5G Enabled Public Safety Services and Applications

Discussion of the project outcomes harmonized with EU PPDR orientation

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Nowadays we are tackling challenges like

– *Disasters, crime and terrorism* *are not confined to* *geopolitical borders*

– *To be and to feel Safe* *is not* *taken for granted* *as it used to be*

– *We* *value Human life* *more and more (COVID-19)*

– *There are more and more* *international* *natural or man-made disasters or exceptional occurrences*

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Be **ready** for such situations, because **prevention is better than cure.**

PPDR Challenges and how to Approach to …

- o **Broadband Network and Services**
- o *National-wide* **deployment**
- o **Dispatching Solutions**
- o **Cyber-Security & Privacy**

- ☐ **Ecosystems** *(5G, Devices, Apps)*
- ☐ **Certified & Trusted** *Applications*
- ☐ **PPDR User experience**
- ☐ *All sorts of* **Interoperability**

- – **Strategy** *(Broadband, Spectrum, …)*
- – **PPDR User Requirements and Needs**
- – **pan-European** *Orientation*
- – **Harmonised Legislation/Regulation**

- ❖ **Governance** *and* **Financial** *Model*
- ❖ **Consultations &Outreach**
- ❖ **Trainings, Knowledge**
- ❖ **Innovation** *Platform and* **Culture**

PEMEA applications: a practical and evident example
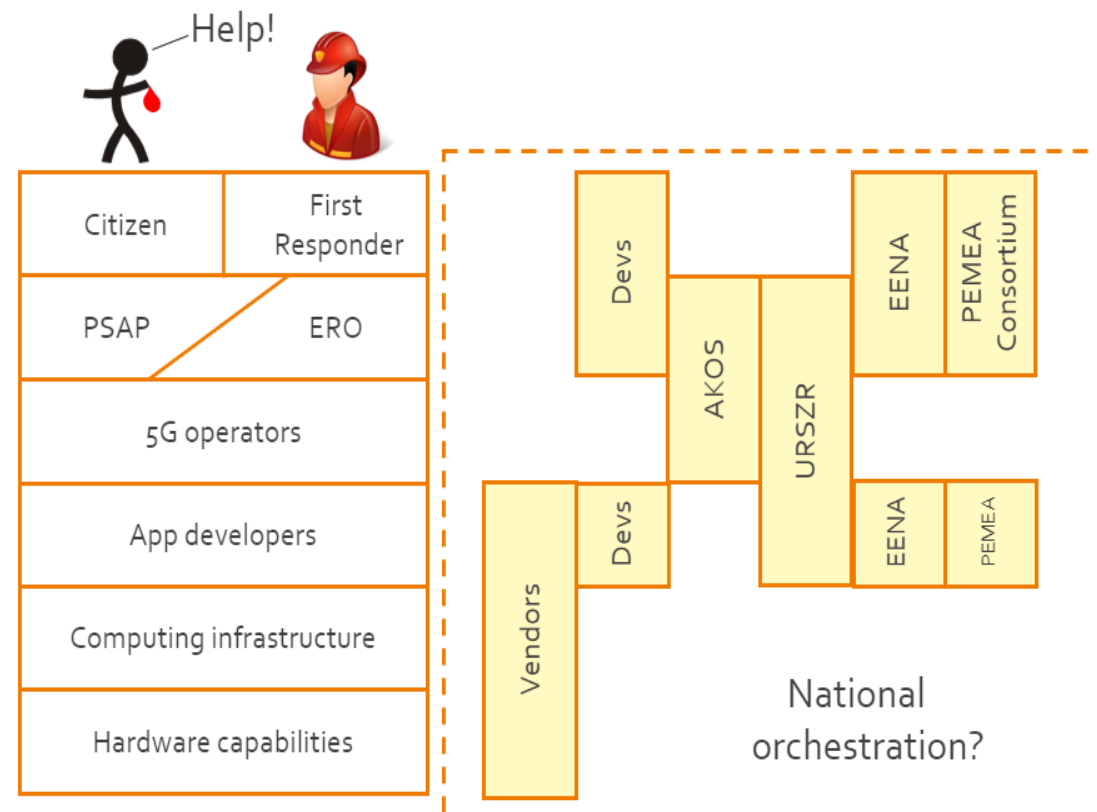
- *Certified & Trusted Applications*
- *Apps **Strategy** Overall and **Legislation** is not yet on Horizon*
- *Single Sign On: Identity, Cridential and Access Management (**ICAM**)*
- o *App and Data **Security***
- o ***Privacy** and ZVOP-2 (GDPR) because of rich context (ID, LOC ++, MED, ICE)*
- *Business Models are related to **B2B2C, free-of-charge** is very realistic option*

National orchestrator could apply Pan-European directions, set-up framework for inter/intra-EROs apps usage and for developers of apps and promote/disseminate apps to general public.

Key challenges detected by Study (*) are still Present

Incompatible critical communications networks, insufficient coverage, limited data capabilities, lack of video

Inefficient information sharing among stakeholders and with external data sources

*Determining the exact **Location** and selection of the **Fastest route***

Inefficient coordination between units from different organizations
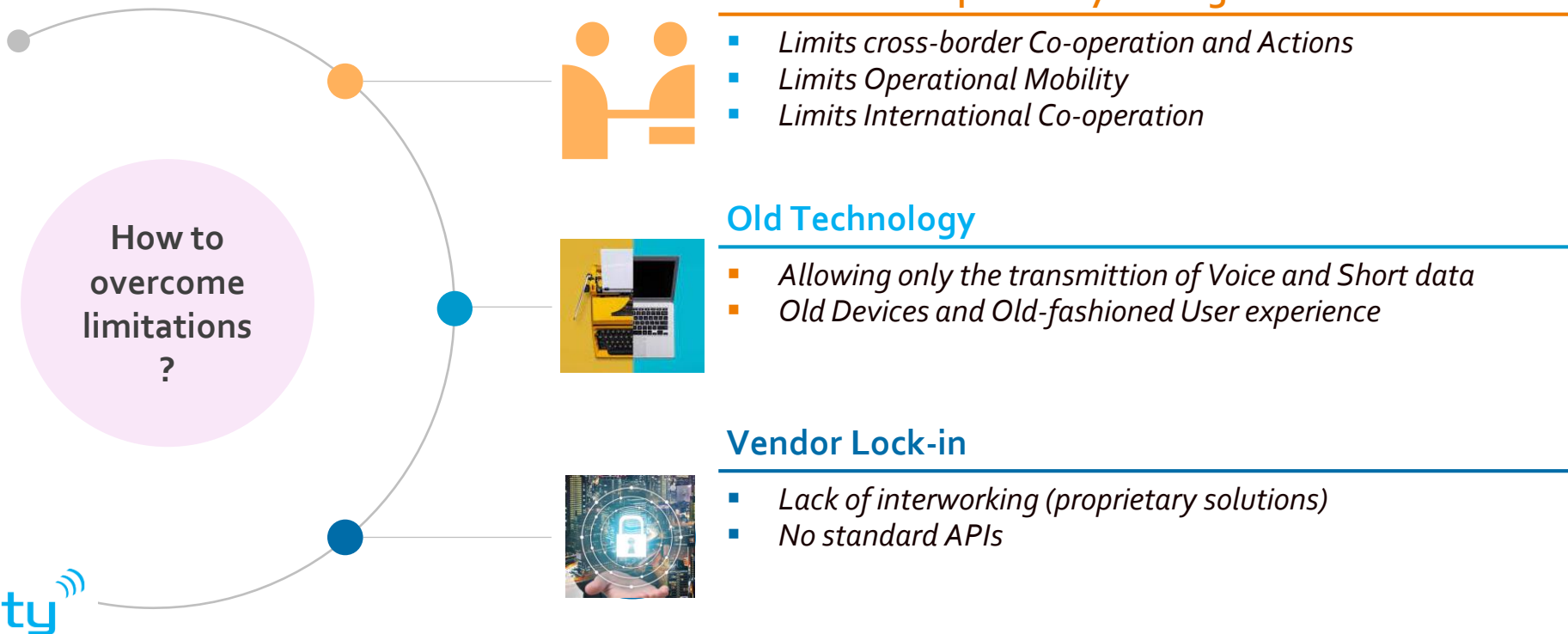
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PPDR strategy and broader knowledge about what are the strategic orientations in the PPDR domain could overcome these challenges.

(*) Study on protocols and supporting systems used in PPDR organizations in Slovenia, made by Faculty of criminal justice and security in 2019.

The Limitations of Communication Systems in EU countries

— *Based on our own Study of the EU Countries' PPDR Systems and the Broadmap project outcomes **each country poseses its own communications solution***

How to overcome limitations ?

Minimal interoperability among EU countries

- *Limits cross-border Co-operation and Actions*
- *Limits Operational Mobility*
- *Limits International Co-operation*

Old Technology

- *Allowing only the transmittion of Voice and Short data*
- *Old Devices and Old-fashioned User experience*

Vendor Lock-in

- *Lack of interworking (proprietary solutions)*
- *No standard APIs*

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PPDR-Developed European countries speed up the process and progress to overcome these limitations and to support interoperability at all levels with operational mobility.

Pan-European Momentum: from PPDR Networks to PPDR Services
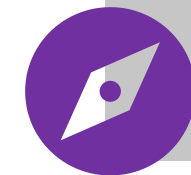
From Schangen Convension (1990) as a base for PPDR communications to the EU PPDR Communication Service (Broadmap, 2017), NG 112 (ETSI 2019) and a Strengthened Civil Protection Mechanism (2021)

- *"... to install **standardised and compatible communications systems"** as stated in Article 44(2)(d) of the **Schengen** Convention*

*2025-2030 EU Goal: to facilitate transition and set up services*

- *A PPDR mobile communication system based on **ETSI standards** (e.a. TETRA, DMR) using the **harmonized spectrum** (TETRA: 380–400 MHz)*

- *Additional effort was needed to make national deployments **Interoperable** (ISI project – Norway, Sweden and Finland, etc.)*

- *The SpiceNet model proposes a reference architecture for harmonized pan-European **PPDR mission critical broadband services** with 3 layers:*

  - ***Harmonization** (Organizational schemes, Radio Regulations, Standardized commercial solutions)*

  - ***Interoperability and governance at the Service Layer** (Standardised Mission Critical Solutions for public safety, Standardized PPDR Interoperable Communication Service for Europe (SpiceNet -> SpiceNet HUB in Slovenia) , SpiceNet governance)*

  - ***Networks and users** (PPDR Networks by Country, PPDR Users at the EU Level -> Operational Mobility)*

- ***Next Generation 112** with standardized **Emergency Services IP Network** (ESInet)*

- *Strengthening Civil Protection Mechanism and EU's **Emergency Response Coordination Centre***

# Unified critical communications network with support for multimedia services - lessons learned from others

– *Deeper Insight in PPDR Broadband (PPDR BB) Networks after Survey of PPDR Situation in USA, South Korea, some countries in Europe, in Russia and CIS countries, in Adria Region*

– *Key elements for successful transition to PPDR Broadband Networks*

  – *PPDR BB Network Strategy is a part of National Broadband Strategy*

  – National Radio Frequency Spectrum Strategy

  – *Single Governmental Body or Agency*

  – Close dialogue with *all Critical CommS Stakeholders*

  – *MNOs and Vendors involved*

  – *Unified Network for all PPDR Users*

  – *Governance Models for PPDR BB Network*

  – *RAN and Spectrum owned by MNO(s)*

  – *Core Network and User Governance in the hands of the Agency*
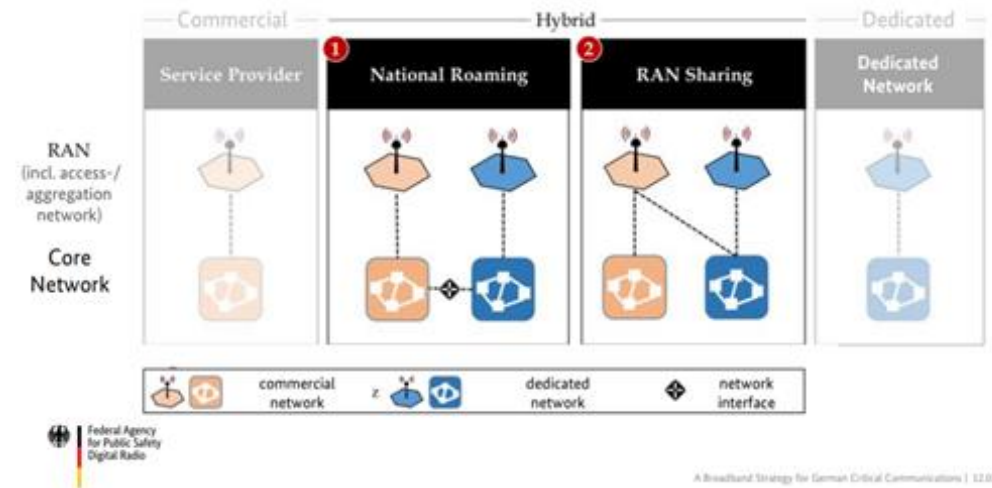
Source: Governance Model Variants for PPDR BB Networks, Federal Agency for Public Safety Digital Radio
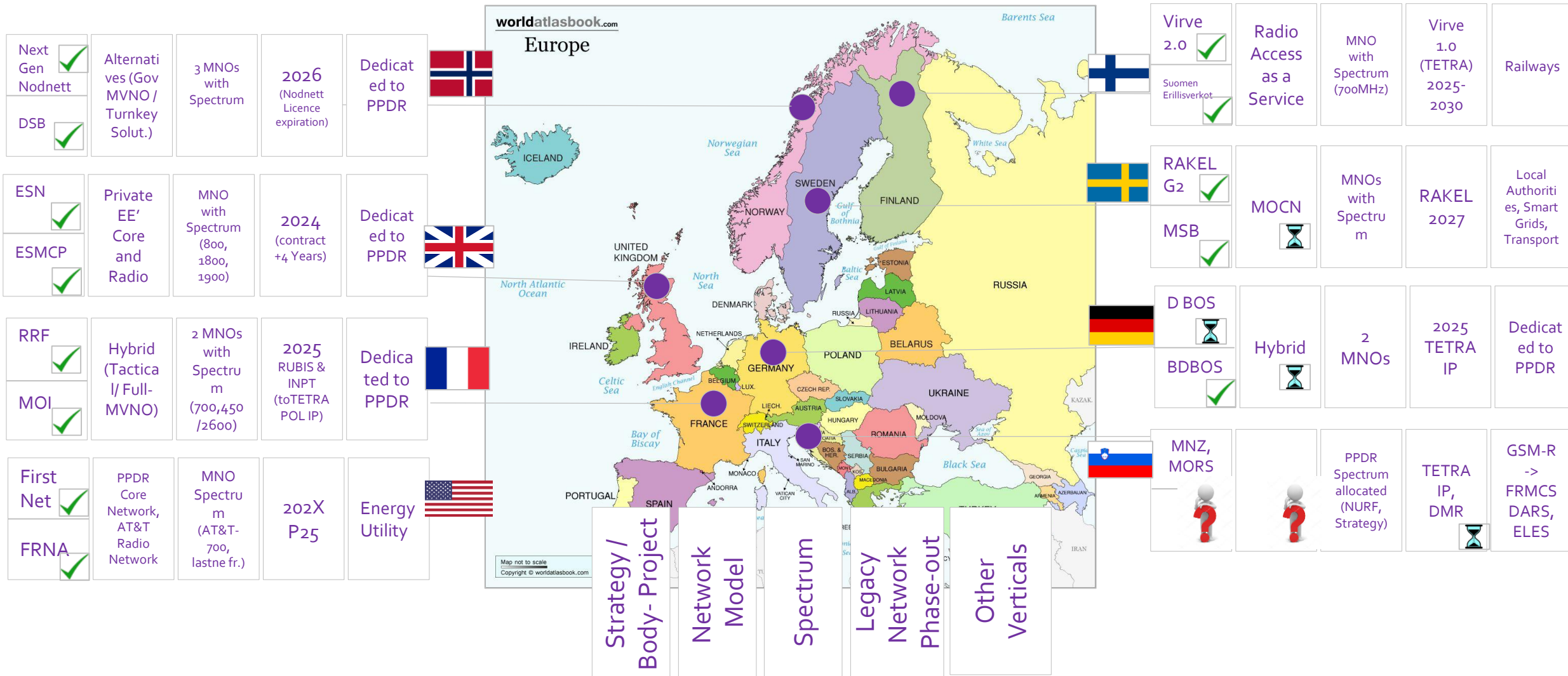
Timeline – pan-European mobile broadband for Public Safety

– **This decade** is the timeframe for Legacy PPDR Networks to be phased-out
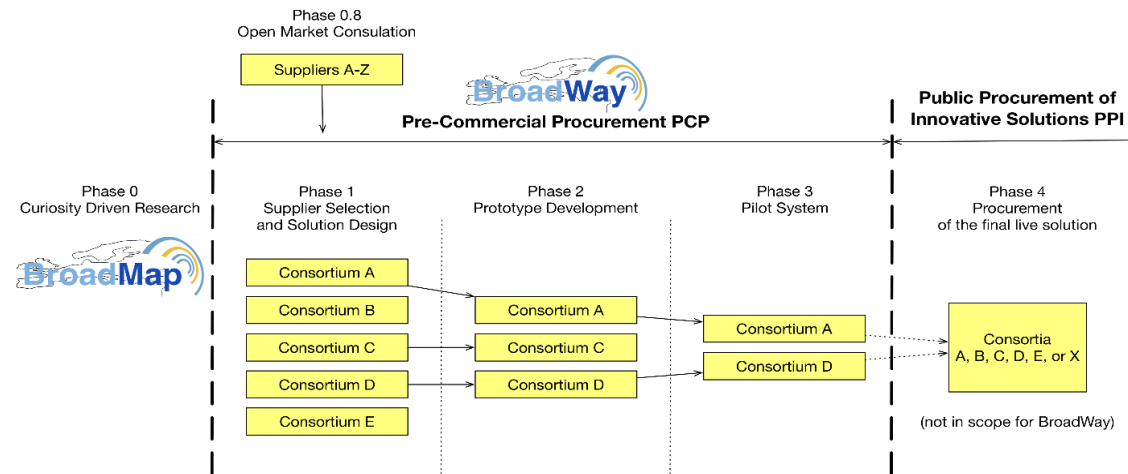
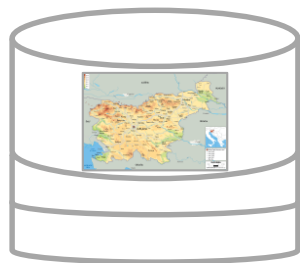
– Operation **BroadWay** provides **Innovative solutions for Pre-Commercial Procurement by 2022. Public procurement** process of Innovative Solutions to be finished **by 2025**

– During the BroadWay PCP, the procurement team will seek to agree the basis for the formation of a **European Grouping of Territorial Cooperation** (EGTC). This organisation will become the **single authority** for **procurement and conformance** of final live pan-European mobile broadband for Public Safety.

Norway
| Next Gen Nodnett ✓ | Alternatives (Gov MVNO / Turnkey Solut.) | 3 MNOs with Spectrum | 2026 (Nodnett Licence expiration) | Dedicated to PPDR |
| DSB ✓ | | | | |

United Kingdom
| ESN ✓ | Private EE' Core and Radio | MNO with Spectrum (800, 1800, 1900) | 2024 (contract +4 Years) | Dedicated to PPDR |
| ESMCP ✓ | | | | |

France
| RRF ✓ | Hybrid (Tactical / Full-MVNO) | 2 MNOs with Spectrum (700,450 /2600) | 2025 RUBIS & INPT (toTETRA POL IP) | Dedicated to PPDR |
| MOI ✓ | | | | |

USA
| First Net ✓ | PPDR Core Network, AT&T Radio Network | MNO Spectrum (AT&T-700, lastne fr.) | 202X P25 | Energy Utility |
| FRNA ✓ | | | | |

Finland
| Virve 2.0 ✓ Suomen Erillisverkot ✓ | Radio Access as a Service | MNO with Spectrum (700MHz) | Virve 1.0 (TETRA) 2025-2030 | Railways |

Sweden
| RAKEL G2 ✓ | MOCN | MNOs with Spectrum | RAKEL 2027 | Local Authorities, Smart Grids, Transport |
| MSB ✓ | | | | |

Germany
| D BOS ⏳ | Hybrid ⏳ | 2 MNOs | 2025 TETRA IP | Dedicated to PPDR |
| BDBOS ✓ | | | | |

Slovenia
| MNZ, MORS ❓ | ❓ | PPDR Spectrum allocated (NURF, Strategy) | TETRA IP, DMR | GSM-R -> FRMCS DARS, ELES ⏳ |

Column headers: Strategy / Body- Project | Network Model | Spectrum | Legacy Network Phase-out | Other Verticals

Challenge: Interoperable Systems

PPDR Common Information Space with contextual access for PPDR professionals, supplemental data services to external DB
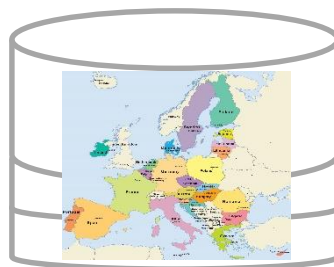
PPDR and Other Information Sources at the EU level or broader

o *Unified User Experience*

o *Operational Interoperability*

■ *Network&Information& Data Interoperability*

■ *Computing&Network&Data &Apps Security & Privacy*

■ *Legislation and Regulation Interoperability*

Final thoughts

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PPDR Agency could be of great help and support

https://5gvarnost.iskratel.com/

twitter.com/Iskratel

linkedin.com/company/Iskratel

Links to 5G Safety events and 5G information:

https://5gvarnost.iskratel.com/viri

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Acronyms

- PPDR – Public Protection and Disaster Relief (civilna zaščita in pomoč pri nesrečah, zaščita in reševanje)
- AKOS - Agencija za komunikacijska omrežja in storitve RS (Agency for Communication Networks and Services of the Republic of Slovenia)
- FVV - Fakulteta za varnostne vede, Univerza v Maribor (University of Maribor, Faculty of Criminal Justice and Security)
- RS MJU, DID - RS Ministrstvo za javno upravo, Direktorat za informacijsko družbo in informatiko (Ministry of Public Administration, Information Society and Informatics Directorate)
- URSZR - Uprava RS za zaščito in reševanje,   Administration of the Republic of Slovenia for Civil Protection and Disaster Relief
- MNZ – Ministrstvo za notranje zadeve, Ministry of the Interior
- MZ -   Ministrstvo za zdravje, Ministry of Health
- MOP – Ministrstvo za okolje in prostor, Ministry of the Environment and Spatial Planning
- SRIP PMiS – Strateško razvojno-inovacijsko partnerstvo Pametna mesta in skupnosti, SRIP Smart Cities and Communities
- IKT HM - IKT horizontalna mreža, ICT Horizontal Network
- EIDES - Slovensko združenje za elektronsko identifikacijo in elektronske storitve zaupanja, The Slovenian Association for Electronic Identification and Electronic Trust Services
- MIZŠ – Ministrstvo za izobraževanje, znanost in šport, Ministry of Education, Science and Sport
- CEF – Connecting Europe Facilities
- H2020 – Horizont 2020
- R&D – Research and Development

- IP-CAN – Internet Protocol-Connectivity Access Network
- AR/VR – Augmented Reality/ Virtual Reality
- M(V)NO – Mobile (Virtual) Network Operator
- SP – Service Provider
- PEMEA - pan-European mobile emergency applications
- ESINet – Emergency Services IP Network
- MC PTT – Mission Critical Push to Talk
- NG 112 – Next Generation 112
- EENA - European Emergency Number Association
- PSCE - Public Safety Communication Europe
- 3GPP - 3rd Generation Partnership Project
- ETSI - The European Telecommunications Standards Institute
- PSAP – Public Safety Answering Point
- E2E – End-to-End
- ID - Identity, LOC - Location,
- MED – Medical, ICE – In Case of Emergency
- CAPEX - CAPital EXpenditure
- OPEX - OPErational Expenditure
- TTM – Time-To-Market
- B2B2C – Business to Business to Customer
- QPP – Quality of Service, Priority, Pre-emption
- *ICAM - Identity, Cridential and Access Management*
- *IoLST – Internet of Life Saving Things*
- *IoPST – Internet of Public Safety Things*
- *GDPR - General Data Protection Regulation*
- ZVOP – Zakon o varovanju osebnih podatkov

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