3GPP TSG RAN Meeting #67
Shanghai, China, March 9 – 12, 2015

RP-150221

Agenda Item: 13.1.1

Motivation for study on further evolution beyond LTE-Advanced using frequency spectrum above 6 GHz

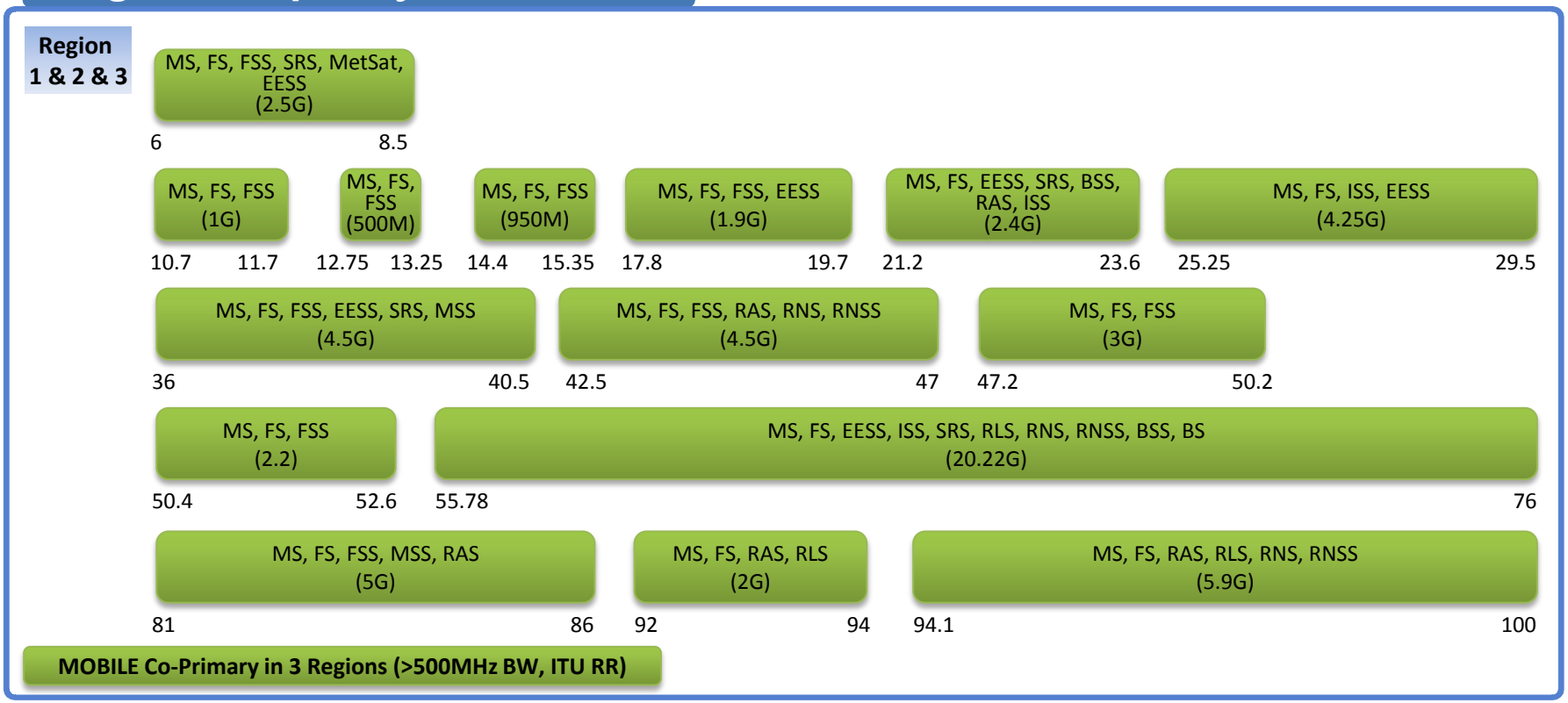
Samsung

Possibility in Frequency Bands above 6GHz

- Possible to find large chunks of contiguous spectrum of > 500MHz bandwidth

Higher Frequency Candidates

※ The following figure does not show current usages in each region/country.



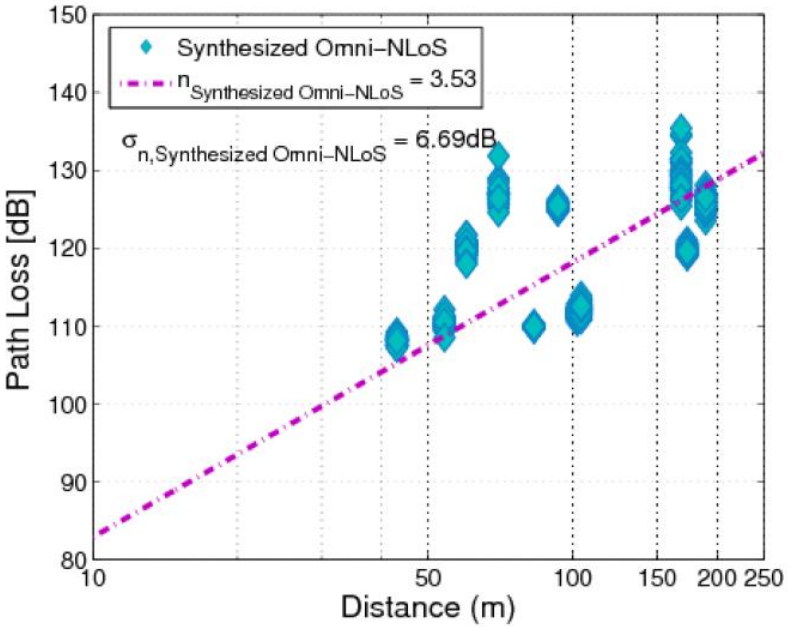
MS : Mobile Service FSS : Fixed Satellite Service LMDS : Local Multipoint Distribution Service FS : Fixed Service P-P : Point to Point S-E: Space to Earth E-S: Earth to Space ISS: Inter-Satellite Service
RAS: Radio Astronomy Service SRS: Space Research Service EESS: Earth Exploration Satellite Service MSS: Mobile Satellite Service RNS: RadioNavigation Service RNSS: RadioNavigation Satellite Service
RLS: RadioLocation Service BS: Broadcasting Service BSS: Broadcasting Satellite Service MetSat: Meteorological Satellite Service

Channel Measurement Examples

- Path loss exponent of 3.53 for 28GHz band observed in typical outdoor urban scenario with NLoS propagation in Daejon, Korea [1]
  - Communication links can be supported over 200 meters of distance

Map of measurement environment

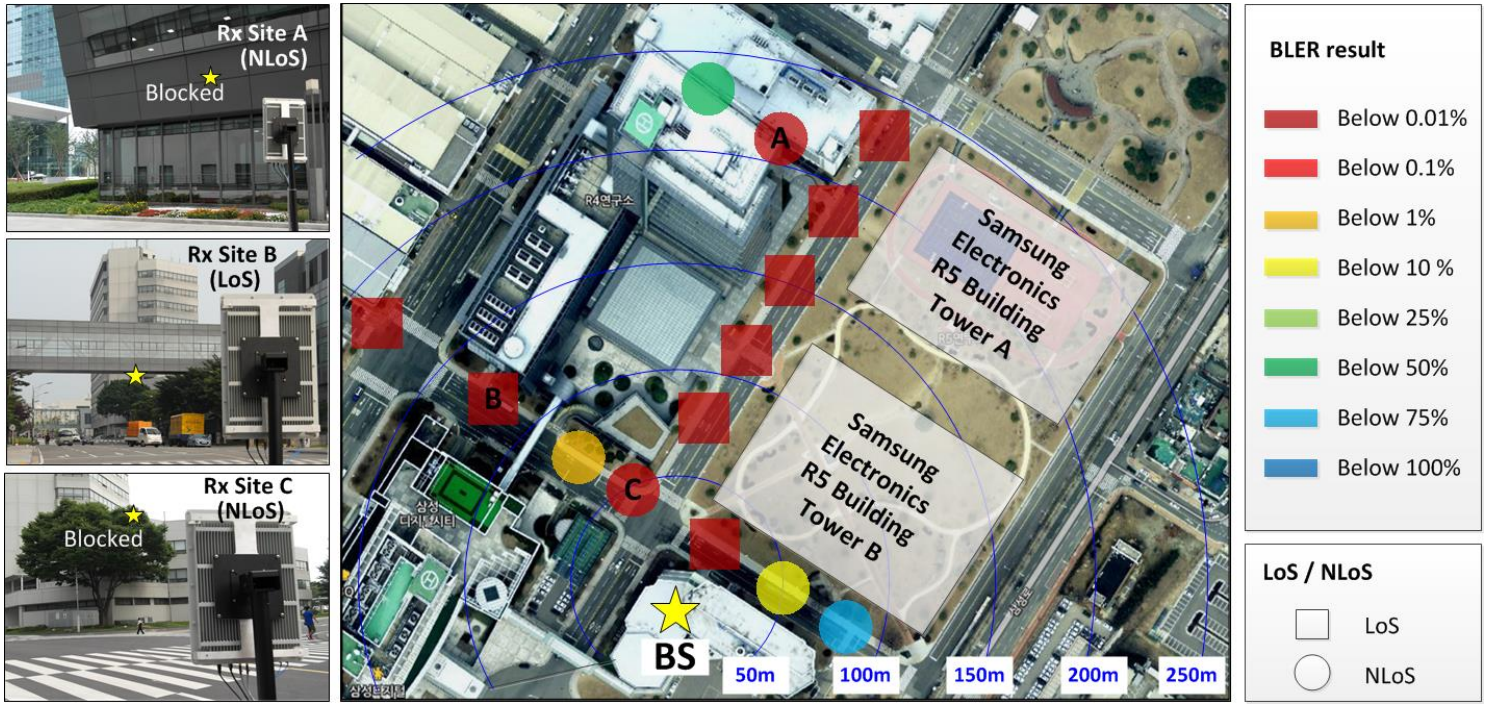
Pathloss measurement results



[1] Sooyoung Hur et al., ”Wideband Spatial Chan¬nel Model in an Urban Cellular Environments At 28 GHz,” in Proc. EuCAP’15, April. 2015.

Use of mmWave for Cellular Service

- mmWave with adaptive beamforming can establish reliable communication links for NLoS sites that are more than 200 meters away from the base station



Tests were performed at sites surrounded by tall buildings where various channel propagation effects such as reflection, diffraction, and penetration were present [2]

[2] Wonil Roh et al., "Millimeter-wave Beamforming as an Enabling Technology for 5G Cellular Communications: Theoretical Feasibility and Prototype Results," IEEE Communications Magazine, vol. 52, no. 2, pp. 106-113, Feb. 2014.

Work Plan

- Study for use of 6 – 100GHz consists of two phases
  - Phase 1 (Sep 2015 – Mar 2016, ad hoc group):
    Study on channel model for 6 – 100GHz (SID in RP-150219)
  - Phase 2 (Mar 2016 – Sep 2017, RAN1):
    Study on feasibility and technologies for 6 – 100GHz (SID in RP-150220)

- We assume a follow-up WI targeting to complete stage-3 standards for use of 6 – 100 GHz until March 2019, i.e., for inclusion in in Rel-15
  - Consistent with the timeline of RAN work for 5G proposed in RP-150222

Thank You!