

DRAFT

ASSESSING THE FEASIBILITY OF THE US CBRS CONCEPT BASED BUSINESS MODELS AND IMPLICATIONS FOR ACCESS TO AND VALUE OF SPECTRUM

WlnnComm 2018, 14-15 November 2018, Melbourne, Florida

Dr. Seppo Yrjola, Nokia Corporate Strategy & Development

1 © Nokia 2018

NOKIA

DRAFT

Megatrends in wireless

Cloud, NFV and network slicing are transforming network infrastructure deployment



Shared spectrum is 'virtualizing' the spectrum asset ownership, altering valuation and utility



Localized edge services and ultra low latency, high reliability applications emerging with vertical needs



Business model innovation boosting as-a-Service models

2 © Nokia 2018

NOKIA

DRAFT

This paper will introduce the framework for assessing the feasibility of the US CBRS concept based business models

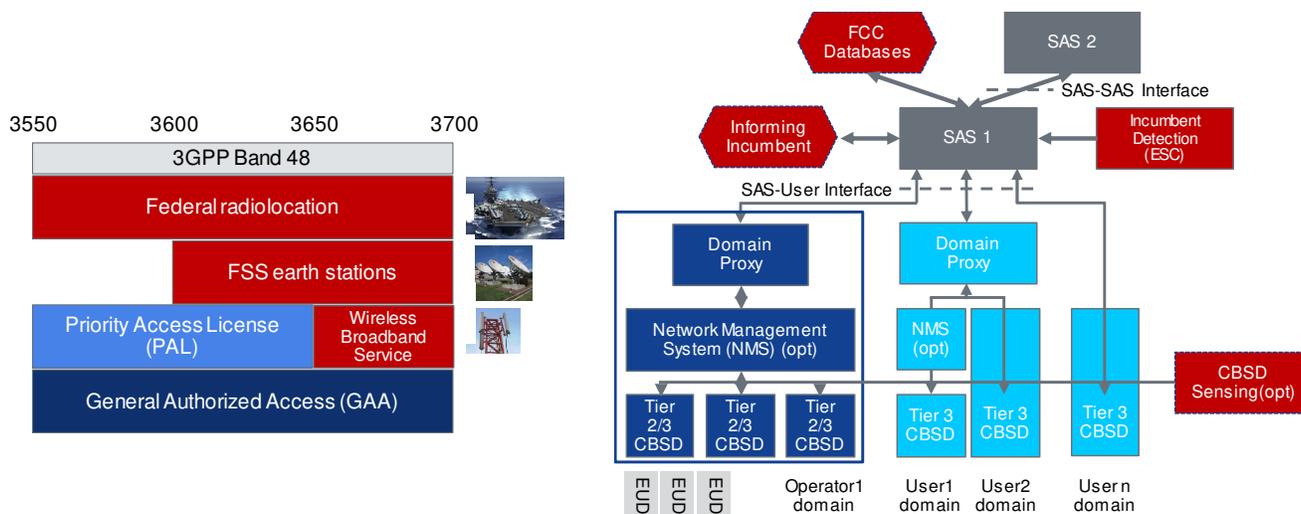
Demand from private networks and implications for access to and value of spectrum

Options for business models that could potentially develop

Comparison with the sharing mechanisms elsewhere, in particular, Licensed Shared Access (LSA) in Europe.

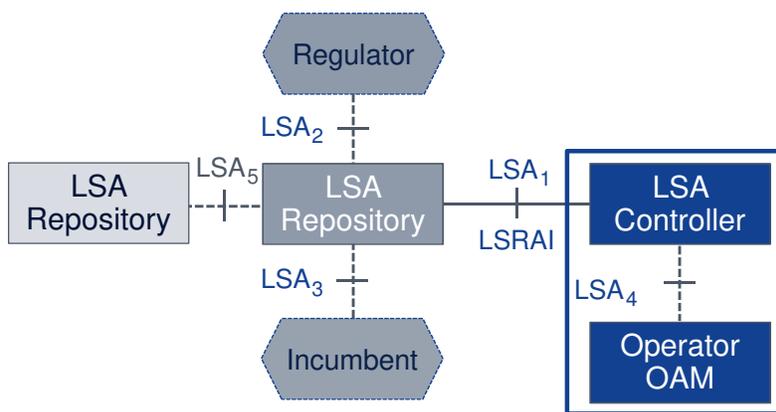
DRAFT

CBRS concept and functional architecture



DRAFT

LSA architecture reference model



ETSI, System Architecture and High-Level Procedures for operation of Licensed Shared Access (LSA) in the 2300 MHz-2400 MHz band. TS 103 235, 2015.
5 © Nokia 2018

NOKIA

DRAFT

Spectrum authorization concepts and their key attributes

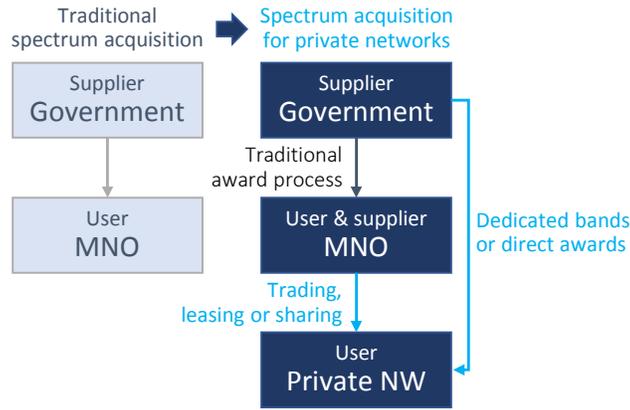
Scenarios/ Attributes	Individual authorization (Licensed)	Shared	General authorization (unlicensed)
Success factors	Spectral efficiency	Spectrum management	Interference management
Customer experience	Guaranteed	Predictable	Unpredictable
Control points	Mobile operators	Spectrum brokers	Device manufacturers
Business models	Traditional access; Connectivity as a Service	Micro-operator; Hosting	Innovative OTT

6 © 2017 Nokia

NOKIA

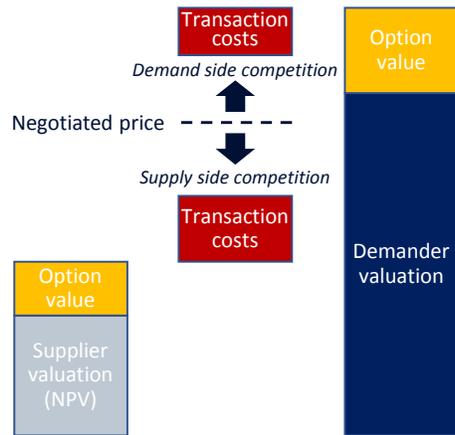
DRAFT

Spectrum acquisition for private LTE and 5G networks



DRAFT

Factors influencing spectrum valuation and prices



DRAFT

There are several problems related to spectrum market

General causes of market failures

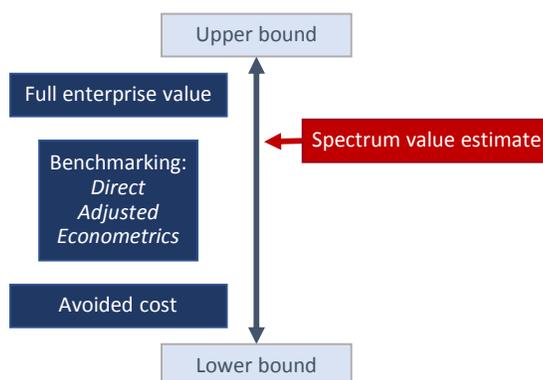
- 1) Information asymmetry;
- 2) Externalities spill-over costs or benefits accrue to anyone not involved in a given interactions;
- 3) Monopoly power; and
- 4) Commercial and technical risks.

Framing characteristics

- Low availability, lack of information on available spectrum
- Low demand due to low achievable QoS
- Regulatory friction and complexity driven transaction costs
- Uncertainty regarding the future primary allocations (Option value)
- Risks of increased interference
- Coordination, harmonization, and controlling mechanisms
- Anti-competitive conduct
- Disruptive effects on end users
- Ability to achieve public interest objectives

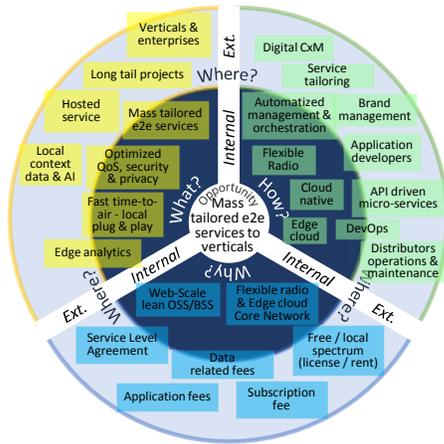
DRAFT

Spectrum valuation methods



DRAFT

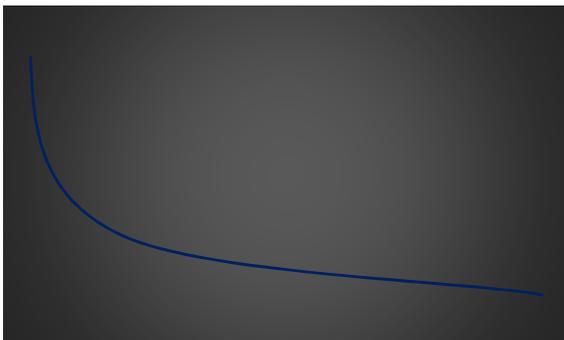
Developed exemplary business model and key business model elements



- **what** element represents offer, value proposition, customer segmentation and differentiation,
- **how** element describes key operations, basis of competitive advantage, mode of delivery, selling and marketing,
- **why** element sets base of pricing, way of charging, cost elements and cost drivers, and
- **where** defines location of all the preceding elements items and divides activities between internal and external involving partners.

DRAFT

Mass tailoring was found to leverage all the three forces of long tail



- 1) *Democratizing the tools of production* through access to “free” spectrum,
- 2) *Cutting the costs of consumption* by democratizing distribution with web-scale automatization, and
- 3) *Connecting supply and demand* via marketplace for resources, apps and services.

DRAFT

Fig. 3. Summary of spectrum sharing concepts as business model enablers

	LSA	CBRS
MNOs gain faster access to lower cost QoS capacity spectrum locally without coverage obligations	✓	✓
Provides opportunistic license-by-rule usage of spectrum	✗	✓
Enables new local business cases, e.g., for MVNOs, small businesses, venues, enterprises, verticals	✗ ✓	✓
Enables new ecosystem roles, e.g., in spectrum management and brokering, micro-operators	✗ ✓	✓




DRAFT

CBRS enables LTE and 5G access to long tail of non served vertical users.

- Designed alternative business model for locally deployed networks represent very different types of business opportunities and value propositions, as opposed to the presently dominant and homogeneous traditional MNO businesses.
- Sharing concepts enable operators gain faster access to lower cost QoS capacity spectrum locally driven by distinct use cases and business needs.
- Concepts can trigger new local business cases, e.g., for MVNOs, small businesses, venues, enterprises and verticals in connection with new ecosystem roles, e.g., in spectrum management and brokering, micro-operators.
- Mass-tailoring business opportunity was found attractive and feasible leveraging all the three forces of long tail.

NOKIA

Thank you
Questions/discussion?

seppo.yrjola@nokia.com