Living in the Line of Duty

by Dennis L. Rubin and Kimberly C. Vásconez

An FHWA training course and partner efforts promise to help mitigate risks to firefighters and other first responders. The goal? Reduce, and ultimately eliminate, their roadway fatalities.

(Above) The first action taken at most crash scenes is traffic control. Here, an ambulance and fire rig block lanes, with the patient operating area behind the ambulance for safety. Safe practices for traffic control are one of the modules taught in FHWA's National Traffic Incident Management Responder Training. *Photo: Chuck Snyder, Cumberland Valley Volunteer Firemen's Association.*

Each year, an estimated average of 5 firefighters, 12 law enforcement officers, and more than 60 employees of State departments of transportation (DOTs) lose their lives in the line of duty. Deaths of firefighters and other public safety responders, along with an unknown number of injuries and near-miss incidents, occur on all types of roadways, making safety an essential mission for all public highway officials.

The second Strategic Highway Research Program (SHRP2) underscored the importance of how public safety responders plan for and respond to vehicle crashes. As a result, the Federal Highway Administration (FHWA) enhanced a Traffic Incident Management (TIM) program to coordinate development and dissemination of information to help State and local officials detect, respond to, and remove

traffic incidents and restore traffic capacity as safely and quickly as possible. In the July/August 2013 issue of PUBLIC ROADS, an article titled "Successfully Managing Traffic Incidents Is No Accident" detailed FHWA's role in establishing and managing the national program.

As a major component of the TIM program, FHWA supported development of a training course by the Transportation Research Board. The SHRP2 National Traffic Incident Management Responder Training began in 2007. The second articlein this series, titled "Training Millions of Responders" and published in the November/December 2013 issue of PUBLIC ROADS, detailed the development and deployment of that training.

Now: A look at how leadership in the firefighting community is rolling out TIM practices among its members.

Jim Austrich, FHWA's manager of the TIM training program, says, "The time has arrived for all responders to learn the skills that will prevent responder deaths and injuries while folks are working at vehicle crash events. Even one responder death is too many."

Why TIM and Why Now?

As the TIM training spreads around the country, public safety agencies and FHWA expect that the number of emergency responders and traffic workers dying and injured in the line of duty will be initially reduced—with a goal of ultimately being eliminated.

Just consider that more than 10 vehicular crashes occur every minute of every day in the United States, which equals more than 15,340 crashes per day and more than 5.6 million vehicular crashes per year. With those kinds of numbers, the exposure rate is extremely high for everyone who pins on a badge or assists in resolving the issues that remain in the wake of vehicular crashes.

After extensive vetting of the course curriculum by stakeholders from all TIM disciplines, FHWA implemented the first phase of a three-part effort to train hundreds of thousands—or even millions—of public safety responders in these practices from 2012 to 2017.

By December 31, 2017, FHWA anticipates that a majority of all first responders, traffic control experts, and other public safety professionals involved in traffic incident planning and response will receive this crucial training. Once the TIM program is completely integrated into all public safety agencies, ongoing training will be necessary.

What Firefighters Have To Say

TIM is a risky business for all responders and motorists. To gain support for underwriting the cost of training such as the TIM course, the National Fire Protection Association investigated the risks taken by firefighters. From this research, the association produced a model that helps fire managers analyze and determine appropriate risk.

The model is a continuous evaluation of the risk to humans (firefighters, law enforcement officers, and highway workers) as compared to the benefits gained by implementing a specific tactical objective or incident action step. The risk model begins by indicating that firefighters and law enforcement officers should be willing to "risk a lot to save a lot." This first tenet of the National Fire Protection Association's risk management plan generally refers to the saving of other human lives.

The next principle of the plan's risk management hierarchy is that first responders should be willing to "risk a little to save a little." This element focuses on expending a few resources now to protect property or prevent other harm, such as immediately containing spilled hazardous materials after an incident in order to prevent a potential release into a community.

"When you discuss 'risk a lot to save a lot' versus 'risk nothing to save nothing' or anything in between those two decision points," says Tim Taylor, retired battalion chief of Prince William County (VA) Department of Fire & Rescue, "we are talking about the initial actions taken or not taken as determined by the first arriving company officer." Chief Taylor provides the following scenario to explain this concept.

"Units are dispatched to the interstate for a two-vehicle accident involving a tanker truck and a passenger vehicle. The first arriving unit officer observes a tanker truck with class 6 poisonous substance placards in place. Two lanes over is a passenger vehicle with heavy damage. The officer determines that the tanker seems to be intact, and no visible leaks observed. He or she initiates full gear approach to access injuries and possible removal of patients if appropriate. In this case, the officer risks a lot (navigating a potentially poisonous substance) to

Indiana State Police

Risk to responders can come from the road conditions that led to an incident. Here, responders have a difficult time even getting to the scene with no passage open around this multivehicle pile up on I–94 in Indiana during a snowstorm on January 23, 2014.

Jon Jones, Cumberland Valley Volunteer Firemen's Association

A paramedic is attending to a patient lying in the road. At times, TIM responders must take high risk for high outcome, especially when they have to work close to traffic.

save a lot (five accident victims). In the 'risk a little to save a little scenario,' the first arriving unit officers observes no visible leaks from the tank, which appears intact, but there is fuel leaking from damaged saddle tanks. The tanker driver is out of the cab and standing with the passenger vehicle. He indicates he is uninjured and the four occupants of the car are shaken and have minor injuries. The officer must determine how much risk there is to remove occupants if necessary and start initial fuel spill containment, thus bridging into a little more risk to contain life safety and environmental issues."

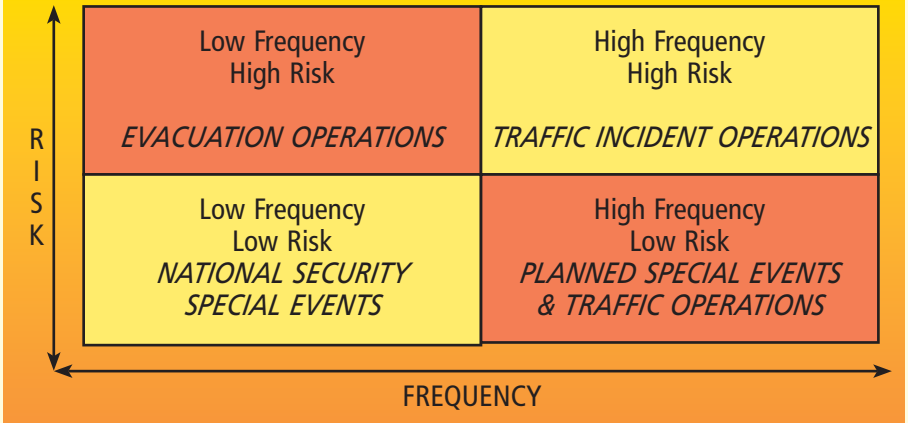
The last component is that all first responders will take "no risk when there is no benefit to be gained." This adage reflects the assumption that "what is already lost is lost." There is no need for any first responders to be injured or killed in the line of duty when the outcome is clear and their actions would not have any effect. "This is the hard decision point for action-oriented public safety responders who by nature are wired to save others," says Taylor.

He describes this risk-nothing scenario by continuing his earlier example: "In this case, the first arriving unit notes a large breech of the tank with visible product on the ground and in the air. The spill zone encompasses both vehicles, and there is no response to verbal commands by speaker system to the vehicle occupants." Taylor concludes that the officer must risk nothing in this situation and await the arrival of an appropriate level of hazardous materials units before any approach can be attempted to evaluate the crash victims. Other actions, such as establishing an evacuation zone and protecting immediate surroundings can be initiated. If any more risky action is taken, then unacceptable risk to the responder occurs, and he or she may become a victim."

The status of risk is not static. It may change throughout the incident. Responders must consider all actions that occur throughout escalation and de-escalation over the duration of an event and assess changes in risk. However, the most immediate assessment of risk occurs in the early phase of an event when first responders with proper training arrive on scene and have the skills to evaluate the risk and order resources based on their assessment of the situation. This last element of the model is sometimes the toughest one to implement and enforce.

Chief Taylor continues: "In the most extreme case, units are dispatched to a train derailment along the I–95 corridor. A freight train is off the track with numerous tank cars on fire with simultaneous explosions occurring. The manifest indicates numerous chemicals involved, including flammable, explosive, and agents hazardous to health. In this scenario, again no actions will be taken by the initial

A Risk Model for Traffic Incident Operations



The National Fire Protection Association developed a model that plots various operations in the roadway environment according to the risk involved and their frequency of occurrence. Traffic incident operations, due to their high frequency of occurrence and high risk involved, are the most dangerous type of operations. *Source: Recreated and reproduced with permission from* NFPA 1500-2013, Fire Department Occupational Safety and Health Program, *© 2012, National Fire Protection Association. This reprinted material is not the complete and official position of the NFPA on the referenced subject, which is represented only by the standard in its entirety. Adapted by Kimberly C. Vásconez.*

arriving units that will put their responders at risk, but many other actions will be initiated to secure the surrounding area. Just a few: establish hot zones and an evacuation process, protect surrounding structures with water curtains, and shut down the highway and establish alternate routing for vehicles.

Finally, the part that makes all aspects of the plan difficult to fully implement is that the responders must work in a highly controlled manner as part of the response process. What this means is that the responders will implement all policies, procedures, and training to be effective and safe whatever the job at hand. The controlled component simply means that the National Incident Management System (NIMS) is used at all events, big or small, whether one jurisdiction alone is involved or multiple municipalities are working together. In other words, the NIMS is to be implemented regardless of the lead agency that is commanding the event.

FHWA officials recognize that adoption and use of NIMS terminology varies among the TIM partners, with fire and rescue departments perhaps more attuned to the lingo than law enforcement officers are. For example, NIMS terminology requires "after-action reviews" to be completed by a multidisciplinary response team, but others have termed the process "hot washes" or "post-incident reports." The gap is being bridged, however, as the TIM training helps spread the use of NIMS terminology.

Struck-By and Near-Miss Incidents

As implied above, the TIM course is raising awareness of the need for common terminology to manage risks to firefighters and other first responders. The course also affirms that more information is needed on near-miss and struck-by incidents.

"It's a rule of executive leadership that you need to measure something if you're going to manage it," says John Corbin, director of traffic operations, Iowa Department of Transportation. "If we're going to aggressively manage and reduce emergency responder and highway worker struck-by incidents, then we need to comprehensively measure, track, and report their occurrence."

Definitions of Struck-By and Near-Miss Incidents

The Transportation Research Board committee investigating the means to collect data on struck-by and near-miss incidents offers the following definitions:

Struck-by incident. Any incident where an emergency responder, roadway worker, or emergency or work vehicle is hit by another vehicle or object within a traffic incident management area or work zone, resulting in an injury, fatality, or property damage.

Near-miss incident. An unintentional unsafe occurrence in a traffic incident management area or work zone that could have resulted in an injury, fatality, or property damage. Only a fortunate break in the chain of events prevented an injury, fatality, or damage. An event shall be classified as a near-miss if any traffic control devices near the scene of the crash or work area are struck.

In an American Association of State Highway and Transportation Officials' (AASHTO) report titled "A Framework for Collecting Emergency Responder/Roadside Worker Struck-by/Near-Miss Data," researchers found that those interviewed for the study often shared anecdotes describing the difficulty of obtaining compliance with reporting on either struck-by or near-miss incidents.

Corbin has been a driving force behind the national acceptance of the AASHTO framework and the recommendations in the study. "While some responder disciplines effectively track struck-by fatalities, there is limited reliable national information about struck-by injuries," Corbin says. "Currently, there is also no single cross-discipline system or process for tracking and reporting struck-by fatalities—let alone injuries—at the national level. The FHWA training course has sensitized the national TIM community to the need to initiate this national tracking and reporting of all struck-by fatal and injury incidents. Corresponding national TIM research projects have laid conceptual groundwork for creating such a system."

Meanwhile, the International Association of Fire Chiefs, the Hampton Roads Fire Safety Officials Committee of Virginia, and the Cumberland Valley Volunteer Firemen's Association have been conducting ad hoc efforts to collect data on responder line-of-duty deaths and near-misses related to highway incident responses. The Cumberland Valley Volunteer Firemen's Association, which encompasses firefighters in Delaware, Maryland, Pennsylvania, Virginia, and West Virginia, has championed responder safety for more than 15 years. The association reports anecdotal incidents on its "Emergency Responder Safety Institute" Web site (www.respondersafety.com). The association also sends an email alert to its subscribers, reporting deaths or injuries of TIM responders as they are identified in the media.

Most communities invest significant resources in training and preparing their public safety responders to protect and safeguard life and property. Injuries and deaths include not only emotional costs, but also the time and financial costs of training to reduce them.

"For far too long, fire and EMS [emergency medical service] responders have operated in a vacuum when it came to highway responses," says Steve Austin, program manager of the Emergency Responder Safety Institute of the Cumberland Valley Volunteer Firemen's Association. "Collaborating, preplanning, and training together with our fellow responders in law enforcement, departments of transportation, and towing and recovery are essential. That is the beauty of the TIM training. Safety is improved for everyone, motorists and responders alike, and the chance for secondary incidents is greatly reduced."

Currently, the estimated number of secondary crashes typically runs as high as 20 percent of all crashes; that is, 20 percent of all incidents are secondary in nature and result from another incident farther up the line at crash sites.

Fire Chief Tommy Hicks, assistant executive director of the International Association of Fire

Chuck Snyder, Cumberland Valley Volunteer Firemen's Association

Incident responders from various disciplines rely on each other at the scene of a crash. If law enforcement, fire, and transportation officers were not controlling access to this tunnel, emergency medical technicians would be unable to operate safely, as they are here.

Chiefs, recently demonstrated to the leadership of the FHWA Office of Transportation Operations a prototype database of voluntary reports on near-miss incidents submitted by firefighters and other responders. The database was developed with seed money from the Department of Homeland Security. Hicks believes that it will have applications in the area of TIM and will be useful to all TIM partners, whether fire or law enforcement, transportation or towing.

Hicks says, "A lesson learned that is not acted on will become an error [that] nobody learns about; therefore, the goal of a national near-miss reporting system is turning lessons learned into lessons applied. Reporting is a voluntary and anonymous process. Those who share their near-miss experiences can do so with absolutely no fear of repercussions from their superiors and know that many others will learn from what they've experienced."

Hicks adds that the International Association of Fire Chiefs finds that voluntary reporting would be far more successful than mandatory reporting, since required reporting might under-represent the number of incidents and decrease attention to this serious issue. "After all," says Hicks, "the main point is to capture that an event occurred, not to place blame." The International Association of Fire Chiefs' near-miss database contains nearly 5,000 reports through voluntary input in less than 10 years.

When asked about whether a voluntary data collection effort is truly reflective of the environment, Hicks noted that the data collected by the near-miss database since 2005 "mirrors the trends of the National Fire Incident Reporting System at the United States Fire Administration as it relates to percentages of injuries. This correlation between the near-miss events and injuries illustrates the value of the voluntary reports."

He also shared that striking similarities exist between the International Association of Fire Chiefs' near-miss datasets and the National Fire Protection Association's National Fire Experience Survey data. Hicks claims that the percentages of near-miss incidents mirror the percentages for injuries fairly closely, telling us that near-miss data, though they do not focus exclusively on injuries, are on-point with national trends and can offer additional insight into risk management strategies. The International Association of Fire Chiefs reports that ratios of injuries per 1,000 fires have remained alarmingly consistent at around 22 to 23 percent. Hicks concluded that "the [National Fire Protection Association] study highlights how important it is to leverage narratives in the near-miss reporting system to learn from the experiences of others." The National Fire Protection Association does not include anecdotal information essential to analyze the causes of or trends in injuries.

What Next?

Leadership at FHWA and the associations—every single responder engaged in traffic incident operations in the field—eventually will participate in the TIM training. This includes firefighters, law enforcement officers, safety service patrols, public works teams, towing personnel, emergency medical services, and others as needed, depending on the type and complexity of the response. FHWA continues to build an instructor cadre in each State and will establish a cadre in each State plus the District of Columbia by the end of 2014.

Immediately after being trained by FHWA, these instructors will start training boots-on-the-ground practitioners, mid-level supervisors, and even executives at the local, regional, tribal, and State levels. As of June 15, 2014, this effort had already begun in 42 States and the District of Columbia, with the plan being to complete at least one training course in all States and two territories by December 31, 2014, as outlined as a part of the second Every Day Counts initiative.

Once the instructor round is fully completed, the plan is to switch the focus to blending this material into every basic training curriculum for firefighters, prehospital care providers, law enforcement officers, and highway workers (tow truck operators). Adding a 4-hour block of instruction to a 16- to 26-week recruit training program should not pose a significant challenge.

Finally, the hope is that responders will revisit this 4-hour course at least once per year after receiving the initial training certification. The materials for an online TIM course were pilot tested in May 2014,

and FHWA launched the course in late June 2014. The electronic, or "e-learning," version will be divided into short modules, so that a trainee can easily access and complete the training, even with a busy work schedule. Using an electronic version for sustainment training is a convenience for first responders and a cost-saving measure for public safety agencies. The e-learning component of the TIM program also is a way to keep the information fresh, and it has been designed to keep the training simple and realistic. Future iterations may include facilitated, multifunctional participation using the e-learning tool and electronic meeting rooms.

Costs Versus Benefits

FHWA's TIM program, and especially the SHRP2 National Traffic Incident Management Responder Training, coupled with the focus on risk management and the struck-by, near-miss framework, is expected to go a long way in resolving this recurring safety problem. Keeping in mind public safety's goal of preventing harm in the community, the TIM program will reduce injuries, fatalities, and property loss by preventing many secondary crashes.

In turn, the U.S. highway system will be more reliable for moving people and goods safely and efficiently. By improving the skills of TIM responders, FHWA and its partners can mitigate some of the $400 billion pricetag that comes with crashes and the resulting traffic congestion, which includes such items as the expense of wasted fuel. Other operational expenses might be drastically reduced as well, once TIM is fully operational.

FHWA Associate Administrator for Operations Jeff Lindley says, "FHWA leadership is very proud of the work that our headquarters and division staff are doing, with the help of their partners in fire and rescue, law enforcement, emergency medical services, towing, and public works, to get the message out about the availability of this foundational training course."

Lindley continues, "It is a game-changer, and the guidance taught in this SHRP2 traffic incident responder course will save responders' and motorists' lives while enhancing mobility and the reliability of the U.S. highway infrastructure."

Dennis L. Rubin is a fire chief who represented the Cumberland Valley Volunteer Firemen's Association as FHWA's onsite fire technical expert from November 2013 to March 2014. He worked with the FHWA Traffic Incident and Events Management Team to support the agency's goal of training fire service instructors on how to deliver the course around the Nation. Rubin served as chief of the District of Columbia and Atlanta, GA, fire departments. He also worked as the city manager for Dothan, AL. He serves as an adjunct instructor with the Department of Homeland Security's National Fire Academy and authored several textbooks on fire service operations.

Kimberly C. Vásconez is a professional emergency manager and serves as the team leader of Traffic Incident and Events Management and director of the TIM program in FHWA's Office of Operations. Her team develops national policy, guidance, and tools for TIM; traffic planning for special events; incident management for transportation officials; and disaster transportation planning. Vásconez has 28 years of disaster management experience with FHWA, the Department of Homeland Security, the Federal Emergency Management Agency, and the U.S. Agency for International Development. She holds a bachelor's degree in journalism from Indiana University of Pennsylvania and a master's degree in public and international affairs from the University of Pittsburgh.

For more information, contact Kimberly C. Vásconez at 202-366-1559 or kimberly.vasconez@dot.gov. To find out more about FHWA's TIM program, please visit www.ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm or contact the SHRP2 TIM course program manager by email at james.austrich@dot.gov.

Dexter Davis. ©2009 Travelers Marketing LLC.

The use of safety service patrol vehicles like the one shown here to block traffic increases the safety zone and reduces the risk to responders and expensive fire equipment. Also used are highway maintenance vehicles and temporary traffic control devices, like arrow boards and cones.