

Public Protection & Disaster Relief



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ITU Seminar on PPDR September 24,2002



A possible event...

- India West Indies Cricket Match is going on in a stadium next to the railway tracks that are in daily use for commuter, freight and high-speed passenger operations.
- It is late Saturday afternoon. A steady 20 MPH wind is blowing right into the stadium from the direction of the tracks. 60000 people are watching the Cricket game.
- A high-speed urban train is speeding at 65 MPH with 1500 passengers on board. It is approaching the stadium on the inside track. 15 cars, 1500 passengers, dual-tandem engines. Speed 65 MPH.
- The freight train is rolling with 7 wagons of hydrochloric acid and 8 wagons of propane at a speed of 45 MPH.
- The freight train has been switched onto the right track.
- The center track is closed for repairs.



The Disaster

- *Behind the stadium the freight train is unexpectedly switched to the center track*
- *The entire event unfolds in less than a minute:*
- *First engine reaches the point where the track has been removed. Locomotives leave the track pulling 16 cars with them. Acid leaking out producing a deadly fog into the stadium. Propane cars remain upright.*
- *Engineer of the passenger train is helpless. Engine and 5 passenger cars leave the track. Impact is deadly.....*
- *Panic breaks out on the entire stadium...*
 - *20.000+ cell phones try to call for help at the same time.....*



**If you think, this is just an
imagination, think again**



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India Gujrat Earth Quake

- **Date of Earth quake** : 26/01/2001
- **Time** : 8:46 AM
- **Richter Scale** : 6.9
- **Epicenter of Quake** : 20 km north-east of Bhuj
- **Affected Districts** : 21 out of 25

Total Deaths : 19,762

Total Injured : 1,66,061



Bhopal Gas Tragedy

Midnight 2-3 December, 1984. Over 40 tonnes of highly poisonous methyl isocyanate gas leaked out of a pesticide factory in Bhopal, central India. At least 20,000 have died

Total Deaths : 20,000

Total Injured : 130,000



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WTC New York September 11, 2001

More than 3,000 people lost their lives on September 11, 2001 after hijacked planes crashed in New York, Northern Virginia and Pennsylvania. The victims were of many faiths and races representing more than 80 nations

Estimated Loss : US\$105 Billion



Total Deaths : 2999

Total Injured : 8986



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“The terrorist attacks of September 11 remain etched in the minds of many...Although the attacks took place in the US, their impact **was felt all around the world**.... terrorism, like other **asymmetric threats**, is not new. But **globalization and technology** have exacerbated the problem of terrorism and increased the potential for mass destruction...**Today’s terrorists have more available means to inflict extensive damage than at any other time in history**...The September 11 attacks have focused our minds on terrorism and elevated **asymmetric security threats** to a new dimension in a dramatic way...”

-SPEECH BY **SINGAPORE DEPUTY PRIME MINISTER AND MINISTER FOR DEFENCE, DR TONY TAN KENG YAM**, AT THE GRADUATION CEREMONY OF THE SECOND NATIONAL SERVICE COMMAND AND STAFF COURSE HELD ON WED, 7 NOV 2001 AT 7:30 PM



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Japan

On March 20, 1995, Five Members of the Aum Shinrikyo, or Cult of the Supreme Truth in English, Entered the Subway System and Released **Sarin Gas** in Five Trains in Tokyo, **Killing 12** People and **Injuring More Than 5,000** Others.

10^6

India

March 3, 2000 **A Bomb Exploded** on a Bus in Sirhand, Punjab, Killing Eight Persons and Injuring Seven Others. The Indian Government Suspects Either Kashmiri Militants or Sikhs Were Responsible

Singapore

April 5, 2002 **Uncover Plane Crash Plot** A Singaporean member of an Islamic militant group linked to al-Qaida is suspected of planning to hijack a plane and crash it into the city-state's international airport

2000 BC

1900 AD

2000 AD

Time

Figure 1. The lethality of a small group.



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Views of the responding agencies on ground 0

On 26th January 2001 a **massive earthquake** measured at 7.9 Richter scale hit Gujrat and in its wake left a trail of untold devastation leading to number of casualties and huge property losses. The immediate response of the district administration in carrying out **rescue and relief operations** was **greatly hampered** by the fact that all the **communications channels** including telecom and VHF wireless network **broke down**, instantaneously.

- In June 1998 Kandla was hit by a **huge tropical cyclone** and again it was a disaster of great proportions. All the **communications links** were **lost immediately** and the flow of information crucial for carrying out any meaningful **rescue and relief operations virtually stopped**. It also took a considerable amount of time to get the network on even keel.

- In May 1999 three district in Gujrat were hit by a **cyclone**. Telecommunications were amongst the first casualties. As it is these areas are far-flung and remote and with the **breakdown of even skeleton communications system** the problem got further accentuated. Total inaccessibility coupled with **lack of information** compounded the difficulties faced by the administration



“After Each Major Event in Recent History, the Most Glaring Indication of Success or Failure by Responding Agencies Has Been Their Ability to Effectively Communicate With Each Other.”

*IACP Project Response -Leading From the Front
Law Enforcement’s Role in Combating and Preparing for Domestic Terrorism



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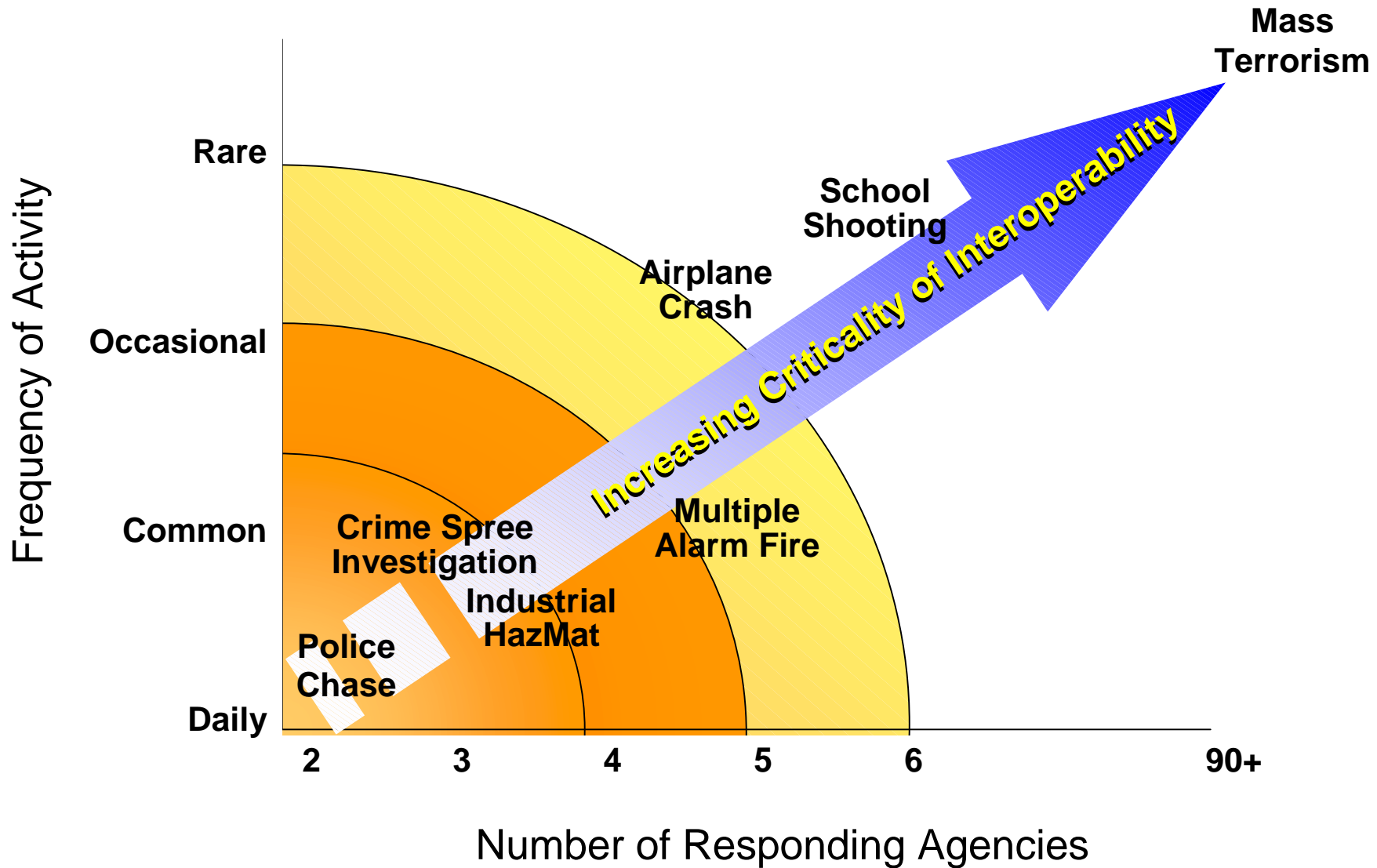


Experience shows that too many human lives are at risk

- Rescue efforts hampered due to
 - Lack of common frequencies
 - No common equipment available
 - Different approach to rescuing
 - Not enough radios
 - No coordination between various agencies involved in rescue
- Public cellular services collapses due to congestion
- Future needs
 - Radio technologies helping to fight risks and crisis
 - Require high data rates, video, multimedia
 - More international cooperation for rescue and anti-terrorism activities



Comparative Interoperability Events



Critical Interoperability Enablers

Spectrum

Planning and Cooperation

Standards

Identify Globally /Regionally Harmonised frequency bands to meet Public safety and disaster relief needs

Develop standards for interoperability solutions in all regions.

Interoperability

Prepare your multi-governmental plan to enable voice & data communications during large scale events.

Rehearse and institutionalize your multi-governmental plan with all responders.

Planning

Practice



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WRC-03 AGENDA ITEM 1.3*

*Resolution 1156 (WRC-2000)

Agenda item 1.3 of WRC 2003

“identification of globally/regionally harmonized frequency bands for future advanced solutions to meet the needs of public protection agencies and organizations, including those dealing with emergency situations and disaster relief, and make regulatory provisions, as necessary ”

Note : Although a number of countries do not have a definition of “public protection,” their definition of “public safety” is consistent with the activities associated with the term “public protection.” - ITU-R WP8A3



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ITU-R Studies for PPDR

- ITU-R had given responsibility to its Study Group 8, Working Party 8A to study
 - **identification of frequency bands for future PPDR use globally/regionally**
 - **associated ITU regulatory provisions**
 - **technical and operational bases for global cross-border circulation of PPDR radio equipment**
- WP8A assigned this task to Working Group 3 under the chairmanship of Mr. Alan Jamieson (NZ).



STUDY PROCESS USED BY WG8A3

- Survey/ Questionnaire comprising 17 questions tailored to assess the:
 - **current PPDR communications activities**
 - **future plans and intentions for PPDR**
 - **need for harmonized spectrum**
- 38 administrations, and 4 sector members responded to the Survey
- 8A3 held 5 meetings including two interim Meetings hosted by India and Italy in 2001 & 2002 to
 - **consider questionnaire analysis & findings**
 - **Preparation of methodology and estimation of future spectrum requirements**
 - **Draft of a new ITU-R report on PPDR requirements**
 - **Draft new recommendation on cross border circulation**
 - **Identification of suitable harmonised spectrum bands**
- The WG 8A3 has completed it's study and finalised the Draft CPM Text in end of May 2002 which will now be considered by the CPM conference in late November 2002



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ITU's DEFINITIONS OF "PUBLIC PROTECTION" AND "DISASTER RELIEF"

The definitions of Public Protection and disaster relief taken from the DNR ITU-R M.PPDR-REQ have been developed by ITU-R WP 8A for the purpose of discussing the agenda item 1.3 as follows:

- ◆ ***Public Protection Radiocommunication:***

Radiocommunication used by responsible agencies and organisations dealing with maintenance of law and order, safety of life and property, and emergency situations.

- ◆ ***Disaster Relief Radiocommunication:***

Radiocommunication used by agencies and organisations dealing with a serious disruption of the functioning of society, posing a significant, widespread threat to human life, health, property or the environment, whether caused by accident, nature or human activity, and whether developing suddenly or as a result of complex, long-term processes.



Summary of PPDR Requirements

- Three **defined PPDR** groups/technologies identified.
 - **Narrowband** : **wide area networks**. Digital voice and low speed data; Telemetry, electrocardiograph, Dispatch alert, etc.
 - **Wideband** : **wide area networks**, Digital voice and medium speed data; e.g. real time video, Sensory data, Vehicle status, Finger print (biometrics), Identifying persons, maps, medical records, etc.
 - **Broadband** : local/tailored area networks and **hot spots**. High quality digital real time video and very high speed data; e.g. **Video clip-on** cameras used by in-building fire rescue, **remote medical support**, Surveillance of crime scenes including use of remote control **robotic devices**, etc.



METHODOLOGY FOR CALCULATING SPECTRUM REQUIREMENTS

- The initial methodology proposed to estimate the spectrum needed by PPDR by the year 2010 was based on the ITU methodology (Rec. ITU-R M.1390) for calculation of IMT-2000 spectrum. This was considered by 8A3 in Goa meeting.
- This methodology was subsequently updated incorporating PPDR user population and service penetration rates.
- The methodology was subsequently validated by administrations of Korea, Australia and Italy.
- Based on the inputs, ITU-R has produced results of spectrum estimates for PPDR and these are included in the CPM Text



Regulatory Options proposed by ITU-R WP 8A

➤ Option 1

- ✓ Listing global or regional bands for PPDR through new footnotes in Article 5 of the ITU Radio Regulations.

➤ Option 2

- ✓ Listing global or regional bands for PPDR Globally/regionally harmonized bands in a new WRC Resolution (or Recommendation), without any specific identification in a footnote to the Radio Regulations. .

➤ Option 3 (Preferred by APT)

- ✓ Listing of global or regional bands for PPDR through a footnote in Article 5, with an appropriate reference to a new WRC resolution.

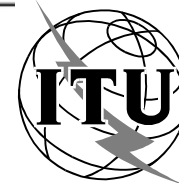


Estimated Spectrum Calculated by ITU-R

	Medium City (Pop. = approx 2.5 Million)		Large City (Pop. = approx 8.0 Million)	
	PPDR User Density		PPDR User Density	
	Low	High	Low	High
Narrow-band	12 to 31 MHz	44 MHz*	17 to 52 MHz	40 to 67 MHz
Wideband	up to 25 MHz	34 MHz*	up to 38 MHz	52 to 70 MHz
Broadband	39 MHz	-	up to 50 MHz	60 MHz



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Harmonised Bands Proposed For PPDR

- **HF Band (3-30 MHz)**
 - **Allocated to Fixed Mobile and Broadcasting Services**
 - **Advantages**
 - **Good propagation that supports communications over short as well as long distances. Suitable for rugged terrain;**
 - **Cost effective for wide area coverage.**
 - **Disadvantages**
 - **Very narrow-band and most crowded;**
 - **Very large antenna required;**
 - **High interference.**
- **VHF Bands(68-74.8, 75.2-88,138-144,148-174 MHz)**
 - **Allocated to Fixed, Mobile, Maritime Mobile and Aeronautical Mobile Services**
 - **Advantage:**
 - **wide equipment availability and good propagation,**



Harmonised Bands Proposed For PPDR

- 380-385/390-395 MHz
 - **Allocated to Fixed and Mobile Services**
 - **Advantage:**
 - **wide equipment availability**
 - **used for PPDR by some countries in region 1 and 3**
- 746-806 MHz
 - **Allocated to Fixed Mobile and Broadcasting Services**
 - **Advantages**
 - **Can be used for narrow-band and wide-band**
 - **cost effective for wide area coverage**
 - **Disadvantages**
 - **Dependent on transition of analogue broadcast to digital**



Harmonised Bands Proposed For PPDR

- 806-824/851-869 MHz
 - **Allocated to Fixed, Mobile and Broadcasting Services**
 - **Advantages**
 - **Analogue and digital narrow-band products are available**
 - **Cost effective for wide area coverage**
 - **Some countries in Region 2 and 3 have designated parts of this band for PP systems**
 - **Disadvantages**
 - **Used extensively by Fixed, Mobile and broadcasting services**
 - **Dependent on existing analogue operations**



Harmonised Bands Proposed For PPDR

- 4900-4990 MHz
 - Allocated to Fixed, Mobile and Fixed Satellite services
 - Advantages
 - Allocated for Mobile services on a global basis
 - Sufficient bandwidth to support broadband applications
 - Disadvantage
 - Used in many countries for non-PPDR Government applications
- 5850-5925 MHz
 - Allocated to several services
 - Advantage
 - Readily available technology and components for RLAN
 - Disadvantage
 - Parts of this band are used for ISM applications and short-range devices

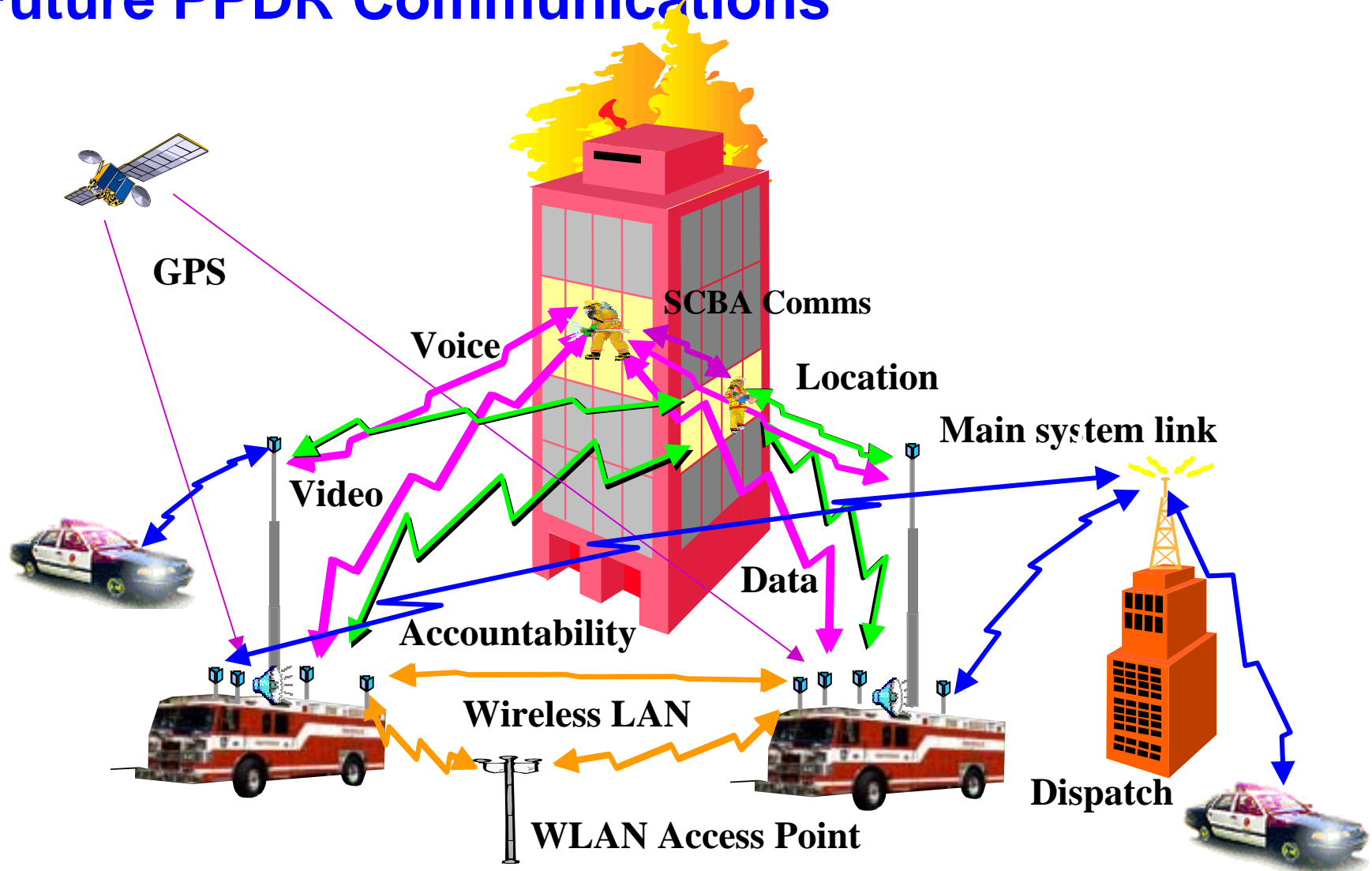


Provisional Views of Most APT Administrations on WRC Agenda item 1.3

- **APT Members strongly support the principle of identification of globally/regionally harmonised bands for PPDR.**
- **The APT member administrations support the spectrum calculation methodology and note the range of spectrum estimates by the ITU-R as contained in the draft CPM Report relating to agenda item 1.3.**
- **Most APT member administrations support option C contained in the draft CPM text because as it gives greater visibility to harmonisation objectives for PPDR and also follows the successful IMT2000 model**



Future PPDR Communications



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First Responder of the Future

The Future Vision of Emergency Management Is One of **Seamless Communication** Between Command, Vehicle and Field, **Rapid Access** to Mission Critical Data, and **Smart Tools** That Empower Individual Firefighters and Emergency Medical Personnel.



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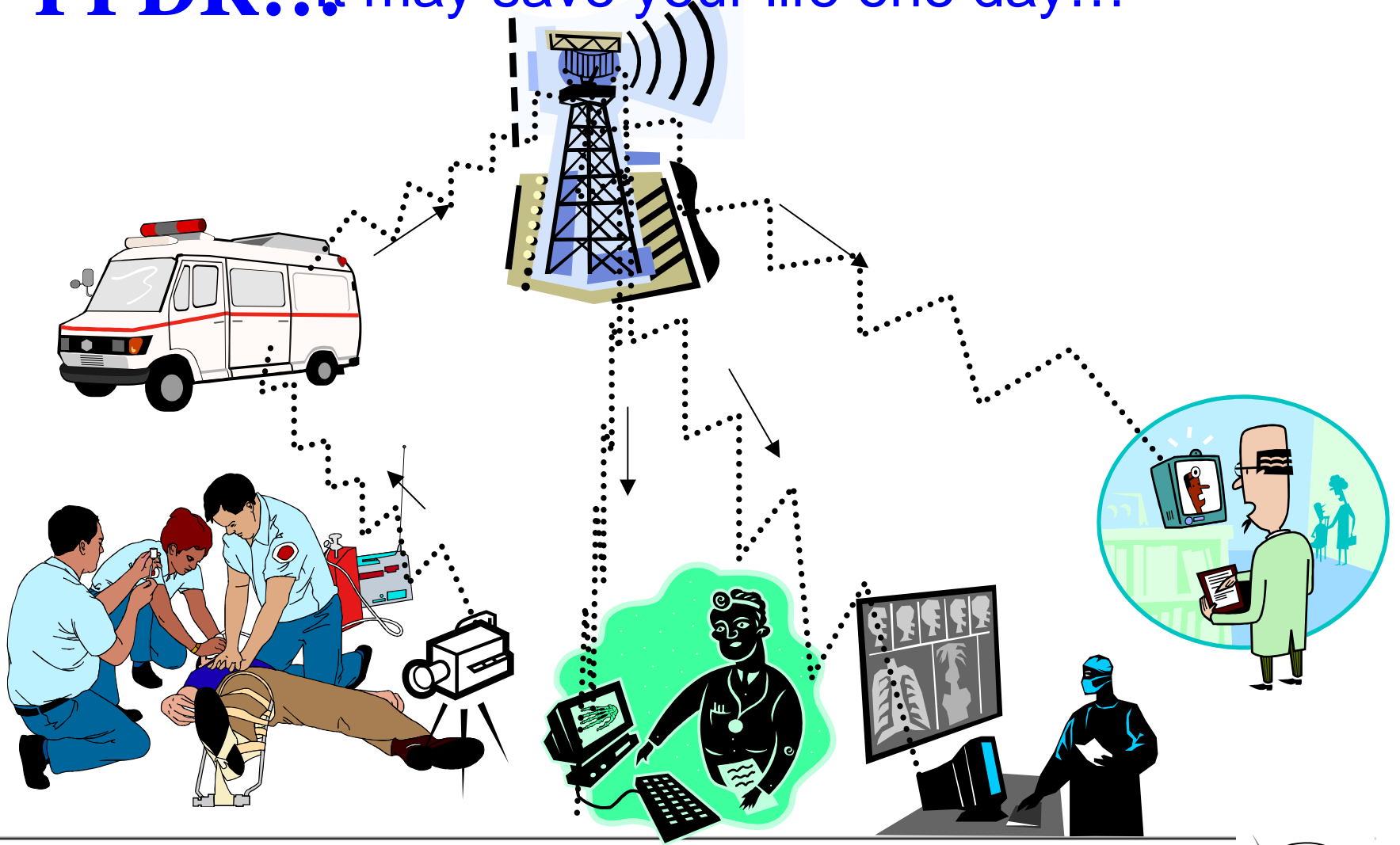


Summary

- **Global safety and security environment post September 11 calls for an increased urgency in finalising spectrum and standards for interoperability among PPDR agencies**
- **WRC 2000 approved agenda item 1.3 for WRC 2003**
- **In May 2002 ITU has proposed draft CPM Text incl.**
 - Spectrum Requirement Calculations
 - Candidate Bands
 - PPDR User Requirements
- **WRC 2003 meeting scheduled for June 2003 would decide the Global/Regional frequency bands for PPDR**



PPDR...It may save your life one day...



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Thank You