

Broadband in Affordable Housing



Agenda

1. Intro
2. Supply and Wiring
3. Supply and Wiring Options
4. Unit Access
5. Unit Access Options
6. Design Guidelines
7. Federal Broadband Rules
8. Internet Service Providers (ISPs)

Broadband means internet service that is fast enough to complete modern tasks.

The FCC defines broadband as **100 Mbps** for downloads and **20 Mbps** for uploads.

Speeds (bandwidth) needed for common activities:

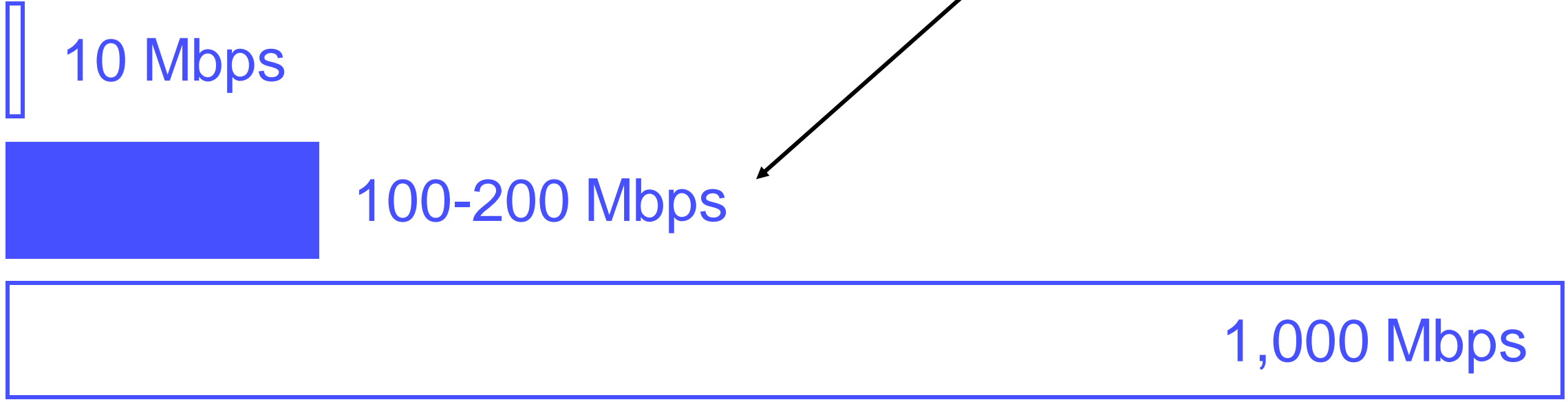
| | |
|-------------------|----------|
| Streaming music | 0.5 Mbps |
| Using web browser | 2 Mbps |
| Zoom | 2 Mbps |
| Online gaming | 3 Mbps* |
| Netflix | 5 Mbps |
| Netflix (4K) | 25 Mbps |

* But latency may be an issue

Think of speeds in terms of orders of magnitude:

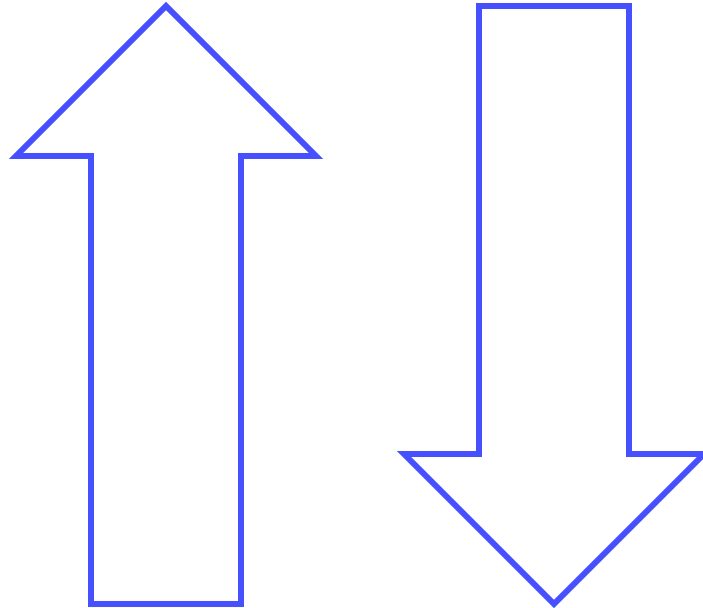


Balance between speed and cost



Ideally, speeds should be symmetrical*:

100 Mbps
Upload



100 Mbps
Download

*easiest to achieve with fiber

Broadband in units is required in:

--> All New Construction

Broadband in common areas is required in:

--> All New Construction

--> Some Preservation

The cost of doing broadband in a project is split into **installation** and **service rate**.

Installation is part of **construction**.

Service rate is part of **M&O**.

Let's talk about **installation** first!



Supply and Wiring

Supply comes in two main flavors:

Wired: Fiber, coaxial, or copper cables connected from the street or utility poles into the basement

Wireless: Antennas on the roof receive radio signals from other antennas on nearby buildings

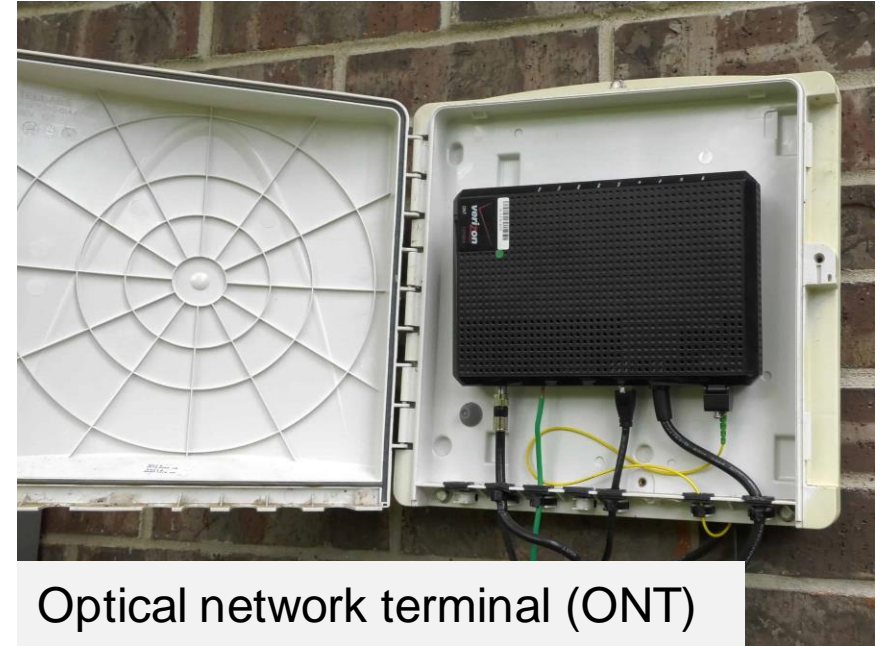
(There are also mobile cell networks, satellites, and laser beams...)



Wired



Microtrenched fiber



Optical network terminal (ONT)

Wireless



Point-to-point antennas



Facebook's Terragraph

Wired

Fiber Cable

Uses optical fibers to transmit data in the form of light

Coaxial/Copper Cable

Uses copper to transmit electrical signals

Wireless

Antennas

Use unlicensed radio frequencies (e.g. 5Ghz)

mmWave

Uses licensed high radio frequencies (e.g. 37Ghz)

Citizens Band Radio Service (CBRS)

Uses licensed radio frequencies to create private mobile network

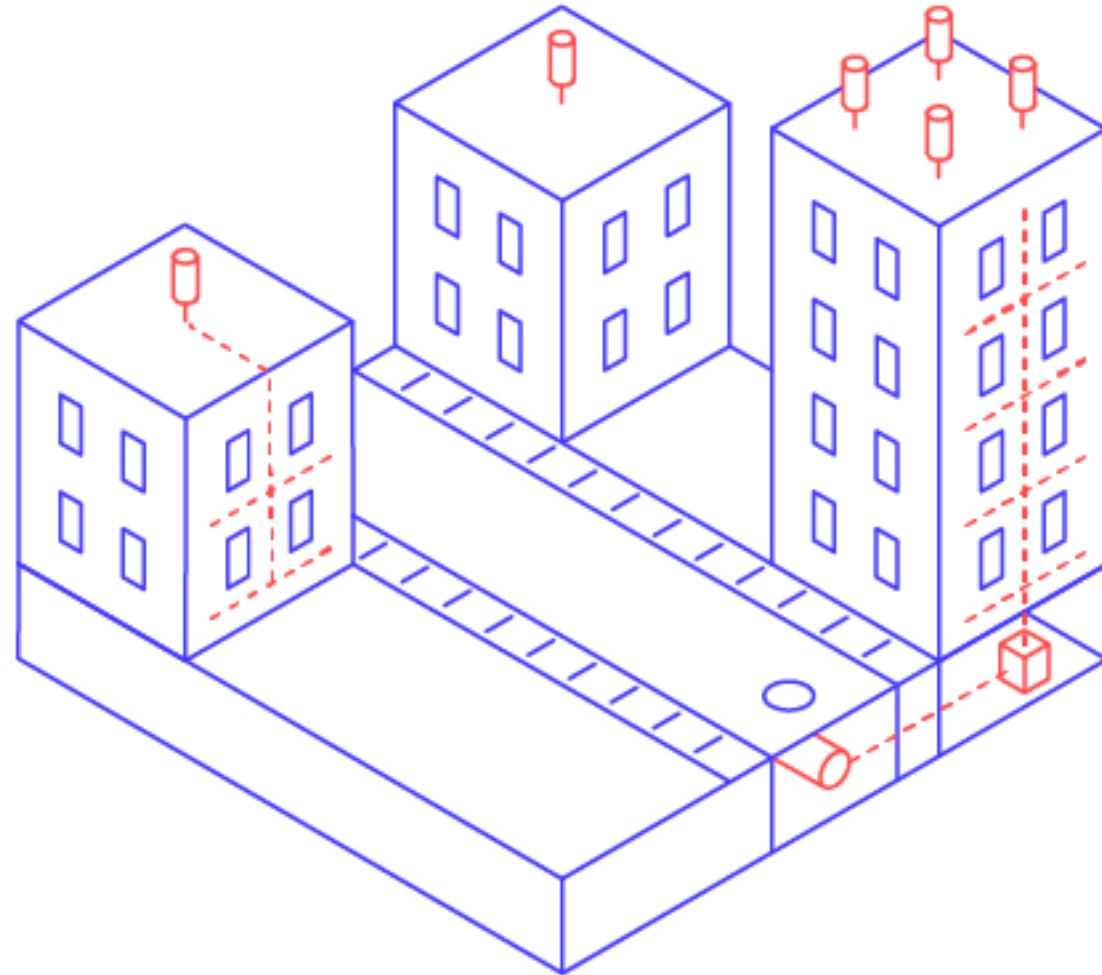
Wired

- ✓ Fiber is most “future-proof”
- ✓ Less likely for signal to be interfered with
- x Expensive if you need new entry point
- x Expensive if not available on street

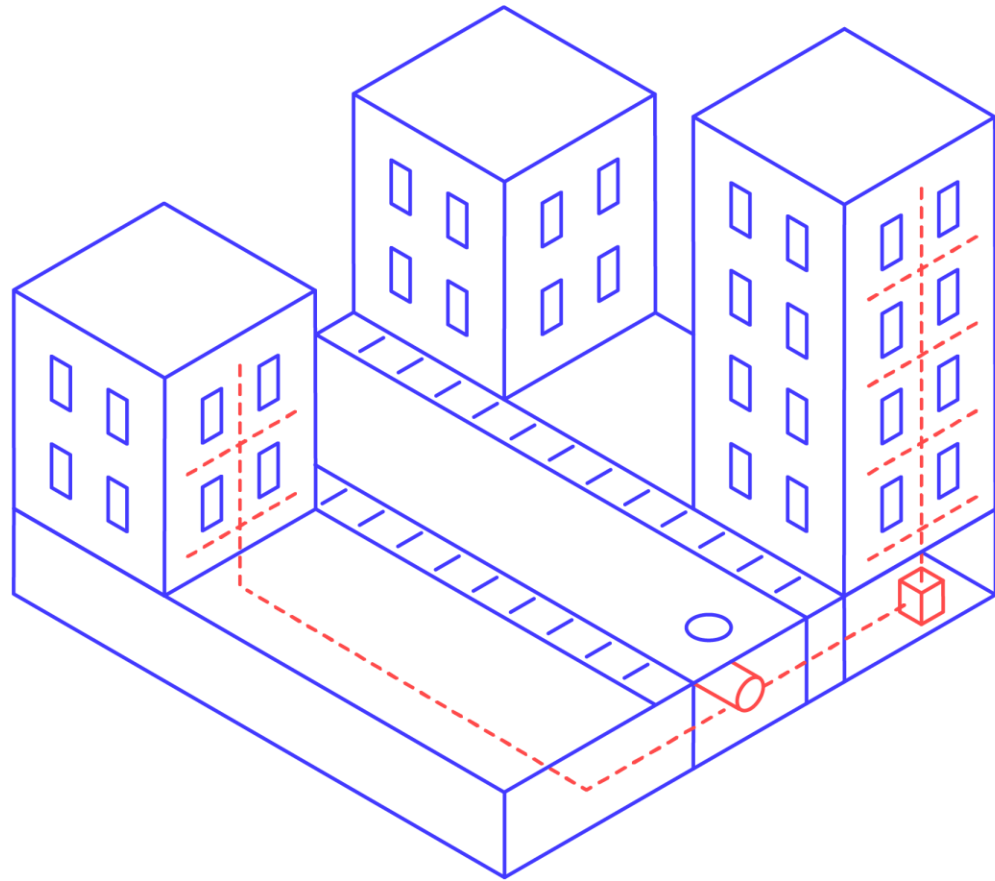
Wireless

- ✓ Inexpensive to install
- ✓ Easy to scale to nearby buildings
- x Can't achieve absolute fastest speeds
- x Weather and buildings can interfere

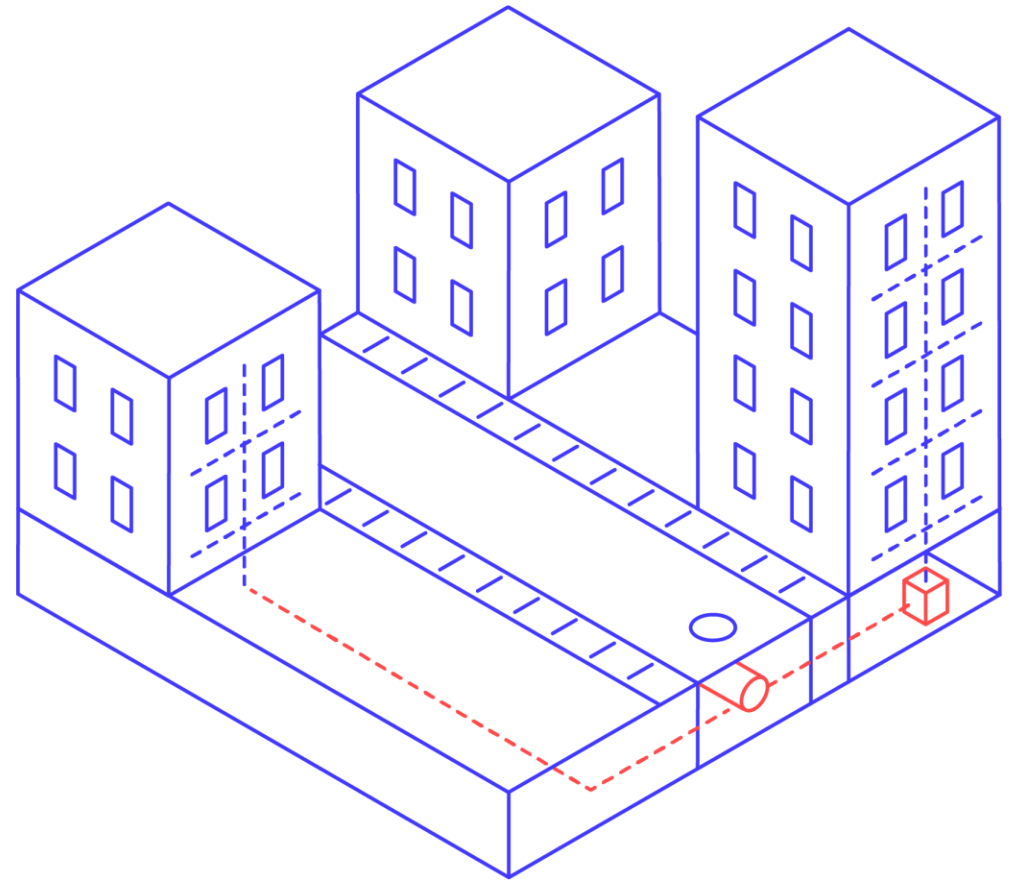
You can also **combine** wired and wireless ("mesh"), which may make sense across a portfolio of projects.



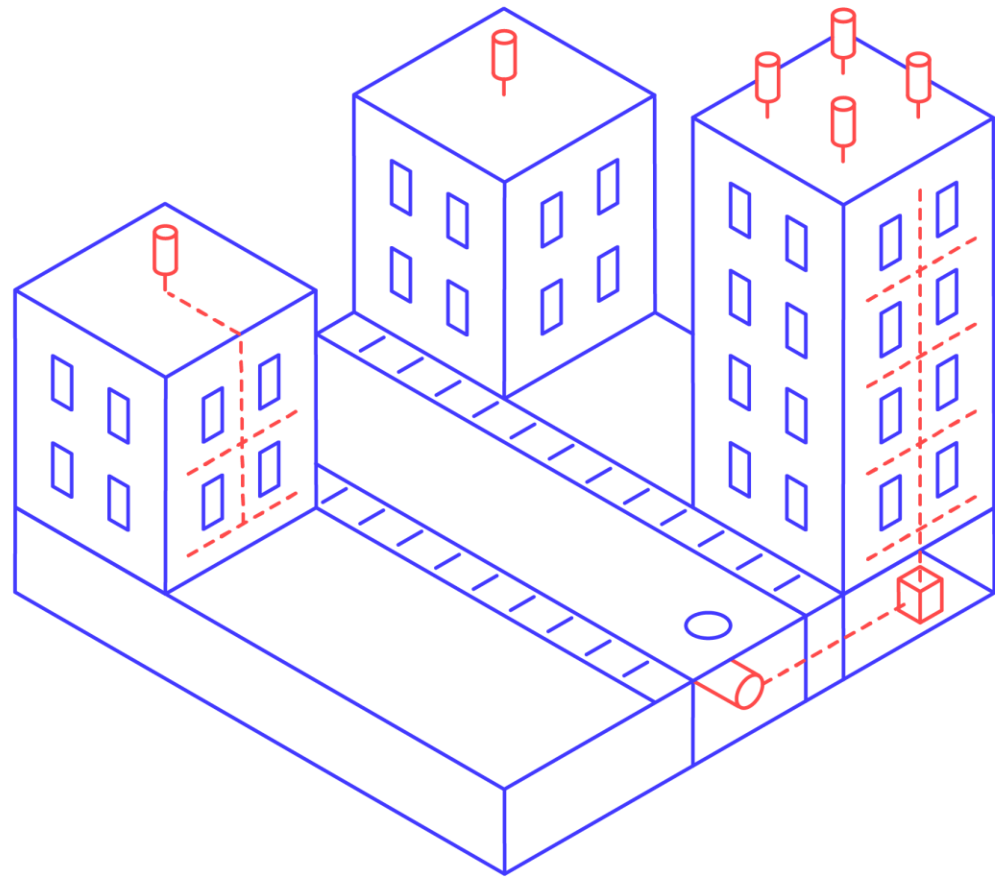
Supply and Wiring Options



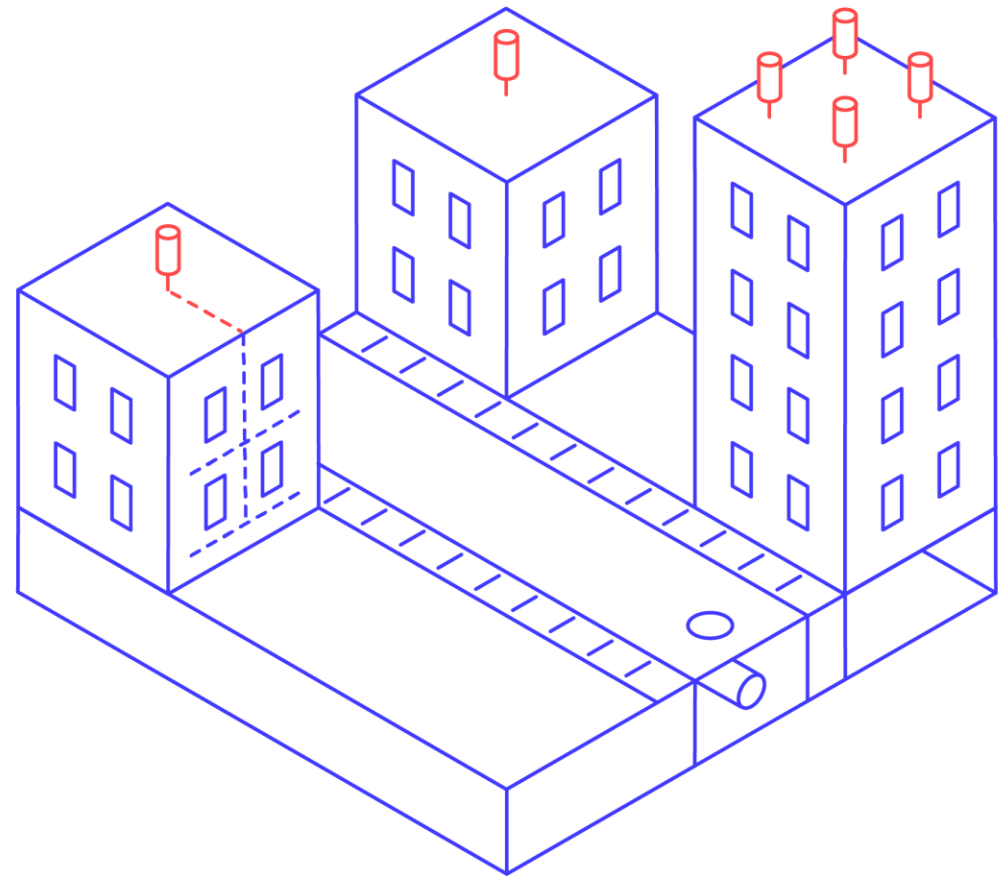
**New Fiber,
New Wiring**



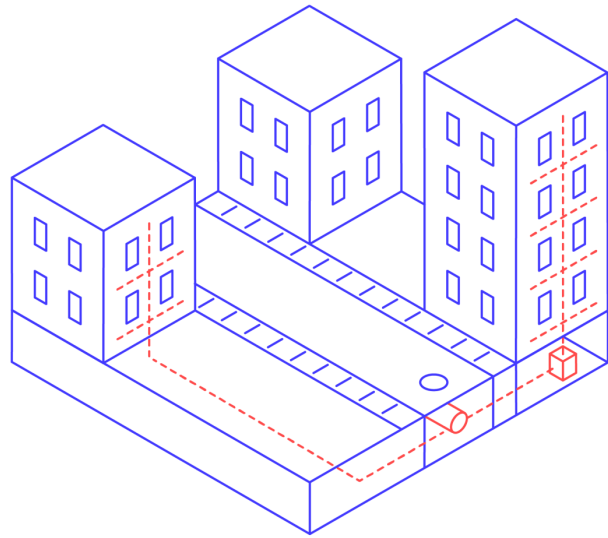
**New Fiber,
Existing Wiring**



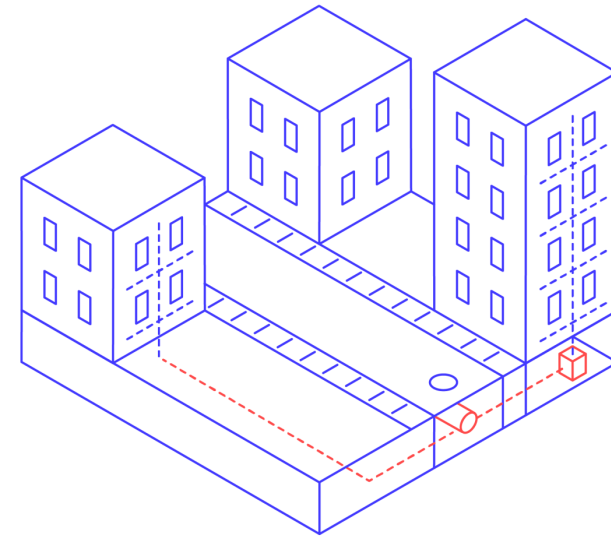
Wireless/Mesh,
New Wiring



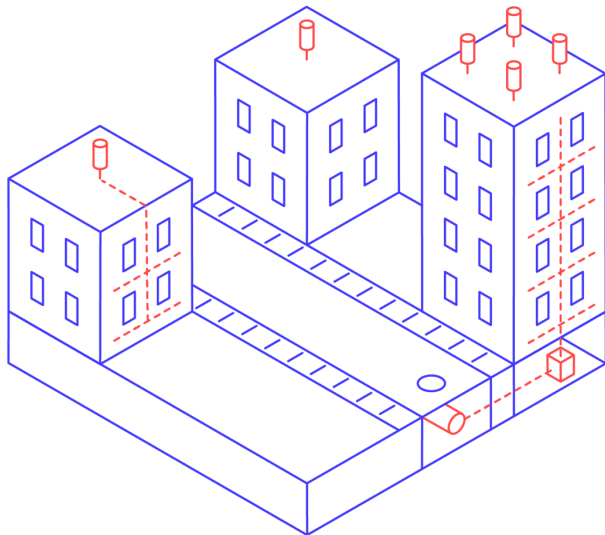
Wireless,
Existing Wiring



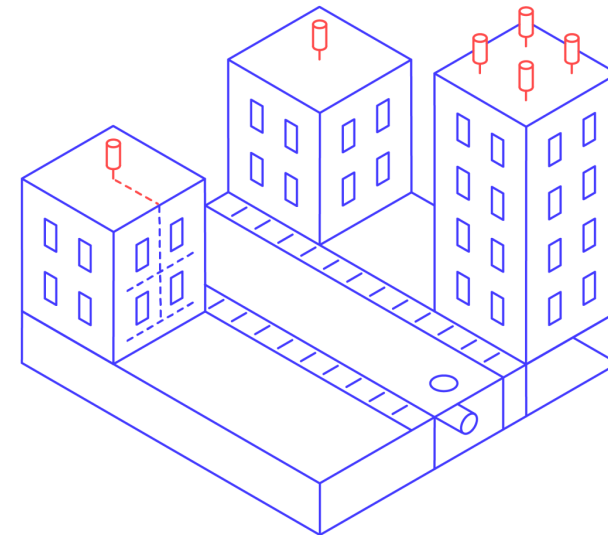
New Fiber, New Wiring



New Fiber, Existing Wiring



Wireless/Mesh, New Wiring



Wireless, Existing Wiring

| Type | New Construction AND Preservation | | Preservation | |
|-------------|--|---|--|---|
| Option | New Fiber, New Wiring | New Fiber, Existing Wiring | Wireless/Mesh, New Wiring | Wireless/Mesh, Existing Wiring |
| Reason | Fiber provides fastest internet speeds | Fiber provides fastest internet speeds, lower installation cost than new wiring | Lower installation cost than fiber | Extremely inexpensive, bare minimum solution |
| Feasibility | Requires fiber available in street near building and accessible minimum point of entry in basement | Requires fiber available in street near building, accessible minimum point of entry in basement, and existing wiring in good repair | Requires line-of-sight to provider's antenna | Requires line-of-sight to provider's antenna and existing wiring in good repair |

Unit Access

Congrats, we brought
internet to your building!



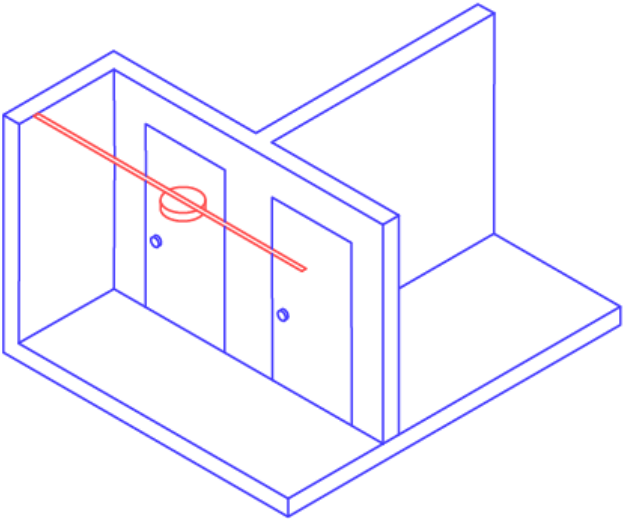
But now what?!



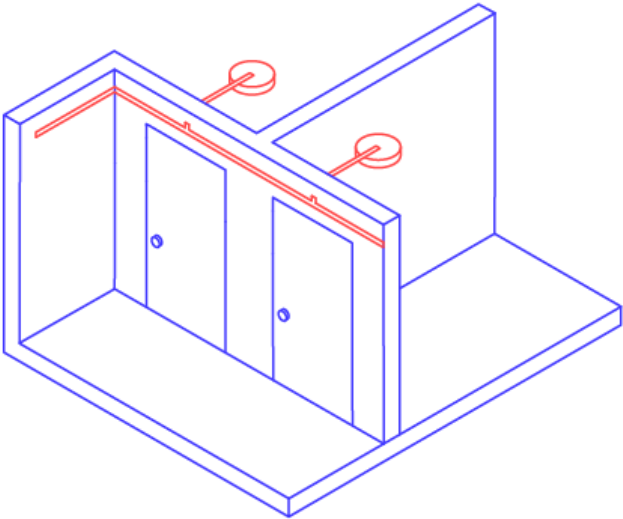
Considerations about tenants:

- How many household members per unit?
- Permanent tenants or transient?
- Any basic technical knowledge?
- More likely to use mobile/wireless devices or wired devices?

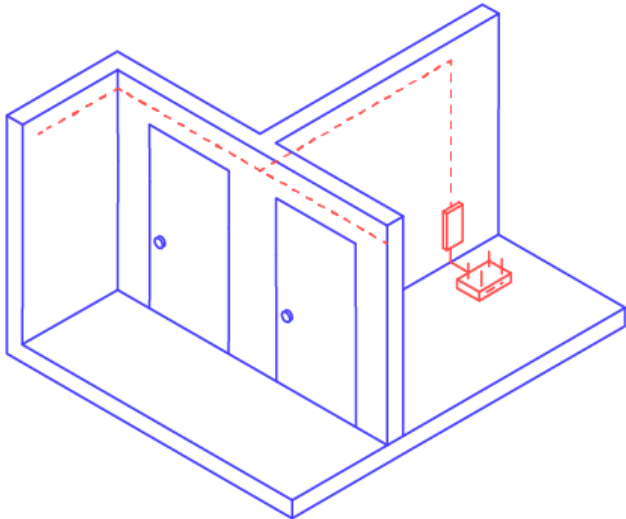
Individualized access



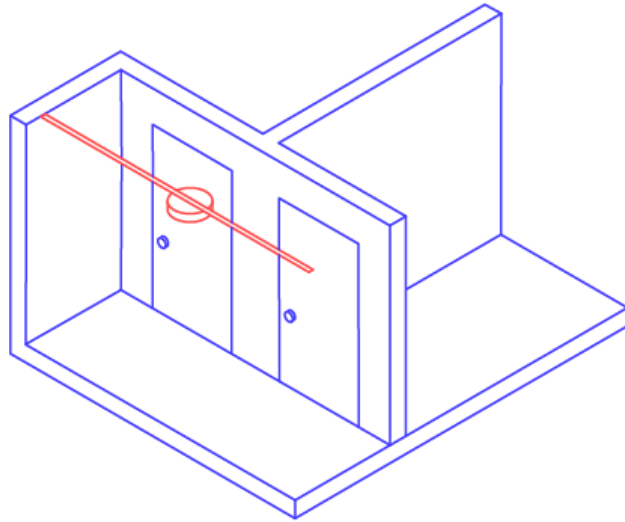
Hallway



Entryway

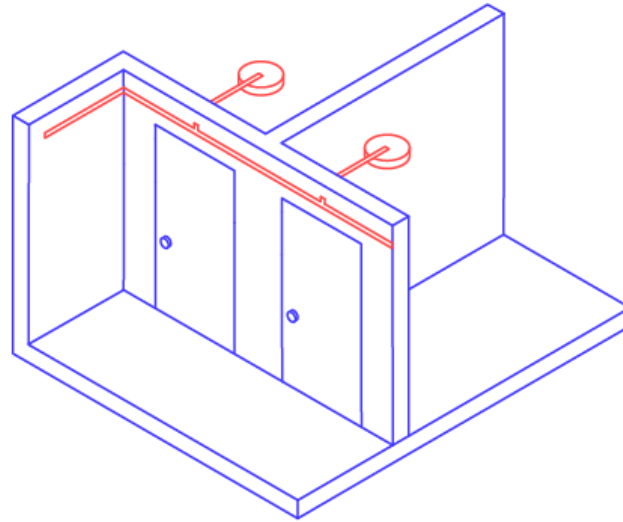


Room



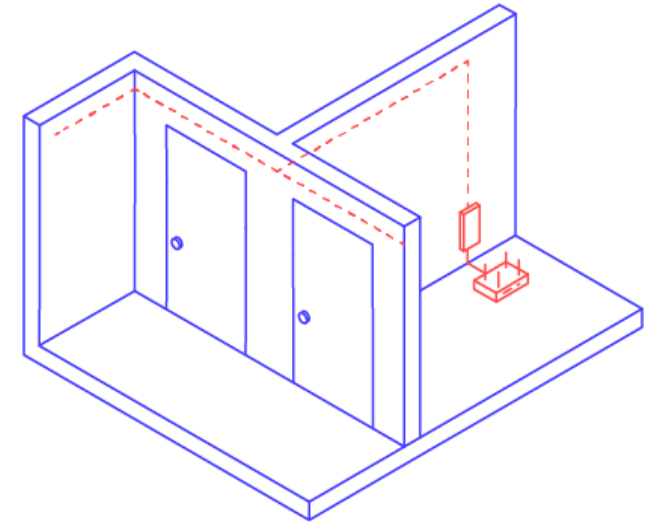
Hallway

Shared
access point
(hotspot)



Entryway

Personal
access point
(hotspot)



Room

Wired
connection point
(wall jack)

Shared access point (hotspot)

- Least effort/cost
- Can add post-construction or during light rehab
- Signal might not propagate into entire apartment
- Shared password or tenant login portal?
- Potential for cybersecurity issues

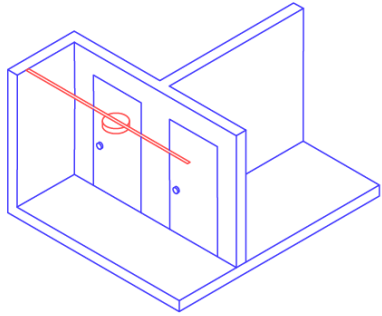
Personal access point (hotspot)

- Medium effort/cost
- Signal might not propagate into entire apartment
- Tenant can't maintain/adjust themselves
- Tenant can add mesh/repeaters if necessary

Wired connection point (wall jack)

- High effort/cost
- Ensures strong signal with router throughout apartment
- You or tenant must add router
- Allows for wired devices, like desktop computers

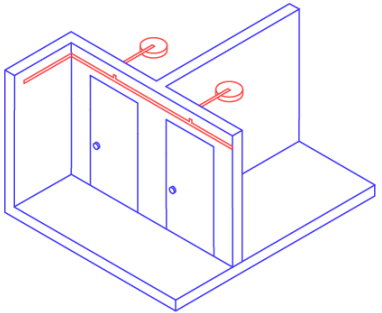
Unit Access Options



Shared
access point
(hotspot)



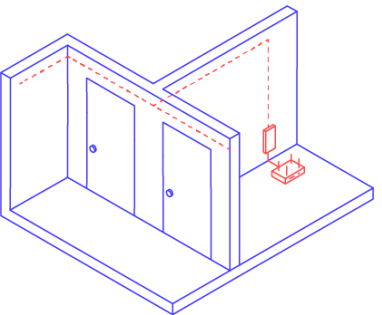
Shelters



Personal
access point
(hotspot)



Senior
housing



Wired
connection point
(wall jack)



All types of
housing

| Type | New Construction AND Preservation | | Preservation | |
|-------------|--|--|---|--|
| Option | Wired connection point (wall jack) | Personal access point (hotspot) | Shared access point (hotspot) | Existing wiring |
| Reason | Provides greatest signal coverage area in unit | Allows easier installation of cabling | Simplest installation method that doesn't involve the cables entering units | Leverages existing wired connection points in units |
| Feasibility | Easiest when installing or replacing electrical systems and wiring | Almost always feasible | Almost always feasible, but signal may not penetrate every part of dwelling units | Existing wiring in good repair, tenants may need routers |

Why **own** the broadband infrastructure?

- ✓ Greater control over what goes on in your building
- ✓ Leverage in getting best rates from ISPs
- ✓ LIHTC-eligible cost, generates equity
- Need to ensure maintenance is part of ISP contract
- Can easily pivot to other ISPs for better terms when renegotiating contracts

Design Guidelines

Look at the [website!](#)

Services and Info -> Design Guidelines -> Broadband

Federal Broadband Rules

Affordable Connectivity Program (ACP)

- For households receiving federal assistance
- \$30/month for internet service + \$100 towards a device
- Tenant has to apply for the program
- Many ISPs offer services that are now free with the ACP
- **MAY EXPIRE SOON** – pricing that depends on ACP is suspect

Recent FCC Rulings:

- Exclusive revenue share agreements between the landlord and ISP are now banned.
- Graduated revenue share agreements (based on % of subscribing units) between the landlord and ISP are now banned.
- Sale-and-leaseback arrangements – where ISP sells inside wiring to landlord and leases it back – are now banned.
- If an ISP has an exclusive marketing arrangement with a landlord, the ISP must disclose it in marketing materials.

Internet Service Providers (ISPs)

Fiber ISPs

Use own fiber infrastructure to deliver internet

Wireless ISPs

Use own antennas or mmWave to deliver internet

Hybrid ISPs

Use own fiber or antennas to deliver internet

Cable ISPs

Use own coaxial cable infrastructure to deliver internet

Managed ISPs

Lease fiber and serve as layer between you and ISP

What does a **Managed ISP** offer?

Managed ISPs try to alleviate some of the pain points customers experience with large ISPs by:

- Monitoring your network to ensure optimal performance
- Helping negotiate best fiber rate
- Coordinating billing across tenants

But note that some of the new fiber, wireless, and hybrid ISPs are offering these “concierge” services now too!

- Andrena
- Brooklyn Fiber
- DojoNetworks
- Flume (M/WBE)
- Honest
- GiGstreem
- Natural Wireless
- NYC Mesh (Non-profit)
- Optimum/Altice
- People's Choice (Minority-owned)
- RCN
- Silicon Harlem (M/WBE)
- Sky Packets (M/WBE)
- Spectrum/Charter
- SpotOn
- Starry
- Verizon
- Xchange
- Younity

Please note: this list may not be fully comprehensive

Contact

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