

APPCON

2019

**BROADBAND
DEPLOYMENT: 5G**

What is 5G?

- A marketing term
- 5G facilitates:
 - Faster broadband
 - Lower energy use
 - More interconnectivity

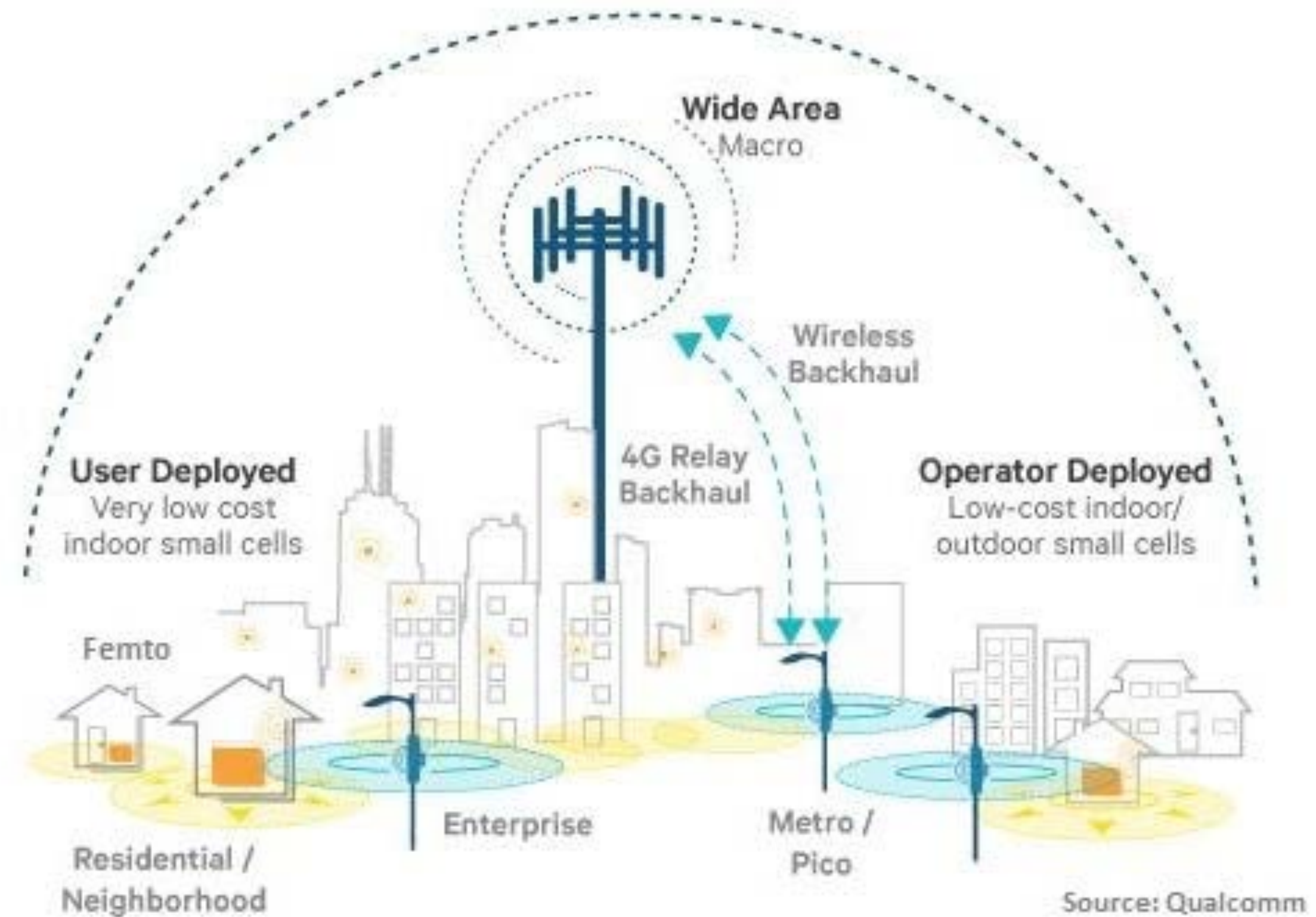


Why Does 5G Matter?

- The sheer number of added devices that will use broadband
 - 28.4 billion IoT devices now
 - 50.1 billion by 2020
- More opportunities for you



What an IoT 5G Network Looks Like

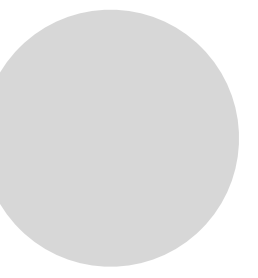


Macro Cell v. Small Cell



What's the Problem?

Well... government



I n c i d e n t a l i s s u e s

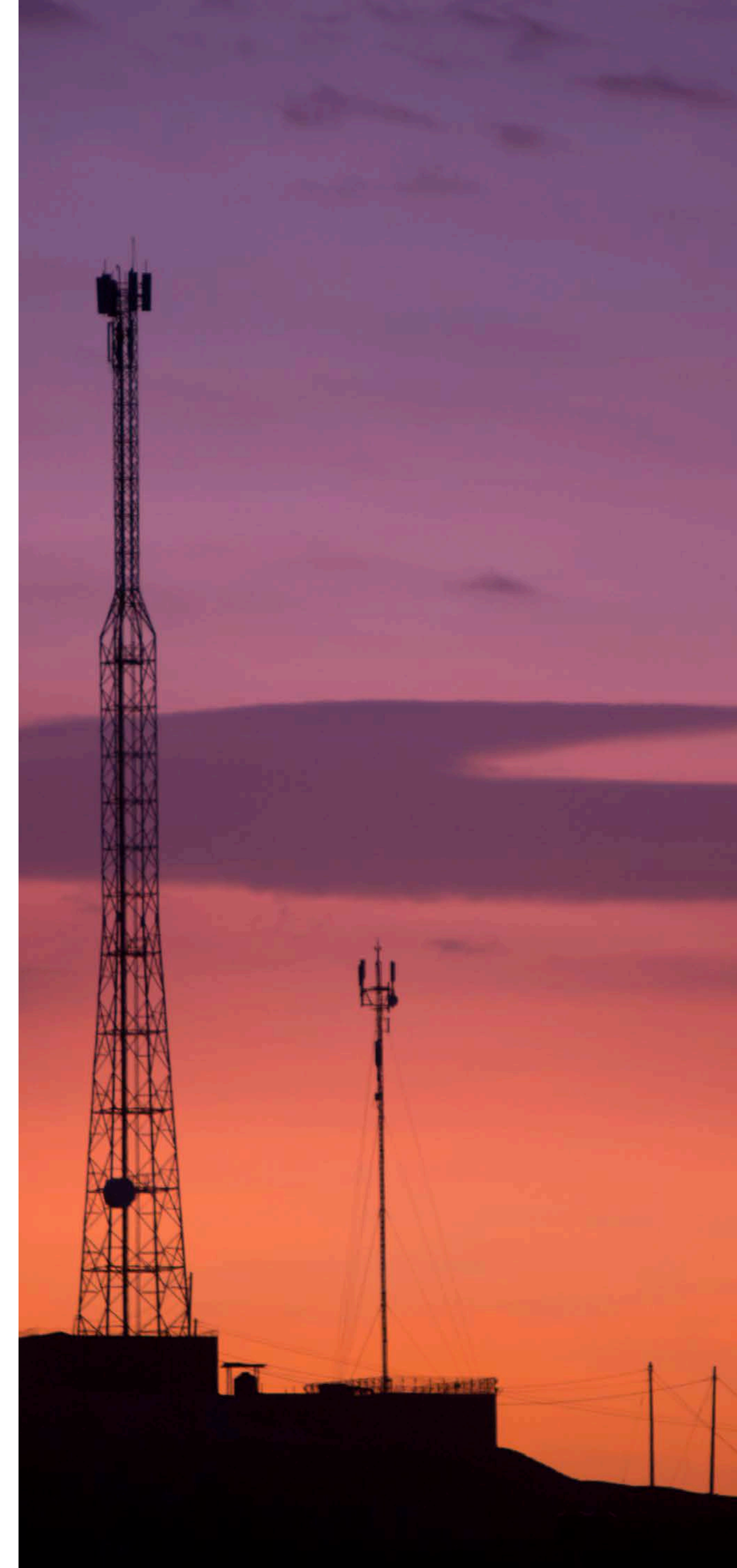
- Outdated regulations
- Onerous permitting processes
- Strapped resources

P u r p o s e f u l i s s u e s

- Leveraging permitting requirements to generate more revenue for the city
- Sitting on applications

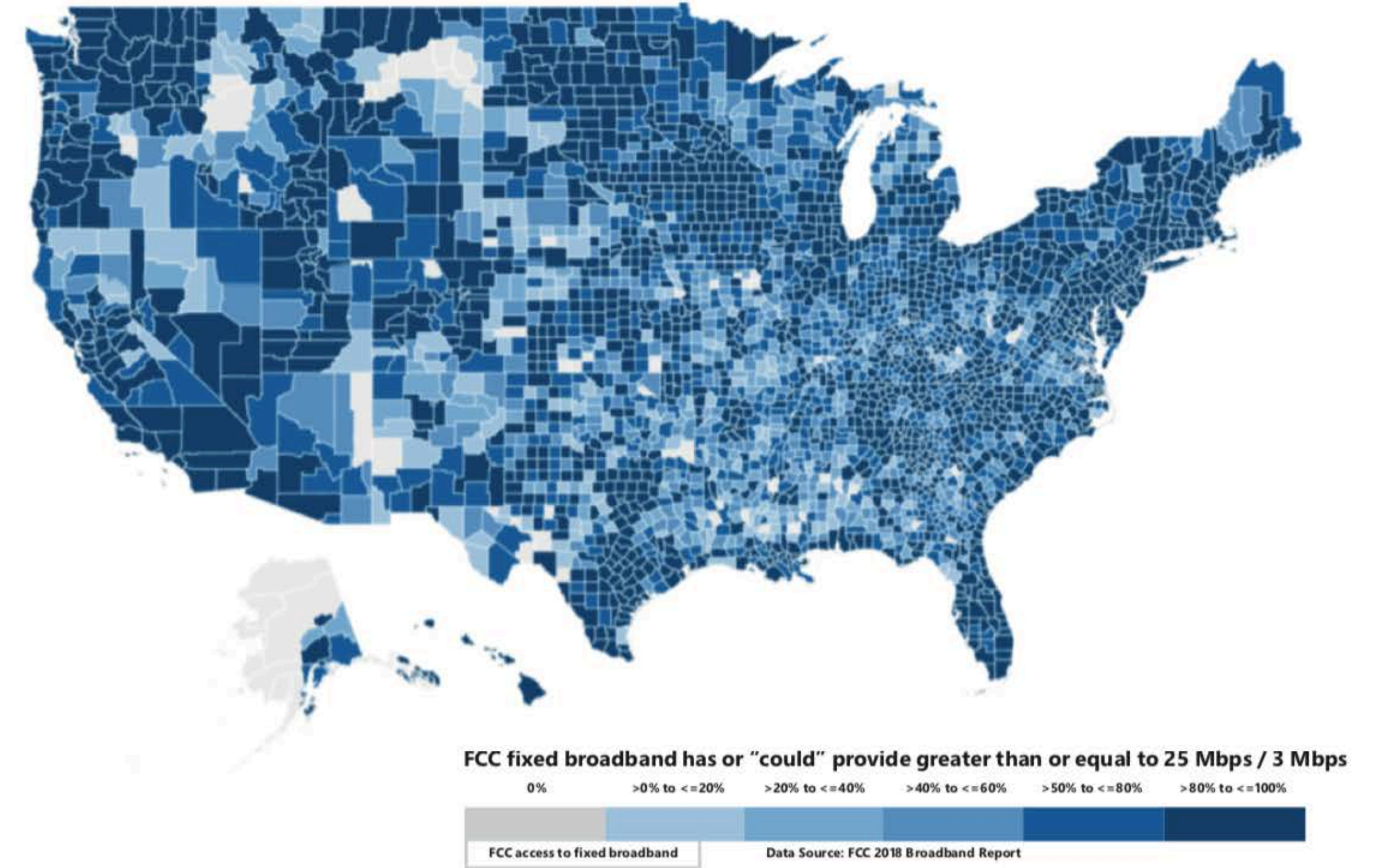
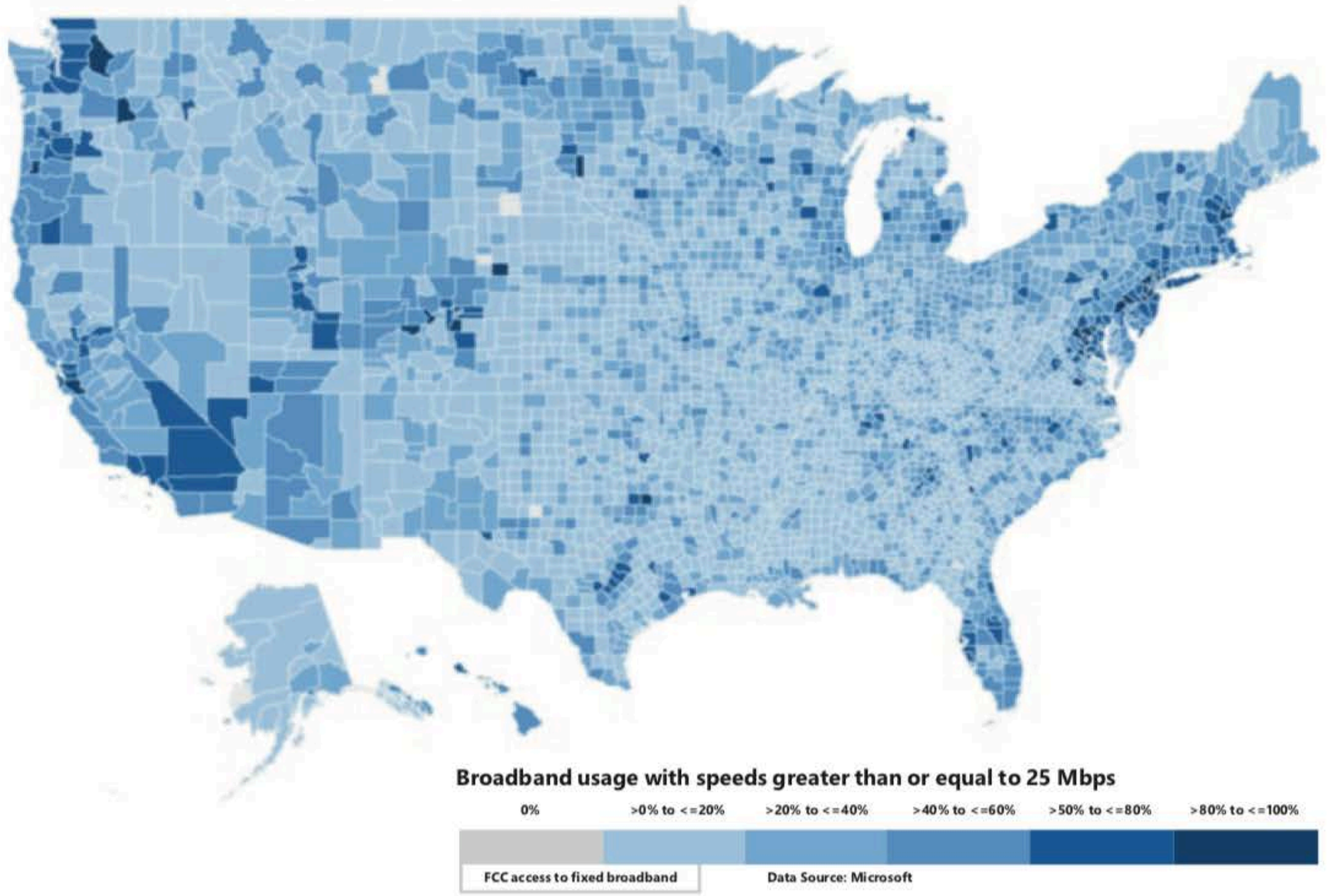
What Needs to be Done

- Remove regulatory barriers to small cell and macro cell deployment
- Ensure states and localities facilitate 5G deployment without undue delay
- Ensure the implementation of certain FCC rules, and include 5G deployment incentives, in infrastructure legislation
- Support the FCC's recent Further Notice of Proposed Rulemaking implementing Sec. 621 of the Cable Communications Policy Act (MB Docket 05-311) (621 FNPRM)
- Liberate more government-owned spectrum bands for commercial IoT use, particularly in the mid-band and millimeter wave bands. Congress must support the Government Spectrum Valuation Act (S. 3617, 115th)

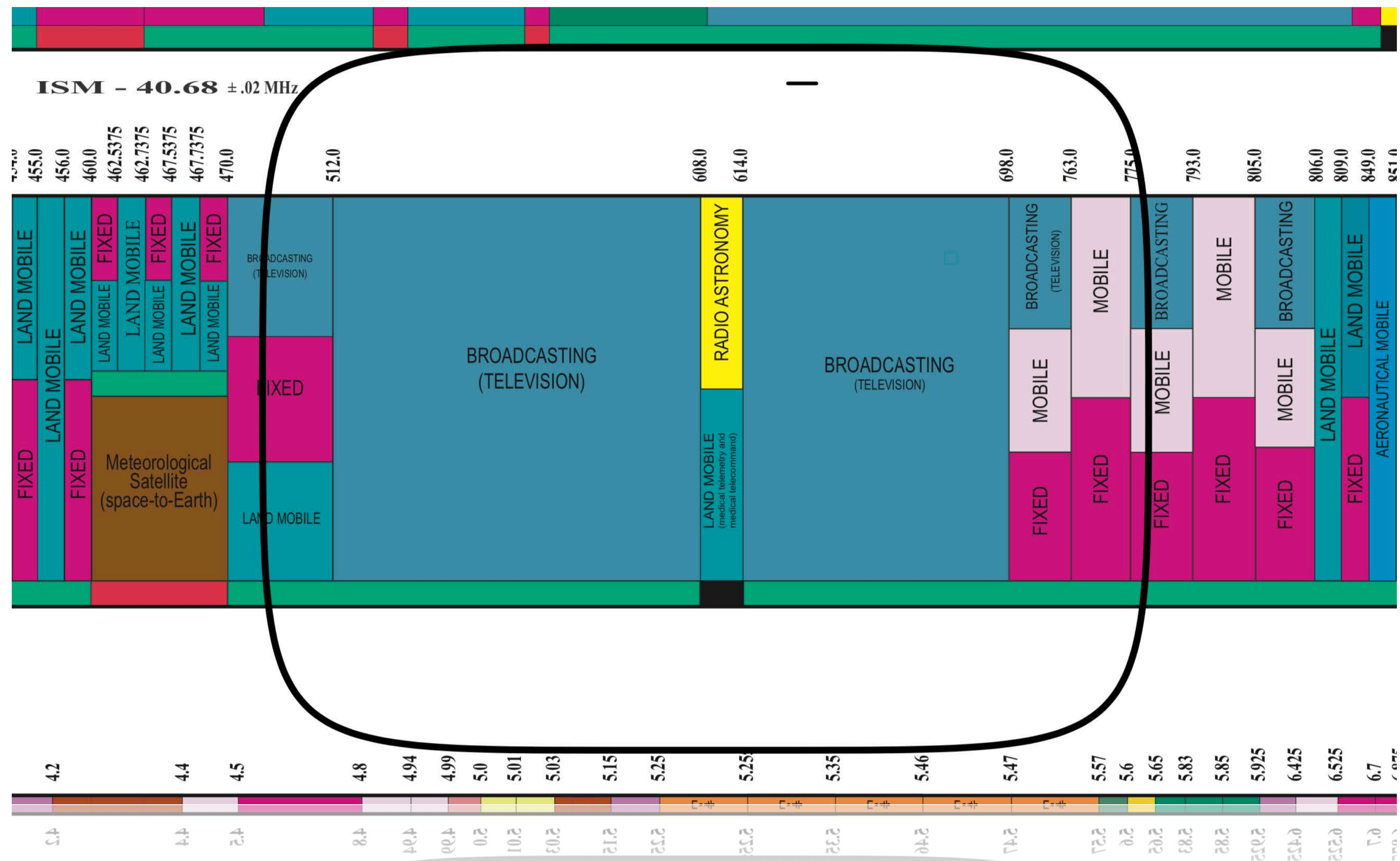


5G is About Faster Internet; What About Where People Currently Have No Internet?

- First, a pat on the back
- There is a “digital divide”
- Why aren’t they connected?



TV What Spaces?



But Why TV White Spaces?

- **Cost-Effectiveness**
- **Coverage**
- **Speed**



Adaptrum is committed to providing comprehensive TVWS products and services to power a wide area wireless broadband solution.

- Leading long-range non-line-of-site TVWS broadband infrastructure and clients
- Reliable & globally proven equipment that just works
- Easy to deploy and simple to manage solution
- End-to-end support services spanning spectrum consultation, network design, deployment, & testing

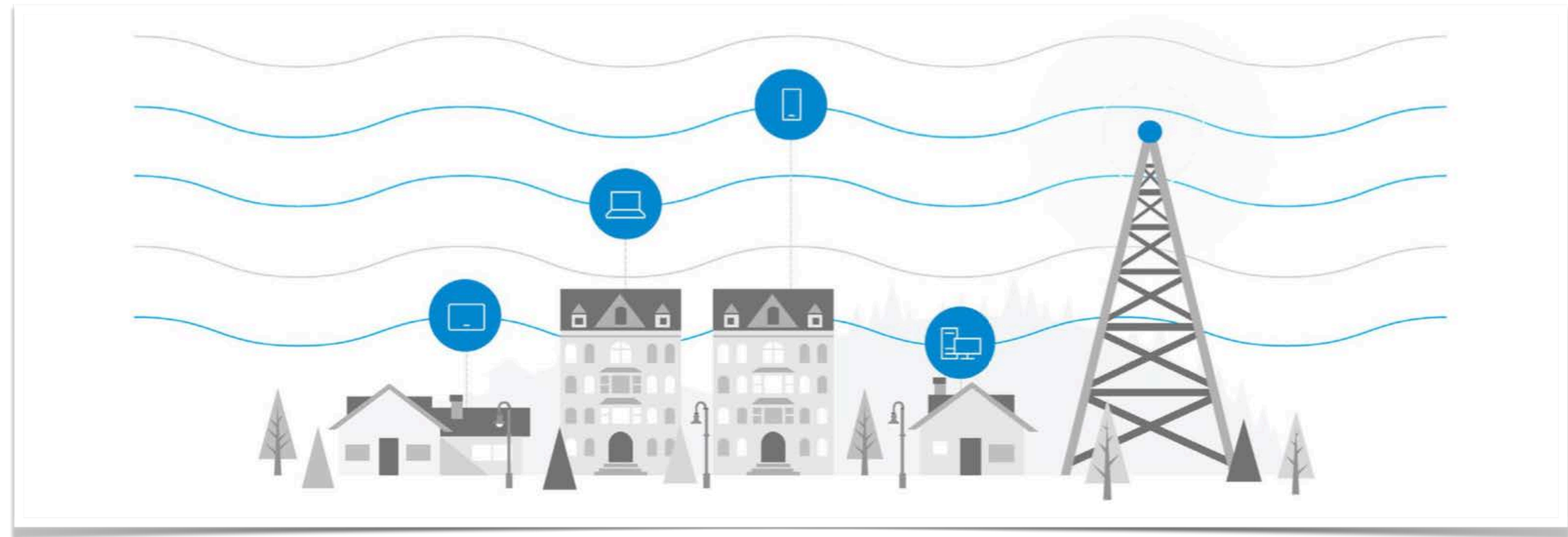
It Hasn't All Been Easy

- **Broadcaster opposition?**
- **FCC takes a step forward**
- **Detente**



What the Customer Sees

- Nuts and bolts
- Pilots and partners



Whither TV White Spaces?

Progress thus far:

Last month, the FCC established basic rules of the road for the unlicensed transmission of broadband signals in all the parts of the TV band they are nominally allowed to operate:

- a) vacant TV channels (each of which is 6 MHz);
- b) TV channel 37; and
- c) the “duplex gap,” an 11 MHz swath of spectrum, just above the TV channels

What Remains to be Done:

- **THERE ARE STILL SOME UNRESOLVED ISSUES ACROSS THE ENTIRE BAND, EVEN THOUGH SOME OF THE RULES ARE ESTABLISHED**
- **FOR EXAMPLE, TOWER HEIGHTS, POWER LEVELS, AND DATABASE ISSUES**

The Ask

Finalize the remaining issues:

- **WE WOULD LIKE CONGRESS TO SUPPORT FINALIZING RULES FOR UNLICENSED BROADBAND IN THE TV BAND SO THAT IT CAN BE USED GOING FORWARD FOR TV WHITE SPACE OPERATIONS**
- **THE FCC RECENTLY FINALIZED SOME ASPECTS OF THE RULES AND CONGRESSIONAL SUPPORT IS CRITICAL TO MAINTAIN THIS FORWARD MOMENTUM**

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THANK YOU