



FirstNet[®]



Creating a Nationwide Network for Public Safety

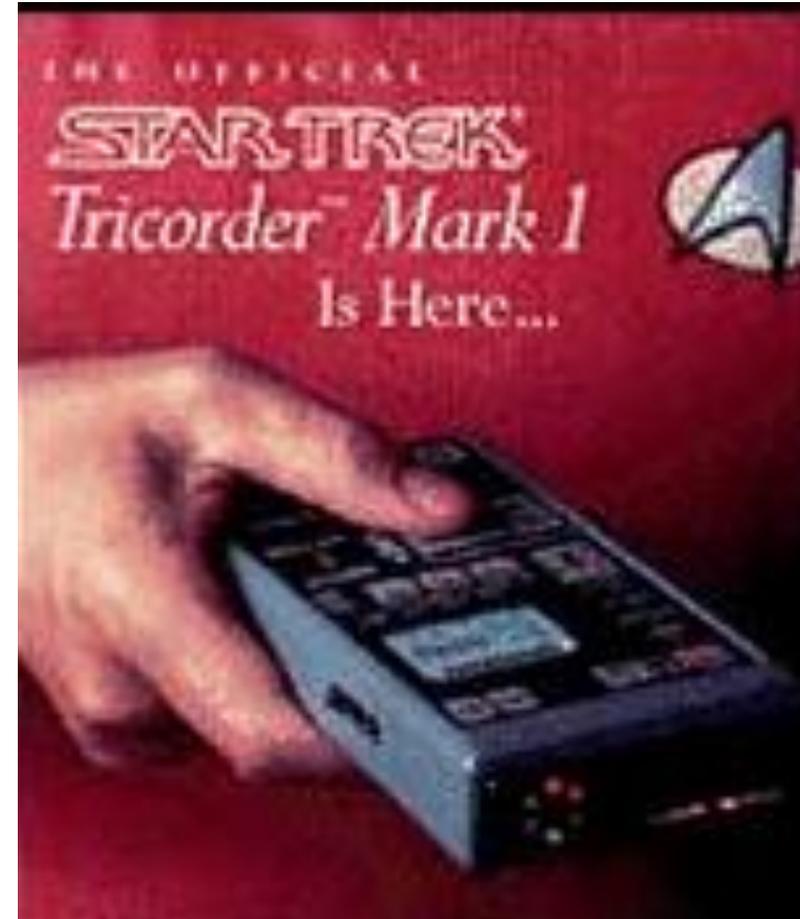
Kevin McGinnis, MPS, Paramedic
FirstNet Board Member

South East Public Safety
Broadband Summit
January 14, 2016

21st Century EMS Communications Systems: “Brick” to the Tricorder & FirstNet!



Kevin McGinnis, MPS, EMT-P
Communications Technology Advisor
National Association of State EMS Officials
National Association of EMS Physicians
National Association of EMTs
National Association of EMS Educators
National EMS Management Association



Pre-1970 to 2014



- VHF – 155.xxx MHz
 - 155.340/155.175 (ambulance to hospital)
 - 155.280 (hospital to hospital)
- UHF – 463.xxx/468.xxx MHz
 - (10 “MED Channels”)
 - Frequency Coordination
 - Voice Communications
 - Biotelemetry
- Telephone
- 700/800 MHz

EMS Needs Improved Communications Technology



Joint Advisory Committee on Communications Capabilities of Emergency Medical and Public Health Care Facilities



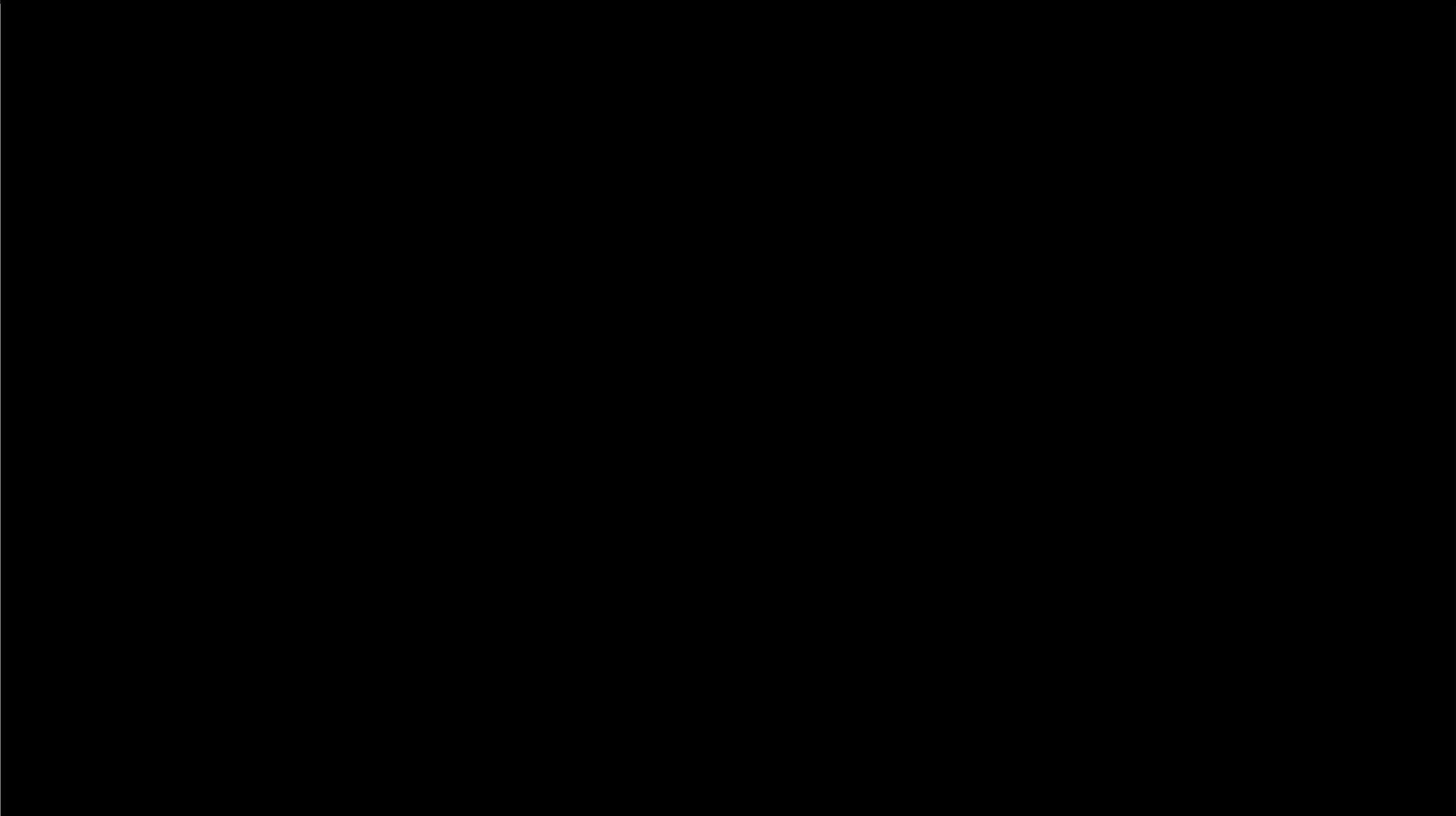
Report to Congress
February 4, 2008

Public Safety Statement of Requirements
for Communications & Interoperability

The SAFECOM Program
Department of Homeland Security
Volume I, Version 1.2
October 2006

Qualitative

A row of five small, square images showing various public safety scenarios: a person on a phone, a person in a uniform, a person in a vehicle, a person in a field, and a person in a field.



“I wonder...”



Situational Awareness

“We wonder...”



Common Operating Picture

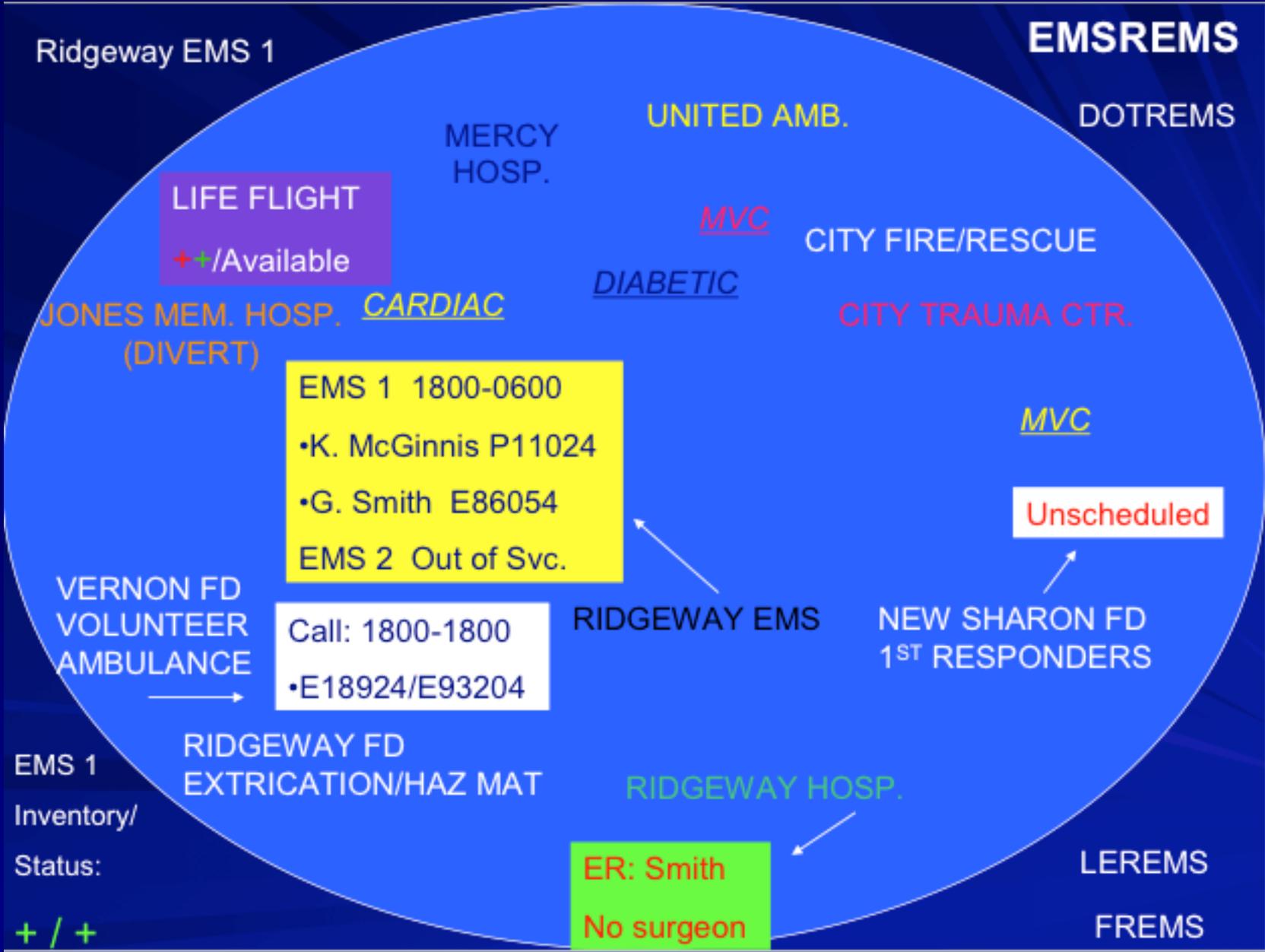
Sequential Processing



Parallel Processing

Inability to Adopt Available Diagnostic Applications

- Network of Data Bases
 - Resource Status
 - Events Status
 - Adequate Bandwidth to Push/Pull/Park Data:
 - Voice
 - Other (Complex Biotelemetry, Video, Images)
- GIS - (Visually) Based User Interfaces
 - Smartphone, Tablet, Laptop, Desktop



THE GOLDEN HOUR

Time Dependent Life Threatening Conditions



≠ 20+30+50+40 Minutes



Trauma, Heart Attack, Stroke.....

Ridgeway EMS 1

EMSREMS



MERCY HOSP.

UNITED AMB.

LIFE FLIGHT

MVC

CITY FIRE/RESCUE

CITY TRAUMA CTR.

JOHNS HOPKINS

2 Patients/45MPH

1001 Hendrix Highway (Nash/Oak Sts.)

Toyota Prius/Object/Head On

MVC

++Airbags ++Belts

NEW SHARON FD
1ST RESPONDERS

++Severity

VERMONT
VOLUNTEER
AMBULANCE

RIDGEWAY EMS



RIDGEWAY FD
EXTRICATION/HAZ MAT

RIDGEWAY HOSP.

Other Medical
Alarms

EMS Information Needs

Injury Severity Predictor Allows Early Launch of Resources



Crash at 8:29 PM, 5/8/10

Probability of Injury: 92%

[Add/Edit Passenger Details](#)

Passenger	Age	Gender	Safety Belt	Entrapment	Ejection	Prob. of Inj.
1	40	F	N	Y	N	92.0%

DeltaV: 30mph

PSAP Contact:

PAYETTE
1130 3RD AVE N
PAYETTE, ID 83661
(208) 642-6006

Incident information:

Incident ID: 1438314045
Event Notification: Vehicle Accelerometer
Event Verified:
Rollover: No
Data Provider: OnStar
Provider Contact: 800-486-7827

Vehicle information:

Color: White
Year: 2009
Manufacturer: General Motors
Make: Chevrolet (1)
Model: Cobalt Sedan

Direction of Force

At A35. Look out for an accident.

ID: ONSTAR-1438314045.2
Status: **CURRENT** Auto-held (updated)

Author: unknown
Received: 10:26 PM, 5/8/10

Recommended action based on probability of injury calculation:

Provide information to PSAP and suggest vehicle extrication, helicopter request and closest and/or receiving hospital early notification.

Map Satellite

Map controls: +, -, Home, Refresh, Zoom In, Zoom Out, Full Screen, Print, Close

Map labels: New Plymouth, 30, 72, 52, Dewey Rd, Leitha, OnStar

Buttons: << Previous Report, Next Report >>, Create Event, Close

Ridgewa

 TOYOTA

PRIUS

Gasoline-Electric Hybrid

*Emergency Response Guide
(Revised)*



VERNO

FREMS

ACN Alert

UNITED AMB.

MVC

CITY FIRE/RESCUE

MVC

NEW SHARON FD

 MVC 

RIDGEWAY EMS

RIDGEWAY FD

2 Patients/45MPH/Front Seats

2004 Toyota Prius Head On/Object

++Doors ++Patients (Driver Priority)

Ridgeway EMS 1

Parallel Processing

EMSREMS

MERCY HOSP.

UNITED AMB.

DOTREMS

LIFE FLIGHT →

ETA: 12 Min's.

MVC

CITY FIRE/RESCUE

JONES MEM. HOSP. CARDIAC
(DIVERT)

DIABETIC

CITY TRAUMA CTR.

Team On Alert for Pt:+

VERNON FD
VOLUNTEER
AMBULANCE

NEW SHARON FD
1ST RESPONDERS

RIDGEWAY EMS

ED On Alert for Pt: +

MVC

RIDGEWAY FD
EXTRICATION/HAZ MAT

RIDGEWAY HOSP.

ROAD CLEARANCE

Ames St. to Clark St. to Old Highway (E); 15.2 Mi.s;
#3945 Old Highway

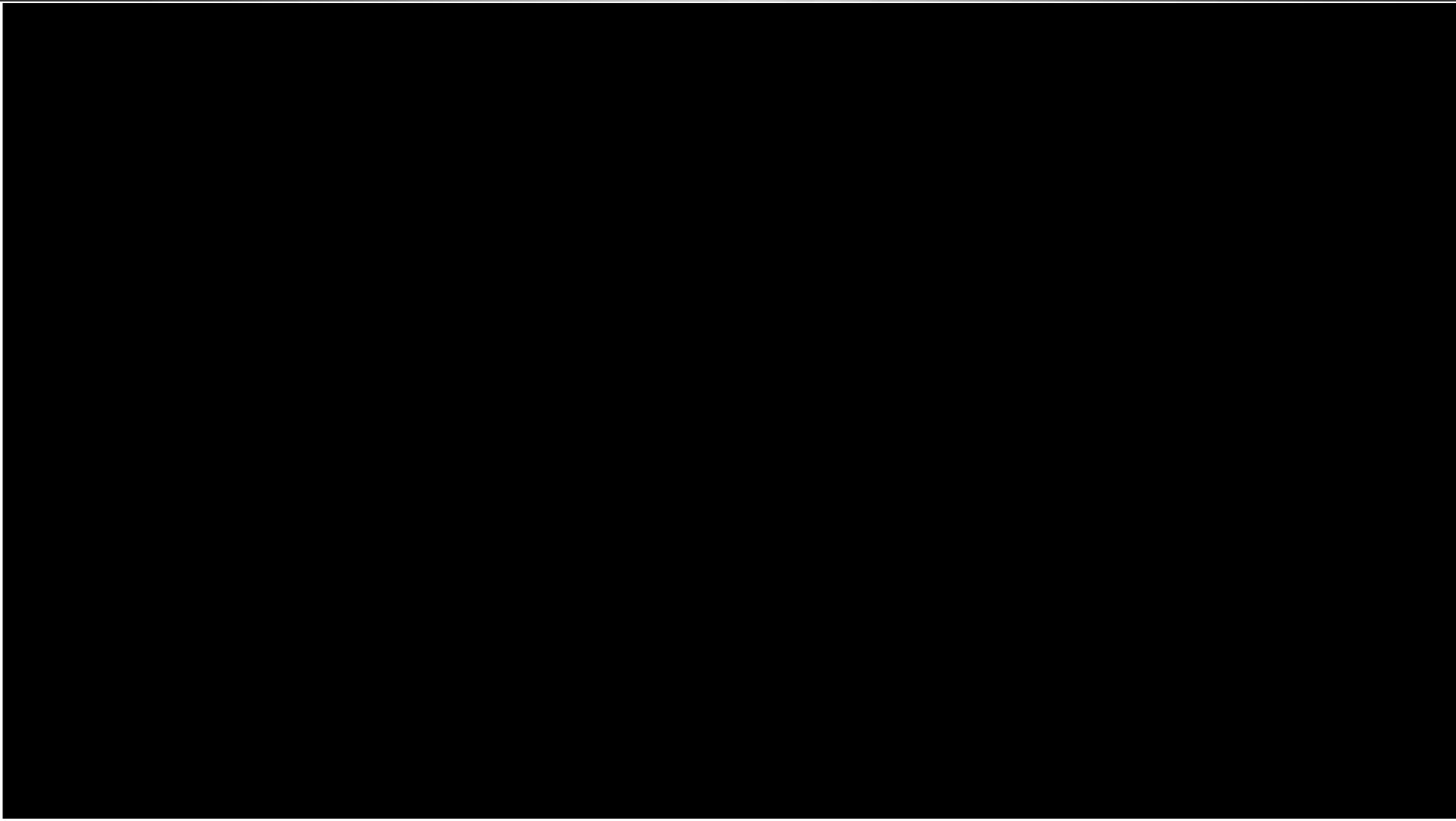
ETA: 10 Min's.

Lights + /Cars ++

FirstNet devices will improve accident triage and enable parallel processing.



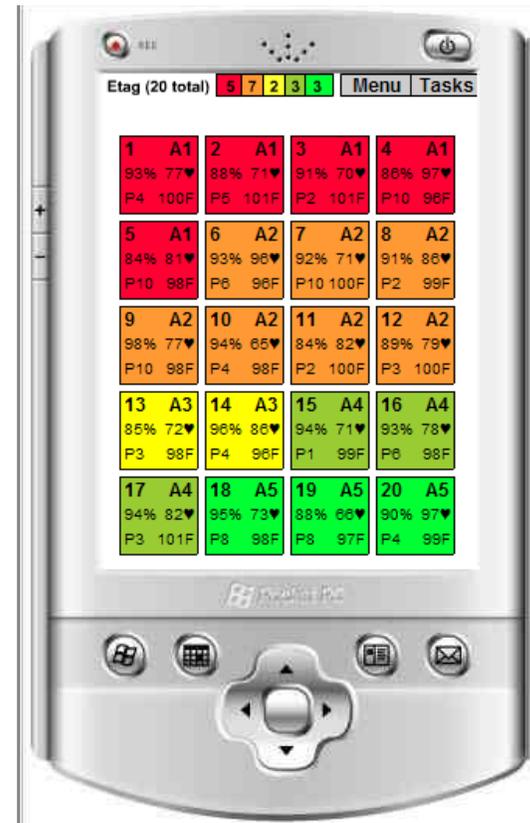




- Two Way Telemedicine (Virtual MD/Community Paramedicine)
- Portable Ultra Sound (Video & Images)



- Multiple Patient Monitoring (Mass Casualty Incident)
- Multiple Responder VS Monitoring
- Infra Red Crowd Disease Detection



Drones



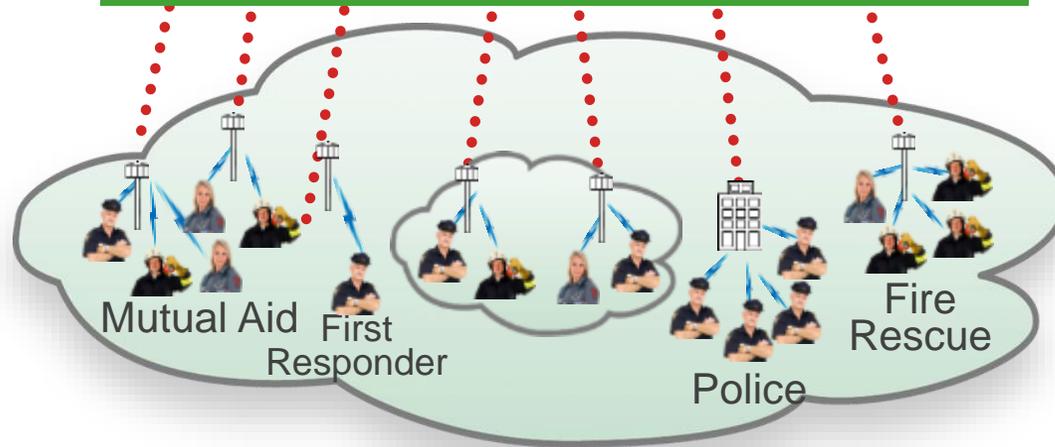
<http://www.npstc.org/ems.jsp> “Documents”

- EMS Based Routine Patient Monitoring
- Automated Dispatching Based on Monitored Patients and Vehicles
- Audio/Video/Data Interfaces with “I’ve fallen” Systems
- Access to Searchable Patient Records/Images/Data
- Real-Time Vehicle Extrication Hazards Alerting Based on AACN Including Video/Images as Necessary
- Syndromic Surveillance and Quick Alerting to Specific Populations
- Physician Mediated Interface Between EMS Dispatch, EMS Crews and Nurse Call Centers

- Won't Cut It:
 - Current: < 9.6+ kbps @ 12.5KHz bandwidth
 - Early Dial-Up: 14.4 kbps
 - Current Dial-Up: 56 kbps
 - V.S. Transmission: 76+ kbps
 - Basic video (300-700 kbps)
 - Ultrasound/CT?
- So Where Did That Leave Us?

Voice

Over 20,000 Separate Private LMR Networks



Data

Commercial Wireless Networks



The Downside

- Communication barriers
- Low data rates
- Limited buying power
- Higher costs
- Not public safety-grade
- Network overload or failure
- No priority access
- Lack of interoperability



FirstNet®



Thank You

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