

## A Critical Tool for Europe for Effective Public Protection and Disaster Response (PPDR) Communications Connectivity: 2 GHz Mobile Satellite Service with a Complementary Ground Component

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### 1. PPDR & European Regulators

The Public Protection and Disaster Response (PPDR) community requires broadband connectivity throughout Europe to cope with increasing threat levels, to more effectively achieve their day-to-day mission, and to better respond to crisis situations.

European regulators, through the works that led to ECC 218, have opened the way to harmonized broadband PPDR services based on a dedicated frequency (e.g., 700 MHz) or other solutions ranging from specific networks to S-MVNO (Secure Mobile Virtual Network Operator) on MNO (Mobile Network Operator) networks, and hybrid solutions.

As each member state is able to select its own solution, some European countries have rejected the idea of allocating spectrum to PPDR, while others that have done so have only allocated limited bandwidth, and have made clear that a 4G nationwide PPDR network will not be reachable in the short term mainly for financial reasons.

### 2. PPDR Requirements

Public safety requirements include nationwide indoor and outdoor coverage at high data rates, low latency, and being available to meet unpredictable capacity surges in many areas simultaneously. To provide the PPDR community with the connectivity it requires, these requirements must be met even when public infrastructure is degraded or unavailable, such as in times of national catastrophes, energy outages or even acts of terrorism.

In addition, with the current societal demands for connectivity, the PPDR solution must also enable the PPDR community to keep citizens informed and, to the extent possible, allow citizens to reach the PPDR community.

Because of the costs associated with a dedicated PPDR communications network solution, it is critical that the solution chosen is able to leverage commercial communications networks and infrastructure.

Finally, in selecting a PPDR solution, it is highly desirable that the solution is able to be deployed as soon as possible and be able to keep pace with the constantly changing mobile telecommunications networks.

### **3. Eiji: Thales Secure-MVNO (Secure Mobile Virtual Network Operator)**

Opened to commercial service in France, Thales Communications & Security (“Thales”)’s S-MVNO Eiji solution is initially designed to complement existing nationwide low data rate PPDR networks by offering public safety forces high data rate communications through a more resilient and secure access than standard subscriptions to a MNO offer.

This can be achieved by dynamic choice of the best available MNO, through national roaming for smartphones and tablets, and through multi-modem terminals for vehicles (Eiji Box).

### **4. EchoStar XXI and CGC plus Thales Eiji for Mission-Critical (MC) Uses**

Using the EchoStar XXI satellite, which launched in June of 2017, EchoStar Mobile, an EU-wide licensee for mobile satellite services (MSS) with a complementary ground component (CGC) will begin commercial operations in the 2 GHz band by the end of 2017. This satellite network will provide low/medium data rate communications and voice capabilities to handheld terminals and on-the-move vehicle terminals covering Europe. EchoStar XXI will provide Eiji with ubiquitous geographical coverage and the appropriate resiliency for mission-critical applications.

In addition, EchoStar Mobile, by design, is able to reuse its MSS capacity on the ground through a CGC.

The EchoStar Mobile S-band network will not be limited to the provision of public safety services, but, from the PPDR point of view, the integrated CGC portion of EchoStar Mobile’s network will make possible the use of:

- **Urban eNodeB:** Built with energy resiliency, and with satellite (EchoStar XXI and others) and land backhaul, they will overcome satellite limitations in cities with high rise buildings.
- **Vehicle eNodeB:** A microcell (small mobile phone base station) on every public safety vehicle, providing immediate high capacity “on scene” coverage and contributing to indoor coverage, with a backhaul by satellite, by MNOs and by connection to the urban CGC eNodeB. All those functionalities will be integrated in a new generation Eiji Box.
- **D2D (device-to-device) mode** to communicate w/o eNodeB, for relay (indoor coverage), high performances on scene PTT/PTV.

Thanks to the supplementation of Thales’ Eiji offer with the EchoStar Mobile MSS/CGC network, Thales’ Eiji solution would become the first PPDR communications service on the market to meet the requirements of the PPDR community for mission-critical uses (including 100% geographical coverage, 99.5% or above availability even in case of energy outages, major climatic or terrorist events) at affordable costs and without massive investments by the various states.

### **5. A Harmonized, Flexible 2 GHz Band MSS/CGC Regime for PPDR Communications Needs**

For an ideal PPDR service like Eiji Mission Critical to be successful, the EU and its member states must actively work together to harmonize the MSS/CGC regime in a way that makes the most efficient use of

the 2 GHz band spectrum resource to create an ecosystem of EchoStar XXI/CGC frequency compatible terminals.

This requires that the EU and its member states harmonize their rules to enable the EchoStar Mobile MSS/CGC network to carry two-way interactive traffic on the satellite and ground component, including 4G and 5G communications services. In this manner, Eiji MC will be able to provide users, including the PPDR community, access to the most reliable, resilient and secure high-speed networks.

Increasing the certainty of harmonization across the EU of the regulatory regime for MSS/CGC will enable the PPDR community to receive the benefits of the Eiji solution, including tailoring the network for non-traditional uses, such as highly-mobile picocells, use on a drone, direct mode for indoor coverage and PTT/PTV, push to talk services, among others. Enabling the use of MSS/CGC now for PPDR will bring tangible benefits to the public safety community in the near term.