



Local Control of FirstNet - What Does It Really Mean?

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Agenda

- Administrative setup – applications, devices & users
 - Static or default priority for day-to-day operations (the 95%)
 - Localized need for more capacity (the 5%)
- LTE parameters - What kinds of changes can be made?
- Incident Command, tools and training
- Who can make the changes?



- **User and Device Management**

- Add, change, delete devices
- Device procurement, asset management & replacement
- Device management
- Subscription activation/deactivation
- User identity and credential management

- **Network Design**

- Cell site selection & hardening
- Compliance with laws/ordinances
- Network topology, backhaul
- Reuse public safety IP networks

- **Network Operations & Maintenance**

- Network monitoring
- Real-time support
- Scheduling for planned outages

- **Applications and Services**

Scope >>> – **Mission critical Priority and QoS**

- Local agency applications
- Access to nationwide applications
- Security and information assurance policies (e.g., VPN)
- Application layer controls (keys, group definitions, etc.)



- One major aspect of Local Control will be the initial setup of all the agencies within a given area or region.
- The network will be most efficient if users are given just enough access and priority to get the job done and nothing more.



- Priority could be based on the combination of:
 - Applications
 - Assignment
 - Devices
 - User
- There should be enough bandwidth to handle all users performing normal day-to-day operations but also enough to handle 95% of the normal incidents.



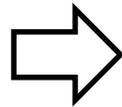
The Other 5%

- Constant tweaking of the network to handle “average” incident load is a problem – either there’s not enough capacity OR they are not set up correctly in the first place.
- ***However, there may be situations where localized adjustments are required because an incident requires an unusually high number of personnel, devices and/or bandwidth-hungry applications.***

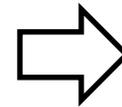


NPSTC Priority & QoS

- Membership
 - Users
 - Government/Standards
 - Industry
- Conducted nationwide web survey
- Currently standardizing NPSTC recommendations
- April 2012 – released Task Group recommendations for Public Safety Priority & QoS utilizing LTE broadband
- December 2012 – released High-Level Launch Requirements for FirstNet Consideration



Task group requirements & recommendations



Requirements Standard



A GLOBAL INITIATIVE

Stage 1,2,3



Key Use Cases



Supervisor witnesses an officer down and needs to initiate "Responder Emergency" for an officer in the field.



Fire dispatch assigns units to a four alarm fire incident at a congested cell with other responders using the same cell for training exercises.



Police in a shootout need to initiate dynamic priority for voice and video communications without taking their eyes off of the perpetrator. No time to enter a priority activation code.



Fire command at a wildfire needs to make frequent calls to adapt to changing incident conditions. No time for per-call priority activations.



Things to Think About...

- What happens if every end-user requests priority on FirstNet? Who gets priority? First-Come-First-Served is not the right answer.
- One type of responder isn't always of higher priority than another type. *When it is impossible to drive in an ice storm due to downed trees and power lines, does EMS/Fire-Rescue/LE have priority or is it DoT/Utilities?*
- Public Safety priority is *situational*. Consideration must be given to the incident and what the user is doing.
- Public Safety Priority and Quality of Service (QoS) is a function of a user and not the particular device they are using. Think about shared devices (vehicular modems).



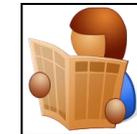
Schools



Second Responders



Government



Citizens/
Public



Utilities



Environment



EMS



Fire-Rescue

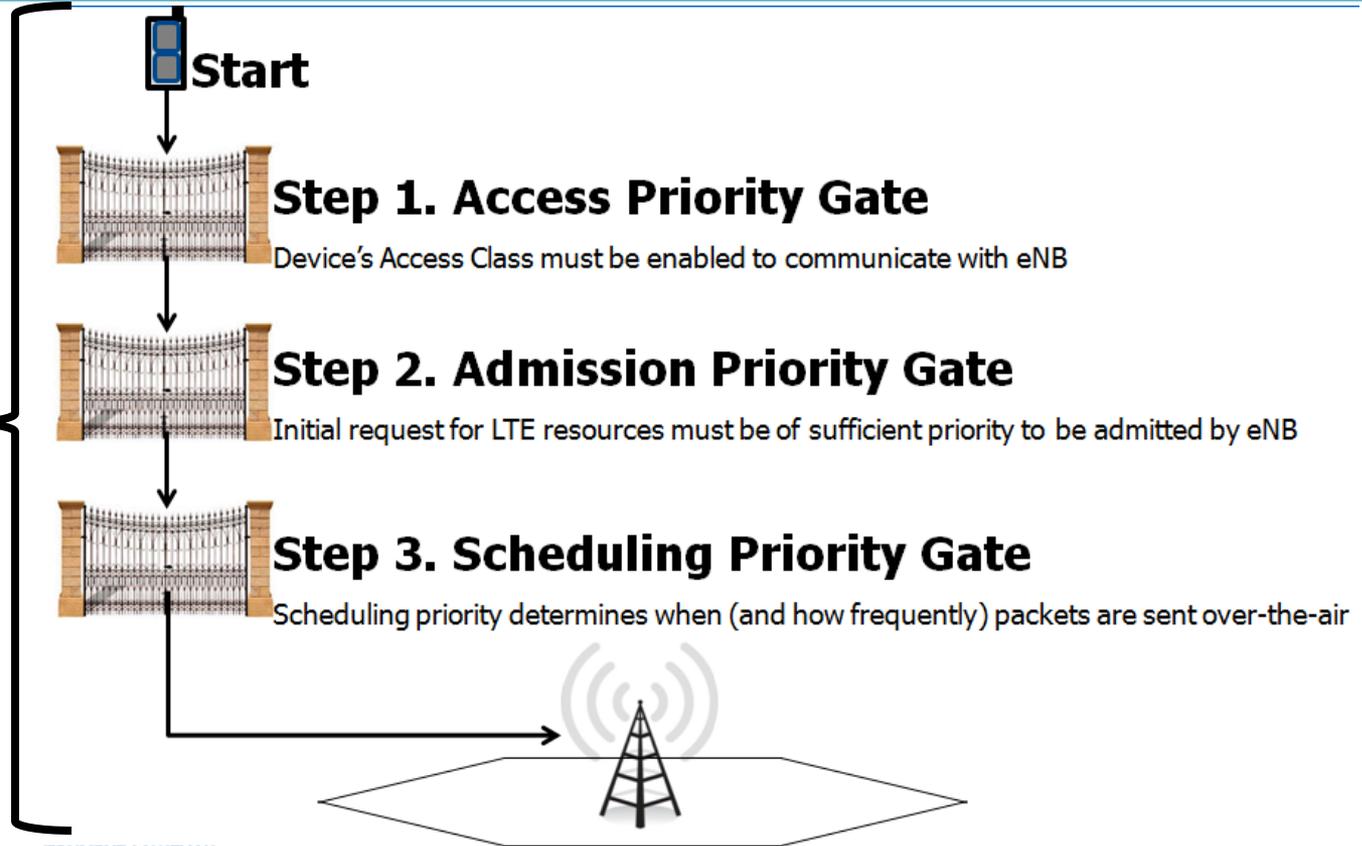


LE



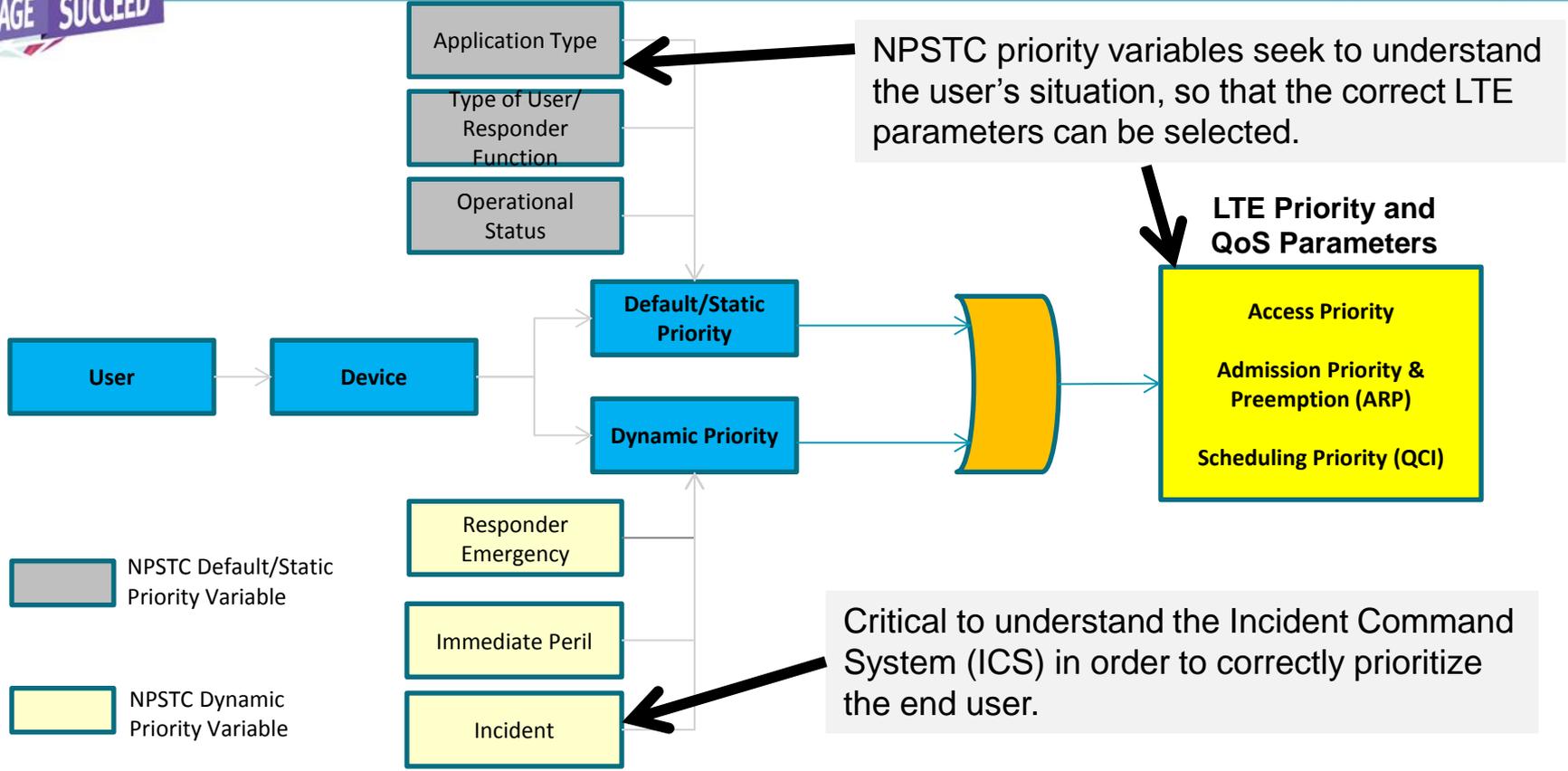
LTE's Rules of the Road

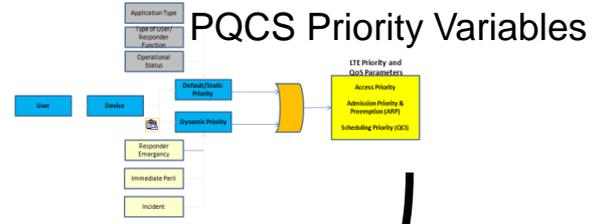
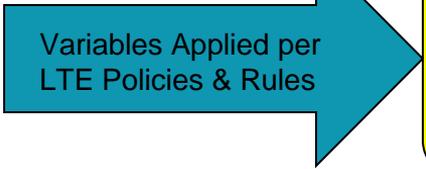
Sequential steps every LTE device must follow in order to begin sending/receiving IP Traffic.



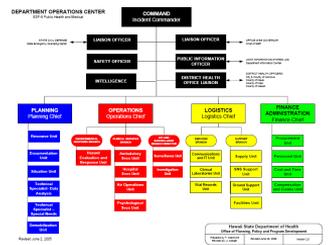
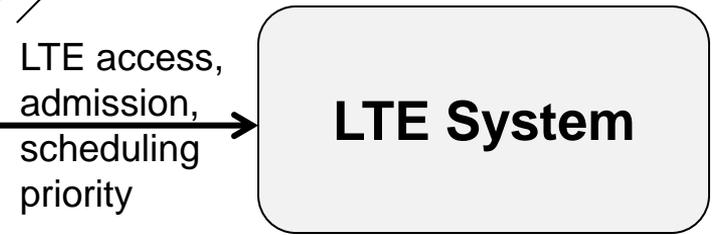


NPSTC's Priority Model





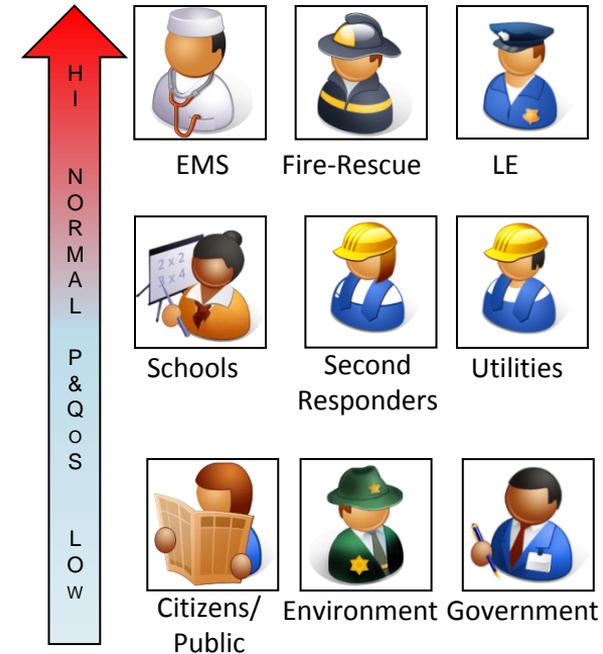
End-User Controls:
Responder Emergency
Immediate Peril
Operational Status





REMEMBER!

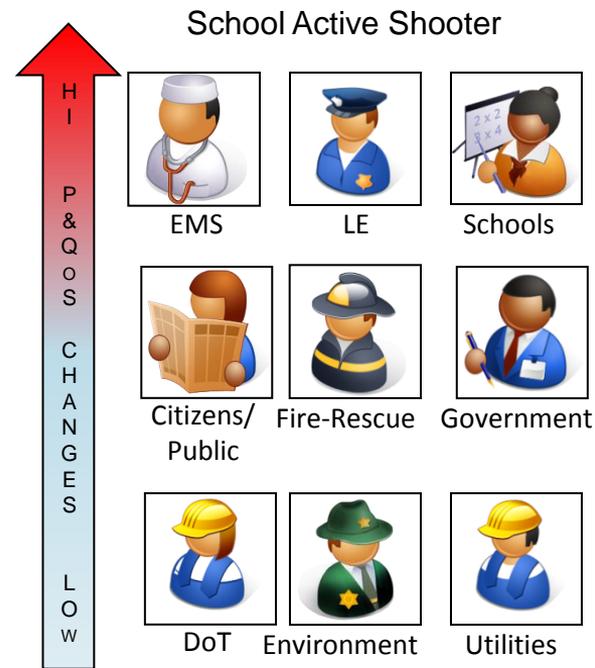
- Incident ALWAYS drives Operations.
- Operations ALWAYS drives technology.
 - If technology is driving operations, then the wrong technology has been selected.
- Over time, operations will adopt to new features and functions supported by a new technology.
 - Unlike many agencies across the country, public safety communications is NOT “100 years of tradition unmarred by progress!”
- Backhaul capacity is a critical limiter for LTE.
- Public safety communications never has an empty closet (all bandwidth will be filled)!





Where Do Incidents Start?

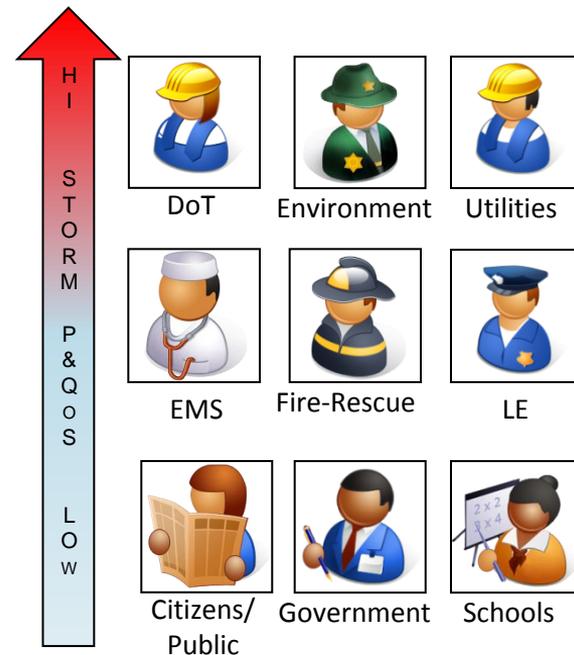
- Almost all incidents start in the Communications Center.
- Initial dispatch assignments/priorities are critical to successful incident management and later transition to ICS field command.
- Adjustments for the 5% will need to be made by instituting secondary policies/rules based on the incident
 - Location
 - Type
 - Responders
 - Requirementsthat might eventually be made via CAD entries (e.g., which priorities change between a 2 and 4 alarm fire?)
 - Unfortunately, CAD interface standards are slow to develop.
- Centers could use modified COML field interface.





Field-Based ICS

- For the foreseeable future, COMLs and COMTs will not have the expertise/training to do minor adjustments to PQCS variables at the incident scene.
- Adjustments will need to be made by instituting secondary policies/rules based on the incident
 - Location
 - Type
 - Responders
 - Requirementsutilizing an appropriate Man-Machine-Interface (MMI).
- So how might all of this work for “the 5%” of incidents requiring local adjustment and control?



Dispatch/
Comm. Center



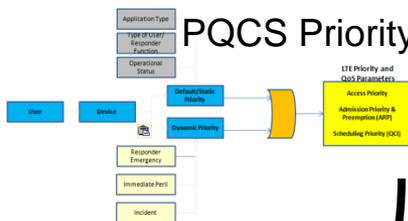
Incident Type & Severity

Priority & QoS Control Service

Field
Incident
Command



ICS Incident
Role & Info

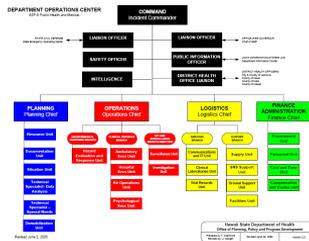


End-User Controls:
Responder Emergency
Immediate Peril
Operational Status

LTE access,
admission,
scheduling
priority

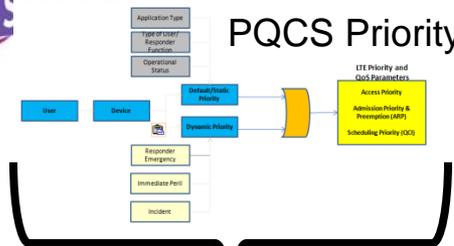
LTE System

Field
Users





It Now Transitions to



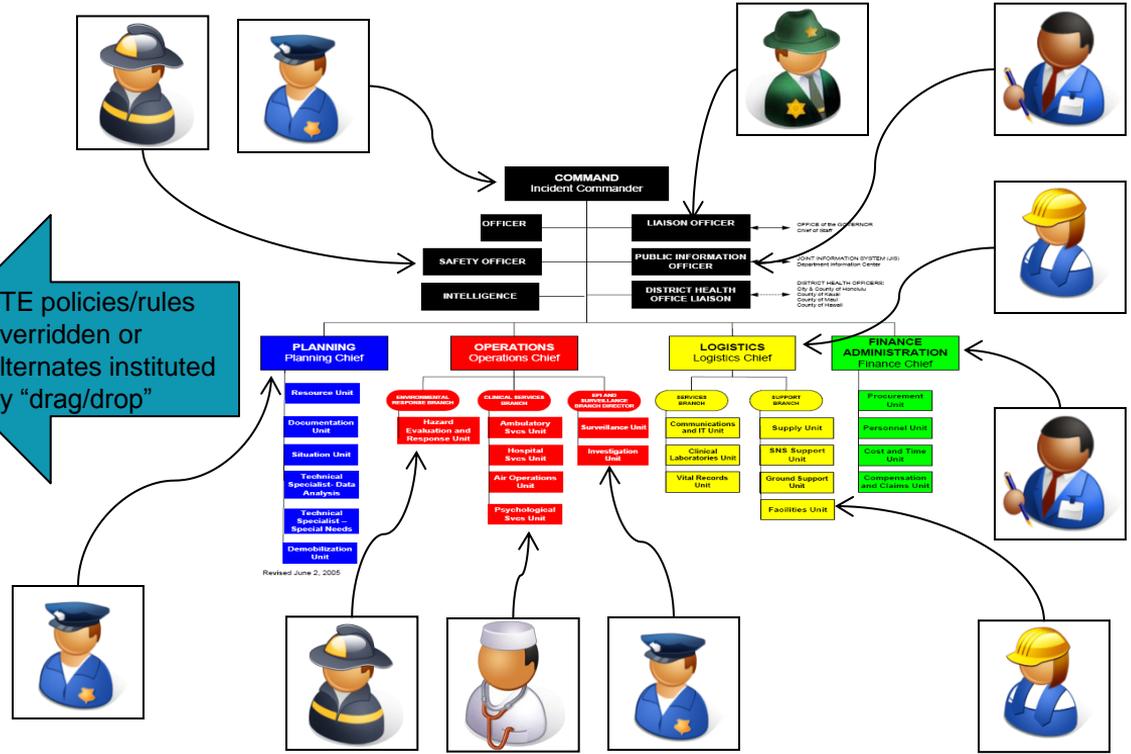
Priority & QoS Control Service

LTE policies/rules overridden or alternates instituted by "drag/drop"



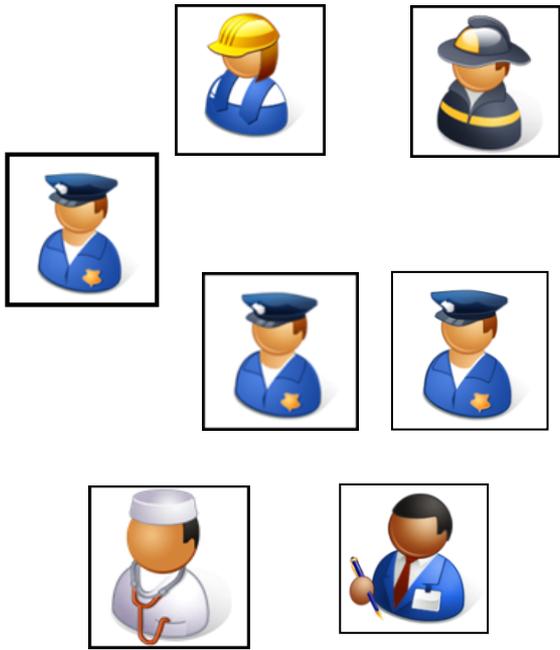
Field Incident Command

ICS Implemented for the 5%

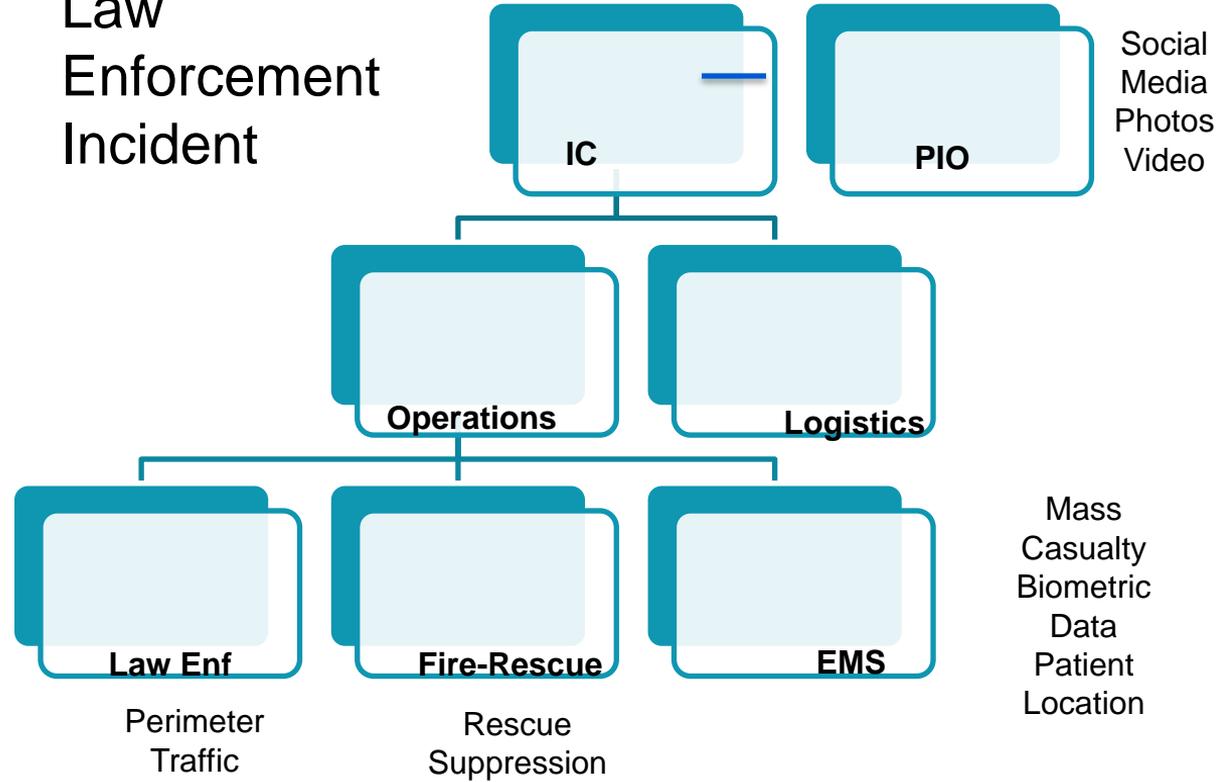




NIMS/ICS Org Chart



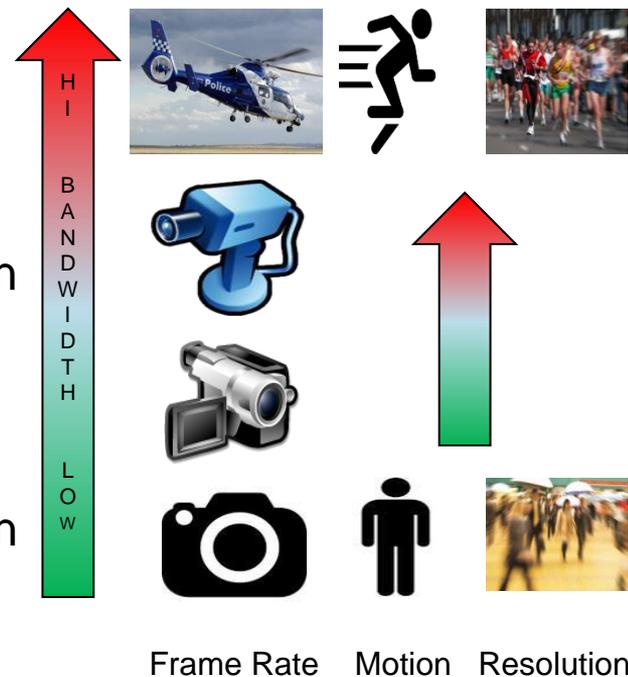
Law Enforcement Incident





High Bandwidth Uses

- Video is the usual high bandwidth “killer.”
 - In the San Francisco LTE test bed, turning on the 5th full-motion camera in a cell sector not only stopped video, but dumped the entire network.
- Selecting the appropriate bandwidth for the application
 - Frame rate vs. resolution: what end-user characteristics/quality are minimally required?
- Video codecs can, using automatic feedback, adjust for reductions in bandwidth, but with some reduction in quality (frame rate and resolution) that must be understood in advance by the end user.





- Voice / Radio
 - Interoperability
 - Priority in emergency situations
- Data
 - It is being used today by many agencies (MDC, Smartphones, Tablets, etc)
 - No interaction by public safety – you get what you get.
 - New public safety broadband network will potentially allow for “adjustments” based on many factors.

Voice



Large Scale Party– lots of people / alcohol

Multiple Agencies

Radio Channels Assigned



Eye in the sky for updates

Incident Command



LPR Readers

Routine Patrol



Fire/Medical

Threat of a retaliation shooting – suspects descriptions broadcast over each radio channel



Security



Outer Perimeter



Interoperability - Priority

“Keep traffic to a minimum*”
*only talk if you know something really important

Easi



All Users on the Same
Radio System or
Dispatcher Patches Channels



Cache Radios



Gateway

Technical – Select Few

Data



Large Scale Party– lots of people / alcohol

Video
Provided
by
Air Unit
to IC
in the field



LPR Readers



Threat of a retaliation
shooting – suspects
descriptions sent out -
Air & Ground Cameras

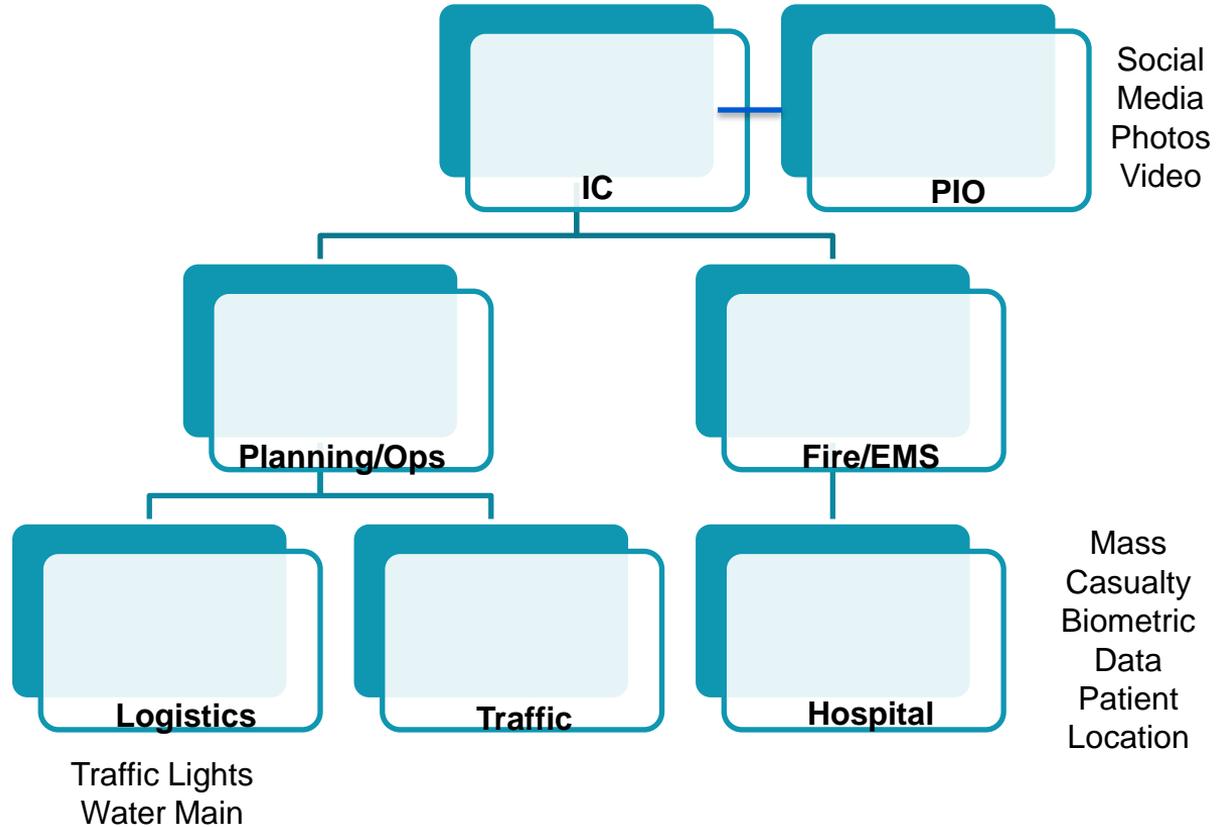
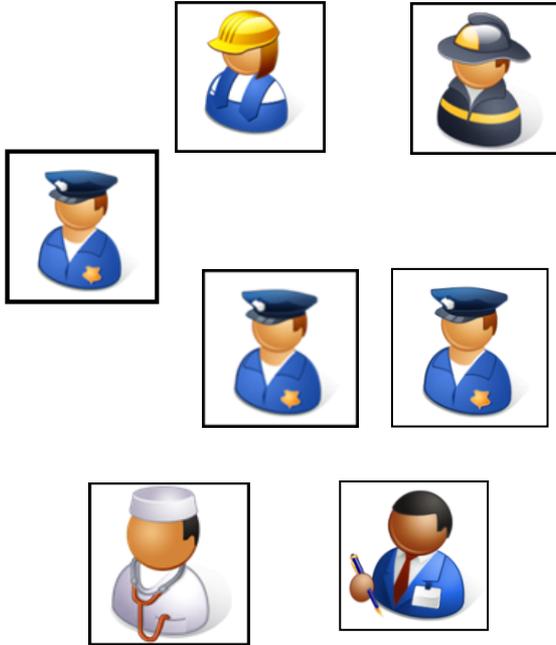


Updates
Provided
Real
Time to
All
Devices





NIMS/ICS Org Chart





CAD Data Priority

- Units are assigned to a call for service.
- Once they take on a NIMS role their data priority is assigned, based on the type of the call.
- No additional changes are made by the Dispatcher.

Call Sign	Call Type	Address
IC	Shooting	123 Main St
Logistics	Shooting	123 Main St
Traffic	Shooting	123 Main St
EMS	Shooting	Level 1 Trauma Center
PIO	Shooting	PD HQ

Public Cameras



EOD Camera

Monitoring

SWAT Team is Called Out



Monitoring Incident Real Time
Including....

Reviewing video for
bank robbery report





Dispatch

- Training will be critical
 - Who will be trained?
 - All Dispatch Personnel?
- How will the priority be managed when multiple agencies are working incidents in the same area – potentially same towers?
 - Coordination will need to occur between agencies
 - Similar to regional or statewide shared interoperability channels
- Processes will need to be in place to hand off from Dispatch to a COML.



Questions?



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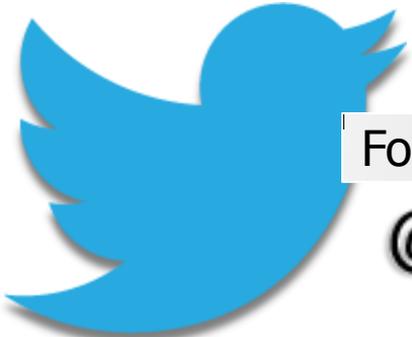
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