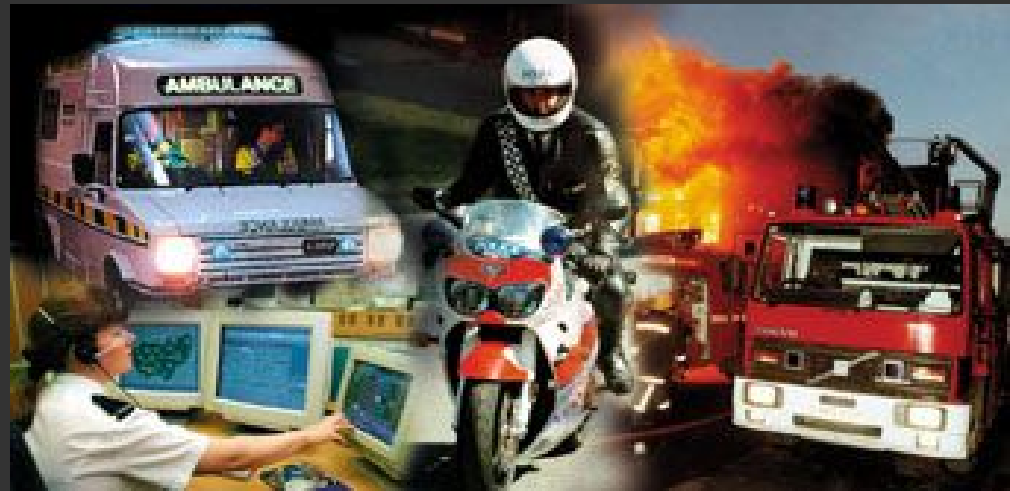# Government Radio Network (GRN)

Based on Tetra Technology, for Homeland Security

Subodh Vardhan

Director Sales & Country Head
Motorola India (G&PS)

Topics

- Introduction to Motorola India

- Introduction to GRN

- Considerations in Deploying GRN Network

- TETRA as GRN Solutions

Motorola is a company of firsts with a rich heritage of innovation. We continue to invent what's next – connecting people, delivering mobility and making technology personal.

Trusted innovation…
yesterday, today, tomorrow.

Our Businesses

Enterprise Mobility Solutions   **Home & Networks Mobility**   **Mobile Devices**

Provides analog and digital two-way radios, voice and data communication products and systems for private networks, wireless broadband systems and end-to-end enterprise mobility solutions to a wide range of enterprise markets, including government and public safety agencies, as well as retail, energy and utilities, transportation, manufacturing and other commercial customers.

Motorola in India

In India for over 20 years

- ✓ Started operations in 1989
- ✓ Major Global R&D Centre for Motorola
- ✓ Motorola radio products available on DGS&D rate contract
- ✓ India's first TETRA System with Delhi Metro (2002)
- ✓ Digital trunking system commissioned by Special Protection Group (2006)
- ✓ Largest Oil & Gas TETRA contract with Reliance Refiner Jamnagar (2007)
- ✓ Three TETRA awards for India's major International Airports- Delhi, Hyderabad & Bangalore
- ✓ Tetra awards from Mumbai Metro and Delhi Airport Metro Express Line (2008)

- ✓ Awarded India's first GRN Network, for Delhi Government, in partnership with HCL Infosystems (2009)
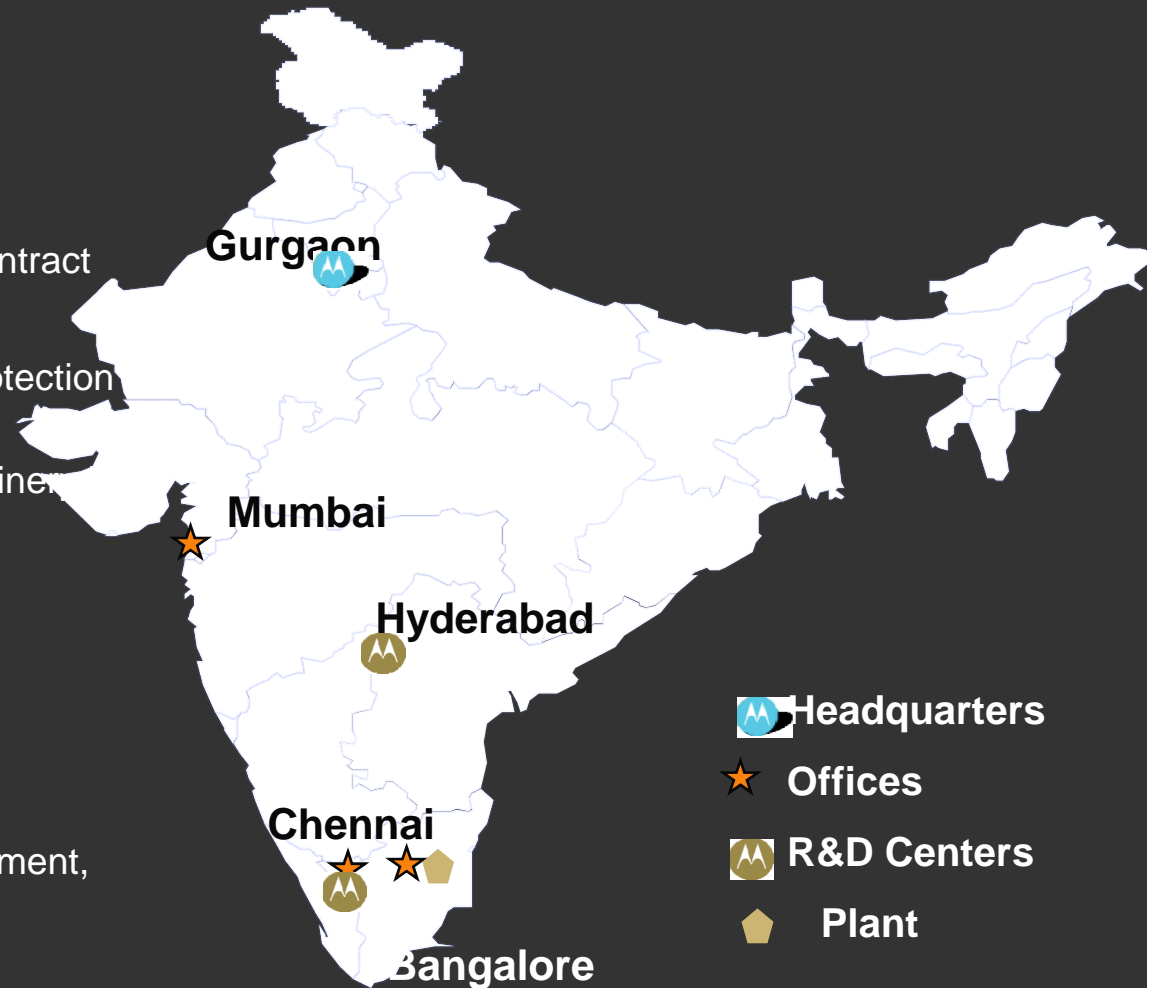
Gurgaon

Mumbai

Hyderabad

Chennai

Bangalore

Headquarters

Offices

R&D Centers

Plant

Delhi GRN

- Tetra based secure communication network, covering the entire NCT of Delhi
- All government users will subscribe to the service
- Additional requirements for Commonwealth Games

Govt. of National Capital Territory of DELHI
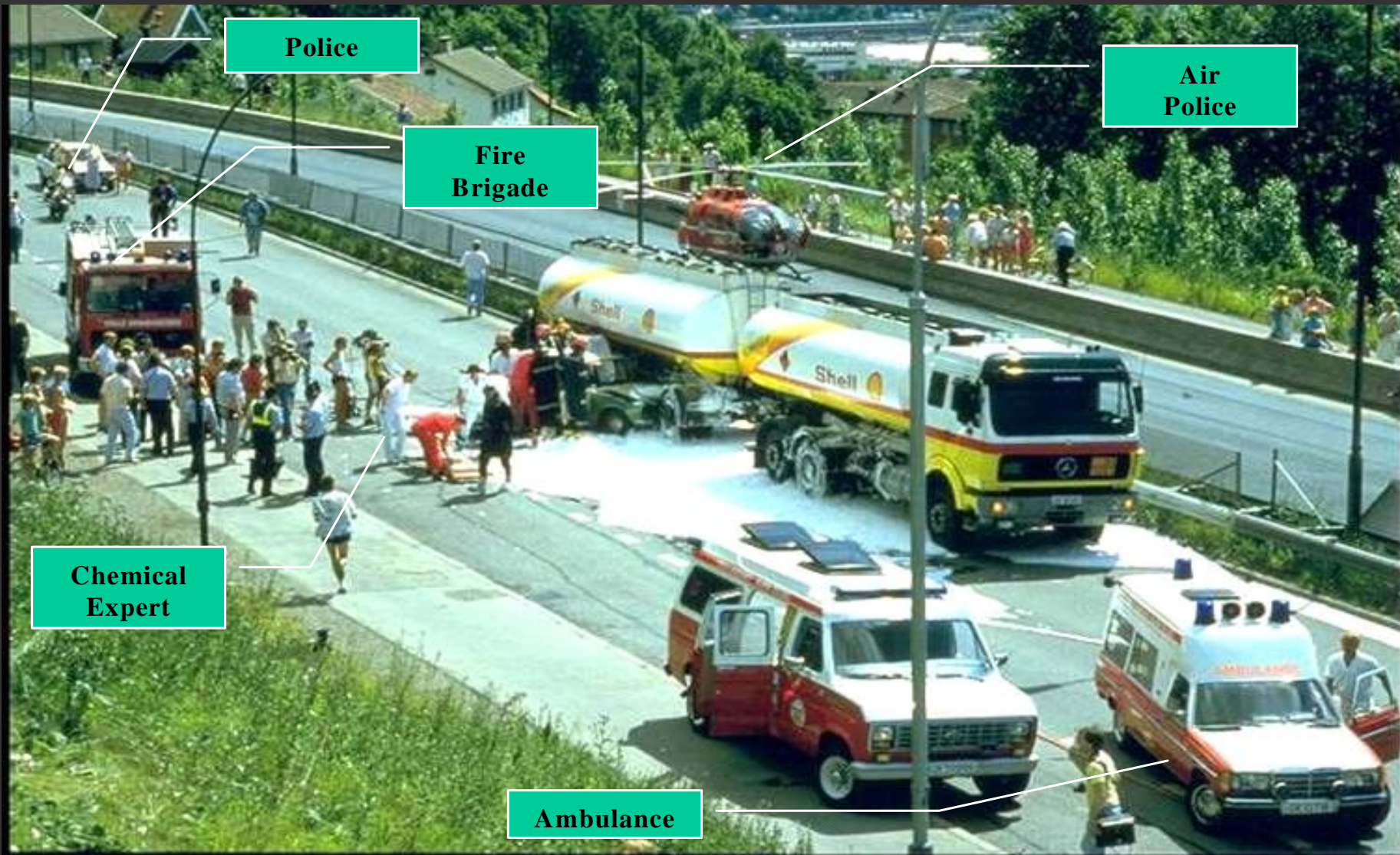दिल्ली सरकार

Secured Communication Network

DELHI 2010®
XIX COMMONWEALTH GAMES
COME OUT AND PLAY

MOTOROLA

HCL

Imagine This Situation!

Police

Air Police

Fire Brigade

Chemical Expert

Ambulance
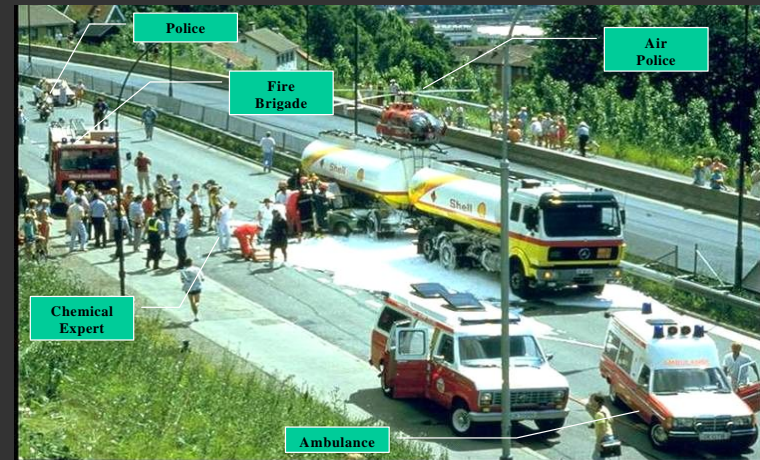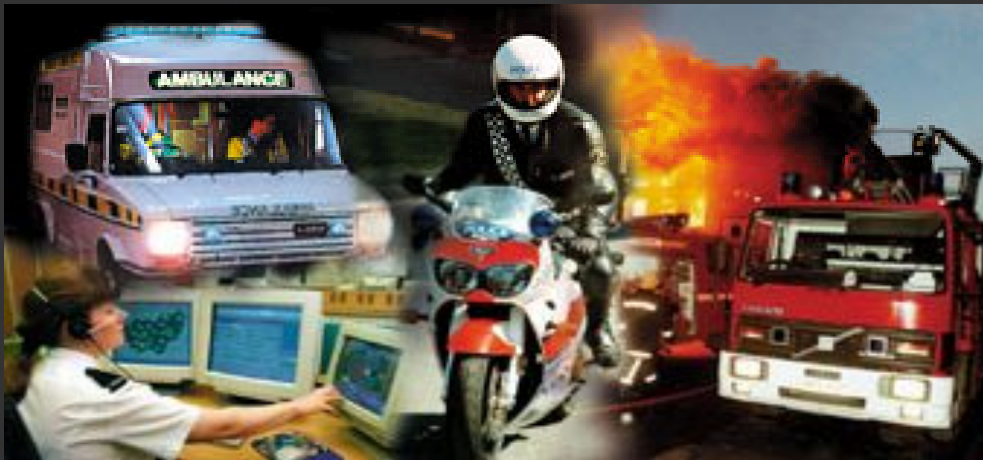
Background

"In a large scale emergency situation involving multiple public safety agencies, such as Police, Fire, and Emergency Medical Services, immediate access to a **common radio communications platform** *that allows public safety officers to communicate among agencies is* **critical** *for effective operations"*


The Answer is **Unified Radio Network**, *also known as* **Government Radio Network (GRN)**

What Is Government Radio Network (GRN)?

- A **single platform** two-way radio network that supports multiple Government organizations throughout a given geographical area
  - **Exclusively** used by government agencies
  - **Not open** to the public
  - **Coverage area can be citywide, region wide or nationwide**

- The single platform network is shared among different organizations which will allow users to **interoperate** among those organizations

- It is a relatively new concept in Asia with few countries having experience in implementing it
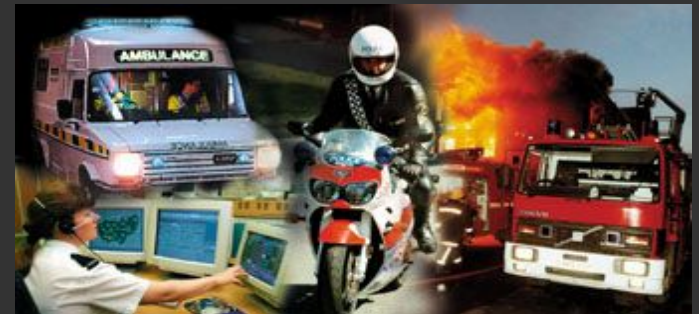
Who Are Potential GRN Users?

- **Mission-Critical Organizations:**
    - All Public Safety and Mission Critical organizations: Police, Fire, Ambulance
    - Ministry of Interior
    - Ministry of Defense
    - Disaster Management Agency
- **Safety-Critical Organizations:**
    - Ministry of Transportation
    - Public works and Utilities: Water, Gas, Energy
    - Maintenance & Inspection Departments
- **Other Government Organizations:**
    - Department of Justice
    - Finance Department
    - Housing & Education departments
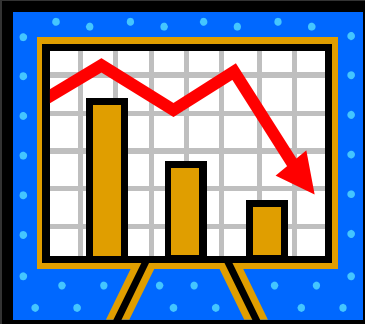   - Miscellaneous government functions, etc.
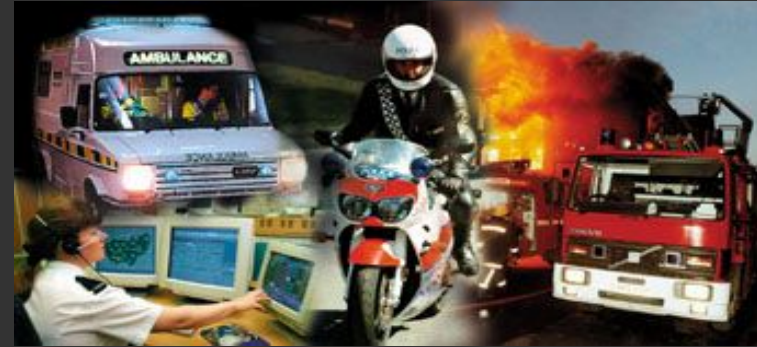
Benefits of GRN - (1)

- Interoperability
  - **Common network allows agencies to inter-communicate**
  - **Facilitate inter-communication among different agencies, especially during time of crisis**

- Cost Savings
  - **Economies-of- scale for using common network**
    - **The larger the network and users, the most cost-effective it becomes**
  - **Greater functionality at a lower lifetime cost**
  - **Access to a unified radio network without a high upfront cost of capital**

Benefits of GRN - (2)

- Security
  - **All information exchanged are within the exclusive government network**
  - **Not open to public**
  - **Can be equipped with high grade of network security (e.g. encryption)**

- High Reliability & Availability

  Network can be designed to support:
  - **High availability of system resources to allow immediate access to available channels, specially during emergency situation**
  - **High levels of Grade of Service**
  - **High reliability of system to ensure that the system has virtually no down time.**

Benefits of GRN - (3)

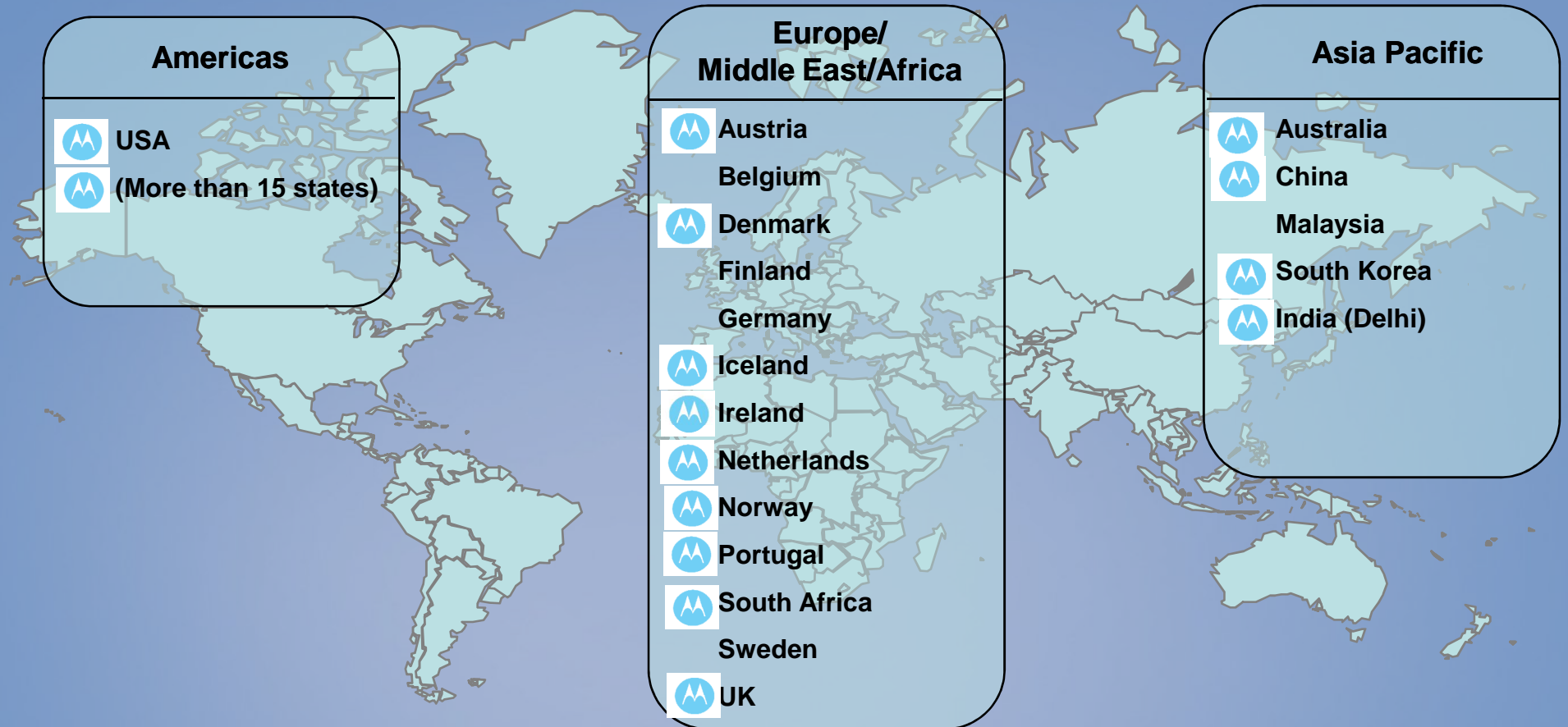- Ease of Training, Maintenance and Support
  - The use of single, uniform platform make it easier for:
    - **Maintenance and operational support**
    - **Training for end users and system operator**
    - **Common GUI**
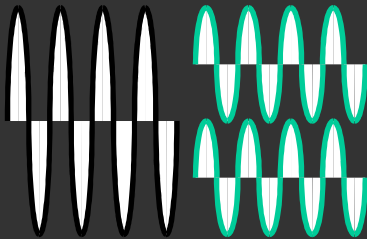
- Efficient Use of Spectrum
  - **Government Radio Networks is built in one common platform.**
  - **Only one common frequency band is utilized resulting in high spectrum efficiency**

Countries with GRN/Nationwide Network

Americas

- USA
- (More than 15 states)

Europe/Middle East/Africa

- Austria
- Belgium
- Denmark
- Finland
- Germany
- Iceland
- Ireland
- Netherlands
- Norway
- Portugal
- South Africa
- Sweden
- UK

Asia Pacific

- Australia
- China
- Malaysia
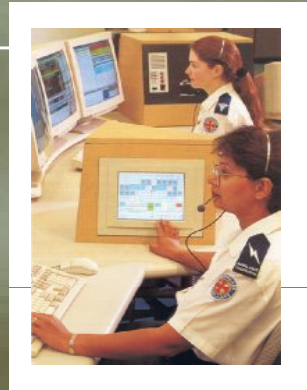- South Korea
- India (Delhi)

Countries using Motorola solution for GRN / Nationwide Network

Example of GRN: Airwave

Largest Operational TETRA GRN in the world!

- **More than 3500 live sites**
- **More than 200,000 users**
- **Example of users:**
  - Police, Fire, Ambulance, MOD, local authority
- **Potential for more than 150 individual organizations**

- **Operated by Airwave**
- **Motorola manufacture and supply network infrastructure equipment**
- **Resilience design with National Fallback Services (NFS)**
- **Interoperability features for multi-agencies communications**

- **Nationwide coverage including major / minor roads and enhanced terminals coverage for urban areas**

Key Considerations for GRN

- GRN should be an <u>independent</u>, government-only private network, because of:
  - **The need for high Grade of Service**
    - **Network Availability**
    - **Fast performance (fast call set-up time)**
  - **The need for full control of the network**
    - **Allows for network design for security, system reliability and network resilience**
  - **Security**
  - **Network capabilities and features**
    - **E.g. Emergency call with priority call, Dynamic Regrouping, Broadcast call, etc.**
  - **Coverage**

Typical Requirement

- Ability to keep privacy and control within each organization while sharing a common network
- Ability to provide comprehensive coverage design in organization's operational area
- Ability to manage high traffic for voice and data especially for high volume event during emergency or high profile events
- High reliability and resilience
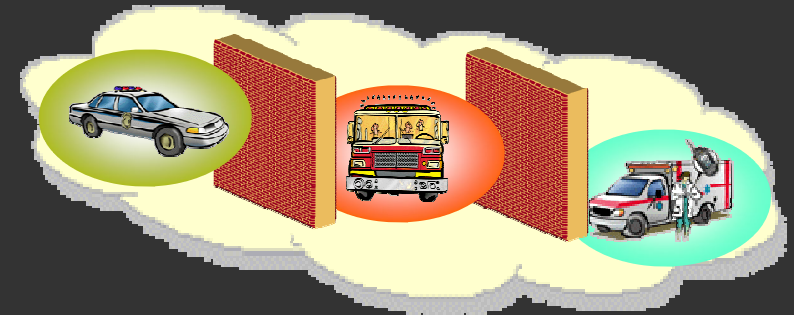- Ability to migrate into the future, i.e. future-proof network to cope with growing demand

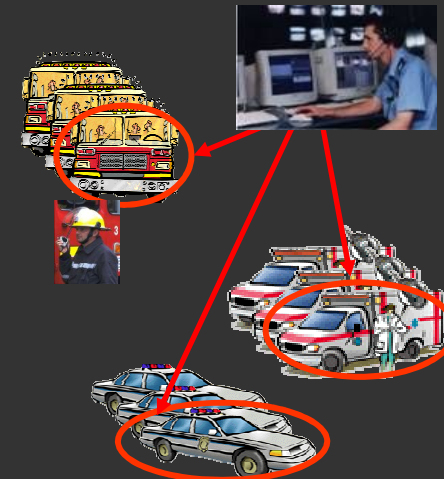# How TETRA Solution Meet GRN Requirement (1)

Requirement:

•**Privacy within each organization while sharing a common network**

Multiple agencies sharing a common network with VPN

Solution:

•Dimetra-IP Virtual Private Network (VPN)
  – **Each agency sees the VPN network as if it is their own closed network**
  – **Users can not "see" outside their VPN network, Others can not "see" into their VPN**
  – **Dimetra Interoperability features for multi-agency communications**

Dimetra-IP Interoperability Features allows intercommunication among various agencies

How TETRA Solution Meet GRN Requirement (2)

Requirement:

- **Comprehensive coverage design**

Solution:

- Superb base station and subscriber performance with high Rx sensitivity
- High Power Output

Better sensitivity means wider RF coverage and in-building penetration

TETRA Standard

Motorola

Diagram for illustration only

How TETRA Solution Meet GRN Requirement (3)

Requirement:

- **Ability to handle high traffic volume**

Solution:

- Well designed Motorola TETRA solution which has been proven to support high profile event with high traffic
  - **Olympics**
  - **G8 Summit**

Peace of Mind that the network able to handle traffic surge during emergency

How TETRA Solution Meet GRN Requirement (4)

Requirement:

- **High Resilience and Reliability**

Solution:

- Multiple redundancies for critical components

Dimetra-IP Solution

Base Station Resilience

- Maintain secure & seamless communications even if links fail (Independent Site Trunk Operation)
- Full redundancy options for critical components
- Redundancy with N+1 links.

Switch Resilience

- Redundancy in all critical subsystems
- A full range of disaster recovery solutions to meet the needs of different customers

How TETRA Solution Meet GRN Requirement (5)

Requirement:

- **Future Proof for comprehensive data applications such as TEDS**

Solution:

- Use TETRA2 TEDS-Ready equipment for easy upgrade
  - **Dimetra-IP is TETRA2 TEDS-Ready**

Summary

- GRN allows interoperability among government agencies supporting both day-to-day and emergency operations

- Due to its high requirement for security, reliability and performance, GRN shall be built as private, government-only network

- TETRA has been proven as a solution to GRN with its comprehensive interoperability and mission critical features

- To successfully implementing GRN network, experiences partner is key to successful implementation:
  - **Motorola has proven solution & extensive experiences in deploying GRN solutions worldwide**

Subodh.Vardhan@motorola.com