

# Fuelling the 5G future: understanding and delivering the spectrum requirements

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**2nd Annual Asia Pacific Spectrum Management Conference**

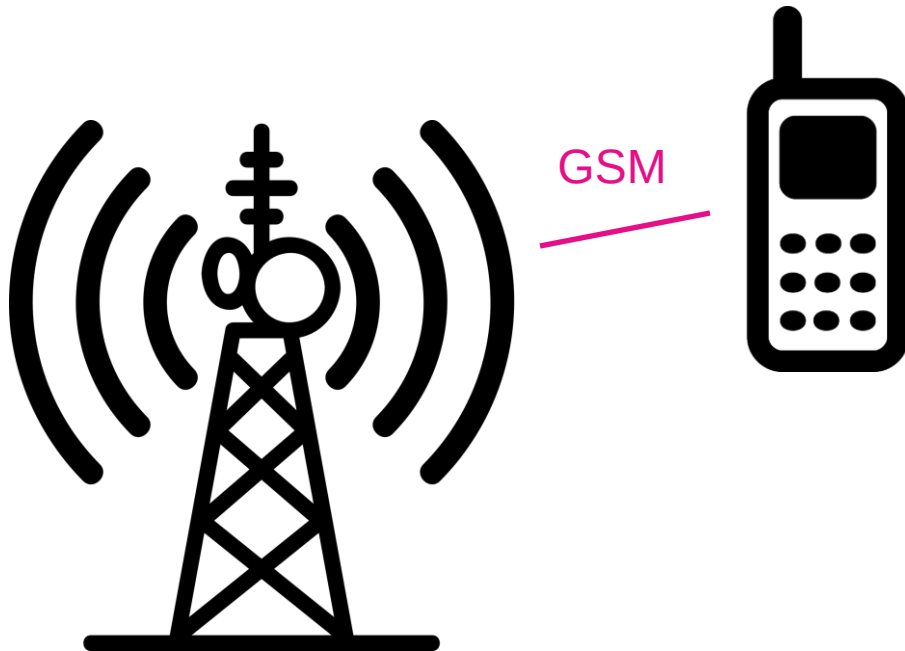
26 April 2016

# Agenda

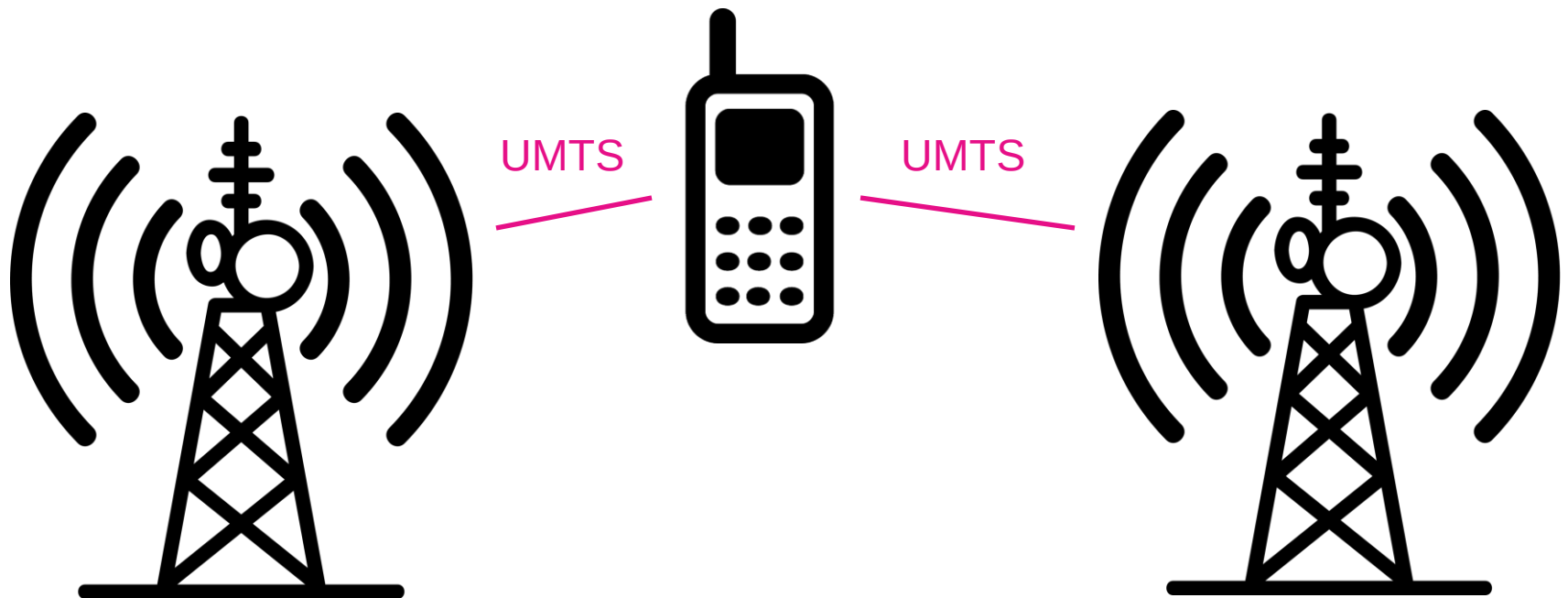
- What is 5G?
- How much spectrum does it need?
- Outcomes from WRC-15
- Needs for WRC-19

# What is 5G?

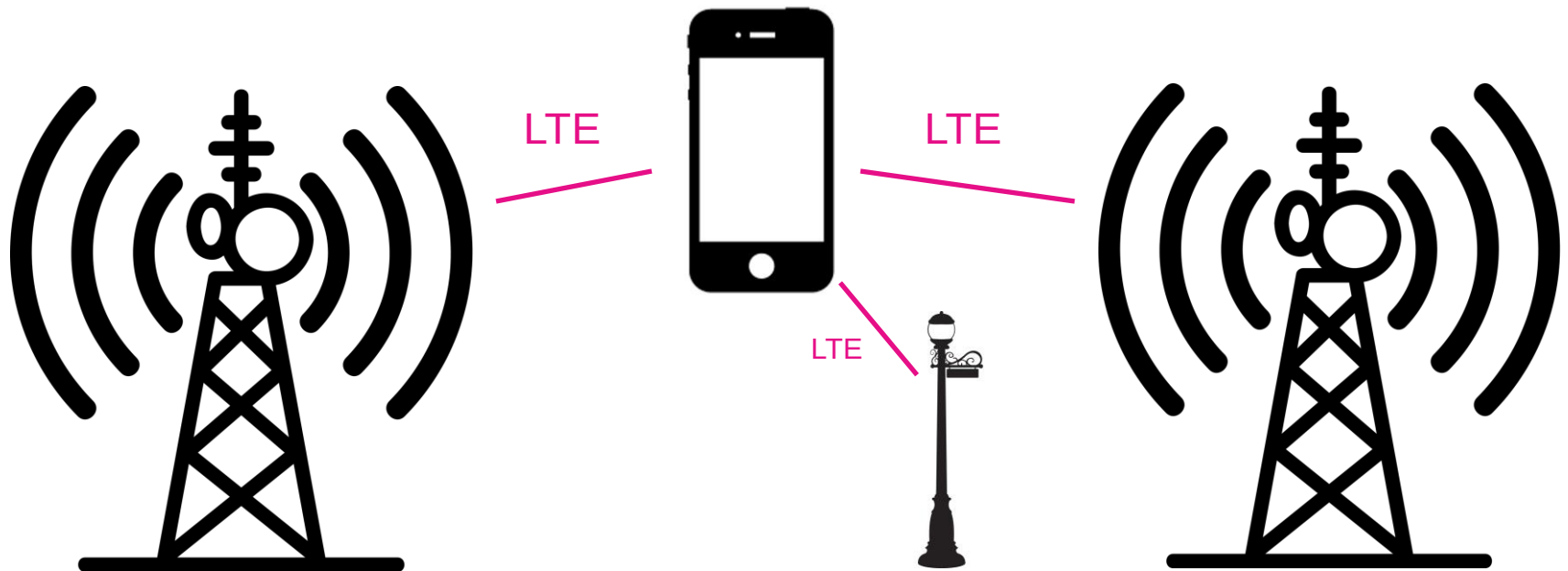
# 2G



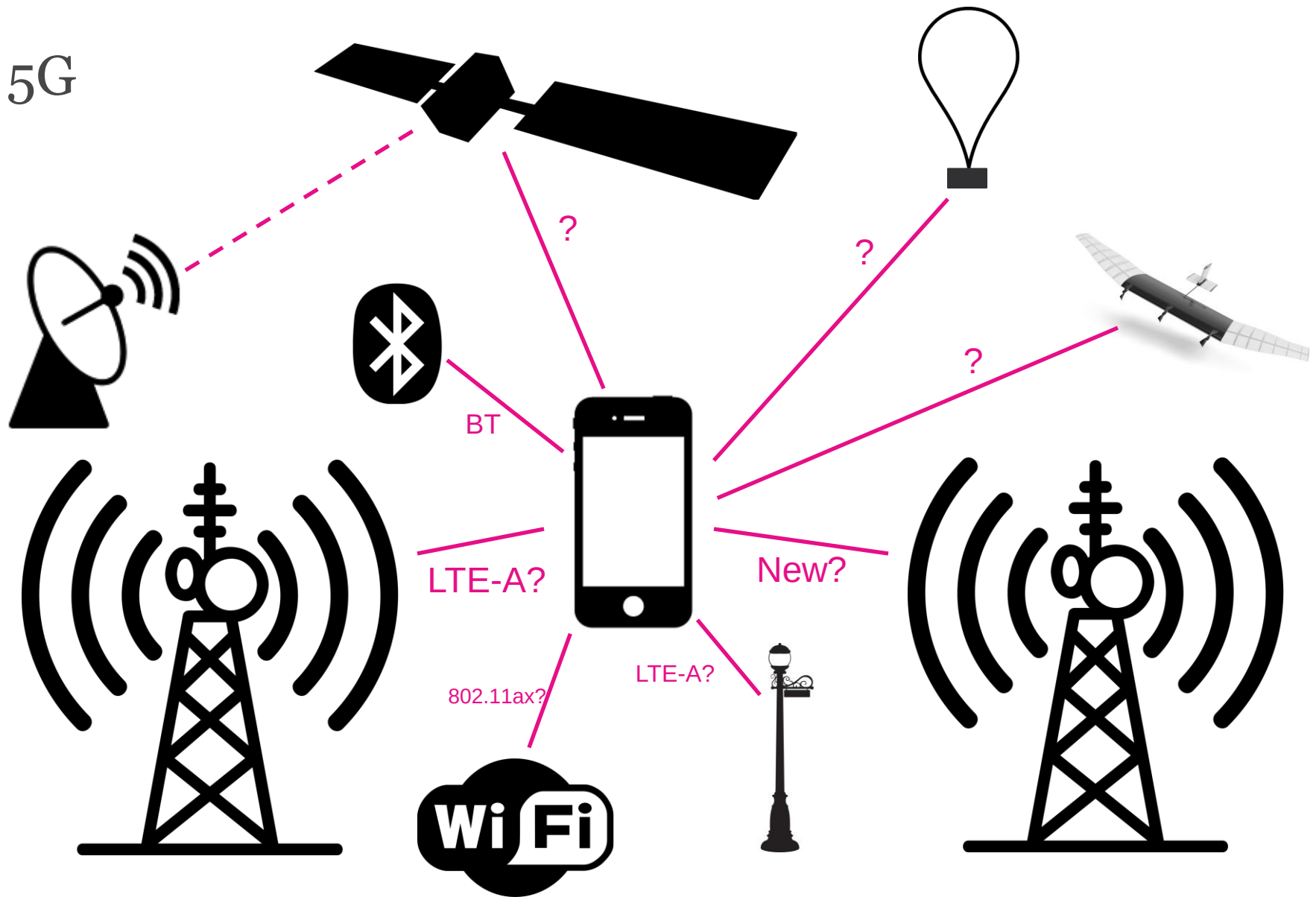
# 3G



# Not-quite-4G



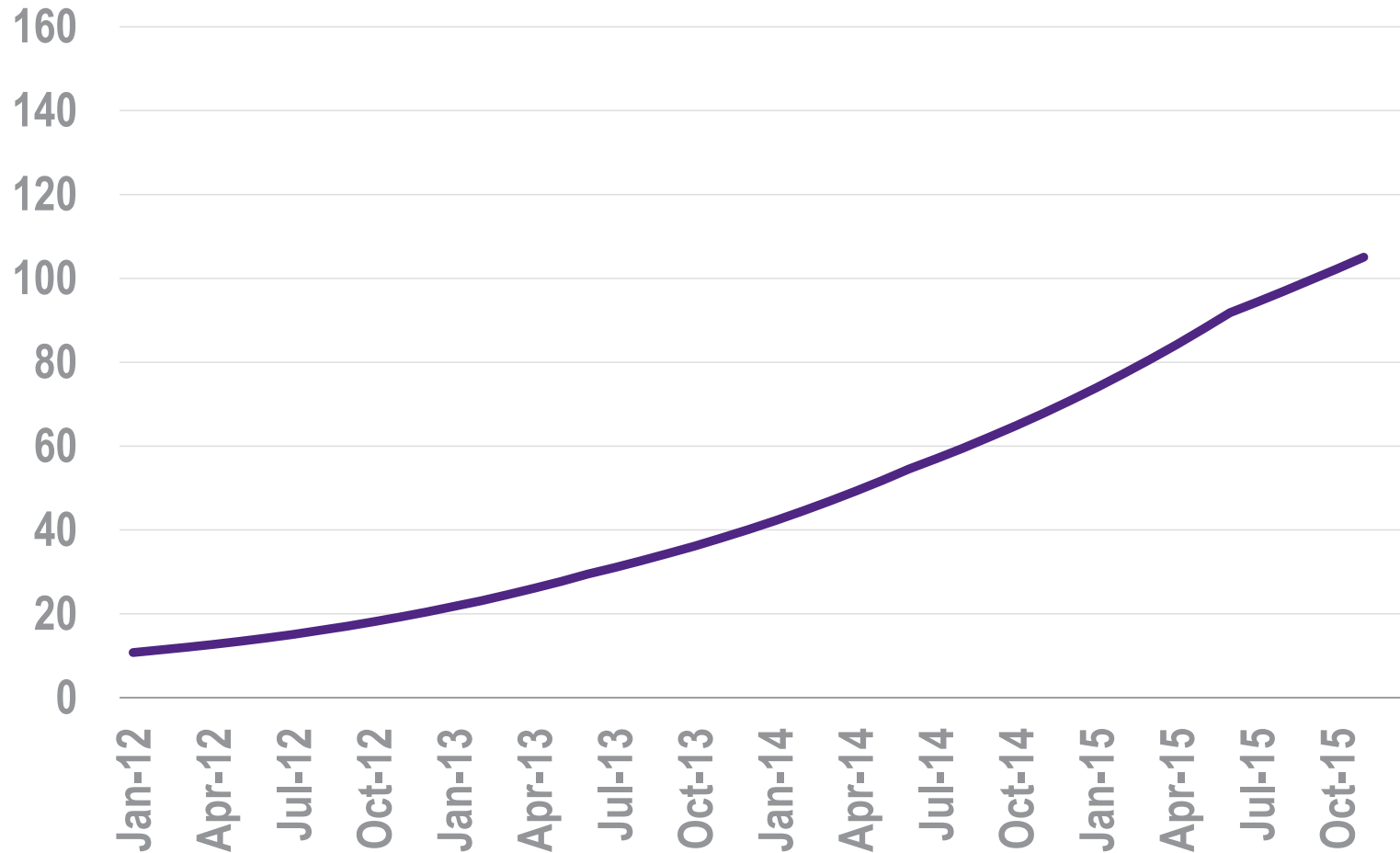
5G



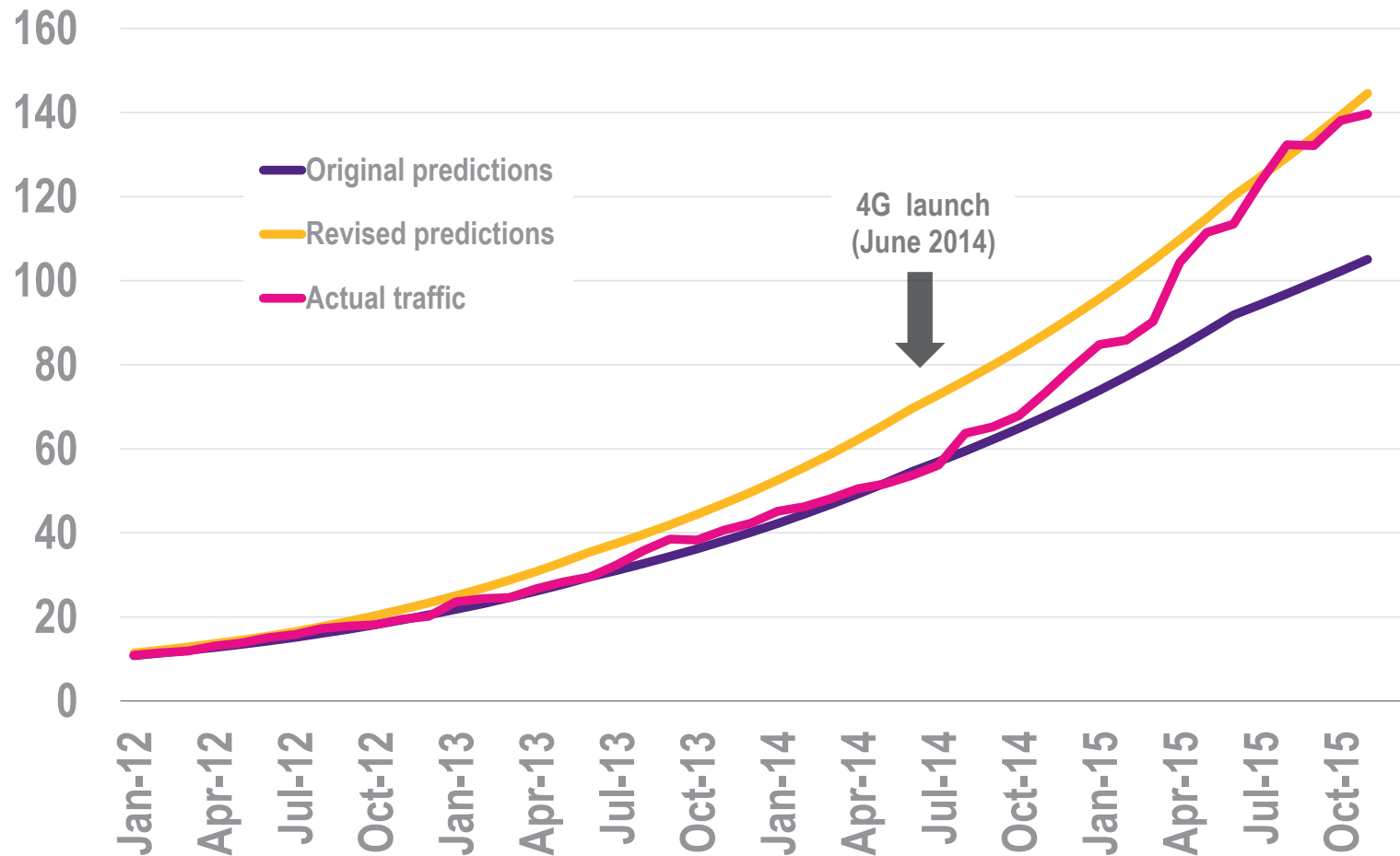
How much spectrum do we  
need?



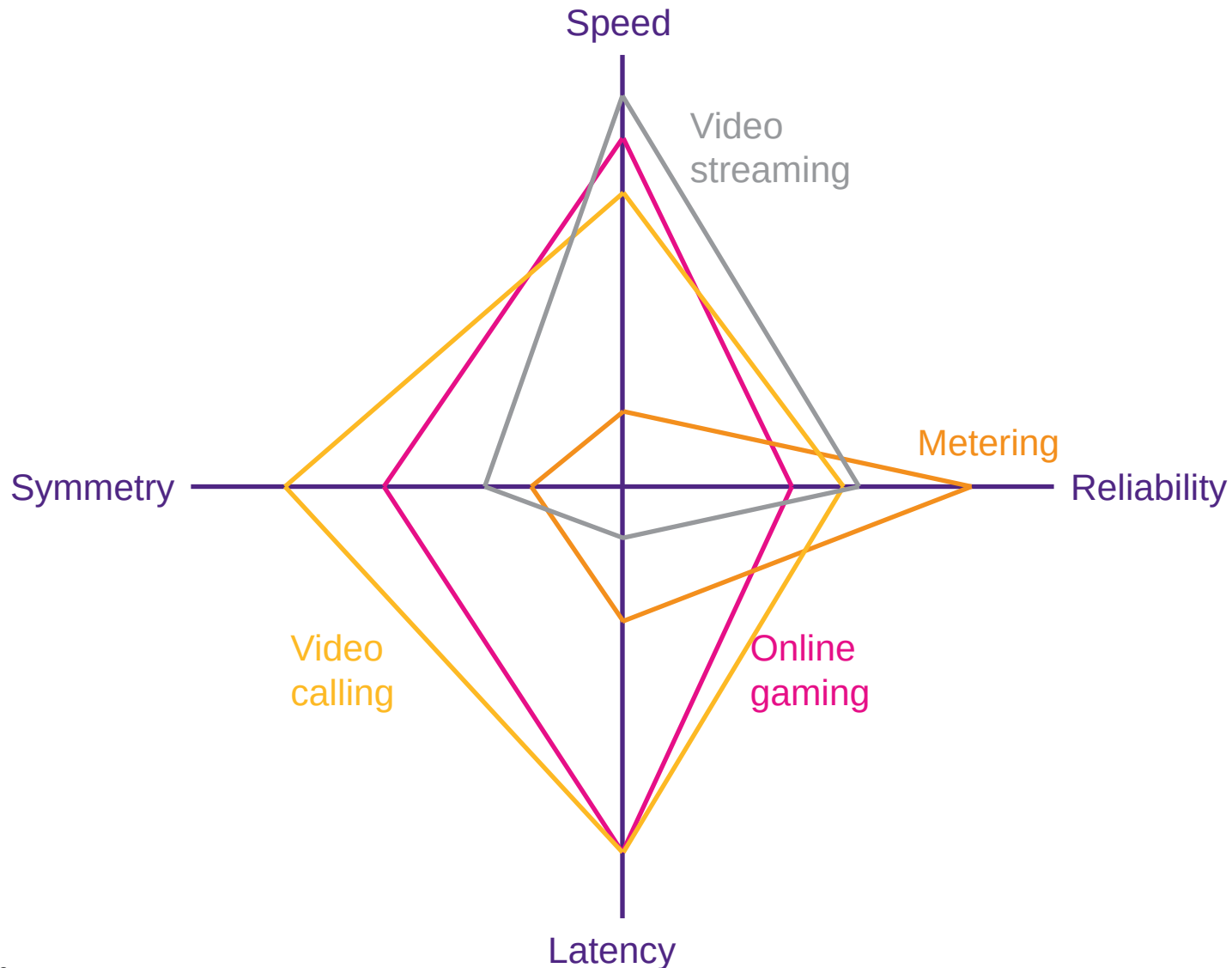
# Ever-growing demand is assured



... but predictions are difficult



# Different services have different needs



# Forecasts need to change

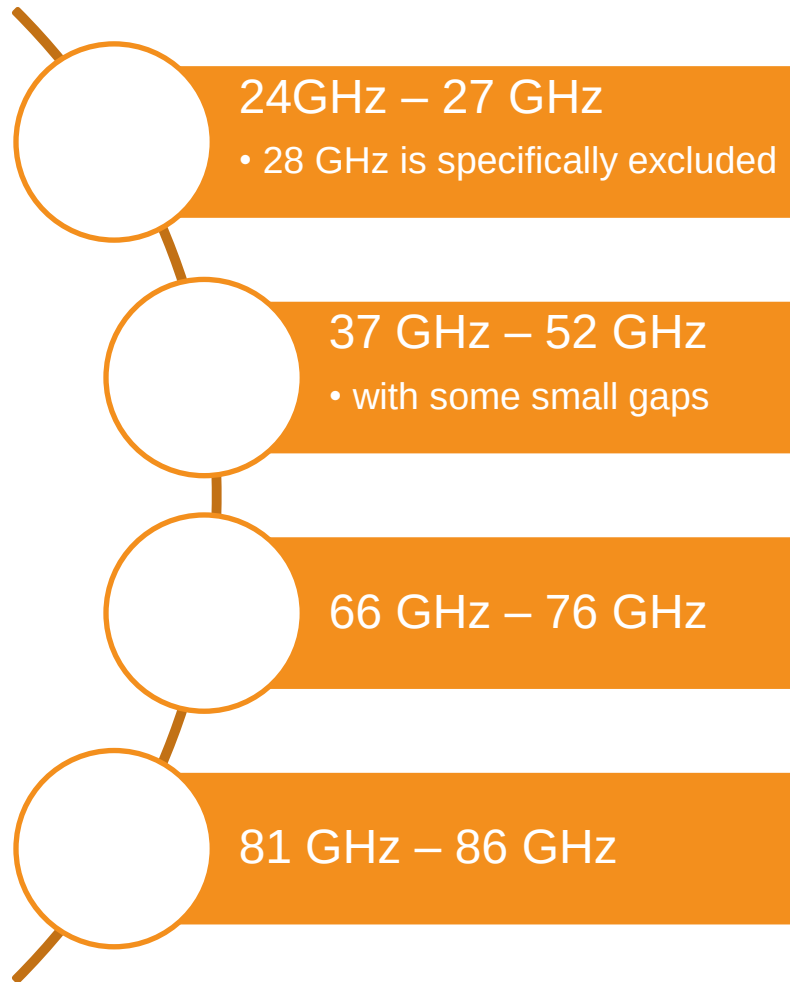
- Relative usage of different services will define mix of technologies
- Defining spectrum needs will need disaggregated demand forecasts
- How will people use their connection in 2030?

- 5G devices may adjust technology use based on service use
  - Models will need to do the same
  - The 5GIC is working on algorithms and rules to govern this



# Outcomes from WRC-15

# Spectrum identified for 5G



- Other bands were allocated for IMT in general
  - LTE and SDL may use these before 5G is commissioned
- UHF below 700 MHz will not be reallocated before WRC-23 in R1
- Studies are looking at how high-frequency bands can be bounced around buildings
  - There is limited in-building penetration
  - Are we relying on picocells or ubiquitous WiFi?

# Developments since WRC-15

Korea, Japan and the US are starting to use 28GHz

EU members are discussing sub-700MHz

MENA countries delaying analogue TV switch-off

SSA delaying spectrum awards

AWS spreading in South America

## Is spectrum harmonisation a dying art?

- Korea wants to use a 5G network at the Winter Olympics in 2018 – but that will be a prototype at best
- Japan hopes to launch 5G in early 2020

# Needs for WRC-19



# Spectrum planning in uncertain climates

- WRC-19 is too late
  - Study groups need to identify spectrum soon, ready for ratification
  - Service demand modelling needs to identify how it will be used
- A wide portfolio of spectrum is needed
  - Long-range spectrum – 600MHz needs to be discussed
  - Satellite capacity
  - Dedicated HAPs spectrum
  - Increased unlicensed spectrum for handoff – maybe with LSA-U or LSA-LAA

# Agenda

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