

WSDot Smart tunnel

<https://youtu.be/9eqICppbGus>

Tunnel Incident Command (short)

Deputy Chief Gary English (ret.)



Who is attending? Show hands

- Tunnel Owners/
operators/TSO
- Fire
- Police
- Health/Ambulance
- TunEngineers
- Road Authority
- Vendors
- Others?





**Tunnel Operations,
Maintenance, Inspection, and
Evaluation (TOMIE) Manual**



U.S. Department of Transportation
Federal Highway Administration

July 2014
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NFPA

502

Standard for Road Tunnels,
Bridges, and Other Limited
Access Highways

2011



Mobile vent unit

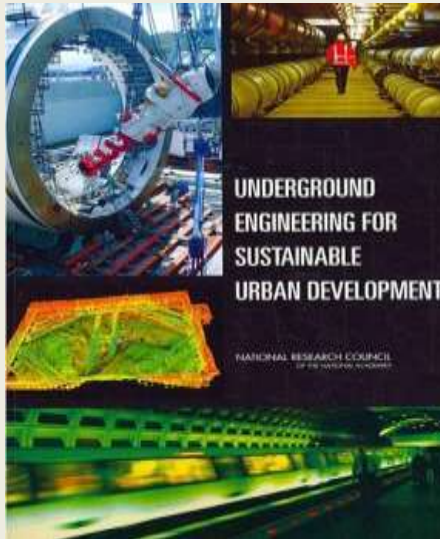
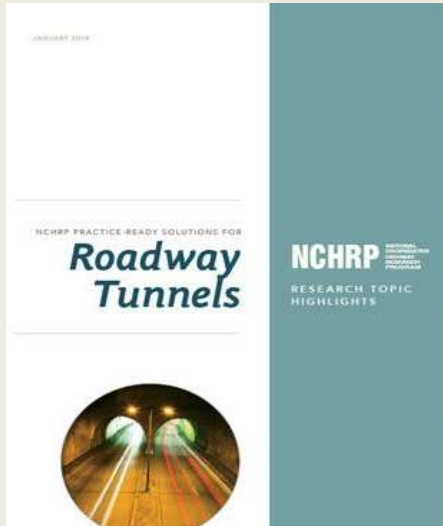


TRB

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OF THE NATIONAL ACADEMIES

Tunnel – 66 projects
30+ papers

7,000 Members
13,000 Annual Meeting
200 Committees
73,000 Papers



Training Inc Command / NIMS

- [ICS-100: Introduction to Incident Command System](#)
- [ICS-200: ICS for Single Resources and Initial Action Incidents](#)
- [ICS-300: Intermediate ICS for Expanding Incidents](#)
- [ICS-400: Advanced ICS for Command and General Staff](#)
- [IS-700: National Incident Management System, An Introduction](#)
- [IS-701: NIMS Multiagency Coordination System \(MACS\)](#)
- [IS-702: NIMS Publication Information Systems](#)
- [IS-703: NIMS Resource Management](#)
- IS-704: NIMS Communication and Information Management
- [IS-706: NIMS Intrastate Mutual Aid](#)
- [IS-800: National Response Framework](#)
- [G-191: Emergency Operations Center Interface](#)
- [G-402 Overview for Executives/Senior Officials](#)
- [G-775: Emergency Operations Center \(EOC\)](#)

**Several WEEKS
of STUDY !!**



Guide

Structure

Every position

Job Description

Duties

Also Mobile App

Incident Command Outline

- Seattle
- History
- President Directive 2003
- Inc Command Structure
- Case Study (*Tunnel X*)
- Summary



IC Vests/
Clipboards

USA = 463 Road Tunnels/ Washington = 62

Seattle 725,000 pop. / 1+ M Weekdays

64 lane km of Road/ Rail tunnel – 2021



Fire brigade = 1000+ 73 apparatus 92,000 alarms/yr

1000 FF
210 On Duty



Road / Rail Tunnels

- 1 Great Northern 1904
- 2 Battery Street 1954
- 3 WSCC (Air Rights) 1988
- 4 Downtwn S TT 1990, 2009
- 5 Beacon Hill Tun 2009
- 6 University Link 2016
- 7 Mt Baker 1942, 1993, 2017

- 8 Alaska Way (SR99) 2018
- 9 NGate Link 2021
- 10 East Link 2023
- 12 Montlake (SR520) 20??
- 13 Ballard Link 2035
- 14 West Link 20??

Freeway

BATTERY STREET TUNNEL –



FFFS 1954

Ventilation Test,
Cars running...
Cough ...Cough ...

1970 California - **773** fires 13 days 233,099 Hectares



1970 Birth Incident Command

- 19,500 firefighters from 500 departments

DIFFERENT

- Terminology
- Command Structure
- Communications
- Resources
- Strategy



Part from Military

- **FIRESCOPE** = 1971
 - Incident Command System
 - Multi-Agency Coordination System
 - Information Management System
 - Technological Support
 - Common Communications

2003 US Presidential Directive-5

National Incident Management (NIMS)

Incident Command System (ICS)

- establish a single, comprehensive approach to domestic incident management
- ALL government/ most private

Major components

- **Common Terminology**
- **Modular Organization**
- Integrated Communications
- Unity of Command
- **Command Structure**
- Manageable Span of Control
- Consolidated Incident Action Plans (IAPs)
- Designated Incident Facilities
- Comprehensive Resource Management



Scalable, start with one, and grow as needed

'Incident' Command

- Single Agency in charge
- Single Agency with support from other agencies

'Unified' Command

- multiple agencies Fire, Police, Ambulance, Road, (tunnel), Public lands, etc., Political
- Unified Command Post

2007

California

Unified

Command

7000 Fire Engines

12,000 people



2007 S. California



2007 Unified Command Worked!

- Command Structure
- Same terminology
- Coordinated resources

- Unified Command

- **Plans written in advance**

Resources contacted in advance

FIRE

POLICE

ROADS

UTILITIES

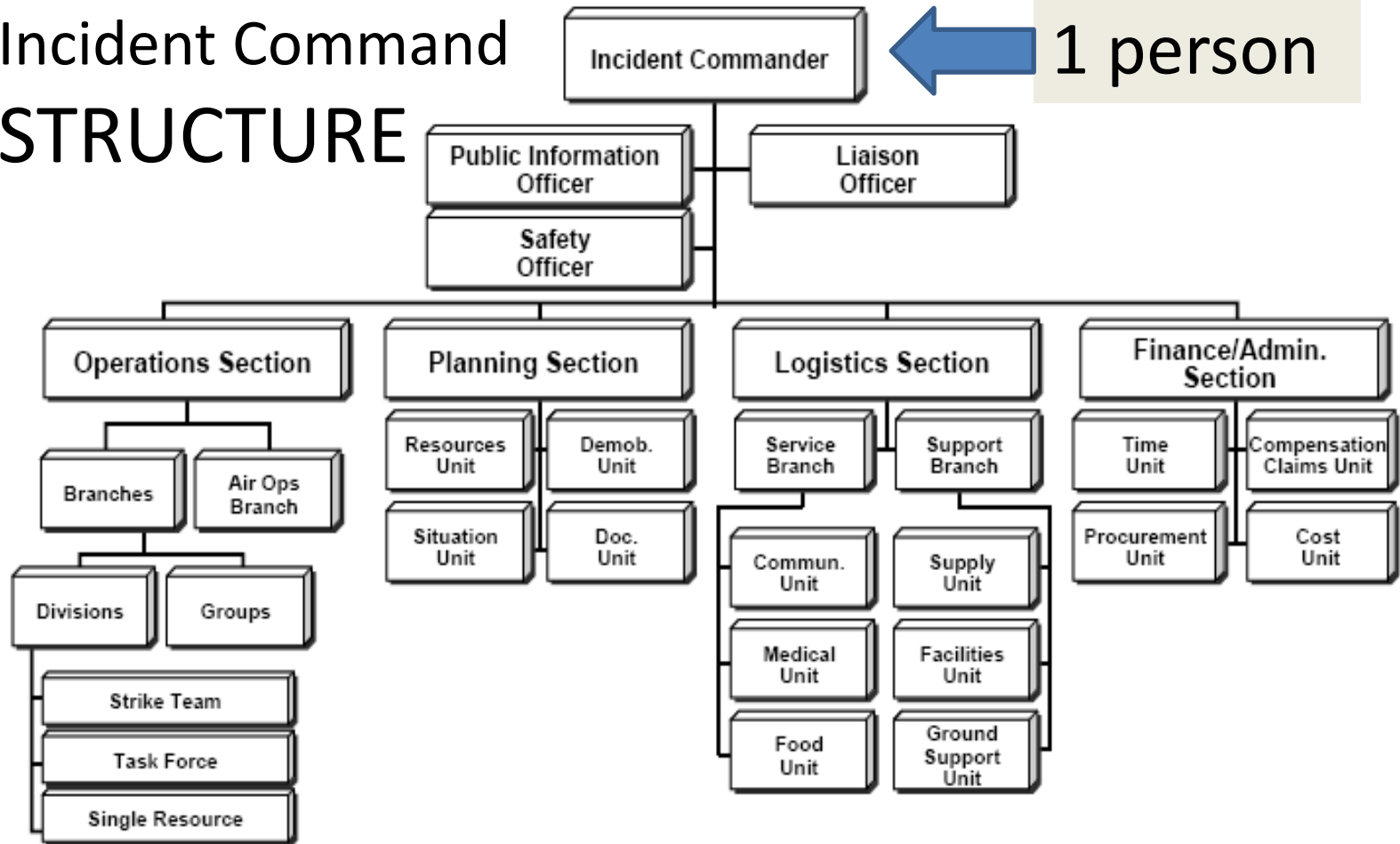
FOREST

Local

State

Federal

Incident Command STRUCTURE

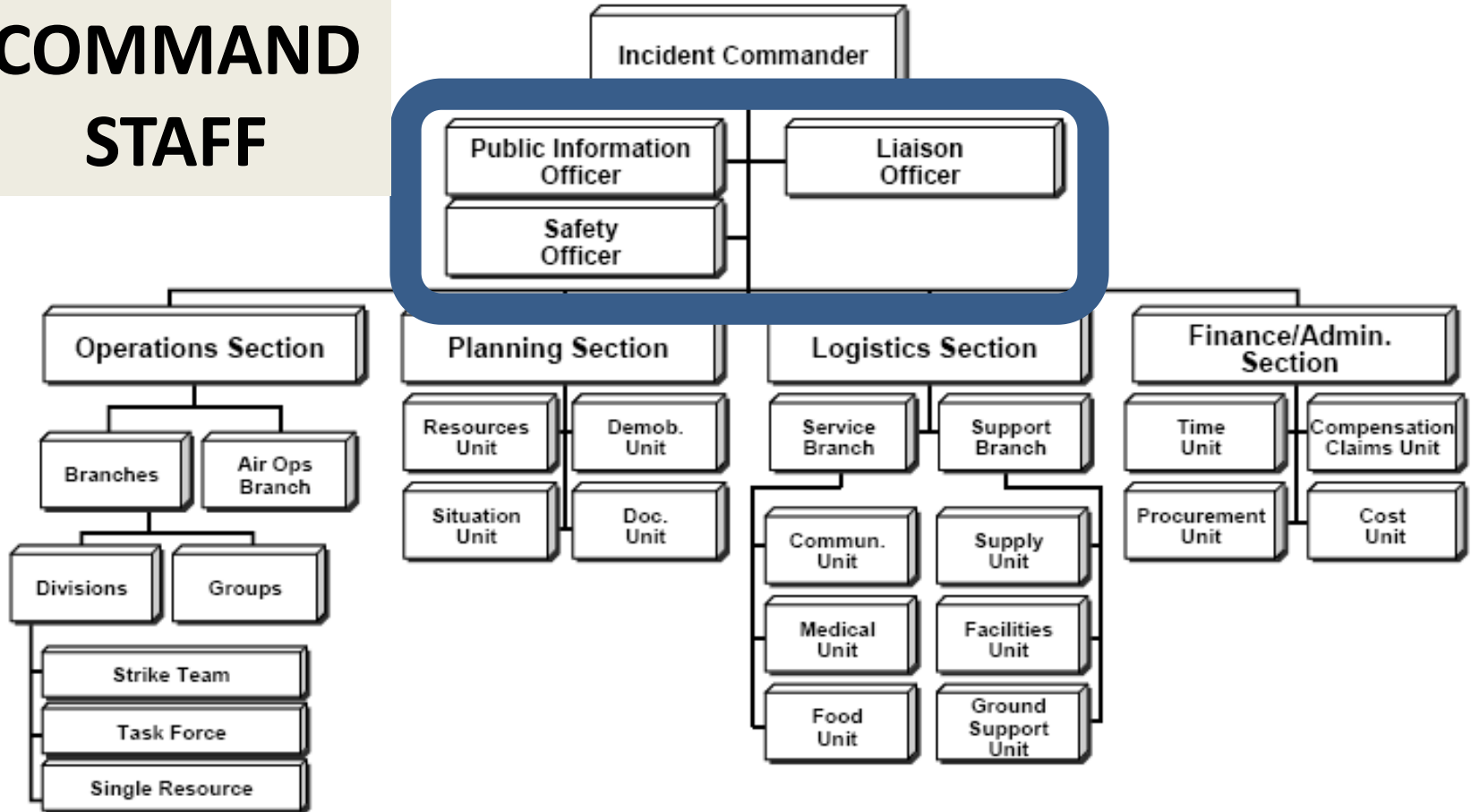


Incident Commander Needs Help!

- 3 Command Staff
- 4 Section Chief



COMMAND STAFF



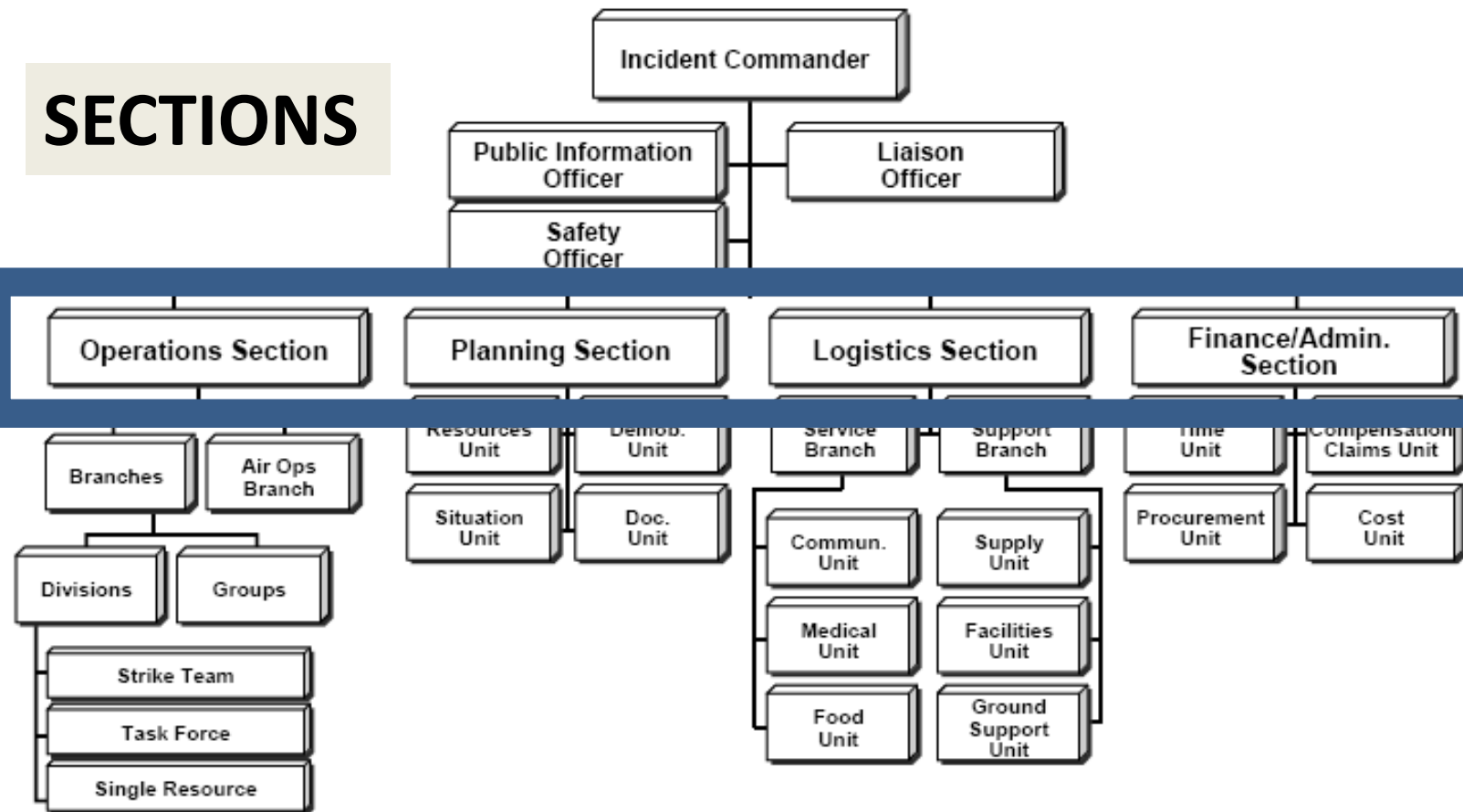
COMMAND STAFF = 3

**INCIDENT
COMMANDER**



- PUBLIC INFO OFFICER- News
- SAFETY OFFICER - FF Safety
- LIAISON OFFICER – Agencies

SECTIONS



SECTIONS = 4

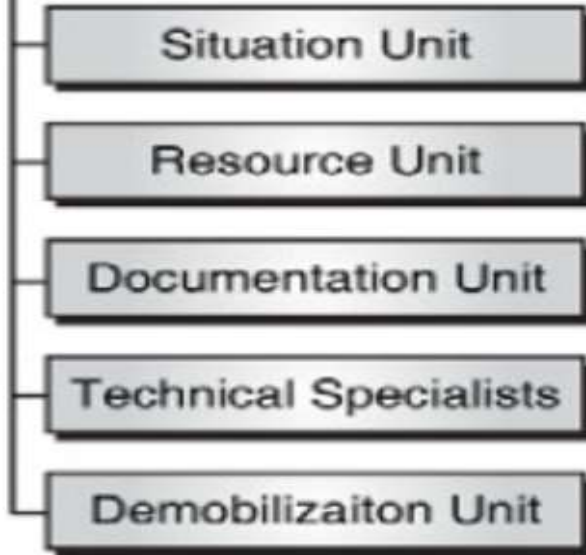
INCIDENT COMMANDER



- OPERATIONS-** Fire, Medical,
- PLANNING** – Now and Future
- LOGISTICS** - Services/ Supply
- FINANCE** – Money/ Records

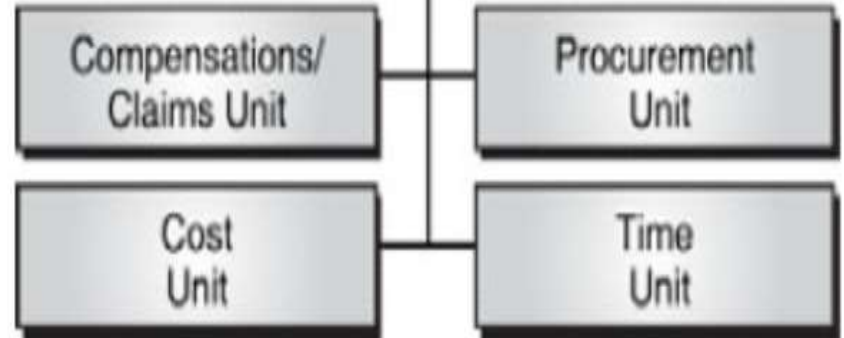
2 of 4 SECTIONS

Planning



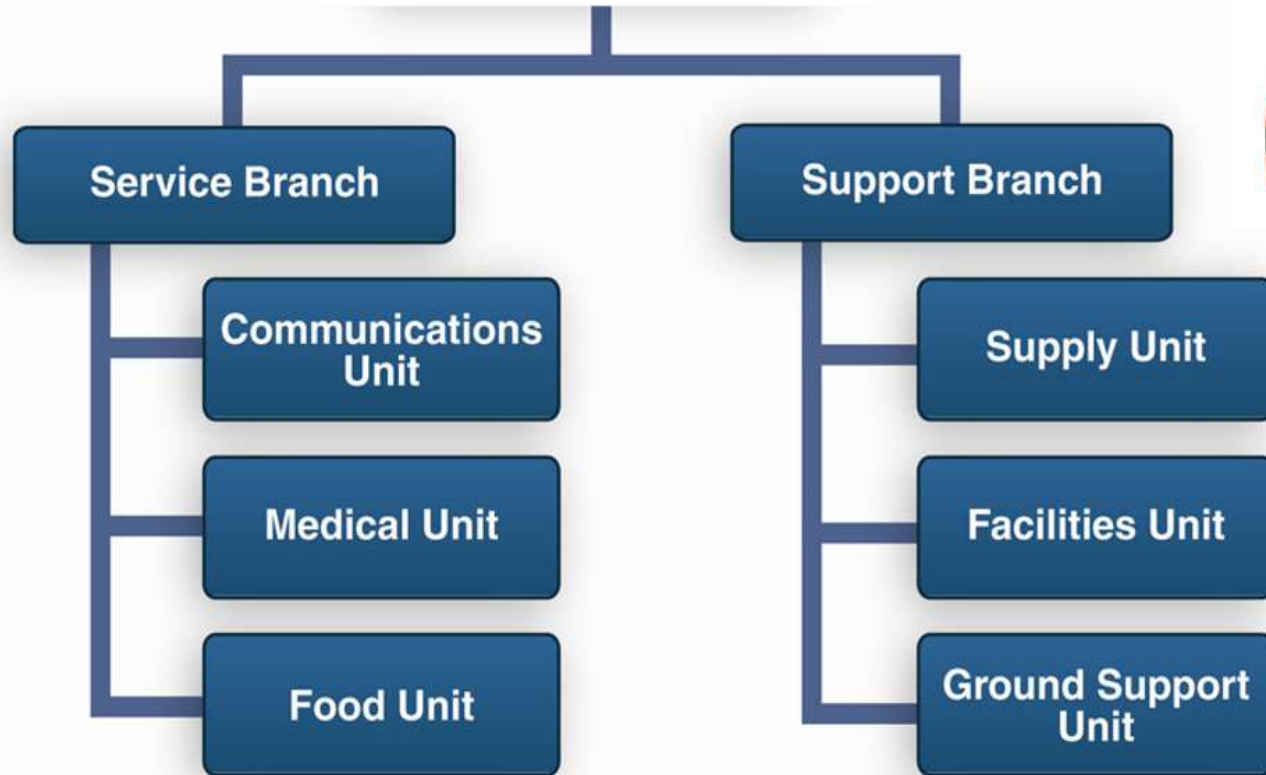
Finance

\$\$\$



Planning
Section Chief

Logistics section



Operations



Suppression
Group

Rescue Group

Medical Group

Mass Care
Group



Operations - Medical Group

Triage, Stabilize, Treat, Transport
Ambulance / Hospital sss



PATIENT Tagged for
Priority- **COLORS**



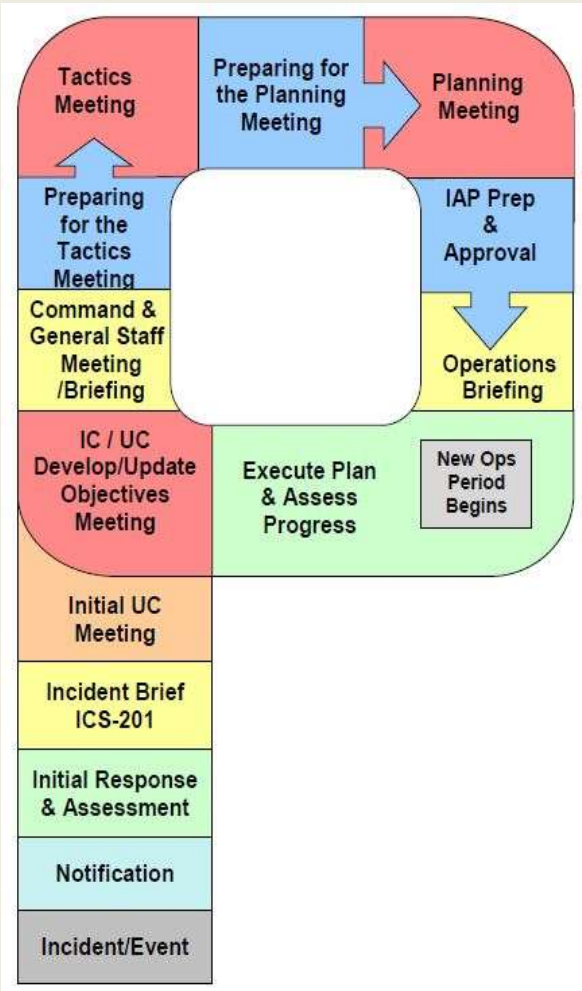
Unit Types

SINGLE RESOURCE = Same task with Officer
(Fire Engine)

GROUP = Task oriented go anywhere
Several Units

DIVISION = Geographic stay in area
Several Units

BRANCH = Separated Operations (tun portals)



PLANNING PERIODS

4-24 HOURS

INCIDENT ACTION PLANS

(Paperwork !!!)



CASE STUDY – Tunnel X

Goal = BUILD INCIDENT COMMAND STRUCTURE

1. Identify Problems

Fire? Rescue? Dangerous Goods? Other?

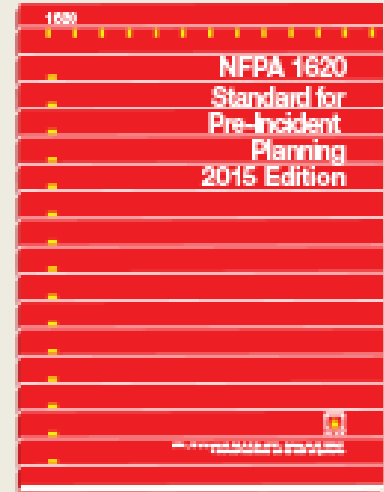
2. Decide on IC positions

3. Assign resources as available

(Skip steps, timeline shortened)

Pre Plan Tunnel X

- Two Way traffic
- 3 Km long
- .5 % grade
- Lights
- Ventilation
- No standpipe
- No cameras
- 15 min Fire Unit
- 30 min 2nd Fire
- 1 hour to Hospital
- P to P 60 min
- (Bus = 50 people)

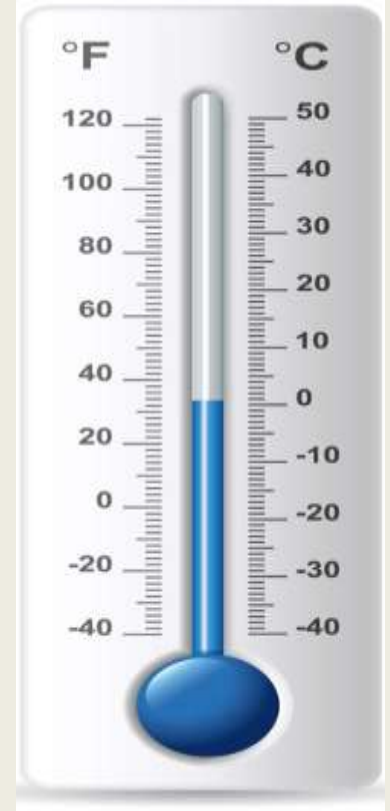


NFPA 1620

Pre Incident Planning

Today

- 8 PM (2000 hrs)
- 0 degrees
- Snow on ground
- Storm predicted
- Normal traffic



Phone Call



1. BAD Accident in Tunnel X
2. Big Tour Bus crashed into Large Truck
3. Many people hurt, some trapped in bus
4. Truck Barrels broken, liquid on ground
5. Smoke from W portal

WHAT ARE PROBLEMS? = Inc Command Assign

? PROBLEM ? = RESOURCE/units

Think...



Info? = Recon

Smoke = Fire

Trapped = Rescue

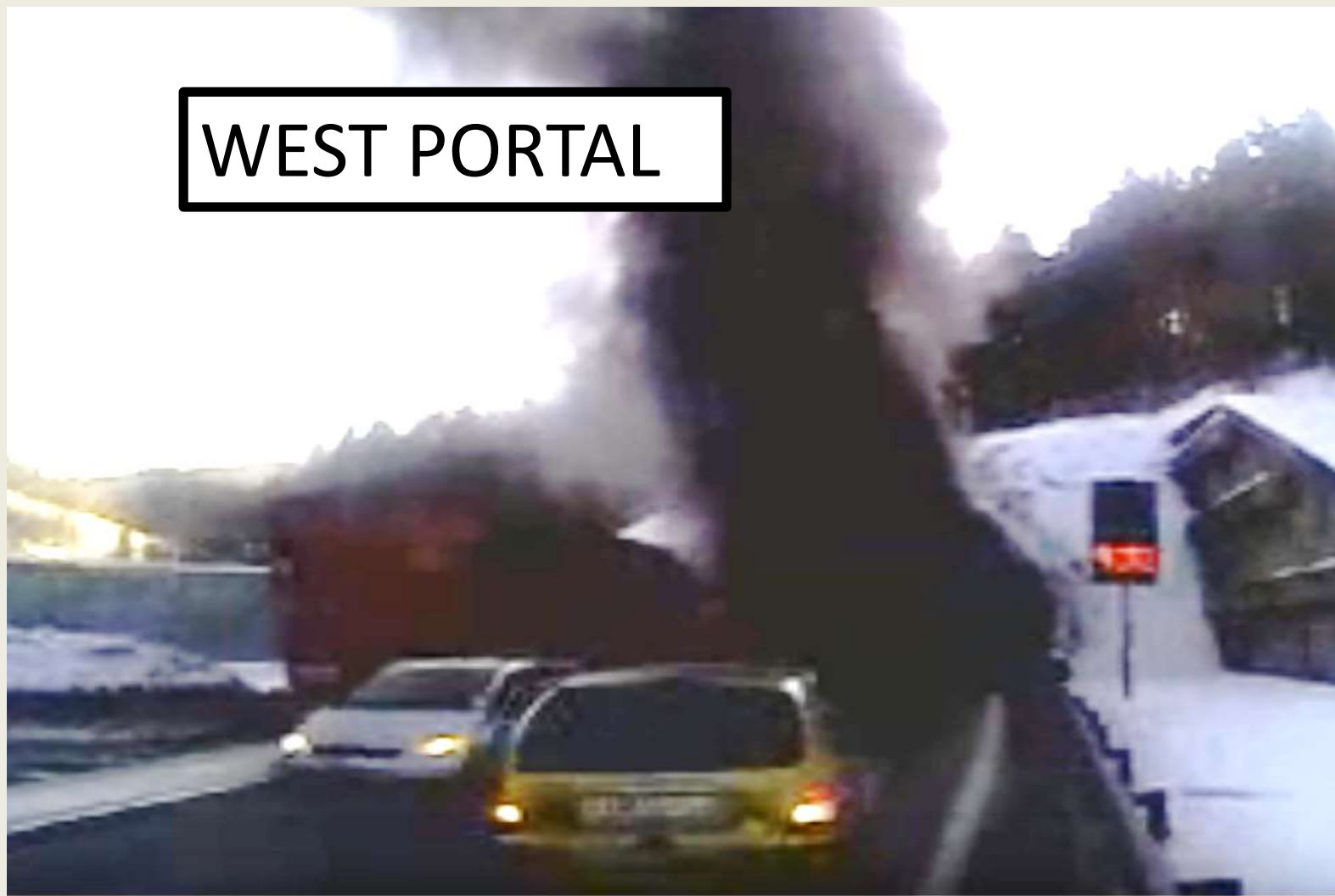
Injured = Medical

Liquids = Dangerous Goods

1st Arriving IS INCIDENT COMMANDER

- Establish Command Post *Say Radio*
 - Command Post / Location
 - Scene size up
 - STRATEGY/ TACTICS
 - Call more resources?
 - Assign units
 - More info! Motorists

WEST PORTAL

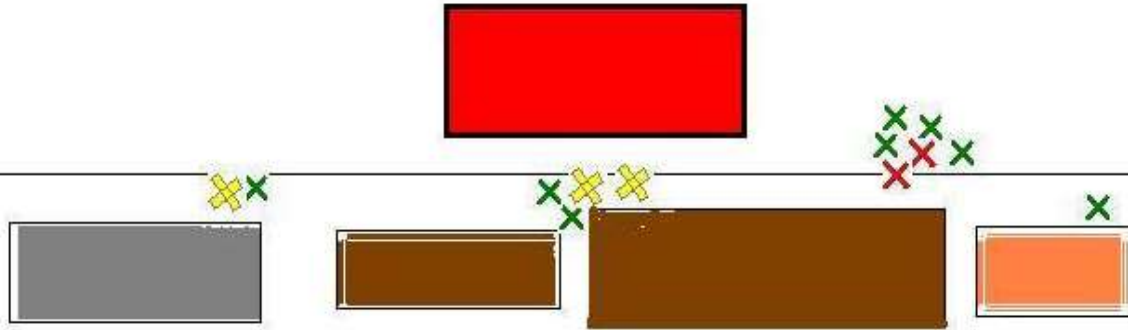


E71 arrives...West Portal

West Portal

5 KM
WEST

TUNNEL
3 KM



(0 BLACK, 2 RED, 3 YELLOW, 8 GREEN)

ESTABLISH COMMAND - radio

- “E71 at Tunnel X West Portal
- Tunnel X **Command** at West Portal send Tun Response x 2
- Black smoke from portal
- **2 red**, 3 yellow, 8 green **(immediate)**
- E71 is W RECON
 - 2nd ENGINE at WEST is MEDICAL GROUP
- 1st Unit E Portal, establish EAST BRANCH”

EAST PORTAL

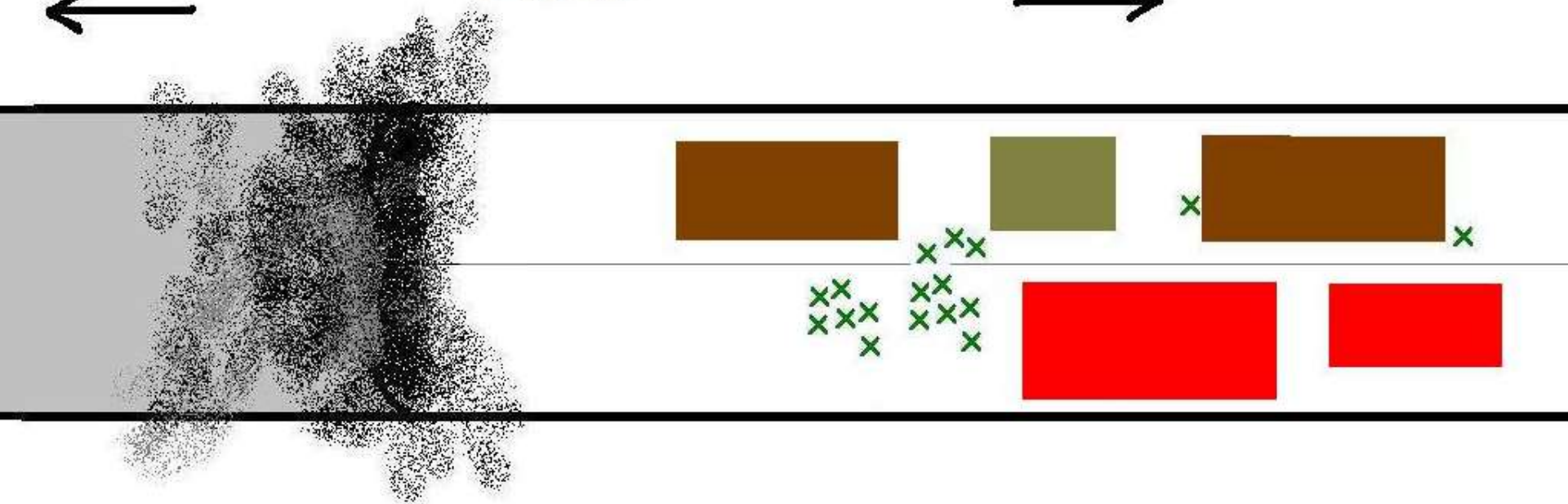


EAST Portal E41 + Rescue 55 arrive

Tunnel
3 KM
←

East
Portal

2 Km
→



0 BLACK, 0 RED, 0 YELLOW, 17 GREEN

EAST PORTAL

- “E41 + Rescue 55 **AT** Tunnel X EAST Portal
- E41 establishing- EAST BRANCH Tun X
- *Brown* smoke from portal -
- E41 = E RECON
- No Red, No Yellow, 17 green

R55 E SHELTER GROUP

- 2 Bus for E Shelter /transport “

Initial Assigned Units –

WEST Portal

TUN X COMMAND

E71 Officer

W RECON

E71 2/3 person

MED GROUP

2nd Engine

EAST Portal

E BRANCH

E41 Officer

E RECON

E41 2/3 person

SHELTER

R55

OTHER UNITS ENROUTE !!

Batt Chief officer arrives

TRANSFER OF COMMAND

- Incident Commander briefs incoming Chief
- Specific List for transfer
- FF Emergencies
- Safety, Strategy / Tactics,
- Assignments,
- Recommendations



Battalion Chief 22

'B22 is Tunnel X Command'

- E 41 Officer is OPERATIONS
- Request Med Helicopter
- NEW = AIR BRANCH West
- E Branch Status report

HOW LONG to finish?

Incident Action Plan = Forms
(notes/ assignments)



W Recon Radio Report

1. Accident at 500 meters
2. 20 people walking out
3. Bus fire, cannot put out
4. 4 Trapped patients
5. **RESCUE** Send 2
6. **FIRE** Send 2
7. Liquid from truck = wine 50 gallons
8. W Recon now **Rescue** at bus



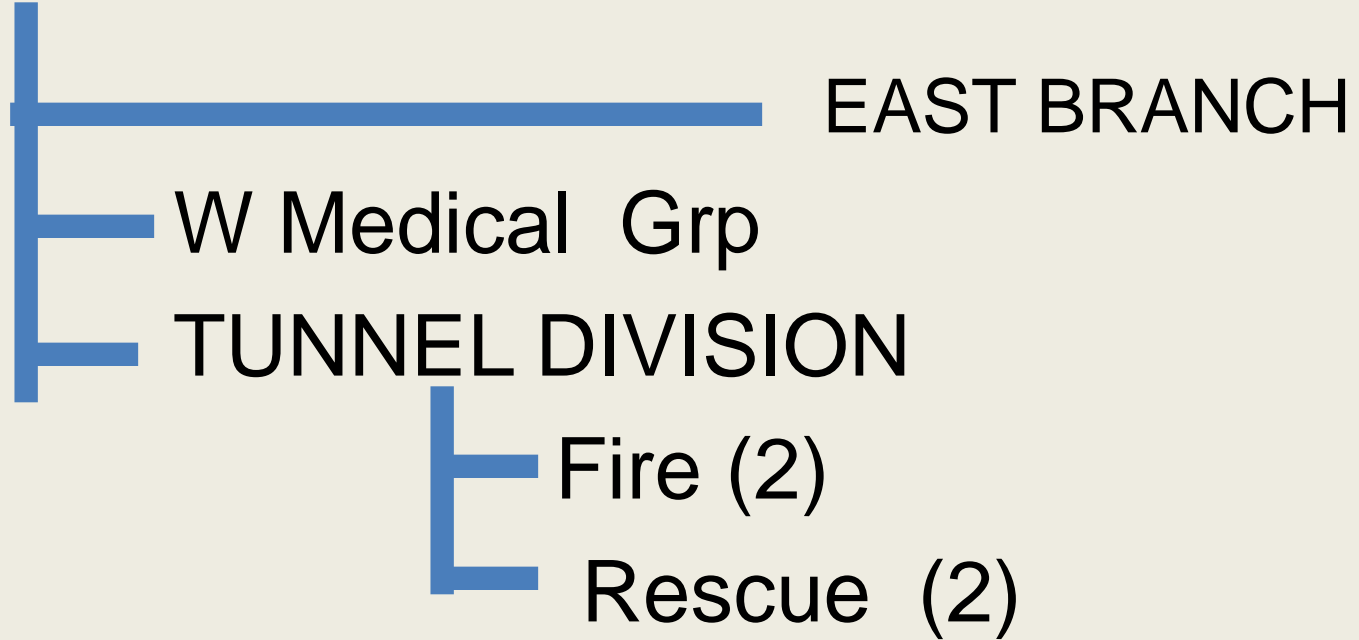
Tunnel X Command

- W Recon received status report
- “3rd engine is W Tunnel Division
- Take hose in W Portal
- Request
 - 2 Rescue units
 - 2 Fire units”

Dispatch Cntr- Air Support status?

TUNNEL X COMMAND

OPERATIONS SECTION



IC Priority = LIFE SAFETY

Resources

Problems!!



FUTURE -Tun X Inc Command



OPERATIONS

(Safety, PIO, Liaison)

Medical Group

W Tunnel Div

Fire 3 units

Rescue 2 units

EAST BRANCH

E Recon

E Shelter

E Rescue ?

E Fire?

:

AIR BRANCH

Air Support

Tun X Inc Command



Relocate Command Post
Change to Unified
Command

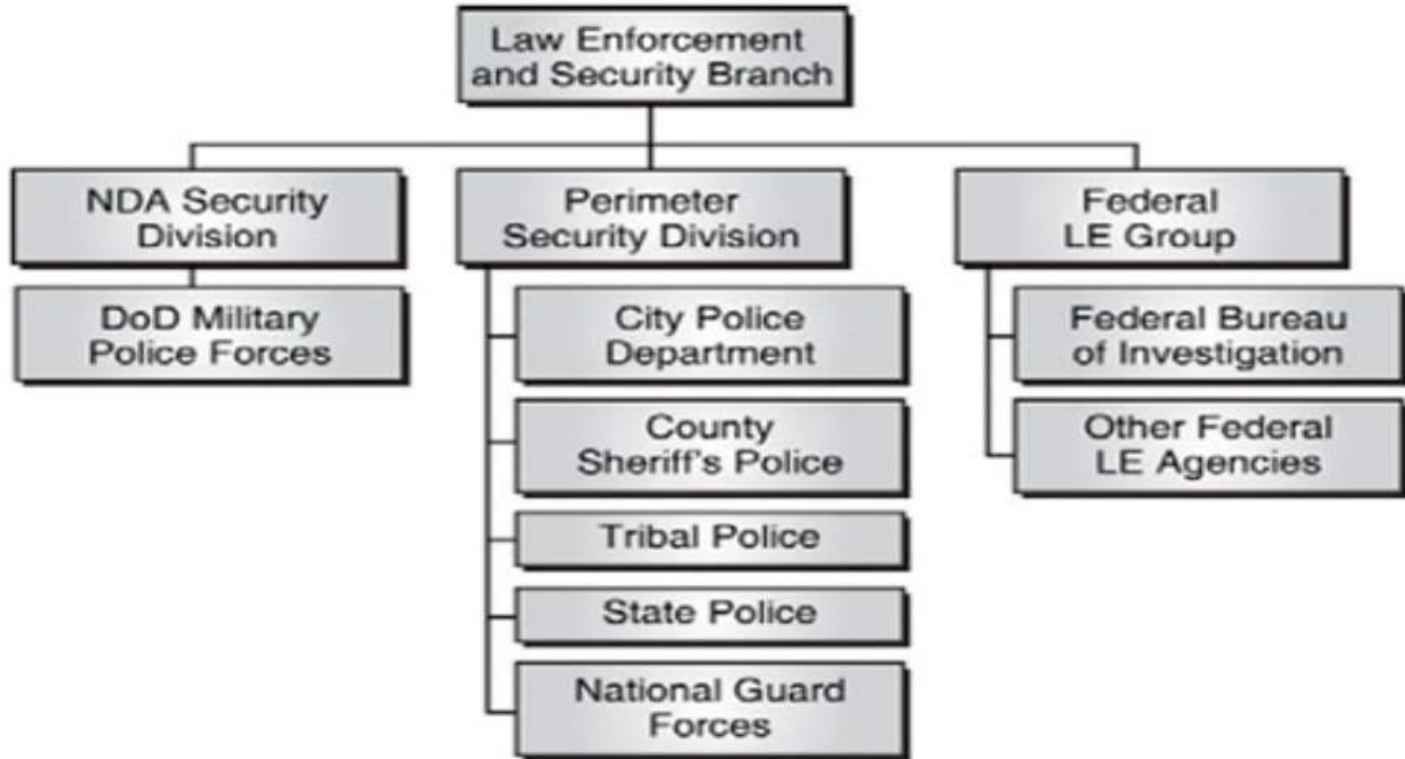


Police / Military –

- Transportation Corridor (Ambulance/Engines)
- Traffic control
- Crowd Control
- Helispot control
- Accident investigation



UNIFIED COMMAND – POLICE



Sasago Japan Collapse/Fire



Inc /Unified Command- all agencies

- **Common Terminology.**
- **Modular** Organization.
- Management by objectives. S + Tactics
- Chain of Command & Unity of Command.
- Unified Command.
- Resource Management.
- Integrated Communication.
- **Accountability.**



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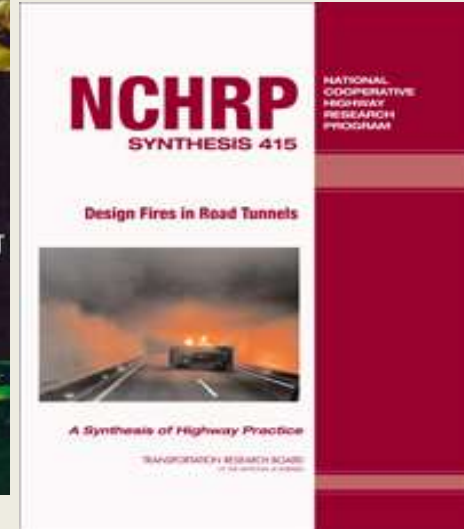
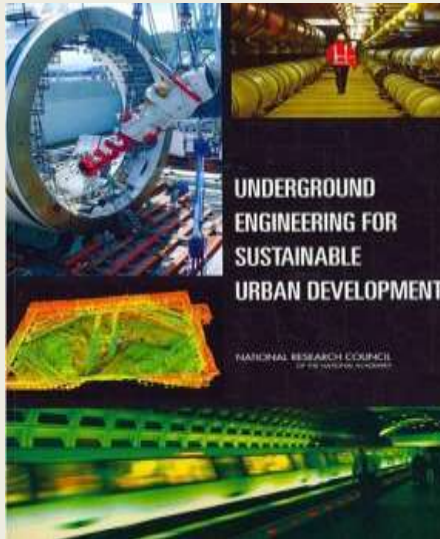
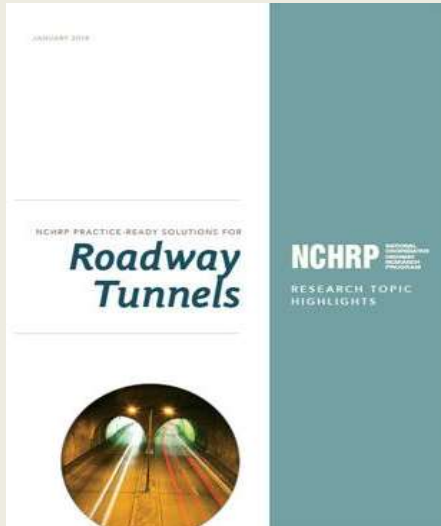


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QUESTIONS? HELP?



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Figure 1 — Incident Command System Structure

