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Good morning, Madam Chairwomen Phillips-Hill and Snyder, Honorable Members of the Broadband Caucus, I appreciate the opportunity to speak with you today regarding rural broadband deployment in the Commonwealth of Pennsylvania. I would like to thank this Caucus for focusing their attention on this urgent topic as this is an issue that affects your constituents and many Pennsylvanians. Prior to my work with the Commission, I spent most of my legal career representing and advising many telecommunication utilities and companies through the seismic technological changes of the 1970s, 80s, 90s and into the new millennium. I was personally involved in drafting Pennsylvania's original Chapter 30, which set out the initial internet service provisions for the Commonwealth. Working with Senator Corman and other members of the General Assembly in 1993, we laid the foundation for a modern broadband network and regulatory scheme and then updated it in 2009.

As I reflect on my career, I have had the privilege to participate in several transformational moments, including the advent of the cable industry, the rise of wireless technologies and the development of Chapter 30. In my opinion, we stand at a similar transformational moment. Internet and broadband services have transformed and will continue to radically transform our lives- with business, education, medicine, culture, entertainment, civic engagement, entrepreneurship, and more. This morning, I hope to share some thoughts and observations with you gleaned from my experience and current work with the Commission, to assist you in creating policies designed to ensure high-speed internet services are available to all Pennsylvanians, regardless of where they live and work.

Need for Rural Broadband

All facets of our modern work are closely tied to the internet and there is no debate that broadband is needed to provide a host of societal benefits, including, but not limited to benefits related to: economic development, telemedicine, business investment, employment, health, education, civic engagement, technology, entertainment, and property values. There is also no question that high speed internet has been transformational to just about everything. Broadband provides the capability to originate and receive high-quality voice, data, graphics, and video telecommunications. Broadband is no longer a want; it is a need.

I'd like to share with you a very recent (August 2018) study that quantifies the real benefits and value of broadband deployment. In this study, researchers from Purdue University examined the economic impact that fully-available rural broadband could have in the state of Indiana.¹ Their report found that rural broadband has substantial societal benefits, including: reducing medical costs, improving education for children and workers, leading to improved median household incomes and driving down unemployment, stimulating economic growth in communities, saving consumers money with better shopping opportunities, and providing increased farm revenue. The report estimates the quantifiable impact of the benefits of rural broadband, if implemented fully across the state of Indiana, to be \$12 billion. I don't want to overstate or distort these findings, BUT...I would note that Pennsylvania has approximately double the population

¹ Alison Grant, Wallace E. Tyner, and Larry DaBoer, *Estimation of the Net Benefits of Indiana Statewide Adoption of Rural Broadband*, Center for Regional Development, Purdue University (August 2018)

of the state of Indiana, with similar current rural broadband availability. I believe Pennsylvania would enjoy the same benefits as Indiana in better healthcare, education, economic growth, farming income, lower unemployment, entrepreneurial opportunities, and more. If those benefits are realized here, and I'm sure you all share the optimism that I have that they would, then the monetary benefit of full rural broadband in the Commonwealth would perhaps be much larger, perhaps even close to \$24 billion.

Demand for Broadband

According to the FCC's most recent data,² 65% of Pennsylvanians subscribe to or "take" service from a 10 Mbps down and 1 Mbps up speed (10/1 speed) fixed carrier; 59.5% of Pennsylvanians take service from a 25/3 speed fixed carrier; and 47.1% of Pennsylvanians take service from a 50 Mbps down and 5 Mbps up speed (50/5 speed) fixed carrier. These "take rates" are approximately equal to or higher than the national averages. Based on this data, the demand for broadband in Pennsylvania is clear.

A recent Pew Research study reveals that internet use is actually trending up across all demographic groups in the entire Nation.³ More specifically, this study shows that only about 11% of all adult Americans currently do not use the internet, as compared to 48% of adult Americans in 2000.⁴ Interestingly, this study reveals that groups like senior citizens, age 65 and older, are part of this trend – with 14% of seniors using the internet

² Federal Communications Commission, *2018 Broadband Deployment Report*, GN Docket No. 17-199, Adopted and Released on February 2, 2018; available at <https://docs.fcc.gov/public/attachments/FCC-18-10A1.pdf>; ("FCC 2018 Broadband Report")

³ Pew Research, March 5, 2018, *11% of Americans don't use the Internet. Who are they?*

⁴ However, the Pew study also noted that for the rural population, this percentage is higher, with 22% of adult Americans currently not using the internet.

in 2000 as compared to 66% of seniors currently going on-line. This data is indicative that our society is driven by the internet and that all demographic and age groups are using the internet more and more.

Who Has Access to Broadband?

The term “broadband” may vary, but the Federal Communications Commission, or FCC, in its most recent broadband progress report from 2018 considers broadband to require a minimum speed of 25 Mbps down and 3 Mbps up (25/3 speed).⁵ At this speed, broadband is sufficient to stream high definition video, and has earned the unofficial moniker of “Netflix speed.” By the FCC’s most recent estimate (2018), over 12 million or 94.9% of Pennsylvanians have access to broadband from a fixed carrier at this 25/3 speed. Wireless speeds analyzed in the same FCC report measured at a 10 Mbps down and 3 Mbps up speed (10/3 speed) are available to over 95% of Pennsylvanians. Overall, 91.8% of the Commonwealth’s population has access to both fixed carrier and wireless speeds.

However, as we know, rural broadband is much less accessible. These same FCC statistics state that the 25/3 speed from a fixed carrier is only available to 82.7% of rural Pennsylvanians (just over 2.25 million people), compared to 98.2% of those in urban areas.⁶ The same dynamic exists with wireless 10/3 speed service, with only 87.1% of the rural population having access to wireless broadband as compared to 97.4% of the

⁵ FCC 2018 Broadband Report at 6, n. 15.

⁶ *Id.* at 62, Table D1.

urban population. These statistics demonstrate that there continues to be a digital divide between rural and urban areas in Pennsylvania.

The FCC’s on-line mapping reports also provide useful information related to the types of technology currently being used to provide broadband to Pennsylvanians.⁷ As shown below, cable is the leader in broadband services, followed by fiber and the other technologies charted.

Carrier/Provider	Speed	Availability	Current Number of Subscribers (at speeds at or in excess of 2 Mbps)
Cable	25/3 speed or faster	93.94% of Pennsylvania’s census blocks	2.675 Million Pennsylvanians
Fiber	25/3 speed or faster	54.28% of Pennsylvania’s census blocks	Proprietary
DSL	25/3 speed or faster	4.83% of Pennsylvania’s census blocks	696,000 Pennsylvanians
Fixed Wireless	25/3 speed or faster	2.03% of Pennsylvania’s census blocks	8,000 Pennsylvanians
Mobile Wireless	2 Mbps	N/A	10.3 Million Pennsylvanians
Satellite	25/3 speed or faster	100% of Pennsylvania’s census blocks	Proprietary

These numbers will change, I would note, with the development of additional broadband deployment funded by the CAF II awards and matching state funds awarded through the Office of Broadband Initiatives.

⁷ Mapping data for Pennsylvania’s fixed broadband deployment available at <https://broadbandmap.fcc.gov/#/>.

FCC's Mapping may underreport underserved areas

Although these statistics from the FCC demonstrate the need for broadband in rural areas in the Commonwealth, I note that this data is based upon reports *filed by the carriers* with the FCC. A fundamental problem with this type of reporting is that it is based on census blocks - with no regard for the service levels within that census block. The simplest illustration is that if Carrier A has one user within Census Block 001 with access to broadband service (25 Mbps/3 Mbps), then the entire census block is designated as having service. It is a very macro-level form of mapping for the availability of broadband service. Accordingly, there are limitations to the data and the way that it is compiled. As such, there are significant limitations with the FCC's mapping and reports, with most objective observers agreeing that the FCC's broadband maps are distorted and overstate the availability of broadband services.⁸

Efforts for Better Mapping

There is good news to report on the FCC's mapping issues. The Center for Rural Pennsylvania has funded a study, in partnership with the Pennsylvania State University M-Labs, to create an accurate map of where broadband is and is not across the Commonwealth. Unlike the census block approach to the FCC's mapping, this project is designed to obtain data on a granular level. Specifically, the project uses "crowd sourcing" to determine the speed of broadband in locations where individuals "report" their broadband speed by logging onto the following website: <http://broadbandtest.us/>.

⁸ U.S. Government Accountability Office, *Broadband Internet, FCC's Data Overstate Access on Tribal Lands* (September 2018).

The results are reported to the individual and become part of the M-Labs study. This data can then be used to determine the “shadows” or areas where no broadband is reported, to a degree of accuracy that far exceeds the census-block level. The study is projected to include the results from at least one million individual lines tested by end of 2018, so we anticipate real, meaningful data and the opportunity to map actual internet speeds across the Commonwealth.

I am also happy to share that the Commission has begun to actively promote this study, and I would encourage all the Members of the Broadband Caucus to share this information among your constituents. Their participation in this study does two things: 1) makes the data set larger and more valuable for a Commonwealth-wide study, and 2) and it educates the consumers (i.e., it quantifies their specific service levels for their knowledge and yours).

Both the Center for Rural Pennsylvania and the Commission have materials we can share with you for spreading the word in this important mapping study.

Broadband Funding Methodologies and Initiatives

As we look forward, I thought it appropriate to share with you a brief, high-level review of the models and methods that have been used to promote rural broadband, and to highlight examples for additional study.

Dedicated Broadband Funds

Many states have supported broadband initiatives through dedicated broadband funding programs. These funds are typically administered by an agency, who then awards

grants and loans dedicated to broadband projects. This policy approach is well understood, as it functions much like the host of other programs that already exist in Pennsylvania. The biggest challenge, of course, is in the funding. One of the largest funds created for broadband is in New York, where funds from bank settlements provided \$500 million in funding for the state's broadband initiatives. New York then successfully leveraged this \$500 million to secure an additional \$170 million in CAF funds from the FCC.⁹ This approach, obviously, requires a one-time, large amount of undedicated funds and has not been replicated by any other state.

Surcharges and Fees

California has also created a large fund for broadband development, approximately \$645 million, but funded it through surcharges. This fund, known as the "California Advanced Services Fund," is administered by California Public Utility Commission and provides targeted grants and revolving loans for broadband initiatives. The funding stream for this fund is a surcharge rate, found as a line item on intrastate service bills, collected from California's consumers.

Like California but to a much lesser degree, several other states have also used universal service funds to provide grants for broadband deployment initiatives, including: Maine, Nevada, West Virginia, Delaware, and Colorado.¹⁰ The State of Washington also currently has a bill pending that would use universal service funds for broadband grants

⁹ The FCC's award to New York suggests that matching state funds are more likely to trigger federal awards in future auctions.

¹⁰ *State Universal Service Funds 2014*, Lichtenberg, Nat'l Reg. Research Institute (June 2015).

to rural areas for 5G service.¹¹ The common theme among these fees is that they are collected from the consumers of teleco services, which is an important policy consideration.

In Minnesota, matching state grants and local funds have been used to create a state grant program that covers up to 50% of broadband development costs for applicants, including municipal actors and non-profits created specifically for broadband development. This program is administered by Minnesota Office of Broadband Development. In Ohio, we see proposed legislation would float a bond for \$50 million in annual funds for broadband development.

Other states, like Oregon, have created policies and funding that are designed to capture maximum federal funds. Specifically, Oregon created a dedicated fund to ensure that all K-12 public schools in state have high speed, affordable broadband by matching state funds with federal funding received through the FCC's E-rate school internet access program.

Using a different model, a few weeks ago, the Governor of Indiana announced a \$100 million-dollar broadband initiative to push broadband into underserved areas, that will be financed by tolls on heavy trucks on one of the state's toll roads.

From a policy perspective, states across the nation are recognizing high-speed broadband, particularly in the underserved areas such as rural and remote areas, is important infrastructure that requires investment by local, state and federal government.

¹¹ SB 5935 - 2017-18

As you formulate policies to incentivize broadband, you should be aware that other states have funded broadband initiatives through a variety of means, ranging from large dedicated funds, to bonds issued for these purposes, to surcharges and fees on a variety of services- ranging from teleco-specific fees to transportation fees.

Tax Credits

Another popular approach to incentivizing broadband is through the use of tax credits. New Jersey, for example, has already used this concept to specifically establish a tax credit for carriers installing broadband facilities in unserved and underserved areas. Pennsylvania already has several programs that use this creative approach, including the Keystone Opportunity Zone (KOZ) or Neighborhood Improvement Zones (NIZ), although those have been focused on general economic development. There may be opportunities to incentivize broadband in rural areas, in much the same way the KOZs and NIZs return tax revenues to participants in the dedicated areas.

Local Government and Quasi-Government Investment

Another model for investment in broadband deployment resides at the municipal government level. For example, in Pennsylvania, a Bradford County Authority is working on the installation of a dark fiber loop for other service providers to use for provision of services. We find this same approach in Maine, where a quasi-municipal broadband utility in Maine, known as “Downeast Broadband Utility” was created earlier this year, to install fiber in rural communities. Announced earlier this month, this regional utility plans to create an open-access fiber optic network, 87 miles in length, to bring high-speed broadband to several rural areas in Maine that lacked the service.

Anchor Tenant Model

Another model for public and private investment is to use “anchor-tenant” projects by which a large corporate entity “tenant” invests in fiber installation. Once the fiber is installed by a large entity, the fiber line can be leveraged by other individuals and/or entities within close proximity to the line.

Private Investment

Additionally, public-private partnership projects have proven very successful for broadband deployment. For example, beginning in 2012, Google Fiber has used public-private partnership money to deploy fiber in certain parts of the MidWest and the South. The state of Kentucky has also specifically used private-public partnerships for investment in broadband deployment.

Commission’s Broadband Initiatives

I am also happy to report that the Pennsylvania Public Utility Commission is working diligently to explore other options to expand access to rural broadband. As one example, the Commission is looking to remove barriers to the installation of the facilities needed to provide broadband service. On July 12, 2018, the Commission formerly adopted a Motion I made to adopt the FCC’s rules over pole attachments. That action led to a Notice of Proposed Rulemaking Order that proposes to adopt the FCC’s existing regulations over pole attachments and create a forum for dispute resolution.¹² The

¹² *Notice of Proposed Rulemaking In re: Assumption of Commission Jurisdiction over Pole Attachments from the Federal Communications Commission*, PUC Docket No. L-2018-3002672 (Order entered July 13, 2018).

purpose of this rulemaking is to: (1) decrease regulatory uncertainty for pole owners and pole attachers and (2) to provide a local forum for pole owners and pole attachers to get relief quickly. We expect that the rulemaking will be published sometime this month with comments due thirty (30) days thereafter. We look forward to working with the stakeholders during the comment period as we work through the rulemaking process.

Additional Regulatory Options

I would like to close with providing some thoughts about obstacles to broadband that don't involve funding. In my opinion, there are several legislative and regulatory improvements that would maximize the deployment of broadband, especially in rural areas. These improvements include, but are not limited to the following:

- Better collaboration between local, state and federal agencies;
- Leveraging state and local government resources and assets (buildings and rights of way) to serve underserved or un-served areas;
- Developing a map of all state and local agency assets for antenna (buildings, towers, other structures);
- Developing standards for conduit installation; and
- Reducing permitting times, increasing access to rights-of-way and implementing reasonable permit fees.

Some of these options are being developed or are under active consideration, so you may be familiar with them and/or actively involved with them already.

Conclusion

Expanding access to rural broadband is an important issue and the Commission stands ready to assist in any way we can to develop solutions to provide greater access to

Pennsylvanians. We are focusing our attention on this topic and are diligently exploring options and seeking solutions.

Thank you again for inviting me here to speak today. I welcome the opportunity to answer any questions you may have.