What Are These Things and Why Are They Here?

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Network Densification and Het-Nets

macrocells provide coverage
small cells and femtocells
provide enhanced capacity
and data throughput

het-nets
(heterogeneous networks)
allow users (both human and machine) to
access core networks thru
multiple cell layers and/or
technologies based on the
fastest connection
low power antennas
small RRU
fiberglass decorative
radome concealment
unconcealed antenna

weatherhead for utilities routed thru external conduits

equipment cage RRUS, DC suppressor, fiber distribution

optional backup battery

power meter

distribution panel and disconnect switch

no batteries
Strand-Mounted Antennas

deployed by cable companies (often w/o permits, pursuant to franchise)
mostly wi-fi but can support licensed (cellular) bands

Cincinnati Case Study

• diverse neighborhoods
• historic resources
• narrow streets/sidewalks
• significant economic development occurring
  • revitalization
  • new businesses opening and moving to Cincinnati
  • rising property values
no ROW facilities regulations or oversight in place
• facilities "appear" overnight
• haphazard installations
• noisy equipment near residences and businesses
• new poles placed in inconvenient locations

Collaborate with Stakeholders on a Standardized Design Menu
Evaluate Appropriate Locations for Various Designs

green zones mean that the City generally requires only an encroachment permit for a pre-approved design

yellow zones mean that the City will subject all projects to a zoning-type discretionary review

red zones mean that the City will not approve any design that involves a wood pole (existing or new)

Lessons Learned

• process incentives (and disincentives) work
• common ground can be found
• time-to-market and certainty in the process motivates the carriers to compromise
• engage stakeholders early and often