



ITU-APT Foundation of India

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**Subject: Comments / counter-comments to Consultation Paper on
Next Generation Public Protection and Disaster Relief (PPDR)
communication networks**

Kind Attention: Mr S. T. Abbas,

Dear Sir,

ITU-APT Foundation of India (ITU-APT) is a non-profit, non-political registered society, is working for last 10 years in India with the prime objective of encouraging involvement of professionals, corporate, public/private sector industries, R&D organizations, academic institutions, and such other agencies engaged in development of Indian Telecom sector in the activities of the International Telecommunication Union (ITU) and the Asia Pacific Telecommunity (APT). The society has been registered with the registrar of the societies with its secretariat working at New Delhi. ITU-APT Foundation of India (ITU-APT) is sector Member of the ITU Development Bureau (ITU-D) and ITU Telecommunication Standardization Bureau (ITU-T) which manifests its usefulness of the Indian Telecom industry.

ITU-APT responses to the above mentioned consultation are in the attached document

Bharat Bhatia
President

ITU-APT response to Consultation Paper on Next Generation Public Protection and Disaster Relief (PPDR) communication 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?

Our Response

The present inadequate and deficient PPDR network is the result of following challenges:

- Limited budget with state police agencies to roll out state of the art digital voice network based on mission critical technologies such as TETRA or P25.
- Extremely high administrative spectrum and license fees for captive users— almost 10 times the license fees in developed countries (typical spectrum fees for one pair of PPDR frequencies in many countries is between \$100 to \$400 as compared to \$1000- \$4000 in India)
- Long time frame for getting necessary DOT licenses – minimum 9 months to an average 12-18 months to get a CMRTS and spectrum license.

Further, the PPDR networks in the country are still evolving from analogue to Digital trunking and many cities still have only analogue conventional or trunking networks. Even those radio networks have limited spectrum and the number of wireless sets per population is also the lowest in the world. The main challenge is the funding and the high spectrum charges. This directly impacts the safety of the public as well as women safety. Please see our response to question 9 for more details on this issue

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.

Our Response

In order to consider the deployment models, it is essential to understand the differences between the commercial approach and the dedicated approach: ITU Reports ITU-R M.2377 and M.2291 provide advantages and disadvantages of various options for network rollout.

	Commercial model	Dedicated PPDR model
Business objective	Revenue growth	Protect life and property
Capacity design	For “typical day”	For “worst day”
Coverage design	Based on population density	Based on full geographic coverage
Legal Liability	Commercial Operator is subject to legal liability	Rests with the PPDR agency
Communications design	One-to-one communications	One-to-many and off-network communications
Broadband data need	Centralized Internet Access and Heavy Download	Distributed Access (Traffic is locally generated, logged and consumed with heavy upload)
Network resiliency	Commercial Grade	Mission Critical Hardening
Service priority differentiation	Device or application only	Dynamic Priority based on Incident Type and User Role
Security Considerations	Carrier Controlled Device Authentication Only	Federated Agency-Based Identity Mgt. User- based Authentication

PPDR agencies need dedicated networks for various reasons mentioned above. However, it may not be economically viable to have both voice and data networks on nationwide basis. We therefore recommend a hybrid model for the country as below:

- The first priority should be to set up next generation (NG) mission critical voice networks in each district HQ as well as each metro city. These Trunk radio networks should be linked to dispatch control centers in each metro/ mega city and district Hq. The wireless network should cover the entire metro/district and the call

center needs to be outsourced (for example see ESTA in Victoria, Australia - <https://www.estavictoria.vic.gov.au/background>).

- b. Dedicated broadband Network in each metro/major cities where the Mobile Broadband Network is owned and operated by the PPDR Agencies themselves.
- c. For areas outside the metro/major cities, mobile broadband services based on the common network infrastructure that is shared between PPDR 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 etc. Also this model can be based on various type of Mobile Virtual Network Operator (MVNO) architecture.
- d. For some of these areas, broadband PPDR services on LTE can also be implemented as an OTT (Over - The – Top) application over existing mobile operators network. This kind of arrangements can also be used in some bigger cities as an initial rollout to familiarize and train PPDR agencies officials.

The above proposals are in line with what is happening in most advanced countries are moving towards a two network approach: one for mission critical voice communications – one primary police network and the 2nd a broad band data network to support video data and high speed internet access. To the extent economically possible this network should also be mission critical. For example see the approach adopted by USA for setting up the Firstnet - FirstNet is the national public safety network in USA, helping law enforcement, firefighters and EMS save lives and protect communities across the United States. (<https://www.firstnet.gov/network/lmr>). t

Q 3. Should PSUs be earmarked for providing nationwide broadband PPDR communication network? Please justify your answer.

Our Response

In areas outside the metro/major cities, Commercial or hybrid model for broadband data network as discussed above can be built by leveraging the vast infrastructure and presence built by State owned TSPs viz. BSNL and MTNL since these PSUs have network resources across the length and breadth of the nation. Such an approach which could help in minimizing the rollout of the PPDR network and reduce overall

deployment, operation and maintenance cost by leveraging the existing infrastructure and assets. In these cases the PSU operators and the PPDR agencies may enter into stringent SLAs for operation and maintenance of such networks. The optical fiber network of BharatNet and Polenet can also play a vital role in providing back haul connectivity.

Q 4. 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.

Our Response

PPDR trunking services are being implemented in many states as captive networks. Both TETRA and P25 technologies permit PSTN connectivity. However there are licensing issues involved. Further, 3GPP is currently working on standards for mission critical interoperability between trunking networks and PPDR LTE networks. Interoperability between trunking radios and PPDR LTE networks is extremely useful for senior officers of the PPDR agencies to reach out to the talk groups managing various PPDR activities. For this the best solution will be to abolish the requirement of CMRTS license for PPDR networks. This will fully facilitate the interoperability of PPDR networks.

Question no. 5: Can frequency bands be identified exclusively for public protection and disaster relief? What are the candidate bands for PPDR operations in India?

Our Response

We recommend

- a. Reserving 350-370 MHz and 380-400 MHz for PPDR digital trunking on a nationwide basis. In addition parts of 1338-174 MHz VHF should be made available for PPDR agencies on availability basis.
- b. 10+10 MHz in 700 (703-748/758-803 MHz) or 814-824/859-869 MHz as dedicated nation wide spectrum for PPDR LTE network. Based on this dedicated spectrum, it should be possible for the PPDR agencies to negotiate a dedicated LTE infrastructure for major cities by monetizing the spectrum resource outside these cities. This kind of hybrid model is best suited for India.

Q 6. If wideband/broadband PPDR is to be implemented in India, what quantum of spectrum will be needed for such solution for PPDR?

Our Response

Various studies around the world have indicated 10+10 MHz is necessary for broadband PPDR. Please refer to various studies indicated in Report ITU-R M.PPDR-spectrum. ([M.2377](#))

Q 7. What is the cost and benefits tradeoff envisaged for public protection and disaster relief viz - a - viz commercial value of spectrum?

Our Response

Studies conducted by **Hong Kong University**¹ as indicated that the societal benefits of allocating 10 + 10 MHz of spectrum for PPDR are far in excess of the value of the spectrum. Although, there is no study for India, studies for other countries provide the details as below:

Country	Opportunity cost (20 MHz)	Annual losses per capita
Australia	\$33	\$299
China	\$9	\$54
Indonesia	\$2	\$505
Malaysia	\$6	\$269
New Zealand	\$20	\$280
Singapore	\$19	\$36
South Korea	\$13	\$182

¹ http://trpc.biz/wp-content/uploads/PPDR_Report_June-2013_FINAL.pdf

Thailand	\$7	\$345
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Similar benefits have been documented in many other studies around the world. A report by **London school of Economics**² extends the research originally undertaken to estimate the socioeconomic benefits for the use of enhanced mobile broadband by public protection and disaster relief (PPDR) agencies for the November 2013 report, Socioeconomic Value of Mission Critical Mobile Applications for Public Safety in the UK: 2x10MHz in 700MHz , into 10 European Countries. The same methodology underpins both reports, but the lacuna in available data has required the extrapolation of some UK ratios and metrics to bridge these. The socioeconomic benefit estimation accruing from intervention-driven changes in policing and other emergency services focuses on four major areas of socioeconomic contribution arising from enhanced use of mobile broadband in 2x10MHz in 700MHz

Q 8. Do you suggest any other workable option that can be adopted?

Our Response

Other option is to have a nationwide broadband PPDR network owned and operated by the Government on the lines of what is being done in South Korea Israel and some middle east countries. However, the costs associated with such an approach are enormous.

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

Our Response

Captive Mobile Radio Trunking (CMRTS) networks are extensively used by State / City Police, Public Sectors, Utilities, Metros, Airports, Refineries, Steel Plants etc for their captive communications needs.

² <http://www.lse.ac.uk/businessAndConsultancy/LSEEnterprise/pdf/tetraReport.pdf>

CMRTS Licensing needs a lot of improvement in terms of ease of doing business.

9.1 Application for CMRTS agreement and Signing of CMRTS agreement: This is still a manual process and handled by CS section of DoT. The current application process for license/spectrum is quite lengthy, iterative and complex without any fixed timelines for completion of each task. There are spectrum/license cases pending for more than a year. We would like to recommend that the process should be reviewed and optimized with a fixed 'hard stop' timeline defined for completion of each task and the overall application process.

The present system for licensing of a wireless communications system for the state police typically takes more than 9 months to 18 months and involves the following sequential steps:

Activity	Remarks	Typical time required in Days/weeks		
		Minimum	Typical	Max
State Police Application to DoT for CMRTS License	Sometimes lot of iterations are required at this step since DoT ask for documents which are very difficult for PPDR agencies to provide and are totally irrelevant for Police customers.	2 weeks	4 to 6 weeks	12 weeks
DOT collects "No Dues" from 5 Groups of WPC	Parallel Activity	8-12 weeks	12-14 weeks	14-16 weeks
DOT collects Comments/ Frequency approval from 5 Groups of WPC	Parallel Activity	8-12 weeks	12-14 weeks	14-16 weeks
DOT seeks TEC Approval	Parallel Activity	8-12 weeks	12-14 weeks	14-16 weeks

DOT puts up for approval from Minister of Communication (MoC)		6-8 Weeks	8-12 weeks	12 weeks
DoT issues a Letter of Intent and invites the police to pay fees / provide BG and sign the CMRTS Agreement		4-6 weeks	4-6 weeks	6-8 weeks
State Police makes an Application to WPC for spectrum license		1-2 weeks	1-2 weeks	1-2 weeks
WPC considers the application and if satisfied issues an agreement in principle and a Demand letter		3-4 weeks	4-6 weeks	6-8 weeks
State Police makes spectrum fees Payment to WPC		2 weeks	3 weeks	4 weeks
WPC issues DL to state police (Decision Letter)		1 week	2-3 weeks	4 weeks
Based on the DL, the equipment vendor make an application for Import License to WPC regional office		1 week	1 week	1 week

WPC RO issues Import license		1 week	1-2 weeks	3 weeks
		37 Weeks Min	55 weeks Typical	70 weeks- Max

This process takes a minimum of 9 months

Recommendations:

Spectrum allotment and licensing of PPDR networks should be simplified so that the process is completed with a month or two.

9.2 High Spectrum Allocation charges: Currently, PPDR agencies have to pay huge amount of money towards license/spectrum charges for deploying a two-way captive radio system. These charges are based on last revision done in 2012, since then, Mobile tariffs have been reviewed & reduced many a times but Captive allocation charges for Two way radios are not reduced since 2012 which are very high in comparison. The two-way captive radio networks deployed by PPDR agencies are non-revenue generating networks deployed for security, safety, emergency services & disaster management for the citizens and protecting national infrastructure. As such there is no case of spectrum exploitation by such users/networks. Such huge payments for license at the start and on recurring basis, affects the budget planning for PPDR organizations and restrains them from expanding / upgrading their communication systems.

Since state PPDR organizations fall under State government, appropriate policy structure should be devised by DoT rather than using the conventional charging philosophy adopted for private wireless networks resulting in huge payments to be made by police agencies.

Providing for the public's safety is ultimately the responsibility of the government – both state governments and the union Government and

one of their highest priorities. “Public safety” means not only putting an end to the levels of crime and violence that impact the everyday lives of our residents, but just as importantly, delivering life saving rescue services, preventing fires, and preparing for and responding effectively to foreign and domestic terrorism, natural and manmade disasters, and pandemic events. Reliable and interoperable wireless communications are essential to public safety’s mission to protect life and property. However, the DOT has continuously been increasing the spectrum fees and making licensing of public safety communications prohibitively expensive and time consuming.

Recommendations:

There should be **Zero or Minimal Spectrum / License charges levied** only to recover spectrum/ administrative cost with an inter-ministerial arrangement in place.