

**SYNTHESIS OF
INCIDENT MANAGEMENT TEAMS
AND
INCIDENT REMOVAL LEGISLATION**

by

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SUMMARY

Today, one of the most disruptive occurrences facing freeway motorists is non-recurrent congestion, unpredictable traffic incidents that result in decreased roadway capacity and considerable amounts of wasted time and fuel. In the hopes of minimizing the impact of these incidents, several incident management programs (IMP) have been developed to improve freeway operations in urban areas. Success of an IMP requires the communication, cooperation, and coordination of several transportation related agencies responsible for the safe and efficient movement of people and goods throughout the urban area.

To maintain the safe and efficient movement of people and goods, most transportation agencies would like to remove an incident from the operating lanes as quickly as possible. However, a major concern of these agencies is the extent that they can be held liable for additional damage incurred while moving a disabled vehicle and/or cargo from the freeway travel lanes.

The two main objectives of this research were to: 1) summarize the current status of IMPs in Chicago, Los Angeles, Austin, Dallas, Fort Worth, Houston, and San Antonio and 2) review state legislation regarding incident removal from roadways in Illinois, California, and Texas. To accomplish these objectives, several transportation officials involved with incident management efforts in these respective metropolitan areas and states were interviewed.

The results of the survey indicated that there were several similarities between the IMPs in each city.

1. Each Incident Management Team (IMT) met roughly every month for about 2 hours.
2. Furthermore, the same public agencies were generally represented on each IMT: state, county, and city DOT, police and fire departments, and in a few instances transit and toll road authorities.
3. The same agencies were also responsible for removing similar incidents from the roadway: stalled or disabled vehicle--service patrol or tow truck, spilled cargo--service patrol or state DOT, hazardous material--fire department's hazardous materials team, injured person--emergency medical services (EMS), and a fatality--coroner.
4. Contact lists indicating what personnel and equipment are needed at a particular incident are being developed in Austin and Houston, but none exist in Dallas and

San Antonio at this time. In Chicago, Los Angeles, and Fort Worth, once the service patrol arrives they decide who to contact and what equipment is needed.

5. Alternate freeway routes to accommodate diverted traffic during an incident had not been developed in Chicago due to restricted vertical clearances on alternative routes (arterial streets). Los Angeles has developed an 1100 page alternate route map for their entire freeway system. Alternative route plans are underdevelopment in Austin, Houston, and San Antonio. Alternative route plans were being developed in Dallas but were discontinued due to lack of support from area cities. Alternative route plans exist in Fort Worth, but the district safety coordinator and the police usually coordinate diversion actions at an incident based on their experience.

Illinois and Texas have laws that allow the state DOT to remove vehicles and debris that interfere with the flow of traffic as soon as possible. At this time, California does not have any specific legislation regarding the removal of vehicles and debris from the roadway by the state DOT. Texas law states that the Texas State Department of Highways and Public Transportation (SDHPT) is not liable for any damages to removed cargo or personal property unless the removal or disposal was carried out recklessly or in a grossly negligent manner. However, the statement "recklessly or in a grossly negligent manner" is subject to a broad interpretation.

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BACKGROUND

Nonrecurrent Congestion

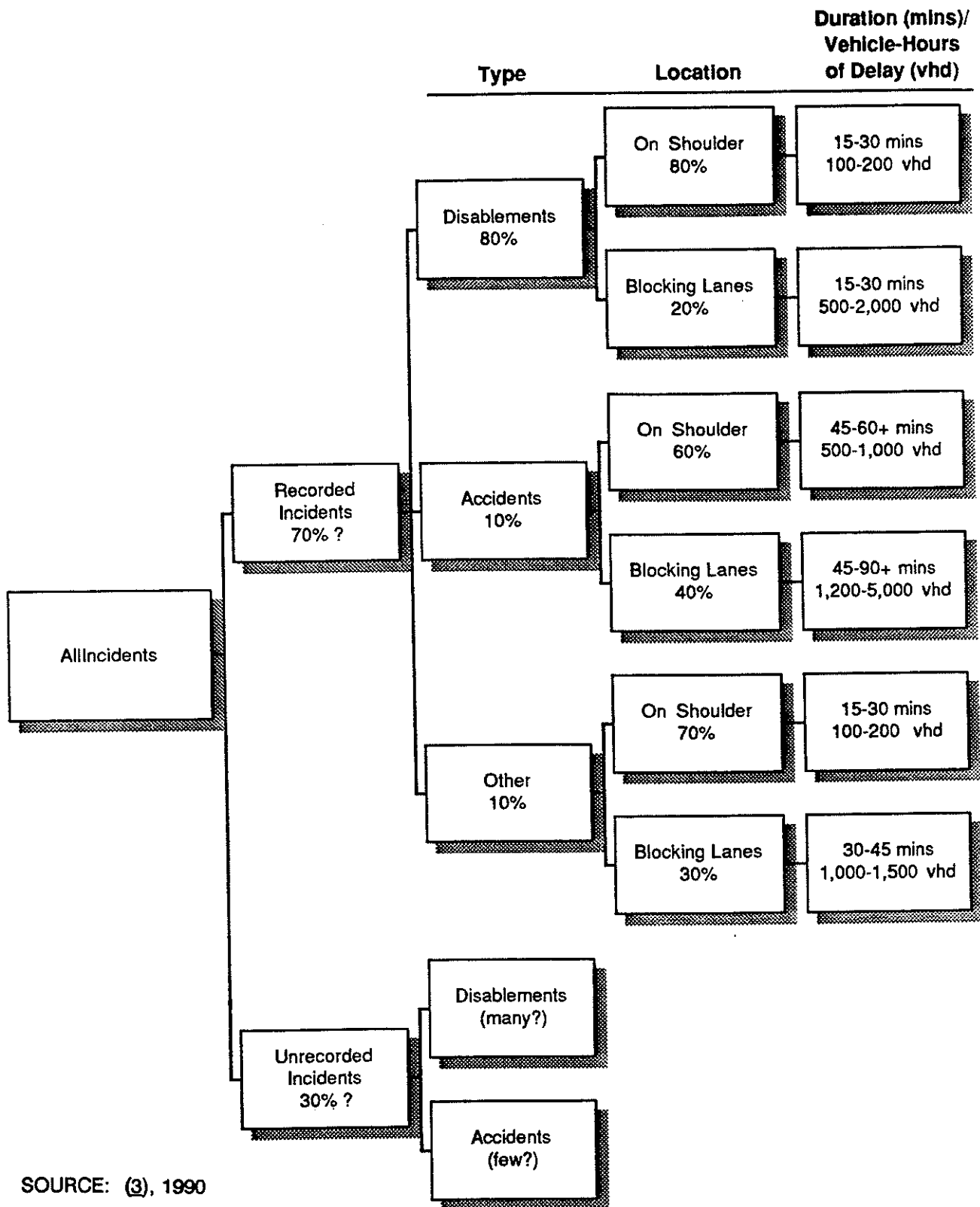
Managing traffic during non-recurrent congestion, specifically, freeway incidents, is one of the most difficult tasks facing traffic managers. Freeway incidents are any nonrecurrent event which results in either a reduction in roadway capacity or irregular increase in traffic demand. These incidents can be classified as either predictable or unpredictable. Examples of predictable incidents include: maintenance and construction activities, and special events (e.g., sports events, fairs, parades, and concerts). Typical unpredictable freeway incidents include: accidents, stalled vehicles, inclement weather, spilled loads, and roadway infrastructure failures (collapsed bridge or washed-out road). Any one or combination of these incidents can result in considerable congestion (increased delay, travel time, fuel consumption, and emissions) depending on the time of day the incident occurs, severity, location, and duration (1). Figure 1 has been provided to illustrate the frequency of certain incidents, their location, duration, and resultant impact to the immediate freeway motorists affected by the incident.

Lindley (2) has reported that incident delay accounts for 61% of all urban freeway delay and is expected to increase to almost 70 percent by the year 2005. During 1987, the Federal Highway Administration (FHWA) estimated that incident-induced congestion accounted for 1.3 billion vehicle-hours of delay resulting in a loss of \$10 billion. For example, incident congestion in a large urbanized area, such as New York City, costs approximately \$1.2 billion per year or approximately \$100 per person per year (3).

Incident Management Programs

Today, incident management programs (IMPs) exist in nearly 30 cities; however, several other cities around the country are developing these programs to minimize the impact of incidents. Robinson (4) has defined freeway incident management (FIM) as, "the coordinated, preplanned use of human, institutional, and mechanical resources to reduce the duration and the impact of incidents." For the full potential of an IMP to be reached requires the communication, cooperation, and coordination of several metropolitan transportation-related agencies responsible for the safe and efficient movement of people and goods.

IMPs improve the motoring public's safety by reducing secondary accidents that result from unsuspecting motorists colliding with the end of an incident queue or the vehicles involved in the initial incident. By minimizing the possibility of secondary accidents not only strives to ensure the motoring public's safety but also reduces the burden on insurance companies which might have a policy holder involved in a secondary accident.



SOURCE: (3), 1990

FIGURE 1. Composite Profile of Reported Incidents by Type

The benefits of quick response that an IMP provides, also translates to improvements in urban mobility which will affect economic growth. A primary consideration facing businesses and developers wishing to locate to a city is the level of mobility to and from employment and shopping centers. If an efficient transportation system exists, the more likely economic growth will be attracted to the city. Many families also consider a community's mobility when evaluating a community to relocate to. If the driving family members have good access to shopping centers and employment the more likely they will locate to the community.

Based on the preceding statements, an effective incident management program can have a significant impact on a city's mobility, which will in turn affect the motoring public's safety and the economic and residential growth of a city.

Incident Management Teams

At the heart of an IMP are the agencies that are represented on the incident management team (IMT). The members representing each agency should have authority to decide what resources (equipment and personnel) their agency can provide to facilitate incident management efforts. Typical members include: state, county, and city DOTs, transit operators, local jurisdictions, police departments, highway patrol, fire/rescue, emergency services, environmental protection agencies, and towing services (5).

Successful operation of the IMT can be facilitated through the following steps (5):

1. Schedule monthly or bimonthly meetings. These meeting should provide informal interaction.
2. Insist on the attendance of the same agency representative.
3. Accept a "team" approach. Recognize that no one agency need be "in charge".
4. Develop a mutually acceptable coordination plan through written agreements of understanding between agencies.
5. Joint development of a coordination plan to ensure each jurisdiction's requirements are met. Allow each jurisdiction to make decisions relevant to its own operations.
6. Distribute pamphlets, brochures, and other documents discussing the need for an incident management program.
7. Ensure the continuous flow of information, recommendations, and experiences in other regions.
8. Distribute information on benefits including low cost incident management measures.

The IMT should ensure that a team member or a combination of team members are responsible for at least one of the 6 common elements of an IMP--detection, verification, response, removal, motorist information, and traffic management. A summary of these elements and options available to transportation agencies is provided in Table 1 (5). Each of these elements warrants considerable attention, planning, and coordination to achieve an effective IMP; however, the remainder of this paper will concentrate on the removal element.

Incident Removal

The more time it takes to clear an incident from the freeway travel lanes, the more likely secondary accidents are to occur from unsuspecting motorists approaching the end of the incident queue (i.e., potential for rear-end accidents due to large speed differentials) or colliding with the vehicle(s) involved in the incident. Furthermore, during morning and evening peak periods, incident-induced congestion can spread quickly to adjacent freeway corridors resulting in gridlock over large portions of the metropolitan area. Therefore, the incident should be removed as quickly as possible from the freeway travel lanes. However, several times the removal of an incident is hindered by liability issues facing the public agency and the uncertain responsibility of motorists involved in property damage only (PDO, noninjury) accidents.

Fast Removal Policies

The liability issues regarding incident removal are a primary concern of many public agencies wishing to restore normal freeway traffic flow conditions as soon as possible. Many of these agencies have fast removal policies in which the agency will push, tow, or drag disabled vehicles and its cargo to a location that will not interfere with normal traffic flow. The agency will remove the incident even if additional damage might occur to the vehicle and its cargo. Typically, if spilled cargo is involved, the trucking company will be allowed to pick up the cargo once the peak period has passed. However, if the freeway infrastructure is damaged and/or the public agency has to pick-up the spilled load and dispose of it, the motor carrier will usually be charged for damages and clean-up. Generally, the courts have upheld these fast removal policies; however, few have been challenged (3).

Traffic Laws and Insurance Policies

In the spirit of incident management, it is desirable to have motorists involved in PDO accidents move their vehicles off the freeway travel lanes as soon as possible. However, most motorists will not remove their vehicles for two reasons. First, most motorists believe it is illegal to move their vehicles before the police arrive. Second, many motorists believe their insurance policy will be void if they move their vehicles before the police arrive (6).

TABLE 1. Freeway Incident Management Elements

Incident Management				
Reduce Duration			Restore/Maintain Capacity	
Detection	Verification	Response	Removal	Motorist Information
<p>Electronic/computerized detection</p> <p>Enforcement personnel/patrols</p> <p>Maintenance/construction/other personnel</p> <p>Service patrols</p> <p>Fixed observers at strategic locations</p> <p>Transit, taxi, trucking organizations</p> <p>Traffic reporters/commercial traffic information services</p> <p>Aerial surveillance</p> <p>Motorists:</p> <ul style="list-style-type: none"> • Call boxes • Cellular telephone/"hot" lines • CB radio 	<p>Assimilate information from:</p> <ul style="list-style-type: none"> • Enforcement personnel/patrols • Courtesy patrols • Service patrols • Closed-circuit TV • Citizen Band Radio • Traffic reporters • Aerial surveillance • Cellular telephone • Emergency call boxes • Other <p>Display/record information</p> <p>Communicate information to appropriate agencies</p>	<p>Pre-planning</p> <p>Enforcement agencies</p> <p>Response teams</p> <p>Service patrols</p> <p>Fire, medical, environment, maintenance, other</p> <p>Inter-agency communication</p> <p>Specialty teams (Haz-Mat)</p> <p>Tow truck agreements</p> <p>Commercial Alpha-Numeric Pager</p> <p>Strategic location of materials and equipment</p>	<p>Appropriately equipped response vehicles</p> <p>Training of response personnel</p> <p>Service patrols</p> <p>Off-freeway accident investigation sites</p> <p>Push aside/remove later (push bumpers)</p> <p>Defer removal until off-peak</p> <p>Rapid removal policies</p>	<p>On-scene traffic management:</p> <ul style="list-style-type: none"> • Lane closures/reopening • Freeway closure/reopening <p>Implement pre-planned alternate routes</p>

SOURCE: (5), 1991

In several states it is a violation of law if a motorist does not remove his vehicle from the freeway travel lanes if it is obstructing the flow of traffic (7). Many states and municipalities use the Uniform Vehicle Code (7) as a guide to establish traffic laws and ordinances. Section 10-103 of the Uniform Vehicle Code states:

The driver of any vehicle involved in an accident resulting only in damage to a vehicle or other property which is driven or attended by any person shall immediately stop such vehicle at the scene of such accident or as close as possible, but shall forthwith return and to and in every event shall remain at the scene of such accident until he has fulfilled the requirements of Section 10-104 (duty to give information and render aid). **Every such stop shall be made without obstructing traffic more than is necessary.** Any person failing to stop or comply with said requirements under such circumstances shall be guilty of a misdemeanor and, upon conviction, shall be punished as provided in Section 17-101.

The requirement that, "every such stop shall be made without obstructing traffic more than is necessary" is a provision in approximately 31 states (7).

The State of Texas elaborates on the above provision in the Texas Motor Vehicle Laws (8):

...when an accident occurs on a main lane, ramp, shoulder, median, or adjacent area of a freeway in a metropolitan area and each vehicle involved can be normally and safely driven, each driver shall move his vehicle as soon as possible off the freeway main lanes, ramps, shoulders, medians, and adjacent areas to a designated accident investigation site, if available, a location on the frontage road, the nearest suitable cross street, or other suitable location to complete the requirements of Section 40 (duty to give information and render aid), so as to minimize the interference with freeway traffic.

The State of Georgia has a similar law to Texas, "providing that when accidents occur on expressways in metropolitan areas, drivers or occupants with licenses must remove the vehicles from the roadway into a safe refuge on the shoulder, emergency lane, or median when the vehicle can be normally and safely driven without further damage or hazard. A person who moves a vehicle in compliance with this law is not regarded as being at fault merely because he moved it (7)."

Dudek, McCasland, and Burns (6) conducted interviews with three insurance agencies to determine if any policies exist that do not allow motorists involved in PDO accidents to remove their vehicles from the freeway before the police arrive. None of these insurance companies had any provisions that prohibited motorists from moving their vehicles involved in a PDO collision; however, they did agree that most motorists believe they should not remove their vehicle from the travel lanes until the police arrive.

Regardless of these traffic laws and insurance policies, most motorists are unwilling to remove their vehicles from freeway travel lanes before the police arrive (6).

Fleet Operators

Many government agencies and private companies have policies and procedures requiring their operators not to move fleet vehicles involved in an accident until the police have conducted an accident investigation. Furthermore, many police departments require fleet vehicles involved in an accident to be photographed or videotaped before being removed from the travel lanes. Besides these policies, many state, city, and private agencies place checklists in fleet vehicles for their employees to follow if involved in an accident. Many of these checklists are not explicit concerning the removal of a vehicle from the travel lanes before the police arrive. Even those agencies which require removal do not explicitly state that the vehicle should be removed as soon as possible from the travel lanes (6).

These policies and procedures are counterproductive to incident management objectives by requiring the operators to leave vehicles on the roadway for extended periods of time even if the vehicles are capable of being moved from the travel way.

Police Accident Investigations

Police should be informed of the effect an accident investigation will have on traffic flow. Freeway capacity is reduced by nearly 30% when an accident investigation is conducted on the shoulder (6). If the vehicles can be moved out of view of freeway motorists (for example, to an accident investigation site), normal freeway traffic flow conditions could be restored in a shorter amount of time.

The remainder of this paper presents the study design of the questionnaire/phone interview, results of the interview and additional comments from transportation professionals involved in incident management, results of legislation passed concerning incident removal from the roadway by state Departments of Transportation (DOT), findings, and recommendations.

STUDY DESIGN

As previously stated, the research reported herein involved: 1) contacting several transportation officials involved with incident management efforts in metropolitan areas and 2) reviewing state legislation regarding the removal of incident related debris from the roadway.

Transportation officials involved in incident management were contacted in Chicago, Los Angeles, Austin, Dallas, Fort Worth, Houston, and San Antonio. These officials were first contacted by phone to familiarize them with the project and its objectives. Next, a letter was sent to these officials containing several questions concerning the development and operation of the IMP in their metropolitan areas. Allowing a few days to organize information related to these questions, the officials were again contacted by phone to follow-up on the questions and address any questions, comments, or suggestions they might have.

The questions were designed to provide a brief review of the IMP in each city and to obtain any legislation that had been passed by the city or state related to incident removal. The list of questions included the following:

1. When was the IMT organized?
2. How often are meetings held?
3. What is the overall objective of the team?
4. What topics are typically discussed at team meetings?
5. Is the IMT dispatched to the incident?
6. Who is responsible or typically removes debris and wreckage (stalled or disabled vehicles, spilled materials, hazardous materials, injured persons, and fatally injured persons) from the roadway?
7. Have lists been formed to determine the type of equipment and personnel need for a specific type of incident?
8. Have preplanned diversion routes been established to manage traffic around an incident at a particular location?
9. Do you know of any legislation that has been passed by the city or state regarding the removal of debris from the roadway?

INCIDENT MANAGEMENT PROGRAMS

The development of IMPs varied slightly between each of the seven cities surveyed; however, there were several similarities. Table 2 provides a summary of the basic components of each city's IMP. This table is a summary of a table provided in a report titled, Incident Management (3).

The discussion that follows will address each city's IMP through the interviews conducted with transportation official.

Chicago, Illinois

Chicago's IMP began in 1960 with the opening of the Kennedy Expressway. Once opened, the traffic demand exceeded the capacity of the Expressway resulting in congestion. Furthermore, in areas where there were no breakdown lanes, congestion was compounded with stalled vehicles and minor accidents. To combat the congestion, the Illinois DOT (IDOT) assigned 20 people in pick-up trucks to patrol the Expressway during the morning and evening peak periods. This patrol was eventually named the "Minuteman Patrol" (3). The overall objective of this patrol is "to respond to any disruptive incident on the Chicago Expressway System and take immediate corrective action to restore normal traffic flow" (9).

Team Meetings

For many years, public agencies (city and state) in the Chicago area involved in transportation system operations have been meeting on an unstructured schedule. However, during 1987, a formal group was organized to plan for reconstruction of the Dan Ryan Expressway (I-90/94). This group meets quarterly to discuss current and upcoming projects and events. In the upcoming years, Chicago will experience another major rehabilitation project with significant lane reductions. Therefore, the group will begin meeting monthly throughout the duration of the project (10).

Typical discussion topics include: reviewing ongoing projects, preparing for the traffic impact of upcoming events/projects, discussing funding sources, addressing the need for additional manpower, staffing, equipment, or capabilities, improving communication between agencies at incidents, discussing media and press releases, planning and improving tactics and operational strategies, and establishing and clarifying agency responsibilities and priorities at incident scenes (10).

TABLE 2. Incident Management Programs

System Type and Location	Detection and Verification				Response		Motorist Information							
	Traffic Operations Center	Service Patrols	Electronic Surveillance	Closed-Circuit TV	Citizen Call	Call Boxes	Other	Incident Mgt. Teams	Wrecker Agreements	Agency Equipment	Other	Alternate Routes	Highway Advisory Radio	Media Partnerships

Existing Areawide Systems

Chicago, IL	●	●		●	●		●	●		●	●		●	●	●
Los Angeles, CA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Fort Worth, TX	●	●	○	○				●	●		○	○	○	●	●
Houston, TX	○	●	●	●		○	○	●	●		●	○		○	●
San Antonio, TX	○	●	○	○				●	●						○

New Areawide Systems

Austin, TX	Initial scoping phase/Texas State Department of Highways and Public Transportation														
Dallas, TX	○	●	○	○	○			●							○

- In Place
- Planned or Proposed

SOURCE: (3), 1990

Team Members

The members of Chicago's Incident Management Task Force have not been formally set, although the usual members include several state and city agencies (10).

State of Illinois: IDOT Operations Engineer
IDOT Emergency Traffic Patrol (ETP) Manager
IDOT Maintenance Engineer
Illinois State Police

City of Chicago: Police Department
Fire Department
Traffic Engineer

This Task Force does not directly respond to an incident, that is the responsibility of the Minuteman Patrol; however, some members may have actual response roles and personally show up at major incidents.

The Minuteman Patrol is the driving force behind incident management efforts in the Chicago area. The Minutemen provide mobile surveillance and response to freeway incidents 24 hours a day, 7 days a week. As of May 1, 1991, the unit has 58 Minutemen, 10 supervisors, and a support staff. The Minutemen are trained to respond to most traffic accidents, disabled vehicles, and small fires. Depending on the nature of the incident, the Minutemen have several heavy duty vehicles at their disposal that can tow semi-tractor trailers, remove or lift debris from the roadway, and provide sand to clean fuel and oil spills (9).

When a major incident occurs, the first unit at the scene must evaluate the incident and advise other agencies about the nature of the incident (severity, hazardous cargo, and injured persons). At this time, information is sent to the media and broadcasted over Highway Advisory Radio so motorists can modify their travel route if needed. While at the scene the Minutemen will render aid until all parties and wreckage are removed (9).

Debris Removal

The following agencies are responsible for removing debris from the roadway (9,10).

Stalled or Disabled Vehicle:

Minuteman Patrol provides assistance to stranded motorists. If needed, he would transport the driver to a phone to make arrangements for a tow or call state police for a tow from a rotation list. The Minutemen are instructed to spend no more than 15 or 20 minutes with these disablements. The goal is to remove motorists and vehicles from the freeway as quickly as possible.

Spilled Cargo:

The Minutemen or Police Unit will give the IDOT dispatcher a description of the cargo so the proper equipment and personnel can be deployed. During off-peak periods, the state police and IDOT program managers will allow motor carriers to clear their own trucks and debris if done within a reasonable time.

Hazardous Material:

The Minuteman Patrol has a unit at their disposal that contains equipment and material for handling minor hazardous material spills.

Injured Person:

The Chicago Fire Department handles injured persons.

Fatality:

The Chicago Fire Department also handles "possible fatalities". Usually an emergency room doctor pronounces D.O.A.. In some no-doubt-about-it-cases, a Chicago Police Patrol wagon will transport a body to the county morgue.

From the interview, a formal list has not been prepared to aid in deciding the type of equipment and personnel needed for a particular incident. However, once a Minuteman arrives, he advises all other responding agencies about the incident so they can provide the appropriate equipment and personnel (10).

Alternate Route Plans

Interstate diversion in the Chicago area is hindered by restrictive vertical clearances along parallel routes and on cross streets (10).

Los Angeles, California

In the late 1960s, Los Angeles developed an informal IMP that was formally organized on November 23, 1971. Currently, the IMP is responsible for 3 geographic areas that encompass nearly 600 freeway miles. The overall objectives of this program are to: 1) promote safety, 2) relieve congestion, and 3) provide for the safe and efficient movement of people and goods throughout the Los Angeles area (3,11,12).

Team Meetings

There are no formal team meetings held on a regular basis. However, meetings are generally held after an incident to critique the response actions. Topics that are typically discussed include improving response actions, additional equipment needs, scheduling response teams (e.g., who will respond on weekends and off-hours), and reinforcing safety to the team members (11,12).

Team Members

Today, the Los Angeles incident management team is formally known as the Major Incident Traffic Management Team (MITMT). The principle members include approximately 2 dozen technicians, design engineers, and maintenance engineers from the California Department of Transportation (CALTRANS) and several California Highway Patrol (CHP) officers. Through this program, CHP has legal responsibility for overall management of the incident, while, CALTRANS is responsible for traffic control during an incident. Furthermore, members of both CALTRANS and the CHP man a Traffic Operations Center (TOC) that is responsible for detecting and monitoring freeway incidents.

The CALTRANS members, who are on call 24 hours a day, 7 days a week, are dispatched to the incident in a truck or car equipped with portable changeable message signs, portable detour signs, portable highway advisory transmitters, flares, pylons, etc. Once at the incident, they typically operate upstream of the incident to notify unsuspecting motorists of the incident ahead. They also decide where motorists should be diverted and what messages the TOC should display on overhead changeable message signs (CMSs).

When an incident occurs that is expected to close two or more lanes for two or more hours, the TOC will notify leaders of the MITMT. These leaders will then contact other members depending on the type of incident. Once at the scene, the MITMT establishes a command post and the TOC turns over control to the team. The TOC then supports the traffic management efforts by notifying radio stations about the incident, operating overhead CMSs, and taping the response actions for critique at a later date. Finally, the team will remain at the scene until the incident is cleared (11,12).

Debris Removal

The following agencies are responsible for removing debris from the roadway (12).

Stalled or Disabled Vehicle:

CHP chooses a private tow service from a rotation list--one for heavy-duty wreckers and the other for light-duty wreckers.

Spilled Cargo:

CALTRANS will typically remove the cargo by hand or front-end loader if necessary.

Hazardous Material:

Usually, the local or county fire department will be contacted. If either fire department cannot handle the spill, a specialized contractor will be called to the scene.

Injured Person:

The Emergency Medical Service (EMS) of the city or county fire department will render aid to injured persons.

Fatality:

The coroner is needed to perform an examination before the body and the wreckage can be removed. In a few rare instances, the coroner in Los Angeles has taken 2 to 3 hours to arrive at the scene of an incident.

At present, a formal list has not been prepared to aid the MITMT in deciding the type of equipment and personnel needed for a particular incident. However, once a CALTRANS maintenance foreman arrives, he decides what equipment needs to be sent to clear the incident (12).

Alternate Route Plans

Currently, an alternate route map exists for the entire Los Angeles freeway system (approximately 1100 pages). If traffic needs to be diverted during a major incident, CALTRANS will attempt (through changeable message signs, CMSs) to divert traffic to an alternate freeway instead of parallel arterial streets (11,12).

Additional FIM Information

A freeway service patrol began operation on July 1, 1991 (11).

Austin, Texas

Similar to many other cities in Texas, Austin has a Traffic Management Team (TMT) that brings together transportation related agencies to solve area traffic problems. The TMT serves to "improve the overall traffic operation and safety along principal arterials and/or urban area corridors by coordinating the activities of the principal operational agencies in the area (13)." Quite frequently the members of the TMT are also members of the IMT. The structure of the IMT is similar to the TMT, except the IMT concentrates on specific issues dealing with nonrecurrent congestion.

Austin's TMT was organized in 1984 and has had a dual role as the IMT since 1990. Currently, the responsibility of the IMT is to develop an incident management plan for the section of I-35 that passes through Austin (14).

Team Meetings

Team meetings are held monthly and last approximately 2 hours. The first half of the meeting is devoted to TMT functions and the second half to IMT functions (14).

During the TMT portion of the meeting, the members discuss solutions to traffic management problems (e.g., coordinate solutions to high accident locations), coordinating reconstruction activities between represented agencies, and upcoming projects (14).

The IMT is currently developing an incident management plan for I-35 in case of any one of the following incidents:

1. 1 to 2 main lanes closed,
2. complete closure of main lanes, and
3. complete closure of main lanes and frontage road.

For each scenario, alternative route plans are being developed. Furthermore, the IMT discusses the construction of CMSs, feasibility of courtesy patrol, and ramp metering or closure at critical geometric locations during peak periods (14).

Team Members

The following agencies and members compose Austin's TMT (14).

Federal Government: FHWA representative.

State of Texas: SDHPT District Traffic Mgmt. Division Officer
SDHPT District Maintenance Engineer
SDHPT District Traffic Engineer
SDHPT District Traffic Engineer Assistant
Department of Public Safety (DPS)

Travis County: Sheriff's Office
Traffic Engineer

City of Austin: Police Department
Planning Engineer
Traffic Signal Supervisor

These TMT members are also represented on the IMT with the addition of the fire department and emergency medical services (EMS).

Currently, the police handle all incidents and operate as the central dispatcher. The police will call in the SDHPT district maintenance foreman, fire department, or EMS if additional help is needed.

Debris Removal

The following agencies are responsible for removing debris from the roadway (14).

Stalled or Disabled Vehicle:

Police department dispatches wrecker from a rotation list.

Spilled Cargo:

Police contact the SDHPT maintenance foreman to provide a front-end loader or sweepers. Police might contact fire department to wash a non-hazardous material off the roadway.

Hazardous Material:

The City of Austin Fire Department handles minor spills.

Injured Person:

The Fire Department's EMS unit renders first aid at the incident and transports injured persons to the hospital.

Fatality:

The interview indicated that the EMS unit would handle fatals; however, whether the coroner would be contacted was not clear.

An incident management plan book is being developed to aid the police in deciding what equipment and personnel are needed for a specific type of incident. Once the plan book is complete, it will contain a list of representative from the SDHPT district office and the City of Austin Traffic Engineering Division that will be on call 24 hours a day (14).

Alternate Route Plans

As previously mentioned, alternate routes to I-35 are being developed as part of an incident management plan (14).

Dallas, Texas

At present, an IMT has not formed in the Dallas area due to organizational problems. However, in the rapidly growing suburbs of north Dallas, a TMT was organized a few years ago. The transportation agencies in this area are aware of this growth and have seen the need for coordination of transportation improvements across jurisdictional boundaries (15).

Team Meetings

The TMT meets monthly to coordinate transportation improvements between members. At this moment, the TMT is working on coordinating signals across city boundaries (15).

Team Members

The following agencies and members compose the TMT in the north Dallas area (15).

State of Texas: SDHPT District Office

Cities: Dallas
Plano
Richardson
Carrollton
Farmers Branch
Garland

Debris Removal

The following agencies are responsible for removing debris from the roadway (15).

Stalled or Disabled Vehicle:

Police department dispatches wrecker from a rotation list.

Spilled Cargo:

SDHPT is contacted to provide a front-end loader or sweepers.

Hazardous Material:

Fire department or hazardous materials team responds to most hazardous material spills.

Injured Person:

An EMS unit handles injured persons and transports them to the hospital if necessary.

Fatality:

A coroner is dispatched to the scene to perform an examination in the case of a fatality.

At this time the SDHPT district office does not have a list specifying equipment and personnel needed for a specific type of incident (15).

Alternate Route Plans

Plans to designate alternative routes in case of a freeway incident had been started but were not supported by area cities. The public officials did not want any traffic diverted to their arterial street system, whether or not traffic would divert to these routes automatically (15).

Fort Worth, Texas

Ft. Worth's TMT and IMT were both organized in the late 1970s. The major incident clearance program was developed after a series of major incidents resulted in severe congestion around the city (3,16).

Team Meetings

TMT meetings are held monthly, while there are no formal IMT meetings. At the TMT meetings, the members review traffic control plans for upcoming projects, discuss how soon abandoned vehicles should be removed from the shoulder, address remedies to high accident locations, and discuss operational problems (16).

Team Members

The following agencies and members compose the TMT in the Fort Worth area (16).

State of Texas: SDHPT District Traffic Engineer
 SDHPT District Design Engineer
 SDHPT District Maintenance Engineer
 SDHPT District Safety Coordinator
 SDHPT District Public Affairs Officer
 DPS

Tarrant County: County Engineer

City of Fort Worth: Director of Transportation
 Police Department--Deputy Chief, Captain, and Lieutenant
 from the Uniform Services Division
 Public Works Department

City of Arlington: Director of Transportation
 Lieutenant Police Traffic Division

The driving force behind Fort Worth's incident clearance program is the SDHPT district safety coordinator and his deputy. Either the coordinator or his deputy are on call 24 hours a day, 7 days a week, ready to respond when notified by the police. At the

incident scene, they will provide traffic control and try to coordinate fire and police activities to expedite the removal of the incident (16).

Debris Removal

The following agencies are responsible for removing debris from the roadway (16).

Stalled or Disabled Vehicle:

Police department dispatches a wrecker from a rotation list.

Spilled Cargo:

SDHPT is contacted to provide a front-end loader or sweepers if needed. Furthermore, they will bill the trucking agency for clean up or damage to the roadway. If the load can be moved to the side of the road, the trucking agency will usually be allowed to salvage what they can during the off-peak period.

Hazardous Material:

Specialists in dealing with hazardous material spills from a local private company handle most hazardous material spills.

Injured Person:

An EMS unit handles injured persons and transports them to the hospital if necessary.

Fatality:

The coroner will frequently be transported by helicopter to the scene within 1 hour. In the case of a fatality the freeway is closed to protect evidence and reconstruct the accident.

At this time, the SDHPT district office does not have a list specifying equipment and personnel needed for a specific type of incident. The district safety coordinator decides what type of equipment is needed and who to contact (16).

Alternate Route Plans

Alternate routes have been established to divert traffic around a freeway incident; however, the district safety coordinator and the police coordinate diversionary actions at the incident. Furthermore, the district safety coordinator and police setup war games (i.e., what if an incident occurred here) and brainstorm what messages to display on CMSs, what lane control signals to display, what frontage road signal timing plan to implement, and where

should traffic be diverted to the frontage road or parallel arterial streets. The final product is a "canned", predesigned, traffic management plan (16).

Houston, Texas

Houston has both a TMT and an incident response team that have been in operation for over 10 years (17).

Team Meetings

TMT meetings are held monthly for approximately 2 hours. During TMT meetings, the members work towards solving transportation related problems through communication, cooperation, and coordination (17).

Incident response team meetings are held quarterly and also last about 2 hours. At these meetings, the team discusses strategies to reduce nonrecurrent congestion (e.g., is additional equipment needed to remove the incident quicker, who will the equipment be purchased from, and who will pay for the equipment), and evaluates deployment strategies and methods to improve strategies (17).

Team Members

The following agencies and members compose the TMT in the Houston area (18).

State of Texas: SDHPT District Traffic Operations Engineer
DPS

Harris County: Assistant County Engineer
Sheriff's Department
Traffic Engineer
Constable Patrol
Toll Road Authority--Operations Engineer

City of Houston: Police Department--Motorcycle Traffic Division
Traffic/Transportation Department
Fire Department--Emergency Operations Center
Belt and Terminal Railroad Company
Dept. of Public Works--Street and Bridge Manager
Planning and Development Department
METRO--Transit/Transit Way Operations

Private: Metro Traffic--disseminate traffic information to the public
Shadow Traffic Reports--disseminate traffic information to the public

The following agencies and members compose the incident response team in the Houston area (18).

State of Texas: SDHPT District Traffic Operations Engineer
SDHPT Interim Communications Center--Supervisor
SDHPT Maintenance Engineer

Harris County: Sheriff's Department
Toll Road Authority--Operations Engineer

City of Houston: Police Department--Motorcycle Traffic Division
Traffic/Transportation Department
Fire Department--Emergency Operations Center
Fire Department--Haz. Mat. Team--Assistant Chief
METRO--Transit/Transit Way Operations
METRO--Transit Police Chief

The police and fire department usually respond to most incidents. Additionally, Houston has a service patrol that operates as part of their Motorist Assistance Program (MAP). This service patrol operates 16 hours a day rendering aid to motorists or pushing stalled vehicles from the travel lanes (17).

Debris Removal

The following agencies are responsible for removing specific types of debris from the roadway (17).

Stalled or Disabled Vehicle:

The MAP service patrol will typically push stalled or disabled vehicles from the roadway. On some occasions, the police will summon a private wrecker service.

Spilled Cargo:

Houston Police Department will contact a private firm or the fire department to remove most spills from the roadway.

Hazardous Material:

The fire department's hazardous materials team responds to most hazardous material spills.

Injured Person:

EMS is contacted through the fire or police department to render aid to injured persons and transport them to the hospital if necessary.

Fatality:

In the case of a fatality the deceased must remain in the vehicle on the roadway until the coroner completes his examination. On a few occasions, 3 hours have passed before the coroner arrives.

The Texas Transportation Institute (TTI) has developed contact lists for both the public and private sector. These lists will aid in the decision making process to determine the equipment and personnel needed at a particular incident (17).

Alternate Route Plans

For the past 2 years, TTI has been developing programmed alternative routes for the Houston freeway system (17).

San Antonio, Texas

The TMT in San Antonio began in 1967 and was not formally established until 1973. Currently, San Antonio does not have a formal IMT (19).

Team Meetings

TMT meetings are held once a month for about 1 to 2 hours. Standard topics include: reports from the SDHPT district office on the current status of reconstruction projects, new proposed traffic control measures that will affect members, traffic problem locations, long range plans that will effect the traffic system and members of the team, and special reports (19).

Team Members

The following agencies and members compose the TMT in the San Antonio area (19).

State of Texas: SDHPT District Traffic Engineer

Bexar County: County Traffic Engineer
Sheriff's Office--Patrol Administrator

City of San Antonio: Police Department--Traffic Division Captain
Public Works--City Traffic Engineer
Metropolitan Transit Authority--Operations Manager

At the incident scene, the SDHPT courtesy patrol works in cooperation with the San Antonio Police Department (SAPD) to remove the incident from the roadway and manage traffic (19).

Debris Removal

The following agencies are responsible for removing specific types of debris from the roadway (19).

Stalled or Disabled Vehicle:

SAPD contracts with a local towing company to remove disabled vehicles. However, both SAPD traffic cruisers and the courtesy patrols are equipped with bumpers to push vehicles from the roadway.

Spilled Cargo:

The SDHPT courtesy patrol has the decision whether or not to bring in a front-end loader or sweep the material from the roadway.

Hazardous Material:

The Fire Department is responsible for minor spills. The SDHPT can provide the Fire Department with absorbent material if requested.

Injured Person:

EMS is contacted to render aid to injured persons and transport them to the hospital if necessary.

Fatality:

A coroner is dispatched to the scene to perform an examination in the case of a fatality.

At this time lists have not been formed to determine the equipment and personnel needed for a particular incident (19).

Alternate Route Plans

No alternate route plans currently exist; however, plans are being formulated (19).

DEBRIS REMOVAL LEGISLATION

As mentioned previously, many public agencies would like to remove vehicles and debris from the roadway as soon as possible to avoid secondary accidents and reduce congestion. However, a primary concern of these agencies is the extent that they can be held liable for additional damage incurred while moving a vehicle and cargo blocking travel lanes.

This section will review state laws passed in Illinois, California, and Texas regarding the removal of incident-related debris by State Departments of Transportation.

Illinois

The State of Illinois Motor Vehicle Code, Section 11-1302 (20), states the following:

Whenever the Department of Transportation finds an abandoned or disabled vehicle standing upon the paved or main-traveled part of a highway, which vehicle is or may be expected to interrupt the free flow of traffic on the highway or interfere with the maintenance of the highway, the Department is authorized to move the vehicle to a position off the paved or improved or main-traveled part of the highway.

IDOT's fast removal policy extends from this Law. IDOT will tow, drag or push disabled vehicles to the nearest exit or other safe drop point. Trucking carriers and automobile owners can make claims against the state for additional damage but very few do (3).

Furthermore, the Minuteman Patrol operates in accordance with this law. Typically, when a vehicle is blocking a lane, the Minuteman will pull behind the vehicle and inform the driver that he is going to push him to the shoulder. Additionally, when an abandoned vehicle is blocking a lane, the Minuteman will pull in front of the vehicle and proceed to drag it to the shoulder (9).

California

At the time of this research, State of California legislation that specifically address the removal of freeway incident-related debris and wreckage was unable to be located. However, the State of California Vehicle Code, Section 20050 (21), states:

Subsection b: The departments and the advisory committee shall focus on, but not be limited to, the following incident and information management techniques:

Article 4: Increased tow truck service.

Article 7: Purchase or leasing of specialized equipment to remove or clear commercial vehicles involved in an incident more quickly and efficiently.

At an incident, the CHP and CALTRANS have dual authority when it comes to removing debris and wreckage at an incident. However, CALTRANS will occasionally summon a wrecker from the CHP's rotation list since the CHP is kept busy completing accident reports and ensuring safety in the immediate area of the incident. Furthermore, if the towing company is concerned they might cause additional damages, the CHP and CALTRANS will release the towing agency of any responsibility and take the responsibility if a suit is filed for additional damages to the vehicles or cargo. However, no claims have been made against the state.

Texas

On May 22, 1991, the Governor of Texas signed an act, Senate Bill 312, regarding the removal of obstructions from roadways and road right-of-way by the Texas State Department of Highways and Public Transportation (SDHPT). This bill states the following:

Article 6673g. REMOVAL OF OBSTRUCTIONS. (a) The State Department of Highways and Public and Transportation may, without the consent of the owner or carrier of spilled cargo or other personal property on the right-of-way or any portion of the roadway of the state highway system in circumstances in which, as determined by the department, the cargo or property is blocking the roadway or may otherwise be endangering public safety.

(b) The department, pursuant to Section (a) of this article, may remove cargo or personal property that the department has reason to believe is a hazardous material, as defined by the Hazardous Materials Act (49 U.S.C. Sec. 1801 et seq.) or a hazardous substance, as defined by the Texas Hazardous Substances Spill Prevention and Control Act (Subchapter G, Chapter 26, Water Code); provided that in doing so, the department must comply with applicable provisions of Section 411.018, Government Code, and the Texas Hazardous Substances Spill Prevention and Control Act.

(c) The department and its officers and employees are not liable for any damages or claims of damages to removed cargo or personal property that resulted from removal or disposal by the department unless the removal or disposal was carried out recklessly or in a grossly negligent manner.

(d) The department and its officers and employees are not liable for any damages or claims of damages that may result from the failure to exercise any authority granted under this article.

(e) The owner and, if any, the carrier of cargo or personal property removed under the authority of this article shall reimburse the department for the costs of removal and subsequent disposition.

Previously, the police had to give authority to the SDHPT to remove spilled cargo. This bill has given the SDHPT this authority if the police are not present. Furthermore, this bill has also reduced their liability if any additional damages occur during removal.

The Texas SDHPT has initiated a statewide public awareness campaign, "Move It", to inform motorists about traffic laws requiring motorists involved in noninjury accidents to move their vehicles off the roadway to a safe location if the vehicles can be driven. This program has been reviewed by lawyers, insurance boards, and TMTs in Austin, Fort Worth, Houston, and San Antonio. To get the word to Texas motorists, approximately 300,000 full-page "Move It" brochures will be sent out across the state, about 12 million letter-size pamphlets will be inserted with vehicle registration notices, and several public service announcements will be made. The results of this project should aid in reducing secondary accidents and congestion caused by motorists leaving their vehicle in the travel lanes until the police arrive.

FINDINGS

The incident management programs (IMPs) in Chicago, Illinois, and Los Angeles, California are two of the oldest and most well known programs in the nation. However, their primary incident response teams differ in structure, but have the same objectives and provide the same function. Chicago's incident management program relies heavily on their around the clock courtesy patrol, the Minuteman Patrol, to respond to disruptive accidents and restore normal traffic flow. The Minutemen will render first aid, call for emergency services and special equipment, remove debris and wreckage from the roadway, and provide traffic control. The driving force behind Los Angeles' IMP is the MITMT (CHP and CALTRANS) which is called to an incident that will close two or more lanes for two or more hours. CALTRANS members provide similar incident management support as the Minuteman Patrol in Chicago. They provide equipment and people to aid in managing traffic at the incident, alert motorists of the incident, and establish diversion routes to minimize congestion.

Incident management teams (IMTs) in Texas are relatively new compared to those established in Chicago and Los Angeles. Unique to Texas, however, are TMTs which work towards improving the safe and efficient movement of people and goods in metropolitan areas by coordinating area transportation improvements among transportation related agencies.

Similarities between all of these IMTs and TMTs is their objective to provide the safe and efficient movement of people and goods throughout the metropolitan area. Other similarities can be found in team members which typically include state, county, and city DOTs and police departments, fire/rescue, emergency services, transit authorities, environmental protection agencies, and towing services. Not so frequently represented are members from the FHWA and private traffic reporters.

Many public agencies have laws that allow the state DOT to remove vehicles and debris from the roadway as soon as possible. However, the extent to which they can be held liable for additional damages is not clearly stated in Illinois', California's, or Texas' Laws. Texas has reduced its liability regarding this issue by stating, "the department and its officers and employees are not liable for any damages or claims of damages to removed cargo or personal property **unless the removal or disposal was carried out recklessly or in a grossly negligent manner.**"

RECOMMENDATIONS

The following recommendations are based on the literature review and interviews conducted with transportation professionals involved with incident management. Some of these recommendations may have been suggested by other professionals; however, these recommendations are based on the views of this researcher acquired through this research.

Incident Management Programs

Incident management programs (IMPs) should be implemented in metropolitan areas. These programs are vital and necessary to ensure the public's safety and mobility within a metropolitan area. Incident management programs provide a rapid means to detect, verify, respond, and remove an incident from the travel lanes. The quicker the incident is removed from the travel lanes the less likely unnecessary secondary accidents are to occur, and the sooner mobility can be restored to a freeway corridor. IMPs can also attract businesses and developers wishing to expand to a city by providing a more efficient and dependable transportation system. In summary the benefits of an IMP can be seen through the improvement in public safety and the increase in economic growth.

Incident Management Teams

Incident management teams (IMTs) should be developed in conjunction with an IMP. Traditionally, the highway patrol or city police are in charge of a major incident. IMTs allow transportation agencies (state, county, or city DOTs) as well as other agencies (Fire Department, Toll Road Authority, Public Transit Agency, etc.) to include their expertise in incident management efforts. Therefore, a wide spectrum of expertise can be exercised at the scene of an incident. Furthermore, the members representing each agency on the IMT should make sure that the people responding to an incident from their agency, understand their secondary job, opening the travel lanes as soon as possible.

Once an IMT has been developed, the members should be kept current on the successes and failures of other area incident management efforts. By knowing the successes, the IMT can stand behind a particular incident management action because that action worked in a comparable city with the same problem. The IMT can also avoid actions that may not work in their city.

A public affairs representative should be included on an IMT, since he/she has been formally trained to address the public. These representatives can be used to handle press releases and educate the public about the benefits of incident management.

Education Efforts and Programs

Programs should be developed to educate governmental officials, policy makers, public agencies, the private sector, and the public about IMPs.

Governmental officials and policy makers need to be aware of IMP benefits (reduced accidents, improved safety, and economic growth) so they will support (financially and publicly) incident management efforts.

Public agencies, like the police, should be made aware of the effect conducting an accident investigation on the shoulder has on the flow of traffic. In some instances, conducting an accident investigation on the shoulder can lead to almost a 30% reduction in freeway capacity without physically blocking the roadway (6).

Efforts should be considered to reduce the response time of the coroner to incidents involving a fatality. The following methods are recommended to reduce the coroner's response time:

1. Change the laws to allow another agency that is more readily available to respond to an incident perform the coroner's examination.
2. Increase the coroner's staff if financial resources are available.

Both of these recommendations will reduce the duration of the incident as well as give more time to the coroner to perform other duties.

The private sector should be informed about the benefits of IMPs, so they will understand how their financial success can be influenced by an efficient transportation system. Many businesses are, however, realizing the economic impact of incidents and the need to reduce this impact. An example of the private sector's interest is demonstrated by a study cited in this paper (3). This study was performed for the Trucking Research Institute to look at what is being done to alleviate incident congestion and to recommend actions to reduce lost time attributed to highway incidents.

Insurance companies should inform their policy holders that when involved in a noninjury accident, they should remove their vehicles from the travel lanes as soon as possible. This will benefit the insurance company by avoiding the chance that one of their policy holders might be involved in a secondary accident resulting from the initial accident.

Fleet operators should change their operating procedures and accident checklists when their drivers are involved in an accident. These procedures and checklist should have their drivers remove their vehicles from the travel lanes if possible.

Public service campaigns like the "Move It" program sponsored by the Texas State Department of Highways and Public Transportation should be implemented in other states or metropolitan areas. This will reduce the duration and impact of incidents by informing motorists involved in noninjury accidents that they should remove their vehicles from the travel lanes, if driveable, while they wait for the police to arrive.

Incident Removal Legislation

States should pass incident removal legislation allowing the state DOT to remove incident related debris from the roadway when interfering with the flow of traffic or endangering the public's safety. This legislation should state the extent the agency removing the debris can be held liable for additional damages, similar to Texas' law. This law will not only protect the state DOT, but also the public if the removal was conducted in reckless or negligent manner. Furthermore, this will allow state DOTs to remove incident related debris from the roadway before the police arrive, thereby reducing the duration and impact of incidents on the motoring public. This legislation will also provide more time for the police to complete the accident report while the state DOT expends its efforts removing the incident and restoring normal traffic flow.

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Steve Pang--Chief of Traffic Management, District 7

Texas State Department of Highways and Public Transportation (SDHPT):

Enoch Needham--Traffic Engineer, District 14
Ray Derr--Traffic Engineer, District 18
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Pat Irwin--District Traffic Engineer, District 15
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