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16. Abstract A two-year study to develop guidelines to respond to major freeway incidents is currently in progress. This study seeks to establish guidelines for application statewide in large and small cities for the preparation of an incident management plan or the improvement of an existing incident management plan. The research investigation and project work during the first fourteen months of this project resulted in the development of this report. This manual is intended to be used as a resource document for transportation related agencies responding to roadway incidents in Texas. This report presents specific procedures to follow when responding to incidents. In addition, appropriate steps are outlined for effective interagency communication and cooperation in incident response. The remainder of this study will concentrate on working with three case study cities to test and evaluate the guidelines. These results will be presented in the final research report.					
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GUIDELINES FOR RESPONSE TO MAJOR FREEWAY INCIDENTS- RESPONSE MANUAL

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IMPLEMENTATION STATEMENT

The major objective of this study is to develop guidelines that can be applied statewide in large and small cities for the preparation of an incident management plan or the improvement of an existing incident management plan. The study proposes to work with three cities in the development, testing, and evaluation of the guidelines. The results of these case studies will be documented in the final research report of this project.

DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the Texas Department of Transportation (TxDOT), or the Federal Highway Administration (FHWA). This report does not constitute a standard, specification, or regulation, nor is it intended for construction, bidding, or permit purposes. The engineer in charge of the project was Michael A. Ogden, P.E. #77485.

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SUMMARY

Major freeway incidents cause significant delay and safety problems. These statistics equate easily into dollars spent and have high public exposure. Roadway incidents can vary from minor automobile accidents to hazardous material truck spills. Therefore, it is vital that proper communication, cooperation, and coordination exists between all responding agencies.

This manual has been prepared as a working document to assist transportation agencies to respond to freeway incidents. Specific procedures and steps are outlined to address all aspects of incident response. Some of these procedures include:

- Establishing multi-agency consensus for incident response planning,
- Identifying common incident classification,
- Establishing interagency cooperation agreements, and
- Developing interagency communication protocols.

Basic transportation agency preparations are included in this document. Steps to improved readiness of non-site incident response are outlined, as well as the type of equipment and materials necessary for transportation agencies responding to incidents. Pre-planning that includes mock-incident scenarios and diversion strategies (alternate routes) are also documented. Specific levels of incident response are identified based on time of day, severity, and location, as well as the type of training necessary for incident response personnel.

Response guidelines are outlined to accommodate the differences in the consequences of response to incidents and capabilities available. They include:

- Maintaining traffic flow,
- Use of flashing lights,
- Removal of vehicles,
- Hazardous materials,

- Fatal or felony accidents, and
- On-site and post reporting by agencies involved.

Approximately eight months remain on this project. Activities during this time will concentrate on working with three case study cities to test and evaluate the guidelines. These results will be presented in the final research report.

INTRODUCTION

This manual has been prepared as a resource document for use by the Texas Department of Transportation (TxDOT) and all other street and highway agencies involved in responding to roadway incidents in conjunction with police, fire, medical, and emergency personnel. These roadway incidents range from spilled debris and automobile accidents to truck overturns and hazardous material spills. Injuries and fatalities may result, as well as the perpetration of felonious acts. Communication and cooperation between all responding agencies is vital. Pre-planned coordination, cooperation, and communication between all responding agencies is essential for effective and efficient detection, traffic control, and clearance of major incidents occurring on the roadway system.

Many studies document that incidents can have serious impacts on traffic, manifested in terms of congestion (delay) and safety (secondary accidents). One California study estimates that by the year 2000, under current operations, approximately 70% of all urban freeway congestion will be due to incidents. It is recognized that each minute of blockage during commuter periods on the freeway results in five minutes of motorist delay. However, during peak hours, queuing delay can be as high as fifty minutes for each minute of blockage.

An objective of each urban transportation agency is to respond to disruptive incidents within its respective roadway jurisdiction and relieve traffic congestion brought on by the incident as quickly and safely as possible. This manual presents specific procedures to follow when an incident occurs. It outlines appropriate steps for effective interagency communication and cooperation in incident response. Since incident consequences and response procedures vary by time of day, the guidelines are categorized by day versus night and by peak period versus off-peak period.

This manual focuses on responses to major freeway incidents in urban areas of Texas; however, the information can be adapted to small municipalities and rural areas. It is intended to serve as a working guideline for transportation and enforcement agencies in Texas responsible for responding to and managing the safe and timely clearance of major incidents on freeway

systems. While the manual incorporates many concepts and experiences developed by other state agencies in incident response, this information has been adapted for specific application to governmental and physical infrastructure conditions existing in Texas. Wherever possible, actual Texas experience and data have been relied upon and given priority in the formulation of these guidelines.

PLANNING FOR MAJOR FREEWAY INCIDENT RESPONSE

Response needs for most major freeway incidents extend beyond the capabilities of a single agency. In Houston, for example, 75% of the lane-blocking freeway incidents require two or more agencies to respond. Different agencies have different responsibilities and objectives when responding to major incidents. These responsibilities have different priorities in the overall incident response framework; however, decisions and actions by any one agency must be compatible with those of the other agencies involved. Incident response planning is a means of establishing the chain-of-command, flow of incident information to aid in response, specific response procedures of each agency, and resources which will be provided by those agencies.

Incident response planning consists of the following steps:

- Establishing multi-agency consensus for incident response planning,
- Identifying common incident classification,
- Establishing interagency cooperation agreements, and
- Developing interagency communication protocols.

Each of these steps is discussed in detail below.

Establishing Multi-Agency Consensus for Incident Response Planning

A consensus of the need for planning should be established among the various agencies involved in incident response. Traffic management teams, now in place in most TxDOT Districts, can serve as the focal point for establishing this consensus; still, other officials that are not a part of the management team will need to be contacted as well. These officials include fire department representatives, medical examiners, and environmental specialists who may be called upon to deal with an incident situation. All agencies that play a role in major incident response must be advised of efforts to establish specific response procedures and why these efforts are needed. Common goals and objectives for improved incident response can be formulated through these consensus-building efforts.

The Texas Department of Transportation is the logical choice to lead in consensus-building for urban freeway incident response because of its broad jurisdictional responsibilities, and because one of the most important benefits is the reduction in incident duration on highways and freeways. Although TxDOT may lead in the consensus-building effort (and perhaps throughout the entire incident response planning process), a law enforcement agency will usually be designated as the agency-in-charge during actual incident response. Designation of lead agencies and development of the chain-of-command are discussed in later sections.

Identifying Common Incident Classifications

Agencies are charged with different tasks in incident response; therefore, each one sees a given incident from a slightly different perspective. For example, consider a hypothetical multi-vehicle accident involving two automobiles and a gasoline tanker truck. Medical response units will view the incident in terms of the number and severity of injuries sustained by vehicle occupants. The fire department will analyze the incident for the potential of fire and explosion. The state water control agency will view the incident in terms of the type and amount of hazardous materials that may be released into the environment.

To improve coordination and cooperation among agencies in multi-agency incident responses, a common measure for indicating the severity of a given incident is proposed. The most obvious measure is the expected duration of each agency's involvement in the incident. An example of an incident classification system used by transportation agencies is shown in Table 1. The duration of incident decides the level, which is further described by the types of incidents that correspond to that classification, and the response activities that may be required.

Table 1 also indicates that all agencies do not become involved in all incident classifications. Incident types may "shift" to the next higher classification under certain conditions. For example, when an incident occurs late at night, the response times of some agencies may increase. If an incident occurs during peak commute periods, the response time may increase due to difficulty in reaching the incident. Agencies may adjust these classifications to reflect specific differences in their response levels because of resources available in an area.

Table 1. Example of An Incident Classification Scheme

	Incident Classification				
	Level I	Level II	Level III	Level IV	Level V
Types of Incidents (examples)	Vehicle stall on shoulder	Vehicle stall in travel lanes	Minor accident (no injuries) Minor load spill	Serious accident (potential injuries) Spilled load (possible hazardous materials) Vehicle fire	Serious accident (with major injuries) Haz. material spill Several vehicles on fire
Anticipated Duration of Lane Blockage	None	0-30 minutes	30-60 minutes	60-120 minutes	> 120 minutes
Types of Response Activities	Motorist assistance	Motorist assistance with minimal on-site traffic control	Police assistance with on-site traffic control Possible implementation of traffic diversion strategies Debris removal	Police assistance with extensive on-site traffic control Fire department response Haz. mat. response Traffic diversion strategies Debris removal	Police assistance with extensive on-site traffic control Fire department response Haz. mat. response Traffic diversion strategies Neighborhood evacuation Debris removal

Regardless of the specifics of the classification table, the key is to establish a consistent basis so that all agencies make the same interpretation of an incident classification.

To establish a consistent basis, agencies classifying incident severity must understand how the actions of each agency in incident response fit together. Certain activities by different agencies can occur simultaneously, such as medical assistance to injured occupants at an accident by paramedics, while diversion strategies by police and transportation agency personnel are implemented. Other activities must occur in sequence, such as medical assistance followed by the removal of incident debris from the roadway. Those activities which must be sequenced extend the total duration of an incident and may cause a shift to a more severe incident classification level.

Establishing Interagency Cooperation Agreements

It is often useful to establish interagency cooperation agreements as part of major incident response planning. These agreements verify each agency's commitment to work cooperatively during incidents and specify the types and amount of resources each agency will commit to incident response. These agreements should include statements concerning:

- Which agency (and officials in that agency) will be in charge during incident response (i.e., the lines of authority/chain-of-command),
- How each agency's need to assist will be determined,
- How agencies will be notified if their assistance is needed, and
- How assistance and coordination of agencies or private sector parties not specified in the agreement will be accomplished.

Developing Interagency Communication Protocols

A coordinated multi-agency approach to incident response requires that officials from each agency be able to pass along and receive important information about the incident as it becomes available. The information flow process for incident response must be determined in the planning process. This information flow process should include specific criteria concerning when each agency will be contacted, who the contact person (or persons) will be, and the appropriate method for communication.

Effective communication and coordination of TxDOT and other agency contacts must be in place long before the occurrence of a roadway incident. It is a function of detailed pre-planning with the key being a central incident communication control point. This focal point may reside with either TxDOT, police, or other transportation agencies within a given jurisdiction. An example flow chart for incident response proceeding from detection, confirmation, coordination, and communication is shown in Figure 1.

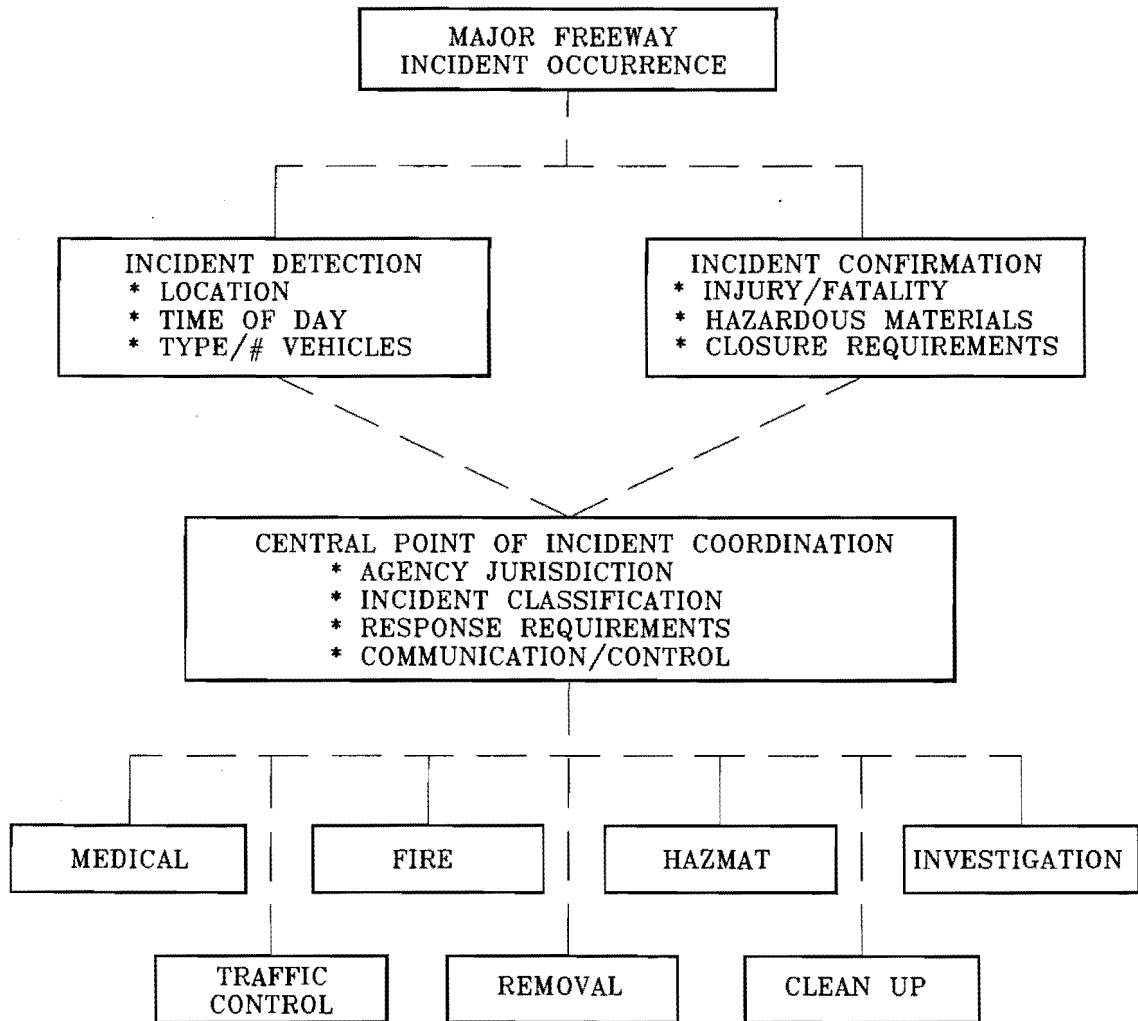


Figure 1. Example of an Incident Response Flow Chart

Various documents assist in effective communication of incident information and minimize response time. The first is a descriptive flow chart of communication lines and contacts associated with different levels of a roadway incident. These lines of communication include incident detection through the final clearance report. Each flow chart should include a position with names, locations, and phone numbers which may be different for day or night incident occurrence.

Other documents required for effective incident communication and response are complete, updated contact lists of TxDOT maintenance and traffic control personnel. This should be designated by day or night with responsible supervisors highlighted. Likewise, TxDOT dispatch should have contact lists of all other potential responding agencies. A secondary contact list for all agencies should also be available to mobilize additional personnel and equipment, if needed.

Usually, the telephone is the designated communication mechanism for exchanging incident information among agencies. Cellular telephones are becoming more common in the work vehicles of many transportation agencies, allowing direct contact with personnel of different agencies in the field. In major urban areas where centralized freeway surveillance and control centers are established, members of key response agencies may be located in the same traffic management center allowing direct communication and decision-making during incidents.

Finally, the public needs to get information concerning the incident (i.e., the location, expected duration, diversion locations, etc.). In addition to official communication systems, commercial radio and television stations should be included when disseminating information to the public. Names and phone numbers of appropriate media personnel should be included in the plan.

TRANSPORTATION AGENCY PREPARATIONS

After the basic structure for interagency cooperation and coordination is established, the transportation agency can improve its response preparedness for major incidents. Transportation agencies are usually called upon to assist in debris removal after a major incident because of the types of equipment they have available (i.e., dump trucks, sweepers, graders, front-end loaders, sanders, boom trucks, etc.). However, requests for other types of assistance for which the agency could serve a useful role are often less frequent because the necessary preparations have not been made beforehand.

Areas in which transportation agencies can provide assistance are on-site response and alternate routing. This section discusses how an agency can improve its capability for response in these functions.

Improved Readiness for On-Site Incident Response

Transportation agencies can enhance their ability to assist in incident clean-up operations on-site by establishing response vehicles which can be dispatched without delay. The vehicles should be provided with equipment and materials as summarized in Table 2. To facilitate access to these materials at the incident site, each response vehicle should be loaded in a uniform manner, with a copy of this loading plan on board the vehicle for use by operating response personnel. All storage compartments and containers should have a label detailing their contents.

The number of response vehicles needed is dependent upon the size of the area and traffic under jurisdiction of the transportation agency. Large TxDOT Districts have several maintenance yards with each having assigned responsibility over a portion of the roadway network. Each yard having freeway responsibilities should have one or more specially-equipped response vehicles. These vehicles may or may not be exclusively dedicated to incident response. If not, the vehicle(s) should be easily accessible for this task. Experience dictates whether more vehicles are needed at a specific yard.

Table 2. Equipment and Materials for Transportation Agency Incident Response

Type of Equipment/Materials	Items
Containment Materials	<ul style="list-style-type: none"> • Trash can full of absorbent • Trash can full of sand • Trash can full of diapers (or white foam pads to absorb diesel or oil) • Shovel • Broom • Coveralls
Traffic Control Devices	<ul style="list-style-type: none"> • Traffic cones w/white reflective sleeves • Pylons • Traffic vests • Flashlight w/fluorescent cones for flagging • Flags • Safety vests • Flares and ignitor
Communication Devices	<ul style="list-style-type: none"> • Cellular telephone • Radio (low and high band), 3 or 4 extras
Other Equipment	<ul style="list-style-type: none"> • Spotting scopes to read hazardous material placards from a distance • Hard hats • Marking paint • Spotlight • Fire extinguishers (20 BC or larger) • First-aid kit • Backpack air blower • Electrical generator • High volume pump to remove fuel from overturned tanker trucks • Fuel tank sealant mastic • Vehicle mounted flood lights • Push bumper on incident response vehicles

For incidents involving overturned combination trucks, special needs may include air bags or air cushions (to return the vehicle to an upright position), as well as mobile construction cranes to expedite incident clean-up. This equipment may be beyond the means of a DOT and could be provided by a private source.

Different methods exist to get heavy-duty tow trucks to the scene of an overturned heavy commercial vehicle (Figure 2). If there is only one provider in town, the process of selection is simplified. However, in large urban areas, there will typically be several operators, so a method of selection is usually needed which is fair to all who qualify. The most common method used in large urban areas utilizes a rotation list maintained by law enforcement agencies which respond to incidents. In some cases, the tow company must qualify for the list by meeting preestablished requirements of equipment size, lift capacity, and a good service record. Less common is the use of a few heavy duty tow companies that are contracted to provide the service. Some jurisdictions are considering penalties in contracts when tow vehicles take excessive time in responding.



Figure 2. Use of a Heavy Duty Tow Truck

Site Specific Planning for Incident Response

Recent research indicates that large urban areas can expect a major freeway incident (blocking one or more travel lanes for more than 30 minutes) once every 85 million-vehicle-miles driven (Figure 3). For areas with high traffic demands and a significant number of freeway lane miles, this incident rate translates into one to two major incidents per week. In some metropolitan areas, a specific multi-agency incident response team (IRT), consisting of state and local police and transportation officials, has been established. The IRT is called to each major incident scene where they establish a command post near the incident and make decisions regarding on-site response and traffic management procedures to implement.

Data is not available to indicate the size of an urban area that can support a formal IRT. Even if a decision is made not to establish an IRT, the transportation agency (TxDOT) should establish an incident response contact person (IRP) who is available to travel to major incidents. The IRP would be in addition to the specific response personnel assigned to assist in debris clean-up, on-site traffic control, etc. The IRP should have a working knowledge of traffic operations and management procedures, and be trained to identify traffic problems which could be reduced at the incident site.

A major task for the IRT or IRP is to implement specific traffic management plans when a major incident occurs. These traffic management plans should be developed prior to the incident and in such detail as to show where and what types of signing and traffic control will be implemented and which agencies will implement them. The magnitude of traffic management actions specified in the plans may vary by the time of day the incident occurs due to the differences in traffic volume expected, as well as the severity of the incident.

A general process for developing site-specific traffic management plans for incident response is as follows:

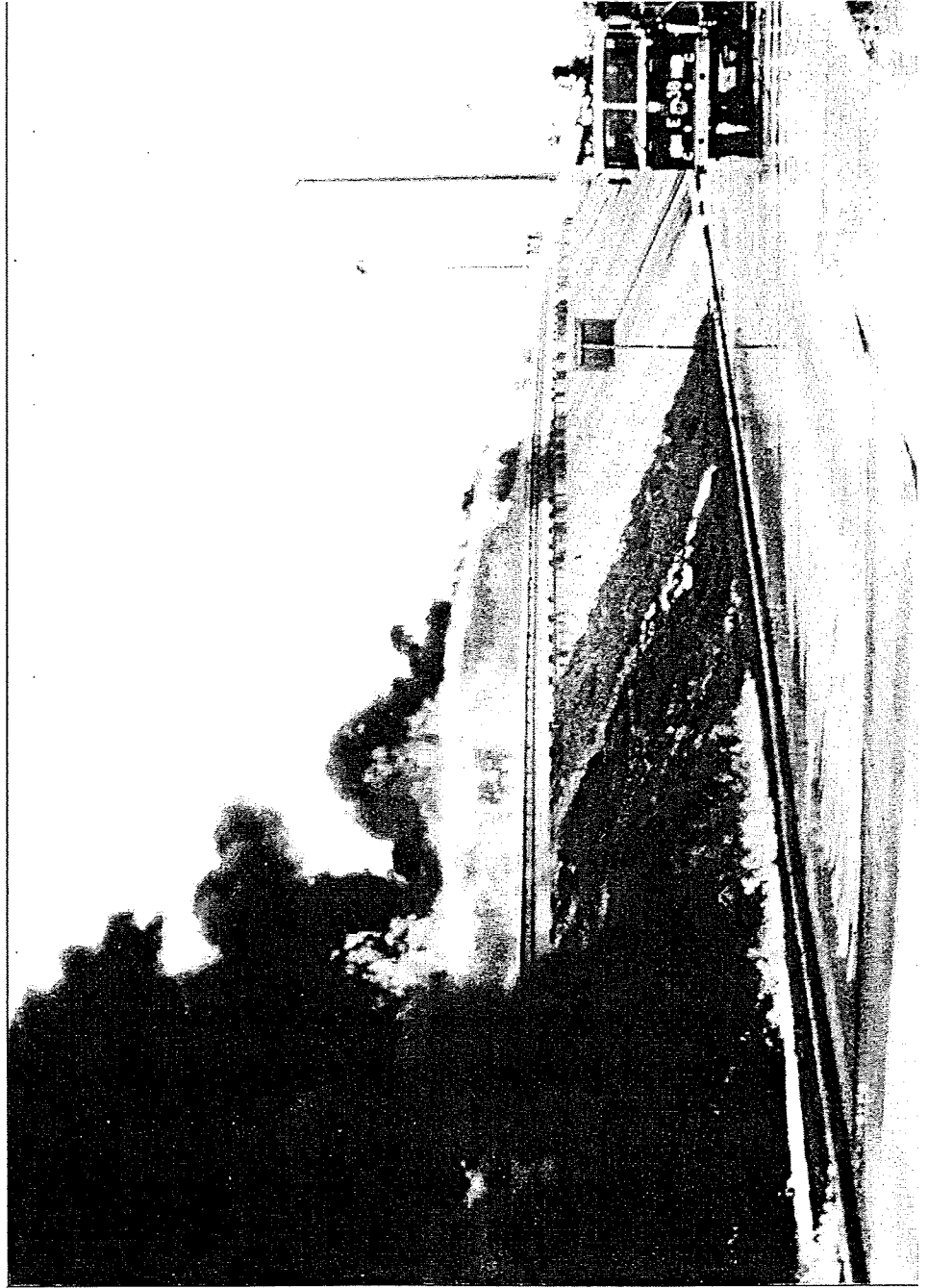


Figure 3. Example of a Major Freeway Incident

1. Prioritize freeway sections (1 to 2 miles in length) to be considered for site-specific traffic management planning. This priority can be based on the severity of potential traffic problems caused by a major incident in that section, or on the actual frequency of major incidents that occur. Typically, sections will begin and end with major interchanges to major arterials that can be used to access alternate routes.

2. Beginning with the highest priority sections, estimate the expected severity of traffic impacts caused by various lane blockages (i.e., one lane, two lanes, etc.) at various times of day. Typically, three time periods are considered: 7 P.M. to midnight, midnight to 5 A.M., and 5 A.M. to 7 P.M. In some jurisdictions, only peak and off-peak conditions may need to be considered. Traffic impact severity can be estimated in terms of the difference between the reduced roadway capacity past the incident site and average traffic volume during that time of day. The maximum number of vehicles which may travel through a given roadway section is established as 2000 vehicles per hour per lane on multi-lane highways. The reduction in capacity caused by incidents is not proportional to the physical reduction of the total roadway width due to lane closure. This loss of capacity, depending on facility and traffic demands by time of day, may translate into significant congestion and delay. Table 3 presents an example of the total facility capacity reduction for the number of lanes obstructed by an incident.

Table 3. Total Capacity Reduction Due to an Incident

Number of Lanes Obstructed Due to Incident	Total Capacity Reduction (%)
Shoulder Blockage or Closure (no lanes blocked)	20%
One Lane of a Three Lane Section	50%
Two Lanes of a Three Lane Section	80%
One Lane of a Four Lane Section	33%

3. Determine appropriate traffic management techniques to be employed for each lane blockage/time of day scenario. Scenarios where traffic demands are less than capacity or exceed capacity by only a small amount may require that officials simply monitor activities at the site. Conversely, if traffic demands far exceed the reduced capacity (or if the roadway will be closed entirely), more elaborate actions will be necessary (Figure 4).
4. For scenarios where demands far exceed capacity, diversion from the freeway will be necessary. Diversion can either be advisory (if some flow can pass by the incident) or mandatory (if the freeway is closed completely). The parallel frontage road adjacent to most urban freeways in Texas is the most likely primary alternative. However, if the amount of traffic that needs to divert far exceeds the capacity of the frontage road, additional arterial routes farther away from the freeway may need to be utilized. For each section, primary and secondary diversion routes need to be identified and inventoried to make sure they are suitable. Generally, routes that pass schools, hospitals, playgrounds, etc. are not politically acceptable alternatives. For each alternative route, the need for trailblazing signs, police officer control at critical locations (high-volume intersections, ramp closures, etc.) is then determined (Figure 5).
5. The possibility of establishing special diversion route traffic signal timings on primary and secondary alternative routes should be examined (involving cooperation between TxDOT and local transportation agencies). At a diamond interchange, a three-phase operation is often preferable to a four-phase operation during diversion. This technique has significant potential for implementation where the signal system is under a computerized system control (either centralized or decentralized).
6. Permanent changeable message signs (CMS) are being installed in several urban freeway corridors statewide. The CMS is a very useful tool during diversion operations. If permanent CMS are not available, portable CMS owned by TxDOT

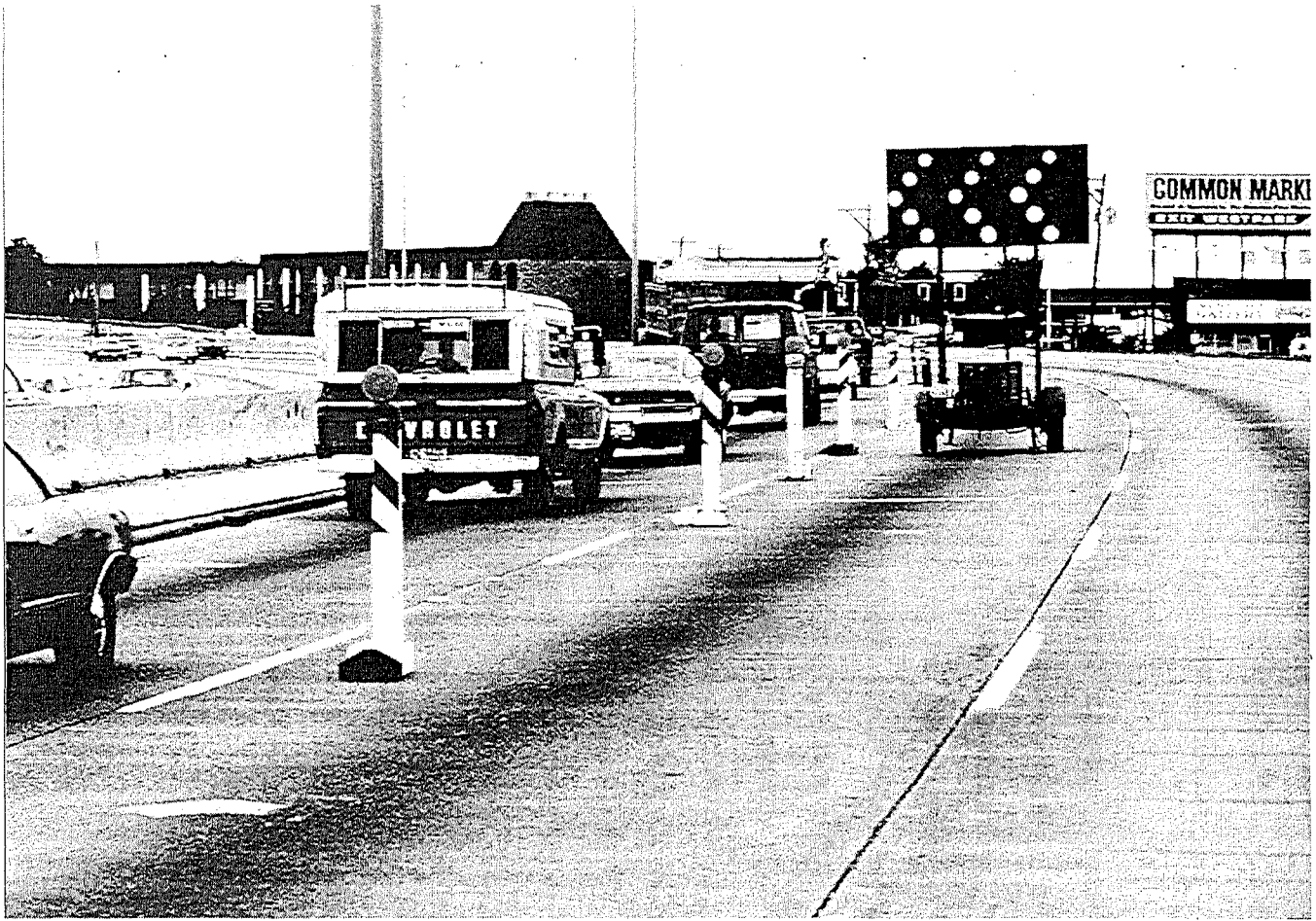


Figure 4. Lane Closure Traffic Control



Figure 5. Law Enforcement Traffic Control

for work zone traffic control may be useful. If used, they should be placed on the freeway shoulder, upstream of the exit ramp where traffic is being diverted. This location should be specified for each site-specific plan, along with the message(s) to be displayed.

7. Consideration should also be given for each site to the potential locations for large equipment staging areas. Many types of incidents require large, specialized equipment to rescue vehicle occupants and clear the roadway. A nearby location should be identified and established for these vehicles to be managed and stored during incident response operations.
8. Once the specific traffic management techniques for a given potential incident site are determined, manpower and equipment resources required to implement those techniques are determined. The locations where signs (advance warning, changeable message sign, etc.) will be stored is determined, and individuals responsible for installing them identified. All pertinent information is transferred to a detailed map of the area, marking traffic control and officer locations, primary and secondary routes, and times and conditions when the various levels of traffic management are to be implemented.

It is recommended that the IRT, IRP, or agency responsible for developing the site-specific traffic management plans for an urban area limit the size and scope of the plans initially to evaluate their effectiveness in incident response. Adjustments in the amount and type of information needed on each site plan can then be customized to the needs of the agencies. When site-specific plans are finished, they must be distributed to the agencies involved for their approval.

Levels of Incident Response

Knowing historical information on the types of incidents, where they typically occur, and their rate of occurrence should be helpful in response activities. Using a large database from Houston and smaller databases from Austin and Beaumont, several informative results become

apparent. First, major freeway incidents usually involve trucks; and, truck incidents usually occur between 9 A.M. and 4 P.M. Also, clearance time for an overturned truck or spilled load typically increases from 2.5 hours (passenger cars and non-overturned truck) to over 3 hours (Figure 6). Location was also a significant factor, with major freeway incidents of all vehicle types occurring 3.5 times more often at freeway-to-freeway interchanges than between them.

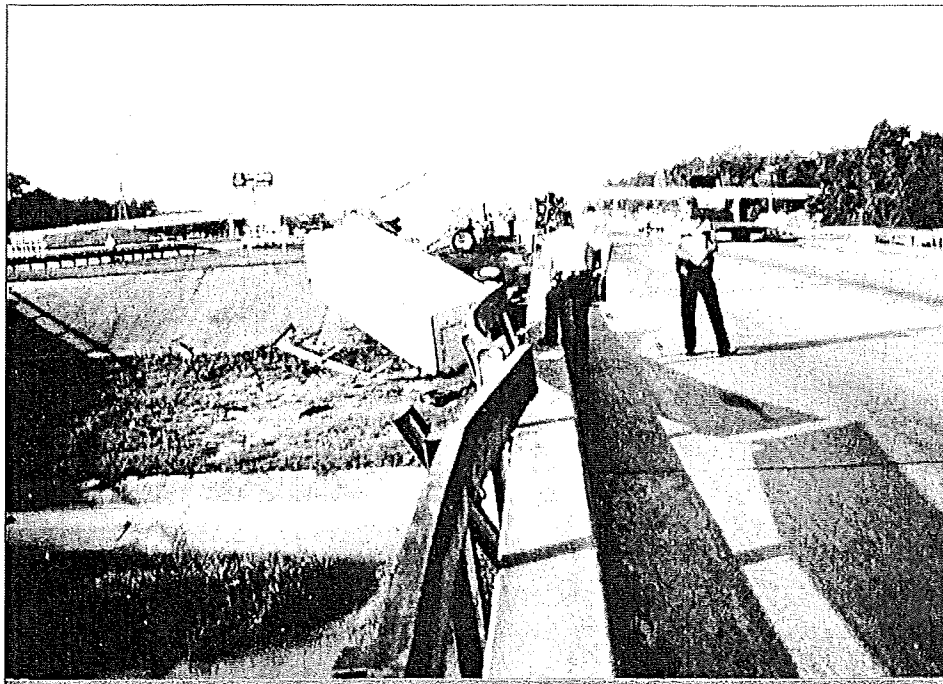


Figure 6. Example of an Overturned Truck Incident

Assessment and classification designation of a freeway incident is dependent upon time of occurrence. In general, transportation agency response may be described as indicated in Table 4. Depending on time of incident occurrence (peak versus off-peak, day versus night) and roadway closure (lane capacity versus traffic demand), response level designation may change as shown in Tables 5 and 6. Other factors, such as availability of alternate detour routes, may also be of influence.

Training

The proper training of incident response personnel is essential to successful incident response. Table 7 lists some of the areas that should be included in the training program for incident response.

Table 4. Response Level Description

Response Level	Departmental Action
1	On site traffic control provided by local law enforcement agencies. Activation of lane control signals and overhead message signs from control center, if available.
2	Level 1 supplemented with special traffic control devices (arrowboards, trailer mounted changeable message signs) provided and operated by department staff and some off freeway traffic management activities (most probably limited to frontage road).
3	Level 1 plus necessary departmental personnel and equipment to deploy traffic control devices for modified version of MUTCD traffic control plan.
4	Level 1 plus necessary departmental personnel and equipment to deploy traffic control devices for closure of lane(s).
5	Level 1 and necessary departmental personnel and equipment for the following activities: <ol style="list-style-type: none"> 1) Deployment of traffic control devices for closure of lane(s). 2) Off freeway traffic management activities (frontage road and primary alternative route(s) including signing and traffic signal handling).

Table 5. Response Level for Peak Period Incidents (Day)

Number of Lanes Closed	Total Number of Freeway Lanes			
	2	3	4	5(+)
	Response Level			
1	3	2	1	1
2	5	4	3	2
3		5	4	3
4			5	4
5(+)				5

Table 6. Response Level for Peak Period Incidents (Night)

Number of Lanes Closed	Total Number of Freeway Lanes			
	2	3	4	5(+)
	Response Level			
1	1	1	1	1
2	3	2	1	1
3		4	3	2
4			4	3
5(+)				4

Table 7. Training for Incident Response Personnel

Area	Training
CPR	Initial training course, with periodic refreshers or updates.
Basic first aid	Initial training course, with periodic refreshers or updates.
Radio communication, with emphasis on reporting	Each agency trains its employees in its own communication procedures and terminology.
Traffic control strategies	TxDOT Traffic Control Course Traffic control section in this manual.
Public relations	Briefing by TxDOT District Public Affairs
Incident command system training	On-the-job training.
Basic hazardous materials identification training	Hazardous Materials Incidents section in this manual.
Removal of disabled vehicles	Disabled Vehicle Removal section in this manual.
Working knowledge of how to use the equipment in the response vehicle	On-the-job training.
General knowledge of departmental procedures and policies of each of the responding agencies	On-the job training.
Fatal or felony accident	Briefing from the DPS accident investigation officer.

RESPONSE GUIDELINES

Guidelines for incident response are classified by day versus night and peak period versus off-peak period to accommodate the differences in the consequences of response to incidents and the capabilities of response. Therefore, the assessment and classification designation of a roadway incident will be dependent on time of occurrence.

Maintaining Traffic Flow

Maintaining traffic flow is an important part of dealing with an incident. With the exception of vehicles parked to secure the incident scene, emergency vehicles should be parked on the shoulder to keep from blocking any additional lanes of traffic. The main goal is to keep as many lanes of traffic open as possible.

Use of Flashing Lights

The use of emergency flashing lights to alert oncoming motorists that an incident has occurred can be positive or negative, depending on the time of day. Flashing lights are a must when vehicles will be travelling on the shoulder or next to it at high speeds, especially at night. Flashing lights and rotators are also important aids in getting to the scene. However, flashing lights can distract motorists if they are used unnecessarily. These distractions cause increased congestion at the scene of the incident. Arrowboards should be set up once the incident response vehicle has arrived at the incident scene.

Removal of Vehicles

Removing vehicles that block the roadway can be a major step in opening lanes of traffic and relieving congestion. Push bumpers provide incident response vehicles and patrol cars with the capability to push vehicles with various bumper designs off the roadway quickly and safely. The longer congestion exists, the higher the probability that a secondary accident will occur. Therefore, it is important to clear the vehicle out of the roadway as soon as possible.

The authority exists to clear obstructions to open the roadway as soon as possible. Section 103 of Article XIII of the Texas Motor Vehicle Code establishes legal authority for vehicle removal from roadways. This may increase the state's exposure for potential tort action. However, the main concern is to work for the greater good of the motoring public; this goal outweighs any damages to private property that could be incurred.

The recommended procedures for pushing vehicles off the roadway are as follows:

1. Always obtain driver permission before pushing the vehicle off to the shoulder (except if the vehicle is a hazard or interrupting the flow of traffic on a bridge facility).
2. Make sure the driver knows where the vehicle is being relocated. The driver must understand the direction to steer. Also, remind the driver that the power steering or brakes may not be functioning.
3. Guide the driver by giving instructions through the loudspeaker.
4. Push the vehicle to the nearest shoulder. Do not cross traffic to clear a vehicle, unless it is absolutely necessary.
5. Ensure the bumper connection is well fit.
6. Do not push the vehicle too quickly.

Push vehicle when:

- the vehicle is stalled or disabled, but its wheels are free to roll,
- the incident response vehicle has compatible bumpers or push bumpers,
- the vehicle is no larger than a pickup, and
- the driver is capable of steering the vehicle to the side of the roadway.

Do not push vehicles when:

- the vehicle is too large to move,
- the wheels are locked (although air-brake systems on heavy trucks can be unlocked so as to move the vehicle out of a traffic lane if damage is not too extensive),
- the driver is not capable of steering the vehicle to the shoulder,
- there are injuries or fatalities. Please note that in cases of incident fatalities, the coroner must examine any bodies before they can be removed from the incident scene, or
- the driver is suspected of being impaired by a substance such as alcohol, and no shoulder or gore area exists within a reasonable distance to move the vehicle to.

Hazardous Materials

The safety consequences of a hazardous material incident cannot be over-stated. Communicate immediately to local, state, and national officials (if necessary) information concerning incident details associated with hazardous cargos spills.

Approach the incident scene upwind; stay clear of all spills, fumes, vapors, and smoke. Do not assume that odorless vapors or fumes are harmless. Do not attempt to enter the incident scene until potential hazardous material exposure is cleared. Use spotting scopes to determine the type of material spill from a distance. Help cannot be provided to others until the hazards have been completely identified.

Placards, container labels, shipping papers, and/or knowledgeable people on the incident scene can be valuable sources of information. Evaluate and consult them all. Use the *1990 Emergency Response Guidebook* for the following procedures.

Obtain the Material Identification Number

- Find the four-digit ID number on the placard or orange panel or,
- Find the four-digit ID number on the shipping papers or package. Shipping papers should be located in a pouch on the driver's door, in clear view of the truck driver's seat, or on the seat itself or,
- Find the name of the substance on the shipping papers, placard, or package.

Find the Guidance Number

- Find the procedures that correspond with the appropriate guide number (white pages with the orange rim)

If unsure of hazardous materials, contact the Chemical Transportation Emergency Center (Chemtrec) at (800) 424-9300 for hazard information warnings and guidance given only the product name and nature of problem.

Fatal or Felony Accidents

In the event of fatalities or suspected felonies (i.e., hit and runs), **extreme care** must be taken to preserve evidence at the scene. Traffic should be routed around all physical evidence (i.e., skid marks, broken glass, automobile parts), if possible. All response team members should be aware of this and take necessary precautions. Care should be taken not to disturb anything on-site.

Response Guidelines

Guidelines for roadway incident response by TxDOT or the transportation agency of jurisdiction are as follows:

1. Incident Communication Control or any other emergency agency dispatch calls the TxDOT dispatch requesting incident response.
2. TxDOT dispatch informs the Incident Response Team, Maintenance Supervisor, and Public Information that an incident has occurred.
3. Members of the Incident Response Team respond to the incident in their trucks.
4. While en route, members of the Incident Response Team communicate with on-site personnel by radio to obtain pertinent details about the incident.

5. Members of the Incident Response Team, including the Maintenance Supervisor (or a representative), develop a plan of action on the way to the incident scene.
6. The Maintenance Supervisor (or a representative) calls in additional maintenance technicians and equipment to the scene, if necessary.
7. TxDOT personnel set up traffic control.
8. The Incident Response Team calls the TxDOT dispatch with traffic control information.
9. TxDOT dispatch notifies selected personnel that specific traffic control has been established.
10. For incidents whose anticipated duration is four or more hours, selected personnel are informed by TxDOT dispatch that an incident has occurred and the types of traffic control in effect.
11. TxDOT contacts the media regarding traffic control and traffic conditions.
12. TxDOT personnel clear the roadway as required.
13. The Incident Response Team informs TxDOT Dispatch that the incident has been cleared.
14. The Highway Radio Operator notifies selected personnel that the incident has been cleared.
15. TxDOT contacts the media regarding traffic control and traffic conditions.
16. Required incident response reports are completed and filed.

In general, these guidelines should be followed for both day and night incidents. However, specific personnel contact locations will be different at night, along with associated staging response times. Also, the maintenance supervisor or incident response team leader will act as spokesperson representing TxDOT for any media communication.

Incident Reporting (On-Site)

A designated individual within TxDOT or the responding transportation agency should complete and file a report regarding activity associated with a roadway incident necessitating closure of travel lane(s). This report can be accomplished at or through agencies represented at a control center, if applicable. These reports should be kept indefinitely so that historical trends can be established and agencies can learn from the information. The following information should be noted in that report:

- Indicate the location of the incident.
- Check off the appropriate weather and road conditions.
- Specify the time that the TxDOT arrived and the time the road was closed.
- Estimate the duration of the closure.
- Provide a brief description and possible cause(s) of the incident.
- If this is a HAZMAT spill, identify the material spilled and its approximate quantity.
- If clean-up is required, fill out all necessary details regarding the equipment used.
- Identify who has taken responsibility for the clean-up.
- List TxDOT's traffic control activities.
- State whether detours or route diversion were needed.
- List all agencies involved.
- Note how TxDOT was notified (by radio or phone).
- List the names of all TxDOT employees on the scene.
- Obtain pertinent information about the vehicles involved.
- List the time the roadway was opened.
- Note the time that traffic control started and ended.

- Check off all equipment used at the incident scene.
- Describe how the clean-up was conducted, noting the equipment, the time clean-up started, and the time it ended.
- Check which traffic investigation method was used, if applicable.
- Make pictorial documentation of the incident and actions.
- Note any damage to any TxDOT highway appurtenances as a result of the incident.
- Indicate presence of medical examiner, if required.
- Note any other pertinent comments about the incident.

Incident Reporting (After Incident)

In addition, the individual within TxDOT or the responding transportation agency responsible for incident dispatch communication should complete and file a written report to corroborate with the on-site report and provide identification/notification information not known by representatives/agencies on-site. This report may be combined with the on-site report if both are done at a control center. The report should include:

- Specify the roadway designation, mile post, county, and nearest major landmark of the incident scene.
- Provide a description of the incident.
- Define any hazardous materials present.
- Note when HAZMAT was notified.
- List each maintenance person on the scene and the time he or she was requested. In addition, note the time that he or she arrived on the scene.
- If any additional maintenance crews were required, list time of contact and response.
- List any additional TxDOT equipment required.
- Indicate who requested the road closure and when.
- Indicate whether the road closure was total.

- Indicate which lanes were closed and when they were reopened.
- Indicate any on- or off-ramps that were closed and the time they were reopened.
- List any detour information, if necessary.
- List any additional comments that pertain to the incident.