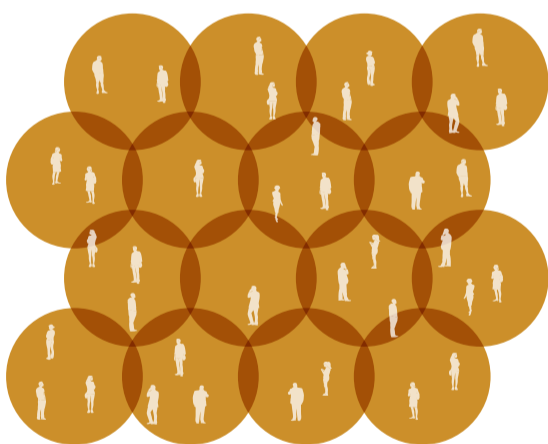


The Value of High-Band Spectrum in a Capacity-Strained Environment

CAPACITY AND FREQUENCY CONCEPTS

- According to former Clearwire CEO Erik Prusch, “2.5 GHz spectrum actually has an advantage over low-band spectrum in dense urban markets because it can carry much more data at higher rates,” which is recognized as a key capability in dealing with increased traffic - Fierce Wireless 1/14/14
- Greater capacity means the network can support more users – and also provide more bandwidth for each user.
- Aggregate capacity is the total capacity of a network across a coverage area.
- The more cells covering an area the greater the aggregate capacity (Shown by size of pipes below).
- In the future, the use of higher frequencies will allow more sophisticated antenna arrays, which will raise spectral efficiency, boost the capacity of each cell site, and allow for faster speeds.
- Higher capacity sites combined with more sites vastly multiplies total capacity

LOW-CAPACITY RURAL DEPLOYMENT

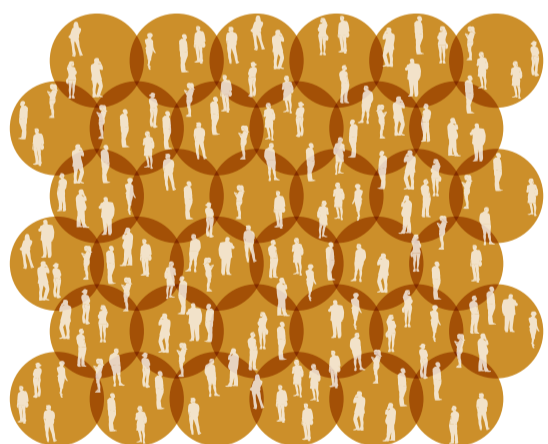


Lower frequencies can only support a small number of users

 RURAL AGGREGATE CAPACITY

- Lower frequency bands enable coverage with fewer cells, but at the expense of capacity.
- Rural networks are typically lower capacity due to less dense populations and lower demand.
- No spectrum crunch in rural areas

HIGH-CAPACITY URBAN DEPLOYMENT



Higher frequencies can support many users



- Most data in the future will flow over higher frequency bands.
- Urban networks are typically higher capacity due to more dense populations and higher demand.
- Urban areas with more user demand experiencing spectrum crunch