**IAFI’s Input Document to Working Group (WG)-1 of NFAP 2022 Review Committee – 600 MHz**

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| **Contribution for updating National Frequency Allocation Table-2022 (upto1 GHz band)** | | |
| 1 | Name of Individual/Organization etc | ITU-APT Foundation of India (IAFI) |
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| 3 | Mail ID | info@iafi.in |
| 4 | Phone/Mobile no. |  |
| 5(a)\* | Nature of business | Telecommunication |
| 5 (b) | Type of Organisation  (Pvt industry, Association, academia, PSU, government departments etc.) | Industry Association |
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| 6 | Frequency band (kHz/MHz) | 918-922 MHz |
| 7\* | Applications of service | The ISM band 865 to 867 MHz is utilized by various applications leading to high interference. Therefore, there is immense need for extended requirement of 1 MHz (up to 868 MHz) for LPWAN requirement.  Further, there is also a need for additional requirement of 2-3 MHz spectrum within frequency range of 918-922 MHz band for LPWAN & low power short range communications considering evolving Ecosystem for IoT & M2M Services. Some of the present use cases are as follows:   1. LPWA network for Smart Street lighting, worker safety, agriculture, and industrial automation, Asset tracking systems for logistics and supply chain management, 2. RFID (Radio Frequency Identification) systems for tracking and inventory management. 3. Wireless sensor networks for environmental monitoring. 4. Remote control systems for home automation, industrial machinery, and automotive applications. 5. Telemetry and data transmission in utilities such as smart metering and infrastructure monitoring. 6. Wireless medical devices for patient monitoring and healthcare applications. 7. Industrial process control and monitoring systems.   These IoT applications leverage the ISM band's characteristics, such as its global availability, minimal regulatory constraints, and suitability for low-power, short-range communication. |
| 8 | Minimum & Maximum power with unit | Ranging from 25mW (14 DBm) to 1W (30DBm) per Radio Unit depending upon indoor or outdoor area deployment with Adaptive power control.  Minimum supported Channel Bandwidth 125 KHz and Maximum up to 1.4 MHz  ≤ 10 % duty cycle for network access points. ≤ 1 % duty cycle for all end devices |
| 9 | Purpose | The present allocation of 865-867 MHz is already being used by many services/users hence need additional requirement of 1 MHz to serve the end users efficiently.  There is considerable ecosystem developing in 915-935 MHz bands for low power license exempt devices. Therefore, it is requested that the portion of this band as suggested above should also be made delicensed in India also in line with global trends.                                                                                                                                                                                          This will help in a faster adoption of IoT and M2M services in the country. Moreover, it will give an opportunity for Indian manufacturers to compete in the global market in this segment. |
| 10 (a) | Countries in which similar applications are used along with web link (if known) | US, Australia, Japan, Singapore |
| 10 (b) | Provisions in frequency allocation table along with footnote of the country along with web link (if known) |  |
| 11 | Radio Regulations provisions (if known) |  |
| 12\* | Type of Radiocommunication service | Mobile service - LPWA network |
| 13 | Compatible Wireless Standard for the device likely to work in the proposed band (ETSI, 3GPP, IEEE, EC, FCC, TEC etc. or any proprietary standard) | LPWA network |
| 14 | Benefit for public | Low-power WAN (LPWAN) is a wireless wide area network technology that interconnects low-bandwidth, battery-powered devices with low bit rates over long ranges. Created for M2M and IOT networks, LPWANs operate at a lower cost with greater power efficiency than traditional mobile networks. They are also able to support a greater number of connected devices over a larger area. Most LPWANs have a star topology where, similar to [Wi-Fi](https://www.techtarget.com/searchmobilecomputing/definition/Wi-Fi), each endpoint connects directly to common central access points. LPWAN is not a single technology, but a group of various low-power, wide area network technologies that take many shapes and forms. LPWANs can use [licensed or unlicensed frequencies](https://www.techtarget.com/searchnetworking/answer/Whats-the-difference-between-licensed-and-unlicensed-wireless) and include proprietary or open standard options.The proprietary, unlicensed Sigfox is one of the most widely deployed LPWANs today. Running over a public network in the 868 MHz or 922 MHz bands, the ultra-narrowband technology only allows a single operator per country. While it can deliver messages over distances of 30-50 km in rural areas, 3-10 km in urban settings and up to 1,000 km in line-of-site applications, its packet size is limited to 150 messages of 12 bytes per day. Downlink packets are smaller, limited to four messages of 8 bytes per day. Sending data back to endpoints can also be prone to interference. |
| 15 | If modification in NFAP-2022 footnote, then quote relevant footnote no. of NFAP-22 | IAFI proposes the following text for a new India footnote to support NB-IOT: “*IND X*: The frequency range of 918-922 MHz band may be used for LPWAN & low power short range communications, in addition to the band 865-868 MHz  *.*” |
| 16 | Remarks |  |

Note.

5\* . Construction service / Manufacturing service/ Shipping Service/Aeronautical Service etc

7\*. Specify the operation of service (e.g Hand held radio/ Vehicle mobile radio/ point to point links/FM/Community Radio/Aeromobile/Short Rang Device etc

12\* Amateur/Fixed/Land mobile/Aeronautical mobile/Maritime Mobile/Aeronautical radio navigation/FM broadcast/Community Radio Service etc

Date and Signature