
CROWN
CASTLE
December 19, 2018
Town Hall
Community Information Session
We’re enabling improved broadband service in your area.
The Foundation for a Wireless World.

Crown Castle Team

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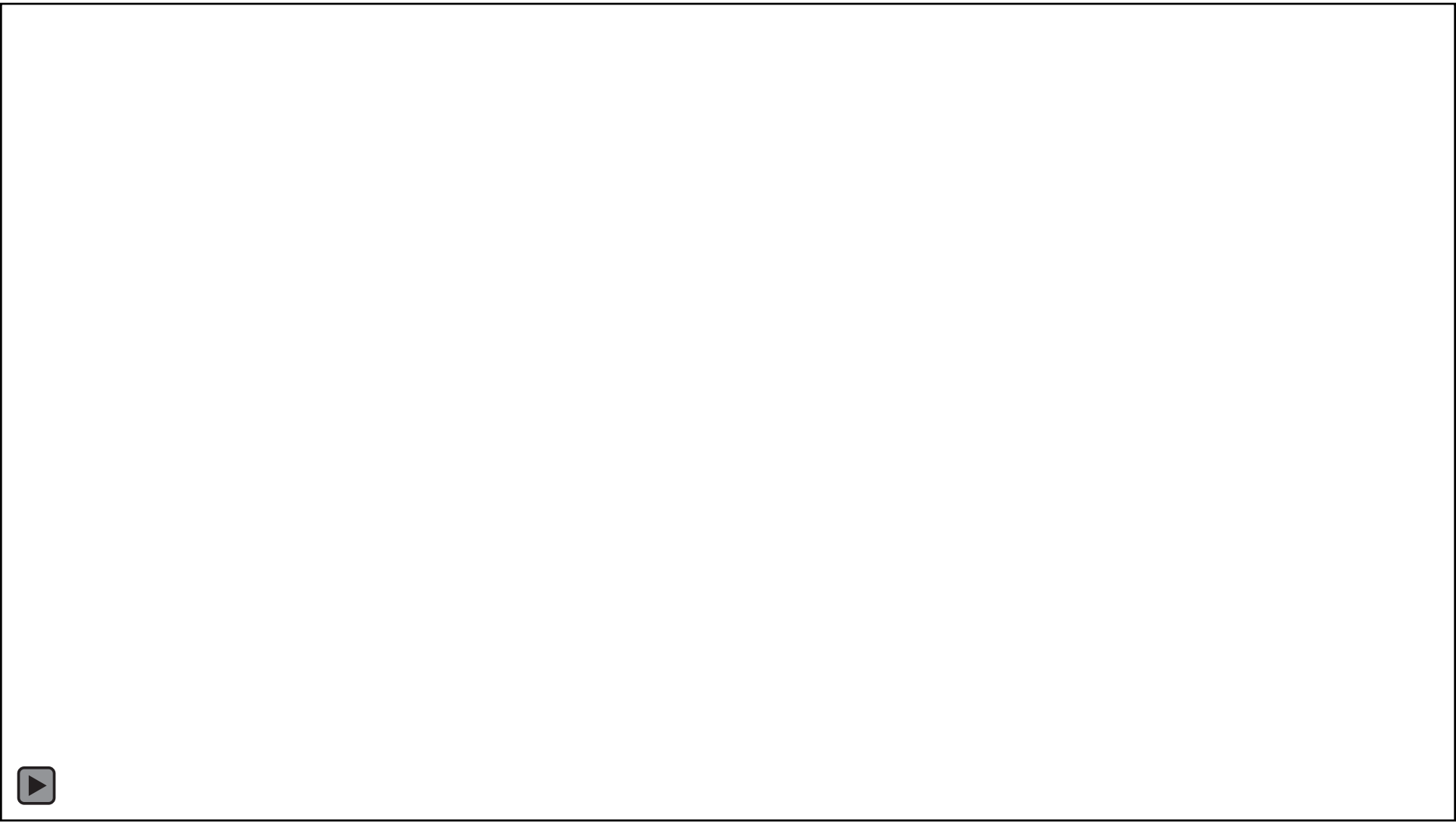
Philadelphia Case Study Video



We enable the services that make life more productive, convenient, enjoyable—and safe

48%

of households rely exclusively on their mobile phones.[1]

Video

is projected to be 75% of mobile data traffic by 2020.[2]

70%

of 911 calls are placed from wireless phones.[3]

We have deep roots in Pennsylvania

Today we have grown to become:

- A trusted partner for education and public safety
- Currently, we have 18 on-air DAS Nodes in Radnor Township
- 5,400 miles of fiber & 1,500 DAS Nodes in PA
- The network builder and operator for KINBER, connecting PA universities.
- Provide broadband connections for over 10% of PA school districts.
- Fiber provider for Radnor Township Library, Mainline Health, Radnor School District Buildings, Villanova, Thomas Jefferson Hospital, and many others
- Operator of 5,400 route miles of fiber in Pennsylvania, with small cell networks in 35 communities. We also operate over 2,100 traditional towers and rooftops in PA.
- Managing and marketing nearly 500 Commonwealth communications sites successfully since 2011 in partnership with State Police.

Wireless demand is creating a need for new infrastructure.

Demand for mobile data is projected to grow

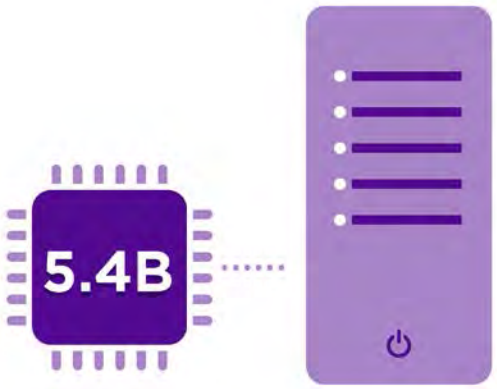
Mobile devices

From 2015 to 2020

Wearable devices

By 2020

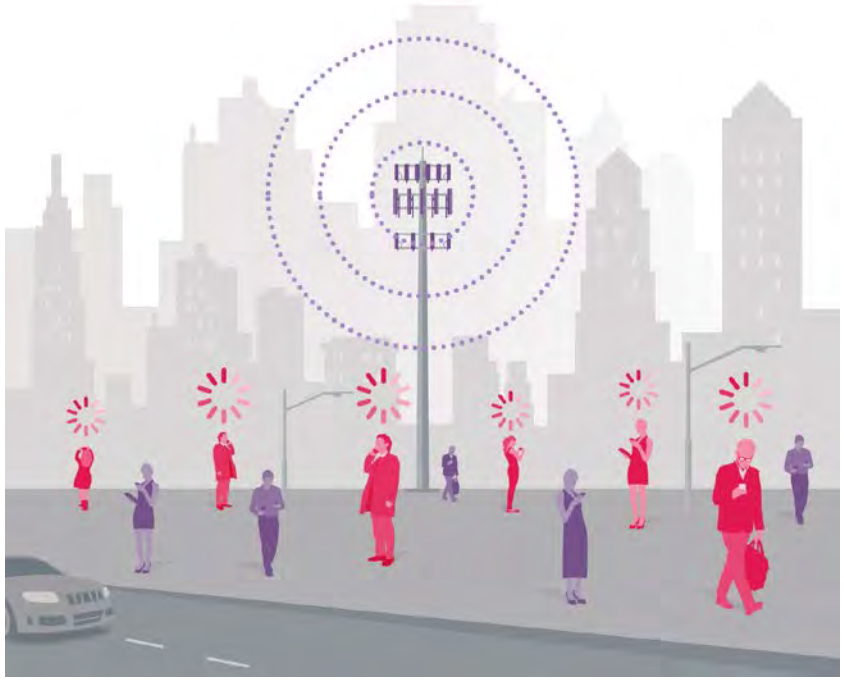
Machine-to-machine connections



By 2024

Increased demand creates congestion—which can only be relieved by additional infrastructure

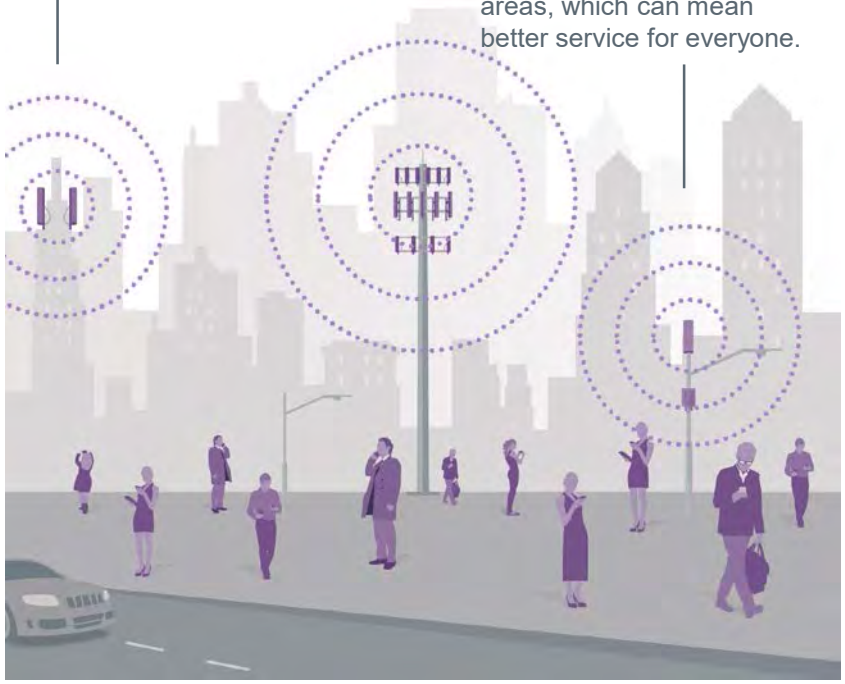
Congestion



Capacity

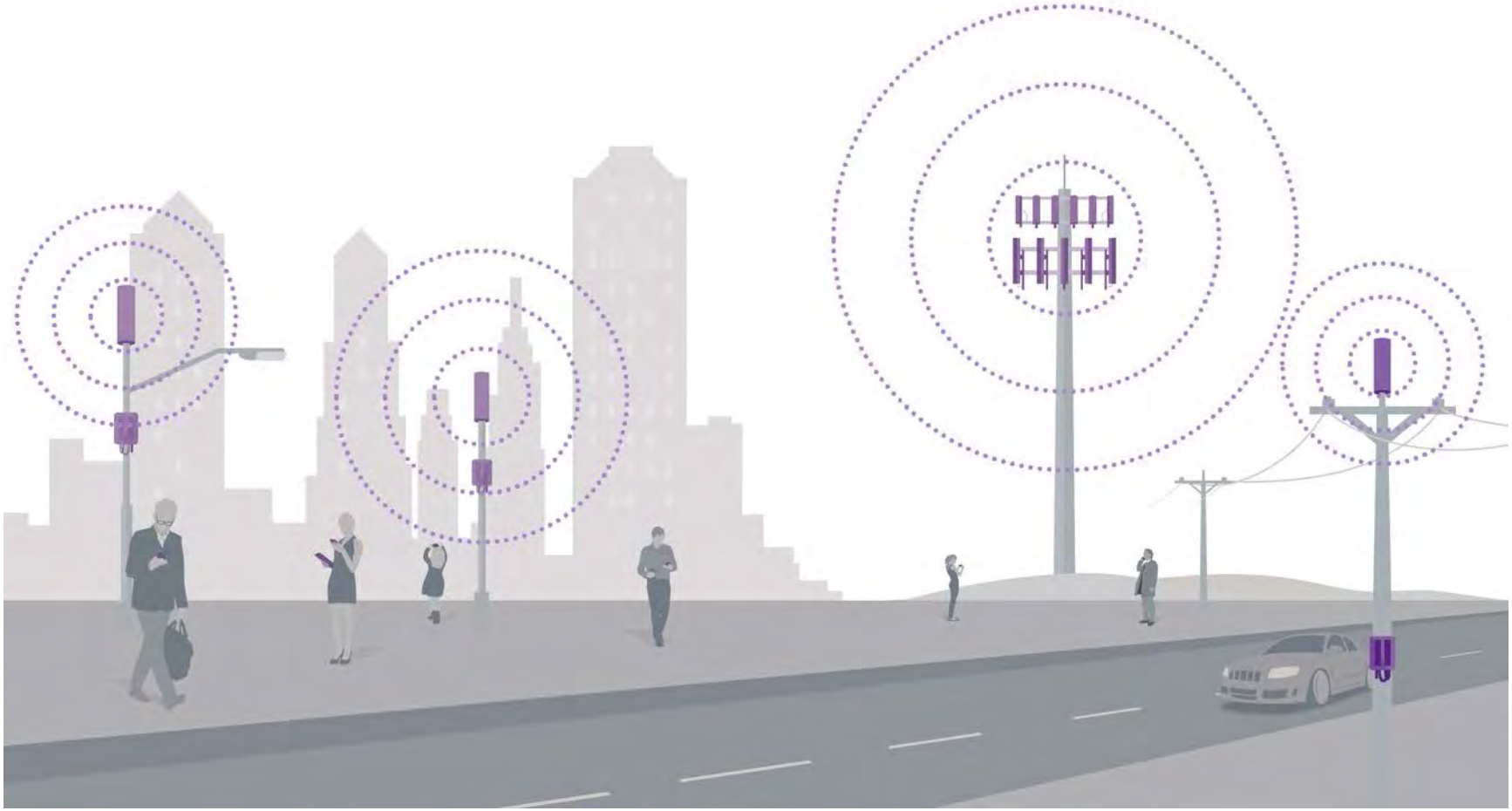
The best way to relieve network congestion is to add new infrastructure.

New innovations, like small cells, allow us to add more capacity in densely populated or high traffic areas, which can mean better service for everyone.



The right infrastructure for your community

A newer type of infrastructure called Distributed Antenna System (DAS) is increasingly being used to add capacity to broadband networks.



DAS and towers at a glance

Towers/Macros

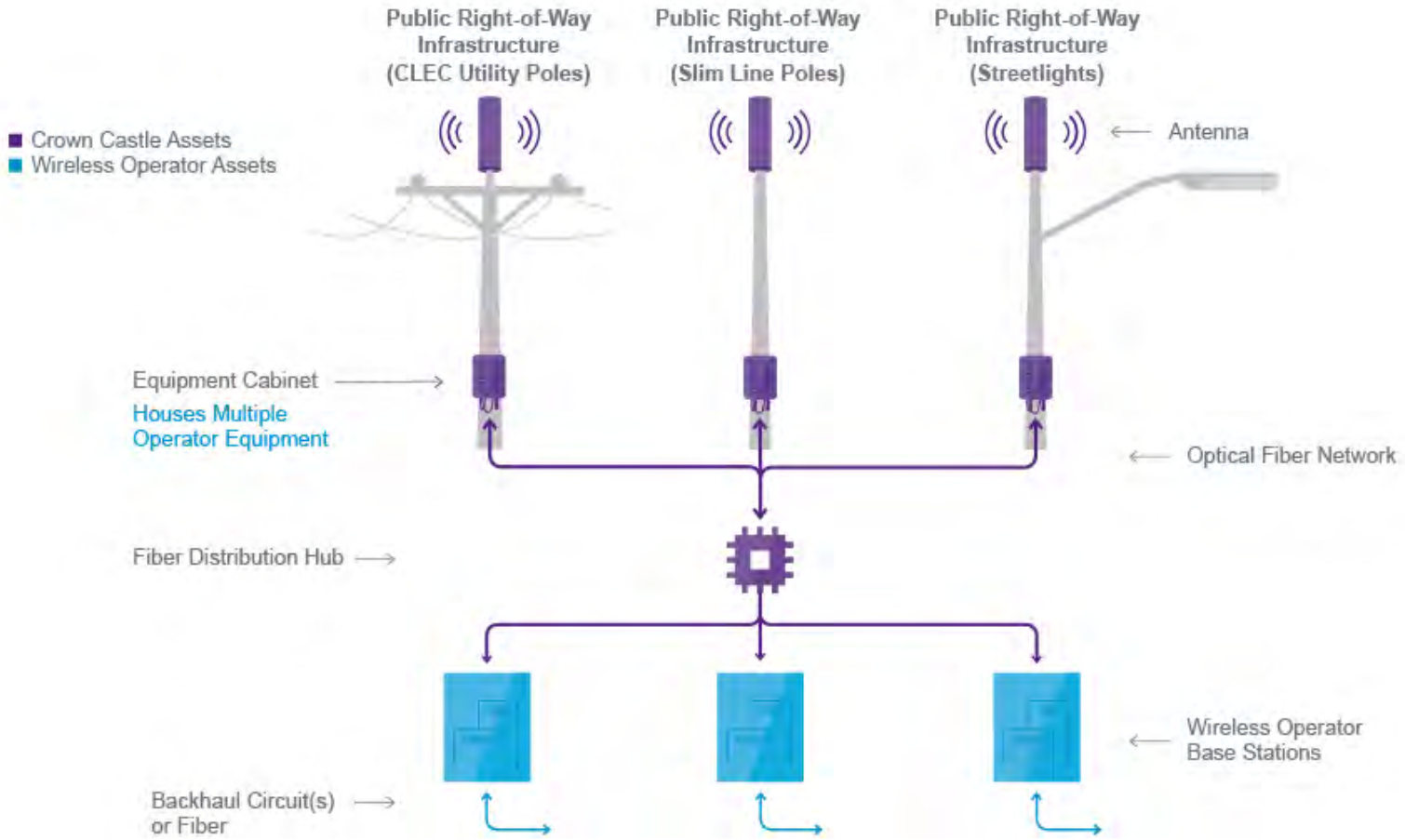
- Tall. Visually prominent.
- High powered. Data signal can degrade over distance.
- Good for voice.
  Not always ideal for data.
- Best for low-density populations.

Small Cells/DAS

- Discreet. Lower to the ground.
- Low powered. Each node covers a small area.
- Good for voice and data.
- Good complement for dense areas with high capacity needs.

Components of DAS

DAS typically consist of these components.



Radnor HOA
Design Specifications

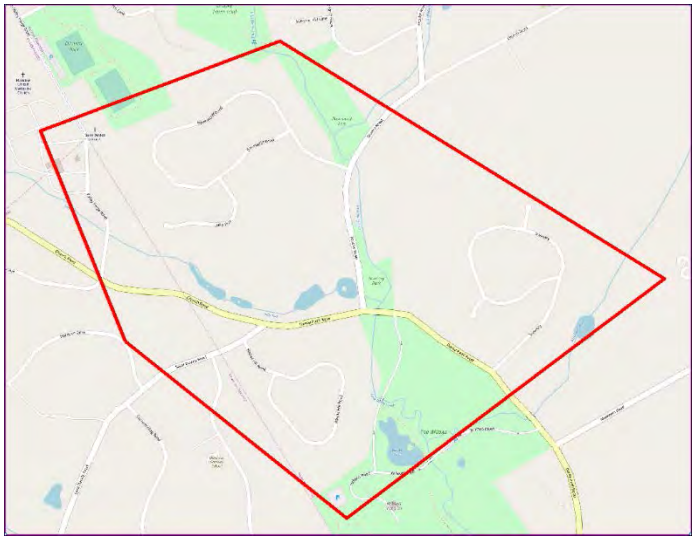
Project Name: Ravenscliff, Roundhill & Inveraray HOAs

General Overview:

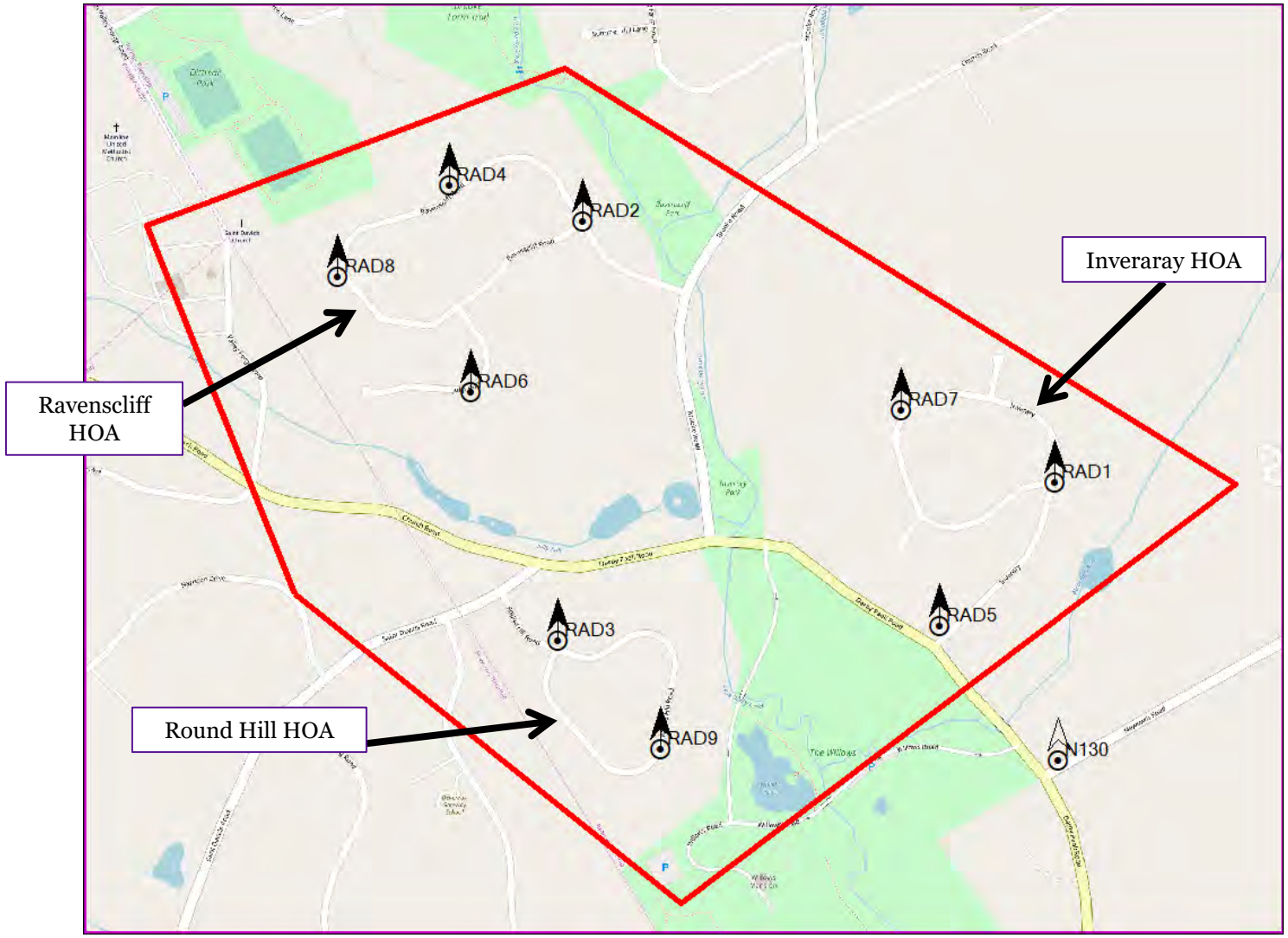
- The area to be covered are inside the Red polygon
- There are 3 HOAs that lack adequate cellular coverage and need to be covered

Design Specification:

- RSRP oDAS design objective: -85 dBm based on AWS



Radnor HOA, PA
Coverage Polygon & Proposed Node Locations



Radnor HOA, PA
LTE MIMO 2100MHz RSRP Predicted Coverage

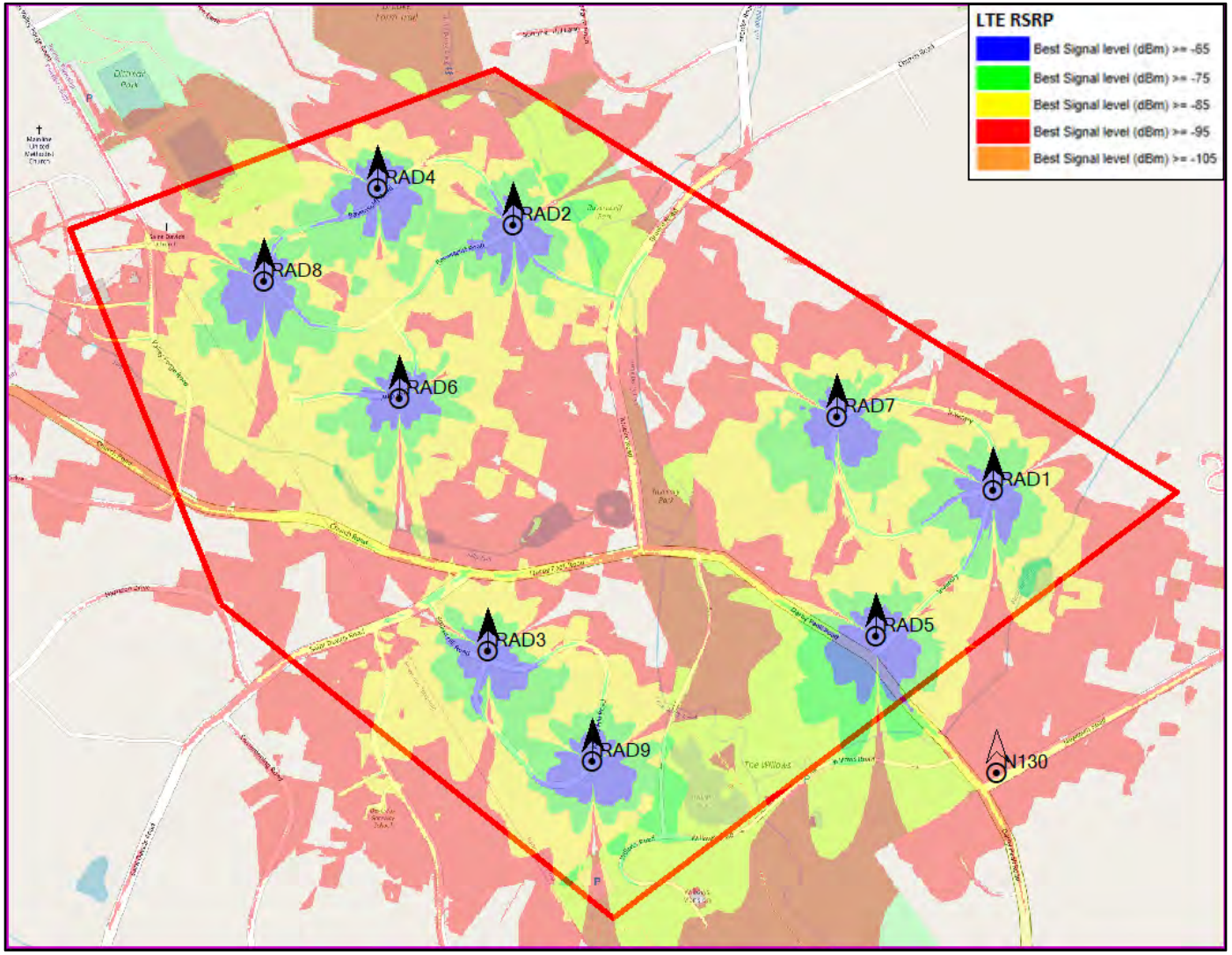


Photo Simulation Samples of Proposed DAS installations located in Ravenscliff, Roundhill and Inveraray.

CROWN CASTLE

207 Ravenscliff Rd

Looking Northwest

CROWN CASTLE

407 Roundhill Rd

Looking East

CROWN CASTLE

400 Inveraray Rd

Looking East

Frequently Asked Questions:

1) I have full bars on my mobile phone – why do we need this system if the existing coverage appears adequate?

The real answer is bandwidth. Signal strength on a mobile device for one provider is not always a good indicator of sufficient and reliable coverage across all providers. Wireless devices today consume more and more data, due in large part to the capabilities and usefulness of the smartphone. While a mobile device may display full bars, calls can still drop and video streaming may not work properly. This happens when there is not enough network capacity to handle the volume of traffic in an area, at a particular time. Crown Castle's systems are designed to enable enhanced network performance and avoid such issues, improving the experience for the smartphone user.

Frequently Asked Questions:

2) How has Crown Castle determined the proposed locations?

We use great care when considering where to place facilities in the public right of way and many factors are involved in the design, engineering and construction of our networks.

The first step is to study the coverage and capacity gap in the area and develop an integrated DAS infrastructure plan that identifies the node locations that are required to eliminate the coverage/capacity gap.

We attempt to place all of our nodes on existing utility poles, light poles and streetlights. Occasionally, there are no existing poles that can be used in the area where a node must be located. In these situations, Crown Castle must install a new pole for the node.

Frequently Asked Questions:

3) Why can't you provide this service through existing rooftops or the local water tank site?

Crown Castle designs and operates network solutions to enhance broadband coverage. Macro sites, which typically have the equipment mounted on water tanks, large towers and rooftops, often cover a large geographic area. However, the HOA requires a more targeted, specialized solution to provide the capacity needed. In this situation, we developed the proposed DAS network to improve performance within the community on existing light poles.

Frequently Asked Questions:

4) Will we have nodes on every street?

We customize our network to improve wireless coverage and capacity with the ability to support multiple carriers and future expansion, minimizing the need for additional facilities.

Frequently Asked Questions:

5) Should I be worried about RF emissions?

The wireless equipment being deployed on our infrastructure produces RF levels well below the FCC's permitted maximums.

Crown Castle fully complies with all FCC regulations addressing the safety of this technology.

Frequently Asked Questions:

6) What measures has Crown Castle taken to validate the structural integrity of the poles it has targeted for deployment?

Crown Castle takes great care when installing equipment. The structural integrity of the pole is carefully evaluated by an independent outside engineering firm, as well as all utility inspectors prior licenses for attachment being issued by the utility.

Every DAS node is inspected on an annual basis and the equipment is regularly monitored at our Network Operations Center in Canonsburg, PA.

Frequently Asked Questions:

7) Will your facilities or network support Wi-Fi?

Crown Castle provides the infrastructure to optimize coverage and broadband service for our customers, the wireless carriers. While this equipment enables enhanced broadband and data coverage, it does not provide Wi-Fi services.

Frequently Asked Questions:

8) Will the proposed installations diminish the value of properties in the community?

Crown Castle aims to improve the necessary, daily broadband connection that communities require. More and more homebuyers and renters are taking into account access to strong cellular signal strength when considering where to live.

Time magazine reported a new study from RootMetrics showing that 76% of 2,000 Americans surveyed ranked mobile connectivity as important as compared to 60% who called out good school districts.

Frequently Asked Questions:

9) With many households doing away with landlines and relying solely on mobile handsets, how does Crown Castle's equipment impact or enhance public safety?

Over seventy percent of all 911 calls originate from wireless devices. Crown Castle's network upgrade will enable citizens to have more reliable access to public safety and emergency services like 911, while giving police, firefighters, and other first-responders access to the information they need.

Thank You

FOR FURTHER INFORMATION
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