Ross Lieberman
Senior Vice President of Government Affairs
ACA Connects–America's Communications Association
2415 39th Place, NW
Washington, DC 20007

rlieberman@acaconnects.org
(202) 494-5661

November 4, 2019

VIA ECFS

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Presentation of ACA Connects—America's Communications Association; *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122

Dear Ms. Dortch:

ACA Connects—America's Communications Association ("ACA Connects") hereby submits a white paper from Vantage Point Solutions ("VPS"), a firm ACA Connects has retained to assess the feasibility of the 5G Plus Plan proposal to connect multichannel video programming distributor ("MVPD") earth stations with fiber to replace MVPDs' use of the C-Band to receive video programming within the timeframes proposed within the plan. As a firm that has engineered over $2.5 billion in fiber networks in recent years and manages the construction of nearly 10,000 miles of fiber each year, VPS is well-qualified to undertake this review.

In the enclosed white paper, VPS provides its assessment that the 5G Plus Plan's proposal is feasible. In particular, VPS finds that connecting all MVPD earth stations with fiber through the purchase of indefeasible rights of use ("IRUs") on 300,000 route miles of existing fiber and the construction of an additional 120,000 route miles, as proposed in the 5G Plus Plan, is achievable within the plan's 18-36 month timeframe for urban and suburban markets and five-year timeframe for rural areas.

In support of this assessment, VPS observes that IRUs for 300,000 route miles of fiber are relatively easy to acquire in today's market, and fiber IRU availability is nearly ubiquitous in urban and suburban areas. As for the new fiber required under the plan, VPS explains that MVPDs have demonstrated their ability to undertake and complete fiber builds within the plan's timeframes, and the overall industry — from providers to equipment vendors to contractors — has demonstrated it is capable of deploying hundreds of thousands of fiber route miles annually, far more than the plan requires. VPS further explains that "middle-mile" fiber deployments of the sort the plan requires are less difficult and expensive, and less likely to encounter

administrative delays or other obstacles, than "last-mile" fiber deployments that connect individual homes and businesses.

The VPS white paper demonstrates that there is no barrier that would prevent MVPD earth station operators from obtaining the fiber connectivity necessary to replace C-Band video delivery within the 5G Plus Plan's timeframes. The plan's staggered timeline for obtaining fiber connectivity is consistent with industry intent to deploy 5G services initially in densely populated areas and its lack of commitment to deploy 5G in very rural areas within five years. Furthermore, the plan's timeline for securing access to fiber is comparable to any reasonable timeline expectations of other proposals for clearing spectrum for 5G.[1] Accordingly, enabling MVPD earth stations to transition from the C-Band to fiber is consistent with the Commission's goals in this proceeding of ensuring that C-Band spectrum is unleashed quickly to meet demand for 5G and that incumbent users of the band are protected from harm to existing operations.

Please direct to the undersigned any questions regarding this filing.

Sincerely,

Ross Lieberman

Enclosure

[1] *See, e.g.*, Letter from Bill Tolpegin, C-Band Alliance ("CBA"), to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed Oct. 28, 2019) (roughly outlining CBA's proposal to clear 300 MHz of C-Band spectrum "within 18-36 months of an FCC Order and auction" through the use of video signal compression and other mechanisms to pack existing users into the remaining 200 MHz). *But see* Letter From Michael Goggin, AT&T, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed Oct. 22, 2019) (arguing for additional "transparency," including an opportunity for public comment, regarding the details of a plan to clear 300 MHz of C-Band spectrum relying on the use of video compression, and the need for detailed transition planning); AT&T Public Policy Blog Post (October 25, 2019), https://www.attpublicpolicy.com/5g/progress-on-the-c-band/ (arguing that detailed transition planning should be completed prior to the private auction that CBA contemplates); Letter From Brian Hurley, ACA Connects, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed Oct. 22, 2019) (explaining why CBA's plan to clear 300 MHz of the band using video compression could not be completed within three years of the start of the transition).

ASSESSMENT OF THE FEASIBILITY OF THE 5G PLUS PLAN'S PROPOSAL

TO DEPLOY A NATIONWIDE FIBER VIDEO PROGRAMMING NETWORK

November 2, 2019

Vantage Point Solutions, Inc. (VPS) has been asked by ACA Connects – America's Communications Association to review the 5G Plus Plan's ("The Plan") proposal to deploy a fiber video programming network connecting all earth stations and Multichannel Video Programming Distributor (MVPD) data centers to determine whether the build is achievable within the proposed timeframe.[1] VPS provides engineering and consulting services to over 450 broadband providers in more than 40 states.[2] This includes working with hundreds of the smallest MVPDs to some of the largest. Based on this experience and our expertise, we believe the timeframe is achievable. In general, Indefeasible Rights of Use (IRUs) for 300,000 route miles of fiber are relatively easy to acquire in today's market. As for constructing 120,000 route miles of fiber, primarily in rural areas, over five years, we are confident that the fiber build is feasible because (1) MVPDs have demonstrated through their ongoing fiber builds that they know how to undertake and complete these projects on time, and (2) the overall industry — from providers to equipment vendors to contractors — has demonstrated it is capable of deploying hundreds of thousands of fiber route miles annually.

[1] The Plan proposes to reallocate at least 370 MHz of C-Band spectrum currently being used to deliver video programming via satellite to Multichannel Video Programming Distributors (MVPDs) and others. The reallocated spectrum would be used for the delivery of terrestrial 5G wireless services via an auction process. As part of The Plan, video programming currently delivered to MVPDs in the C-band satellite service would be transitioned to a fully redundant fiber optic network. The Plan estimates that approximately 420,000 miles of fiber would be required to connect all the earth stations and MVPD data centers in the continental United States. The Plan estimates that 300,000 miles of this fiber network could use existing fiber through Indefeasible Rights of Use (IRU) purchases, and the remaining 120,000 miles of fiber would be new fiber construction. *See e.g.,* Ex Parte from Ross Lieberman (ACA Connects – America's Communication Association) to Marlene H. Dortch, Secretary, Federal Communications Commission, "Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122," (July 2, 2019); Ex Parte from Ross Lieberman (ACA Connects – America's Communication Association) to Marlene H. Dortch, , Secretary, Federal Communications Commission, "Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122," (July 15, 2019); and, Ex Parte from Ross Lieberman (ACA Connects – America's Communication Association) to Marlene H. Dortch, , Secretary, Federal Communications Commission, "Ex Parte Presentation of ACA Connects—America's Communications Association; Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122," (Sept. 25, 2019).

[2] VPS performs engineering, permitting and construction oversight to ensure that a network is built according to industry standards and to maintain schedules. Over the last few years, VPS has engineered over $2.5B in fiber networks and manages the construction of nearly 10,000 miles of fiber each year. These projects are in both urban to rural environments. With a senior management team with over 1,000 years of fiber network engineering experience, VPS is well-positioned to evaluate the 5G Plus Plan's proposed fiber build.

Obtaining 300,000 Route Miles of IRUs

According to The Plan, 300,000 route miles of fiber, of which 240,000 miles are in urban and suburban areas, are to be obtained via IRU.[3] Acquiring the 240,000 miles of IRUs in urban and suburban areas is easily achievable in the proposed timeframe, especially when considering the large number of MVPDs that will be working to secure the IRUs. Urban and suburban areas have almost ubiquitous fiber IRU availability, and securing an IRU on existing fiber is, in general, relatively straightforward. It can be done much faster than new construction and, based on our experience, IRUs typically can be obtained within 30 to 90 days. Each MVPD will be working individually to obtain its own portions of this network, meaning each need only to obtain on average a few hundred miles of fiber IRUs. At the same time, The Plan permits MVPDs to work together to negotiate a single agreement with a large fiber owner for thousands of miles of fiber IRUs, expediting the process and potentially reducing prices. In sum, an 18-month timeframe to obtain these "urban/suburban" IRUs is reasonable.

The remaining 60,000 of the 300,000 fiber route miles to be obtained via IRUs are in more rural areas. The Plan contemplates that these IRUs would be obtained over the duration of the five-year project, as cable systems transition to fiber on a market-by-market basis. We believe this extended timeline leaves ample room to obtain IRUs in these more rural areas.

Constructing 120,000 Route Miles of Fiber

To analyze whether it is feasible to build 120,000 routes miles of fiber where IRUs are not practical or not available within The Plan's timeline, one must first determine the amount of urban and rural construction. Fiber construction in rural areas is less complex and can be completed in less time than in urban areas. Based on population density information for the areas where new fiber construction is proposed, we classified the routes as rural, town, and urban.[4] As shown in the following table, two-thirds of the fiber construction will be in rural areas. Only a small percentage is in urban areas (5%) and the remaining 28% of the construction will be in small, sparsely populated towns.

Classification	Density (Pop/Sq. Mile)	% of the Fiber Build
Rural	Less than 100	67%
Town	100 – 1000	28%
Urban	Greater than 1,000	5%

To evaluate the buildout timeframes for each of these areas, VPS reviewed the buildouts first from the perspective of individual MVPDs and then from an industrywide perspective.

[3] Based on the amount of fiber that is estimated to be located within Core-Based Statistical Areas (CBSAs).

[4] For purposes of this analysis, a "town" is an area of population density of 100 to 1,000 per square mile and an "urban" area consists of metropolitan areas with a population per square mile greater than 1.000. All other areas are considered to be "rural" (population densities of less than 100 people per square mile.

Evaluating an Individual MVPD Build

The Plan has identified 726 MVPDs that would undertake the 120,000 route miles of construction. On average, each MVPD would be responsible for approximately 165 miles of fiber construction, which is a manageable deployment project for a MVPD for various reasons. First, most MVPDs already have been deploying this amount of fiber. They, therefore, have developed or have access to engineering and construction capabilities that can readily be employed. Second, much of these fiber deployments by MVPDs are local loop or last mile fiber builds, which typically are more difficult and expensive to build than middle mile[5] fiber construction of the sort that The Plan requires. This is true for both aerial and buried deployments. This is because there are significant costs – and potentially additional time – associated with working around streets, driveways, sidewalks, yards, and other underground utilities to connect locations. Even for aerial fiber construction, it is more likely that the poles in the local loop are congested and require additional make ready work or pole replacements. By contrast, middle mile deployments of the sort that The Plan requires are relatively straightforward. It is expected that many of the middle mile routes will be along state, county, and local roads that have fewer existing utilities to work around and a less complex permitting and approval process. In addition, when constructing these middle mile fiber networks, MVPDs will likely have the option to select among various routes and choose the one that is most economical and can be completed on time.

To analyze the project's timeframe more closely, we examined each of the following primary phases of the deployment process, each of which have different requirements:[6]

1. **Design and engineering:** The design and engineering requires on-site surveys to develop construction maps, which is often referred to as "fielding." The fielding involves detailed data collection, material selection, structure placement, and cable routing. The results of the fielding are construction plans that ensure the network design parameters, pole owner, and jurisdictional agency requirements are being met. For a 165-mile deployment of similar scope to the MVPD builds, the design and engineering would typically take 60 to 90 days.

2. **Permitting:** For simplicity, we use the term "permitting" broadly to include applications and permits required by government agencies, applications and approvals needed by facility owners (such as pole owners), and public and private easements. When placing new cable (either buried or aerial), coordination and approval of federal, state, county, municipal agencies is normally required. The permitting process is usually conducted in parallel to the design and engineering process. Typical permit lead times can range from 30 days to as long as 6 months. MVPDs or their engineers endeavor to identify early in the process any agency that may take longer to obtain a permit.[7] Once these are identified, they are prioritized for early submission and for greater attention to speed of processing.

[5] Middle mile refers to the portion of the network used for interoffice transport, backhaul, and Internet connectivity.

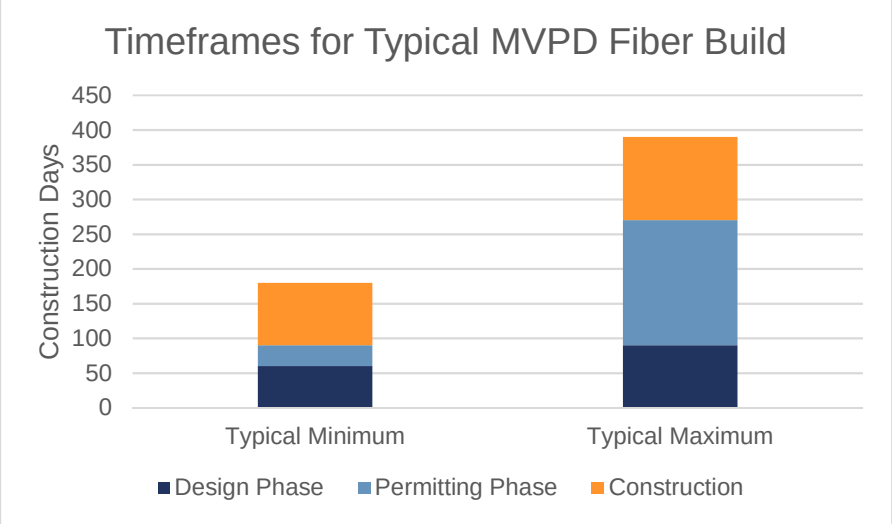
[6] Deploying a Broadband Network – From Start to Finish (and Beyond), Larry Thompson and Brian Enga, January 2018, (https://ecfsapi.fcc.gov/file/1052598259628/USF%20Budget%20NPRM%20Comments%20FINAL.pdf – Attachment 1)

[7] The areas that have more complex permitting will likely be in more environmentally sensitive areas, which are concentrated in the rural areas. These areas have a 5-year construction time horizon, which should provide adequate time to secure any required permits. It has been VPS's experience that it would be extremely rare for a permit process to take more than 2 years in rural areas and most are completed in a matter of a few months.

3. **Construction:** Once the design and engineering has been completed, the construction plans are assembled. The construction plans include the proposed construction maps, guide drawings, and construction standards. The construction plans are typically combined with contract requirement documents and then utilized in a competitive bid processes to select construction contractors for the project. The construction would typically take 90 to 120 days for a project of similar size and scope to the average MVPD fiber build required in The Plan.

Most providers implement Quality Assurance (QA) and Quality Control (QC) procedures for their construction projects. These procedures speed time to market, save costs, and maximize construction quality. QA is the act of observing and providing feedback to correct potential issues during construction but prior to project final acceptance. The purpose of QA is to identify potential problems and allow them to be corrected early in the construction process. QC is the final inspection of the construction product. These time-saving and cost-saving practices can be applied to the fiber builds required under The Plan.

The typical timeframe for each phase of a single MVPD fiber build is summarized in the following chart.



VPS works with many MVPDs that are able to rapidly undertake these steps and deploy hundreds of miles of fiber in a single construction season.[8] In sum, it is reasonable to conclude that The Plan's five-year timeframe leaves ample time for an MVPD to complete a fiber build as required under The Plan.[9]

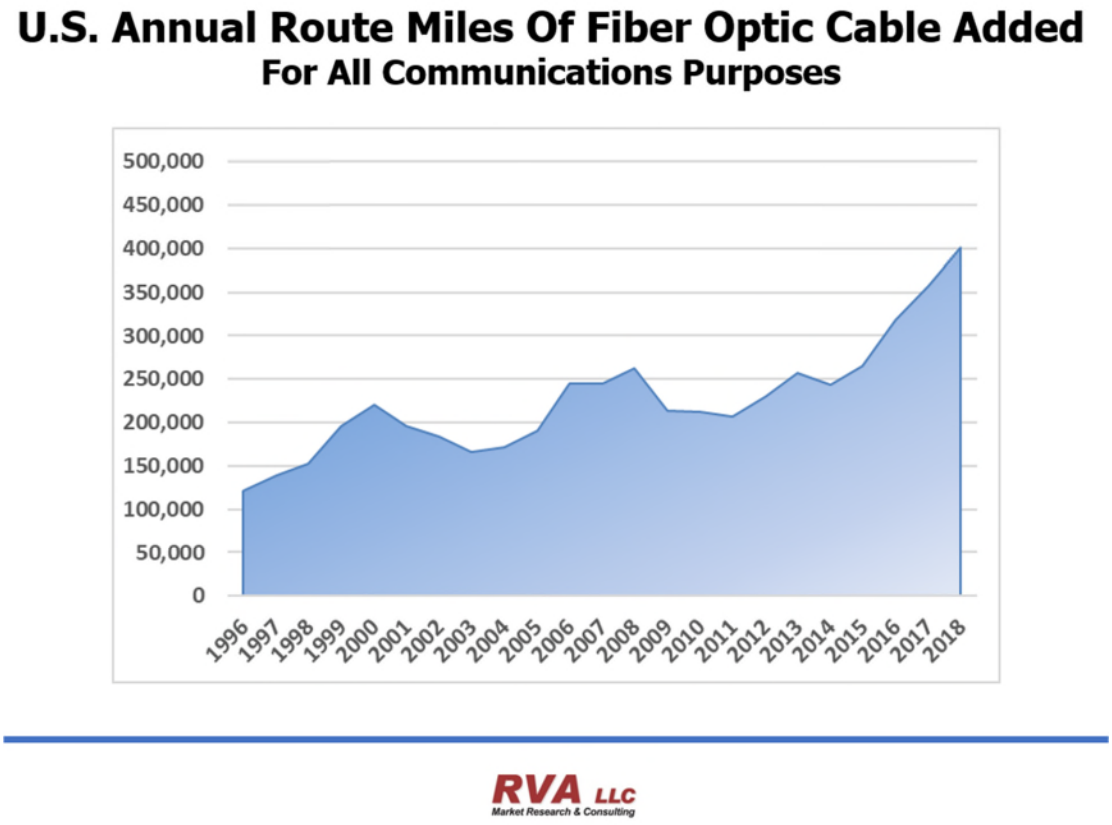
[8] In addition to VPS, there are many firms – both large and small – that perform these services across the country. http://ace-engineers.com/members/ These engineering firm resources ensure that the network is designed efficiently and meets the long-term requirements of the project. Their licensed professional engineers ensure that the plans meet local, state, and national codes, in addition to industry standards, as well as protect public safety. These firms also assist in the permitting processes, construction management and quality control.

[9] Some entities have pointed to permitting delays with Google Fiber as reason to be skeptical about The Plan. However, Google Fiber was building a last mile residential fiber to the home (FTTH) network in urban areas and not transport fiber routes in mainly rural areas. As discussed above, VPS has found that some of the most difficult and sensitive areas of construction are the "last mile" in residential areas, which includes having to deal with multiple entities owning or controlling of poles, ducts, conduits, and private easements, for instance, across a homeowner's property where no public easements exist.

Evaluating MVPD Builds in the Aggregate

Having concluded that individual MVPD fiber builds are feasible within The Plan's five-year timeframe, we next examine the capacity of the industry to handle the collective amount of fiber build required under The Plan. This includes a review of the historical annual rate of fiber construction in the U.S., significant ongoing projects, and a review of some comparable nationwide programs.

The number of fiber route miles constructed across the country each year has been increasing significantly in recent years. As shown in the following chart, 400,000 route miles of fiber were deployed in 2018. The 24,000 miles per year required under The Plan is only about 6% of this amount.



The fiber deployment required by The Plan would involve many companies each working independently to effectively create a portion of the network. This is similar to what is often done when deploying state or regional networks. Even with the larger size and scope of the fiber construction required by The Plan, we do not foresee any unique coordination problems that would prevent the buildout from occurring on schedule. Past projects of similar scale have demonstrated that the manufacturer, contractor, and engineering industries can scale for similar large nationwide deployments. Also, as current large fiber deployments finish construction in the coming years, capacity will become available for other large projects. In addition, for the nationwide build contemplated by The Plan, the builds would be staggered over the five-year period, which would enable MVPDs to utilize

different engineering firms and contractors at different times and would permit them to account for the construction seasons in various parts of the country.

Further, the aggregate amount of permitting required for the build is not an unmanageable increase when considering the amount of fiber construction that is already occurring throughout the United States. It also is not significantly different than large fiber builds that have been accomplished in the past. In addition, there have been several new laws, regulations, and other initiatives in the recent years that will help streamline the permitting process.[10]

Examples of these historical and ongoing large-scale projects include:

- **American Recovery and Reinvestment Act of 2009 (ARRA) Deployments:** The Plan would not be the first nationwide fiber deployment of this size using multiple service providers, vendors, engineering consultants and construction contractors. For example, the ARRA contained two programs that funded widescale fiber deployments across the country with a great many stakeholders. One of these was Broadband Technology Opportunities Program (BTOP) administered through the National Telecommunications and Information Administration (NTIA). The BTOP program administered more than $4 billion in broadband grants with more than 112,000 miles of fiber being constructed between 2010 and 2013.[11] The BTOP program mainly focused on projects that had predominantly middle mile purposes, similar to what is proposed in The Plan.

  Additionally, during this same timeframe, the USDA conducted another ARRA broadband deployment project, the Broadband Initiative Program (BIP). Through BIP, USDA administered over $3.5 billion in grants and loans and included over 250 projects for infrastructure. USDA reported that over 62,000 miles of fiber were deployed under BIP during approximately the same time that BTOP builds were occurring.[12]

- **Tier 1 Telecommunication Company Deployments:** Tier 1 companies such as AT&T, CenturyLink, and Verizon have been announcing large fiber network projects in recent years. CenturyLink is creating an extensive 4.7 million fiber strand mile[13] intercity fiber network across the U.S. and parts of Europe. The first phase, comprising 3.5 million fiber strand miles, was completed in June. An additional 1.2 million

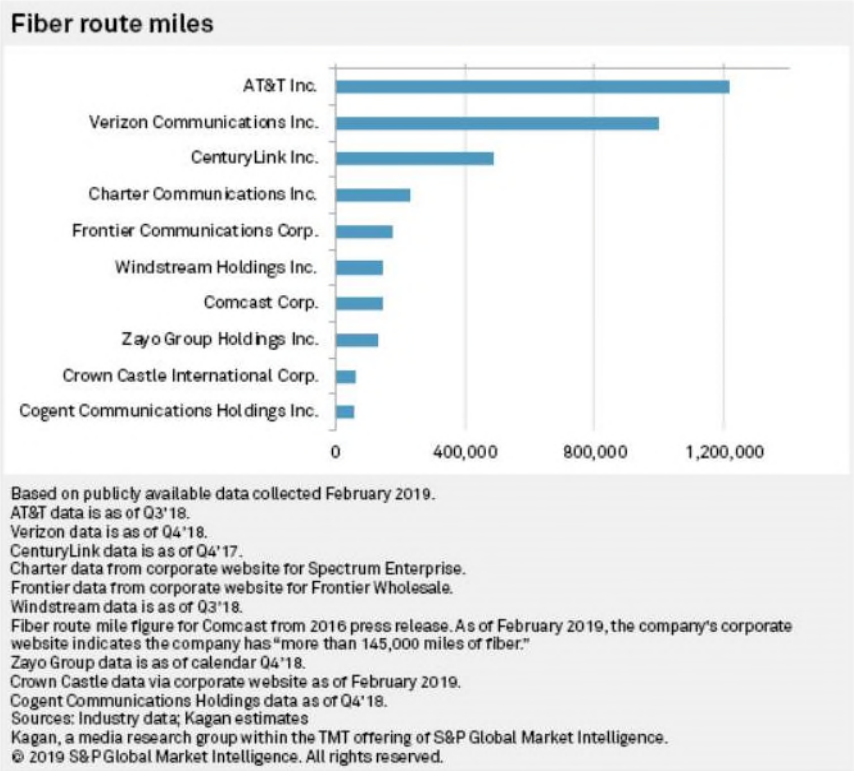
[10] *See e.g.*, the Broadband Deployment Advisory Committee's reports and recommendations regarding Competitive Access to Broadband Infrastructure (https://www.fcc.gov/sites/default/files/bdac-cabi-report-04252018.pdf), Removing State and Local Regulatory Barriers (https://www.fcc.gov/sites/default/files/bdac-regulatorybarriers-01232018.pdf), and Streamlining Federal Siting(https://www.fcc.gov/sites/default/files/bdac-federalsiting-01232018.pdf); and the FCC's order on facilitating pole attachments (https://docs.fcc.gov/public/attachments/DOC-352544A1.pdf).

[11] Remarks by Anthony Wilhelm, Acting Chief of Staff, National Telecommunications and Information Administration, 2014 Broadband Communities Summit, April 10, 2014, pg. 2 (https://www.ntia.doc.gov/speechtestimony/2014/remarks-acting-chief-staff-wilhelm-2014-broadband-communities-summit)

[12] U.S. Department of Agriculture Rural Utilities Service Broadband Initiative Program Quarterly Report As of 9/30/14, pg. 3 (https://www.rd.usda.gov/files/reports/Broadband%20Initiatives%20Program%20Report%20September%202014.pdf)

[13] Fiber network owners and cable manufacturers often talk in terms of fiber "strand" miles. Fiber cables consist of many strands, and the number of strands has been increasing with time. We believe that the average strands per cable today is between 60 and 96 strands per fiber cable.

fiber strand miles will be added by early 2021.[14] Verizon is purchasing 12.4 million strand miles of fiber per year through 2020 from Corning[15] and over 10 million strand miles from Prysmian.[16] The chart below shows the number of fiber route miles that have been deployed by these large providers.[17]



- **Manufacturer Production Capacity:** To keep up with demand, manufacturers have been increasing production capacity. For example, Corning has opened new fiber manufacturing facilities and announced goals of $5 billion in annual sales by 2020.[18]

[14] CenturyLink Expands Fiber Network Across U.S. and Europe, Corning, July 23, 2019 (https://www.corning.com/worldwide/en/about-us/news-events/news-releases/2019/07/centuylink-expands-fiber-network-across-us-and-europe.html)

[15] Fiber Optics Market to Grow at 20.6% through 2025, Novus Light, October 1, 2019 (https://www.novuslight.com/fiber-optics-market-to-grow-at-20-6-through-2025_N9671.html)

[16] Verizon Signs $300M Optical Cable Purchase with Prysmian, FierceTelecom, May 8, 2017 (https://www.fiercetelecom.com/telecom/verizon-signs-300m-optical-component-purchase-prysmian)

[17] Fiber Route Leaderboard, S&P Global Market Intelligence, March 4, 2019 (https://www.spglobal.com/marketintelligence/en/news-insights/blog/fiber-route-mile-leaderboard)

[18] Corning Celebrates Opening of Fiber Optic Cable Manufacturing Facility, Corning, January 26, 2018 (https://www.corning.com/worldwide/en/about-us/news-events/news-releases/2018/01/corning-celebrates-opening-of-fiber-optic-cable-manufacturing-facility.html)

Conclusion

In conclusion, when viewed both from the individual MVPD and industrywide perspectives, The Plan's buildout timeframes for new fiber construction are feasible. The individual project size is not unusual for a MVPD, and the deployment steps are well understood. Additionally, The Plan's proposed buildout does not pose unique challenges to the industry in the aggregate that would prevent it from occurring on schedule. The 24,000 miles per year of new construction that The Plan requires on average is a small part of the overall industry construction per year. Therefore, contractors and cable/equipment manufacturers should have the capacity for this amount of construction. Finally, as explained above, the industry has demonstrated its ability to complete projects similar in size and scale to The Plan's proposed fiber build, within comparable timeframes.