Bridging the Digital Divide
DOT Right-of-Ways

SASHTO Conference- Savannah- August 20, 2019

KCI

THE MOST INCREDIBLE THING
WE'VE ENGINEERED IS OUR TEAM

What's the Digital Divide?

- Gap that exists between communities that have access to broadband services and communities that do not have access.

- The FCC's 2018 Broadband Deployment Report labeled **24 million U.S. households** as lacking their definition of high-speed service — 25 Mbps for downloads and 3 Mbps for uploads.

- 2019 report by Microsoft put that figure at **162.8 million U.S. households**.

Why should we care?

Broadband services are no longer a luxury:

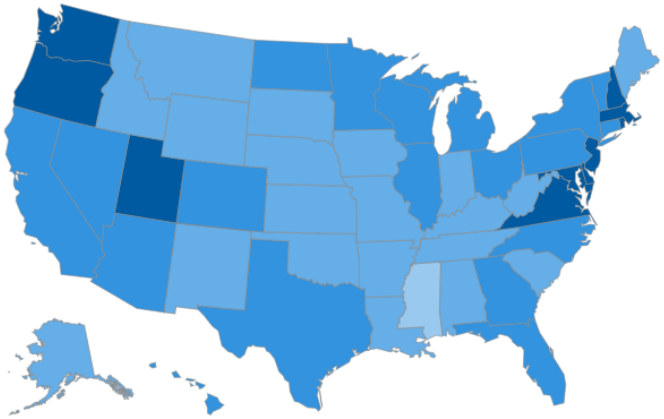
- Essential component of our critical infrastructure.
- Key to economic vitality.
- Supports the health, safety and prosperity of our communities.

Building the Case

Microsoft

Counties with the highest unemployment rate have lower broadband usage

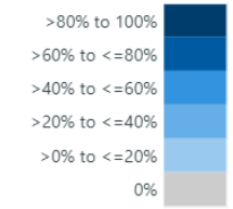
49.5%	Broadband usage
47.6%	10 counties with the lowest unemployment rate
20.2%	10 counties with the highest unemployment rate
-27.4%	Difference



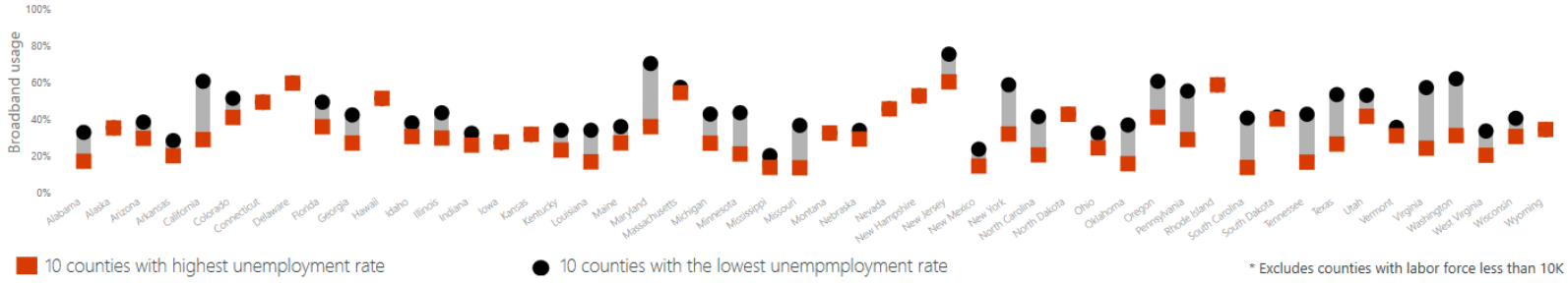
FCC broadband availability

Broadband usage

Broadband usage by state



Average broadband usage based on Microsoft data



* Excludes counties with labor force less than 10K

Data sources: FCC 2018 Broadband Report, Bureau of Labor Statistics, and Microsoft data;
Crandall et al. (2007) – Brookings Institution; Thompson and Garbacz (2009) – Ohio University; Gillett et al. (2006) – MIT; Shideler et al. (2007) – Connected Nation; Crandall et al. (2003) – Brookings Institution; Atkinson et al. (2009) – ITIF

Broadband Delivery Options

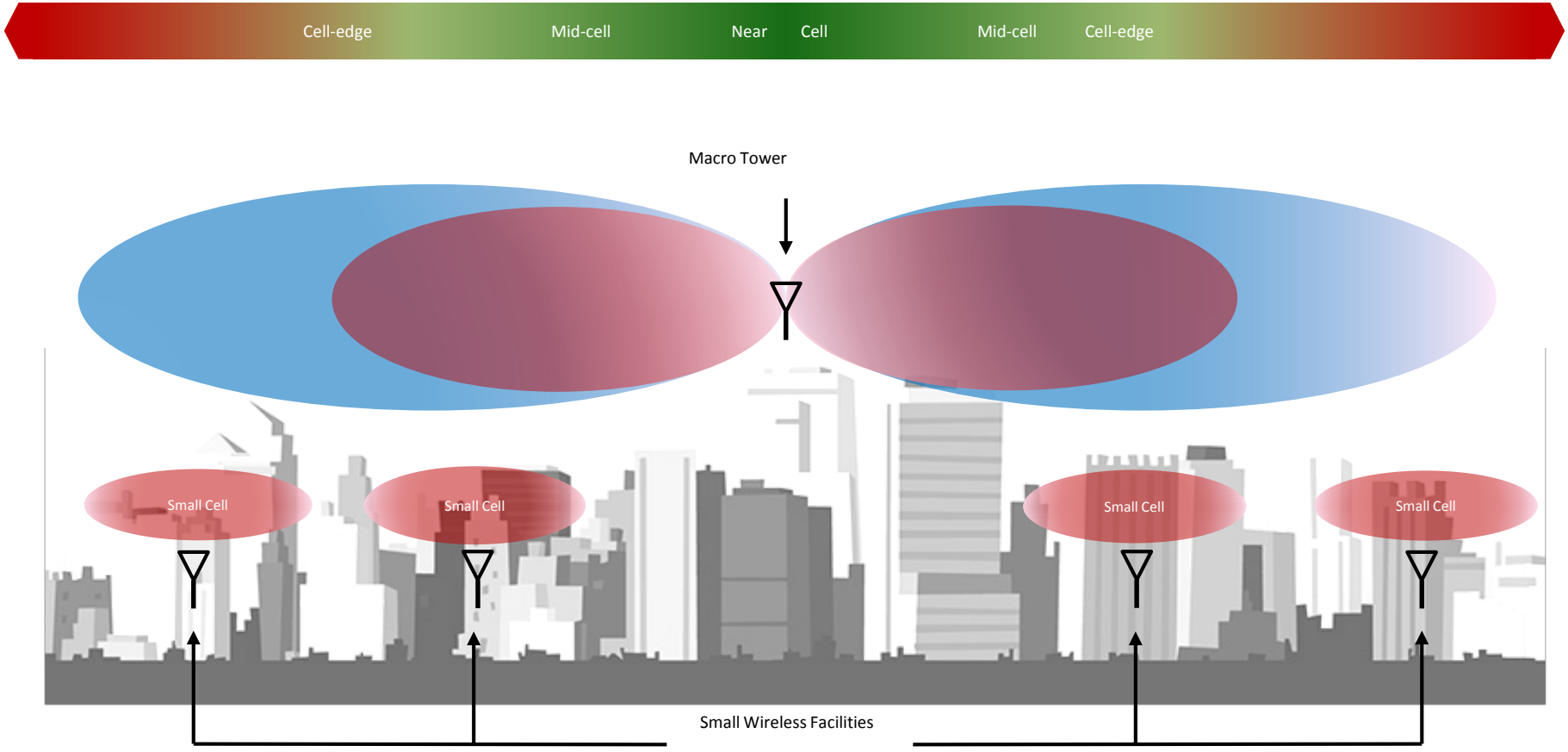
- **DSL (Digital Subscriber Line):**
  - Transmit data over copper telephone lines.
  - Speed less than 15 Mbps.
- **Cable Services- Coaxial cable:**
  - 15 Mbps to 150 Mbps.
- **Fiber to the Home (FTTH):**
  - Up to 1,000 Mbps.
- **Wireless:**
  - Mobile-to- Mobile: Wireless Service Providers- AT&T, Verizon, Sprint, T Mobile, etc….
  - Fixed Wireless- Wireless Internet Providers (WISP)- 2,000 providers with average of 1,200 customers.

M2M- Wireless Technologies

- **Macro - Umbrella Coverage**
  - Traditional towers and roof top installations
  - Ground mounted equipment
  - Signal covers large geographical area
  - Provides overlay network; emergency power backup

- **Small Cells-Capacity**
  - New smaller installations less than 50’
  - Pole mounted equipment preferred
  - Closer to customer, thus smaller footprint
  - Capacity offload for network; no emergency power backup

Macro / Small Cell Network



Macro Monopoles

Small Cells

What's Needed to Bridge the Divide?

- **Infrastructure:**
  - Fiber and antennas.
- **Real Estate:**
  - Location, location, location…..
- **Capital:**
  - Investment not seen since 1940's & 1950 (REA).
  - Private and public funding.

Objectives of Wireless Industry

- Predictable results- established processes.
- Speed to market; shot-clock timelines.
- Reasonable development and reoccurring costs.
- Opportunities to deploy **small cell** technologies.

Why Public Right-of-Ways?

- Location, location, location….
  - Close to the customers; businesses, residents, and vehicular traffic.
- Similar types of infrastructure.
- Numerous collocation opportunities.
- Access to fiber and power.

Regulatory Changes

- **FCC Order 11-50 (April 7, 2011)- Impacts Utilities:**
  - Wireless guidelines for attachments to **utility poles**.
  - Established review timelines and fees.

- **FCC Ruling (September 27, 2018)- Impacts DOT's:**
  - Application Review:
    - 60 days collocations.
    - 90 days for new structures.
  - Application Fees:
    - Collocations- $500 per application, up to five locations, and $100 for each beyond five.
    - New Pole- $1,000 per application.
    - "or" cost based, "reasonable approximation of costs".
  - Reoccurring Fee:
    - $270 per year for both collocation or new pole.
    - "or" cost based, "reasonable approximation of costs".

FCC September Ruling- More

- Fees must be nondiscriminatory and represent a reasonable approximation of costs.
- Aesthetic requirements must be reasonable and nondiscriminatory.
- Unlawful to require that small cells be placed underground.

Importance of Public ROW's

- **Coverage vs. Capacity:**
  - **Coverage**- If wireless coverage does not exist, macro towers are the most economical means of providing coverage to large geographic area. Cloverleaf locations are great opportunities.
  - **Capacity-** Small cells make sense to complement areas where coverage is marginal and needs to be improved, such as areas with concentrated populations; libraries, post offices, churches, gas stations, and busy intersections.

- **4G (Existing Technology) vs. 5G (Emerging Technology):**
  - 4G is already deployed in rural areas and needs to be supplemented with both macro and small cell installations.
  - 5G is just now being launched in dense urban cities. Ultimately, 5G will make it to rural areas in the future.

- **Broadband vs. Mobile-to-Mobile:**
  - **Broadband**- It is important to provide access to the internet for homes and businesses.
    - Wireless and hardwired- copper and fiber.
  - **Mobile-to-Mobile**- Wireless connectivity is critical for emergency services, travelers, industry, businesses, and families.

Lessons Learned

- **Wireless industry knows nothing about right-of-ways!!!**
- **Confusion between local, state, and federal guidelines.**
- **Collaborative efforts are the key to a successful outcome.**

Conclusion- Protect Your ROW!

- **Wireless design guidelines must be based on best practices- safety is paramount!**
- **Look for common goals.**
- **Create efficient application processes.**
- **Establish RF safety guidelines for workers.**

Questions

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