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U.S. Department
of Transportation
**Federal Highway
Administration**

1200 New Jersey Ave., SE
Washington, D.C. 20590

April 2, 2021

FOIA Control Number:
2020-0305
In Reply Refer to:
HOP-1

This is in response to your Freedom of Information Act (FOIA) request, dated September 28, 2020, FOIA Control Number 2021-0305, wherein you seek the following publications from 2017 to 2020:

- 1) A copy of the Compendium of Traffic Management developed by ICF International Inc. for FHWA under Task Order DTFH6116D00052, (6925_6925_0018_0_DTFH6116D00052_0) #18.
- 2) A copy of the Traffic Incident Management (TIM) Training Compendium, developed by Leidos/SAIC for FHWA under Task Order DTFH6116D00053 (6925_6925_0011_0_DTFH6116D00053_0) #11.

All documents per the date of your FOIA request have been processed.

A copy of the Compendium of Traffic Management entitled “Strengthening Linkages between Transportation Demand Management and Traffic Management” is publicly available at <https://ops.fhwa.dot.gov/publications/fhwahop18072/index.htm>.

A copy of the Traffic Incident Management (TIM) Training Compendium entitled “Traffic Incident Management Training Compendium and Capacity Building Progression Roadmap” is enclosed and not publicly available.

The Freedom of Information Act only applies to records already in existence and does not require an agency to create, compile, or obtain from records outside the Department, or answer questions presented as FOIA requests.

There are no associated fees with this request.

Pursuant to U.S. Department of Transportation regulations (49 CFR § 7.32), you have the right to appeal this decision in writing to Mr. Arlan Finfrock, Associate Administrator for Administration, Federal Highway Administration. Your appeal may be mailed to 1200 New Jersey Avenue, SE, E66-322, Washington, DC 20590-9898, or sent via e-mail at FHWA.foia.appeals@dot.gov or via fax at (202) 366-7499. Should you wish to exercise this right, the Agency decision on the appeal will be the final administrative action. Your appeal must be postmarked or, in the case of electronic or facsimile transmission, submitted within ninety (90) calendar days from the date the initial determination is signed. The appeal should include the FHWA file or reference number assigned to the request and all information and arguments relied upon in making the appeal.

You also have the right to seek dispute resolution services from the FHWA FOIA Public Liaison, Jim Spratt, FOIA.PublicLiaison@dot.gov, via phone (202) 366-4240; or the Office of Government Information Services (<https://ogis.archives.gov>) via phone (202) 741-5470/toll free (877) 684-6448; fax (202) 741-5769; or e-mail ogis@nara.gov.

Sincerely,

**MARK RICHARD
KEHRLI**

Digitally signed by
MARK RICHARD KEHRLI
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Mark Kehrli
Director, Office of
Transportation Operations

TRAFFIC INCIDENT MANAGEMENT TRAINING

Compendium and Capacity Building Progression Roadmap



U.S. Department of Transportation
Federal Highway Administration

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16. Abstract The Federal Highway Administration (FHWA) has been providing specialized training for Traffic Incident Management (TIM) mid-level management and field practitioners for over eight years. The SHRP2 TIM Responder Training Course has been a great success, with over 325,000 first responders nationwide receiving training that has institutionalized TIM quick clearance, prompt/reliable/interoperable communication and safety protocols among TIM Task Forces and other practitioners that arrive at the scene of a traffic crash. Many sources through the development and delivery of the TIM program commented that a stratified training progression curriculum must be developed to support the different roles that TIM Task Force members play in the field. To analyze this, the FHWA commissioned this report to (1) summarize minimum job performance requirements, (2) determine relevant courses that could be adapted to complement and/or enhance the existing National Responder Training, and (3) recommend options to establish a "TIM Skill Level(s)" tiered training approach that could be achieved by TIM responders by completing specified training. Additionally, recommendations for TIM training sustainability are detailed.			
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LIST OF ABBREVIATIONS AND ACRONYMS

AASHTO	American Association of State Highway Transportation Officials
ARTBA	American Road Transportation Builders Association
APWA	American Public Works Association
ATSSA	American Traffic Safety Association
CALTRANS	California Department of Transportation
CVVFA	Cumberland Valley Volunteer Fireman's Association
DHS	U.S. Department of Homeland Security
DOT	Department of Transportation
EMS	Emergency Medical Services
ERSI	Emergency Response Safety Institute
FHWA	Federal Highway Administration
FSP	Freeway Service Patrol
GDOT	Georgia Department of Transportation
HAZMAT	Hazardous Materials
HDOT	Highway Department of Transportation
HERO	Highway Emergency Response Operators
IACP	International Association of Chiefs of Police
IAFC	International Association of Fire Chiefs
IAFF	International Association of Fire Fighters
ICS	Incident Command System
IFSTA	International Fire Service Training Association
IMSA	International Municipal Signal Association (IMSA)
IMTF	Incident Management Task Forces
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
JPR	job performance requirement
MUTCD	Manual of Uniform Traffic Control Devices
NAEMSO	National Association of State EMS Officials
NCHRP	National Cooperative Highway Research Program
NFPA	National Fire Protection Association
NHI	National Highway Institute
NIMC	National Incident Management Coalition
NIMS	National Incident Management System
NLEA	National Law Enforcement Associates
NQS	National Qualification System
NREMT	National Registry of Emergency Medical Technicians

LIST OF ABBREVIATIONS AND ACRONYMS (CONTINUED)

NSA	National Sheriffs' Association
NSSE	National Special Security Event
NTIMC	National Traffic Incident Management Coalition
NUG	National Unified Goal
NVFC	National Volunteer Fire Council
QC	Quick Clearance
RWIS	Road Weather Information System
SHRP2	Strategic Highway Research Program 2
SOP	Standard Operating Procedure
SQC	Safe, Quick Clearance
TIM	Traffic Incident Management
TMC	Transportation Management Center
TOC	Traffic Operations Center
TSMO	Transportation Systems Management and Operations
TRAA	Towing and Recovery Association of America
TRB	Transportation Research Board
USDOT	U.S. Department of Transportation
USFA	U.S. Fire Administration

EXECUTIVE SUMMARY

As traffic incident management (TIM) practices and responder needs have become better understood by each first responder group, so too has the need for comprehensive and continuous TIM training. With limited funding to address roadway safety, ever-increasing congestion, and rising costs to add roadway capacity, the Federal Highway Administration (FHWA) has commissioned this task order to provide guidance to continue TIM improvement beyond the second Strategic Highway Research Program (SHRP2).

The FHWA study team has identified and reviewed minimum job performance requirements and relevant training courses to fill in training gaps and has also developed recommendations regarding a possible National Incident Management System (NIMS)-like training progression for first responder training. The research team also examined existing TIM literature, publications, data, and reports to further explore TIM training needs.

This report includes (1) a summary of the Minimum Job Performance Requirements review; (2) a summary of the relevant courses that could be adapted to complement and/or enhance the existing National Responder Training; (3) a recommendation for other opportunities to incorporate TIM into existing programs such as NIMS, incident command system (ICS), or organizational accreditation requirements; and (4) recommended options to establish a “TIM Skill Level(s)” tiered training approach that could be achieved by TIM responders by completing specified training. Lastly, the study team recommends ideas for TIM training sustainability.

This report was prepared as a roadmap document for FHWA for future TIM training and capacity building. The report includes basic background and historical information related to TIM to assist in understanding the research, training, and recommendations contained herein. It is understood that implementation of the recommendations will be dependent upon senior FHWA approval as well as availability of funding, primarily at the Federal and State Department of Transportation levels.

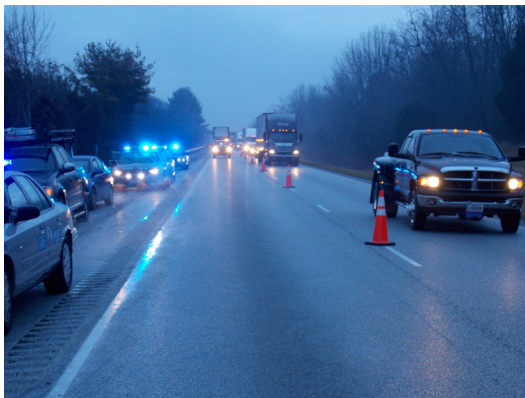


Figure 1. Photo. An incident scene.

Source: Parsons Corporation

The information contained within this document is geared toward multidisciplinary TIM stakeholders from both public and private sectors. These stakeholders include but are not limited to: personnel from transportation agencies, law enforcement, fire and rescue, emergency medical services (EMS), public safety communications, emergency management, towing and recovery, hazardous materials (HazMat), utilities, contractors, and the media.

MINIMUM JOB PERFORMANCE REQUIREMENTS

The FHWA study team reviewed over a dozen relevant organizations to determine their minimum job performance requirements (JPRs) and how these requirements could be used to inform training needs for TIM responders. While many organizations have small portions of TIM included within their JPRs, this research determined

that only the National Fire Protection Agency 1091 contains JPRs that are truly relevant and beneficial to the development of a TIM Training compendium.

POTENTIAL TIM TRAINING PROGRESSION COURSES

In addition to the organizations reviewed to determine possible minimum JPRs and their relevance to TIM training, many other organizations' free and for-fee course offerings were examined for possible inclusion within a potential TIM training progression. The courses with the greatest potential for inclusion came from organizations such as the American Association of State Highway and Transportation Officials (AASHTO), Emergency Responder Safety Institute (ERSI) and the National Fire Protection Association (NFPA).

REVIEW OF A NIMS-LIKE COURSE PROGRESSION

The FHWA study team reviewed the NIMS training progression as well as their National Qualification System (NQS) as possible models for a TIM Training Compendium. The NQS establishes standard minimum qualifications for specific incident-related positions to provide consistency across the Nation. It is recommended that a NQS be considered as a model for recognizing proficiency across various TIM-related activities.

GAP ANALYSIS – IDENTIFICATION OF TIM TRAINING NEEDS

After reviewing various TIM programs across agencies and the examination of recent TIM literature and symposia, the FHWA study team identified 12 major gaps in TIM training, ranging from a lack of awareness of TIM to a lack of multidisciplinary training. Other gaps include conflicting priorities, unfamiliarity with the media's role in TIM, and lack of interagency coordination at the senior executive level. These gaps have been considered as the team developed its task order recommendations.

RECOMMENDATIONS

Based upon the analysis performed regarding minimum job performance requirements and possible free or for-fee TIM-related courses, a review of the NIMS training, a gap analysis related to TIM training needs and the potential establishment of a NIMS-like training progression, the FHWA study team has developed the following list of recommendations for consideration:



Table 1. Study team recommendations.

RECOMMENDATIONS	
1	Traffic incident management (TIM) programs must be on-going and actively managed to reflect the latest technologies. The programs must be geared towards future travel needs, which will dictate the future of TIM.
2	TIM training should be institutionalized to be sustainable and should be codified into a training progression similar to National Incident Management System (NIMS). Courses from TIM 100 to TIM 800 are briefly described in this document and are designed to address the identified TIM training gaps.
3	A “National TIM Qualification System” should be developed and implemented to standardize on-scene responses, promote agency integration and coordinate common procedures. This National Traffic Incident Management Qualification System (NTIMQS) would supplement the “Preparedness” component of NIMS and would establish standard minimum qualifications for specific TIM-related positions.
4	A TIM Training Sustainability Plan should be developed, adopted and executed. Recommendations associated with this effort are briefly described in this document.

For TIM Training to be successful, TIM programs must be ongoing and actively managed to reflect changing travel patterns and the latest technologies. The SHRP2 training has served to unify TIM responders across various disciplines, providing them with a common language and response criteria and there is a need to build on this success.

Below is a brief list of recommendations to ensure sustainability for traffic incident management training.

Table 2. Sustainability recommendations.

TOPIC	RECOMMENDATION
Training	Establish a multidiscipline, nationwide, traffic incident management (TIM) training committee.
TIM Skill Level Training	Move toward institutionalizing TIM training by implementing the TIM Skill Level(s) tiered training approach modeled after the National Incident Management System (NIMS) Incident Command System.
National TIM Qualification System	Codify traffic incident management as a standard like the Federal Emergency Management Administration NIMS program by institutionalizing TIM within a NIMS-like structure by creating a “National TIM Qualification System.” This system would standardize an on-scene response to promote agency integration and coordinate responses and common procedures.

Table 2. Sustainability recommendations (continuation).

TOPIC	RECOMMENDATION
Professional Qualification Standards	Implement National Fire Protection Association (NFPA)-like professional qualifications standards for TIM that outline the requisite knowledge and skill for TIM-related tasks.
TIM Network	The TIM Network should be expanded and actively managed to reach all responders and influence training best practices.
The Responder	The Responder should be expanded and actively managed to reach all responders.
National Special Security Event	Traffic Incident Management is a natural component of NSSE, and the training compendium should include elements related to these events.
Manual of Uniform Traffic Control Devices (MUTCD)	This familiarization training is offered in the Responder Training courses; however, it is recommended that consideration be given to changing the language in Chapter 6-I (07) for on-scene responder organizations from “should” train to “shall” train.
TIM Responder Training Professional Development Credits	TIM in-service credits should be expanded nationwide to encourage participation in TIM classes.
TIM Self-Assessments	Consistently applied metrics push an organization to continually improve TIM training. A continued emphasis on TIM-self assessment must continue.
TIM Post-Course Assessment Tool	Participation in TIM assessment should be a requirement for successful completion of the Responder Training course.
Towing and Recovery	While the Towing and Recovery Association of America (TRAA) is challenging members of the towing industry to promote the second Strategic Highway Research Program (SHRP2) National TIM Responder Training, TIM training should be mandated for any towing recovery responder operating on the highway.
Refresher Training	It is recommended that annual refresher training be a requirement for all TIM responder trainees.

Table 2. Sustainability recommendations (continuation).

TOPIC	RECOMMENDATION
Transportation Systems Management and Operations (TSMO)	It is recommended that an awareness section on TSMO be developed and added to the TIM Training Compendium.
Distracted Responders	There is a TIM training need on this topic to enhance responder safety and the creation of specific operational guidelines. This could be an FHWA initiative, and upon completion included within the TIM training compendium.
Law Enforcement Accreditation	To enhance the recognition of TIM and expand the number of TIM training participants, efforts should be made to include Traffic Incident Management training as a law enforcement professional requirement.
Fire Service Accreditation	To enhance the recognition of TIM and expand the number of TIM training participants, efforts should be made to include Traffic Incident Management training as a fire service professional requirement.
Funding	Dedicated Federal, State, and local funding sources need to be identified to ensure TIM training sustainability.

FHWA-led TIM and TIM training are essential elements of the Every Day Counts programs, and development, adoption, and implementation of these recommendations will be instrumental to the successful continuation of TIM training nationwide.

CHAPTER 1. PURPOSE OF THIS REPORT

As traffic incident management (TIM) practices and responder needs have become better understood by each first responder group, so too has the need for comprehensive and continuous TIM training. With limited funding to address roadway safety, ever-increasing congestion, and rising costs to add roadway capacity, the Federal Highway Administration (FHWA) has commissioned this task order to provide guidance to continue TIM improvement beyond the second Strategic Highway Research Program (SHRP2).

The research team has identified and reviewed minimum job performance requirements and relevant training courses to fill in training gaps and has also developed recommendations regarding a possible training progression for first responder training similar to that used in the National Incident Management System (NIMS). The research team also examined existing TIM literature, publications, data, and reports to further explore TIM training needs.



Figure 3. Photo. National traffic incident management training.

Source: Parsons Corporation

This report includes (1) a summary of the minimum job performance requirements and recommendation for TIM qualifications; (2) a summary of the relevant courses that could be adapted to complement and/or enhance the existing national responder training; (3) a recommendation for other opportunities to have TIM included as part of existing programs such as NIMS, incident command system (ICS), or organizational accreditation requirements; and (4) recommended options to establish a “TIM Skill Level(s)” tiered training approach that could be achieved by TIM responders by completing specified training. Lastly, we recommend ideas for TIM training sustainability.

This report was prepared as a roadmap document for FHWA for future TIM training and capacity building. The report includes basic background and historical information related to TIM to assist in understanding the research, training, and recommendations contained herein. It is understood that the recommendations are broad based and may not all be achievable due to lack of funding or because the recommendations are outside the oversight of FHWA.

The information contained within this document is geared toward multidisciplinary TIM stakeholders from both public and private sectors. These stakeholders include, but are not limited to, personnel from transportation agencies, law enforcement, fire and rescue, emergency medical services (EMS), public safety communications, emergency management, towing and recovery, hazardous materials (HazMat), utilities, and the media.

CHAPTER 2. TRAFFIC INCIDENT MANAGEMENT

As described in the FHWA *Traffic Incident Management Handbook*, a highway incident is any non-recurring event (such as a vehicle crash, a vehicle breakdown, or a special event) that causes a reduction in roadway capacity or an abnormal increase in traffic demand and disrupts the normal operation of the transportation system. Most highway incidents are random events that occur with little or no advanced warning. They can vary widely in terms of severity, ranging from a minor crash involving a single response agency (such as law enforcement) to a natural disaster or other catastrophe requiring a multi-agency response from multiple jurisdictions and disciplines. Incidents are a major source of congestion on the roadway system and can contribute to problems away from the actual incident scene (for example, secondary crashes caused due to unexpected congestion).

Traffic Incident Management (TIM) is defined as the coordinated, preplanned use of technology, processes, and procedures to reduce the duration and impact of incidents and to improve the safety of motorists, crash victims, and incident responders. Specifically, TIM involves the use of technology, procedures, and processes to accomplish the following:

- Reduce the amount of time to detect and verify that an incident has occurred.
- Shorten the time required for appropriate response personnel and equipment to respond to the scene.
- Facilitate the management of response apparatus and personnel on site to minimize the amount of capacity lost due to the incident and the response equipment.
- Lessen the amount of time required to clear the incident from the travel lanes.
- Provide for the rapid notification of travelers upstream of the incident to encourage a reduction in traffic demand entering the incident area and to reduce driver frustration.
- Reduce secondary crashes.
- Increase responder safety.

The national traffic incident management timeline includes two key measures for traffic incident management: roadway clearance and incident clearance. It is important that all responders understand the difference between these measures, and how they fit into the timeline.

Building strong, sustainable TIM programs is essential for prompt and safe responses on highways. As our understanding of TIM improves, many jurisdictions are realizing that institutionalizing these programs creates a more effective and efficient response while safeguarding responders and motorists. For TIM to be successful in the long-term, organizations must incorporate TIM into their training requirements and ensure that highway/roadway Standard Operating Procedures (SOPs) or Standard Operating Guidelines (SOGs) mirror the instructional format of TIM Responder Training. TIM should be viewed as more than a job function—it should be considered an ongoing activity that requires regular planning, preparation, training, and performance measurements. Every responder engaged in traffic operations should participate in ongoing TIM training. TIM training must be institutionalized to ensure that critical services are provided and to create long-term success among TIM programs.

TRAFFIC INCIDENT MANAGEMENT TRAINING
COMPENDIUM & CAPACITY BUILDING PROGRESSION ROADMAP

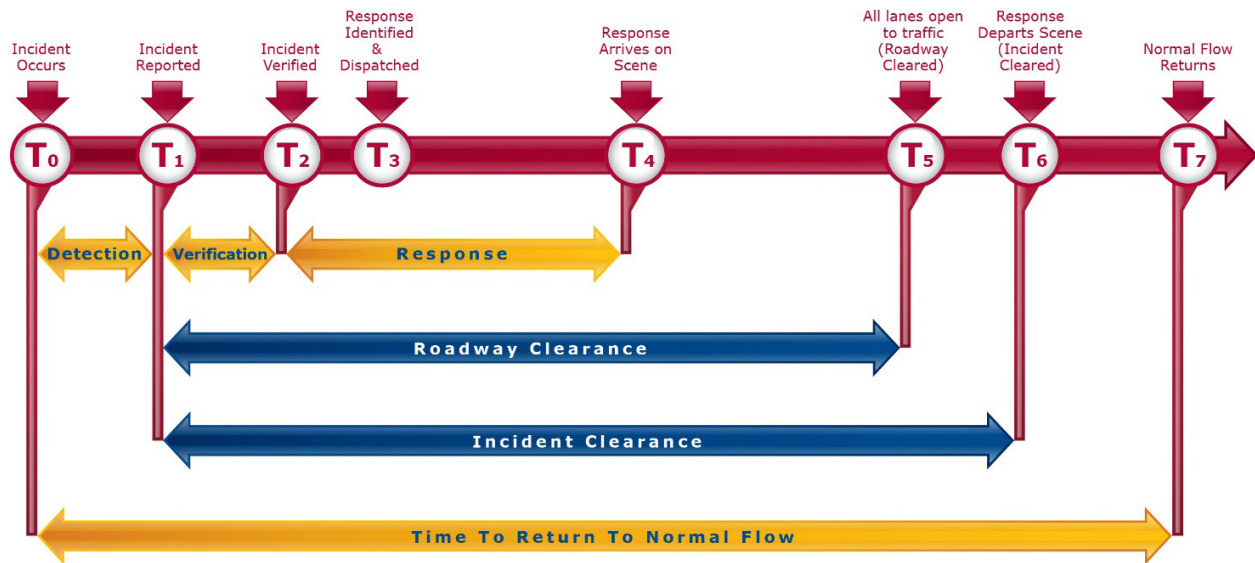


Figure 4. Diagram. Traffic incident management timeline.

Source: Federal Highway Administration

CHAPTER 3. BRIEF HISTORY OF TRAFFIC INCIDENT MANAGEMENT

Since the 1980s leadership from the Federal Highway Administration (FHWA) has promoted traffic incident management (TIM) as an effective strategy for traffic operations, conducting research and dissemination of noteworthy practices. However, it was not until the FHWA formed the National Traffic Incident Management Coalition (NTIMC) in 2004 that TIM was formalized and then achieved a sustained, broad-based interest. The NTIMC, comprised of representatives from responder disciplines and other interested stakeholders, developed and promoted many initiatives as described below.

From 2003 to 2005, FHWA, American Association of State Highway Transportation Officials (AASHTO), NTIMC, and others conducted an international scan on traffic incident response practices in Europe. The findings of the group included the importance of setting a national policy that supports efforts of traffic incident responders. As a result of this significant scan, FHWA, AASHTO, and other members of the NTIMC produced, presented, and adopted a National Unified Goal (NUG) for TIM in 2007. The NUG includes a collection of 18 strategies designed to help agencies contribute to reaching three primary objectives:

- ✓ Responder Safety.
- ✓ Safe, Quick Clearance.
- ✓ Prompt, Reliable, Interoperable Communications.

Adoption of the NUG was a notable step in advancing TIM as a national issue. To identify additional opportunities to advance the state of TIM practices, policies, and programs, FHWA convened more than 50 national leaders in June 2012 from the fields of transportation, law enforcement, fire and rescue, and emergency medical services to discuss challenges and innovative solutions in promoting safe and quick response to traffic incidents. The effort received unprecedented support for TIM from USDOT, AASHTO, the Transportation Research Board (TRB) through the second Strategic Highway Research Program (SHRP2), as well as from the International Association of Chiefs of Police (IACP), International Association of Fire Chiefs (IAFC), National Volunteer Fire Council (NVFC), and the National Association of State EMS Officials (NASEMSO).

Starting in 2010, FHWA has conducted TIM advanced practitioner workshops and held outreach visits in the country's 40 largest metropolitan areas. They have educated mid-level managers and senior decision makers from the following areas: government, law enforcement, fire and rescue, emergency medical services, metropolitan planning organizations, towing, and State and local department of transportation (DOT) agencies. FHWA has used these visits to discuss the importance of TIM policies, procedures, noteworthy practices, lessons learned, performance measurement, and safe, quick clearance laws and policies. To date, these workshops continue with over 67 sessions.

The NTIMC was superseded in 2013 by a new Executive Leadership Group (ELG) comprised of top representatives from FHWA, AASHTO, IACP, NVFC, IAFC, International Municipal Signal

Association (IMSA), American Traffic Safety Services Association (ATSSA), and the Towing and Recovery Association of America (TRAA). The ELG meets twice per year to discuss overall TIM policy and strategy.

FHWA continues to bring enhanced multidisciplinary relationships and provide tools to educate professional responders on how to address traffic incidents safely and quickly. Among other initiatives, FHWA hosted senior executive and public safety summits in Washington, DC in June 2012 and January 2015. FHWA also sponsored a TIM responder training symposium in 2016. In addition to the multidisciplinary classroom training, FHWA expands TIM training opportunities by providing instructor-led virtual training through the National Highway Institute (NHI) TIM responder web-based training and has worked to have TIM responder training offered in law enforcement and fire basic training academies. FHWA will continue to reach responders across the Nation through its Every Day Counts initiatives and through the continued support of SHRP2 responder training, information exchanges and Webinars. Additionally, FHWA spearheads the National Traffic Incident Response Awareness Week each November to bring nationwide attention to first responders and their safety.



Figure 5. Screenshot. Cover of Traffic Incident Management Handbook
Source: Federal Highway Administration

CHAPTER 4. TRAFFIC INCIDENT MANAGEMENT STAKEHOLDERS



Figure 6. Photo. Tow recovery instruction.

Source: Parsons Corporation

One of the challenges inherent in traffic incident management (TIM) is that there are numerous stakeholders involved who have myriad and often divergent priorities. It is acknowledged that the priorities of different responder groups may hinder success in practicing collaborative incident management. Each responder group—transportation, law enforcement, fire and rescue, emergency medical response, and towing—arrives at the scene of a crash with a different immediate objective, even though the ultimate goal is to clear the crash scene in a safe and timely manner. Law enforcement personnel need to manage traffic around the scene of a crash while also documenting

the circumstances and issuing citations or making arrests when necessary. Fire and emergency medical services (EMS) personnel are typically focused solely on controlling hazards and ensuring that crash victims receive medical attention. Transportation personnel are responsible for providing traffic control, informing other drivers of the incident, providing alternate route information, and clearing vehicles and debris from the roadway. These major roles, along with other stakeholders' responsibilities, are shown in the table below.

Table 3. Primary traffic incident management stakeholders.

STAKEHOLDER	RESPONSIBILITY
Law Enforcement (LE)	Often the first responder on scene, LE personnel will secure the incident scene; provide initial emergency response if there are injuries; direct traffic around the incident; conduct accident investigation.
Fire and Rescue (F&R)	Protect the incident scene; provide emergency aid to injured motorists; suppress fires; address any initial hazardous materials release.
Emergency Medical Services (EMS)	Treat injuries; prepare and transport seriously injured motorists to the hospital.
Transportation (DOT)	Secure the incident scene; establish traffic control around the incident; provide motorist assistance; incident clearance; restore traffic flow after incident cleared.
Towing and Recovery (T&R)	Removal of damaged vehicles and debris; incident scene clean-up.

Table 3. Primary traffic incident management stakeholders (continuation).

STAKEHOLDER	RESPONSIBILITY
Communications	<p>Transportation Management Center (TMC) – Incident detection, verification; identify alternate routes; provide motorist information.</p> <p>Public Safety Dispatch – Receive and transmit incident information; dispatch public safety incident response.</p> <p>Traffic Media – Inform motorists of incidents, incident clearance times and alternate routes.</p>
Medical Examiner	Investigate any incident involving a fatality.
HazMat Responders	Contain and clean up any hazardous material spills associated with traffic incidents.

Opportunities to collaborate exist, but each responder community needs to be aware of and understand the priorities of other responders. Furthermore, responders need to recognize how the priorities and actions of each group contribute to their common goal: the safety of responders and the public. Emergency personnel who block access to all travel lanes may not be aware that the resulting additional congestion increases the risk of a secondary crash. Conversely, first responders may not recognize all the hazards of a crash scene. Given the role of multidisciplinary coordination in successful TIM, it is critical that all responders be trained in standardized best practices.

CHAPTER 5. MINIMUM JOB PERFORMANCE REQUIREMENTS

As part of the task order objectives, the Federal Highway Administration (FHWA) study team reviewed minimum job requirements for first responders by researching many stakeholder and related organizations. The objective was to identify minimum job performance requirements for relevant disciplines such as fire, law enforcement, emergency medical technicians, towing and recovery, and departments of transportation (DOT), and to determine if the fulfillment of these requirements would warrant additional training in these competencies for traffic incident management (TIM) professionals.

Below is a list of organizations with broadly relevant TIM job performance offerings. Table 4 contains a list of job performance offerings for some of these organizations.

- American Association of State Highway and Transportation Officials (AASHTO)
- American Public Works Association (APWA)
- National Registry of Emergency Medical Technicians (NREMT)
- National Law Enforcement Associates (NLEA)
- National Sheriffs' Association (NSA)
- American Traffic Safety Services Association (ATSSA)
- Towing and Recovery Association of America (TRAA)
- American Road Transportation Builders Association (ARTBA)
- International Municipal Signal Association (IMSA)
- Emergency Responder Safety Institute (ERSI)
- National Fire Protection Association (NFPA)
- California Department of Transportation (Caltrans) Traffic Incident Management Guidelines
- Hawaii Department of Transportation (HDOT) Freeway Service Patrol (FSP) Operator Requirements
- Georgia Department of Transportation (GDOT) Highway Emergency Response Operators (HERO) Operator Requirement



Figure 7. Photo. Safety service patrol vehicle and the equipment it carries.

Source: Parsons Corporation

Table 4. Traffic incident management job performance offerings by organization.

ORGANIZATION	TRAFFIC INCIDENT MANAGEMENT JOB PERFORMANCE OFFERING
American Association of State Highway and Transportation Officials (AASHTO)	<p>120 web-based courses.</p> <p>Has a traffic and safety section with several relevant courses.</p> <p>Their training site has skills matrices that show the required skills for each level and category.</p>
American Traffic Safety Services Association (ATSSA)	<p>Provides certification in a variety of areas.</p> <p>They maintain a State-by-State database of training/certification requirements.</p>
Towing and Recovery Association of America (TRAA)	<p>Certify on three levels.</p> <p>Training is completed through Wreckmaster.</p> <p>Level 1 - Light Duty (Nationally Certified Tow Operator™).</p> <p>Level 2 - Medium/Heavy Duty (Master Tower®).</p> <p>Level 3 - Heavy Recovery (Heavy Recovery Specialist®).</p>
California Department of Transportation (Caltrans)	<p>Caltrans Traffic Incident Management Guidelines.</p> <p>The roles and responsibilities of those involved with incident management activities vary based on severity of incidents and jurisdictional boundaries.</p>
National Fire Protection Association (NFPA)	<p>Minimum job performance requirements (JPRs) for Traffic Control Incident Management Personnel (TCIMP).</p> <p>(1) Educational requirements established by the Authority Having Jurisdiction (AHJ).</p> <p>(2) Age requirements established by the AHJ.</p> <p>(3) Medical requirements established by the AHJ.</p> <p>(4) Job-related physical performance requirements established by the AHJ.</p>

Table 4. Traffic incident management job performance offerings by offering organization (continuation).

ORGANIZATION	TRAFFIC INCIDENT MANAGEMENT JOB PERFORMANCE OFFERING
Emergency Responder Safety Institute (ERSI)	<p>Free online training for roadway incident qualifications and certifications.</p> <p>(1) Advance Warning,</p> <p>(2) High Visibility Innovations,</p> <p>(3) Blocking Procedures at Roadway Incidents,</p> <p>(4) TIM Incident Command & Management.</p>

National Fire Protection Association (NFPA) 1091 Job Performance Requirements (JPR)

The NFPA developed NFPA 1091 “Standard for Traffic Control Incident Management Personnel Qualifications.” NFPA professional qualifications standards identify the minimum JPRs for specific emergency services levels and positions. The standards can be used for training design and evaluation; certification; measuring and critiquing on-the-job performance; defining hiring practices; job descriptions; and setting organizational policies, procedures, and goals. Professional qualifications standards for specific jobs are organized by major areas of responsibility considered as duties.

The professional qualifications standards are written to describe the performance required for a specific job and are grouped according to the duties of the job. The complete list of JPRs for each duty defines what an individual must be able to do to perform and achieve that duty.

The intent of the JPRs is to provide a clear and concise method to determine that an individual, when measured to the standard, possesses the skills and knowledge to perform a job-related task. The requisite knowledge is the fundamental knowledge one must have to perform a specific task. Requisite skill is the essential skills necessary to perform a specific task. Prior to performing a TIM related task, individuals should have requisite knowledge and skill which are the foundation for safely performing such a task.

An analysis of the research revealed a variety of job performance requirements, many of which are specific to the needs of individual organizations. Except for the National Fire Protection Association (NFPA 1091), no discipline had specific TIM related job performance requirements (JPRs) that would be relevant for this study. The NFPA 1091 JPRs are applicable to all responders and may be used as guidance for the delivery of responder training and qualifications.

CHAPTER 6. POTENTIAL TRAFFIC INCIDENT MANAGEMENT TRAINING PROGRESSION COURSES

As a second objective of the task order, the Federal Highway Administration (FHWA) study team reviewed training course information from a variety of sources that could help traffic incident management (TIM) responders in the following areas: responder and motorist safety, safe/quick clearance of roads and prompt/reliable/interoperable communications. The research



Figure 8. Photo. Clearing an incident during inclement winter weather.

Source: Getty Images

identified relevant courses that could be adapted to complement the existing FHWA-led second Strategic Highway Research Program (SHRP2). The information collected and analyzed helped determine the relevant free or for-fee courses that could be used to advance TIM responder capabilities. The research findings were cataloged by organization, course, type, length, cost, pre-requisites, and description.

The training structure and content of TIM programs vary greatly from one entity to the next. Some States and organizations have well-established TIM programs that offer enhanced TIM training, while other TIM

programs are housed between or within other agency offices, such as maintenance or operations. Organizational structures and TIM training also vary depending on the size of the TIM programs.

To further the FHWA efforts, two other entities have shaped TIM training and TIM professional qualifications. The first, the National Fire Protection Association (NFPA), developed professional qualifications standards and minimum job performance requirements for specific emergency services levels and positions (NFPA 1091), as described in the previous section of this report. The second, Emergency Responder Safety Institute (ERSI), has developed an online grouping of TIM-related courses that supports FHWA and enhances TIM.

Several of the following organizations have issued TIM responder training or guidelines:

- The Emergency Responders Safety Institute's Responder Safety website has a suite of free short courses.
- The IACP has prepared an informational video.
- The TRAA incorporates TIM into its certification courses.
- The United States Fire Administration issued a revised Traffic Incident Management Systems Manual in 2012.
- The National Fire Protection Association's Technical Committee on Professional Qualifications for Traffic Incident Control Management developed standards and guidelines for responders from all disciplines (NFPA 1091).

Below is a sample of courses from selected organizations with relevant TIM training offerings.

American Association of State Highway Transportation Officials

The American Association of State Highway Transportation Officials (AASHTO) offers an entry-level seminar that outlines basic and advanced methods of Temporary Traffic Control in Work Zones. This course reviews principles for the design, installation, and maintenance of traffic control devices and identifies applicable standards for common urban, rural, and freeway situations. The course reviews traffic control theory and devices, hand signaling devices, typical situations for construction, and traffic terminology. The course further identifies traffic control strategies related to moving traffic through or around road or street construction, maintenance operations, utility work, and incidents on or adjacent to the roadway.



Figure 9. Screenshot. The AASHTO 2017 Annual Report.
Source: AASHTO

Emergency Responder Safety Institute (ERSI)

The Emergency Responder Safety Institute (ERSI) provides the Responder Safety Learning Network (RSLN) to further TIM through free, vetted, multidisciplinary training, and resources for roadway emergency responders. The learning network uses text, audio, video, graphics, and animation to deliver practical training content that all responders can use to stay safe when operating on the roadways.

Through a special agreement with FHWA, RSLN offers a National TIM Training Certificate for registered users who complete 10 specific online self-paced programs. The ten programs required for the National TIM Training Certificate include:



Figure 10. Screenshot. Flyer promoting free online training through the Responder Safety Learning Network.

Source: Responder Safety Learning Network

1. Advance Warning.
2. Blocking Procedures at Roadway Incidents.
3. High Visibility Innovations.
4. Manual on Uniform Traffic Control Devices (MUTCD).
5. Move It or Work It.
6. See and Be Seen: Emergency Lighting Awareness.
7. Special Circumstances: Safe Operations for Vehicle Fires.
8. Special Hazards.
9. Termination.
10. TIM Incident Command & Management.

ERSI also offers additional training programs and a vast resource library, all free of charge. Further relevant value-added training programs include:

- Recommended Practices for TIM Standard Operating Procedures (SOPs).
- Scene Control.
- The First 15 Minutes at Roadway Incidents.
- Traffic Incident Management on Rural Roads.
- TIM Strategies for Public Outreach.
- Who's in Charge at Roadway Incident Scenes.
- Fire Service Collaboration with Towing and Recovery.

National Towing and Recovery Association (TRAA)

Towing and Recovery operations clear the roadway of disabled or damaged vehicles and their cargos, restoring the roadway to full capacity. It is important for the towing and recovery professionals to know as much as possible about the nature of the vehicle involved so they can bring the correct equipment. This is stressed in the National Responder Training courses.

The National Towing and Recovery Association (TRAA) has developed a three-level National Driver Certification Program with the objective of establishing a higher standard of professionalism in their industry. The three levels are provided through a trademarked private company, Wreckmaster, and are fee based. The three levels are:

Level 1 - Light Duty (Nationally Certified Tow Operator™).

Level 2 - Medium/Heavy Duty (Master Tower®).

Level 3 - Heavy Recovery (Heavy Recovery Specialist®).

Emergency Response to Hazardous Materials

The International Association of Fire Fighters (IAFF) provides an Emergency Response to Hazardous Materials (ER2HM) course to teach the responder community how to plan for and respond to hazmat incidents, in addition to training the members of the community how to assist during recovery. The course was designed around the “whole responder community” approach. This approach integrates all members as vital partners in response to natural and man-made disasters. The course combines 4 hours of web-based training and a 2-day instructor-led training program. This training expands upon the awareness-level training offered in the TIM Responder Training class.



Figure 11. Photo. First responders assist in recovery of a run-off-road crash.

Source: Parsons Corporation

Understanding the New NFPA 1091

Standard for Traffic Control Incident Management Personnel Professional Qualifications (2015 Edition) is a new NFPA voluntary standard that applies to any individual who performs traffic control duties at incident scenes, regardless of the agency or discipline to which that individual belongs. Traffic control at incident scenes is a duty that is not uniformly taught across all responder disciplines. In some cases, it is not formally taught at all. This new standard establishes the job performance requirements that all persons who participate in traffic control at incident scenes should meet. The standard also provides a benchmark for training individuals in traffic control for incident scenes. This self-paced program explores both uses of NFPA 1091, explaining it in “plain language” for emergency responders and discussing how it can be used as a training objectives blueprint.

Federal Highway Administration/National Highway Institute – SHRP2

As the most successful and widely attended TIM training in the Nation, SHRP2’s National Traffic Incident Management Responder Training brings law enforcement, firefighters, DOT, towing, medical personnel, and other incident responders together to engage in interactive, hands-on incident resolution exercises. Learning to coordinate response activities and optimize operations in the classroom is vital to responding effectively in the field and to building a unified national practice on incident management. SHRP2’s 4-hour National Traffic Incident Management Responder Training must be a core course in any TIM compendium that may be developed.

Federal Highway Administration - National TIM Responder Train-the-Trainer Program

The National TIM Responder Train-the-Trainer (TtT) program is intended for experienced TIM practitioners to provide TIM Trainers the knowledge and materials necessary to conduct TIM training for TIM responders. TIM Trainers should be selected based on their knowledge and experience and willingness to conduct SHRP2 4-hour National Traffic Incident Responder Training classes.

CHAPTER 7. NATIONAL INCIDENT MANAGEMENT SYSTEM

The Department of Homeland Security developed the National Incident Management System (NIMS) concept in 2004, following Homeland Security Presidential Directive (HSPD) 5. NIMS provides a framework for incident planning and response at all levels, regardless of cause, size, or complexity. The broad scope of NIMS encompasses every discipline, including transportation, which includes Traffic Incident Management (TIM) programs. It also provides a training compendium model that could be considered by the Federal Highway Administration (FHWA) for TIM training, or potentially provide a structure within which Strategic Highway Research Program (SHRP2) and other FHWA TIM courses could fit.

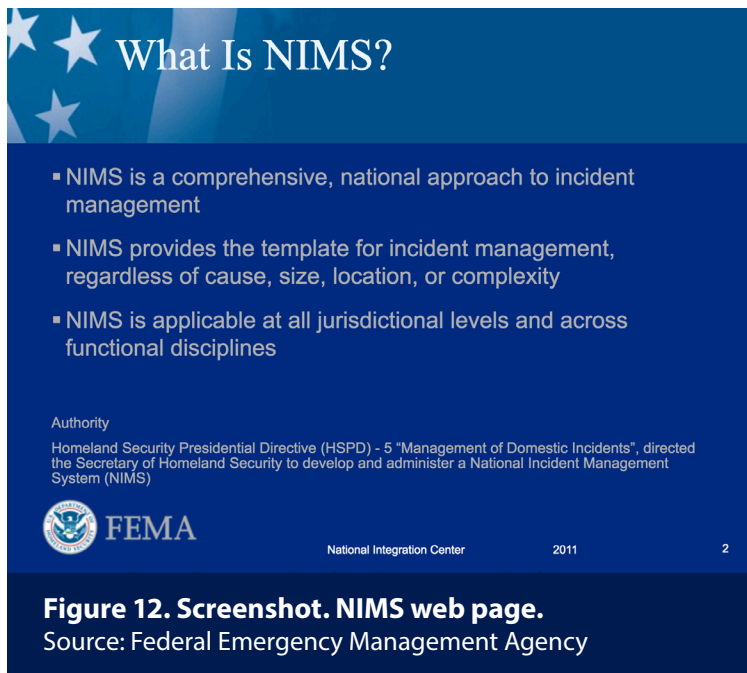


Figure 12. Screenshot. NIMS web page.
Source: Federal Emergency Management Agency

It is recognized that while most public safety professionals understand their responsibility to obtain certain NIMS training, as mandated through HSPD 5, many TIM partners are not certain whether it applies to them. However, any stakeholder that deploys resources to a TIM Area on a roadway must comply with HSPD 5 requirements. This includes DOTs, safety service patrols, towing companies that contract services to TIM operations, and departments of public works that may clear roads of debris, support power restoration in the area, provide lighting, and conduct temporary traffic control operations.

NIMS training provides a systematic approach that establishes a common set of incident objectives and strategies that all agencies with responsibility for managing an incident together can use. NIMS training supports the Incident Command System (ICS) to standardize an on-scene response through Unified Command that promotes agency integration, coordinated responses, and common procedures. The NIMS requirements clearly articulate a need for a formalized structure for incident management and could be used as a basis for a similar TIM training compendium.

Table 5. National Incident Management System program areas, concepts, and program components.

TRAFFIC INCIDENT MANAGEMENT (TIM) PROGRAM AREA	NATIONAL INCIDENT MANAGEMENT SYSTEM CONCEPTS	TIM PROGRAM COMPONENTS
Strategic	Preparedness	<ul style="list-style-type: none"> ✓ Planning ✓ Training and exercises ✓ Ensure readiness of personnel and equipment ✓ Mutual-aid agreements ✓ Multi-agency operations agreements ✓ TIM Task Forces and/or Teams
	Resource Management	<ul style="list-style-type: none"> ✓ Identify and type resources ✓ Identify location of resources ✓ Mobilize resources ✓ Reimbursement
Tactical	Incident Command System	<ul style="list-style-type: none"> ✓ On-scene command and control procedures
Support	Communications and Information Management	<ul style="list-style-type: none"> ✓ Develop information policies ✓ Develop interoperability standards ✓ Utilize common terminology ✓ Develop communications system

Supplementing the resource management component of NIMS, the National Qualification System (NQS) establishes guidance and tools to assist stakeholders in developing processes for qualifying, certifying, and credentialing deployable emergency personnel. The primary benefit of establishing national professional qualifications standards is to provide both public and private sectors with a framework of the job requirements for emergency services personnel. Other benefits include enhancement of the profession, individual as well as organizational growth and development, and standardization of practices. This is another element of the NIMS-like course progression structure for possible consideration for TIM training.

The NQS establishes standard minimum qualifications for specific incident-related positions to provide consistency across the Nation and support nationwide interoperability. Use of the NQS approach to qualify, certify, and credential incident management and support personnel ensures personnel deploying through mutual aid agreements and compacts have the capabilities to perform the duties of their assigned roles.

NQS uses a performance-based approach that focuses on verifying the capabilities of personnel to perform as required in the various incident-related positions. This approach incorporates

education, training, and experience to build proficiency and establishes performance as the primary qualification criterion. This approach differs from training-based systems, which use the completion of training courses or passing scores on examinations as qualification criteria. A performance-based approach is advantageous over a training-based system because it provides greater confidence of on-the-job performance since evaluators have observed the proficiencies of the individual through their performance of a series of pre-designated tasks.

CHAPTER 8. GAP ANALYSIS – IDENTIFICATION OF TIM TRAINING NEEDS



Figure 13. Photo. A safety service patrol team.

Source: Parsons Corporation

Despite the progress made by local, regional, and State transportation and public safety agencies in implementing Traffic Incident Management (TIM) training programs and procedures, effective management of crash scenes sometimes remains an elusive goal. Addressing this challenge offers a great potential to improve safety for both the public and first responders. In addition to compromising safety, traffic incidents are a major cause of congestion, which can cost lives and wastes time and fuel while reducing productivity.

The organizational structure of TIM programs varies greatly from one agency to the next. Some States have well established TIM programs that operate as their own office within the agency, while other TIM programs are housed between or within other agency offices, such as maintenance or operations. These organizational structures and TIM training programs also vary depending on the size of the TIM program and whether it is staffed by State personnel or contractors.

Based on a review of existing literature, including the *Traffic Incident Management Gap Analysis Primer* and notes from the TIM responder symposiums, the following gaps in TIM training have been identified.

- Lack of awareness of TIM.
- Lack of executive level buy-in from some agencies for TIM training.
- Lack of interagency coordination at the senior executive level.
- Lack of coordination among TIM operations.
- Different responders at the scene have different goals, roles, and responsibilities.
- Conflicting priorities and unfamiliarity with the media's role in TIM.
- Lack of multidisciplinary training.
- TIM trainers not actively training responders.
- Lack of standardized equipment staging and scene management.
- Lack of ownership for TIM efforts.
- Lack of dedicated funding for TIM.
- Lack of institutionalization for TIM training.

While ongoing efforts are being made to address these gaps through the Responder Training Programs, it is important to remain focused on the issues until a complete understanding is achieved. Future TIM training will need to continue to address these gaps and provide guidance and information that will measurably improve first responders' on-scene incident management in these areas. The following recommendations are provided to enhance existing training, close the existing gaps and support the different roles that TIM responders play in the field.

CHAPTER 9. RECOMMENDATIONS

Congress authorized the second Strategic Highway Research Program (SHRP2) as part of the Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) to provide funding for the Transportation Research Board (TRB) of the National Academy of Sciences to research better ways to improve the safety, renewal, reliability, and capacity of the Nation's highway system. In pursuit of these goals, the SHRP2 partner organizations—TRB, American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA)—recognized the need for a multidisciplinary training course that provides responders with a shared understanding of requirements and responsibilities for incident management. TRB led the development and pilot testing of a live multidisciplinary training course and corresponding train-the-trainer course to address the need for coordinated incident response. The SHRP2 National Traffic Incident Management Responder Training began in 2007.



Figure 14. Photo. First responders clear an incident scene in the desert.
Source: Parsons Corporation

The actions of the National Traffic Incident Management Coalition (NTIMC), FHWA, and TRB have shaped the state of the practice that exists today. Traffic Incident Management (TIM) practitioners and other National roadway safety leaders have expressed their strong desire that these organizations both continue and enhance the program. In the past decade, substantial resources have been invested to develop and deliver multidisciplinary TIM training programs to over 325,000 first responders nationwide, which is a major achievement. Progress is being made toward the goal of training 1 million responders by 2024. With more than 70 percent of first responders yet to be trained, the challenge is twofold: first, to keep the SHRP2 training momentum going, and second, to build upon the success of this program by enhancing and expanding its scope. The SHRP2 suite of products has been a remarkable success. However, if the need and progression are not reinforced, revised, or improved, the full benefit may not be realized.

With this goal in mind and based upon our research under this task order, the FHWA study team has developed the following recommendations for the future of FHWA-led TIM training.

INSTITUTIONALIZING AND SUSTAINING TRAFFIC INCIDENT MANAGEMENT TRAINING

As lessons learned and awareness of the saturation level of the SHRP2 TIM training are quantified, and with dedicated TIM training facilities now existing in Tennessee, Colorado, and Pennsylvania, it may be time for the next generation of TIM training. A curriculum for a stratified training progression should be developed to support the various roles that TIM members play in the field.

Expand SHRP2 training beyond its initial curriculum into a NIMS-like training progression using a tiered training approach. This could take the form of a training progression, that is systematic, scalable, and expandable to enhance skills for multiple levels of practitioners using a core curriculum.

To be successful, TIM programs must be ongoing and actively managed. The logical TIM institutionalization and course progression would be to codify traffic incident management as standard, similar to the Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS) program. The SHRP2 training has served to unify TIM responders

across various disciplines, providing them with a common language and response criteria. To build on this success and to institutionalize TIM training for all first responders, we recommend that SHRP2 training be expanded beyond its initial curriculum into a NIMS-like training progression using a tiered training approach. This could take the form of a training progression that is systematic, scalable, and expandable to enhance skills for multiple levels of practitioners using a core curriculum.

TIM SKILL LEVEL(S)

A potential “TIM Skill Level(s)” tiered training approach could be modeled after Incident Command System (ICS) training by completing specified training modules.

TIM 100 First Responder Workshop. TIM 100 basis is the National Traffic Incident Management Responder Training (the current SHRP2 training). This 4-hour core program offers a coordinated, multidisciplinary training program for all emergency responders and those supporting traffic incident and event management. The training objective is to influence responders from different TIM disciplines, including law enforcement, emergency medical services (EMS), fire and rescue, department of transportation, towing and recovery, and dispatch, to acquire a common set of core competencies that promote a shared understanding of the requirements for achieving the National Unified Goal (NUG) for TIM. This TIM training may be adapted to be State specific while utilizing a core curriculum.



Figure 15. Photo. Responders attending in-person training.

Source: Parsons Corporation

The preferred instructional method for this training is classroom presentations by approved trainer(s) to a multidiscipline audience. This allows for participant interaction. Alternate methods of content delivery include sector-specific instruction, such as that provided in law enforcement academies or the web-based training currently offered by the National Highway Institute (NHI). Another training method is the self-paced modular delivery of core content, as provided by the Emergency Responder Safety Institute.

Lastly, instruction could be delivered through the development and delivery of instructor-led virtual training. This training blends the qualities of instructor-led classroom training with the convenience of a virtual, online classroom.

TIM 200 Targeted Training. TIM 200 provides targeted, specific training to responders. As a follow-on to TIM 100, this course can offer recommended information to enhance the responders' safety. In addition to the areas below, this course should cover transportation systems management and operations (TSMO) awareness to provide a broader context and promote active responder participation in the TSMO process.

Hazardous Material Training:

Course: <https://www.saferesponse.com/courses/hazardous-materials-response-awareness-level/>

Course: <https://www.hazmatstudent.com/hazmat-training/>

Course: <https://www.iafc.org/events/event/2018/07/02/self-paced/hazmat-awareness-alert-via-iaff>

Course: <https://www.safetyunlimited.com/online-courses/OSHA-HAZWOPER-First-Responder-Awareness-FRA.asp>

Alternative Fuel Vehicles:

Course: <https://www.nfpa.org/Training-and-Events/By-topic/Alternative-Fuel-Vehicle-Safety-Training/Fire-service-training>

Course: http://www.ncdoi.com/OSFM/RPD/PT/Videos_Alternative_Fuels.aspx

Electric Vehicles:

Course: <https://catalog.nfpa.org/Electric-Vehicle-Safety-for-Emergency-Responders-Online-Training-P14554.aspx>

Course: <http://naftc.wvu.edu/afvsafetytraining/first-responder-online-training/>

TIM 300 Senior Leadership Seminar. The course content for TIM 300 is the Advanced TIM for Mid-Level Managers Workshop. These sessions are intended for senior public safety and transportation leadership to jointly attend training seminars that emphasize the importance of ongoing, sustained TIM programs and utilize national examples of TIM best practices. The objective is to obtain buy-in from senior executives on pre-identified issues and solutions. These seminars are usually short to accommodate senior leaders' schedules. Issues must be fully developed and understood before presenting them for senior leadership review and consideration.

TIM 400 Executive Level Briefing (for Decision Makers). The TIM 400 sessions are generally briefings for executive-level decision makers. The purpose of the briefing is to: raise awareness of the national TIM program; emphasize the importance of TIM to safe and efficient traffic operations; highlight the issues, needs, and action items discussed during the TIM 300 workshop; and request support for continued statewide and regional TIM program development and funding.

**TIM Skill Level Tiered
Training Approach**

- ✓ TIM 100 First Responder Workshop
- ✓ TIM 200 Targeted Training
- ✓ TIM 300 Senior Leadership Seminar
- ✓ TIM 400 Executive Level Briefing (for Decision Makers)
- ✓ TIM 500 Transportation Functional Exercise
- ✓ TIM 600 Interoperable Communications Equipment Test
- ✓ TIM 700 Annual Retraining
- ✓ TIM 800 Discipline Specific Training

TIM 500 Transportation Functional Exercise. Representatives from public safety, towing and recovery, traffic management centers (TMCs), and transportation jointly attend an exercise featuring a scenario that draws on all their respective capabilities and responsibilities. These exercises may be full scale mock scenarios or towing and recovery capability demonstrations.

TIM 600 Interoperable Communications Equipment Test. Communications representatives from public safety, TMCs, and transportation agencies jointly design and attend a drill created to test interoperable communications capabilities (usually radio) between the agencies. Such a drill is useful in advance of a larger exercise that may rely on interoperable communications.

TIM 700 Annual Retraining. TIM 700 is a yearly refresher training for the national TIM program that matches the content and objectives of SHRP2. This training includes a 1-hour video prepared by Dr. Grady Carrick, Enforcement Engineering, Inc., that matches the content and objectives of the SHRP2.

TIM 800 Discipline Specific Training. The TIM responder course was designed as a multidisciplinary course; however, content contained in the multidisciplinary training could be extracted and act as stand-alone material. An example is the current dispatchers and TMC operators training. Additional discipline-specific training could be added to TIM 800 as developed to include public utilities or the media.

NATIONAL TIM QUALIFICATION SYSTEM

An additional step toward institutionalizing TIM training is to codify TIM as a standard, as the FEMA NIMS program is. Institutionalizing TIM within a NIMS structure by creating a “National TIM Qualification System” would standardize an on-scene response to promote agency integration and coordination of responses and common procedures. This National TIM Qualification System would closely mirror the National Incident Management System Guidelines of the National Qualification System (NQS).

The National TIM Qualification System would supplement the NIMS “Preparedness” component by establishing guidance and tools to assist stakeholders in developing processes for qualifying, certifying and credentialing highway first responders. The National TIM Qualification System would also establish standard minimum qualifications for specific TIM-related positions to provide consistent support for TIM principles across the Nation. This will be a “training-based” system, which will require completion of training courses as qualification criteria. Education, training, and experience could also be considered. The qualifications shall be based on industry guidelines/standards for traffic management job performance requirements.

It is understood that this type of training compendium will require a separate training support structure similar to that provided by the NIMS Qualification System. This would certainly be a major enhancement to TIM training and would require targeted funding and widespread support of the Executive Leadership Group and the TIM community.

FUTURE OF TIM TRAINING

In order to provide context and depth to the TIM training recommendations that were detailed above, this section lists “big picture” issues that TIM training must be prepared to address in the coming years.

- (1) **It is impossible to fully predict the changes responders will face over the next decade, but changes in transportation are clearly taking place and responders must adapt quickly.** The U.S. population will continue to grow, and as the population grows, travel increases. As the Nation’s transportation system changes, priorities will likely remain—safety, transportation security, congestion relief, environmental protection, energy use, and deployment of technology. All these factors are influenced by TIM and must be addressed by enhanced training in the areas of situational awareness, information sharing, crash investigation, drone technology, hazardous materials recognition and mitigation, and towing and recovery best practices.
- (2) **Congestion on highways will need to be addressed through capacity expansion or a variety of demand management technological innovations.** Peak period pricing for tollways or special use lanes may gain in prominence. Trucks will continue to dominate the freight market, and increasing truck traffic will become even more of a source of congestion along the interstate and urban arterials. The demand for transportation services will increase to support economic growth and will outpace capacity. Multi-tiered roadways may require specialized awareness training. Managing incidents at a complex interchange, a facility that typically contains many lanes and carries high traffic volumes through a maze of tightly spaced ramps, poses challenges with advanced warning and incident clearance and will require specific training.
- (3) **The current trend of embedding innovative technologies into the operations and management of the transportation system will continue and probably accelerate in the next decade.** Transportation systems will become more and more automated. The use of shared voice/video and text data will increase. Technology will allow a greater number of stakeholders to access cross-discipline communications. With this increased use of technology, additional responder training in the safe use of technology to avoid distraction should be considered.
- (4) **Camera coverage, queue detection, traffic sensors and road weather information system technologies will eventually be widespread in the TIM world.** Immediate and up-to-date real-time information will continue to become more readily available to the masses, and integration into the responding world will be a natural byproduct. Drone technology will also continue to gain momentum, and we will start seeing more aerial incident footage being generated as agencies adopt this approach. Unmanned aircraft systems (UAS) are capable of real-time enhanced video, photography, communication with a traffic incident command center, and safe flight operation near or over live traffic. Applying UAS during TIM activities will enable real-time confirmation and monitoring of the traffic incident



Figure 16. Photo. A drone that can be used to monitor traffic or incidents remotely.

Source: Getty Images

as well as make it possible to monitor alternate routes, incident queuing, and secondary crashes. This technology should be included as safety enhancement training in responder training courses.

- (5) **The vehicles of today will evolve rapidly in the next few years with autonomous or connected vehicles becoming mainstream.** Stakeholders such as the automotive industry, technology firms and public safety officials will need to continue working together to provide safety for first responders and motorists and to ensure everyone is communicating and effectively using the tools and resources available. Many questions will need to be answered as to how these vehicles will operate on the roadways and, more specifically, how they will travel through incident scenes.

Some believe that increased vehicle automation will result in more predictable, safer travel on our Nation's roadways. Others have expressed concern that having a mix of automated and operator-controlled vehicles on the same roadways may not improve safety at all. We cannot predict the rate of adoption of automated or connected vehicles, nor do we know how long it will take for the vehicle fleet to achieve full automation. However, the consensus is that we will be able to predict this information more accurately between now and 2025. Automated and connected vehicle operations training will be necessary for responders to ensure they understand the technology and its limitations at incident scenes.

- (6) **Transportation security will become more critical to national security, requiring more involvement by TIM responders to secure the Nation's highway infrastructure system.** According to the FHWA, the Nation's highway transportation system includes approximately 4 million miles of roadways, 600,000 bridges, and 50 tunnels that are greater than 500 meters in length. The U.S. highway system is particularly vulnerable to potential terrorist attacks because of its openness. Vehicles and their operators can move freely and with almost no restrictions, and some bridge and tunnel elements are easily accessible and located in isolated areas, making them more challenging to secure. Future TIM training for all responders should also include a homeland security situational awareness module.
- (7) **It is anticipated there will be a greater acceptance of TIM training as legacy employees retire (those who may not have fully accepted TIM concepts to date) and, as a new generation of TIM responders come on board, TIM concepts and strategies will become the norm across all disciplines.** TIM concepts will bring all responders and stakeholders into the fold, as the target of "one million responders trained" will be achieved. TIM trainers should be prepared to continually reach new generations of responders.
- (8) **TIM training should be viewed by agencies more as risk management training than as simply incident management protocols.** All agencies seek to manage risk, and TIM training could be considered a means of reducing risk for insurance companies as they weigh other factors to determine vehicle and workers compensation premiums. Agencies and organizations should be encouraged to leverage the TIM Responder Training as a safety enhancement that reduces liability and risk.

- (9) **State-of-the-art TIM training facilities in Tennessee and Colorado (and soon in Pennsylvania) offer first responders an opportunity to participate in hands-on training in a safe, controlled environment, and the construction of such facilities by agencies is recommended.** Such facilities provide safety training and research opportunities in areas of traffic incident management, technology systems, work zones, commercial vehicles and connected and automated vehicles. Increasing awareness of these facilities during training and informational sessions may encourage other States to develop similar facilities, further enhancing the Nation's ability to train TIM professionals safely.

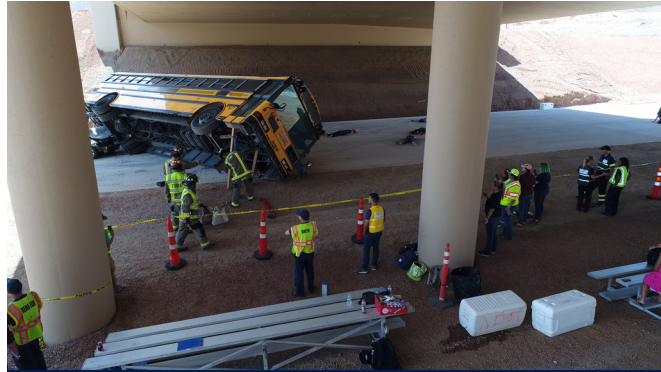


Figure 17. Photo. Emergency responders recover an overturned school bus under a bridge.

Source: Parsons Corporation

- (10) **Collection of performance measures will be further defined, standardized and refined to provide meaningful data and resources that directly relate to the three core measures: incident clearance, roadway clearance, and secondary incidents.** Performance data will be captured through quantitative, qualitative, and monetized benefits. Analysis of this data will promote quicker restoration of roadway capacity and more efficient deployment of resources. Future TIM training will be greatly influenced by continuing efforts to collect and enhance performance data. Performance measures should continue to be emphasized during all TIM training.

The data collected through the FHWA Everyday Counts Program (EDC-4) will be used to recognize trends, institutionalize programs, and identify areas for improvement. Accelerating standardized data collection will help TIM training programs realize the full potential for keeping motorists and incident responders safer and roads and highways clear.

The data collected through the FHWA Everyday Counts Program (EDC-4) will be used to recognize trends, institutionalize programs, and identify areas for improvement. Accelerating standardized data collection will help TIM training programs realize the full potential for keeping motorists and incident responders safer and roads and highways clear.

TIM training will continue to be a critical element in the ongoing effort to improve highway safety, and how and when these issues impact the operation of our Nation's roadways will determine how future TIM training will need to be adapted.

TIM TRAINING SUSTAINABILITY

For the TIM Training to be successful, TIM programs must be ongoing and actively managed to reflect changing travel patterns and the latest technologies. As previously stated, the logical TIM institutionalization and course progression would be to codify traffic incident management as a standard like the FEMA NIMS program. The SHRP2 training has served to unify TIM responders across various disciplines, providing them with a common language and response criteria, and we need to build on this success to maintain forward momentum.

Below is a brief list of topics and recommendations to ensure sustainability for traffic incident management training.

Table 6. Sustainability recommendations.

TOPIC	RECOMMENDATION
Training	Establish a multidiscipline, nationwide, TIM training committee.
TIM Skill Level Training	Move toward institutionalizing TIM training by implementing the TIM Skill Level(s) tiered training approach modeled after NIMS Incident Command System.
National TIM Qualification System	Codify traffic incident management as a standard like the FEMA NIMS program by institutionalizing TIM within a NIMS-like structure by creating a “National TIM Qualification System.” This system would standardize an on-scene response to promote agency integration and coordinate responses and common procedures.
Professional Qualification Standards	Implement TIM standards, like those of the National Fire Protection Association (NFPA), that outline the requisite knowledge and skills for TIM-related tasks.
TIM Network	The TIM Network should be expanded and actively managed to reach all responders and influence training best practices.
The Responder	The responder should be expanded and actively managed to reach all responders.
National Special Security Event (NSSE)	Traffic Incident Management is a natural component of NSSE, and the training compendium should include elements related to these events.
Manual of Uniform Traffic Control Devices (MUTCD)	This familiarization training is offered in the Responder Training courses; however, it is recommended that consideration be given to changing the language in Chapter 6-I (07) for on-scene responder organizations from “should” train to “shall” train.
TIM Responder Training Professional Development Credits	TIM in-service credits should be expanded nationwide to encourage participation in TIM classes.
TIM Self-Assessments	Consistently applied metrics push an organization to continually improve TIM training. A continued emphasis on TIM self-assessments must continue.
TIM Post-Course Assessment Tool	Participation in TIM assessments should be a requirement for successful completion of the Responder Training course.
Towing and Recovery	While the Towing and Recovery Association of America (TRAA) is challenging members of the towing industry to promote the SHRP2 National TIM Responder Training, TIM training should be mandated for any towing recovery responder operating on the highway.
Refresher Training	It is recommended that annual refresher training be a requirement for all TIM responder trainees.

Table 6. Sustainability recommendations (continuation).

TOPIC	RECOMMENDATION
Transportation Systems Management and Operations (TSMO)	It is recommended that an awareness section on TSMO be developed and added to the TIM Training Compendium.
Distracted Responders	There is a TIM training need on this topic to enhance responder safety and the creation of specific operational guidelines. This could be an FHWA initiative, and upon completion included within the TIM training compendium.
Law Enforcement Accreditation	To enhance the recognition of TIM and expand the number of TIM training participants, efforts should be made to include Traffic Incident Management training as a law enforcement professional requirement.
Fire Service Accreditation	To enhance the recognition of TIM and expand the number of TIM training participants, efforts should be made to include Traffic Incident Management training as a fire service professional requirement.
Funding	Dedicated Federal, State, and local funding sources need to be identified to ensure TIM training sustainability.

FHWA = Federal Highway Administration. NFPA = National Fire Protection Association.

NIMS = National Incident Management System. SHRP2 = second Strategic Highway Research Program.

TIM = traffic incident management. TSMO = transportation systems management and operations.

The following section expands upon each of the topics summarized above (Recommendations are underlined).

Training. TIM Responder Training is the foundation for TIM sustainability. As mentioned throughout this report, there are numerous training opportunities. The training may be multi-agency classroom, web-based or agency-specific. All TIM training is important; however, standardizing the content and delivery will improve sustainability. Institutionalizing TIM training must be a priority. Establish a multidisciplinary, national TIM training committee.

TIM Skill Level Training. Move toward institutionalizing TIM training by implementing the TIM Skill Level(s) tiered training approach modeled after NIMS Incident Command System.

National TIM Qualification System. Codify traffic incident management as a standard like the FEMA NIMS program by institutionalizing TIM within a NIMS-like structure by creating a “National TIM Qualification System.” This system would standardize an on-scene response to promote agency integration and coordinate responses and common procedures.

Professional Qualification Standards. Implement NFPA-like professional qualifications standards for TIM that outline the requisite knowledge and skill for TIM-related tasks.

TIM Network. In order to more broadly involve the responder community in TIM outreach and implementation of the National Unified Goal, NTIMC established the TIM Network in 2009.

The TIM Network seeks to supplement the benefits of training by continually sharing information and best practices with its members on a real-time basis. The TIM Network is currently only reaching a small percentage of responders online with approximately 45 page visits a week. Through its website (www.timnetwork.org), Facebook page, and Twitter account, the TIM Network shares timely information about incidents involving emergency responders and offers forums in which its members can hold national, multidisciplinary dialogues every day. The TIM Network should be expanded and actively managed as well as actively marketed to reach all responders and influence training best practices.

The Responder. The Responder e-newsletter is produced monthly and is emailed to members, as well as posted on the TIM Network. Each issue contains several feature articles as well as information on good practices and information about TIM initiatives, training and webinars. The Responder should be expanded and actively managed and marketed to reach all responders.

National Special Security Event. A National Special Security Event (NSSE) is an event of national or international significance deemed so by the Department of Homeland Security (DHS). NSSE places the U.S. Secret Service as the lead agency in charge of planning, coordination and implementation of security operations. TIM contributes to multifunctional plans for large special events, especially those designated as NSSE, and therefore TIM training needs to include how incident management can best coordinate with other security operations. While most NSSEs include a traffic management component, it may be helpful to engage the TIM subcommittee of the International Association of Chiefs of Police for guidance as to how to specifically include TIM as part of the planning process. Traffic Incident Management is a natural component of NSSE, and the training compendium should include elements related to these events.

Manual of Uniform Traffic Control Devices (MUTCD). TIM responders should be familiar with the MUTCD Chapter 6-I “Control of Traffic through Traffic Incident Management Area.” This familiarization training is offered in the Responder Training courses; however, it is recommended that consideration be given to changing the language in Chapter 6-I (07) for on-scene responder organizations from “should” train to “shall” train. It is recognized that this change will require the support of the MUTCD Committee and the Executive Leadership Group; however, it may be an opportunity to require responder training in traffic incident management.

TIM Responder Training Professional Development Credits. A wide variety of responders maintain and improve professional competence to enhance career progression, to keep abreast of new technology and practices, or to comply with professional regulatory requirements. Professional development credits are recognized differently from State to State or agency to agency. TIM in-service credits should be expanded nationwide to encourage participation in TIM classes.

TIM Self-Assessments. FHWA has conducted a TIM self-assessment of States, regions, and localities since 2003. The self-assessment covers three fundamental areas: strategic (organization of and institutional support for TIM program), tactical (policies and procedures used by field personnel), and support (tools and technologies that support TIM). TIM Training is a key element of the tactical self-assessment, so continuous support of the self-assessment process helps to drive better on-road incident management. Consistently applied metrics push an organization to continually improve TIM training. An emphasis on TIM-self assessment must continue.

TIM Post-Course Assessment Tool. The National TIM Responder Training Post-Course Assessment Tool was designed, developed, and implemented to measure students' reaction to the course material, the effectiveness of the training, and the on-the-job changes facilitated by the training. It also provides an understanding of the operational benefits from the training program. Capturing this type of information is critical to the ability to measure both short term and long-term effects of TIM training on both safety and performance. Participation in TIM assessment should be a requirement for successful completion of the Responder Training course.



Figure 18. Photo. A large truck is recovered by a towing operator.

Source: Parsons Corporation

Towing and Recovery. Towing and recovery operations clear the roadway of disabled or damaged vehicles and their cargos, restoring the roadway to its full capacity. Timely dispatch of appropriate towing and recovery assets to an incident scene can be facilitated through a contact list of towing and recovery companies who have been pre-approved regarding equipment and capabilities. The Towing and Recovery Association of America (TRAA) has also prepared a traffic incident management handbook for the towing industry. The purpose of the document is to facilitate the understanding of traffic incident management programs within the industry and to describe how

industry members can involve themselves in local programs. While TRAA is challenging members of the towing industry to promote the SHRP2 National TIM Responder Training, TIM training should be mandated for any towing recovery responder operating on the highway.

Refresher Training. It is important that annual refresher training be a part of the Responder Training program. TIM is not “one and done” because it changes over time. An example of refresher training is the 1-hour video prepared by Dr. Grady Carrick that reinforces the content and objectives of SHRP2. At the end of the video, the attendee can print a certificate. It is recommended that annual refresher training be a requirement for all TIM responder trainees.

Transportation Systems Management and Operations (TSMO). Many States have reported that active responder participation in TSMO planning has been less than ideal. TSMO plans are developed when management and operations stakeholders and planners work together to define a common vision for transportation system operations. The TSMO plan includes three elements: strategic, programmatic, and tactical. As part of the TIM training, the importance of TSMO participation with transportation organizations in the planning process will improve the safety, efficiency and reliability of the transportation systems. It is recommended that an awareness section on TSMO be developed and added to the TIM Training Compendium.

Distracted Responders. There is a category of driver that most people do not think of when they think about distracted drivers: emergency first responders. As technological tools such as GPS devices, cell phones, and laptop computers have become widely available, they have also found their way into police cars, ambulances, fire trucks and other emergency vehicles. Unfortunately, these technologies, which are designed to save lives, may also put other people and responders

in harm's way. A need exists for TIM training and operational guidelines on this topic to enhance responder safety. This could be an FHWA initiative, and it could be included within the TIM training compendium.

Law Enforcement Accreditation. The Commission on Accreditation for Law Enforcement Agencies (CALEA) is the credentialing authority whose primary mission is to accredit public safety agencies based on a national body of standards developed by law enforcement professionals. To enhance the recognition of TIM and expand the number of TIM training participants, efforts should be made to include Traffic Incident Management training as a law enforcement professional requirement.

Fire Service Accreditation. The Commission on Fire Accreditation International (CFAI), is a commission within the Center for Public Safety Excellence (CPSE) that offers a step-by-step process that aligns all aspects of the organization with national standards and best practices. To enhance the recognition of TIM and expand the number of TIM training participants, efforts should be made to include TIM training as a fire service professional requirement.

Funding. The biggest challenge to TIM training sustainability and growth is funding. As States and local jurisdictions shoulder more of the funding burden, keeping these programs moving forward will be challenging. Dedicated Federal, State, and local funding sources need to be identified to ensure TIM training sustainability.

FHWA-led TIM and TIM training are essential elements of the Every Day Counts programs, and development, adoption and implementation of these recommendations will be instrumental to the successful continuation of TIM training nationwide.



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