

Mobile Network Sharing and Effective Rollout of Mobile Telecommunications Infrastructure in the 5G Era

Telecommunications Regulatory Affairs Advisory Committee
9 November 2021



Background

- A large number of 5G RBS are required to ensure extensive mobile coverage, as well as support of high data capacity and high speed data transmission
- Challenges encountered at buildings where multiple MNOs have RBS with large quantity of antennae and radio equipment
- Aspects to be discussed
 - update on various forms of **mobile network sharing**
 - proposed measures to encourage mobile network sharing to facilitate the **effective rollout of mobile telecommunications infrastructure**

Update on various forms of mobile network sharing



Site Sharing

- MNOs share the **same physical site location** and ancillary facilities (e.g. electricity supply)
- MNOs install their own base station equipment, antennae and cabling facilities separate from one another

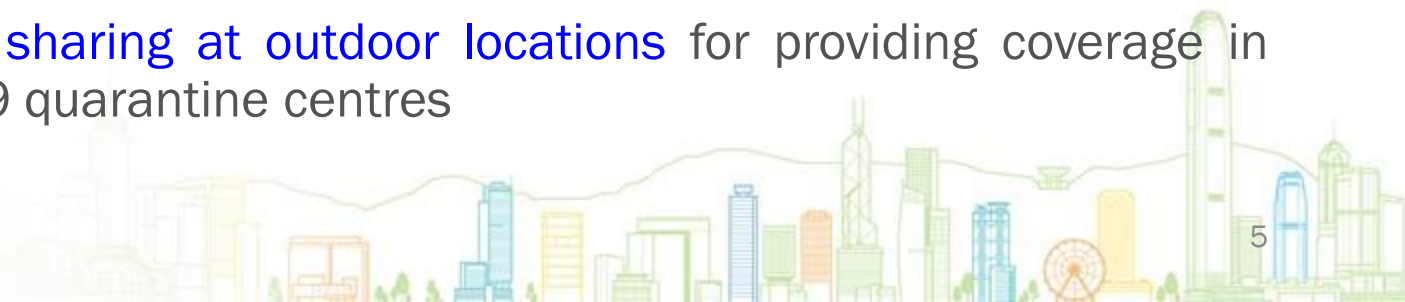


Examples of
site sharing



Antenna Sharing

- MNOs **share use of antennae** and ancillary facilities at the site location
- Antennae may be passive or active antenna units in 5G era
- Each MNO installs and operates its own base station equipment separately with control over the output frequencies and power of its radio signals transmitted by the common antennae
- Examples:
 - **Integrated radio systems at indoor locations** (e.g. shopping malls, railway premises and road tunnels)
 - **Antenna sharing at outdoor locations** for providing coverage in COVID-19 quarantine centres



Antenna Sharing (cont.)

- Examples of antenna sharing at quarantine centres



Radio Network Access (RAN) Sharing

- MNOs share use **all or part of other RAN equipment** and facilities and maintain their own core networks for interconnection with the shared RAN equipment
- Approaches of RAN sharing
 - **Multi-Operator Radio Access Network (MORAN)** approach to share RAN equipment and facilities but using dedicated spectrum (adopted at some Government venues)
 - **Multi-Operator Core Network (MOCN)*** approach to share RAN as well as spectrum by the MNOs

MNOs in Hong Kong are not allowed to adopt MOCN where **pooling of spectrum is applied*

Capacity Leasing

- **Commercial agreements** between MNOs for expansion of service coverage or enhancement of network capacity
- Agreements may involve acquisition of a specified amount of mobile voice and data capacity from another MNO
- Network slicing technology supported by 5G makes more flexible sharing of network resources at various levels of the core and radio networks



Domestic Roaming

- **Commercial agreements** among MNOs such that customers of one local MNO (MNO-1) are permitted to roam into the network of another local MNO (MNO-2) when MNO-1 cannot provide network coverage at a particular geographical location but it can be served by the MNO-2
- Not implemented in Hong Kong yet



Effective rollout of mobile telecommunications infrastructure



Installation of RBS at Government Venues

- Since March 2019, a Pilot Scheme has been launched to make available more than 1 000 Government venues for RBS installation under streamlined procedures with good reception by the industry
- Major concerns reflected by relevant Government departments about MNO's RBS installation applications include
 - extensive use of **space** and ancillary facilities
 - **negative visual impact** due to a large number of RBS installations



Proposed Requirement – RBS Installation at Government Venues

- For venues where more than one MNO have interests in RBS installation, MNOs have to coordinate among themselves and submit applications with a **sharing arrangement of antennae or RAN** on top of ancillary facilities
- Applications which do not contain such a sharing proposal may be considered as inefficient use of space at Government venues, access to the Government venues concerned may not be supported



Proposed Requirement – RBS Installation at Government Venues (cont.)

- For venues already installed with RBS by the Incumbent MNO(s), MNO(s) shall first attempt to reach agreement on **sharing arrangement with the Incumbent MNO(s)** before making an application under the scheme
- The Incumbent MNO(s) should facilitate sharing of its/their antennae and other ancillary facilities as far as practicable and technically feasible



Installation of RBS at Private Venues

- MNOs are encouraged to adopt suitable mobile network sharing arrangement at private venues as far as practicable and technically feasible
- Processing of MNO' applications* for approval of RBS by OFCA and other relevant Government departments will be speeded up in particular for venues where public members have raised or will likely raise objection to RBS installation in their neighborhood

* Applications for RBS installation at private venues are processed under “Guidance Note for Submission of Applications by Public Telecommunications Operators for the Installation of RBS for Public Telecommunications Services in buildings and on Rooftops”

Consideration of Visual Impact

- **Adoption of mobile network sharing:** reduce number of antennae and radio equipment
- **Mitigating measures:** match or blend RBS installation with existing structures or landscape



Examples of
mitigating
measures taken
by MNOs



Consideration of Visual Impact (cont.)

- MNOs should have **due regard to visual impact as a standard practice**, in RBS installation through adopting
 - mobile network sharing
 - mitigating measures
- OFCA will provide suggestions to MNOs on the best practice (through an information note) for RBS installations in respect of minimising negative visual impact to the buildings concerned or surrounding environment



Use of More Efficient Network Equipment

- Under **technology neutral** approach, MNOs may deploy any generation of mobile technologies based on widely adopted technical standards to provide mobile services
- To achieve **more efficient use of radio spectrum, space and energy**, MNOs are encouraged to consider using advanced network equipment that
 - support multiple frequency bands operation
 - serve multiple generations of mobile services



Way Forward

- **Government Venues:** OFCA to revise Guidance Notes for the Pilot Scheme to reflect the requirement of mobile network sharing as a default arrangement at the government venues concerned
- **RBS installation in general:** OFCA to prepare an Information Note to provide guidance on the best practice including
 - adoption of suitable mobile network sharing arrangement
 - mitigating measures to minimize negative visual impact due to RBS installations
 - use of advanced network equipment



Thank you

