Washington State Joint Transportation Committee Study

Broadband Access to State Highway Right of Way Study

December 2021

Table of Contents

Report Overview

Report Overview

This study was commissioned by ESHB 1457 in 2021 in order to facilitate the development of right of way ("ROW") to improve broadband access in Washington. The study culminates in this report that addresses Task 1 through 4 of the Broadband Access to State Highway Right of Way RFP. Overview of the report is as follows.

Task 1 – Evaluate current state broadband infrastructure goals. The results of this evaluation are addressed in **Chapter 1** of this report. **Chapter 1** of the report was developed by **KPMG LLP ("KPMG")**.

Task 2 – Identify expansion opportunities. The results of this assessment are addressed in **Chapter 2** of this report. **Chapter 2** of the report was developed by **KPMG**.

Task 3 – Documenting legal and regulatory Requirements. This portion of the study was performed by **Nossaman LLP**. The memorandum documenting findings was provided by **Nossaman LLP** directly to the Joint Transportation Commission ("JTC"). This memorandum is provided in this report for reference in **Appendix 2**.

Task 4 – Recommend effective WSDOT strategies. The relevant analysis recommendations are included in **Chapter 4** of this report. **Chapter 4** of the report was developed by **KPMG.**

.

KPMG

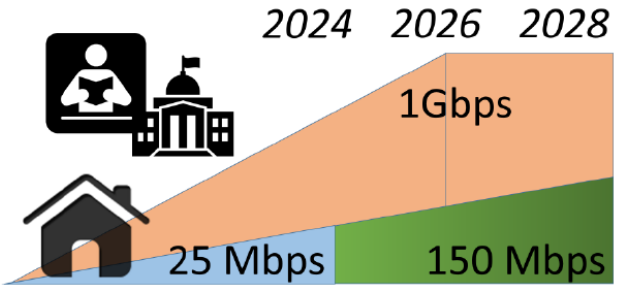
Chapter 1 – Evaluation of Current State Broadband Infrastructure Goals

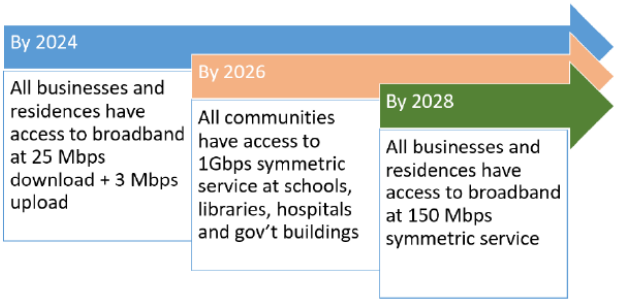
Chapter 1 – Evaluation of Current State Broadband Infrastructure Goals

Introduction and Purpose

This study commissioned by ESHB 1457 in 2021 in order to facilitate the development of right of way ("ROW") related strategies towards universal broadband access. In 2019, the Washington State Legislature enacted Second Substitute Senate Bill 5511 creating the Statewide Broadband Office in the Department of Commerce and set the following goals for the Statewide Broadband Office.

Given the purpose of the study to develop ROW strategies and the State's broadband goals, Chapter #1 examines the demand for broadband service with respect to the State's broadband goals. Furthermore Chapter #1 assesses the current state of broadband technology options and their overall applicability for ROW related deployment.

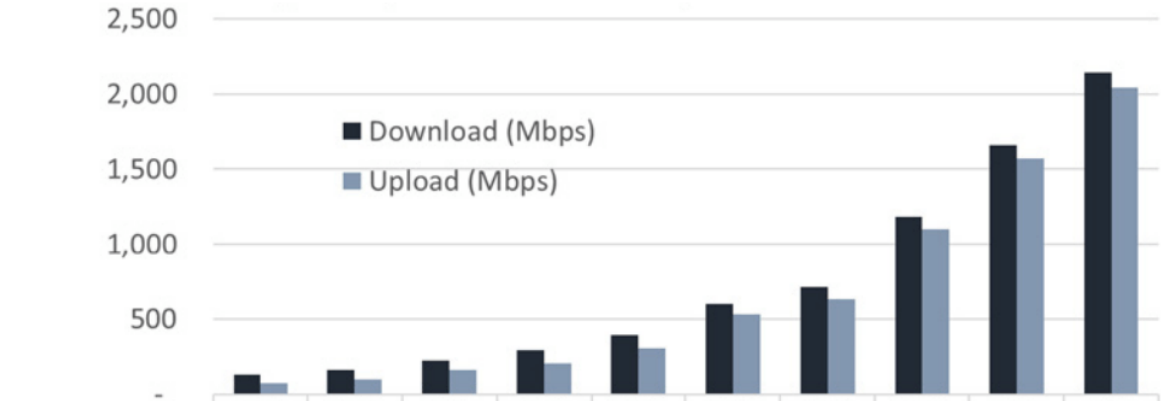




Washington's Broadband Goals and Demand for Broadband Service

The broadband demand drivers for residential use include the number of devices per household, increased adoption of telecommuting and remote services including telemedicine and e-education, use cases that require voice and video transmission, adoption of smart home applications and gaming. Research commissioned by the Fiber Broadband Association (FBA) indicates that in the short term a household of four requires 131/73 Mbps of bandwidth and this bandwidth requirement will grow to 2,141/2,044 Mbps by 2030.

PROJECTED PEAK BANDWIDTH REQUIREMENTS - HOUSEHOLD OF 4



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Download (Mbps)	131	158	222	293	396	601	709	1,182	1,658	2,141
Upload (Mbps)	73	98	160	203	302	529	633	1,100	1,570	2,044

- Does not include Robotics
- Early adopters, Radiologists, Power Users/Gamers, others may require much more

Source: Fiber Broadband Association Technology Committee

The current expectation is that the internet speed requirements of residential customers is likely to grow from 25/3 Mbps presently to 2 Gbps symmetrical service by 2030 and beyond as summarized in the table below. This expectation continues to evolve and will be influenced by technology disruptions, range of applications and growth in the number of a connected devices.

2021-2024	2025-2028	2029 and Beyond
25 / 3 Mbps **to** **100 / 25 Mbps**	100 / 50 Mbps to 150 / 150 Mbps	1 Gbps / 500 Mbps to 2 / 2 Gbps

Furthermore, the broadband demand for institutional use is fundamentally driven by the population that these institutions serve. This demand is influenced further by increased use of remote services including distance education and telehealth services, use of private networks and deployment of real time analytics.

Overall, the State's Broadband goals for achieving a 1 Gbps symmetrical connection by 2028 for community anchor institutions and achieving a 150 Mpbs symmetric service for residential and business use are consistent with short/medium term use cases for broadband connectivity.

Current State of Broadband Technology

The broadband technology options to homes and businesses are wireline including fiber optic networks, fixed wireless, and satellite internet services as described below.

1. **Wireline:** Connect homes and businesses through a wired connection (i.e., coaxial cables, fiber optic network). These connections run from the central distribution point to a local access points, and then to the surrounding neighborhoods for last mile connections. Fiber optic technology is expected to be the only long-term wireline technology option.

2. **Fixed Wireless:** Connect homes and businesses through a fixed wireless system where the signal originating from a central distribution point are directed toward access points affixed to locations like cell towers and on top of a buildings antenna array that are between the distribution point and the customer utilizing radio links for connections.

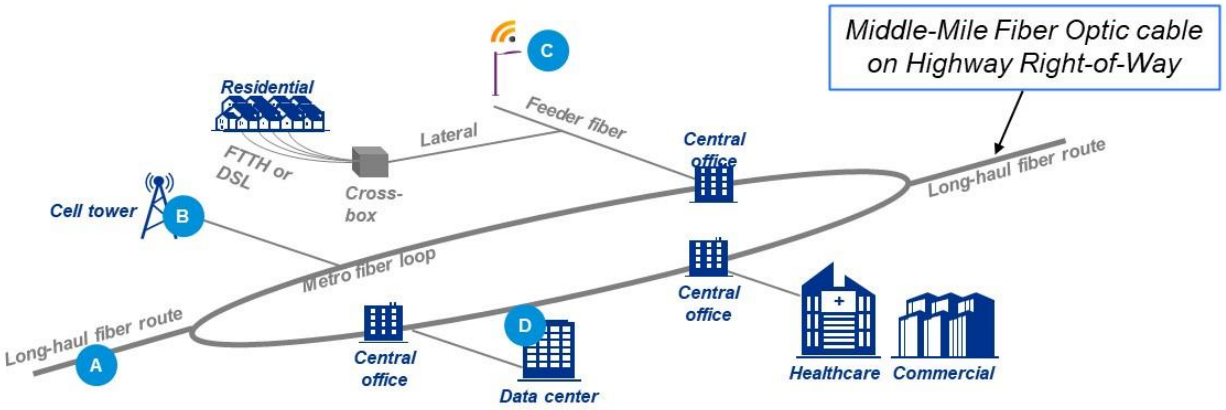
3. **Satellite Based:** Connect homes and businesses through a satellite internet system where internet service is received through connecting to an orbiting satellite. The process involves transmitting signals from a dish to an orbiting satellite above the Earth's atmosphere. After the signal is received, it is beamed back to the Internet Service Provider's Network Operations Center (NOC) which is connected to the internet. Then the signal is transmitted to access points (i.e., receivers like a home satellite dish).

These technology options are outlined further below.

Wireline - Fiber Optic Network

Fiber technology uses fiber optic cable, which consists of very thin strands of glass that enable data to be transmitted as pulses of light, delivering high internet speeds. Furthermore, fiber optic network underpins the broadband ecosystem and enables other broadband technologies – i.e., connects to cell tower, fiber to the home (FTTH) or small cell infrastructure. The broadband ecosystem and the central role fiber technology plays is outlined in the figure below. The middle-mile networks supported by fiber

technology can help support fixed wireless system as well as create points of presence ("PoP"s) that can make "last-mile" connectivity financially and operationally viable in rural and remote areas.



	A Fiber Providers	B Towers	C Small Cells	D Data Centers
Participant Description	Own the fiber routes and offer both lit and dark fiber services to enterprise, wholesale, and consumer segments	Steel beam structure that houses electronic equipment from carriers to transmit radio frequencies (RF)	Consist of small radio equipment and antennas that can be placed on structures such as streetlights, building sites, or poles	Data center is a physical facility that organizations use to house their critical applications and data.

Fiber Centrality

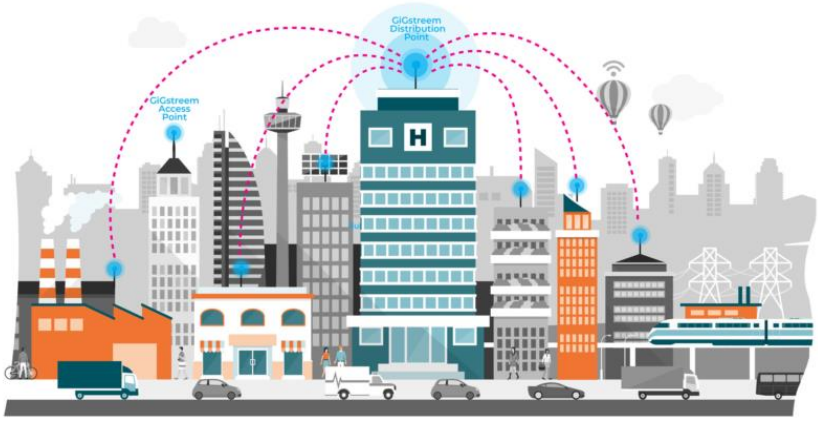
As compared to other telecommunication technology such as fixed wireless or satellite, a fiber optic network offers several advantages in terms of network speed, low latency, more reliable bandwidth, and higher performance. Fiber optic technology itself continues to develop alongside the increased demand for greater speed and efficiency. New devices called optical couplers and optical switches support a new communication trend called AON, or all-optical networks. This technology allows data to be transmitted without any electrical processing, which in turn can result in farther transmission distances.

Given the central role of fiber optic in the broadband ecosystem and use cases that fiber supports, telecom firms are transitioning their networks from copper coaxial cable to hybrid or fully fiber optic cable assemblies. The capacity of fiber optic cables in terms of data transmission continue to improve through sophisticated electronics. Additionally, fiber optic cables are typically designed for approximately a 40 year useful life, making them a suitable candidate to support the next generation of devices and related connectivity requirements.

Due to high cost of deployment (trenching and fiber deployment costs), the service providers are often not able to extend their FTTH services to remote areas and less populated communities. However, as the economics of these installations improve by private sector investment and public sector funding assistance, it is reasonable to expect increased FTTH services in the short and medium term.

Fixed Wireless:

Fixed wireless technology is one type of broadband connection that caters to consumers located in rural, and less populated areas, who are underserved by other types of technologies due to high cost of deployment.



Fixed wireless internet lets consumers in rural areas benefit from high-speed internet from local service providers. Fixed wireless speeds are usually slower as compared to fiber network speeds; however, they are comparable to other options such as cable and satellite. In some areas, fixed wireless service providers offer speeds of 100+ Mbps. Business-class fixed wireless plans are often much faster, with leading companies offering 500 Mbps symmetrical plans that rival dedicated fiber in terms of reliability, security, and speed of installation.

Fixed wireless systems consist of a radio transmitter that sends a signal on a combination of channels to numerous receivers, including homes and businesses. Each wireless technology operates on a different part of the radio spectrum. Digital versions of wireless cable promise to provide digital television, interactive services, high-speed internet access, and data-networking services. Breakthroughs in digital technology and digital compression now permit operators to increase dramatically the amount of data that can be sent in a finite amount of spectrum. Fixed wireless access customers can be located

between 2 and 20 miles from the wireless provider's network between the two locations. Fixed wireless provides internet-access at speeds ranging up to 150 Mbps. The fixed wireless radio access is dependent on the radio connection and the quality of the radio connection will determine the ultimate quality of service to the customer.

One of the benefits of fixed wireless broadband is its broad consumer availability. Service providers are not required to invest heavily in new cable and infrastructure, offering service to larger areas is often more cost effective. Wireless Internet Service Providers (WISP) are rapidly expanding the fixed wireless service in areas with a low concentration of wired options due to the flexible nature of fixed wireless deployment.

The fixed wireless system offers several advantages over satellite service in terms of weather conditions do not affect fixed wireless like they do satellite internet, there is virtually no lag time (i.e., low latency)

with fixed wireless as signal only travels between the receiver and the nearest tower; fixed wireless service providers often allow for very high caps (100GB or more) or no caps at all; and the consumers have access to reliable bandwidth.

The fixed wireless option comes with certain limitations in terms of requirement of a direct line of sight between location of the antenna at the consumer's premises and the ground station of the provider, network security concerns for a wireless service are somewhat different from a wired one, and severe storms can cause a slight reduction in download and upload speeds called "rain fade."

There are several types of new technologies under development that will make it easier for consumers to access the internet through fixed wireless services. Some providers have initiated wireless access that does not require line of sight radio connectivity. Since many customers may not have line of sight capabilities, this technology could create additional fixed wireless opportunities for consumers. Other providers are implementing systems that are easy for the customer to install and simply "plug and play." Going forward, emerging technologies such as 5G fixed wireless access (FWA) could replace Digital Subscriber Line (DSL) and Cable Modem – but fiber optic networks will still be critical in providing backhaul to such technologies.

Satellite:

Satellites are able to transmit data at very high speeds, but it was not until recently that consumer-friendly applications became popular. Data over satellite is not new; very small aperture terminal (VSAT) providers such as Gilat, PanAmSat, Comsat, and GE have been providing data connections to businesses for years. In many large business satellite-based offerings, the end user's terminal or satellite dish is capable of both sending and receiving data. Improvements to satellite technology may soon allow for much higher speeds, as well as drastically increased data limits, eliminating two of the main drawbacks of the service.

High-speed internet access via satellite provides consumers another wireless alternative and is well suited for businesses and consumers who cannot subscribe to traditional high speed internet access methods, such as people residing in rural, remote, or less populated areas. Over the past few years, a number of satellite companies have developed a line of service that fills the need for high speed internet connections in rural and remote locations. Using satellites that orbit far above the earth's atmosphere, companies are able to offer satellite internet access, including two-way internet service (the satellites both send and receive data) that is relatively affordable for residential customers and businesses.

The download and upload speed for satellite internet access depends on several factors including: the satellite internet provider, the consumer's line of sight to the orbiting satellite, and the weather condition. Typically, a consumer can expect to receive about 100 Mbps download speed and approximately 25 Mbps upload speed. Setting up satellite internet access can be more costly and more involved than obtaining high-speed internet access using DSL or Cable Modem. A user must have: a two or three foot dish (or base station as it is often called), a satellite internet modem, and a clear line of sight to the provider's satellite.

Satellite access to the internet is an alternative to DSL service and CM service, and in particular, its major advantage is its ability to reach areas that other alternatives cannot. There are several challenges with the

satellite services including weather conditions affecting satellite internet more than fixed wireless. The line of sight is required for a satellite dish in order to see the satellite. In extreme weather conditions, the service may get impacted. The cost of satellite equipment and installation is higher as compared to other alternatives. Due to long haul satellite links, the transmission delay may be higher than other alternatives. The satellite internet services have a higher latency as compared to other options because the satellite is positioned much farther from the receiver.

Increased competition and new entrants like Starlink, OneWeb, Telesat and Amazon (Project Kuiper) internet service providers could be transformative for satellite internet going forward. With faster speeds, lower latency and unlimited data, Starlink and other service providers will assist residents of rural households who currently are unable to experience affordable, reliable and high-speed internet service.

Rural Connectivity Challenge: The speed, timeframe to deployment and overall cost dynamics for the various last mile broadband technology options are shown below.

Category	Fiber Optic	Fixed Wireless	Satellite
Potential Speed	Very High	High	Moderate to High
Cost per Access / 100 Mbps	Moderate to High	High	Very High (if available)
Deployment Speed	Low to Moderate	Moderate to High	High
Operating Expenses	Low	Moderate (High Electric Use)	Moderate to High

Achieving universal high-speed coverage could be challenging in the rural and remote areas. This is primarily due to high capital investment required, less than optimal return on investment potential, and operational challenges faced by the service providers.

This challenge can be addressed by advancing broadband infrastructure deployments leveraging incoming federal and state funding towards rural connectivity and by adopting middle mile strategies by leveraging WSDOT's ROW to enable last mile connectivity.

Role of Fiber Optic Networks in WSDOT's ROW

The following factors make fiber optic technology a potential option for deployment on WsDOT's ROW towards meeting the State's broadband goals.

Fiber Centrality: Fiber underpins the broadband ecosystem and supports other technology options including fixed wireless. Fiber is core to supporting the key elements including enabling long haul and middle mile connectivity as well as providing backhaul to cell towers and small cells to enable wireless technologies.

Supports Future Use Cases: Key characteristics such as high speeds, low latency, low attenuation, high reliability, and upstream/downstream symmetry make fiber technology apt for supporting the next generation of applications and connected devices.

Low Technology Obsolescence Risk: In addition to the centrality of fiber, continuous improvement to equipment and electronics as well as ability to strategically pull more fiber through existing infrastructure provide low cost scalability and low risk of obsolescence compared to alternatives.

Alignment with State DOT's ROW: The fiber technology plays a critical role in middle mile and long-haul connectivity in the broadband ecosystem. Given their continuous and strategic nature, WsDOT's highways are well suited to enable middle and long haul connectivity enabled by fiber technology.

*****

Disclaimer

This analysis and report is prepared for the use of the Washington State Joint Transportation Committee. KPMG LLP and its subcontractors assisted the Washington State Joint Transportation Committee in the preparation of this report and while the information presented and views expressed in this document have been prepared in good faith, KPMG LLP accepts no responsibility or liability to any party in connection with such information or views. KPMG LLP does not assume any liability associated with any person's use of this document. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation. Any decisions made by other parties predicated on this analysis will be at their own risk.

KPMG's role is limited to providing this study. In so doing, KPMG has undertaken no contacts with legislative branch officials or legislative branch employees at any level of government that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. In no event will KPMG undertake meetings with government officials of any branch or level of government on behalf of the Washington State Joint Transportation Committee or otherwise appear in a public or private context that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. This study is offered as a holistic work and should be read and interpreted only in its entirety.

KPMG

Chapter 2 – Identify Expansion Opportunities

Chapter 2 – Identify Expansion Opportunities

Introduction and Purpose

The focus of the study commissioned by ESHB 1457 is the development of right-of-way (ROW) strategies leveraging the WSDOT highways and transportation infrastructure towards addressing broadband access to unserved and underserved households. As outlined in Chapter 1, WSDOT's ROW is conducive for middle-mile and long-haul broadband infrastructure deployment that can enable last-mile connectivity to assist in meeting the needs of unserved and underserved households.

The purpose of Chapter 2 is to:

- Provide an assessment of current state of middle-mile broadband infrastructure and unserved and underserved households in relation to WSDOT's ROW;
- Develop a high-level framework for prioritization of state highways that helps the state address connectivity requirements of unserved and underserved households; and
- Provide preliminary observations on priority state highways (interstates and state routes) for WSDOT.

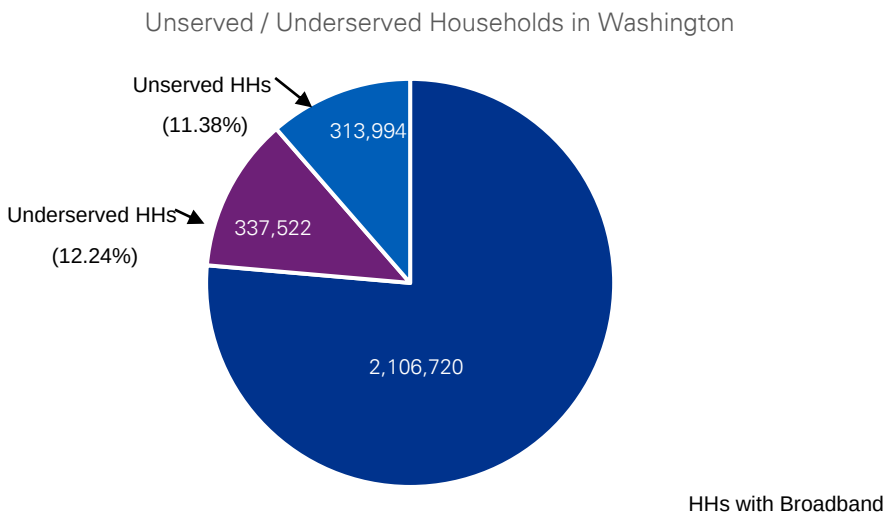
Middle-Mile Assessment

The status of existing fiber networks in the State were mapped to understand fiber presence in the vicinity of WSDOT's interstate highways and state routes. This mapping was done on a telecom firm/carrier level (See Appendix A). While having fiber presence in the vicinity of unserved/underserved areas does not always translate into coverage as some of these fiber networks serve a different customer group (i.e., commercial) and are not focused on providing retail services (i.e., service providers) in an open access basis.

Therefore, to estimate the level of broadband coverage, in addition to mapping of existing fiber networks, the presence of number of service providers within each county along the interstate highways and select state routes was evaluated. Furthermore, leveraging multiple data sources, including broadband coverage survey information provided by the Broadband Office, Ookla speed test data, FCC data, and Microsoft device data to access overall the broadband coverage in terms of average speed in relation to the State's goal of 25/3 megabits per second (Mbps). (See Appendix A for details on the middle-mile assessment).

Based on existing fiber presence, speed metrics and competitive landscape measured by the number of service providers, the overall challenge was defined as follows and a prioritization framework for ROW was developed to help address the challenge.

Challenge – Unserved/Underserved Households



Households considered unserved/underserved are those households located in areas that have a lack of affordable, reliable and high-performance (25/3 Mbps) internet service. This can involve households gaining internet access in outdated ways such as dial-up or having no internet access. The analysis indicated that approximately 651,000 households of the estimated total 2.8 million households in the State of Washington (~ 24 percent of total households in the State) are either unserved or underserved in terms of broadband connectivity (25/3 Mbps or higher).

Framework for Highway and ROW Prioritization

Based on the input provided by the Joint Transportation Committee (JTC) staff, members, WSDOT, the Statewide Broadband Office, and Staff Workgroup members, and leveraging lessons learned from similar broadband programs from other states, a potential scoring framework was developed to determine the prioritization of public investment to address affordable, reliable and high-performance internet access to rural areas and unserved/underserved communities. The evaluation criteria and scoring are outlined below.

Nos.	Evaluation Criteria	Max. Score	Definition
1	Service need: Number of unserved/ underserved households	40 points	— Unserved / underserved households indicates the level of connectivity of the area considered and severity as to lack of service — Measures effectiveness of public investment to address # of unserved / underserved households within a corridor
2	Current infrastructure: Where is open access fiber optic cable lacking?	30 points	— Measures lack of open access/availability to serve the underserved market

Nos.	Evaluation Criteria	Max. Score	Definition
			— Measure lack of excess of capacity to serve the current market inferred by fiber presence, current speed score and number of providers in the served markets — Measures extent to which new highway broadband infrastructure could be effective to introducing new service and/or drive competition
3	Population Centers Covered / Points of Presence Addressed	30 points	— Measures number of population centers / points of presence that could be addressed by a corridor
	TOTAL	**100 points**	

The prioritization framework is dynamic in nature and can be modified from time to time based on State's goals and objectives for broadband deployment related to WSDOT ROW. While input from tribal nation representative was incorporated into the evaluation criteria, evaluation criteria could be expanded and updated to incorporate evolving priorities moving forward.

Refer to Appendix A for details.

Key Recommendations

From the prioritization of the state highways perspective, the following interstate highways and state routes present opportunities to address connectivity requirements of unserved and underserved households in the State and represent priority corridors for WSDOT.

- **Interstates I-5, I-90 and I-405**: These interstates could help address approximately 484,000 unserved/underserved households within a five-mile radius of these interstate highways
- **State routes SR-2, SR-14 and SR-395**: These state routes could help approximately 175,000 unserved/underserved households within a five-mile radius of these routes

As noted previously, prioritization framework is dynamic and as a result, the prioritization that results can evolve and be adjusted based on the State's goals and objectives. All recommendations should be developed through WSDOT and Department of Commerce existing public processes, subject to resource availability.

The potential ROW strategies by which WSDOT, working closely with the State's Broadband Office, could address broadband deployment in these priority corridors/highways are discussed further in Chapter 4.

*****

Disclaimer

This analysis and report is prepared for the use of the Washington State Joint Transportation Committee. KPMG LLP and its subcontractors assisted the Washington State Joint Transportation Committee in the preparation of this report and while the information presented and views expressed in this document

have been prepared in good faith, KPMG LLP accepts no responsibility or liability to any party in connection with such information or views. KPMG LLP does not assume any liability associated with any person's use of this document. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation. Any decisions made by other parties predicated on this analysis will be at their own risk.

KPMG's role is limited to providing this study. In so doing, KPMG has undertaken no contacts with legislative branch officials or legislative branch employees at any level of government that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. In no event will KPMG undertake meetings with government officials of any branch or level of government on behalf of the Washington State Joint Transportation Committee or otherwise appear in a public or private context that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. This study is offered as a holistic work and should be read and interpreted only in its entirety

Chapter 4 – Effective WSDOT Strategies

Chapter 4 – Effective WSDOT Strategies

ROW Strategies - Introduction and Purpose

Chapter 1 highlighted the role of fiber infrastructure in the Washington State Department of Transportation ("WSDOT") right-of-way ("ROW") as a long-term middle-mile technology alternative with low obsolescence risk. Chapter 2 focused on the prioritization framework for state highways to help the State address its connectivity needs to meet the State's broadband goals. In Appendix 2, the memorandum prepared by Nossaman LLP focused on documenting legal and regulatory requirements related to WSDOT ROW use.

Chapter 4 focuses on implementation strategies that WSDOT and the State of Washington could adopt to enable fiber deployment on WSDOT ROW including on priority corridors. In developing ROW strategies, the following background work was conducted:

1. Reviewed current WSDOT Right of Way Encroachment Policy
2. Received input from WSDOT on:
    - key opportunities and challenges regarding ROW encroachment, and
    - current systems related to fiber infrastructure
3. Benchmarked relevant right of way encroachment policies from other states and reviewed relevancy for WSDOT
4. Reviewed mutually beneficial partnership structures with DOT and financing models from precedent transactions and leading practices from other states
5. Reviewed analysis performed by Nossaman LLP on state and federal laws/regulations
6. Incorporated input from the Staff Workgroup

Chapter 4 provides ROW implementation strategies for WSDOT in the following categories. All recommendations should be developed through WSDOT and Department of Commerce existing public processes, subject to resource availability.

1. **Governance:**
    - **Recommended Roles and Responsibilities:** The role that WSDOT and the Department of Commerce could play to effectively advance broadband deployment and enable a coordinated approach for installation of middle mile fiber/conduits and related infrastructure on WSDOT's ROW in anticipation of long-term broadband needs.
    - **Right of Way Implementation Strategy:** The relevant strategies for WSDOT and the State of Washington to advance broadband infrastructure on WSDOT's ROW (to effectively authorize other entities to install broadband infrastructure).
2. **Recommended ROW Administration and Partnership Approaches:** Strategies for mutually beneficial WSDOT and service provider partnerships to provide broadband services for transportation purposes, as well as addressing connectivity gaps to meet the state broadband goals.

Governance

The purpose of a governance structure is to create a coordinated and streamlined effort in advancing broadband development both for transportation purposes and to achieve the State broadband goals. Such coordination can be achieved through effectively defining roles and responsibilities for the Department of Commerce (the Broadband Office) and WSDOT, and other key state departments/agencies including the Department of Education, and through supporting policies. Key considerations for each are summarized below:

Recommended Roles and Responsibilities

Focus Area	Department of Commerce (Broadband Office)	WSDOT
Overview of the Role	— Act as a single point of contact for statewide broadband program coordination with public agencies and private sector partners to promote coordinated broadband planning for the State — Transparent sharing of information regarding existing broadband infrastructure inventory and mapping of broadband assets and policies	— Address the transportation connectivity needs for the State — Owner and operator of transportation broadband network(s) located within WSDOT ROW
Consultation and coordination with stakeholders	— Coordinate with all public agencies and seeking to help address their connectivity requirements — Collaborate with tribal nations for broadband infrastructure development — Coordinate with public sector agencies and private sector service providers — Be a resource to local communities and private sector service providers	— Coordinate with other governmental agencies, counties and cities, and private sector service providers on WSDOT ROW related broadband deployment — — Coordinate transportation related connectivity needs with stakeholders (including tribal nations) and the private sector partners

Focus Area	Department of Commerce (Broadband Office)	WSDOT
Financial Planning and Administration	— Pursue funding from state, local and federal governments towards broadband, administer grant programs and evaluate the economic return on investment for the planned public investment — Establish a 5-year capital investment program — Assess and prioritize public investments to meet the State's broadband goals	— Lead the financial planning and project prioritization for transportation related fiber deployment / infrastructure projects and to support Intelligent Transportation Systems ("ITS") and overall WSDOT operations — Assess and implement mutually beneficial public private sector opportunities for broadband investment in WSDOT ROW to advance transportation needs and support the State's broadband goals
Policies and Implementation	— Develop and implement specific guidance, policies, strategies and plans to increase broadband affordability, adoption, reliability and accessibility throughout the State	— In coordination with the Broadband Office, provide input on transportation connectivity related broadband policies including on WSDOT ROW policy per ESHB 1457 — Include stakeholders (including tribal nations) in development of guidance and policies consistent with existing WSDOT processes —
Middle Mile Fiber Network Operations	— Responsible for coordinating operations and maintenance by leveraging a neutral private sector host on state-initiated corridors and interstate highways	— Accomplish transportation objectives as well assist on state broadband operational metrics — Operate the network either directly or through a neutral host to meet operational performance metrics including transportation safety and congestion management

The above recommended roles and responsibilities can be expanded to include other key agencies including Department of Education. In addition, to facilitate coordination and decision making between these agencies, formation of an advisory committee comprising of representatives from such participating agencies and/or stakeholder groups (such as tribal nations) is recommended.

WSDOT ROW Access and Implementation Strategies

Developing and adopting "Collaboration", "Build Once", "Dig Once" or similar policies can result in efficient coordination of broadband infrastructure installation with highway construction and other utility infrastructure to reduce costs and help to facilitate accelerated broadband deployment more effectively by creating an environment of collaboration and information sharing among government agencies and broadband providers.

The policy recommendations from this study, if implemented, help mitigate the operational and safety impacts to WSDOT by reducing the scale and number of repeated excavations and the number of permit requests related to state highway projects for the installation and maintenance of broadband infrastructure in WSDOT ROW. This will further result in cost efficiencies, increased access to and reliability of broadband networks, public and economic benefits, and decreased time needed to deploy broadband infrastructure. It is also important to note that WSDOT would require adequate resources in performing its roles and responsibilities and in the overall administration related to ROW access.

Recommended WSDOT Implementation Strategies	
1 Standardize Specifications for Common Infrastructure	Establish standardized specifications for private sector and WSDOT initiated projects and to accommodate current and future needs without jeopardizing project affordability. In developing specifications, WSDOT should assess the following factors:
	A. **Capacity:** Sufficient number of conduit(s) should be installed to accommodate current and anticipated future broadband needs. Consideration should be given to explore the feasibility of using multi-duct conduits to enable sharing of conduit and easier installation of fiber cable strands in the future
	B. **Segmentation:** ensure that conduits have the necessary level of separation from each other for commercial, network security, operational and/or maintenance purposes
	C. **Access:** For ease of maintenance and/or network security reasons, project sponsors may require vaults and hand-holes to be separate or dedicated for each entity
	D. **Costs:** Consideration should be given to ensure affordability of the project as planning for the future may require trenches to be widened or deepened to accommodate multiple conduits
	E. **Robustness:** Consideration should be given to develop standards for the materials, construction methods, and installation of fiber cable strands to minimize maintenance and repairs
2 Collaboration with Key Stakeholders	— Minimize costs and unnecessary digging by ensuring that stakeholders such as utility companies, WSDOT, and broadband providers work together to plan and execute the project phases.

	— incorporate standard working practices with local governments and tribal nations to demonstrate leading practices on how to install fiber infrastructure by providing construction plans and standards.
3 Develop an Information Sharing, Tracking and Infrastructure Management System	— Make information on the location of existing fiber and conduit(s) more easily available to stakeholders and local governments. — Develop a system to track its planned, ongoing, and completed construction (potentially using an asset management system) — Prioritize and select projects for locality participation — Establish a method to quickly notify potentially interested parties and to coordinate participation with project contractor(s)
4 Voluntary Joint Trenching	Create a platform for WSDOT and/or the private service provider(s) to voluntarily inform the utility industry and other service providers regarding opportunities for collocating and installing fiber infrastructure.
5 Resource Sharing Agreements	To promote mutual partnerships, create standardized agreements defining conduit and fiber strand requirements and related standardized specifications consistent with transportation use cases that telecom service providers can leverage for access to WSDOT ROW

Benchmarking - Governance Highlights from Other States

State	Policy Observations	Policy Description
Utah	Distinct Broadband Partnership Office And executive support	Utah utilizes distinct process and office for telecom providers interested in partnering with the DOT to install fiber conduit and coordinate the process. UDOT broadband success is driven by support from the highest levels of the DOT. Ensure buy-in with UDOT leadership up front.
Arizona	Standardized conduit specification office with a rural focus	Requires the DOT to coordinate the installation of multi-user conduit(s) in state highway ROW specifically targeting rural highways.
California	Information sharing to telecom companies on state highway projects	DOT notifies telecom providers and contractors working on broadband deployment of department-led highway construction projects and authorizes those companies to coordinate with the DOT on conduit installation.
Nevada	Executive support and information Sharing	DOT provides information, advice, strategic plans, priorities and recommendations in administering access to ROW to telecommunications providers for state-wide telecommunications purposes; the director to coordinate with telecom providers for the reasonable, efficient, and cost-effective installation, maintenance, operation, relocation and upgrade of telecom facilities within ROW for state highways.

Colorado	Resource sharing & In-Kind Contribution	Colorado enables private sector engagement and creative in-kind contributions, such as allowing developers to store equipment in ROW that encourages development
West Virginia	Proactive Coordination with Telecom Carriers	West Virginia encourages telecommunications carriers to coordinate the installation of broadband conduits to minimize costs for carriers and to minimize disruption and inconvenience to the traveling public.
Virginia	Fiber Optic Resource Sharing	Virginia works with telecommunication providers on resource sharing agreements for limited access ROW (fiber sharing, collocation spaces, fees) – mutually beneficial partnerships for transportation purpose as well as to advance private broadband deployment
Georgia	Incentivize Collaboration	Reduce annual rates when telecom companies install fiber simultaneously to help increase deployment of broadband in the state
Wisconsin	Fee Reduction for unserved location and Agreement/Permit Term Length	Though Wisconsin has the authority to charge fees for longitudinal occupation of C/A ROW, fees are waved for installation in underserved areas. Leverage longer-term ROW occupancy fees to encourage broadband adoption
New York	Tiered Fiber Optic Installation Fees	New York employs a tiered permitting structure based on population density of designated installation area and type of installation, thereby more closely aligning cost and return on investment.
Maryland	Fiber Leasing	Maryland leases fiber to scale broadband statewide, increase private investment, and streamline development

Select detailed case studies of Build Once/Dig Once Policy/Similar Policies are included in the Appendix.

Right of Way Administration and Partnership Models

Administration

ROW administration allows for and helps drive broadband development and installation of fiber. There are a range of administration mechanisms leveraged by state DOTs to manage broadband ROW requests. The administration and handling of incoming Right of Way or Encroachment permit requests varies in office accountability and responsibility, flowchart of approvals, and approach to fiber development and installation across the states (reference ***Appendix B: State Benchmarking of ROW Admin, Formula and Pricing Methods*** for DOT specific details on various administration and permitting processes across the US).

The administration of Fiber Right of Way Encroachment Requests tends to fall into two main categories: (1) As a traditional Easement / Encroachment ROW Request or (2) Distinct Fiber Trading / Mutual Broadband Partnership Office.

Traditional Easement / Encroachment ROW Request: States utilize a traditional "Utility Permit Application" that would be completed by a developer for the state or district engineer/designee, ROW technician, or permitting staff to review. This is the most common administrative process within the US and is utilized by states such as New Jersey, Maryland, and Tennessee, where fiber is treated as any

other utility installation. The process includes a thorough check of safety issues and alignment to department of transportation future transportation needs, rather than a specific review into fiber commercial needs. Many DOTs utilized district offices to review ROW encroachment requests specific to a given geography. These permit offices reviewed the application and plans for technical and administrative completeness and subsequently determined whether the plans were acceptable for permit delivery.

Distinct Fiber Trading / Mutual Broadband Partnership Office: In other states, a distinct Fiber Trading / Mutual Partnership Office is utilized to proactively drive broadband development. Applied in Colorado and Utah, this structure necessitates premium broadband knowledge within the DOT to review the broadband needs of the state to inform the approval process. The developers are viewed as partners in the development process and work collaboratively with the government to ensure sufficient fiber is installed in areas necessary. This structure utilizes Master Service Agreements and active databases of installed fiber, highlighting in-kind contributions as a means of meeting both the governments' and the private developers' needs.

Furthermore, some DOTs and transportation agencies, and states have taken a more active approach in procuring neutral private sector host entities to develop and operate the state's priority corridors including the interstates. These states include Pennsylvania, Georgia, North Carolina, and Kentucky.

States across the US utilize a range of structures for broadband deployment within state ROW; these structures have been synthesized across three main categories. WSDOT can evaluate and adopt a category based on whether the highway ROW under consideration is a priority and whether broadband deployment is WSDOT/State initiated or private sector initiated. The categories are described below.

1. **Transactions –** A transactional approach could be taken for priority corridors to the DOT as well for meeting state broadband goals. These are typically taken for interstates and/or for long/back haul routes.

2. **Flexible Partnerships –** Mutually beneficial partnership approach provides the flexibility for opportunity to drive both DOT and developer needs that allows for a range of solutions in driving installation of fiber broadband.

3. **Permits –** No Fee, Fixed Pricing or Tiered Pricing are market driven, reactive, and usually designed for shorter lengths of easement needed and predetermined locations for utility installation. These are typically used for corridors/routes that are not necessarily priorities for the DOT or the State

Based on the benchmarking of leading practices from other states and review of the current process for ROW access in WSDOT, the following administration/partnership models are recommended:

Recommended Administration/Partnership Models

Leading Entity and Corridor Priority	Recommended Partnership/ Administration Model	Structure	Explanation	Example States
State-led Approach (State and DOT driven for Priority Corridors)	Transactions Targeted, mostly competitively procured solution where DOT makes a capital	Neutral Host Operating Agreement	DOT/State contracts with the neutral private sector host that meets DOT/State operational requirements and operate the network on	PA, NC, GA, KY

	investment and/or service payment.		nondiscriminatory basis to meet the State's goals	
Private Sector Initiated Approach (If the proposal is for a Priority Corridor)	Can be Transactional or Permits Based Program structures that do not clearly fit in 'Permits' or 'Transaction' categories	Mutual Partnership	Non-exclusive relationship between government and private company to build out broadband, likely under an MSA, and in return for primarily in-kind contributions	CO, UT
Private-led Approach (Market Driven) For Non-Priority Corridors	Permits Structure through which a developer applies for a permit, which, if approved, allows for installation. Often incorporates in-kind contribution.	No Fee	Permit for fiber installation provided at no monetary cost	CO, OH, SC, TX, VA
		Fixed Pricing	Set fee (likely per mile or foot) for fiber regardless of location to cover DOT's costs	GA, PA, NJ
		Tiered Pricing	Varied fee (likely per mile or foot) based on population density	FL, MD, NY, TN, UT, WI

Leading practices and recommendations for partnership/administrative models are outlined below.

State /DOT Led Transactional Approach - Leading Practices and Recommendations

- Administer a non-discriminatory open access network to encourage private sector participation
- Establish points of presence along the state routes that incentivizes last-mile development
- DOT to lead procurement process and could own the network
- Department of Commerce to provide the role of aggregating governmental needs including education needs
- Network operations and maintenance by a neutral private sector host
- Integrate and diversify funding and financing sources for the planned corridors
- Private sector co-invests to cover portion of the capital costs to reduce the cost burden for DOT
- Explore opportunities for a private sector operator to co-invest in the network

— Ensure financial sustainability and recouping both capital costs invested and operating and maintenance costs

Private Sector Initiated Approach – Leading Practices and Recommendations

DOT will receive permit requests or solicited and unsolicited proposals from private sector entities for the corridors and routes that may be priority for DOT and/or the State.

— Establish clear pathway for unsolicited proposals from the private sector

— Accelerate the overall process for reviewing and approving permit requests on priority corridors

— Private sector owns, operates, and maintains the network and provide excess capacity for DOT's use

— DOT and Department of Commerce (Broadband office) to assess public side use cases including for transportation connectivity and rural broadband access and enable to the extent possible enable/negotiate an open access network.

Permits - Leading Practices and Recommendations

— Structure the pricing to cover costs of review of the application for installation of broadband infrastructure and oversight of such infrastructure

— Adopt a tiered pricing policy based on the importance of the corridor to cover unserved/underserved locations

— Set a review framework for ROW permit requests and specific processing time (e.g., 60 days from receipt of all required information for processing permits)

Ultimately, any ROW strategy that WSDOT adopts will need to be consistent with the analysis of federal and state laws and regulations presented as part of Appendix 2[1]. Specifically, any partnership approaches specified above should meet the neutral and non-discriminatory requirements as outlined in the analysis provided for Appendix 2. Also, limitations on compensation/fees to DOT are further delineated in the analysis provided for Appendix 2.

*****

Disclaimer

This analysis and report is prepared for the use of the Washington State Joint Transportation Committee. KPMG LLP and its subcontractors assisted the Washington State Joint Transportation Committee in the preparation of this report and while the information presented and views expressed in this document have been prepared in good faith, KPMG LLP accepts no responsibility or liability to any party in connection with such information or views. KPMG LLP does not assume any liability associated with any person's use of this document. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation. Any decisions made by other parties predicated on this analysis will be at their own risk.

KPMG's role is limited to providing this study. In so doing, KPMG has undertaken no contacts with legislative branch officials or legislative branch employees at any level of government that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. In no event will KPMG undertake meetings with government officials of any branch or

[1] Appendix 2 – Memorandum prepared by Nossaman LLP on Documenting Legal and Regulatory Requirements

level of government on behalf of the Washington State Joint Transportation Committee or otherwise appear in a public or private context that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. This study is offered as a holistic work and should be read and interpreted only in its entirety.

*****

Appendices

Disclaimer

This analysis and report is prepared for the use of the Washington State Joint Transportation Committee. KPMG LLP and its subcontractors assisted the Washington State Joint Transportation Committee in the preparation of this report and while the information presented and views expressed in this document have been prepared in good faith, KPMG LLP accepts no responsibility or liability to any party in connection with such information or views. KPMG LLP does not assume any liability associated with any person's use of this document. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation. Any decisions made by other parties predicated on this analysis will be at their own risk.

KPMG's role is limited to providing this study. In so doing, KPMG has undertaken no contacts with legislative branch officials or legislative branch employees at any level of government that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. In no event will KPMG undertake meetings with government officials of any branch or level of government on behalf of the Washington State Joint Transportation Committee or otherwise appear in a public or private context that could be fairly interpreted as public policy advocacy, lobbying, or otherwise be perceived as impairing our objectivity or independence. This study is offered as a holistic work and should be read and interpreted only in its entirety

Appendix 1

Washington State Joint Transportation Committee

Appendix 1: Chapter 2 – Identify Expansion Opportunities

Middle-Mile Assessment

Key Considerations for ROW Permit Application(s) Evaluation

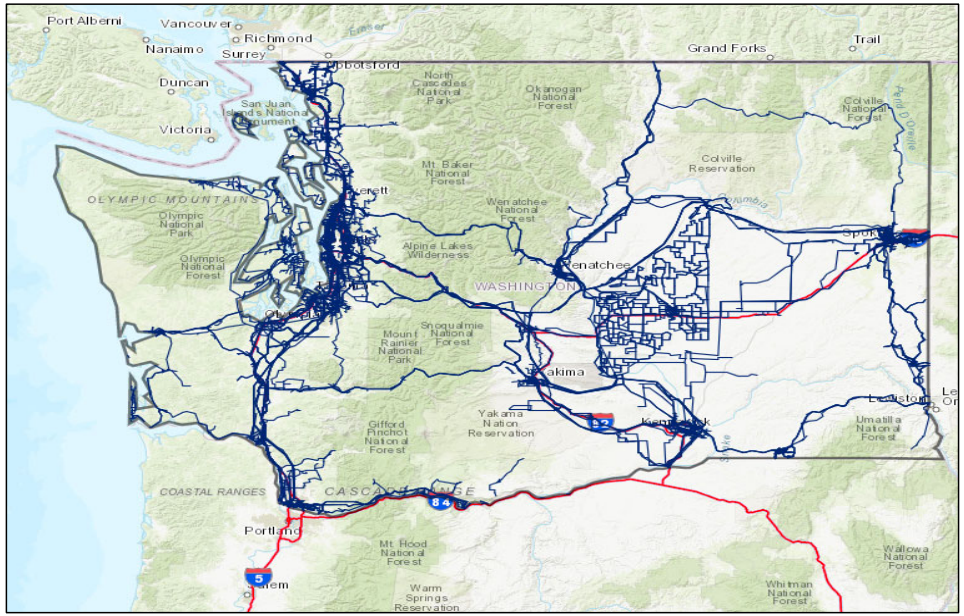
- Address long-term connectivity requirements of the public and private sector
  - ✓ Future proofing – i.e., ability to expand the network capacity in the future
  - ✓ Technical specifications
  - ✓ Performance requirements
- Open access network
  - ✓ Non-discriminatory access to all service providers and public agencies
- Compliance with state right-of-way access policies / procedures
  - ✓ Dig Once / Build Once
  - ✓ Fiber swap
  - ✓ Construction, operations and maintenance coordination with WSDOT
- Permit fees / compensation to the state

Determining Consumer Broadband Access

- Data Problem:
  - ✓ Presence of fiber does not necessarily mean open access
  - ✓ Telcos / carrier level data for existing fiber presence is proprietary
  - ✓ Multiple data sources (i.e., existing fiber presence, average internet speed, and number of service providers) are used for the analysis
- Can Estimate Coverage by looking at:
  - ✓ Where is Fiber located?
  - ✓ What are Broadband Speeds by location?
  - ✓ Where are open access providers?

Where is Fiber Located?

Current Fiber Optic Cable Coverage in Washington



Observations:

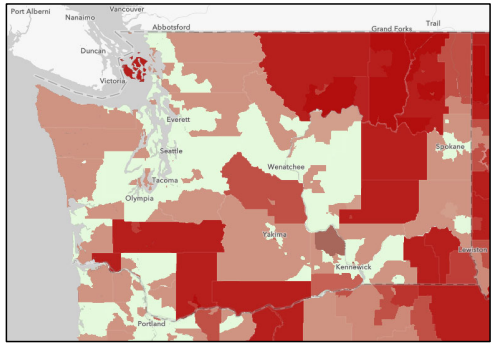
- Fiber presence shown represents proprietary private sector networks
- Not necessarily open access / non-discriminatory network(s) to serve public needs
- Analysis is leveraging multiple sources of data (fiber presence, internet speed and number of providers) to ascertain whether or not existing fiber optic networks can be leveraged for public use

Notes: Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

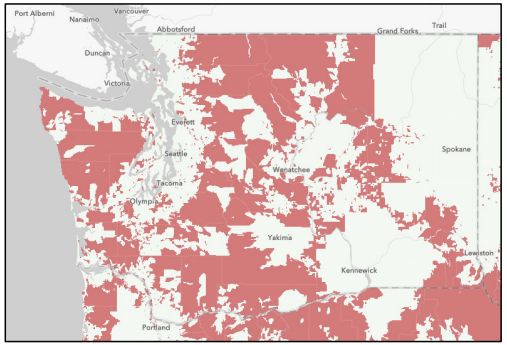
What are Broadband Speeds?

- FCC Form 407 Data
  - ✓ Widely recognized as unreliable – For example, FCC broadband score shows excellent coverage in Pend Oreille County
  - ✓ A composite score is calculated by aggregating the speeds of DSL, Cable, Broadband in the particular area adjusted by the mix of customers having these services
  - ✓ “Broadband Score” higher than 500 corresponds to >100/25 Mbps speed
- There are multiple metrics to measure average broadband speed
  - FCC broadband score
  - Ookla test
  - Microsoft device data
  - Washington Broadband Office survey

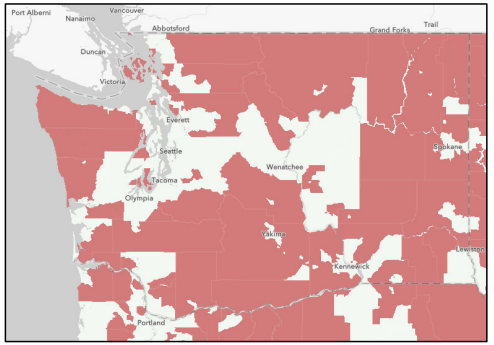
National Sources of Washington Broadband Speed Data



Source: National Telecommunications and Information Administration Data



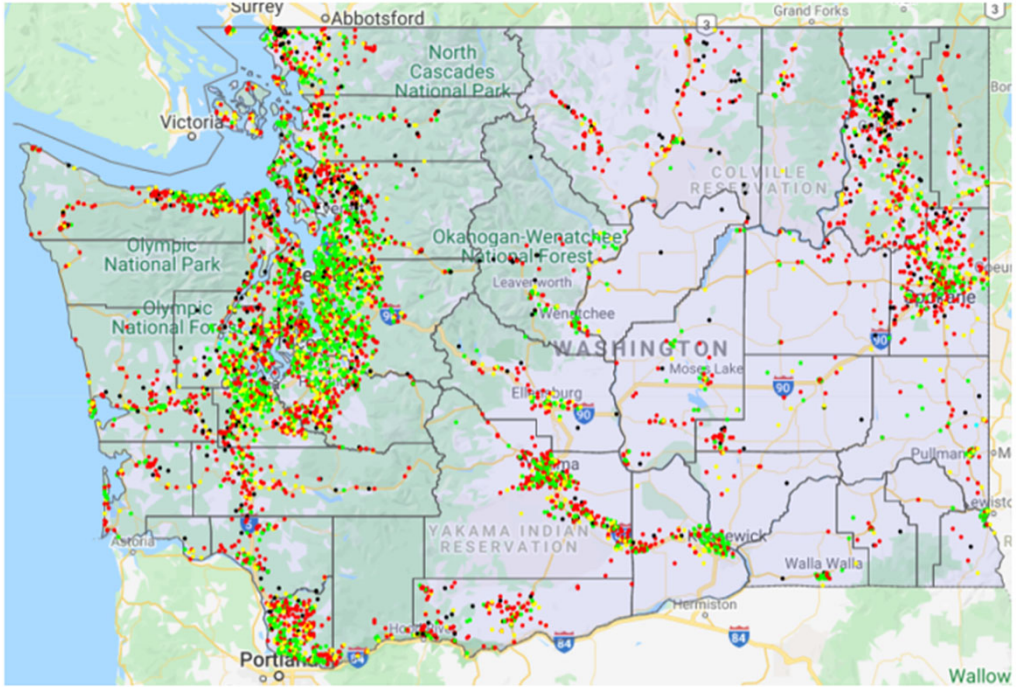
Source: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps



Source: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

- Each National Data Source has different strengths and weaknesses. Study looks to all sources to obtain aggregate estimate of coverage.

Office of Broadband Speed estimate



Broadband State and County Dashboards

Download

• No Service	5.9%
•0-10 Mbps	39.8%
•10-25 Mbps	18.6%
•25-150 Mbps	29.7%
•150+ Mbps	6.0%

Upload

No Service	5.9%
<3 Mbps	42.3%
3-10 Mbps	30.1%
10-25 Mbps	15.7%
25-150 Mbps	5.1%
> 150 Mbps	0.9%

Households	2,885,677
Population	6,724,540
Test locations	38,271
Total Tests	50,095

Reasons for No Service

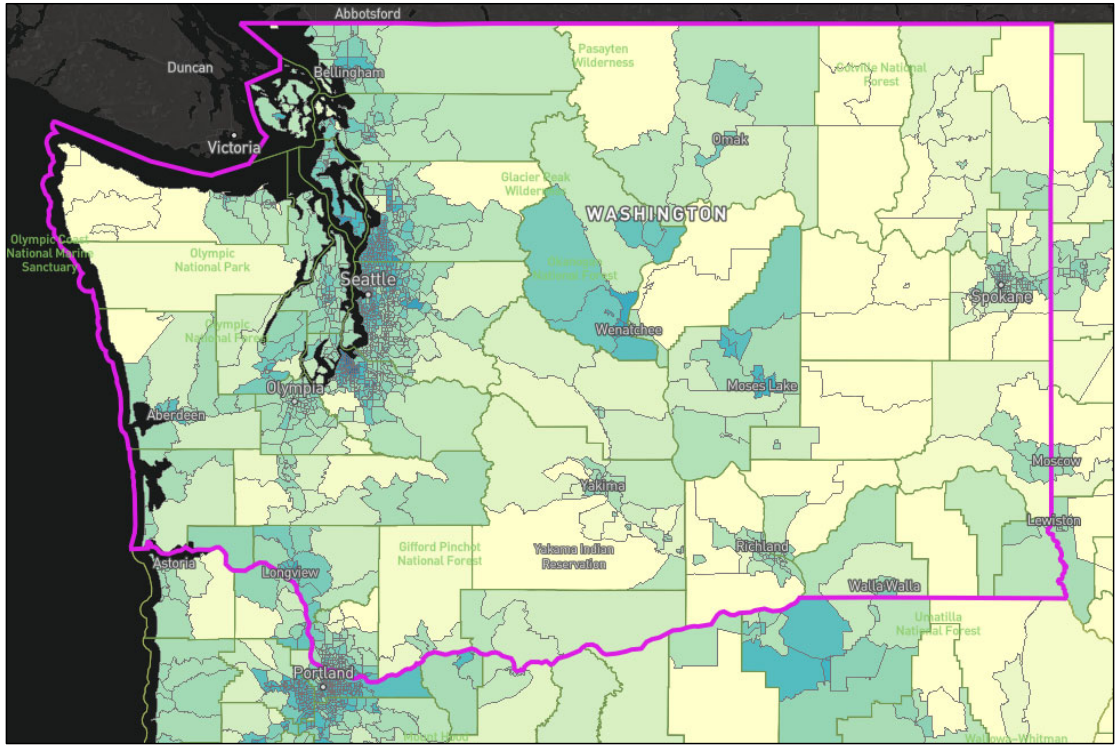
Respondents can select all that apply

Too Expensive	16.96%
Not Available	91.17%
Use Public	0.15%
No Computer	1.61%
Don't Know How Internet	1.53%
Don`t Know How Computer	0.46%
Don't Need	0.23%
Privacy	0.15%
Physical Issues	0.08%

Sources: Washington State Broadband Office

Identifying Service Needs: Where Are Service Providers?

Number of Providers



Number of Fixed Residential Broadband Providers

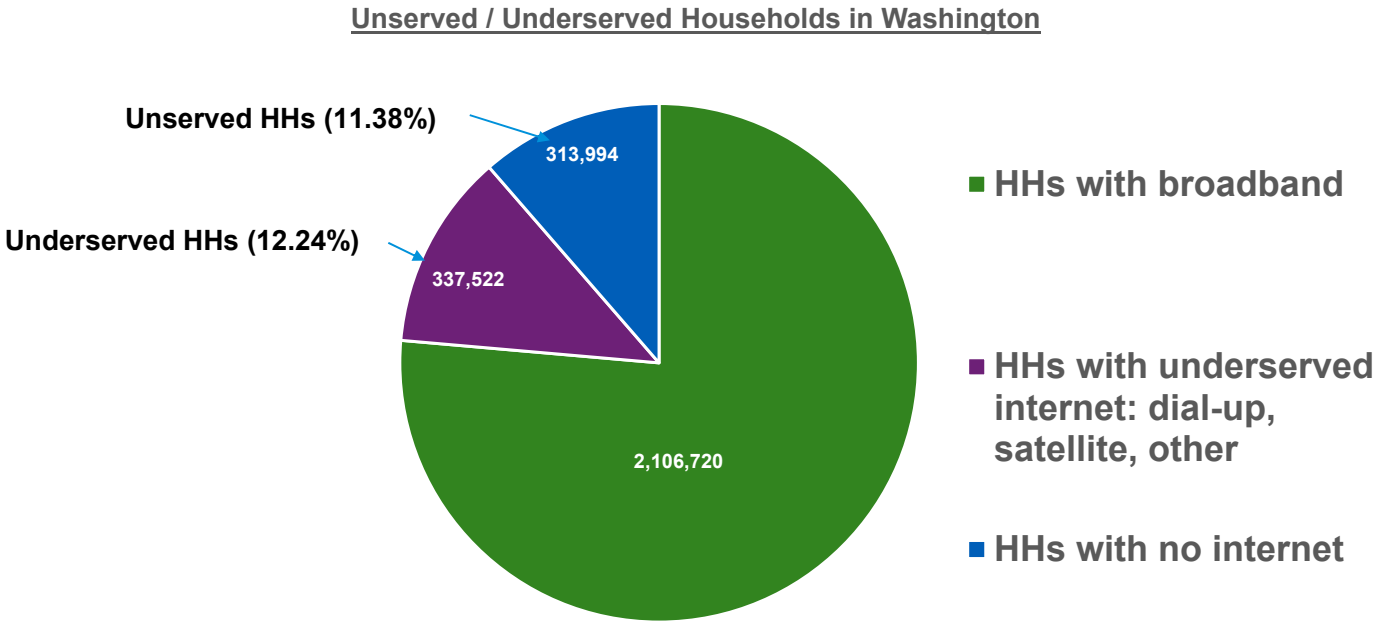
0 1 2 3 4 6 12 or more

Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

- Number of providers of one or less defines lack of access and/or affordability
- Lower number (or lighter color) indicates that lack of fiber presence to connect to or inaccessibility

Aggregate Conclusion: Number of Unserved and Underserved Households in Washington



Notes: 1) The value for total households with no internet has been derived after reducing available input data for households with internet from the total number of households in Washington. Households with internet has further been broken up into 2 categories; (a) households with a broadband internet connection, and (b) households with underserved internet comprising of dial-up, satellite, non-subscription and any other forms of low-speed internet. Finally, households with no internet and households with underserved internet have been added to estimate total underserved households
Sources: ACS 2019 data

Framework for Highways and ROW Prioritization

Prioritizing Broadband access to state highway right-of-way

Nos.	Evaluation Criteria	Max. Score	Definition
1	Service need: Number of unserved/underserved households	40 points	• Unserved / underserved households indicates the level of connectivity of the area considered and severity as to lack of service • Measures effectiveness of public investment to address # of unserved / underserved households within a corridor
2	Current infrastructure: Where is open access fiber optic cable lacking?	30 points	• Measures lack of open access/availability to serve the underserved market • Measure lack of excess of capacity to serve the current market inferred by fiber presence, current speed score and number of providers in the served markets • Measures extent to which new highway broadband infrastructure could be effective to introducing new service and/or drive competition
3	Population Centers Covered / Points of Presence Addressed	30 points	• Measures number of population centers / points of presence that could be addressed by a corridor
	TOTAL	**100 points**	

Evaluation Criteria # 1 – Unserved / Underserved Households Addressed

Corridor	# of Unserved / Underserved HHs
90	107,421
5	302,835
82	48,964
405	74,183
182	39,457
205	22,189
705	36,448
Total Interstate Mileage / Underserved	**631,497**

Corridor	# of Unserved / Underserved HHs
20	27,848
101	36,689
2	67,601
97	25,609
395	43,913
14	63,693
18	34,200
6	6,286
702	3,827
Total Major State Route Mileage / Unserved and Underserved HHs	**309,666**

- # of Unserved / Underserved Households are based on a five (5) mile radius along the state routes
- Some degree of overlap exist between the interstate highways and state routes for unserved / underserved households

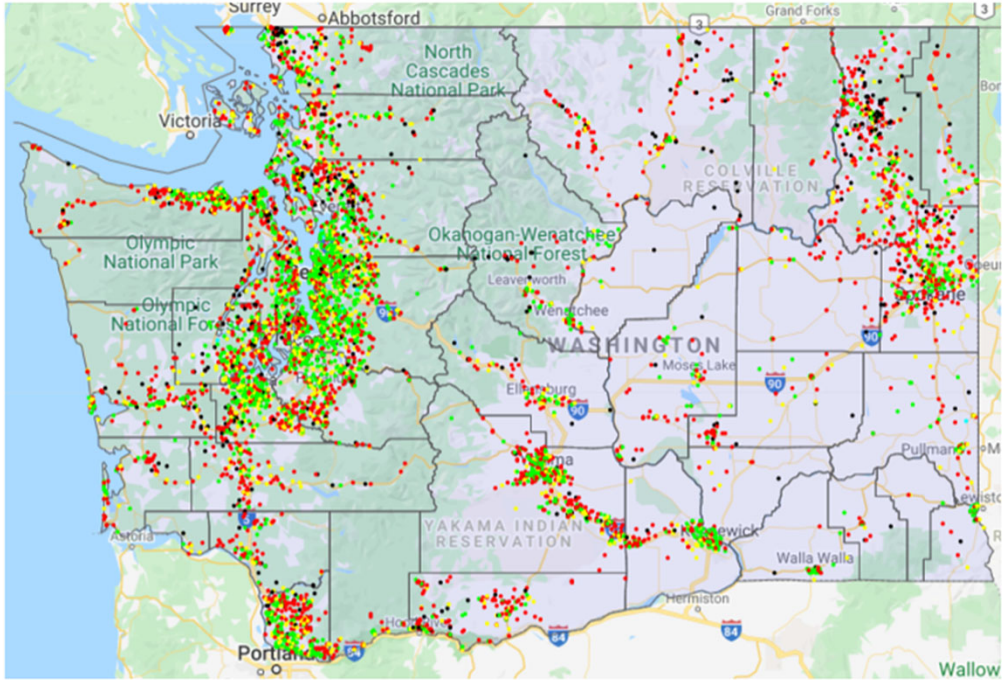
Sources: ACS 2019 and WSDOT

Evaluation Criteria # 2 – Where is Fiber Access Lacking?

Observations:

The purpose of this metric is to measure lack of excess broadband capacity to serve the current market inferred based on the following:

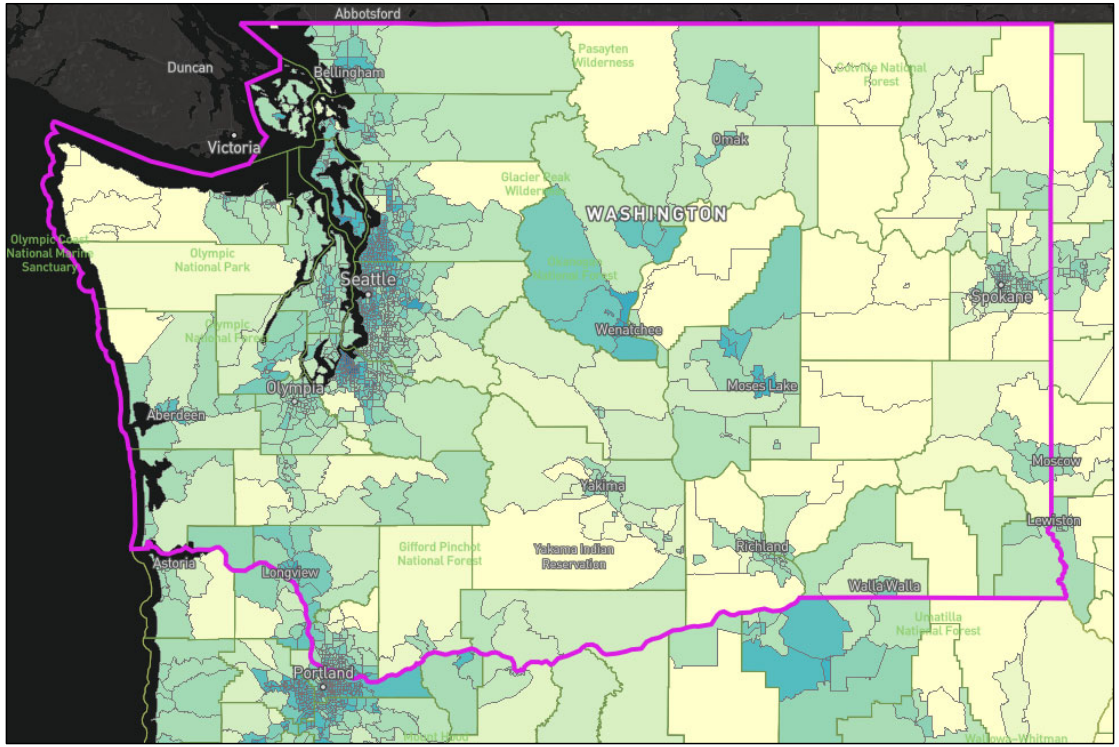
- Fiber presence on the long-haul routes on the interstate highways
- Overall broadband speed metric as measured by the broadband score across the corridor
- Number of service providers in the addressable market/counties served by the corridor



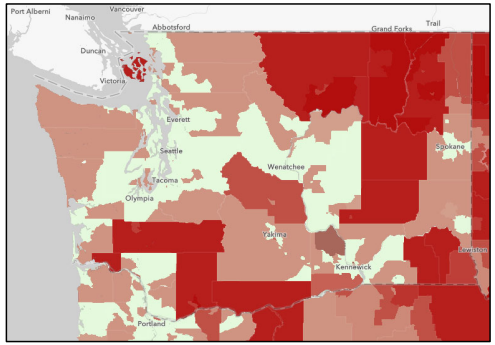
Sources: Washington State Broadband Office

Evaluation Criteria # 2 – Number of Broadband Service Providers (2/3)

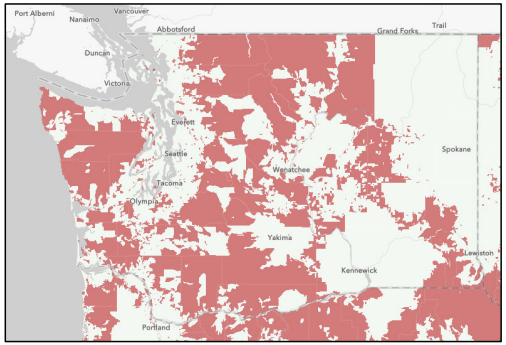
Number of Providers



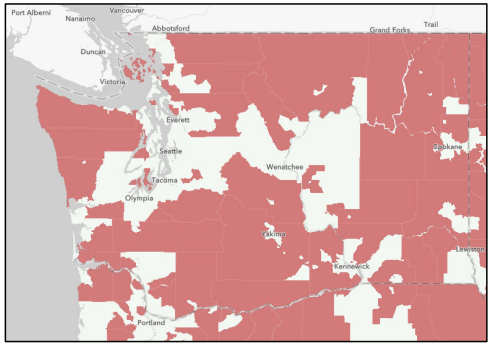
Evaluation Criteria # 2 – Average Broadband Speed (3/3)



Source: National Telecommunications and Information Administration Data



Source: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps



Source: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

- Each National Data Source has different strengths and weaknesses. Study looks to all sources to obtain aggregate estimate of coverage.

Evaluation Criteria # 3 – Population Centers Covered / Points of Presence

WA State Internet Highways

Corridor	Counties Covered	# of Population Centers
90	King, Kittitas, Grant, Adams, Lincoln, Spokane	12
5	Clark, Cowlitz, Lewis, Thurston, Pierce, King, Snohomish, Skagit, Whatcom	33
82	Kittitas, Yakima, Benton	9
405	King, Snohomish	3
182	Benton, Franklin	2
205	Clark	1
705	Pierce	1

WA State Routes

Corridor	Counties Covered	# of Population Centers
20	Jefferson, Island, Skagit, Whatcom, Chelan, Okanogan, Ferry, Stevens, Pend Oreille	10
101	Pacific, Grays Harbor, Jefferson, Clallam, Mason, Thurston	10
2	Snohomish, King, Chelan, Douglas, Grant, Lincoln, Spokane, Pend Oreille	9
97	Klickitat, Yakima, Kittitas, Chelan, Douglas, Okanogan	7
395	Benton, Franklin, Adams, Lincoln, Spokane, Stevens, Ferry	7
14	Clark, Skamania, Klickitat, Benton	5
18	King	3
6	Pacific, Lewis	2
702	Pierce	N/A

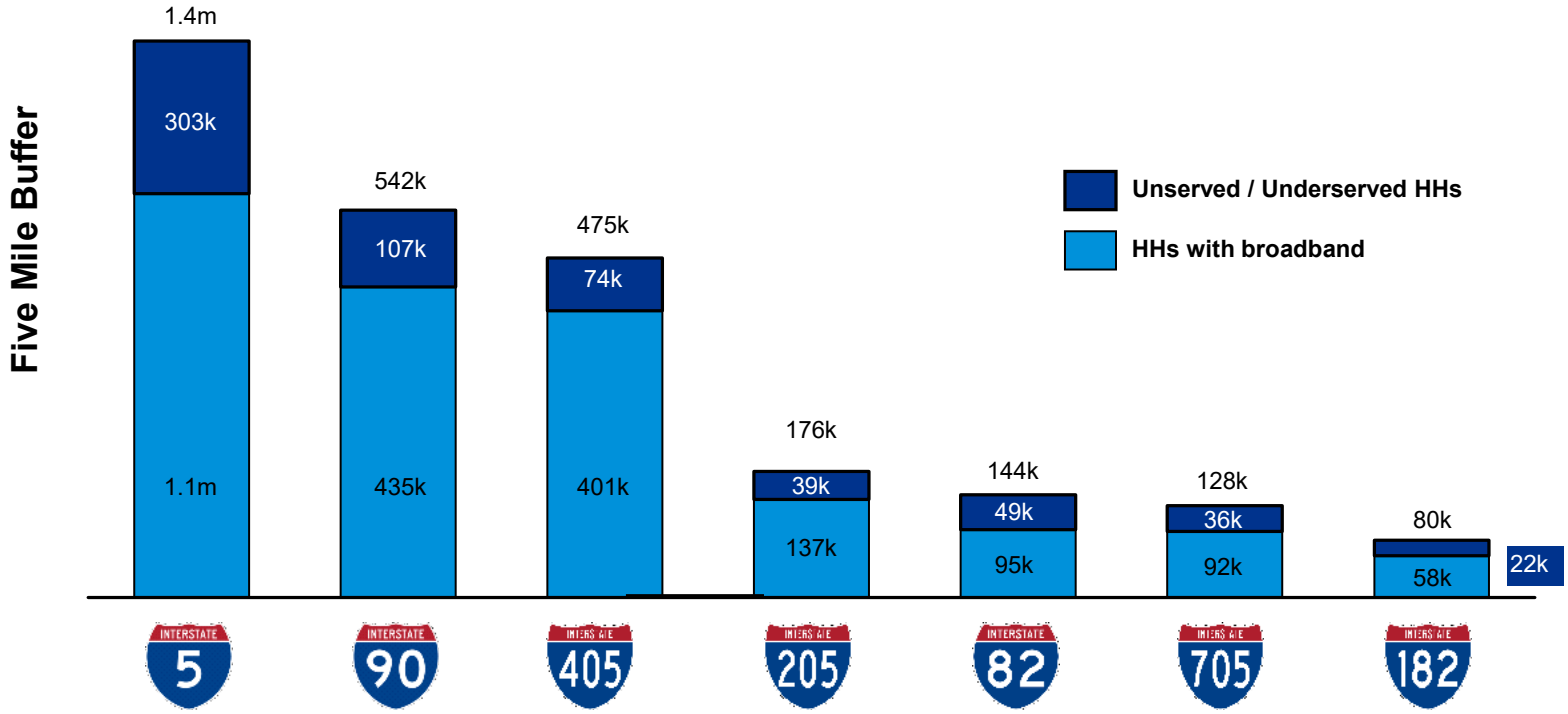
Interstate Network – Summary of Prioritization Scoring

Nos.	Evaluation Criteria	90	5	82	405	182	205	705
1	Unserved / Underserved Households Addressed	15.0	40.0	5.0	10.0	5.0	5.0	5.0
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	15.0	15.0	20.0	15.0	15.0	10.0	10.0
3	Population Centers Covered / Points of Presence Addressed	15.0	30.0	10.0	5.0	5.0	5.0	5.0
Total Score		**45.0 points**	**85.0 points**	**35.0 points**	**30.0 points**	**25.0 points**	**20.0 points**	**20.0 points**

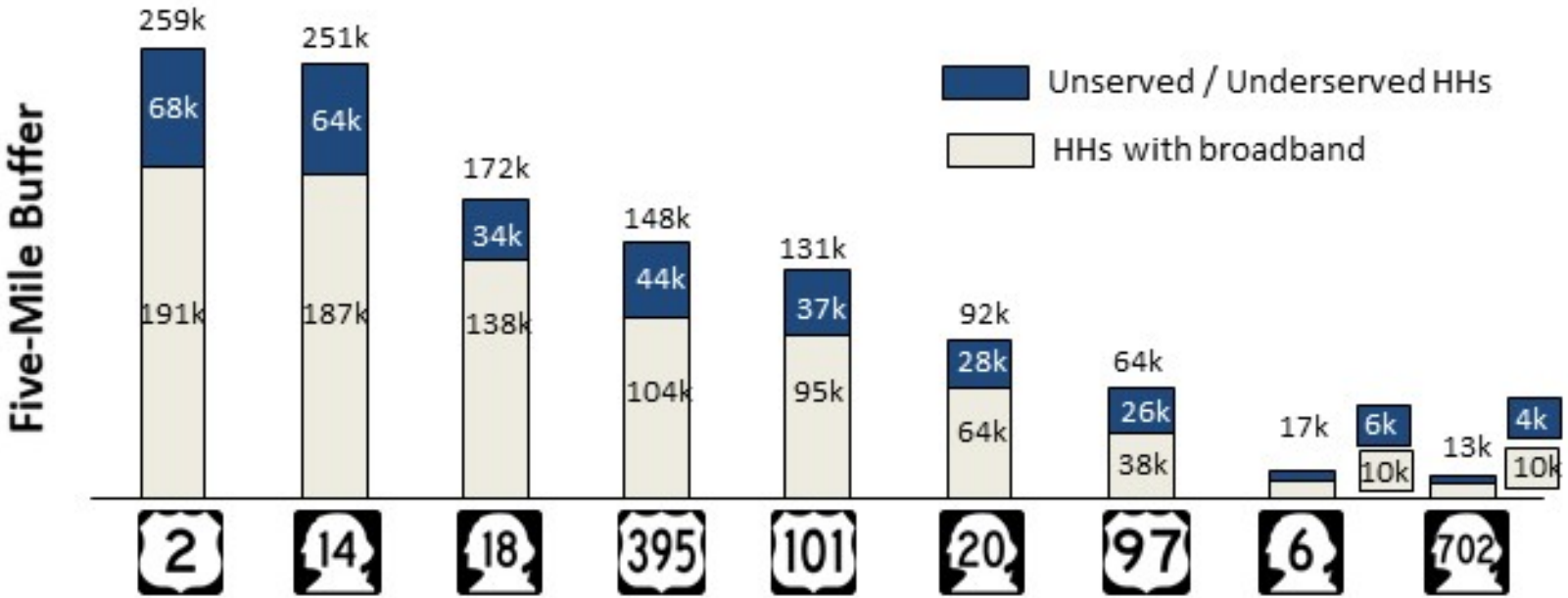
Select State Routes – Summary of Prioritization Scoring

Nos.	Evaluation Criteria	20	101	2	97	395	14	18
1	Unserved / Underserved Households Addressed	15.0	20.0	40.0	15.0	25.0	35.0	20.0
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	10.0	10.0	20.0	10.0	15.0	20.0	20.0
3	Population Centers Covered / Points of Presence Addressed	30.0	30.0	30.0	20.0	20.0	10.0	5.0
Total Score		**55.0 points**	**60.0 points**	**90.0 points**	**45.0 points**	**60.0 points**	**65.0 points**	**45.0 points**

Prioritization of Permitting Right-of-Way Access – Interstate Highways



Prioritization of Permitting Right-of-Way Access – Select State Routes



Interstate Highways Evaluation Data

I-90: Existing Fiber Presence / Providers

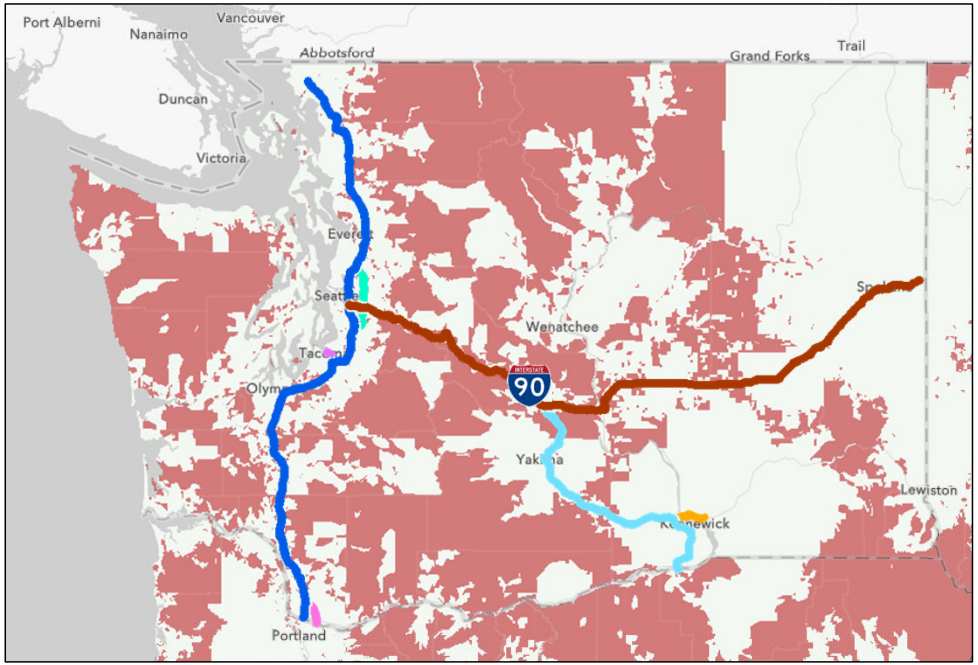
Fiber Providers along Washington I-90

Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
Legacy Noel Communications	Regional Fiber Company	1,467
Grant PUD High Speed Network	Regional Utility Company	756
LUMEN (Legacy Centurylink)	National Fiber Company	749
zayo	National Fiber Wholesaler	740
NOANET	Regional Wholesaler	331
AT&T	National Wireless Company	297
Orbitcom	Regional Fiber Company	292
allstream.	National Fiber Company	282
XO communications	National Fiber Company	256
Syringa Networks	National Fiber Company	155

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

I-90: Broadband Speed (1/3)



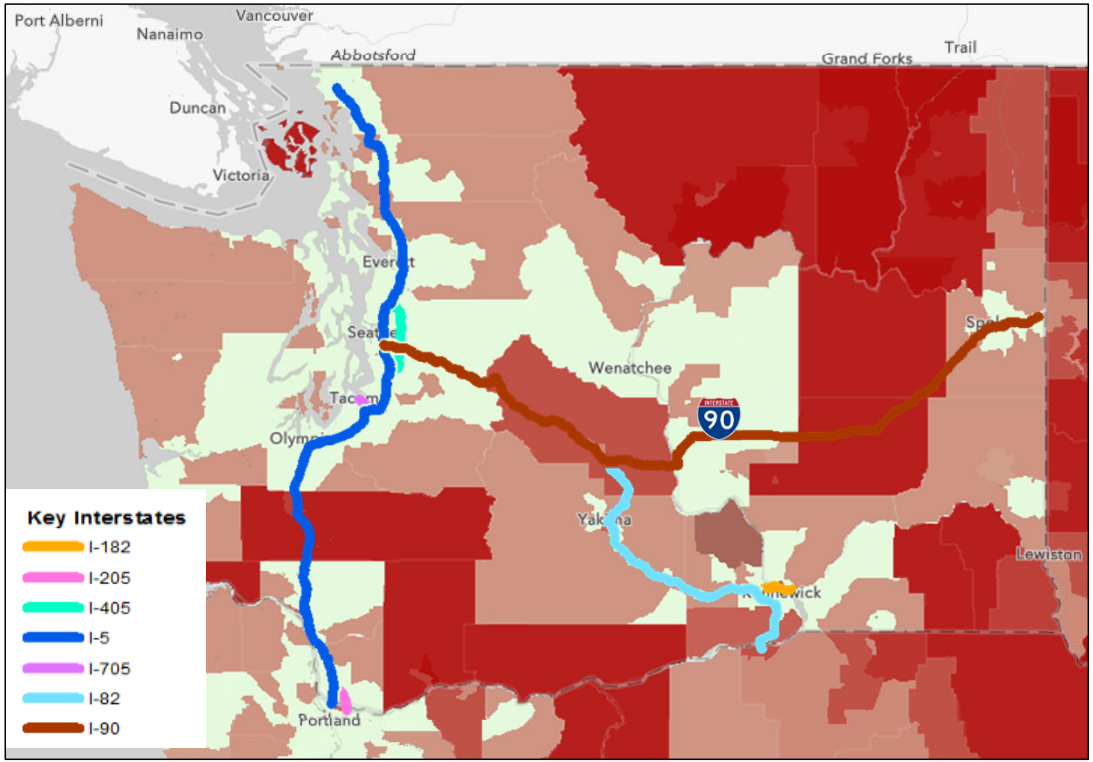
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

- *I-95 Corridor has low internet speeds for most part, except for around Seattle region which reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

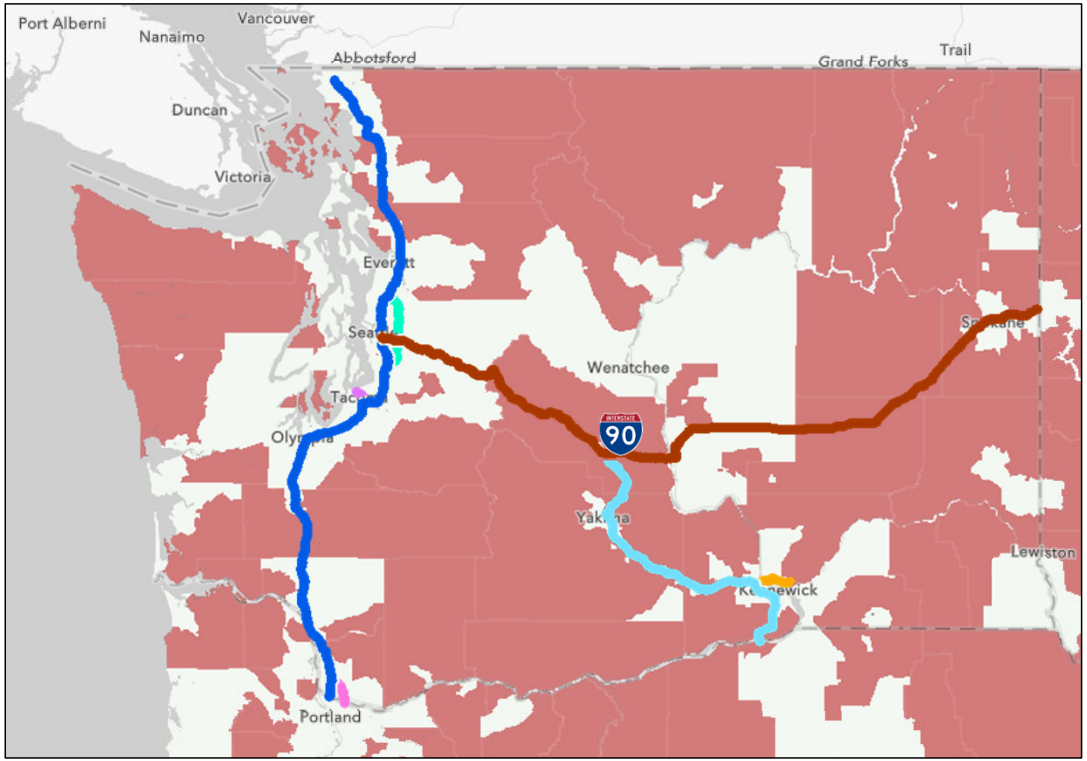
I-90: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

I-90: Broadband Speed (3/3)

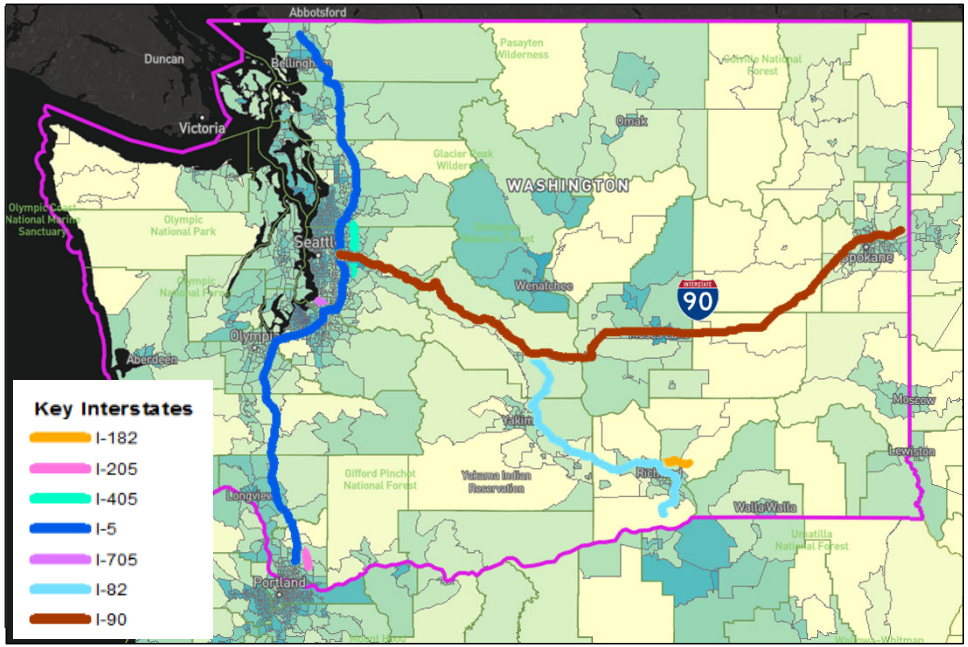


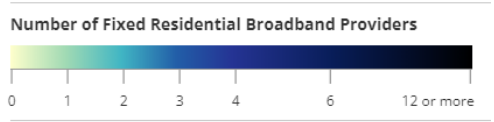
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

I-90: # of Service Providers





Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
King,	2.87 %	27.07 %
Kittitas	35.59 %	97.15 %
Grant	13.84 %	48.10 %
Adams	7.96 %	35.33 %
Lincoln	90.53 %	99.75 %
Spokane	10.91 %	56.45 %

Sources: ESRI, FCC, ACS 2019

- Kittitas and Lincoln Counties served by I-90 primarily have one provider or less
- This affects access to broadband as well as overall affordability in these regions
- Intermittent long-haul and middle-mile networks do not serve rural residential demand due to underlying economics

I-90: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	15.0	▪ Second highest (107k) underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	15.0	▪ Noel Communications, Grant PUD, Lumen, and Zayo have existing presence; however, corridor has the second highest unserved / underserved households ▪ Existing fiber presence is concentrated around Seattle, Ellensburg, Sprague, and Spokane areas ▪ Except for the major metro areas, the corridor has an average internet speed of less than 50/10 Mbps
3	Population Centers Covered / Points of Presence Addressed	15.0	▪ Twelve population centers are covered by the interstate highway – approximately 53,000 households are residing within 5-mile radius
Total Score		**45.0 points**	

I-5: Existing Fiber Presence / Providers

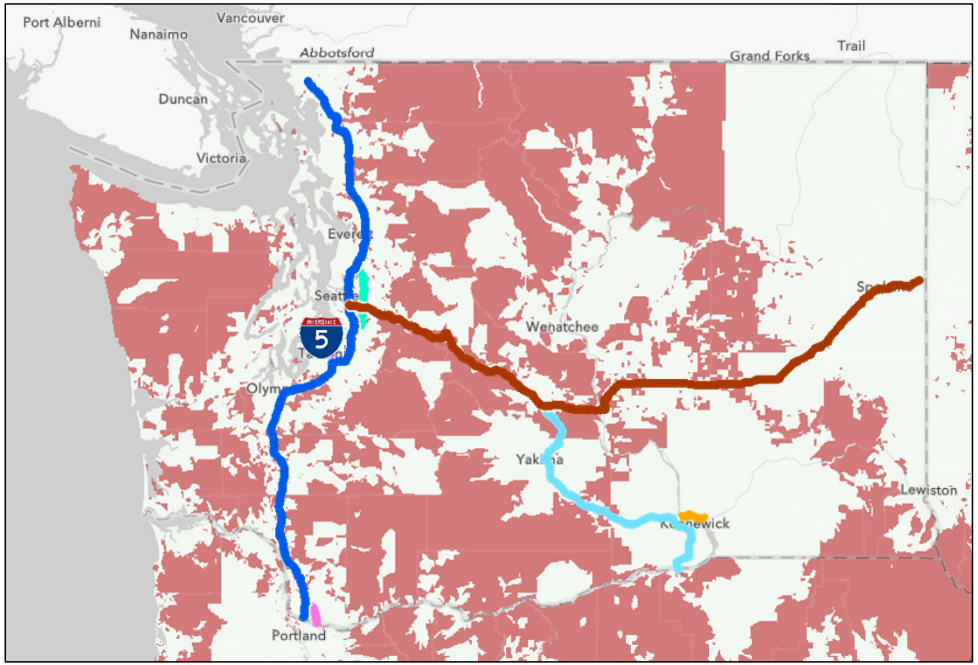
Fiber Providers along Washington I-5

Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
Legacy Noel Communications	Regional Fiber Company	1,732
wave	Regional Fiber Company	1,182
zayo	National Fiber Wholesaler	1,086
LUMEN (Legacy Centurylink)	National Fiber Company	786
allstream.	National Fiber Company	767
COMCAST	National Fiber Company	563
AT&T	National Wireless Company	492
Blackrock Cable	Regional Cable Company	489
NOANET	Regional Wholesaler	435
alaska COMMUNICATIONS	Regional Fiber Company	292

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

I-5: Broadband Speed (1/3)



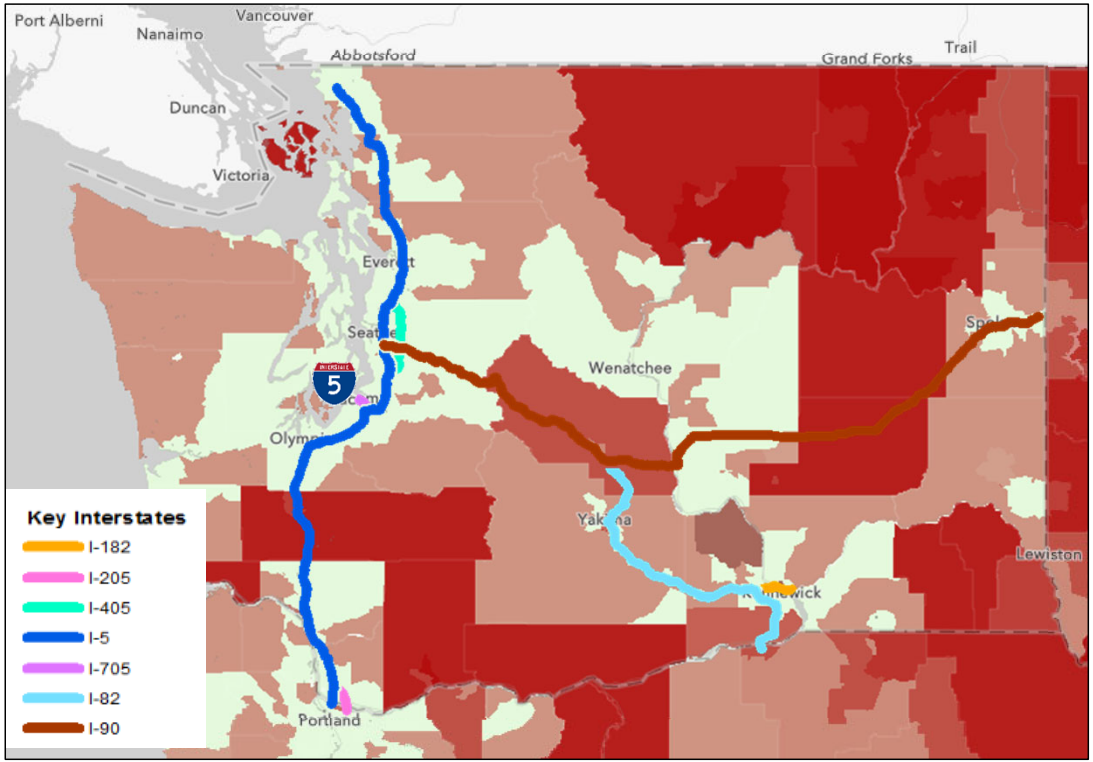
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

- *I-5 Corridor has low internet speeds for most part, except for around Seattle region and Adam County which reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: : FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

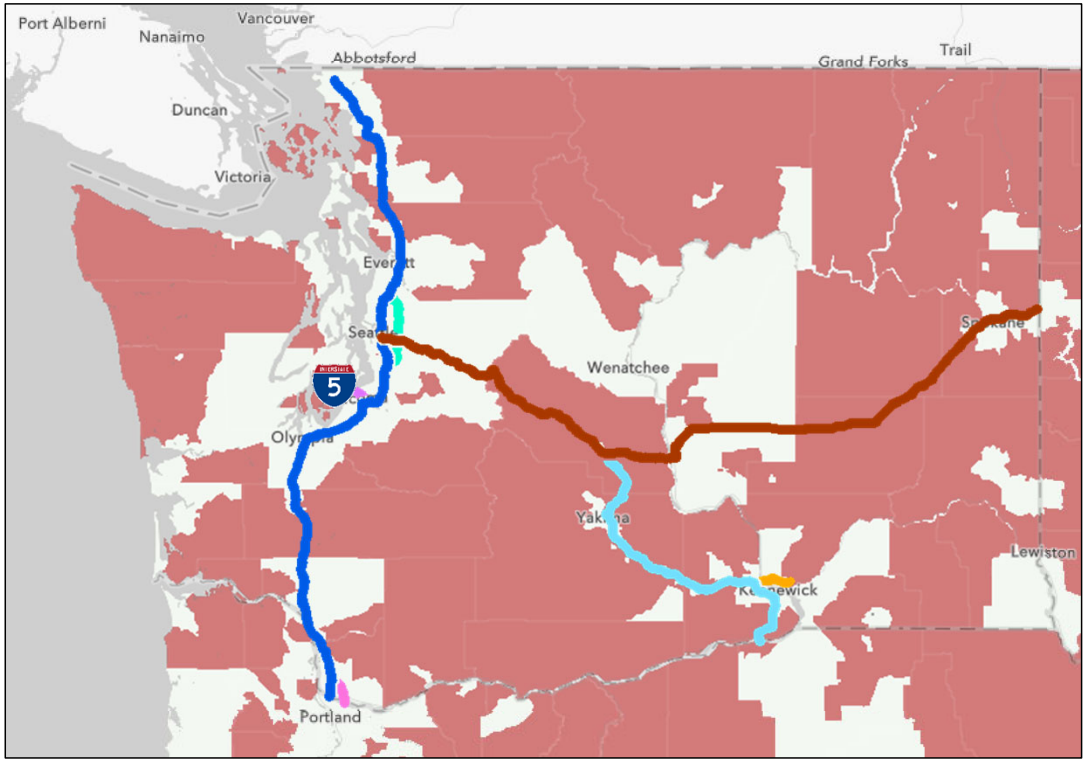
I-5: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

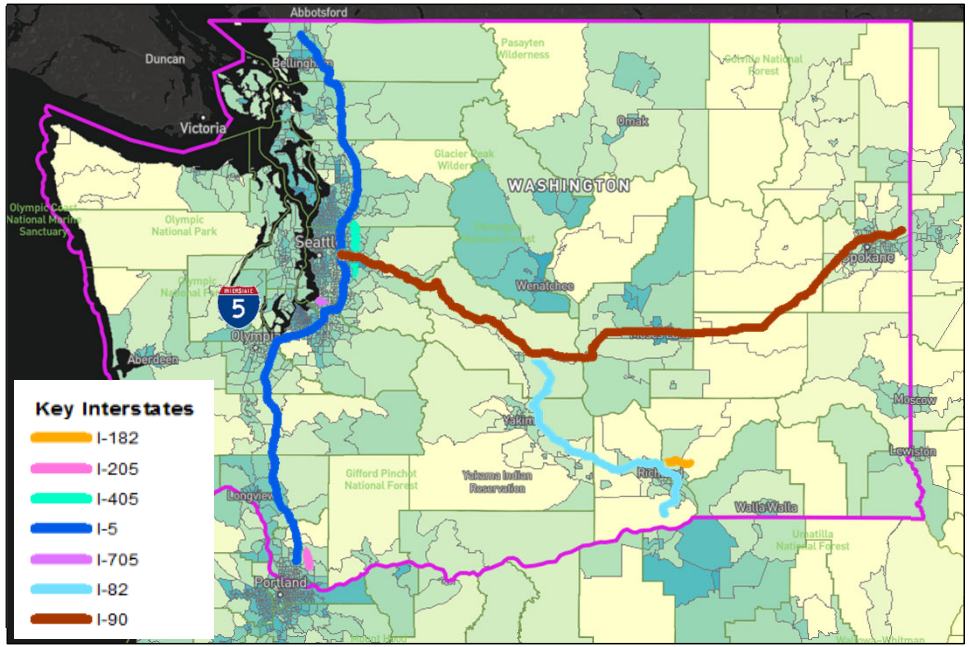
Sources: National Telecommunications and Information Administration Data

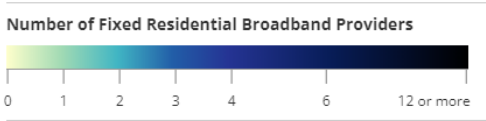
I-5: Broadband Speed (3/3)



Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

I-5: # of Service Providers





Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
Clark	4.68 %	15.24 %
Cowlitz	8.54 %	37.53 %
Lewis	29.01 %	95.22 %
Thurston	6.85 %	54.33 %
Pierce	3.77 %	33.32 %
King	2.87 %	27.07 %
Snohomish	3.65 %	30.52 %
Skagit	7.59 %	76.38 %
Whatcom	9.79 %	69.07 %

- Lewis, Skagit and Whatcom counites served by I-5 primarily have one provider or less
- Seattle, Olympia, and Portland regions have higher # of service providers

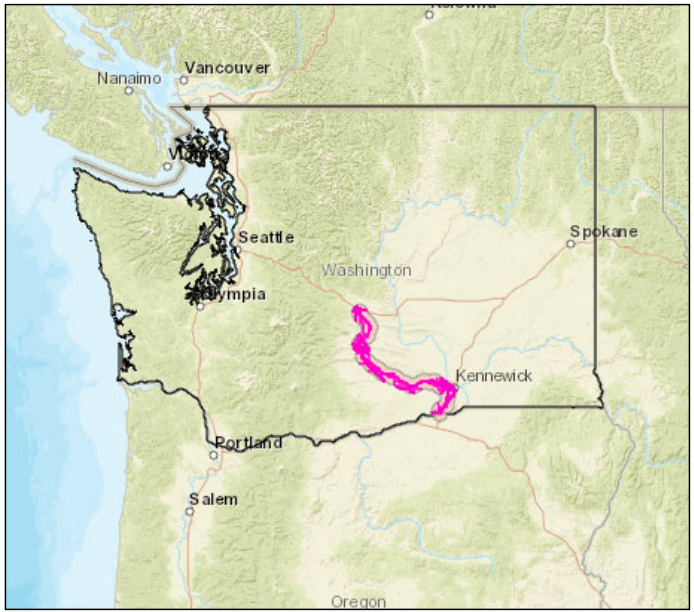
Sources: ESRI, FCC

I-5: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	40.0	▪ Highest (302k) underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	15.0	▪ Noel Communications, Wave, Zayo and Lumen have existing presence; however, corridor has the highest unserved / underserved households ▪ Existing fiber presence is concentrated around Seattle, Olympia and Portland areas ▪ Except for the major metro areas, the corridor has an average internet speed of less than 50/10 Mbps
3	Population Centers Covered / Points of Presence Addressed	30.0	▪ Thirty three population centers are covered by the interstate highway – approximately 1.4 million households are residing within 5-mile radius
Total Score		**85.0 points**	

I-82: Existing Fiber Presence / Providers

Fiber Providers along Washington I-82

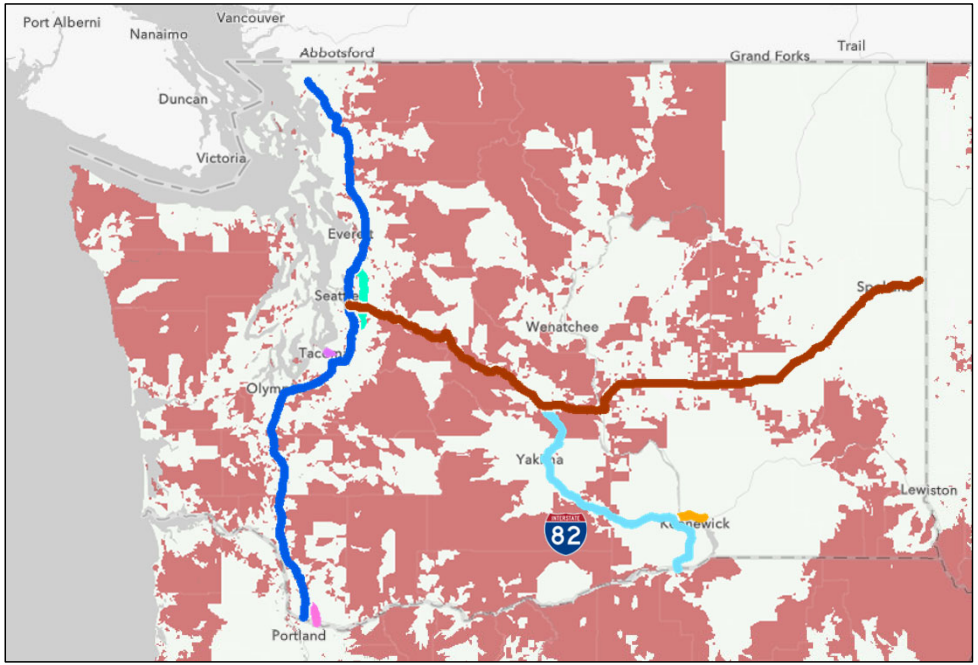


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
Spectrum	National Cable Company	379
Legacy Noel Communications	Regional Fiber Company	361
NOANET	Regional Wholesaler	179
cogent	National Fiber Company	148
LUMEN (Legacy Centurylink)	National Fiber Company	128
zayo	National Fiber Wholesaler	112
Benton PUD	Regional Utility Company	108
Syringa Networks	National Fiber Company	99
allstream	National Fiber Company	82
Franklin PUD	Regional Utility Company	74

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

I-82: Broadband Speed (1/3)



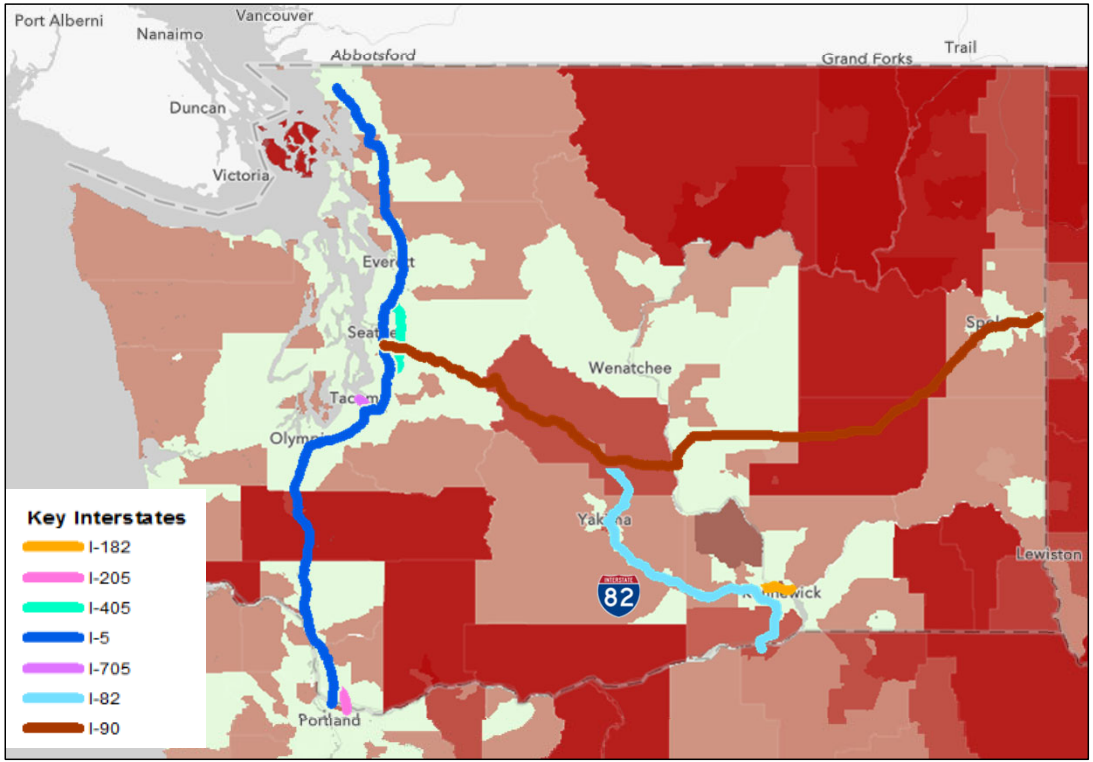
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

- *I-82 Corridor has low internet speeds for most part, except for around Kennewick area which reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

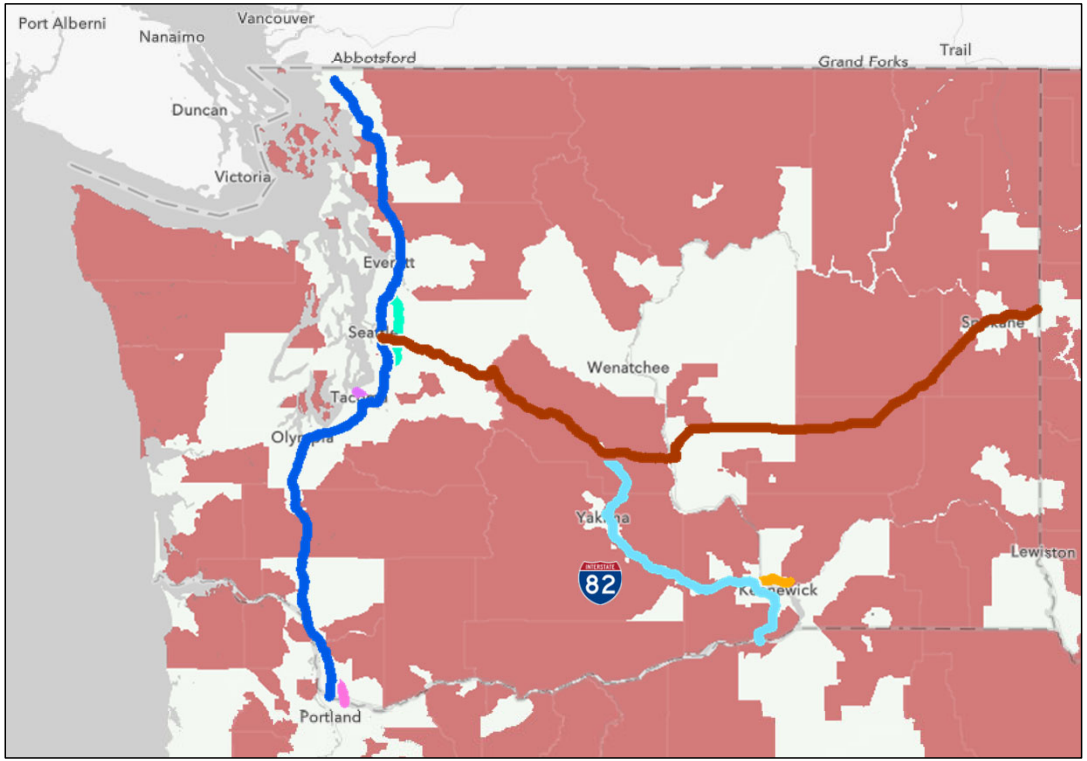
I-82: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

I-82: Broadband Speed (3/3)

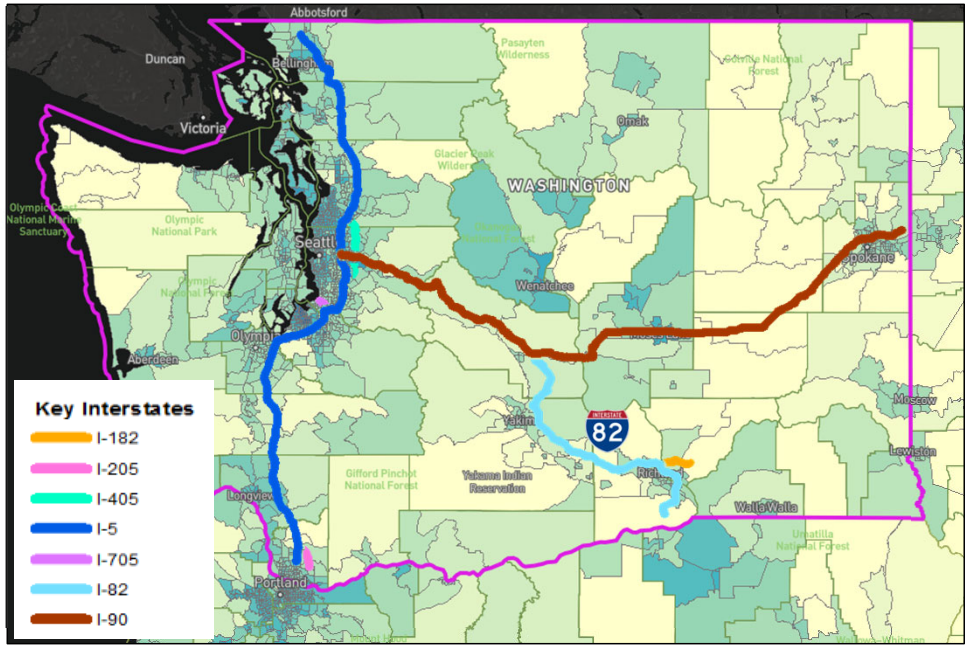


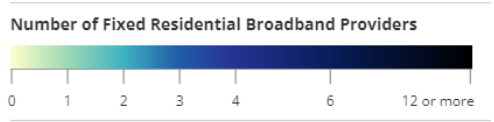
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

I-82: # of Service Providers





Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
Kittitas	35.59 %	97.15 %
Yakima	7.69 %	37.75 %
Benton	2.81 %	13.6 %

Sources: ESRI, FCC, ACS 2019

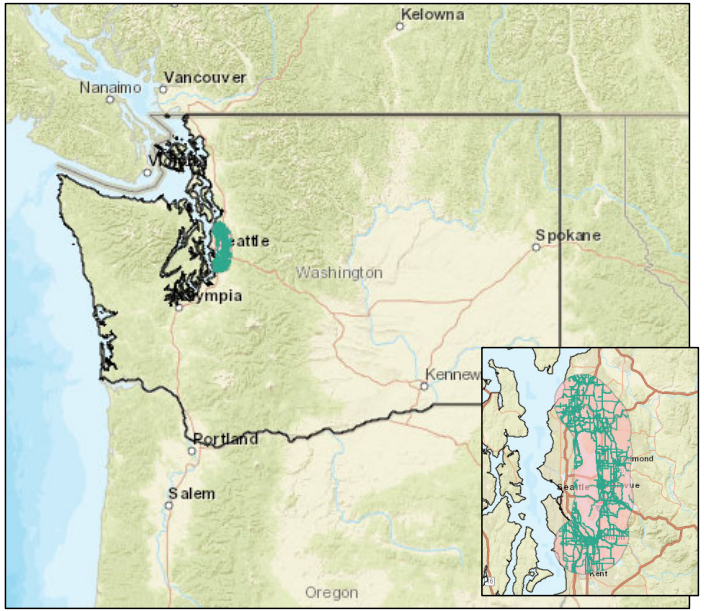
- Kittitas served by I-82 primarily have one provider or less
- Kennewick area have higher # of service providers

I-82: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	5.0	▪ Approximately 49,000 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	20.0	▪ Spectrum, Noel Communications, Noanet and Cogent have existing presence; however, corridor has approximately 49,000 unserved / underserved households ▪ Existing fiber presence is all along the corridor ▪ Except for the major metro areas, the corridor has an average internet speed of less than 50/10 Mbps
3	Population Centers Covered / Points of Presence Addressed	10.0	▪ Nine population centers are covered by the interstate highway – approximately 143,000 households are residing within 5-mile radius
Total Score		**35.0 points**	

I-405: Existing Fiber Presence / Providers

Fiber Providers along Washington I-405

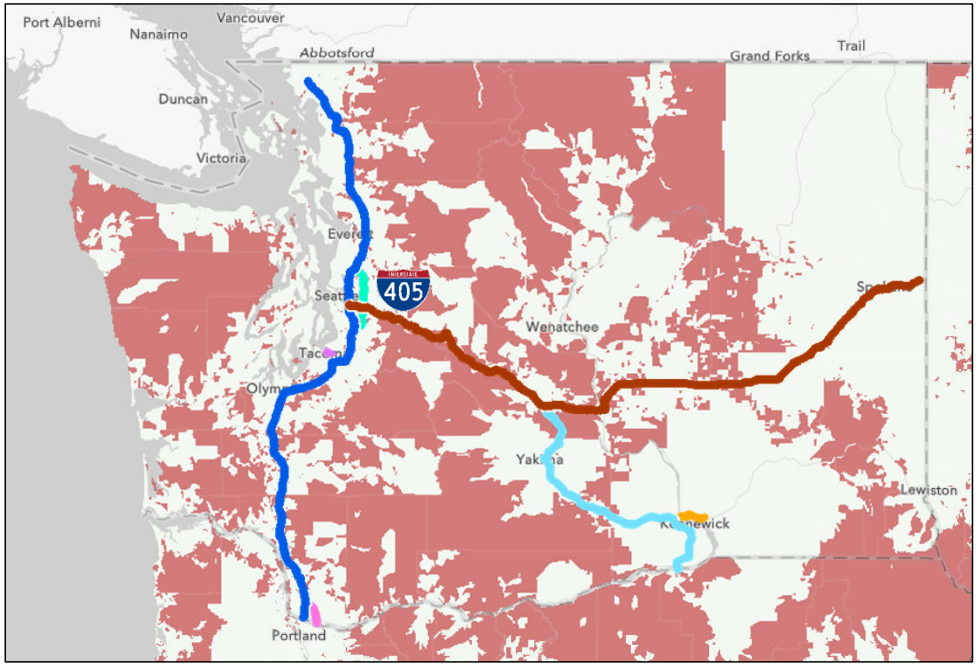


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
LUMEN (Legacy Centurylink)	National Fiber Company	642
Legacy Noel Communications	Regional Fiber Company	603
zayo	National Fiber Wholesaler	349
allstream	National Fiber Company	335
verizon	National Wireless Company	325
COMCAST	National Fiber Company	244
wave	Regional Fiber Company	233
Blackrock Cable	Regional Cable Company	208
AT&T	National Wireless Company	206
XO communications	National Fiber Company	156

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

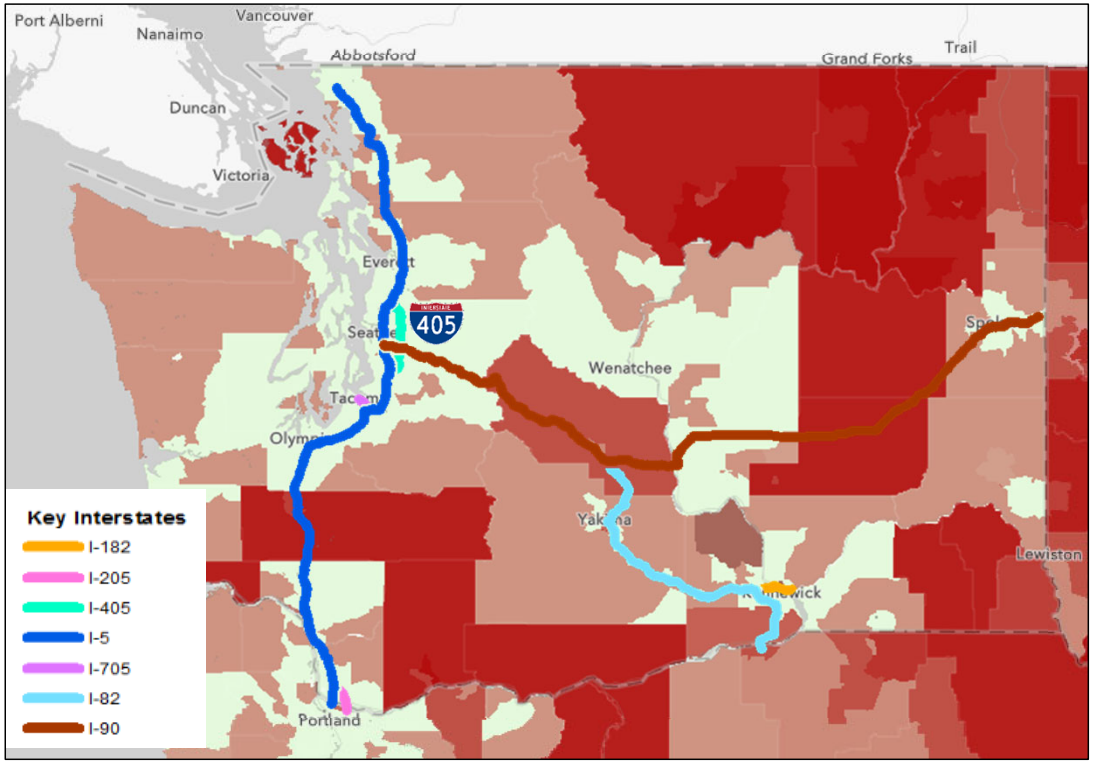
I-405: Broadband Speed (1/3)



- *I-405 Corridor has moderate internet speeds for most part, with Seattle region which reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

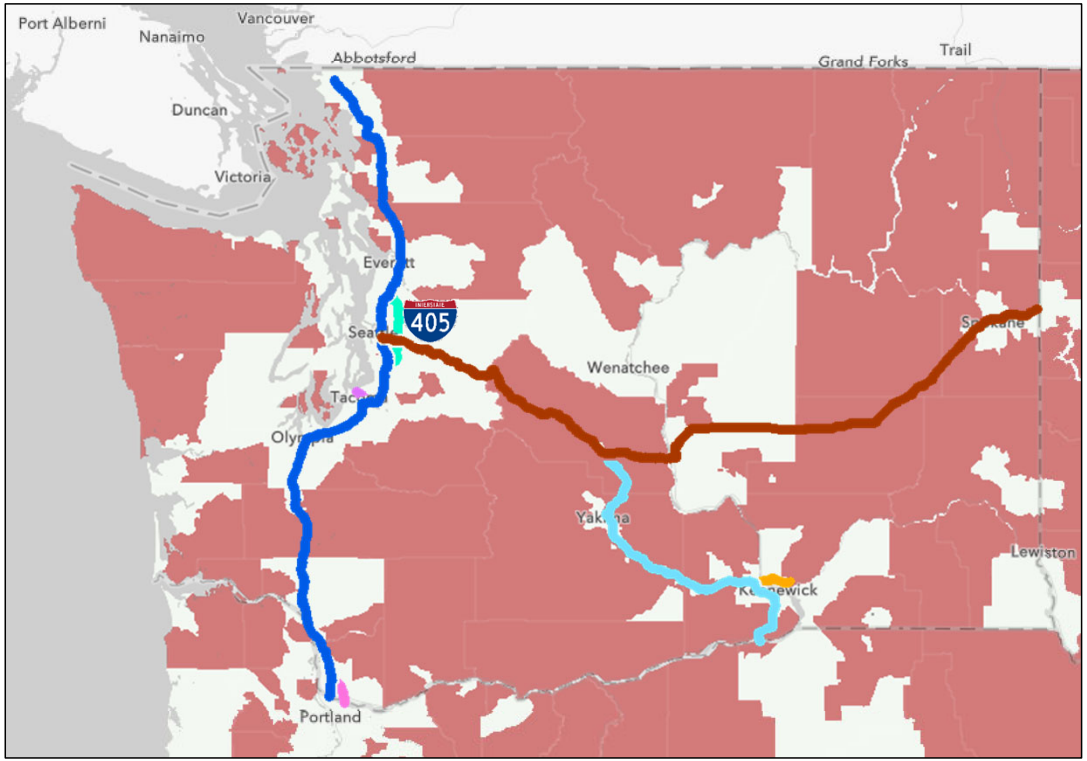
I-405: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

I-405: Broadband Speed (3/3)

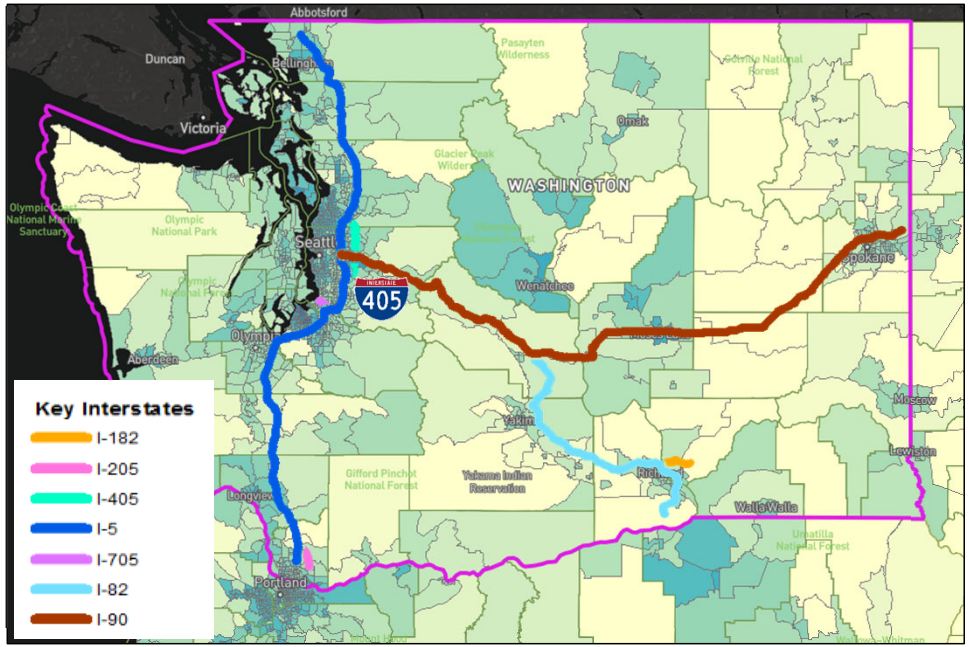


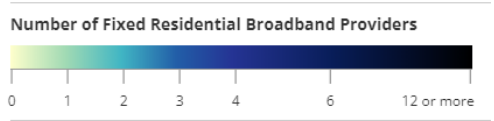
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

I-405: # of Service Providers





Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
King	2.87 %	27.07 %
Snohomish	3.65 %	30.52 %

Sources: ESRI, FCC, ACS 2019

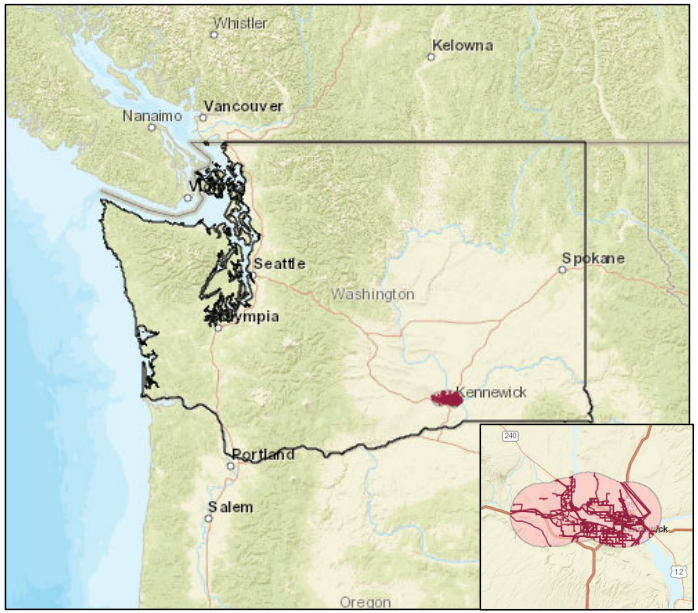
- Majority of households in King and Snohomish counties served by I-405 have more than one service providers

I-405: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	10.0	▪ Approximately 74,000 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	15.0	▪ Lumen, Noel Communications, Zayo and Allstream have existing presence; however, corridor has approximately 74,000 unserved / underserved households ▪ Existing fiber presence between Seattle and Olympia region ▪ Corridor has an average internet speed of less than 50/10 Mbps
3	Population Centers Covered / Points of Presence Addressed	5.0	▪ Three population centers are covered by the interstate highway – approximately 476,000 households are residing within 5-mile radius
Total Score		**30.0 points**	

I-182: Existing Fiber Presence / Providers

Fiber Providers along Washington I-182

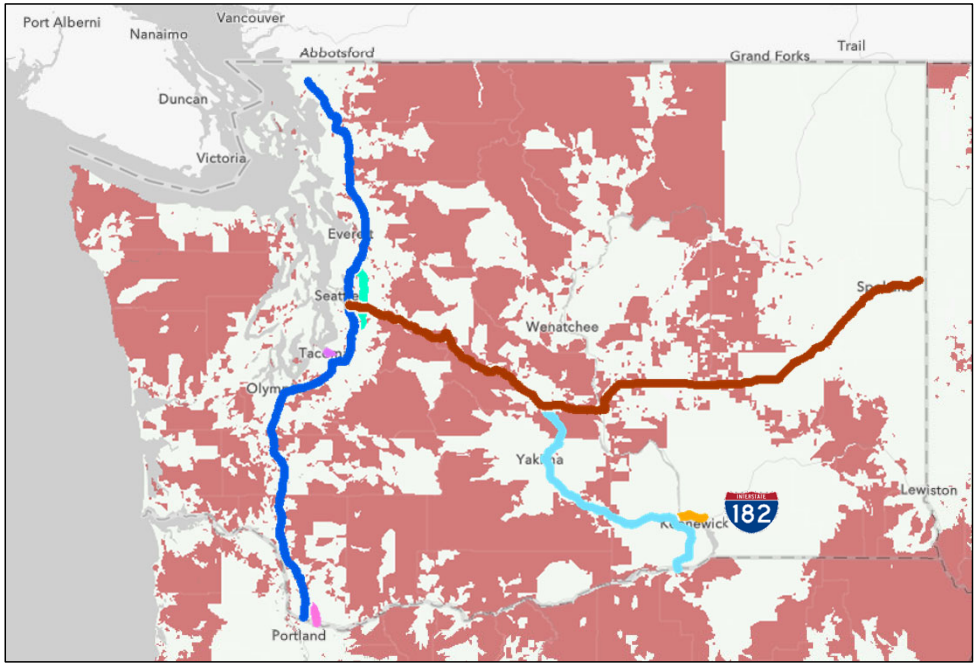


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
Spectrum	National Cable Company	207
Franklin PUD	Regional Utility Company	206
Legacy Noel Communications	Regional Fiber Company	145
NOANET	Regional Wholesaler	120
Benton PUD	Regional Utility Company	99
Lumen (Legacy Centurylink)	National Fiber Company	68
allstream	National Fiber Company	56
zayo	National Fiber Wholesaler	54
fatbeam	National Fiber Company	52
Bonneville	Regional Wholesaler	29

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

I-182: Broadband Speed (1/3)



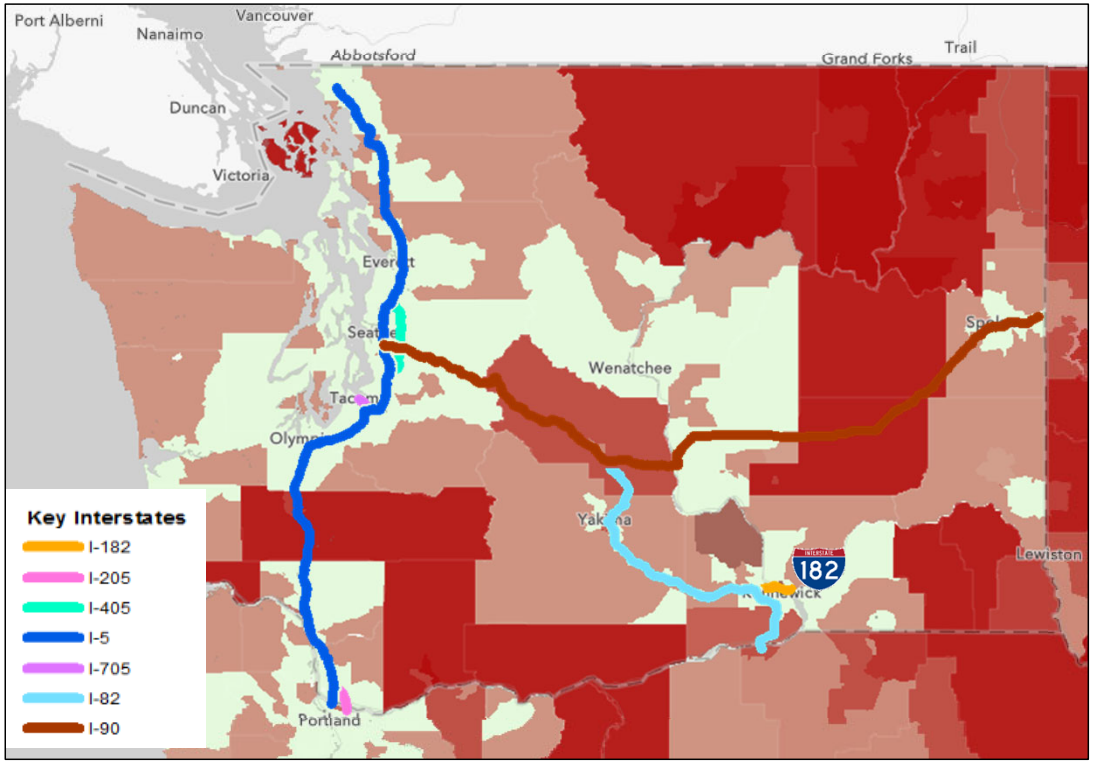
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

- *I-182 Corridor has low internet speeds with Kennewick area which reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

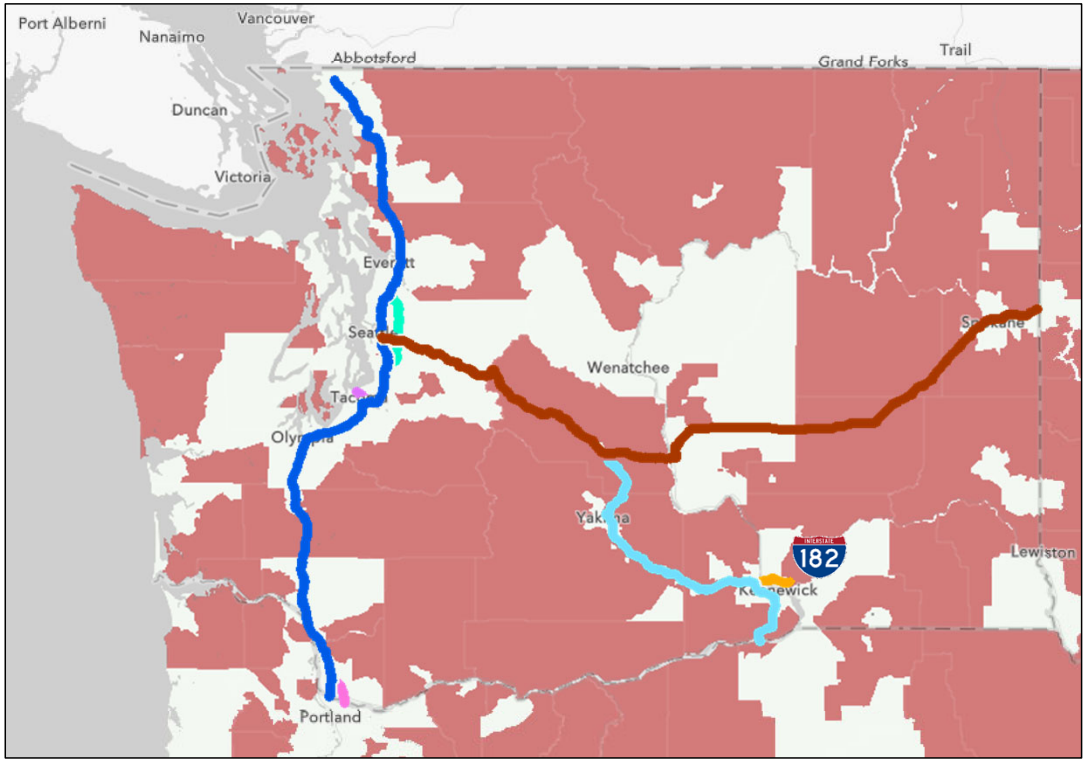
I-182: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

I-182: Broadband Speed (3/3)

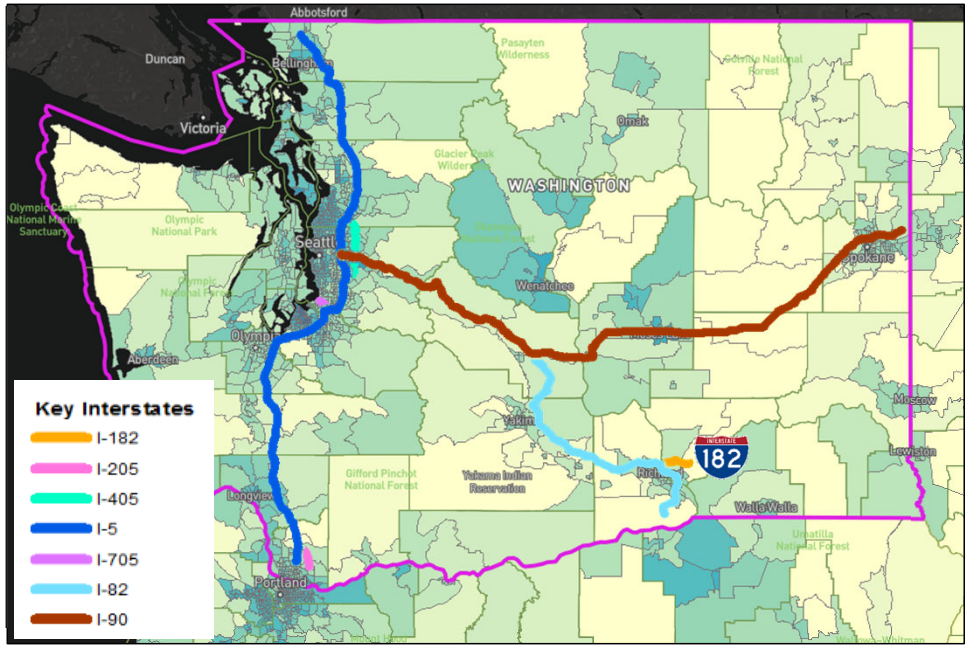


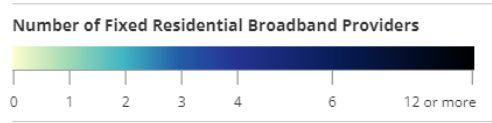
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

I-182: # of Service Providers





County	% of Population with No Providers	% of Population with One provider or less
Benton	2.81 %	13.6 %
Franklin	0.11 %	22.91 %

Sources: ESRI, FCC, ACS 2019

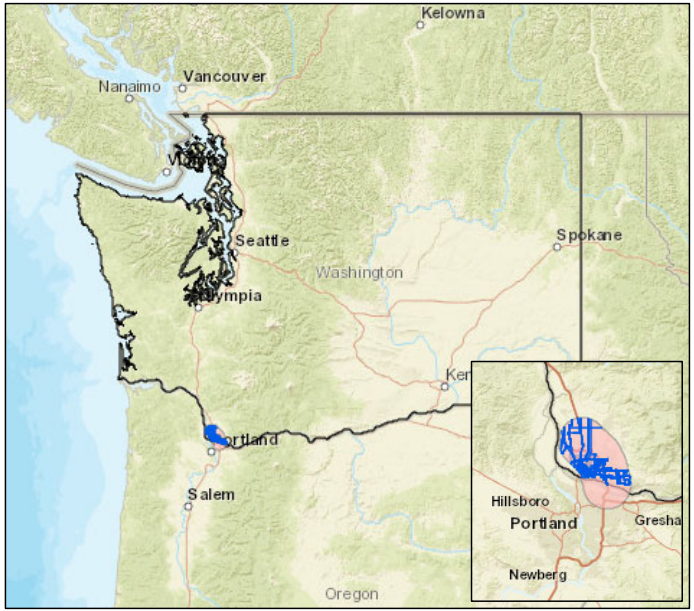
- Majority of households in Benton and Franklin counties served by I-182 have more than one service providers

I-182: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	5.0	▪ Approximately 22,000 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	15.0	▪ Spectrum, Franklin PUD, Noel Communication, and Neonet have existing presence; however, corridor has approximately 22,000 unserved / underserved households ▪ Existing fiber presence is around Kennewick area ▪ Corridor has an average internet speed of 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	5.0	▪ Two population centers are covered by the interstate highway – approximately 80,000 households are residing within 5-mile radius
Total Score		**25.0 points**	

I-205: Existing Fiber Presence / Providers

Fiber Providers along Washington I-205

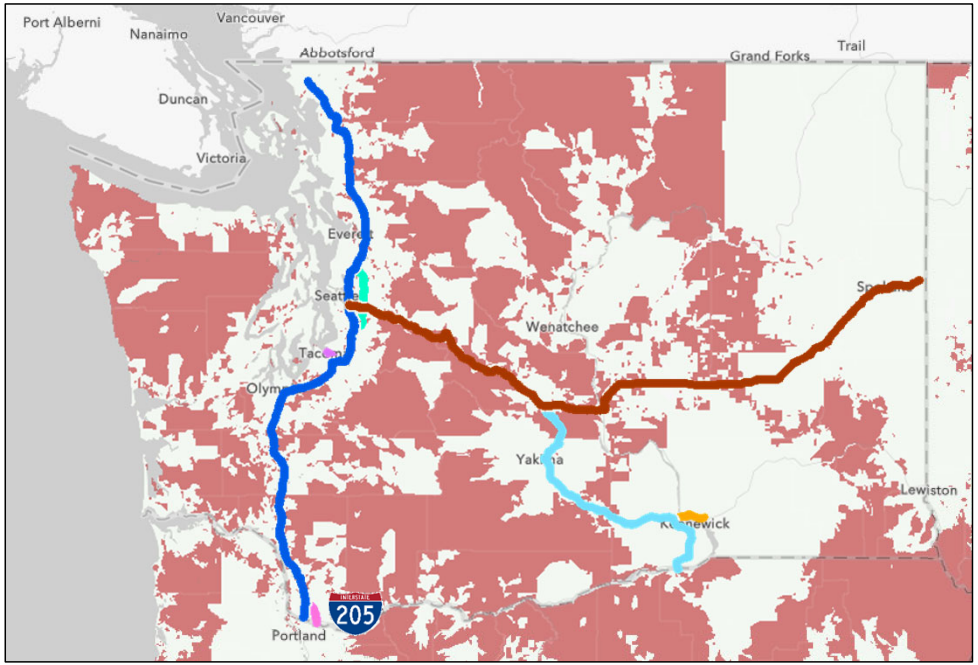


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
NOANET	Regional Wholesaler	237
allstream.	National Fiber Company	197
Legacy Noel Communications	Regional Fiber Company	102
zayo	National Fiber Wholesaler	86
LUMEN (Legacy Centurylink)	National Fiber Company	64
wave	Regional Fiber Company	28
AT&T	National Wireless Company	27
Bonneville	Regional Utility Company	23
cogent	National Fiber Company	12
XO communications	National Fiber Company	9

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

I-205: Broadband Speed (1/3)



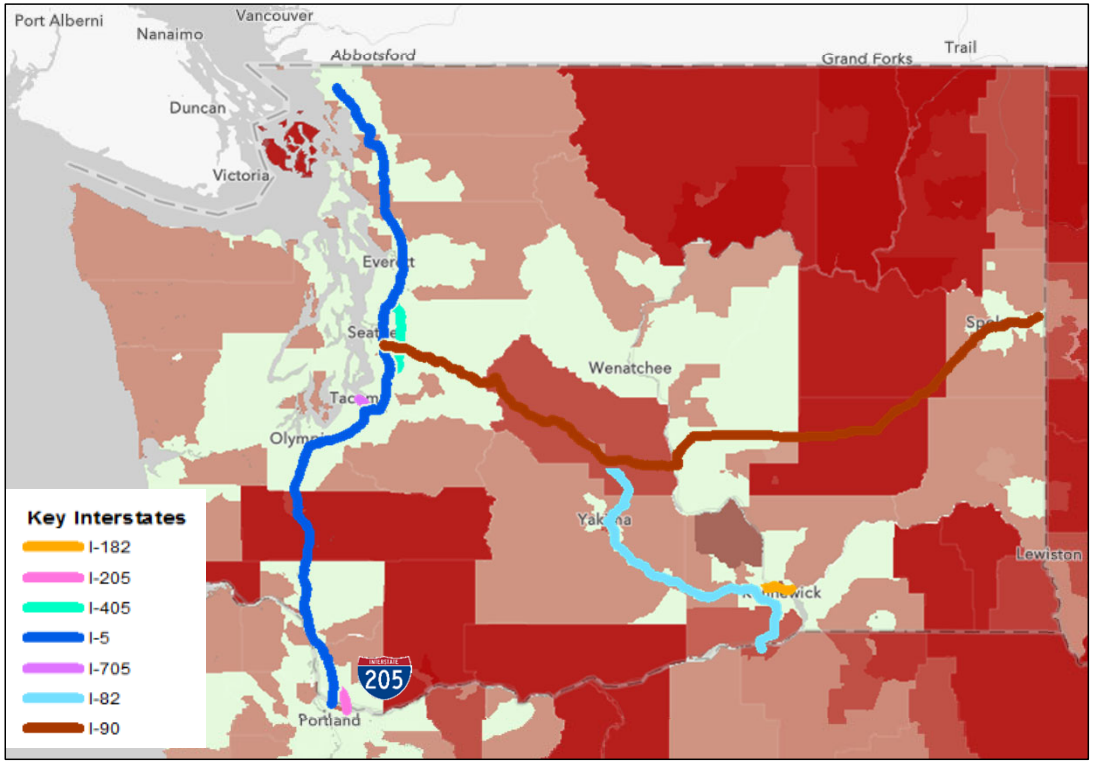
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

- *I-205 Corridor has moderate internet speeds with Portland region which reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

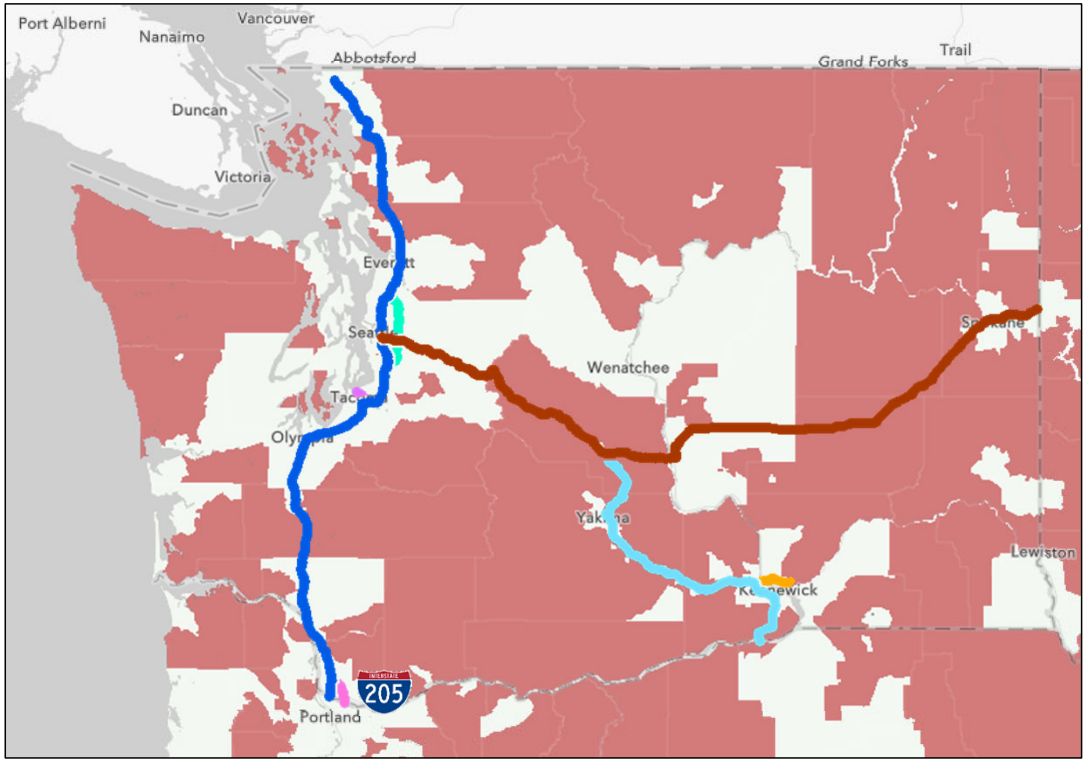
I-205: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

I-205: Broadband Speed (3/3)

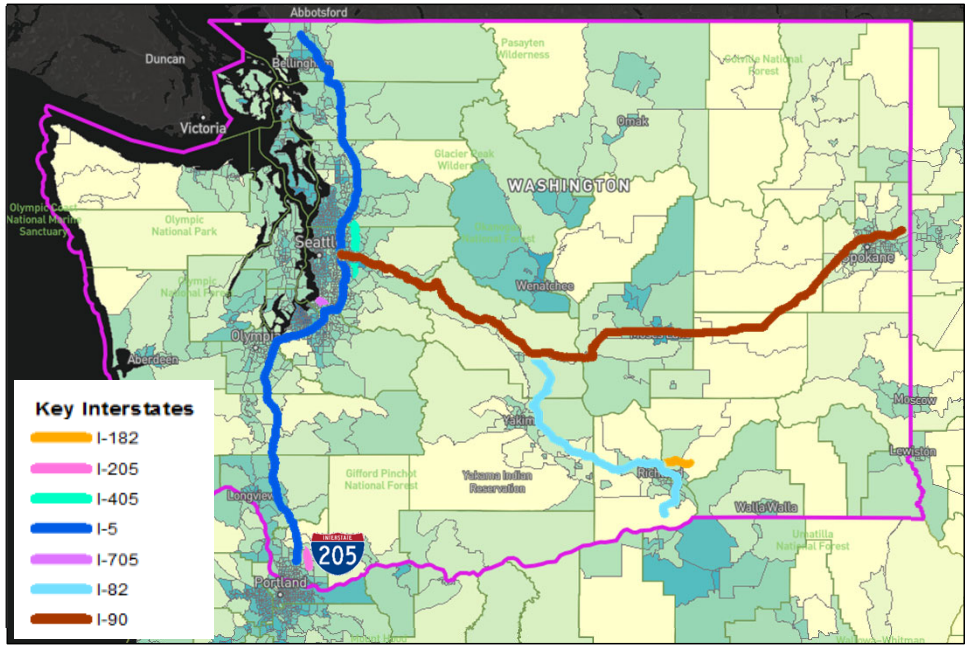


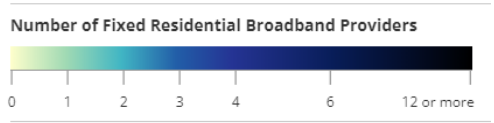
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

I-205: # of Service Providers





Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
Clark	4.68 %	15.24 %

Sources: ESRI, FCC, ACS 2019

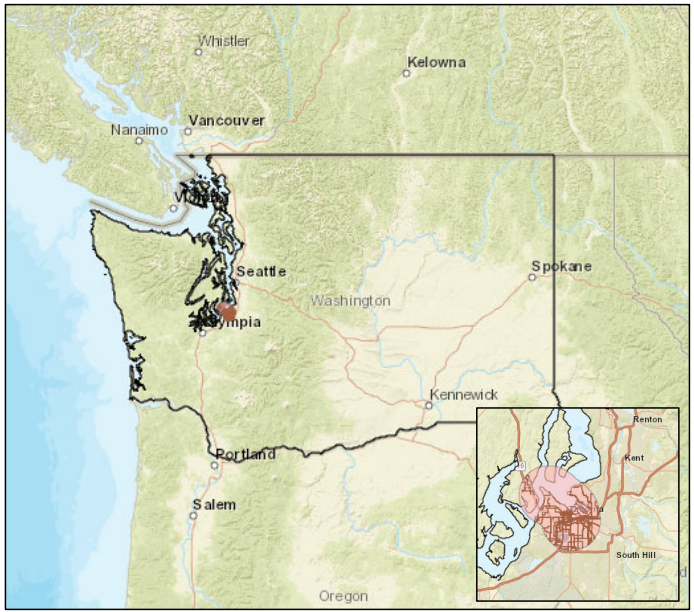
- Majority of households in Clark county served by I-205 have more than one service providers

I-205: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	5.0	▪ Approximately 39,500 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	10.0	▪ Neonet, Allstream, Noel Communication, and Zayo have existing presence; however, corridor has approximately 39,500 unserved / underserved households ▪ Existing fiber presence is around Portland metro area ▪ Corridor has an average internet speed of 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	5.0	▪ One population center is covered by the interstate highway – approximately 177,000 households are residing within 5-mile radius
Total Score		**20.0 points**	

I-705: Existing Fiber Presence / Providers

Fiber Providers along Washington I-705

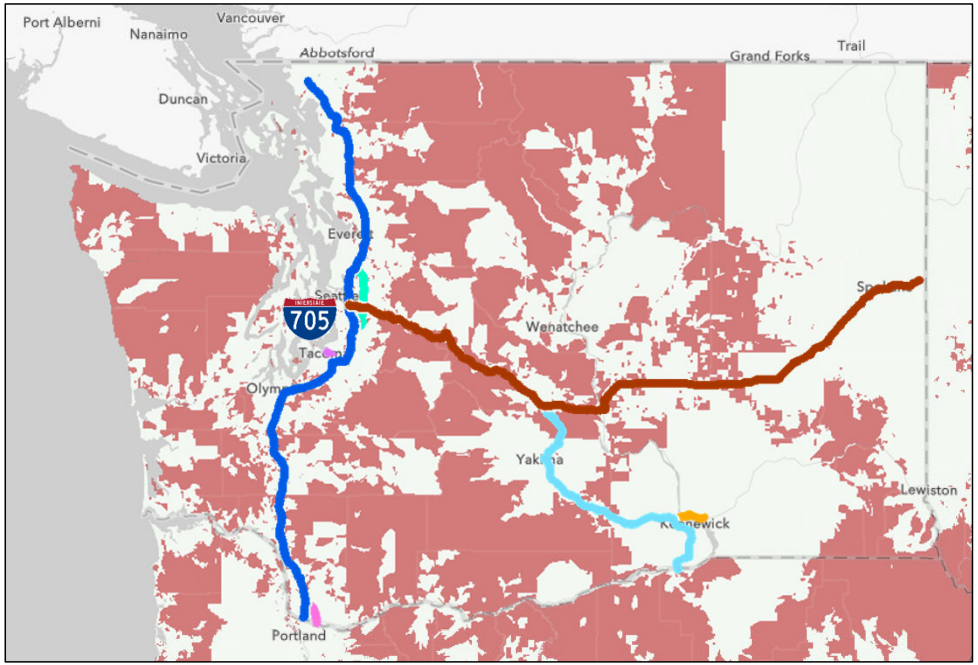


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
zayo	National Fiber Wholesaler	109
CLICK! CABLE TV	Regional Public Utility	91
allstream.	National Fiber Company	91
Legacy Noel Communications	Regional Fiber Company	84
LUMEN (Legacy Centurylink)	National Fiber Company	83
COMCAST	National Fiber Company	54
wave	Regional Fiber Company	31
xo communications	National Fiber Company	23
alaska COMMUNICATIONS	Regional Fiber Company	19
fatbeam	Regional Fiber Company	11

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

I-705: Broadband Speed (1/3)



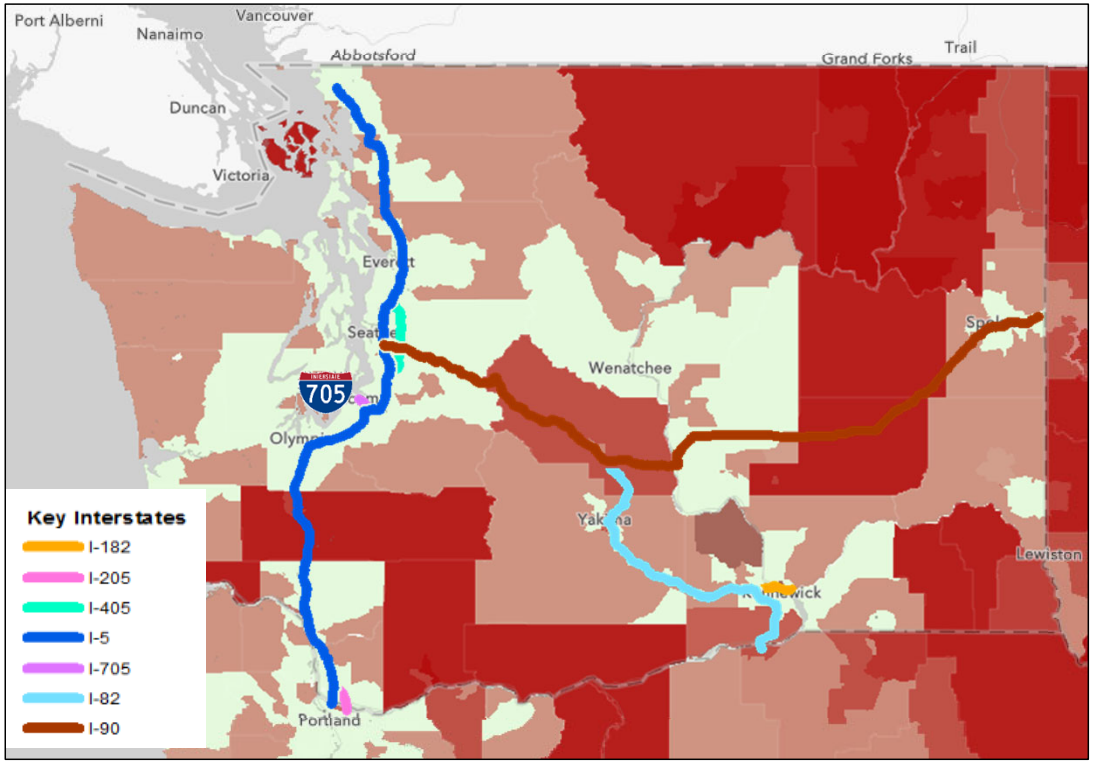
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

- *I-705 Corridor has moderate internet speeds with Tacoma area which reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

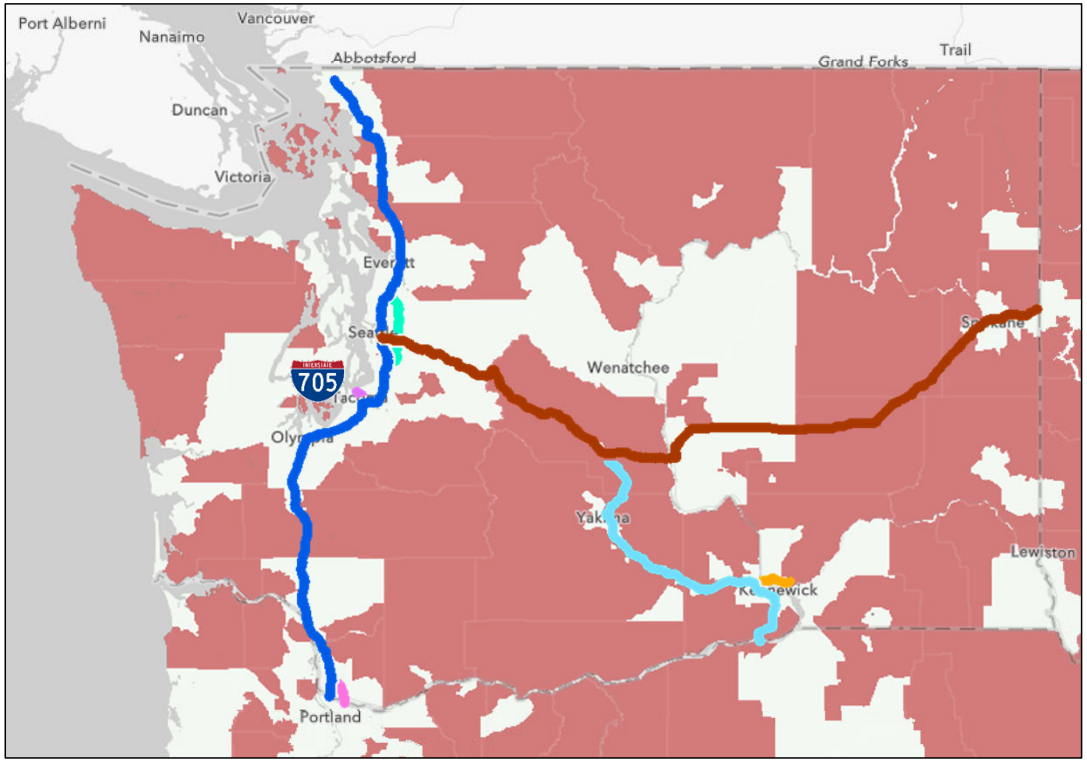
I-705: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

I-705: Broadband Speed (3/3)

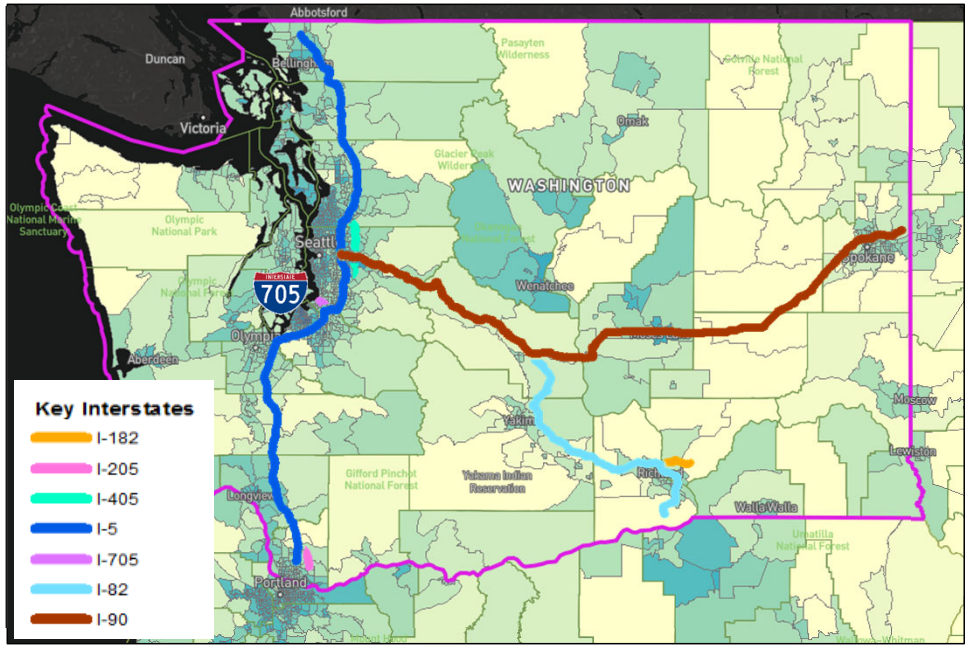


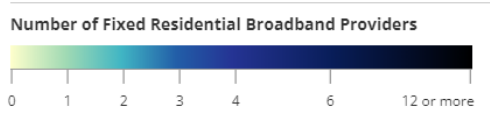
Key Interstates

- I-182
- I-205
- I-405
- I-5
- I-705
- I-82
- I-90

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

I-705: # of Service Providers





Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
Pierce	3.77 %	33.32 %

Sources: ESRI, FCC, ACS 2019

- Majority of households in Pierce county served by I-705 have more than one service providers

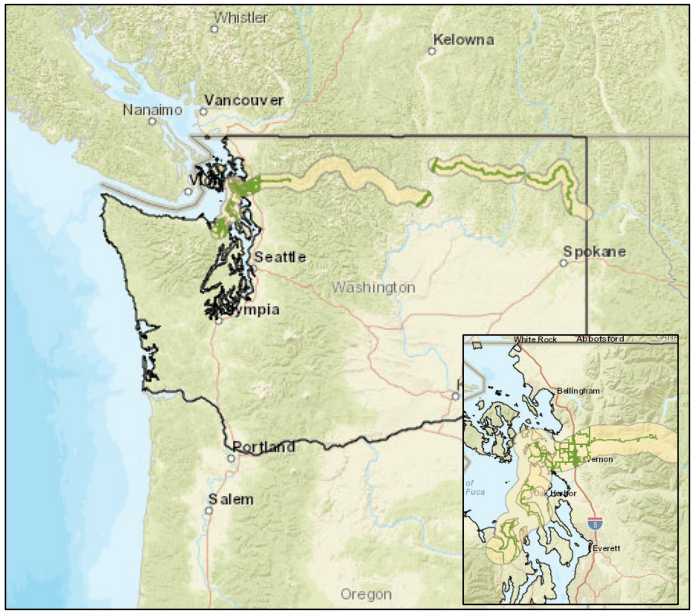
I-705: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	5.0	▪ Approximately 36,500 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	10.0	▪ Zayo, Click Cable, Allstream, and Noel Communication have existing presence; however, corridor has approximately 36,500 unserved / underserved households ▪ Existing fiber presence is around Tacoma metro area ▪ Corridor has an average internet speed of 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	5.0	▪ One population center is covered by the interstate highway – approximately 128,500 households are residing within 5-mile radius
Total Score		**20.0 points**	

Select State Routes Evaluation Data

US-20: Existing Fiber Presence / Providers

Fiber Providers along Washington US-20

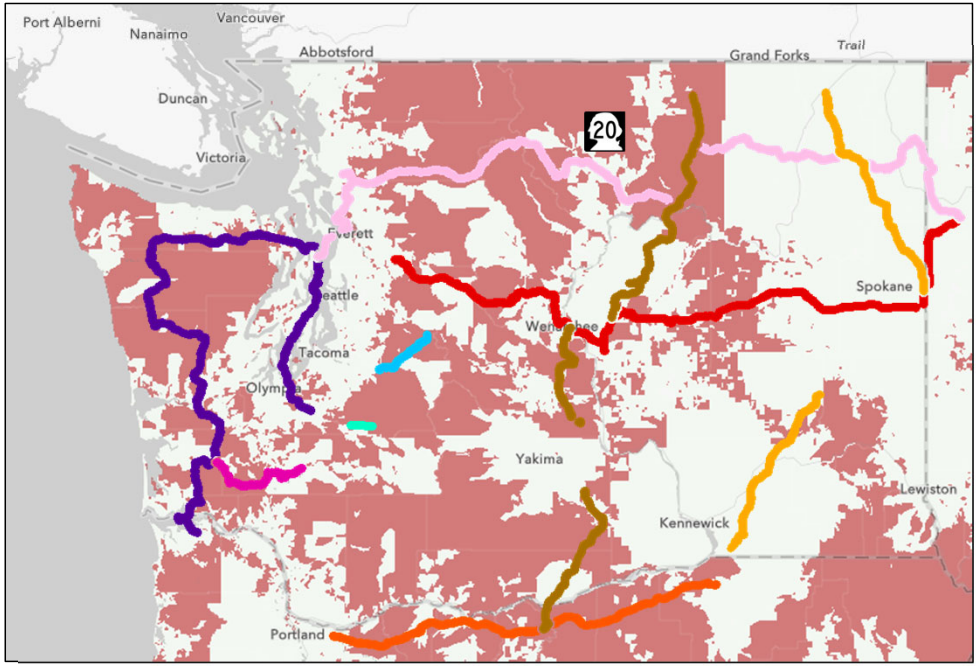


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
wave	Regional Fiber	277
NOANET	Regional Wholesaler	276
Blackrock Cable	Regional Cable Company	245
Legacy Noel Communications	Regional Fiber Company	164
STARTOUCH	Regional Wholesaler	144
allstream	National Fiber Company	131
zayo	National Fiber Wholesaler	87
Skagit County	Municipality	48
COMCAST	National Fiber Company	29
Rail America Row	Regional Fiber Company	28

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

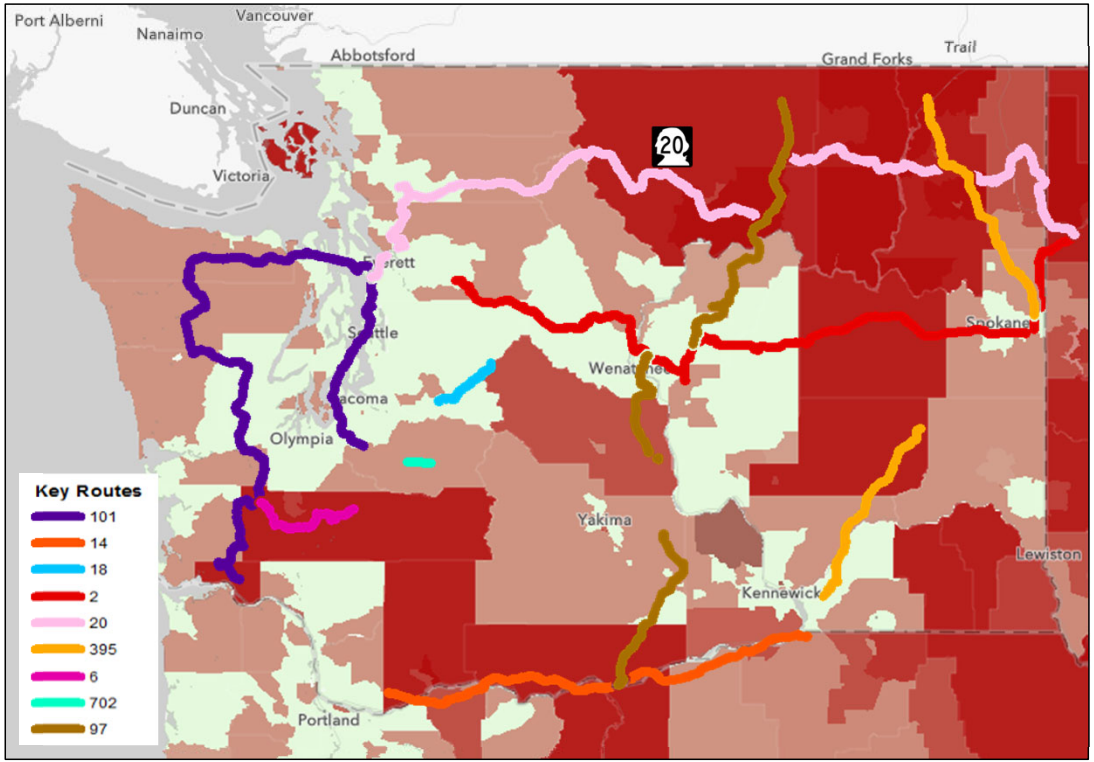
US-20: Broadband Speed (1/3)



- *US-20 Corridor has moderate internet speeds along Burlington, Sedro-Woolley, Rockport areas. The eastern portion of the corridor (Mazama area) reflects speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

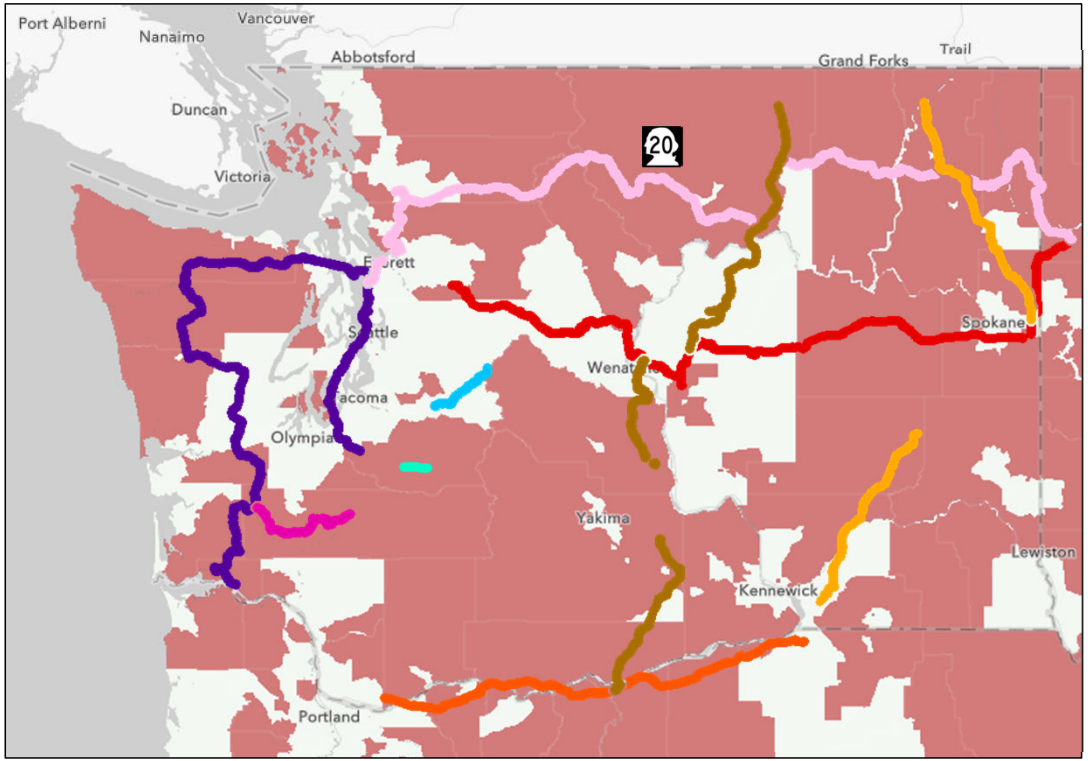
US-20: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

US-20: Broadband Speed (3/3)

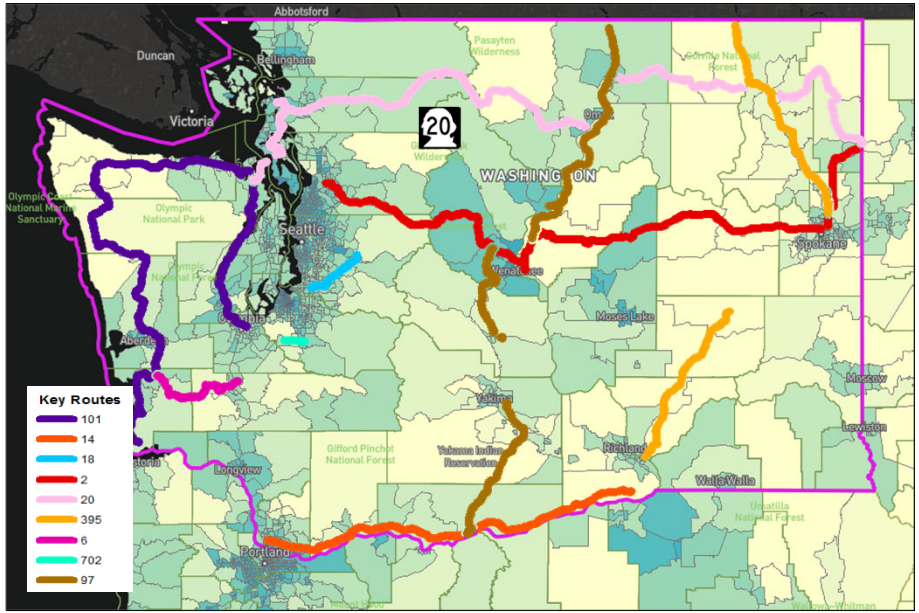


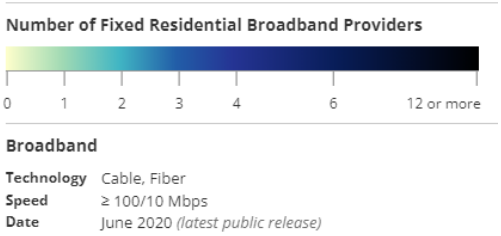
Key Routes

- 101
- 14
- 18
- 2
- 20
- 395
- 6
- 702
- 97

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

US-20: # of Service Providers





- *Majority of households in Jefferson, Island, Skagit, Whatcom, Okanogan, Ferry and Stevens counties have one or less service providers*

County	% of Population with No Providers	% of Population with One provider or less
Jefferson	17.04 %	97.65 %
Island	1.82 %	67.51 %
Skagit	7.59 %	76.38 %
Whatcom	9.79 %	69.07 %
Chelan	5.91 %	18.86 %
Okanogan	37.98 %	80.87 %
Ferry	0.39 %	99.42 %
Stevens	0 %	62.7 %
Pend Oreille	0.07 %	48.32 %

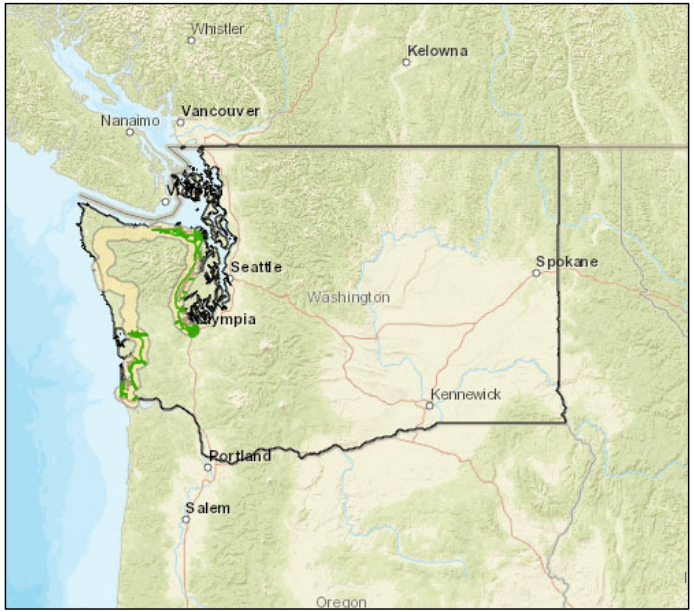
Sources: ESRI, FCC, ACS 2019

US-20: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	15.0	▪ Approximately 27,800 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	10.0	▪ Wave, Noanet, Blackrock Cable, and Noel Communication have existing presence; however, corridor has approximately 27,800 unserved / underserved households ▪ Population density is lower as compared to other corridors ▪ Existing fiber presence is located on the western and eastern parts of the corridor ▪ Corridor has an average internet speed of 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	30.0	▪ Ten population center is covered by the state route – approximately 91,800 households are residing within 5-mile radius
Total Score		**55.0 points**	

US-101: Existing Fiber Presence / Providers

Fiber Providers along Washington US-101

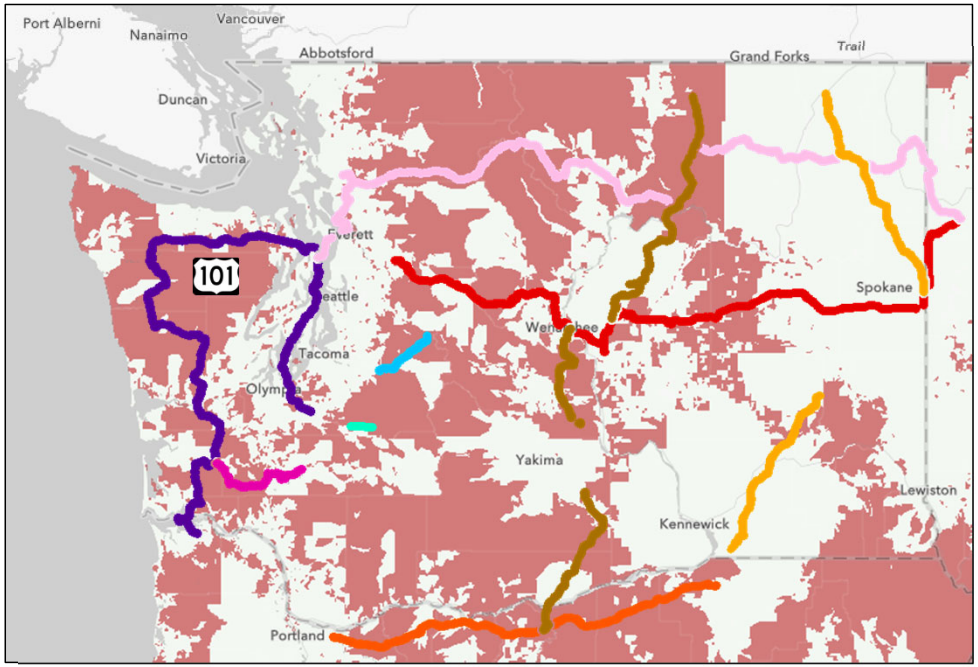


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
NOANET	Regional Wholesaler	244
wave	Regional Fiber	216
Legacy Noel Communications	Regional Fiber Company	83
PUD	Regional Utility Company	78
Rail America Row	Regional Fiber Company	60
allstream	National Fiber Company	38
zayo	National Fiber Wholesaler	33
Spectrum	National Cable Company	24
Grays Harbor PUD	Regional Utility Company	19
COMCAST	National Fiber Company	19

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

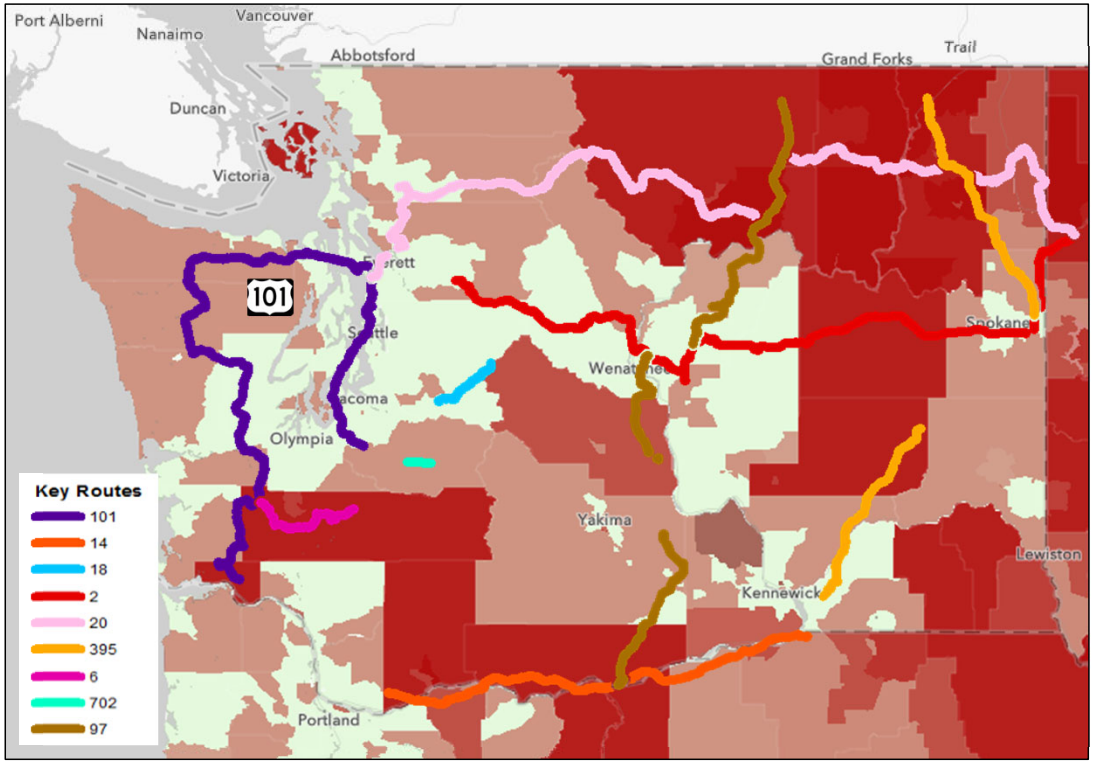
US-101: Broadband Speed (1/3)



- *US-101 Corridor has low to moderate internet speeds along the north-western and the western part of the corridor that have internet speeds ranging 25 Mbps to 50 Mbps (upload) and 3 Mbps to 10 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

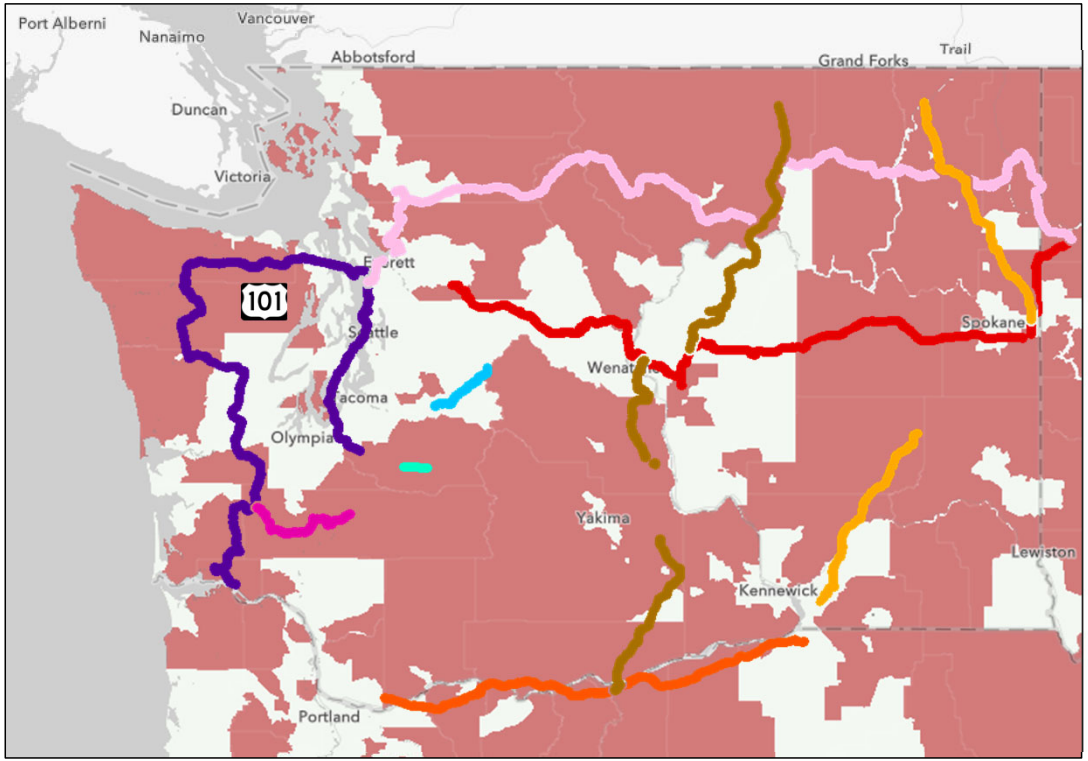
US-101: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

US-101: Broadband Speed (3/3)

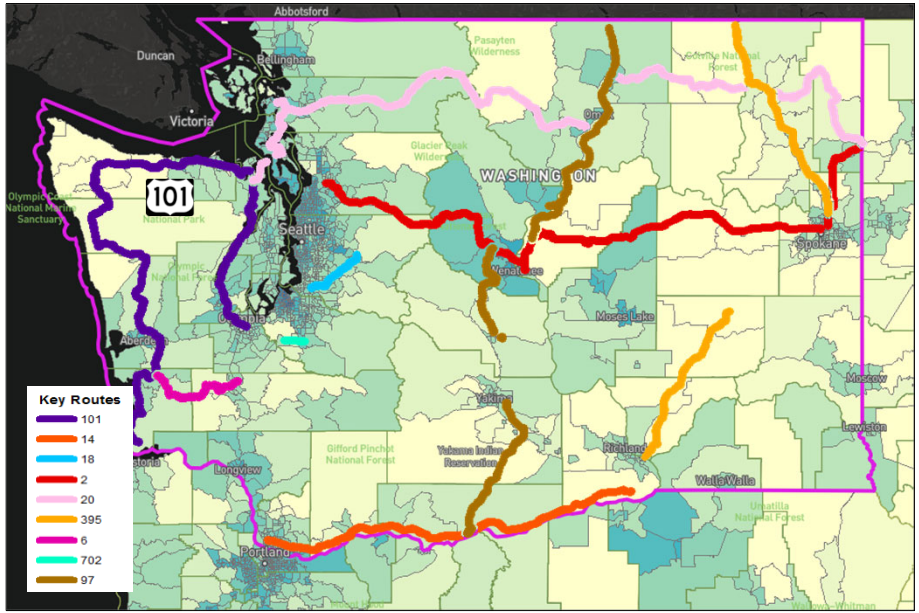


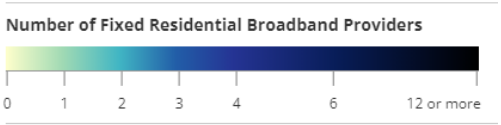
Key Routes

- 101
- 14
- 18
- 2
- 20
- 395
- 6
- 702
- 97

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

US-101: # of Service Providers





Broadband

Technology Cable, Fiber
Speed ≥ 100/10 Mbps
Date June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
Pacific	14.56 %	100 %
Grays Harbor	11.58 %	71.71 %
Jefferson	17.04 %	97.65 %
Clallam	25.64 %	81.46 %
Mason	18.64 %	70.98 %
Thurston	6.85 %	54.33 %

- *Majority of households in Pacific, Grays Harbor, Jefferson, Clallam, Mason and Thurston counties have one or less service providers*

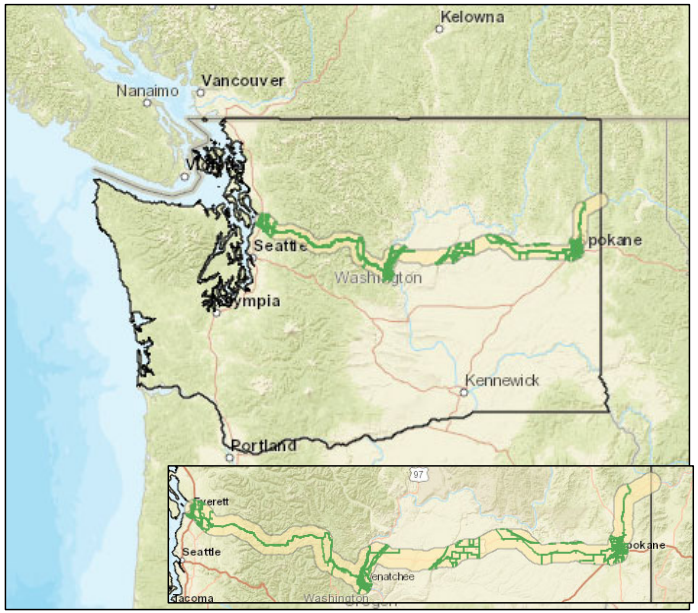
Sources: ESRI, FCC, ACS 2019

US-101: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	20.0	▪ Approximately 36,600 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	10.0	▪ Noanet, Wave, Noel Communication, and Pacific County PUD have existing presence; however, corridor has approximately 36,600 unserved / underserved households ▪ Population density is lower as compared to other corridors ▪ Corridor has an average internet speed up to 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	30.0	▪ Ten population center is covered by the state route – approximately 131,400 households are residing within 5-mile radius
Total Score		**60.0 points**	

US-2: Existing Fiber Presence / Providers

Fiber Providers along Washington US-2

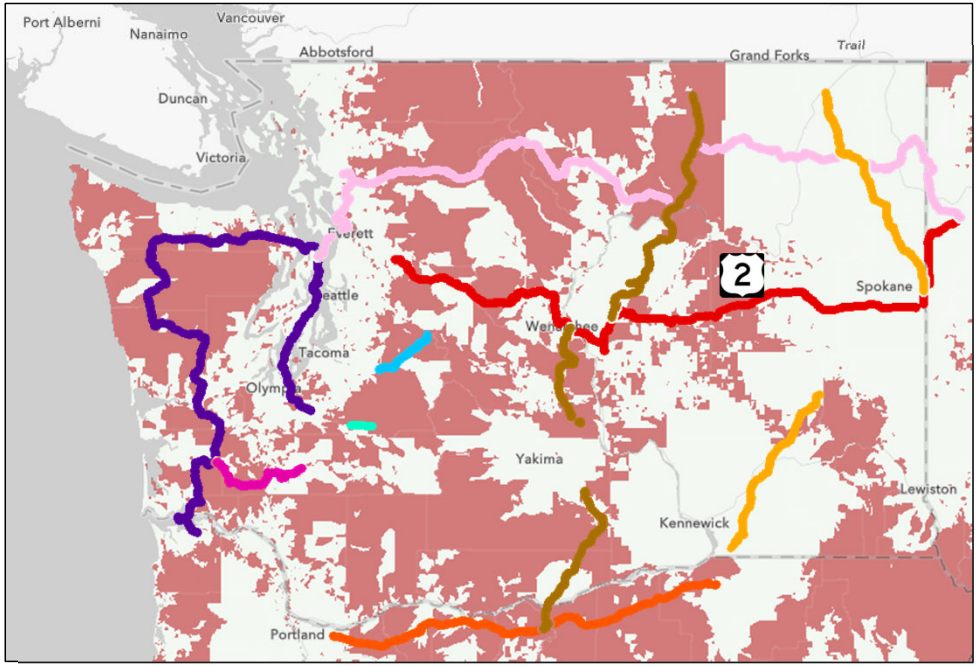


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
Legacy Noel Communications	Regional Fiber Company	866
zayo	National Fiber Wholesaler	619
LUMEN (Legacy Centurylink)	National Fiber Company	376
NOANET	Regional Wholesaler	281
allstream.	National Fiber Company	250
Orbitcom	Regional Fiber Company	234
Grant PUD / High Speed Network	Regional Utility Company	211
Syringa Networks	National Fiber Company	208
Blackrock Cable	Regional Cable Company	173
XO communications	National Fiber Company	153

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

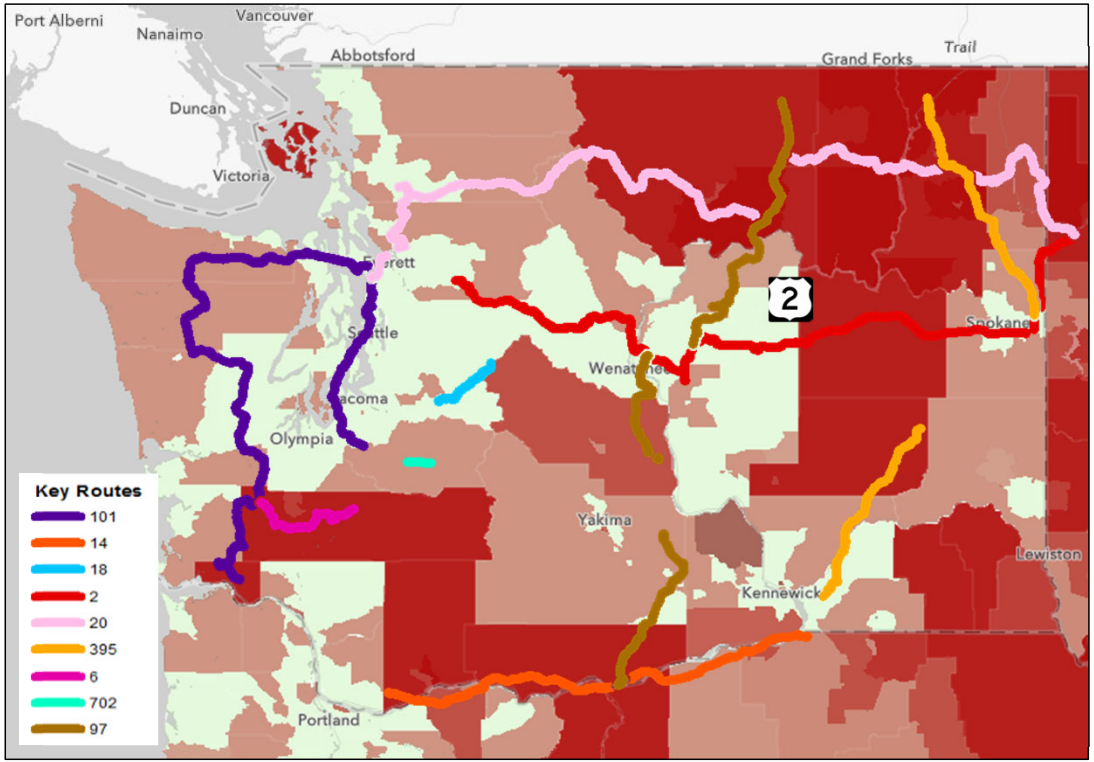
US-2: Broadband Speed (1/3)



- *US-2 Corridor has moderate internet speeds along the western and eastern part of the corridor. Spokane area have internet speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

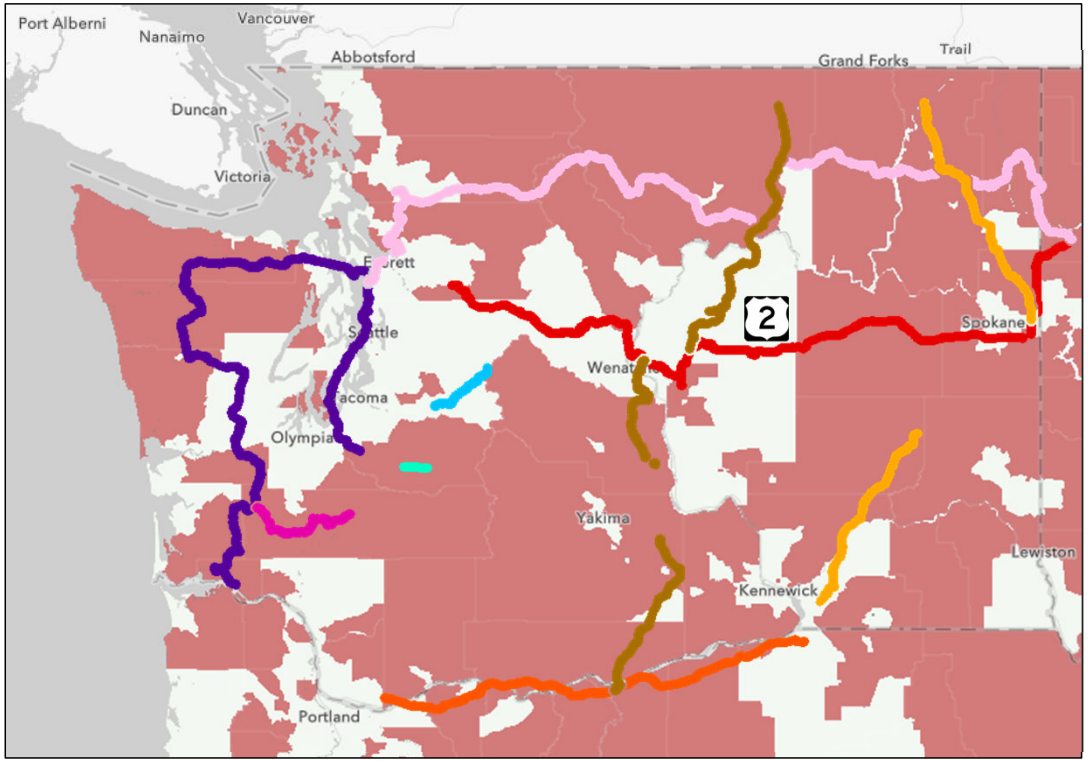
US-2: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

US-2: Broadband Speed (3/3)

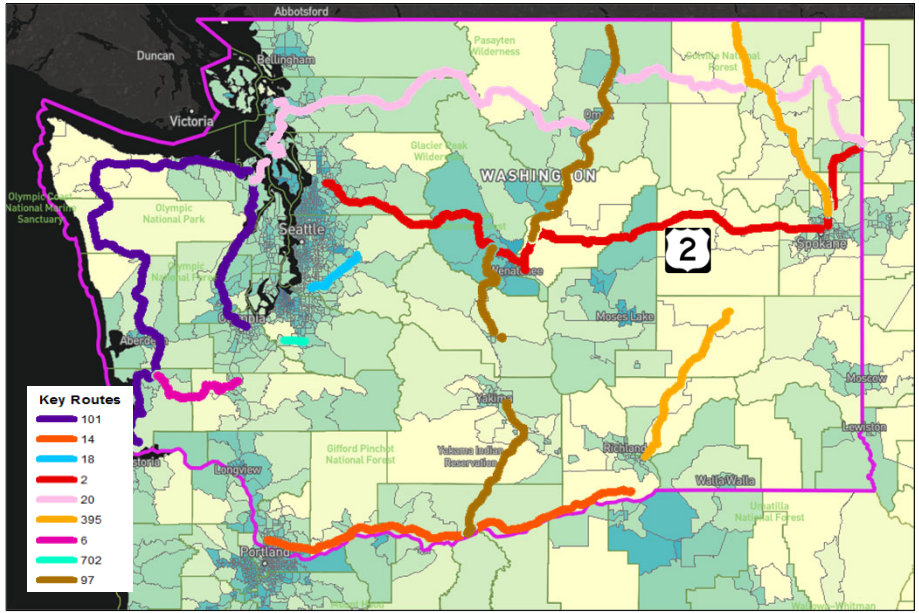


Key Routes

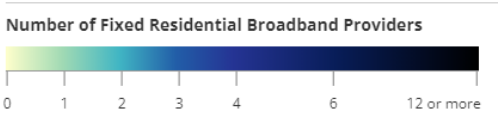
- 101
- 14
- 18
- 2
- 20
- 395
- 6
- 702
- 97

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

US-2: # of Service Providers



- *Majority of households in Lincoln and Spokane counties have one or less service providers*



County	% of Population with No Providers	% of Population with One provider or less
Snohomish	3.65 %	30.52 %
King	2.87 %	27.07 %
Chelan	5.91 %	18.86 %
Douglas	9.11 %	31.43 %
Grant	13.84 %	48.1 %
Lincoln	90.53 %	99.75 %
Spokane	10.91 %	56.45 %
Pend Oreille	0.07 %	48.32 %

Sources: ESRI, FCC, ACS 2019

US-2: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	40.0	▪ Approximately 67,600 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	20.0	▪ Noel Communications, Zayo, Lumen and Noanet have existing presence; however, corridor has approximately 67,600 unserved / underserved households ▪ Existing fiber presence is concentrated around Seattle and Spokane area ▪ Corridor has an average internet speed up to 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	30.0	▪ Nine population center is covered by the state route – approximately 258,800 households are residing within 5-mile radius
Total Score		**90.0 points**	

US-97: Existing Fiber Presence / Providers

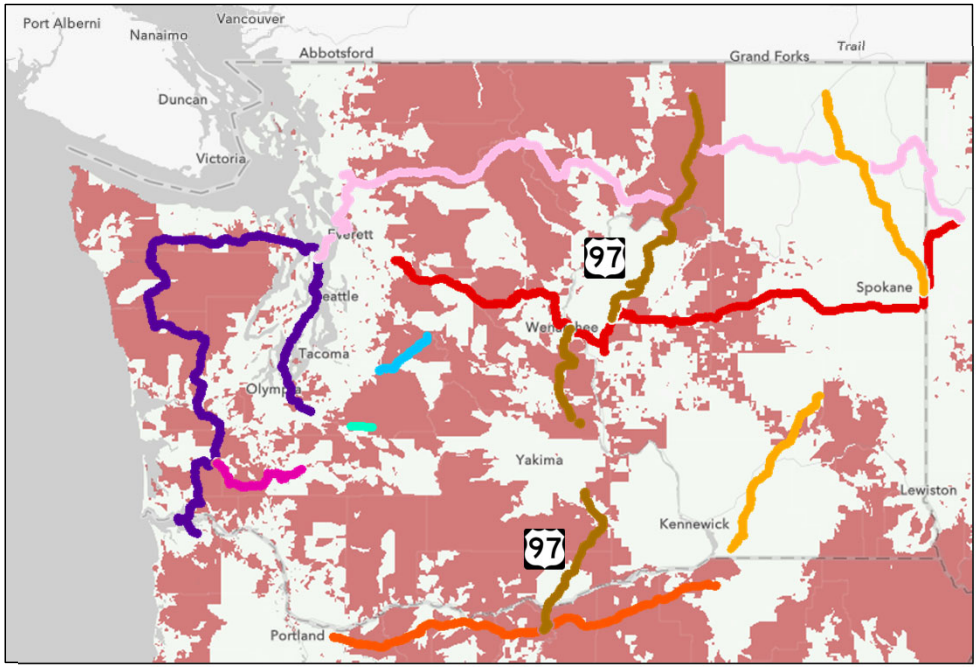
Fiber Providers along Washington US-95

Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
Legacy Noel Communications	Regional Fiber Company	420
Rail America Row	Regional Fiber Company	259
zayo	National Fiber Wholesaler	197
NOANET	Regional Wholesaler	194
Spectrum	National Cable Company	171
LUMEN (Legacy Centurylink)	National Fiber Company	98
allstream	National Fiber Company	87
Syringa Networks	National Fiber Company	78
wave	Regional Fiber	63
cogent	National Fiber Company	46

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

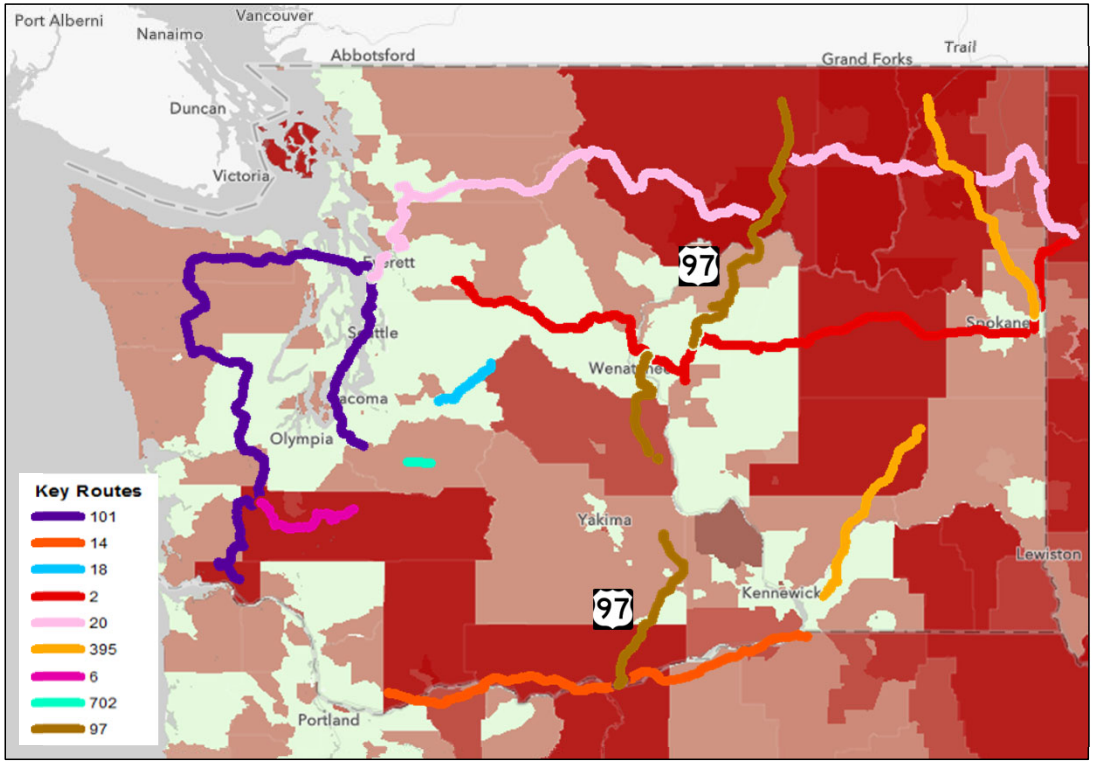
US-97: Broadband Speed (1/3)



- *US-97 Corridor has moderate internet speeds along the Wenatchee area have internet speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

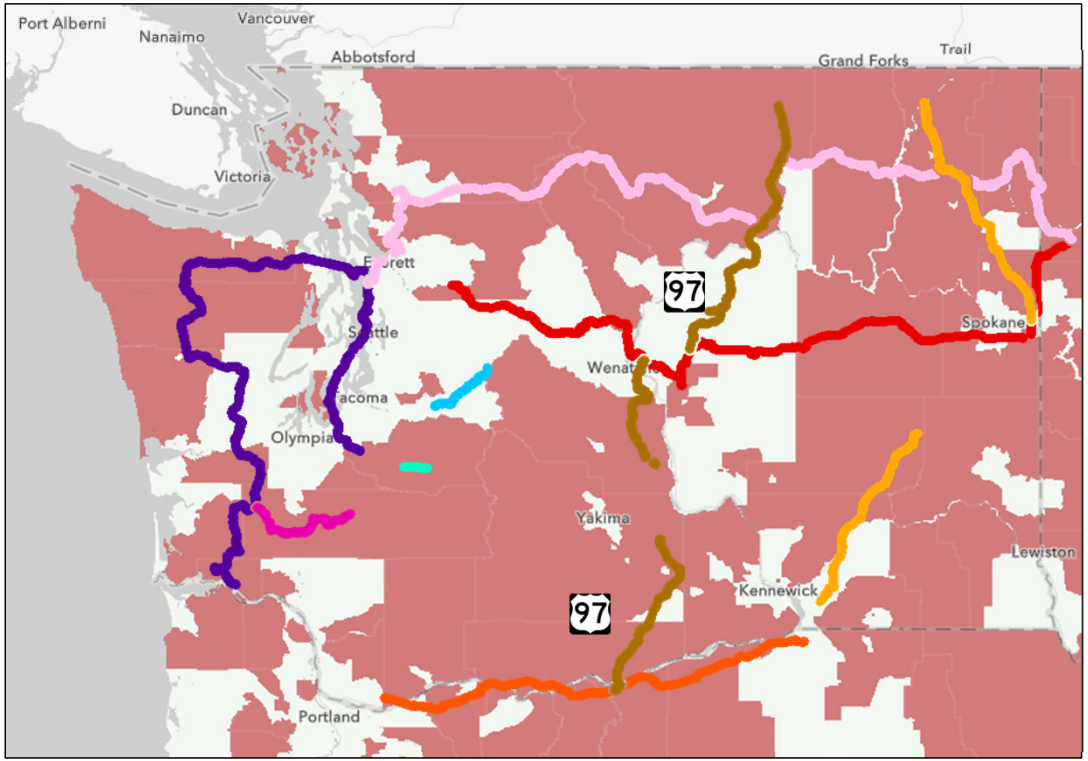
US-97: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

US-97: Broadband Speed (3/3)

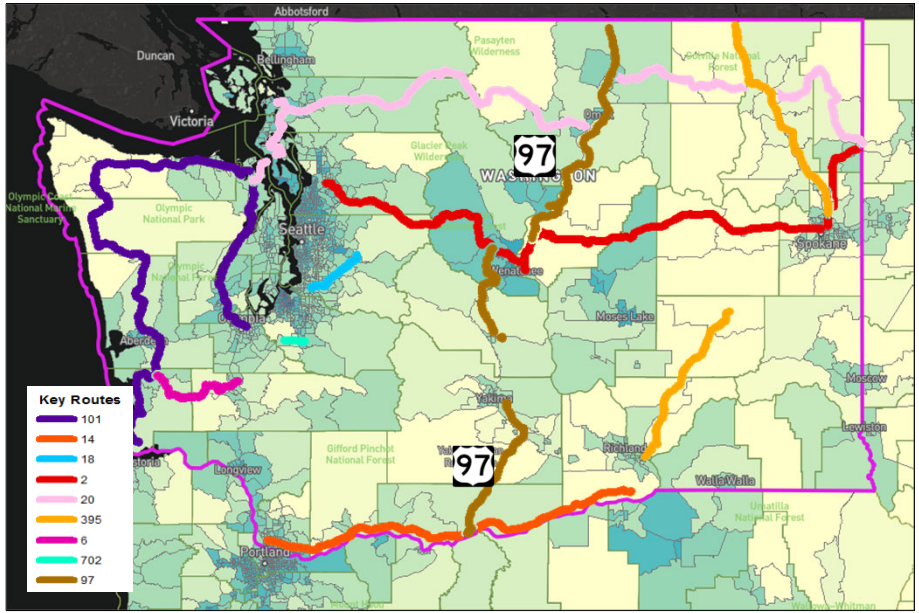


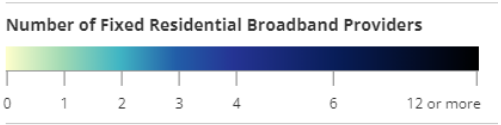
Key Routes

- 101
- 14
- 18
- 2
- 20
- 395
- 6
- 702
- 97

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

US-97: # of Service Providers





Broadband

Technology Cable, Fiber
Speed ≥ 100/10 Mbps
Date June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
Klickitat	45.81 %	95.34 %
Yakima	7.69 %	37.75 %
Kittitas	35.59 %	97.15 %
Chelan	5.91 %	18.86 %
Douglas	9.11 %	31.43 %
Okanogan	37.98 %	80.87 %

- *Majority of households in Klickitat, Kittitas, and Okanogan counties have one or less service providers*

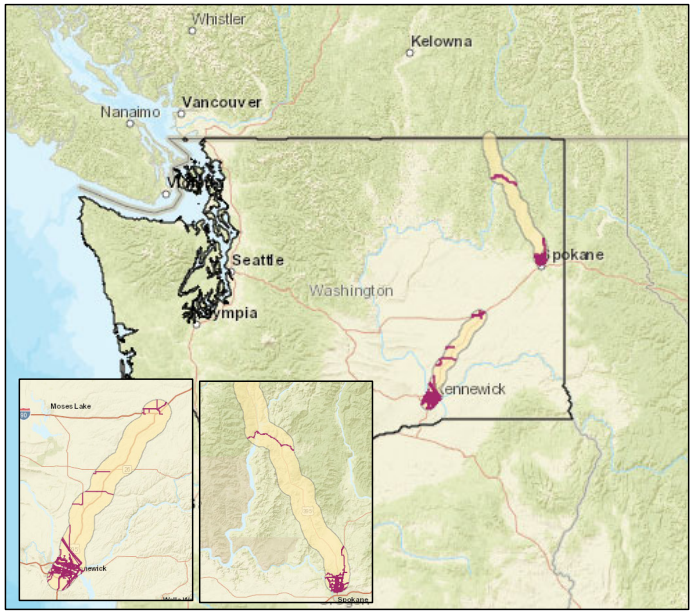
Sources: ESRI, FCC, ACS 2019

US-97: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	15.0	▪ Approximately 25,600 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	10.0	▪ Noel Communication, Rail America Now, Zayo and Noanet have existing presence; however, corridor has approximately 25,600 unserved / underserved households ▪ Population density is lower as compared to other corridors ▪ Existing fiber presence is concentrated around Tonasket, Omak, Okanogan area in north and Shaniko, Madras, Redmond areas in south ▪ Corridor has an average internet speed up to 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	20.0	▪ Seven population center is covered by the state route – approximately 63,700 households are residing within 5-mile radius
Total Score		**45.0 points**	

US-395: Existing Fiber Presence / Providers

Fiber Providers along Washington US-395

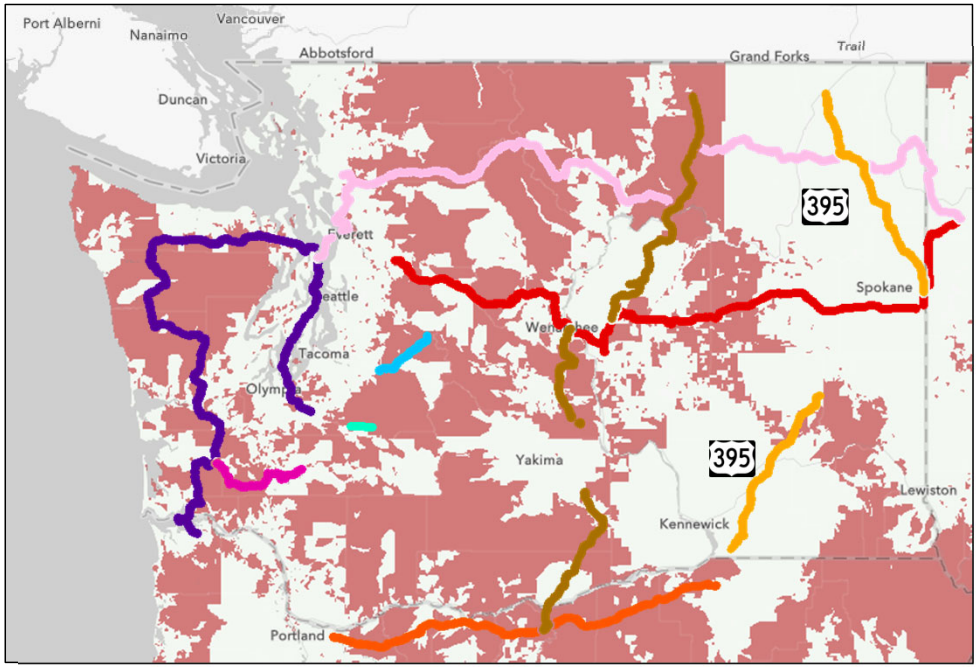


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
Legacy Noel Communications	Regional Fiber Company	292
NOANET	Regional Wholesaler	211
Franklin PUD	Regional Utility Company	210
zayo	National Fiber Wholesaler	188
Spectrum	National Cable Company	148
LUMEN (Legacy Centurylink)	National Fiber Company	131
Orbitcom	Regional Fiber Company	120
Benton PUD	Regional Utility Company	83
allstream	National Fiber Company	81
Bonneville	Regional Fiber Company	54

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

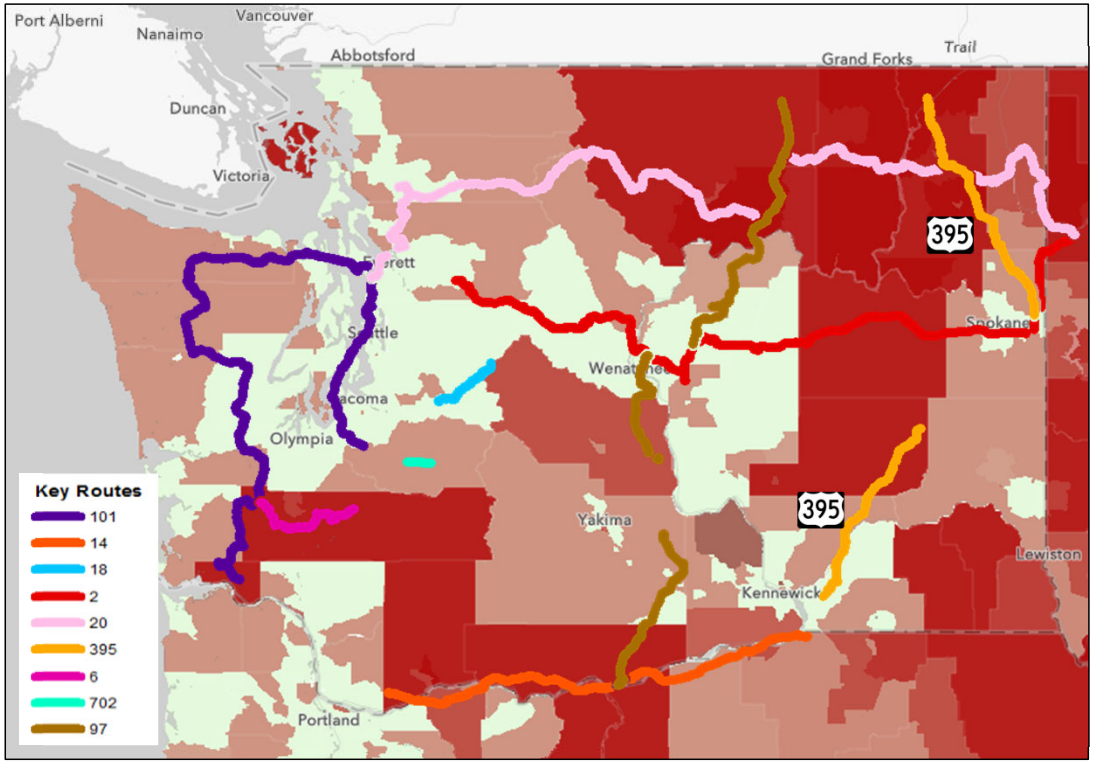
US-395: Broadband Speed (1/3)



- *US-395 Corridor has low to moderate internet speeds along the norther and southern part of the corridor. Spokane and Kennewick areas have internet speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

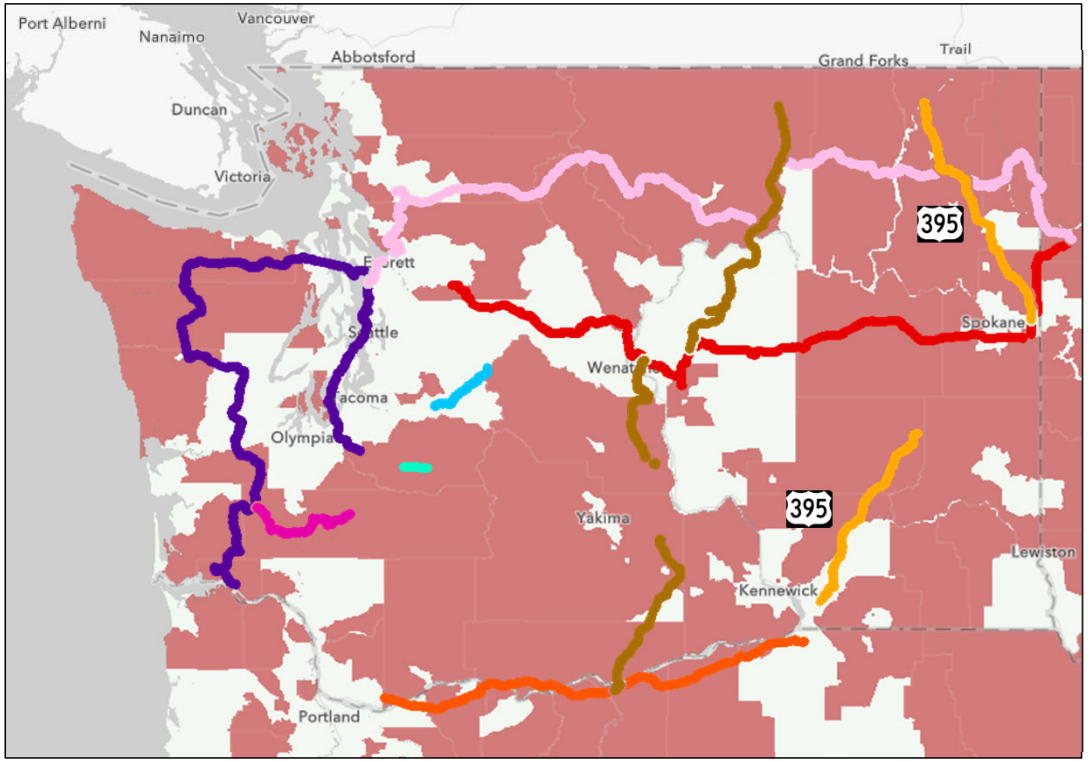
US-395: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

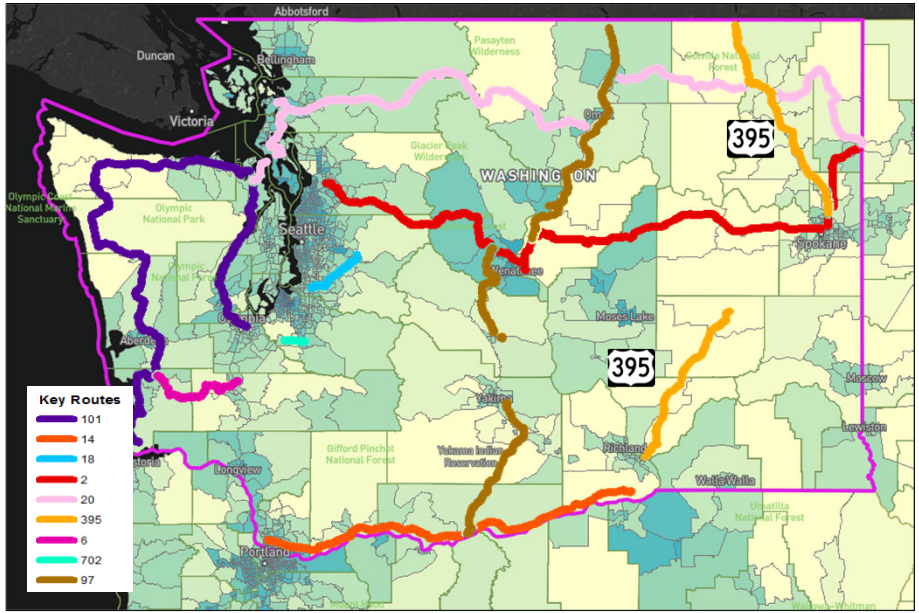
Sources: National Telecommunications and Information Administration Data

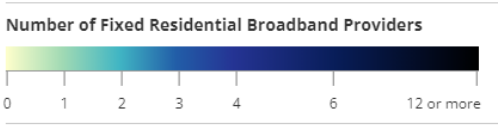
US-395: Broadband Speed (3/3)



Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

US-395: # of Service Providers





Broadband

Technology	Cable, Fiber
Speed	≥ 100/10 Mbps
Date	June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
Benton	2.81 %	13.6 %
Franklin	0.11 %	22.91 %
Adams	7.96 %	35.33 %
Lincoln	90.53 %	99.75 %
Spokane	10.91 %	56.45 %
Stevens	0 %	62.7 %
Ferry	0.39 %	99.42 %

- *Majority of households in Lincoln, Spokane, Stevens, and Ferry counties have one or less service providers*

Source: KPMG Analysis based on Publicly Available Information

US-395: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	25.0	▪ Approximately 43,900 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	15.0	▪ Noel Communications, Noanet, Franklin PUD, and Zayo have existing presence; however, corridor has approximately 43,900 unserved / underserved households ▪ Existing fiber presence is concentrated around Spokane and Kennewick area ▪ Corridor has an average internet speed up to 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	20.0	▪ Seven population center is covered by the state route – approximately 148,300 households are residing within 5-mile radius
Total Score		**60.0 points**	

US-14: Existing Fiber Presence / Providers

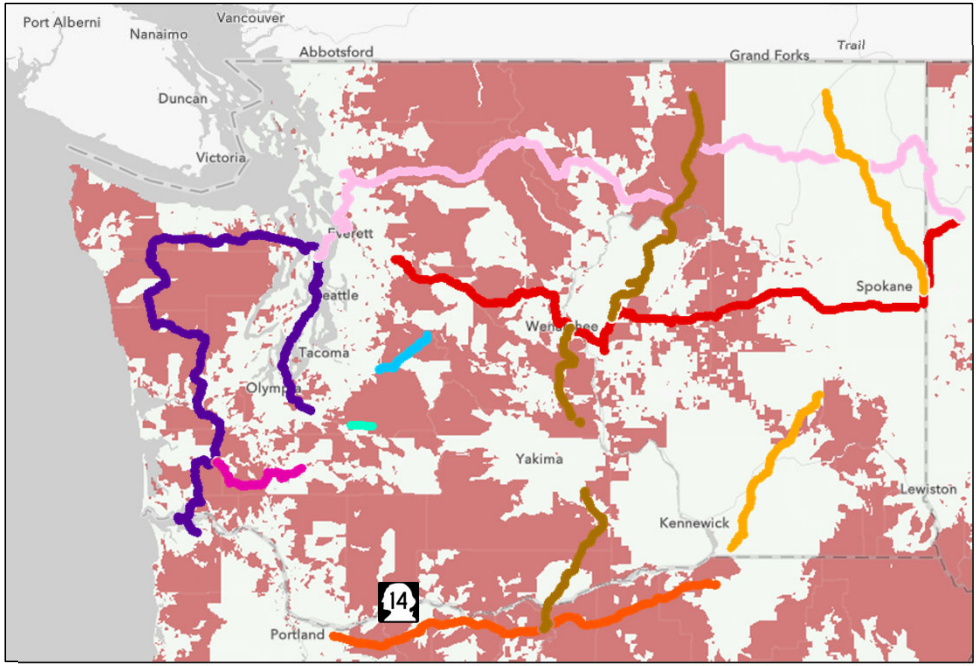
Fiber Providers along Washington US-14

Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
allstream	National Fiber Company	373
NOANET	Regional Wholesaler	269
Legacy Noel Communications	Regional Fiber Company	243
zayo	National Fiber Wholesaler	189
Bonneville	Regional Fiber Company	123
wave	Regional Fiber	104
LUMEN (Legacy Centurylink)	National Fiber Company	87
Spectrum	National Cable Company	44
XO communications	National Fiber Company	27
AT&T	National Wireless Company	23

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

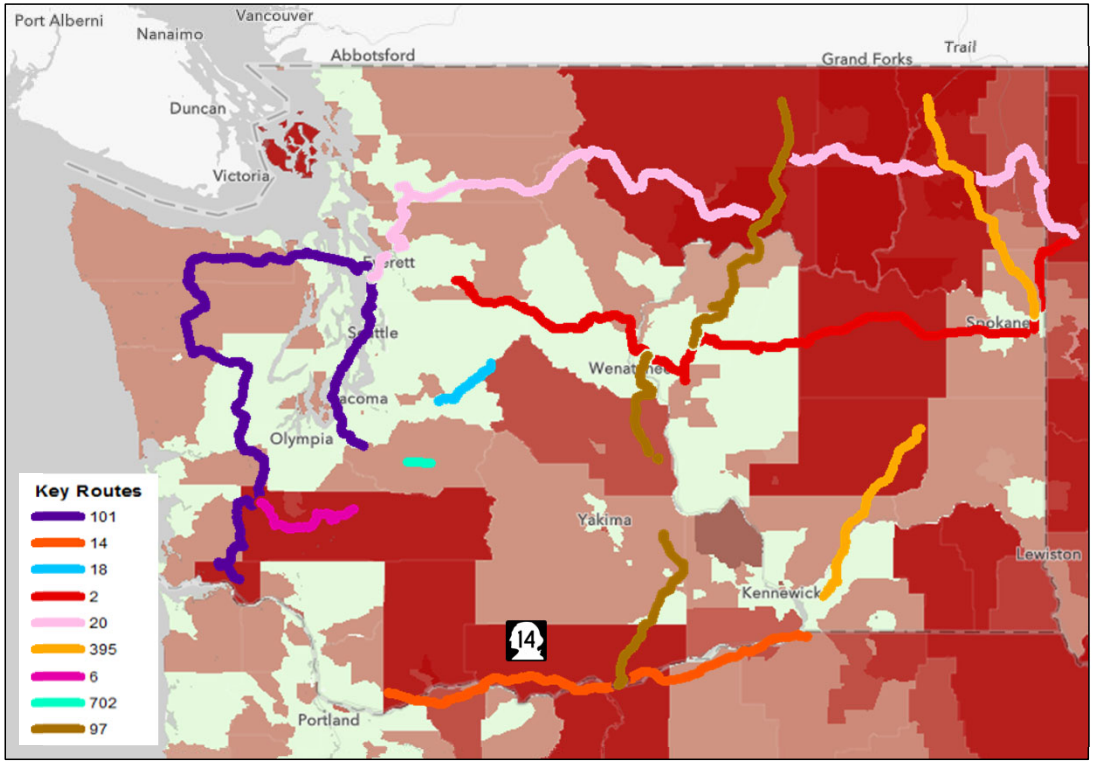
US-14: Broadband Speed (1/3)



- *US-14 Corridor has low to moderate internet speeds along the corridor. Gresham and Biggs Junction areas have internet speeds ranging 25 Mbps to 50 Mbps (upload) and 3 Mbps to 10 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

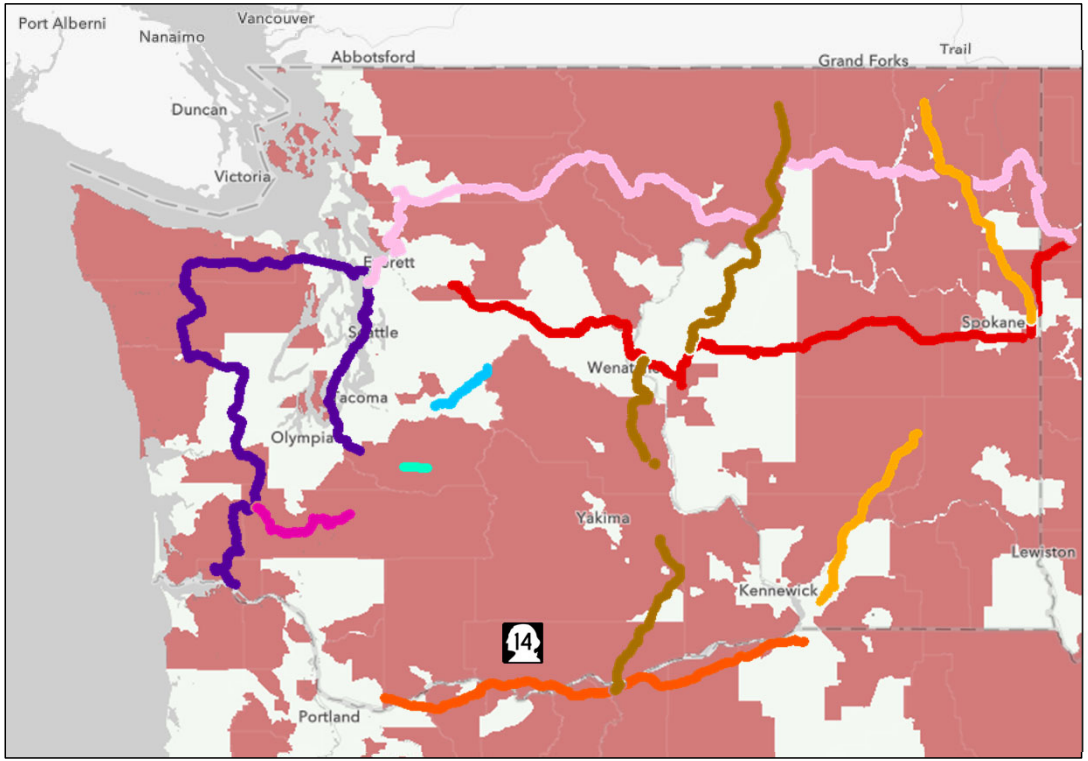
US-14: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

US-14: Broadband Speed (3/3)

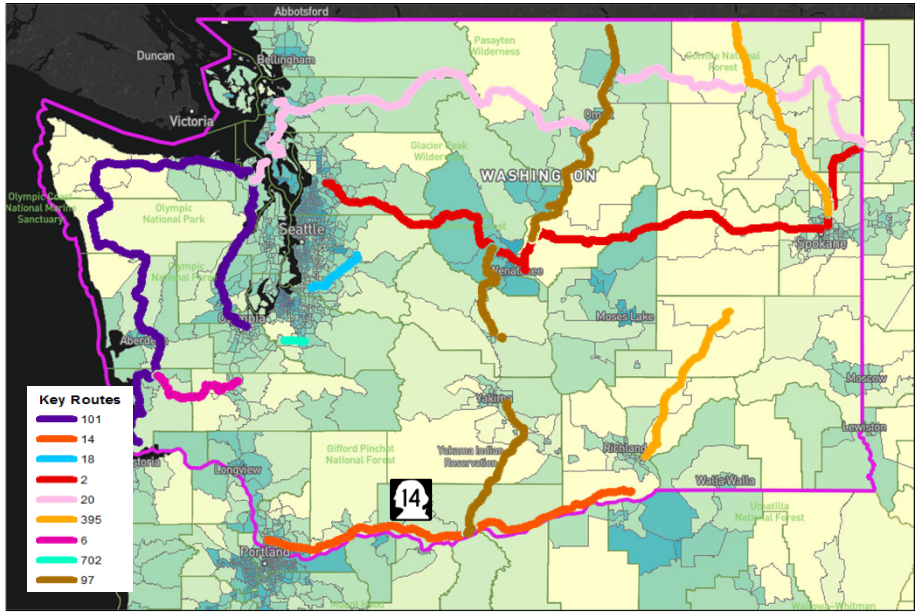


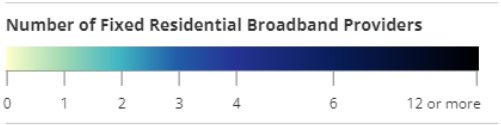
Key Routes

- 101
- 14
- 18
- 2
- 20
- 395
- 6
- 702
- 97

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

US-14: # of Service Providers





County	% of Population with No Providers	% of Population with One provider or less
Clark	4.68 %	15.24 %
Skamania	34.46 %	98.32 %
Klickitat	45.81 %	95.34 %
Benton	2.81 %	13.6 %

- *Majority of households in Skamania and Klickitat counties have one or less service providers*

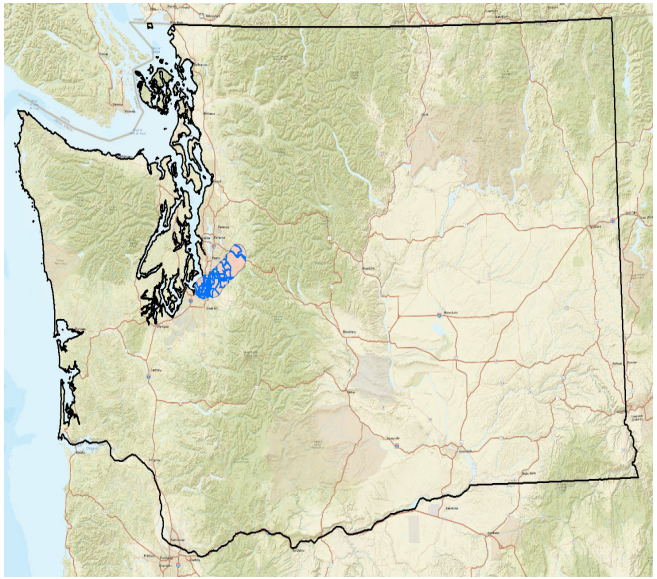
Sources: ESRI, FCC, ACS 2019

US-14: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	35.0	▪ Approximately 63,600 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	20.0	▪ Allstream, Noanet, Noel Communications, and Zayo have existing presence; however, corridor has approximately 63,600 unserved / underserved households ▪ Existing fiber presence is concentrated around Portland to Gresham area ▪ Corridor has an average internet speed up to 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	10.0	▪ Five population center is covered by the state route – approximately 250,600 households are residing within 5-mile radius
Total Score		**65.0 points**	

US-18: Existing Fiber Presence / Providers

Fiber Providers along Washington US-18

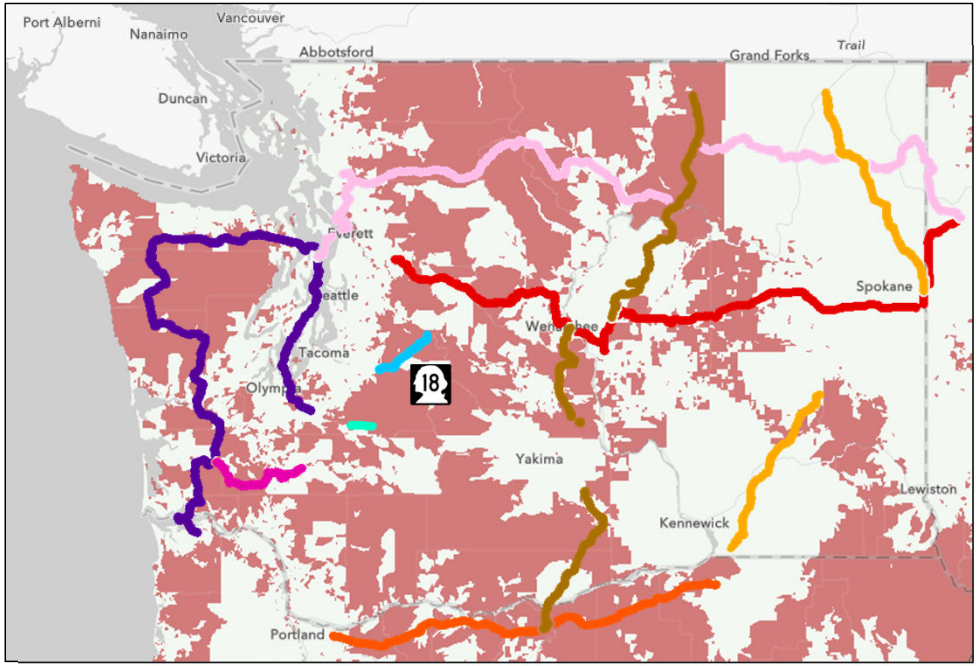


Top Providers[1]

Company	Footprint	Fiber Mileage (within 5-mile buffer)
NOANET	Regional Fiber Wholesaler	310
LUMEN (Legacy Centurylink)	National Fiber Company	179
zayo	National Fiber Wholesaler	161
Legacy Noel Communications	Regional Fiber Company	153
allstream	National Fiber Company	131
COMCAST	National Fiber Company	74
verizon	National Wireless Company	74
wave	Regional Fiber Company	68
XO communications	National Fiber Company	55
AT&T	National Wireless Company	54

Notes: 1) Only includes fiber providers (and corresponding fiber mileage) within a 5-mile buffer range of interstate highways
Source: KPMG Analysis based on Publicly Available Information

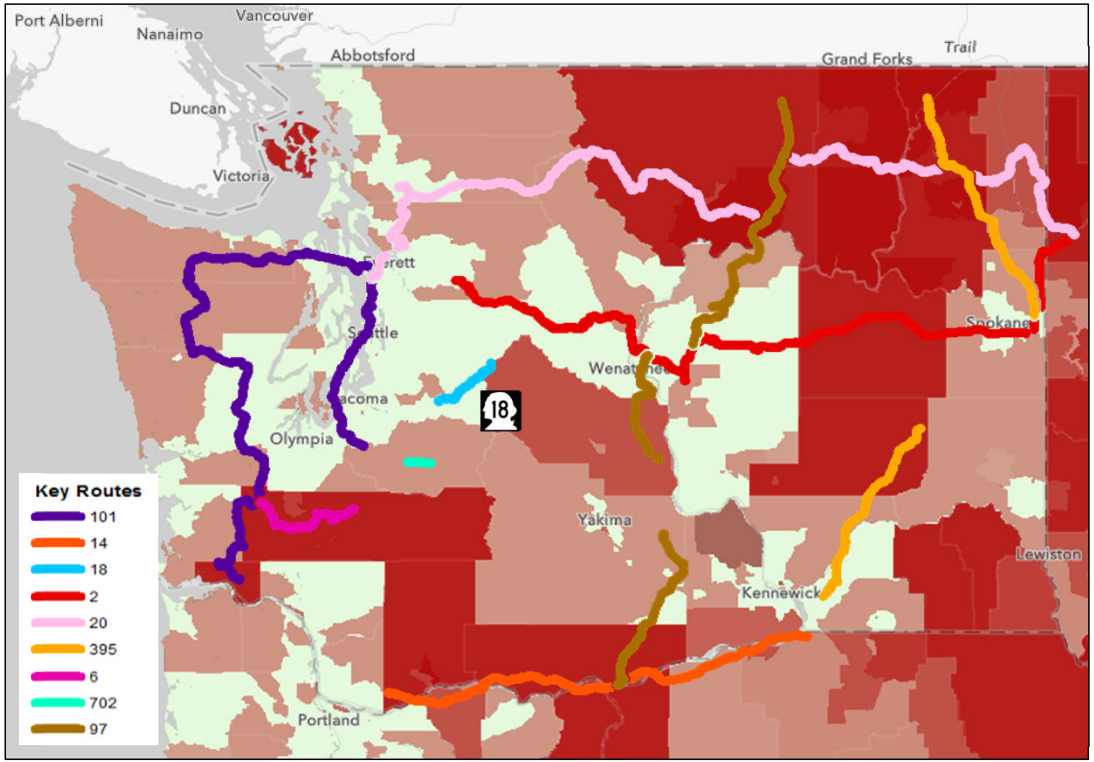
US-18: Broadband Speed (1/3)



- *US-18 Corridor has low to moderate internet speeds along the Auburn, Kent, Covington, and Maple Valley areas. Overall, the corridor has internet speeds ranging 50 Mbps to 100 Mbps (upload) and 10 Mbps to 25 Mbps (download)*

Sources: FCC Form 477 Data - Fixed Broadband Services at 25/3 Mbps

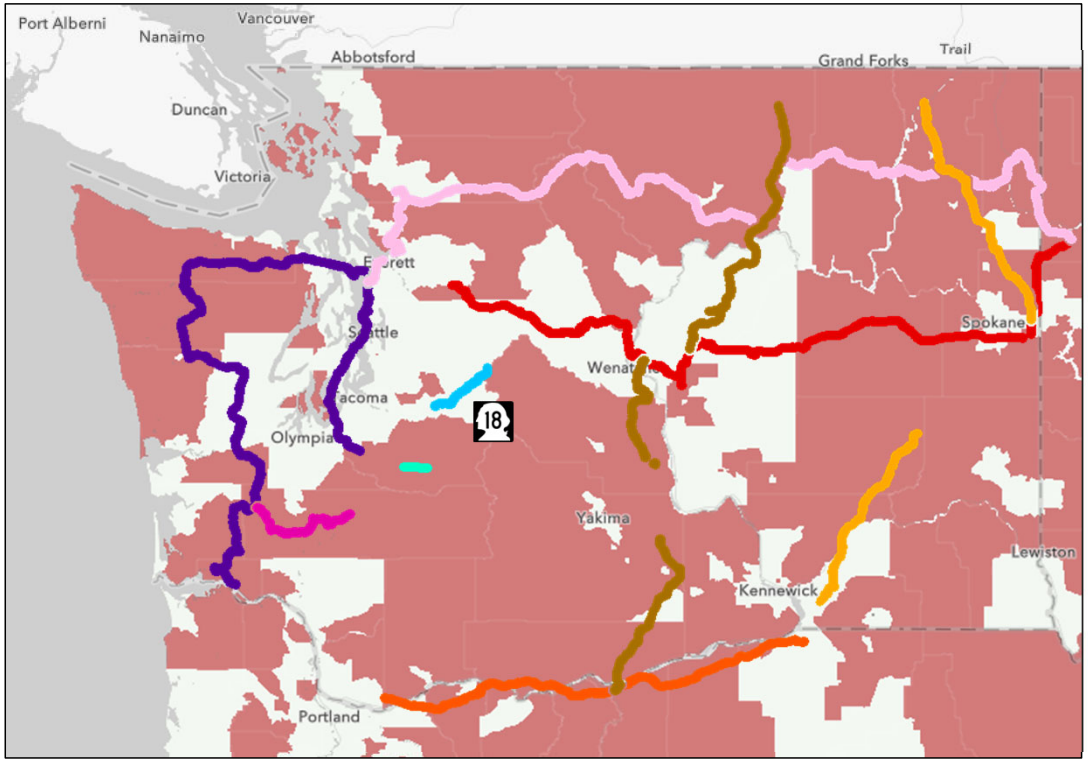
US-18: Broadband Speed (2/3)



Level	Indicator of Broadband Need	Yes	No	No Data
County	Speed Tests - M-Lab Median Speeds Fixed Broadband Below 25/3 Mbps			
	Usage - 75% or More of Devices Connect to Microsoft Updates/Services via Fixed Broadband Download Speeds below 25 Mbps			
Census Tract	Speed Tests - Ookla Median Speeds Fixed Broadband Below 25/3 Mbps			
	American Community Survey - 25% or More of Households Report No Internet Access			
	American Community Survey - 25% or More of Households Report No Computer, Smartphone or Tablet			
Census Block	FCC Form 477 – No Provider Reports Consumer Fixed Broadband Services at 25/3 Mbps			NA

Sources: National Telecommunications and Information Administration Data

US-18: Broadband Speed (3/3)

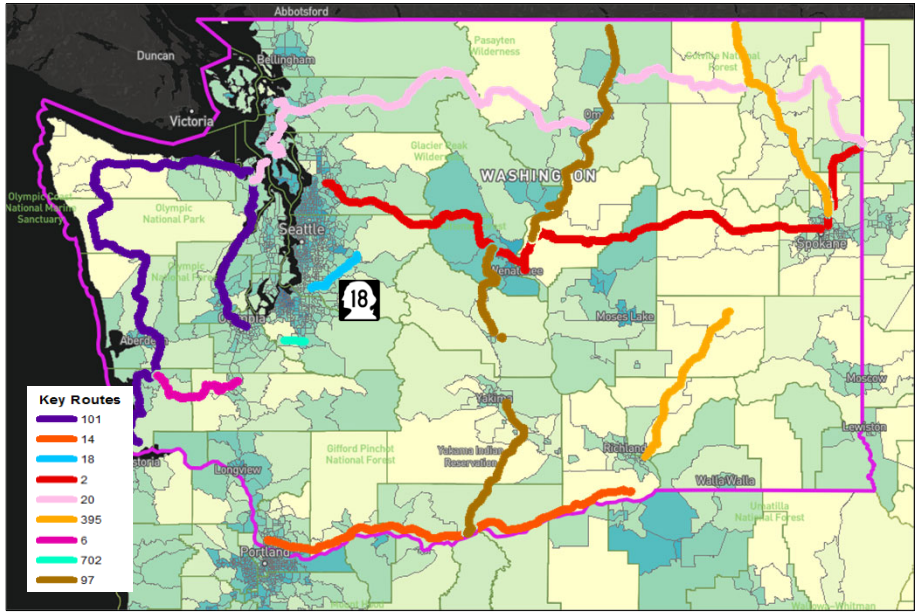


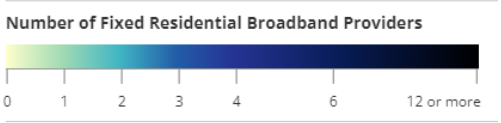
Key Routes

- 101
- 14
- 18
- 2
- 20
- 395
- 6
- 702
- 97

Sources: Ookla Median Speeds Fixed Broadband Below 25/3 Mbps (Census Tract)

US-18: # of Service Providers





Broadband

Technology Cable, Fiber
Speed ≥ 100/10 Mbps
Date June 2020 *(latest public release)*

County	% of Population with No Providers	% of Population with One provider or less
King	2.87 %	27.07 %

- *Majority of households in King county have more than one service providers*

Sources: ESRI, FCC, ACS 2019

US-18: Corridor Evaluation Score

Nos.	Evaluation Criteria	Score	Remark(s)
1	Unserved/Underserved Households Addressed	20.0	▪ Approximately 34,200 underserved / underserved households are covered within 5-mile radius of the corridor
2	Lack of Existing Fiber Presence or Excess Capacity to Serve Unserved / Underserved Households	20.0	▪ Noanet, Lumen and Zayo have existing presence; however, corridor has approximately 34,200 unserved / underserved households ▪ Existing fiber presence is concentrated around Auburn, Kent, Covington, and Maple Valley area ▪ Corridor has an average internet speed up to 50/10 Mbps in most areas
3	Population Centers Covered / Points of Presence Addressed	5.0	▪ Three population center is covered by the state route – approximately 172,400 households are residing within 5-mile radius
Total Score		**45.0 points**	

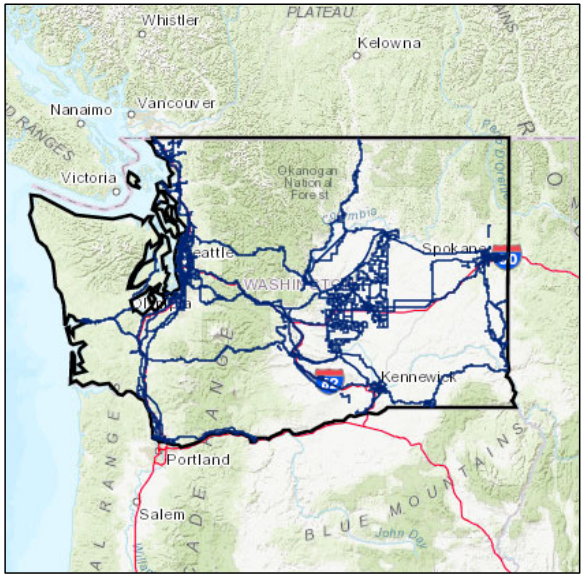
Mapping of Existing Fiber Networks in Washington State

Washington State Broadband Providers Footprint and Mileage (1/5)

Legacy Noel Communications

Noel Communications Fiber

states



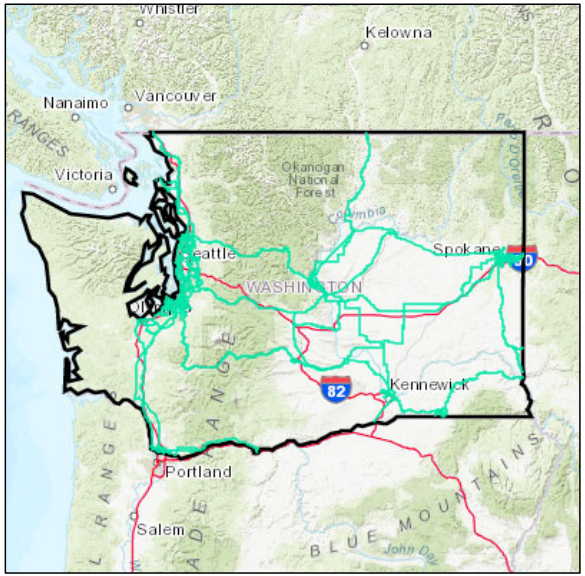
Fiber Network

4,494 miles

zayo

Zayo Fiber

states



Fiber Network

2,535 miles

Sources: KPMG Analysis based on Publicly Available Information

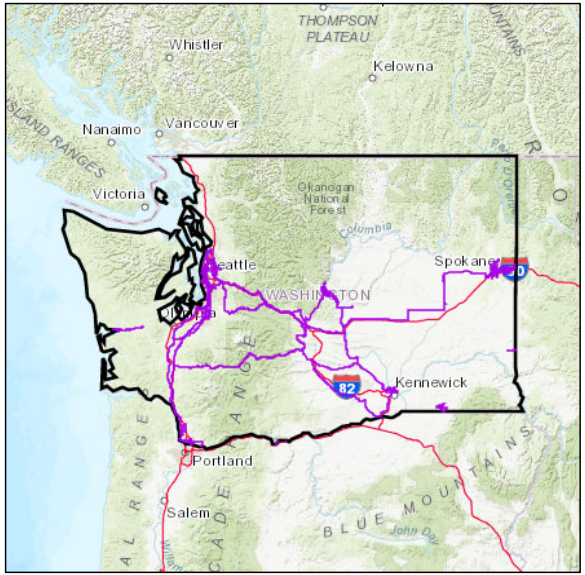
Washington State Broadband Providers Footprint and Mileage (2/5)

LUMEN

(Legacy Centurylink)

CenturyLink Fiber

states



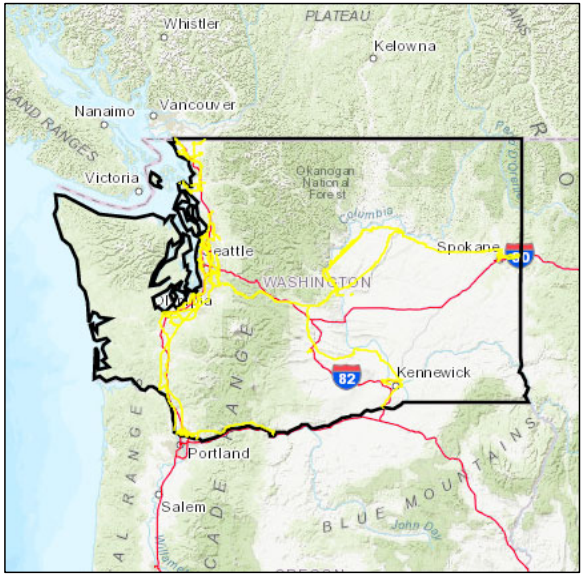
Fiber Network

2,521 miles

allstream

Allstream Fiber

states



Fiber Network

1,810 miles

Sources: KPMG Analysis based on Publicly Available Information

Washington State Broadband Providers Footprint and Mileage (3/5)

wave

Wave Fiber

states

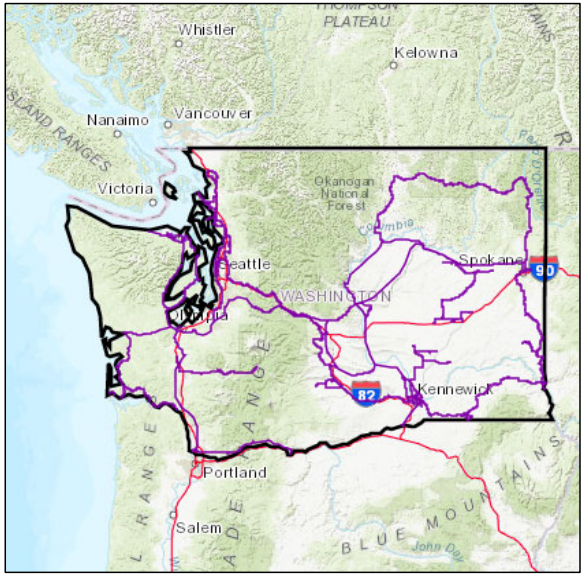
Fiber Network

1614 miles

NOANET

NOANET Fiber

states



Fiber Network

1400 miles

Sources: KPMG Analysis based on Publicly Available Information

Washington State Broadband Providers Footprint and Mileage (4/5)

AT&T

AT&T Fiber

states

Fiber Network

1,028 miles

COMCAST

Comcast Fiber

states

Fiber Network

1,002 miles

Sources: KPMG Analysis based on Publicly Available Information

Washington State Broadband Providers Footprint and Mileage (5/5)

Grant PUD High Speed Network

Grant PUD Fiber

states

Fiber Network

756 miles

XO communications

XO Communications Fiber

states

Fiber Network

722 miles

Sources: KPMG Analysis based on Publicly Available Information

Appendix 2

NOSSAMAN LLP | Memorandum

PRIVILEGED AND CONFIDENTIAL

TO: Paul Neal
Washington Joint Transportation Committee

FROM: Fredric W. Kessler

DATE: November 18, 2021

RE: Broadband Deployment within WSDOT Right of Way

You have requested that we prepare this analysis of federal and state laws and regulations that affect the use of state highway infrastructure for the provision of broadband facilities and services. For our analysis, we have reviewed, among other sources, the relevant sections of (i) the Federal Telecommunications Act of 1996 ("FTA"); (ii) applicable Federal Communications Commission ("FCC") rulings and case law interpreting relevant provisions of the aforementioned law and statutes; (iii) the Washington State Constitution (the "Constitution"); (iv) the Revised Code of Washington ("RCW"); (v) the Washington Administrative Code ("WAC"); (vi) the WSDOT Right of Way Manual (2020) ("ROW Manual"); (vii) the WSDOT Utility Accommodation Policy (2016) ("Utility Policy"); and (viii) the WSDOT Utilities Manual (2014) ("Utilities Manual").

Our analysis follows.

I. Federal Requirements and Limitations on Use of State Right of Way for Telecommunication Infrastructure and Facilities

A. Introduction

WSDOT's arrangements for broadband facility development and use in highway right of way will be subject to the constraints on state government created by 47 U.S.C. §253 ("Section 253") and 47 U.S.C. §332(c)(7) ("Section 332(c)(7)"). They are stated in full in Appendix 1 to the memo.

In general, Section 253 bars any state law or other legal requirement that prohibits or has the effect of prohibiting any entity from providing telecommunications service. There is a safe harbor for managing right of way and for fair and reasonable compensation for use of right of way, provided it is on a neutral and nondiscriminatory basis.

Section 332(c)(7) applies specifically to wireless facilities. It allows state and local government to regulate placement, construction and modification of personal wireless service facilities. As in Section 253, however, such regulation must be on a neutral and nondiscriminatory basis and cannot prohibit or have the effect of prohibiting provision of personal wireless services.

There is a large body of case law interpreting and applying Sections 253 and 332(c)(7). The cases have not always been consistent in the interpretation of these sections. For example, there has

been a split among the Federal Circuit Courts of Appeal on what state or local action amounts to an effective prohibition of the ability to provide telecommunications service under Section 253(a) and on the amount of compensation permitted under Section 253(c).

For better or worse, the Federal Communications Commission ("FCC") holds broad power, including rulemaking authority, to interpret and enforce Sections 253 and 332(c)(7), and has exercised that power to resolve judicial differences.[1] The Supreme Court has established the standard for when deference is owed to interpretations of federal statutes by federal regulatory agencies charged with administration of the statutes such as the FCC. If the statute speaks unambiguously to the precise question at issue, courts, as well as the federal agency, must give effect to the express Congressional intent. If, however a statute is silent or ambiguous, the agency's interpretation is entitled to deference by the judicial branch, so long as the interpretation is a reasonable construction of the statute.[2] The FCC's reasonable interpretations of Sections 253 and 332(c)(7) prevail over contrary judicial decisions.[3]

In 2018 the FCC issued a sweeping order (the "*Small Cell Order*")[4] establishing its interpretations and application of Sections 253 and 332(c)(7) in the context of deployment of small cell networks vital for establishing 5G wireless services nationwide. The *Small Cell Order*, which aggressively limits state and local governmental laws and other requirements affecting small cell deployment, was challenged by dozens of state and local governments. With minor exceptions not relevant here, the Ninth Circuit upheld all of the *Small Cell Order*, holding that it deserves *Chevron* deference, is consistent with Congressional directives in the Telecommunications Act, and is not otherwise arbitrary, capricious or contrary to law.[5]

The *Small Cell Order*, together with the FCC's order in a 2009 proceeding involving the grant of exclusive access to state right of way to a wholesale provider of fiber optic facilities[6], are highly instructive regarding permissible terms for WSDOT partnerships with telecommunications service providers to expand broadband services to unserved and underserved communities. While it is true that the *Small Cell Order* is only applicable to small wireless service facilities, there can be little doubt that the FCC would adopt the same key interpretations and rulings in the case of fiber optic facilities. Both types of facilities are essential technological components for advancing nationwide 5G deployment, and the FCC is committed to removing state and local regulatory barriers inhibiting that deployment.[7] Also,

---

[1] 47 U.S.C §§151, 201(b).
[2] *Chevron USA Inc. v. Natural Resources Defense Council*, 467 U.S. 837, 104 S.Ct. 2778, 81 L.Ed.2d 694 (1984) ("*Chevron*").
[3] *Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs.,* 545 U.S. 967, 983-986 (2005) (Commission's interpretation of an ambiguous statutory provision overrides earlier court decisions interpreting the same provision).
[4] *Declaratory Ruling and Third Report and Order*, FCC-18-133A, September 26, 2018.
[5] *City of Portland v. FCC*, No. 18-72689 (9th Cir. 2020), cert. denied, Case No. 20-1354 (June 28, 2021). Similarly, the Fifth Circuit has held that the FCC's interpretation of a reasonable period to act under Section 332(c)(7)(B)(ii) deserves *Chevron* deference. *City of Arlington v. FCC,* 668 F.3d 229 (5th Cir. 2012), aff'd, 569 U.S. 290 (2013). For more on the scope of the FCC's preemption authority, see Congressional Research Service, Stepping In: The FCC's Authority to Preempt State Laws Under the Communications Act (March 26, 2021).
[6] *Petition of the State of Minnesota for a Declaratory Ruling regarding the Effect of Section 253 on an Agreement to Install Fiber Optic Wholesale Transport Capacity in State Freeway Rights of Way,* Memorandum Opinion and Order, 14 FCC Rcd 21697 (Dec. 20, 1999) ("*Minnesota Order*").
[7] See *Small Cell Order*, ¶1-4.

even though Section 332(c)(7) does not directly apply to fiber optic facilities, Section 253 does, and the *Small Cell Order* includes detailed interpretations of Section 253.

B. Effect of Prohibiting under Sections 253 and 332(c)(7)

Sections 253 and 332(c)(7) preclude state or local laws, regulations or other requirements that prohibit or have the effect of prohibiting provision of telecommunications and personal wireless services. The FCC has consistently interpreted the effective prohibition language in Section 253 as any law, regulation or requirement that "materially limits or inhibits the ability of any competitor or potential competitor to compete in a fair and balanced legal and regulatory environment."[8]

An insurmountable barrier is not necessary in order to materially inhibit provision of services.[9] It is sufficient if the requirement materially impairs, hinders, obstructs or impedes.[10] In addition, this limitation on state and local governments extends to the wide variety of activities that relate to provision of service, including introducing new service or improving service.[11]

This interpretation of Sections 253 and 332(c)(7) applies to an expansive range of government conduct, including fees and charges for access to or use of state or local property.[12] It has been argued that when a state or local government offers its land or property for use for installation of telecommunications facilities, it is acting as any other landowner participating in the market and therefore is not constrained by Section 253. The FCC rejected this view in the *Small Cell Order*. It reasoned that Sections 253 and 332(c)(7)(B)(i)(II) expressly authorize federal preemption and do not carve out an exception for governmental conduct in a proprietary capacity.[13]

C. Who is Protected by Section 253

Section 253 protects any entity that provides telecommunications services. If a state or local action materially inhibits the ability of any such player to compete in a fair and balanced regulatory environment, it can invoke Section 253 to have either a court or the FCC overturn the action.

It does not matter if a contract to install, operate or use fiber optic facilities is with an entity that does not itself provide telecommunications service. Congress defined "telecommunications service" as "the offering of telecommunications … regardless of the facilities used."[14] The majority of towers are owned or operated by independent companies rather than wireless service providers. Most wireless service providers work with third parties on their network buildout efforts. Similarly, many telecommunications service providers utilize long haul and middle mile fiber owned or operated by

---

[8] *California Payphone,* 12 FCC Rcd at 14206, ¶31; *Small Cell Order*, ¶35. The Ninth Circuit has cited the *California Payphone* formulation as leading authority. *Sprint v. County of San Diego,* 543 F.3d 571, 578 (9th Cir. 2008).
[9] *Small Cell Order*, ¶35.
[10] *Small Cell Order*, ¶41 and footnote 103; *see Verizon Communications, Inc. v. FCC,* 535 U.S. 467, 491 (2002) ("the 1996 Act prohibits … regulation that *impedes* the provision of 'telecommunications service'") (emphasis added)
[11] *Small Cell Order*, ¶37.
[12] *Small Cell Order*, ¶57.
[13] *Small Cell Order*, ¶93.
[14] 47 U.S.C. 153(46). See *Public Utility Comm'n of Texas*, 13 FCC Rcd at 3496, ¶74 (finding that "section 253(a) bars state or local requirements that restrict the *means or facilities* through which a party is permitted to provide service")(emphasis added).

independent companies. The FCC explains that the "fact that facilities are sometimes deployed by third parties not themselves providing covered services does not place such deployment beyond the purview of Section 253(a)."[15]

What matters is whether a transaction is with an entity that provides facilities used for telecommunications services, and whether the transaction has the inhibitory effect on the service providers that may use those facilities – or shuts them out from using those facilities. This was the gist of the *Minnesota Order*, which rejected a ten-year exclusive right of access to state freeways and other state highways granted to a wholesaler of fiber optic lines because of the exclusivity's potential to harm the ability of service providers to compete.

D. Fair and Reasonable Compensation

The *Small Cell Order* put to rest a long-running dichotomy in judicial decisions over the meaning of fair and reasonable compensation for use of right of way as permitted by Section 253(c). One line of cases has held that "compensation" means cost recovery; the other line of cases has held that "compensation" is not necessarily limited to cost recovery and can take into account the totality of circumstances, such as the use contemplated, the amount other telecommunications providers would be willing to pay, and the impact on the profitability of the business.[16] In the *Small Cell Order*, the FCC laid down its rules limiting compensation to cost recovery:

> We conclude that ROW access fees, and fees for the use of government property in the ROW, such as light poles, traffic lights, utility poles, and other similar property suitable for hosting Small Wireless Facilities, as well as application or review fees and similar fees imposed by a state or local government as part of their regulation of the deployment of Small Wireless Facilities inside and outside the ROW, violate Sections 253 or 332(c)(7) unless these conditions are met: (1) the fees are a reasonable approximation of the state or local government's costs, (2) only objectively reasonable costs are factored into those fees, and (3) the fees are no higher than the fees charged to similarly-situated competitors in similar situations.[17]

Long before the *Small Cell Order*, the FCC signaled the direction in which it was heading in the *Minnesota Order*. In exchange for the rights the state granted to the wholesale provider, the state received 20% of the lit capacity of the fiber optic network, some dark fiber and $5 million worth of facilities and services for MnDOT's ITS. The FCC held that these commercial contract terms overstepped Section 253's requirement for fair and reasonable compensation, even though the wholesale provider had not requested any ruling or protection from the FCC.[18]

---

[15] *Small Cell Order*, footnote 84.
[16] E.g., compare *XO Missouri v. City of Maryland Heights,* 256 F. Supp. 2d 987, 993-95 (E.D. Mo. 2003)*; Bell Atlantic–Maryland, Inc. v. Prince George's County,* 49 F. Supp. 2d 805, 818 (D. Md. 1999), vacated on other grounds, 212 F.3d 863 (4th Cir. 2000) with *Qwest Comms. Inc. v. City of Berkeley,* 433 F.3d 1253, 1257 (9th Cir. 2006); *TCG Detroit v. City of Dearborn, 206 F. 3d 618, 625 (6th Cir. 2000). See also* *Puerto Rico Tel. Co. v. Municipality of Guayanilla,* 450 F.3d 9, 18 (1st Cir. 2006); *Qwest Corp. v. City of Santa Fe*, 380 F.3d 1258, 1273 (10th Cir. 2004).
[17] *Small Cell Order*, ¶50.
[18] *Minnesota Order*, ¶21.

The FCC rejected arguments made in the *Small Cell Order* proceedings that the fair and reasonable compensation standard in Section 253(c) must be interpreted to provide fair rental value to governmental entities. The FCC reasoned that the focus of the statutory language is to protect service providers.[19]

The FCC's elaboration of its holding in the *Small Cell Order* provides a number of guidelines to assure that compensatory provisions in statutes, regulations and contracts comply with Section 253.

- Fees must represent a reasonable approximation of actual and direct government costs. The FCC expressly declines to mandate any specific accounting method to document costs.[20]

- Eligible costs include costs to maintain the right of way, maintain structures within the right of way, and process an application or permit. They may also include a variety of other direct and actual costs that may vary by location, scope and extent of a planned deployment.[21] While not mentioned in the *Small Cell Order*, reasonable fees to cover government costs to monitor and inspect traffic controls and construction activities are likely eligible for cost recovery.

- The costs included must be objectively reasonable. Excessive or arbitrary charges by contractors or consultants to the governmental entity are not reasonable and therefore ineligible for cost recovery.[22]

- Fees must be competitively neutral and nondiscriminatory. A government cannot impose a range of fees on one type of provider but not another, such as on new entrants but not incumbents. Fees charged to one provider cannot be materially higher than those charged another provider for similar uses or in similar situations. Different uses of right of way do, however, justify different fees.[23]

- Fees must be related to actual use of public right of way. In particular, a fee based on a percentage of a service provider's gross revenue are impermissible because they generally bear no relation to costs of actual right of way use.[24]

In the *Small Cell Order* the FCC established certain safe harbor fee levels that it concluded are presumptively reasonable for small wireless facilities. The safe harbors are:

- Non-recurring fees: $500 for a single, up-front application for up to five small wireless facilities; $100 for each additional facility in the same application; or $1,000 for a new pole or support facilities.

---

[19] *Id*., at ¶55.
[20] *Id*., at ¶55, 76.
[21] Id., at ¶72, 75, __
[22] *Id*., at ¶55, 70, 76.
[23] *Id*., at ¶55, 58, 77. See also footnote 230 ("We recognize that different uses of the ROW may warrant charging different fees …")
[24] *Id*., at ¶70.

- Recurring fees: $270 per facility per year, inclusive of all costs, including fees for ROW access and attachment to government structures.[25]

The FCC warned that "there should be only very limited circumstances in which localities can charge higher fees consistent with the requirements of Section 253."[26]

WSDOT currently charges the following application fees for utility franchise activities:[27]

Application/Process	**Fee**
Category 1 Installation	$500
Category 2 Installation	$300
Category 3 Installation	$150
Category 4 Installation	No Charge
Franchise Consolidation	$300
Franchise Renewal	$250
Transfer of Ownership	$50

WSDOT also charges reimbursable engineering costs beyond the application fee for meeting costs, engineering and plan reviews, pre-application field reviews, and post-application field inspections including meetings, traffic control oversight and travel time.[28] It is advisable for WSDOT to review its combined fees to determine whether they fall within the FCC safe harbor.

Despite the *Small Cell Order*, 14 states (not including Washington) report that they generate revenue from longitudinal installations of telecommunications facilities, ranging from annual lease fees to resource sharing to revenue sharing, and 22 states (including Washington) report generating revenue from microcell installations, ranging from annual fees, one-time fees, resource sharing and revenue sharing.[29]

E. The Minnesota Order

The *Minnesota Order* dealt with a contract between the State of Minnesota and a wholesale fiber optic developer in which the developer received a ten-year exclusive right of access to freeway rights of way to install fiber optic facilities. At least one purpose of the exclusivity was to reduce third party activity within limited access highways that could impact highway operations and public safety. Minnesota sought a declaratory ruling that the arrangement did not violate Section 253. The FCC ruled against the state.

Fundamentally, the FCC objected to the developer's ten-year contractual exclusivity. Placing the burden of proof on the state, the FCC was not convinced that the exclusivity would not have the

---

[25] *Id*., at ¶79.
[26] *Id*., at ¶80.
[27] WSDOT Utilities Manual, M 22-87.10, §110.03(2) (Feb. 2019).
[28] *Id*., at §110.03(3).
[29] NCHRP, Legal Issues Concerning the Use of Transportation Facilities to Generate Revenue for State DOTs, http://nap.edu/25845, p. 23 (2020).

potential to materially affect the ability of other telecommunications service providers to compete in a fair and balanced environment.[30]

The exclusivity was not saved by the fact that the developer was obligated to collocate other providers' fiber, and to lease or sell network capacity on a non-discriminatory basis. In the FCC's opinion, these provisions were not sufficient to overcome the prohibitory effect of the exclusivity.[31] The FCC thought that the non-discriminatory provision in the contract was ambiguous, as it contained no obligation to offer capacity on an indefeasible right to use (IRU) basis.[32] The FCC acknowledged that under the right circumstances IRUs might be an adequate substitute for a competitor's right to construct its own facilities within the right of way.[33] But in the absence of a contractual obligation of the developer to offer IRUs or to limit its charges to fair, reasonable, neutral and nondiscriminatory rates, the FCC expressed concern that the developer might be able to use its exclusivity to extract monopolistic profits from its sale and leasing of fiber capacity.[34] The FCC could not find that the contract provisions were sufficient to protect resellers and collocators or to render the exclusivity compatible with Section 253.[35]

The FCC also held that the state had not shown that restrictions on physical access to freeway right of way were necessary to protect public safety and welfare.[36] Throughout the *Minnesota Order* is an unspoken, erroneous assumption that the state can and should make limited access highway right of way available to all comers for fiber optic installations, management and maintenance. Ranging far beyond its expertise, the FCC went so far as to find that in rural areas fiber installations do not create increased safety hazards.[37]

The *Minnesota Order*, particularly its dismissiveness of highway operational and safety concerns, raised alarms with the Federal Highway Administration and the Minnesota Department of Transportation. After conferring closely with the FCC, the FHWA issued guidance, about a year after the *Minnesota Order*, for states wishing to make limited access right of way available for fiber optic telecommunications projects.[38]

---

[30] *Minnesota Order,* ¶5, 7.
[31] *Id*., at ¶26, 27, 28.
[32] An IRU interest in a communication facility is "a form of acquired capital in which the holder possesses an exclusive and irrevocable right to use the facility and to include its capital contribution in its rate base, but not the right to control the facility or, depending on the particular IRU contract, any right to salvage". *Reevaluation of the Depreciated-Original-Cost Standard in Setting Prices For Conveyances of Capital Interests in Overseas Communication Facilities Between or Among U.S. Carriers*, CC Docket No. 87-45, *Report and Order*, 7FCC Red 4561 at 4564, n.1 (1992)
[33] *Minnesota Order,* ¶27, 28.
[34] *Id*., at ¶32.
[35] *Id*., at ¶34.
[36] *Id*., at ¶35, 42.
[37] *Id*., at ¶41.
[38] *Guidance on Longitudinal Telecommunications Installations on Limited Access Highway Right-of-Way*, Federal Highway Administration (Dec. 22, 2000), at Guidance on Longitudinal Telecommunications Installations on Limited Access Highway Right-of-Way - Utility Program - Design - Federal Highway Administration (dot.gov) ("*FHWA Guidance*").

The *FHWA Guidance*, which received the FCC's tacit approval and provides "insight into the thinking of the FCC,"[39] achieved two important objectives. First, it reaffirmed that the FHWA and state departments of transportation are statutorily responsible to manage highways so as not to impair highway use and safety, and that these concerns are legitimate constraints on availability of limited access rights of way for longitudinal telecommunications installations.

Second, the *FHWA Guidance* provided a set of guidelines for compliance with Section 253 in this context. Its principle elements are as follows:

- Companies other than the selected developer should have the opportunity to have their own fiber optic facilities installed concurrently with the selected developer's.

- The selected developer may be the sole party responsible for all installation work; but its charges, terms and conditions for installation should be fair, reasonable and nondiscriminatory, and may include a reasonable profit.

- States should give reasonable advance notice of anticipated opening of the right of way, reflecting the time reasonably required for third party telecommunications companies to develop business plans and obtain financing.

- The selected developer should install spare fiber and empty conduit adequate to accommodate reasonably anticipated future demand whenever additional fiber and conduit cannot be installed outside the clear zone.

- The design should include connection points at each end outside the clear zone to enable third parties to access conduit or interconnect with facilities in the conduit.

- Rates, terms and conditions for interconnection and use of conduit should be fair, reasonable and nondiscriminatory, and may include a reasonable profit.

- The selected developer should be obligated to sell IRUs for fiber, and offer other facilities and services for resale, at rates and on terms and conditions that are just, reasonable and nondiscriminatory, and that may include a reasonable profit.

- An independent entity, without interest in the arrangements, such as a public utilities commission or arbitrator, should be authorized to hear and decide challenges to the selected developer's compliance.

- Preferably, the selected developer should be a wholesaler of telecommunications to minimize risk of anti-competitive or discriminatory behavior.[40]

The FHWA Guidance states that agreements at variance from these guidelines will not necessarily run afoul of Section 253, but those that follow the guidelines will have "a reasonable level of assurance" against preemption.[41]

---

[39] *FHWA Guidance*, under "Conclusion".
[40] *Id*., under "Guidance on Competitive Issues".
[41] *Id*., under "Guidance on Access to Freeway Right-of Way".

We do not know to what extent, if any, the FCC currently respects the FHWA Guidance. However, the tension between the pro-competitive purposes of Sections 253 and 332(c)(7) and the highway management and safety concerns of departments of transportation has not changed in the 21 years since the FHWA Guidance was issued in an attempt to reconcile these disparate objectives. Together, the *Minnesota Order* and the *FHWA Guidance* directly affect the contracting structures and terms that WSDOT may deploy to partner with the private sector for middle-mile fiber optic installations in WSDOT right of way.

II. State Constitutional Limitations on Use of Certain Tax Revenues for Highway Purposes

Article II, Section 40 of the Constitution limits expenditure of motor vehicle license fees and gas tax revenue to "highway purposes." It states in part:

> **SECTION 40 HIGHWAY FUNDS.** All fees collected by the State of Washington as license fees for motor vehicles and all excise taxes collected by the State of Washington on the sale, distribution or use of motor vehicle fuel and all other state revenue intended to be used for highway purposes, shall be paid into the state treasury and placed in a special fund to be used exclusively for highway purposes. Such highway purposes shall be construed to include the following:
>
> (a) The necessary operating, engineering and legal expenses connected with the administration of public highways, county roads and city streets;
>
> (b) The construction, reconstruction, maintenance, repair, and betterment of public highways, county roads, bridges and city streets; including the cost and expense of (1) acquisition of rights-of-way, (2) installing, maintaining and operating traffic signs and signal lights, (3) policing by the state of public highways, (4) operation of movable span bridges, (5) operation of ferries which are a part of any public highway, county road, or city street;
>
> (c) The payment or refunding of any obligation of the State of Washington, or any political subdivision thereof, for which any of the revenues described in section 1 may have been legally pledged prior to the effective date of this act;
>
> (d) Refunds authorized by law for taxes paid on motor vehicle fuels;
>
> (e) The cost of collection of any revenues described in this section:

In determining whether an expenditure constitutes a valid "highway purpose", courts examine (1) the relationship between the expenditure and the proposed highway purpose, and (2) the benefit of the expenditure to the highway system.

A. Relationship Between Expenditure and Highway Purpose

In determining the constitutionality of expenditures, courts examine the connection between the expenditure and the contemplated highway use (or purpose of the expenditure).[42] In other words, the courts will determine how attenuated the expenditure is from permissible highway purposes.

The basic premise of the constitutional limitation is to ensure that fees and taxes will be used to provide roads, streets, and highways on which taxpayers can drive their motor vehicles.[43] The subdivisions enlarge what constitutes a "highway purpose."[44] Although the expenditure's purpose does not have to be explicitly stated in Article II, Section 40, the purpose must be implicitly related to a purpose mentioned in the amendment.[45] Thus, for an expenditure to be valid, its purpose must contribute toward the safety, administration, or operation of the highway system.[46] For example, the Washington Supreme Court held that expenditures for park and ride facilities were "directly related to a more efficient and safer operation of the system."[47] It also held that expenditures to determine the value of interstate highway land for purposes of potential transfer of the land to Sound Transit served a highway purpose because land transfers are specifically within the statutory authority of the department of transportation.[48]

B. Expenditure Must Provide a Benefit to the Highway System, Even Indirectly

In addition, the court also examines whether the expenditure provides a benefit to the highway system.

Benefits to the highway system can be direct or indirect. The costs of administering or using the highways are permissible, such as valuing highway lanes that may be transferred to light rail use or the construction of a park and ride. Expenditures that deplete funds in furtherance of non-highway purposes are viewed skeptically, even if those expenditures are incidentally related to the operation of

---

[42] *Freeman v. Gregoire*, 171 Wash. 2d 316, 330, 256 P.3d 264, 271 (2011).
[43] *State ex rel O'Connell v. Slavin*, 75 Wash.2d 554, 452 P.2d 943 (1969).
[44] Subdivisions (a) to (e) set forth what may be deemed an expansion of that which might otherwise be considered as being embraced within the term 'highway purposes,' when such words are given their ordinary meaning. The content of the subdivisions does not limit the scope of the term 'highway purposes,' but enlarges and extends it. *State ex rel. Bugge v. Martin*, 38 Wash. 2d 834, 840, 232 P.2d 833, 836 (1951).
[45] Although the objective of efficient utilization in the operation of highways and reducing congestion and hazardous driving conditions is not specifically spelled out, it is, nevertheless, *implicitly related* to the specific highway purposes delineated in the amendment. *State ex rel. Washington State Highway Comm'n v. O'Brien*, 83 Wash. 2d 878, 882, 523 P.2d 190, 193 (1974). The O'Brien court further noted that expenditures " 'indirectly benefit[ing]' " the highway system are constitutionally valid, if the expenditures " 'contribute toward the safety, administration, or operation of the highway system.' " *O'Brien*, 83 Wash.2d at 882–83, 523 P.2d at 190 (emphasis omitted).
[46] *Automobile Club of Wash. v. City of Seattle*, 55 Wash.2d 161, 168-169 (1959).
[47] *State Highway Comm'n v. O'Brien*, *supra*, 83 Wash.2d at 883.
[48] *Freeman v. Gregoire*, *supra*, 171 Wash. 2d at 330, 256 P.3d at 271 ("Since DOT is statutorily authorized to transfer highway lands, appropriations authorizing a valuation related to such transactions necessarily serve a highway purpose. Unlike the expenditure in Slavin, which was given to third party municipal corporations and directed specifically at financing the planning of a comprehensive mass transit scheme, the appropriation in this case was provided directly to DOT and was a necessary preliminary step in managing the use of highway lands.")

highways.[49] Appropriation of highway funds to help a municipal corporation prepare studies for a public transportation system did not sufficiently benefit the highway system, even if it may have resulted in less transportation issues.[50] An expenditure on the relocation of utilities without prior rights violated the constitutional prohibition because the relocation of such facilities did not benefit the highway system.[51]

It can be difficult to reconcile the outcomes of some of these cases. In almost all of them, indirect benefits to the highway system were arguably present. The distinction is between expenditures that contribute, directly or indirectly, toward the safety, administration or operation of the highway system, and those that use highway funds in furtherance of non-highway purposes. Expenditures on park and ride lots are permissible because the lots enhance safe and efficient highway operations. Expenditures on studies by municipalities to support planning for rail and bus transit systems, on the other hand, are too distantly connected to highway purposes to pass muster.

The constitutionality of using highway funds to develop, operate and maintain fiber optic facilities and wireless facilities in state highways will depend on the usage of those facilities. Highway fund expenditures on such broadband facilities that will be used for highway operations or administration, in other words for WSDOT's needs, should be constitutional. On the other hand, expenditures from the highway fund on, for example, spare conduit that will be made available to the private sector for commercial use would be constitutionally suspect.

It will be important for the state to carefully track cost allocations between broadband facility development for WSDOT's purposes and broadband facility development for commercial use. In the case of fiber optic facilities, if an installation will include conduit with some microducts devoted to WSDOT use and other microducts held available for commercial use, it will be an interesting cost accounting question whether only incremental costs of the spare microducts can be excluded, or whether a proportionate share of all installation costs must be excluded.

III. State Constitutional Limitations on Gifting of State Funds

Art. VIII, Sections 5 and 7 of the Washington State Constitution prohibit gift of public funds:

> **SECTION 5 CREDIT NOT TO BE LOANED.** The credit of the state shall not, in any manner be given or loaned to, or in aid of, any individual, association, company or corporation.
>
> **SECTION 7 CREDIT NOT TO BE LOANED.** No county, city, town or other municipal corporation shall hereafter give any money, or property, or loan its money, or credit to or in aid of any individual, association, company or corporation …

[49] Wash. AGO 2017 No. 1 (Wash. A.G.), 2017 WL 1057454, p. 4.
[50] *State ex rel O'Connell v. Slavin*, *supra*.
[51] *Washington State Highway Commission v. Pacific Northwest Bell Tel. Co.*, 59 Wash. 2d 216, 367 P.2d 605 (Wash. 1961) ("We hold that payment of the cost of relocation of the utility facilities cannot be made from the motor vehicle fund. Such an expenditure would not be 'exclusively for highway purposes.'").

Even though the language of sections 5 and 7 is different, courts interpret them similarly, which means that cases involving local governments may be helpful when analyzing state gift of public funds issues under Article VIII, Section 5.

The purpose of the prohibition is to "prevent [public] funds from being used to benefit private interests where the public interest is not primarily served."[52] In determining whether an expenditure amounts to a gift of state funds, courts utilize a two-step approach. First, they examine (1) whether the expenditure carries out a fundamental purpose of the government and if not, (2) the court focuses on the consideration and donative intent.

If the funds are being expended to carry out a fundamental purpose of the government, then no gift of public funds has been made. A "fundamental purpose of government" applies to core government functions, like protecting the public health, safety and welfare of the state.[53] Furthermore, a violation does not occur when the receiving entity serves wholly public functions. The courts have recognized that this extends to transfers to the federal or state government, counties (including those in another state), state agencies, special purpose districts, and Native American tribes.[54]

However, if an expenditure is not for a "fundamental purpose of government", then the inquiry shifts to the consideration received by the public for the expenditure and the donative intent of the appropriating body.[55] With consideration as the key factor,[56] courts examine the specifics of the transaction to determine what the local government received in return (i.e., "consideration") for its expenditure. It is not a question of whether the local government made a good or bad deal. Rather, the courts assess whether the consideration received is "legally sufficient." The courts do not engage in an in-depth analysis of the adequacy of consideration because doing so interferes with governmental power to contract and would constitute judicial interference with government decision-making.[57]

Although the courts do not generally look at the value of the consideration, grossly inadequate consideration or significant cost to the taxpayers could create an inference of donative intent.[58]

---

[52] *Japan Line, Ltd. v. McCaffree*, 88 Wash.2d 93, 98 (1977).

[53] So, for example, it is not a gift of public funds for police to unlock vehicles at the request of motorists who have locked themselves out — doing so is part of the community caretaking function under *Hudson v. City of Wenatchee*, 94 Wash.App. 990, 974 P.2d 342 (1999). A county did not make a gift of public funds when it provided relocation assistance to a business for flood control purposes under *Citizens Protecting Res. v. Yakima Cty.*, 152 Wash.App. 914, 219 P.3d 730 (2009). Such expenditures are not gifts of public funds because they involve functions that constituents generally expect their local governments to provide. *But see CLEAN v. State*, 130 Wash.2d 782, 798 (holding that the development of a baseball stadium for a major league team is not a "fundamental purpose" of state government).

[54] *Lancey v. King County*, 15 Wash. 9, 45 P. 645 (1896) (holding that King County action to condemn land for a right-of-way for a federal canal project did not violate article 8, section 7 since the federal government is not a private entity).

[55] *Peterson v. State*, 460 P.3d 1080, 1083, 1085 (2020).

[56] *Peterson v. Department of Revenue*, 9 Wash.App.2d 220, 228 (2019) (noting that donative intent is used to scrutinize the sufficiency of consideration, which is the 'key factor').

[57] More recent cases have reviewed the sufficiency of the consideration received by local government. For examples, see *King County v. King County Taxpayers,* 133 Wash.2d 584, 949 P.2d 1260 (1997), finding sufficient consideration for the Seattle Mariners baseball stadium lease, and *CLEAN v. City of Spokane*, 133 Wash.2d 455, 947 P.2d 1169 (1997), upholding city participation in construction and operation of downtown parking garage.

[58] *See Peterson v. State*, *supra*, at 1084.

Furthermore, that a third party benefits is not sufficient to convert a lawful contract into a gift of public funds.[59]

For decades, the state has granted franchises on non-interstate state highways for installation of utilities pursuant to Wash. Rev. Code § 47.44.020, which states in part:

> If the department of transportation deems it to be for the public interest, the franchise may be granted in whole or in part, with or without hearing under such regulations and conditions as the department may prescribe, with or without compensation, but not in excess of the reasonable cost for investigating, handling, and granting the franchise.

Private utility use of state highways without obligation to compensate for the use demonstrates that there is an important public interest served by utilities, negating donative intent.[60] The state serves a vital public interest in high speed broadband communications availability by allowing private companies to utilize excess fiber optic capacity installed on state highways, even if allowed without monetary compensation or with below market compensation. Accordingly, under gift of public funds jurisprudence the state should have considerable latitude in structuring transactions with private companies for use of state highways or use of state-owned middle-mile fiber optic facilities within state highways

IV. WSDOT's Statutory Authority to Enter into Franchises and Airspace Leases

A. General Authority

RCW §47.01.260 sets forth generally the authority of WSDOT. WSDOT can exercise all powers and perform all duties necessary, convenient and incidental to the planning, locating, designing, constructing, improving, repairing, operating and maintaining state highways. In addition, subsection (3) authorizes WSDOT "to acquire property and to construct and maintain any buildings, structures, appurtenances, and facilities necessary or convenient to the health and safety and for the accommodation of persons traveling upon state highways."

In addition, RCW §47.04.047 states that it is the state's "declared policy…*(intentionally omitted)* to assure that the use of rights-of-way of state highways accommodate the deployment of personal wireless service facilities consistent with highway safety and the preservation of the public investment in state highway facilities."

B. Authority Regarding Franchises

RCW 47.44.010 authorizes WSDOT to grant franchises to use state highways for construction and maintenance of, among other utilities, fiber optic lines and conduits. It encourages joint trenching "so that all permittees and franchisees requiring access to ground under the roadway may do so at one time."

---

[59] *Peterson v. State*, *supra*, at 1085.

[60] *See Washington State Highway Commission v. Pacific Northwest Bell Tel. Co.*, *supra*, 59 Wash. 2d at 229 ("The fact that utilities long have been allowed to use state highways at no expense clearly demonstrates that the public is vitally interested in the important function they perform in the economy of the state." (dissenting opinion))

As previously stated, WSDOT may grant the franchise with or without compensation, but any compensation it charges cannot be "in excess of the reasonable cost for investigating, handling, and granting the franchise."[61] WAC §468-34-020 requires that the franchise applicant pay the reasonable cost to WSDOT (1) for investigating, handling and granting the franchise or permit, including fees of hearing officers and reporters, and basic overhead charges, and (2) for providing an inspector during construction and/or maintenance of the utility facility.

C. Statutory Policy Regarding Broadband Facilities

It is the declared policy of the state to promote collaboration with broadband facility owners and to accommodate broadband facilities in limited access highways, consistent with highway safety and preservation of highway assets.

> (3) It is, therefore, the declared policy of this state to limit access to the highway facilities of this state in the interest of highway safety and for the preservation of the investment of the public in such facilities, and to ensure that the use of rights-of-way of limited access facilities accommodate the deployment of broadband facilities consistent with these interests. In furtherance of this policy, the department is directed to adopt and maintain an agency policy that requires the department to proactively provide broadband facility owners with information about planned limited access highway projects to enable collaboration between broadband facility owners and the department to identify opportunities for the installation of broadband facilities during the appropriate phase of these projects when such opportunities exist. Coordination between the department and broadband facility owners under this section must comply with applicable state and federal law including, but not limited to, chapter 47.44 RCW and RCW 47.04.045.[62]

The state has an important new statute reflecting and expanding upon this state policy.[63] It states:

> (1) The department is directed to adopt and maintain an agency policy that requires the department to proactively provide broadband facility owners with information about planned state highway projects to enable collaboration between broadband facility owners and the department to identify opportunities for the installation of broadband facilities during the appropriate phase of these projects when such opportunities exist.
>
> (2) If no owners are ready or able to participate in coordination of the installation of broadband infrastructure concurrently with state highway projects, the department may enlist its contractors to install broadband conduit as part of road construction projects in order to directly benefit the transportation system and motor vehicle users by:

---

[61] RCW 47.44.020.
[62] RCW 47.52.001.
[63] RCW 47.44.160, enacted in ESHB 1457 (July 25, 2021).

> (a) Reducing future traffic impacts to the traveling public on the roadway;
>
> (b) Supporting the vehicle miles traveled reduction and congestion management goals of the state by allowing for more telework; or
>
> (c) Proactively preparing the transportation system for the widespread development and use of autonomous vehicles.
>
> (3) Broadband facility owners must first obtain a franchise granted by the department pursuant to RCW 47.44.010 and 47.44.020 before installing broadband facilities within the department's conduit. The costs for installation and maintenance of such broadband facilities shall be the responsibility of the broadband facility owner. The department may adopt rules establishing a fee schedule for occupancy of broadband facilities within the department's conduit consistent with federal law.
>
> (4) As used in this section:
>
> (a) "Broadband conduit" means a conduit used to support broadband infrastructure, including fiber optic cables.
>
> (b) "Broadband infrastructure" has the same meaning as in RCW 43.330.530.[64]

Subsection (3) may be a source of confusion regarding permissible compensation to the state. In specifying a franchise pursuant to RCW 47.44.010 and 47.44.020, the legislature may have intended to limit the compensation for use of WSDOT's conduit to WSDOT's reasonable cost for investigating, handling, and granting the franchise. But the franchise statutes are only directed at use of state highway right of way; they do not appear to cover use of WSDOT's own improvements and facilities. An amendment to RCW 47.44.160 may be beneficial in order to clarify the legislature's intent.

D. Authority Regarding Airspace Leases

RCW §47.12.120, titled "Lease of unused highway land or air space," specifically provides WSDOT with the legal authority to "rent or lease any lands, improvements, or air space above or below any lands that are held for highway purposes but are not presently needed." It further states that the lease must be upon such terms and conditions as WSDOT may determine and comply with zoning ordinances of political subdivisions of government.

The ROW Manual lists 17 different types of leases used by WSDOT and airspace lease is one of them. An airspace lease is used when tenancy lies within the right of way lines of the constructed facility. "Airspace" is defined as "the space above, at, and below the gradeline of all completed highways, as well as the area alongside the travelled way, which could include any proposal to lease property that straddles the right of way line."

---

[64] "Broadband infrastructure means networks of telecommunications equipment and technology for providing high speed internet and other advanced telecommunications services at speeds of at least 25 megabits per second download and three megabits per second upload. See RCW 43.330.530 (2) and (3).

1. Non-Highway Use of Airspace

WAC §468-30-110 addresses statutory requirements for non-highway use of airspace on state highways. Any use of such space is subject to approval of the FHWA and will not be allowed if such use subjects the highway facility or the public to undue risk or impairs the use of the facility for highway purposes. WSDOT is given broad discretion in granting such use and in stipulating terms and conditions WSDOT deems proper in addition to the terms and conditions set forth in WAC §468-30-110. WAC §468-30-110 may have to be updated to take into account the policy and terms in the new RCW 47.44.160.

The ROW Manual states that all real property, including airspace, within the right of way boundaries of a project must be devoted exclusively to public highway purposes. However, the ROW Manual permits exceptions to such general rule by referencing 23 C.F.R. 1.23(c) which states "Temporary or permanent occupancy or use of right of way for nonhighway purposes, or reservation of subsurface mineral rights, may be approved if it is determined that it is in the public interest and that it will not impair the highway or interfere with the free and safe flow of traffic." Like WAC §468-30-110, the ROW Manual may have to be updated for purposes of implementing RCW §47.44.160.

2. Economic or Market Rent for All Airspace Leases

WAC §468-30-110 addresses the consideration for occupancy of the airspace, which depends on the use of such airspace. If the airspace can be developed and used as an entity, the consideration will be economic rent. If the use is in conjunction with an abutting tract, rent will be based on its contribution value to the abutting property but not less than economic rent. Lastly, if the use constitutes a highway purpose, the rent may be offset in part or in whole with other valuable considerations as determined by WSDOT.

The ROW Manual states that all leases must be based on economic or market rent or consideration equivalent to economic or market rent. There are three approved ways to determine the rental rate of WSDOT property:

(a) Appraisal – this is required on all leases that have an annual total rent of $25,000 or more;

(b) Value memo – a value memo is acceptable for all rental rate determinations under $25,000/year for rent; and

(c) Formula method – this is used on properties expected to bring in less than $10,000/year in rent and is based on tax assessed values of abutting properties. [65]

[65] WSDOT Right of Way Manual, M 26-01.25, p. 11-51, 11-52 (Sept. 2020). The ROW Manual states that non-payment of rent, except in the instances of consideration in lieu of economic/market rent, is considered illegally gifting an asset of the Motor Vehicle Fund. However, there are exceptions and one such exception is when property is leased for a "highway purpose" or when the economic rent can be justifiably offset by benefits to the motoring public which equal rent value and is so documented. As discussed in this memo, this statement has merit regarding the constitutional limitation on use of highway funds, but it is questionable regarding the constitutional limit on gifting of public funds, which is more flexible than indicated in the ROW Manual.

To the extent that economic or market rent for airspace leasing for telecommunications facilities exceeds recovery of the state's reasonable costs, it is probably preempted by Sections 253 and 332(c)(7), as interpreted by the FCC, as discussed in Part I.D of this memo.

RCW §47.12.125 requires that all moneys paid to the state of Washington under any of the provisions of RCW §47.12.120 (Lease of unused highway land or air space) be deposited in WSDOT's advance right-of-way revolving fund, except moneys that are subject to federal aid reimbursement and moneys received from rental of capital facilities properties, which shall be deposited in the motor vehicle fund.

3. Wireless Lease

WSDOT only requires permits for utility installations in highway rights of way, rather than more expensive leases for non-utility uses. Washington law classifies communications companies that use macro cells and micro cells as personal wireless providers rather than utilities and therefore treats their facilities as subject to 23 CFR Part 710, which concerns right of way and real property, rather than 23 CFR Part 645, which concerns utilities. 23 CFR §710.403 requires that all non-highway use must be charged fair market rent. WSDOT also treats back haul fiber that serves a wireless facility as part of the cell rather than a utility.[66]

RCW 47.12.120 and RCW 47.04.045 address WSDOT's statutory authority over wireless leases. The cost of the lease should be limited to the fair market value of the portion of the right of way being used by the wireless service provider and the direct administrative expenses incurred by WSDOT in processing the application.

WSDOT has used a rate calculator to determine fair market rent. The calculator takes into account factors such as tower height, the amount of equipment to be installed, property value and traffic density at the location. While WSDOT has used appraisals in a few parts of the state such as very expensive locations, it typically avoids appraisals due to cost and time needed. However, if parties cannot agree on fair market rent, WSDOT will use a third party appraisal.[67]

WSDOT has used several options for meeting the fair market rent requirement. Providers sometimes provide WSDOT with shared use of the wireless site, in which case WSDOT credits the value of this use toward the lease fee.[68]

All lease money paid to WSDOT must be deposited in the motor vehicle fund. As with airspace leases, WSDOT has broad authority to adopt rules to implement wireless leases under RCW §47.04.045.

The ROW Manual discusses three primary leases used in wireless leasing:

a) Wireless lease with attachments – Permits the tenant to install equipment inside WSDOT's equipment shelter and attach to WSDOT's tower;

---

[66] NCHRP, Legal Issues Concerning the Use of Transportation Facilities to Generate Revenue for State DOTs, *supra*, at pp. 34, 39.
[67] Id, at p. 34.
[68] Id.

b) Wireless ground lease – Permits the tenant to request space on a utility pole/light standard located on WSDOT-owned property; and

c) Wireless lease for utility pole attachment - Permits the tenant to request space on a utility pole/light standard located on WSDOT-owned property.[69]

The requirement to pay fair market rent for wireless facilities in state right of way, plus application processing costs, may violate the FCC's rulings in the *Small Cell Order* on allowable compensation. The rate calculator, which factors in tower height, the amount of equipment to be installed, property value, and traffic density at the location, does not seem to be a reasonable approximation of WSDOT's actual and direct costs related to accommodating wireless facilities.

V. Requirements of WSDOT Utility Accommodation

Generally, utilities must obtain written approval from WSDOT prior to occupation by any materials, equipment, or personnel within the operating highway right of way.

The Utility Policy applies to all franchises and permits issued subject to RCW §47.44 (Franchises on State Highways) including §47.44.160 (Broadband facilities and infrastructure – collaboration). The Utility Policy defines "Franchise" as "occupancy and use document required for longitudinal occupancy of highway rights of way in accordance with chapter 47.44 RCW." The Utility Policy is consistent with AASHTO policy guidelines on accommodating utilities within highway/freeway rights of way, state laws and regulations and federal policies and procedures. The Utility Policy prescribes the means by which utility installations may be accommodated without adversely affecting highway operations and safety, precluding future highway improvements or negatively impacting visual quality of the highway. The Utility Policy adopts Utilities Manual Chapters 1 (Utility Accommodation) and 9 (Control Zone Guidelines).

The Utility Policy imposes certain requirements such as the location of longitudinal installations (on a uniform alignment and grade as near as practicable to the right of way line), the type of construction (single pole construction), and other requirements such as National Electrical Safety Code.

The Utilities Manual also sets forth certain requirements relating to utility accommodation. It states that franchise duration should not exceed 25 years (even though RCW 44.44.020 allows up to 50 years) and franchise renewal is required prior to the franchise expiration date for the franchise to remain valid.

VI. Reconciling Franchise and Leasing Statutes

WSDOT's authority to enter into airspace leases covers WSDOT lands and improvements and enables a wide variety of uses, so long as compatible with highway operations and safety. The broadband franchise statute, RCW 47.44.160, is narrower, focusing only on use of spare WSDOT conduit that is installed concurrently with planned WSDOT highway projects.

While WSDOT's airspace leasing authority includes authority to lease out its own improvements, in the case of WSDOT's own fiber optic broadband facilities it appears that RCW 47.44.160 may

[69] WSDOT Right of Way Manual, *supra*, at p. 11-47.

supersede, as it specifies the use of a franchise for installations within WSDOT's conduit. However, whether the legislature actually intended to preclude airspace leasing in these specific circumstances is not entirely clear.

Could RCW 47.44.160(3) be construed to apply to any spare WSDOT conduit, not just conduit installed in conjunction with a WSDOT highway project? The statement of legislative intent in the bill adopting the section declares intent of "maximizing the use of rights-of-way during construction or repair of transportation systems" and "proactively facilitating installation and improvement of [broadband] infrastructure during state road construction projects …" It is therefore likely that the franchise requirement in RCW 47.44.160(3) only applies to WSDOT-owned spare conduit installed in conjunction with a WSDOT highway project. Private sector use of other WSDOT spare conduit and fiber capacity probably would not be governed by RCW 47.44.160.

Accordingly, WSDOT should be able to use its airspace leasing authority to solicit transactions for private parties to install their own broadband facilities in state highways, whether or not in conjunction with a WSDOT highway project. The lone exception may be a franchise, rather than a lease, in the specific circumstances covered by RCW 47.44.160.

There are important differences between franchises and airspace leases. A franchise granted under RCW 47.44.010 subjects the franchisee to removal of its facilities when necessary for highway improvements, without compensation except where the state receives proportionate federal reimbursement.[70] An airspace lease grants a leasehold estate, and removal of lessee's improvements typically would require compensation for termination of the leasehold and relocation of the facilities. An airspace lease also can encompass facilities other than the utility facilities for which franchises are granted. Franchises are limited to 50 years, and no exclusive franchise may be granted.[71] There is no statutory limit on the term of airspace leases. In addition, franchises and their statutory limitations do not apply to leases for deploying wireless facilities.[72]

FWK/FWK

[70] *Id*; RCW 47.44.030.
[71] RCW 47.44.020.
[72] RCW 47.44.081.

Appendix 1

SEC. 253. REMOVAL OF BARRIERS TO ENTRY

(a) IN GENERAL- No State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.

(b) STATE REGULATORY AUTHORITY- Nothing in this section shall affect the ability of a State to impose, on a competitively neutral basis and consistent with section 254, requirements necessary to preserve and advance universal service, protect the public safety and welfare, ensure the continued quality of telecommunications services, and safeguard the rights of consumers.

(c) STATE AND LOCAL GOVERNMENT AUTHORITY- Nothing in this section affects the authority of a State or local government to manage the public rights-of-way or to require fair and reasonable compensation from telecommunications providers, on a competitively neutral and nondiscriminatory basis, for use of public rights-of-way on a nondiscriminatory basis, if the compensation required is publicly disclosed by such government.

(d) PREEMPTION- If, after notice and an opportunity for public comment, the Commission determines that a State or local government has permitted or imposed any statute, regulation, or legal requirement that violates subsection (a) or (b), the Commission shall preempt the enforcement of such statute, regulation, or legal requirement to the extent necessary to correct such violation or inconsistency.

SEC. 332. MOBILE SERVICES

(c) REGULATORY TREATMENT OF MOBILE SERVICES

(7) PRESERVATION OF LOCAL ZONING AUTHORITY-

(A) GENERAL AUTHORITY- Except as provided in this paragraph, nothing in this Act shall limit or affect the authority of a State or local government or instrumentality thereof over decisions regarding the placement, construction, and modification of personal wireless service facilities.

(B) LIMITATIONS-

(i) The regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof--

(I) shall not unreasonably discriminate among providers of functionally equivalent services; and

(II) shall not prohibit or have the effect of prohibiting the provision of personal wireless services.

(ii) A State or local government or instrumentality thereof shall act on any request for authorization to place, construct, or modify personal wireless service facilities within a reasonable period of time after the request is duly filed with such government or instrumentality, taking into account the nature and scope of such request.

(iii) Any decision by a State or local government or instrumentality thereof to deny a request to place, construct, or modify personal wireless service facilities shall be in writing and supported by substantial evidence contained in a written record.

(iv) No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions.

(v) Any person adversely affected by any final action or failure to act by a State or local government or any instrumentality thereof that is inconsistent with this subparagraph may, within 30 days after such action or failure to act, commence an action in any court of competent jurisdiction. The court shall hear and decide such action on an expedited basis. Any person adversely affected by an act or failure to act by a State or local government or any instrumentality thereof that is inconsistent with clause (iv) may petition the Commission for relief.

Appendix 3

Summary of Select State Build Once/Dig Once Policies

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
Policy Overview	Policy requires coordination and collaboration with internet service providers (ISPs) and utilities to install conduit for future use	Policy requires a competitive process which allows providers to install infrastructure when the ROW is open for utility work State promotes broadband conduit coordination between DOT and private entities	Policy requires coordination and collaboration between DOT and ISPs The DOT issues public bidding notices citing the need for conduit or cable	Policy requires DOT to play facilitator role for cooperative fiber and conduit trades with broadband service providers
Key Priorities of Policy	Interoperability and reduction of capital costs for telecom infrastructure	Accelerating broadband infrastructure throughout the state	Reducing cost	Broadband deployment and advancement of ITS initiatives in the State
Policy Scope	Sharing of highway ROW for monetary or in-kind compensation	Promote coordination between the DOT and private entities for the planning, relocation, installation, or improvement of broadband conduit with the ROW	Sharing of highway ROW to install fiber in new state-funded construction project that includes trenching. The State has successfully combined water and broadband	Facilitate cooperative fiber and conduit trades with broadband service providers

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
			projects to reduce costs	
O&M of Broadband Network	Private entity installs and maintains the conduit(s)	State provides maintenance and operations (e.g., Dakota County)	DOT may permit a third party to manage the fiber and conduit leasing	Varies between DOT and telecoms
Resource Sharing Policy Exist?	Yes	Yes	n/a	Yes
Joint-trench Agreement Exist	n/a (information not available)	Yes	Yes	n/a (information not available)
Policy Require the Use of Trenchless Technology?	Yes (horizontal directional drilling)	No	No	n/a (information not available)
Key Takeaways	Encourage the use of trenchless technologies If the conduit is installed and owned by a private entity, leasing rates remain competitive	Effectively communicate policies, including development and dissemination of best practices and model policies to state agencies and other stakeholders	Uniform ROW application processes can simplify filings and substantially reduce time and costs both for local governments and for communicati on carriers	ROW is open at all times, allowing for easy access to complete continuous build-outs, and ensuring that no single company has exclusive access

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
Summary	Maryland DOT coordinates with ISPs and local utilities to install conduit for future use and provides ROW access without charge to certain entities (until 2020). Through resource sharing, the State has been able to achieve interoperability and reduce capital costs for broadband infrastructure	The State promotes broadband conduit coordination between the DOT and private entities, connects broadband infrastructure to ITS and co-locates fiber / conduit in the same trench with other utilities. The policy includes a competitive process which allows service providers to install infrastructure when the ROW is open for utility work	The Illinois DOT currently employs a policy to collaborate with ISPs and to install fiber in new state-funded construction projects that includes trenching. This policy states that the Department of Central Management Services shall collaborate to install fiber-optic network conduit where it does not already exist in every new state-funded construction project that opens state-owned roadways	Utah DOT has facilitated cooperative fiber and conduit trades with broadband service providers to expand its communications network across the state without major capital investment. Utah DOT's approach to deploying broadband has also advanced ITS initiatives in the state, as well as promoted economic growth by enabling access to broadband in both urban and rural areas. Regional Broadband Planning councils were created to develop strategic plans to address local needs and provided recommendations
Approach to Policy and Practices	The Dig Once policy calls for the DOT to enter into an agreement with private service providers to install and maintain their conduits for future use. The policy	During the 2013 session, the legislature created the Office of Broadband Development (OBD) within the Minnesota	The policy requires Illinois DOT and ISPs to collaborate to install fiber in new state-funded construction	Utah DOT's approach to Dig Once policy is to install empty conduit(s) along major routes and provide access to the state ROW to service providers for broadband build-outs.

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
	requires sharing of the state ROW for monetary or in-kind compensation that may include communications or Information Technology (IT) equipment provided to Maryland State Highway Administration (MSHA) or exclusive allocation of fiber optic cables to MSHA	Department of Employment and Economic Development (DEED). For the purposes of coordination of broadband infrastructure development, the OBD is required to collaborate with the DOT and private entities to encourage and coordinate broadband efforts for the planning, relocation, installation, or improvement of broadband conduit within the ROW in conjunction with any current or planned construction, including, but not limited to, trunk highways and bridges projects. Additionally, the OBD is responsible for encouraging and assisting local units of government to adopt and implement similar policies	which includes trenching. The DOT issues public bidding notices explicitly citing the need for conduit or cable. The State has also successfully combined water and broadband projects to reduce costs of implementin g broadband network	The policy allows Utah DOT to enter into fiber trades with service providers. The Telecommunications Advisory Council reviews and approves trades and valuations, and coordinates potential issues relating to deployment of broadband networks. Additionally, the DOT has developed a single point of contract for all broadband projects and the DOT representative meets with service providers every 2 months about broadband projects. The DOT has developed a database of fiber and conduit locations, plans for economic development, contact information and web links are available online to provide the service providers with information about the area they are servicing. Utah DOT installs conduit for its own network and allows private companies to use excess state-owned conduit in exchange for the use of company-owned conduit in areas where the state does

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
				not have broadband infrastructure. Utah DOT trades existing or planned fiber / conduit / circuit on a foot by foot basis for 30 years with automatic 5-year renewals. Ownership and maintenance of fiber varies between DOT and service providers. This approach has resulted in large cost savings since the DOT was able to expand its broadband network without major investment
Key Benefits of Policy	Through resource sharing, the DOT has been able to achieve interoperability and reduce capital costs for broadband infrastructure. Additionally, sharing of highway ROW for either monetary or in-kind compensation has allowed the DOT to improve its communication and/or transportation system.	The state's broadband infrastructure development and coordination efforts have resulted in effective implementation of broadband Dig Once policies, communications , and coordination for state highway projects. Based on information reviewed, these efforts appear to be successful and of continuing importance in implementing	All levels of government work collaboratively with service providers for installation of fiber-optic network across the state. All parties benefit through efficiencies gained and reduction in project costs resulted from reduced time for installation of fiber, towers and related	Through frequent meetings with telecoms, creating open ROW, extensive information sharing and trading assets with telecoms, the state has doubled its broadband network, which now includes 900 miles of conduit owned by the DOT and about 1,000 miles obtained through trades.2 Utah DOT has indicated an estimated cost savings of 15.5% per mile when conduit and fiber are installed at the time a road is being constructed versus installing the

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
		Minnesota's statutory goal of accelerating broadband infrastructure throughout the state. Additionally, the OBD believes that the policy has a potential to save millions of dollars for the state.	infrastructure .	conduit and fiber at a later time.
ROW Valuing Method	The method for determining fair market value or renting of the state ROW varies on a case-by-case basis; however, fiber exchanged for use of ROW typically has worked best for the DOT. Fees charged for the use of state ROW vary upon the specific proposal received and are negotiated with the service providers based on the location and the state's existing or future needs along the proposed route. Since 1994, Maryland has executed 23 agreements with private companies (Verizon, Nextel, AT&T) for sharing the state ROW for monetary or in-kind compensation	Minnesota DOT accommodates private sector fiber on the interstate ROW through a barter arrangement by a Minnesota bandwidth expansion project, Connect Minnesota. The state does not have any direct fees; however, it uses offsetting reciprocal agreements to accommodate yearly maintenance costs. Barter values are based on initial capital costs which considers the conduit size, number of fibers, and distance.	Illinois charges fair market value of a lease for the use of interstate ROW for fiber optic cables. An annual fee is charged based on the current fair market value of a lease for the land, as such, fees are typically higher in urban areas and lower in rural areas. Presently, there are no charges for use of other state highway ROW.	Utah allows installation of fiber on interstates and service providers are required to pay fees for the use of intestate ROW. The fee amount varies (state law) as it is based on the value of the adjoining properties or area properties and the type of conduit. Utah has a preference to accept "in-kind" compensation.

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
	(communications or IT equipment provided to MSHA).			
Lessons Learned	— Encourage the use of trenchless technologies — Promote the installation of spare fiber and/or empty conduit where feasible — Ensure the resale of network capacity at reasonable and nondiscriminatory rates for broadband infrastructure projects in the state ROW — Identify environmentally-sensitive areas early in the process	— Promote and communicate Dig Once policies, including development and dissemination of best practices and model policies to state and local agencies and other stakeholders — Verify that agencies with construction oversight, construction funding, and land stewardship	— Encourage Dig Once ordinances based on uniform standards and processes for fiber conduit installation — Uniform ROW application process can simplify filings and substantially reduce time and	— Cooperative planning with service providers — ROW is open at all times, allowing for easy access to complete continuous build-outs, and ensuring that no single company has exclusive access — Extensive mapping of fiber locations — DOT can enter into fiber trades with service providers

Benchmark Summary: State DOTs Policies	Maryland DOT	Minnesota DOT	Illinois DOT	Utah DOT
		responsibilities lead by example in implementing "Dig Once" policies which encourage broadband competition and deployment, including planning, joint use, construction and notification	costs for developers — Work with local government agencies to develop and manage a training for efficient roll out of Dig Once policy	

State Benchmarking of ROW Admin, Formula and Pricing Methods

State	Administration	Formula	ROW Encroachment Pricing Methodologies
Wisconsin	— WisDOT's Division of Transportation System Development (DTSD) Region offices responds to questions on use of highway lands and projects dependent on location divided into five regions with 9 offices and 1 complex: North Central (2 offices), Northeast (1 office), Northwest (2 offices), Southeast (1 office), Southwest (3 offices, 1 complex). — Form DT1553 "Application/Permit to Construct and Operate Utility Facilities on Highway Right-of-Way" are processed in appropriate District office, this includes review of drawings, installation requirements, and ongoing maintenance	10k (≤ 100,000 AADT2) or $12k (> 100,000 AADT) x miles + 20% per duct per mile (each duct over two)	— One-time annual occupancy fee based on annual average daily traffic count, number of miles and 20% per duct per mile (each duct over two)
New York	— The New York City Charter assigns New York City Department of Information Technology and Telecommunications (DOITT) to be the authority in administering all franchises and revocable consents relating to telecommunications, which broadband initiatives fall under	— NYDOT charges permitting fees as well as annual fees based on encroachment type, strand count, and population density (3 tiers). The annual fees based on the criteria listed are as follows:	— Annual usage fee based on population density (three tiers) — Additional multiplier for per-strand charge above 288

	— DOITT authority includes oversight of private companies' use of public rights-of-way for broadband	— Tier 1: $3.98 (per ft and per cable) — Tier 2: $2.12 (per ft and per cable) — Tier 3: $.58 (per ft and per cable) — There is a multiplier that applies to each tier for each additional fiber cable exceeding 288 strands	
Utah	— UDOT reviews traditional encroachment applications for Statewide Utility License Agreement which allows developers to apply for encroachment permits for specific projects — Developers interested in partnering with UDOT meet directly with Lynne Yocom, UDOT Fiber Optics Manager, to discuss partnership potential and shepherd the process. — There are four region permit offices that report to individual permit engineers and staff level inspection professionals (3 per region), who are also responsible for other permitting requests	— Annual compensation rate per zone ($/mile) x # of miles accessed — Annual compensation rate per zone ($/mile) = zonal land value ($/mile) x rate of return on value of land (currently 10%)	— Interstates -Per mile pricing — State ROW -In-kind and/or monetary compensation
Maryland	Developers must first submit a utility permit application to construct transmission lines under or near a state highway.	— Company Using State Property to	— Land value per square footage, required rate of

	This application should include route maps, sharing agreements with MDOT, or monetary compensation agreements. The Developer's proposal is reviewed at the district office level with either a District Level Engineer or Designee, is added into the database of existing projects, and then begins an iterative process of commenting and resubmittal until a permit is eventually issued or denied.	Install its Own Fiber — Across the Fence: Land Value of ROW x length of area x width of area x rate of return x alienation factor x use factor — Tunnels and Bridges (Premium): Fiber = $3.75 x (# Strands/200) x Linear feet, Empty Conduit = # of conduits x Linear feet x $3.75	return, alienation and use factors — Premium for bridges and tunnels — Separate structure for state-owned Dark Fiber
Tennessee	— TDOT begins their encroachment process by conducting a preliminary review of the project in conjunction with the developer — Following the submission of a complete application, the Regional Utilities Engineer, Regional Engineering Director, State Utilities Engineer, State Transportation Engineer assess the application materials and receive a surety bond — Upon approval, the developer is notified of acceptance and the District Maintenance Engineer inspects and monitors installation progress. Surety bond released upon	— Annual per mile rate per 1 ¼ inch innerduct or equivalent ($1,500 for Urban, $1,000 for Suburban, or $500 for Rural) x # of miles accessed — Clear Zone Rate = $4,000 x # of miles of trench	— Per mile pricing — 3 categories with varying rates based on population — Consent needed to transfer rights

	determination of compliance.		
Georgia	— GUPS permit application is submitted by the utility on the GUPS website — Permit is reviewed at the District Office level and State Utilities Office; if no changes, it goes to District Utilities Engineer (DUE) for final approval — GUPS will send automatic e-mail with instructions for contacting Area Permit Inspector (API) who will provide a questionnaire — Upon questionnaire completion, API release permit back to utility for End User License Agreement review — If utility agrees to all requirements and provisions the permit approval is complete	— GDOT charges annual permit fees as well as a $100 processing fee — Charges $0.50 per linear foot of communication cables for communications services	— Annual fees are assessed exclusively on longitudinal easements and is applied on both state and local roads — Additional permit processing fee applied
Pennsylvania	— Developer usually required to obtain State Highway Occupancy Permit before beginning work on state highway ROW — The District Permit Offices are responsible for review and approval of permit applications for non-limited access highways and coordinate with other District functions to avoid other	— $55 per application for ROW access — $40 per opening in pavement (per 100 feet), $20 per opening in shoulder (per 100 feet), $10 per opening outside of pavement and shoulder (per 100 feet)	— Fixed application fees for proposal review by department — Digging fee for opening pavement per 100 feet (variable based on location of opening)

	highway improvement conflicts		
New Jersey	— Highway Occupancy Permits and Applications for Utility Openings are required for construction of transmission, fiber-optic, or electric conduit — Right of way plans and documentation are submitted to the Project Coordination Unit and subsequently transmitted to applicable District Offices — The NJDOT Permit offices reviews these plans for technical and administrative completeness and subsequently determines whether these plans are acceptable for permit delivery	— Permit application fee of $300-$600 is applied — Additional access fees are not charged	— Permit fee $300-$600 — No additional fee
Florida	— FDOT Office of ROW is subdivided into seven (7) geographical districts with responsibility for the transportation facilities within their designated counties — FDOT will issue permits for the construction, alteration, operation, relocation, removal, and maintenance of utilities upon the ROW in conformity with the FDOT Utility Accommodation Manual (UAM)3	— Based on FMV — Exact formula not specified	— Allows for "a just, reasonable, and nondiscriminatory fee for placement of the facilities… based on the FMV of space used by comparable communications facilities in the state."

	— When a Utility Permit application complies with all requirements in the UAM and the utility work does not unreasonably interfere with the safety, operation, maintenance, future improvement, or expansion of the transportation facility, a Utility Permit must be approved by the Local Permit Office		
Colorado	— CDOT ITS Department reviews unsolicited applications for broadband fiber ROW use — Fiber Management Team then reviews application if accepted by ITS and votes if they should approve the agreement as a P3 and sign an MSA — If approved and signed as an MSA, broader discussions surrounding in-kind contributions and future work are held	— Fees are not charged	— Limited ROW Fees — In-Kind contributions in lieu of ROW fees
Virginia	— Regional Land Use Departments review permitting requests (150 Land Use Staff across staff divided into 5 regions, 9 districts) –no exclusive broadband staff — Request is then reviewed by Operations and Traffic Engineering, Residencies, Bridge Divisions, the P3 Office, and the ROW Division	— No usage fees for non-limited access ROW, free permit — Land acquisition ROW value appraised via over-the-fence valuation, plus a convenience factor and permitting fee (~$10/100ft installation)	— C/A –across-the-fence appraisal plus in-kind contribution — Non-Limited Access –No fees assessed

	— Revenue Sharing Request is handled by Central Office — Governor's Broadband Advisor may be consulted if necessary	— Distinct from phone and cable providers, who are required to pay fixed multiplier per access line	
Texas	There are 25 regional offices that handle ROW permitting in the state, with slightly different rules for each. Generally, a developer must submit a region-specific Utility Installation Review to begin the process. This submittal is then reviewed by area engineers, permit coordinators, and maintenance administrators. After review for safety and construction conflicts, the permit is provided and the developer may begin construction.	— No usage fees for broadband-only providers	— No ROW easement fees
Ohio	— Each district office is responsible for the review of E-Permit application, plan, and supplemental requirements — Managed differently in each district, involves Permit Technician, Area Engineer, ROW Engineer — There are 12 ROW Districts in Ohio with between one and three dedicated staff per district — Controlled Access ROW exception requests are managed by the Central office. No set process exists for review.	— Fees are not charged	— N/A –No permitting in C/A

South Carolina	— SCDOT uses an automated Encroachment Permit Processing System to accept, process, manage permit requests and issue the permits. — Utility permit is routed to the county level, where it is reviewed by permitting staff — If interstate request, county would forward the request to the central office and coordinate with FHWA	— Fees are not charged	— SC does not charge for ROW easements.