

# Vertical Assets for Fixed Wireless Internet

How can fixed wireless devices impact broadband access?

**Fixed wireless antennas transmit internet to nearby receivers.**

Installing fiber optic cable to deploy broadband in low population or low income areas can be expensive for internet service providers (ISPs). Fixed wireless internet can achieve last-mile internet deployment by using transmitters with internet access (e.g., via fiber or from another transmitter) to send broadband internet to nearby receivers. Fixed wireless transmitters are often mounted on tall structures called vertical assets ([Dawson, 2021](#)).

Internet speed is most commonly measured by bandwidth in megabits per second (Mbps) (for more information, see our previous Science Note, [Internet Speed](#)). The quality of fixed wireless internet depends on ([Dawson, 2021](#)):

- **Receiver and transmitter placement.** Receivers further away from vertical assets have less available bandwidth. Barriers between the receiver and transmitter (e.g., trees, rain) can also reduce internet quality.
- **Radio frequency of the wireless signal.** Lower frequencies can transmit further, but have less bandwidth.



## Research Highlights

Fixed wireless internet can provide internet to sparsely populated areas, avoiding the costs associated with installing fiber.

Transmitters are most effective on tall buildings or structures, known as vertical assets.

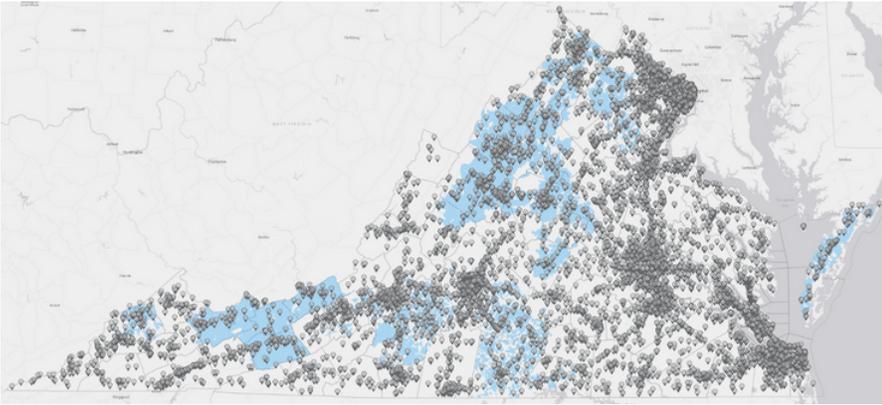
States can increase accessibility to vertical assets through a range of strategies, including mapping and vetting assets, and ensuring structure access.

- **Transmitter technology.** Newer transmitters can provide speeds of up to 100 Mbps for households within one mile, and speeds of up to 50 Mbps within 5–6 miles ([Dawson, 2021](#)). However, many rural internet service providers currently use older technology that provides slower speeds.
- **Transmitter infrastructure.** Wireless transmitters must have access to an internet source (e.g., fiber) that can manage the larger bandwidths associated with multiple receivers. ([Dawson, 2021](#)).

## States can help increase the accessibility of vertical assets.

Fixed wireless transmitters are most effective when placed on vertical assets with a line of sight to many potential customers. Mapping and vetting assets can be time consuming for ISPs. However, most states do not publish vertical asset mapping and ownership data publicly.

- Vertical assets may be tall towers, water tanks, multilevel buildings, or poles and pipes on public or private property.



**Figure 1.** A map of census blocks at least partially served by fixed wireless networks shaded in blue, and individual vertical assets pinned throughout the state. This is an example of the interactive map provided by Virginia ([Commonwealth Connection, 2022](#)).

State and local governments can use a range of strategies to support fixed wireless deployment, including but not limited to ([NCDIT, 1](#)):

**1. Mapping Vertical Assets** ([NCDIT, 2](#)).

County- (e.g., [NC](#)) or state-level (e.g., [VA](#)) mapping of vertical assets and potential customers can remove this labor-intensive step for ISPs (**Figure 1**).

- Virginia's map includes a wide variety of asset types, such as railways, country clubs, university buildings, retail stores, restaurants, and churches.

**2. Vetting Vertical Assets** ([NCDIT, 3](#)).

Vertical assets can be vetted to ensure that:

- They are located in a community that needs service.
- Transmitters can connect to existing infrastructure, such as fiber.
- Vertical asset owners are willing to lease their space to an ISP.

**3. Government Structure Access.** Giving wireless broadband providers access to government vertical assets can lower broadband deployment costs.

- In North Carolina, roughly 15% of vertical assets are publicly owned, while 85% are private ([Knox, 2022](#)). It is not clear if this trend holds across other states.
- NC provides overviews of the [right to pass through private property and structure access](#).

Broadband adoption in rural areas lags behind adoption in urban and suburban areas (see our [Broadband Availability & Adoption Note](#)). The federal government has taken steps to promote the deployment of wireless infrastructure in rural regions by making more federal assets available for rural broadband deployment.

- In 2014, the FCC updated the review process for wireless infrastructure deployment, and provided exemptions from the environmental public notification process for short-term towers ([FCC, 2014](#)).
- In 2018, the president directed the Secretary of the Interior to “[increase] access to tower facilities and other infrastructure assets managed by the [DOI]” ([Fed. Register, 2018](#)).

**SB 820 explicitly allows installation of fixed wireless transmitters in Missouri.**

To provide political subdivisions with more confidence about the legality of allowing their vertical assets to be used for fixed wireless transmitters, Missouri passed a provision in [SB 820](#) in 2022 that explicitly allows political subdivisions to install transmitters on their vertical assets. Little to no research has been done to determine the effects of policies similar to the provision in [SB 820](#) to improve fixed wireless deployment.