



# Multimedia Critical Communications System

## Empowers Public Safety Operation

**LEADING** NEW ICT

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# Threats to Public Safety in the Digital Economy



## Terrorism

- Istanbul Airport Attack
- 239 Injured



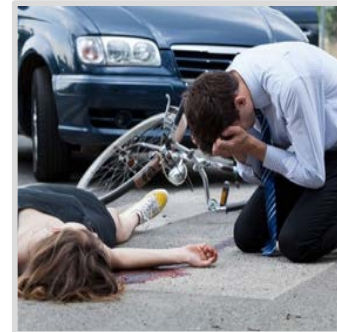
## Disorder

- London Social Media
- 2 Billion Spread



## Disaster

- Ecuador M7.8 Earthquake
- \$2-3B Economic Loss



## Accident

- Shanghai, the Bund
- 10K Stampede



## Crime

- Germany
- 750K Refugees



## Cyber-attack

- Global WiFiKill Bug
- 40% Internet Penetration

### *Proactive Policing Can Reduce Threats*

**€15.7 bn** annual socio-economic benefit was estimated via mission-critical mobile broadband utilization in the EU.

--Actica Consulting

# Next-Generation Public Safety Command System



China NG110

~1992

**C2**  
Command and Control  


Verbal communication-based command system

1992~

**C3I**  
+ Communications and Intelligence  
  
Wireless-facilitated command system

2003~

**C4ISR**  
+ CAD, Surveillance and Reconnaissance  
  
Video-assisted command and reconnaissance

2010~

**C-C4ISR**  
+Collaboration



Broadband and Applications  
Situational-awareness command and cross-agency collaboration



# Command and Control Driven Private Mobile Radio to LTE

Command & Control Center



- 1986 -**
- Alarm Console

## PMR Stage I



- 2005 -**
- Voice Trunking
  - CAD/GIS/GPS
  - Grid Video Surveillance

## PMR Stage II



- 2015 -**
- Unified Intelligence and Command
  - Big Data application
  - Information sharing across department and levels
  - Broadband Trunking
  - Big Data application/MP
  - Precise GIS system: AML-advanced mobile location

## PMR Stage III

Analog Trunking  
VHF/UHF

Analog Trunking  
MPT1327

Narrowband Digital Trunking  
(TETRA, P25, DMR)

Broadband Digital Trunking  
LTE

FM

FDMA

TDMA

OFDMA

• 1G Analog

1990s

• 2G GSM

2000s

• 3G WCDMA

2010s

• 4G LTE

HUAWEI

# Key Requirements of LTE-based Police Service



Comprehensive  
Multimedia Information



Cross-agency  
Collaboration

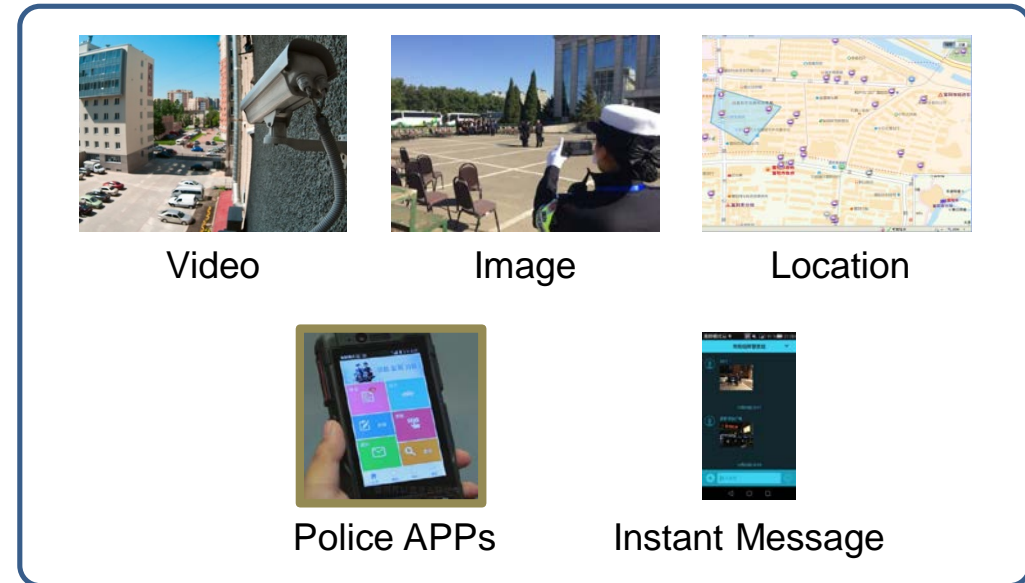


Situation-aware  
Dispatch

# Communication: From Voice To Multimedia



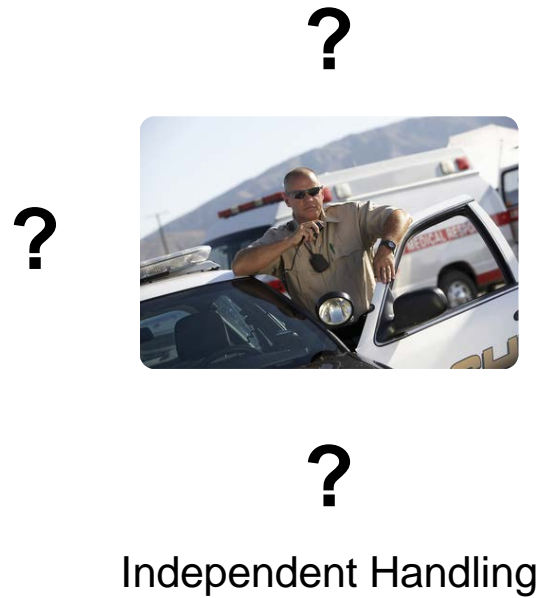
Call-Taking and Dispatching  
via Voice



Multimedia Dispatching and Information Sharing

**Rich Multimedia:** Voice -> voice, video, image, text, and data...  
**Broadband** is the key factor to ensure multimedia transmission in real time.

# Responder: From Silo To Collaboration



Cross-agency Communication

**Higher Efficiency:** Smooth and fast information transfer

**Integration** is the key factor for sharing information among different departments.



# Dispatch: From Oral To Situational Awareness



Situation Report  
via Call



Situation Acquisition via Video

**Visible:** Video delivers 10x more informative content than voice.  
**Ubiquitous video** is the key factor for providing on-scene situational awareness.

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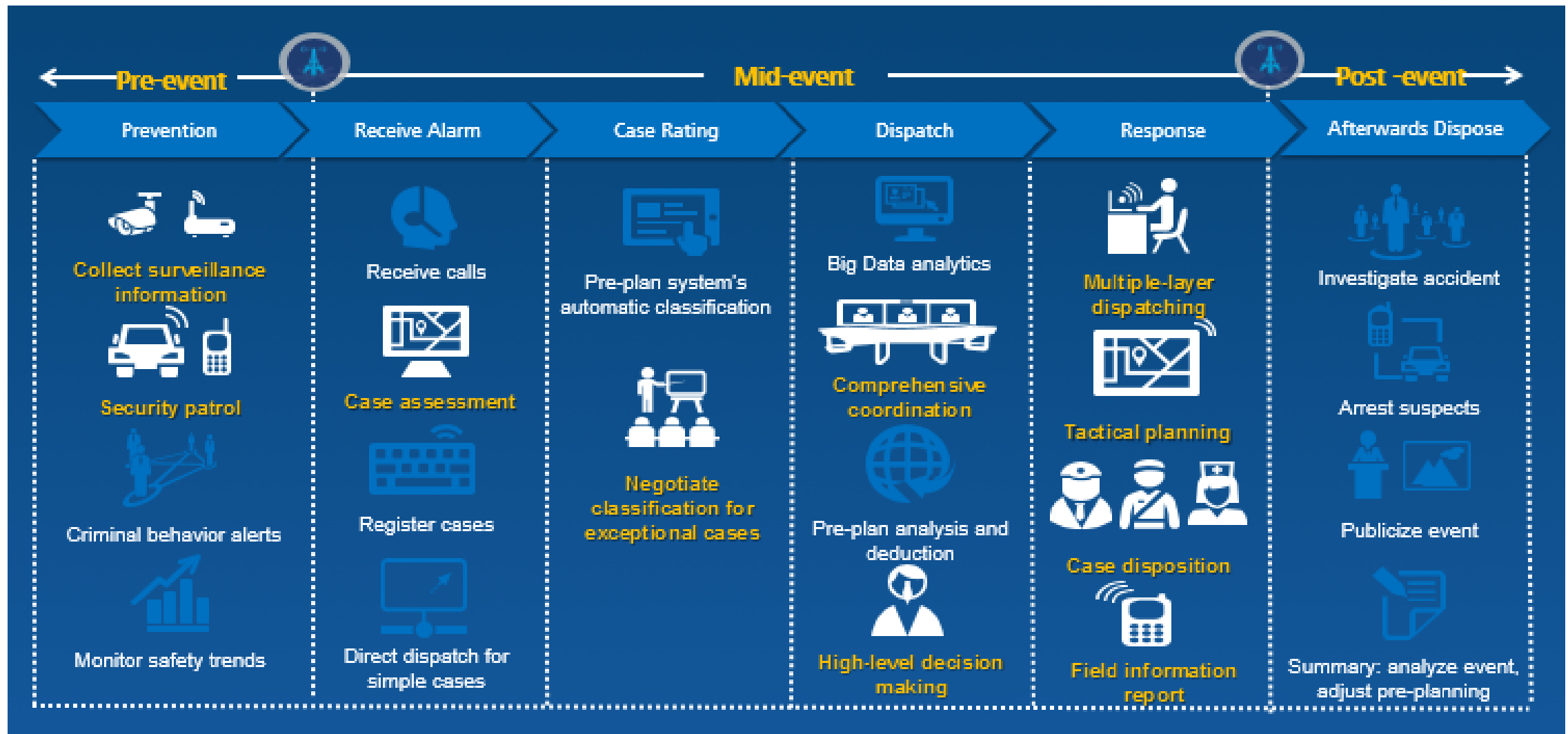
02

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# eLTE Playing a Role in The Entire Police Incident Process



**Yellow** : Huawei MCCS-involved workflows

**White** : Partner-involved workflows

# 4-Application Scenarios in Public Safety

## Routine



- Multimedia IM sharing
- Police data check
- Daily patrol
- Real-time video
- Location report
- Mobile CAD
- Mobile enforcement
- Enforcement record

.....

## VIP Security



- Security route plan
- Provisional camera
- Task dispatching
- Sign-in through video
- Electric fence
- Provisional check point
- Call within motorcade
- Video upload along route

.....

## Events



- Private security
- Multimedia dispatch
- Cross-dept. collaboration
- Panoramic monitoring
- Command on field
- Massive location
- Seamless coverage
- On-field situation sharing

.....

## Emergency



- Fast response
- Command and control
- Police collaboration
- Cross-department collaboration
- On-field video upload
- Video consultation
- Location sharing
- Intelligence analysis

.....



# Key Scenario 1: Routine Incidents, Daily Law Enforcement



- Paperless duty management and law enforcement
- GIS-based team member collaboration, operation on map, easy and fast
- Voice to multimedia, comprehensive information quick sharing, situation-aware command and dispatch

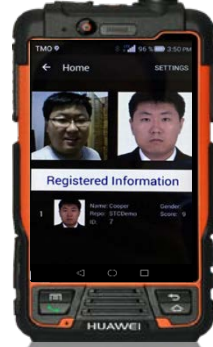
# Key Scenario 1: Routine Incidents, Enhanced Applications



Mobile OA



Mobile Responder



Face Recognition



ID Authentication



Video Feeds Retrieval



Traffic Law Enforcement



Community Management



Mobile CAD

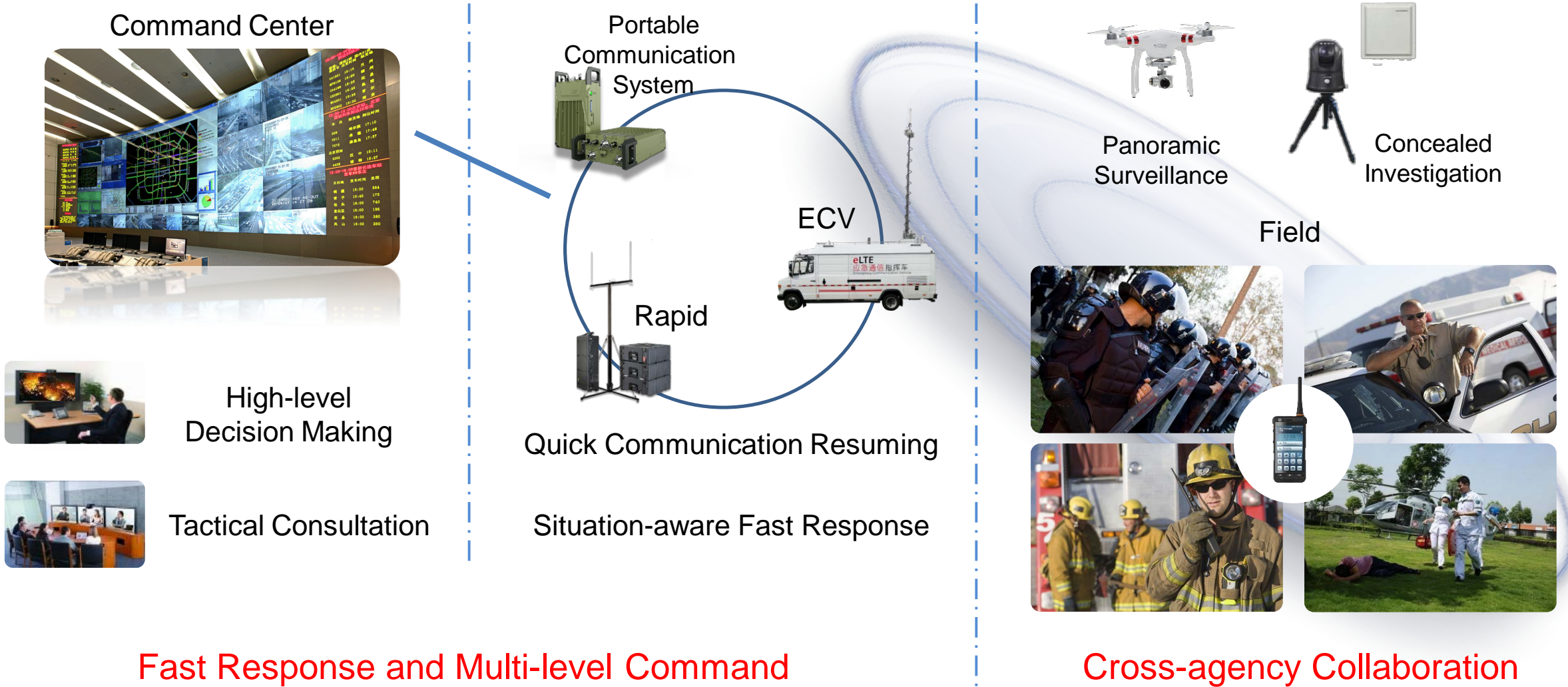


Body Camera

.....



# Key Scenario 2: Emergencies (Anti-terrorism, D&R)



# Key Scenario 3: Events Guarantee

## Panoramic Video

**UAV Video**  
Air-to-ground monitor



**Wireless Camera**  
Easy and fast to deploy, adapts to compensation

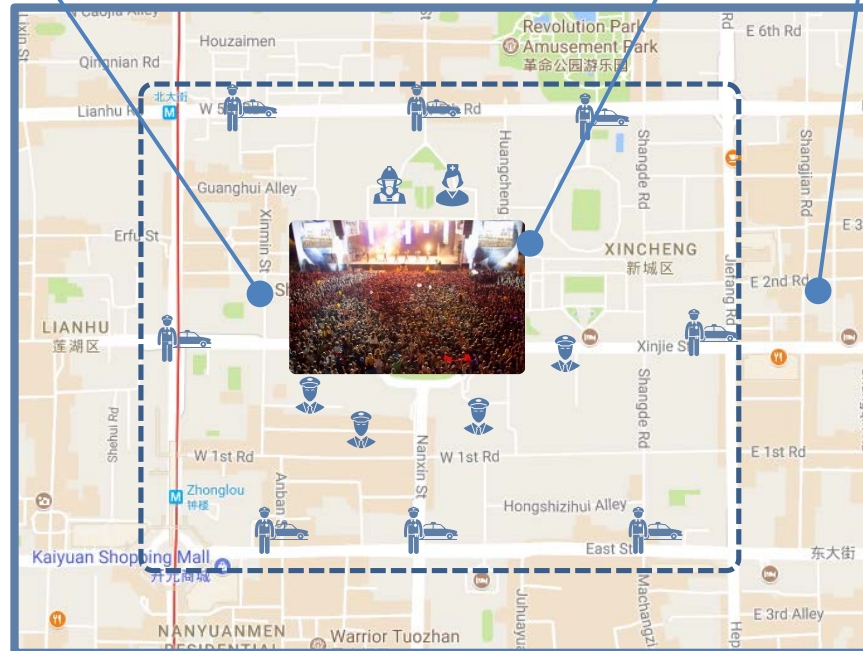
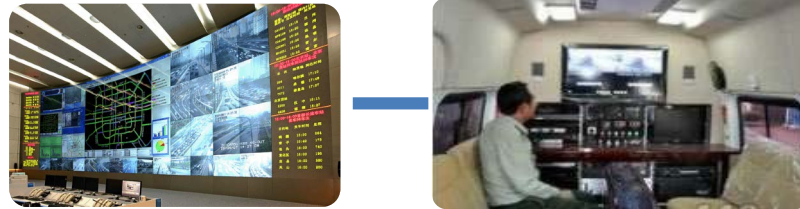


**Vehicle-mounted Camera**  
Patrol and monitor in street



## Front Command

**Fronted Command Center**  
Multi-level command



## Peripheral Protection

**ID Authentication**  
Mobile checkpoint



**Multimedia Group Messaging**  
Team collaboration in real time





# Key Scenario 4: VIP Security



- Plan security route with seamless eLTE coverage, with commander control in time and assign police forces dynamically
- Full-route video surveillance; visible and situation-aware
- Multi-level command: eLTE embedded SUV; remote command + mobile command

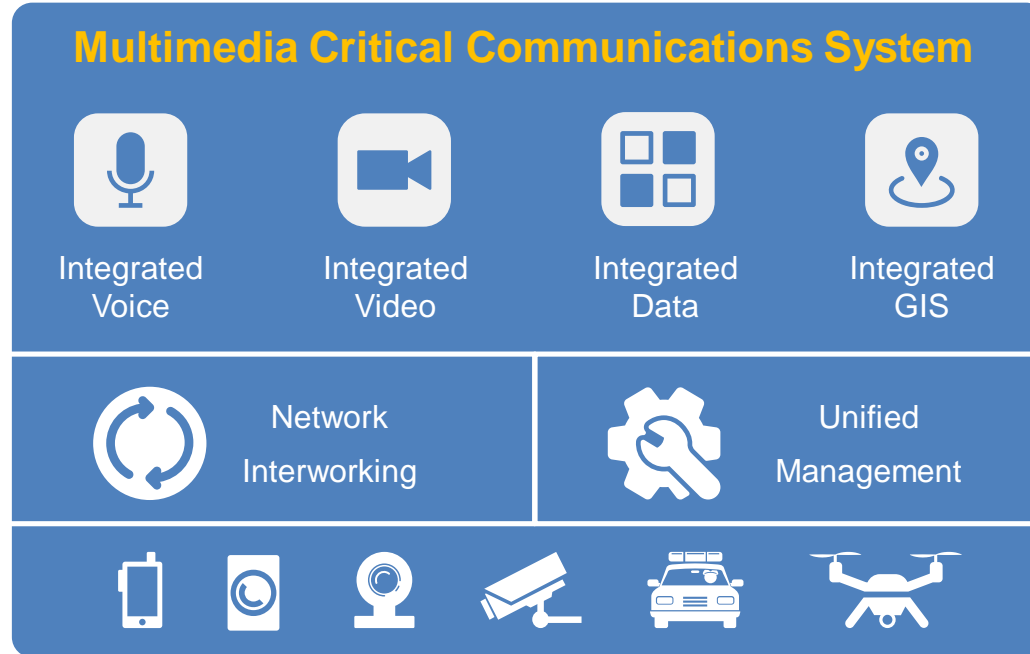
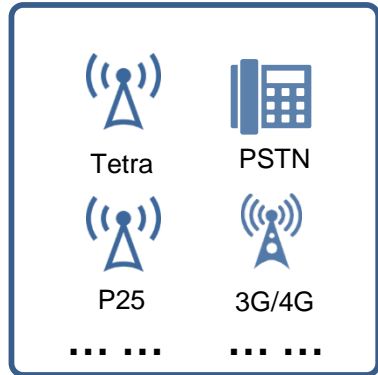
# Huawei eLTE MCCS Empowers Public Safety Operations



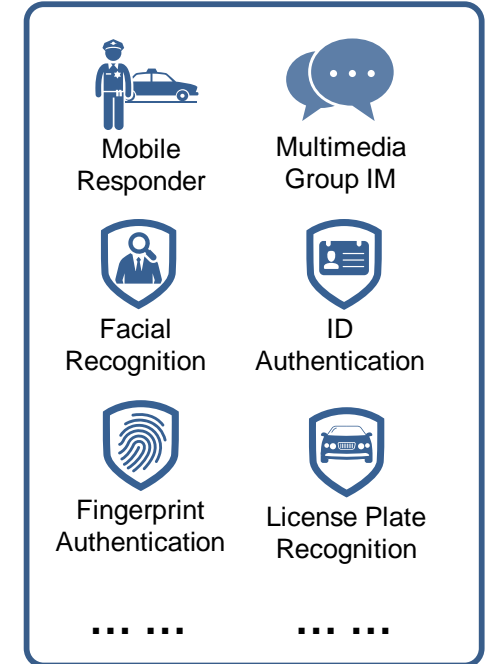
## Other Infrastructure



## Other Networks



## Applications



**Full Integration**

eLTE (Enterprise LTE) = Broadband Trunking + Mobile Broadband + ...

**Enabling Mobile Policing**

# Key Value of Huawei eLTE MCCS

## Investment Protection



- Existing narrowband retained within lifecycle
- No need for huge initial investment

## Standard Compliance



- 3GPP standard, can be evolved to 4.5G/5G
- Broadband targets over the next 15 years

## Open Ecosystem



- 10+ Open labs worldwide
- 117 members in eLTE Alliance
- Develop E2E joint solution with partners



# Protecting Legacy Investment: Smooth Evolution to MCCS



**Network:** First, deploy continuous coverage in high-benefit areas

**Device:** Replace narrowband devices according to police category and department

**Investment:** Gradually divert narrowband budget to broadband deployment



No need for huge initial investment



Broadband-narrowband connectivity  
Legacy investment protection



Private-public connectivity  
Service continuity for blind spot and indoors



High quality dedicated network  
makes broadband services boom



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# Sustainable LTE Contributions in 3GPP

All advanced 4.5G/5G technologies can be used with eLTE

## Standards Organizations

Chair or Vice Chair in SA2, CT Plenary, RAN4, SA5, CT4...

Chair of ITU/APT Working Party / Working Group, IMT-2020 ...

Chair or Vice Chair in WWRF, ETSI, IEEE802.11...

# 90

Key roles in 170+ standard organizations

# 916

Approved LTE core specifications

# 300

Proposals on mission-critical communication

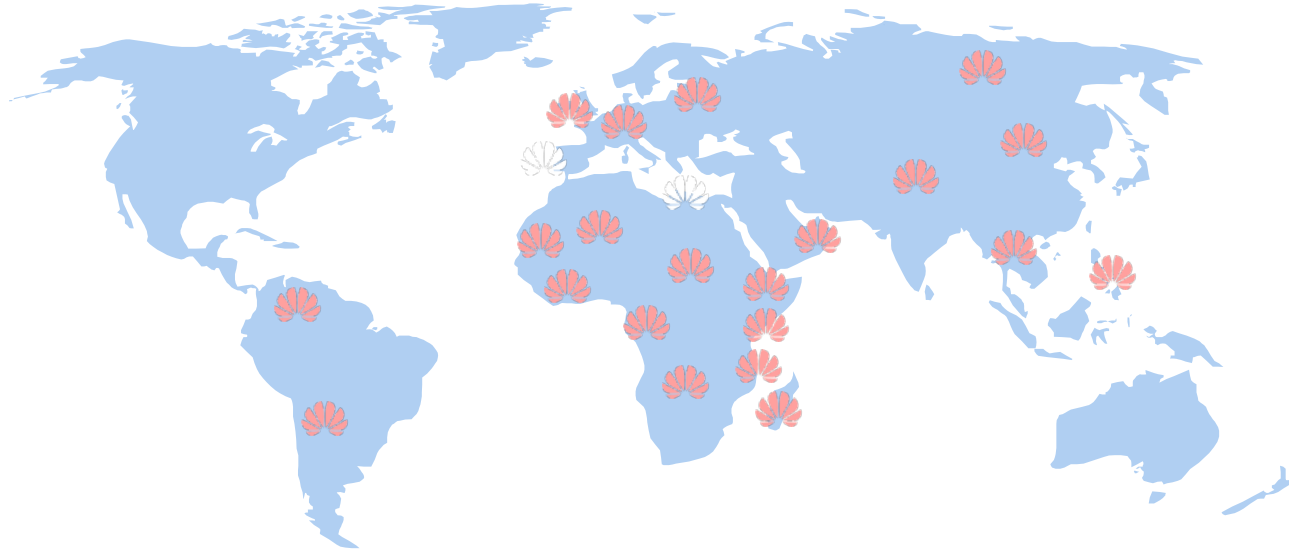
# NO.1

Approved contributions in 3GPP SA6 MCPTT

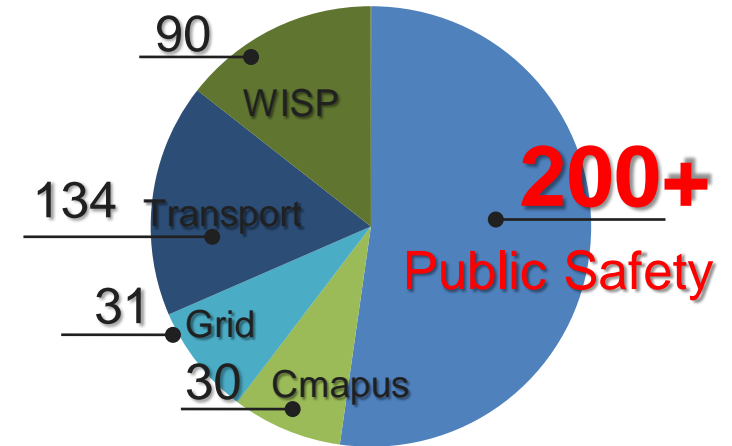
# eLTE Global Reference in Public Safety

**398 Networks in 136+ Countries**

(As of Q4 2017)



## eLTE Networks in Industries



- ✓ *Country T: World's first 3GPP-based multimedia trunking network*
- ✓ *Country P: eLTE-based Safe City network with Mobile Policing*
- ✓ *China's Wujiang: All-service convergent network with 60+ mobile applications*
- ✓ *China's Hohhot: Massive hybrid grouping for narrowband and broadband*
- ✓ *Country E: Security-oriented network for multi-level intelligence*



# China Wujiang: MCCS Speeds City Informatization

## Panoramic surveillance:

- Fixed, mobile, and vehicle...
- **1,000+** smartphone (with camera)
- **2,000+** wireless cameras

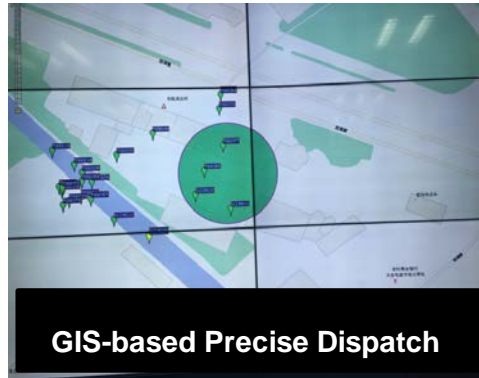
## Busy business:

- **Over 60** Apps, paperless OA
- **100 Mbps** data consumed per user per day

## Social benefits:

- Average **15%** decline in crime rate annually
- **6 times** the law enforcement efficiency

### Daily Policing



GIS-based Precise Dispatch



Video-based Mobile Enforcement



Mobile CAD

### Big Events – G20 Summit



ID Certification at Checkpoint  
**250K+ persons, 60K+ vehicles**  
**15 arrested** in net escapes



Fronted Command and Control Center  
**Visible dispatch**  
**Real-time video conference**



Vehicle-mounted Video Surveillance/call/distribution  
**Guaranteed video quality**  
**100 MB/day** each vehicle



# Country P: eLTE Making City Safer



- Network Scale:**
- ~80K handsets
  - 800 mobile domes
- Network Efficiency:**
- **94.4%** call receiving in 10s
  - Only **4 minutes** from receiving to dispatch



**Cricket Super League**  
27K+ Audience

- **0 Injuries/Complaints**



**Car Bomb on 2017.2.13**

- **Breaking** similar cases
- shortened from 45+ days to **3 days**



**ePenalty on EP820**

- Including ID, vehicles, online penalty
- **\$3K/day for 300 police staff**

# Country K: World's First eLTE Network for Safe City



## Unified Emergency Number 999#



**0 Injuries** during  
Pope's Visit



**150%** Alarm Response



**50%** Visitor Rate



**8,000** Police



**45%** Crime Rate



**2,000** Cameras

*"The prospect is that we shall be able to leverage technology to build a more robust security response."*

*-- President*



**eLTE**

# Summary: 4 Reasons We Need Huawei MCCS

- ① Dedicated broadband system with full services, voice/video/data/GIS, all-in-one
- ② Next-generation command and control, enabling multimedia information sharing, cross-agency collaboration, and situation-aware dispatch
- ③ Full integration with existing infrastructure (narrowband trunking, fixed video, ...), protecting legacy investment
- ④ Standard compliance and open ecosystem

# FAQ

## ① How can we balance broadband and narrowband investment?

- Broadband is the trend. It is no longer economical to invest in narrowband.
- Considering network capacity and maintenance cost, the overall cost of broadband is equivalent to narrowband.
- Gradually divert narrowband budget to broadband deployment.
- Network deployment strategy: First, deploy continuous broadband coverage in high-benefit areas according to population density, crime rate, and security requirements.



# FAQ

## ② Why do we need a dedicated network?

- In terms of network purpose, a carrier network provides Internet services to citizens for profit; therefore, operators only pay attention to downlink data and valuable area coverage. Public safety, meanwhile, usually requires a full-coverage nationwide network with more uplink data (e.g., video surveillance).
- In some cases, the carrier network may be shut down for security purpose (e.g., criminals might remotely control a bomb via a public carrier network).
- In big events, the carrier network can become congested and cannot guarantee Quality of Service (QoS).

# FAQ

## ③ What is the benefit of eLTE if a dedicated spectrum is not available?

- Cooperate with the operator and use the carrier network for non-MC (mission-critical) service.
- Use POC (PTT over cellular) for non-MC communication.
- Small and light, three-proof terminal for officer and supervisor. Mobile policing apps facilitate official business and law enforcement.
- Integrate POC and narrowband trunking and fixed and mobile video through MCCS. In the unified dispatching center, open up multi-services such as voice, video, and GIS.

# THANK YOU



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