

AT&T Small Cells in the City of Alexandria, VA

Enhancing our network to meet consumer demand today while preparing for the technologies and innovations of tomorrow.

March 2019



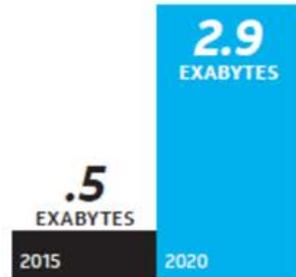
Innovation Driving Consumer On-Line Activity

More Mobile

Over 2/3 of U.S. adults aged 25-34 were wireless-only in 2016.¹



Mobile traffic projected to increase in the U.S. over *six-fold*.²



Mobile video traffic will soar – growing 5-fold from 2016 to 2021.⁴

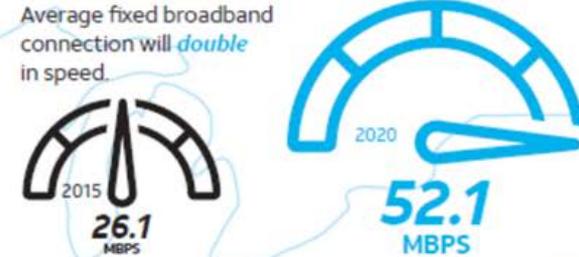
Mobile speeds will *jump* from 6.59 Mbps in 2015 to *20.9 Mbps* in 2021.³



By 2020, mobile data traffic in the U.S. will be equivalent to 6x the volume of the entire U.S. Internet in 2005.⁵

More Speed & Coverage

Average fixed broadband connection will *double* in speed.



Americans with access to 25 Mbps fixed broadband download speeds.⁶



More Devices

4.1 Billion devices in the U.S. (up from 2.3 Billion in 2015)

By 2020, there will be 12.3 networked devices for *every person* in the U.S.

Virtual Reality Headsets (WORLDWIDE):



Smartphones:



TVs:



More Applications

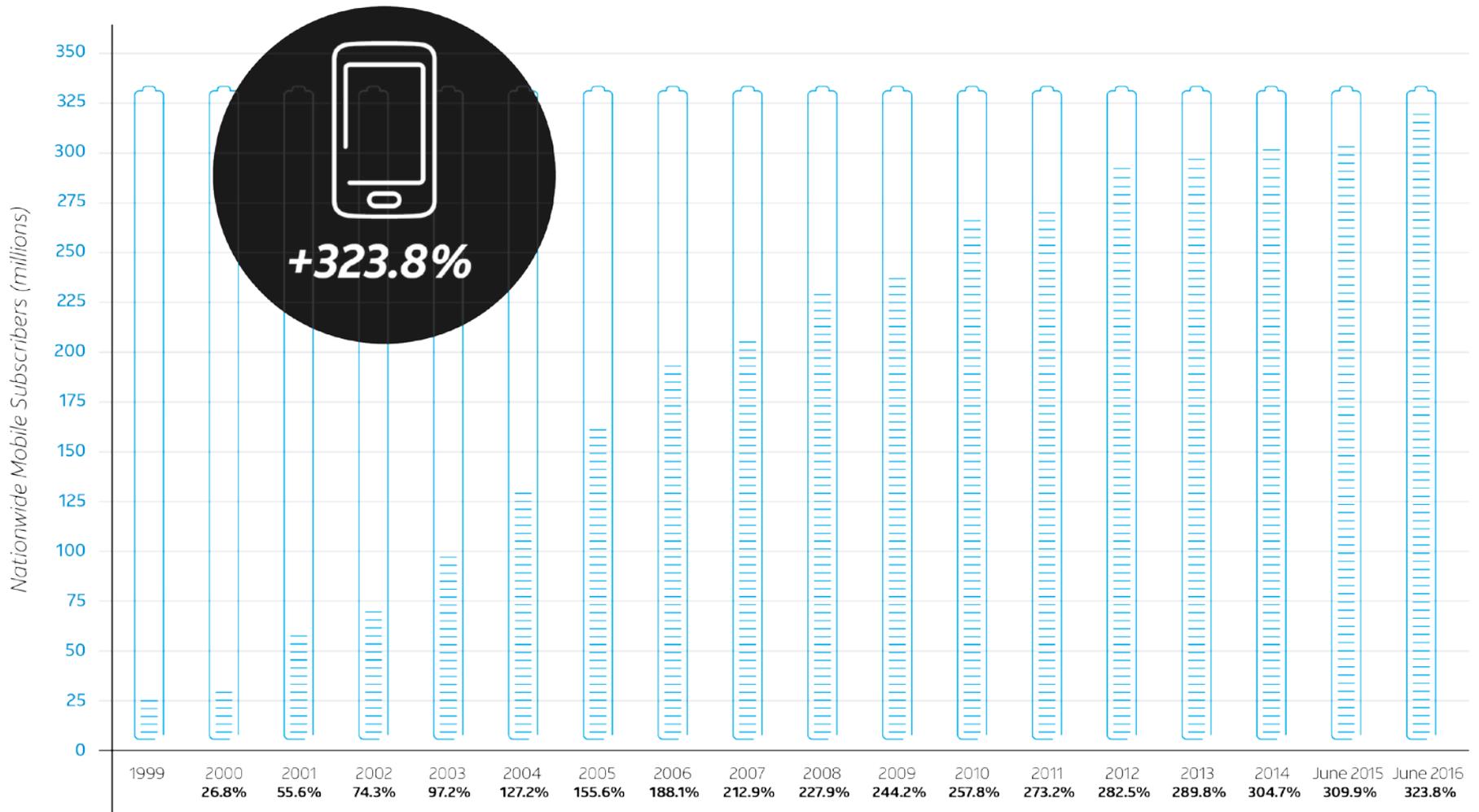


IP Video will be 85% of all IP traffic.⁷

Internet gaming will explode, growing 8-fold by 2020.⁸



The number of mobile subscribers in the U.S. has increased by more than 4x since 1999

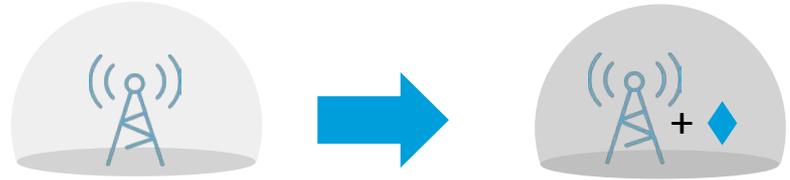


Source: FCC Local Telephone Competition and Voice Telephone Services Reports
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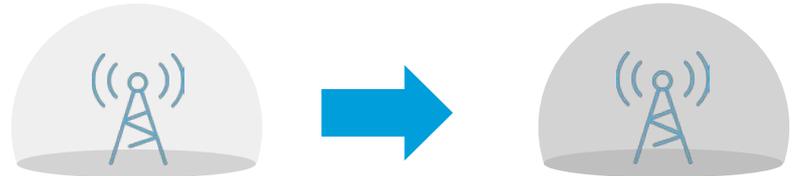


Ways to Increase Wireless Network Capacity

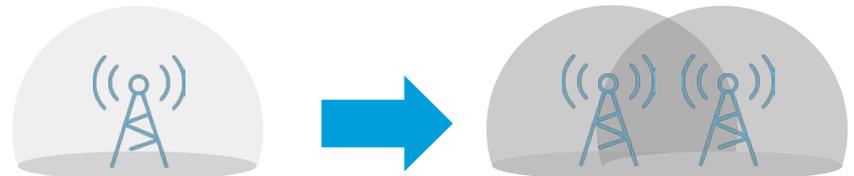
- ① *Deploy more spectrum*
- Spectrum is **not readily available**



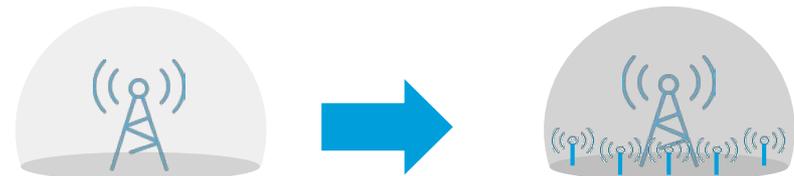
- ② *Improve spectrum efficiency*
- Repurposing existing spectrum
 - e.g., 3G carves for LTE



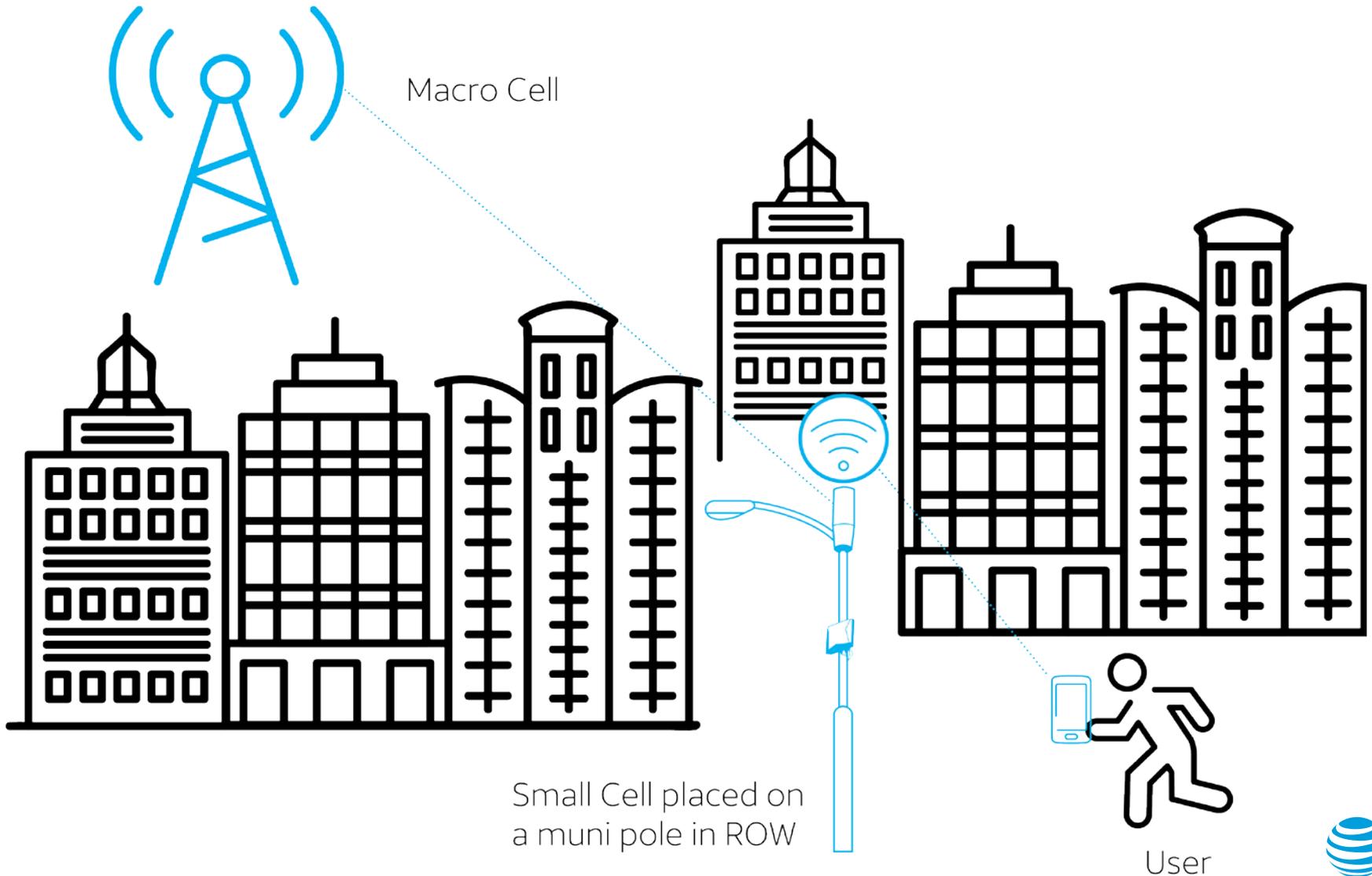
- ③ *Add more macro (cell sites) cells*
- Optimal for low concentration areas



- ④ *Add more small cells*
- Offloads surrounding macro sites

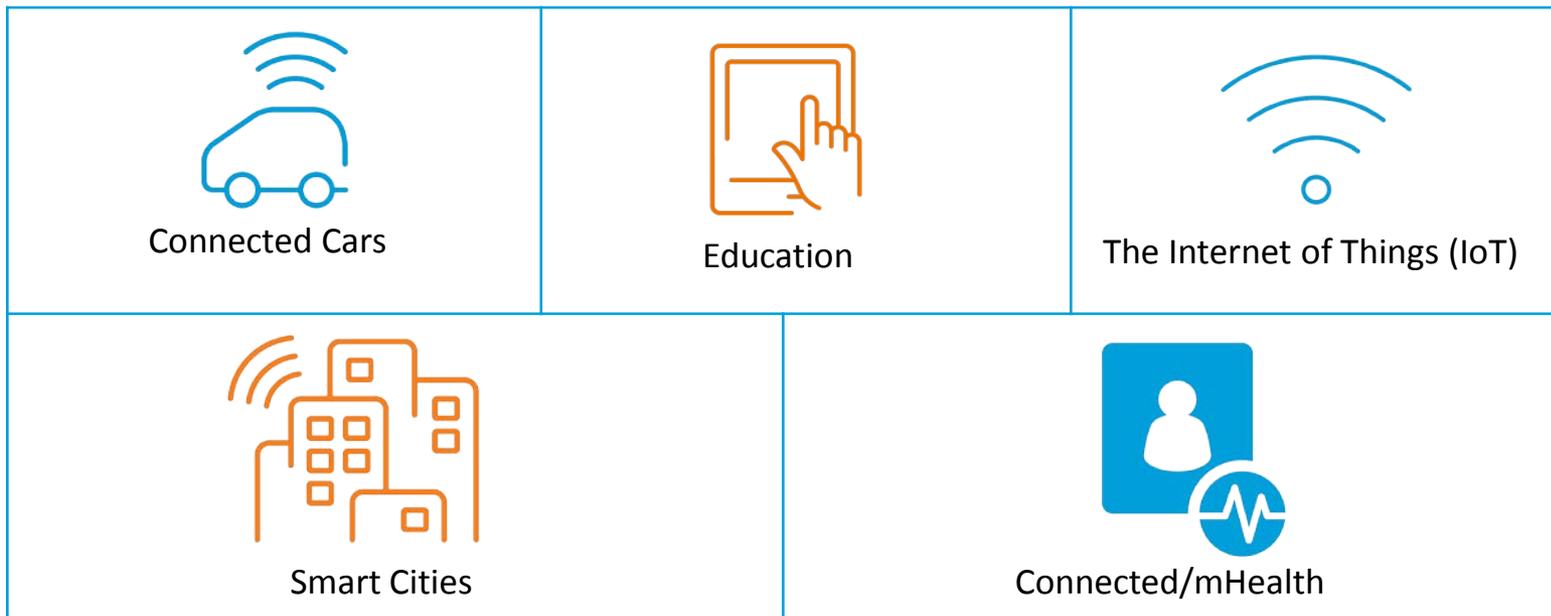


Small cells help to bring the network “closer” to its users to deliver increased data capacity, faster connectivity speeds and an overall better wireless experience.



Benefits of Small Cells to Consumers and Communities

- Small cells help to lay the foundation that is needed for 5G and to bring the next generation of technologies and services to market.
- By bolstering network capacity, more efficiently using spectrum and expanding access to faster mobile internet speeds, small cells help us prepare for the technologies of the future—such as 5G, smart cities and new developments in the Internet of Things (IoT).

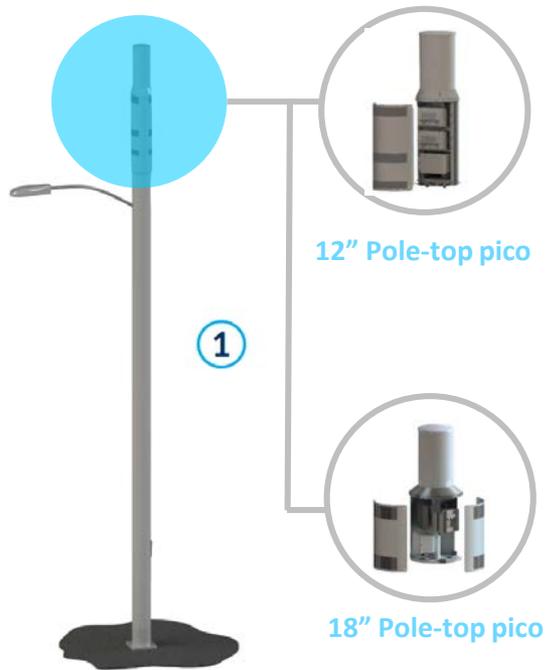


AT&T Small Cell Antenna Design Examples

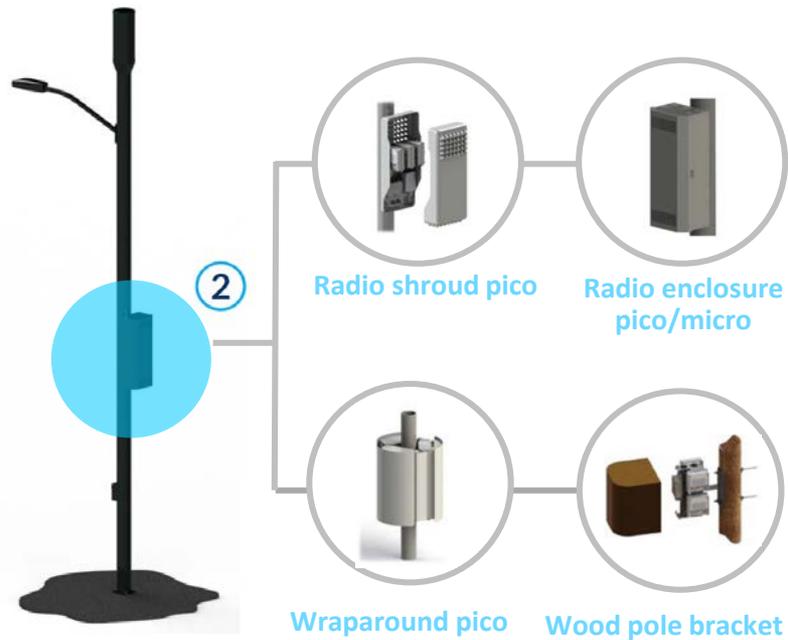


Small Cell Concealment Solutions at a Glance

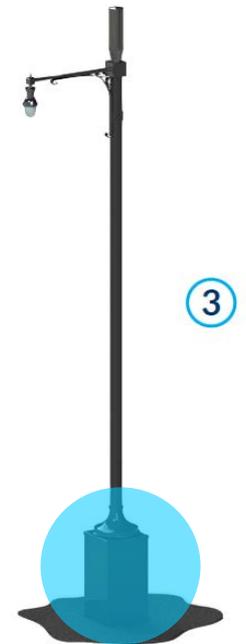
Pole-top solutions



Mid-pole solutions



Bottom-of-the-pole solutions



Slide credit: Commscope



Examples of Proposed Small Cell Equipment Options

CommScope Radio Enclosure and Pole Top Solutions

Cobrahead Light Pole



Rendering with CommScope Pico Radio Enclosure



Rendering with CommScope Pole Top Solution



Concrete Light Pole



Examples of Proposed Small Cell Equipment Options



Antenna & Canister
on Replacement Pole Simulation

CRAN_RWSH_NORVA_045
3014 Jefferson Davis Highway
Alexandria, VA 22305



Successful Small Cell Deployments in Virginia



Chain Bridge Road
McLean, VA



Successful Small Cell Deployments in Virginia



South Fern Street
Arlington, VA



Successful Small Cell Deployments in Virginia



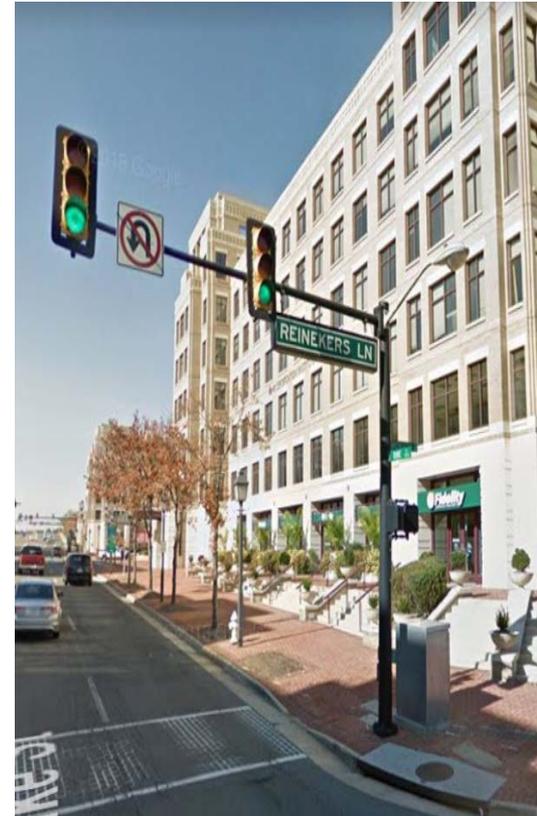
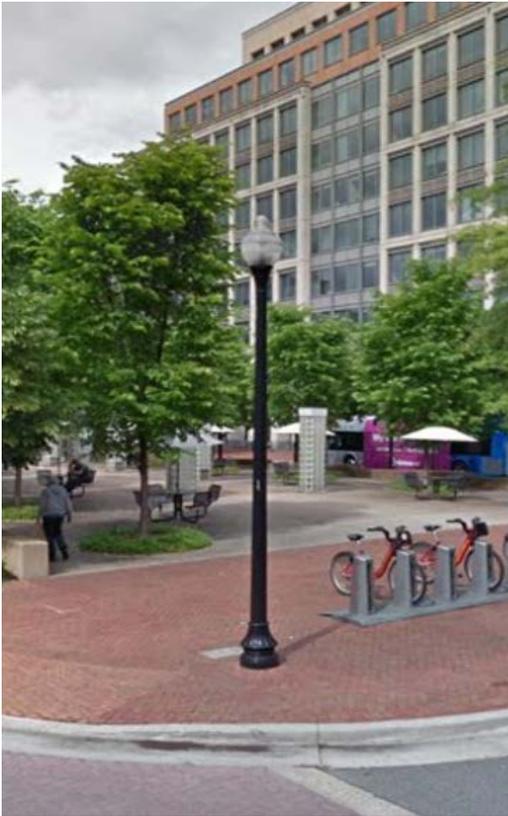
Centerville Road
Chantilly, VA



Gosnell Road/ Leesburg Pike
Tysons, VA



City of Alexandria – Potential Structure Options



City of Alexandria decorative streetlight, historic streetlight, and traffic signal mount poles



Examples of Proposed Small Cell Equipment Options

CommScope Pole Bottom Radio Solution

Original Picture



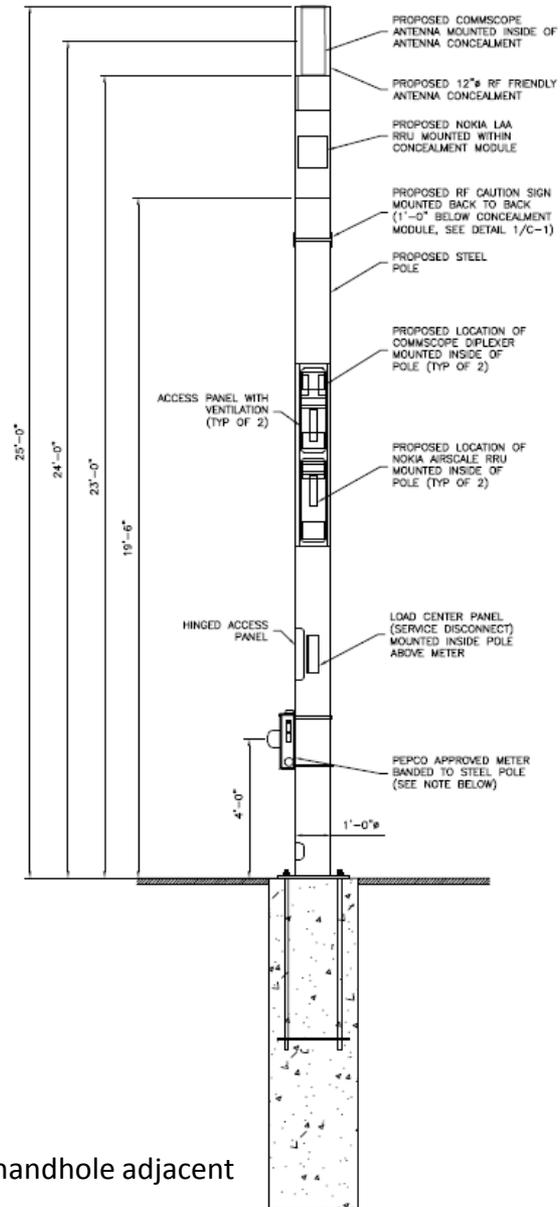
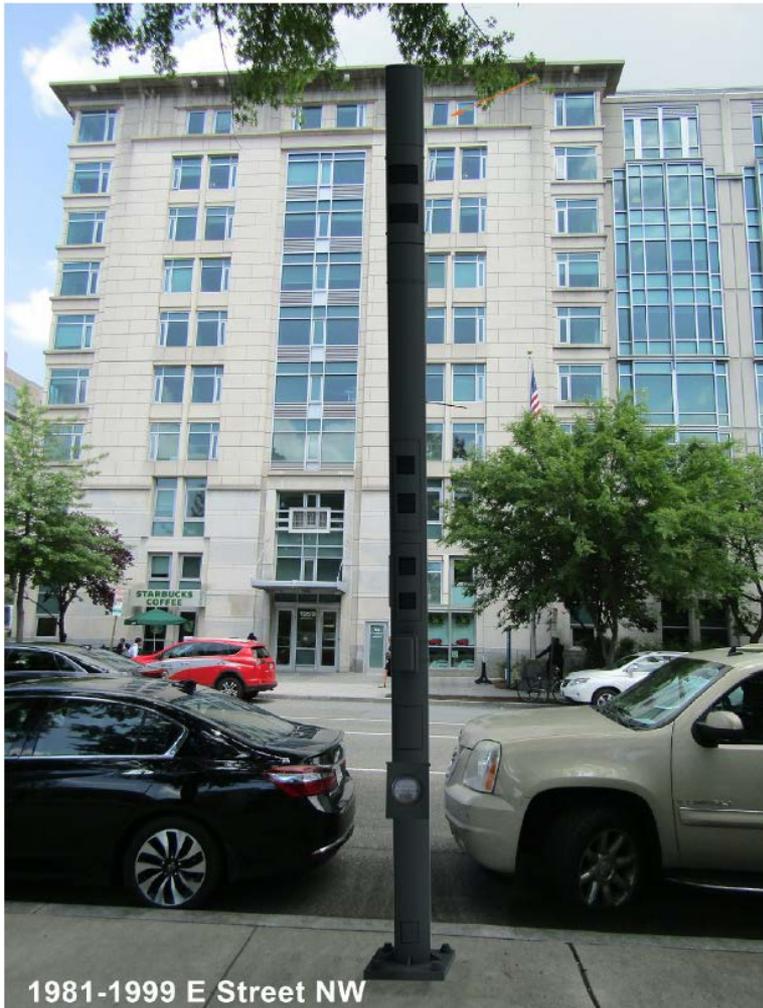
Rendering with CommScope Bottom Pole Solution



Decorative Streetlight



Examples of the AT&T Small Cell Equipment Options



Small Cell Design Option

- New "Slick Stick" pole in ROW.
- Equipment enclosed inside 12" diameter pole. Requires in ground handhole adjacent the pole.



CITY OF ALEXANDRIA

Areas of Interest for AT&T Network Capacity

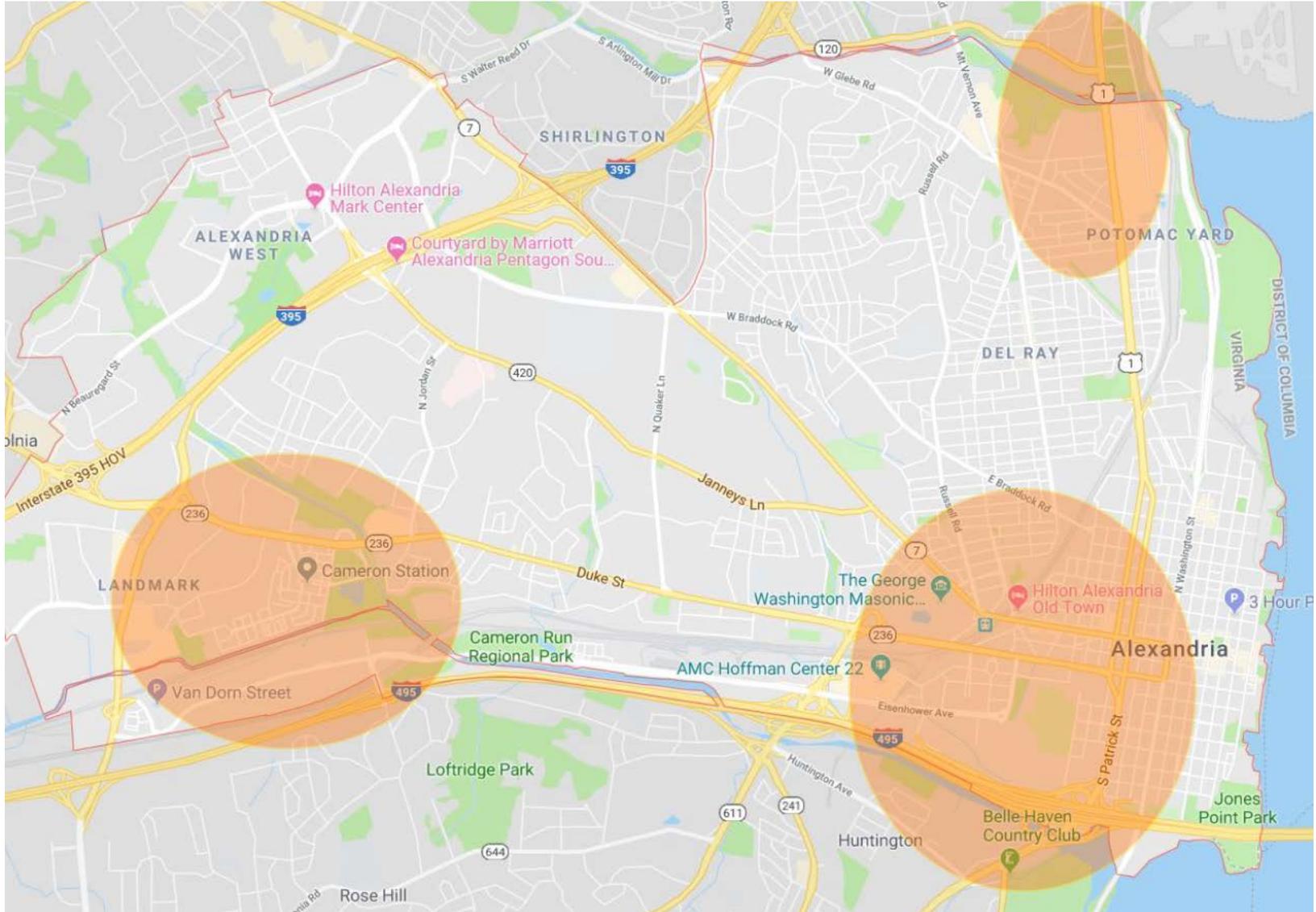


City of Alexandria- Current Site List

SITE ID	POLE/SPACE OWNER	SITE TYPE	COORDINATES: LATITUDE	COORDINATES: LONGITUDE	TOWER OWNER SITE ID	SITE ADDRESS
CRAN_RWSH_NORVA_021	Dominion	Wood Utility Pole	38.803628	-77.117513	C0914 E116	4768 Eisenhower Ave
CRAN_RWSH_NORVA_020	Dominion	Wood Utility Pole	38.81259	-77.1215	B 87	5205 Duke St
CRAN_RWSH_NORVA_033	Dominion	Wood Utility Pole	38.808077	-77.058266	0M03	221 Buchanan St
CRAN_RWSH_NORVA_047	Dominion	Wood Utility Pole	38.83081	-77.0518	C1015 RN95	418 E Raymond Ave
CRAN_RWSH_NORVA_048	Dominion	Wood Utility Pole	38.80329	-77.0507	S147	298 S. Patrick St
CRAN_RWSH_NORVA_061	Dominion	Wood Utility Pole	38.804108	-77.05496	C1014 QJ13	238 South West St
CRAN_RWSH_NORVA_044	Dominion	Wood Light Pole	38.83555	-77.052	C1016 RB79	3398 Montrose Ave
CRAN_RWSH_NORVA_045	Dominion	Wood Utility Pole	38.833419	-77.051645	4681	3014 Jefferson Davis Highway



The Overall City of Alexandria Network Objective



MOVING FORWARD...

QUESTIONS

&

ACTION ITEMS

