GSMA

Direct-To-Device

D2D

Enabling Mass-Market
Satellite Connectivity

GSMA

58%

Of the global population is connected to mobile broadband on their own device.

66% have some access to a device

38%

Of the world's population live within the footprint of a mobile broadband network but are not using it…

… THE USAGE GAP

2/3 of these do not own a phone

4%

Of the global population is not covered by mobile broadband…

… THE COVERAGE GAP

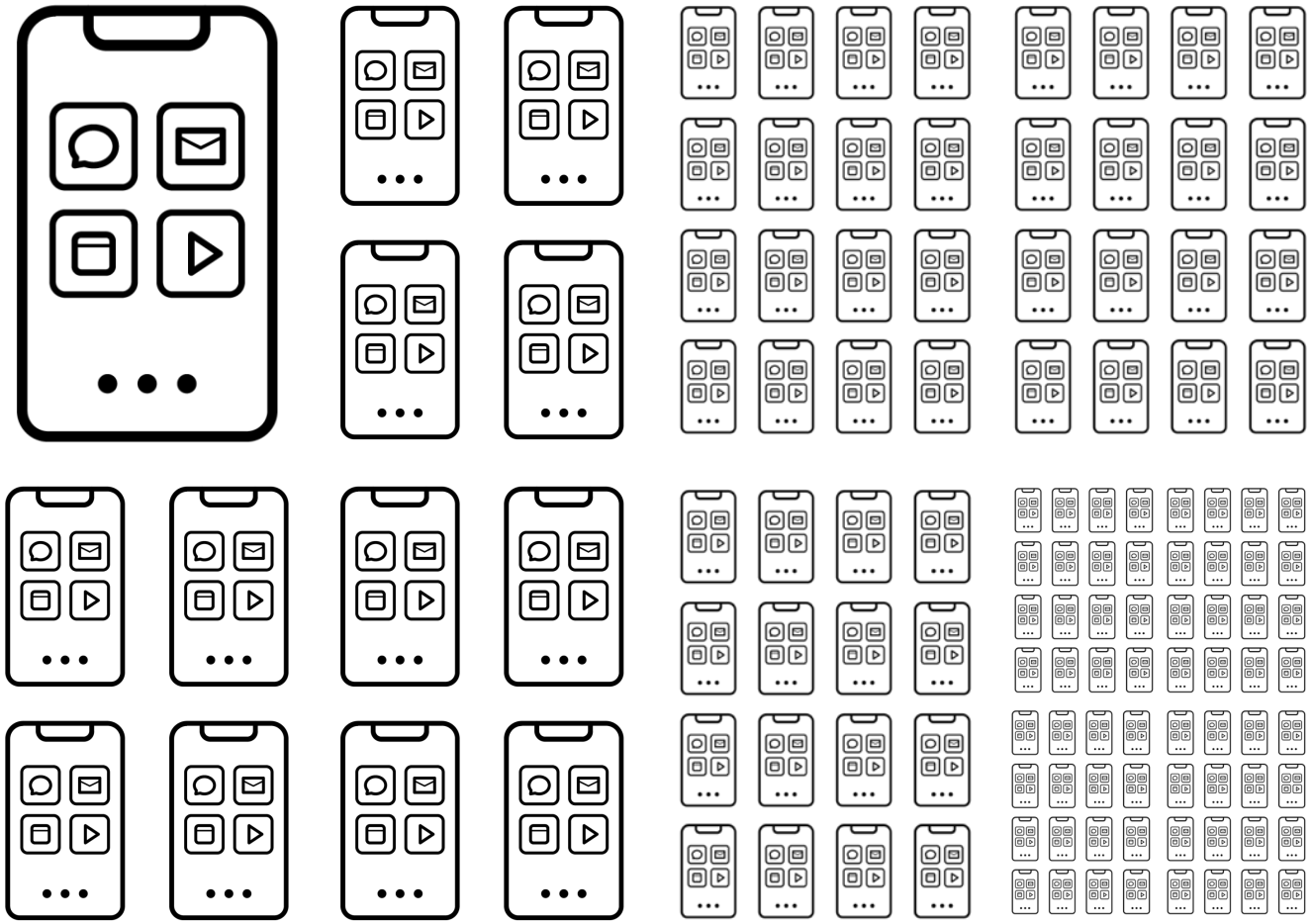
D2D

May be one part of the solution to the COVERAGE GAP. It will not impact the USAGE GAP.

Mobile and Satellite

Industry Development

- Satellite systems and mobile have always worked together, especially for backhaul
- Satellite operators are today making commercial agreements with mobile operators to offer D2D services
- This includes MNOs allowing satellite operators to provide them services using their own licensed spectrum
- Spectrum coexistence issues are critical – both international and local



4.7 billion

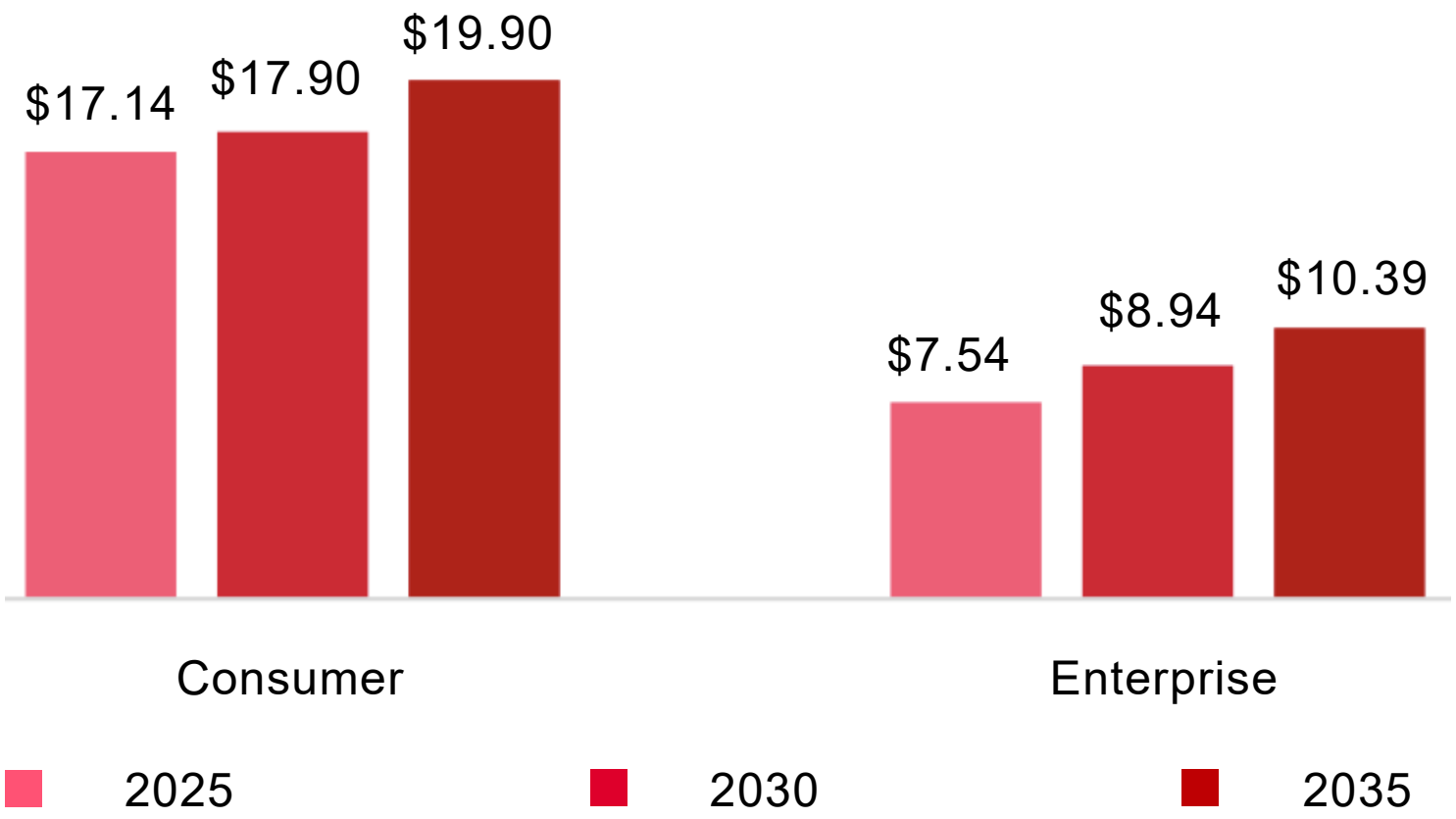
people are connected to the mobile internet today using their own devices

D2D relies on handset scale realised by mass-market adoption of mobile

D2D Business Case

Addressable market revenue per year (billion)

Source: GSMA Intelligence



- Consumers may pay more for non-population coverage e.g. streaming media on remote roads. Utilities may use D2D for IoT capabilities
- MNOs may save CapEx through D2D by fulfilling coverage obligations without terrestrial base station – consumers potentially pay the same

Satellite 2.0 – Going Direct to Device

GSMA

D2D Spectrum

- D2D may use mobile satellite (MSS) or terrestrial mobile (IMT) spectrum
- Today, D2D using MSS requires bespoke / tailored mobile handsets
- D2D using terrestrial mobile spectrum will use standard handsets

1. Mobile spectrum

GSMA

1.

Working with MNOs

D2D in mobile spectrum must be offered through the spectrum licence of the mobile operator

2.

International

International coordination is being carried out through the WRC-27 process and new local regulation may need updating to ensure harmonisation

3.

Interference

D2D must protect terrestrial mobile. Secondary (no interference / no protection) allocation under Radio Regulations along with associated provisions

4.

Handsets

Standard handsets may be used for D2D using mobile spectrum

2. Satellite spectrum

GSMA

1.

Regulation

Where in-country regulations allow D2D using MSS spectrum, technical and regulatory provisions already exist in the ITU Radio Regulations. Satellite providers must meet national requirements

2.

Handsets

3GPP Release 17+ handsets are required

Popular high-end handsets are compatible but more affordable devices are not

3.

Interference

D2D using mobile satellite spectrum must not interfere with terrestrial mobile – including in bands under discussion at WRC-27

Early Regulation on D2D

United States

4500km

- “SCS will be authorized pursuant to a secondary MSS allocation in the U.S. Table. These operations may not cause harmful interference to—and shall not claim protection from—any station operating in accordance with ITU provisions, whether in the United States or internationally.”

- “We authorize SCS only where one or more terrestrial licensees … lease access to their spectrum rights to a participating satellite operator.”

Australia

4000km

- “Our view is that operation of an IMT satellite direct-to-mobile service in Australia is only practical where there is an Australia-wide spectrum licence.”

- “When a space station transmits to a radiocommunications receiver in a mobile phone, reception by the phone continues to be authorised by the spectrum licence”

- “A mobile phone used in an IMT satellite direct-to-mobile service can be operated within the geographic area of the spectrum licence, provided it operates in accordance with the conditions of the licence.”

GSMA

The GSMA's function is to unite the mobile ecosystem to advance innovation and reduce inequalities.

Our members are directly involved in D2D solutions for mobile connectivity using both NTN and terrestrial technologies.

MNOs are agnostic as to how connectivity is provided.

Closing the 38% usage gap is critical… alongside the 4% coverage gap.