# Future of Fiber

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Fiber Broadband Association

# Agenda

- Who Is FBA
- Current Fiber Deployment Statistics
- Driving the Future of Fiber
  - 5G & Applications
  - Smart Communities
- Future Growth & Funding
- Barriers to Deployment
- Thank You!

# About the Fiber Broadband Association

**Our Mission**

The Fiber Broadband Association's mission is to accelerate deployment of all-fiber access networks by demonstrating how fiber-enabled applications and solutions create value for network operators and their customers, promote economic development and enhance quality of life.

**Our Vision**

To be the voice for ultra high-speed wireline broadband deployment throughout the Americas.

# About the Fiber Broadband Association

- **Fiber Broadband Starter Kit & Workshop** for companies, organizations, communities to learn how to build **all-fiber networks**.
- **Research & Thought leadership** on all things fiber through our **Optics** online magazine.
- **Collaborate** with industry allies to propel fiber deployment forward for a **broadband future** here and around the **globe**.
- **Connect** vendors, manufacturers, contractors, network operators, engineering firms and all contributors to fiber deployment **– "the Fiberverse"**.
- **Remove barriers** to deployment while supporting pro-fiber policies in all forums.

# State of Fiber Today: *Deployment is on the Rise*

## United States

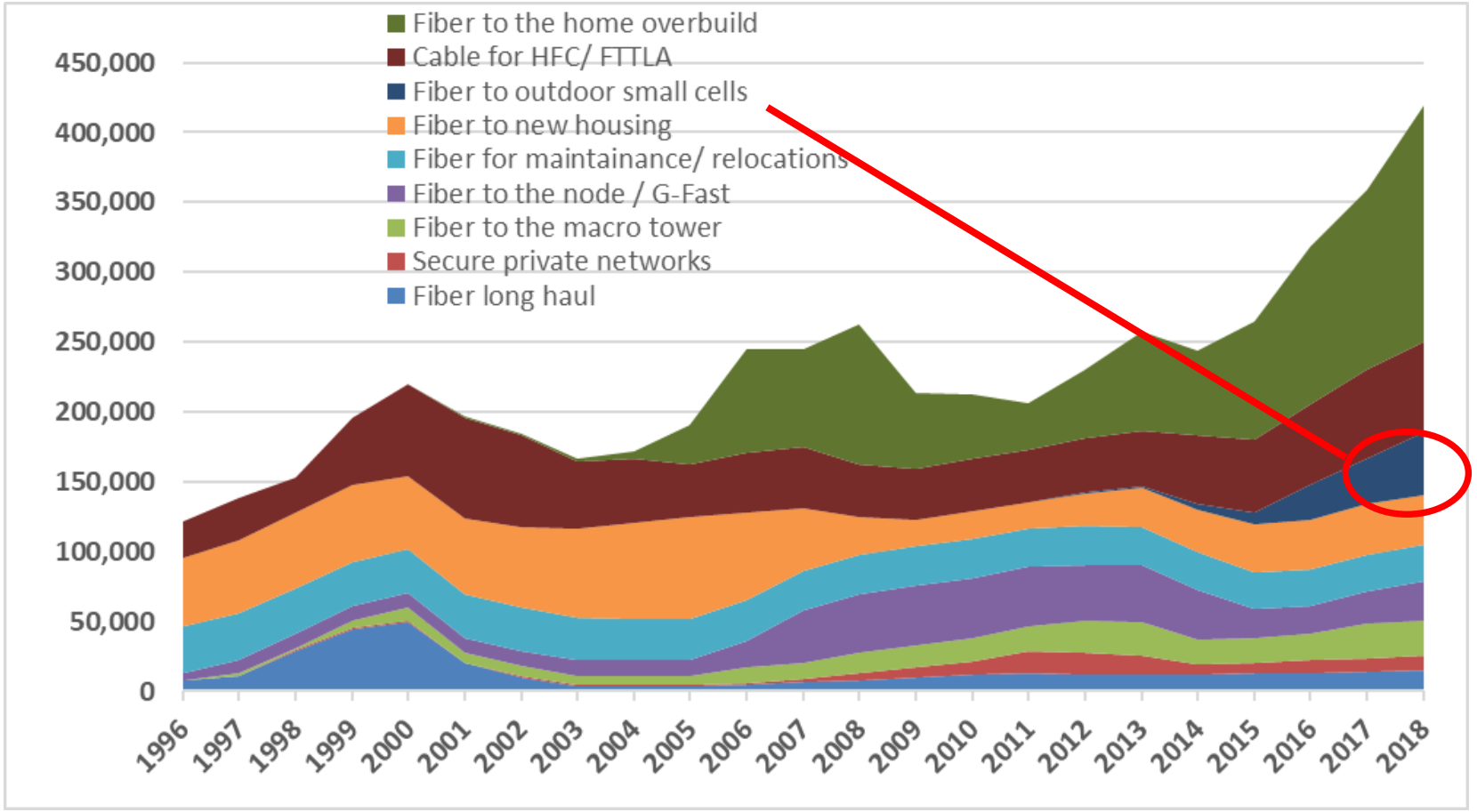
- **49.2 Million** Homes Marketed
- **17%** Growth in 2019
- **20.5 Million** Homes Connected

## North America

- **70 Million** Homes Marketed
- **15% Growth** in 2019
- **27.3 Million** Homes Connected

According to a 2019 study from RVA, LLC

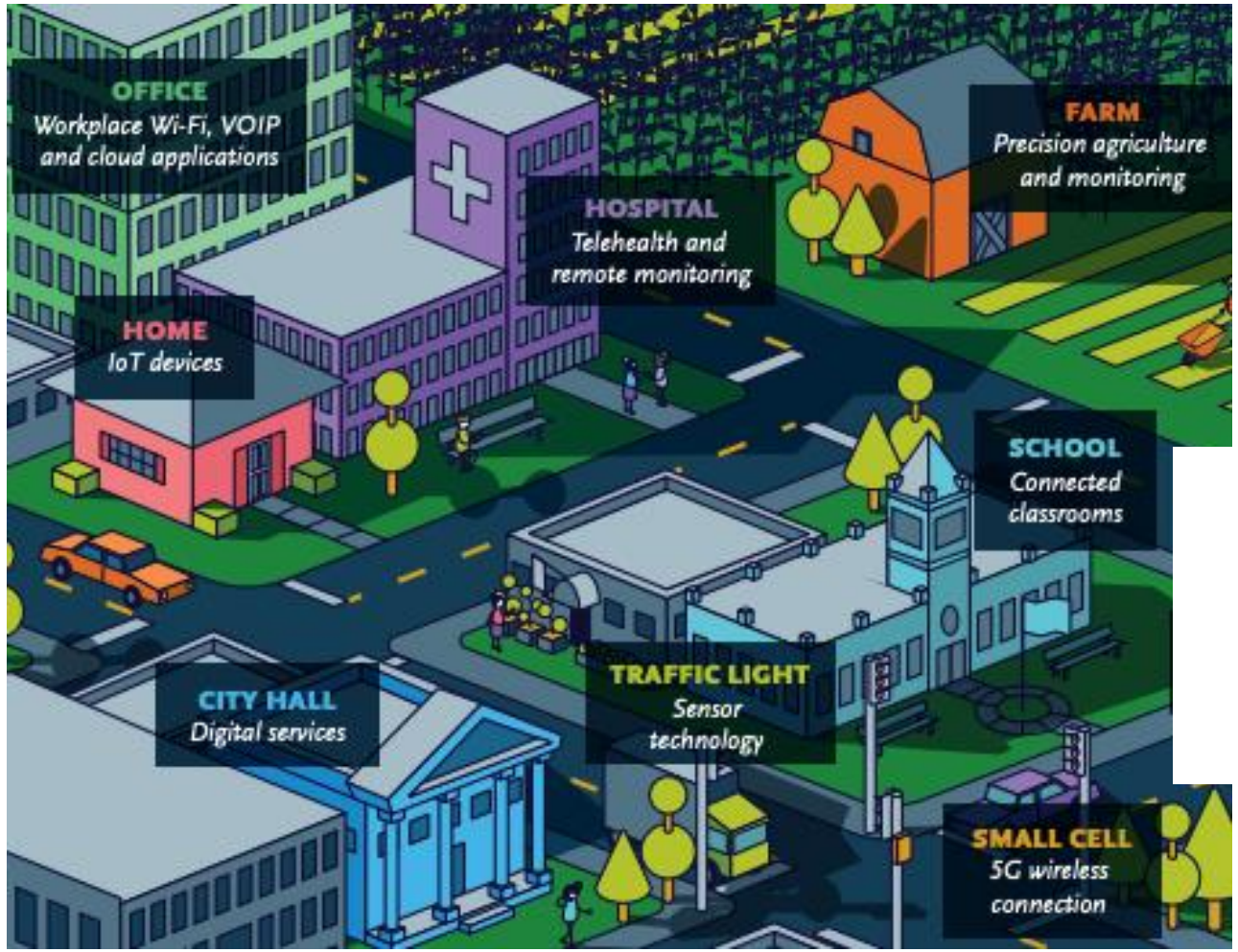
# State of Fiber Today

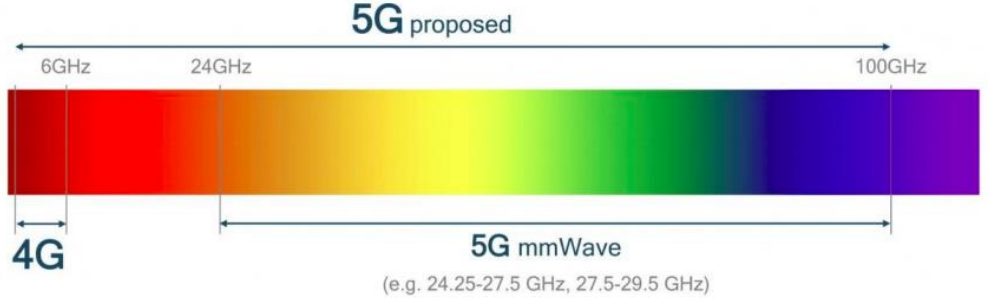



Reviewing fiber route miles, i.e. the number of linear miles fiber is deployed overhead or underground – whether single or multiple fiber strands/ lines.

According to a 2018 study from RVA, LLC

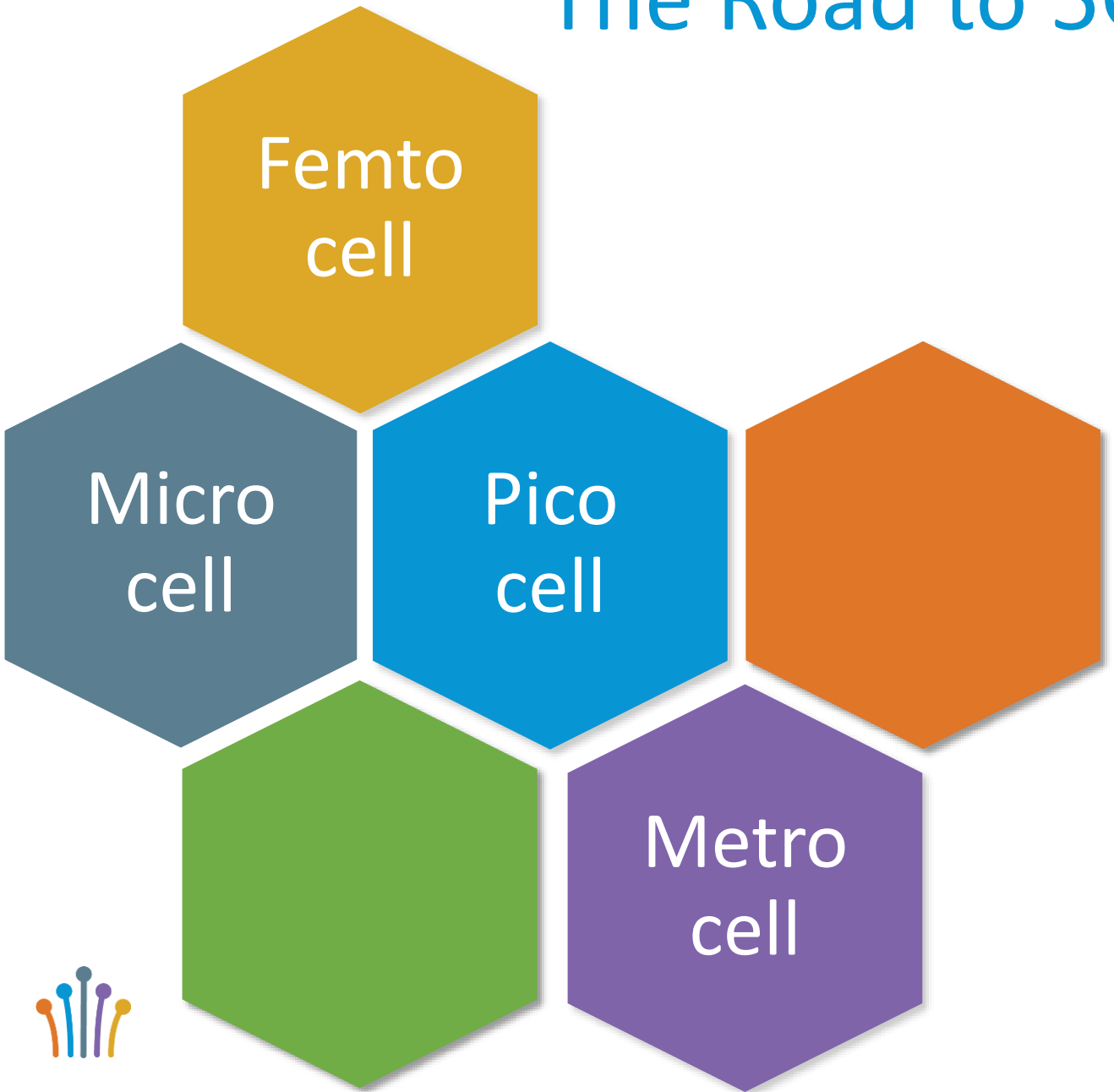
# Driving the Future of Fiber: 5G




** Source: Qualcomm*

# The Road to 5G is Paved with Fiber




## Use Cases Demand 5G

Enhanced mobile broadband capacity/speed
Low latency-gaming and AVs
Massive machine-to-machine communication
Many IoT devices

## Fronthaul/Backhaul/Midhaul

More fiber needed with 5G architecture
Fronthaul – computing/processing in centralized place. Backhaul – transmit information to final destination.

## Wireless Growth Demands Fiber

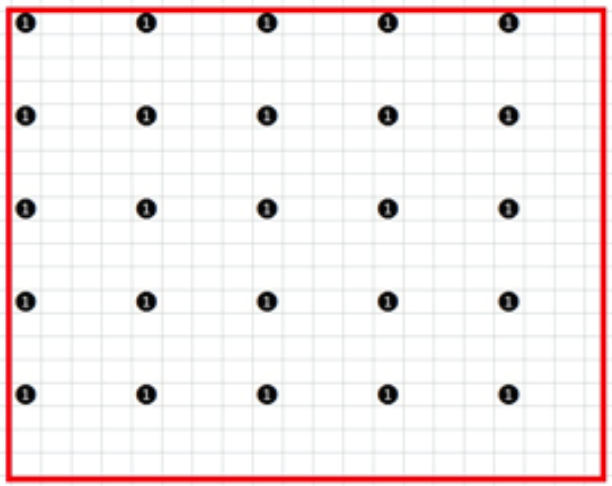
FBA RESEARCH- To meet 5G/wireless demands: estimated 1.4 million miles of fiber needed in top 25 US metros. A $130-150 B in investment in the US in new fiber over 5-7 years.

# 5G Densification

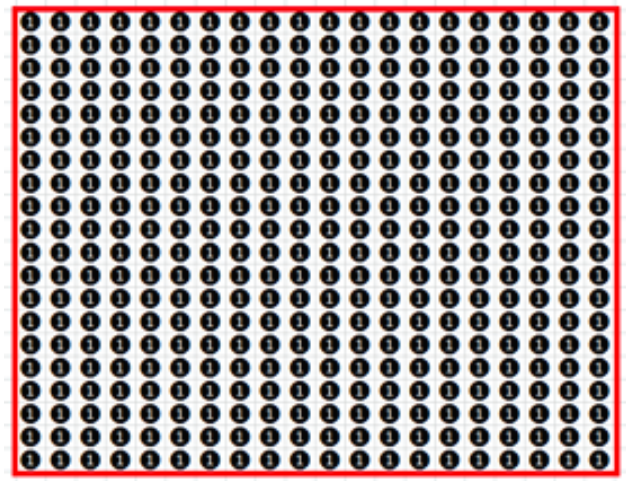
## *To go to 4G requires 25X more fiber*

## *To go to 5G requires at least 16X more fiber*

3G
1 site every 10 km
Cell density=1 cell/100 km2

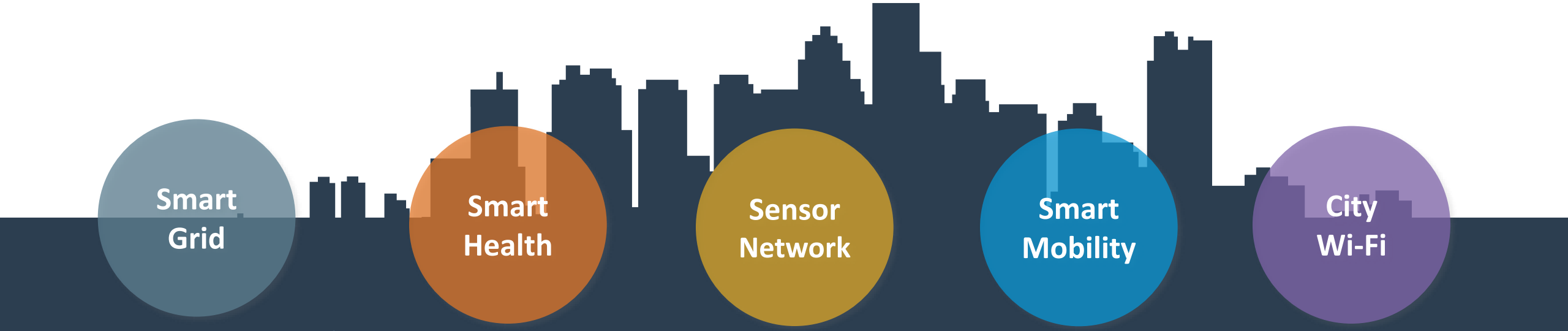


4G
1 site every 2km
Cell density= 5 x 5
= 25 cells/100 km2



5G
1 site for every 0.5 km
Cell density= 20 x 20
= 400 cells

# Driving the Future of Fiber: Smart Communities




## Energy Efficiency

EPB in Chattanooga built out a fiber network to reliably manage its energy and electrical systems

## Healthier Cities

Hiawatha Broadband in Minnesota piloting project to use its fiber as a platform for home monitoring of patients with dementia

## Civic IoT

US Ignite and cities around the U.S. (and the world) are developing a smart city app store predicated on big bandwidth

## Safer Streets

Verizon and the City of Boston are using sensors and advanced traffic signal controls to measure traffic, improve safety

## Connected Community

Santa Monica City Net provides fiber-supported Wi-Fi to its residents in public places

# Smart Communities, Small Cells & GDP

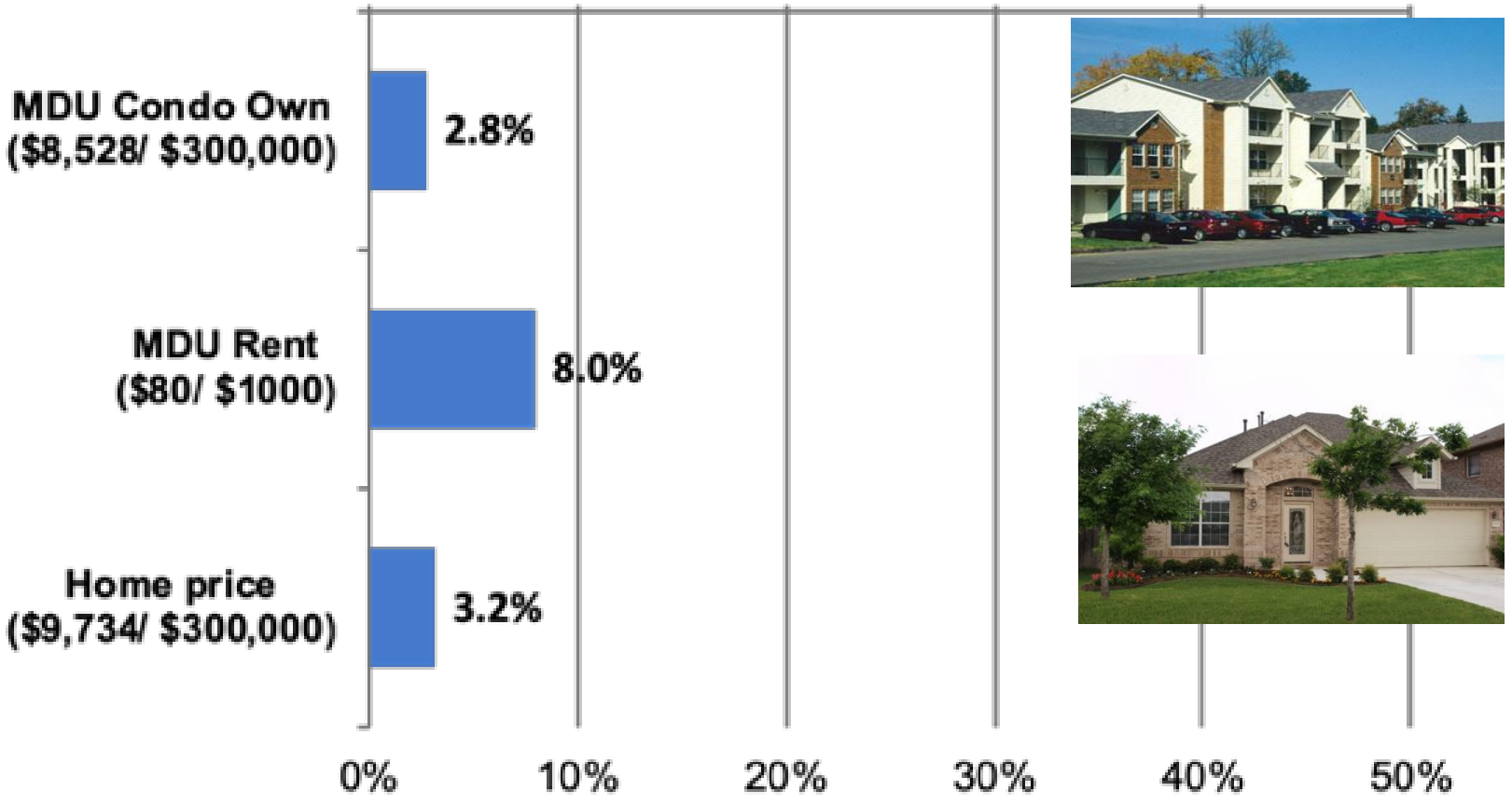
According to 2018 research from RVA, LLC:

## Fiber Cities are more likely to be Smart Cities

- Cities with fiber have, on average, 37% more deployed small cells and just over 35% more smart city applications
- Only 33% of cities without fiber report small cell activity, versus 60% of cities with fiber to the residence
- 2019 Research confirms a positive correlation between availability of fiber networks & GDP

# Fiber Adds To Home Value

**RVA Consumer Study May 2016**

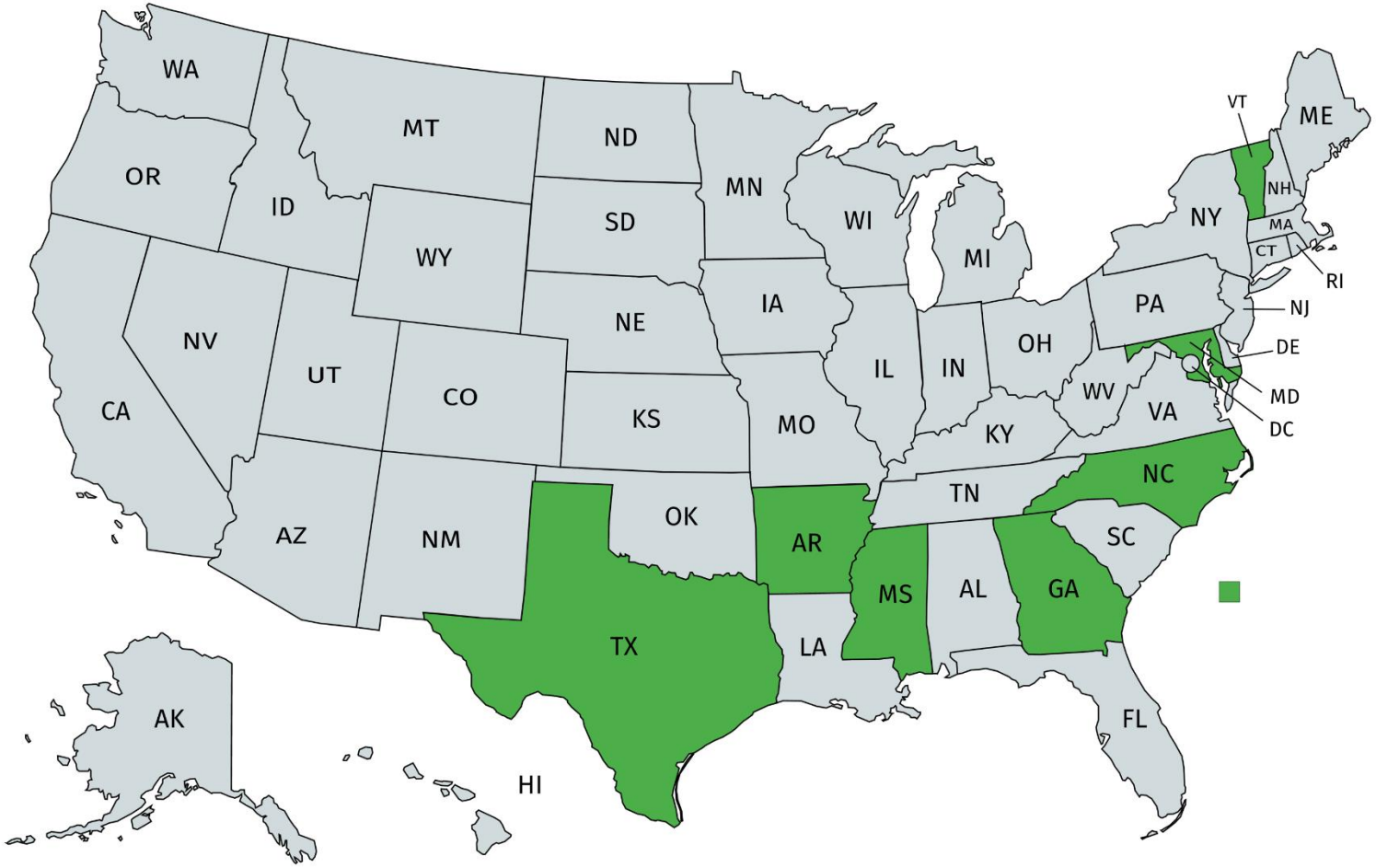


# Fiber and Lowering Unemployment

- Our study in Tennessee found that access to high speed broadband can **significantly reduce unemployment rates**, especially in rural communities.
- Counties with access to high speed broadband have a **0.26% lower unemployment rates** compared to low speed counties.

According to 2019 study from FBA, University of Tennessee at Chattanooga and Oklahoma State University

# Driving Future of Fiber: Growth & New Opportunities for Deployment



# Broadband Funding Opportunities

**FCC**

- **RDOF**/ Connect America (CAF)
- E-Rate, Schools & Libraries, Rural Healthcare

**USDA RUS**

- Traditional Telecom Programs (Loans/Guarantees
- Broadband Program (Grants, Loans/Guarantees)
- Community Connect Programs (Grants)
- Pilot Reconnect Program (Grants, Loans/Guarantees)

**State Funds**

- Universal Service Programs
- Broadband Deployment Programs

**Public Private Partnerships**

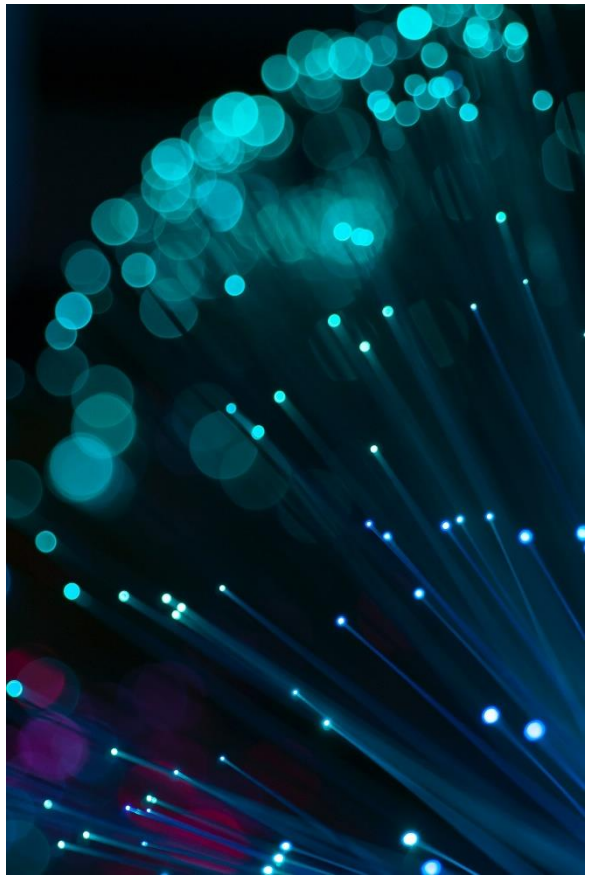
- Models Vary by Risk, Benefit, Control

# FBA Study: Deploying Fiber to 90% of US Households

- We can reach **90% of U.S. homes** with fiber broadband networks in the next 10 years.
- Reaching 90% of U.S. homes will cost approximately **$70B**.
- **We can achieve this** with:
  - Targeted government support
  - Muni builds
  - Private sector innovation
  - Public-private partnerships
  - Innovative deployment models

According to 2019 study from FBA and Cartesian

# FBA RESEARCH: NEW Weighting Methodology to Improve Funding Decisions



- Our research shows that the FCC's **CAF II auction** penalized fiber broadband providers:
  - It **disincentivized participation by gigabit providers** and few areas saw gigabit bids.
  - It failed to consider the **socioeconomic benefits** produced by different access technologies and use cases— e.g., telecommuting, remote health and learning, e-commerce, and video streaming.
- To determine weights in future auctions, the FCC should use a **methodology** that accounts for the full benefits of different technologies.

According to 2019 study from FBA and Cartesian

# Barriers to Fiber and 5G Deployment

## Lack of Skilled Labor/Workforce

-DOL grants and apprenticeship programs
-Working with Community Colleges on Curriculum
-Certifications
-Second Career/Vets

## Railroad Crossings

-No federal law
-Some state caps
-Charges for crossing fees arbitrary and vary dramatically by RR

## Poles

- Industry solutions work
-Some compliance issues
-Outliers on unreasonable fees, surveys
-Not enough certified make-ready crews

## ROW & Permits

-Positively work with cities and states
-Some delays remain
-Federal permitting delays; *Mobile Now* streamlined
-E.g. State ROW treating fiber different


June 1-3, 2020

*May 31: Fiber Starter Kit Workshop*

Gaylord Opryland Resort
Nashville, TN

# Save the Date!

## *North America's Premier Fiber Event*

www.FiberConnect.org

Fiber Broadband ASSOCIATION

*Accelerating the Connected Future*