5G Fixed wireless Access, technology and performance

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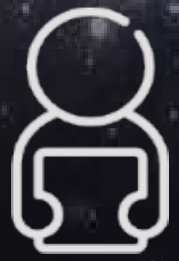
Evolution of Use Cases

4G



Full-length HD movie in seconds

5G

4G

5G

Stop a self-driving car faster

Fixed wireless broadband

Drone Control & Communication

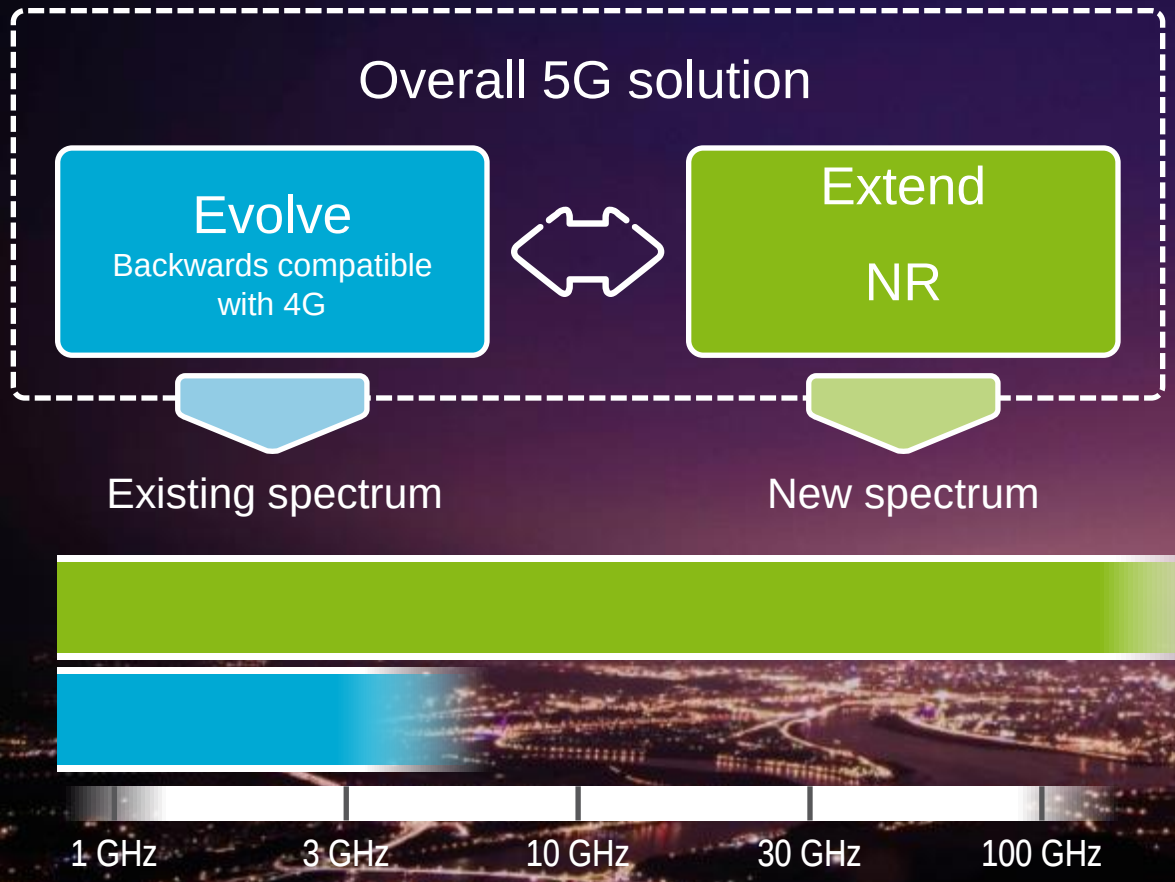
10 Year Battery Life for Remote Sensors

Virtual Reality / Hologram

Remotely Operate Robots

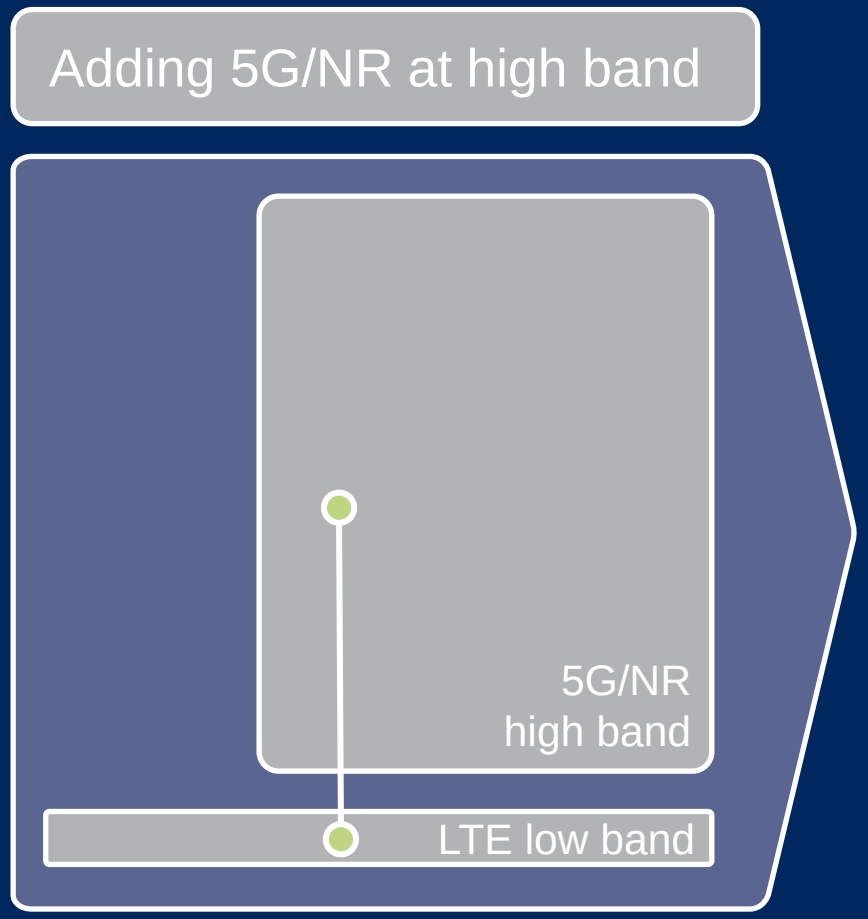
To enable new revenue streams, new business models, new use cases

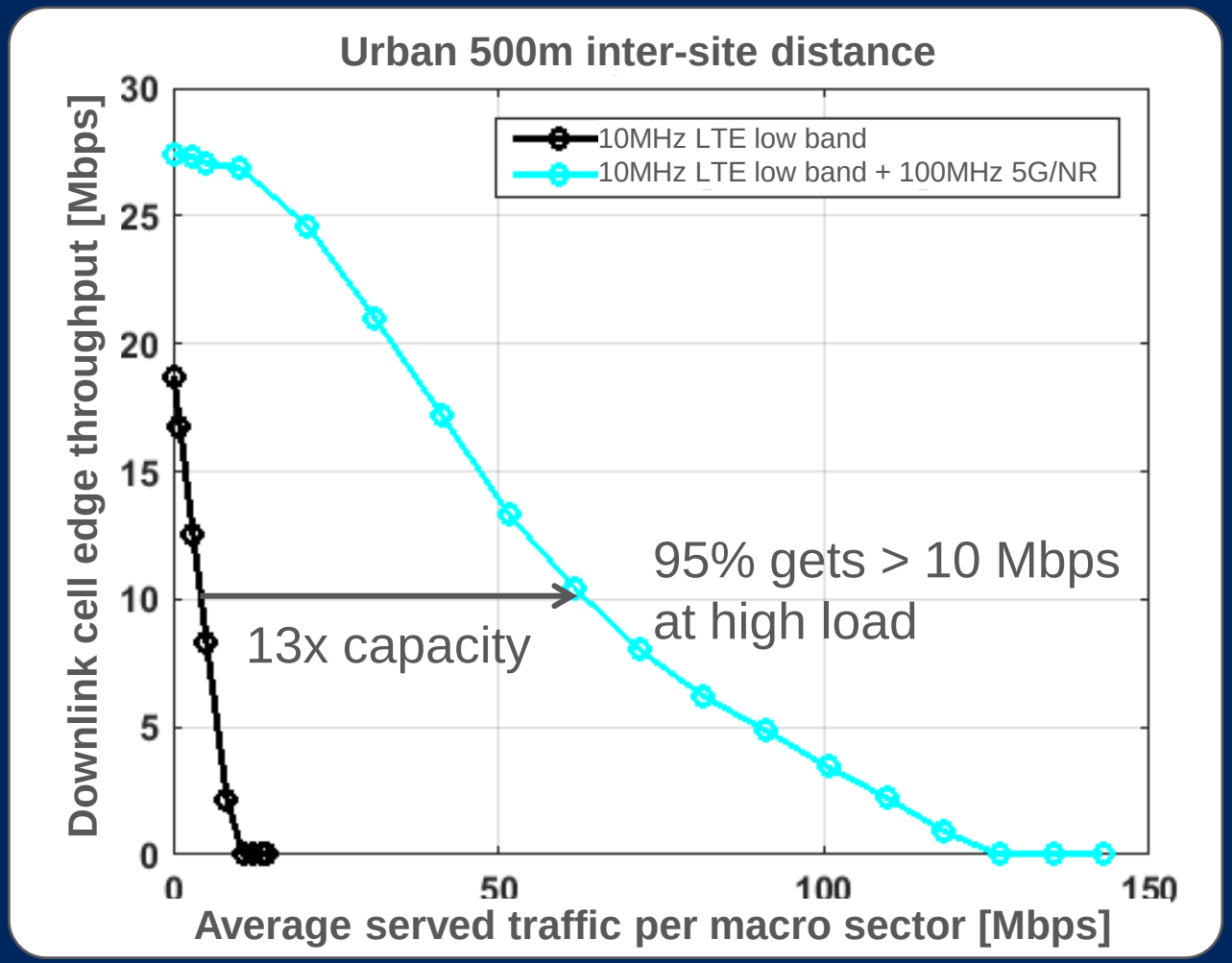
5G Radio Access



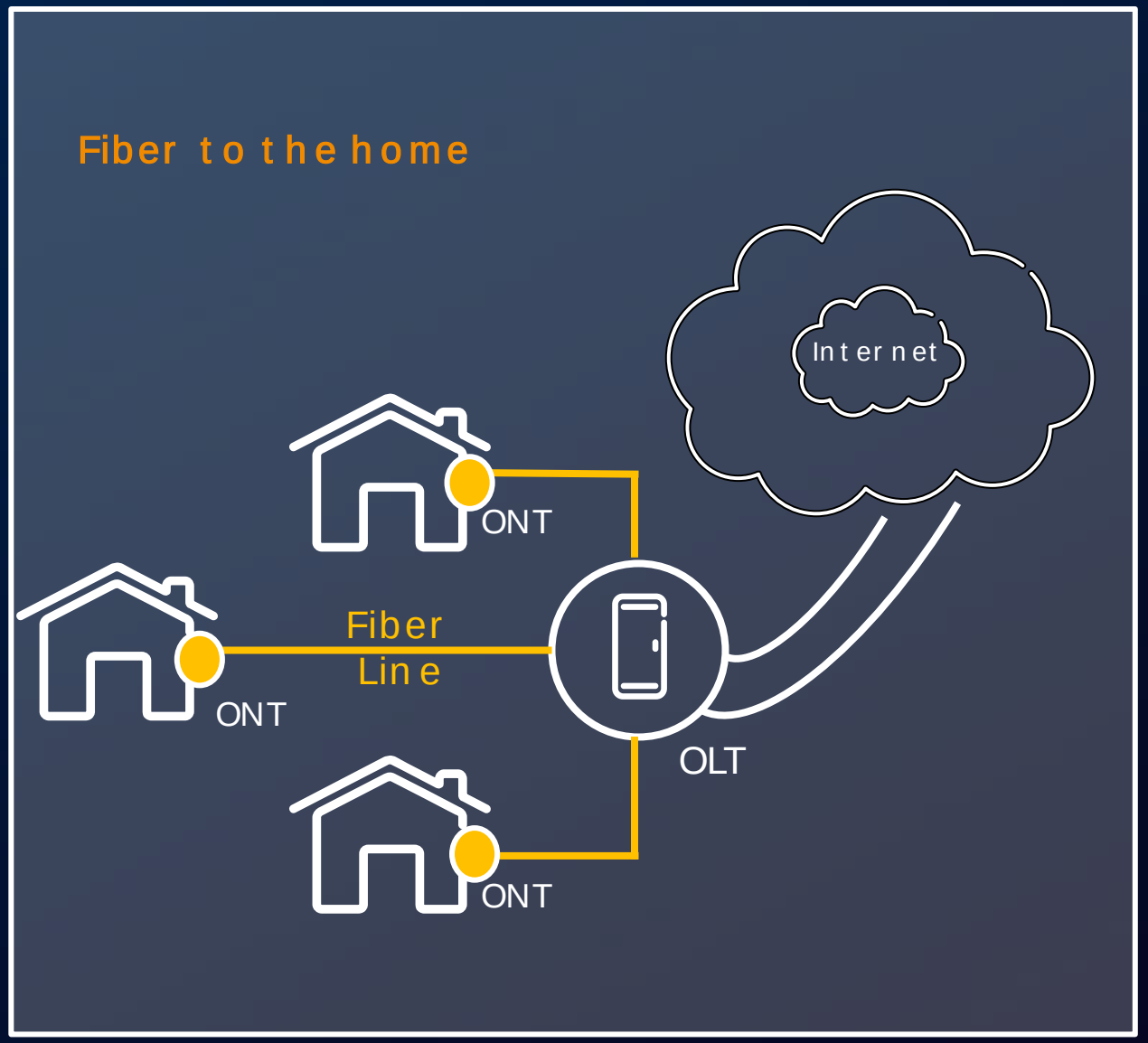
- Evolution of existing technology adding new RAN technology
- Combined allows rapid switching based on radio conditions
- Gradual migration of new technology into existing spectrum
- Flexible connections for multiple services

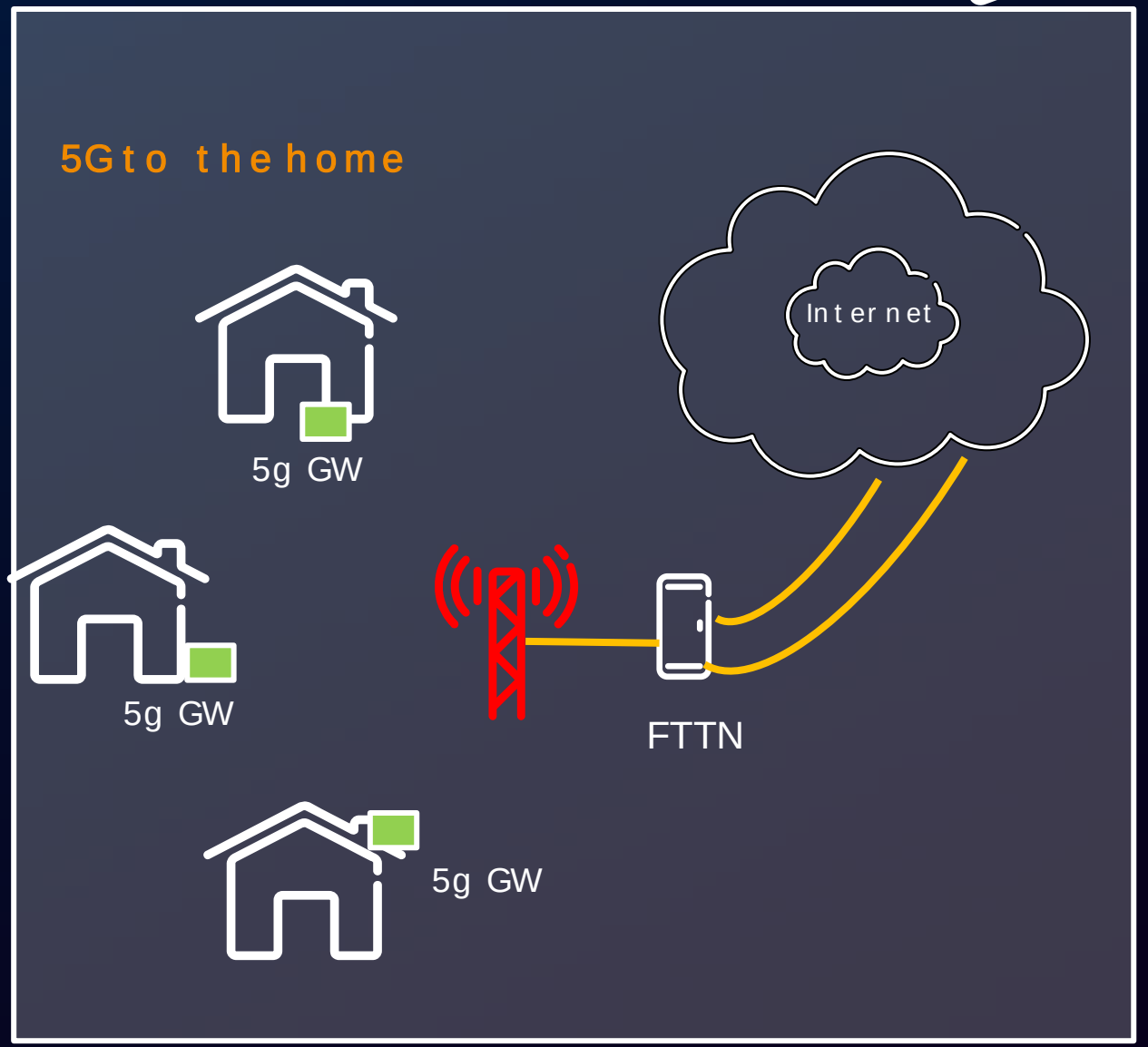
Enhanced Mobile Broadband





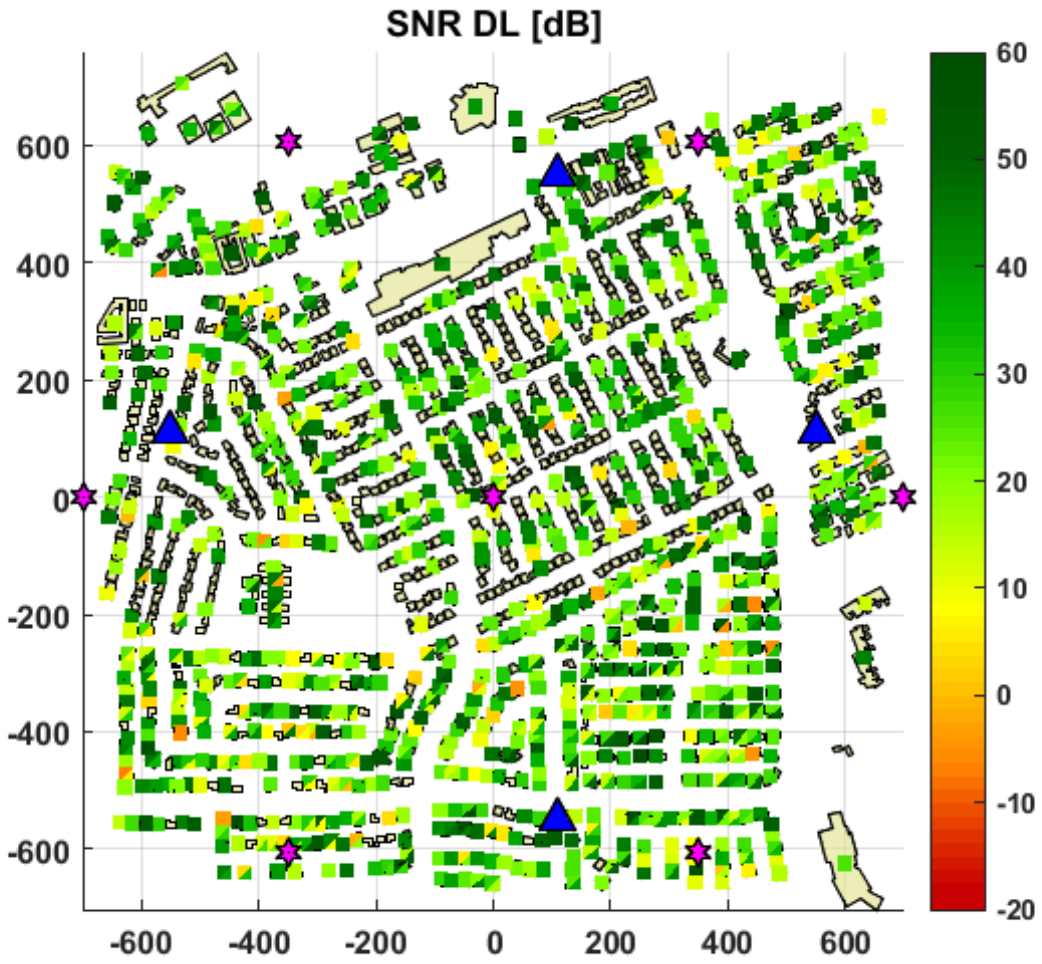
Fixed Wireless Access





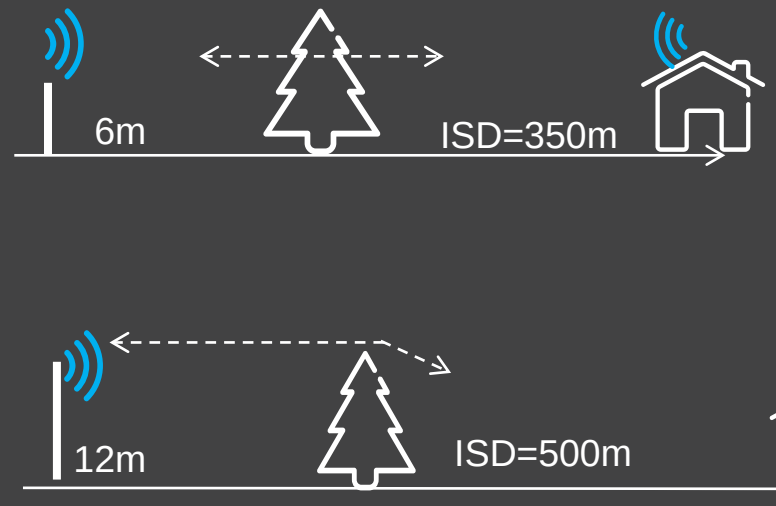
Source: Company Reports

Fixed Wireless Access (28 GHz)

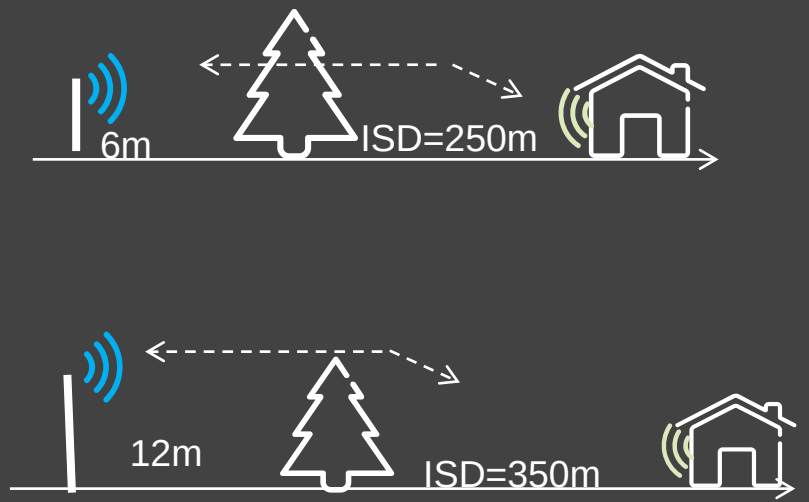


*Results with 200MHz; Cell edge engineered to 100 Mbps

Roof-top CPE

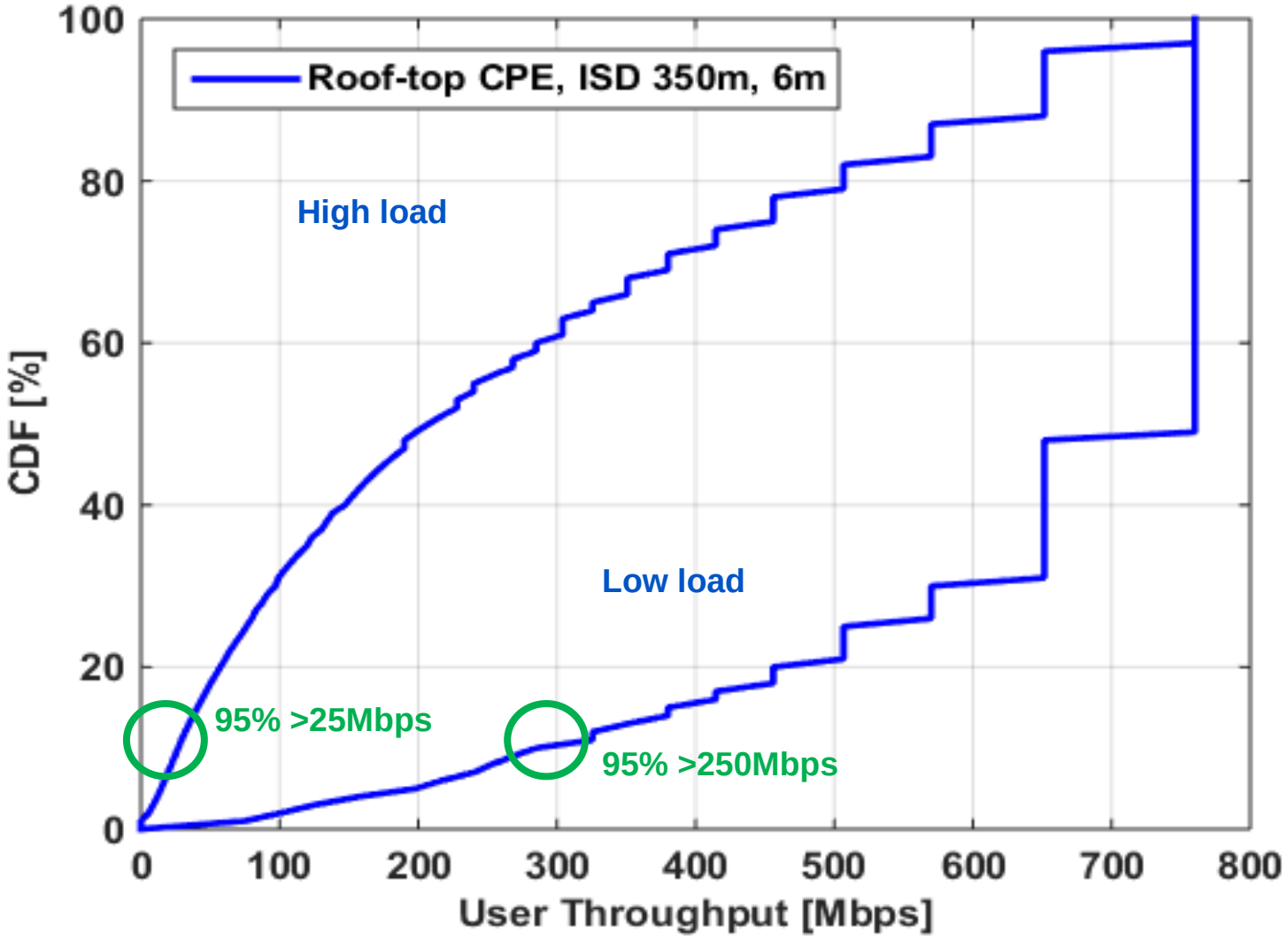


Wall-mounted CPE



Optimum Coverage with Rooftop CPEs, 35 ft. Utility Poles

Fixed Wireless Access Performance



- 200 MHz Spectrum Block
- 100 Mbps Offered Speed / 25 Mbps Busy Hour Household Consumption
- Low Load – Marketed Speed
- High load – Busy Hour HH Consumption
- 90 homes covered
- 18 homes connected

Summary & Conclusions

- Enhanced Mobile Broadband
  - 5G deployment will enhance the existing 4G mobile experience
  - 5G will interwork seamlessly with 4G
  - Coordinating a high band 5G carrier with a low band 4G carrier drives capacity gains

- Fixed Wireless Access
  - 5G will also be deployed for Fixed Wireless Access
  - Can engineer the network for speeds of 100 Mbps to 1 Gbps
  - 5G FWA performance is dependent on base station antenna height and CPE mounting

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