3GPP TSG RAN Meeting #69
Phoenix, USA, 14 – 16 September 2015

RP-151373

Agenda Item: 14.1.1

Motivation for study on channel model for frequency spectrum above 6 GHz

KT, Samsung

mmWave Channel Modeling Activities

- **Many existing and ongoing projects worldwide targeting 5G channel measurement and modelling**
  - METIS2020
  - COST Action, IC1004
  - mmMagic
  - MiWEBA
  - 5G mmWave Channel Model Alliance

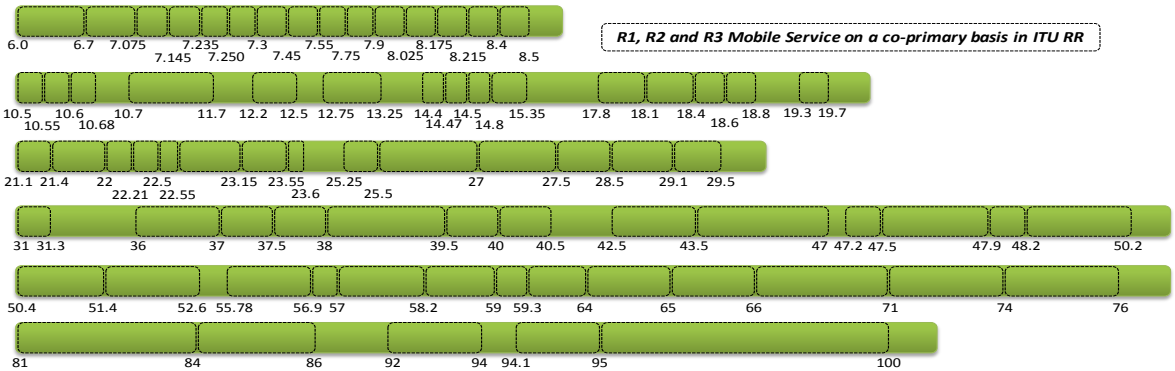
- **Developing channel model targeting for a wide range (up to 100 GHz)**

Ⅱ Possibility in Frequency Bands

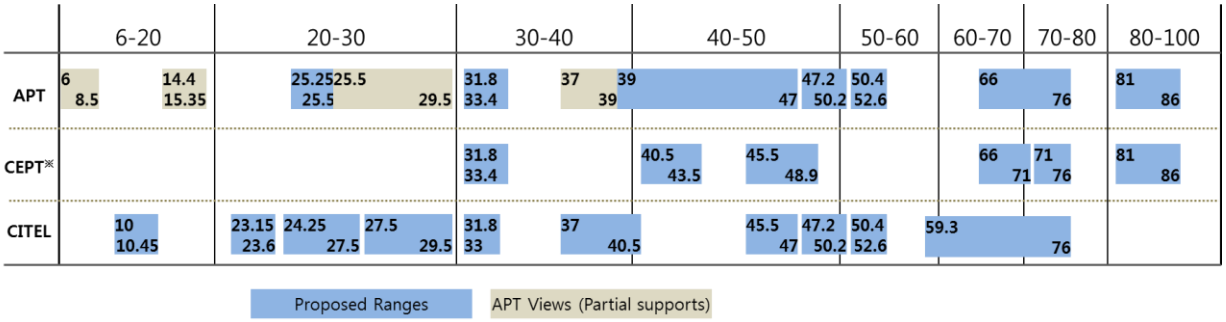
- **Possible to find large chunks of contiguous spectrum of > 500MHz bandwidth**

Candidates above 6 GHz

- **Higher opportunities for wide-contiguous spectrum (Spectrum ranges allocated to MS by ITU Radio Regulation)**



- **Frequency ranges supported by regional preparatory groups (toward WRC-19)**

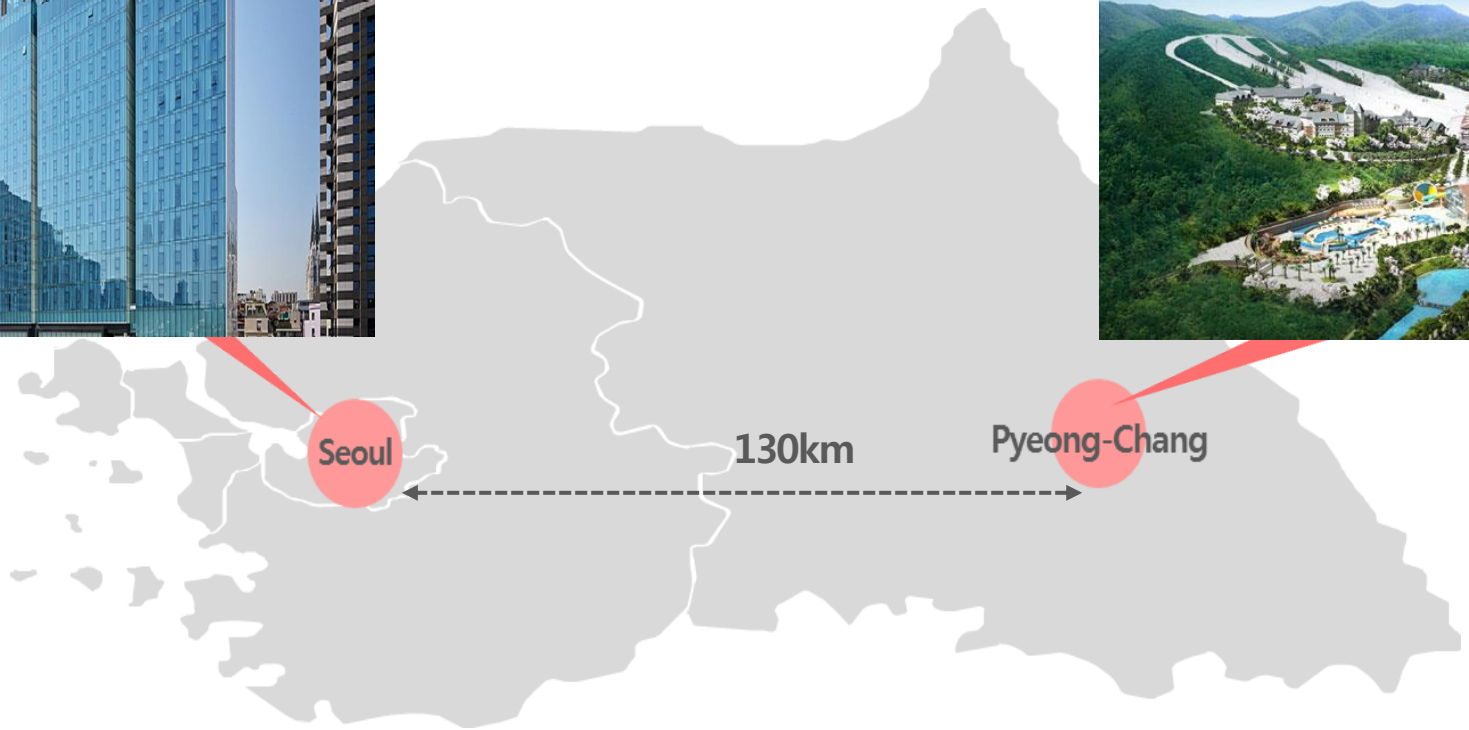


※ CEPT candidates are in draft, not final conclusion. (Finalized on Sept. 18)

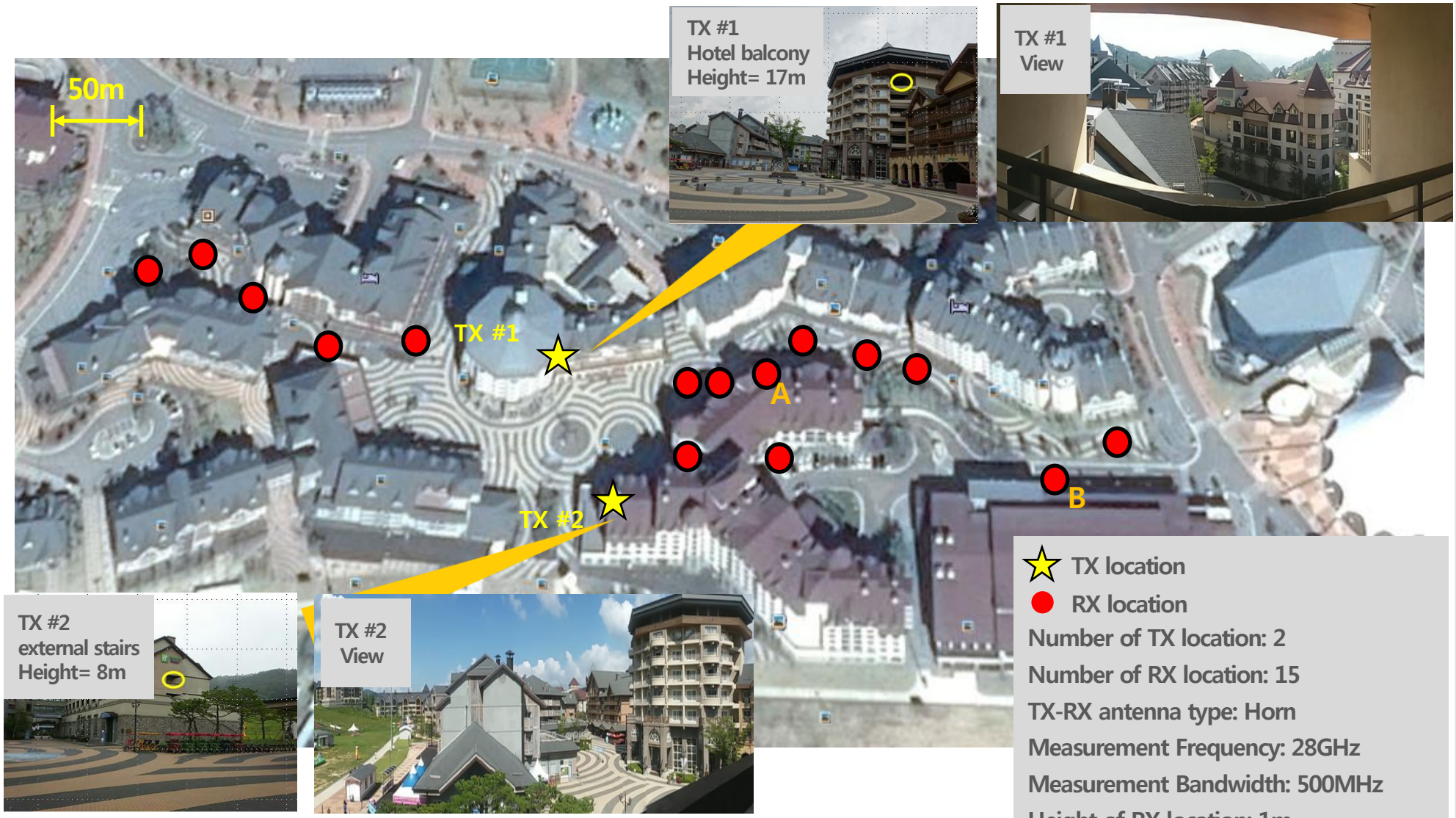
※ Further considerations in CEPT: 5.925-7.145 / 7.235-7.25 / 7.75-8.025 / 10-10.45 / 10.5-10.6 / 12.75-13.25 / 14.3-14.4 / 14.4-15.35 / 17.7-18.6 / 18.8-19.7 / 21.4-23.55 / 24.5-27.5 / 24.25-25.5 / 27-27.5 / 27.5-29.5 / 31-31.3 / 42.5-47 / 45.5-50.2 / 47.2-50.2 / 50.4-52.6 / 55.78-59.3 / 59.3-66 GHz

III mmWave Channel Measurement Overview

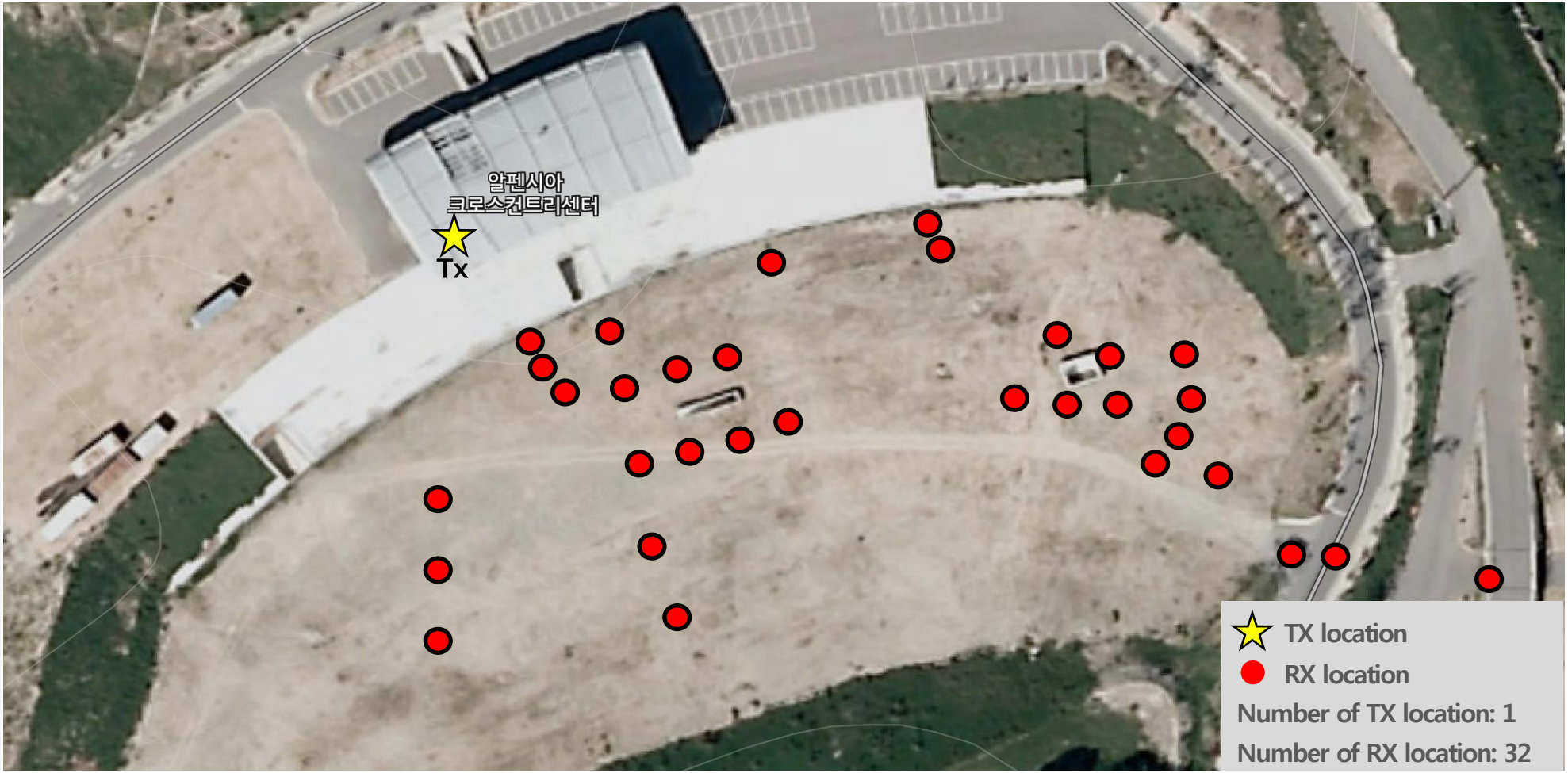
- KT carried out millimeter wave channel measurement and modeling in ski resort placed in Pyeong-chang, venue of Winter Olympics in 2018



IV Measurement Location Overview – Ski Resort Town

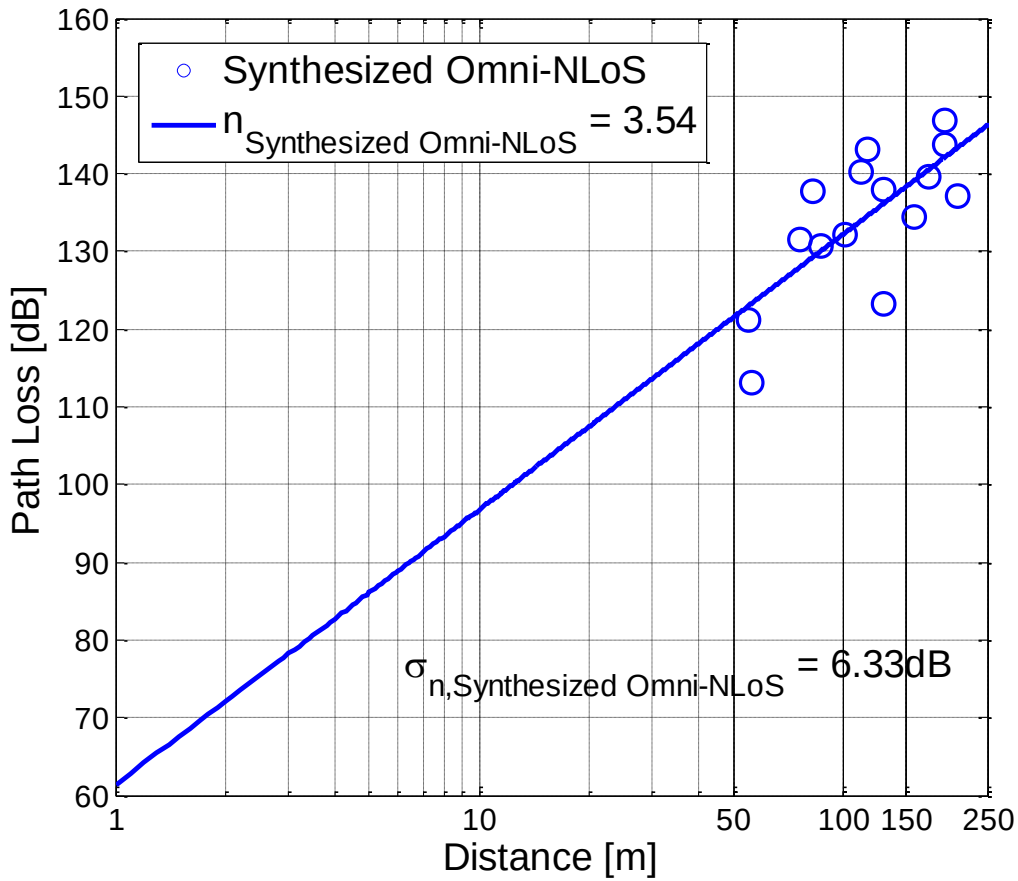


V Measurement Location Overview – Biathlon Stadium

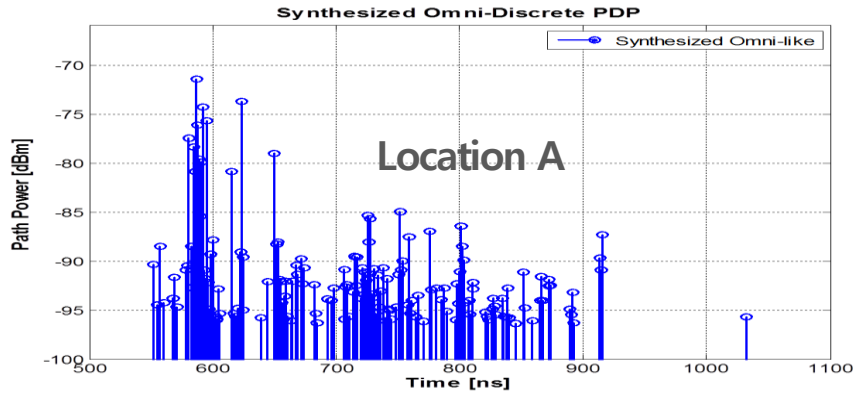


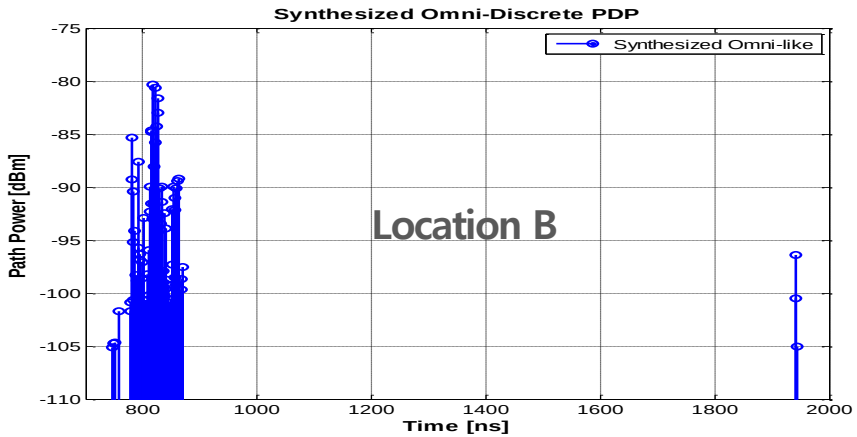
VI Channel Measurement Result in Alpensia ski resort

Path loss exponent



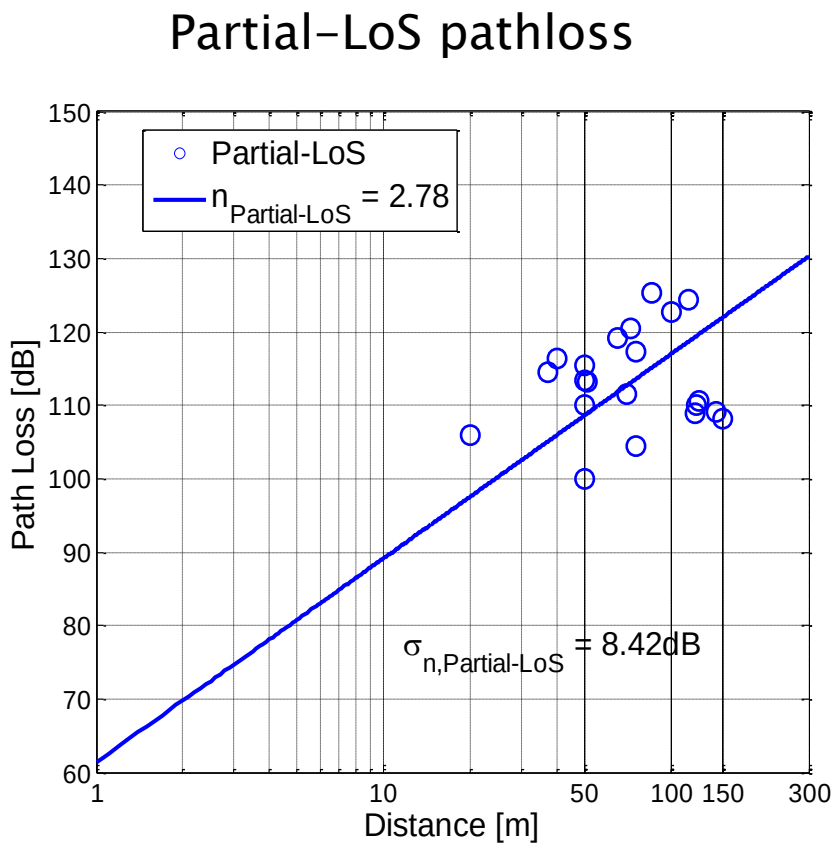
Example of impulse response





- **Communication links can be supported over 200 meters of distance**

VII Channel Measurement Result in Biathlon Stadium



- **Communication link with Partial-LoS (some obstruction in between) can be supported over 150m**

VIII Objective of SI

- **The study item aims to develop a channel model to enable feasibility study and developing framework of using high frequency spectrum ranging from 6 GHz to 100 GHz**
  - From RAN#69 (Sep 2015) to RAN#70 (Dec 2015), RAN identifies the status/expectation of existing information on high frequencies (e.g. spectrum allocation, scenarios of interest, measurements, etc.)
  - From Q1 2016, RAN1 develops a channel model(s) for frequencies up to 100GHz
    - Define the scenarios of interest for 3GPP based radio communication above 6GHz
    - Consider the work done outside 3GPP as well as earlier 3GPP work, such as the 3GPP 3D-channel model as a starting point and identify and agree modifications and additions for proper modelling of wireless channels of the high frequency spectrum for the identified scenarios

IX Time Budget Proposal

- From RAN#69 to RAN#70, RAN-level email discussion will take place, which will be followed by a session in RAN#70
- RAN WG1 time budget proposal

RAN #70				Q1/2016					RAN #71
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84	84	93	93	93	91	78	78	78	78
2									

RAN #71						Q2/2016													RAN #72
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79	79	79
3										**3**									

Additional comments

This SI will not be subject to the regular RAN prioritization, it will be done in parallel to the existing RAN WG work/capacity (no TU's discussion; no schedule constraints due to the existing work).

Thank you