

# **Model Procedures Guide for Highway Incidents**

**For joint use by the  
Fire Service, the Emergency Medical Services,  
Law Enforcement, Transportation, and the  
Towing & Recovery Industry  
First Edition**

**DRAFT VERSION 8 (Phoenix)**

**March 2003**

**Prepared in association with the  
US Department of Transportation  
Intelligent Transportation Systems  
Joint Program Office**

**Please send comments to: [HiwayMPG@mitretek.org](mailto:HiwayMPG@mitretek.org)  
The National Fire Service IMS Consortium, Attention: Ken Brooke  
600 Maryland Ave, SW Suite 755  
Washington, DC 20024**



**Model Procedures Guide for**  
**Highway Incidents**

**First Edition**

**Prepared by the National Fire Service Incident Management System  
Consortium Model Procedures Committee**

**Published by Fire Protection Publications Oklahoma State University**



**The goal of this document is to provide guidance for responder safety at the highway incident while mitigating the incident and maintaining traffic flow around the incident.**

## **Statement of Purpose**

Many agencies, departments, organizations, and individuals respond to many types of incidents on the highway, both emergency and non-emergency, but all urgent. The motives, missions, and methods of the members of this regional response force vary, and yet they can find themselves thrown together with little notice and compelled by circumstance to jointly and immediately deal with highly stressful and dangerous problems in one of the hazardous working environments imaginable – the highway. This guide is designed to assist responders to better organize their collective efforts by implementing an Incident Management System within which they can best use their marshaled resources. Additionally, the organizational structure provides for safety for personnel responding to and working at the incident scene, as well as reduction in risks to motorists and pedestrians. While the origins of IMS lie within the fire service, the paradigm is well suited for joint use by law enforcement, fire and rescue, emergency medical services, HAZMAT, traffic management, repair and maintenance, utility, towing and recovery, public works, motorist assistance, and the many other types of organizations working on the highway.

This model encourages the use of the Incident Management System (IMS) for all highway incidents. IMS can be used for emergency incidents, non-emergency incidents, routine activities on the highway, highway maintenance activities, landslides, snowstorms, and other disasters; as well as planned parades or other events. It provides for the effective management of personnel and resources for the safety and welfare of everyone on the highway. It is intended to serve as the initial design document from which organizations in your region may build joint operating procedures. Once adopted by all, and with appropriate training of personnel, IMS provides an easily understood organizational structure and procedures with which to manage a wide variety of events. The model procedures contained in this guide are designed and intended to apply to both emergency and non-emergency events, including many that either do not involve emergency response organizations, or that use their services in a routine manner. The authors of

this guide encourage the use of IMS for small, routine incidents; for large, complicated, and unexpected disasters; and provide for the means of expanding the organization in order to meet the spiraling management needs of escalating events.

This guide covers the responsibility of Incident Command to reduce risks to motorists trapped in the traffic queue caused by the incident. Since they are essentially trapped in their vehicles due to the highway incident, their welfare becomes the responsibility of those managing the incident. If they are not provided deliberate preventative care, many may require emergency care. This should not be taken lightly, as thousands of vehicles can be stopped in a few minutes by an otherwise minor highway incident. Attending to their needs is actually sympathetic to the goals of on-scene activities, and can usually be accomplished through traffic management, balancing the following considerations:

- Expediently providing emergency services and removing the traffic blockage
- Protecting incident responders (and those in their care) from moving vehicles
- Protecting motorists (and passengers and cargo) from the hazards of the incident
- Facilitating emergency vehicle (and other response vehicle) movement
- Facilitating traffic flow past the incident (and in the region)

Please read this document often. The daily application of its concepts and procedures will encourage regional standardization. This will enhance the likelihood of the entire community of emergency providers becoming better organized, more adaptive, and more expedient in the delivery of critical services.

## **Copyright @ 2001 National Fire Service Incident Management System Consortium**

The National Fire Service Incident Management System Consortium grants to the user of this document permission to photocopy all or part of the procedure, as long as it is not altered nor offered for resale.

Further, the purpose of the model is to provide procedures for fire departments and other agencies to use in the design and adoption of IMS and related standard operating procedures. Users are encouraged to use all or part of the document for that purpose.

When this document is photocopied in total or in part, the copies should be accompanied by the following courtesy line:

**Source: National Fire Service Incident Management Consortium.**

## **Notice on Gender Use**

In order to keep sentences uncluttered and easy to read, this text has been written using the masculine gender pronouns. Years ago, it was traditional to use the masculine pronouns to refer to both sexes in a neutral manner. Society evolves faster than language, and the male pronouns still predominate our speech. This usage is applied to this manual for the purpose of brevity and is not intended to address only one gender. Passive voice has also been used as a means to reduce gender-specific semantics, wherever it did not significantly detract from clarity.



# Table of Contents

Statement of Purpose .....	v
Notice on Gender Use .....	vii
Table of Contents .....	ix
Table of Illustrations .....	xiii
Foreword .....	1
<b>CHAPTER 1    COMMAND PROCEDURES .....</b>	<b>7</b>
Responsibilities Of Command .....	7
Functions Of Command .....	8
Command Options .....	12
Investigation Mode .....	12
Intervention Mode .....	12
Command Mode .....	13
Transfer Of Command .....	14
General Considerations .....	16
Progress Reports .....	16
Incident Action Plan .....	17
Tactical Worksheets .....	18
<b>CHAPTER 2    ORGANIZATIONAL STRUCTURE – COMMAND .....</b>	<b>19</b>
Organizational Hierarchy .....	19
IMS Organizational Development .....	20
Initial Response .....	20
Reinforced Response .....	21
Command Organization .....	22
Strategic Level .....	23
Tactical Level .....	24
Task Level .....	24
Command Structure – Basic Organization .....	24
Command Structure (Division Or Group) .....	25
Geographic Division Designation .....	26
Division/Group Designation .....	27
Establishing Divisions or Groups – Basic Operational Approach .....	29
D/G Guidelines .....	30
<b>CHAPTER 3    COMMAND STRUCTURE – EXPANDING THE ORGANIZATION BY     ESTABLISHING BRANCHES .....</b>	<b>36</b>
Functional Branch Structure .....	40
Multi-Jurisdictional Incidents .....	40
<b>CHAPTER 4    EXPANDING THE ORGANIZATIONAL STRUCTURE BY</b>	

ESTABLISHING SECTIONS.....	43
Operations Section.....	44
Operations Section Chief.....	46
Staging Area(s).....	47
Incident Command Post (ICP).....	48
The Incident Commander's Role After The Operations Section Has Been Implemented.....	49
Command Staff.....	49
Information Officer.....	50
Safety Officer.....	52
Liaison Officer.....	54
Planning Section.....	55
Logistics Section.....	58
Finance/Administration Section.....	60
CHAPTER 5    UNIFIED COMMAND.....	62
Single Command – Incident Commander.....	62
Deputy Incident Commander.....	63
Unified Command.....	64
Single/Unified Command Differences.....	67
CHAPTER 6    SAFETY.....	69
Managing Responder Safety.....	69
Rules Of Engagement.....	71
Risk Analysis.....	72
Scene Characteristics.....	73
Incident Factors.....	73
Responder Capabilities.....	73
Incident Safety Officer (ISO).....	73
Incident Scene Accountability.....	75
Emergency Traffic Communications.....	76
Rapid Intervention Crews (RICs).....	77
Responder Rehabilitation (Rehab).....	79
Critical Incident Stress Management.....	81
CHAPTER 7    BASIC ORGANIZATIONAL APPROACH FOR HIGHWAY INCIDENTS.....	83
Principles of Highway Incident Management.....	83
What is a Highway Incident?.....	85
Transportation Roles in the Highway Incident IMS Organization.....	86
Traffic Control Strike Teams.....	87
Traffic Control Task Forces.....	87
Traffic Control Groups.....	89
Traffic Management Divisions.....	89
Traffic Management Branches.....	89
Operations Section.....	89
Traffic Incident Command.....	90
The Traffic Control Function.....	91

Transportation Resources.....	92
Traffic Control Devices .....	93
Traffic Control Resources.....	93
The Flagger .....	94
Organizing the Highway Incident.....	95
The Highway Incident Without Response .....	95
The Highway Incident Prior to the Arrival of Response Units.....	96
The Single Unit Response to Highway Incidents .....	97
The Small Response to Highway Incidents .....	98
The Reinforced Response to Highway Incidents .....	101
Larger and Longer Highway Incidents .....	103
CHAPTER 8    HIGHWAY IMS APPLICATIONS .....	111
THREE-CAR MOTOR VEHICLE ACCIDENT .....	113
NATURAL DISASTERS, WINTER STORM (A.5.) .....	115
Situation: .....	115
Strategic Goals:.....	116
HUMAN CAUSED DISASTERS, BRIDGE ACCIDENT (B.6.).....	119
Situation: .....	119
Conditions: .....	119
Problem: .....	120
Potential Hazards: .....	120
Resources: .....	120
PLANNED EVENT, PARADE AND CEREMONY (D.2.) .....	125
POSSIBLE TERRORIST ACT ON AN INTERSTATE HWY.....	129
Situation: .....	129
Conditions:.....	129
Problems: .....	129
Potential Hazards: .....	130
Resources: .....	130
Law Enforcement:.....	131
Fire: .....	131
EMS: .....	132
State DOT: .....	132
HAZARDOUS MATERIALS INCIDENTS, TRACTOR AMMONIA SPILL (E.5.) .....	133
Situation: .....	133
Environmental Factors:.....	134
Response Unit Locations: .....	135
Problems .....	135
APPENDIX A.    Glossary of Terms.....	139
APPENDIX B.    HIGHWAY INCIDENT WORK SHEETS .....	143
APPENDIX C.    MUTCD APPLICATION NOTES .....	157
Why?.....	159
When? .....	159

Must We?.....	160
Where? .....	161
What (Should be Done)?.....	161
What (Should be Used)?.....	162
Who (of my personnel is affected)?.....	164
How Can We Prepare For This? .....	165
What Else? .....	166
APPENDIX D. THE UNIFORM VEHICLE CODE .....	167
Section 1.....	168
Section 2. Incident Commander.....	169
Section 3. Incident Management Committee.....	169
Section 4. Incident Management Authority.....	169
Section 5. Liability Protection for Authorized Incident Clearance Functions.....	170
Section 6. Compensation for Incident Removal Costs .....	170
Section 7. Road User Duties Approaching Incidents.....	171
Section 8. Avoidance of Lane Blockage -- Expedited Removal of Vehicles .....	171
Section 9. Additional Incident Clearance Guidelines .....	172
Section 10. Definitions Section.....	173
APPENDIX E. Highway Incident Operations .....	175
The Temporary Traffic Control Zone (TTCZ) .....	178
Highway Incident Geography .....	181
Warning Approaching Traffic .....	182
Taper and Merge Layout.....	184
Clearance of Stranded Vehicles .....	187
Highway Incident Complications .....	192
APPENDIX F. CREDITS.....	195
APPENDIX G. Notes .....	197

# Table of Illustrations

Figure 1, Model Procedures Guides.....	3
Figure 2, Initial Response - Highway Incident .....	21
Figure 3, Reinforced Response - Highway Incident.....	21
Figure 4, The Configuration of Command .....	23
Figure 5, Command Organization.....	24
Figure 6, Command Structure Basic Organization.....	25
Figure 7, Division Designation.....	26
Figure 8, Geographical Division Areas of Responsibility .....	27
Figure 9, Division/Group Designation.....	28
Figure 10, An Unmanageable IMS Organization .....	37
Figure 11, Two-Branch Organization.....	37
Figure 12, Organization expands from this .....	39
Figure 13, To This.....	39
Figure 14, Functional Branch Structure.....	40
Figure 15, Jurisdictional Branches.....	41
Figure 16, Air Operations Organization .....	42
Figure 17, IMS Sections .....	44
Figure 18, The Operations Section .....	44
Figure 19, Complete Expansion of the Operations Section.....	45
Figure 20, Staging.....	48
Figure 21, Command Staff.....	50
Figure 22, The Information Officer .....	50
Figure 23, The Safety Officer .....	52
Figure 24, The Liaison Officer .....	54
Figure 25, The Planning Section.....	55
Figure 26, The Planning Section Organization.....	56
Figure 27, Sources of Transportation Technical Specialists.....	58
Figure 28, The Logistics Section .....	58

Figure 29, The Logistics Section Organizational Positions.....	59
Figure 30, The Finance/Administration Section.....	60
Figure 31, Assignments in the Finance/Administration Section .....	60
Figure 32, Single Command Structure.....	63
Figure 33, Using Deputy Incident Commanders .....	64
Figure 34, Unified Command - Multi-Jurisdictional Highway Incident .....	65
Figure 35, Unified Command - Single-Jurisdiction, Multiple-Agency Highway Incident .....	66
Figure 36, Unified Command – Transfer of Command.....	66
Figure 37, Highway Incident Model Rules of Engagement .....	72
Figure 38, The Rehab Unit.....	79
Figure 39, Example Traffic Control Strike Teams .....	87
Figure 40, Example Traffic Control Task Forces .....	87
Figure 41, Flagman Ahead Warning Sign .....	94
Figure 42, The Single Unit Response .....	98
Figure 43, The Small Response With Direct Reporting Units.....	99
Figure 44, Reorganizing the Small Response Using Groups.....	100
Figure 45, Using Command Staff on a Highway Incident.....	102
Figure 46, Reinforced Response from Traffic Management .....	103
Figure 47, A Simple Traffic Control Incident .....	103
Figure 48, Reinforcing a Law Enforcement Response .....	105
Figure 49, Initial IMS Organization at a Large Highway Incident.....	106
Figure 50, Using Unified Command at a Large Highway Incident.....	107
Figure 51, An Example Traffic Management Branch Organization.....	108
Figure 52, IMS Organization, 3-Car Motor Vehicle Accident .....	114
Figure 53, Winter Storm Situation Map .....	115
Figure 54, Winter Storm IMS Organization .....	117
Figure 55, Bridge Accident Situation Map.....	119
Figure 56, Bridge Accident IMS Organization.....	121
Figure 57, IMS Organizations - Major Planned Event .....	126
Figure 58, Terrorist Incident IMS Organization .....	130
Figure 59, Ammonia Spill Scenario Map .....	133
Figure 60, Standardized Black-on-Coral Incident Management Signage .....	163

Figure 61, The Temporary Traffic Control Zone.....	178
Figure 62, Temporary Traffic Control Zone Management Areas.....	180
Figure 63, Warning Approaching Traffic .....	183
Figure 64, MUTCD Table 6C-1, Advance Warning Sign Spacing .....	184
Figure 65, The MUTCD Taper Length Criteria.....	185
Figure 66, Tapers and Buffers .....	186
Figure 67, Clearance of Stranded Motorist Vehicles, 4-Lane, 2-Way Highway .....	189
Figure 68, Clearance of Stranded Motorist Vehicles, 2-Lane, 1-Way Highway .....	190





# Foreword

In the early 1970s, a system was developed in California to address the resource management needs associated with large-scale wildland fires. The value of applying this system to any emergency or non-emergency situation requiring the management of people and resources soon became apparent. The system became known as the California FIRESCOPE Incident Command System (ICS).

During the same period, another incident management system, Fire Ground Command (FGC), was developed by the Phoenix, Arizona Fire Department. The Fire Ground Command system also lent itself very well to managing the different events to which most fire departments respond.

As a result of the differences in focus and development of the two incident management systems, there were inconsistencies in terminology and application. A single incident management system that integrates the efforts of resources and agencies is critical to effective command and control of all incidents. It is particularly important on major incidents where a single department will interface with other resource agencies in its local area, as well as resource agencies from the state and federal government.

In 1989, at the International Association of Fire Chiefs annual conference in Indianapolis, a panel discussion was convened to discuss the possibility of merging the two incident management systems.

In July 1990, at a meeting in Phoenix, Arizona, representatives from the Phoenix Fire Department and FIRESCOPE sat down to begin the process of developing the combined system. Staff from the National Fire Academy in Emmitsburg, Maryland, were at the meeting to provide assistance. Subsequent ad hoc meetings were held in September, 1990; January, 1991; and August 1991. As these meetings continued, other fire service organizations became involved in the process.

At the August, 1991 meeting in Chesterfield, Virginia, the ad hoc committee structure evolved into a formal organization – the National Fire Service Incident Management System Consortium.

That name very accurately describes the organization and its goals. Chairs were selected for the Consortium and its three standing committees. In February, 1993, at a meeting in Houston, Texas, the Consortium adopted a Constitution and Bylaws. In 1999, the Consortium became a legally incorporated not-for-profit corporation.

The charter members of the Consortium were:

- California Department of Forestry and Fire Protection (CDF)
- Channel Industries Mutual Aid (CIMA) Organization, Houston, Texas
- Emergency Management Institute (EMI)
- Fire Ground Command (FGC)
- FIRESCOPE
- International Association of Fire Chiefs (IAFC)
- International Association of Fire Fighters (IAFF)
- International Fire Service Training Association (IFSTA)
- International Society of Fire Service Instructors (ISFSI)
- National Advisory Committee on Integrated Emergency Management System
- National Fire Academy (NFA)
- National Fire Protection Agency (NFPA)
- National Volunteer Fire Council (NVFC)
- National Wildfire Coordinating Group (NWCG), including:
  - Bureau of Indian Affairs (BIA)
  - Bureau of Land Management (BLM)
  - National Association of State Foresters
  - National Park Services
  - U.S. Fish and Wildlife Service
  - USDA Forest Service
- Society of National Fire Academy Instructors (SNFAI)
- United States Fire Administration (USFA)
- Women in the Fire Service (WFS)

The Consortium has accomplished a number of achievements. The two traditional systems were merged into the Incident Management System. The first work that they applied the

merged system was to the Model Procedures Guide for Structural Firefighting. As well, the Consortium has developed an excellent relationship with the staff of IFSTA/Fire Protection Publications, who publish and distribute the works of the Consortium.



**Figure 1, Model Procedures Guides**

The Consortium has also published the following other documents:

- Model Procedures Guide for Structural Collapse and US&R Operations
- Model Procedures Guide for Emergency Medical Incidents
- Model Procedures Guide for High-Rise Firefighting
- Model Procedures Guide for Wildland-Urban Interface Fires
- Model Procedures Guide for Hazardous Materials Incidents
- Model Procedures Guide for EMS Incidents

As the nation's traffic congestion increased, it soon became clear that the traditional answer of constructing additional roadways was not going to solve the problem. Taking a lesson from the success in managing the nation's airways, the federal and state DOTs began to change their emphasis from construction and maintenance to also include operating and managing traffic on the highways. Since the majority of congestion is due to incidents, it soon became clear that traffic management implied incident management. Even though DOTs had begun to address traffic management on a regional basis, such activities were usually disjoint from public safety efforts related to emergency incidents. After-the-fact analysis of many major incidents showed

that such interagency cooperation was needed for successful management of incidents with minimal risk to responders and the public.

Closer cooperation was needed with public safety to best address the needs of all. In July, 2000, the US Department of Transportation approached the Consortium and solicited their assistance in extending the successful application of IMS into the world of highway incident management.

This model procedures guide is the result of that collaboration.

The Incident Management System includes the strength of the Incident Command System for large-scale incidents and the simplicity of Fire Ground Command for routine applications. There is a strong integration of strategy and tactics in the model procedures. The new system permits early implementation of Command and a smooth escalation of the organization to meet the demands of a major incident or disaster.

**The key elements of the system are:**

- The systematic development of a complete, functional organization with the major functions being Command, Operations, Planning, Logistics, and Finance/Administration.
- Designed to allow for multi-agency adoption in federal, state, and local fire and emergency agencies, as well as for incorporating non-emergency responders, such as transportation, into the IMS organization. Organizational terminology used in IMS is designed to be acceptable to all levels of government.
- Designed to be the basic operating system for all highway incidents within each jurisdiction. The transition to large and/or multi-agency operations requires minimal adjustment for any of the agencies involved.
- The organization builds from the ground up, with the management of all major functions initially being the responsibility of one or just a few persons. Functional units are designed to handle the most important incident activities. As the incident grows in size and/or complexity, functional unit management is assigned to additional individuals in order to maintain a reasonable span of control and efficiency.
- Designed on the premise that the jurisdictional authority of the involved agencies will not be comprised. Each agency having legal responsibility within its jurisdiction is assumed to have full command authority within its jurisdiction at all times. Assisting agencies will normally function under the direction of the Incident Commander appointed by the jurisdiction within which the incident occurs.
- Multi-jurisdictional incidents will normally be managed under a unified command structure involving a single incident ICP and a single incident action plan - applicable to all agencies involved in the incident.
- The system is intended to be staffed and operated by qualified personnel from any agency. A typical incident could involve the use of personnel from a variety of agencies working in many different parts of the organization.
- The system expands and contracts organizationally based upon the needs of the incident. Span-of-control recommendations are followed closely; therefore, the organizational structure is never larger than required.

On highway incidents, experience has proven the critical necessity of integrating response agencies into one operational organization, managed and supported by one command structure. For this reason, the Consortium supports an integrated, multi-disciplined organization over separate incident management systems for each organization. Separate response disciplines (transportation, law enforcement, public works) are encouraged to address their specific tactical needs, while retaining the overall IMS structure.

The National Fire Service Incident Management System Consortium believes that any Incident Management System should be guideline-driven for the following reasons:

- Written guidelines can reflect either strict department policy or allow flexibility in the management of incidents.
- Provides a standardized approach to managing any incident.
- Provides a predictable approach to incident management.
- May be applied routinely.
- Provides a training tool for responders' reference.
- Provides a baseline for critiques and review of incidents.
- Makes the Incident Commander's operations more effective.

This model reflects a procedural approach to the overall organizational structure of the Incident Management System suitable for use in the highway environment. The Consortium addresses various models of other "all risk" types of urban emergencies in other Consortium documents.

# CHAPTER 1

## COMMAND PROCEDURES

This model procedure guide identifies standard operating guidelines (SOGs) that can be employed in organizing all response resources into an effective, efficient, and coordinated workforce operating under a single command authority.

Command procedures are designed to:

- Fix the responsibility for Command on a specific individual through a standard identification system, depending on the arrival sequence of members, companies, supervisors, and chief officers.
- Ensure that a strong, direct, and visible command will be established from the onset of the incident.
- Establish an effective incident organization, defining the activities and responsibilities assigned to the Incident Commander (IC) and to other individuals operating within IMS.
- Provide a system to process information to support incident management, planning, and decision making.
- Provide a system for the orderly transfer of command to subsequent arriving officers.

### Responsibilities Of Command

The IC is responsible for the completion of the tactical priorities. The tactical priorities are:

1. Stabilize the incident and provide for life safety.
2. Where possible, remove immediately endangered injured and non-injured persons.
3. Triage the injured.
4. Provide appropriate field treatment and transportation of the injured.
5. Provide for the safety, accountability, and welfare of personnel. This priority is ongoing throughout the incident.

6. Facilitate the safe flow of traffic past the incident.<sup>1</sup>
7. Restore the roadway to normal operations.<sup>1</sup>

IMS is used to facilitate the completion of the tactical priorities. The IC is the person who drives IMS toward that end. The IC is responsible for building a command structure that matches the organizational needs of the incident to achieve the completion of the tactical priorities for the incident.

## Functions Of Command

The functions of Command define standard activities that are performed by the IC to achieve the tactical priorities. The Functions of Command include:

8. Assume and announce Command and establish an effective operating position (ICP).
9. Rapidly evaluate the situation (size-up).
10. Initiate, maintain, and control the communications process.
11. Identify the overall strategy, develop an incident action plan, and assign companies and personnel consistent with the incident action plan and SOGs.
12. Develop an effective incident management organization.
13. Provide tactical objectives.
14. Integrate local and regional traffic management operations.<sup>1</sup>
15. Initiate and maintain a tactical work sheet.
16. Review, evaluate, and revise (as needed) the incident action plan.
17. Provide for the continuity, transfer, and termination of Command.

The IC is responsible for all of these functions. As Command is transferred, so is the responsibility for these functions. The first five (5) functions must be addressed immediately from the initial assumption of Command.

## ESTABLISHING COMMAND

***NOTE: Throughout this document, the term member refers to a individual assigned to any agency having jurisdiction, or responsibility, that responds to highway incidents. Throughout***

---

<sup>1</sup> Readers are encouraged to apply this guide to both emergency and non-emergency highway incidents. This guide was specifically written for application to fire, medical, or law enforcement incidents having traffic control aspects; and to incidents that are solely traffic blockages.

*this document, the term company represents a response unit, regardless of organization, such as an engine, ambulance, DOT vehicle, or law enforcement unit, and the personnel assigned.<sup>2</sup> The term company officer is used to describe the member in charge of that response unit. The term chief officer is used to describe: (1) a member in charge of fire service company officers; or (2) a law enforcement supervisor in charge of law enforcement personnel; or (3) a transportation supervisor in charge of transportation personnel.*

The first responder to arrive at the scene shall assume Command of the incident. The initial IC shall remain in Command until Command is transferred or the incident is stabilized and terminated.

The first company officer or member on the scene must initiate whatever parts of IMS are needed to effectively manage the incident scene. The exact actions of that first company or member will vary depending on the type or scope of the incident:

1. A single-company incident (single-patient medical incident, traffic collision with minor injuries, disabled vehicle, property damage collision, etc.) may only require that the company officer or member acknowledge its arrival on the scene.
2. For incidents that require the commitment of multiple companies, the first company officer or member on the scene must establish and announce “Command” and initiate an incident management structure appropriate for the incident.

The first-arriving company officer or member activates the command process by giving an initial size-up report. This size-up report should include:

- Designation of the company arriving on the scene.
- A brief description of the incident situation, i.e., HAZMAT release, multi-vehicle accident, guardrail damage, etc.
- Obvious conditions (HAZMAT spill, multiple patients, working fire, bridge collapse, etc.).
- Brief description of action taken, i.e., “Crew 42 is setting up a temporary traffic diversion.”
- Declaration of the strategy, or standardized operation (e.g., traffic stop, vehicle tow, tire change) to be used.
- Any obvious safety concerns.

---

<sup>2</sup> For the purposes of retaining the common terminology used throughout the family of Model Procedure Guides, this guide will continue to use the term “company,” even though it may not be an accepted term of practice within law enforcement or transportation. More common law enforcement synonyms in use would include patrol car or unit, scout car, squad car, cruiser, or motor unit. Rather than transportation companies, work crews and teams might be more commonly encountered at highway incidents.

- Assumption, identification, and location of Command.
- Request or release resources as required.

**Examples:**

For an ordinary traffic stop –

*“I-ADAM-14 on a traffic stop, northbound Main Street at 4<sup>th</sup> Ave. Reckless driving. Black late model sedan with California plates.”*

For an ordinary, non-blocking, vehicle with mechanical trouble --

*“SERVICE-PATROL-4 with a disabled pickup truck on the shoulder, westbound I-64 at mile marker 232. Apparent overheated engine.”*

For vehicle accident with unexpected severity --

*“RESCUE-AMBULANCE-21 on the scene of a multi-vehicle accident with a rollover. Correct location as dispatched. Apparent multiple patients. Dispatch a heavy rescue unit, two suppression units, two additional ambulances with an EMS supervisor, traffic control, and one air ambulance . RESCUE-AMBULANCE-21 is beginning triage.”*

**Radio Designation**

The radio designation “Command” will be used along with the geographical location of the incident (e.g., “Abbott =Command,” “I-5 Command”). This designation will not change throughout the duration of the incident. The designation of “Command” will remain with the officer currently in command of the incident throughout the event.

**Radio Communications Format**

Many national organizations have adopted the military protocol format for effective radio communications. In this protocol, the sender states the intended receiver’s radio designation first, then follows with the sender’s designation. For example, suppose that the IC needs to call the Traffic Control Group during the course of an incident. The proper radio transmission would be:

*“Traffic Control Group from Command” or “Traffic Control. Command”*

Saying the receiver's designator first is an attention getting device. By getting the receiver's attention up front in the message, the receiver is less likely to reply, "*Unit calling Traffic Control Group, repeat.*" Remember that the amount of radio traffic during responses is generally high and each responder listens for their own radio designation before "tuning in" to the radio traffic. This methodology reduces confusion and preserves airtime for more important messages.

## Communications Order Model

In order for the IC (or any message sender) to obtain confirmation that a radio message/order was received, understood, and the recipient is taking correct action, the radio message must be repeated. This repetition does not need to be word-for-word, but should be a brief and concise summary of the intent of the message or order from the sender. The format of the repetition should assure the IC (or other sender) that the message was received by the intended recipient, was correctly understood, and the recipient is taking correct action.

The benefit of the communications order model is best illustrated when the recipient misunderstood the message and is taking incorrect action. This inappropriate action could be life threatening. During the repetition, the IC has an opportunity to detect the error and make corrections before inappropriate actions are taken.

For clarity of purpose during radio communications, the phonetic designations of "Alpha," "Bravo," "Charlie," and "Delta" are suggested. A usage may be, "Delta Division from Command."<sup>3</sup>

For example:

*"DOT 7 from Command. Divert eastbound traffic from I-66 onto Route 50 at Exit 60, and you are assigned as West Division Supervisor."*

---

<sup>3</sup> The complete phonetic alphabet: ALPHA, BRAVO, CHARLIE, DELTA, ECHO, FOXTROT, GOLF, HOTEL, INDIA, JULIET, KILO, LIMA, MIKE, NOVEMBER, OSCAR, PAPA, QUEBEC, ROMEO, SIERRA, TANGO, UNIFORM, VICTOR, WHISKEY, X-RAY, YANKEE, ZULU.

There are other phonetic alphabets in common use in law enforcement, such as: ADAM, BAKER, CHARLIE, DAVID, EDWARD, FRANK, GEORGE, HENRY, IDA, JOHN, KING, LINCOLN, MARY, NORA, OCEAN, PAUL, QUEEN, ROBERT, SAM, TOM, UNION, VICTOR, WILLIAM, X-RAY, YELLOW, ZEBRA

*“Command, DOT 7. Copy. I will divert westbound traffic from I-66 onto Route 50, as West Division.”*

*“DOT 7, Command. Negative! Divert eastbound traffic from I-66 onto Route 50 and you will be West Division Supervisor.”*

*“Command, DOT 7. I will divert eastbound traffic from I-66 onto Route 50, and be the West Division Supervisor.”*

## **Command Options**

Depending upon the type of incident, the first-arriving company officer or member may have several command options to choose from when arriving at the incident, depending on the situation and department policy. If a unit without tactical capabilities initiates Command, the establishment of a ICP should be a top priority. At most incidents, the initial IC will be a company officer. The following command options define the company officer’s direct involvement in tactical activities and the modes of command that may be used.

### **Investigation Mode**

Upon arrival, an incident may not have visible indicators of a significant event. These situations generally require investigation by the first-arriving company, with other responding companies remaining staged. The officer of the first-in company should assume Command and go with the company to investigate (initial assessment), using a portable radio to command the incident.

### **Intervention Mode**

Some situations demand immediate action and require the company officer’s direct involvement to take an immediate action that will stabilize the incident. In these situations, the officer goes with the crew to provide the appropriate level of assistance and supervision. Examples of these situations include:

- Incident out of sight from the right-of-way (e.g., vehicle down an embankment, inside a tunnel, immersed) or other scenes that are difficult to evaluate.
- Critical life safety situations (i.e., childbirth, rescue, cardiac arrest, patient in burning car, etc.) where immediate action should be taken.

- Any incident where the safety and welfare of responders, patients, good Samaritans, bystanders, or approaching traffic is a major concern.
- Multiple locations of patients.

Where fast intervention is critical, utilization of the portable radio will permit the company officer's involvement in the initial activity without neglecting initial command responsibilities. Intervention mode should not last more than a few minutes and will end with one of the following:

1. The situation is stabilized and/or adequate resources arrive on the scene.
2. The situation is not stabilized and the officer must withdraw from initial activities and establish a ICP. The company's crew remains to continue their original assignments and other support activities.
3. Command is transferred to a later arriving company officer. When command is transferred, the relieving officer may opt to return the company/unit officer to their crew, or assign this officer to a subordinate command support position.

## Command Mode

Certain incidents, by virtue of their size, complexity, or potential for rapid expansion, require immediate strong, direct, overall command. In such cases, the company officer will initially assume a safe and effective command position, and maintain that position until relieved by a higher-ranking officer. **A tactical work sheet (see APPENDIX B) shall be initiated and used to assist in managing this type of incident.**

If the company officer selects the Command mode, the following options are available regarding the assignment of the remaining crew members:

- The officer may place the company into action with the remaining members. One of the crew members will serve as the acting company officer and **should be provided with a portable radio**. The collective and individual capabilities and experience of the crew will regulate this action. Crews operating in confined spaces or unbreathable atmospheres must consist of a minimum of two persons.
- The officer may assign the crew members to work under the supervision of another company officer. In such cases, the officer assuming Command must communicate with the officer of the other company, and indicate the assignment of those personnel.
- The officer may elect to assign the crew members to perform staff functions to assist Command.

A company officer assuming Command has a choice of modes and degrees of personal involvement in the tactical activities, but continues to be fully responsible for the Command functions. The initiative and judgment of the officer are of great importance. The modes identified are guidelines to assist the officer in planning appropriate actions. The actions initiated should conform to one of the above-mentioned modes of operation.

## **Transfer Of Command**

Command is transferred to improve the quality of the Command organization. The following guidelines outline the transfer of command process. The transfer of command procedures through various ranking officers must be predetermined in SOGs by each local highway incident response community.

Within the chain of command, the actual transfer of command will be regulated by the following procedure:

- The officer assuming Command will communicate by radio or face-to-face with the person being relieved. Face-to-face is the preferred method to transfer Command.
- The person being relieved will brief the officer assuming Command, indicating at least the following:
  - Incident conditions – number of patients, incident location and extent, HAZMAT spill or release, etc.
  - Tactical work sheet/incident action plan for the incident.
  - Progress toward completion of the tactical objectives.
  - Safety considerations.
  - Deployment and assignment of operating companies and personnel.
  - Appraisal of need for additional resources.

Whenever practical, the person being relieved of Command should review the tactical work sheet with the officer assuming Command. This sheet provides the most effective framework for Command transfer because it outlines the location and status of personnel and resources in a standard form that should be well known to all members. Often, the first transfer of Command takes place via radio. The first chief officer to arrive on scene initiates the transfer

from the first-in company officer. At this first transfer, only a few companies may be committed and a radio transfer is effective.

Later-arriving, higher-ranking chief officers assuming Command must conduct the transfer face-to-face at the ICP. All supervisors and officers must be prepared to transfer the position responsibilities to the person relieving them, when required. The new IC, based on the needs of the incident, will reassign the person being relieved of Command.

The practice of “Passing Command” is not a recommended practice. Passing Command to an officer not on the scene can create a gap in the Command process and compromise incident management and responder safety. The application of “Passing Command” has historically been applied to critical fast attack situations between the first and second due companies. In this situation, the first-due company would assume initial Command, take action, and pass Command to the second-due company by radio upon their arrival on the scene. The use of “Passing Command” should be rarely applied as the more formalized transfer of command process described above is preferred. **Command cannot be passed/transferred to an officer not on scene.**

In some critical situations, it may be appropriate to advise an inbound company or chief officer of the intent to transfer Command to him upon their arrival at the scene. When a chief officer arrives at the scene at the same time as the initial-arriving company, the chief officer should assume Command of the incident. Assumption of Command is discretionary for senior level department officers.

Should a situation occur where a later-arriving company or chief officer cannot locate or communicate with Command (after several radio attempts), they will assume and announce their assumption of Command, and initiate whatever actions are necessary to confirm the safety of the missing crew.

When time and circumstances allow, the officer who will be assuming Command may endeavor to do his own size-up prior to assuming Command. This provides an opportunity to see where companies are operating and an idea of their effectiveness.

It also gives the officer a chance to get his own perspective and understanding of the scope and magnitude of the incident. By doing this prior to assuming Command, the officer can

gain some understanding of the current incident action plan and ease the transition from one IC to another. The officer should announce his on-scene arrival to the IC, and advise that he will be doing the size-up. Until the officer completes the size-up and the formal transfer of Command process has taken place, the current IC maintains Command of the incident. In extreme and life-threatening situations that affect personnel safety, anyone can effect change by initiating corrective action and notifying Command.

## General Considerations

The response and arrival of additional ranking officers on the incident scene strengthens the overall Command function. As the incident escalates, the IC should use these additional officers as needed. However, *the arrival of a ranking officer on the incident scene does not automatically mean that Command has been transferred to that officer.* Command is only transferred when the outlined transfer of command process has been completed. Chief officers and staff personnel should report directly to a designated location for assignment by the IC.

Tactical level communications procedures should include standard communications necessary to gather and analyze information to plan, issue orders, and supervise operations.

For example:

- Assignment completed.
- Additional resources required.
- Unable to complete.
- Special information.

## Progress Reports

The IC and response resources generally arrive at an incident with limited knowledge about the incident, conditions or circumstances. It is essential that the IC quickly obtain a “picture” of what is happening. Progress reports provide initial and on-going information that is critical to effective and safe decision-making.

Progress reports should be provided by the first companies assigned to Divisions (geographic areas) or Groups (functional assignments) . This early updating begins the picture-

building process for the IC. As the incident continues, Division/Group (D/G) supervisors should obtain critical information and forward progress reports to the IC on a regular basis. Progress reports should be communicated to the IC as progress is made; and just as important, when progress toward objectives cannot be achieved. Progress reports allow the IC to prioritize resource commitments to areas of most need. Reports are typically required more frequently in the early stages of the incident and less frequently as the incident is stabilized. Radio discipline will be required when making progress reports. Nonessential communication should be avoided. Progress reports should be brief and concise in nature.

The IC has the overall responsibility for managing an incident. Simply stated, the IC has complete authority and responsibility for the incident. If a higher-ranking officer wants to effect a change in the management of an incident, he must first be on the scene of the incident, then utilize the transfer of command procedure.

## **Incident Action Plan**

Incident action plans are critical to the rapid, effective control of emergency operations. An incident action plan is a well-thought-out, organized course of events developed to address all phases of incident control within a specified time. The incident action plan must be completed in a time frame that allows the least amount of negative action to continue.

Written incident action plans may not be necessary for short-term, routine operations. Large scale or complex incidents, however, require the creation and maintenance of a written plan for each operational period.

Action planning starts with identifying the strategy to achieve a solution to the confronted problems. Strategy is broad in nature and defines “what” has to be done.

Once the strategy has been defined, the IC or the Operations Section Chief needs to select the tactics (the “how, where, and when” of the incident action plan) to achieve the strategy. Tactics are measurable in both time and performance. An incident action plan also provides for necessary support resources, e.g., traffic control, transportation vehicles, extrication tools, law enforcement, critical incident debriefing teams, etc.

Once a plan is established and resources are committed, it is necessary to assess its effectiveness. Information must be gathered and analyzed so that necessary modifications may be made to improve the plan, if necessary. This step is part of a continuous size-up process.

## **Tactical Worksheets**

As an incident escalates from a few companies to a major operation, it will be impossible for the IC to mentally track where all of the resources are committed on the emergency scene. It is essential that the IC document the resources committed on the scene, their current location, which D/G they are assigned to, other resources that are currently available, and a sketch of the scene. The tactical worksheet should be started very early in the incident.

Tactical worksheets are printed forms that are designed to allow the IC (and D/Gs) to document the commitment of resources in a standardized format. As a result, information can be found in the same location on the worksheet. This standardization allows for a more effective transfer of command when the need arises.

Several examples of tactical worksheets can be found in APPENDIX B of this document. Agencies are encouraged to adopt and modify these examples, or develop their own worksheet. Blank worksheets should be carried on all response vehicles and command vehicles. They must be used on a routine basis. The information contained in these forms has proven extremely useful in cost recovery and post-incident analysis.

# CHAPTER 2

## ORGANIZATIONAL STRUCTURE – COMMAND

The Incident Commander (IC) is responsible for developing an organizational structure using standard operating guidelines (SOGs) as soon as possible after arrival and for implementing initial tactical control measures. Obviously, the size and complexity of the organizational structure is determined by the scope of the emergency and availability of resources.

### **Organizational Hierarchy**

The Incident Management System (IMS) organizational structure develops in a modular form based upon the nature, complexity, and size of an incident. The organization's staff builds from the top down, with responsibility and performance placed initially with the IC. As a situation dictates, four separate Sections can be employed, each Section potentially having the need to establish several Divisions, Groups, and Units. The specific organizational structure for any given incident will be based upon its management needs. If one individual can simultaneously manage all major functional areas, a larger command organization is not required. When a function requires dedicated management, a manager is assigned that responsibility.

IMS should be considered the basic system to be used on any size or kind of incident. The only change in using IMS on a very large incident rather than a small incident is the method of growth of the basic emergency management organization to meet the increased needs. Thus, the full establishment of IMS should be viewed as an extension of the existing incident organization. The determination to expand the organization will be that of the IC and is done when the determination is made that the initial attack or reinforced attack will be insufficient.

The terms and titles used in the Incident Management System organizational hierarchy are defined below for ease of reference and understanding. The roles are more fully described later in the text.

**Incident Commander (IC):** The individual responsible for the management of all incident operations.

**Officer:** A member of the Command Staff; e.g., Information Officer, Safety Officer, or Liaison Officer. Command Staff report directly to the IC.

**Section Chief:** A member of the General Staff; e.g., Operations Section Chief, Planning Section Chief, Logistics Section Chief, or Finance/Administration Section Chief.

**Director:** An individual responsible for command of a Branch; e.g., Suppression Branch Director, Medical Branch Director, Traffic Management Branch Director, Law Enforcement, or HAZMAT Branch Director.

**Supervisor:** An individual responsible for command of a Division or Group (D/G); e.g., Division A Supervisor, Extrication Group Supervisor, Traffic Control Group Supervisor.

**Unit Leader:** An individual responsible for managing a particular activity in the Operations, Planning, Logistics, or Finance/Administration Sections; e.g., Rehab Unit Leader, Traffic Control Unit Leader, or Supply Unit Leader.

**Single Resource:** An individual, a piece of equipment and its personnel, or a crew or team of individuals with an identified supervisor that can be used on an incident; e.g., Engine 1, Rescue-Ambulance-4, Service-Patrol-5, Traffic Control 17.

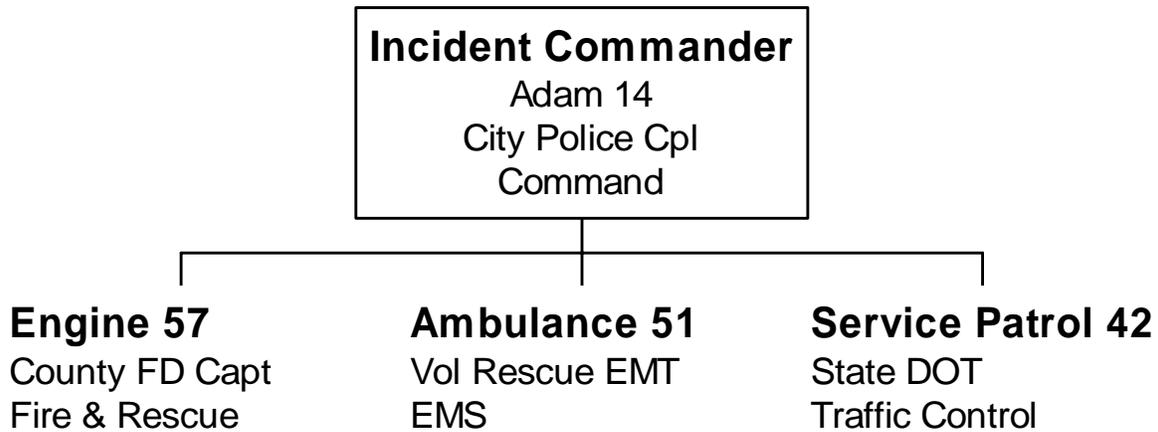
## IMS Organizational Development

The two basic components of IMS organizational development are the initial response and the reinforced response. Each of these is highlighted as follows.

### Initial Response

In most jurisdictions, the initial response will consist of anywhere from one to five single resources that are dispatched to a reported highway incident. This is also commonly referred to in the fire service as a *first alarm assignment* and in law enforcement as an *initial response*. The first-arriving unit or officer will assume Command until arrival of a higher-ranking officer. On arrival of a higher-ranking officer, the IC will brief him. The higher-ranking officer will then

assume Command. This transfer of command is to be announced. The new IC will reassign the officer being relieved of Command responsibilities.

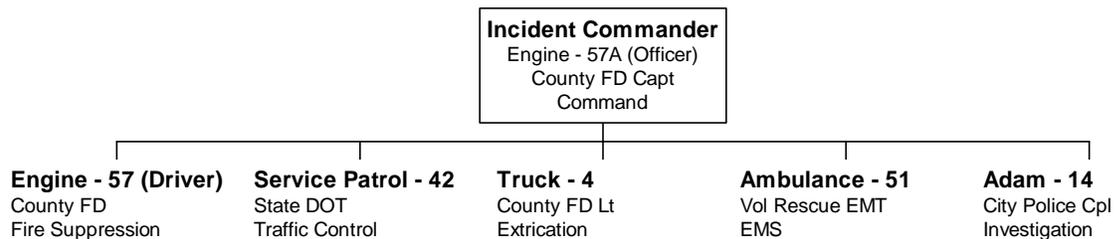


**Figure 2, Initial Response - Highway Incident**

Figure 2 illustrates a typical initial dispatch of resources to the scene of a reported motor vehicle accident with minor injuries on an interstate or arterial highway. The City police unit, arriving first on the scene, assumes command. The engine company and ambulance report directly to Adam 14 upon arrival, and are assigned to suppression and EMS tasks according to standard operating procedures. The service patrol unit arrives and assumes traffic control duties. All units report directly to the IC.

### Reinforced Response

A reinforced response is initiated when the IC determines that the initial response resources are insufficient to deal with the size or complexity of the incident. In this case the IC will request appropriate additional or special resources from within the agency, or through mutual aid.



**Figure 3, Reinforced Response - Highway Incident**

Figure 3 shows the change to the organization of resources on the scene after it was determined that the injured driver of one of the crash vehicles was trapped. Since the major problem became one of extrication and medical treatment, the police corporal transferred command to the engine OIC, who requested a truck company to handle the extrication. The initial response was reinforced with additional resources. All units still report directly to the IC.

## **Command Organization**

The Command organization must develop at a pace that stays ahead of the tactical deployment of personnel and resources. In order for the IC to manage the incident, he must first be able to direct, control, and track the positions and functions of all operating companies. Building a Command organization is the best support mechanism the IC can use to achieve the harmonious balance between managing personnel and incident needs. Simply put, this means:

**Small scale and "simple" incidents = Small Command organization**

**Large scale and complex incidents = Large Command organization**

The basic configuration of Command includes three levels:

1. **Strategic Level** – This entails the overall direction and goals of the incident.
2. **Tactical Level** – Objectives that must be achieved to meet the strategic goals. The tactical level supervisor/officer is responsible for completing assigned objectives.
3. **Task Level** – Specific tasks assigned to companies that lead toward meeting tactical level requirements.



**Figure 4, The Configuration of Command**

### **Strategic Level**

The strategic level involves the overall Command of the incident. The IC is responsible for the strategic level of the Command structure. The incident action plan (IAP) should cover all strategic responsibilities, all tactical objectives, and all support activities needed during the entire operational period. The IAP defines where and when resources will be assigned to the incident to control the situation. The IAP is the basis for developing a Command organization, assigning all resources, and establishing tactical objectives.

Strategic level responsibilities include:

- Planning.
- Determination of the appropriate strategy.
- Establishment of overall incident objectives.
- Setting of priorities.
- Development of an incident action plan.
- Obtainment and assignment of resources.

- Prediction of outcomes.
- Assignment of specific objectives to tactical level units.
- Integrating local and regional traffic management operations.

## Tactical Level

Tactical level *supervisors* direct operational activities toward specific objectives. Tactical level supervisors supervise grouped resources and are responsible for specific geographic areas or functions. A tactical level assignment comes with the authority to make decisions and assignments within the boundaries of the overall plan and safety conditions. The accumulated achievements of tactical objectives should accomplish the strategy as outlined in the incident action plan.

## Task Level

The task level refers to those activities normally accomplished by individual companies or specific personnel. The task level is where the work is actually done. Task level activities are routinely supervised by company officers. The accumulated achievements of task level activities should accomplish tactical objectives.



Figure 5, Command Organization

## Command Structure – Basic Organization

The most basic organization combines all three levels of the Command structure. For example, the company officer on a single-unit response to a single vehicle traffic accident determines the strategy and tactics and supervises the crew doing the task.

The basic structure for a "routine" incident involving a small number of companies requires only two levels of the Command structure. In this situation, the IC directly handles strategic and tactical levels. Companies report directly to the IC, and operate at the task level.

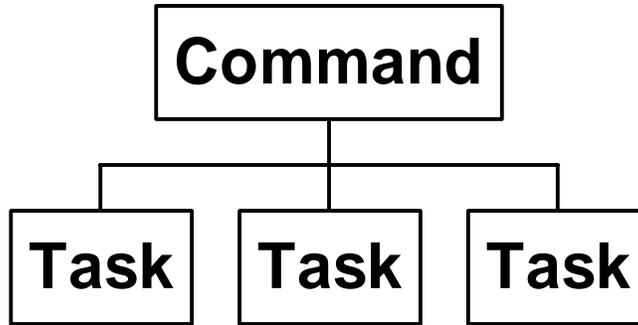
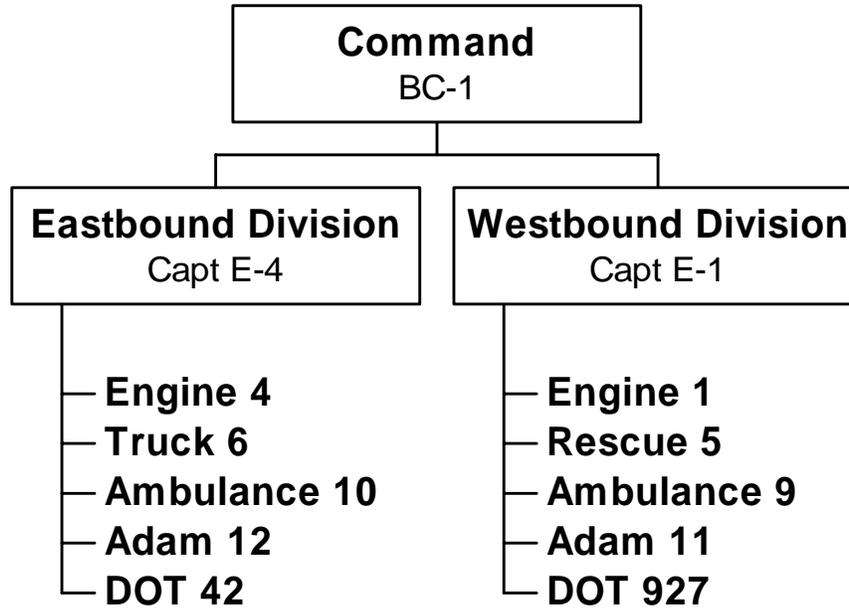


Figure 6, Command Structure Basic Organization

## Command Structure (Division Or Group)

The terms Divisions and Groups are tactical level management components that assemble companies and/or resources for a common purpose. Divisions represent geographic areas, and Groups represent functional assignments. Divisions and Groups are at the same organizational level within IMS. When Groups are formed, they may operate within more than one Division. When this occurs, Group Supervisors should communicate and coordinate their activities with affected Division Supervisors.

The following examples illustrate the use of these terms. As an incident escalates, the IC should organize companies into manageable components. A Division is the organizational level having responsibility for operations within a defined geographic area. In order to effectively deploy tactical level management unit terminology, the entire highway incident response community must have a designated method of dividing an incident scene.

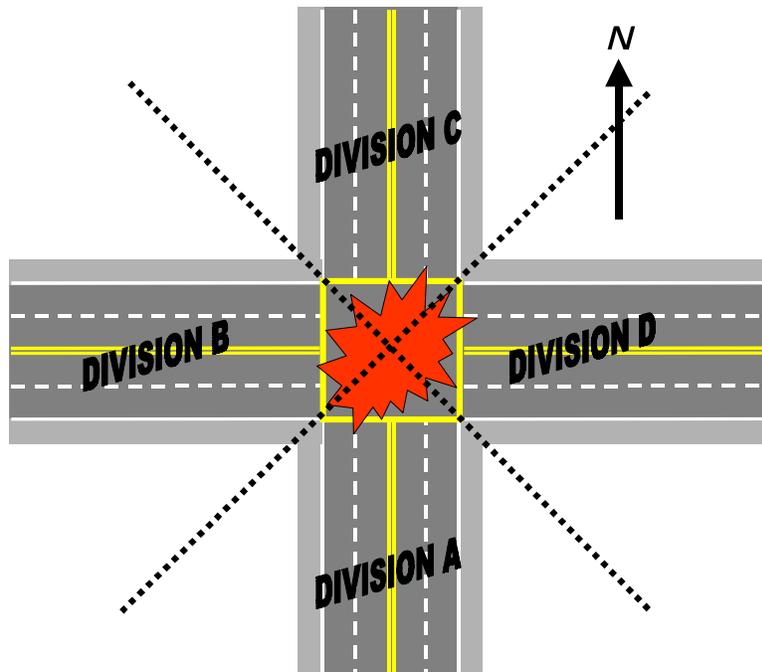


**Figure 7, Division Designation**

Figure 7 shows how the IC can reduce the number of units that are directly reporting to him from eleven to two. He appoints two of the engine OICs to head two divisions to direct operations in two different areas, and assigns resources to each.

### **Geographic Division Designation**

In situations where a highway incident is geographically dispersed, divisions may be set up based on logical or practical criteria. For example, a completely blocked intersection could be divided up into the four approaches as follows.



**Figure 8, Geographical Division Areas of Responsibility**

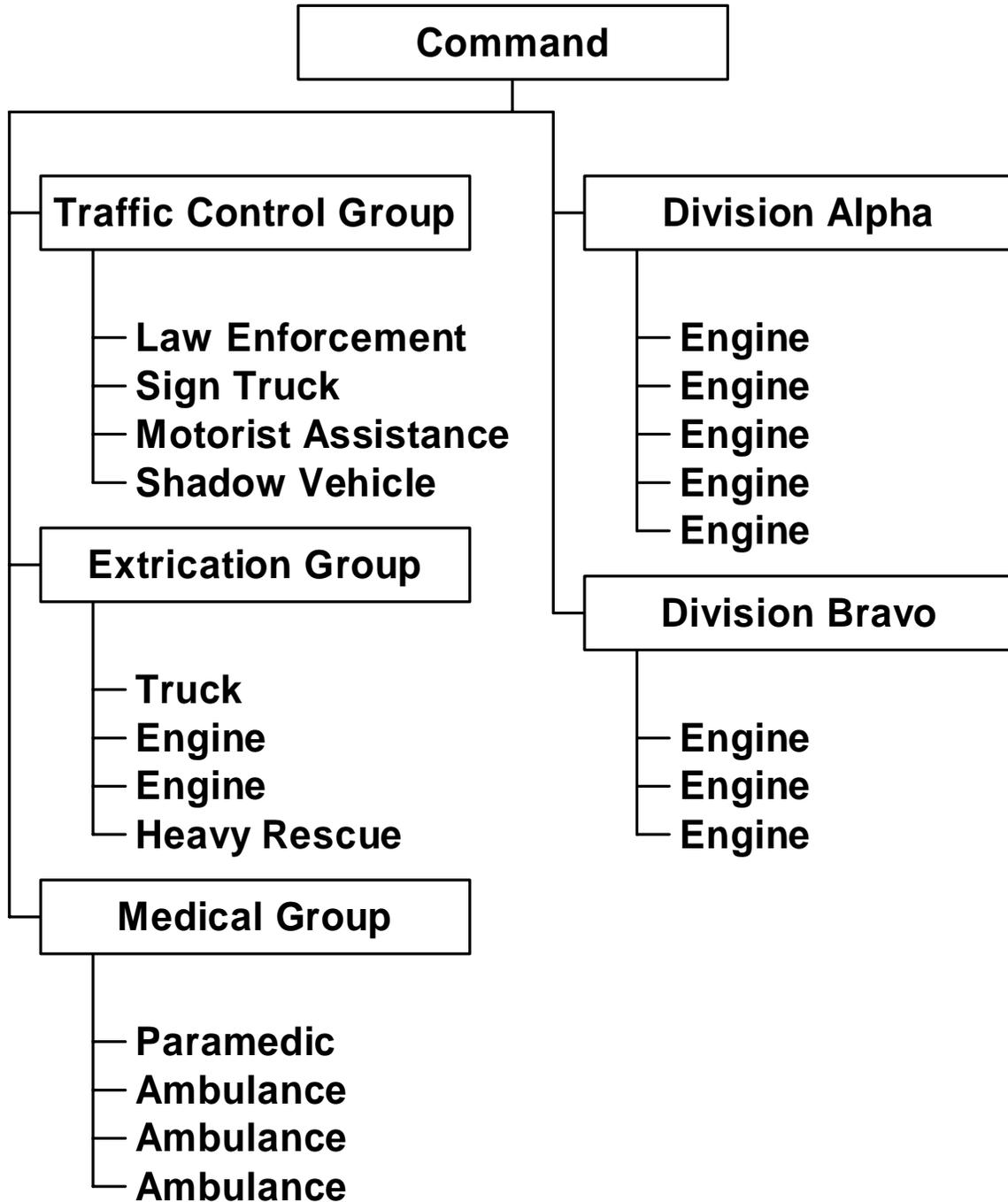
In Figure 8, a large incident at a highway intersection has been divided into four division areas, with each responsible for a side of the incident and the approaching roadway to that side.

For clarity of purpose during radio communications, the phonetic designations of “Alpha,” “Bravo,” “Charlie,” and “Delta” are suggested. For example, “*Command from Division Delta.*”

### **Division/Group Designation**

**Divisions** are the organizational level having responsibility for operations within a *defined geographic area*. The Division level is organizationally between Single Resources, Task Forces, or Strike Teams and the Branch.

**Groups** are an organizational level responsible for a *specific functional assignment*. The Group level is also organizationally between Single Resources, Task Forces, or Strike Teams and the next higher command level. Examples are Traffic Control Group, Extrication Group, Search Group, Rescue Group, HAZMAT Group, and Medical Group.



**Figure 9, Division/Group Designation**

In Figure 9, the IC has established three groups assigned to the functions of traffic control, extrication, and medical activities. At the same time, he organized two divisions to handle operations in the two major operating areas at this incident. As can be seen in this example, the individual resources do not report directly to the IC.

## Establishing Divisions or Groups – Basic Operational Approach

A major incident will initially have more tasks that need doing than the available resources can accomplish. There is a tendency to start performing these tasks immediately upon arrival, thereby postponing the establishment of IMS. *This is a major error.* The lack of direction will result in confusion and lack of coordination. This increases the risks to emergency personnel and decreases the likelihood of a successful operation.

Complex emergency situations often exceed the capability of one officer to effectively manage the entire operation. The span of control must be reduced by creating organizational subcomponents to direct operations in specific geographic areas or to manage incident-related functions. This is accomplished by establishing Divisions or Groups .

D/Gs reduce the span of control to more manageable, smaller-sized units. D/Gs allow the IC to communicate principally with these organizational levels, rather than multiple individual company officers, thus providing an effective Command structure and incident scene organization.

Generally, D/G responsibilities should be assigned early in the incident, typically to the officer of the first company assigned to a geographic area or function. This early establishment of D/Gs provides an effective organizational framework on which the operation can be built and expanded.

The number of resources that can be effectively managed by the IC varies. Normal span of control is three to seven. In fast-moving, complex operations, a span of control of no more than five D/Gs is recommended. In slower-moving, less-complex operations, the IC may effectively manage more D/Gs. *When the span of control is exceeded, the IC should establish Branches or an Operations Section.*

The D/G procedures provide an array of major functions that may be selectively implemented according to the needs of a particular situation. This places responsibility for the details and execution of each particular function on the D/G.

When effective D/Gs have been established, the IC can concentrate on overall strategy and resource assignments, allowing the D/G Supervisor to manage his assigned resources. The IC determines strategy and assigns tactical objectives and resources to each D/G. Each D/G

Supervisor is responsible for the tactical deployment of the resources at his disposal in order to complete the tactical objectives assigned by the IC. D/G Supervisors are also responsible for communicating their needs and progress to Command.

The use of D/Gs reduces the overall amount of radio communications. Most routine communications within a D/G should be conducted face-to-face between company officers and the D/G Supervisor. This process reduces unnecessary radio traffic and increases the ability to transmit critical radio communications.

**The safety of response personnel represents a major reason for establishing D/Gs.** Each D/G Supervisor must maintain communication with assigned companies to control both their position and function. The D/G Supervisor must constantly monitor all hazardous situations and risks to personnel and take appropriate action to ensure that companies are operating in a safe and effective manner.

The IC should begin to assign D/Gs based on the following factors:

- Situations that will involve a number of companies or functions beyond Command's span of control. Command should initially assign responsibility for D/G operations to the first company officer assigned to a geographic area or functional position. As additional chief officers become available, they may be assigned to relieve the company officer of responsibility for the area or function.
- When companies are involved in complex operations (large geographic area, complex highway incidents, hazardous materials operations, mass casualty incidents, technical rescues, etc.).
- When companies are operating from tactical positions that Command has little or no direct control over (i.e., they are out of Command's sight).
- When the situation presents special hazards and close control is required over operating companies (e.g., significant traffic congestion, unstable structural conditions, fire threatening rescue areas, threats of violence, etc.).
- When establishing D/Gs, the IC will assign/advise each unit:
  1. Tactical objectives.
  2. A radio designation (Division or Group).
  3. The identity of resources assigned to that D/G.

## **D/G Guidelines**

D/Gs will be regulated by the following guidelines:

- Command assigns D/Gs as required for effective operations; this assignment will relate to both geographic areas and functional assignments.
- The incident scene should be subdivided in a manner that makes sense. This should be accomplished by assigning Divisions to geographic locations (e.g., Division Alpha) and/or assigning functional responsibilities to Groups (e.g., Eastbound Traffic Control Group when multiple Groups are established because traffic control is needed at more than one location). The radio call sign for the Eastbound Traffic Control Group could be abbreviated to “Eastbound Group.”
- Command shall advise each D/G of specific tactical objectives (e.g. Traffic Control Group would advise that the right two lanes are to be blocked.). The overall strategy should be provided if time permits so that the D/G Supervisors have some idea of what is going on and how their assignment fits into the overall plan. (e.g. Traffic Control would know that heavy rescue is conducting an extrication in the blocked lanes.)
- The number of companies assigned to a D/G will depend on conditions within that area of responsibility. Command will maintain an awareness of the number of companies operating within a D/G and the capability of that specific D/G to effectively direct operations. If a D/G Supervisor cannot adequately control the resources within his D/G, he should notify the IC so that responsibilities can be split or other action taken. In most cases, three to seven companies or grouped resources represent the maximum span of control for a D/G Supervisor.

D/G Supervisors must use the appropriate, specific D/G designation in radio communications (e.g., “Main Street Command from Division A” or “Main Street Command from Northbound Group”).

As stated above, D/Gs will be supervised by chief officers, company officers, or any other member designated by Command. Regular transfer of command procedures should be followed in transferring D/G responsibility when necessary. In some cases, a D/G Supervisor may be assigned to an area/function initially to evaluate and report conditions and advise Command of needed tasks and resources. This D/G Supervisor will then assume responsibility for directing resources and operations within his assigned area of responsibility.

The D/G Supervisor must be in a position to directly supervise and monitor operations. This will require the D/G Supervisor to be equipped with the appropriate protective clothing and equipment for his area of responsibility. **If a D/G Supervisor is operating within an**

atmosphere that is “immediately dangerous to life and health<sup>1</sup>”, then he must be accompanied by a partner at all times.

In general, the D/G Supervisor must do the following:

- Complete objectives assigned by Command.
- Account for all assigned personnel.
- Ensure that operations are conducted safely.
- Monitor work progress.
- Redirect activities as necessary.
- Coordinate actions with related activities and adjacent D/Gs.
- Monitor welfare of assigned personnel.
- Request additional resources as needed.
- Provide Command with essential and frequent progress reports.
- Reallocate or release resources within the D/G.

**NOTE:** The D/G Supervisor should be readily identifiable and maintain a visible position *in his area of responsibility as much as possible.*

The primary function of company officers working within a D/G is to direct the operations of their individual crews in performing assigned tasks. Company officers will advise their D/G Supervisor of work progress, preferably face-to-face. All requests for additional resources or assistance within a D/G must be directed to the D/G Supervisor. These Supervisors will communicate with the next higher level of supervision. Command is responsible for obtaining resources and prioritizing their commitment.

Each D/G Supervisor will keep Command informed of conditions and progress in his D/G through regular progress reports. The Supervisors must limit progress reports to essential information only. Command must be advised immediately of significant changes, particularly those involving the ability or inability to complete an objective, the existence of hazardous conditions, accidents, imminent structural collapse, etc.

---

<sup>1</sup> See definitions and refer to NFPA 1500 for specific applicability.

The D/G Supervisor should avoid becoming involved in physical task activities because doing so compromises his ability to manage effectively. While participation in these physical activities may be required and allowable in the early stages of an incident when few resources are on scene, as additional units arrive the Supervisor must resume the supervisory role.

When a company is assigned from Staging to an operating D/G, the company will be told what D/G they will be reporting to and the name of the D/G Supervisor. The D/G Supervisor will be informed of which resources have been assigned to him by the IC. It is then the responsibility of the Supervisor to contact the assigned company to transmit any instructions relative to the specific action requested.

D/G Supervisors will monitor the conditions of the crews operating in their areas of responsibility. Relief crews will be requested in a manner that ensures the safety of personnel and maintains progress toward the D/G's objectives. Supervisors will ensure an orderly and thorough reassignment of crews to incident rehab. Crews must report to the incident rehab intact to facilitate accountability.





# CHAPTER 3

## COMMAND STRUCTURE – EXPANDING THE ORGANIZATION BY ESTABLISHING BRANCHES

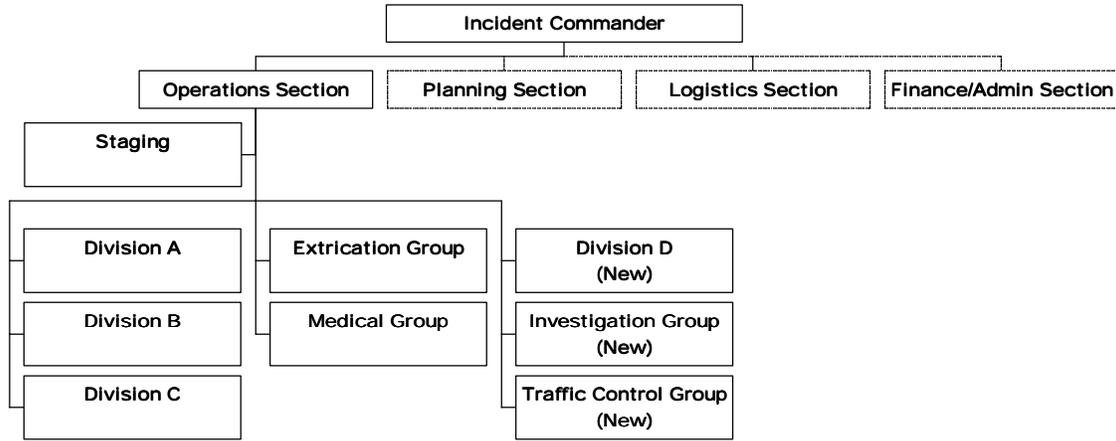
As a small incident escalates into a major incident, the span of control may become stretched as more D/Gs are implemented. In addition, the Incident Commander (IC) can become quickly overwhelmed and overloaded with information management, assigning companies, filling out and updating the tactical work sheets, planning, forecasting, requesting additional resources, talking on the radio, and fulfilling the other functions of Command. The immediate need of the IC is support. As additional chief officers arrive on the scene, the Command organization may be expanded through implementation of Branches and Sections and the involvement of officers, supervisors, and staff personnel to fill Command and General Staff Positions. Section level positions can be implemented at any time, based on the needs of the incident.

D/Gs identify tactical level management assignments in the command structure. As an event places more demands on the IC, **Branches** may be added to facilitate more effective incident management. The person in charge of the Branch is called the **Branch Director**. Factors that may cause an IC to consider the creation of a Branch or Branches are:

- The span of control for the number of D/Gs in place begins to become unwieldy or unmanageable.
- The incident becomes more complex (e.g., rush hour traffic jam, multi-jurisdictional, worsening weather conditions).
- The incident has two or more distinctly different operations (e.g., road/infrastructure repair, fire, medical, hazardous materials, law enforcement).

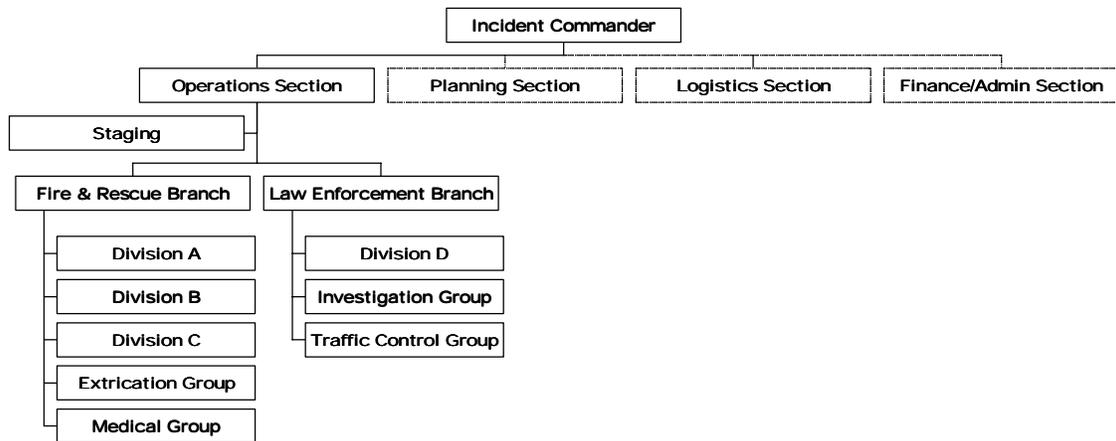
While Branches may be established at an incident to serve several purposes, they are not always essential to the organization of the Operations Section. When the number of D/Gs exceeds the recommended span of control, however, the IC or Operations Section Chief should establish a multi-Branch structure and allocate the D/Gs within those Branches.

In the following example, the IC has one Group and four Divisions reporting to the Operations Section Chief, with two additional Divisions and one Group in the process of being added. At this point, a two-Branch organization should be created.



**Figure 10, An Unmanageable IMS Organization**

Situations such as shown in Figure 10 are unworkable. (Subordinate resources have been omitted for clarity.) Here, the Operations Section Chief has just formed two new groups and a new division. With nine individuals reporting directly to him, he quickly realizes that he cannot cope with all of their competing demands for attention. The solution he chooses to implement places an intermediate level of command between him and them – branches. After reorganizing things, his portion of the IMS structure appears as follows.



**Figure 11, Two-Branch Organization**

Now, the branches have solved the Operations Chief’s span of control problem.

Branches should operate in their areas of responsibility on separate radio channels, and communicate to Command or Operations on a different channel if possible. The radio designation of functional Branches should reflect the objective of the Branch (i.e., HAZMAT Branch, Medical Branch, Law Enforcement Branch, etc.) Branches may also be designated numerically, e.g., Branch I, Branch II, Branch III and so forth.

When the IC or Operations Section Chief assigns Branch Directors, the D/G Supervisors must be notified of their new immediate superior in the command structure. This information should include:

- The name of the Branch the D/G is now assigned to.
- The radio channel their Branch is using.

Radio communications should be directed from the D/G Supervisor to the Branch Director; not directly to Command or Operations. D/G Supervisors will relay information on Branch formation to the companies operating in their D/G.

Branch Directors may be located at the ICP or at operational locations. When located at the ICP, Branch Directors can communicate on a face-to-face basis with the IC or Operations Section Chief.

When an incident encompasses a large geographic area, it may be more effective to have Branches in tactical positions. When so deployed, Branch Directors immediately implement command and control procedures with their Branch. In these situations, Operations must assign personnel to monitor a Branch radio command channel.

An IC may establish Branches before assigning Divisions or Groups. Branches are not limited to the Operations Section; any Section Chief may establish Branches within his section.

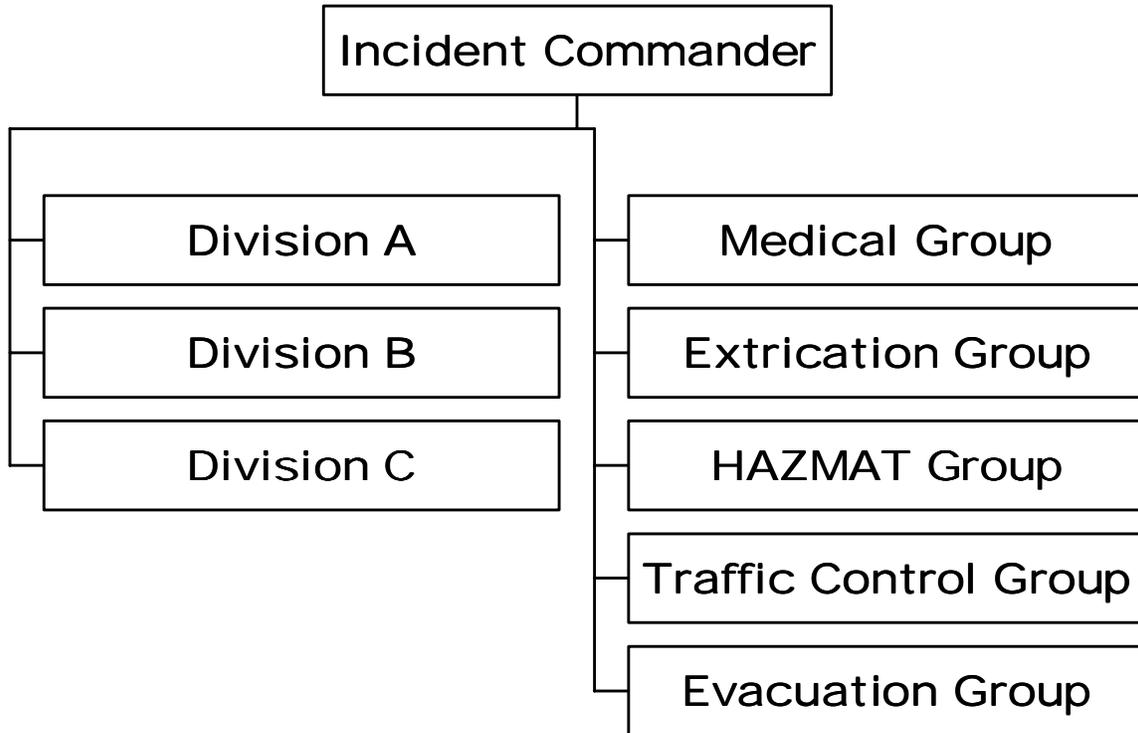


Figure 12, Organization expands from this ...

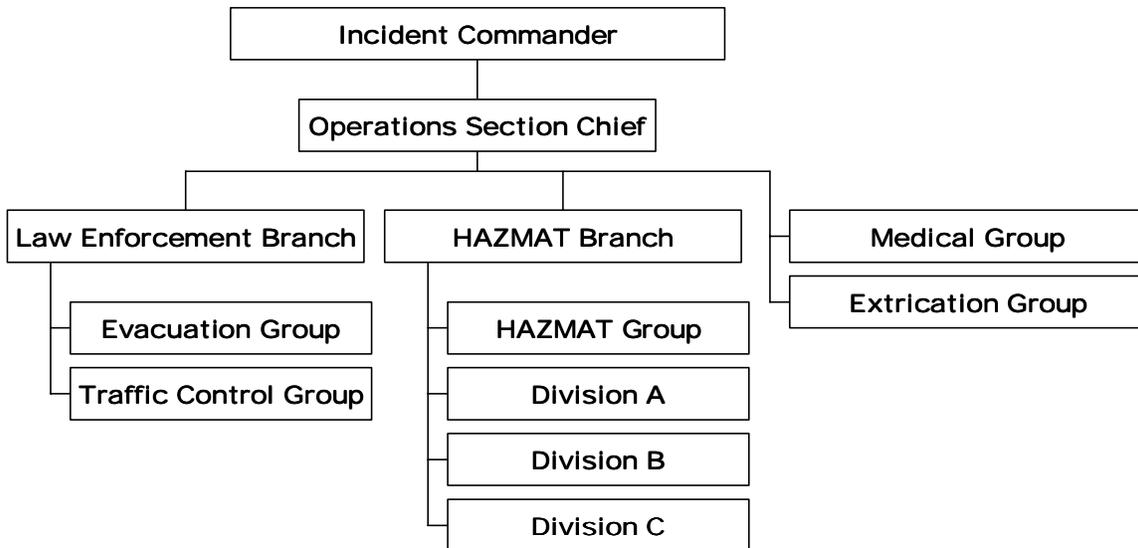


Figure 13, To This

Figure 12 and Figure 13 show another example of how to reorganize many direct-reporting units into a more effective branch structure.

## Functional Branch Structure

When the nature of the incident calls for a functional Branch structure, such as a major aircraft crash within a jurisdiction, each department within the jurisdiction (transportation, police, fire, EMS, etc.) may have its own functional Branch operating under the direction of a single Operations Section Chief. In the example below in Figure 14, the Incident Commander is from law enforcement, the Operations Section Chief is from the fire department, with deputies from the traffic management and medical departments. Other alignments could be made, depending upon the jurisdictional plan and the type of emergency. Note that Incident Command in this situation could be either Single or Unified Command, depending upon the jurisdiction. Unified Command is addressed in Chapter 5 of this Guide.

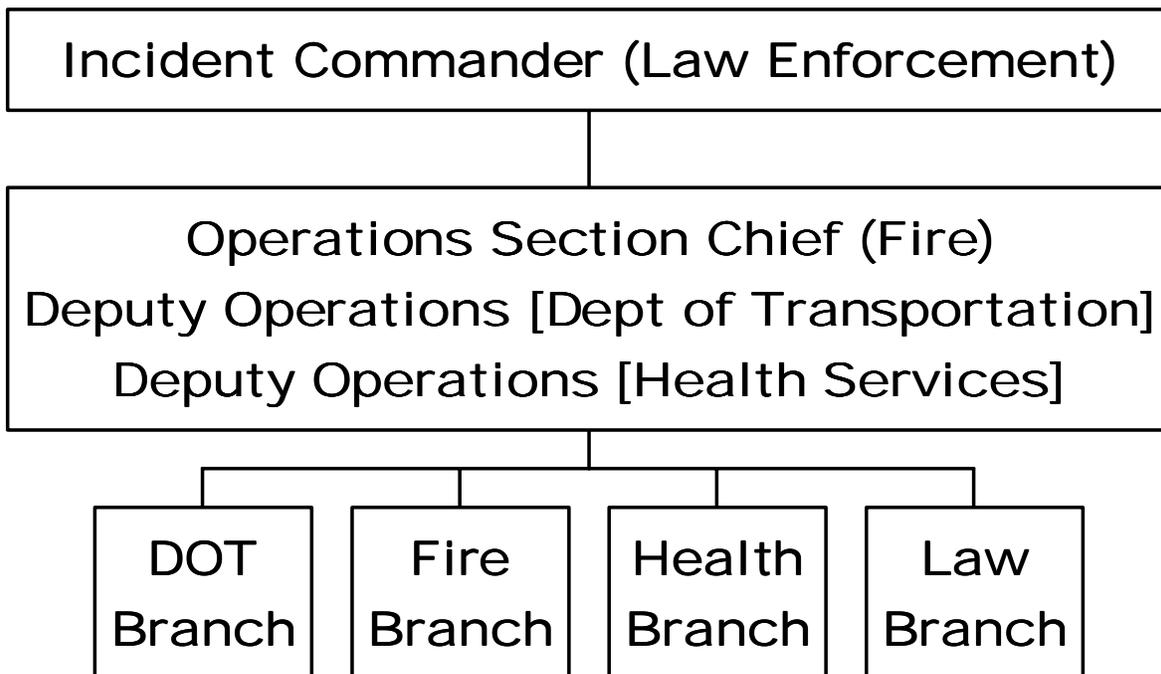


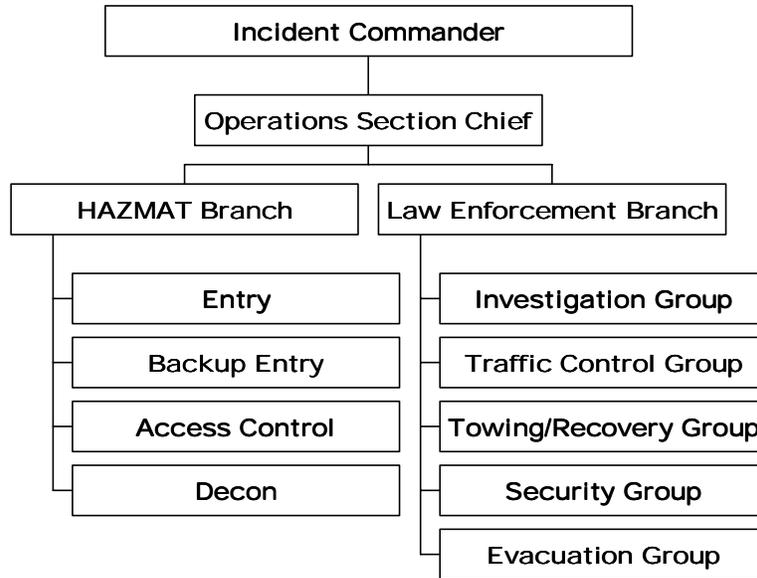
Figure 14, Functional Branch Structure

## Multi-Jurisdictional Incidents

When the incident is multi-jurisdictional, resources are best managed under the agencies that have normal control over those resources.

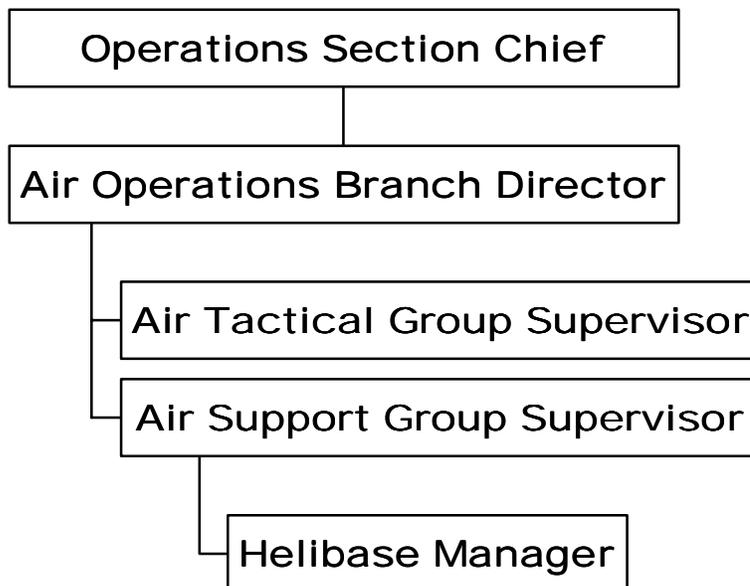
Branches should be used at incidents where the span of control with D/G's is maximized or at incidents involving two or more distinctly different management components (e.g., a

lengthy blockage of a major highway during rush hour due to a HAZMAT spill). The IC may elect to assign Branches to forward positions to manage and coordinate activities, as illustrated in Figure 15.



**Figure 15, Jurisdictional Branches**

When the incident requires the use of aircraft, such as for the transportation of patients, responders, or for aerial reconnaissance, the Operations Section Chief should establish the Air Operations organization. Its size, organization, and use will depend primarily upon the nature of the incident and the availability of aircraft. While the use of an Air Operations organizational element may be rare, consider the variety and numbers of aircraft that may become involved in a highway incident. It is common to find medical air evacuation, police, news media, traffic reporting services, and even sightseers flying in the vicinity of a major highway incident, especially if the event is newsworthy and has lasted for some time. Any and all of these may be available, willing, and able to be pressed into service. Close liaison with FAA flight control may be necessary, especially if the incident happens to be in the vicinity of an airport. Conflicts between commercial airplanes and incident-related air traffic should be avoided at all costs.



**Figure 16, Air Operations Organization**

# CHAPTER 4

## EXPANDING THE ORGANIZATIONAL STRUCTURE BY ESTABLISHING SECTIONS

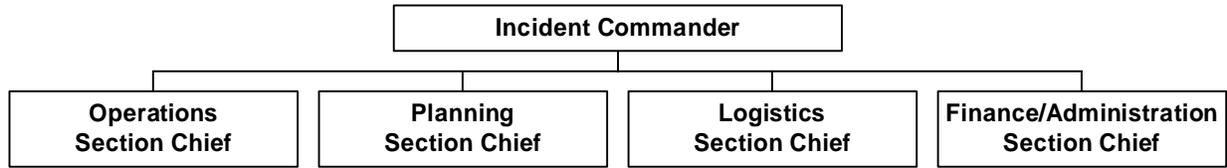
During the early stages of large-scale or complex incidents, the immediate need of the Incident Commander (IC) is command support. As additional ranking officers arrive on scene, the command organization may be expanded by the assignment of company officers and staff personnel to fill Command and General Staff positions.

The transition from the initial response to a major incident organization will be evolutionary and Section and Unit level positions within IMS will be staffed only when the corresponding functions are required by the incident. Until such time as a Section or Unit is specifically staffed, all functions associated with that Section or Unit remain the responsibility of the IC.

The majority of positions within IMS will not be activated until the initial response is determined to be insufficient to handle the situation. When this occurs, additional qualified personnel are requested through normal dispatching procedures. If it is later determined that a specific position is not needed, the request can be canceled. Some agencies have elected to use a modular form of dispatching, such as dispatching entire organizational elements together.

During the initial phases of an incident, the IC is normally responsible for the four Section roles. These positions are called the General Staff positions and include:

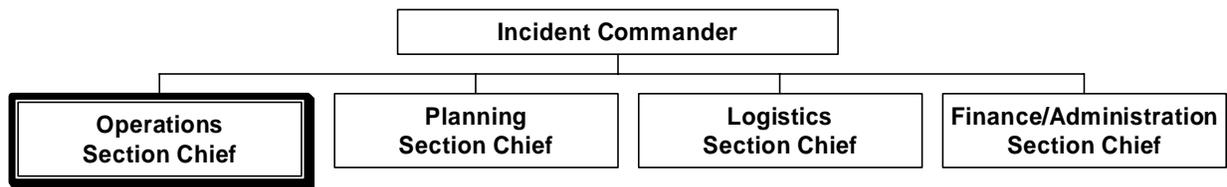
- Operations
- Planning
- Logistics
- Finance/Administration



**Figure 17, IMS Sections**

We will examine each of these sections in this chapter.

## Operations Section



**Figure 18, The Operations Section**

The Operations Section is responsible for the direct management of all incident tactical activities, the tactical priorities, and the safety and welfare of the personnel working in the Operations Section. The Operations Section Chief uses the appropriate radio channel to communicate strategic and specific objectives to the Branches and/or tactical level management units.

The Operations Section is often implemented (staffed) as a span-of-control mechanism. When the number of Branches or D/Gs reporting directly to the IC exceeds the capability of the IC to effectively manage, the IC may staff the Operations Section to reduce the span of control, and thus transfer direct management of all tactical activities to the Operations Section Chief. The IC is then able to focus his attention on management of the entire incident rather than concentrating on tactical activities.

We have already seen the various organizational elements that may be implemented within the Operations Section. If expanded to the fullest extent, theoretically the Operations Section could manage a very large number of resources, as shown in Figure 19. Such an expansion would be highly unlikely in a highway incident, due to the practical considerations of co-locating so many units on the highway.

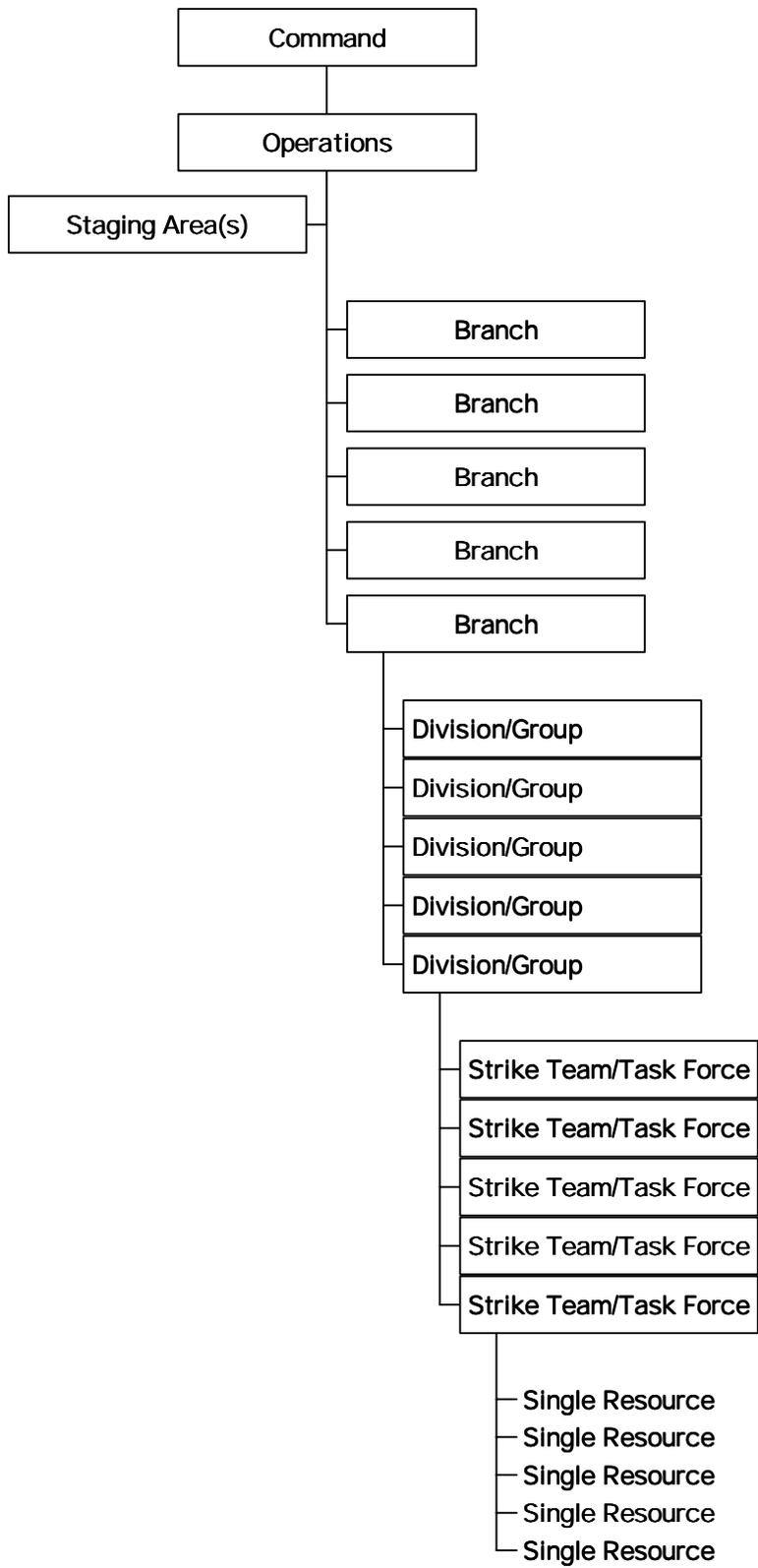


Figure 19, Complete Expansion of the Operations Section

## Operations Section Chief

The Operations Section Chief is responsible for the direct management of all incident tactical activities and should have direct involvement in the preparation of the incident action plan for the period of responsibility. The responsibilities of the Operations Section Chief can be summarized as follows:

- Manage incident tactical activities.
- Coordinate activities with the IC.
- Participate in development of the incident action plan.
- Implement the Operations portion of the incident action plan.
- Assign resources to tactical level areas based on tactical objectives and priorities.
- Build an effective organizational structure through the use of Branches and D/Gs.
- Provide tactical objectives for the D/Gs.
- Control Staging and Air Operations.
- Provide for life safety.
- Determine needs and request additional resources.
- Consult with and inform the other members of the General and Command Staff as needed.

It is important to emphasize that the implementation of an Operations Section Chief is not an automatic event based upon the arrival of the second or third chief officer on the scene. It may be more appropriate to assign later-arriving chief officers to developing D/G or Branch positions first. Chief officers in these positions enhance the command organization and improve the decision-making process.

In some situations, it is more prudent to implement one of the other Section Chiefs before the Operations Section is implemented. For example, a prolonged incident may require the early implementation of a Planning Section before the span of control criteria requires an Operations Section Chief.

The Operations Section Chief is typically located at the Incident ICP. This permits close coordination with other Command and General Staff, as well as face-to-face communication with the IC. The benefits of a command vehicle, as outlined elsewhere in the manual, enables the Operations Section Chief to better communicate and track resources.

## Staging Area(s)

The incident scene can quickly become congested with emergency equipment if newly arriving equipment is not managed effectively. Staging areas are locations designated within the incident area that are used to temporarily locate resources that are immediately available for assignment. For major or complex operations, the IC should establish a Staging Area early, and place a Manager in charge of Staging. The Staging Area Manager reports to the Operations Section Chief, if the Operations Section has been implemented, and directly to the IC, if the Operations Section has not been implemented. A radio designation of “Staging” should be used. It is important to note that Multi-Casualty incidents generally include a separate Ambulance Staging Area that is managed under the Transportation supervisor, and that movement of response vehicles should be closely coordinated with the Traffic Control Group.

Multiple staging areas can be established as the needs of the incident require, as shown in Figure 20. The configuration or condition of the road network might require that different responders approach the scene from different directions. Rerouting everyone to a common staging area might cause unacceptable delay and lengthy detours through unfamiliar routes. When more than one staging area is established, each must be assigned a unique radio designation, ideally using easily-recognizable landmarks as part of the name, such as eastbound at “Exit 112 Staging” and westbound at “Exit 113 Staging.”

In this expanded organizational structure, the Staging Area Manager reports to the Operations Section Chief. The Operations Section Chief may establish, move, and discontinue the use of Staging Areas. All resources within the designated Staging Areas are under the direct control of the Operations Section Chief and should be immediately available. Staging will request logistical support (i.e., food, fuel, sanitation, etc.) from the Logistics Section, as needed.

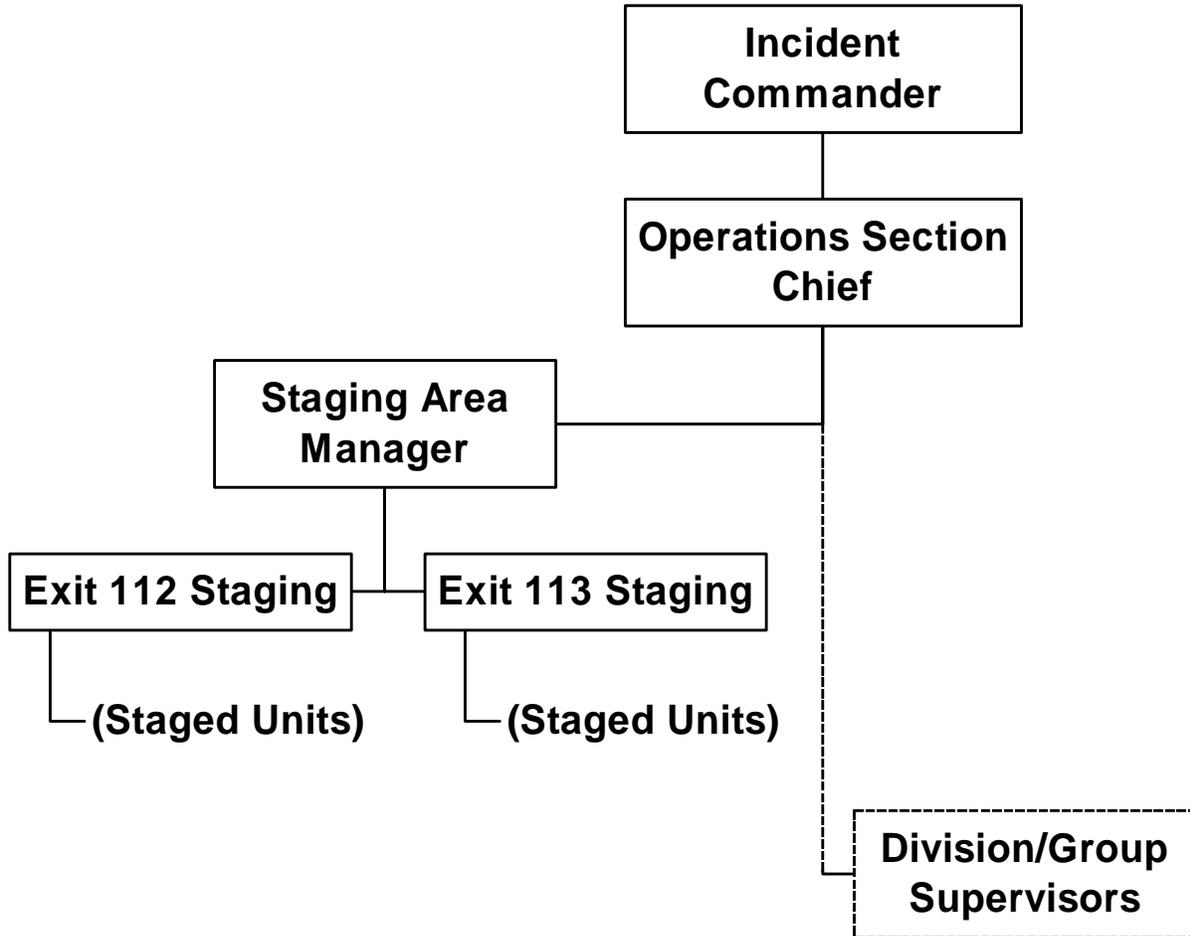


Figure 20, Staging

### Incident Command Post (ICP)

As an incident escalates to major operations, it becomes more important that an ICP at a fixed location be established. This typically would be a chief officer's vehicle or a specially designed command vehicle. A stationary ICP vehicle provides several benefits to incident management: climate control, reduced noise, improved communication systems, better lighting, desk space, computers, tactical plans, etc. A stationary ICP also improves multi-agency operations. Agency Representatives need to report to an easily-identified location, whether it is the ICP or a designated liaison area. Selection of ICP location is critical, for its location should be chosen to avoid having to relocating it later in the incident. Some factors to consider include:

- The ICP should be located upwind or upslope from a hazardous materials incident
- Shelter

- Hazards
- Communications
- Room to operate
- Rehabilitation
- Security

## **The Incident Commander's Role After The Operations Section Has Been Implemented**

Once the Operations Section is in place and functioning, the IC's focus should be on the strategic issues, overall strategic planning, and other components of the incident. This focus is to look at the big picture and the impact of the incident from a broad perspective. The IC should provide direction, advice, and guidance to the Command and General Staff in directing the tactical aspects of the incident.

On a highway incident, the responsibilities of the IC after activation of an Operations Section Chief may be summarized as follows:

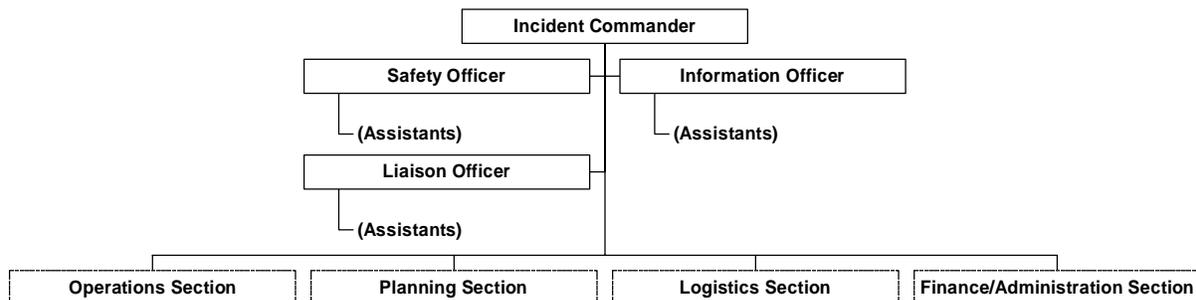
- Review and evaluate the plan, and initiate any needed changes.
- Provide on-going review of the overall incident (The Big Picture).
- Participate in the further development of the Incident Action Plan.
- Select priorities.
- Staff Command and General Staff functions as necessary.
- Provide direction to Command and General Staff.
- Review the organizational structure, and initiate change or expansion to meet incident needs.
- Establish liaison with other internal agencies not directly involved in incident operations, outside agencies, and property owners and/or tenants.

## **Command Staff**

Command Staff positions are established to assume responsibility for key activities that are not a part of the line organization. Command Staff can have assistants based on the size and complexity of the incident or requirements established by Incident Command. Using assistants can prove to be very useful in highway incidents, as transportation representatives can be utilized

in a direct support role as members of the Command Staff. Three specific staff positions are identified within IMS and shown in Figure 21:

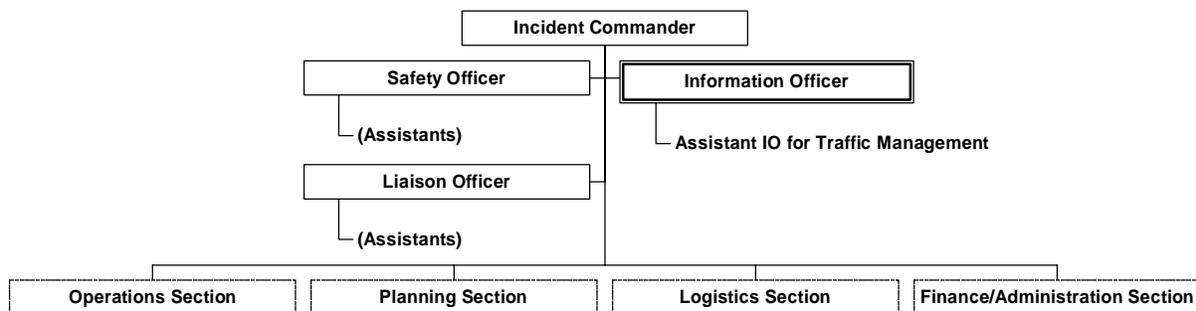
- Safety Officer
- Information Officer
- Liaison Officer



**Figure 21, Command Staff**

## Information Officer

The Information Officer's (IO) function is to relay accurate and complete information regarding incident cause, size, current situation, resources committed, and other matters of general interest. The Information Officer will normally be the point of contact for the media and other governmental agencies that desire information directly from the incident. In either a Single or Unified Command structure, only one Information Officer would be designated.



**Figure 22, The Information Officer**

## Assistant Information Officers

Assistants to the IO may be assigned from other agencies or departments that are involved in an incident. Additional staff will also be needed when there is significant media attention drawn to

an incident, and more efficient means of disseminating information are needed, such as press conferences. For example, a particular Assistant Information Officer could be designated to deal with traffic reporters from local radio and television media, who may constantly inquire as to the duration of any traffic blockage for their audiences, especially during high demand rush hours. Helicopters or light planes operated by these same organizations may also provide information that could be used by the Traffic Control Group, so the flow of information could be bi-directional.

The primary on-scene demand for information from the media is from traffic reporting organizations that earn their livelihood by detecting and reporting on traffic problems. This demand can be voracious, and require considerable diplomacy. Surrounding communities, transportation authorities, and other response organizations will become more and more interested as congestion affects them, even though they may be located far from the scene. Their information departments will also need information to pass to their constituency and management. Centralized traffic management centers (TMCs) already interface with most of this community, and would probably be willing to deal with the direct information interface with them. Some have the means of alerting approaching traffic with message signs, and some are implementing traffic information services that connect directly to the motorist. In order to do so, they would require direct and current information from the scene, both to pass on to the media, and for their own use in regional traffic management.

It may be appropriate for the Information Officer to concentrate on traffic information, or to assign this specialized area of responsibility to an Assistant Information Officer for Transportation. The most requested information items are as follows, in decreasing order of interest. Updates to previous reports may be considered even more important than the initial report:

1. Descriptions of the incident location and extent.
2. Extent of traffic blockage.
3. Predicted time of re-opening the highway to traffic.
4. Special instructions to motorists approaching the incident.
5. Color commentary concerning the cause of the incident; injuries and deaths; number and types of vehicles involved; responding agencies; and current situation.

There is a high degree of automation in use in the traffic management community, and effective interaction with TMCs and other elements may be best undertaken using specialized computer and communications technology. Considering the high demand from traffic managers for highway incident information, there may be opportunity to have them equip highway incident response organizations with the technological means to interface with traffic management systems.

## Safety Officer

The Safety Officer's function at the incident is to assess hazardous and unsafe situations, and develop measures for assuring personnel safety. The Safety Officer has emergency authority to alter, suspend, or terminate unsafe acts. Even in a Unified Command structure, a single Safety Officer would be designated. For more information on the Safety Officer's role, see Chapter 6.

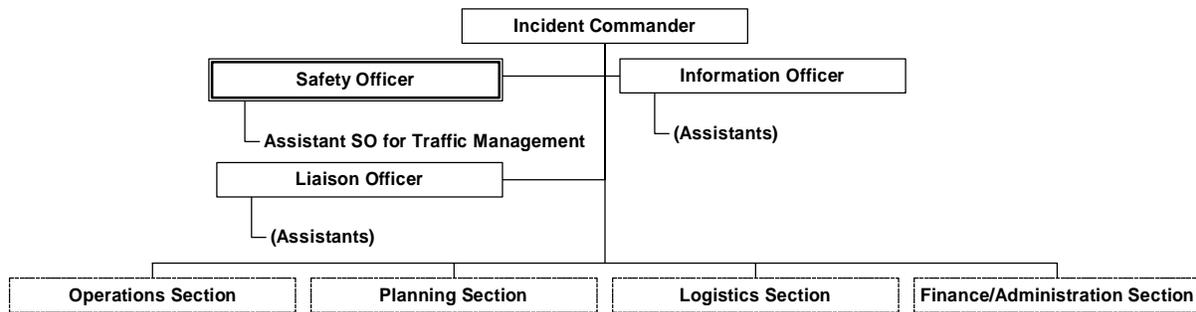


Figure 23, The Safety Officer

## Assistant Safety Officers

The Incident Commander fulfills his responsibility for ensuring the safety of everyone in the vicinity of the highway incident through the Safety Officer. At highway incidents, many others can be placed at risk besides responders, and the Safety Officer should be mindful of the hazard that moving vehicles present to anyone at the scene.

The primary hazard to highway incident responders is from moving vehicles, as the injury and death statistics have shown for many years. The source of this hazard is external to the incident scene, can come from any direction, and is fundamentally different from the many other risk areas normally monitored by the Safety Officer. Its scope is much broader than the immediate work area at the scene, and is typically larger than can be monitored by a single individual. The

traffic risk to responders can change rapidly with changes in the weather or visibility, rush hour, sporting event schedules, the stability of the incident, and the number of responders. In summary, the traffic hazard is complex, dynamic, and extensive.

Assistant Safety Officers may be assigned to support the safety function as needed. They may be assigned from any agency or departments making up the Command organization. For example, a particular Assistant Safety Officer could be designated to assess and monitor the hazards to responders and passing motorists. Under his direction, either traffic control or responder activity could be modified to assure safe operations. Assistant Safety Officers could also be assigned out to traffic control areas in order to obtain first-hand information regarding traffic hazards. Assistant Safety Officers could also be assigned to Divisions or Groups.

The effectiveness of traffic control measures should be continuously monitored by Safety Officers, utilizing as many assistants as may be demanded by the particular highway incident situation. Operating with delegated authority from the Incident Commander through the Safety Officer, these assistants can take action to stop or correct unsafe traffic movement.

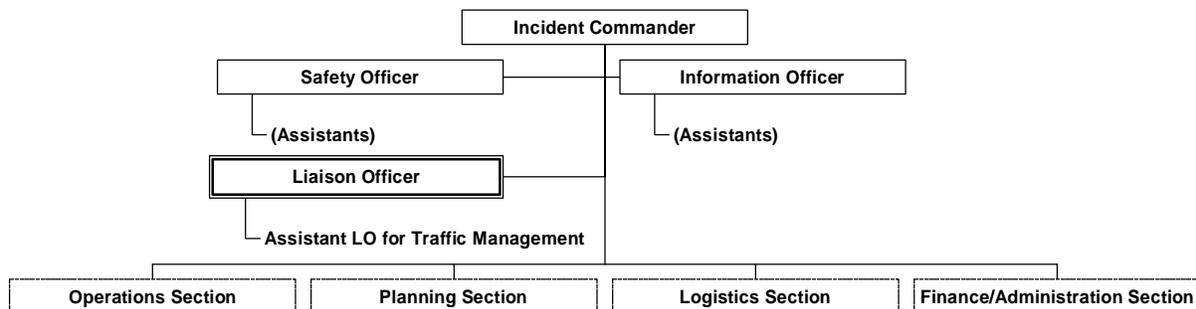
Assistant Safety Officers, like the Safety Officer, have the authority to alter, suspend, or terminate any activity that is an unacceptable safety risk. Their areas of concern are different from the usual hazards of structural firefighting, EMS incidents, or the other more traditional incident activities. Responders should have some control of traffic hazards through the use of traffic control. When Assistants exercise their authority, they must inform the Safety Officer, who will in turn inform the IC of any modified operational assignments.

Assistant Safety Officers for Traffic Management should be positioned to observe traffic control operations from secure, detached perspectives while maintaining communications with both the traffic control units and the Safety Officer. For open road situations, the Safety Officer would probably require an assistant to be responsible for each approaching direction of travel, while remaining to monitor the traffic and responder activity at the scene proper. For intersections, interchanges, and complicated situations, he should assign staff to monitor each avenue of approach to the work zone at the scene.

## Liaison Officer

The Liaison Officer's function is to be a point of contact for representatives from cooperating agencies, either in a face-to-face mode, or through radio, cell phone, or other telecommunications. The Liaison Officer is not directly involved in the incident operations, and concentrates on coordinating with organizations and agencies that are supporting the incident or that are affected by it. The point of contact for external organizations can be different, depending if the incident is organized as a Single Command or as a Unified Command. In a Single Command structure, the Liaison Officer is always the point of contact. Under a Unified Command structure, members of the Unified Command will handle coordination with their parent agencies directly. In either case, agency representatives should have decision-making authority for their agency.

The Liaison Officer reports directly to the Incident Commander as a member of the Command Staff of the IC's IMS organization. Agency Representatives who are on the scene of an incident report back through their own chain of command to their home agencies. They are not part of the incident IMS organization, and interact with the IC only through the Liaison Officer. As described further in CHAPTER 5, Agency Representatives are not part of Unified Command. Those members of Unified Command, when it is established, themselves represent their agencies, and their agencies do not utilize separate Agency Representatives.



**Figure 24, The Liaison Officer**

For example, in a Single Command organization, an arriving representative from the Traffic Management Center would seek out the Liaison Officer, rather than the Incident Commander. In a Unified Command situation, where a senior representative from the Traffic Management Center was serving as a member of the Unified Command, an arriving representative from that organization would probably directly contact their Unified Command member.

## Assistant Liaison Officers

Establishing and maintaining liaison with the many companies, organizations, agencies, and communities that are either affected by traffic problems caused by a highway incident or that may contribute resources to assist the Incident Commander can become a daunting task. As other organizations become aware of the problem, they will want to take action to relieve congestion and reduce the stress to the transportation network. These actions, even though taken in good faith, may in turn affect on-scene operations. A fairly straightforward example might relate to establishing detours around an incident for the traveling public that have the unanticipated effect of congesting or even blocking emergency response routes to the scene. Successful coordinated activity depends upon the exchange of timely, accurate information. Some of the most useful information is the most basic of facts, including accurate descriptions of the incident location, the extent of the scene where emergency activity is occurring, and the anticipated duration of the traffic blockage.

One person may quickly become overwhelmed by such demands and need assistants to handle the workload. Among such assistants, it may be appropriate to appoint an Assistant Liaison Officer for Transportation. If a Traffic Management Center covers the incident area, they can offload much of the liaison workload, as they already interface with, and have operational arrangements in place with, most of the transportation community. It might even be possible for the highway incident response community to establish a way for liaison personnel from traffic management to respond to highway incidents, making a liaison resource directly available to the Incident Commander.

## Planning Section

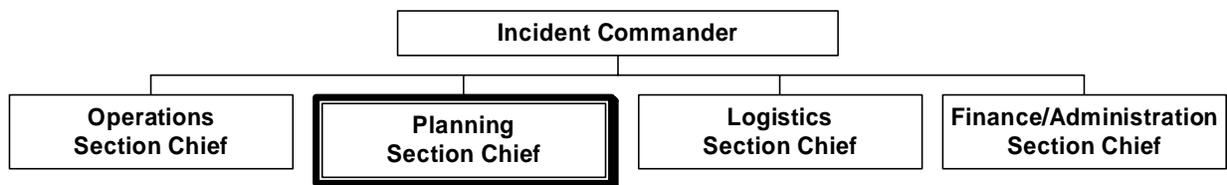
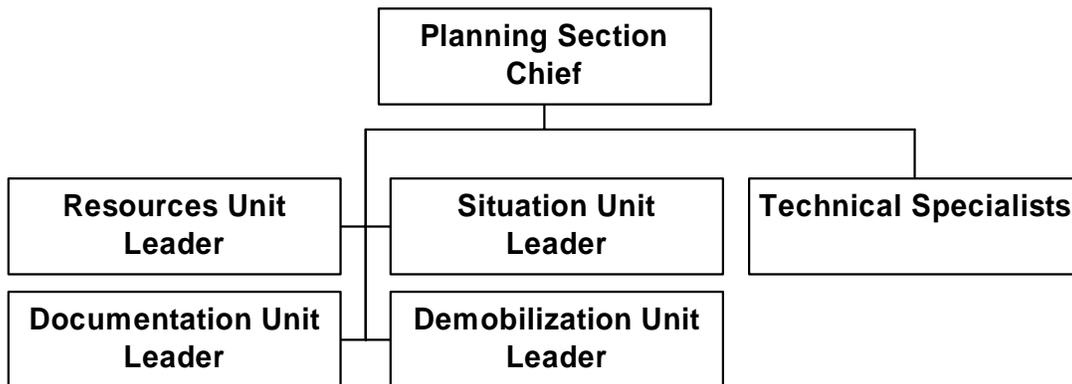


Figure 25, The Planning Section

The Planning Section is responsible for gathering, assimilating, analyzing, and processing information needed for effective decision-making. Information management is a full-time task at large and complex incidents. The automation of traffic management in recent years has greatly increased the amount and quality of information available to traffic managers, enabling them to adjust traffic signals and other controls in reaction to a highway incident. These new traffic management capabilities depend upon receiving information from incidents, both concerning the current situation and also regarding the forecasted duration and extent of incident scene operations. The Planning Section will handle much of this demand for information, working closely in coordination with the Information and Liaison Officers on the Command Staff.

This critical information should be immediately forwarded to Command (or whoever needs it). Information should also be used to make long-range plans. The Planning Section Chief's goal is to plan ahead of current events and to identify the need for resources before they are needed. The strategic concerns of the Incident Commander need to extend forward with sufficient foresight to cover all of his IMS organization's activities.



**Figure 26, The Planning Section Organization**

The responsibilities of the Planning Section Chief may be summarized as follows:

- Evaluate current strategy and plan with the IC.
- Maintain resource status and personnel accountability.
- Refine and recommend any needed changes to plan with Operations Section input.
- Evaluate incident organization and span of control.
- Participate in the development of the incident action plan.
- Forecast possible situation(s).
- Evaluate future resource requirements.

- Utilize technical assistance as needed.
- Evaluate tactical priorities, specific critical factors, and safety.
- Gather, update, improve, and manage situation status with a standard systematic approach.
- Coordinate planning needs with any available outside agencies.
- Plan for incident demobilization.
- Maintain incident records

Certain incidents or events may require the use of Technical Specialists who have specialized knowledge and expertise. Technical Specialists may function within the Planning Section, or be assigned wherever their services are required. The organizations and systems that manage transportation have a great deal of specialized knowledge that can be helpful in planning a course of action to deal with a highway incident. This is especially true when the incident involves more than one “mode” of transportation, such as at rail crossings, at transit facilities, and involving pipeline. There can be serious different modal traffic consequences in these other systems from an intermodal incident. For example, transportation incidents on highways may affect other modes of transportation such as maritime, air, pipeline, transit, or rail. Organizations known as “authorities,” such as port authorities, bridge & tunnel authorities, airport authorities, or toll road authorities run transportation facilities, have specialized resources and personnel with special skills that can provide engineering, architectural, communications, operational, scientific, and institutional advice to the Incident Commander. Figure 27 shows many of the possible sources and specialties of technical specialists, as they relate to the various transportation modes that might be affected or involved with highway incidents.

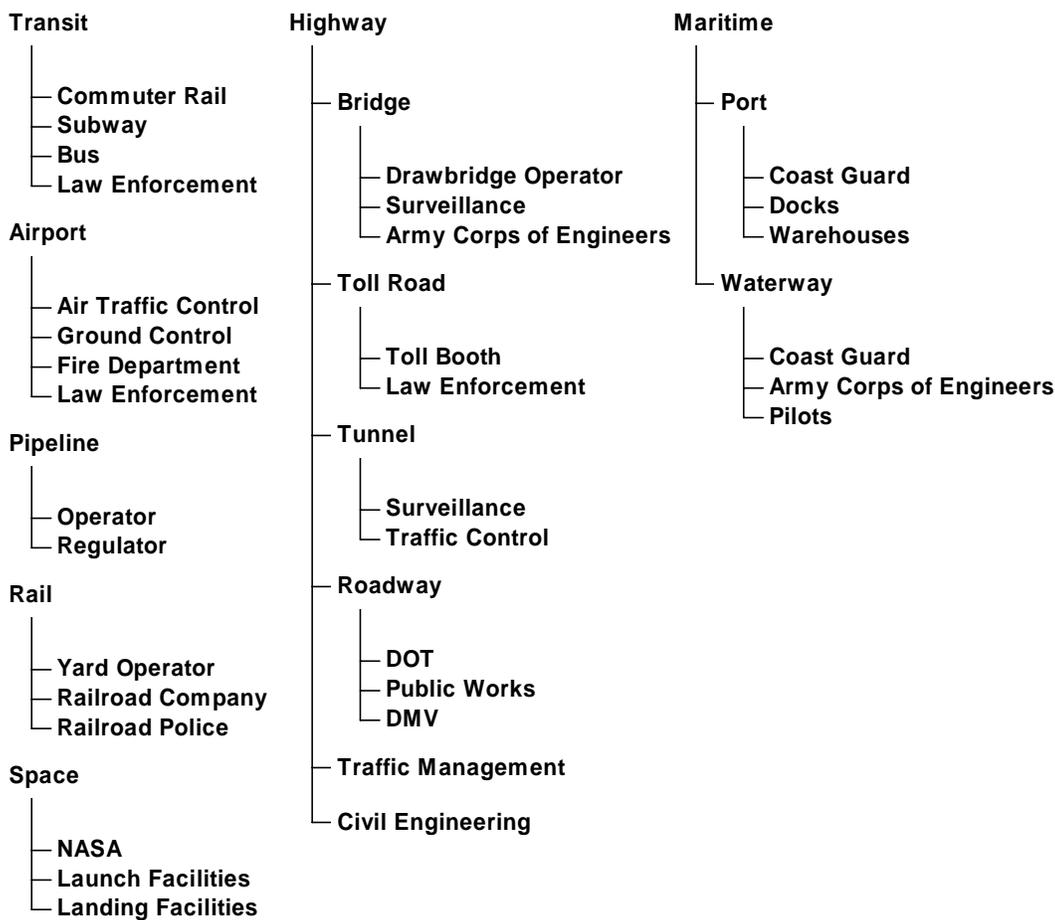


Figure 27, Sources of Transportation Technical Specialists

## Logistics Section

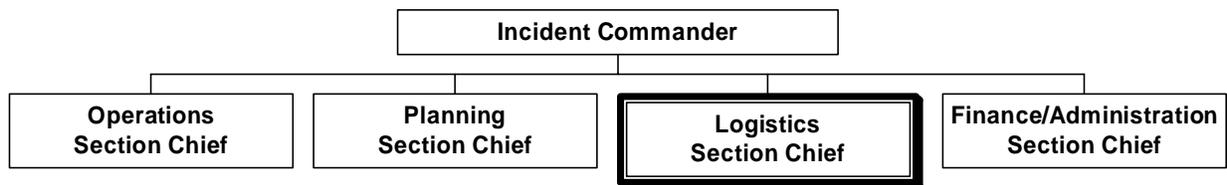
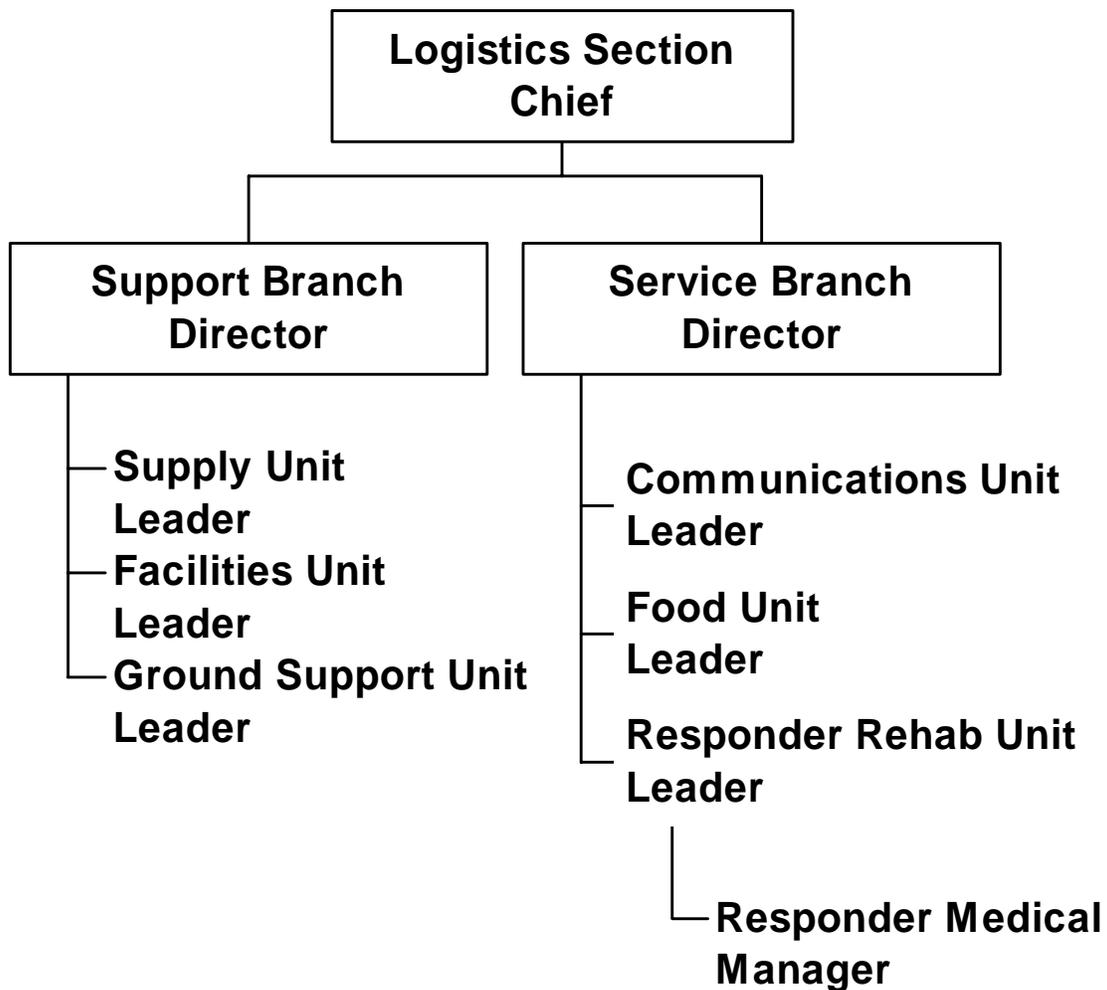


Figure 28, The Logistics Section

The Logistics Section is the support mechanism for the organization. Logistics provides services and support systems – which may be separated into Branches – to all the organizational components involved in the incident including facilities, transportation, supplies, equipment

maintenance, fueling, feeding, communications, and responder medical services and rehabilitation. Its organizational breakout is as shown in Figure 29.



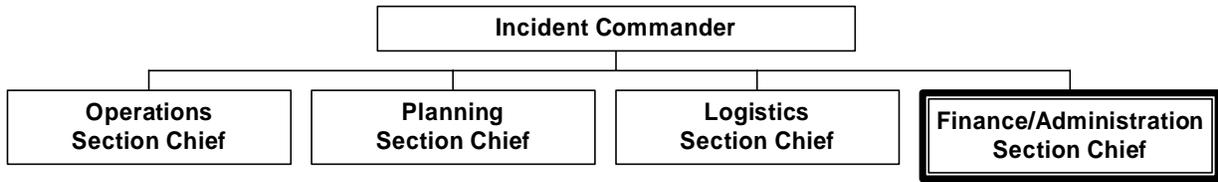
**Figure 29, The Logistics Section Organizational Positions**

The responsibilities of the Logistics Section Chief may be summarized as follows:

- Provide for medical aid for incident personnel, and manage responder rehabilitation.
- Coordinate immediate critical incident stress debriefing function.
- Provide and manage any needed supplies or equipment.
- Participate in the development of the incident action plan.
- Forecast and obtain future resource needs (coordinate with the Planning Section).
- Provide for communications plan and any needed communications equipment.

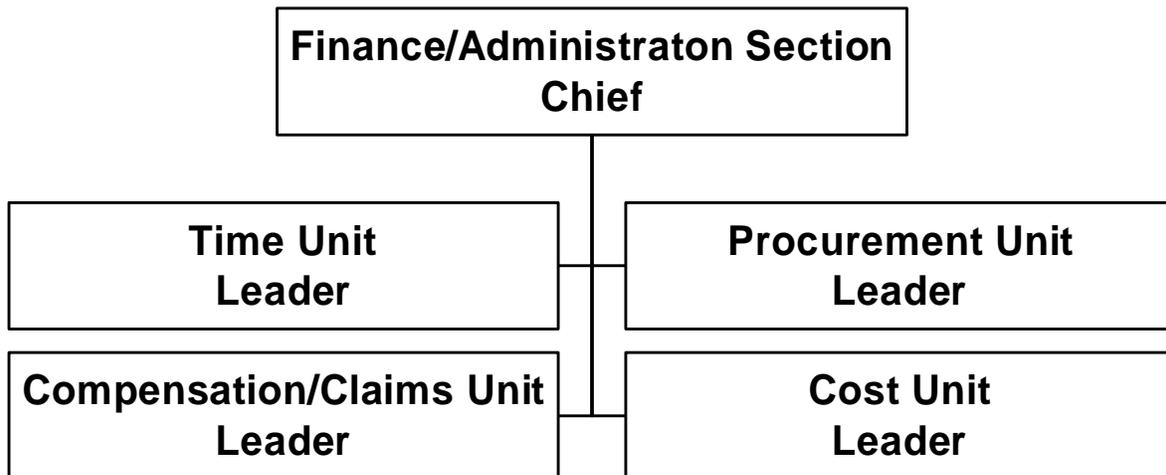
- Provide fuel and needed repairs for equipment.
- Obtain specialized equipment or expertise per Command.
- Provide food and associated supplies.
- Secure any needed fixed or portable facilities.
- Provide any other logistical needs as requested by Command.
- Supervise assigned personnel

## Finance/Administration Section



**Figure 30, The Finance/Administration Section**

The Finance/Administration Section is established on incidents when agencies involved have a specific need for financial services. Its usual organization is shown in Figure 31. Not all agencies will require the establishment of a separate Finance/Administration Section. In some cases where only one specific function is required, such as cost analysis, that position could be established as a Technical Specialist in the Planning Section.



**Figure 31, Assignments in the Finance/Administration Section**

The responsibilities of the Finance/Administration Section Chief may be summarized as follows:

- Procure services and/or supplies from sources within and outside of the fire department or city as requested by Command (coordinate with Logistics).
- Document all financial costs of the incident.
- Participate in the development of the Incident Action Plan.
- Document for possible cost recovery of services and/or supplies.
- Analyze and advise the IC on legal risk for incidents (e.g., hazardous materials cleanup).
- Document for compensation and claims of injury.
- Obtain any and all needed incident documentation for potential cost recovery efforts.

Cost reimbursement issues will arise in conjunction with any effort that involves several agencies. These can be difficult to resolve between organizations that are institutionally separated, such as the transportation and public safety communities. Most of what is provided by transportation to public safety comes in the form of supplies, equipment, information, and services. Most is actually furnished by vendors and contractors, which invoke contractual charge-back mechanisms. Due to long experience with highway construction and repair, transportation organizations usually have well-developed procurement systems that can respond to the needs of a highway incident. The administrative and financial interaction pivots upon authorization by designated members of the IMS organization at an incident. These individuals are normally assigned to the Finance/Administration Section. They must utilize careful accounting practices during the incident in order to document incurred costs and to justify reimbursement for them.

# CHAPTER 5

## UNIFIED COMMAND

Command is responsible for overall management of the incident, and can be provided within the IMS in two general ways. The principle of Unity of Command<sup>1</sup> is preserved in either method, with a single individual vested with the authority of providing immediate direction to resources that are being utilized on the incident. In both Single Command and Unified Command, the Section Chiefs, who are members of the General Staff, oversee the Operational, Planning, Logistics, and Finance/Administration Sections. The General Staff always reports to Incident Command. In Single Command, Command is staffed with a single individual. In Unified Command, on the other hand, a group provides the Command function.

Using Unified Command provides the opportunity for all agencies that have statutory authority for an incident to jointly participate in the development of the overall strategy of the incident.

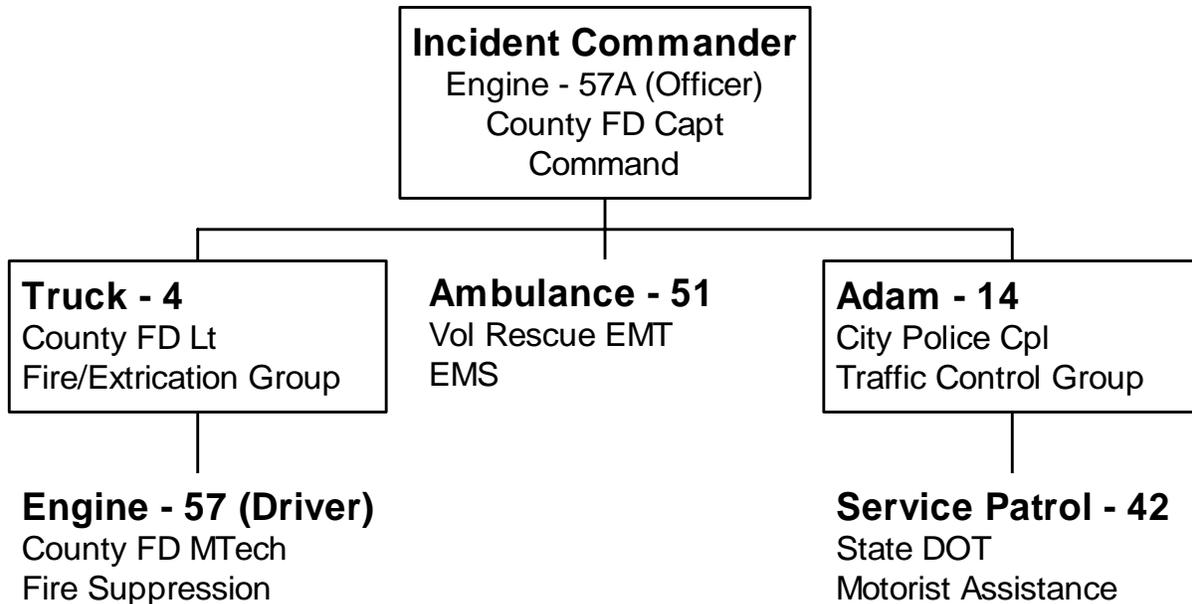
Highway incidents are the most common situations where multi-jurisdictions, multi-agencies, and disciplines find they must work together harmoniously in highly stressful, hazardous environments. Unified Command provides the best way to organize these joint efforts.

### **Single Command – Incident Commander**

Within a jurisdiction in which an incident occurs, and when there is no overlap of jurisdictional boundaries involved, a single Incident Commander (IC) will be designated by the jurisdictional agency to have overall management responsibility for the incident. The IC will prepare incident objectives that in turn will be the foundation upon which subsequent action planning will be based. The IC will approve the final incident action plan, and approve all requests for ordering and releasing of primary resources. An example of a single command structure is shown in Figure 3, and reproduced below.

---

<sup>1</sup> The well-established management principle that every individual in an organization should have only one superior.



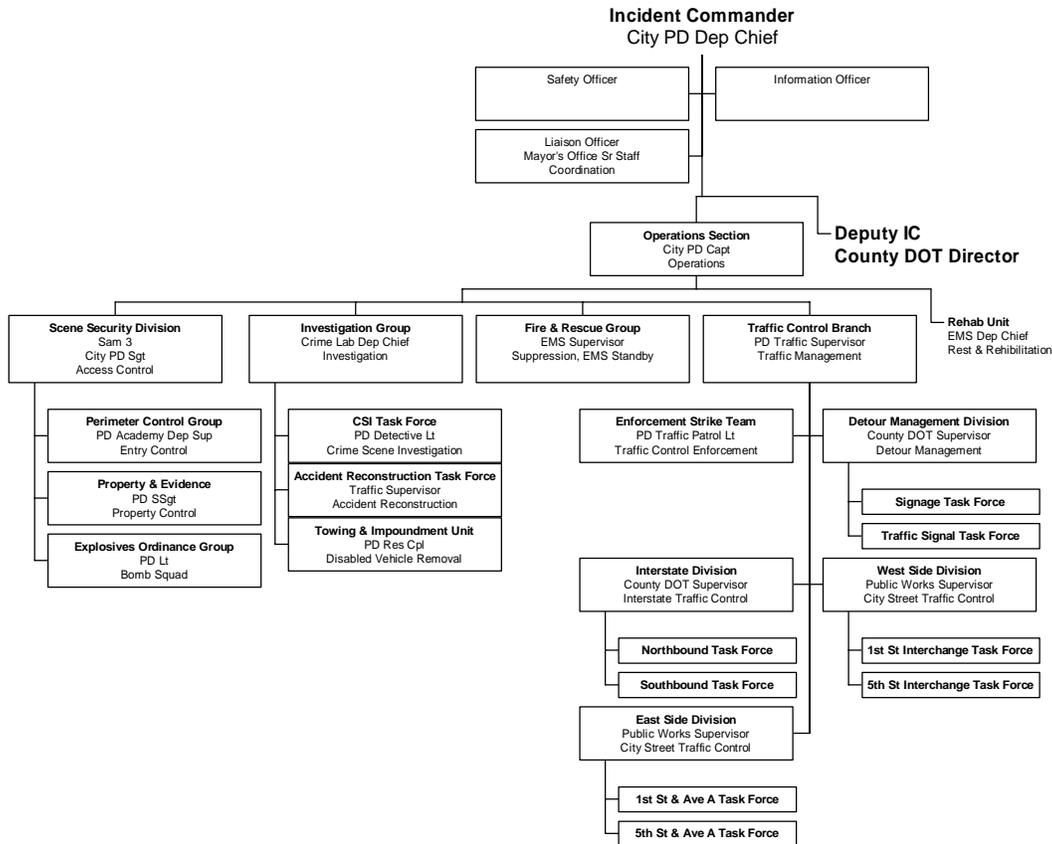
**Figure 32, Single Command Structure**

## Deputy Incident Commander

The IC may have a deputy. The deputy should have the same qualifications as the IC and may work directly with the IC, be a relief IC, or perform certain specific assigned tasks. In an incident within a single jurisdiction, where the nature of the incident is primarily a responsibility of one agency; e.g., fire, the deputy may be from the same agency as the IC. In a multi-jurisdictional incident, or one that threatens to be multi-jurisdictional, an individual designated by the adjacent agency may fill the deputy role. In some cases, even more than one deputy could be appointed. Another way of organizing to meet multi-jurisdictional situations is described under Unified Command.

Deputy positions should also be considered for multidisciplinary operations to accommodate communications and coordination between agencies.

An example of how such an organization might be staffed at a highway incident is shown in Figure 33, where several organizations have jurisdiction and several organizations from the same jurisdiction are operating at the same incident.



**Figure 33, Using Deputy Incident Commanders**

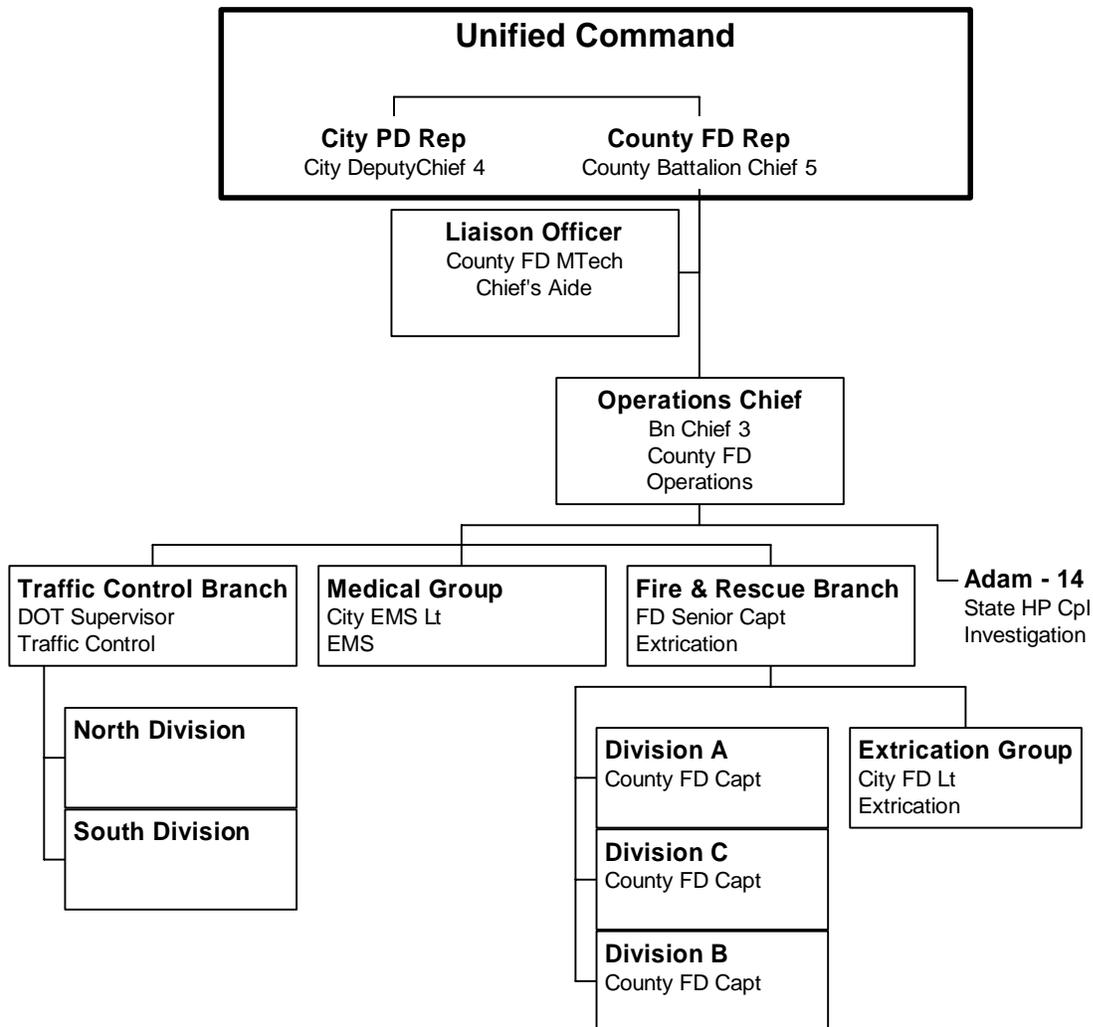
## Unified Command

A Unified Command structure may be appropriate under two common conditions: (1) multi-jurisdictional incidents; and (2) multi-departmental incidents.

An incident may be multi-jurisdictional for geographic reasons, i.e., a major flood or a major medical incident crossing boundaries and involving resources from both jurisdictions. Or it may be multi-jurisdictional because many agencies have a statutory role to play in the response, investigation, or mitigation, i.e., a major transportation accident, hazardous materials spill, or suspicious explosion. An example of a multi-jurisdictional Unified Command structure is shown below in Figure 34. In an instance where a highway crash happened at the city limits, both County and City units have statutory jurisdiction.

The State DOT, while involved, did not have statutory jurisdiction, but provided liaison between the incident and the regional traffic management agencies that were attempting to route traffic

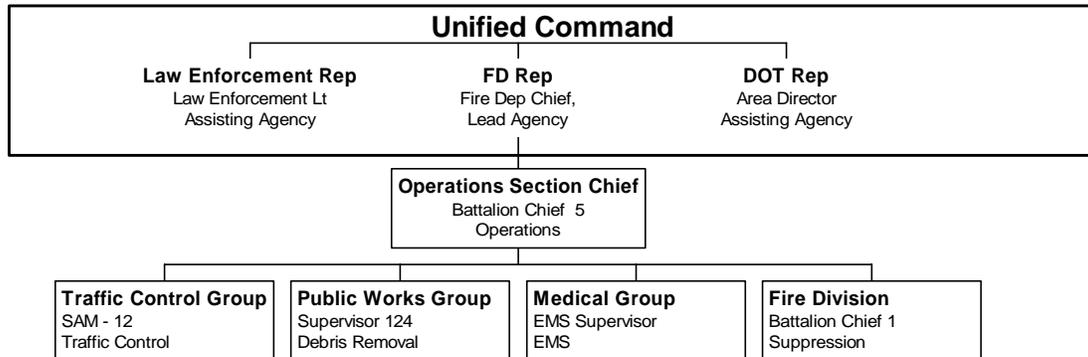
around the blockage. Such an agency is a “Cooperating” or “Assisting” Agency, which may have a substantial presence at an incident, but does not have statutory authority to direct operations.



**Figure 34, Unified Command - Multi-Jurisdictional Highway Incident**

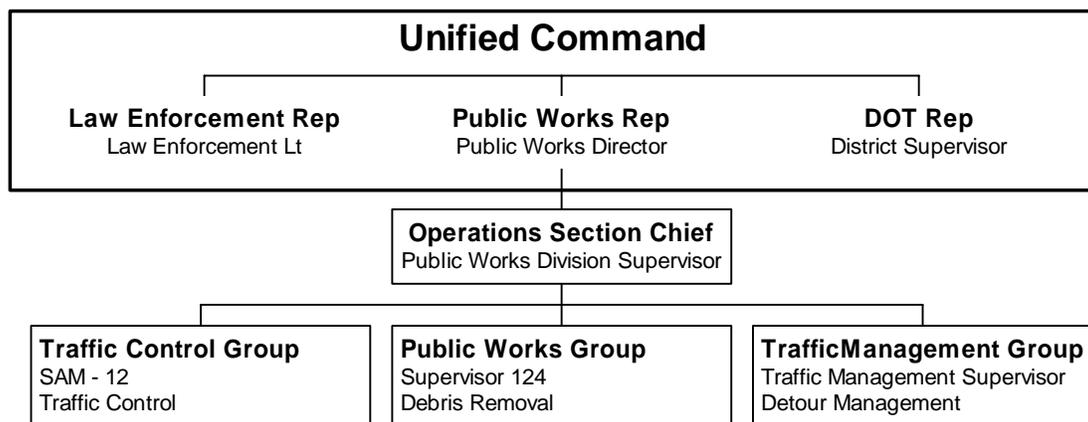
The incident may be totally contained within a single jurisdiction, but more than one department or agency shares authority due to the nature of the incident or the kinds of resources required; i.e., a long-duration, multi-vehicle crash within a single city. Fire, medical, (especially when EMS is a service separate from fire or law), traffic management, and law enforcement can all have simultaneous but diverse objectives. An example of this kind of Unified Command structure that might be found on a highway incident involving a road washout that caused a crash

with injury is depicted below in Figure 35. At this particular instance in time, the fire agency is the lead agency, since the priority concern is extricating and treating the occupants of the crash vehicles.



**Figure 35, Unified Command - Single-Jurisdiction, Multiple-Agency Highway Incident**

As priorities change, such as when all patients have been extricated, treated, and transported, Law Enforcement (after any investigation is completed, Public Works) would most likely take over as Lead Agency. This should be matched with corresponding changes in staffing in the Operations Section. For instance, in the same example incident, the IMS structure might appear as follows, when dealing primarily with traffic problems:



**Figure 36, Unified Command – Transfer of Command**

Operational units may be accustomed to a close relationship with their senior management, but they are separated when assigned to an incident that is utilizing Unified Command. They cannot interact directly according to their normal operational custom while so assigned, for that would

**It is a major mistake to bypass the chain of command.**

bypass the chain of command. Operational units must report through the Operations Chief, and Unified Command members must coordinate through the Operations Chief.

## **Single/Unified Command Differences**

There are several primary differences between Single and Unified Command structures. First, in a Single Command structure, a single IC is solely responsible, within the confines of his authority, to establish objectives and overall management strategy associated with the incident. The IC is directly responsible for follow-through to ensure that all functional area actions are directed toward accomplishment of the strategy. The actions required to effect operational control will be the responsibility of a single individual (Operations Section Chief) who will report directly to the IC.

By comparison, under a Unified Command structure, individuals designated by their jurisdictions, or by different agencies within the same jurisdiction, must jointly determine objectives, strategy, and priorities. Commonly under Unified Command, one of the members will be designated as primary, usually representing the major player. As an incident progresses, the primary member will change as the emphasis of the incident changes. As investigation, scene control, and body recovery become the major concerns, Law Enforcement could take over command. And finally, as attention turns to vehicle and debris clearance, and repair of the roadway, public works could assume the primary position.

As in a Single Command structure, the Operations Section Chief will have responsibility for implementation of the Incident Action Plan. The determination of which agency or department the Operations Section Chief represents must be made by the Unified Command. It may be done on the basis of greatest jurisdictional involvement, first arriving command officer, by existing statutory authority, or by mutual knowledge of an agency representative's qualifications, certifications, experience, or availability.



# CHAPTER 6

## SAFETY

**Responder safety is being emphasized by the IMS Consortium in the following material to raise the overall importance of personnel safety in all agencies that respond to highway incidents. Much additional information is available from many sources regarding responder safety, hazardous working conditions, and the function of the Health and Safety professionals. The intent of the IMS Consortium is to adapt and bring together some of this information that applies to highway incident management in this single guide.**

### Managing Responder Safety

An Incident Commander (IC) has no greater responsibility at any highway incident scene than seeing to the safety and well being of responders, passing motorists, bystanders, and pedestrians. Elements critical to personnel safety are the appointment of a Safety Officer, implementation of an incident scene accountability system, establishing procedures for broadcasting emergency radio messages, deploying dedicated Rapid Intervention Crews, and establishing Responder Rehabilitation operations. The incident action plan for a highway incident must always provide a strong emphasis on ensuring traffic hazard protection for all personnel.

Safely moving vehicles and apparatus in the vicinity of a highway incident can often be a relatively simple task, quickly and easily accomplished as an additional assignment to one of the response companies, or it can be an extremely complicated operation. The more complex and extensive measures must often be implemented in conjunction with long duration highway incidents on congested highways. Generally, the hazard to responders increases as the speed of vehicles passing the incident scene increases, and as the separation between moving traffic and responders decreases. Warning motorists approaching a queue of vehicles that have been slowed or stopped due to a highway incident lessens the likelihood of secondary collisions and additional emergency incidents.

Safety at highway incidents, perhaps more than any other type, can be dependent upon weather conditions. Responders and patients can be directly affected by exposure to the elements.

Visibility and road conditions can also increase the likelihood of secondary crashes. The Incident Commander must attempt to reduce the added additional hazard from inclement weather to both responders and passing motorists. Decreasing the speed of passing vehicles, increasing the buffer distance between moving traffic and the responders' work zone, and increasing the warning distance for approaching motorists are effective ways to increase safety. Weather conditions may require providing shelter for Rehab and additional protective clothing. Advance preparation, coordinated standard procedures, and accurate weather forecasting can better secure responders, patients, and passers-by from these dangers.

NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 edition, sets a minimum requirement for a fire service related occupational safety and health program. The IMS Consortium recommends that employees of agencies that respond to highway incidents read this information, as well as the other occupational safety and health publications that apply to their own agencies, and become familiar with their requirements and recommendations.

All agencies involved in highway incidents have many obligations to provide safety equipment and to develop operational procedures for their individual members to follow. But it is incumbent on individual responders to use the personal protective equipment issued and to follow agency operational procedures to ensure the safety of all personnel operating on the highway. Members that are provided safety clothing shall use the protective ensemble as described in agency regulations that is appropriate for the type of incident and the hazards that they are exposed to. These include: highway incidents, structural fire fighting, wildland fire fighting, emergency medical incidents, proximity fire fighting, and hazardous materials incidents. Responders must wear the appropriate respiratory protection when exposed to IDLH atmospheres and a Personal Alert Safety System (PASS) shall be activated prior to entry. Eye, face, and hearing protection needs to be worn when appropriate for protection. Retroreflective clothing must be worn whenever working on the highway. Responders operating at highway incidents shall, whenever practicable, operate in crews of two or more.

The following are some of the ways identified in the NFPA 1500 Standard to reduce the overall risks to members operating at the scene of emergency incidents:

- Adopt rules of engagement
- Appoint an Incident Safety Officer
- Implement a personnel accountability system
- Provide for emergency traffic communications
- Control access to the scene

## Rules Of Engagement

The Incident Management System starts with the arrival of the first responder. Risk management shall be integrated into the routine functions of incident command. As referenced in NFPA Standard 1500, the concept of risk management shall be utilized on the basis of the following principles:

1. Activities that present a significant risk to safety of members shall be limited to situations where there is a potential to save endangered lives
2. Activities that are routinely employed to protect property shall be recognized as inherent risks to the safety of members. Actions shall be taken to reduce or avoid hazards and unnecessary risks.
3. No risk to the safety of members shall be acceptable when there is no possibility to save lives or property.

All agencies participating in highway incident management would greatly benefit by collectively adopting similar strategic principles that serve to guide responders in appropriately managing risk when engaged in highway operations. It is productive for all to adopt a philosophy of balancing the risks of taking any action with its likelihood of success and the value of success. While the Incident Commander retains responsibility for health and welfare at the incident, the Safety Officer can serve as an effective on-scene independent monitor who ensures continued compliance with these principles.

The following Model Rules of Engagement can serve as a template for common use by agencies that respond together to highway incidents. They are meant to apply to all professions and to all hazards encountered in conjunction with highway incident management. Regional response communities are strongly encouraged to adopt similar common rules of engagement for highway incident management. Such an approach will greatly help incident commands maintain their

proper perspective when considering alternative courses of action and when balancing competing priorities.

**Highway Incident Model Rules of Engagement**

**We will balance risks with the benefits of taking any action.**

- I. We MAY risk our lives a lot, in a calculated manner, for savable lives, or for preventable further injury or death.
- II. We WILL NOT risk lives at all, for property or lives that are already lost.
- III. We MAY risk lives only a little, in a calculated manner, for salvageable property, or preventable further damage or destruction.
- IV. We WILL endeavor to consider the needs of others in the vicinity.

**Engagement Needs Assessment**

**We will assess the benefits of our planned actions.**

- I. We WILL consider the likelihood of success of our actions.
- II. We WILL consider the benefit we could provide if we succeed.

**Engagement Risk Assessment**

**We will assess the risks of our planned actions.**

- I. We WILL assess the threats of injury and death to responders and those in their care.
- II. We WILL consider the likelihood of threats occurring and their severity.
- III. We WILL endeavor to consider threats of property damage or destruction.

**Figure 37, Highway Incident Model Rules of Engagement**

See the Glossary of Terms in the appendix for definitions of the terms used in the Model Rules of Engagement.

## **Risk Analysis**

Risk assessment is a continuous process lasting the entire duration of each incident. The Incident Commander should continually reevaluate conditions to determine if the level of risk has changed and a change in strategy or tactics is necessary. The Incident Commander should monitor and evaluate traffic conditions in support of risk analysis.

At a minimum, the risk analysis for a highway incident should consider:

## Scene Characteristics

- Traffic hazards
- Fire and explosion hazards
- Environmental hazards
- HAZMAT hazards
- Criminal and terrorist threats

## Incident Factors

- Condition of crash vehicles
- Scene access and egress
- Environmental conditions
- Evidence
- Risk to vehicle occupants
- Known or probable occupants
- Occupant survival assessment

## Responder Capabilities

- Available resources
- Operational capabilities
- Operational limitations
- Training
- Experience
- Rest and rehabilitation

## Incident Safety Officer (ISO)

Safety always remains the responsibility of the Incident Commander. Whenever the size or complexity of the incident prevents the IC from personally monitoring safety and health conditions at the incident, the IC should appoint an ISO as a member of the Command Staff, and delegate his authority to perform these functions. Complex incidents, or those that cover a large geographic area, or with operations occurring at multiple locations, may also require the appointment of Assistant Safety Officers. The following items should be considered regarding the appointment of an ISO:

- The ISO must be assigned as early in the incident as possible.
- The ISO shall reconnoiter and monitor the scene for unsafe conditions, hazards, and risks. The ISO recommends any changes to the Incident Action Plan to the IC as a result of these on-going surveys.
- The ISO shall have the authority to alter, suspend, or terminate any activity he determines to be unsafe or to involve an imminent danger, informing the IC and other affected operational personnel immediately of any such action.

- Where an ISO identifies unsafe conditions, operations, or hazards that do not present an imminent danger, the ISO shall recommend appropriate action to the IC to mitigate or eliminate the unsafe conditions, operations, or hazards.
- The ISO addresses health and safety issues associated with all responders and support personnel, including those operating away from the immediate incident scene (e.g., at staging, at traffic control points, or the rehabilitation area). Adequate Assistant Safety Officers must be used to provide incident safety oversight. For example, separate Assistant Safety Officers could be designated to monitor widely-separated Traffic Control Areas.
- The ISO must ensure his own and his assistants' health and safety, and all must use all required personal protective equipment and retroreflective clothing.
- The ISO must have radio communication equipment and not operate alone in hazardous environments. He must monitor the use of the accountability system, any emergency radio traffic, the Responder Rehabilitation Unit, and the deployment of Rapid Intervention Companies/Crews.

Different types of incidents present different types of hazards, and agencies respond to many types of highway incidents. Regulatory requirements, statutory authority, national standards, and standard operating procedures concerning occupational health and welfare apply differently to different professions in different situations. Therefore, the ISO may require specialized knowledge concerning hazards and operations in order to adequately protect those at the scene. A single incident can involve very diverse activities, which may necessitate functional health and safety specialists being assigned as assistants to the ISO. The Health and Safety specialty should be institutionalized within each highway incident response agency to establish resource pools available for dispatch to highway incidents. Health and Safety personnel resources should be organized with on-call rosters in order that they can quickly respond when needed. Suggested specialty pools should include, at a minimum:

- Fire Suppression
- Law Enforcement
- HAZMAT
- Emergency Medical Services
- Traffic Control

It is important to capture lessons learned from unfortunate occurrences and to integrate them into ongoing health and safety procedures. The ISO should continuously document pertinent information about the incident, including the Incident Safety Plan, observed operational activities, and significant health and safety events. It is important to include successful or positive actions as well as those actions that require training or procedural changes to improve incident safety and health for all members. The ISO, accompanying the IC, should participate in

all after-action critiques and analyses, particularly those that involve the injury or death of a responder, or the damage or loss of property belonging to a response agency.

## Incident Scene Accountability

Agency responding to highway incidents shall adopt and routinely use a standard personnel identification system to maintain accountability for each of their members assigned to each incident. Written guidelines shall be established and used that provide Incident Commanders with the capability to account for all responders assigned to their incident. Even though the Incident Commander is responsible for overall personnel accountability, he may utilize additional accountability officers based on the size, complexity or needs of an incident. Each IMS position is accountable for all subordinate responders through the chain of command to the IC.

Several accountability systems have been developed and, while they vary in design, there are common elements that agencies should adopt for use at emergency incidents to fully account for their personnel. Several such systems are identified in the IMS Model Procedures Guide for Structural Firefighting. Whatever the design, the accountability system must be able to locate every responder to a highway incident periodically during the incident. In addition, the system shall:

- Capable of incorporating accountability for responders that actually respond to the scene and of removing members from accountability that actually depart from the scene.
- Capable of documenting the entry of responders into, and exit from, specifically identified hazard zones (e.g., confined space, IDLH atmospheres, HAZMAT hot zones, unstable crime scenes)
- Capable of conducting a roll call at the beginning of the incident and at nominal 15-minute intervals throughout the operation. Dispatch shall remind the IC of the need to conduct a roll call when needed.
- Capable of signaling when a responder is missing or is late returning from an assignment and the need to mount an immediate rescue effort, such as by the RIC (See below).

It is critical for each resource (responder, apparatus, company, unit, etc) to be uniquely identified, or the IC will likely lose track. Different agencies are likely to employ different identification systems and methods due to their specialized individual needs. These legacy

systems are unlikely to be compatible with each other and can contain duplicates of resource identifiers used in other agencies. (For example, there is an “Engine 1” in many fire departments.) It is unlikely that all agencies could justify the expense of converting to a common identification system, but it may be possible for agencies to internally convert their resource designations in a coordinated manner with each other, so that no duplicates remain. Nevertheless, Incident Commanders must still be able to identify and locate responders assigned to their incidents by roll call, regardless of their home agency. Adopting the convention of using the combination of each responder’s identification number and agency’s name should ensure that unique identifiers always appear on each incident’s rolls. “Riverdale Engine 1” would then be clearly distinguishable from “Valley Town Engine 1” and from “Hillsburg Engine 1.”

For highway incident operations, the common elements of an accountability system are:

- Full integration into the IMS.
- Mandatory use by all personnel on the scene.
- An on-scene responder is assigned the task of accounting for all on-scene personnel, starting with the arrival of the first responder.
- Identified benchmarks for required roll calls (Personnel Accountability Reports) throughout an incident. (*Possible Benchmarks: Change in status from offensive to defensive operations, secondary crash, hazardous materials event, significant environmental event, structural collapse, reported lost responder, or based on set periods of elapsed time.*)

The Personnel Accountability Report (PAR) is the utilization of the accountability system to conduct and record a roll call of all personnel at an incident. The IC shall conduct a PAR for the Operations Section (and may conduct a PAR for the entire IMS organization) whenever a change in conditions could increase the hazard to ongoing operations. A PAR should be conducted whenever an evacuation order has been given to provide a systematic method of confirming the health and welfare of all personnel operating at the incident. The IC may request a PAR anytime during an incident to provide this accountability.

## **Emergency Traffic Communications**

Emergency services agencies communication systems should provide a standard method to give priority over routine radio communication to the transmission of emergency messages and notification of imminent hazards to all levels of the incident command structure. NFPA 1221,

Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, 2002 edition, provides additional information regarding the requirements for this capability.

To ensure safety, clear text speech should be used in emergency communications at an incident. Agencies should have a standard operating guideline that uses the radio term “Emergency Traffic” as a designation to clear radio traffic. Emergency traffic can be declared by an IC, D/G Supervisor, or any member who is in trouble or subject to an emergency condition. Various radio tones may also be used by departments to draw attention to this “Emergency Traffic” message.

Examples of emergency conditions that could warrant emergency radio traffic include:

- A responder down
- A responder missing
- A responder trapped
- An imminent crash
- The need to immediately evacuate the work zone
- A adverse wind shift causing smoke or HAZMAT threat to responders
- Discovery of new danger such as a hazardous material, secondary device, or unseen hazard.

When a member has declared an emergency traffic message, he should use terms identified in the department’s standard operating guideline, such as “responder down.” At the conclusion of the emergency condition direction to resume normal radio and incident operations (an “All Clear”) must be transmitted to allow a return to normal operations.

In addition to an emergency traffic radio message, Incident Commanders could use an additional signal, such as an apparatus air horn, to signal an ordered “evacuation” of personnel. Some departments have incorporated a series of three 10-second short blasts on an air horn with a 10-second silence between each series of blasts of an air horn. For ICs using this system, it is very important for them to select apparatus away from the Command Post to reduce the possibility of missing radio messages while the air horns are sounding.

## **Rapid Intervention Crews (RICs)**

A RIC should be designated to standby in a state of readiness should the need arise to initiate a rescue effort for downed or missing responders. RICs are not typically assigned on highway

incidents, and their use (where work is not being accomplished in a confined space or an unbreathable atmosphere) is not required by any established standard of practice. Their use is not, however, prohibited! Also, it is important to remember that a highway incident that is secondary to a fire, explosion, building collapse, hazardous materials release, confined space, or other event will require implementation of RIC procedures as appropriate.

A RIC is comprised of a minimum of two responders who are attired and equipped to perform the actions necessary to affect the rescue of other responders. The best practice is to utilize a complete company and keep it intact. The RIC should have awareness of where resources are committed on the incident, and the RIC should not be assigned to other duties that would in any way delay or impede their rescue effort. More than one RIC may be required for large area, large scale, or complex operations.

In highway incidents, a likely use for the RIC is to respond to a secondary crash in the immediate vicinity of the original incident. Accordingly, the RIC should be capable of quickly deploying a minimally effective heavy rescue, EMS, and traffic control response anywhere along the avenues of approach to the scene, particularly to where traffic control is being conducted by responders. Depending upon the capabilities of responding units, the topography of the highway, and the traffic flow, this may require organizing the RIC as a task force, with suppression, EMS, law enforcement, and traffic control resources assigned to it. Also, since maneuvering room can be quite limited in the vicinity of highway incidents, a single RIC may not be able to respond in all directions of travel, and multiple RIC task forces might even be required.

It should be noted that the utilization of RICs on highway incidents should be directly related to the severity of the secondary crash hazard and the likelihood of its occurrence. Roads empty of traffic, or completely filled with blocked traffic in the vicinity of the original incident would present a low secondary crash hazard. Poor visibility, slippery road surface conditions, high incidence of impaired drivers, or other factors can markedly increase the secondary crash hazard. Effective traffic control will serve to lower the hazard of secondary crashes. Also, at some determined distance away from the original incident, separate alarm responses to crashes will be more responsive and effective than a RIC response from the original scene. Indeed, if the IC has deployed resources to such a distance, it may be argued that those resources should be transferred to separate incidents. Even though far distant crashes may technically be secondary

to the original incident, their distance from the Command Post may place them outside of the IC's geographical span of control.

## Responder Rehabilitation (Rehab)

In a full implementation of the IMS, Rehab is located within the Logistics Section under the Medical Unit, as shown in Figure 38. Of course, if the Logistics Section or Service Branch has not been implemented, Rehab may be moved upwards in the organization. It should remain outside of the Operations Section, however.

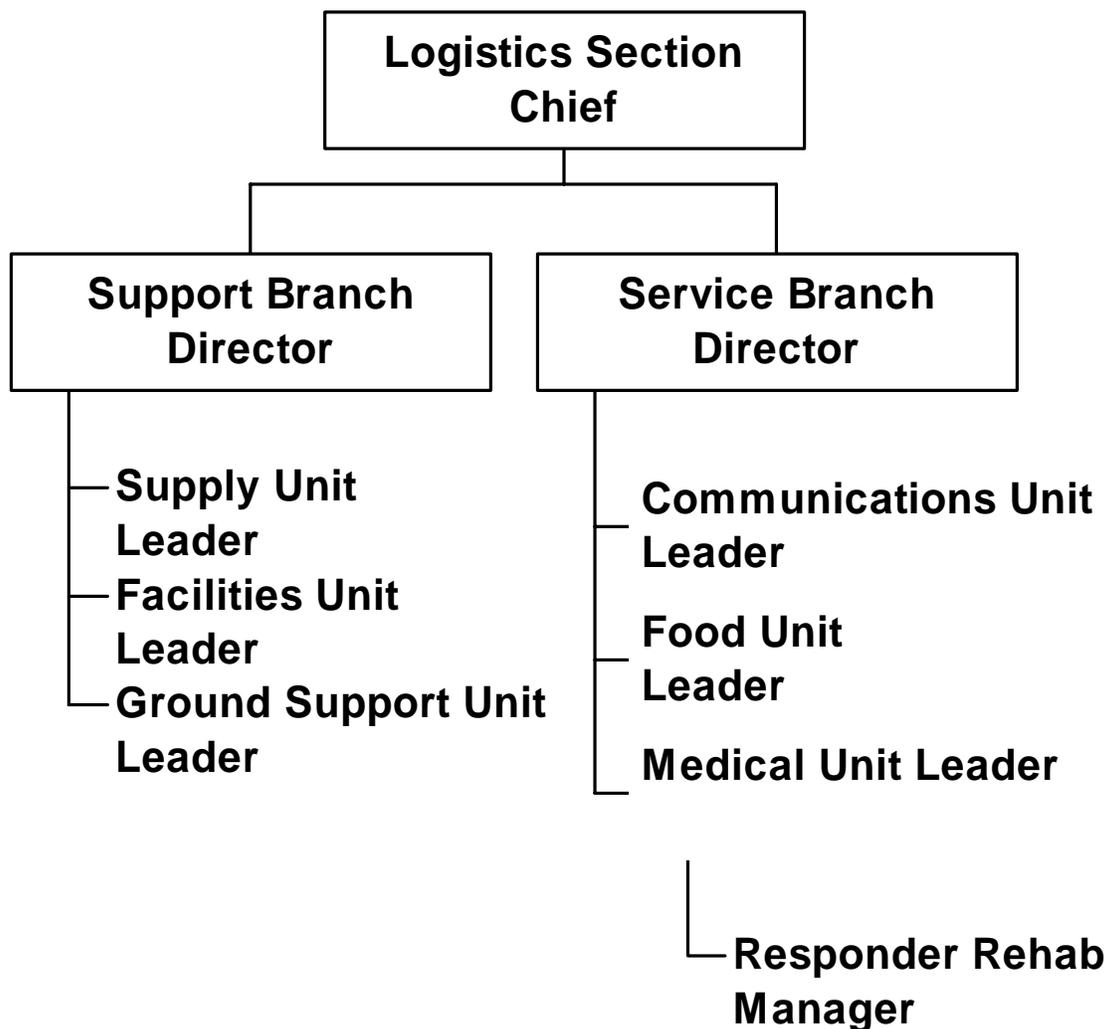


Figure 38, The Rehab Unit

Command has the responsibility to ensure that the physical and mental condition of emergency responders operating at the scene of a highway incident does not deteriorate to a point where it affects the safety of each member or it jeopardizes the safety and integrity of the operation. The purpose of Rehab, is to evaluate and assist personnel who may be suffering from the effects of sustained physical exertion or exposure to high stress conditions during highway incident operations. Rehab will provide a specific area where personnel will assemble to receive:

- Medical assessment
- Revitalization – rest, refreshments, etc.
- Treatment for injuries
- Monitoring of physical condition
- Patient (responder) transportation
- Initial critical incident stress debriefing

Command officers should consider the need for Rehab during the initial planning stages of an emergency response. Climatic or environmental conditions (e.g., high or low temperatures) should not be the sole justification for establishing Rehab. Any activity or incident that is large in size, long in duration, and/or labor intensive will rapidly deplete the energy and strength of personnel and therefore merits the establishment of Rehab.

All supervisors should maintain an awareness of the condition of each member operating within their immediate span of control and ensure that adequate steps are taken to provide for each member's safety and health. The command structure should be used to request relief and the reassignment of fatigued crews.

Critical components of all Rehab operations include:

- Nourishment
- Rest
- Recovery
- Medical evaluation and treatment
- Accountability

Highway incidents can present additional concerns regarding the location of the Rehab Unit. Since crews are often operating while fully exposed to traffic hazards and the weather elements, the Rehab Unit should offer shelter and security to units assigned to it. This can present a challenge to the Rehab Unit Leader when establishing rehab operations at highway incidents located away from accessible buildings. Each of these elements must be included when developing standard operating procedures for carrying out crew Rehabilitation.

## Critical Incident Stress Management

Highway incidents have the potential of creating significant emotional and physical stress in responding personnel. This is especially true in incidents involving children, violent crime, or many deaths or injuries. All agencies involved in highway incident response should have a programmed method of identifying incidents that may negatively affect the well being of responders, and of providing appropriate stress management response. Certain incidents, including mass casualty, those involving serious injury or death of a responder, or close community relationship to the victims, warrant an automatic critical incident stress management (CISM) response. CISM is generally considered a scaled response based on the type of incident, numbers involved, and the needs.

The manner in which CISM response is delivered will depend upon the organization and the jurisdiction. There are numerous local, state, and national organizations that can provide CISM resources. Plans and resource contacts should be in place in Standard Operating Procedures ahead of any incident.

The Incident Commander should consider the need for CISM early into an incident and mobilize the response as appropriate. Often CISM activities begin at the scene. Because most major highway incidents are multi-agency or multi-jurisdictional, the primary jurisdiction should include the needs of all responders in CISM plans or response.

**The information in this section is not inclusive of all aspects of responder and incident safety. The intent is to apprise response agencies across the country of the need to address this very important area and to provide additional safety for personnel working in one of the most dangerous occupations in one of the most dangerous environments:**

**The Public Highway**



# CHAPTER 7

## BASIC ORGANIZATIONAL APPROACH FOR HIGHWAY INCIDENTS

The Incident Management System (IMS) must be initiated by the first-arriving resource. IMS allows the Incident Commander to escalate and expand the command organization as needed. It begins simply at street level with the first-arriving unit establishing command and expands as other units arrive and as the situation requires. Only the positions needed should be implemented, based on the number of tasks to be performed or availability of additional resources.

**The incident management organization expands and contracts  
as the demands of the incident dictates.**

### Principles of Highway Incident Management

The responsibilities of the first-arriving company will include the functions of command. The first-arriving company will be faced with decisions that must be made quickly, including some tasks that must be completed at the onset of most highway incidents. To organize his approach, the initial Incident Commander should develop an action plan that accounts for the unique aspects of highway incidents that addresses responder safety, the needs of the incident, and the movement of traffic past the incident. One of the goals is to maximize traffic flow. The Incident Commander can facilitate this by forming a Traffic Control Group. On the highway, the Incident Commander should provide for the following:

- **SURVEY** the scene to obtain an overall understanding of the situation.  
Observe the speed and density of traffic approaching from all directions.

- **SAFETY** hazard assessment (existing or potential). Highway traffic is always a hazard, threatening responders, patients, and motorists alike. Weather and road conditions merit special consideration. Observe motorists' behavior in the vicinity.
- **SIZE-UP** the situation and inform dispatch. Match the needs of the incident with the dispatched resources. Request additional resources or release unneeded resources as needed. Consider your incident's impact on regional traffic.
- **SEPARATE** scene operations from moving traffic. The nearer that moving vehicles are to scene operations, the slower they should be allowed to pass.
- **SET UP** the scene for emergency services and establish command. Accommodate road users safely.
- **START** operations, expanding or contracting as dictated by the incident. Coordinate with all impacted organizations.
- **SEE** what else needs to be done. Look at least an hour into the future. Re-survey the scene, re-assess the hazards, revise the size-up reported to dispatch, review the setup, and restart operations as needed. Adjust the incident action plan to match.
- **SORT** out competing priorities, limited resources, and other conflicts.
- **SEND** units away from the scene as soon as released. Release units as soon as practical and reduce the distraction of the response force's presence on the highway as quickly as practicable and safe. Open the roadway and relieve congestion.

Large highway incidents usually have one thing in common: they will demand more from the initial arriving responders than they can provide. It is very difficult not to immediately address these immediate problems. It is very difficult for company officers to step back out of the action and take command.. The common tendency is for the initial arriving units to become immediately immersed in the highest priority problems, committing all of their resources to these

tasks, and none to command. Often, they will wait until well into the incident operations to implement an Incident Management System. **This is a major error**, resulting in confusion and the loss of a coordinated, directed, efficient effort. The Incident Management System must be implemented with the first-arriving resources on the scene.

The incident action plan should include an ongoing reevaluation of the overall needs of the incident and available units to satisfy those needs. In highway incidents, the traditional fire service resources will be assigned to emergency medical services, extrications, HAZMAT, and firefighting. There are usually other problems that also need to be addressed as well, and resources outside of the fire service will handle them. Traffic flow and control should always be considered a priority, which may require the involvement of many other agencies, especially when traffic is rerouted. Resource demands shift as the incident progresses, and vehicle and cargo recovery, accident investigation, roadway repair, and other activities may also place heavy demands on resources. The character of the incident will change as it evolves, and eventually no longer concern the fire service. Organizational responsibilities also shift to match the changing character of the incident, eventually passing from the initial IC to others, and probably from the fire service to other organizations. Throughout, the Incident Management System must be maintained, and the IC should remain diligent regarding scene safety and responder safety. This is always a concern due to traffic flow, and traffic control should also be assigned to specific resources.

## **What is a Highway Incident?**

The core of the difficulty in attempting to define the bounds or contents of highway incidents is related to the broad range of events that cause highway incidents and to the variety of organizations that respond to them. Highway incidents span everything from mowing and landscaping operations to weather disasters, from traffic stops to wildland fires, and from disabled vehicles to terrorist activity.

If an organization responds to an occurrence on the highway, then it is involved in highway incident management. Others are most likely participating along side of its responders, or were involved before them, or will take over after them. It is imperative that those working together on highway incident management understand everyone's functional capabilities and they resolve

jurisdictional and institutional issues. The success of any sort of joint operation rests upon the ability of people to work together. This guide will not presume to instruct the user in achieving operational harmony, but shall insist it be done. Incident Commanders must be empowered to accomplish their jobs. When they are, they can accomplish all of our missions; to save and protect lives, property, the environment, and to maintain traffic flow on our nation's highways. IMS offers a convenient, effective, and a proven way for them to do this.

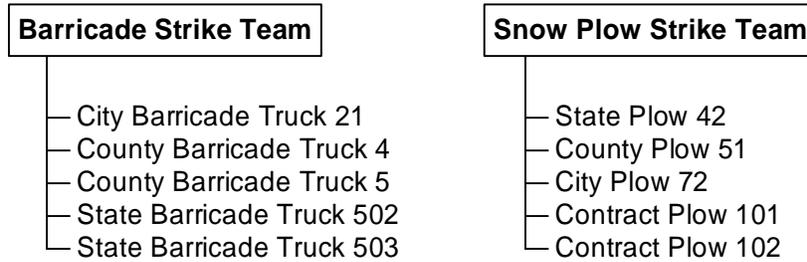
Note that responsibility for achieving a successful resolution of the incident cannot be delegated. The IC remains always responsible. The necessary authority to act, however, is delegated downwards through the IMS organizational structure, along with each assigned functional objective and task. As each responder accepts an assignment, they incur an obligation to the IC to complete each job. In this manner, the entire effort progresses in a cohesive manner, in accordance with the incident action plan, towards a favorable outcome.

## **Transportation Roles in the Highway Incident IMS Organization**

Emergency services have become well accustomed to using IMS for all types of incidents. Other agencies are becoming more comfortable with using it, especially as joint operations are becoming more commonplace. IMS is also evolving in its application to joint service incidents, and incident commanders are becoming familiar with integrating representatives from other services into their IMS organization. Transportation is one of the newer participants in highway incident management, and transportation units are appearing on IMS organization charts more and more frequently. According to the needs of the incident, they should be assigned to whatever appropriate position is suitable, ranging from single resources up through division and group levels, and even to and including Incident Command.

The following sections briefly describe IMS positions that have been assigned a transportation role, rather than the more familiar emergency services functions. With no loss of integrity, the IMS can easily be used to address the functional requirements for traffic control and other supporting transportation services within the same command and control structure already familiar to most of the highway incident community.

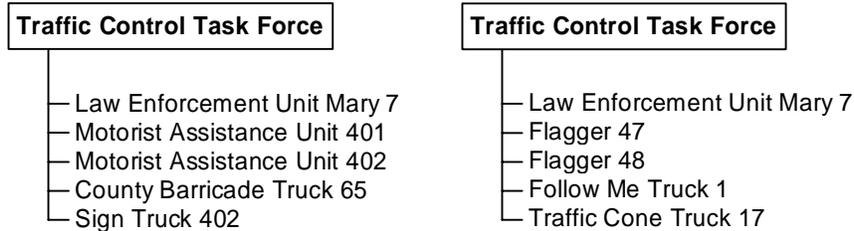
### Traffic Control Strike Teams



**Figure 39, Example Traffic Control Strike Teams**

Assembling traffic control resources into strike teams, each with five units of the same type (dump trucks, sign trucks, barricade units, repair crews, etc) may provide an efficient way to manage these resources. Aside from providing accountability efficiency, strike teams can help the IC deploy grouped resources . Traffic management can be an intensive consumer of traffic control manpower and equipment, especially while being established and dissembled.

### Traffic Control Task Forces



**Figure 40, Example Traffic Control Task Forces**

Using Traffic Control Task Forces, each consisting of an assemblage of different types of traffic control resources under a single supervisor is a convenient way to organize all of the different resources needed to set up and operate a roadblock, checkpoint, merge, or taper. Traffic Control Task Forces may contain an indeterminate number of individual resources, constrained only by the command and control guidelines concerning span of control.

Specialized transportation resources are usually warehoused together at depots, yards, or centers, dispatched in convoy, and then reallocated according to need at the scene. Arriving piecemeal at staging areas, task forces may be assembled by the Staging Officer in response to requests from the Operations Section.

Incident Commanders should seriously consider assigning a law enforcement unit with each task force or strike team with traffic control tasking. Traffic Control strike teams and task forces may require special attention during their response and deployment, due to their size, weight, and limited maneuverability. They do not enjoy the special right-of-way privileges of emergency vehicles, which further encumber their movement. Police escort may be required in order for them to make their way through heavy traffic congestion, which might be successfully accomplished only with the assistance of law enforcement units.

Enforcement is key to effective traffic control. If motorists do not respond to direction, uncontrolled traffic will present an unacceptable risk to everyone on the scene. The potential for conflict between flaggers and motorists should not be underestimated, and ICs should recognize that situations could escalate dangerously around highway incidents. Sometimes, the authority of the flaggers engaged in traffic control needs backup from traffic law enforcement. Often the mere presence of police vehicles serves to keep the peace and preserve order, but there are times when law enforcement's active participation is needed. Normally, law enforcement would assume the lead role in such situations. Law enforcement resources are usually extremely limited, however, so judgment must be used in balancing the demands of the incident (interviewing, reporting, investigating, security, etc) with the need for maintaining a safe traffic environment. Should the situation warrant, law enforcement chase cars can be positioned downstream of the incident to stop and cite offenders using radio coordination with the flaggers. Factors such as the following would tend to indicate the need for a law enforcement presence:

- Extreme weather conditions
- Impaired drivers
- Poor visibility
- Poor road conditions
- Long delays

## **Traffic Control Groups**

Traffic Control Groups may be formed when it is convenient to consolidate traffic control functions under a single functional organizational element with the IMS. Traffic control groups provide specialized traffic services and use particular traffic control resources. Such a form of functional (rather than geographical) organization may be useful in a dynamic or unstable situation where resources need to be flexibly relocated between different divisions quickly to react to changing highway conditions. Or, when other emergent aspects of a highway incident demand the full attention of operational command officers, and traffic control is not complicated, a group organization may be appropriate.

## **Traffic Management Divisions**

Traffic Management Division manages a well-defined geographical portion of a highway incident. This may occur when the IC wishes to manage traffic movement from separate directions, separate routes, access points, or intersections. Examples where such an organization might be appropriate would include incidents at complicated interstate interchanges, highway intersections, or coastal hurricane evacuation routes.

## **Traffic Management Branches**

In extremely complex situations, such as highway incidents affecting an entire freeway interchange or in disaster situations, the Incident Commander (or Operations Section Chief) may elect to consolidate traffic control operations under a completely separate branch. This may be dictated by the need to coordinate several divisions or groups, or when a separate agency that may respond with unique jurisdictional responsibilities. A branch organization might also be the best way to coordinate traffic management involving separate transportation modes, such as a railroad bridge incident over an inland waterway, or a subway station at an airport.

## **Operations Section**

Some highway incidents are purely traffic problems, and there may be little or no need for emergency services. Indeed, it often happens that fire & rescue units are dispatched to highway incidents, only to find upon their arrival that their services are not required. In such cases, it is

appropriate to transfer operations to transportation units who are more suited to manage the incident. If incident operations are concentrated on traffic management, it is completely appropriate to appoint a transportation or law enforcement responder to the position of Operations Section Chief. Such a course of action might be appropriate, even if there remains a small emergency services activity at the scene, such as with a trooper completing a report.

### **Traffic Incident Command**

At highway incidents, transportation organization representatives can opt to either assume Command, participate in Unified Command, or to serve under the command of other responding agencies. The determination of which option to exercise depends upon the situation at the incident, and local operational arrangements. The first unit to arrive on the scene should always quickly and clearly establish command. That unit could easily be a transportation or other unit that is not part of the emergency services. While it would be rare for such a responder to be qualified to command emergency units, they should nevertheless establish Command. Should the situation demand further response as might be more appropriate to the specific incident, adjustments can be made as subsequent responders arrive and the IMS organization is expanded to meet the circumstances.

If Command is transferred to later-arriving units, it should be done in the same professional manner as required for transfers of Command within the emergency services. Likewise, at the conclusion of the emergency services' involvement in the incident, Command should be formally transferred to units remaining on the scene. This incident activity may only involve traffic control.

## The Traffic Control Function

Traffic control is the direction of traffic in the vicinity of a highway incident. According to the Manual on Uniform Traffic Control Devices (MUTCD)<sup>1</sup>:

*The primary function of temporary traffic control is to provide for the safe and efficient movement of vehicles, bicyclists, and pedestrians through or around temporary traffic control zones while reasonably protecting workers and equipment.<sup>1</sup>*

This function addresses one of the primary motivations of the emergency services, which is to guard and protect those at the incident from being injured or killed. It also addresses one of the central concerns of the transportation community, which is the safe movement of traffic along the highway. All are mindful of the overriding need for safety, adopting safe emergency operations at the scene and safe passage of traffic by the scene as operational requirements for the combined and integrated highway incident management team.

Depending on the hazard and complexity of the situation, traffic control may be a single responder or a large and widely deployed organization. For simple traffic situations, traffic control might be implemented with very few resources, such as with a secondary assignment to an apparatus driver using the supplies already carried by his vehicle. This might be appropriate for a deserted country road with good visibility of all approaches. For long-lasting incidents, or with heavy or fast traffic, as might be encountered on a freeway or in a metropolitan area, hazards are significantly more serious, and the impact to the traveling public is much greater.

---

<sup>1</sup> The Manual on Uniform Traffic Control Devices, or MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets and highways. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F. It is available in loose-leaf printed form from FHWA, on CD-ROM, and on the Internet at <http://mutcd.fhwa.dot.gov/>.

It concentrates on traffic control devices used in conjunction with highway construction work zones, however new material has been added that applies to emergency highway incidents. The new highway incident subject matter (Section 6I) has largely been copied from the more mature work zone sections, and is greatly in need of review by the emergency services community. As an example, the design and use of temporary traffic control devices is not covered extensively. The types of traffic channelizing devices used in work zones are designed for visibility, durability, and unattended use, while those favored for use by the emergency services are designed for quick and easy short-term use.

Instructions for providing feedback to improve the publication can be obtained from the website and are contained in the publication itself.

Significant additional resources should be provided to address a significantly different mission. As the size and complexity of the traffic control task grows, so should the traffic control organization. IMS provides the Incident Commander with the tools to flexibly expand the traffic control function and to place it at appropriate positions within his IMS structure.

## **Transportation Resources**

In the preceding examples, both transportation resources and emergency services were used for traffic control. Users may already be familiar with the emergency resources of fire and rescue, emergency medical services, and law enforcement, as well as their use in auxiliary traffic control functions. Other resources are becoming more generally available from the transportation community. Ranging from street sweepers to construction crews to barricade teams to tow trucks, these resources have the potential to provide the same services to both the Incident Commander and to the traveling public as they provide during the normal course of routine daily operations. They can augment or replace firefighters, medics, and law enforcement now directing traffic, and address traffic problems in a more comprehensive manner.

In general, the organizations and agencies providing these resources are not emergency response organizations, and their vehicles are not emergency vehicles, and can appear to respond slower when compared to fire, EMS, and law enforcement. Most are not round-the-clock operations, and must often call in personnel to mount a response after business hours. They are not organized in the familiar paramilitary command and control structure as is found in the emergency services, and will use supervisors, foremen, managers, and directors rather than company officers, law enforcement supervisors, and chief officers.

These broad and varied resources can provide many services and functions to aid in the management of highway incidents. Such services can range from emergency roadway repair to mass patient transport to traffic control; to providing bulk damming, diking, and absorption material; to providing construction and demolition equipment and operators. However, crew training, experience, and capabilities; apparatus types and kinds; supplies; operational procedures; and even terminology and nomenclature are not standardized across the nation. This elevates the importance of pre-planning and practice if they are to be used to maximum benefit.

## Traffic Control Devices

The specification for all devices used for traffic control is contained in the MUTCD<sup>2</sup>. This manual covers such devices, regardless of whether they are carried in a highway construction contractor's vehicle, a state or local DOT vehicle, or in an emergency vehicle. Incident Commanders and their organizations are cautioned to ensure that such devices carried on their apparatus or used at a highway incident meet the specifications contained in the MUTCD. This includes traffic cones, flares, signs, and flags. Their appearance has been standardized throughout the United States in order that motorists are confronted with the same types of traffic control wherever they may travel.

*Using unapproved traffic control devices can expose responders' organizations to significant liability.*

## Traffic Control Resources

Perhaps the most common and useful resource used at highway incidents, Traffic Control Resources protect responders and the traveling public from each other by separating moving vehicles from vulnerable and distracted workers at the scene. They also organize and channel traffic around blockages caused by highway incidents, helping to relieve the schedule and economic pressure placed upon travelers from trip delays. At the one end of the spectrum are flaggers drawn from the ranks of emergency responders, taking the form of a law enforcement officer directing traffic through an intersection using whistle, flashlight, and flares; or an engine driver using the apparatus, traffic cones, and flares to divert traffic upstream of an incident. At construction zones (which may turn into emergency incidents), flaggers are usually subcontract employees of the firm performing the work. At the other end of the spectrum, central controllers can synchronize an entire region's traffic control signals to better route traffic in reaction to an incident. Traffic Management Centers can coordinate road closings and detours to best handle a blockage, even to alerting neighboring regions to implement even broader control measures if needed.

---

<sup>2</sup> The Manual on Uniform Traffic Control Devices (MUTCD), Millennium Edition, December 2000; Incorporating: Proposed Revision No. 2, Revision No. 1 dated December 28, 2001, and Errata No. 1 dated June 14, 2001

## The Flagger



**Figure 41, Flagman Ahead Warning Sign**

Temporary traffic control devices and the presence of flaggers directing traffic designate the Temporary Traffic Control Zone (TTCZ), which is the operational domain of traffic control around a highway incident.

**A flagger shall be a person who provides temporary traffic control.<sup>1</sup>**

Authorized responders are made recognizable as flaggers to motorists in accordance with applicable state and local statute, and they are generally drawn from the ranks of fire, law enforcement, and transportation responders. Motorists are usually required to obey direction from highway incident responders, but their authority to direct traffic remains unclear in some jurisdictions. Flaggers, on the other hand, are usually accorded a more clearly stated statutory status, partly due to the long history of their use on highway construction projects. Usually, regardless of their firefighting, medical, law enforcement, or other status, responders who are directing traffic should be trained as “flaggers.”<sup>3</sup> By doing so, their legal status will usually be clarified with respect to the MUTCD, and they are usually specifically recognized in state and local statutes.

---

<sup>3</sup> Flagger training is available in the form of short courses certified by the American Traffic Safety Services Association, the National Safety Council, and the International Municipal Signal Association, and taught in local communities.

*Using improperly trained flaggers can expose responders' organizations to significant liability.*

Flaggers comprise the basic traffic control personnel resource, equivalent to the basic emergency services personnel resources that include firefighters, emergency medical technicians, and law enforcement officers. Also, like other resources, flaggers can be organized into company units, Task Forces and Strike Teams under IMS if the need presents itself.

## **Organizing the Highway Incident**

This section applies the organizational principals of the Incident Management System to generic highway incidents. This model procedures guide will not get into specialized levels of detail, but rather will concentrate on how to integrate all participants into a coordinated and unified effort that produces the best outcome for all.

This guide will work its way from the simple to the complex highway incident as it progresses through the following examples. This incident “complexity” will be measured more in terms of the impact of the incident has upon the roadway and the surrounding community and the size and the variety of response to it. Even though technical rescues, HAZMAT events, mass casualties, terrorist attacks, and lost cargo loads (to name a few of the more complicated types of incidents) all have their internal technical issues. The IC will delegate their handling to the specialists and experts that will be coordinated within an IMS organization. The complexity addressed by this guide concerns the organization and employment of resources to handle these problems while operating in one of the most dangerous environments in the world – a public highway.

### **The Highway Incident Without Response**

Perhaps the most common highway incident involves motor vehicle accidents with minor damage and without injuries, which may be resolved with the drivers exchanging insurance information and departing the scene. Since the situation is resolved before any response reaches the scene, it might be said that this is not an “incident!” However, these situations can cause significant traffic problems and many 9-1-1 calls with conflicting information concerning the type of incident, its severity, and its location. As a result, several alarm assignments can be dispatched to several reported incident locations. The first-arriving unit to each dispatched location should still assume command upon arrival. An initial size-up report to Dispatch by the

IC indicating that nothing was found and releasing the responding units is nearly as important as actually finding the reported accident. Slowing the unneeded emergency response down is an important safety consideration, as well as easing the impact on traffic flow. The Incident Management System (again consisting of the sole position of IC) ends soon after it begins with the “nothing found” report, and the incident terminates. The IC’s period of responsibility is measured in seconds, and would only be made explicit in the radio traffic under unusual circumstances.

### **The Highway Incident Prior to the Arrival of Response Units**

The most dangerous time period in a highway incident occurs between the occurrence of an event, and the arrival of responding units. Other than the injuries, damages, or spills directly caused by the incident, the traffic pattern has been unexpectedly changed due to blockages or distractions. Distraught, distressed, and distracted pedestrians can enter the travel lanes, as the occupants of involved vehicles extricate themselves, Good Samaritans attempt to render aid, and curiosity seekers converge on the scene. There is a great risk of secondary crashes, further injuries or deaths, and additional property damage. If some of the 9-1-1 cellular callers to the Public Safety Answering Point (PSAP)<sup>4</sup> are located at the scene, they provide an opportunity to possibly reduce these hazards.

Command cannot be established prior to any responder arriving at the scene, therefore no IMS organization has yet been established. The only contact with the scene is through call-takers, and the only contact with responding units is through dispatchers. Additional relevant information concerning the situation can greatly help responding units prepare for managing the incident, however, and it should be provided to them. Changes to the reported situation may dictate changes in the response, during the response. Modifying the response assignment, or issuing direction to responding units, such as designating staging areas, initial tactics, or task assignments should be accomplished under the usual authority structures of the responding

---

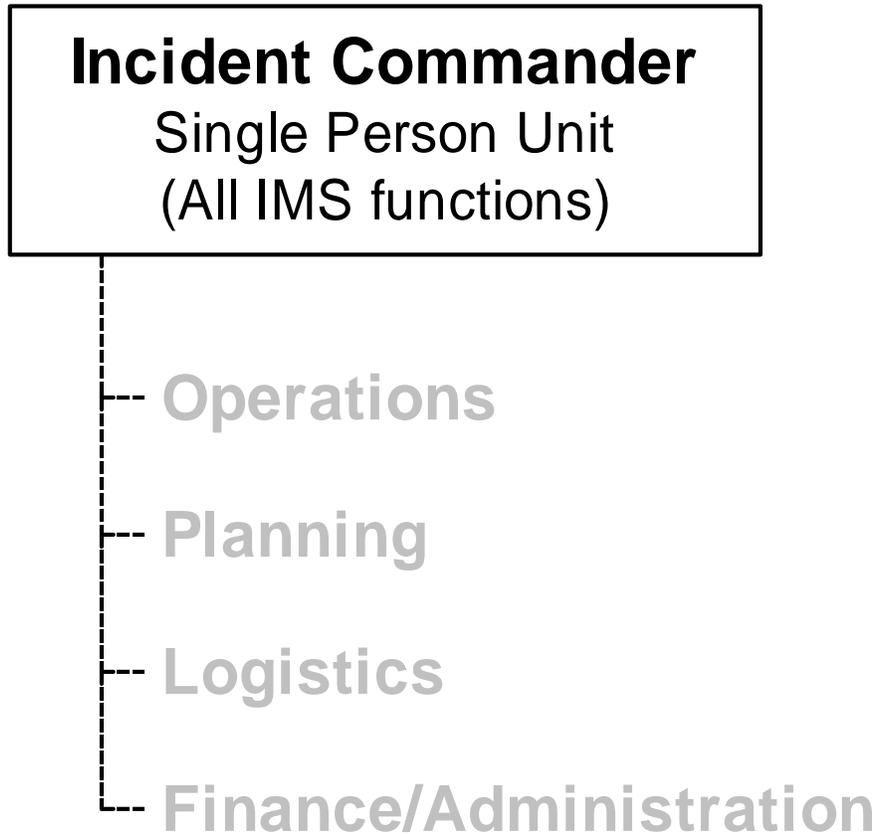
<sup>4</sup> The PSAP is the communications center to where 9-1-1 calls are automatically routed, and where call-takers determine the nature and location of the emergency. A serious highway incident can result in many calls, sometimes approaching a hundred separate calls received at several PSAPs. Callers usually report differing observations and locations, and sorting out so many calls can prove to be a significant challenge. As a result, several phantom highway incidents may be initially handled as actual, separate incidents, each with separate dispatched responses to ensure that units reach the real location.

organizations. The ranking responding member of the organization having responsibility for the particular type of incident should probably take charge during this phase, however such a determination can only be made at the local level.

Pre-arrival instructions given to on-scene callers could also be beneficial, similar to the assistance given by Emergency Medical Dispatchers on EMS incidents. If call-takers could pass on fundamental safety directions, such as having pedestrians vacate the roadway, lives could be saved. Simple instruction on safely and properly placing flares could ease a rapidly building traffic problem. Weather and exposure situations may also be helped with rudimentary verbal assistance.

### **The Single Unit Response to Highway Incidents**

Traffic stops by law enforcement for an infraction of the traffic laws, disabled vehicles being assisted by wreckers or motorist assistance units, or small highway maintenance jobs are at the simplest level of highway incident complexity. These usually involve a single person unit. Since there is little to do in the way of coordination, resource allocation to tasks, or directing operations, all of the incident management functions are rolled up into a single position. The Incident Management System should still be implemented, with the position of Incident Commander always filled.



**Figure 42, The Single Unit Response**

Even though none of the usual issues of span of control, unity of command, or division of responsibility appear, this single person unit can quickly and easily become overloaded, should the incident escalate in severity or extent. Dispatchers should be aware of the possibility of the IC needing additional resources, and be prepared to send them quickly if needed.

### **The Small Response to Highway Incidents**

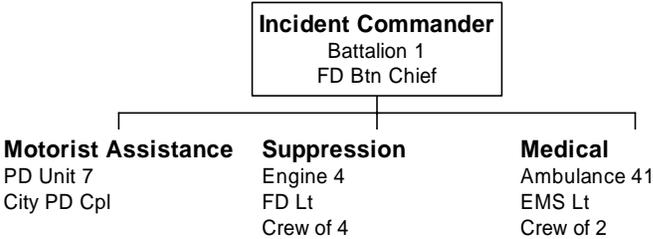
Next up on the scale of complexity for highway incidents would be those with several units responding, such as accidents reported with major damage, or with injuries, or with minor leakage of hazardous materials. For example, the Incident Commander might commonly encounter a two-vehicle accident in the traffic lanes, with possible injuries to the vehicle occupants (possibly trapped in their vehicles), and with various fluids from the vehicles leaking onto the roadway. The IC should assign companies as they arrive to provide medical care, handle extrications, firefighting and HAZMAT tasks, accident investigation, and traffic control.

In this manner, the IC ensures that all of the needed tasks are assigned to responding units, IMS functions are being staffed, and all responsibilities are met for the incident. The IC decides, based upon limited resources, which are the highest priority tasks, and assigns units to them as they arrive.

The IC assigns specific tasks to designated units and sets up a simple Incident Management System to organize the effort. It might unfold as follows:

PD Unit 7, Battalion 1, Engine 4 (crew of 3), and Ambulance 41 (crew of 2) are dispatched to a reported vehicle fire. They respond in convoy, and arrive together, with Battalion 1 assuming command and providing Dispatch with an initial size-up report of a single vehicle on the shoulder with large amounts of vapor being released from the engine compartment. He reports that all occupants appear to be out of the vehicle. Suspecting an overheated engine, the IC assigns Engine 4 to check out the vehicle and Ambulance 41 to assess the occupants. PD Unit 7 proceeds to set up traffic control and to interview the driver.

Battalion 1 established a simple IMS organization to direct the operation, with all units reporting directly to him. The IMS structure and task assignments appeared as follows:



**Figure 43, The Small Response With Direct Reporting Units**

Upon learning from Engine 4 that the vapor was indeed steam from leaking coolant, from Ambulance 41 that there were no injuries, and from PD Unit 7 that the driver had already called AAA and was waiting for a tow truck, the IC released all fire department units and placed them back in service. Fred’s Towing arrives and departs with the disabled car and its occupants. Then PD Unit 7 returned to service.

When the car sat on the shoulder emitting a cloud of steam, it attracted the attention of passing motorists. These rubberneckers slowed down to get a good look, and eventually created traffic backups in both directions from the incident. Cellular 9-1-1 calls complaining about the delay were still being received more than an hour after the initial car fire reports. Only through good coordination between the 9-1-1 Center and the Traffic Management Center were further accidents prevented from happening in the backup. Since some of the calls were insistent that

something be done, city police units continued to monitor the traffic situation during the course of their usual patrols and traffic controllers continued to observe the traffic flow using the closed circuit television cameras along the route.

### Expanded Incident

With just a few small complications, the incident and the Incident Management System might evolve as follows:

PD Units 7 and 8, Battalion 1, Engines 4 and 5 (crews of 4), Ambulance 40 (crew of 2), and Ambulance 41 (crew of 2) are dispatched to a reported two-vehicle accident with injuries. Engine 4 arrives first on the scene, followed closely by the EMS and police units. The Battalion Chief is delayed indefinitely in traffic. The Captain assumes command, provides Dispatch with a size-up report, and requests one additional truck company after hearing that the occupants of one vehicle are trapped. He assigns the Engine 5 Officer as the Extrication Group Supervisor, and then assigns Engine 4 and Engine 5 as his resources. He assigns Ambulance 40 as Medical Group Supervisor and assigns Ambulance 40 and Ambulance 41 as his resources. He then assigns PD Unit 7 Law Enforcement Group Supervisor, and assigns PD Unit 8 as his resource.

The organization and activities of the initial assignment at this point are as follows:

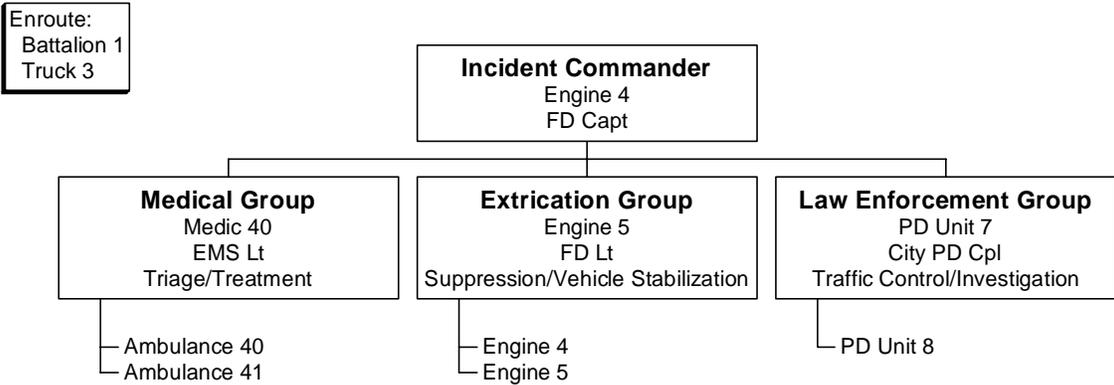


Figure 44, Reorganizing the Small Response Using Groups

This basic structure addresses the need for unity of command with a well-defined chain of command, and keeps the span of control manageable. Eight units operating independently would have been dangerous and unproductive, and it would have been difficult for one individual to control all eight units directly. By using the Incident Management System, the Incident Commander provides the strategic direction to the company officers working at the tactical

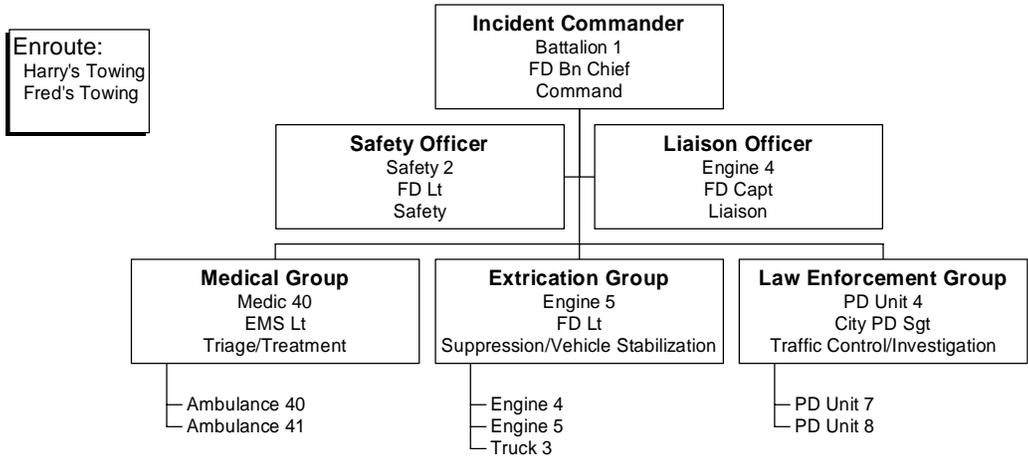
levels. The former company officers assigned as Group Supervisors report directly to the Incident Commander and supervise their assigned units.

The IMS puts resources into common management components to maximize the organizational effectiveness. Attempting to command too many units will dilute the IC's ability to effectively command any one of them. It is generally safe to limit one's span of control to between three and seven subordinates, with an optimum of five. This is only a guideline, since many factors determine the "command overload" limit. Extremely talented and experienced command officers with highly developed multi-tasking skills might be able to handle more, especially if subordinate units are also highly effective. Considering that the IC is often working with units from other organizations with unknown skill levels or other issues that demand attention, span of control is very important. ICs should understand and use IMS to maintain effective span of control.

### **The Reinforced Response to Highway Incidents**

As the incident progresses, and units progress towards completing their initial assigned tasks, Battalion 1, Truck 3, and the Safety Officer arrive on the scene, as well as a City PD Supervisor (PD Unit 4). The IC assigns Truck 3 to the Extrication Group, and the Safety Officer to his command staff. After briefing the Battalion Chief on the situation, Engine 4's Captain transfers Command to Battalion 1. The new IC then reassigns him as the Liaison Officer to interface with the Traffic Management Center, who has been in contact with Dispatch, concerned about the increasing traffic congestion due to the accident. The City PD Sgt is assigned as Law Enforcement Group Supervisor, and immediately requests two wreckers to remove the vehicles.

After these changes, the IMS structure appears as follows:



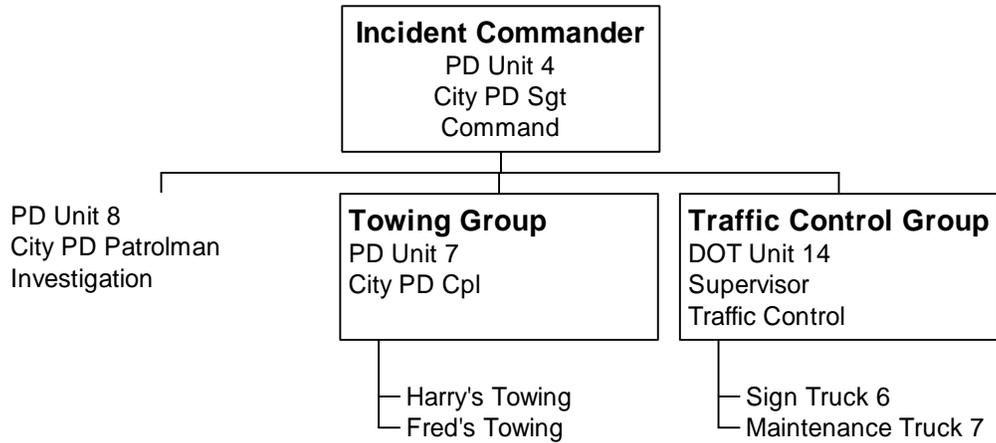
**Figure 45, Using Command Staff on a Highway Incident**

While doing his initial safety assessment of the scene, the Safety Officer determined that the traffic passing the scene was the primary hazard to the responders. He also noticed that the guide rail had suffered significant damage. The scene was protected; however he could see other problems building in the backup as drivers became frustrated while attempting to negotiate the blockage. Even though the PD units were handling the traffic, the building traffic congestion was beginning to stretch their capabilities. They alerted the Law Enforcement Group Supervisor that they needed additional units so that they could begin their investigation and prepare reports. He requested additional resources from the IC.

Upon checking with the Traffic Management Center (TMC), the Liaison Officer learned that the incident was beginning to cause major traffic problems along the arterial, with congestion now extending more than a mile in both directions. After checking with the IC, the Liaison Officer requested further assistance from the TMC. The TMC was advised by the County DOT that they were sending a maintenance truck, and a sign truck, along with a supervisor.

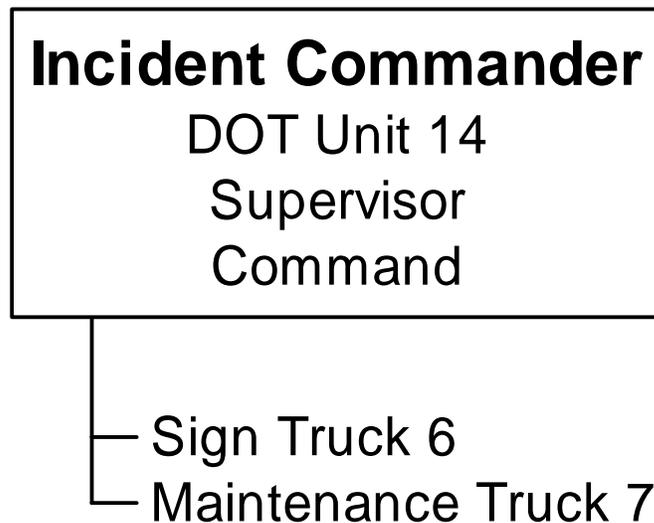
The Extrication Group was able to remove the trapped occupants. The reported injuries to the vehicle occupants were minor cuts, scrapes, and bruises, and all patients refused transport after being treated on the scene. Only a small amount of coolant and brake fluid leaked from the vehicles, and the Truck 3 crew covered the small pools with absorbent. At this point, the IC released the fire department resources. The IC (Battalion 1) then transferred Command to PD Unit 4.

After the wreckers and DOT vehicles arrived on the scene, the IMS organization was as follows.



**Figure 46, Reinforced Response from Traffic Management**

After waiting until Fred’s Towing finished loading the second vehicle, the scene was turned over to the DOT supervisor as the law enforcement units left the scene, resulting in the final implementation of IMS, which looked as follows:



**Figure 47, A Simple Traffic Control Incident**

The remaining units performed the repairs and dealt with the traffic congestion for two additional hours. When repairs were completed and traffic returned to near normal flow, the incident was terminated, and all remaining units were released.

**Larger and Longer Highway Incidents**

The following scenario demonstrates the application of IMS principles to larger and more complicated highway incidents.

A “Be on the Lookout” (BOLO) statewide broadcast identified two vehicles whose occupants overpowered the crew of an armored car making a cash pickup at a downtown department store shortly after closing. They were further identified as members of a street gang known for their hatred of the police. Automatic weapons were fired and what appeared to be grenades were used during the robbery. Several hostages were taken. Units from the Metro Major Crimes Task Force made a felony traffic stop of two suspected vehicles on the Interstate in response to the BOLO.

During the felony vehicle stop, gunfire was exchanged between Task Force units and the suspects and there were several crashes. Two officers, one suspect, and several motorists are reported injured. All suspects have been taken into custody, and all hostages have been accounted for. One person is trapped in a passing vehicle involved in one of the crashes. Law enforcement has secured the scene.

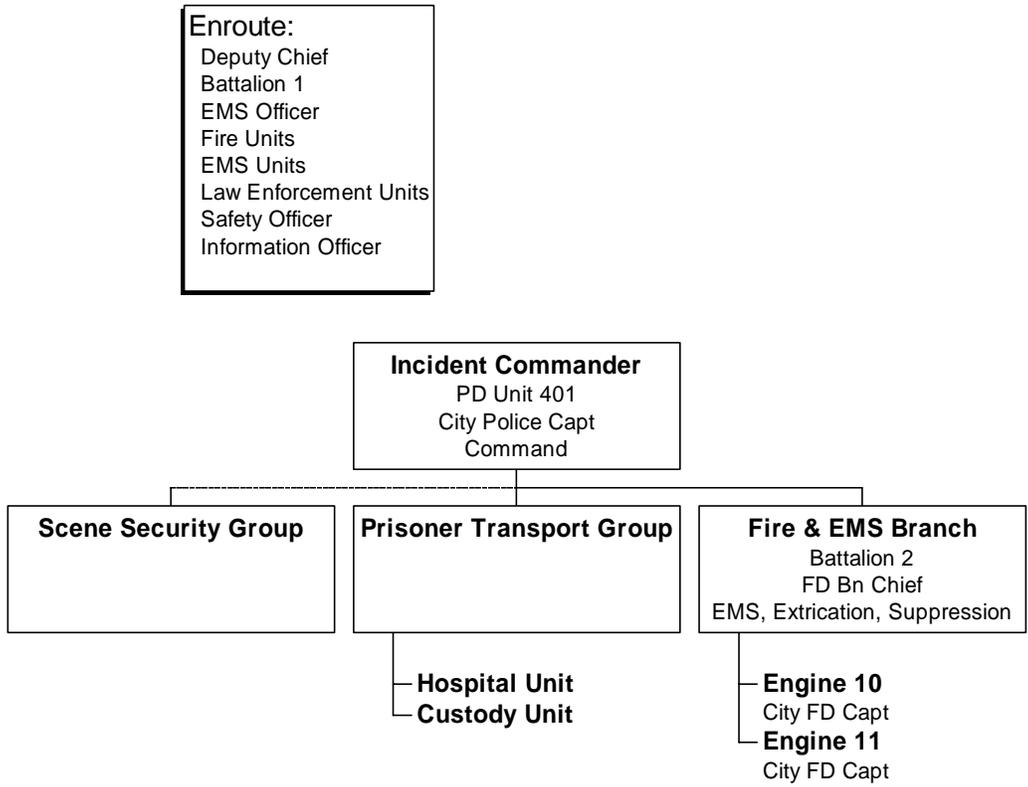
There are many law enforcement units on the scene and en route. PD Unit 401 has assumed Command and established a ICP at the scene. IC requested fire and EMS resources and establishes staging at the Sears parking lot. IC also directs on scene units to re-position vehicles to establish an ingress for emergency services for scene access.

The following units are dispatched on this incident:

Deputy Chief & Aide	EMS Officer 3
Battalions 1 & 2	Medics 4 & 5
Engines 10, 11, 12, 13	Ambulances 6, 7, 8, 9
Heavy Rescue 14	Safety Officer
Trucks 15, 16	Information Officer

Proceeding to the scene with his aide, Battalion 2 begins to assess the situation and reports to the ICP. The IC assigns Battalion 2 as the Fire & EMS Branch Director.

The IMS organization now appears as follows.



**Figure 48, Reinforcing a Law Enforcement Response**

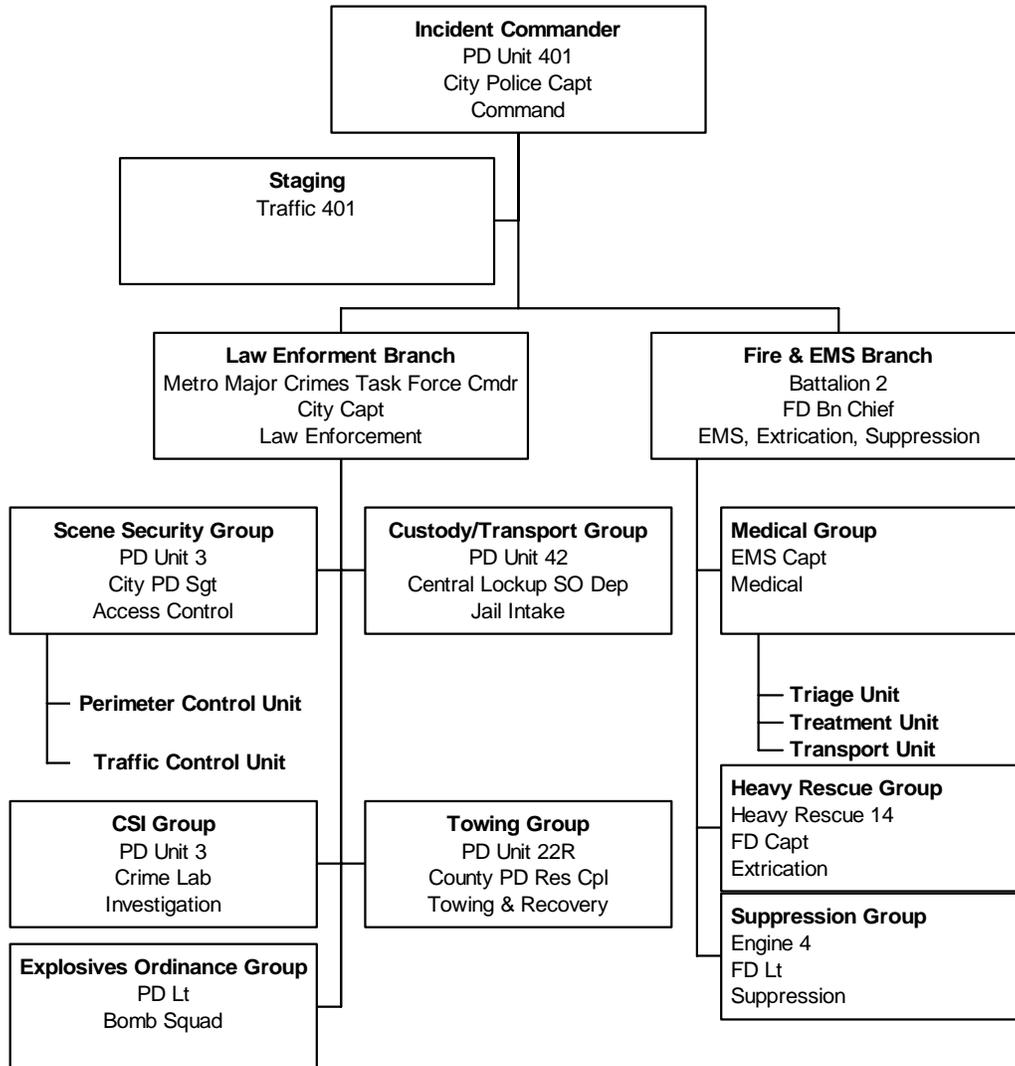
Note that the incident is still primarily a law enforcement incident, and that fire & rescue is providing support. This highway incident is being organized utilizing IMS. The framework for Battalion 2’s organization is being prepared for the rest of the fire and EMS resources.

Engine 12 establishes fire & EMS radio communications in Staging. The Branch Director directs the EMS Officer and the next available ALS Unit to respond, followed by Command Officers and Command Staff, and then the rest of the units. He assigns the EMS Officer as the EMS Group Supervisor. The IC detailed five law enforcement officers to the Fire Branch to serve as escorts. Acknowledging reports of massive traffic problems, the IC also requested an Interstate Traffic Control Task Force from Dispatch.

As units arrive, they report to Staging. The Fire & EMS Branch assigned a Medical Group to facilitate the treatment and transport of the patients, with Heavy Rescue 14 assigned to the extrication.

The IC began releasing unneeded units to clear the area. A perimeter was established, and access control was instituted.

At this point, the IC has begun to expand the IMS organization, which has now evolved into the following:

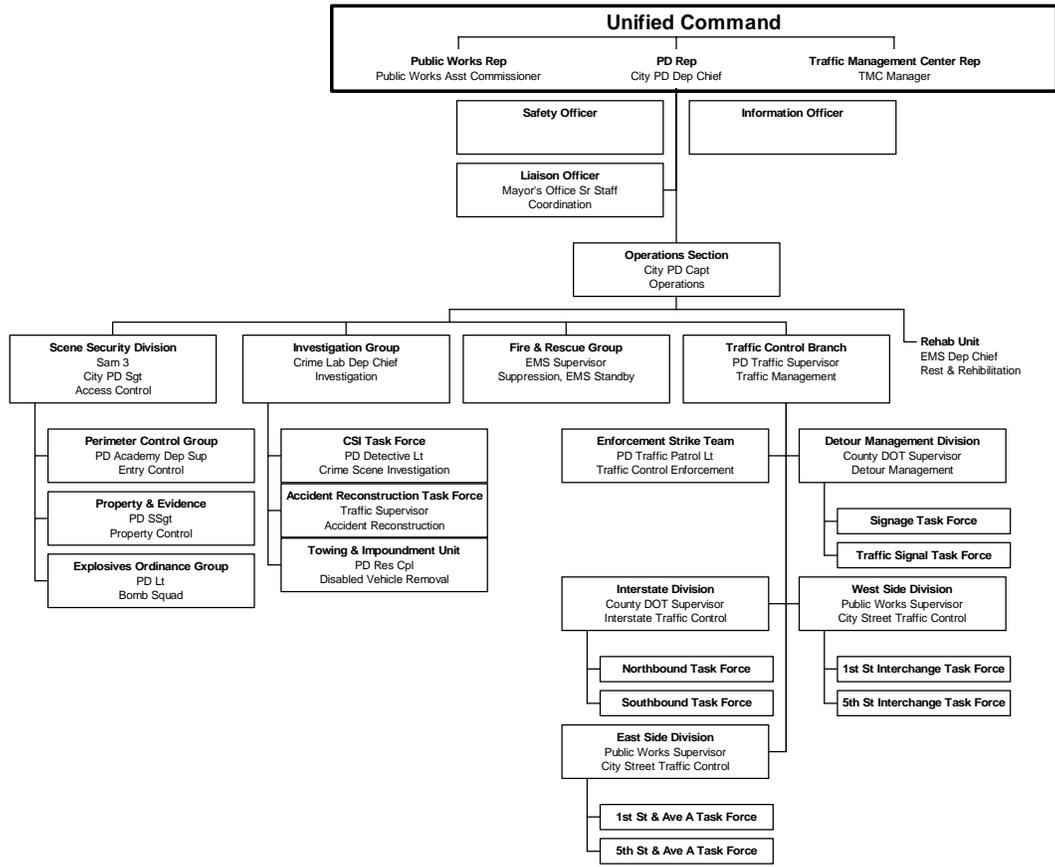


**Figure 49, Initial IMS Organization at a Large Highway Incident**

Injured motorists and responders were treated and transported. The perpetrators were taken into custody, treated, and transported to jail. All activities were completed related to extricating, treating, and transporting the patients and were managed under IMS. Guidance on how EMS incidents should be managed may be found in the *Model Procedures Guide for EMS Incidents*.

The crime scene investigation teams from area police departments were now occupied with the most time-consuming activity remaining to be completed at the incident. Since there was still some fire danger from leaking gasoline and oil from the crash vehicles, as well as risk of injury from sharp metal, some fire & rescue and EMS remained to monitor these hazards and provide treatment if needed. The roadway remained completely shut down, and traffic in the entire region was beginning to be seriously affected. Traffic management had become a

large problem, and traffic control measures were instituted over a wide area around the incident. Most of the area radio, television, and print media had learned of the incident, and a large crowd of reporters had converged on the scene. As the story spread, more and more spectators gathered at vantage points to see the action first-hand. At this point, the IMS organization looked like the following (the single resources have been omitted for clarity):



**Figure 50, Using Unified Command at a Large Highway Incident**

As the incident settles down to a more deliberate pace, roles and responsibilities shift to meet the changing needs of the incident. Senior management representatives from the several organizations involved in this high profile incident begin to arrive on the scene. Since all of their interests in the incident need to be addressed, they jointly established a Unified Command. Since law enforcement had the most immediate mission, they are retaining the lead role. The former incident commander assumed the role of Operations Section Chief, and the three senior organizational representatives commenced Unified Command.

The Operations Chief chose to divide his law enforcement work into two pieces, assigning responsibility for scene security to a division, and dedicating a group to the investigation. Fire & EMS were consolidated into a smaller group, and since

traffic management function had grown to a sizable effort, and it was elevated to branch level.

The primary activity claiming the attention of the Operations Section concerns the investigations being conducted by various PD units, however the traffic situation is becoming a major distraction to the Operations Section Chief.

Now, more than 45 minutes after the incident, serious traffic congestion has spread through a large region. Intense pressure is being brought to bear on Incident Management as City and County Government officials and the 9-1-1 call center are deluged with complaint calls from travelers. After consultation with DOT, Public Works, the Safety Officer, and the Traffic Management Branch, a two-prong traffic management strategy was adopted:

- detour as much traffic around the incident and through city arterial streets as possible; and
- open a single lane on the interstate past the scene.

Sergeant Krupke’s Traffic Management Branch was organized as follows to handle this tasking:

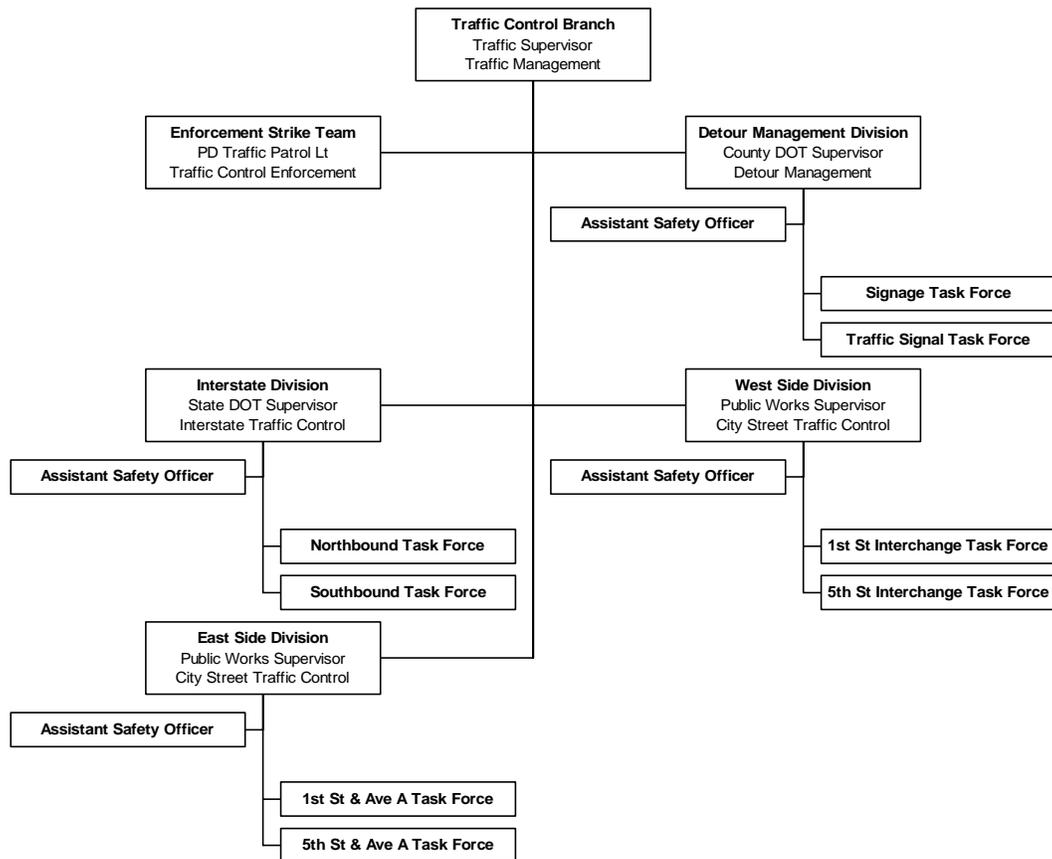


Figure 51, An Example Traffic Management Branch Organization





# CHAPTER 8

## HIGHWAY IMS APPLICATIONS

The following scenarios were adapted from material found in the Incident Command System National Training Curriculum, Scenario and Incident Action Plan Catalog, October 1994, available through the National Wildfire Coordinating Group, National Interagency Fire Center, Publications Management System, Boise, ID. They are also available on the internet, through <http://www.nwcg.gov/>.

The correspondence between each of the following scenarios and the NWCG publication is indicated following each of the scenario titles.



## THREE-CAR MOTOR VEHICLE ACCIDENT

### Situation

A three-car accident occurs in the outside (right shoulder) lane of a six-lane divided highway, 100 yards past an off-ramp. Only that lane is blocked by the vehicles. Time of day 10:00 AM.

The driver in one of the cars is trapped and injured. Another of the involved vehicles has a minor gasoline leak.

### Conditions

The weather is sunny with mild wind, 72 degrees (F). Traffic is light and moving past the incident at approximately 10 mph. A backup is slowly building behind the blockage.

### Problems

- Scene safety.
- Fuel leak control.
- Extrication.
- Medical treatment.
- Traffic incident investigation.
- Facilitate the safe flow of traffic past the accident.
- Remove damaged vehicles and debris from the roadway.
- Restore the roadway to normal operation.

### Solutions.

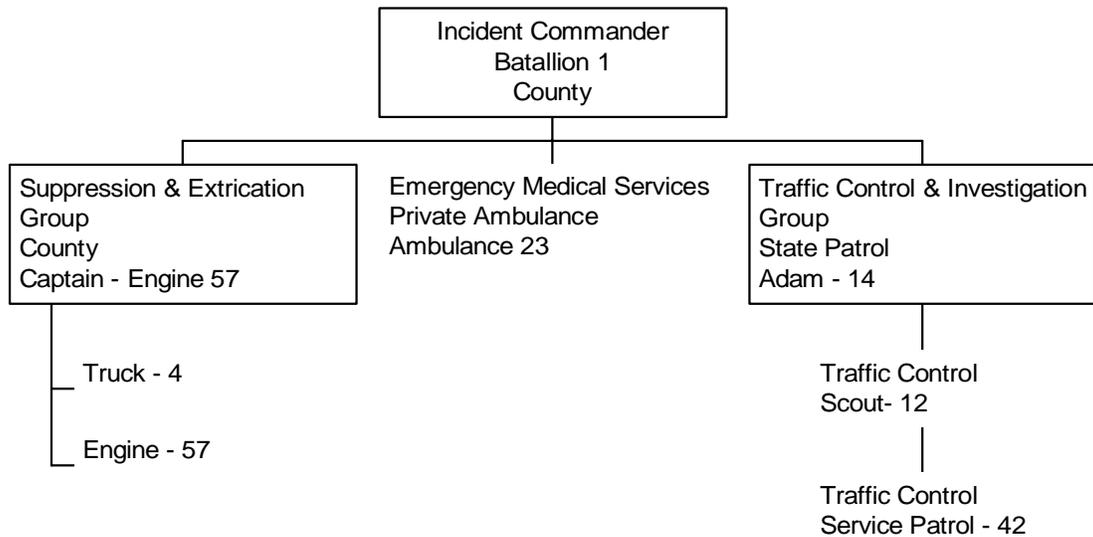
- Notification to law enforcement, fire, EMS for primary response.
- Establish IMS.
- Notification to traffic management for traffic control & motorist information.
- Notification to towing & recovery for vehicle removal.

**Actions** (Not necessarily in order of priority – activities may be conducted simultaneously.)

- Deploy a protection line.
- Establish temporary traffic control.
- Mitigate fuel leak.
- Perform extrication.
- Treat & transport patients.
- Conduct investigation.
- Remove vehicles.
- Attempt to maintain traffic flow around the incident.

**Traffic-Related Considerations.**

- Restore the roadway as soon as practical.
- Congestion on local roadways.
- Rerouting of traffic via off/on ramps.
- Reduction of risk of secondary crashes.
- Public information.



**Figure 52, IMS Organization, 3-Car Motor Vehicle Accident**

**Responding Resources**

Battalion 1

Engine 57

Truck 4

Ambulance 23

Adam – 14

Scout – 12

Service Patrol - 42

## NATURAL DISASTERS, WINTER STORM (A.5.)



**Figure 53, Winter Storm Situation Map**

### **Situation:**

It is 1130 Monday, January 10. Your City and a large part of the surrounding County are 24 hours into a major winter storm. Current snow depth in the City is slightly over a foot of snow on the level. High winds are causing drifting throughout the City and areas of the County to the east. The drifting snow is blocking roads everywhere, including City and County major arterials and collector streets within the City. Areas of the County west of the City are experiencing mixed snow and rain, with winds not causing any major problems. Higher elevations 25 miles to the west (still within the County) are experiencing snow fall at the rate of 1/2 inch every three hours, with a current accumulation of approximately 10 inches.

Snow accumulations have restricted transit service by the County Transit District to snow and ice routes within the City. The City's Police and Fire Departments are having trouble responding to calls due to snow and slick roads.

Neither the City nor the County has been able to keep up with snow removal. The County has had to close three major arterials in the northern part of the City due to severe drifting.

As required by your City and County Emergency Operations Plans, the City Manager and the County Executive Officer have established a unified command organization operating out of the City Emergency Operations Center. They have appointed you as Day Operations Section Chief, with the County Public Works Director as your deputy and Night Operations Section Chief.

**Strategic Goals:**

- Provide for safety of responders
- Maintain heavy traffic routes and access to emergency service facilities, including fire, police, and contract ambulance stations.
- Maintain access to the hospital, nursing homes, Red Cross shelters, and other sensitive facilities.
- Maintain the Transit District snow and ice routes and access to the bus stops.

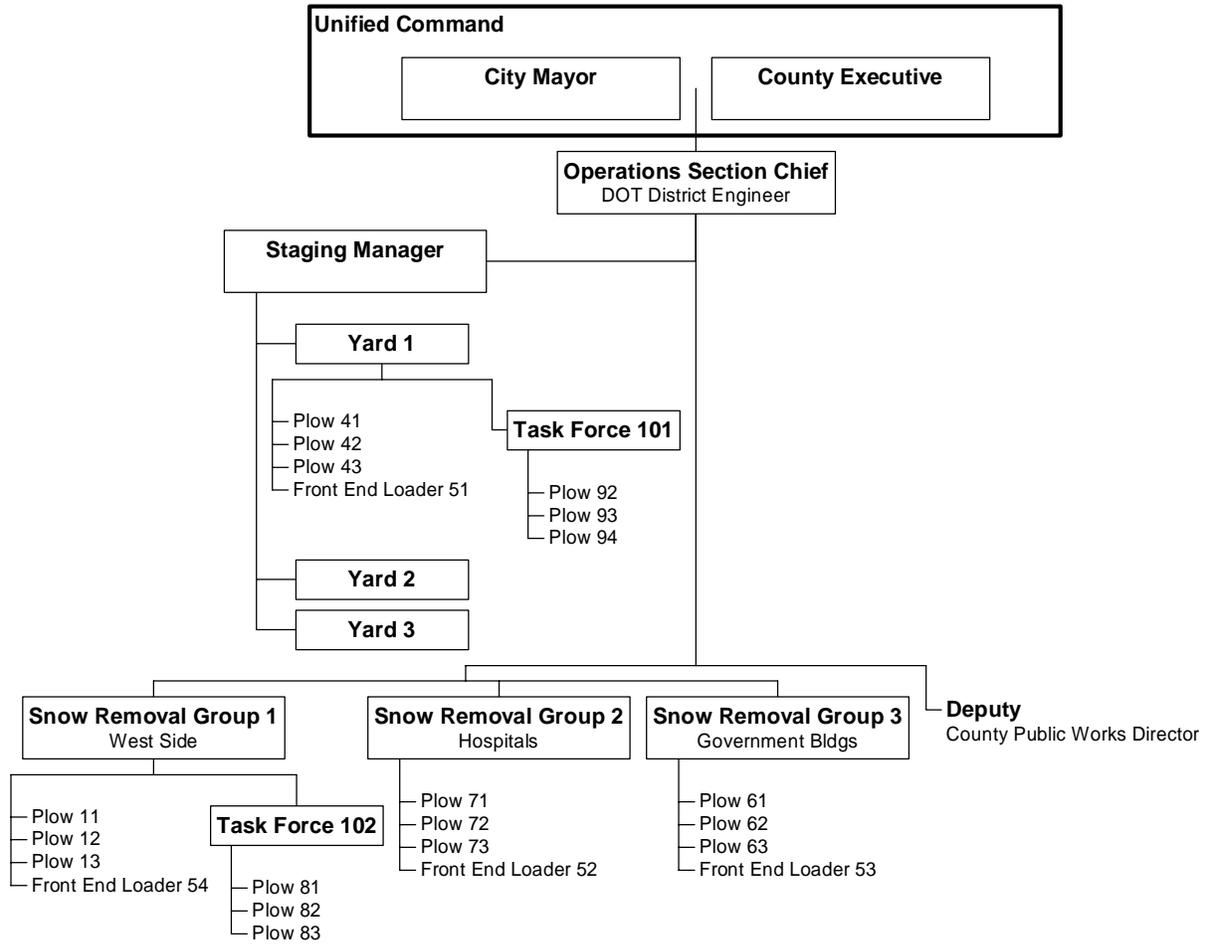


Figure 54, Winter Storm IMS Organization



## HUMAN CAUSED DISASTERS, BRIDGE ACCIDENT (B.6.)

### Situation:

A rush hour collision occurs on the eastbound side of the Hillsdale Bridge over Old River Road between a commuter bus and a delivery truck carrying paint. The force of the impact sends the truck into a nearby bridge support, killing the driver. Due to the accident, all traffic comes to a complete standstill in both directions.

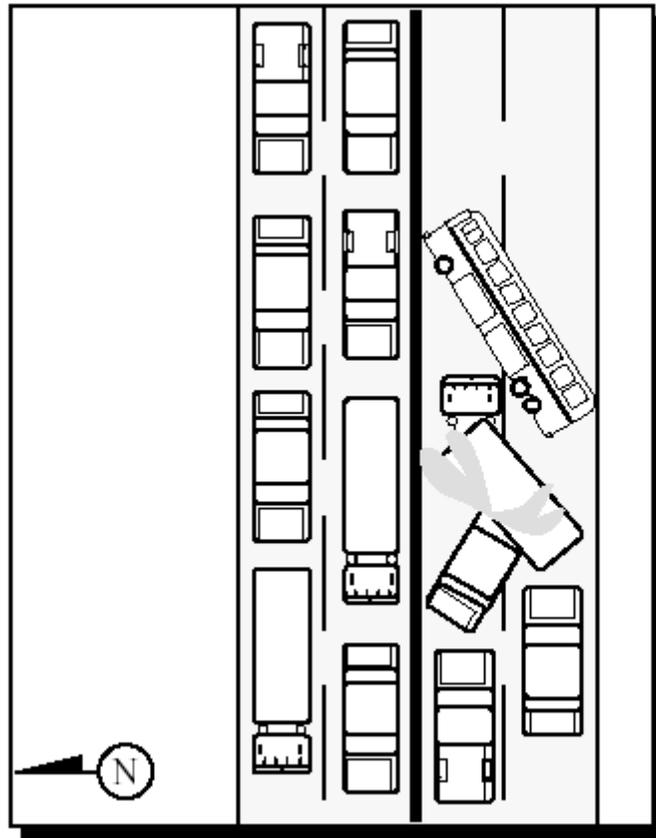


Figure 55, Bridge Accident Situation Map

### Conditions:

The weather is cold and rainy with heavy, thick fog. Local temperature is approximately 45 degrees F. The wind is from the west at 15-20 mph. The bridge,

which connects Largeville with Hugeburg, is one mile long, and has four lanes (two in each direction).

**Problem:**

The bus contains 25 commuters of which those seated in the first six rows (eight people) are all seriously injured. The remaining passengers are slightly injured. The bus driver will require extrication from the bus as will several of the forward seated passengers. Throughout the incident, paint spills from the damaged delivery truck flowing onto the opposing lanes of traffic causing a severe slippage problem. Police & Fire from both towns as well as bridge police are responding but are having difficulty getting through the gridlock.

**Potential Hazards:**

- Possible structural integrity problems with bridge
- Toxic fumes from paint
- Explosion
- Additional accidents due to road conditions

**Resources:****Police:**

- Local PD      3 Marked Units
- State PD      2 Marked units

**Fire:**

- Local Fire Engine Companies
- 1 Hazmat Company
- 1 Rescue Company

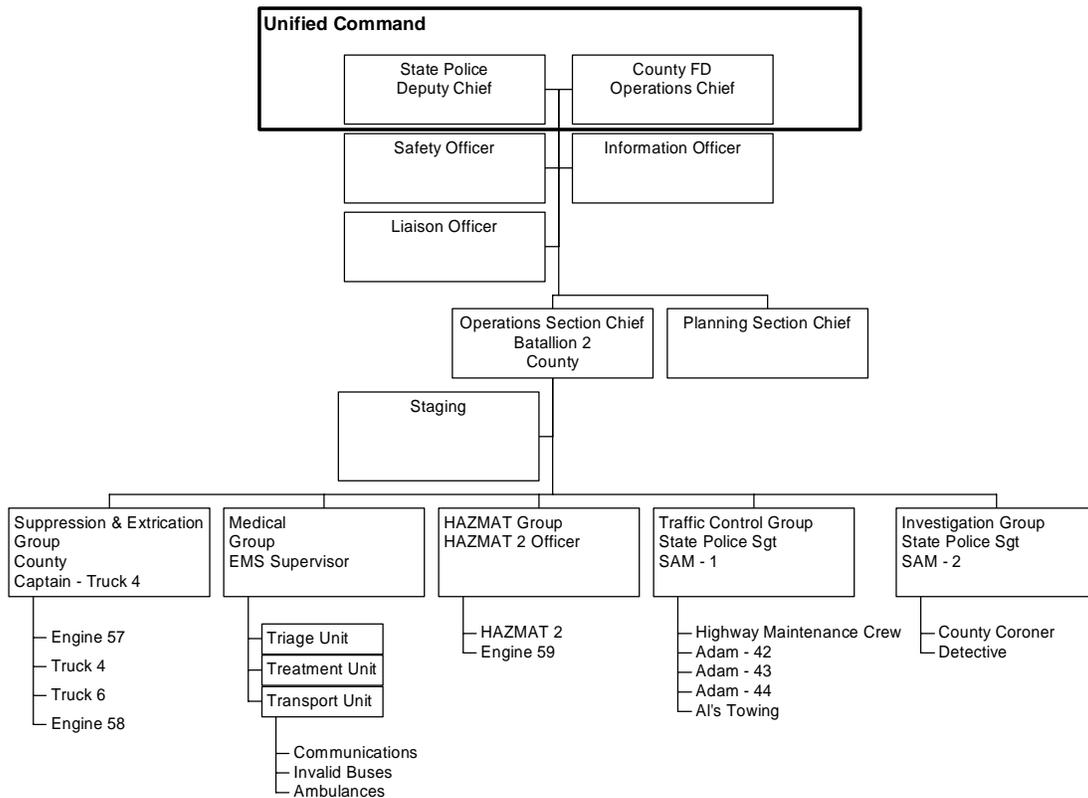
**EMS:**

- 7 BLS units
- 1 ALS transport units
- 3 ALS non-transport units
- 1 EMS Supervisor
- 8 Off Duty BLS personnel

**Misc:**

- Bridge Engineering Team
- Highway Maintenance Crew
- Al's Towing

Depending upon circumstances, this IMS organization could be assembled as a single command or unified command:



**Figure 56, Bridge Accident IMS Organization**

**Problems**

Scene safety.

HAZMAT spill.

Extrication.

Medical treatment.

Fatality.

Traffic incident investigation.

Facilitate the safe flow of traffic past the accident.

Remove damaged vehicles and debris from the roadway.

Restore the roadway to normal operation.

**Solutions.**

Notification to law enforcement, fire, EMS for primary response.

Establish IMS.

Notification to traffic management for traffic control & motorist information.

Notification to towing & recovery for vehicle removal.

**Actions** (Not necessarily in order of priority – activities may be conducted simultaneously.)

Deploy a protection line.

Establish temporary traffic control.

Mitigate paint spill.

Perform extrication.

Treat & transport patients.

Conduct investigation.

Remove vehicles.

Engineering evaluation of bridge structure.

Restore roadway.

**Traffic-Related Considerations.**

Open the roadway as soon as practical.

Congestion on local roadways.

Rerouting of traffic.

Reduction of risk of secondary crashes.

Public information.



## PLANNED EVENT, PARADE AND CEREMONY (D.2.)

Your town/community will be hosting a parade and ceremony to honor the service men and women veterans of Operation Desert Storm with an attendance of over 40,000 people. Planning for this event will start in the mayor's office. Meetings will be held by department heads and organizations in the community. Other organizations, agencies and the utilization of mutual aid agreements will be used for this event which will receive national publicity.

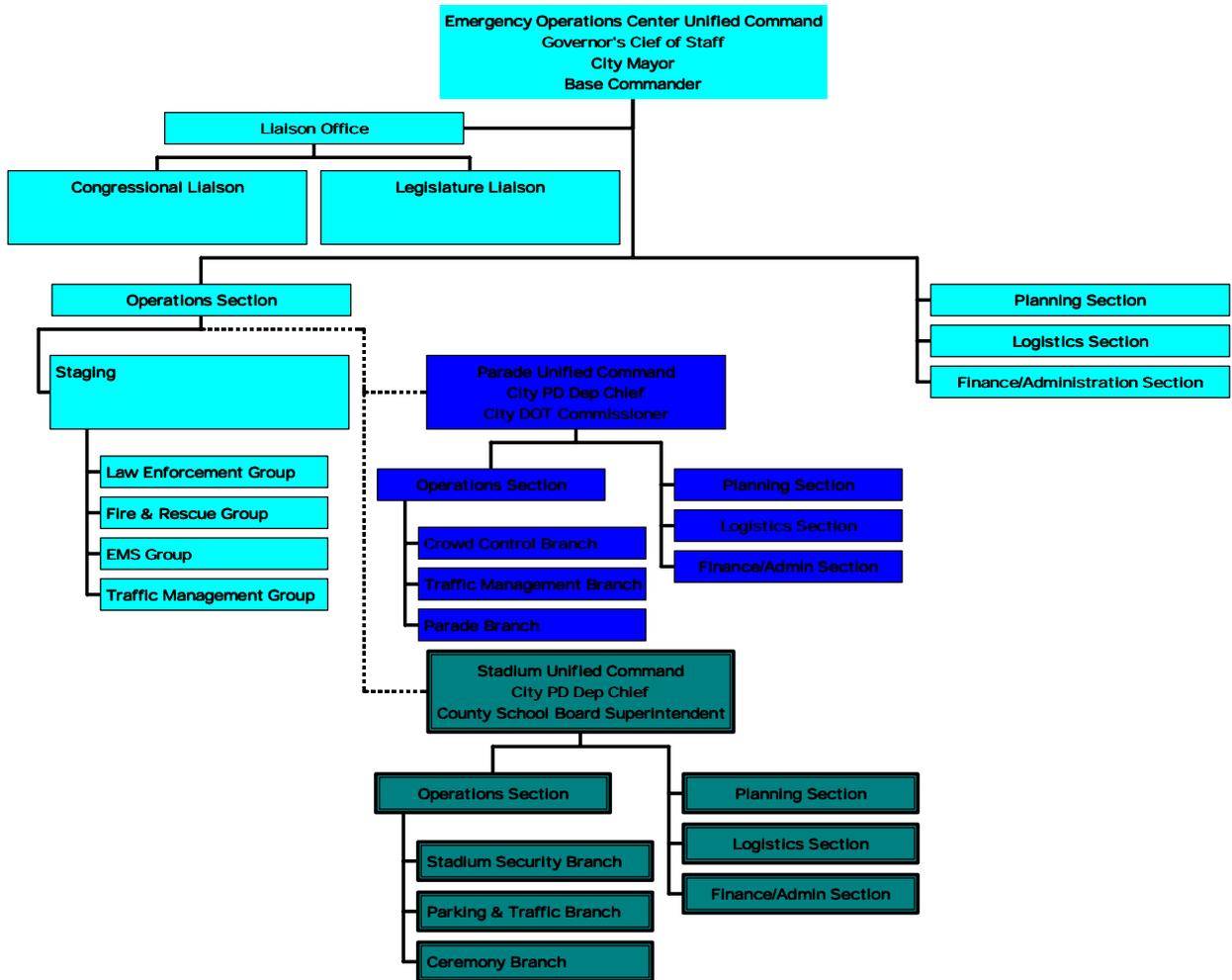
An estimated 50,000 people will be attending the parade and ceremony at the high school football stadium. All principle players and coordinators were briefed. Radio frequencies and assignments were given out. The EOC was activated to coordinate the event. The attendees include local war veterans, Governor of New Jersey, U.S, Senators, U.S, House of Representatives, and State Senators and Representatives.

The following concerns and needs must be addressed when developing an IMS organization flow chart

- Emergency Management/liaison and EOC
- Intelligence/Planning
- Video/Photo and Public Information
- Food and Cafeteria
- Radio Communications
- Parade Route
- Traffic
- Parking
- Staging
- Shuttles
- Towing
- Site, Security
- Crowd Security
- High School Security
- High School Parking
- Foot Patrol
- Mounted Patrol
- Security for Dignitaries
- Dignitary protection
- Secure Area
- Escorts
- Protestors

The following agencies will be involved in this event and will contribute resources

- Local Law Enforcement Agencies
- County Sheriffs Department
- State Police
- Area EMS (ALS and BLS)
- Area Fire Departments
- American Red Cross
- Public Works Local and County
- State, County, City DOTs



**Figure 57, IMS Organizations - Major Planned Event**

Figure 57 shows one possible way to organize this planned event, shown as a snapshot view of the upper echelons just prior to the start of the parade. The City EOC was set up as an Area Command, organized along IMS Unified Command guidelines. The EOC Operations Chief established a pool of emergency services reserve resources under a Staging Manager, to provide

on-call reinforcement support to incident commanders in the field. Two special field incidents were established, each using Unified Command, one for the parade, and one for the stadium event. The Parade Incident Command's Operational Section Chief might have chosen to organize its operational activities using separate branches, one for Crowd Control, one for Traffic Management, and one for the conduct of the parade itself.

Note that the character and makeup of these organizations would probably change significantly as the events unfolded during the day. With the parade ending and the stadium activities beginning, a significant amount of resources could be shifted to the stadium and the parade incident terminated. Again, at the conclusion of the stadium events, perhaps a new IMS organization could be formed using elements of the Traffic Management Branch of the parade IMS organization to manage the mass exodus. Finally, as things return to normal, the EOC would be deactivated, and only a few Traffic Management remnants would deactivate the traffic controls, and restore the traffic network to normal operations.



## **POSSIBLE TERRORIST ACT ON AN INTERSTATE HWY**

### **Situation:**

Saturday, 1400 hrs, at the intersection of the I 10 Freeway and the State Highway 138 overpass, a rental truck parked just before the Hwy 138 overpass in a turnout on the shoulder of the northbound I 10 exploded, causing numerous vehicles in the northbound lanes to collide. The northbound lanes are completely blocked and the southbound lanes are barely moving.

As first responding units start to arrive on scene reports of suspicious circumstances related to this incident come into the County Sheriff's Department. Several passing motorists reported that shortly before the truck exploded, men were seen to park the rental truck and run to a waiting dark sedan, which sped away.

By the time 911 calls start to come in there are approximately 10 cars involved in collisions in the northbound lanes with 20 victims with injuries ranging from minor to major. Three victims in two cars will need to be extricated. There are no known fatalities at this time. The explosion has started a small brush fire next to the turnout on county property. The fire has the potential of spreading to nearby State and National Forest land.

### **Conditions:**

The weather is sunny, hot, and clear. Local temperature is 85 degrees. The wind is from the NE at 10-15 mph although could pick up in the late afternoon. Sunset is at 1945 hrs.

### **Problems:**

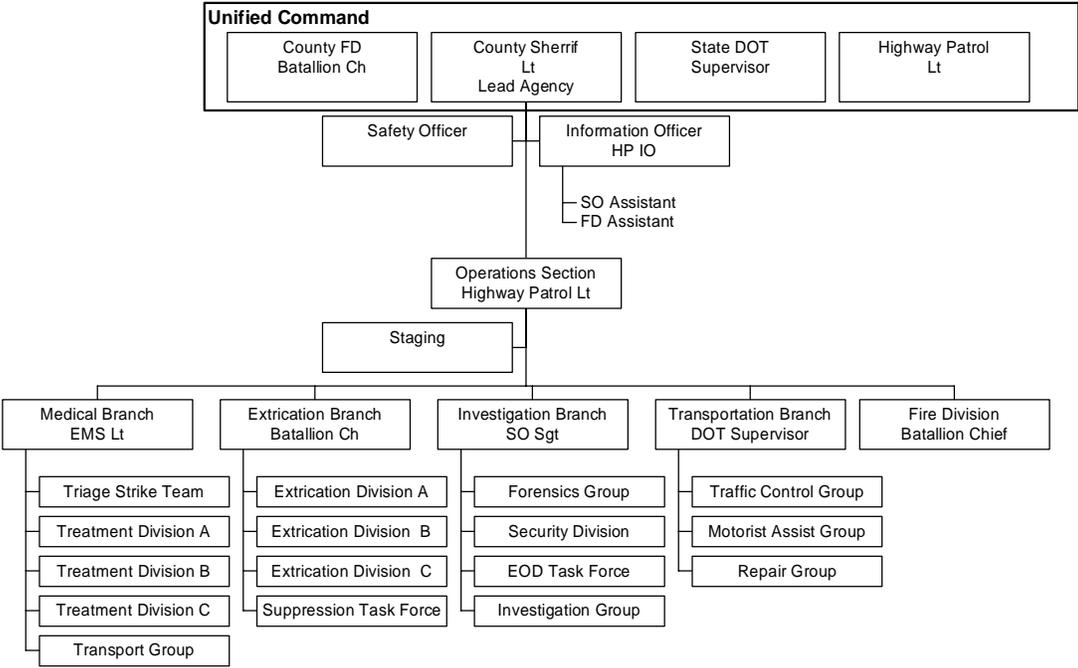
The incident area needs to be treated as a crime scene. There are numerous injured victims, with some entrapped. A small but growing brush fire will soon impact other jurisdictions. Law Enforcement, Fire, EMS and other resources are responding but are having difficulty because of the gridlock.

**Potential Hazards:**

- Additional possible terrorist incidents
- Possible attacks on responders
- Unknown chemical, biological, or nuclear hazards.
- Emergency response through blocked highways
- Secondary crashes and other incidents involving blocked traffic
- Possible wildfire
- Communication overload and failure (voice and data, radio and cellular telephone)

**Resources:**

When the County Sheriff’s Office supervisor arrived on scene and joined the Unified Command as the lead agency representative, considerable resources had responded and had been organized by the Highway Patrol Lt who had served as the initial Incident Commander:



**Figure 58, Terrorist Incident IMS Organization**

**Law Enforcement:****Highway Patrol (Original jurisdiction on the highway)**

Lt.	6 patrol officers
2 Sgts.	Information Officer

**County Sheriff's Dept. (Terrorist investigation jurisdiction, in support of the FBI)**

Lt.	8 one patrol deputies
Sgt.	2 Scientific Investigators
4 Detectives	Information Officer
Bomb Sqd. (crew of 4)	

**US Forest Service Law Enforcement**

2 officers

**FBI**

Two special agents

**Fish & Game**

One officer

**Fire:****County Fire Dept.**

2 Battalion Chiefs	1 heavy rescue
6 engines	Information Officer
2 trucks	

**State Dept. of Forestry**

1 brush patrol

**US Forest Service**

1 brush patrol

**EMS:****County EMS**

- 2 EMS Supervisors
- 5 ALS Ambulances

**Commercial (County Contract) Ambulance Service**

- 10 BLS Ambulances

**Volunteer Ambulance Service**

- 10 BLS Ambulances

**State DOT:**

2 Supervisors

2 Service Patrol units

Construction equipment from nearby large  
highway project

4 Traffic Control crews

5 Highway Repair crews

# HAZARDOUS MATERIALS INCIDENTS, TRACTOR AMMONIA SPILL (E.5.)

Situation:

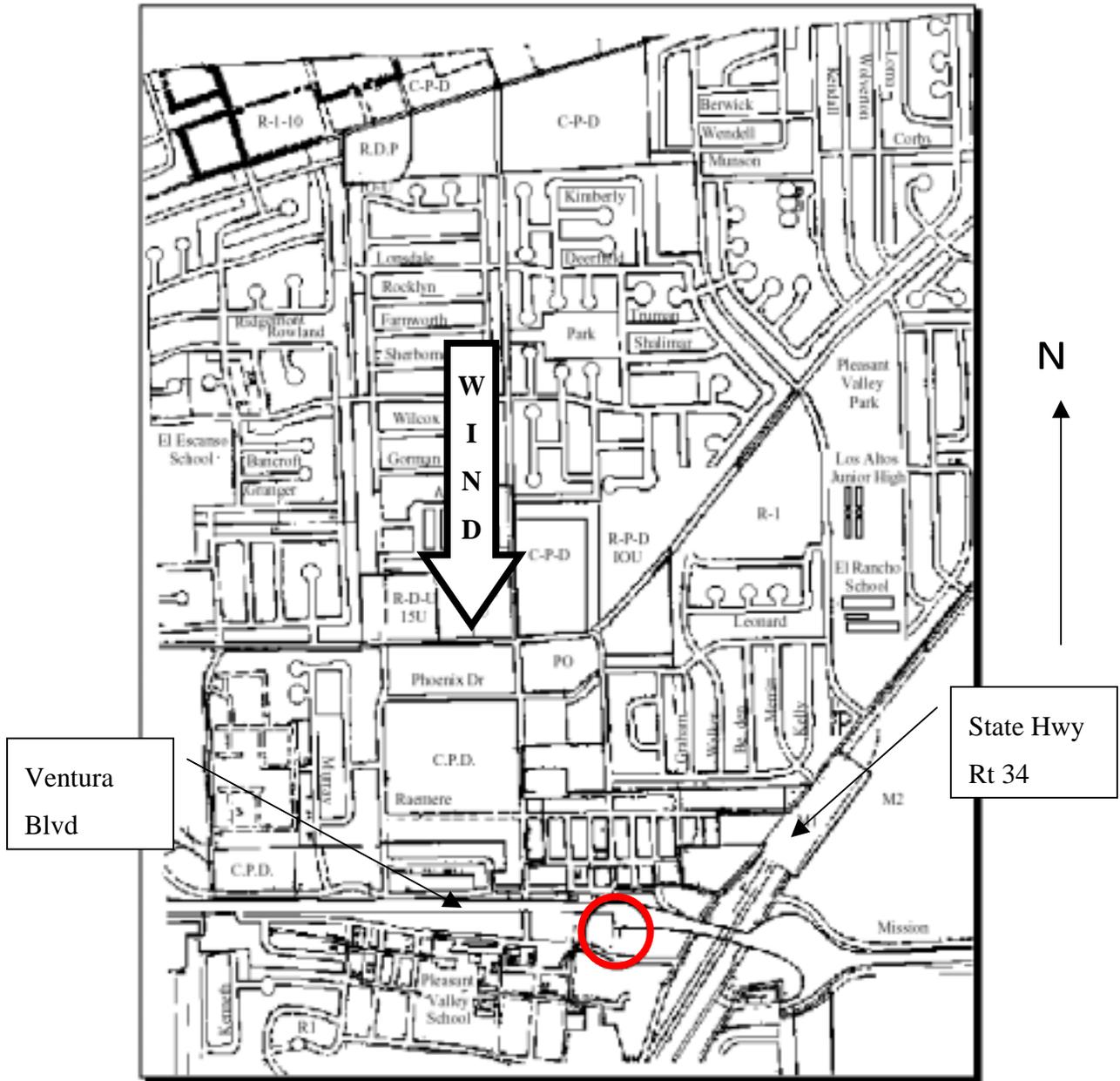


Figure 59, Ammonia Spill Scenario Map

An accident involving a tractor transport carrying gasoline in an aluminum tank trailer occurs on a city surface street (four-lane asphalt undivided city street with storm drains that lead directly to the oceanfront) ammonia is leaking at approximately 5 gallons per minute. The event will cause the freeway to be shut down in both directions. Multiple City, County, State, and Federal agencies will converge on the scene.

**Situation Description:**

A tractor-trailer carrying ammonia traveling west on Ventura Blvd. one block west of State Highway 34 is struck by an eastbound gravel truck.

The ammonia tanker overturns and begins to leak, venting fumes into the air. Several persons are injured in attempting to rescue the driver, who is trapped and screaming for help.

As a result of this accident both east and westbound traffic on Ventura Blvd. is immediately blocked. Also North and South traffic on St. Highway 34 is heavily congested. The students at Pleasant Valley Elementary School were at recess, and the teachers are holding them in classrooms after hearing of the accident, awaiting instructions from authorities.

As traffic in both directions on the boulevard halts, drivers of lead vehicles attempt to offer aid. Other callers to 9-1-1 report that the driver of the gravel truck is not responsive. Others then run back in both the east and west directions warning other drivers and business owners along the boulevard of the ammonia spill. Drivers within the first few hundred feet leave their vehicles and proceed to a safe distance to observe.

**Environmental Factors:**

**Date/Time:**

Wednesday, at 1:05 p.m.

**Weather:**

A low pressure system has been moving on shore during the morning with light rain showers expected by sundown. The sky is overcast, temperature 66 degrees, humidity 83 percent and winds from the North at 3-5 miles per hour. It was not raining at the time of the accident.

## **Traffic:**

Moderate traffic on boulevard in both directions.

## **Response Unit Locations:**

- State Trooper - Unit eastbound 1 mile from scene
- City Police - At Police Headquarters 1/2 mile west
- Fire - At station 54 1/4 mile west

There are multiple calls on 911 within 1-2 minutes of the accident. Fire and City police arrive on scene within 3-5 minutes. The State Trooper arrives within 7 minutes and Co. Environmental Health and County Highway units within 20 minutes.

## **Problems**

- Possible evacuation & Scene safety.
- HAZMAT spill issues (e.g., environmental protection, off-loading, mitigation, , perimeter control)
- Extrication.
- Medical treatment.
- Traffic incident investigation.
- Redirect traffic around the incident.
- Remove damaged vehicles and debris from the roadway.
- Restore the roadway to normal operation.

## **Solutions.**

- Establish IMS.
- Notification to law enforcement, fire, EMS for primary response.
- Notification to EPA, Coast Guard, Fish & Wildlife
- Commercial hazmat mitigation services.
- Notification to traffic management for traffic control & motorist information.

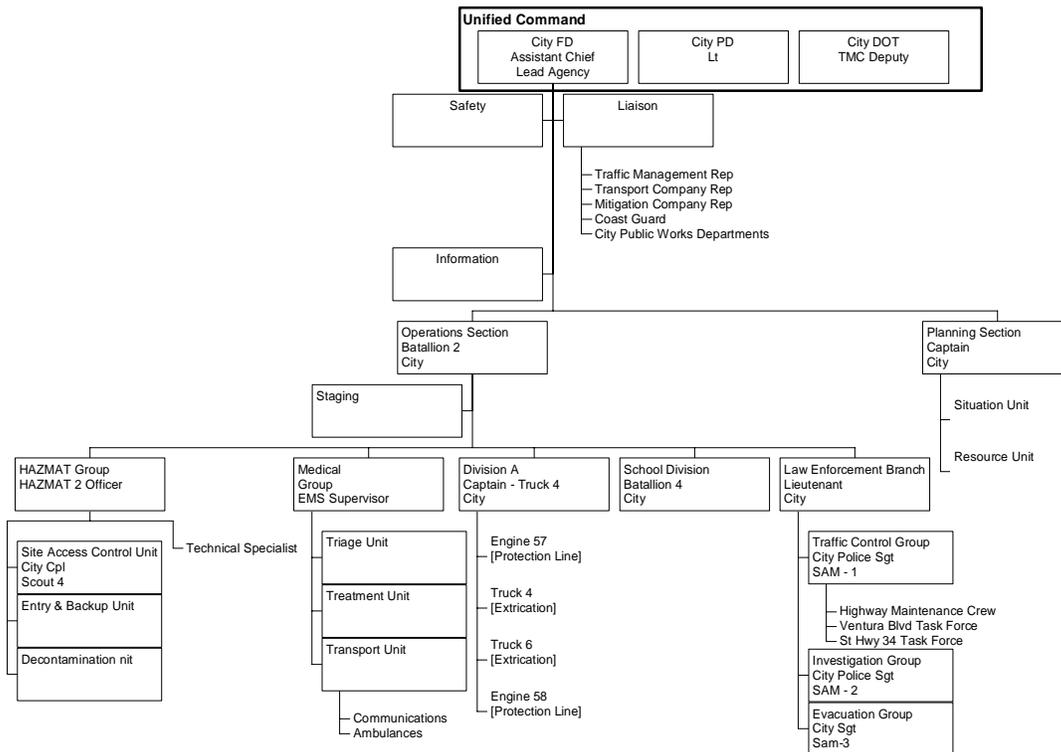
- Notification to towing & recovery for truck removal.

**Actions** (Not necessarily in order of priority – activities may be conducted simultaneously.)

- Deploy protection lines.
- Establish temporary traffic control.
- Mitigate ammonia spill.
- Air monitoring.
- Perform extrication.
- Treat & transport patients.
- Conduct investigation.
- Remove the trucks.
- Restore roadway.

**Traffic-Related Considerations.**

- Open the roadway as soon as practical when safe to do so.
- Congestion on local roadways.
- Rerouting of traffic.
- Reduction of risk of secondary crashes.
- Public information.







# APPENDIX A.

## Glossary of Terms

**The following terms are used in this Guide with the meanings shown below. These are generic terms, and the authors of this document have made no attempt to resolve the similarities and differences between the many definitions appearing in state and local statutes and ordinances. Readers are cautioned to verify the applicability of material in this guide to their local situation.**

**Authority Having Jurisdiction.** The organization, office, or individual responsible for approving equipment, an installation, or a procedure.

**Jurisdiction.** The jurisdiction of a response organization is defined by the boundaries of its operating area and by the function of the organization. The authority and jurisdiction of an organization are defined under law, and are usually formally expressed in a charter or contract that is legally enforceable. Response organizations operate “under color of law.”

**Emergency Vehicle.** An emergency vehicle is defined by the Authority Having Jurisdiction, and usually codified in statutes and ordinances. Commonly, fire & rescue apparatus, law enforcement vehicles, and ambulances are regarded as emergency vehicles.

**Responder.** An individual, together with the resources under his immediate control, that responds to a call for service on the highway. A responder, in order to be distinguished from members of the general public, must be qualified and authorized to provide requested services, and capable of providing those services at the incident.

**Shadow Vehicle.** Commonly used to trail moving highway maintenance and repair work, shadow vehicles warn oncoming motorists of upcoming work zone activity. They are usually large vehicles, such as dump trucks, equipped with crash attenuators, warning lights and rotating

beacons, and signs. They are positioned upstream of the work zone, interposed between oncoming traffic and the work zone.

The following definitions apply to the Model Rules of Engagement (See CHAPTER 6):

“**WILL**” implies a willingness to act, while “**WILL NOT**” implies a reluctance to act. Both are guidance to the Incident Commander regarding accepted standards of operational practice. Neither imply compulsory direction to the Incident Commander.

“**MAY**” implies that an optional action would meet standards of operational practice. It is intended to guide, but not to compel, the consideration of a particular course of action by the Incident Commander.

“**Risking lives a lot**” implies mounting an extraordinary effort with extreme urgency, and with a likelihood of injury or death.

“**Risking lives only a little**” implies mounting a best effort with a deliberate, considered approach, and with a low likelihood of injury, and little likelihood of death.

“**Not risk lives at all**” implies refusing to act in a particular manner, due to an unacceptable risk of injury or death.

“**Endeavor to consider**” implies a good faith attempt to contemplate mounting a particular effort, after other matters of higher importance have been addressed.

“**Savable**” considers the likelihood of rescue and survival of a patient, in the judgment of the Incident Commander.

“**Preventable**” considers the likelihood of occurrence of the risk and the likelihood of the effectiveness of preventative actions, in the judgment of the Incident Commander.

“**Salvageable**” considers the likelihood of recovery of property in a usable condition, in the judgment of the Incident Commander.

“**Lives**” are human lives, not animals’ lives, and not pets’ lives.

“**Property**” includes animals and inanimate objects, and includes evidence.

“**Needs of others in the vicinity**” encompasses residents, motorists, and others engaged in unrelated activities that may be affected by incident operations.





**APPENDIX B.**  
**HIGHWAY INCIDENT WORK SHEETS**



**There are many possible forms of incident worksheets. The examples shown in this Appendix are the more generic forms used in FIREScope, and are meant to show typical worksheet organization, layout, and content.**

While there have been many specialized worksheets and forms developed for other emergency services applications, such as for structural firefighting, crime scene investigation, and patient care, the authors of this guide are not aware of any multi-disciplinary highway incident worksheets in wide use. Should highway response communities choose to develop standardized worksheets for use at highway incidents, please forward copies to the publisher of this guide for possible inclusion in future editions.

When developing such worksheets, it is suggested that the following guidelines be used:

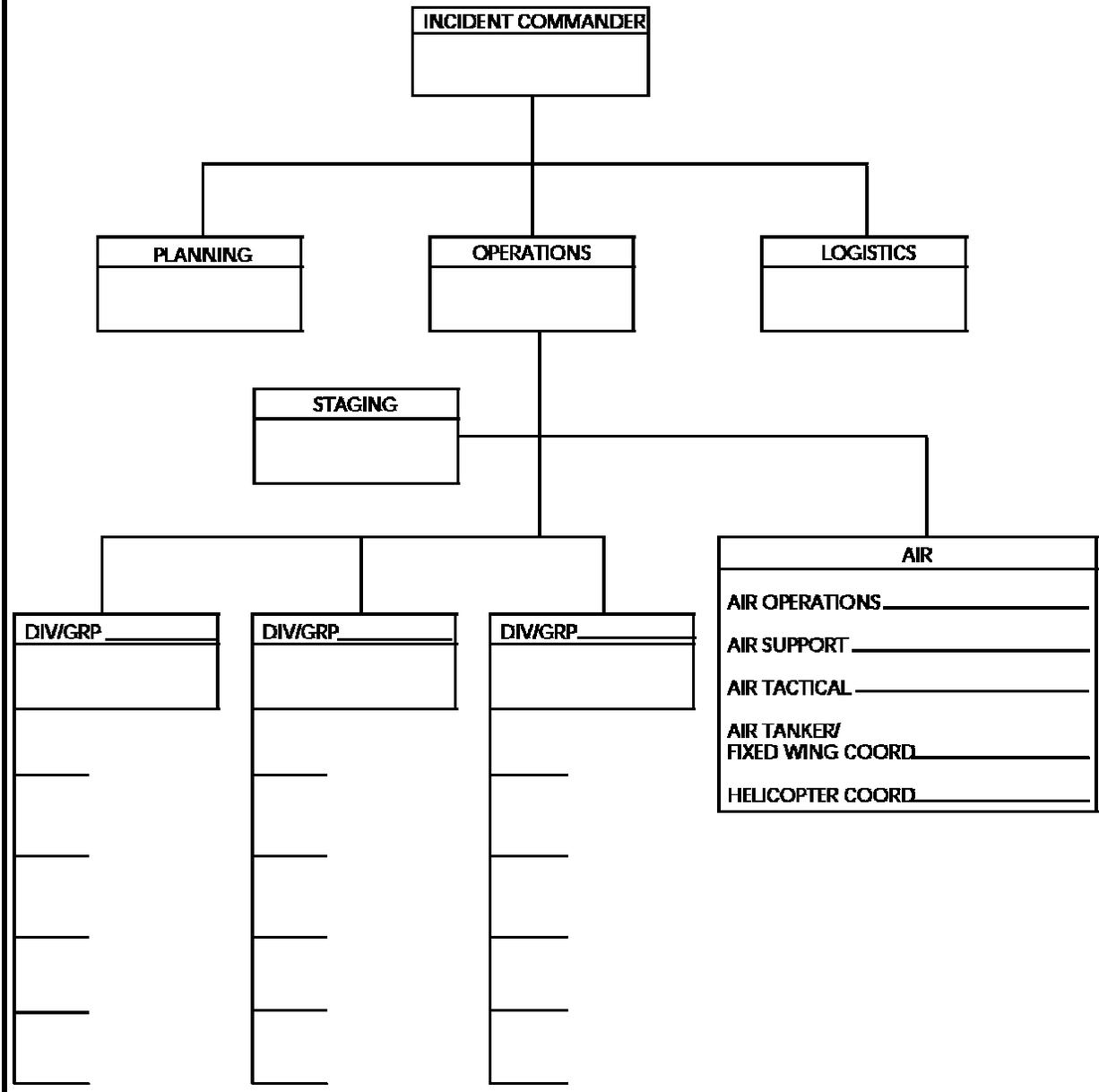
1. Standardize their use throughout the highway incident response community. Design them to be usable by all agencies and all professions responding to incidents on the highway.
2. Synchronize worksheet content with existing information systems that provide source information, such as those that manage calls for service. Synchronize worksheet content with existing information systems that manage after-the-fact reporting of incident activities, such as for traffic information systems, EMS information systems, NFIRS, UCR, and NIBRS. Avoid situations that require translating information from one format to another, or from one encoding to another.
3. Avoid duplication of effort and situations that require re-entry of identical information in multiple locations. If possible, use automation to fill in the blanks with known information.
4. Accommodate users that need to update or correct previously-entered information. Create an audit trail that can be used to trace the process of changing worksheet information.
5. Pay close and careful attention to worksheet utility. Ease of use under adverse conditions is extremely important to responders.
6. Where practicable, combine the process of manually entering data onto worksheets with input of the same data into automated information systems. Where this is impracticable, allocate sufficient resources to accomplish timely data entry.



<b>INCIDENT BRIEFING</b>	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
<b>4. MAP SKETCH</b>			
<b>ICS 201</b> <b>5-94</b>	PAGE 1	8. PREPARED BY (NAME AND POSITION)	



6. CURRENT ORGANIZATION





<b>OBJECTIVES</b>	<b>ICS 202</b>	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
4. OPERATIONAL PERIOD (Date/Time)				
5. OVERALL INCIDENT OBJECTIVE:				
6. OBJECTIVES FOR THIS OPERATIONAL PERIOD:				
7. WEATHER FORECAST FOR OPERATIONAL PERIOD				
8. GENERAL/SAFETY MESSAGE				
9. ATTACHMENTS ( <input checked="" type="checkbox"/> IF ATTACHED)				
<input type="checkbox"/> ORGANIZATION LIST (ICS 203)		<input type="checkbox"/> MEDICAL PLAN (ICS 206)		<input type="checkbox"/>
<input type="checkbox"/> ASSIGNMENT LISTS (ICS 204)		<input type="checkbox"/> INCIDENT MAP		<input type="checkbox"/>
<input type="checkbox"/> COMMUNICATIONS PLAN (ICS 205)		<input type="checkbox"/> TRAFFIC PLAN		<input type="checkbox"/>
<b>ICS 202</b>	<b>5-94</b>	10. PREPARED BY (Planning Section Chief)		11. APPROVED BY (Incident Commander)

<b>ORGANIZATION ASSIGNMENT LIST</b>		<b>ICS 203</b>	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
5. INCIDENT COMMANDER AND STAFF		4. OPERATIONAL PERIOD (DATE/TIME)			
INCIDENT COMMANDER		9. OPERATIONS SECTION			
DEPUTY		CHIEF			
SAFETY OFFICER		DEPUTY			
INFORMATION OFFICER		a. BRANCH I - DIVISIONS/GROUPS			
LIAISON OFFICER		BRANCH DIRECTOR			
6. AGENCY REPRESENTATIVES		DEPUTY			
AGENCY	NAME	DIVISION/GROUP			
		DIVISION/GROUP			
7. PLANNING SECTION		b. BRANCH II - DIVISIONS/GROUPS			
CHIEF		BRANCH DIRECTOR			
DEPUTY		DEPUTY			
RESOURCES UNIT		DIVISION/GROUP			
SITUATION UNIT		DIVISION/GROUP			
DOCUMENTATION UNIT		DIVISION/GROUP			
DEMobilIZATION UNIT		DIVISION/GROUP			
TECHNICAL SPECIALISTS		c. BRANCH III - DIVISIONS/GROUPS			
		BRANCH DIRECTOR			
		DEPUTY			
		DIVISION/GROUP			
		DIVISION/GROUP			
		DIVISION/GROUP			
8. LOGISTICS SECTION		DIVISION/GROUP			
CHIEF		DIVISION/GROUP			
DEPUTY		DIVISION/GROUP			
a. SUPPORT BRANCH		d. AIR OPERATIONS BRANCH			
DIRECTOR		AIR OPERATIONS BR. DIR.			
DEPUTY		DEPUTY			
SUPPLY UNIT		AIR TACTICAL SUPERVISOR			
FACILITIES UNIT		AIR SUPPORT SUPERVISOR			
GROUND SUPPORT UNIT		HELICOPTER COORDINATOR			
		AIR TANKER/ FIXED WING COORDINATOR			
b. SERVICE BRANCH		10. FINANCE/ADMINISTRATION SECTION			
DIRECTOR		CHIEF			
DEPUTY		DEPUTY			
COMMUNICATIONS UNIT		TIME UNIT			
MEDICAL UNIT		PROCUREMENT UNIT			
FOOD UNIT		COMPENSATION/CLAIMS UNIT			
		COST UNIT			
<b>ICS 203</b>		<b>5/94</b>		PREPARED BY (RESOURCES UNIT)	

<b>1. BRANCH</b>	<b>2. DIVISION/GROUP</b>	<b>ASSIGNMENT LIST</b>				<b>ICS 204 (5-94)</b>			
<b>3. INCIDENT NAME</b>			<b>4. OPERATIONAL PERIOD</b>						
			DATE <input style="width:100%;" type="text"/>						
			TIME <input style="width:100%;" type="text"/>						
<b>5. OPERATIONS PERSONNEL</b>									
OPERATIONS CHIEF <input style="width:100%;" type="text"/>		DIVISION/GROUP SUPERVISOR <input style="width:100%;" type="text"/>							
BRANCH DIRECTOR <input style="width:100%;" type="text"/>		AIR TACTICAL SUPERVISOR <input style="width:100%;" type="text"/>							
<b>6. RESOURCES ASSIGNED THIS PERIOD</b>									
<b>RESOURCE DESIGNATOR</b>	<b>LEADER</b>	<b>NUMBER PERSONS</b>	<b>TRANS. NEEDED</b>	<b>DROP OFF PT./TIME</b>	<b>PICK UP PT./TIME</b>				
<b>7. CONTROL ASSIGNMENT (S)</b>									
<b>8. SPECIAL INSTRUCTIONS/SAFETY MESSAGE</b>									
<b>9. DIVISION/GROUP COMMUNICATION SUMMARY</b>									
<b>FUNCTION</b>	<b>LOCAL</b>	<b>FREQ.</b>	<b>SYSTEM</b>	<b>CHAN.</b>	<b>FUNCTION</b>	<b>LOCAL</b>	<b>FREQ.</b>	<b>SYSTEM</b>	<b>CHAN.</b>
<b>COMMAND</b>					<b>SUPPORT</b>				
	<b>REPEAT</b>					<b>REPEAT</b>			
<b>DIV/GROUP TACTICAL</b>					<b>GROUND TO AIR</b>				
<b>PREPARED BY (RESOURCE UNIT LEADER)</b>				<b>APPROVED BY (PLANNING SECTION CHIEF)</b>			<b>DATE</b>	<b>TIME</b>	







*Highway incident responders should obtain competent legal opinion regarding the consequences of not following a recognized standard of recommended practice. There may be significant liability attached to nonconforming practice that results in injury, death, or property damage.*

## APPENDIX C.

# MUTCD APPLICATION NOTES

It is reasonable to ask, “How does this manual apply to highway incidents, and how does it affect incident operations that are conducted by the fire service, emergency medical services, and law enforcement?” There has never been any requirement to use particular devices, or to conduct traffic control in any particular manner at highway incidents before. Moreover, many members of the emergency services would dispute the authority of the US DOT to dictate how operational incident procedures are standardized.

Let us tackle these questions in reverse order, beginning with the legal authority expressed in the manual. The Federal Highway Administration (FHWA), in partnership with the American Association of State Highway and Transportation Officials (AASHTO) has jointly administered the MUTCD since 1971, under the National Committee on Uniform Traffic Control Devices. The following describes the legal basis for the MUTCD:

*The responsibility for the design, placement, operation, maintenance, and uniformity of traffic control devices shall rest with the public agency or the official having jurisdiction. 23 CFR 655.603 adopts the Manual on Uniform Traffic Control Devices as the national standard for all traffic control devices installed on any street, highway, or bikeway open to public travel. When a State or other Federal agency manual or supplement is required, they shall be in substantial conformance with the national Manual on Uniform Traffic Control Devices.*

*23 CFR 655.603 also states that traffic control devices on all streets and highways open to public travel in each State shall be in substantial conformance with standards issued or endorsed by the Federal Highway Administrator.<sup>1</sup>*

*Traffic control devices ... within the highway right-of-way shall be placed only as authorized by a public authority or the official having jurisdiction, for the purpose of regulating, warning, or guiding traffic.<sup>2</sup>*

---

<sup>1</sup> Section 1A.07, p 1A-4

<sup>2</sup> Section 1A.08, p 1A-5

The procedures, and specifications contained in the MUTCD are intended to establish basic uniformity of traffic control devices throughout the nation. This makes common, practical sense, and is the reason why there are not 50 different stop signs across the nation, all with different shapes, colors, and meaning. Imagine the chaos that would be faced by the private and commercial traveling public if it weren't so. Where better to concentrate on standardizing traffic control than in those situations where normal traffic flow has been changed? What more dangerous change in traffic flow is there than those resulting from the unexpected incident, especially those causing injury, death, property damage, hazardous materials spills, or violations of the law? For that reason, no special exclusion exists for emergency incidents in the Code of Federal Regulations, the US Code, or the MUTCD.

The (perhaps common) perception that the MUTCD never before applied to highway incidents is partially born out by direct observation. The key to understanding the scope of previous applicability of the MUTCD lies in the definition of "incident." Traditionally in the transportation world, incidents primarily were construction and repair projects on the highway, or maintenance activities such as landscaping or painting. As DOTs across the country become more and more involved in highway operation, the definition of incident broadened to include any activity that affected traffic flow. Still, the entire category of incidents that were handled by the emergency services, while not excluded, was certainly not emphasized.

There has been a long-standing tacit acceptance by the emergency services of the MUTCD, though it was probably an unknowing adherence to an unread standard. This occurred gradually, as highway incidents occupied the emergency services more and more over the years. The expansion of the mission scope of the fire service to encompass emergency medical services has not been without controversy. The parallel and related mission extension into the realm of highway incidents met with less argument and wider acceptance. Just as with emergency medical service, success in meeting this new challenge depended upon fire departments developing new skills, using new tools, and carrying new equipment. Engines began carrying flares, traffic cones, flags, and the like, and their members began using them on the highway. Their use by fire & rescue mimicked their use by the highway construction crews, who were trained to operate in accordance with the MUTCD. Also, the sources of supply used by the fire service to procure their new traffic control devices were actually those already used by DOT

agencies and construction contractors. Since those organizations were already bound to comply with the MUTCD, they specified products that conformed to it when procuring traffic control devices from those same suppliers. When the fire (and the other emergency services) came shopping at the same vendors, they were sold items from the same stock.

Now, for what is probably the first question asked by the reader about this model procedures guide, namely, “How does this obscure government manual affect me?” Let’s look at the “who, what, where, when, and why” aspects of this question as might be faced by a fire & rescue, EMS, or law enforcement department.

## Why?

Because managing highway incidents in the best interests of everyone on the highway is the right thing to do!

Because the entire community has come together decided that it should be done this way.

## When?

The new MUTCD Chapter 6I, “Control Of Traffic Through Traffic Incident Management Areas” is being added to the MUTCD. This change is going through the required federal rule-making process as of the published date of this model procedures guide. The Notice of Proposed Amendments for MUTCD Revision 2, dated May 21, 2002 was published in the Federal Register, and open to public comment until August 19, 2002. The proposed text, figures, and change list are also online with the entire manual, accessible through the Internet at <http://mutcd.fhwa.dot.gov/>. After review of the public commentary, the change to the MUTCD will be finalized and published. After that happens, the new requirements flow down through the states to the local level as described in the MUTCD:

*In accordance with 23 C.F.R. 655.603(b)(1), States or other Federal agencies shall adopt changes to the MUTCD within 2 years of issuance. For new devices or replacement of damaged devices, compliance shall be required effective immediately upon adoption by the State or other Federal agency.<sup>3</sup>*

---

<sup>3</sup> Introduction, p I-4

In other words, highway operations, and traffic control devices used in highway operations, must follow the MUTCD within two years after the final rule. Old, non-conformant traffic devices can be used for up to two years, but new or replacement items must conform.

## Must We?

The direction contained within the MUTCD is phrased in three different ways, each with different degrees of compulsion:

1. *Standard*—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All standards are labeled, and the text appears in bold large type. The verb shall is typically used. Standards are sometimes modified by Options.
2. *Guidance*—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in large type. Guidance text is the same size as Standard text, but it is not bold. The verb should is typically used. Guidance statements are sometimes modified by Options.
3. *Option*—a statement of practice that is a permissive condition and carries no requirement or recommendation. Options may contain allowable modifications to a Standard or Guidance. All Option statements are labeled, and the text appears in small type. The verb may is typically used.<sup>4</sup>

There are no “shall” requirements, yet, in the new Chapter 6I that apply directly to highway incidents. All of the requirements directly applicable to the highway incident response community are “should” requirements. They establish a national standard of recommended practice, and do allow departments to deviate somewhat from the letter of the law. Only limited latitude is permitted, however, since a permissible deviation is one that is supported by engineering judgment or study that indicates that such a practice is appropriate. Casual disregard would not be recommended. Also, even though a device or procedure may be only recommended; however if adopted, there may only be certain allowed implementations.

Clarification is available.

*Requests for any interpretation, permission to experiment, interim approval, or change shall be sent to the Federal Highway Administration (FHWA), Office of Transportation Operations, 400 Seventh Street SW, HOTO, Washington, DC 20590.<sup>5</sup>*

---

<sup>4</sup> Introduction, p I-3.

<sup>5</sup> Section 1A.10, p 1A-6

## Where?

The new definition contained in Chapter 6I spells out the new applicability of the MUTCD:

*A traffic incident is an emergency road user occurrence, a natural disaster, or a special event that affects or impedes the normal flow of traffic.<sup>6</sup>*

*A traffic incident management area is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a road user incident, natural disaster, or special event. It extends from the first warning sign or emergency warning lights on a vehicle to the last temporary traffic control device or to a point where vehicles return to the original lane alignment and are clear of the traffic incident.<sup>7</sup>*

The MUTCD clearly now covers emergency calls for service on the highway, as well as other types of happenings. The only criterion is that the “road user incident” affects traffic. It should be noted that all activity by emergency services affect traffic, as long as it is conducted within view of road users. This is the “rubbernecking” phenomenon. Some emergency activities have more direct affect, through traffic control being exercised in the vicinity of the incident scene.

## What (Should be Done)?

In short, responders should conduct temporary traffic control.

*The primary functions of temporary traffic control at a traffic incident management area are to move road users safely and expeditiously past or around the traffic incident, and to reduce the likelihood of secondary crashes.<sup>8</sup>*

*An essential part of fire, rescue, spill clean-up, and enforcement activities is the proper control of road users through the traffic incident management area in order to protect responders while providing safe traffic flow.<sup>9</sup>*

There are two competing goals for traffic controllers at a highway incident, (1) moving traffic and (2) preventing further crashes. Controlled traffic movement past an incident must be done in consideration of the safety of both the responders and the road users. Proper traffic control should lower, and not increase the likelihood of further crashes. A few conclusions can be drawn from this:

1. Do not begin on-scene operations until they can be done safely.

---

<sup>6</sup> Section 6I.01, p 6I-1.

<sup>7</sup> Section 6I.01, p 6I-1.

<sup>8</sup> Section 6I.01, p 6I-1.

<sup>9</sup> Section 6I.01, p 6I-3.

2. Take action to prevent secondary crashes.
3. Do not move traffic until it can be done safely.
4. Move traffic as soon as it can be done safely.

## What (Should be Used)?

The whole point of the MUTCD is to specify the approved types of traffic control devices and the manner in which they should be used. The MUTCD defines traffic control devices as follows:

*Traffic control devices shall be defined as all signs, signals, markings, and other devices used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, pedestrian facility, or bikeway by authority of a public agency having jurisdiction.<sup>10</sup>*

This covers everything used to direct traffic. Just about any device imaginable is included in the 1100 pages. If signs are used, they may conform to the new colors that have been adopted for incident management:

*Warning and guide signs used for temporary traffic control traffic incident management situations may have a black legend and border on a fluorescent coral background...<sup>11</sup>*

*For unexpected traffic incidents, particularly those of an emergency nature, temporary traffic control devices on hand may be used for the initial response as long as they do not themselves create unnecessary additional hazards.<sup>12</sup>*

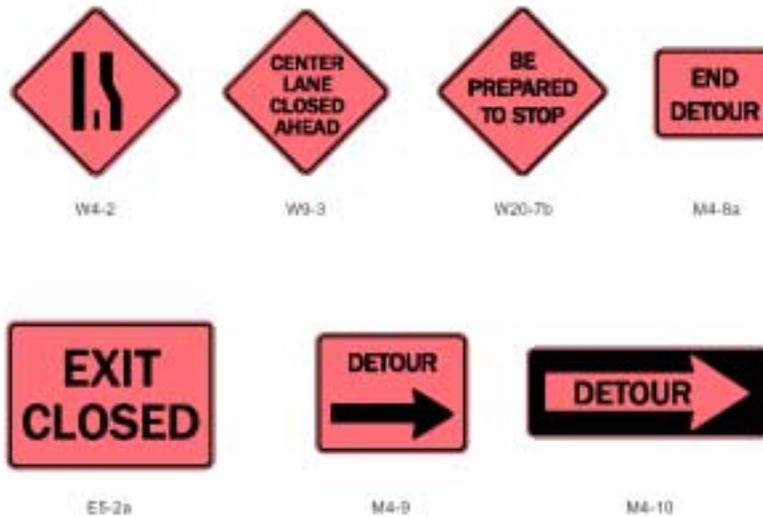
Note that the initial response assignment is allowed to use whatever might be on hand, including flares, which are “temporary traffic control devices.” The key consideration is that the use of such devices cannot create “unnecessary additional hazards.” This might be a tricky judgment to defend, but hopefully due deference will be given to the Incident Commander’s on-scene perspective.

---

<sup>10</sup> Introduction, p I-1.

<sup>11</sup> Section 6I.01, p 6I-3.

<sup>12</sup> Section 6I.01, p 6I-3.



**Figure 60, Standardized Black-on-Coral Incident Management Signage<sup>13</sup>**

The MUTCD treats traffic incidents, and their handling differently, based upon their expected duration. Responders are to estimate the expected duration of traffic blockage within 15 minutes of arrival, and set up traffic controls based upon that estimate. Major incidents have an expected duration of traffic blockage greater than 2 hours, intermediate incidents between 30 minutes and 2 hours, and minor incidents less than 30 minutes.<sup>14</sup> This is an unfamiliar method of classifying highway incidents for the emergency services, and excludes other incident metrics that are more familiar to the fire and other emergency services, such as number of vehicles, injuries, entrapment, fire, or spill.

For major and intermediate incidents:

*Traffic control should be provided by qualified flaggers using appropriate traffic control devices....*

*Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.*

*The channelizing devices discussed in Section 6F.55 should be used whenever possible if a roadway is expected to be closed for more than 3 days.*

*When flares are used to initiate temporary traffic control at traffic incidents or for short-term temporary traffic control, more permanent traffic control devices should replace them as soon as practical.<sup>15</sup>*

<sup>13</sup> Section 6I.01, Figure 6I-1, p 6I-2.

<sup>14</sup> Section 6I.01, p 6I-1.

<sup>15</sup> Section 6I.02, p 6I-4; Section 6I.03, p 6I-5.

In other words, for incidents that are expected to block traffic for more than 30 minutes, qualified flaggers should be used. They should set up traffic control not only in the vicinity of the on-scene operations, but also at the back end of the traffic queue forming as a result of the blockage from the incident. Flares can be used temporarily, but should be replaced with the more permanent devices described in the MUTCD. If highway incident operations and traffic blockages last beyond three days, then “channelizing devices” should be used. These include the familiar drums, cones, tubular devices, and barricades used around highway construction projects.<sup>16</sup>

And, for minor incidents:

*On-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning.*

*When a minor traffic incident blocks a travel lane, it should be removed from that lane to the shoulder as quickly as possible.<sup>17</sup>*

This is a cautionary warning to responders to consider if oncoming traffic can see them while in the roadway. The “incident,” meaning the traffic blockage, should be moved out of traffic to the shoulder and as far out of the travel lanes as possible.

## Who (of my personnel is affected)?

As can be seen from the above, if a responder is directing traffic at a traffic incident that is expected to last more than 30 minutes, that responder should be a trained flagger. Any responder who could be assigned such duty needs to be trained, equipped, and provided with proper retroreflective clothing. The MUTCD specifies how they must be trained, and what they must wear:

*Because flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers, they should be trained in safe traffic control practices and public contact techniques. Flaggers should be able to satisfactorily demonstrate the following skills and abilities:*

*A. Skill in communicating specific instructions clearly, firmly, and courteously;*

*B. Ability to move and maneuver quickly in order to avoid danger from errant vehicles;*

---

<sup>16</sup> Section 6F.55, pp 6F-44 – 6F-47.

<sup>17</sup> Section 6I.04, p 6I-5.

*C. Ability to control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a temporary traffic control zone in frequently changing situations;*

*D. Ability to understand and apply safe traffic control practices, sometimes in stressful or emergency situations; and*

*E. Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.<sup>18</sup>*

As was described in CHAPTER 7, several national organizations offer training leading to certification as flaggers which meets these requirements.

*Flaggers shall wear safety apparel meeting the requirements of ISEA “American National Standard for High-Visibility Apparel” (see Section 1A.11) and labeled as meeting the ANSI 107-1999 standard performance for Class 3 risk exposure. The apparel background (outer) material shall be either fluorescent orange-red or fluorescent yellow-green as defined in the standard. The retroreflective material shall be either orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 300 m (1,000 ft). The retroreflective clothing shall be designed to clearly identify the wearer as a worker.<sup>19</sup>*

This is the same standard now being applied to turnout gear in the fire service, as well as uniforms of the other members of the highway incident response community. This indeed may be the reason for such application.

## How Can We Prepare For This?

By pre-planning highway incidents in the same manner as is commonly done for major challenges in structural firefighting, hazardous materials sites, large social events, and disaster planning, the highway incident response community can sort out roles and responsibilities before they respond to emergency calls for service to the highway.

*In order to reduce response time for traffic incidents, highway agencies, appropriate public safety agencies (law enforcement, fire and rescue, emergency communications, emergency medical, and other emergency management), and private sector responders (towing and recovery and hazardous materials contractors) should mutually plan for occurrences of traffic incidents along the major and heavily traveled highway and street system. Special events should be planned for and coordinated in advance.<sup>20</sup>*

---

<sup>18</sup> Section 6E.01, p 6E-1.

<sup>19</sup> Section 6E.02, p 6E-1.

<sup>20</sup> Section 6I.01, p 6I-1.

## What Else?

The MUTCD also requires that public safety responders to highway incidents reduce the use of emergency warning lighting on emergency vehicles as much as possible. This recognizes that emergency vehicle lighting serves a warning purpose, which is much less applicable while parked on the scene of highway incidents. Temporary traffic control is now charged with warning traffic, using approved traffic control devices, and the presence of other flashing and stroboscopic lighting will distract and confuse approaching motorists.

*Public safety agencies should examine their policies on the use of emergency-vehicle lighting, especially after a traffic incident scene is secured, with the aim of reducing the use of this lighting as much as possible while not endangering those at the scene. Special consideration should be given to reducing or extinguishing forward facing emergency-vehicle lighting, especially on divided roadways, to reduce distractions to oncoming road users.<sup>21</sup>*

---

<sup>21</sup> Section 6I.05, p 6I-6.

## APPENDIX D.

# THE UNIFORM VEHICLE CODE

The National Committee on Uniform Traffic Laws and Ordinances (NCUTLO) is a private, non-profit membership organization dedicated to providing uniformity of traffic laws and regulations through the timely dissemination of information and model legislation on traffic safety issues. Additional information on NCUTLO may be obtained directly from them at the following address, or on the internet at <http://www.ncutlo.org/>.

NCUTLO  
107 S. West Street, # 110  
Alexandria, VA 22314  
Phone: 800/807-5290  
Fax: 540/465-5383

Recently, in response to national concern regarding the high numbers of injuries and deaths of emergency responders at highway incidents, NCUTLO, in partnership with the Federal Highway Administration, drafted a model statute to address the problem.

Readers may be interested to learn of some of the dynamics that entered into the discussions that lead up to the compromise wording in the model statute. There was, of course the natural tension between committee members from the fire & rescue community and those from the law enforcement community. The former wanted to secure as large a safety zone around their work area as possible, while the later wanted to reopen the highway as quickly as possible to alleviate traffic congestion.

There were also differences of opinion regarding the assignment of the responsibility for preserving scene safety – to the approaching motorists, or to those managing the incident scene. If the approach were taken as in several early state laws to require the motorists to change lanes away from the incident and to reduce speed, such actions might in themselves increase the likelihood of secondary crashes. If the responsibility were assigned to incident responders, the enforcement task would drain personnel from other critical emergency duties.

The draft consensus wording that was finally adopted has been reproduced below, with permission from NCUTLO. The explanatory notes are part of the model statute.

## **Incident Responders Safety Model Law<sup>1</sup>**

*(draft -11/15 /01)*

*2The purpose of section 1(a) is to establish the somewhat conflicting aims of incident management: protection of people and property at the scene and maintenance of traffic flow. (Note: if traffic flow is not maintained, traffic queues quickly occur, which often lead to secondary and tertiary crashes.) Subsection (b) mandates incident management planning and suggests agencies to be involved in such planning.*

### **Incident Management Traffic Control Purposes and Planning**

#### **Section 1.**

(a) The primary purposes of temporary traffic control at a incident area are maintenance of incident area safety and security, including:

1. Protection of responders to the incident;
2. Protection of roadway users and others at incident site;
3. Movement of road users safely past, around or away from the incident;
4. Reduction of the likelihood of secondary crashes;
5. Expeditious clearance of the roadway;
6. Protection of vehicles and cargo at the incident.

(b) In order to reduce incident management response time, highway, public safety and other involved agencies should plan for effective management of temporary traffic control in incident areas. Effective incident management is the planned and coordinated multi-agency program to detect and remove incidents, and to restore traffic capacity as quickly and safely as possible. The major partners in an incident management program are transportation agencies (state and local), law enforcement agencies (state and local), firefighting departments, emergency medical services, and the towing and recovery industry. Other groups such as environmental and public health agencies also may be involved, depending on the nature of the incident. Current and accurate traveler information is another important element of an incident management program.

---

<sup>1</sup> Penalties generally are not included in this legislation. However, any moving motor vehicle violation would automatically be covered by the general penalty provision applying to all moving violations, which exists in practically every jurisdiction; and of course enacting jurisdictions may enact additional penalties deemed appropriate. One exception to the lack of express penalties is the inclusion of subsection 7(d), which provides for mandatory suspension of the license for violations of section (7) that result in a serious injury or death. Jurisdictions enacting this provision should define the term "serious injury" if it is not already defined in their vehicle code.

<sup>2</sup> Note: italicized annotated inserts are not part of the model law; rather they are intended merely to help explain the purposes of the various sections.

*The purpose of section 2 is to provide ultimate authority and responsibility to the incident commander identified pursuant to statute, regulation, or local established practice, and to require the incident commander to use a unified command system.*

## **Section 2. Incident Commander**

Incident management shall be the responsibility and authority of the incident commander. Identification of the incident commander shall be done according to statute, regulation or local practice. In exercising his or her authority, the incident commander shall use a unified command system.

*Section 3 authorizes but does not require the establishment of an ongoing incident Management Committee to recommend additional operational rules and guidelines for handling emergency incidents. Jurisdictions that do not wish to establish such a committee should delete this section.*

## **Section 3. Incident Management Committee**

(a) A Incident Management Committee may be established by the (3 ) to maintain and enhance the effectiveness of managed resources involved in responses to incidents, and as needed to recommend operational rules or guidelines for mitigating the impacts of such incidents.

(b) The Committee shall consist of but is not limited to one or more representatives of the following:

- The state police, highway patrol or a local law enforcement agency.
- The state and county departments of transportation (or Highways);
- A firefighting agency;
- An emergency medical services agency;
- The state and county departments of environmental control;
- The towing and recovery industry;

*Section 4 defines incident management authority established by this model and defines when it begins and terminates.*

## **Section 4. Incident Management Authority**

Incident management involves the rapid application of traffic control measures in areas affected by an incident. Incident management authority authorized by this Act commences whenever a responder arrives at the incident. It terminates whenever the incident commander declares the incident terminated.

---

<sup>3</sup> Note: insert the name of the agency charged with establishing the traffic incident committee.

*Section 5 provides liability protection to responding agencies and their personnel when incident clearance functions authorized by section 5 are exercised with reasonable care at the direction of the incident commander.*

## **Section 5. Liability Protection for Authorized Incident Clearance Functions**

(a) Governmental agencies responding to incidents, including but not limited to law enforcement, firefighting, emergency medical services, hazardous materials, transportation agencies and other emergency governmental responders are authorized to exercise the incident clearance functions enumerated in this section. If such functions are exercised with reasonable care and at the direction of the incident commander, those governmental agencies and their personnel and other designated representatives are insulated from liability resulting from such actions taken pursuant to incident clearance, including:

1. Incident detection and verification;
2. Incident area security and protection;
3. Rescue of persons from vehicles and hazardous environments;
4. Emergency medical transportation and care;
5. Hazardous materials response and containment;
6. Fire suppression and elimination;
7. Transportation of vehicle occupants;
8. Traffic direction and management, and establishment and operation of alternate routes, including but not limited to traffic detours and/or diversion;
9. Crash investigation;
10. Dissemination of traveler information;
11. Incident clearance, including removal of debris, coordination of clearance and repair resources, and temporary roadway repair and facilities restoration;
12. Removal of vehicles and cargo;
13. Any other actions reasonably necessary.

(b) When directed by the incident commander, towing and recovery service providers are authorized to perform the following enumerated functions, and any other actions reasonably necessary to perform those enumerated functions:

1. Removal of vehicles from the incident area;
2. Protection of property and vehicles;
3. Removal of debris from the roadway;
4. Transportation of persons or cargo.

*Section 6 provides that the owner (or owners) of vehicles removed from an incident site at the direction of the incident commander (or the owner or owners of vehicles whose cargo was removed from the incident site at the direction of the incident commander), shall be liable for such removal costs.*

## **Section 6. Compensation for Incident Removal Costs**

Notwithstanding any other law or regulation, any agency, person or organization incurring the cost of removing vehicles and/or cargo at an incident, if such removal is authorized by the traffic

incident commander, shall have the unqualified right to compensation for the cost of such removal from the owner (or owners) of:

1. The vehicles removed; and/or
2. The vehicles whose cargo was removed in whole or in part.<sup>4</sup>

*Section 7 established the duties of the driver when approaching an incident (which is an emergency road user occurrence, a natural disaster, or a special event.) Subsection (a) requires drivers approaching an incident to maintain a speed no greater than reasonable or prudent under the conditions, including actual and potential hazards then existing. Subsection (b) requires every driver approaching an incident area (which is an area of highway where authorized officials impose a temporary traffic control zone in response to a road user incident, natural disaster or special event) to obey the directions of any authorized official directing traffic and all applicable traffic control devices. Subsection (c) requires drivers approaching an incident area to slow down and vacate any lane wholly or partially blocked. Subsection (d) provides for a mandatory license suspension for a violation of section 7.*

## **Section 7. Road User Duties Approaching Incidents**

- (a) When in or approaching an incident, every driver shall maintain a speed no greater than is reasonable and prudent under the conditions, including actual and potential hazards then existing.
- (b) When in or approaching an incident area, every driver shall obey the directions of any authorized official directing traffic and all applicable traffic control devices.
- (c) Except for emergency vehicles, when in or approaching an incident area, every driver shall reduce speed and vacate any lane wholly or partially blocked.
- (d) If a violation of this section results in a serious injury or death to another person, in addition to any other penalty imposed by law, the violator's driver's license shall be suspended for a period of at least (180) days and not more than (2) years.<sup>5</sup>

*Section 8 contains provisions intended to avoid dangerous situations that could create incident-causing crashes or intensify traffic problems resulting from already-existing incidents. Subsection (a) prohibits dangerous stops; subsection (b) requires the emergency flashing lights to be activated when crashes or mechanical breakdowns occur; subsection (c) requires immediate removal of vehicles from the roadway, if possible; subsection (d) provides responders with authority to move or order the removal of a vehicle from the roadway; and subsection (e) provides authority to a law-enforcement officer or the incident commander to remove vehicles from the highway at the owner's expense.*

## **Section 8. Avoidance of Lane Blockage -- Expedited Removal of**

---

<sup>4</sup> Note: this provision is not intended to limit such owners' rights of action against other parties.

<sup>5</sup> Jurisdictions enacting subsection (d) may wish to modify its penalties to include possible incarceration. Jurisdictions with motor vehicles codes that do not define the term "serious injury" should add such a term to the definitions section (section 10). Jurisdictions may also wish to add a specific penalty for violations of section 7 that do not result in serious injury or death to another person.

## Vehicles

- (a) No person shall stop or park a vehicle in such manner as to impede or render dangerous the use of the roadway by others, except to avoid collision, at the direction of an authorized official, or in the case of a crash or mechanical breakdown.
- (b) In the event of a crash or mechanical breakdown, the emergency flashing lights of such vehicle shall be activated if the vehicle is equipped with such lights and such lights are in working order.
- (c) If a vehicle stopped in the roadway is movable and its driver is capable of moving it, the driver shall immediately move the vehicle to the shoulder or to a designated area off the highway.
- (d) A responder to an incident may move a vehicle remaining on the roadway, or require the driver or other person in charge of the vehicle to move it to the shoulder or a designated area off the highway.
- (e) A law-enforcement officer or the incident commander may order the removal of any vehicle remaining on the highway at the owner's expense. The vehicle's location shall be reported to the nearest law-enforcement agency as soon as practicable.

*Section 9 provides provide additional clearance guidelines covering incidents, including: subsection (a) -- guidance and control of road users through the incident area; subsection (b) -- where possible, the use of traffic control devices to redirect the normal path of the road users; subsection (c) -- where possible, avoidance of queuing at highway-rail grade crossings; subsection (d)-- removal of temporary traffic control devices when the incident is over; and subsection (e) -- possible special rules for big trucks and hazardous carriers when traffic diversions or detours are required.*

### **Section 9. Additional Incident Clearance Guidelines**

- (a) An essential part of the management of incidents is the proper guidance and control of road users through the incident area.
- (b) When redirection of the road users' normal path is required, whenever practical traffic control devices shall be used to direct vehicles from the normal path to a new path.
- (c) When highway-rail grade crossings exist either within or in the vicinity of incident, lane restrictions or other measures taken should avoid conditions where vehicles may be forced to stop on the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a law enforcement officer or other authorized official shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.
- (d) All temporary traffic control devices should be removed as soon as practical when the incident has been resolved.
- (e) If a incident requires establishment of a traffic diversion or detour, large trucks and vehicles carrying hazardous cargo may be required to follow a different route from other vehicles; or they may be required to park at a designated area off the highway until the roadway is open, until an escort can be provided, or until the incident commander otherwise directs.

*Section 10 defines technical terms used in the model law.*

## **Section 10. Definitions Section**

- (a) "Authorized official" means any person authorized to direct traffic by a statute, a law enforcement officer or an incident commander.
- (b) "Designated area off the highway" means a crossroad, parking lot, or other area designated to park in until arrival of an investigating law enforcement officer.
- (c) "Detour" means a temporary rerouting of road users onto an existing highway in order to avoid a temporary traffic control zone.
- (d) "Diversion" means a temporary rerouting of road users onto a temporary highway or alignment placed around an incident area.
- (e) "Driver's license" means any license to operate a motor vehicle issued under the laws of this state.
- (f) "Emergency vehicle" means any ambulance, fire, rescue or police vehicle or any other vehicle authorized by law, governmental regulation or local practice to respond to an emergency road user occurrence.
- (g) "Governmental incident responder" means any governmental agency or its designated representatives with authority to provide services at a incident, including but not limited to law enforcement, fire department, emergency medical services, hazardous materials and transportation agency personnel.
- (h) "Gross weight rating" means the combined weight of a vehicle and its maximum legal load.
- (i) Highway means the entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular travel.
- (j) "Incident" means an emergency road user occurrence, a natural disaster, or a special event.
- (k) "Incident area" means an area of a highway where authorized officials impose a temporary traffic control zone in response to a road user incident, natural disaster or special event.
- (l) "Incident clearance" means the process of highway crash clearance and the removing of wreckage, debris, or any other matter that disrupts the normal flow of traffic, and the restoring the roadway capacity to its pre-incident condition. This process also may include temporary repair to the infrastructure.
- (m) "Incident commander" means an incident commander or the incident commander's designated representative.
- (n) "Large trucks" means any truck with a gross weight rating in excess of 26,000 pounds.
- (o) "Responder" means any law enforcement, fire department, emergency medical services, hazardous materials, highway or transportation department, towing and recovery or any other organization authorized by law, governmental regulation, or local practice to respond to a traffic incident.
- (p) "Response personnel" means law enforcement, fire department, emergency medical services, towing and recovery, and any other personnel authorized by law or local practice to respond to an incident.
- (q) "Roadway" means that portion of a highway improved, designed or ordinarily used for vehicle travel, exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm or

shoulder is used by persons riding bicycles or other human-powered vehicles. In the event that a highway includes two or more separate roadways the term 'roadway' means any such roadway separately but not to all such roadways collectively.

(r) "Security" means the protection of people and property in the incident area.

(s) "Temporary traffic control zone" means an area of a highway where road user conditions are changed because of a work zone or an emergency incident through the use of temporary traffic control devices, police, or other authorized officials.

(t) "Traffic" means pedestrians, ridden or herded animals, vehicles, streetcars and other conveyances either singly or together while using any highway for purposes of travel.

(u) "Vehicle" means every device in, upon, or by which any person or property can be transported or drawn upon a highway, except trains and light rail transit operating in exclusive or semi-exclusive alignments. Light rail transit operating in a mixed-use alignment, to which other traffic is not required to yield the right-of-way by law, is a vehicle.

**APPENDIX E.**  
**Highway Incident Operations**



Traffic Control is a function to be performed at a highway incident, in the same category as extrication, patient treatment, or accident investigation. The Traffic Control Supervisor (or Leader, or Director, or responder, as explained in CHAPTER 8) is that single individual that establishes and enforces special traffic rules that limit or restrict traffic movement through the Temporary Traffic Control Zone around a highway incident. The TCS has the inherent authority that is necessary to accomplish his job, delegated to him by the Incident Commander upon his assignment to the position. The TCS is empowered to direct the movement of vehicles and take other direct actions as may be necessary to:

- Protect responders and those in their care from the hazards of moving traffic
- Facilitate emergency response through traffic in the vicinity of an incident
- Prevent further incidents involving vehicles in the vicinity of an incident
- Facilitate traffic flow past the incident

This Appendix provides guidance on several important aspects of traffic control in and around a highway incident. A brief description of the Temporary Traffic Control Zone is followed by a discussion of emergency vehicle positioning at the scene of a highway incident. Suggested ways to use traffic control devices to warn and guide traffic in the vicinity of a highway incident are covered next. The last two sections in this appendix both cover specific traffic challenges that are commonly faced by responders to highway incidents.

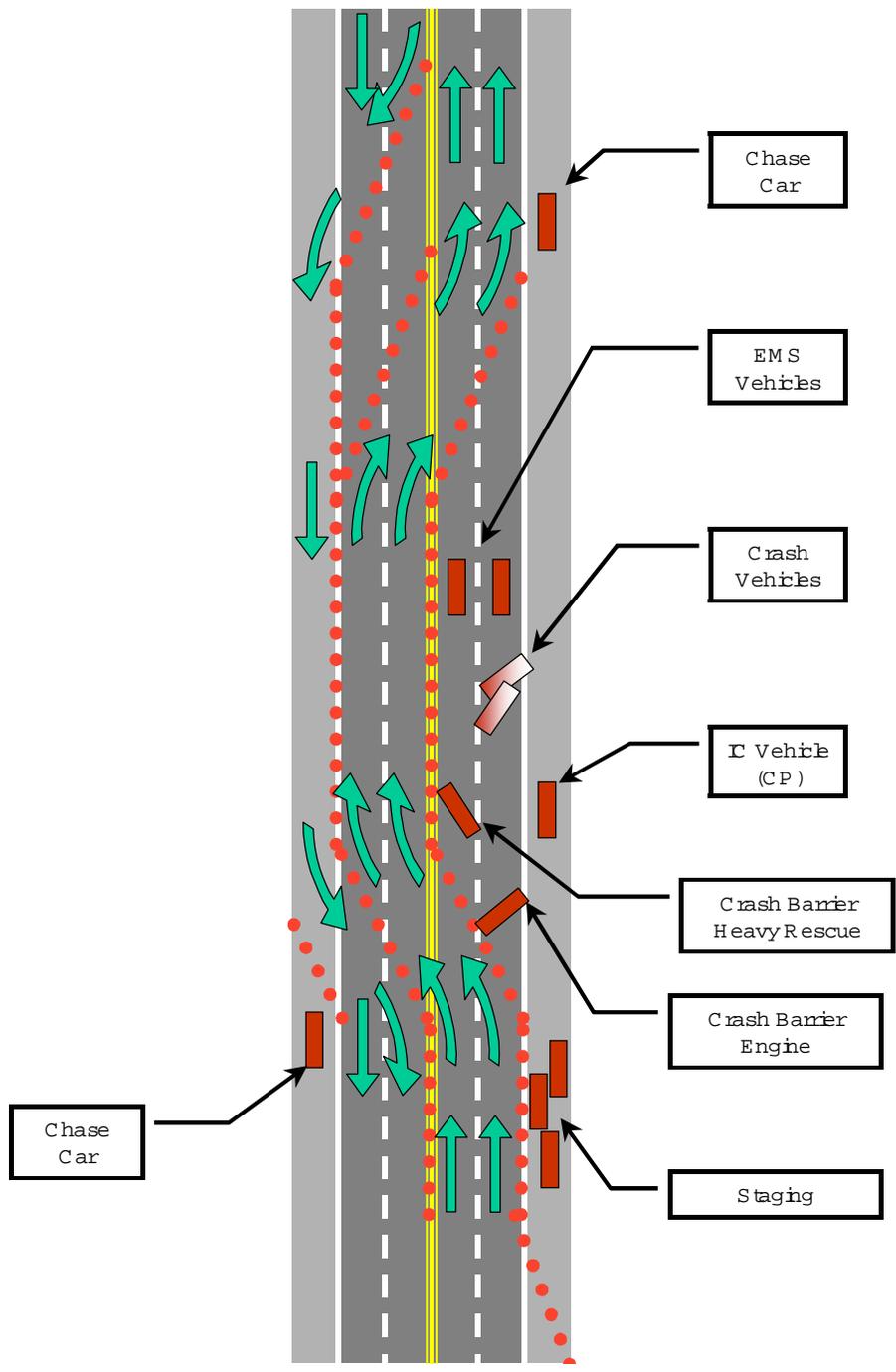


Figure 61, The Temporary Traffic Control Zone

### The Temporary Traffic Control Zone (TTCZ)

The TTCZ is that highway area where special traffic rules apply, limiting or restricting traffic. Traffic movement in the TTCZ is directed by personnel reporting to the Traffic Control

Supervisor (TCS), using the authority delegated to him by the Incident Commander in accordance with the applicable state and local statutes.

Traffic control devices are comprehensively described in the MUTCD, although the manual may be further adapted for use somewhat differently in different regions. The temporary traffic control devices that are most commonly employed traffic control device in the TTCZ at highway incidents, consist of emergency vehicle lights, flares, and traffic cones; as well as flashlights, flags, and hand signals.

*All traffic control devices used on street and highway construction, maintenance, utility, or incident management operations shall conform to the applicable provisions of this Manual.<sup>1</sup>*

Note that this is a mandatory requirement!

---

<sup>1</sup> MUTCD, Sect. 6F.01, p 6F-1.

The TTCZ is often subdivided into components as an aid in conversation and planning. The MUTCD divides the TTCZ in the following manner:

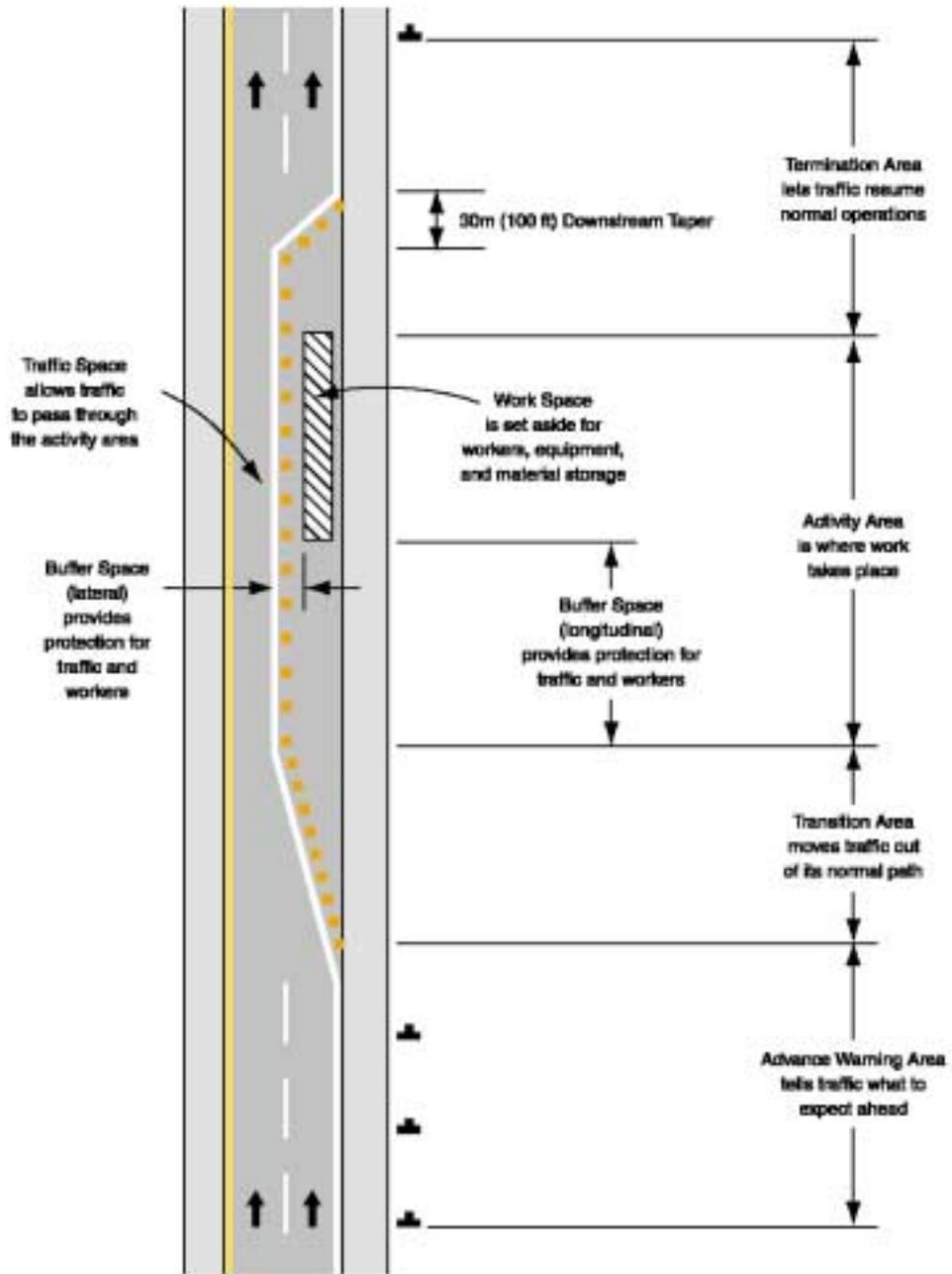


Figure 62, Temporary Traffic Control Zone Management Areas<sup>2</sup>

<sup>2</sup> MUTCD, Section 6C, Figure 6C-1, p 6C-4.

Proceeding from the upstream (bottom of illustration) end, these components are:

- The Advance Warning Area is an important consideration, as motorists are warned of upcoming traffic problems. These warnings are the primary means of preventing secondary crashes, where oncoming traffic collides with queued traffic. In order to be effective, oncoming traffic must be given ample opportunity to slow and/or stop
- The Transition Area is where traffic is shifted or merged into a new traffic pattern around the incident. Consideration should be given to position a flagger at each significant change to normal traffic flow.
- The Activity Area is the primary focus of the highway incident response. This area encompasses the crash vehicles (or other primary focus of a highway incident), as well as the working area around them. There may be several response vehicles within the Activity Area, as well.
- The Termination Area provides for the gradual and orderly return of traffic into the normal traffic pattern and flow. Response vehicles depart the scene through the termination area, including EMS vehicles transporting patients, towing and recovery vehicles that are towing inoperative vehicles, units returning to service, as well as passing traffic.
- Lateral and Longitudinal Buffer Spaces provide the separation between responders working at the scene and moving traffic.

A great deal of additional guidance regarding temporary traffic control in the Temporary Traffic Control Zone can be found in Section 6 of the MUTCD.

## Highway Incident Geography

Emergency vehicle positioning is a critical factor in both effectively using response resources and in scene safety. Due to their bulk, warning lighting, and on-board supplies and equipment, fire apparatus make useful traffic barriers. They can also make for troublesome traffic obstacles, and their emergency lighting can be a hazardous distraction to passing motorists. The first consideration for the Incident Commander is to deploy the response assets where they can be best utilized for emergent incident operations. The next immediate considerations should be, however, for scene safety and facilitating traffic flow. Ideally, company officers should position their apparatus to enable them to both meet their primary assignment and to provide protection to their crews from oncoming traffic. This is especially important during the initial scene setup, where the apparatus and the part time attention of the apparatus driver may provide the only protection available until full traffic control can be established.

The following general guidelines are designed to balance the utilization of the capabilities of response resources, scene safety, and traffic flow:

- Position the ICP vehicle on the shoulder at a detached vantage point where the Incident Commander can view the entire scene, as well as approaching traffic. The ideal location is immediately upstream of the scene, on the shoulder.
- Position EMS vehicles close downstream of the scene, with a clear egress route. This should be done as a matter of standard operating procedure, requiring no special coordination. They will be handling the most vulnerable personnel on the scene – the patients. Avoid EMS vehicle congestion by staging later arriving units. Ferry additional medical personnel to the scene as required.
- Position fire and rescue apparatus upstream of the scene, angled across traffic lanes with the driver capable of directly observing the scene from his primary operating position at the apparatus. This should also be done as part of normal and standard operating procedures, without additional on-scene coordination. Place apparatus with the shortest reach closest to the scene, regardless of their order of arrival.<sup>3</sup> Stagger apparatus on alternate lanes with sufficient spacing to allow later passage between them by other emergency vehicles, if needed.
- Assign a Staging Manager as soon as possible and assign him as appropriate within the IMS organization. His initial task should be to establish a Staging Area at a position that is protected from oncoming traffic, ideally out of the right-of-way or along the shoulder, upstream of the scene. He should immediately determine the best ingress route from staging to the scene. As traffic congestion worsens, he should standardize ingress routes through the queued traffic to the Staging Area.
- As early as practical, appoint a Traffic Control Supervisor (TCS) and assign him as appropriate within the IMS organization. Assign the TCS with the initial task of clearing uninvolved vehicles from the scene vicinity, then (working with the Operations Section Chief, the Safety Officer, and the Staging Manager) of implementing a Temporary Traffic Control Plan for the duration of the incident.
- Where practical, utilize law enforcement chase vehicles to stop and cite vehicle operators who behave hazardously within the TTCZ.

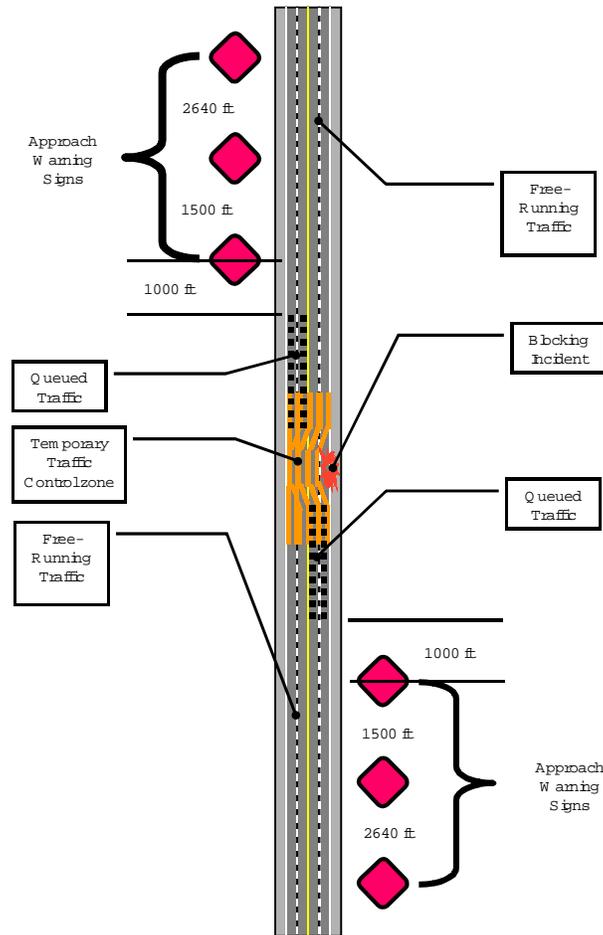
## Warning Approaching Traffic

Secondary collisions between oncoming traffic approaching a blocking highway incident and the queued vehicles stopped or slowed due to the incident is an all too common occurrence, and one where courts have found that the Incident Commander's agency may be liable. Stabilizing and

---

<sup>3</sup> Engines generally have the longest reach, since they can lay hoses to the scene. Heavy rescue apparatus have a medium reach, due to their need to connect tools to electrical, pneumatic, and hydraulic power units on the vehicle.

containing the overall traffic situation should be regarded as an integral part of stabilizing and containing the incident itself. Indeed, traffic managers would view the extended traffic effects as part of the incident.



**Figure 63, Warning Approaching Traffic**

The MUTCD covers the design and use of traffic warning devices, including their placement and spacing upstream of work zones. The warning distances are dependent upon approaching traffic speed, and their placement is well established and supported by both field experience and scientific research. The guidance does presume a static traffic flow situation, and fixes their distances from the work zone. This is not applicable to highway incidents, since traffic responds differently to them than to construction work zones. Incidental congestion is characterized by rapidly growing and slowly shrinking queues of blocked vehicles. Figure 64, adapted from the MUTCD, shows the recommended placement of three warning signs for highway incidents

under various traffic situations. For freeway traffic flows, even without any traffic backup at the scene of the incident, the Advance Warning Zone can extend a full mile upstream of the incident!

<b>MUTCD Table 6C-1 Suggested Advance Warning Sign Spacing</b>			
<b>Road Type</b>	<b>Distance Between Signs (feet)</b>		
	<b>Rear of queue &amp; Last warning sign</b>	<b>Last warning sign &amp; Middle warning sign</b>	<b>Middle warning sign &amp; First warning sign</b>
<b>Urban (low speed)</b>	100	100	100
<b>Urban (high speed)</b>	350	350	350
<b>Rural</b>	500	500	500
<b>Expressway / Freeway</b>	1,000	1,500	2,640

**Figure 64, MUTCD Table 6C-1, Advance Warning Sign Spacing**

At some point, progressing further and further upstream into the regional highway transportation system, responsibility should pass (in a coordinated manner, of course) from the Incident Commander to regional resources better equipped to deal with the problem. Detour management, for example would usually fall under a Traffic Management Center, as would signal system adjustments and other means of regulating traffic flow over a broad area. The determination of both the separation and the interaction between incident and regional traffic control is one of the tasks of the Liaison Officer.

### **Taper and Merge Layout**

The following guidelines were adapted from the MUTCD, from information contained in Table 6C-2, concerning the length of tapers set up for traffic control around highway incident activities that are blocking traffic. Note that the original table was based upon highway work zone criteria, which sought to maximize traffic flow around a relatively long duration blockage. This is much different than the environment around a shorter duration highway incident, where the safety of responders, patients, and other personnel in and around the scene assumes paramount importance, followed by considerations for the safety of passing motorists, with traffic flow and motorist convenience ranked far down the list of priorities being considered by the Incident Commander.

These factors have led the authors of this guide to adapt the original table into the following form, with traffic passing speeds lowered to the 25 – 35 mph range. Note that traffic passing speed greatly affects the required traffic control taper lengths, since only a ten mph increase in approaching traffic speed roughly doubles their recommended length.

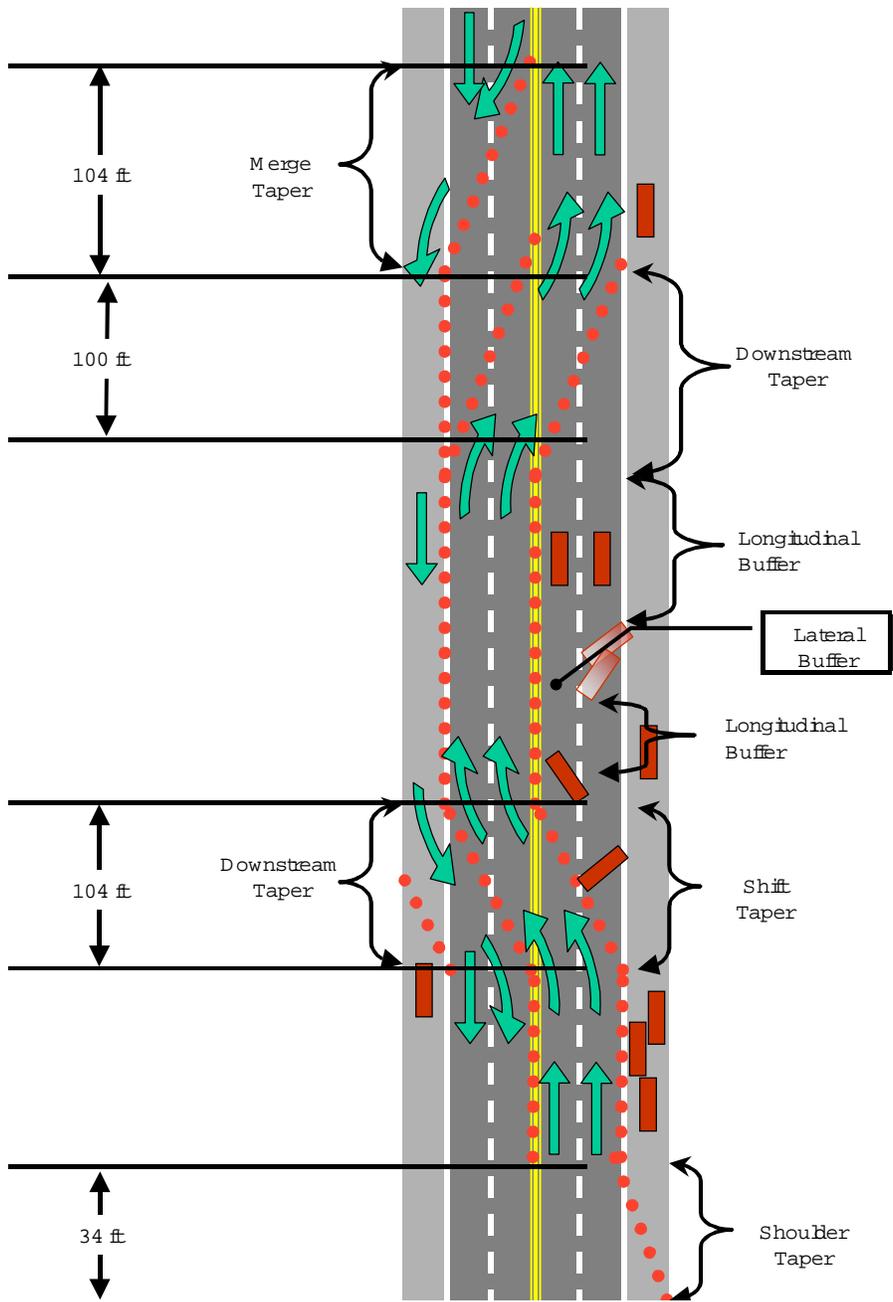
MUTCD Table 6C-2 Taper Length Criteria for Temporary Traffic Control Zones	Length of Taper (feet)	
	25 mph	35 mph
Speed of Approaching Traffic		
Merging (per lane)	125	245
Shifting (per lane)	63	123
Shoulder	42	82
One-Lane, Two Way (max)	100	
Downstream (per lane)	100	

**Figure 65, The MUTCD Taper Length Criteria**

In addition, the MUTCD specifies that the spacing between individual channelizing devices should be no more than the distance in feet equal to the speed limit in mph.<sup>4</sup> The authors of this guide recommend spacing flares, cones, or other channelizing devices much closer together. A spacing of approximately a car length between devices provides clear directional guidance to passing motorists. However, where emergency vehicles must cross the channelizing barrier, spacing should be double the width of the largest apparatus. Avoid forcing vehicles to drive over lighted flares.

---

<sup>4</sup> MUTCD, Sect. 6C.08.



**Figure 66, Tapers and Buffers**

In a typical highway incident situation on a four lane highway, where the Incident Commander has directed that passing traffic through the TTCZ be limited to 25mph, and where traffic is queued (slowing or stopping vehicles prior to entering the TTCZ) on either approach, the TTCZ might be set up as shown Figure 66. As a guide, with the objective of protecting against the highest hazards first, the TCS should accomplish the following tasks in the specified order.

Stop traffic only as necessary to ensure the safety of responders and vehicle occupants while constructing a Temporary Traffic Control Zone (TTCZ) around the incident scene.

Traffic must not be released past the scene after it has been halted for any reason without the direct approval of the TCS, who should request further permission from the Operations Section Chief and the Safety Officer. A general announcement of the pending traffic release should be broadcast to all responders prior to its actual release.

1. **Set up the TTCZ.** The Activity Area is the highest priority, followed by the Advance Warning Area, then the Transition Area, and finally the Termination Zone. This is a high risk activity, with responders, motorists, and pedestrians exposed to the serious hazards of an unstable traffic situation. Stop traffic as necessary to prevent further incidents.
2. **Determine the need for expanding the TTCZ** to the opposite travel lanes, or other nearby highways by repeating Steps 1 and 2, above. Rubbernecking may cause additional traffic congestion in lanes that are not directly affected by on-scene activities, but that are still needed for responders' ingress to the scene or egress from the scene.
3. **Adjust and modify the TTCZ** as the workspace needs of the incident dictate, as determined by the Operations Section. Protect both road users in the TTCZ and responders working in the Activity Area by maintaining a safe separation between moving traffic and response activities. Be alert for unexpected intrusions of response activities into traffic, and for passing vehicles that unexpectedly intrude into the Activity Area.
4. **Remove the TTCZ when no longer needed.** Dismantle the Termination Area, then the Activity Area, then the Transition Area, then the Advance Warning Area. Maintain the Advance Warning Area as long as the traffic queue remains, which could be four to six times as long as the duration of the original traffic blockage.

## Clearance of Stranded Vehicles

One of the most difficult traffic control challenges at a highway incident is clearing the immediate scene of uninvolved vehicles to allow responders to deal with the emergent aspects of

the incident. These vehicles are often trapped by the blocking incident ahead of them and the backed-up traffic behind them. The task is complicated by several factors, including the fact that responding emergency vehicles are arriving at the scene at the same time as the clearance is needed. Since the scene is either uncontrolled, or in the early stages of the formation of the IMS organization, motorists are often faced with a bewildering and confusing onslaught of loud sounds, bright lights, and distraught passengers. If responders are not careful, these drivers can be given conflicting direction. The result is too often chaotic and dangerous maneuvering of civilian and emergency vehicles, resulting in secondary crashes and further deterioration of the situation.

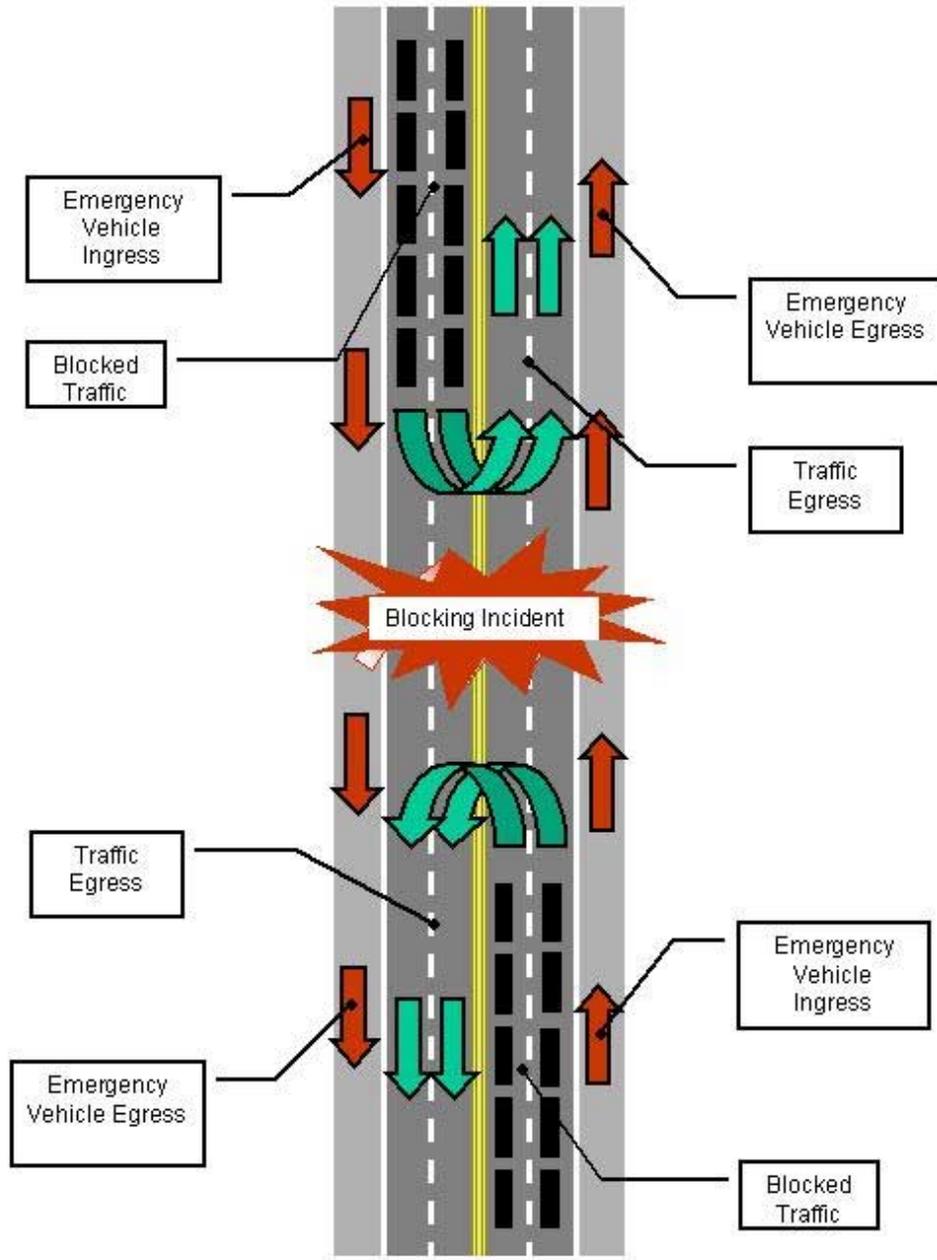
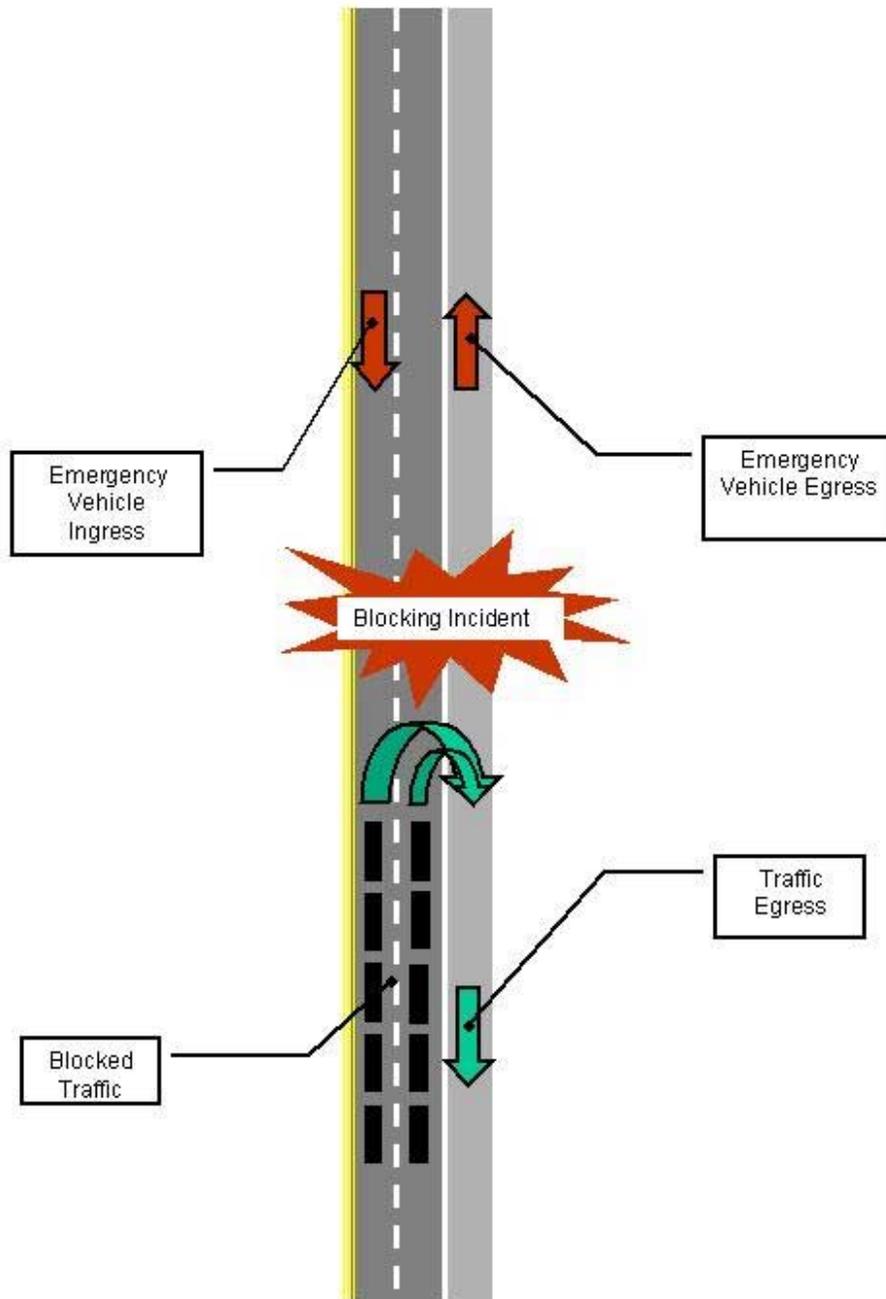


Figure 67, Clearance of Stranded Motorist Vehicles, 4-Lane, 2-Way Highway



**Figure 68, Clearance of Stranded Motorist Vehicles, 2-Lane, 1-Way Highway**

The above two illustrations show ways that may be used by the TCS to better organize the simultaneous clearance of trapped uninvolved vehicles and arrival of emergency response vehicles. Figure 67 is meant to illustrate a two-way highway, and Figure 68 a one-way traffic

situation (such as one side of a freeway). They are intended to highlight the following principles:

- Direct emergency response vehicles onto emergency ingress and egress routes that are separate from normal or clearing traffic.
- Avoid establishing emergency vehicle routes that run against normal traffic (counter-flow).
- Provide at least two lanes' width for u-turning motorists.

Traffic control in these early stages can demand considerable manpower. The TCS should be alert to the possible need to evacuate vehicle occupants as hazard conditions change. Evacuees will require evacuation transportation, temporary shelter during the incident, and transport back to their vehicles, which can require considerable resources to accomplish. If immovable vehicle occupants are to be sheltered in place, additional resources will be needed to monitor and protect them. These can present considerable obstacles to the beginning emergent operations, and should be quickly reported to the Incident Commander.

If vehicles cannot maneuver to clear the scene, they may have to be temporarily abandoned in place. If vehicles are abandoned, their drivers should leave them unlocked with keys in the ignition, which imposes an obligation on the Incident Commander to ensure their security, possibly necessitating additional law enforcement resources. If these abandoned vehicles must be removed, especially under hazardous conditions, other qualified drivers must be used. If these vehicles cannot be removed under their own power, an additional towing and recovery operation must be launched.

In situations where volunteer or other individual responders make their way directly to the scene, abandon their vehicles, and then report on foot to the ICP or work area, they should not worsen the traffic control problem around the incident. The best procedure is for volunteers to park their vehicles in the staging area. The Staging Manager may need to move them, and should be given custody of the vehicle keys. A less desirable procedure would be for individual responders to park their vehicles out of traffic, downstream of the incident. Anything that results in abandoned and locked responders' vehicles blocking incident operations or traffic flow past the incident should be avoided. If they need to be moved later, they may need to be towed.

## Highway Incident Complications

**Secondary Incidents.** Should a secondary crash occur, it will become an incident in its own right, and should be dealt with according to its seriousness. The Incident Commander already has control of the nearest emergency response resources, however they are most likely already fully engaged in the primary incident. They are even so, the best available to respond to the secondary incident, at least to perform the initial size-up. There can be no presumption of the relative importance of the primary and secondary incidents, and there can be no pre-emption of the Incident Commander's judgment of how best to initially handle the new incident. If at all possible, the Incident Commander of a highway incident where a secondary crash has occurred should:

1. Release a small number of resources under his command for dispatch to the new incident. This could be a single company, and is intended only to satisfy the need for quick response, initial size-up, and establishing command at the secondary incident.
2. Designate a member of his IMS organization to assume command of the primary incident. This would normally be the Operations Section Chief, who would reassign units beneath him to fill in any IMS gaps.
3. Take command of the area covering the primary and the secondary incidents. This is a field command of multiple related incidents in a geographically-defined area. The primary mission of Area Command is to balance the resource needs of the separate incidents within the area.
4. Request additional resources be dispatched to the area command, for his allocation between the primary and secondary incidents. This alarm assignment should be sufficient to replenish the primary incident, staff the secondary incident, staff the area command, and to establish an area reserve force.

**Frustrations.** The delay caused by highway incidents can place motorists under a great deal of stress, and some may strongly disagree with the manner in which traffic controllers impede their freedom of movement. Some may challenge or circumvent traffic direction in unexpected and dangerous ways. Commercial carriers faced with late delivery penalties, motorists late for important appointments, and frustrated commuters may consider their needs to be paramount, and have little regard for other considerations. Confrontations can quickly spiral out of control and turn violent. Law enforcement may be the only response resource equipped to deal with

violence, but all responders should practice civility and patience when dealing with the frustrated motorist.

**Exposure.** Risks to motorists must also be reduced from both the causes and the consequences of the highway incident (including vehicular traffic, weather, road conditions, fire, hazardous materials spill, etc). For example, weather factors that are commonly associated with highway incidents, such as snowstorms, fog, or heavy rain can rapidly exacerbate a benign traffic queue behind a simple motor vehicle accident into a mass casualty incident. Secondary crashes caused by these factors are all too common at highway incidents. This sort of situation can escalate into a major evacuation and shelter operation that far exceeds the parameters of the original incident(s).

**Pedestrians.** Occupants of vehicles that are stopped for extended periods at highway incidents are prone to engage in unusual and dangerous actions outside of their vehicles. Personnel responsible for traffic control should be alert for occupants leaving their vehicles at unexpected times. They may be retrieving items from the trunks of their vehicles, relieving themselves, or simply stretching their legs. Curiosity can draw them to the scene for a closer look, abandoning their vehicles. Crowd control can quickly turn into a major problem as the broadcast media publicize the incident, and a significant law enforcement effort may be required to maintain scene security. Sightseeing traffic (or fleeing motorists) can also transform a minor congestion problem into regional gridlock, which would call for extraordinary regional traffic management measures.

**Inattention.** Motorists may become inattentive to traffic control measures after extended waits in traffic queues at highway incidents. Truck drivers may take advantage of being stopped and nap in their sleeper cabs. Other motorists may simply fall asleep at the wheel, daydream, or become immersed in cellular phone conversations. Unresponsiveness may even be the result of carbon monoxide poisoning caused by exhaust leakage from idling engines into the passenger compartment. Traffic flow can therefore be difficult to smoothly restart after protracted stoppages.



# APPENDIX F.

## CREDITS

The National Fire Service Incident Management System Consortium wishes to thank the following people for their dedicated work in producing this model procedures guide. Their dedication to this work has produced an excellent primer that will provide a better understanding of the requirements and needs that are experienced by fire and rescue, emergency medical services, law enforcement, transportation, and other responders to highway incidents. This guide is a living document, and your comments and criticisms are welcomed and will be considered for inclusion in the next edition.

**Ken Brooke, Principal Contributor**  
**Mitretek Systems, Inc., Supporting**  
**Intelligent Transportation Systems Joint Program Office**  
**US Department of Transportation**

**Gene Chantler, Chair, Model Procedures Committee**  
**National Fire Service Incident Management System Consortium**

### **Highway Incident Model Procedures Guide Committee Membership**

**Craig Allred**  
**Public Safety Program Coordinator**  
**ITS Joint Program Office**  
**Federal Highway Administration**

**David Helman**  
**Incident Management Coordinator**  
**ITS Joint Program Office**  
**Federal Highway Administration**

**John Amrhein**  
**Emergency Services Coordinator**  
**San Bernadino County Sheriff's Dept.**

**Wayne Bindas**  
**Connecticut Fire Academy**

**Ronald P. Miner**  
**Southeast Regional Manager**  
**Northrop Grumman Mission System**

**Bob Neamy**  
**Deputy Chief**  
**Los Angeles Fire Department**

**Robert Ricker**  
**Lieutenant, New Jersey State Police**  
**Incident Management Unit Head**









