Unit 2 Assignment

Interdisciplinary Policy Framework

2019 Broadband Progress Report

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***Step 1:*** *Core Problem Intended to be Solved by the Broadband Progress Report*

“The Federal Communications Commission is charged with “encourage[ing] the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans.”” [1, page 2]

The Broadband Progress Report is an annual report by the Federal Communications Commission (FCC) to consolidate, discuss, and analyze data collected on the deployment of fixed and mobile broadband throughout the United States. This report is required by the Telecommunications Act of 1996, asking the FCC to report the availability of “advanced telecommunications capability” broadband to the United States population. The FCC aspires to “clos[e] the digital divide between Americans with, and without, access to modern broadband networks.” [1] Their objectives include following universal service and common carrier regulations/obligations to deploy and provide access to broadband nationwide. The Broadband Progress Report is responsible for gauging access to broadband throughout the United States. Availability is determined through the access to at least one or both fixed and mobile LTE services. [1] The Broadband Progress Report discusses regulations in relation to accessibility of broadband with “advanced telecommunications capability”. In their efforts to deploy broadband as quickly as possible, they find many regulations to prevent or slow down progress in deployment.

“To close the digital divide, it is essential to remove regulatory barriers to investment. Regulatory barriers unnecessarily delay broadband buildouts, slow transitions from legacy networks and services to next-generation networks, and impeded wireless infrastructure projects to deploy advanced networks.” [1, page 32]

***Step 1:*** *Definition of Broadband*

Broadband includes fixed and mobile services with “advanced telecommunications capability”, defined as “high-speed, telecommunication capability that enables users to originate and receive high-quality voice, data, graphics, and video.” [1] The FCC set minimum speed benchmarks for both fixed and mobile services, which they believe are an appropriate measure to provide “advanced telecommunications capability” to users.

“We conclude that the current speed benchmark of 25 Mbps/3 Mbps remains an appropriate measure by which to assess whether a fixed service is providing advanced telecommunications capability.” [1, page 5]

“We use 4G LTE as our starting point and present 4G LTE coverage data based on the Form 477 minimum advertised speeds of 5 Mbps/1 Mbps.” – in regards to mobile service [1, page 7]

***Step 2:*** *Policy Objectives of the “Advanced Telecommunications Capability”*

The FCCs objectives to provide broadband of “advanced telecommunications capability” include meeting universal service and common carrier standards and deployment of broadband in all areas of the United States. Broadband is considered an essential service to the American population. In order to serve all of the American population, as per standard, the FCC is working on deployment of broadband in as many areas of the U.S. as possible. [1] An example of the commissions efforts to provide wide-scale broadband is their deployment and efforts to improve the connectivity of healthcare providers throughout rural areas. The report discusses lifting the cap on funding for the program in order to further fund broadband to healthcare providers in rural regions. [1]Universal services must comply with common carrier regulations and obligations which help provide essential services to the public fairly. Regulations include “just and reasonable” rates and safeguards against monopolies. Obligations require non-discriminatory rates and control over market entry and exit. As a common carrier, those providing broadband services must comply with requirements in order to provide universal service in a fair and just manner. The FCC, through adoption of various frameworks, follow common carrier requirements. Through the adoption of the “Second Report and Order” for Wireline Infrastructure, the FCC eliminated “unnecessary impediments and costs to timely network upgrades, while maintaining protections for consumers and enabling providers to invest in next-generation networks.” [1] This complies with the regulation requirement of “just and reasonable” rates.

***Step 3:*** *Role of Technology in Creating/Driving Changes in Broadband*

“These actions simplify the regulatory approval process for this rapidly growing segment of the satellite communications market and expand the FSS frequency bands where these operations can be conducted.” [1, page 37]

The FCC announced and conducted application and bidding processes for the Spectrum Frontiers licenses to speed the deployment of 5G services in these bands. Their involvement in the expansion of access to spectrum is a driving factor in the growth of broadband. Encouraging expansion allows them to continue progressing deployment of broadband in areas of need in order to reach the American population and close the broadband consumer gap.

“Commission approved the first U.S.-licensed satellite constellation to provide broadband services using a new generation of low-Earth orbit (LEO) satellite technologies in the SpaceX Authorization Order” [1, page 38]

The FCC’s approval of this project shows their efforts to create newer and more effective methods of providing broadband as a universal service. By working on projects that further the accessibility of broadband, the FCC can sooner reach their goal of providing “advanced telecommunication services” to the American population.

***Step 4:*** *Policy Options*

*Status Quo* Fixed and mobile broadband that meets “advanced telecommunication capabilities” with defined minimum speeds. – *Definition of Broadband, Status Quo*

The FCCs definition of broadband defines minimum speeds for fixed and mobile services that meet “advanced telecommunication capabilities”, therefore providing the Universal Service of broadband. For fixed services, minimum speeds are 25 Mbps/3 Mbps and for mobile services, they are defined to be 5 Mbps/1 Mbps. With mobile services, 4G LTE provides these speeds. Fixed wireless services utilize radio waves, providing high-speed service. This system is susceptible to high latency from high traffic, an issue arising in cities and suburbs with growing populations. The current broadband policy, as defined and used by the FCC, requires the defined minimum speeds for fixed and mobile services. Current policies for mobile services allow elimination of LTE in areas where service is lacking, but measure improvement for service in the areas over time[1]**.** Availability of broadband with “advanced telecommunication capabilities” is determined through access to fixed and/or mobile services rather than the quality of service.

*Proposition 1* Fixed and mobile broadband that meets “advanced telecommunication capabilities” with defined minimum speeds, focused on accessibility to mobile services in rural and underserved areas. – *Definition of Broadband, Proposition 1*

The American population is increasingly relying on mobile broadband as their source of communication and internet, especially in rural areas. The definition of minimum service speeds can be adjusted to better meet standards of “advanced telecommunication capabilities”. An adjustment to 10 Mbps/2 Mbps can drastically increase the quality of mobile broadband service. By increasing the minimum speed of mobile broadband services, mobile broadband can better meet standards. To meet increasing demands for mobile service, increased spectrum would allow for a more cost-efficient method of expansion. Focusing on deployment in rural and underserved areas complies with universal service and common carrier requirements, providing better service to the American population. The availability of mobile services is an essential service and therefore should have speeds closer to that fixed services to better meet “advanced telecommunication capabilities”.

*Proposition 2* Fixed broadband deployed through fiber optic lines that meet “advanced telecommunication capabilities”, focused on subsidizing fixed fiber in rural and underserved areas for better and reliable broadband service. – *Definition of Broadband (For Fixed Broadband), Proposition 2*

Expanding deployment of fiber optic lines for fixed internet services better meet standards of “advanced telecommunication capabilities”. Fiber can provide fixed service download speeds up to 1000 Mbps. Light signals travel faster than the electrical signals commonly used for fixed services in cable/DSL or radio waves used in fixed wireless and therefore has lower latency, allowing for fixed services using fiber to better meet “advanced telecommunication capabilities”. City and suburban populations are exponentially growing with residents expecting high-speed services that accommodate high usage. Deploying fiber accommodates higher traffic, adapting to increasing levels of fixed service usage among populations as they increase. Fiber is also able to withstand extreme weather, preventing outages as a result of severe weather and allowing for necessary services such as communication services to continue functioning[2]. Subsidizing fiber in areas of need where deployment of broadband can progress availability. Areas of need would have access fixed broadband services of high-speed that meet “advanced telecommunication capabilities” and are less susceptible to outages due to extreme weather.

***Step 4:*** *Factors of Evaluation*

***Cost of Deploying Broadband with given Specifications:***

Status Quo: Following the Status Quo definition of broadband, no changes in the cost of deploying broadband will occur.

Proposition 1: Increasing minimum speeds of mobile broadband service along and expanding accessibility to areas of need, new cell-sites would need to be created in order to deploy broadband. A new cell-site is estimated to be $550,000 including site development and operating costs. This approximates to $55 million for a network expansion. A more cost efficient method of expansion would be to release spectrum, a one-time cost, to expand the accessibility of mobile services. [3]

Proposition 2: Deploying fiber for fixed broadband services increases deployment costs as well. If deployment for fixed broadband were to switch completely to fiber, it is estimated that by 2029, the cost to deploy 90% of households with fiber would be $70 billion. [4]

***Accessibility in Areas of Need:***As outlined in the FCCs Broadband Progress Report, areas of need include underserved and rural areas, elementary and secondary schools and classrooms, Tribal Lands, and disaster-affected areas.

Status Quo: The Status Quo definition of broadband defines fixed and mobile broadband as a universal service. Therefore, areas of need are priority in the deployment of broadband. However, these areas may not receive quality service due to difficulties in deploying broadband in areas with a lack of infrastructure.

Proposition 1: The definition of broadband in Proposition 1 focuses on the deployment of mobile broadband service to areas of need. Using spectrum to do so allows for quicker deployment as less infrastructure needs to be built. With increased mobile service speeds, areas of need would have access to service with speeds similar to fixed broadband service. This accessibility allows for better mobile communication services in rural areas that can be used throughout the area, helping better public safety.

Proposition 2: Proposition 2 calls for deployment of fiber, especially in areas of need. Fiber provides high-speed service with low latency and easily accommodates high traffic. Deploying fiber in areas with a lack of infrastructure such as rural farm or disaster-affected areas would allow for quality fixed service in homes and small towns.

***Quality of Service: Speed and Reliability:***

Status Quo: The Status Quo definition of broadband states that minimum fixed speeds are 25 Mbps/3 Mbps and minimum mobile speeds are 5 Mbps/ 1Mbps. The deployed fixed and mobile services are reliable but can suffer from high latency as a result of high-traffic and are dependent on radio waves, which can be affected by weather or other outage factors.

Proposition 1: The Proposition 1 definition of broadband states that minimum fixed speeds are 25 Mbps/3 Mbps while minimum mobile speeds are increased to 10 Mbps/2 Mbps. By utilizing spectrum to expand mobile broadband, service is less dependent on large scale infrastructure and can be more easily expanded to areas of need.

Proposition 2: The Proposition 2 definition of broadband states that minimum mobile speeds are 5 Mbps/1 Mbps while minimum fixed speeds are dependent on the deployment of fiber, which can reach download speeds of 1000 Mbps or more. Deploying fiber in areas with a lack of infrastructure such as rural farm or disaster-affected areas would allow for quality fixed service as well as reliable and resilient service that can withstand severe weather. This accessibility is crucial as it allows for communication during severe weather.

***Step 4:*** *Analysis of Factors on Policy*

The first factor, the cost of deploying broadband with the given specifications in the definition, discusses the economic impacts of changing the FCCs definition and deployment of broadband. Making changes to the definition of broadband means changes in the deployment of broadband and would incur costs. Proposition 1 provides two methods of deployment and network expansion, cell-sites and increased spectrum. Cell-sites rely on construction of sites, equipment costs, and more. Spectrum costs include the release of an amount of spectrum which can then be used for expanded mobile broadband services. Proposition 2 proposes deploying fiber, especially in rural areas susceptible to extreme weather for more reliable service. The second factor discusses the accessibility of broadband in areas of need. The Status Quo adheres to the FCCs priority of broadband deployment in these areas. Both Proposition 1 and 2 address issues of accessibility through the changes in the broadband definition. Proposition 1 suggests increasing the minimum mobile service speed and expanding mobile broadband to better reach areas of need. Proposition 2 suggests expanding fixed broadband to areas of need using fiber, which brings access directly to those in need of service. The third factor compares the quality of service through speed and reliability. The Status Quo follows the FCC definition of broadband service and provide service that meets “advanced telecommunication capabilities”. Both Proposition 1 and 2 expand the broadband network, progressing availability in areas of need and complying with universal service requirements. This also meets the FCCs objectives to provide broadband while meeting universal service and common carrier requirements.

***Step 5:*** *Prioritization of Factors*

Service in areas of need is FCCs top priority and therefore, should be considered priority amongst the three factors. Their progress in deployment of broadband of “advanced telecommunications capability” is most important in helping close the gap between those with and without broadband in the United States. The second is the cost of deploying broadband fitting the definition of each policy. The cost of deploying a service is important as it determines the cost to the consumer. Changes in the definition of broadband will incur costs. Quality of service falls last as there are minimum speeds and requirements already in place.

***Step 5:*** *Costs and Benefits of Definitions*

The Status Quo is a definition and policy system already in place that shows progress in the deployment of broadband. Adopting the Status Quo would therefore have neither costs nor benefits since no changes would occur. Proposition 1 increases the minimum speed of mobile broadband service and also suggests expansion of the mobile network providing consumers with service comparable to fixed service and increase usage. Releasing spectrum to accommodate for higher traffic and expansion into areas of need would incur a one-time cost that would permanently progress the deployment, accessibility, and quality of broadband. Proposition 2 suggests deploying fiber which has the same cost and benefits as Proposition 1. The reliability of fiber as well as the quality of service provided would greatly impact areas of need and minimize the gap between populations in the United States.

***Step 5:*** *Final Recommendation*

In order to progress the deployment of broadband in areas of need as well as growing cities and suburbs, deployment of fiber would allow for broadband service that better meets “advanced telecommunications capabilities” and is accessible to more of the American population. The cost of deploying fiber in 90% households by 2029 was estimated to be $70 billion. This price would incur only once but would guarantee reliable and accessible fixed service to a large percentage of the American population. Not only would it close the gap between those with and without broadband, but it would also be able to accommodate the increase in consumers, avoiding issues with latency or speed. Fibers weather resistance also allows for reliability in rural and disaster-affected or disaster-prone areas, limiting the need to re-deploy broadband and further reducing long-term costs in providing the universal service of broadband.

**References**

[1] FCC, “2019 BROADBAND DEPLOYMENT REPORT,” Federal Communications Commission, FCC 19-44, May 2019.

[2] “The Perfect Storm: How Weather Affects The Internet,” *Pilot*, 03-Jun-2019. [Online]. Available: https://www.pilotfiber.com/blog/the-perfect-storm-how-weather-affects-the-internet.

[3] “Mobile Broadband: The Benefits of Additional Spectrum,” presented at the FCC STAFF TECHNICAL PAPER, 2010.

[4] L. R. Youngers, “Re: Notice of Ex Parte Submission of the Fiber Broadband Association, WC Docket Nos. 19-126 and 10-90,” Fiber Broadband Association, Sep. 2019.