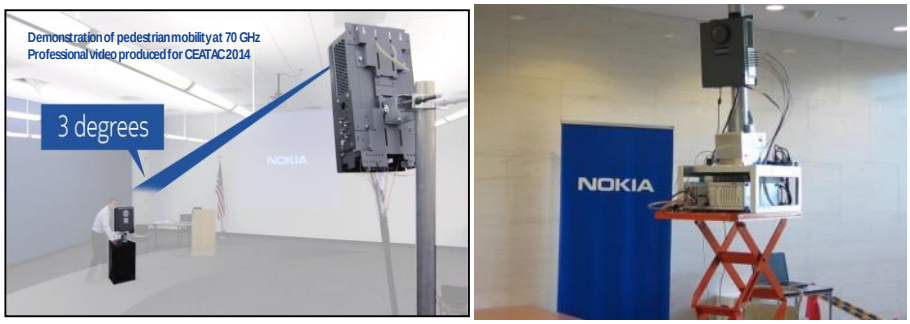
mmWave Proof-of-Concept System at FCC's 5G Workshop

Nokia Networks features new 5G radio systems that use advanced antennas and operate in the bands up to 100GHz for extreme throughput and virtual zero latency. Until now, only frequencies below 6 GHz have been considered for mobile networks, mostly due to their favorable wide area coverage properties. While more spectrum below 6 GHz is needed (also for 5G) and innovative techniques will be put into operation to make more efficient use of already allocated spectrum, there will be a growing need to unlock new spectrum bands in the 6 to 100 GHz range. Flexible air interfaces will be needed to handle the differing characteristics inherent in large frequency ranges. To achieve the 1ms latency target of applications like vehicle-to-vehicle communication and the tactile Internet 5G will use extremely small radio sub-frame lengths. In combination with flexible dynamic TDD, the bandwidth and power efficiency of the system will be optimized.

Nokia has been proactively researching and developing technologies around 5G. It may be noted that high band mmWave system will be standardized in 3GPP by 2019 and this PoC system will give us practical knowledge on how to build a system at these high bands.

Specifically, Nokia has developed an experimental 5G system @ 73 GHz band (E-band) which we are demonstrating at FCC's 2016 5G workshop. This demonstration shows a one (1) GHz bandwidth single link system using null cyclic prefix (CP) single carrier modulation which communicates using steerable lens antenna with a 3 degree beamwidth serving a fully mobile user device with a peak rate of 2.3 Gbps. This system can also support a radio latency of less than 1 msec and multi-user acquisition and tracking. We have successfully demonstrated this system at various trade shows (MWC-2015, GITEX-2015) and at our customer premises.

Further enhancements to this PoC system are also available. As an example, at MWC-2016 Nokia demonstrated a 2 GHz mmWave system using 2x2 MIMO and 64 QAM modulation delivering a peak rate of approximately 15 Gbps.



5G mmWave Nokia Demo @ 73 GHz