Non-Urban America & the Digital Divide

Deep Fiber + New Business Models

Haywood County Broadband Committee
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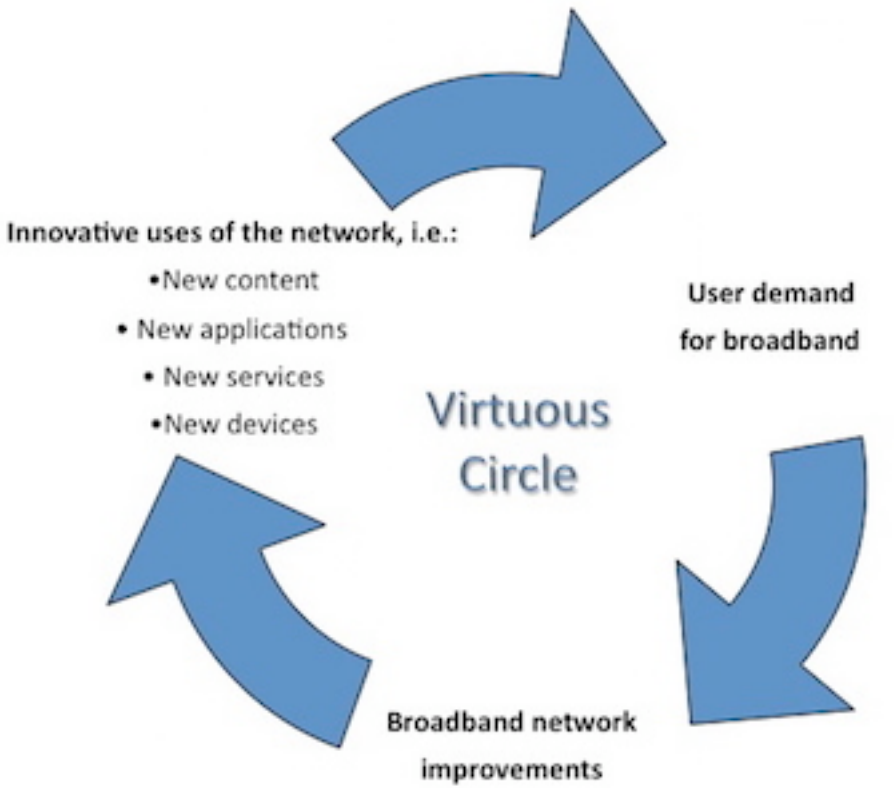
The Broadband Virtuous Cycle

100 M US. Homes with > 100 Mbps Internet Access in 2020

Non-Urban America Being Left Further Behind!!



➢ **Performance doubles Every 2 years in urban and suburban areas**

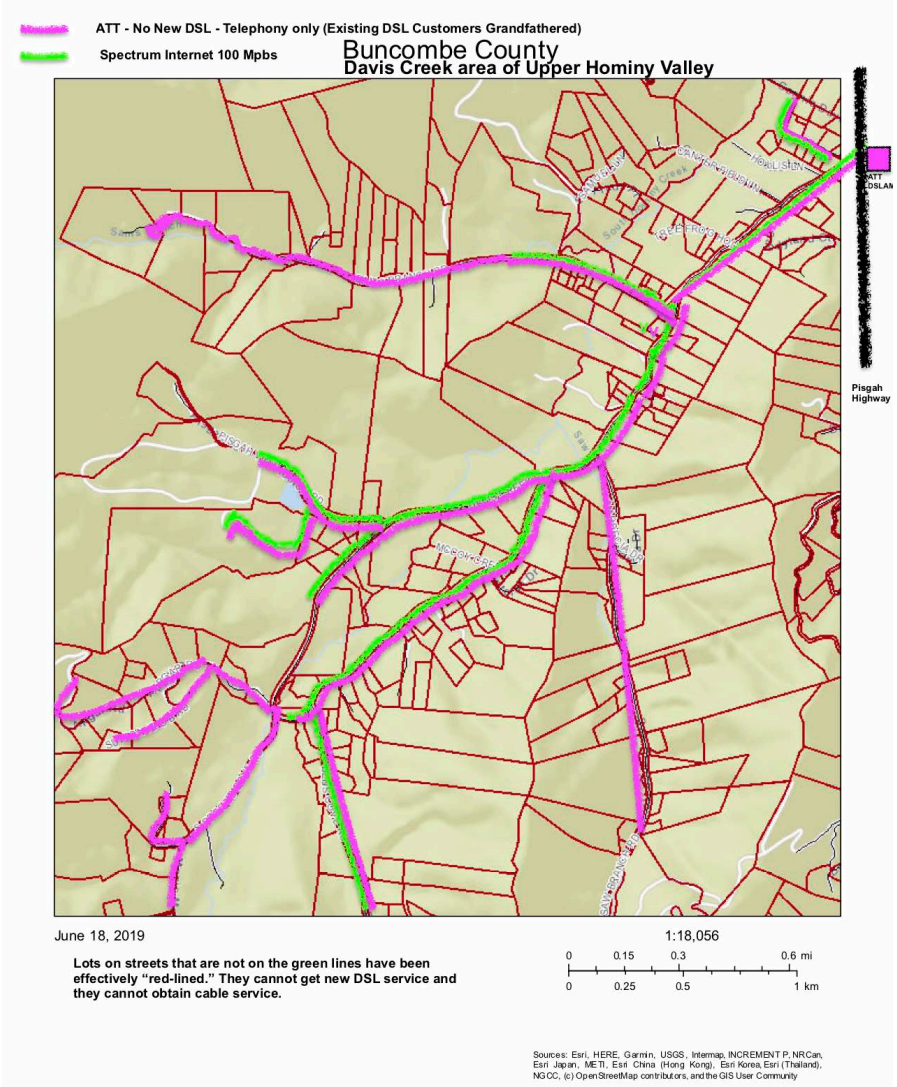
Population Covered	Notional Cost Factor
00% – 90%	1X-2X
90% - 99%	2X-20X
99% - 100%	20X – 200X

- **Telco copper and conventional cellular technology hitting limits; 5G will require 100 times more cell sites per square mile in rural America**
- **Without deep fiber, rural America will be left further behind.**
- **The economics of rural broadband are daunting - and require a fundamental rethinking across Technologies, Local Conditions, and Business Models.**

Source: Stagg Newman, FCC Subadvisory Committee work

Davis Creek Road Area – Upper Hominy Valley

Iconic example of the "Rural" Problem



- Charter Spectrum provides 100 Mbps to only 2/3rds homes
- ATT exiting market abandoning customers with no or *SLOW DSL*
- Poor cellular coverage due to terrain

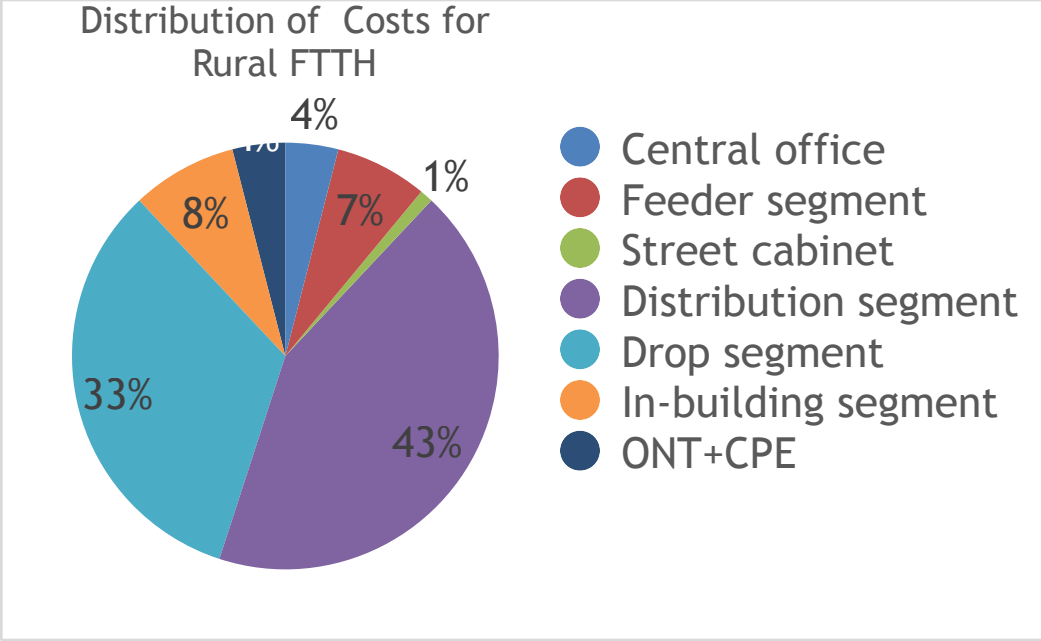
The Technologies – Deep Fiber

Sine Qua Non – and it is a civil engineering problem

Insufficient architectures

- Wide area wireless networks without deep fiber
- DSL
- Satellite except for most remote areas
- Older cable networks

Capital Cost Distribution for Rural FTTH (1000-3000 Households. density 23 HHs/Km²)



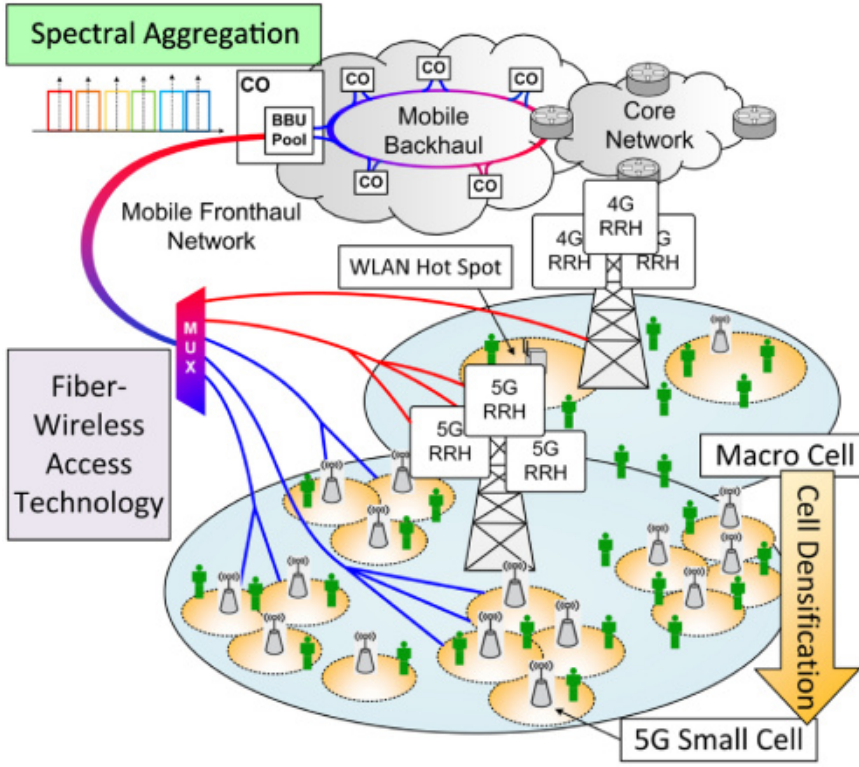
- 50% of cost is construction of outside plant to the curb
- 33% of cost is drop to the house

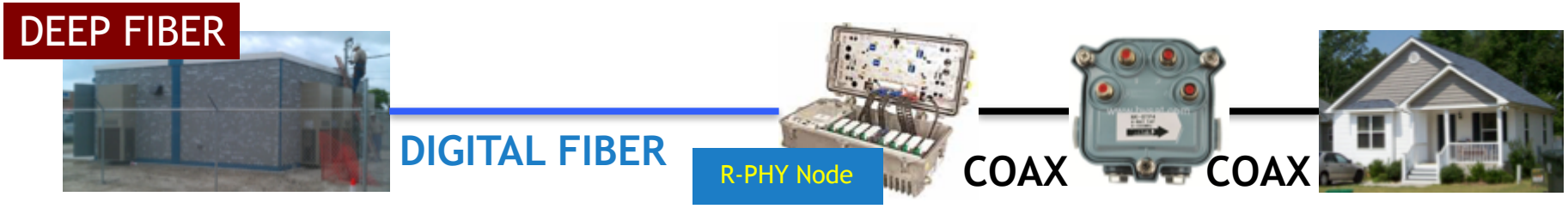
➢ Both of these are dominated by labor costs

Source: Stagg Newman, FCC Subadvisory Committee work

Future-proof networks
Deep Fiber, 5G Wireless, Modern Cable

- Future proof networks
  - Deep Fiber down almost all streets
  - Final drop by either
    - Fiber (fiber to the home)
    - Modern cable
    - Really high speed wireless
  - Robust Mobility
    - Cell site radius of ¼ mile or less





Source: John Chapman, Cisco. FCC Subadvisory Committee work

What the Local Communities Can Do

Act *now* to "***Bridge the Digital Divide***"

- Inventory
- Friendly policies such as dig once, do once for all utilities
- Partnerships including utilities
- RfN for Overbuilds or Upgrades or orchestrate Buy-outs if incumbents will not commit to modernize
- Migigate risks through demand commitment and aggregation and anchor contracts

Find Partners to create a Deep Fiber Fixed and Mobile Broadband Evolvable Infrastruture

Source: Stagg Newman, FCC Subadvisory Committee work

Summary

- The “Broadband Gap” between rural and underserved areas and urban centers in American is widening rapidly. Costs to close the much larger gap have increased dramatically in the last decade.
- Broadband for the vast majority of Americans is on a virtuous cycle with performance doubling every 18 to 36 months continuing to exacerbate the divide.
- There is a rich set of technology options that can contribute to solutions but the heart of the problem is overcoming the cost of construction and operations.
- New business models and new polices must enable diverse local/ regional solutions – because Broadband is increasingly seen as a means for economic well being and as an investment in making rural areas desirable places to thrive.