New Wireless Communication Technologies and Their Impact on Communities

Delivered to the American Planning Association Pennsylvania Chapter

October 21, 2019

New Wireless Technologies

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New Wireless Technologies

C

New Wireless Technologies

So, too, have wireless networks

New Wireless Technologies

- ✓ Introduced in 1991
- ✓ First time voice and data go “digital”
- ✓ Introduced “texting”

New Wireless Technologies

- ✓ Introduced in 1998
- ✓ Download speeds of 2Mbps

New Wireless Technologies

- ✓ Introduced in 2008 as “LTE”
- ✓ Greater download speeds of 100Mbps

New Wireless Technologies

- ✓ **Benefit:** Download speeds of up to 1 Gbps = faster, higher-quality video and multimedia content
- ✓ **Benefit:** "Smart Homes" and "Smart Cities" as part of the Internet of Things (IOT)

Massive Growth in Mobile Data:

- Mobile data traffic continues to grow at an incredible rate according to Cisco*
  - ✓ Global mobile IP traffic will reach 4.8 Zettabytes (ZB)/year by 2022

*Cisco Visual Networking Index: Forecast and Trends, 2017–2022 White Paper, (REV 2/27/2019)

Imagine 1 Library of Congress

Containing 39 million books covering 838 miles of shelves

= 15 Terabytes (TB) of data

NOW Imagine 1 Library of Congress

For every Man, Woman and Child in the U.S.

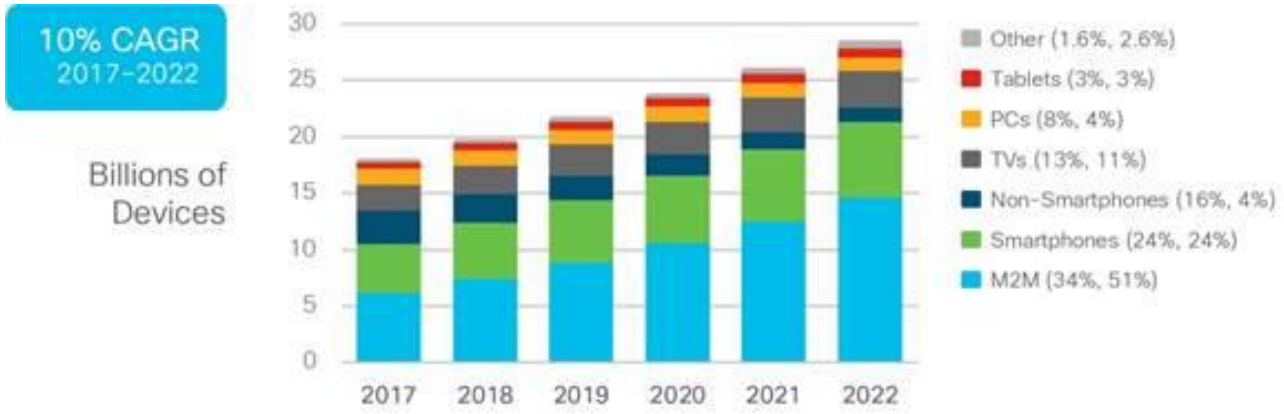
= 320 million Libraries of Congress = 4.8 ZB

Massive Growth in Mobile Data:

- Mobile data traffic continues to grow at an incredible rate according to Cisco*
  - ✓ Global mobile IP traffic will reach 4.8 Zettabytes (ZB)/year by 2022
  - ✓ In North America, mobile IP traffic will reach 1300 Exabytes (EB)/year = 87 million Libraries of Congress worth of data by 2022!
  - ✓ The number of mobile-connected devices per capita will reach 13.4 by 2022
  - ✓ That's an increase of 67% from 2017

*Cisco Visual Networking Index: Forecast and Trends, 2017–2022 White Paper, (REV 2/27/2019)

Massive Growth in Connected Devices:



* Figures (n) refer to 2017, 2022 device share

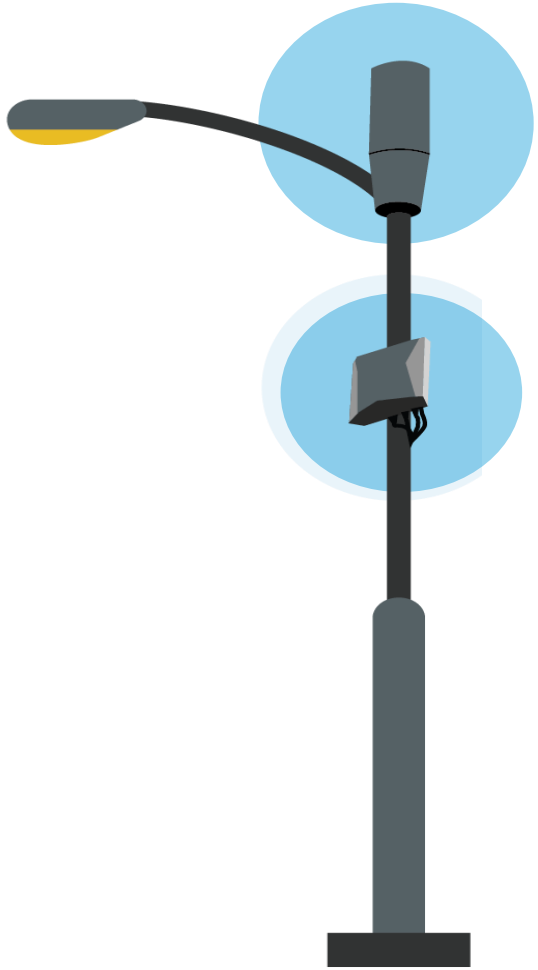
Source: Cisco VNI Global IP Traffic Forecast, 2017–2022

- ✓ M2M applications (smart meters, video surveillance, healthcare monitoring, etc.) are growing the fastest, at 19% annually
- ✓ By 2022, M2M connections will account be 51% percent of the total devices and connections with 14.6B connections
- ✓ Smartphones will grow the second fastest, at 9 % annually, to 3.2B devices by 2022

What are Wireless Carriers doing?

- ✓ Deploying new Macro Cells
- ✓ Adding Capacity to Existing Sites
- ✓ Deploying Small Cells

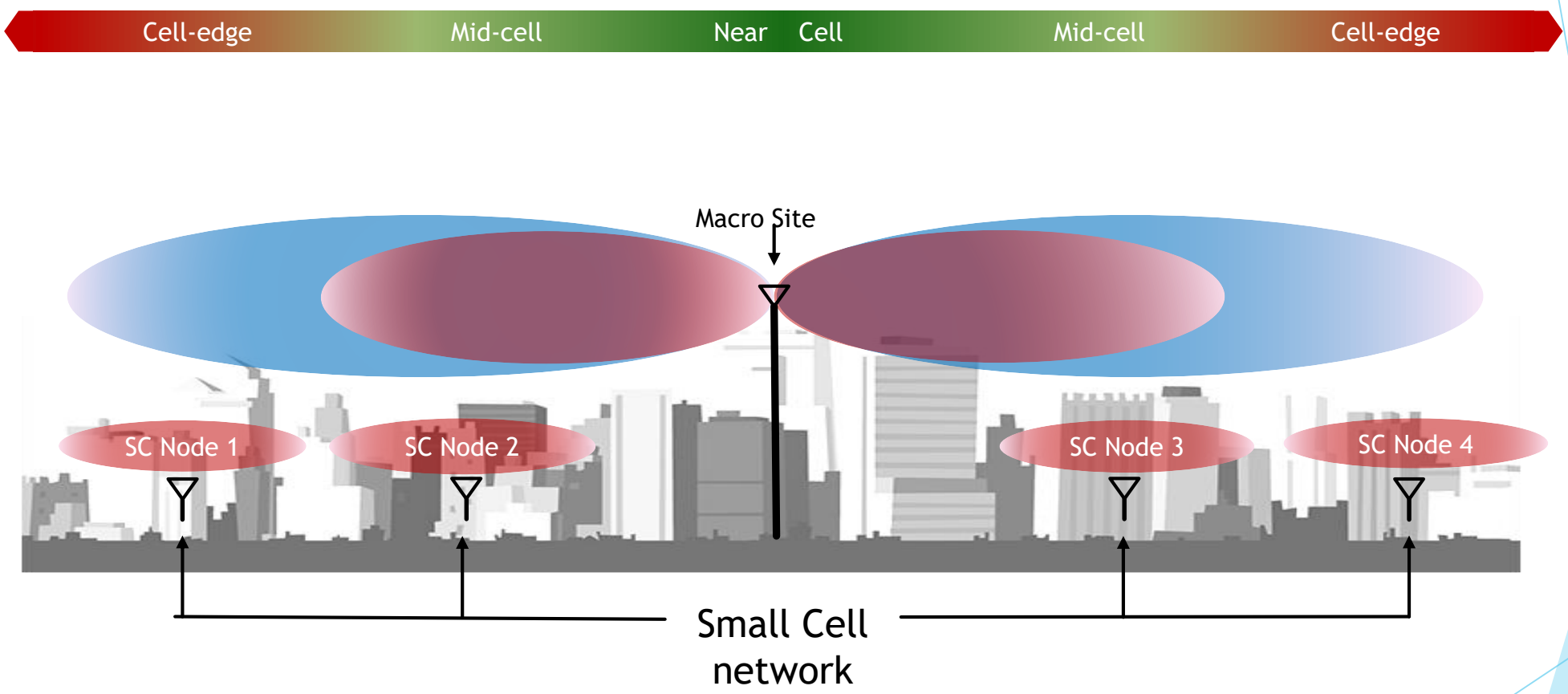
What is a Small Cell?



- ✓ A mini-network of smaller, low-power antennas distributed throughout an area, which are designed to provide coverage over the same area as a single higher-power cell site located much higher above the ground

- ✓ Addition of more antennas at a lower height = More reliability

Macro Site vs Small Cell “Nodes”



What are the benefits of Small Cells?

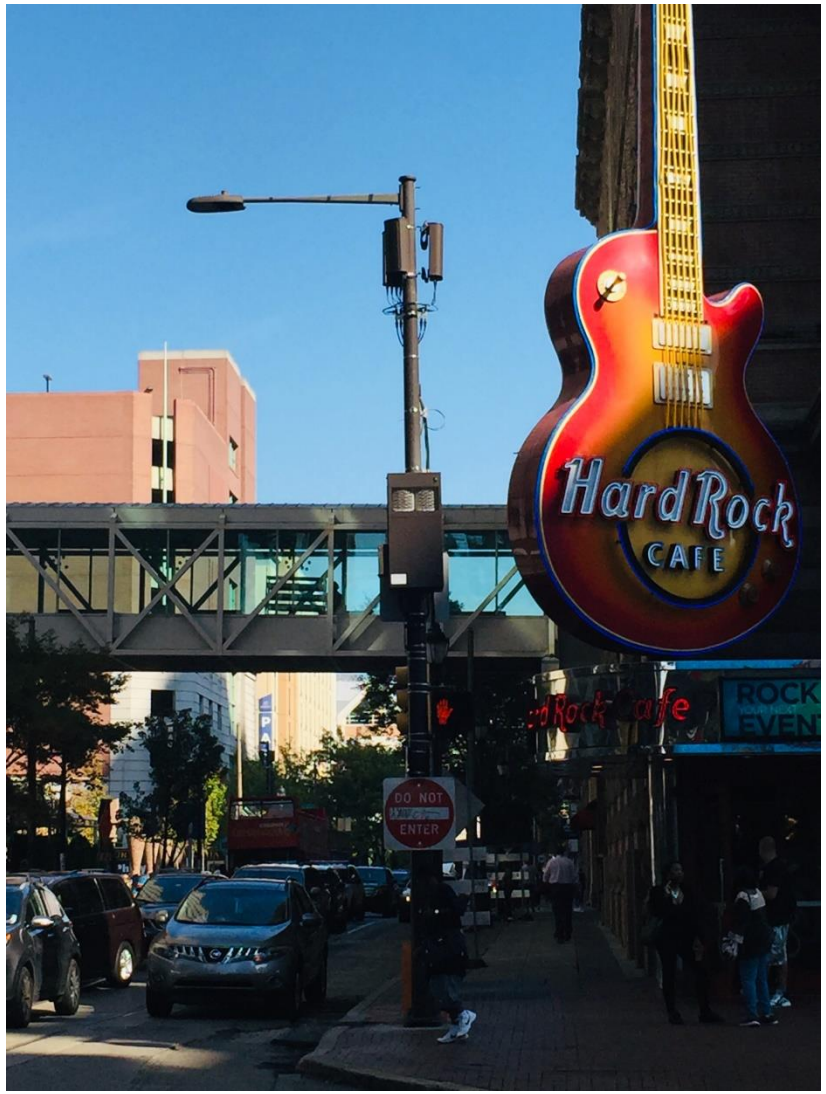
- **NOW:** Primarily intended for capacity offload and coverage in difficult service areas
- **FUTURE:** To serve as the platform for 5G technology

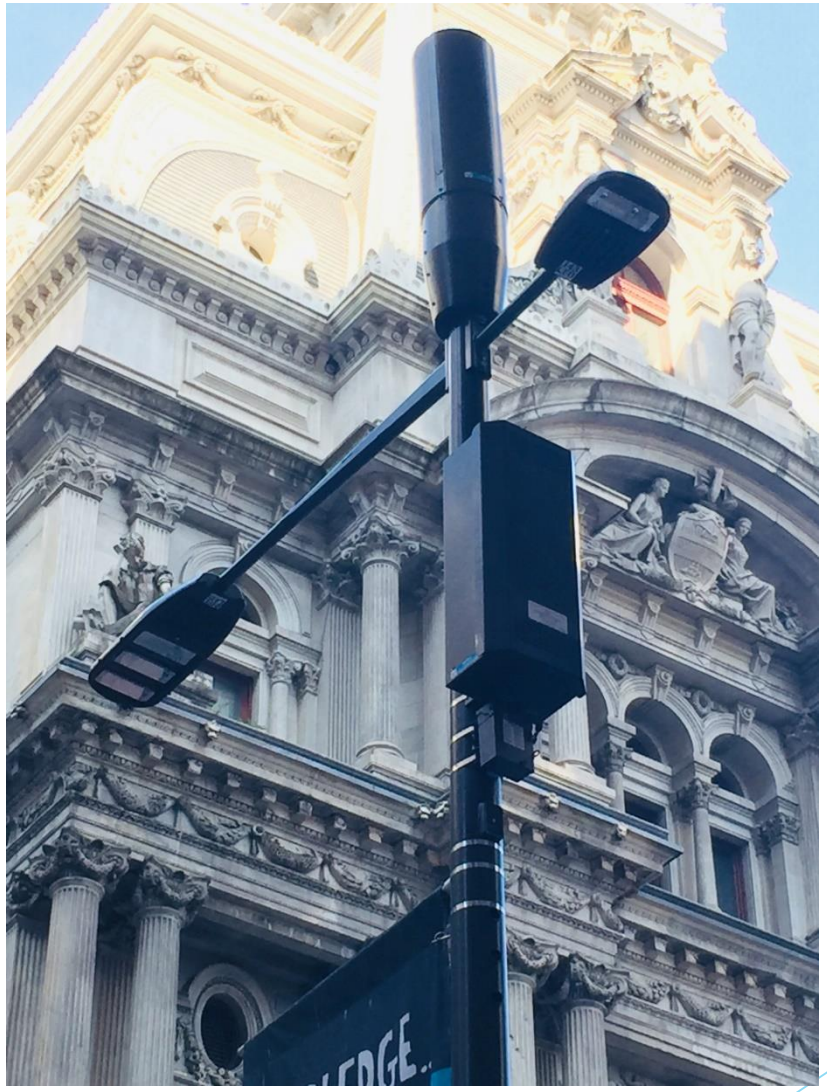
What are the benefits of Small Cells?

- Node locations are targeted to specific locations
  - ✓ Antenna height: 30 to 50 foot
  - ✓ Low power compared to a macro
  - ✓ Coverage radius of 500 to 1,000 feet
- Different Equipment Needs
  - ✓ Smaller Antenna
  - ✓ Fewer Cabinets
  - ✓ Modular Design

What does a small cell look like?

- Antennas are mounted on existing utility poles, street lights, traffic lights and other existing structures in the public ROW, when and where possible


Hard Rock
CAFE
DO NOT
ENTER



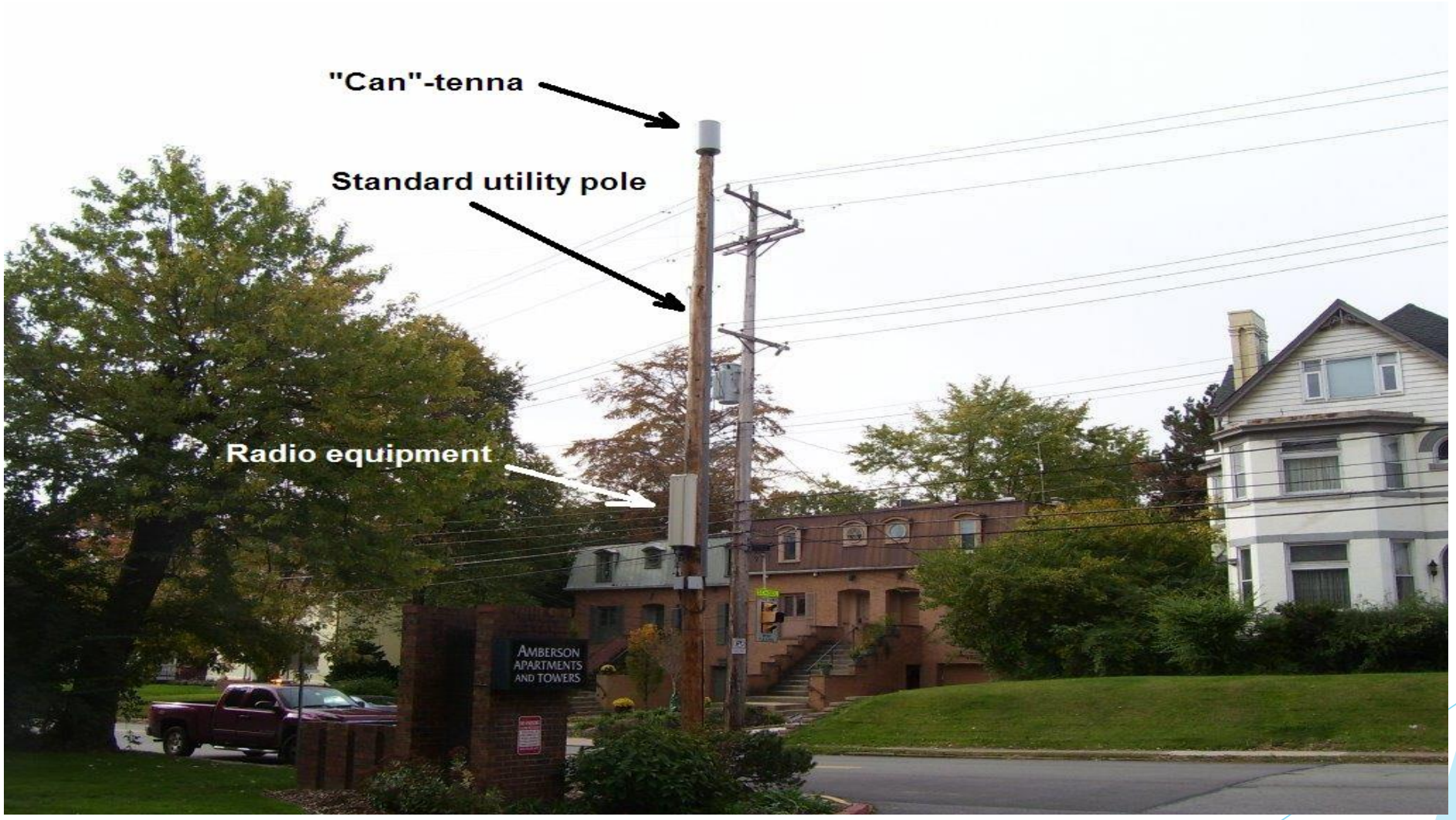

SHOPPING PLACE


15th


OMNI ANTENNA
15th
RRHs in BASE


AMBERSON
APARTMENTS
AND TOWERS


AMBERSON
APARTMENTS
AND TOWERS

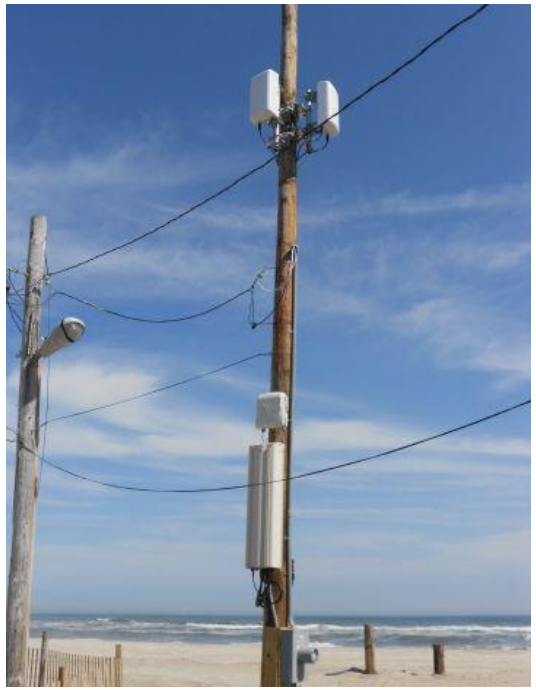

"Can"-tenna
Standard utility pole
Radio equipment
AMBERSON
APARTMENTS
AND TOWERS

Tough to call these installations ‘towers’

So, how do you regulate these facilities ?

- Are they “public utility” facilities?

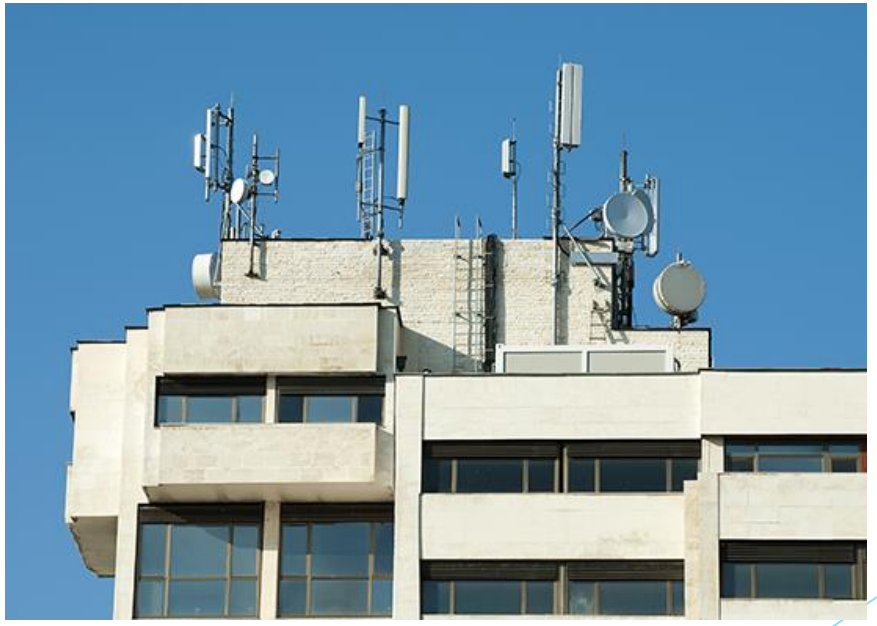
vs.



So, how do you regulate these facilities ?

- Are they “wireless communications” facilities?

OR



There certainly is a need for regulation

Federal Laws & Regulations

Telecommunications Act of 1996

Federal Law

47 U.S.C. §332: State and local regulations **UNLAWFUL** which:

(a) **"Effectively prohibit"** ability of wireless providers to provide telecommunications services

(b) Unreasonably discriminate among providers of **"functionally equivalent services"**

✓ Preserves general authority to state and local governments on siting decision for cell sites

✓ 3rd Circuit Court of Appeals: Providers have right to cure **"significant gaps"** in coverage by the **"least intrusive means"**

Key Take Away:

State and Local governments are the primary decision makers.

Among other things:

- ✓ Changes standard of "effective prohibition" to make unlawful regulations that "**materially inhibit**" deployment of wireless services
- ✓ Requires fees to be a "**reasonable approximation of municipal costs**"
- ✓ Establishes "**presumptively reasonable fees**"
  - ✓ $500 for "Non-reoccurring fees" up to 5 apps
  - ✓ $100 for each additional app over 5
  - ✓ $1,000 for non-reoccurring fees for new pole
  - ✓ $270 annual "reoccurring fees" for ROW use
- ✓ Guidance established on **aesthetic controls**
- ✓ **New "shot clock"** for small cell applications:
  - ✓ 60 days for collocation applications
  - ✓ 90 days for new facilities

State Laws and Regulations

2012

PA WIRELESS BROADBAND COLLOCATION ACT

(ACT 191)

Among other things:

- ✓ Collocation applications that do not amount to **"substantial changes"** to **"existing facilities"** to be reviewed administratively as a building permit
- ✓ **Limits review fees** to no more than $1,000
- ✓ **"Deemed approval"** remedy for failure to act on qualifying application within 90 days
- ✓ However, **Act 191 fails to address deployments in the public ROW**
- ✓ That will be left to new state legislation

2019

PENNSYLVANIA HB 1400

- ✓ Re-introduced for the 2019-2020 legislative calendar by Rep. Frank Farry (Bucks)
- ✓ Concerned with deployment of small cells within the public ROW
- ✓ Over half of the states have similar legislation

2019

PENNSYLVANIA
HB 1400

Among other things:

- ✓ Maintains local authority over many siting issues
- ✓ Provides protections for historic districts, decorative poles and underground utility areas
- ✓ Establishes uniform fees on a statewide basis (with escalators) and limits “batched” applications for collocations
- ✓ Requires providers to fix ROW damage, or suffer financial penalties and stay on future approvals
- ✓ Provides enhanced safety provisions

HOW SHOULD A MUNICIPALITY DEAL WITH REGULATING SMALL CELLS MOVING FORWARD?

There is a better way – A simpler, easier way to administer wireless siting issues

- Communities can increase their options and encourage thoughtful wireless network build-outs by **examining the permitting processes** to streamline or simplify the process
- **Adopt a clear and balanced local ordinance** which deals with modern siting technology (macro, small cell and DAS)
- Working with county, municipal and planning groups, **a model ordinance has been developed** that is designed to provide a simplified, but comprehensive, municipal tool for regulation of wireless deployment consistent with the needs of current wireless technology and applicable federal and state laws

The model ordinance was a public-private collaboration based on service realities and community sensibilities

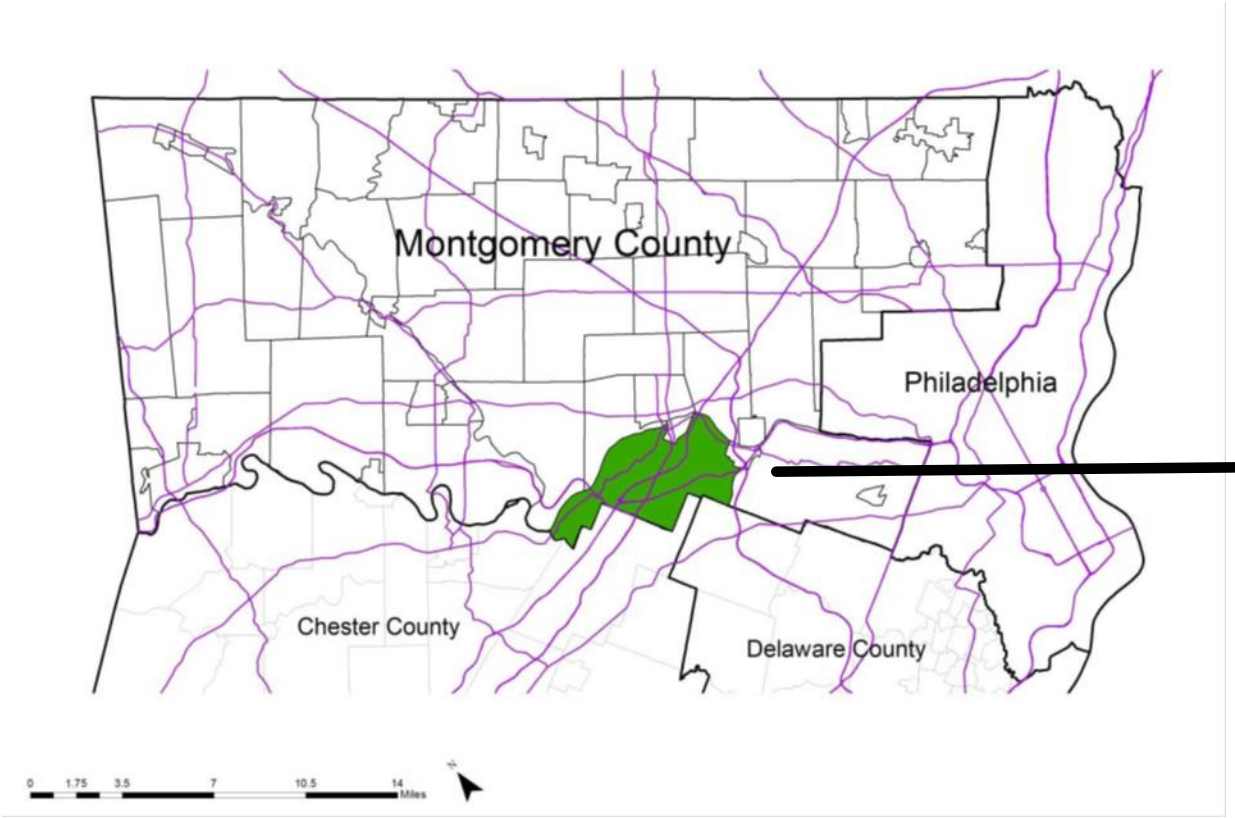
- The template, based on work begun by the Cumberland County Planning Dept., was carefully crafted to be consistent with current federal and state laws and regulations governing wireless broadband deployment, including the FCC “Shot Clock” Order, the recent FCC Broadband Ruling, Section 6409(a) of the Spectrum Act, and even the Pennsylvania Wireless Broadband Collocation Act (Act 191)
- Covers the current, developing technologies of small cells, micro-cells and DAS, while still preserving siting regulations over large-cell site installations
- Can be tailored to meet the municipality’s particular siting policies and priorities

Available at NO CHARGE

The model ordinance is available through the Cumberland County Planning Department

https://www.ccpa.net/DocumentCenter/View/23552/WCF_PSATS-Ordinance-CCPD-FINAL-MODEL?bidId=

A CASE STUDY:
UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA



UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA

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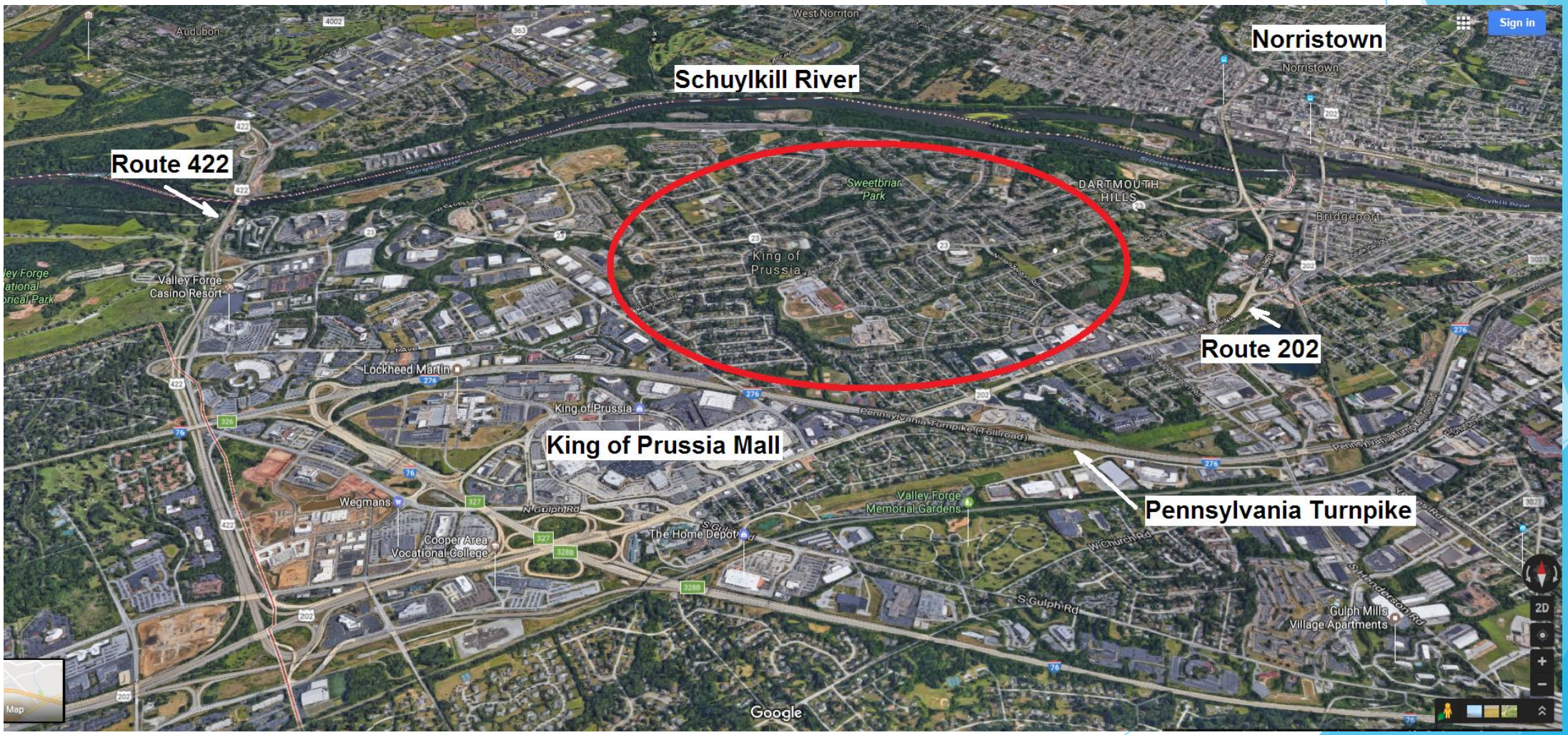
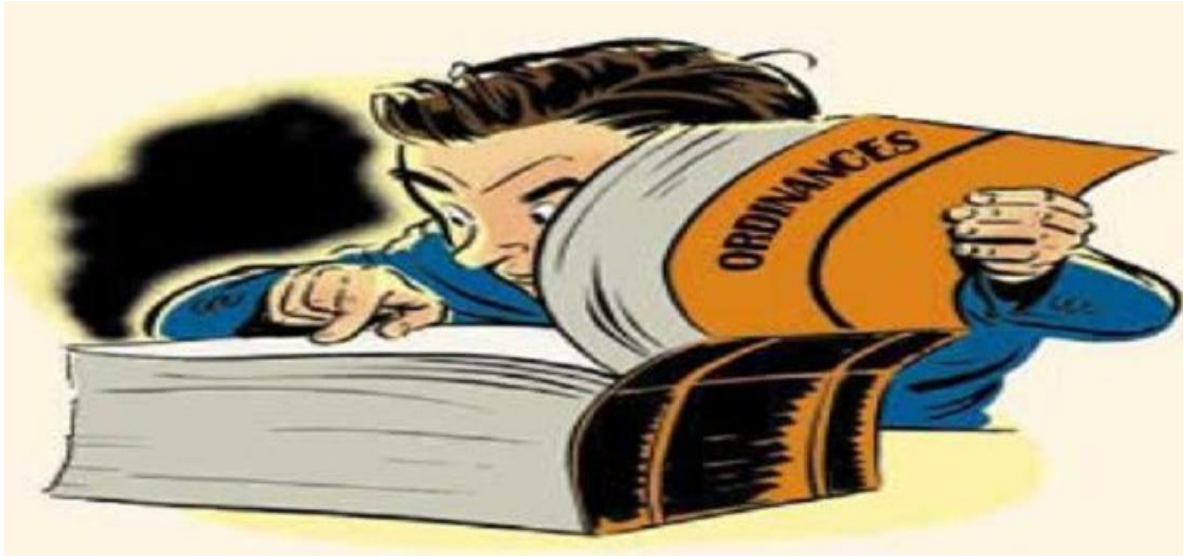
MONTGOMERY COUNTY, PENNSYLVANIA



MODEL ORDINACE ADOPTED by UPPER MERION TOWNSHIP, 11/12/2015



ORDAINED AND ENACTED by the Board of Supervisors for Upper Merion Township, Montgomery County, Pennsylvania, this 12th day of November, 2015.

ATTEST:

David Kraynik, Township Manager

UPPER MERION TOWNSHIP
BOARD OF SUPERVISORS:

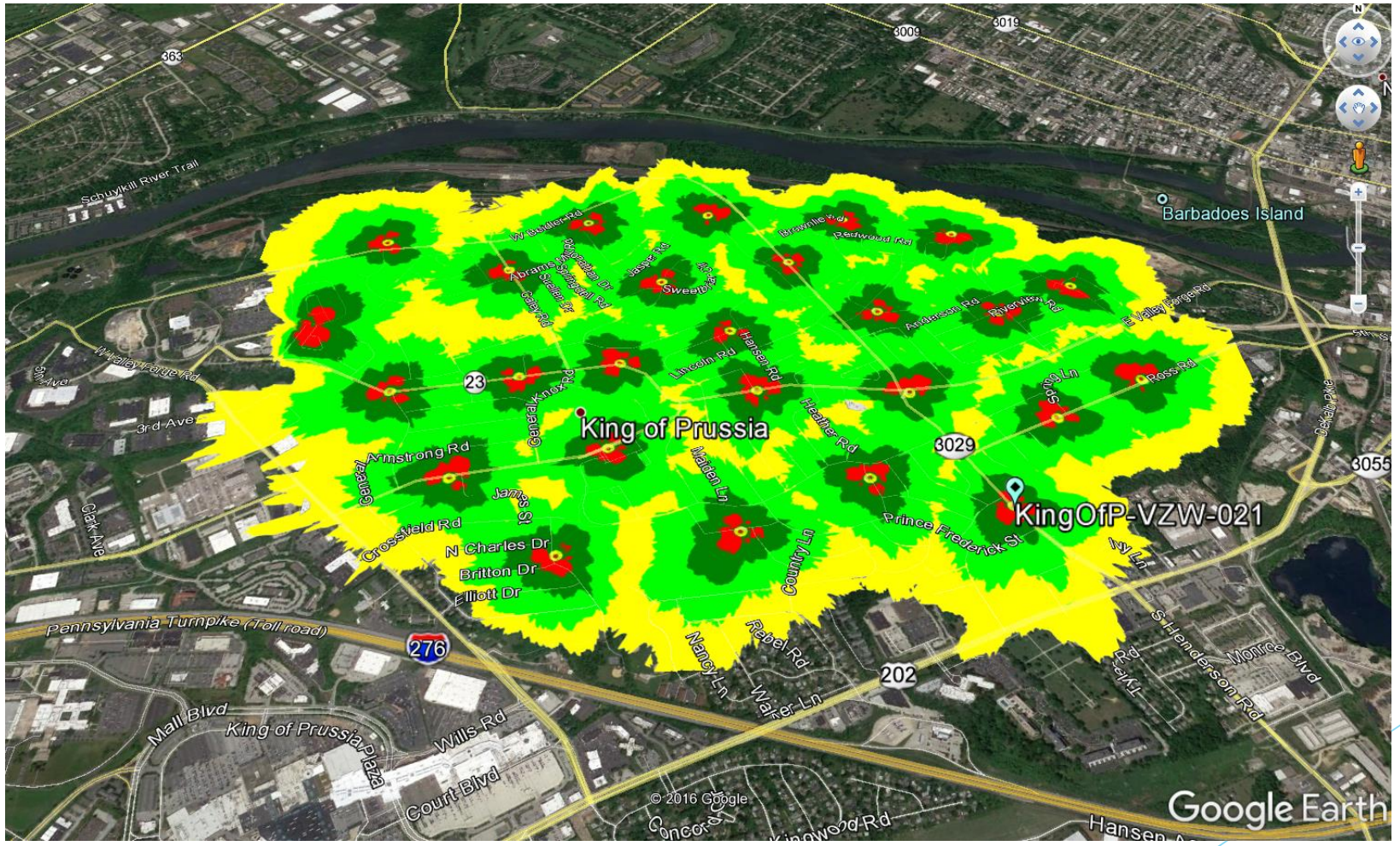
By: _____

Erika Spott, Chairperson

STATUS: KING OF PRUSSIA PROJECT

- ExteNet proposed 26 DAS nodes in area north of the KOP Mall
  - ✓ 22 nodes permitted “by right” already “on-air”
  - ✓ 3 nodes approved through a conditional use process
  - ✓ 1 node involves further investigation

UPPER MERION TOWNSHIP: READY FOR “THE INTERNET OF THINGS”



Who Needs Zoning for Small Cell Antennas?

- All PA municipalities need zoning for small cell antennas
- All PA municipalities need zoning for macro cells
- But the regulations are not the same

Zoning for Small Cell Antennas

Main Themes:

- Balance between permission and regulation
- Changing characteristics of the technology
- Changing legal landscape

Zoning for Small Cell Antennas

Where and How?

- Small Cells should be permitted in every zoning district, no exceptions
- Incentivize collocation by permitting by right
- New poles or “substantial change” to existing poles permitted by conditional use or special exception

Zoning for Small Cell Antennas

Regulations to Avoid:

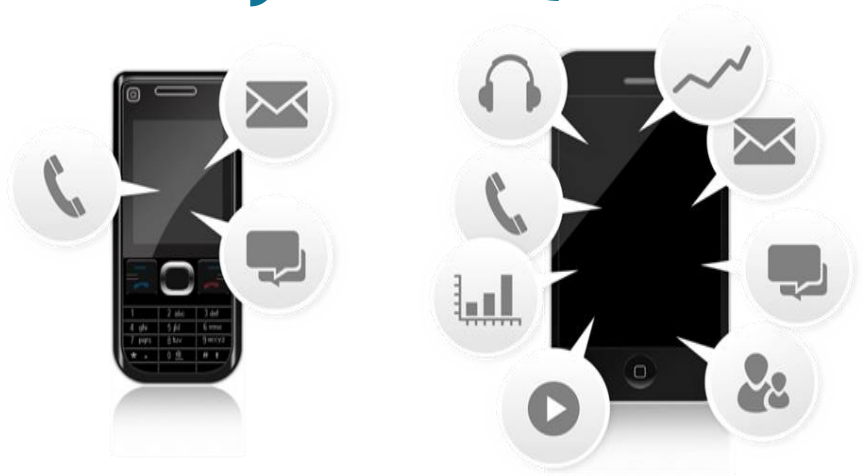
- Permit in nonresidential districts only
- Permit at street intersections only
- Permit at very low height limits (requires more antennas)

Zoning for Small Cell Antennas

Ordinance Elements:

- Purposes
- Definitions – “collocation,” “small wireless facility,” etc.
- Design requirements – location, height, width, color, etc.
- Performance standards
- Process of approval, including time limits
- Fees – according to federal limits
- Abandonment and removal

Thank you. Questions?



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