

Boulder County Small Cells Study Session

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Presentation Outline

- Interrelationship between height, density, and emissions
 - Does encouraging colocation or consolidation of towers inappropriately increase RF (radiofrequency) emissions in terms of FCC rules and potential health or environmental impacts?
 - How does the relationship between height, density, and emissions change for macro-towers versus small cell towers?
 - How do carriers monitor their RF emissions?
 - What can the County do to make sure emissions are meeting FCC requirements?
- Co-location: feasibility, analysis guidelines, incentives
 - Should the County be encouraging/requiring silo (or other similar) structures for co-location, particularly for macro-towers?
 - What guidelines should the County use for analyzing and requiring/encouraging co-location?
- Third party verification
 - Is it feasible for the County to use third party verification for every tower application?
 - What types of third party verification services are available?
 - Are third party verifiers able to acquire and analyze data presented by carriers to determine whether carriers' alternative sites analysis is adequate and accurate?

Interrelationship between height, density, and emissions

- Does encouraging collocation or consolidation of towers inappropriately increase RF (radiofrequency) emissions in terms of FCC rules and potential health or environmental impacts?

Answer: No. There are per-band emissions (power) level specifications from the FCC that manufacturers must meet. Co-locating multiple bands on a siting tower does not violate any FCC regulation. The FCC, with many others, have examined the potential for cellular, including 5G health effects and there is no evidence of any scientifically-substantiated cellular/5G health concerns to date (all parties agree more research is beneficial)

- How does the relationship between height, density, and emissions change for macro-towers versus small cell towers?

Answer: For small cells the tower height will be lower (3-15 meters), the density will be greater (small cell every 100m-500m depending upon user density and local regulations), and emissions (transmit power) will be lower (5-10 W Tx for a small cell) versus (50-100 W for a macro site). Note that 5G *small cell* build out is primarily an urban (high user density) mobile broadband provision strategy. In suburban and rural county areas, using current existing cellular infrastructure (1 GHz – 2 GHz) for low-band 5G (<1 GHz) and mid-band 5G (“CBRS” 3.4 – 3.9 GHz) is an option

Interrelationship between height, density, and emissions

- How do carriers monitor their RF emissions?

Carriers have intelligent software reporting and finely-calibrated radios (Tx/Rx power, frequency band, channel plans). Importantly, the FCC regulates and strongly enforces RF emission limits. Any carrier that exceeds transmit power, and is detected, will be subject to extreme penalties and associated loss of market share resulting from consumer (and jurisdictional) backlash.

- What can the County do to make sure emissions are meeting FCC requirements?

Drive tests are easy to perform and provide a decent 1st-level assessment: A user can access the radio Tx/Rx power levels in real-time on Apple and Android cellphones; bring in highly-sensitive equipment only when needed

Can investigate network analytic platforms such as Ookla/Mosaik for lots of detailed cellular 4G/LTE/5G network assessment data (may be a subscription fee)

Mandate (set a standard) that radio vendors must send transmit power reports (carriers have this data) for review/compliance by the County

Co-location: feasibility, analysis guidelines, incentives

- Should the County be encouraging/requiring silo (or other similar) structures for co-location, particularly for macro-towers?

Answer (small cells): Recommend specifying aesthetic guidelines for small cell siting purposes, and, for the co-location of small cell radio transmission equipment on poles in city/county RoW

- Answer (macro-towers):
- What guidelines should the County use for analyzing and requiring/encouraging co-location?

Answer:

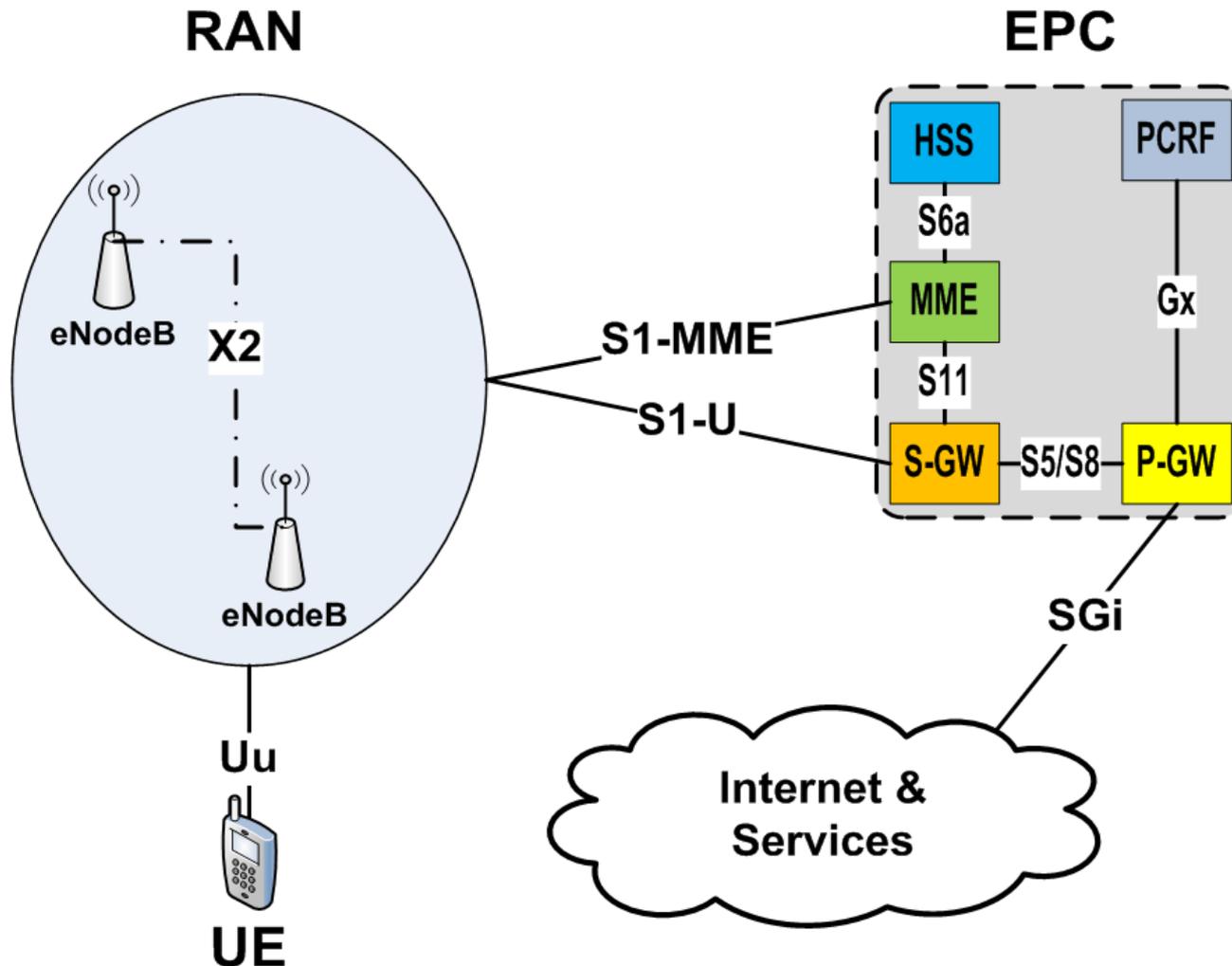
[1] Small cell siting challenges and recommendations Issue date: 13 August 2018, Version: 1.1

[2] Imagining Future Cities: Design Guidelines for Wireless Small Cells in Urban Landscapes, Irena Stevens, University of Colorado Boulder

Third party verification

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Basic LTE Network (CUP DETAILS HIDDEN)



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