

**GOVERNMENT OF MEGHALAYA**  
**INFORMATION TECHNOLOGY & COMMUNICATION DEPARTMENT**

No. ITR 17/2013/116,

Dated Shillong, the 3<sup>rd</sup> January, 2018.

From: Shri. M.R.Synrem, IAS.,  
Secretary to the Govt.of Meghalaya,  
Information Technology & Communication Department.

To: Principal Advisor ,  
(Networks Spectrum & Licensing)  
Telecom Regulatory Authority of India  
Mahanagar Doorsanchar Bhawan  
Jawahar lal Nehru Marg (Old Minto Road)  
New Delhi: 110002

Subject: Request for comments on TRAI Consultation Paper 'Next Generation Public Protection and Disaster Relief (PPDR) Communication networks' issued on 9<sup>th</sup> October,2017.


Ref: No.102-4/2017-NSL-ii Dated 9<sup>th</sup>October,2017

Sir,

In pursuance to your letter on subject cited above, I am directed to enclosed herewith our views/ comments from the Department on Public Protection and Disaster Relief(PPDR) as requested therein, for your information and necessary action.

Enclosed: as stated

Yours faithfully,

  
(M.R.Synrem)

Secretary to the Govt.of Meghalaya,  
Information Technology & Communication Department.



## Views on PPDR

PPDR supports a wide range of public services such as the maintenance of law and order, protection of life and property, disaster relief and emergency responses. PPDR communication system has two components namely Public Protection (PP) radio communications and Disaster Relief (DR) radio communications and these are defined by the ITU-R2 as follow:

### **Public protection (PP) radio communication:**

Radio communications used by responsible agencies and organizations dealing with maintenance of law and order, protection of life and property, and emergency situations.

### **Disaster relief (DR) radio communication:**

Radio communications used by agencies and organizations 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.

PPDR services (law enforcement, emergency medical service, firefighting, search and rescue, border security etc.) are provided by various PPDR agencies. PPDR agencies, also known as first responders, are the primary forces that deal with incident response. These agencies are responsible for day-to-day public protection and also respond to any disaster and deploy the required services in the disaster prone area. They would typically be public protection personnel grouped into mission oriented categories, such as police, fire brigades, emergency medical response etc.

Currently, PPDR communication infrastructure in India is either old Analog Systems or it uses narrowband radios

The narrowband nature of these radios limits them to only 2-way voice communications with no inherent support for high-bandwidth transmission requirements such as interactive video communication, remote video surveillance of security or disaster sites etc.

Mobile technologies capable of sending and receiving bandwidth-intensive data can help emergency responders do their jobs more effectively and safely. PPDR agencies need mobile broadband networks that enable them to share streaming real-time video, detailed maps and blueprints, high-resolution photographs and other files



Various forms of communication services on a PPDR network is given below:

**Voice Services:** Voice service is primary for PPDR communication. The key elements of voice service in mission critical situation<sup>7</sup> are:

· *Direct or Talk Around:* It provides PPDR agencies with the ability to communicate unit-to-unit when out of range of a wireless network or when working in a confined area where direct unit-to-unit communications is required.

· *Push-to-Talk (PTT):* It provides the ability to address a particular individual or group at the press of a single button. This is a time-saving tool first responders rely on in urgent situations.

· *Group Call:* It provides communications from one-to-many members of a group and is of vital importance to the PPDR. The ability to define and redefine talk groups quickly is essential for effective teamwork.

**Talker Identification:** It provides the ability to a user to identify who is speaking at any given time and could be equated to caller ID available on most commercial cellular systems today.

· **Emergency Alerting:** It is essentially an alarm button with overriding priority which indicates that a member of the group is in needs to communicate immediately.

· **Audio Quality:** This is a vital element for mission critical voice. The listener must be able to understand without repetition, and can identify the speaker, can detect stress in a speaker's voice

**Data Services:** While voice services will remain an important component of PPDR operations, data and video services are expected to play a key role increasingly. PPDR agencies today are using narrowband data applications such as pre-defined status messages, data transmissions of forms and messages, access to databases and wideband data applications such as short messages, email, and compressed video. There is a need for broadband technology to transmit video or high resolution images, to use geographic information systems (GIS) and to access the internet at high speeds.

There can be three types of technologies that are used for PPDR based upon data rates:

a. **Narrowband:** speed or bit rate up to 64kbps which is one voice channel in a radio system

b. **Wideband:** carry data rates of several hundred kilobits per second (e.g. in the range of 384-500 kbit/s)

c. **Broadband:** data rates in range of 1-100 Mbit/s



PPDR networks can be categorized into two broad types:

- (a) Spectrum based models
- (b) Network deployment strategy based models

### **Spectrum based models**

Public safety mobile broadband can be delivered through a dedicated network, commercial network or a combination of both dedicated and commercial network (hybrid network).

- **Dedicated:** In this approach, dedicated spectrum is allocated for PPDR network. Dedicated spectrum can offer availability, control and security. For economic reasons, dedicated spectrum is shared by a number of PPDR agencies (police, fire, emergency medical services etc) and other critical communication user organizations.

- **Commercial:** In this approach, no spectrum is allocated to PPDR network. The spectrum is shared with the commercial networks throughout the country.

- **Hybrid:** In this model, the spectrum can be shared with the commercial network operator in some areas and dedicated spectrum in some areas. Spectrum can be shared with the commercial network operators to provide enhanced coverage by leveraging the already existing networks in the less populated area (rural areas) at lower cost. However for densely populated area (urban areas) dedicated spectrum can be allocated to PPDR.

### **Network deployment strategy based models**

- (i) Private LTE for Public Safety :

The Mobile Broadband Network is planned, build, and operated by the PPDR/PS-LTE Agency themselves. These networks provide the mobile broadband services through service offering tenders.

- (ii) Hosted Public Safety :

The common network infrastructure that is shared between PPDR/Public Safety and Commercial network subscribers. In this type of model the mobile broadband services to PPDR agencies are differentiated using user access barring, special QoS, on demand resource reservation, dedicated applications

- iii) Mobile Virtual Network Operator (MVNO) :

This model is based on partly Dedicated and partly Shared Network Infrastructure between PPDR /Public Safety and Commercial Networks.



There may be geographical split between PPDR and Commercial network(s).

Mobile Virtual Network Operator (MVNO) architecture. The MVNO models may be of the following three types:

- Over-The-Top services: PPDR/PS services in LTE can be implemented as applications over MBB. Here the business logics are located outside of the network and connected to the networks using VPN or Internet. Public Safety over MBB uses this model.

- MVNO Model: In this model, the public safety service provider role is separated from the network provider.

- RAN Sharing Model: In this model, Common RAN will be shared across both commercial and PS Services. In this model the Core and App Servers hosting the PS services are not shared.

Trunking operators (Public Mobile Radio Trunking Services (PMRTS) and CAPTIVE MOBILE RADIO TRUNKING SERVICE (CMRTS) in India are assigned 814-819 MHz/859-864 MHz band for Analog and 811-814/856-859 MHz band for Digital networks

**Q1. Do you consider the existing fragmented model of PPDR communication network in the country adequate to meet the present day challenges? If not, what are the deficiencies in the existing model of PPDR?**

The PPDR communication networks in India use narrowband radios. The narrowband nature of these radios limits them to 2-way voice communications with no inherent support for high-bandwidth transmission requirements like photograph, video GPS etc of the affected area.

High speed mobile data capabilities that can be relied upon in adverse situations are becoming increasingly necessary for public safety. PPDR agencies need mobile broadband networks that enable them to share streaming real-time video, detailed maps and blueprints, high-resolution photographs and other files.

Emerging technology like LTE may be chosen for mobile broadband PPDR network with reservation for Disaster situation. Internet of things and IPv6 may can contribute a lot for PPDR operations and emergency rescue operations.



**Q2. In the various models described in para 2.11-2.15, in your opinion which of the model (dedicated, commercial, hybrid) will be more suitable for Indian conditions? or Is there any other alternate model which would be more suitable for Indian telecom environment? Please provide rationale for the suggested model.**

The Hybrid model will be more suitable for Indian Conditions. The Spectrum can be shared with the commercial network operators to provide enhanced coverage by leveraging the already existing networks in the less populated area (rural areas) at lower cost. However for densely populated area (urban areas) dedicated spectrum can be allocated to PPDR. Moreover confidential or secured location with national importance or related to defense/sensitive area dedicated spectrum would be ideal choice

**Q3. Should PSUs be earmarked for providing nationwide broadband PPDR communication network? Please justify your answer.**

Yes, PSUs may be earmarked for providing nationwide broadband PPDR communication network since the TSP(PSU) have vast infrastructure and presence across the nation (specially in remote locations) which could help in minimizing time to market and reduce overall deployment, operation and maintenance cost by leveraging the existing infrastructure and assets.

**Q4. Will it be technically feasible and beneficial to permit PPDR trunking service roaming on public telecom networks? If yes, what challenges do you foresee in implementation of such an arrangement? Please justify your answer.**

The technological innovations has enabled and made it feasible for PPDR trunking service roaming on public network, Trunking service on common carrier smartphone, Interoperation between LTE and TETRA network and interconnection to 2G/3G/PSTN /IP PBX through gateway. Mobile applications can also be installed on any commercial smart phone allowing the user to access trunking specific services through the public network's data connection.

With LTE it is now possible to utilize a cost effective strategy to expand private network coverage, perhaps into more rural locations where a private LTE system may not have been considered.

However, one of the limitations may be congestion during the occurrence of



disaster.

**Q5. Can frequency bands be identified exclusively for public protection and disaster relief? What are the candidate bands for PPDR operations in India?**

Yes, frequency bands can be identified exclusively for public protection and disaster relief.

The countries in Region 3 (Region 3 includes India too) have also identified the bands 380-400MHz and 746-806MHz for PPDR applications.

**Q6. If wideband/broadband PPDR is to be implemented in India, what quantum of spectrum will be needed for such solution for PPDR?**

Like many other countries namely South Korea, USA, UAE 2x10 MHz may be allocated for PPDR application

**Q7. What is the cost and benefits tradeoff envisaged for public protection and disaster relief viz-a-viz commercial value of spectrum?**

Cost will be opportunity cost for allocating 2x10MHz exclusively for PPDR application, however the benefit is every life saved because of effective communication and coordination.

**Q8. Do you suggest any other workable option that can be adopted?**

**Q9. Please give your comments on any related matter not covered in this consultation paper.**