S.O.P. #: 400-21A

SUBJECT: ROADWAY INCIDENT OPERATIONS SAFETY PROCEDURES

DIVISION: EMERGENCY OPERATIONS

Objective: To establish procedures and guidelines for responses on roadways which create a safer environment for Fire Department members working these incidents. All members should understand and appreciate the high risk that they are exposed to when operating in or near moving vehicular traffic. Responders should always operate within a protected environment at any roadway incident. According to the Federal Highway Administration, the likelihood of a secondary crash increases by 2.8% for each minute the primary incident continues to be a hazard.

Scope: These procedures are designed to limit the number of fire service injuries and deaths while operating on roadway incidents. Accomplishing this goal may require EMS transport units to relocate to an alternate location to provide a safe environment for providers and patients. This policy is consistent with NFPA and Traffic Incident Management programs.

Section 1: Operational Guidelines

A. Interstate Crossovers – Defined as openings in limited access highways, which can be utilized by emergency vehicles as a crossover to access the opposite directional lanes.

1. These should only be used after a risk vs. benefit size-up of the situation, and as a last resort. Officers and drivers should consider high speed/low volume & high speed/high volume traffic as the most hazardous. Officers and drivers should also recognize the hazards that not only exist to the fire department units, but also to the moving highway vehicles that may not be able to react to the sudden slowing of traffic in a timely manner. There is an increased risk of secondary collisions occurring after the utilization of these crossovers. These crossovers should never be used when clearing location and returning to quarters.

B. "Wrong way" approach

1. Approaching the scene by way of traveling the wrong direction is extremely dangerous and poses a significant safety risk to our members and other motorists.
2. Travel in the wrong direction shall only be considered if any of the following parameters are met:

   a. The lane is completely shut down by police, major apparatus (Engine, Truck, or Squad), CHART, etc.

   b. On roadways other than highways, the driver and Officer have a clear line of sight and determine that there is no oncoming traffic.

   c. A temporary traffic control zone has been established and the roadway has been closed to oncoming traffic.

C. Utilization of advance warning notification devices (flares, traffic cones)

1. To enhance incident safety, flares or traffic cones deployed by police or CHART can be utilized upstream in the transition area to assist in the tapering of the traffic lanes. Fire department members should understand that advance warning devices do not block traffic; they only suggest that drivers yield. (Refer diagram 1)

2. At incident scenes, cones and/or flares used to establish a taper are typically placed no further apart in feet than the speed limit.

Procedure –Highway – Motor Vehicle Collisions
35 mph = 35' apart
45 mph = 45' apart
55 mph = 55' apart
65 mph = 65' apart
An alternative guideline is to place a flare or cone at every dashed line.

3. When deploying advance warning devices members should walk from the accident scene, facing the oncoming traffic and placing each device at the appropriate length, to taper the traffic away from the apparatus and emergency scene.

4. AT NO TIME SHOULD MEMBERS, NOT PROTECTED BY AN APPARATUS BUFFER, TURN THEIR BACK TO THE UPSTREAM TRAFFIC!

D. Lane designations

1. For highways that are three lanes or less, the following designations will be used;
    a. Left or inside shoulder
    b. Left lane
    c. Center lane
    d. Right lane
    e. Right shoulder
    f. Entrance or Exit ramp

2. For highways that consist of four lanes or greater, the following designations will be used;
    a. In order, starting with the fast lane shoulder; (**Refer to diagram 2**)
        1. Left or Inside shoulder
        2. Lane 1 (fast lane)
        3. Lane 2 (next lane over)
        4. Lane 3 (3rd lane from fast shoulder)
        5. Lane 4 (slow lane)
        6. Right or outside shoulder

7. Entrance or exit ramp
8. Additional lanes will be numbered accordingly in sequence, starting with the Left or Inside Shoulder.
9. Eastbound and Westbound can be substituted with Northbound and Southbound.

b. These designations can be used with the terminology of upstream and downstream to denote the positioning of apparatus.

c. This terminology is accepted throughout the state of Maryland and nationally, including the Maryland State Police and CHART.

E. Apparatus tool and equipment placement

1. The placement of tools, equipment and supplies frequently used for roadway incidents is vital to provide for the safety of members. Use a spotter whenever possible when tools are stored in compartments that force a member to turn their back to moving traffic.

Section 2: Highway Responses

Definition: Responses to incidents on roadways that are characterized by higher speed limits, multiple lanes, and where access is limited to entrance and exit ramps. Examples include, but are not limited to Interstates 70, 83, 95, 195, 695, 795, 895, Route 43, 702, etc.

A. On highways, major apparatus) is dispatched on all medical responses to provide a safety buffer for the transport unit. On reported vehicle fires and motor vehicle collisions (MVC), major apparatus is sent in each of the opposing lanes. The purpose of a multi-unit response is two-fold.

1. To cover opposite lanes in the event the incident is not where it was reported. Frequently, by the nature of these incidents the locations provided by the caller are inaccurate.

2. To provide a safety buffer as well as advance warning to the oncoming motorists.

3. The second arriving major apparatus and/or CHART should not be cleared until the primary units have either left the scene, or the upstream traffic has been reduced to the point that the scene is safe.

B. These incidents require the response of a major apparatus for the safety of members operating on roadway incidents. Minor apparatus such as brush units, utility trucks, and satellite Haz-Mat units are not permitted to handle these incidents singularly, when not accompanied by a major apparatus. Minor apparatus should position downstream of the incident, but within the incident area and protected by the buffer.

Procedure –Highway – Motor Vehicle Collisions

A. Upon arrival, the driver shall position the apparatus in such a way to provide protection for all responding members. The OIC may provide guidance on apparatus position based upon tactical objectives.

1. For MVCs, the apparatus should be positioned upstream of the incident at a 45 degree angle, blocking the lanes required to provide a safety zone for the members operating at the incident scene. The "Lane +1" strategy (blocking the accident lane in addition to an adjacent lane) is used to give extra working space for all members operating on the scene. The shoulder may be considered a lane. The apparatus should be angled in such a way to deflect the traffic away from the accident scene. (**Refer to diagram 1**)
2. The apparatus should not partially block lanes with only the front bumper or rear tail board as this increases the risk of apparatus being struck by drivers in the partially open lane.
3. The wheels of the apparatus should be turned to face away from the downstream activity area, because if the apparatus is struck and pushed, it improves the chances of being pushed away from the crews operating in the activity area.
4. The transport unit(s) and other minor apparatus should be placed downstream of the major apparatus and completely within the activity area. EMS transport units should be positioned to have their rear patient loading area angled away from the nearest lanes of the moving traffic. Transport units should stay as close to the shoulder when possible, especially when they arrive prior to the major apparatus(s). (Refer to diagram 1)
5. ALL members operating on the incident scene shall wear an ANSI approved reflective safety vest. The ONLY exception is for incidents requiring SCBA. The green reflective fire department issued (NFPA 1999 Standard on Reflective Clothing) Blauer jacket is acceptable.
6. When possible, members should exit the apparatus from the protected, downstream side, away from moving traffic.
7. When possible, patients in vehicles should be approached from the side that is away from the moving traffic.
8. EMS Providers must recognize that "treating in place" is often not the best safety practice when operating on a roadway incident scene and shall make every effort to move to a safe location as soon as practical. At no time shall moving the transport unit compromise patient or provider safety.

B. The second arriving major apparatus shall respond to the incident scene in the same directional lane as the first major apparatus and set up between 150 to 200 feet upstream of the first major apparatus, angled in the same direction to deflect the vehicles away from the accident scene. (Refer to diagram 1)

1. When given limited time to adhere to warning devices, the probability of secondary collisions increases for vehicles transiting the area.

2. Consideration shall be made to identify the safest area of refuge for members who are not assigned an operational task.

3. The second arriving major apparatus should not be cleared until the primary units have either left the scene, or the upstream traffic has been reduced to the point that the scene is safe.

C. The major apparatus traveling in the opposite directional lane should not stop the apparatus in the opposite lane and access the incident scene traffic lanes under normal circumstances. Members stopping in the opposite lane and stepping into to the incident lanes of traffic are leaving themselves exposed to the traffic in the incident lane. This should only be done when a risk versus benefit analysis has been completed, and when in the judgment of the OIC, there is an immediate life safety benefit.

D. A CHART vehicle may be used in place of the secondary major apparatus and should be deployed in the same fashion. If not on location, CHART can, and should, be requested through Fire Dispatch for all state roadways.

E. Any other responding units should be staged off the highway if their services are not immediately needed.

F. If multiple lanes are involved, the IC should consider the need for additional resources.

G. Tractor drawn apparatus can be positioned by utilizing the trailer to taper the traffic away from the incident while positioning the tractor slightly turned inward to provide additional protection and safe means of egress for the driver/OIC. The wheels of the apparatus shall be turned away from the incident.

Procedure –Highway – Vehicle Fire

A. Upon arrival, the driver is to position the apparatus in such a way to provide protection for all responding members operating on the scene.

1. When possible, the apparatus should be positioned upstream of the incident at a 45 degree angle, blocking the lanes required to provide a safety zone for members operating at the scene. The “Lane +1” strategy (blocking the accident lane in addition to an adjacent lane) is used to give extra working space for members. Due to the nature of the incident, the OIC is permitted to close all lanes to protect the scene and the safety of the members. The shoulder may be considered a lane. The apparatus should be angled in such a way so that the pump panel is positioned downstream and facing toward the activity area to protect the driver by placing them in the safety area. Additionally, the apparatus should not partially block lanes with only the front bumper or rear tail board which could be struck by drivers in the partially open lane, unless a risk versus benefit analysis has been completed, and when in the judgment of the OIC, there is an immediate life safety benefit. (**Refer to diagram 1**)

2. The wheels of the apparatus shall be turned to face away from the downstream activity area so that if the apparatus is struck and pushed, it would be pushed away from the crews operating in the activity area.

3. AT NO TIME should any part of the hose line cross over or be in lanes with moving traffic.

4. When possible, members should exit the apparatus from the protected, downstream side, away from moving traffic.

5. Traffic cones and/or flares may be set up by police or CHART along the perimeter of the activity area to provide further safety.

6. ALL members not utilizing SCBA on the incident scene are to be in an ANSI approved reflective safety vest.

A. The reflective fire department issued (NFPA 1999 Standard on Reflective Clothing) Blauer jacket is acceptable for this use.

B. The second arriving suppression unit shall set up between 150 – 200 feet upstream of the first suppression unit, angled to deflect the vehicles away from the accident scene. If the second engine is needed to provide water, it can be parked closer, but should still be angled in such a way to deflect traffic away from the incident scene.

C. The second arriving suppression unit should not leave until the primary units have either left the scene, CHART is present to support the crews, or the upstream traffic has been reduced to the point that the scene is safe.

D. The suppression unit traveling in the opposite directional lane should not stop the apparatus in the opposite lane and step into the incident scene traffic lanes under normal circumstances. Fire department members, stopping in the opposite lane and stepping into to the incident lanes of traffic are leaving themselves exposed to the traffic in the incident lane. This should only be done based on a risk vs. benefit analysis, when in the judgment of the OIC; there is an immediate life safety benefit.

E. Any other responding units may be staged off the highway if their services aren't immediately needed.

F. If multiple lanes are involved, additional water supply is needed the IC may consider additional resources.

Procedure –Highway – All other incidents

A. Upon arrival, the driver shall position the apparatus in such a way to provide protection for all responding members.

1. For any highway operation, the apparatus should be positioned upstream of the incident at a 45-degree angle, blocking the lanes required to provide a safety zone for the members operating at the incident scene. The "Lane +1" strategy (blocking the accident lane in addition to an adjacent lane) is used to give extra working space for all members operating on the scene. The shoulder may be considered a lane. The apparatus should be angled in such a way to "deflect" the traffic away from the accident scene. (**Refer to diagram 1**) Partially blocking lanes with only the front bumper or rear tail board increases the risk of apparatus being struck by drivers in the partially open lane and should only be done when a risk versus benefit analysis has been completed, and when in the judgment of the OIC, there is an immediate life safety benefit.

2. The wheels of the apparatus should be turned to face away from the downstream activity area, because if the apparatus is struck and pushed, it improves the chances of being pushed away from the crews operating in the activity area.

3. The transport unit(s) and other smaller response vehicles should be placed downstream of the major apparatus and completely within the activity area. EMS transport units should be positioned to have their rear patient loading area angled away from the nearest lanes of the moving traffic. Transport units should stay as close to the shoulder when possible, especially when they arrive prior to the major apparatus. (**Refer to diagrams 2**)

4. Flares or traffic cones may be set up by police or CHART along the perimeter of the activity area to provide further safety.

5. ALL members operating on the incident scene shall wear an ANSI approved reflective safety vest. The ONLY exception is for incidents requiring SCBA.

    a. The green reflective fire department issued (NFPA 1999 Standard on Reflective Clothing) Blauer jacket is acceptable for this use.

6. When possible, members should exit the apparatus from the protected, downstream side, away from moving traffic.

7. When possible, the patients in vehicles should be approached from the side that is away from the moving traffic, when at all possible.

8. EMS Providers must recognize that "treating in place" is not the best practice when operating a roadway incident scene and shall make every effort to move to a safe location as soon as practical. At no time shall moving the transport unit compromise patient or provider safety.

B. The second arriving major apparatus shall respond to the incident scene in the same directional lane as the first suppression unit and set up between 150 to 200 feet upstream of the first suppression unit, angled in the same direction to deflect the vehicles away from the accident scene. (**Refer to diagram 1**)

1. Consideration shall be made to identify the safest area of refuge for members who are not assigned an operational task.
2. The second arriving major apparatus and/or CHART should not be cleared until the primary units have either left the scene, or the upstream traffic has been reduced to the point that the scene is safe.

C. Major apparatus traveling in the opposite directional lane should not stop the apparatus in the opposite lane and access the incident scene traffic lanes under normal circumstances. Members, stopping in the opposite lane and stepping into to the incident lanes of traffic are leaving themselves exposed to the traffic in the incident lane. This should only be done when a risk versus benefit analysis has been completed, and when in the judgment of the OIC, there is an immediate life safety benefit.

D. A CHART vehicle may be used in place of the secondary major apparatus and should be deployed in the same fashion. If not on location, CHART can, and should, be requested through Fire Dispatch for all state roadways.

E. Any other responding units should be staged off the highway if their services aren't immediately needed.

F. If multiple lanes are involved, the IC should consider the need for additional resources.

G. Tractor drawn apparatus can be positioned by utilizing the trailer to taper the traffic away from the incident while positioning the tractor slightly turned inward to provide additional protection and safe means of egress for the driver/OIC. The wheels of the apparatus shall be turned away from the incident.

Section 3: Roadway Incidents

Definition: Responses to incidents on roadways that include primary, secondary, tertiary roads as well as parking areas. This includes any roadway that has free access through right-of-way intersections.

A. Upon arrival, the driver shall position the apparatus in such a way to provide protection for all responding members

1. For MVC's, the unit should be positioned in such a way to create a safety zone for all members operating at the scene. Due to multiple right-of-ways, additional suppression units, cones and/or flares can be deployed to block other access points to the scene. The unit should also not partially block lanes with only the front bumper or rear tail board which could be struck by drivers in the partially open lane.

2. The wheels of the apparatus shall be turned to face away from the downstream activity area, so that if the apparatus is struck and pushed, it would be pushed away from the crews operating in the activity area.

3. AT NO TIME should any part of the hose line cross over or into the moving lanes of traffic.

4. When possible, the members should exit the apparatus from the protected, downstream side, away from moving traffic.

5. ALL members working on the incident scene are to be in an ANSI approved reflective safety vest. The ONLY exception is for fire incidents requiring SCBA.

   a. The reflective fire department issued (NFPA 1999 Standard on Reflective Clothing) Blauer jacket is acceptable for this use.

B. Operators of emergency vehicles at the scene should conduct 'light shedding'; turning off all lights such as vehicle headlights, or spotlights that might create vision impairment to approaching motorists at nighttime incidents, while still providing the required lighting to assist the members with illumination in the activity area.

Diagram 1

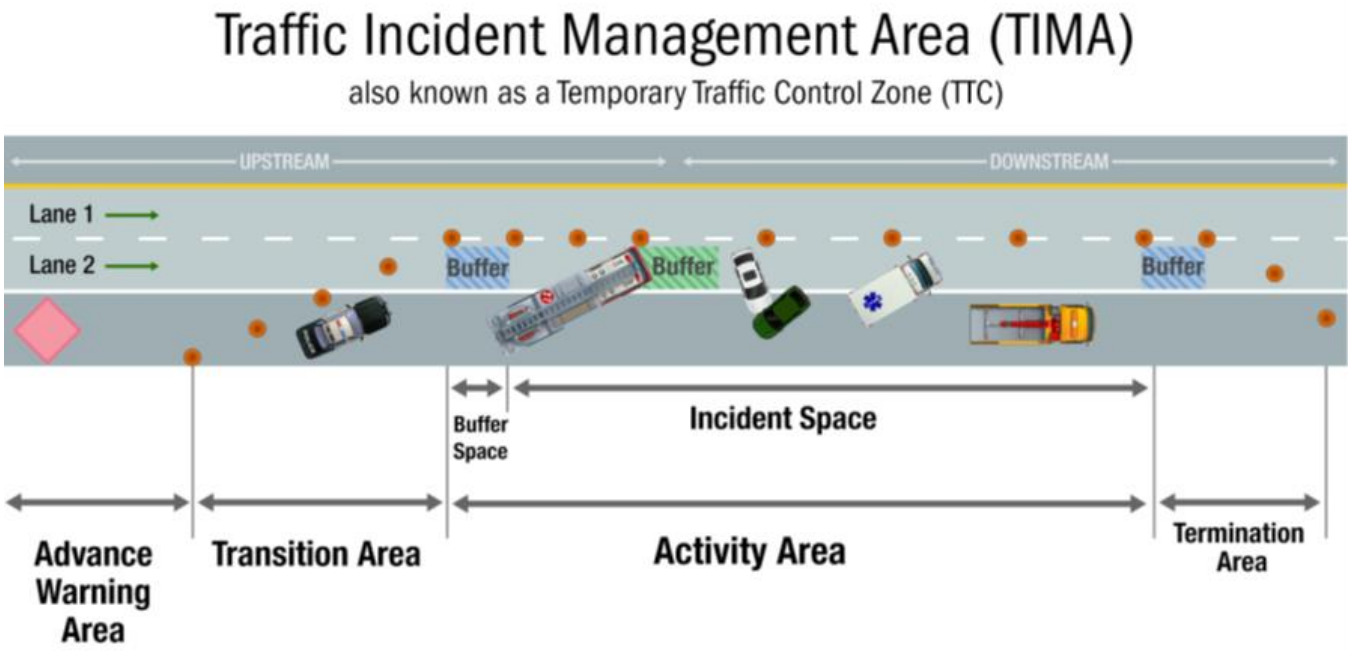
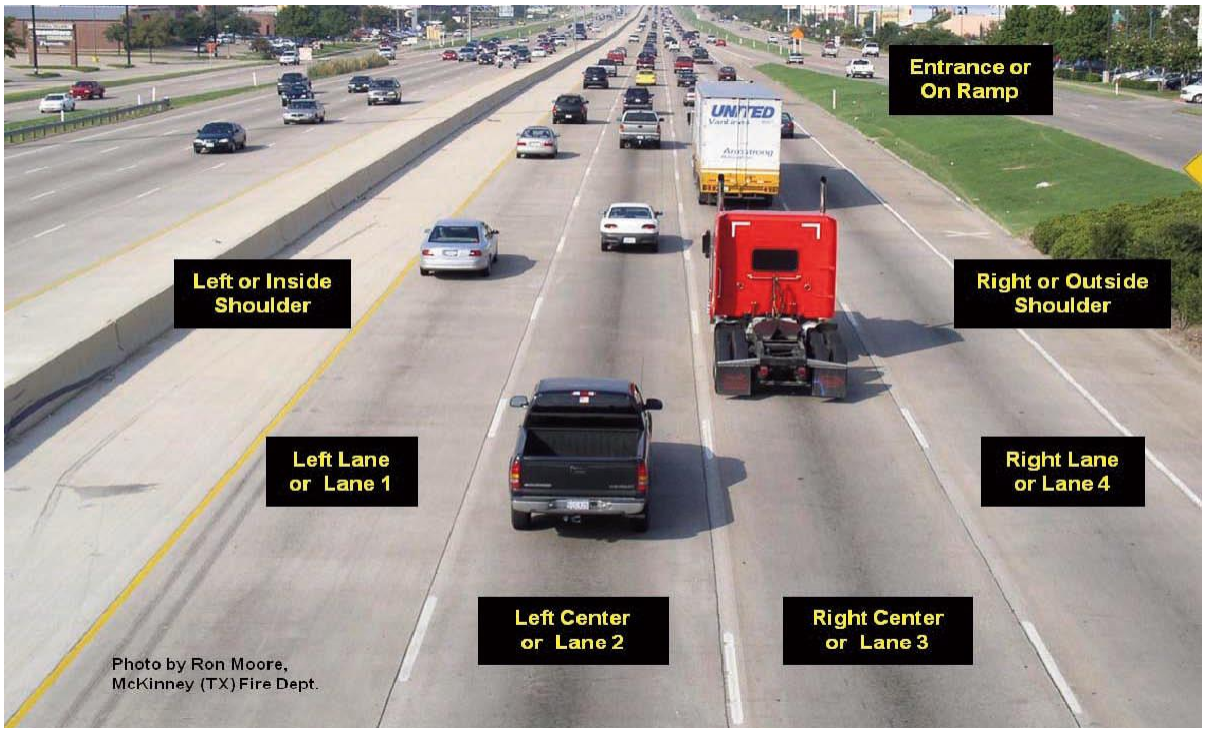


Diagram 2



Appendix A

Definitions and Terminology

Activity Area –This is the physical area of a roadway incident where members perform incident mitigation and where patient care takes place. The activity area is comprised of the *Buffer Space* and *Incident Space*. **(Refer to diagram 1)**

Advance Warning Area- established upstream of the incident to alert drivers of the upcoming incident scene. All advance warning devices should also be upstream of any traffic queues so that warning is given to road users before encountering stopped traffic

Advance Warning Notification –Procedures that advise approaching motorists to transition from normal driving status to that required by the temporary emergency traffic control measures ahead of them.

Advance Warning Notification Devices – Equipment or devices used in the transition zone to advise approaching motorists of a temporary transition in traffic patterns or lane closures. Examples: Flares, approved traffic cones, CHART arrow trucks. **(Refer to diagram 1)**

Block –the required positioning of a major suppression unit, on a 45 degree angle to the lanes of traffic, to create a physical barrier between upstream traffic and the activity area. Includes 'block to the right' or' block to the left'.

Blocking- is the act of positioning a responder vehicle upstream of an incident to obstruct the flow of moving traffic in one or more lanes, and/ or the shoulder

Buffer Space – the transition area from the incident space in which no vehicles or equipment should be positioned. It provides a recovery area for errant vehicles in the taper. **(Refer to diagram 1)**

Downstream- the direction that traffic is moving as it travels away from the incident scene

Incident Space- location where the incident has occurred and emergency responders are working. A blocking vehicle should be positioned at the upstream end of the activity area to provide a boundary between responders and moving traffic and protect responders from impacts by errant vehicles.

Linear Positioning – positioning fire department apparatus parallel to or within a single travel lane or shoulder of a roadway. Linear positioning only creates a physical barrier within that single lane or shoulder of the roadway. This positioning provides very limited protection for crews, equipment, and patients.

Major Apparatus - Engine, Truck, Squad.

Minor Apparatus - A small command or support vehicle (BC/DC, EMS Supervisor, Brush Unit, Utility, etc.)

Queue- a traffic queue is the back of traffic that results from an incident or blocked lance. A queue may form in either direction of travel.

Taper –the action of merging and/or reducing the lanes of moving traffic into fewer lanes of moving traffic.

Termination Area – used to notify drivers of the end of the Traffic Incident Management Area (TIMA) while still protecting emergency responders working at the end of the incident space. **(Refer to diagram 1)**

Transition Area –the section of the TIMA where drivers are redirected out of their path, usually involving the strategic use of tapers to close lanes needed for the safety of the activity area. **(Refer to diagram 1**)

Upstream- the direction that traffic is traveling from as the vehicles approach the incident scene.

Appendix B

Resources

Kimberly Vasonez, Traffic Incident Management (TIM) Performance Measurement – On the Road to Success, FHWA Office of Operations

National Traffic Incident Management Training Program, Responder Training Program, Maryland DOT

Jack Sullivan, Traffic Incident response Lane Designation Terminology, Emergency Responder Training Institute

NFPA 1091: Standard for Traffic Incident Management
NFPA 1500: Standard on Fire Department Occupational Safety, Health, and Wellness
NFPA 1999: Standard on Protective Clothing and Ensembles for Emergency Medical Operations

Additional Information;
http://ops.fhwa.dot.gov/publications/fhwahop10009/tim_fsi.htm

http://respondersafety.com/Resources.aspx