B4B - *Build For Broadband* Webinar

G.Fast Technology: Getting More Broadband in Brownfield MDUs

July 25, 2019

Presenter: Kevin McClain, ADTRAN

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B4B - *Build For Broadband* Initiative

Practices that support access to competitive, high-speed broadband for the current and future connectivity needs of Seattle residents.

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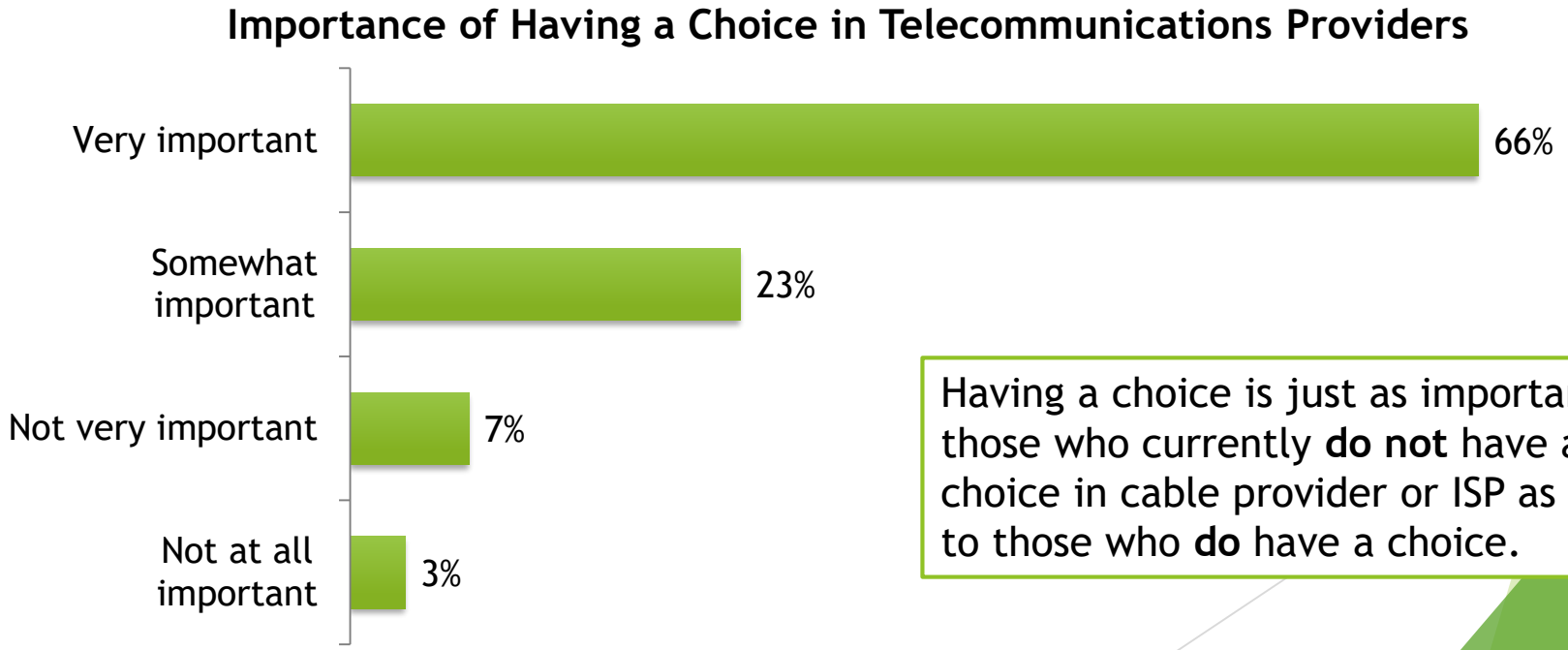
Goals

- MDU residents have access to competitive, high-speed broadband equal to that experienced by SF residents
- MDU housing is prepared for long term broadband future

89% of MDU residents say it is at least somewhat important to have a choice in providers.



Having a choice is just as important to those who currently **do not** have a choice in cable provider or ISP as it is to those who **do** have a choice.

- 95% of MDU residents report having a way to access the internet in the place they live

- Significant Lack of Competitive Choice in MDUs Compared to Single Family Homes in terms of access **to 100 Mbps+ broadband** providers

- Most Critical Factors in Supporting Multiple ISPs and 100 Mbps Speeds:
  - Building Age and Infrastructure
  - Prioritized Telecommunications Planning

- 3,200+ Seattle King County Area MDUs Built Before 2000

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G.FAST TECHNOLOGY:

GETTING MORE BROADBAND IN BROWNFIELD MDUS

Kevin P. McClain

Business Development Director, ADTRAN

July 25, 2019

What is the Challenge?

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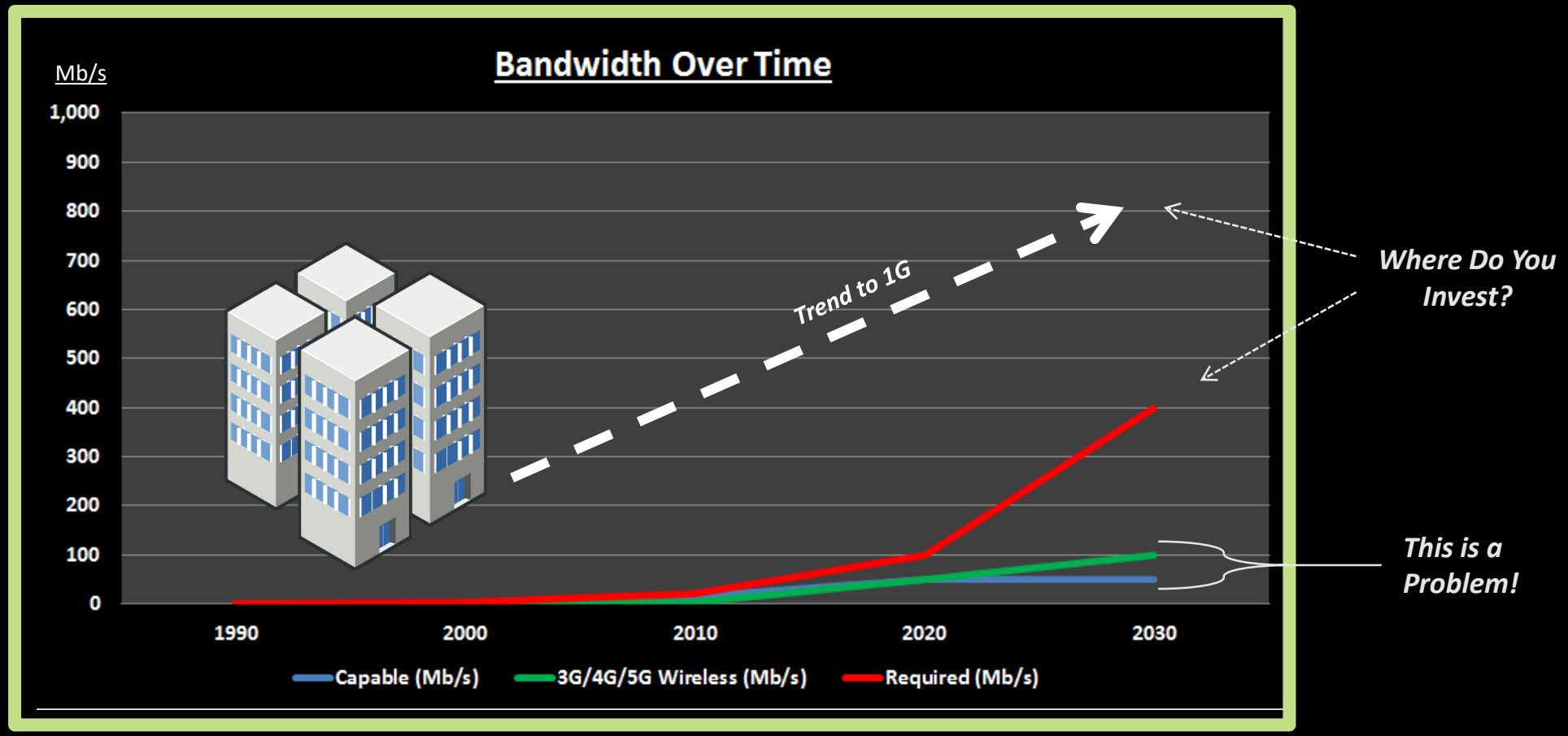
New applications are driving up bandwidth requirements

- Broadcast TV is being replaced with bandwidth intensive 4K “On-Demand” TV via Netflix, Hulu and YouTube
- Gaming is bandwidth intensive and now mainstream for primary MDU demographic where Bandwidth = Competitiveness
- Average MDU tenant is now running several devices (Android, X-Box, Laptop, AppleTV, Nest, etc.) at the same time
- Shop and Work from home is now a “Productivity Requirement” even for those who like to shop or work in an office where VHSI is available
- The future is “Instant Data Analytics” that requires higher “constant” bandwidth to compile, assemble and present

Why is it Impacting MDUs?

Existing facilities have reached their limit of acceptable bandwidth for future applications:



What are the Options?

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Rewire your facility with Fiber

- Future proof w/ 10G today **BUT…**
  - Costly option because it requires fiber to the building and to be run and terminated into every unit.
  - Complex option requiring months to install that will be disruptive to the facility.

Use existing facilities with G.hn or G.fast

- Not future proof w/ 1G today **BUT…**
  - Low cost option requiring only fiber to the building but doesn't require termination in each unit.
  - MDUs with as few as 25 units are likely to pass a service provider's standard Return On Investment (ROI) model.
  - Simple option that can be installed in days and minimally disruptive to the facility.

OPTIONS	Future Proof Upgrade	Minimal Cost Upgrade	Simple Upgrade
Fiber	*YES*	*NO*	*NO*
G.hn/G.fast	*NO*	*YES*	*YES*
Winner	**Fiber**	**G.hn/G.fast**	**G.hn/G.fast**

G.hn vs. G.Fast

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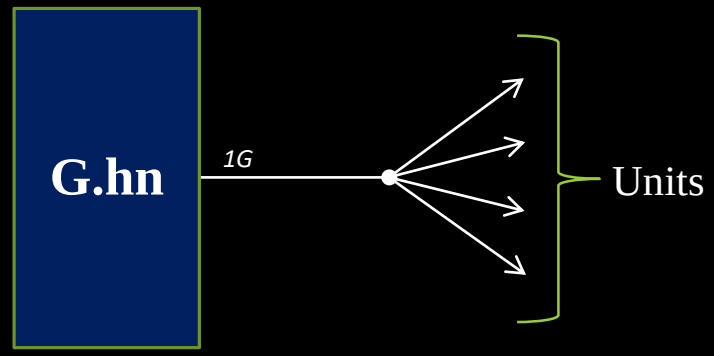
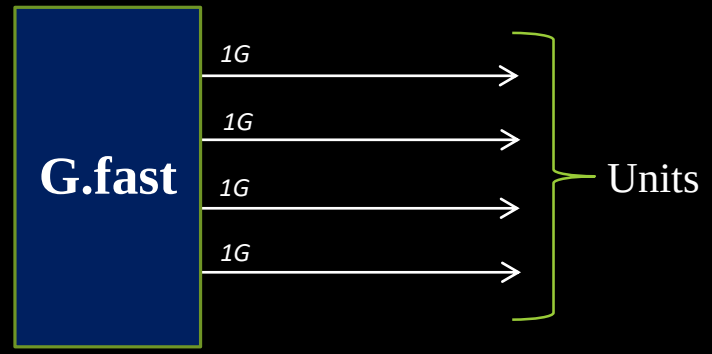
Similarities

- Both provide 1G speeds over Flat Wire, CAT-3, CAT-5 and Coax
  - ~750 feet for "telco pair" and ~1,000 feet for "coax"
- Both have wide deployment
  - 100 Mhz for G.hn vs. 106 Mhz for G.fast (first version)
- Both are based on higher frequencies for higher bandwidth
  - 200 Mhz for G.hn vs. 212 Mhz for G.fast (present version)

Differences

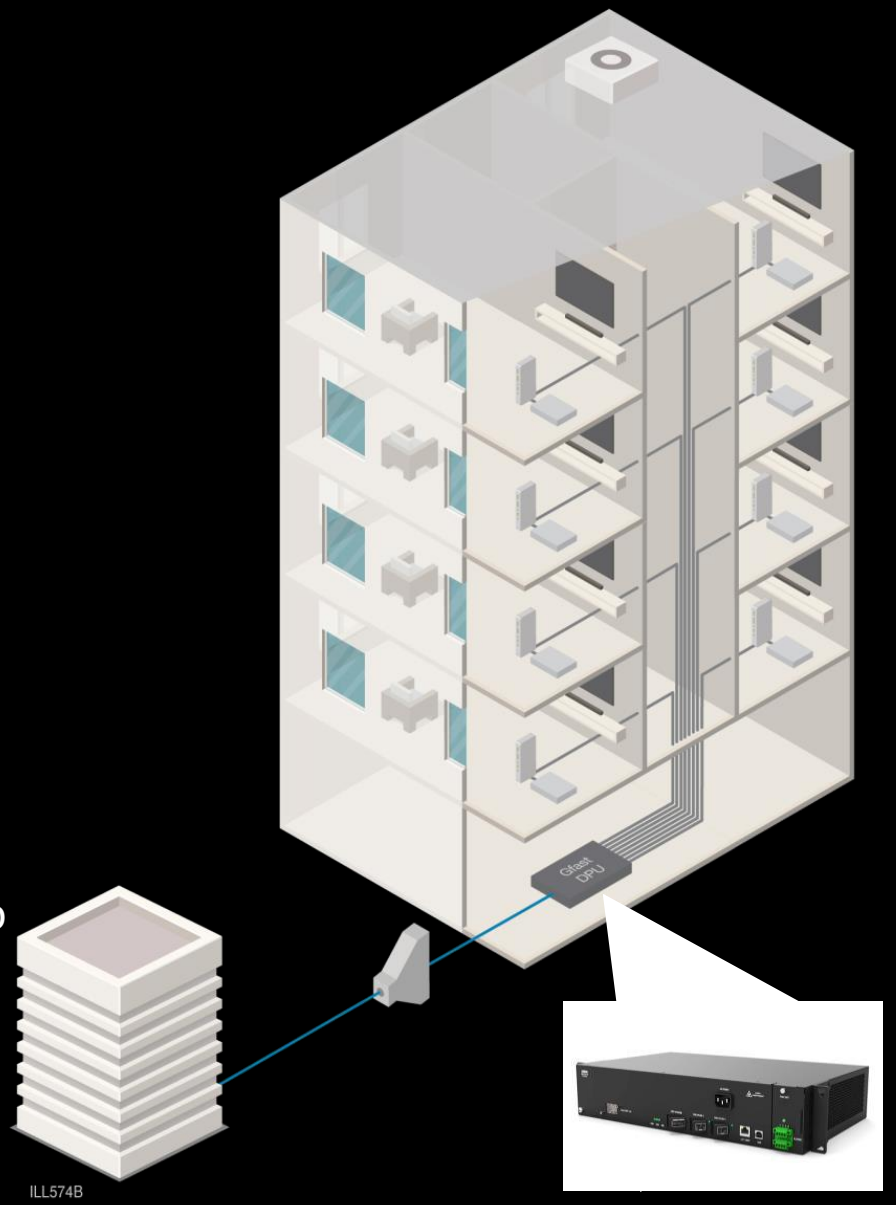
- G.hn is a "Point-to-MultiPoint" 1G SFU technology
  - 1G "shared" per unit
- G.fast is a "Point-to-Point" Nx1G SFU/MDU/MTU technology
  - 1G "dedicated" per unit
  - G.mgfast at 848 Mhz for multi-gig (future)





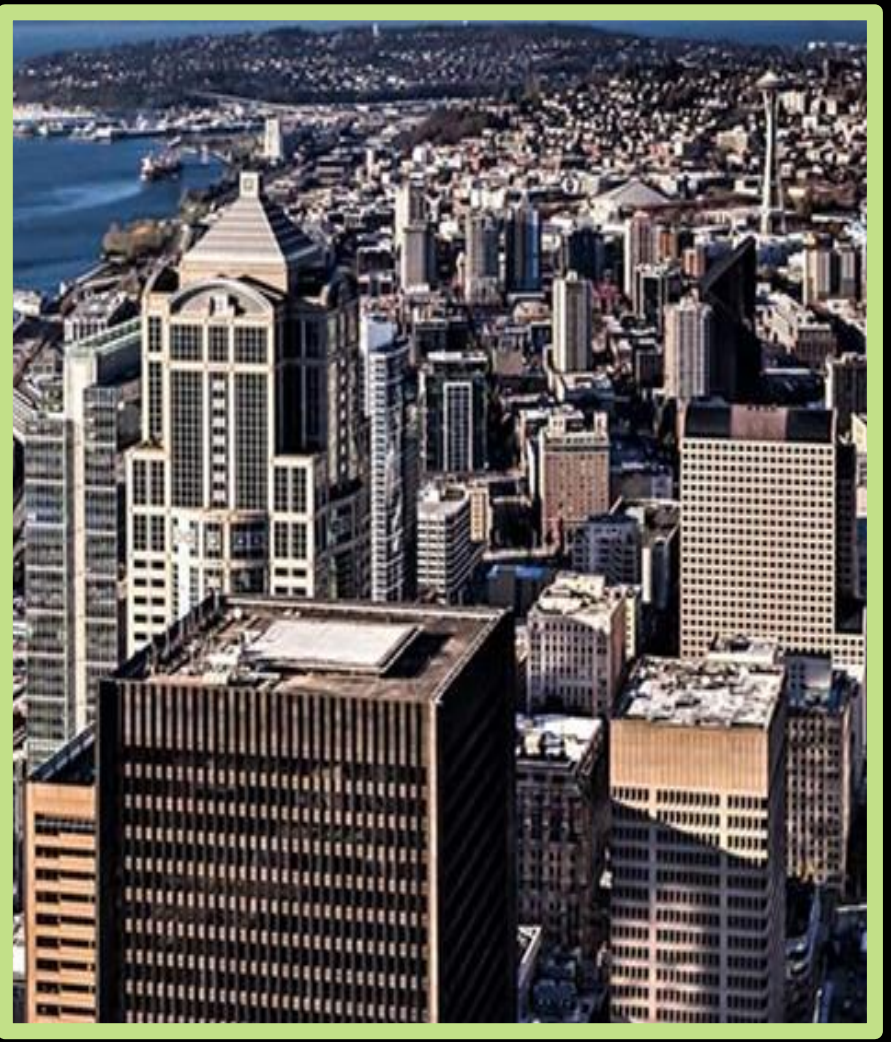
How is G.Fast Deployed?

- **STEP 1:** Fiber is brought into the building
- **STEP 2:** AC powered G.fast box is installed in a room/closet with telco pairs or coax going to all units and connected to 10G fiber
  - High Density 48 port “Pizza Box” (1.75”H x 19”W x 12”D)
  - Temperature hardened requiring no heating/cooling
  - Very low power at less than 2.5W per “active” subscriber
  - Single pair or coax is hardwired to G.fast box with a “home run” to each unit, office and/or common area
- **STEP 3:** G.fast → Ethernet Modem is placed in each unit, office and/or common area requesting service
  - Service is activated ONLY upon detection of the modem being connected to the RJ11 or Coax jack
  - Wireless access is provided by Residential Gateway (RG) connected to the Ethernet port on the modem
    - **NOTE:** Combined G.fast Modem/RG “single” box is planned



Summary

- Supports 1G to each unit
- Ideal for Mid/High Rise MDUs
  - Buildings are converted to 1G using a fiber fed G.fast “Pizza Box” and existing wiring
  - Can be converted quickly
- If 10G is eventually required to each unit in the future; fiber fed G.fast gives you two options:
  - Extend fiber to each unit via 10G PON (Today)
  - Upgrade to G.mgfast (Future)



B4B-Build For Broadband Initiative

Tip 6000

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ENSURING BROADBAND SERVICE ACCESS FOR MULTIPLE-DWELLING-UNIT (MDU) DEVELOPMENT PROJECTS

Created April 23, 2019

This B4B Tip is designed to support planning for broadband service connections when constructing new MDU residences (e.g., townhomes, apartments, condominiums). It addresses planning for the *exterior* connectivity needed to serve a property and provides general guidance on how to approach the planning, helpful contact information and key terms.

BROADBAND SERVICE CONNECTIONS FOR MDU DEVELOPMENT PROJECTS

High-speed broadband access is a high priority for Seattle residents and a key consideration for MDU residents when selecting where they will live. Residents expect fast access to broadband service once they move into a new residence. To ensure your property can meet these expectations, it's critical to plan for broadband service connections like other key utilities, such as water or electricity – at the *start* of your development process.

PLAN EARLY TO INCREASE CHOICE AND SPEED TO SERVICE

MDU residents want broadband options. Providing

SMALL PROJECT ALERT

CONVERTING SINGLE FAMILY RESIDENCE INTO MDU

DON'T ASSUME ISP CAN SERVE YOUR BUILDING

Early broadband coordination is especially important when converting a single-family residence lot into multiple units (e.g., townhomes). The added number of residences increases the load on existing cable systems and may require system reengineering by the ISP. Waiting to contact an ISP until after your building is complete can result in:

- Residents having to wait months for service connectivity to be constructed;
- Increased construction costs for ISPs, which could change their Return on Investment (ROI) decision on bringing service to your building; and
- Increased costs to you if the ISPs require you to cover some of the non-standard installation costs associated with getting post-construction connectivity to your building.

WHEN YOU INITIATE A BUILDING PROJECT

RESEARCH BROADBAND SERVICE PROVIDERS OPTIONS

DETERMINE WHICH PROVIDERS CAN SERVE THE PROPERTY

Building Community Awareness

- Early Telecommunication Planning
- Benefits of Infrastructure Investments

Planning problems magnified by trying to design for something that's hard to predict

Tips

Website

Webinars

www.seattle.gov/tech/initiatives/broadband/build-for-broadband

Thanks for Participating!

www.seattle.gov/tech/initiatives/broadband/build-for-broadband

Alice Lawson, Broadband & Cable Program Manager, alice.lawson@seattle.gov

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