IoT – Smart City Small Cells

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Overview

What is a Small Cell?

Why do we need them?

What if we don’t build them?

Where do we need them?

What’s the general process?

What does the construction look like?

What are the barriers?

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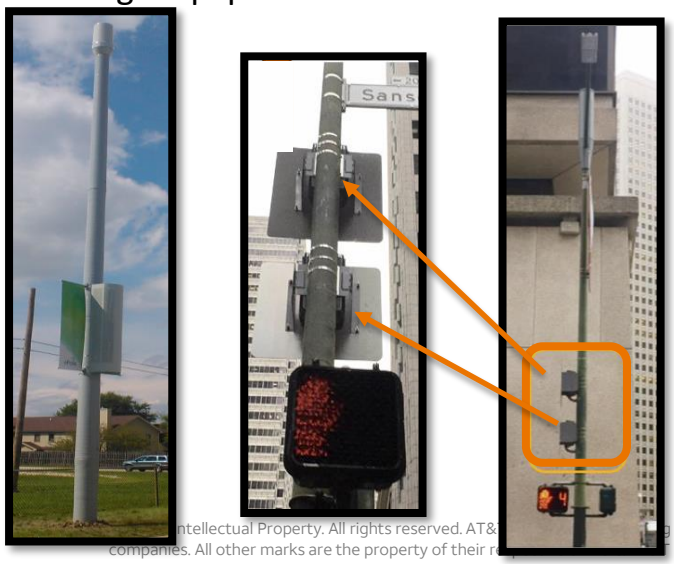
What is a Small Cell?

Hidden Equipment: External Variations

Hidden Equipment: Internal View

Behind Sign Equipment:



Behind Sign: Side View

Have you seen a Small Cell?

Small Cells are:

- Low Profile
- Compact
- Scalable
- Unobtrusive
- Low Power Output

What is a Small Cell Network?

- Provides capacity and increased connectivity speeds data consumption

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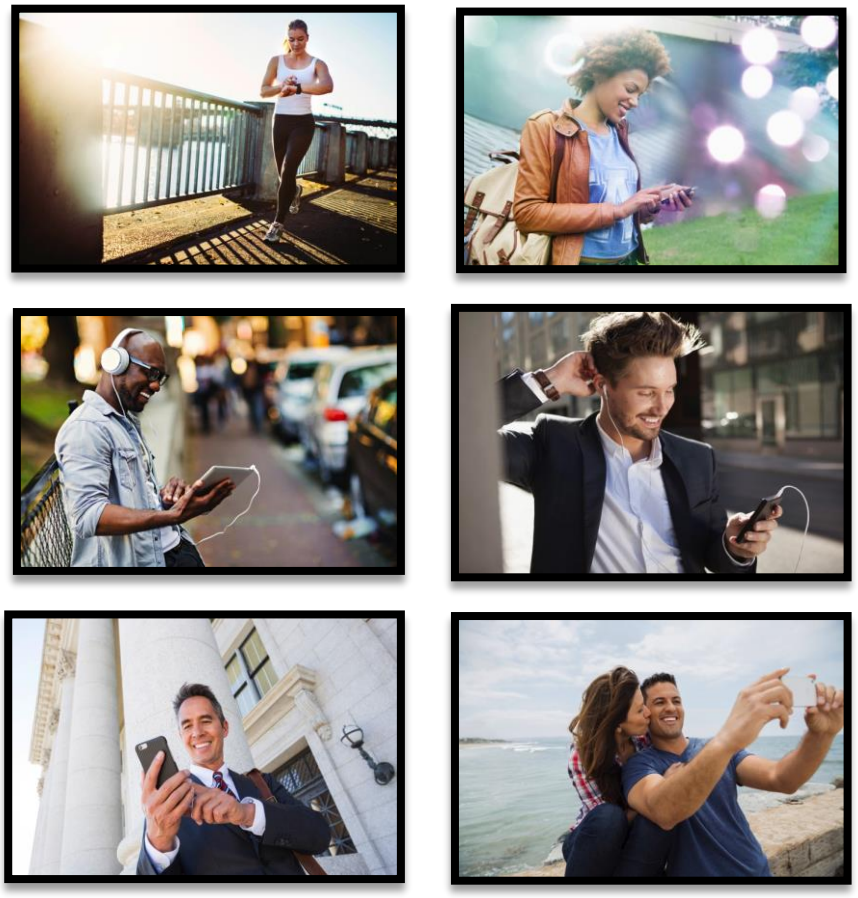
Why do we need them?

- Growing demands for data consumption
- Prepares the network for next generation of technologies
  - Path to 5G
  - Internet of Things
  - Smart Cities
  - Spectrum exhaust
- Increased Capacity and Speed
  - Offloads data from Macro
  - Improves Macro Performance
  - Supplements 4G services



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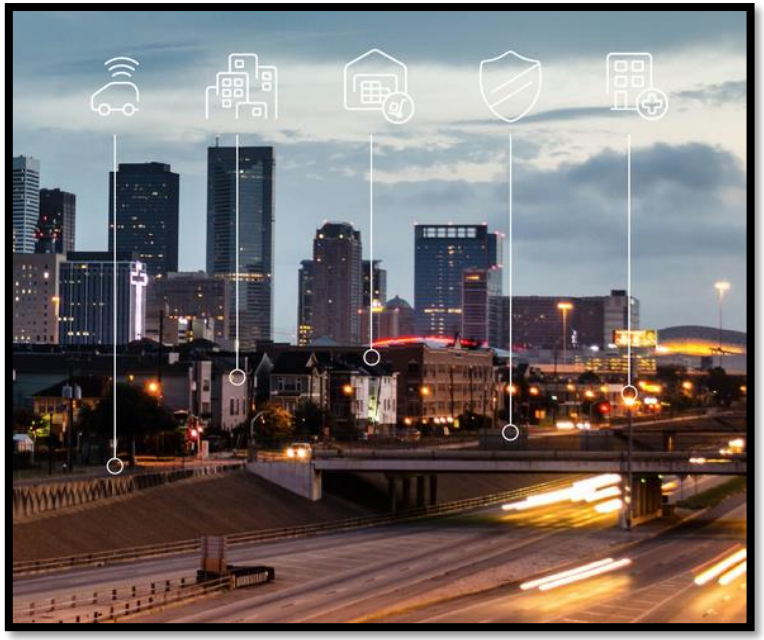
What if we don't build them?

- Macro towers will be overloaded:
  - Slower speeds
  - Bad connections
  - Internet of Things and Smart City Smart grid undeployable
- Unable to meet/keep up with the rapid data needs of today



Click Image for IoT – Smart City Video

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Where do we need them?

- Urban
  - Smart Cities
  - Densification
- Suburban
  - HotSpots
  - Events

- Rural
  - Coverage for underserved Communities
  - Disaster Recovery
  - Agricultural
  - Transportation:
    - Services for passengers
    - Operational needs
      - Shipping
      - Aircraft
      - Trains

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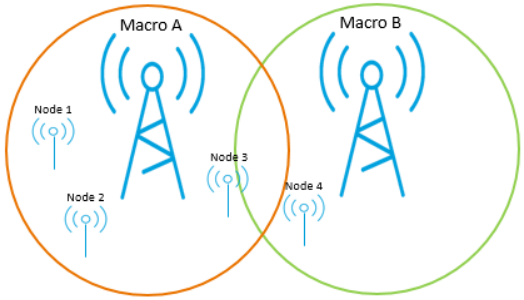
What's the general process?

Determining Factors:

- Capacity needs
- Network HotSpots
- Municipal Requirements
- Node availability
  - 1st Choice – Utility Pole in Right of Way
  - 2nd Choice – Municipal Street Light
  - 3rd Choice – Municipal Traffic Signal Pole
  - 4th Choice – Building (side mount)
- Cost of build

Node Process:



- RF provides RF Interaction Data for Node to Macro
- Data Gathering and Planning
- Review Data and Potential Locations for Final Hubs
- All Parties Final Approve
- Build & Integrate

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What does the construction look like?

Transport – 3 types:

- Overhead

- Underground

- Microwave

Placing a NEW pole: 3 days

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What are the Barriers?

- Antenna Ordinances, Zoning Issues, Permits
  - Prohibitions on placement in ROW or on muni poles
  - Deployment restrictions, like minimum separation distances
  - Build new vs alter current pole
  - May need to go through beautification board
  - Applications/Permitting time consuming, due to detail required
- Agreement Issues (ComED, WE Energies, etc)
  - Attachment Fees
- Regulatory Delays
- Cost

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