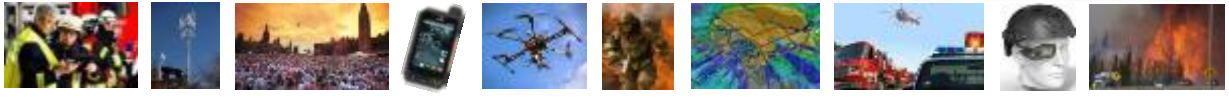
Defence Research and Development Canada | Recherche et développement pour la défense Canada

Canadian Safety and Security Program

Centre for Security Science – Wireless Activity



RAC-CEA

WIRELESS BROADBAND WORKSHOP

Ottawa

March 26, 2019

DRDC | RDDC

Canada

700 MHz Public Safety Broadband Network (PSBN)

- A transformational national capability
- Canada very active since 2010
- Key tenets – Interoperability, affordability, sustainability, efficient use of spectrum, 24/7 availability
- Band 14 (758-768 MHz D/L, 788-798 MHz D/L)



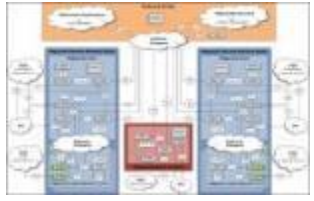


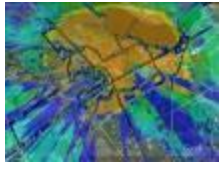





Extensive PSBN Work in Canada since 2010

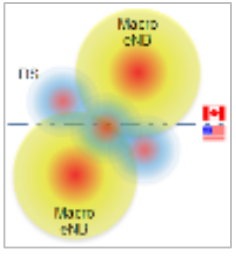
- Technology
  - 700MHz Spectrum Requirements for Canadian Public Safety
  - Technical Advisory Group (technical reports, technical advice)
- Test and evaluation capabilities
- Experiments
- Collaboration with the US
  - Canada-US IWG
  - Technical Annex for CSS/CRC – PSCR collaboration
  - Chair the Deployable System Work Group
  - DHS S&T / FirstNet / NPSTC
  - Texas A&M
- Operational/governance initiatives
  - Industry Canada consultation 2012
  - Montreal Model
  - FPT IWG
  - IWG Governance Sub-committee
  - TNCO

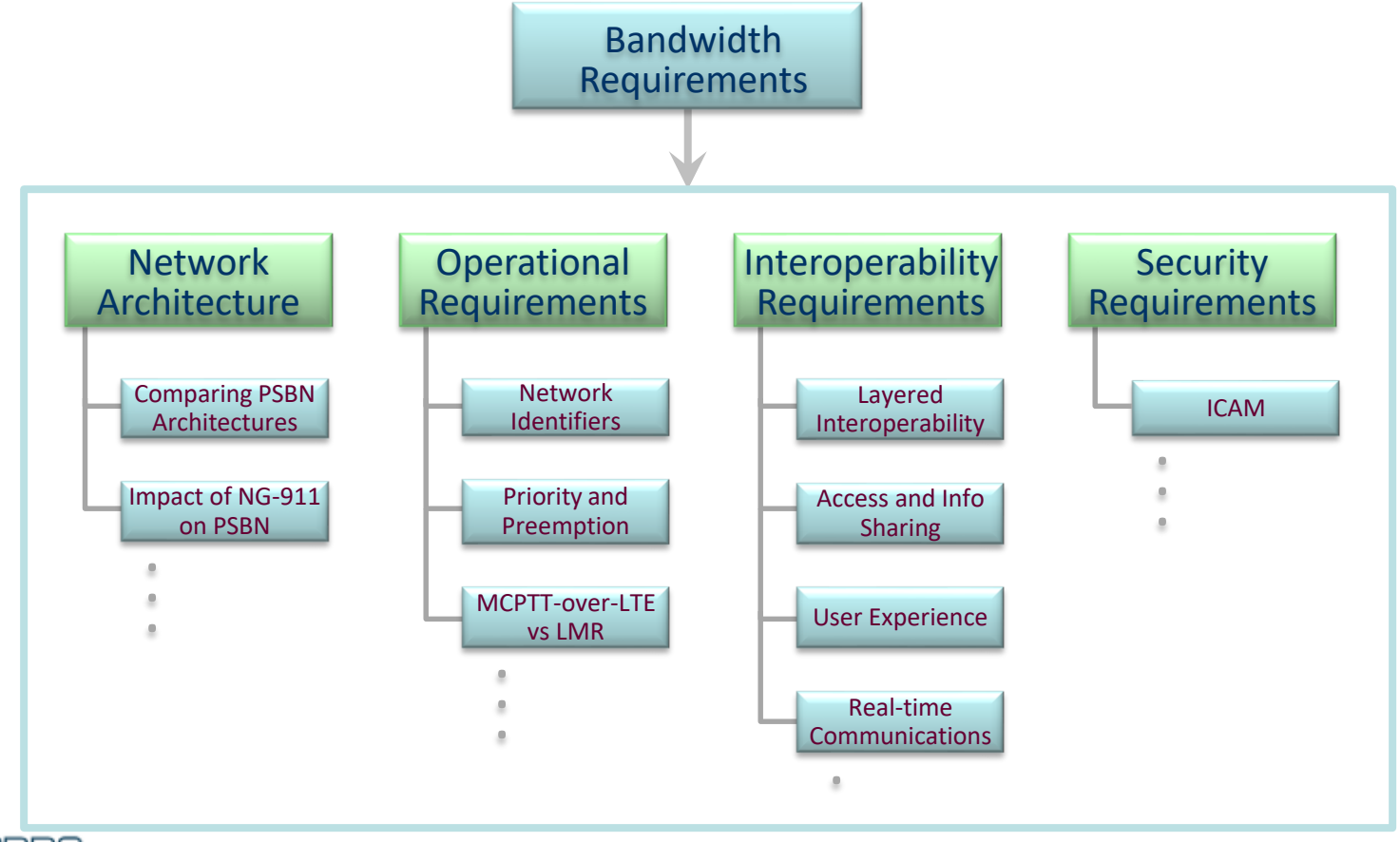




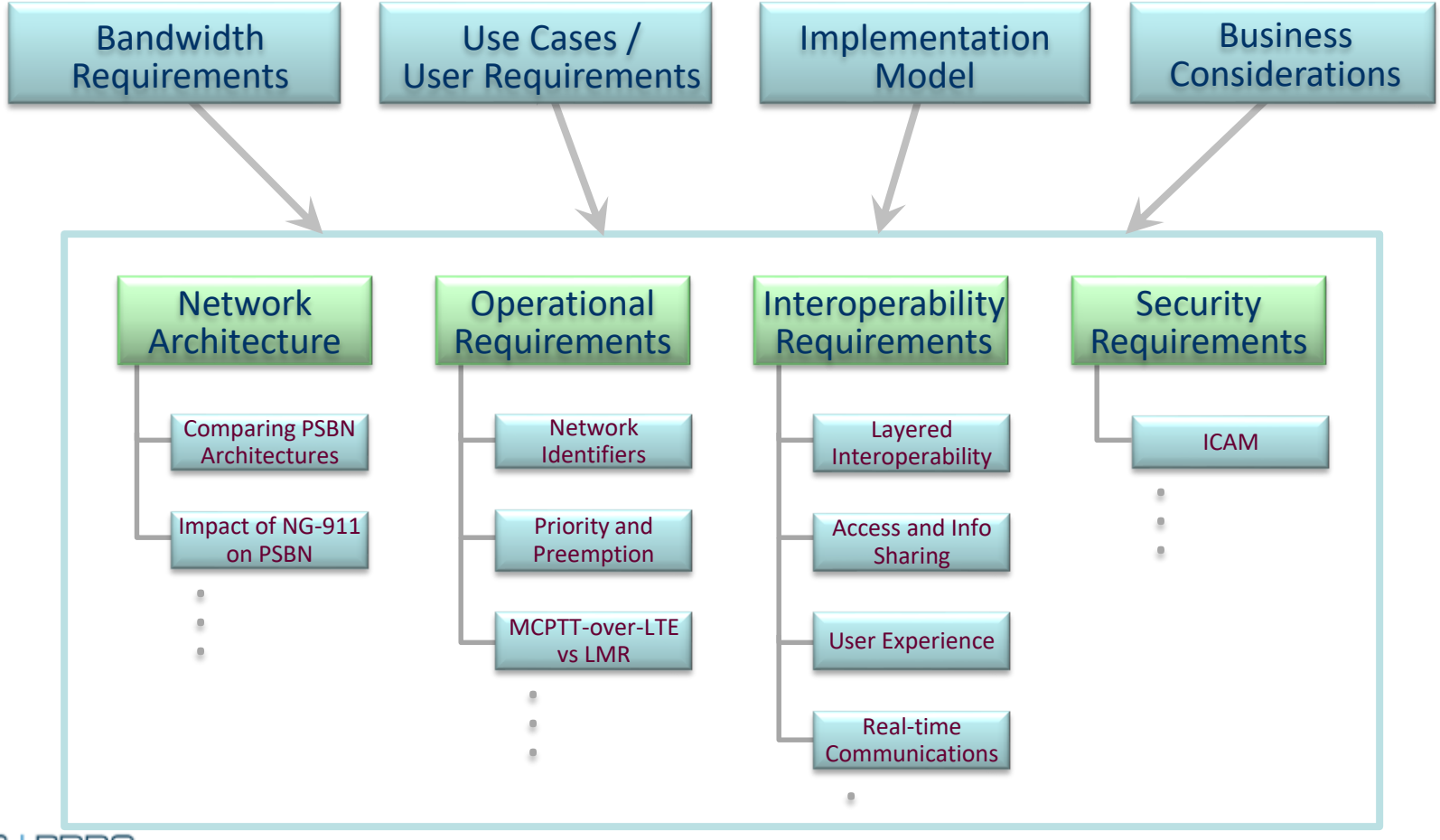




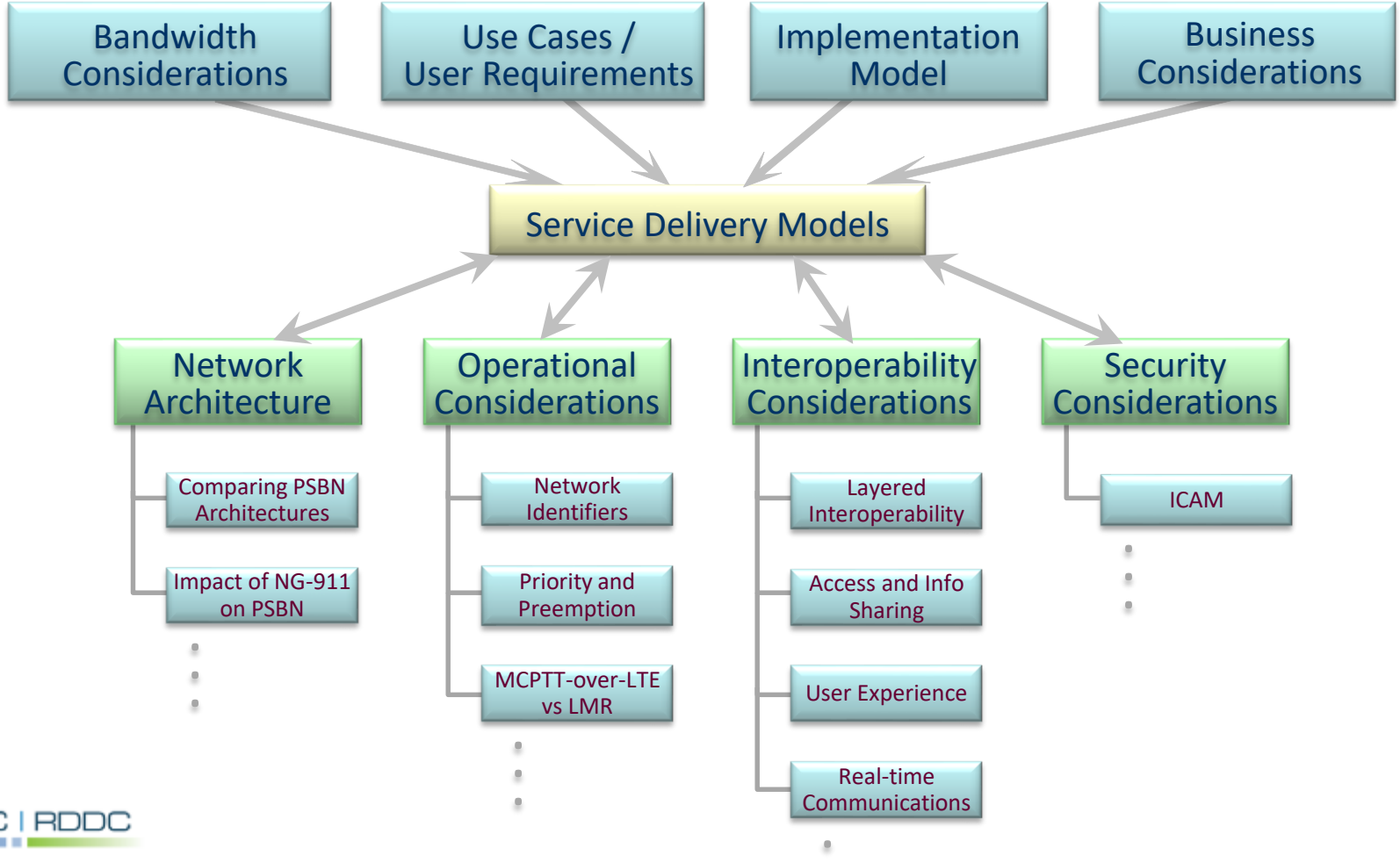
DRDC CSS S&T Advice… Something Missing



DRDC CSS S&T Advice… Ok, getting there



CSS S&T Advice… Ahhh ☺… But One Last Thing



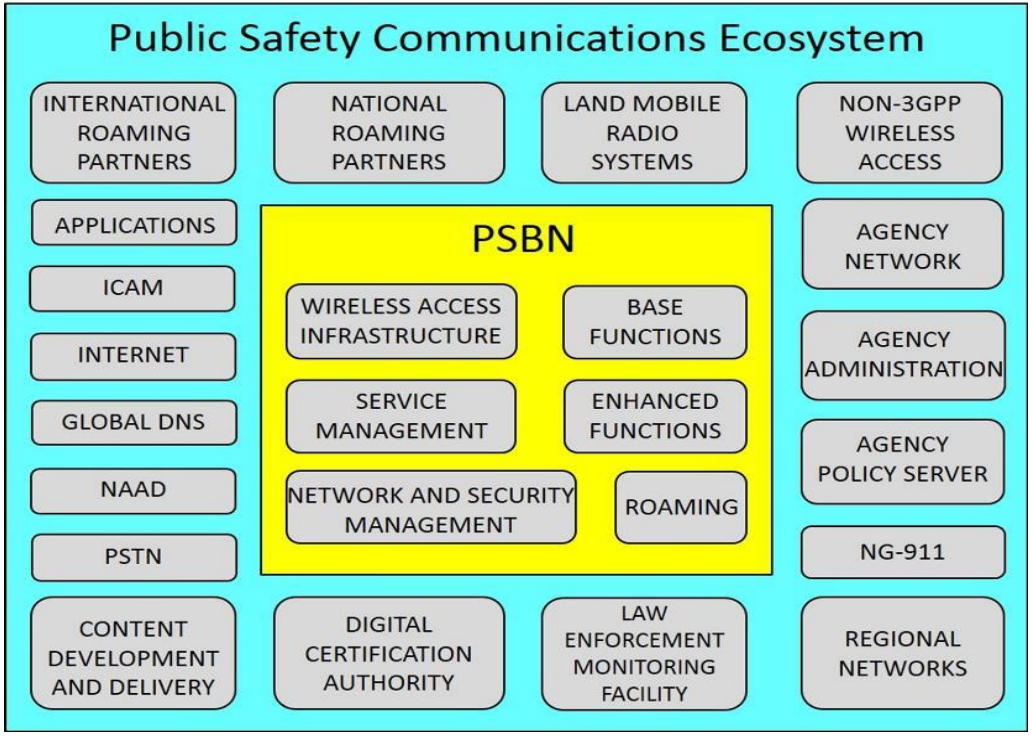
CSS S&T Advice… Now Were Talking

Network Architecture

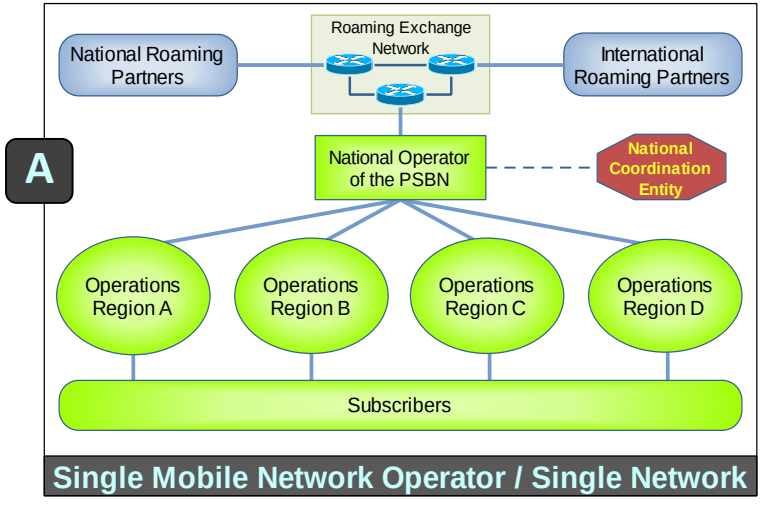
Operational Considerations

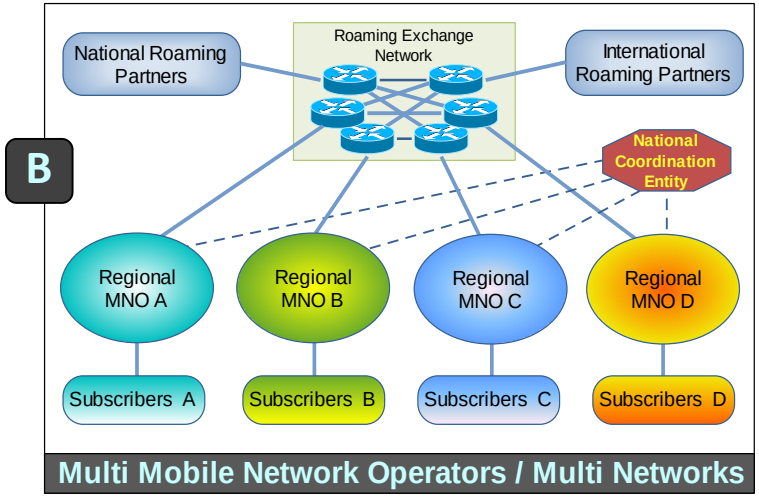
Interoperability Considerations

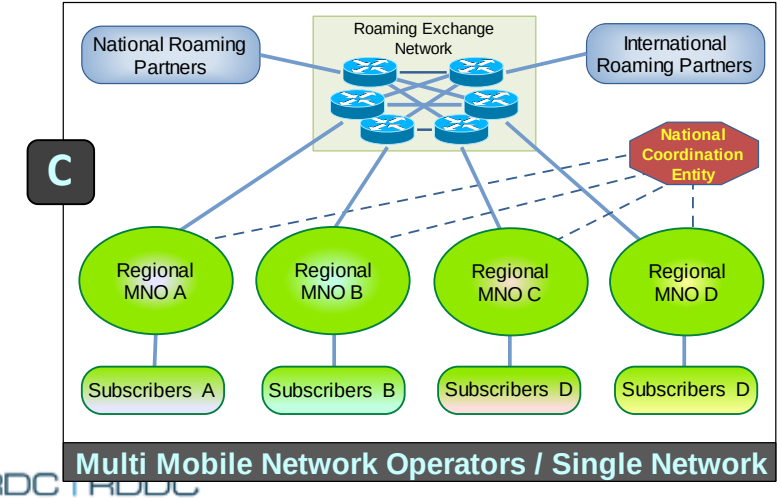
Security Considerations

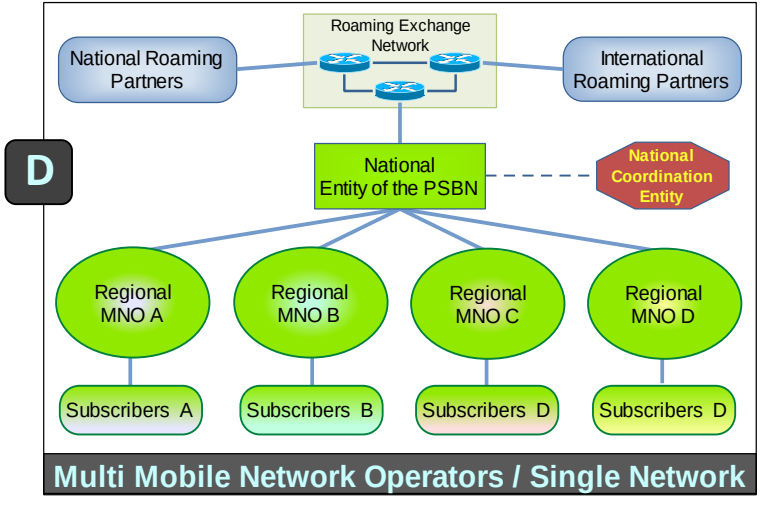


Possible Service Delivery Models – 4 Options



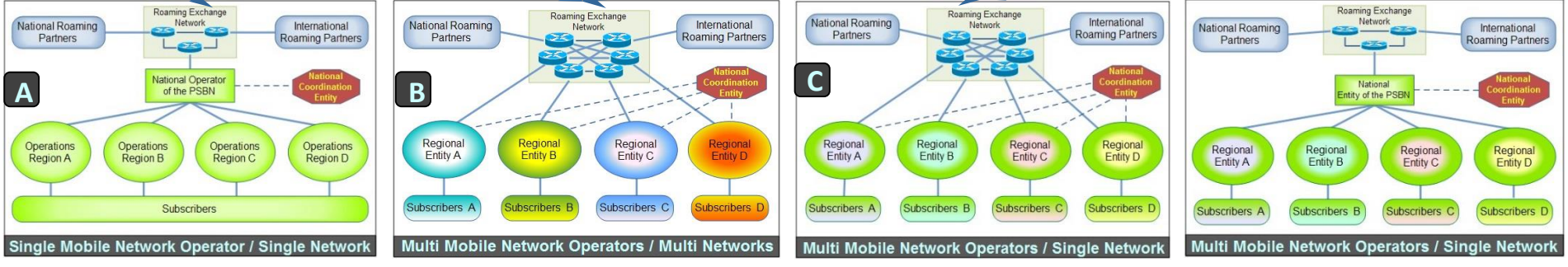






Implementation and Service Delivery Options

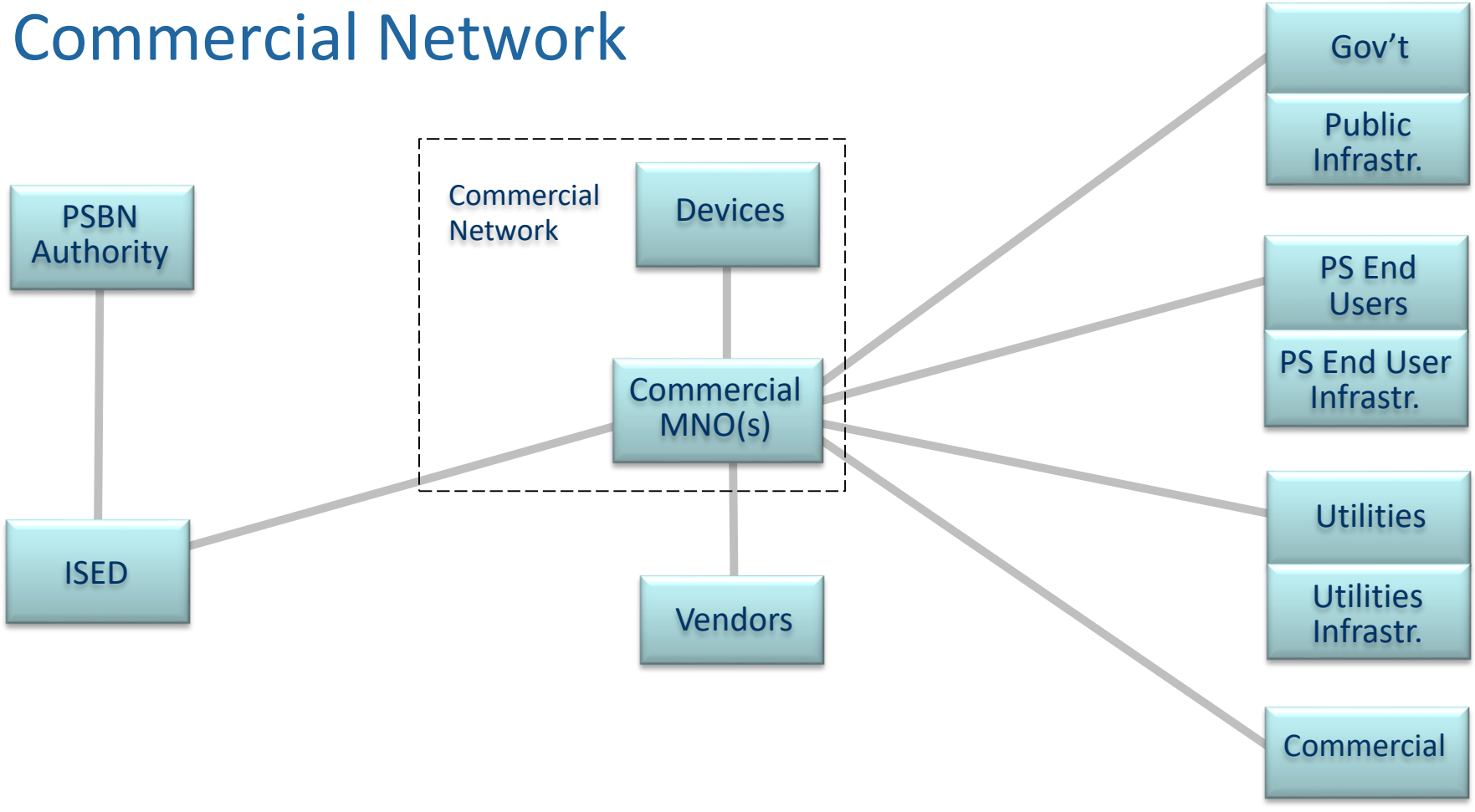
Dedicated Public Safety Broadband Network	Shared Public Safety – Commercial Network	Commercial Network
• Public safety use only • Dedicated public safety broadband spectrum	• Both public safety and commercial usage • Designated public safety broadband spectrum	• Public safety service on commercial networks • Spectrum obtained through auction



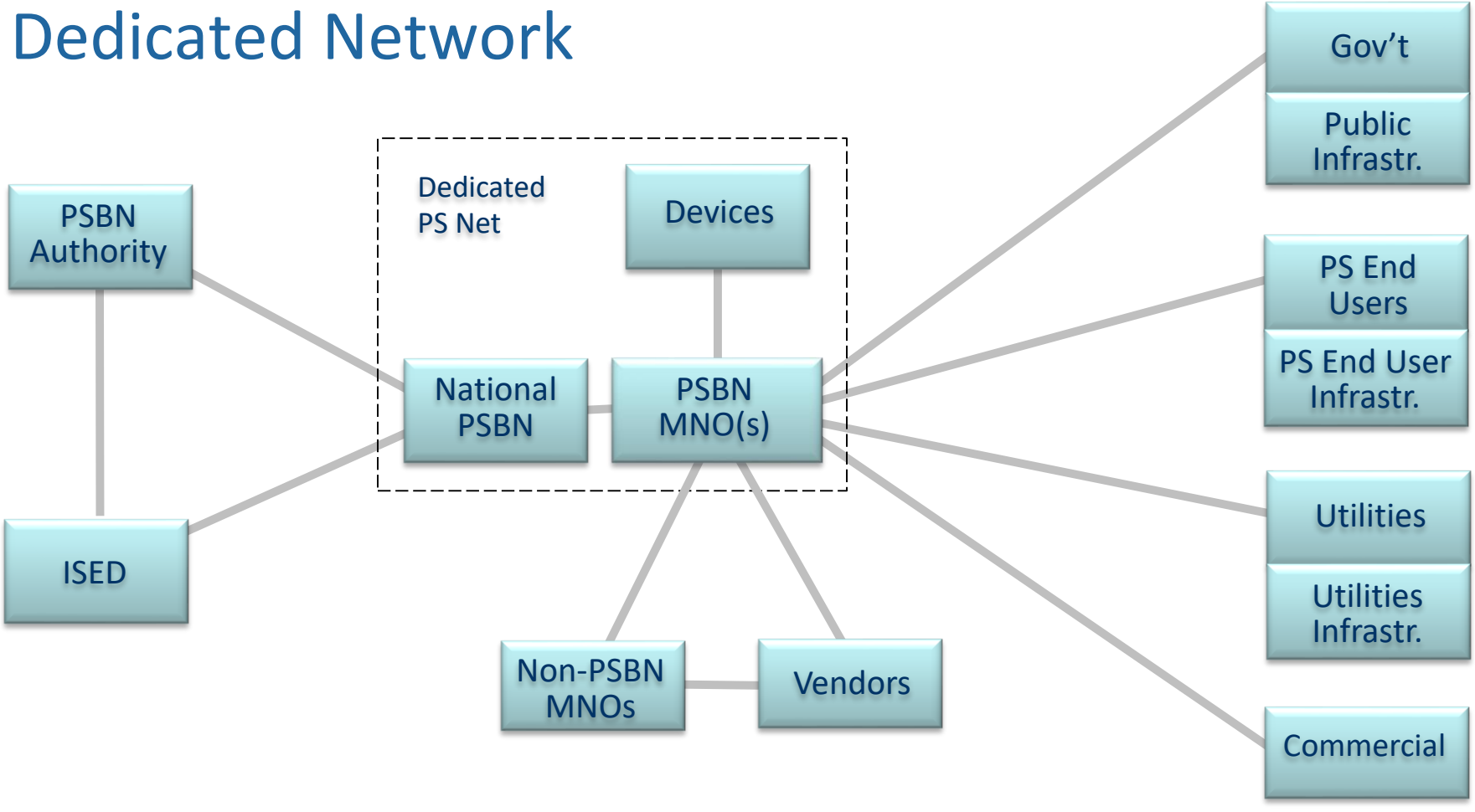
24/7 Service Availability | Interoperability | Affordability | Sustainability

Efficient Use of Spectrum | Information Access and Sharing | Common User Experience

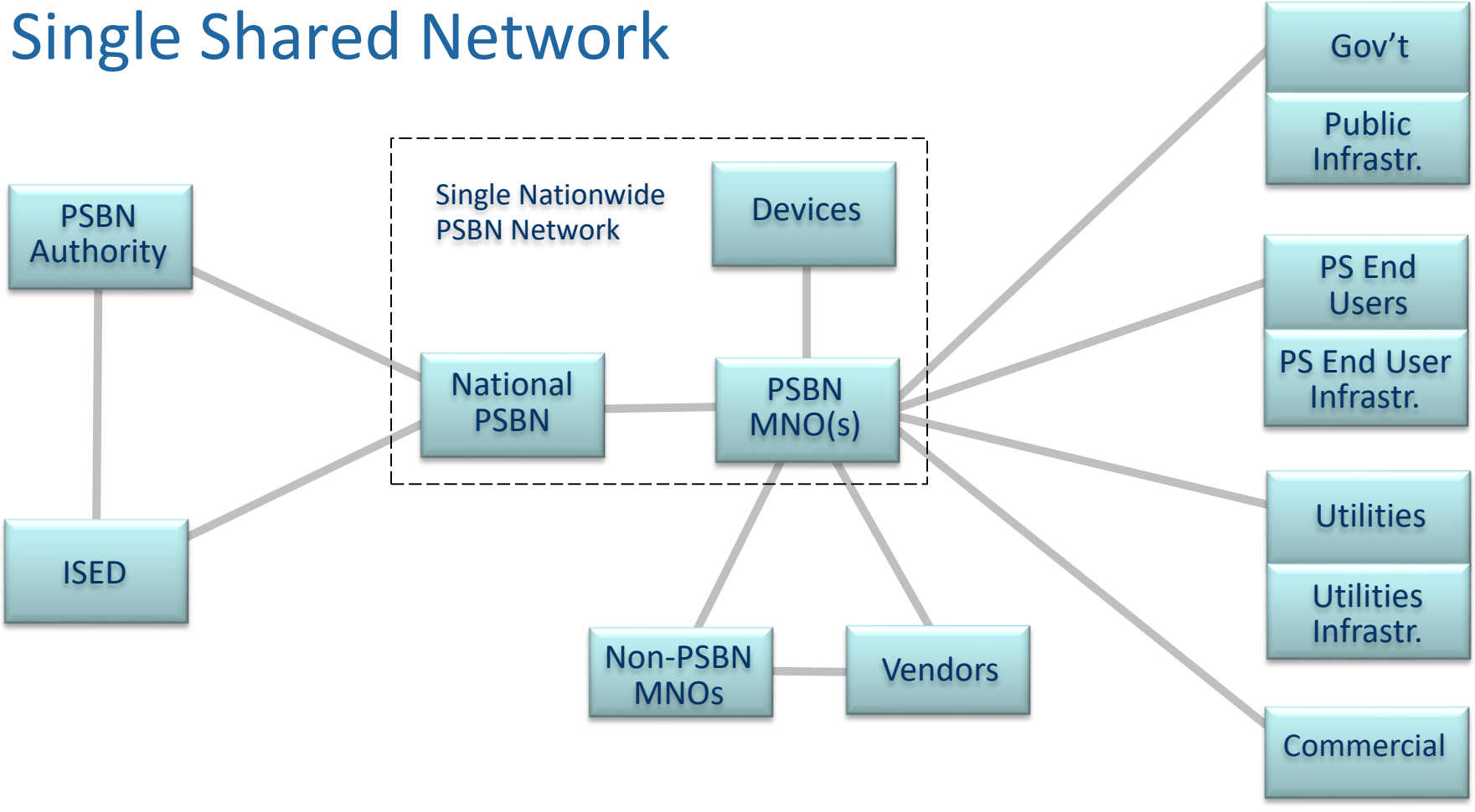
PSBN Stakeholder Relationships – Commercial Network



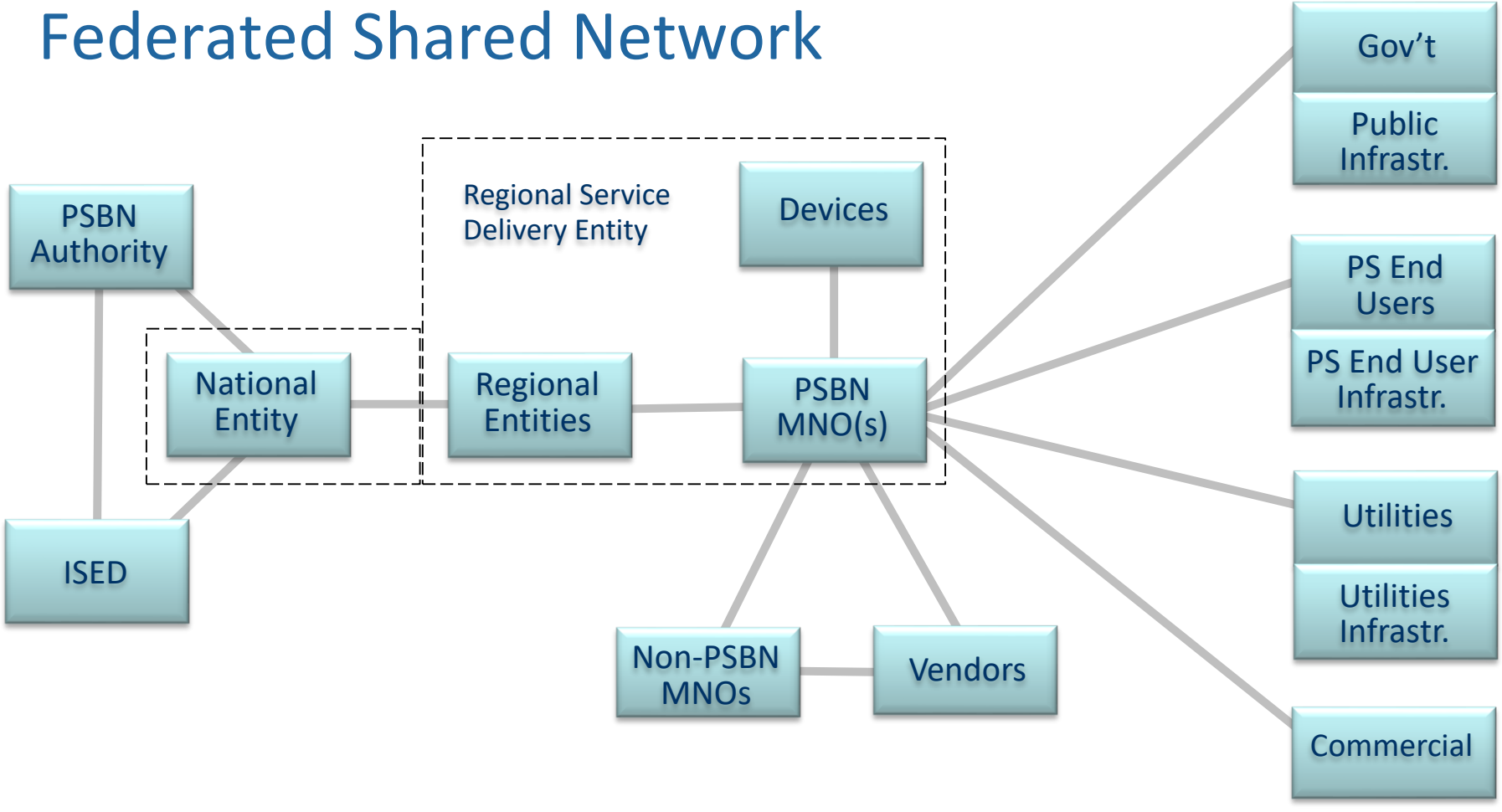
PSBN Stakeholder Relationships - Dedicated Network



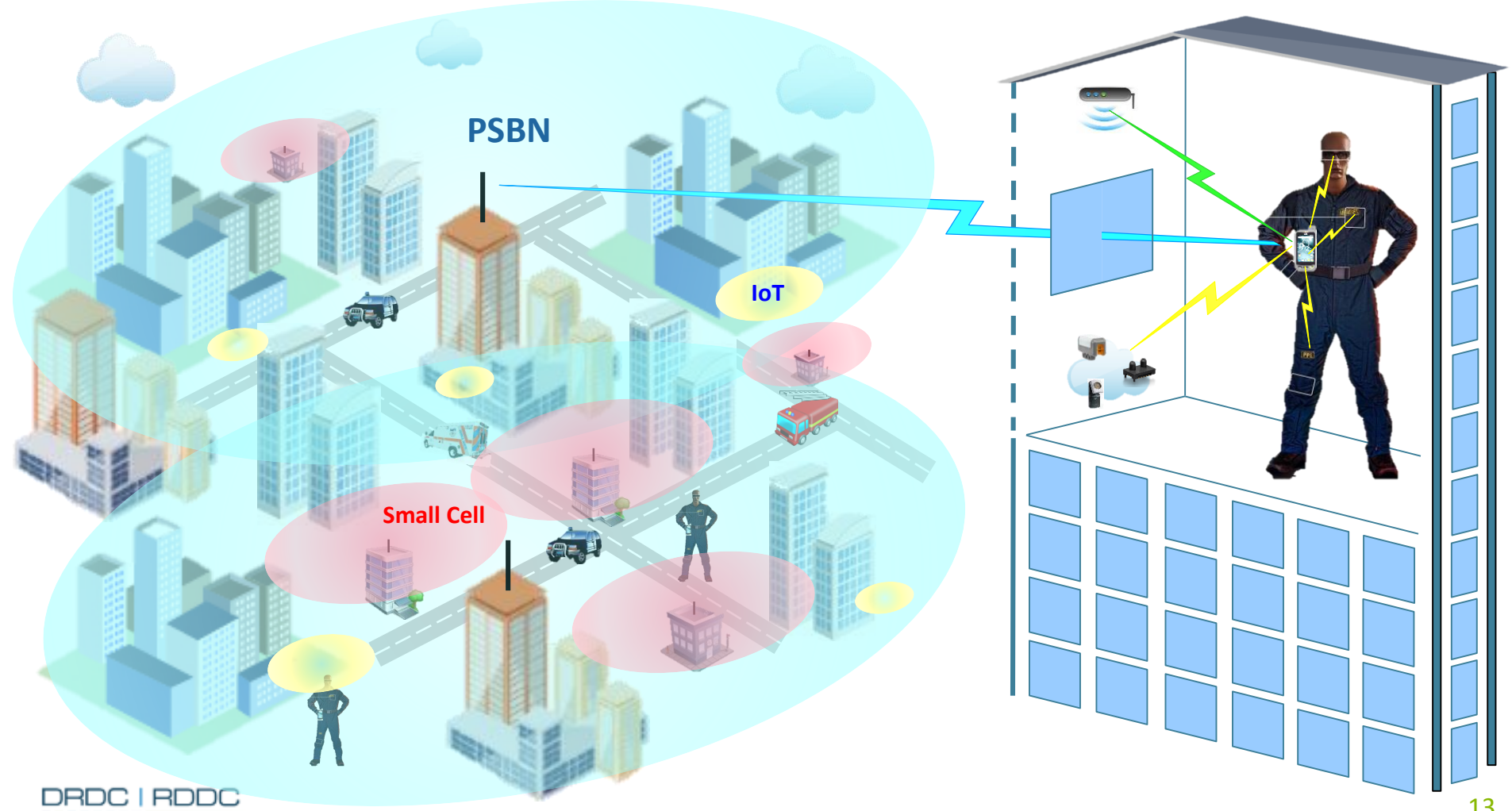
PSBN Stakeholder Relationships – Single Shared Network



PSBN Stakeholder Relationships - Federated Shared Network



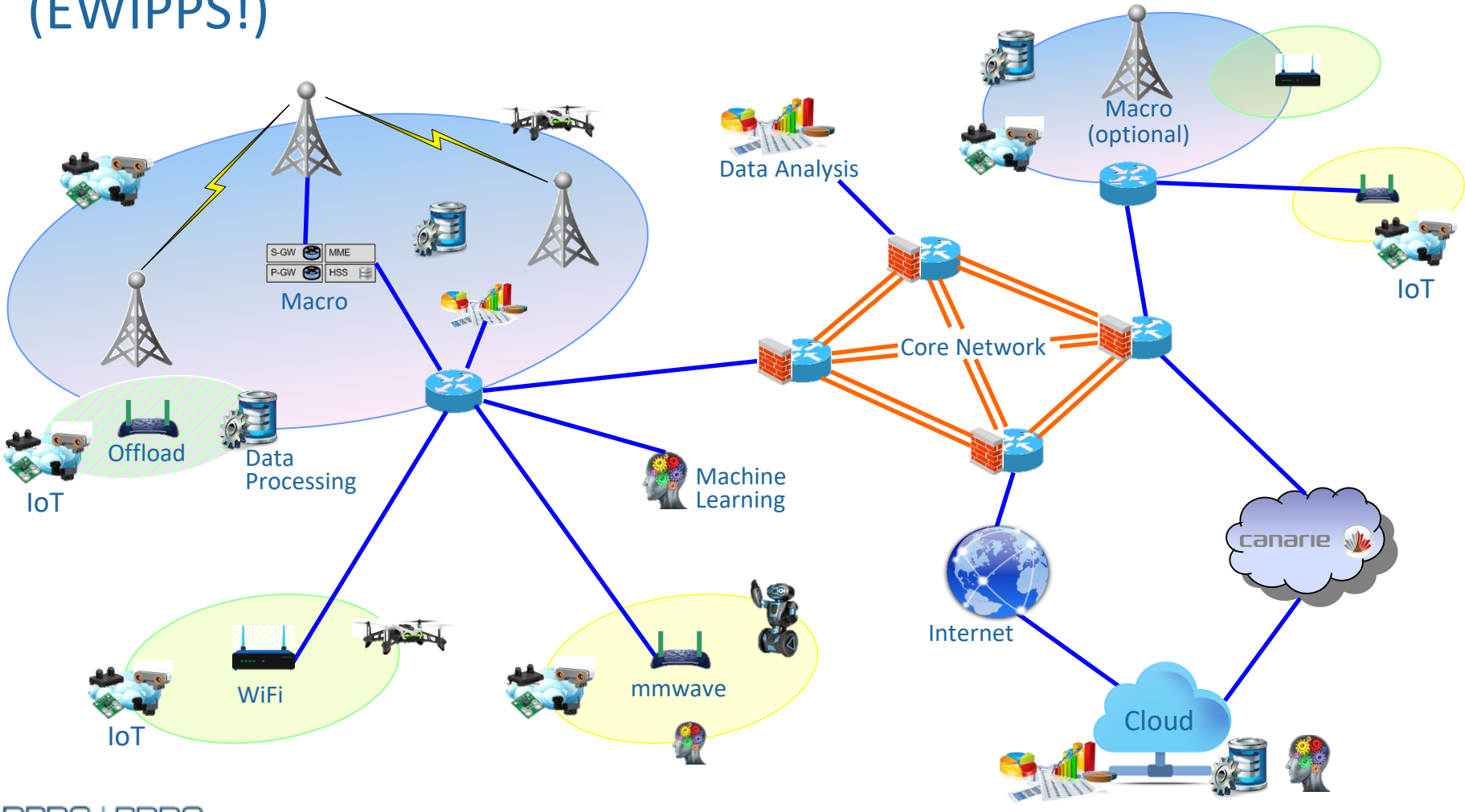
Evolving Wireless Landscape!



Emerging Wireless Technologies for Public Safety

- Need to solve the **everywhere**!
- In-building communications
- New wireless infrastructure could be different wireless technology; different wireless network…HetNets
- Internet of Things
- Next Gen Wireless (3GPP, WiFi)
- Service continuity (session persistence)
- Data science

Emerging Wireless Innovation Platform for Public Safety (EWIPPS!)



What EWIPPS Will Enable

- S&T research
  - Heterogeneous networking
    - 3GPP to non-3GPP session persistence
    - Outdoor-indoor communications
  - Sensors, IoT and IoLST
    - Assess impact (loading, …) of IoT and IoLST , “smart” stuff
  - 5G and WiFi
    - Millimeter wave
    - PSBN offloading (3GPP to 3GPP)
    - Identify/address gaps specific to public safety communications needs
  - Data science
    - Analytics (trends/patterns ➔ prediction ➔ automation)
    - Processing (retrieval, storage, aggregation, fusion, manipulation, transformation)
    - Data mining, modeling, classification
    - Machine learning, cognition
- Test and evaluation capability
- Experimentation and demonstrations

Thanks!!

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SCIENCE, TECHNOLOGIE ET SAVOIR POUR LA DÉFENSE ET LA SÉCURITÉ DU CANADA