger led off with several slides showing images of the crash scene, including tire tracks in the snow and the damaged vehicle. He advised those holding their own fatal reviews to omit showing gruesome coroner photos, as the committee will include civilians who are not accustomed to seeing those types of images.

Steve Kubista said the role of the county engineer on a fatal crash committee is to look at the road, signs, and striping and consider if something in the road geometrics or design should be fixed. The engineer needs the crash information as soon as possible after the crash so he or she can review the site under similar conditions. The engineer will also want time to study the information before meeting with the rest of the committee.

EMS personnel on a fatal review committee can provide details about what they saw at the crash scene: the patients' condition, seat belt marks, where they were sitting, what injuries were apparent, what was in the victims' pockets, comments victims may have made at the scene. Grabow recommended limiting EMS committee members to one or two who were on the scene.

Weather, road design, signage, and alcohol most likely did not cause the crash, but there are still some unknowns—the time the crash occurred, and whether the driver was wearing a seat belt. Karger said that's why it's helpful to have a committee made up of the various individuals. "One person might notice something that others hadn't," he said.

Multiple factors most likely led to the crash. That's when a fatal review committee needs to decide what one or two key messages should be put out to the public, Roggenbuck said. Fatigue, inattention, and lack of seat belt use were among the suggestions from the audience in this session.

Besides discovering why a crash occurred, bringing together this varied group of individuals might lead to addressing other broader issues.

Karger said that the quality of the sherrif's office investigations has improved since it began conducting fatal reviews. "We do a lot more follow up," Karger said, adding that his department also works more closely with county engineers and has better relationships with EMS and the county attorney's office. "It's accomplished more than I would have ever expected when we first started."

Amy Roggenbuck, Dan DeSmet, John Karger, Curt Mowers, Jake Grabow, and Steve Kubista

Child Passenger Safety: Overview of Sessions

Seven concurrent sessions were specifically geared for child passenger safety (CPS) advocates including practitioners, technicians, and law enforcement personnel.

The "ABC's of School Buses and Car Seats" detailed the challenges of incorporating child safety seats into school buses. Attendees learned what safety seats are on the market for school buses and how they should be properly installed. Presenter Jennifer Booge explained current Minnesota law and how compartmentalization keeps school buses the safest form of transportation.

In "CPS Course for Non-CPS'ers," intended primarily for law enforcement personnel or those unfamiliar with CPS, presenters Kevin O'Neill and JoEllen Rutzen described what officers need to look for regarding enforcement of current child passenger safety laws. Officer O'Neill presented a case study from a crash in Lakeville, Minnesota, and explained why injuries to a child could have been prevented had the child been in the proper restraint for his age.

"CPS–CSI: Unraveling Car Seat Mysteries" explored how advancements in the field of CPS have changed the use and misuse of car seats and boosters. LATCH is one example of a development that has made safety seat installations easier, but also added more confusing elements for parents and caregivers. Diana VanWormer gave advice on how to address these problems for those installing seats.

In "New CPS Product Update," attendees learned what's new in safety seat technology and what can be expected for the coming year. Kelly Van Eschen provided demo seats and helped attendees familiarize themselves with them.

Sharon Munns from the Mayo Clinic, in a session titled "CPS for Special Care Infants and Children," explained in detail the different types of medical and behavioral conditions that may require a special type of child restraint, followed by a demonstration of new special needs seats on the market.

In "Cultural Diversity in CPS—Working with Non-English-Speaking Populations," Sakawdin Mohamed and Esther DeLaCruz discussed the different non-English-speaking communities in Minnesota. This session provided the histories and cultural differences, as well as risk perceptions among local non-English-speaking populations, particularly immigrant communities such as Somali and Hispanic.

Finally, the "CPS and Vehicle Manufacturers—Advances in Technology" session provided information on how car manufacturers and child safety seat manufacturers are working together to make it easier to install and use safety seats correctly and effectively. Shannon Swanson covered some of the new vehicle features that parents and caregivers need to be aware of, including the location of air bags, advanced air bag systems, "Swivel N' Go" seats by Chrysler and Dodge, changes in LATCH, and safety belt standards.

2008 Star Award Presentations

Presenters: **Sue Groth**, Minnesota Department of Transportation, and **Cheri Marti**, Office of Traffic Safety, Minnesota Department of Public Safety

The Kathy Swanson Outstanding Service Award is given to recognize an individual who has shown exceptional leadership in efforts to improve traffic safety in Minnesota, build partnerships, and mentor others in the field. The annual Star Awards are given to recognize excellence in enforcement, emergency medical services, education, engineering, child passenger safety, and the media.

Back row: Jim Theodore, Dave Kopacz, Jeremy Cossette, Jeff Passolt, Earl Rook, Cheri Marti. Front row: Sue Groth, Tom Jansky, Cheryl Bisping, McKenna Passolt, Bernie Arseneau

2008 Kathy Swanson Outstanding Service Award Recipient
Bernie Arseneau, Minnesota Department of Transportation

2008 Star Award Recipients
Enforcement
Jeremy Cossette, White Earth Tribal Police

Emergency Medical Services
Jim Theodore, volunteer firefighter and retired EMT

Education
Cheryl Bisping, Mesabi Safe Communities Coalition

Engineering
Dave Kopacz, Federal Highway Administration

Child Passenger Safety
Tom Jansky, Gold Cross Ambulance

Media
Jeff Passolt, KMSP-FOX 9 News

Closing Plenary: The Success Stories of the I-35W Bridge Collapse Response

John Fruetel, Assistant Chief of Operations, City of Minneapolis Fire Department

For John Fruetel, August 1, 2007, had been just another day at the office. But after work, as he was riding his motorcycle to a Twins game downtown, his cell phone starting ringing. Hearing the news that the I-35W bridge had just collapsed, he headed right for the site.

Each day, 140,000 vehicles cross the I-35W bridge. That much average traffic, in addition to rush hour and people traveling to the Twins game, meant it was impossible to know how many cars and people had been on the bridge at the moment it went down. The first few minutes after the collapse were chaotic. "When I arrived, I saw fires, people rescuing others in cars, on the bridge, and in the water," Fruetel said. "I knew there was nothing I was going to be able to do to control it…I had no command staff initially so it was hard to get my hands around the incident."

Fruetel assumed the role of first-on-scene incident commander and set up on the 10th Avenue Bridge. Many rescue teams and vehicles arrived "out of nowhere," and two tactical channels were used to communicate with them. Rescue requests were coordinated through the emergency operations center (EOC) throughout the night. Fire chiefs from other areas were used to set up teams at various locations, and EOC command staff set up a logistics operation with Fruetel continuing to do on-site command.

A number of decisions had to be made as the event unfolded. First, a rail car that sustained damage from falling bridge fragments needed to be assessed. In addition, many victims needed rescue from precarious places on the bridge. One bridge section initially appeared to be moving, as though a secondary collapse was about to occur where rescue workers had set up.

"The night of the bridge collapse, we couldn't have been as effective without our mutual aid partners coming in to help," Fruetel said. Back in 2000, a preplanning analysis was conducted to determine where the gaps were in the city's ability to respond to emergencies. In 2002, Minneapolis was chosen to participate in a FEMA-sponsored course and "we did just awful," Fruetel said. "So we decided we needed to deal with our response effectiveness by upgrading lots of equipment and by forging more mutual aid partnerships," he continued.

Fruetel said that the last EMS transport left the scene of the bridge collapse just two hours and six minutes after the collapse; 50 patients were transported by EMS; over 100 patients were treated in the first 24 hours; and 13 people died.

Once all viable rescues had taken placed, Fruetel made the decision to pull everyone off the bridge as trained task force responders came in. A few days later, Navy divers arrived to deal with technical issues beyond the skills of the water crew.

The Minneapolis Police Department set up a unified command post early on and secured the perimeter of the site. The Corps of Engineers lowered the water level of the Mississippi River to help with the water and diving efforts to get cars out of the river. The Minnesota Department of Public Health set up a family assistance center. A debris site was set up for the National Transportation Safety Board. Mn/DOT implemented a transportation plan to move traffic around the bridge.

"Command was passed off from fire to law enforcement to the state in a smooth transition," Fruetel said. "The relationships worked well. The stories of the response teams are stories of success."

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