

Special Interim Committee on Broadband Development

January 2022



January 5, 2022

Rob Vescovo, Speaker House of Representatives State Capitol Building Jefferson City, MO 65101

Dear Mister Speaker:

The Special Interim Committee on Broadband Development has met, taken testimony and concluded its review. The below listed committee members are pleased to submit the attached report:

Representative Jay Mosley

Representative Wes Rogers

Representative Travis Smith

Chairman Representative Louis Riggs

Representative Cyndi Buchheit-Courtway

Representative Bishop Davidson

Representative Travis Fitzwater

Sincerely,

Representative Louis Riggs Committee Chairman

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Introduction and Summary of Public Testimony

Speaker of the House Rob Vescovo appointed the Interim Committee on Broadband Development to investigate the status of broadband internet deployment in the State of Missouri in 2021, to conduct public hearings in Jefferson City, to conduct town hall meetings across Missouri, to take written testimony, and to prepare a report covering every facet of the importance of increasing broadband internet access across the entire State of Missouri. At the conclusion of this process, Speaker Vescovo requested recommendations for legislative and fiscal action that would ensure that all Missourians have access to broadband internet resources.

The members of the Committee included Representatives Louis Riggs (Chair), Cyndi Buchheit-Courtway, Bishop Davidson, Travis Fitzwater, Jay Mosely, Wes Rogers, and Travis Smith. Each member assisted with at least one town hall meeting in addition to their regular duties.

The lack of access to Broadband (high-speed) internet in much of rural America has been compared to the lack of access to electricity in rural American in the 1930's, when many utilities refused to provide electricity to areas that deemed "unprofitable."

As of the date this report is released, Missouri is ranked 32nd in the United States in terms of access. With an estimated 150,000 households unserved/underserved based on data released by the Federal Communications Commission (FCC) in 2020, that is nearly 400,000 Missourians who do not have access to State-minimum 25/3 speeds at a time when the Federal government is increasing the minimum speeds it will fund to 100/20 (with 100/100 serving as the new benchmark). Within the last three years, Missouri was ranked as low as 49th in speed.

While Missouri has seen some progress, moving from 41st in access to 32nd due in some measure to the influx of funds from Connect America Fund (CAF II) funds, the USDA, and the US Department of Commerce, as well as significant expenditures from the State of Missouri Broadband Fund, there is still a tremendous amount of work to do in order to move Missouri from below the middle of the pack into the Top 10 states in the country.

As of this writing, Missouri ranks 44th in terms of home use of fixed broadband (64.6% in Missouri, national average 70.8%), 44th on reliance on cellular data for internet (14.4% in Missouri, national average 11.8%), 11th on reliance of satellite internet (8.3% in Missouri, national average 6.5%) and 15th for households with no internet access at all (15.0% in Missouri, national average 13.4%). As we approach 2022, none of these numbers is particularly encouraging and all demonstrate significant room for improvement across Missouri.

Much of the attention to gaps in broadband coverage has been focused on Missouri's Rural areas, again with ample justification. The major problem for Rural Missourians is lack of access itself. However, the broadband "digital divide" is not limited to Rural areas. The Interim Committee has heard significant testimony that the digital divide is also acute in Missouri's urban cores as well as in many suburban areas where the obstacle to broadband access hinges on the issue of affordability as well as physical access, particularly in low-income housing developments. Data from Pew Research Center identified household income as the primary determinant whether a household has a broadband connection. Some 57% of households making less than \$30,000 per

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year and 74% of households making between \$31,000-\$49,999 per year have access in the home. In contrast, 98% of households with more than \$75,000 have access in the home. One of the key take-aways of the COVID-19 situation is that online education access is a critical issue in every area of the State of Missouri, from the smallest Rural K-8 district to the largest urban and suburban school districts. School districts deployed thousands of wi-fi "hot spots" across the State of Missouri, with decidedly mixed results. Far too many students found that they could not make the hot spots work because they did not have a sufficient cell phone signal to activate the hot spots to begin with, rendering thousands of tablets issued to bridge the gap between in-seat and online classes completely useless.

Another key takeaway of the COVID-19 situation is that far too many Missouri senior citizens were unable to access remote medical services, known as "Telehealth," for a variety of reasons, including lack of bandwidth to enable Zoom and other technologies to work in their homes, but also due to lack of knowledge regarding operations of the computers in their homes. Significant testimony regarding the lack of digital literacy also points to a barrier to broadband adoption that has not been addressed in a meaningful sense at the statewide level in Missouri.

Testimony heard by the Committee also points to significant broadband-related barriers to workforce development as well deployment of precision agriculture resources using GPS technology. With the acceleration of the Internet of Things (IoT) and work from anywhere (WFA) remote workforces across the United States, now is the time to take significant steps to bridge the digital divide in Missouri once and for all.

Additional testimony concerned the negative impact that the Federal government has had on broadband development across the State of Missouri. The Federal approach has been based on deeply flawed premises, starting with using census block methodology that "checks the box" that every person within a census block is served if one household is served, a fallacy that affects hundreds of thousands of Missourians. The second deeply flawed premise is that the FCC maps that are used to determine those who are served, underserved and unserved are based on voluntary data furnished by providers that populate maps that are obsolete the moment they are released and do not accurately reflect the reality on the ground in real time. The third premise is that by shoveling huge sums of money into a reverse auction process that exalts quantity over quality, much of the Federal funding has been wasted on "solutions" that not only do not solve problems, they exacerbate existing digital gaps because many areas are deemed "served" have no semblance of universal access to Broadband (high-speed internet) whatsoever.

On the plus side, the Missouri Broadband Fund has been praised for its effective challenge process as well as its nearly 7:1 return on investment using matching funds that has attracted significant follow-on capital. The flexibility and responsiveness of the Missouri Broadband Office has also received high marks, administering matching fund grants as small as \$25,000 using community standards instead of census block methodology to better reflect reality on the ground compared to the federal approach. The Parson Administration has signaled its willingness to invest a significant portion of Missouri's American Rescue Plan Act (ARPA) funding to broadband internet, a most welcome development in 2022 and immediately thereafter.

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Meetings were held around the state as part of the fact-finding responsibilities of the Interim Committee on Broadband Development. These meetings were coordinated and hosted both by members of the committee and other state officials with the intention to engage stakeholders and providers in a discussion regarding various broadband issues facing a particular region. The dates and locations of these meetings are listed below:

- 6-11-21 Palmyra: [No recording available]
 - Host: Rep. Louis Riggs, Rep. Greg Sharpe, Rep. Ed Lewis, and Rep. Danny Busick
- 7-26-21 <u>Independence</u>
 - o Host: Rep. Wes Rogers
 - Participants: Rep. Doug Richey, Rep. Emily Weber, Rep. Bill Kidd, and Rep. Ashley Aune
- 7-28-21 Perryville
 - o Host: Rep. Cyndi Buchheit-Courtway
 - o Participants: Rep. Rick Francis, Rep. Dale Wright, and Sen. Elaine Gannon
- 8-9-21 Springfield
 - o Host: Rep. Bill Owen and Rep. Bishop Davidson
- 8-10-21 Ava
 - o Host: Rep. Travis Smith
 - o Participants: Sen. Karla Eslinger
- 8-17-21 Hazelwood
 - o Host: Rep. Jay Mosely
 - o Participants: Sen. Angela Walton Mosley
- 8-24-21 Ashland
 - o Host: Rep. Travis Fitzwater
 - o Participants: Sen. Mike Bernskoetter
- 9-10-21 Albany
 - o Host: Rep. Randy Railsback
 - o Participants: Rep. J. Eggleston, Rep. Dean Van Schoiack, Sen. Dan Hegeman
- 9-24-21 St. Louis, HSSU
 - o Host: Rep. LaKeySha Bosley
- 9-27-21 <u>Poplar Bluff</u>
 - o Host: Rep. Hardy Billington, Rep. Darrell Atchison
 - o Participants: Sen. Holly Rehder
- 10-28-21 Eminence: [No recording available]
 - o Host: Rep. Bennie Cook, Rep. Ron Copeland

Additionally a Northeast Missouri Broadband Steering Committee was created to address broadband issues in that region of the state.

- 11-3-21
- 11-18-21
- 12-28-21



The following providers and organizations supplied testimony before the Interim Committee on Broadband Development during its committee hearings in Jefferson City:

• 6-10-21

 MO Department of Economic Development – Timothy Arbeiter (Director of the Office of Broadband Development)

• 7-20-21

- The Pew Charitable Trusts Kathryn de Wit (Project Director Broadband Access Initiative) and Anna Read (Senior Officer – Broadband Access Initiative)
- Association of Missouri Electric Cooperatives (AMEC) Caleb Jones (CEO) and Co-Mo Electric, Ralls County Electric, SEMO Electric
- o Farm Bureau Garrett Hawkins (President)

• 8-16-21

- University of Missouri System Marshall Stewart Vice Chancellor for Extension and Engagement & Chief Engagement Officer
- o Google Fiber Peter Cunningham (General Manager)
- o Ameren
- o AT&T Christopher Pickel (Regional Director, External Affairs)
- o LUMEN/Century Link Claudia Sands (Government Relations Manager)
- o Bluebird Network Michael Morey (CEO)
- Socket Telecom Matt Kohly (Director of Carriers Relations and Government Affairs)
- o City of Kansas City Melissa Kozakiewicz (Assistant City Manager)
- o Chariton Valley Kirby Underberg (President & CEO)
- Wisper Internet Shannon Shores (Vice President of Sales and Marketing) and Chris Sigley (Chief Technology Officer)

• 9-16-21

- Missouri Cable Telecommunications Association (MCTA) Andy Blunt (Executive Director)
- o Charter/Spectrum Mike Lodewegen (Senior Manager, Government Affairs)
- o American Public Power Assoc. Joy Ditto (President)
- MPUA, City Utilities of Springfield, Marshall Municipal Utilities, City of Houston
- o Coalition for Local Internet Choice (CLIC)
- o Bollinger County Library Eva Dunn (Director)
- Von Technologies Michelle Vondrasek (President)
- MO Chamber of Commerce Kara Corches (Vice President of Governmental Affairs)
- o MO 911 Service Board Brian Maydwell (Executive Director)
- o MoreAble
- o KCFiber Aaron Wendel (Managing Partner)
- Kingdom Telephone Company, Green Hills Communications, and Mark Twain Telephone Company

• 10-18-21

FFA - Marie Davis (NE District Supervisor in Agricultural Education and MO FFA)

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- MO Department of Higher Education Zora Mulligan (Commissioner)
- MO Department of Elementary and Secondary Education Dr. Margie Vandeven (Commissioner)
- o Ralls & Shelby County Presiding Commissioners Wiley Hibbard (Ralls) and Glenn Eagan (Shelby)
- MO Municipal League Richard Sheets (Executive Director)
- UM System Telehealth Network Rachel Mutrux (Senior Program Director of Telehealth)
- o BNSF Railway Jeffrey Davis (Director of Government Affairs)
- o MACOG Doug Hermes (Statewide Planner)
- o Meramec Regional Planning Commission Bonnie J. Prigge (Executive Director)
- o Intelligent Community Forum Louis Zacharilla (Co-Founder)
- o LTD Broadband Haley Tollefson (Marketing Director)
- Health Forward Foundation McClain Bryant Macklin (Director of Policy and Strategic Initiatives)
- Kansas City Public Library Carrie Coogan (Deputy Director for Public Affairs & Community Engagement)
- Fortinet
- o MO Developmental Disabilities Council self advocates
- o Motorola
- o S2K Tech Day Veerlapati (CEO)
- o Microsoft Vickie Robinson (General Manager, Microsoft Airband Initiative)
- Satellite Broadcasting & Communications Association (SBCA) Steven Hill (President)
- o SSM Health Sue Kendig (Women's Health Integration Specialist)
- o BJC Medical Group Dr. Michele Thomas
- o AARP Jay Hardenbrook (Associate State Director Advocacy)

• 11-22-21

- o AgriExperts Keith Eisberg and Abner Womack
- o MO MODOT Eric Schroeter (Assistant Chief Engineer)
- o MO Department of Agriculture Chris Chinn (Director)
- o MO DED Timothy Arbeiter (Director of the Office of Broadband Development)



Chapter 1: Access

Missouri is currently ranked 32nd in the United States in terms of access, an improvement from 41st in access within the last three years. That is a significant improvement, but as mentioned in the introduction, Missouri lags behind the rest of the United States in every key factor that determines meaningful broadband access.

The General Assembly enacted a state standard of minimum 25/3 access in 2018 through H.B. 1872. This was based on the Federal standard announced by the FCC in order to determine eligibility for Federal funding as discussed previously. In 2021, ARPA guidelines announced a new recommendation (not yet a requirement) of 100/100 speeds, with approval of 100/20 when 100/100 was not practical. The Missouri General Assembly also enacted a 'hierarchy' of needs in 2018 to determine who was served and who was not: 10:1 or less speed is classified as "unserved," 10:1-25:3 access is "underserved" and anything above 25:3 is deemed "served." It is reasonably foreseeable that the Federal standard will only increase from this day forward, rendering existing statutes and standards obsolete (as will the march of technology itself).

As mentioned previously, physical access remains a barrier to deployment in Rural areas (also commonly classified as 'last mile access'). As of this date, 15% of all Missouri households have zero access at all. Currently 66,583 households or about 177,617 people fall into unserved/underserved census blocks.

An assumption can be made that the Federal standard will be increased, with "unserved" reclassified as no service but not quite 25/3, "underserved" reclassified as above 25/3 but not quite 100/20, and "served" reclassified as above 100/20. Based off the December 2020 FCC data and 2010 Decennial Census information, reclassifying these definitions would place 362,967 households or around 948,853 people in the unserved/underserved category—a quantum leap backwards on the heels of Federal funds being plowed into technologies that only provided 10/1 and then 25/3 standards over the last decade.

It is also reasonably foreseeable that the Federal government will continue to "move the goalposts" regarding sufficient broadband access, and Missouri must be in a position to move forward as a result. Fortunately, the preferred method of building out broadband resources, fiber to the home (FTTH) is already future-proof and its providers will be able to keep pace with increasing Federal standards as well consumer demand for higher speeds.



Chapter 2: Speed

As late as 2018, Missouri was ranked 49th in the nation for internet speed. While that number has improved along with overall access, speed remains a significant challenge across Missouri. Advertised rates mention the words "Up to," but all too often real speeds measured in real time fall far short of the advertised rates. Another takeaway that no one saw coming from the COVID-19 situation was the lack of resiliency in the system itself. At one point during the period when Missouri students were sent home to learn remotely, business owners across the state noticed slower internet speeds than usual in populated areas. According to the Department of Economic Development, at any given moment, 40-45% of all available bandwidth in the State of Missouri was being soaked up Netflix and YouTube. In the event that remote learning should take place again on such a scale, the lack of available bandwidth will prove an obstacle to normal business operations again.

In order to more accurately gauge the real speeds being used, other states have incorporated maps that demonstrate real-time usage through various means, including state-operated websites. The University of Missouri-Columbia has such a feature available today through the Missouri Resource Rail. There is no Federal equivalent to this and the FCC coverage maps in current use are appallingly inadequate in terms of accurate information as well as out of date. West Virginia currently uses a map that provides real-time data that is administered through the auspices of its Broadband Enhancement Council. Due to the deficiencies inherent in the Federal approach, it has become evident that Missouri needs to provide its own mapping resources to provide a clear picture of not only where broadband resources are located, but also what speeds are routinely being delivered across the state.

Site Selectors choosing to bring businesses to different states use "desk-top eliminations" to decide whether or not to proceed further with their inquiries. One of the first eliminations is based on lack of sufficient internet. While communities like Houston and North Kansas City have introduced city-wide broadband services and Hannibal has pursued "100 Gig" certification to differentiate themselves from other communities to attract new businesses, the entire state could be pursuing similar distinctions with sufficient mapping resources that reflect actual speeds. North Kansas City at this moment offers free residential internet to most of its residents and its businesses have access to some of the fastest broadband internet speeds *in the world*. The net result has been a business boom that any community in Missouri could replicate.



Chapter 3: Affordability

The most significant barrier to broadband access next to complete lack of physical "last-mile" access is affordability. This is an issue across Missouri, but is most acutely felt in Missouri's urban cores in St. Louis and Kansas City. In order to bridge this digital divide, the Federal government announced and has funded an Emergency Broadband Fund (EBB) that enables households that qualify for free or reduced lunches to obtain up to \$50 a month in assistance to be able to afford broadband internet. Due to recent Congressional enactments, the EBB program will remain intact for the foreseeable future. Funding levels are expected to be at least \$30 per month per household.

Unfortunately, the effectiveness of this program in Missouri has been far from satisfactory. Only 11% of Missouri households that qualify for this program have signed up; the national average itself is also appalling, at 16%. In Missouri, that means that 8 out of 9 households that qualify are not using this benefit, to the detriment of tens of thousands of Missouri students who use online resources for remote learning or the simple act of uploading homework assignments on time. The Federal guidelines governing this program leave the responsibility for publicizing this benefit up to the individual providers, some of which have taken significant measures to inform those in their service areas. Some have not. It has become evident that providers do not have a uniform approach to these programs, which is a matter that must be addressed in order to have a realistic approach of bridging the digital divide across Missouri. This is a problem wherever households qualify for free or reduced lunches, which is the threshold for inclusion in these programs. Providers can make significant strides in this area by offering more low-cost plans that can be supplemented with Federal funds.



Chapter 4: Digital Literacy and Inclusion

Another significant barrier to broadband adoption is the lack of cohesive digital literacy and inclusion efforts across Missouri. As mentioned previously, COVID-19 demonstrated the lack of digital literacy among Missouri senior citizens, who were unable to access Zoom and other platforms to attend virtual doctor's appointments during the height of the pandemic (and thereafter). Missouri authorized patients as end users of telehealth resources in 2016 and telehealth visits increased by as much as 1500% with a number of Missouri providers from 2019-2020. That improvement in the delivery of services did not apply to those who could not log on to their computers or follow the directions to activate their remote appointments. The ability to stay home and avoid other sick people is not particular to COVID; that is a 365-day a year blessing to those who are already immuno-compromised and have no business being around other sick people.

Digital literacy is also a barrier to those who have mental health issues and do not seek treatment from brick and mortar facilities due to the stigma attached to mental illness. This problems cuts across all segments of our society regardless of age. The damage caused by COVID-19-related isolation will take years to calculate, if it can ever be properly assessed.

Digital literacy is also a barrier to parents and grandparents of students who are in school who are attempting to learn remotely. Untold thousands of Missouri students lost as much as a year of instruction as a result of COVID-related measures. With the onset of more after-school academic programs, weekend programs, and summer school programs designed to increase the effectiveness of teaching and learning, more digital literacy resources will be needed in order to bridge this divide.

The nonprofit sector in Kansas City, in partnership with the Kansas City Mayor's office and other digital stakeholders, has created the capacity to go house-to-house throughout neighborhoods to assist with digital literacy. These "digital navigators" assist those who do not know how to set up email accounts or upload resumes to do so. Such entities as Kansas City Public Library (KCPL) and Mid-Continent Public Library (MCPL) provide dedicated computer terminals and training to those who do not have home access. Indeed, public libraries across the State of Missouri proved to be reliable partners throughout the pandemic, providing wi-fi hot spots across the state, as well as dedicated computer resources within their facilities.



Chapter 5: Emerging Trends

The Committee heard a variety of testimony regarding emerging trends, including the use of low-earth orbit satellites as a possible solution to last-mile access issues in areas of Missouri that will be impossible to reach with terrestrial solutions such as fiber for the foreseeable future.

Another emerging trend that will only accelerate is the need for more bandwidth to operate "smart" devices. The Committee heard testimony that the average Missouri household now uses 7 smart devices that require the internet to operate; the record household use to date is 27 devices. As technology improves and more devices use internet access to operate, the need for additional bandwidth will only increase.

Other emerging technologies that show promise with regard to access do not increase speed, but boost the distances that signals can travel. In order to deploy these technologies in true "last mile" areas that have no service at all, Missouri will need to consider a funding mechanism that will not otherwise meet 25:3 or higher standards.



Chapter 6: Accountability

The Committee heard testimony in Jefferson City and numerous examples during town hall meetings that accountability is a major issue regarding the effectiveness of existing and prior efforts to provide broadband resources to areas all across Missouri. As mentioned previously, there is widespread dissatisfaction with the Federal approach to building out broadband across the state through the reverse auction process that emphasizes quantity over quality and leaves far too many Missourians without recourse when their needs are not being met, despite the Federal government's approval of the processes in those areas which remain underserved.

Much of the frustration centers on a lack of accountability to those who are allegedly served in these areas after receiving millions upon millions in Federal funding. The Committee heard testimony from LTD, which won the lion's share of the latest USDA RDOF auction in Missouri, to the effect that it is waiting for FCC guidance before it deploys any broadband resources in Missouri at all. By winning reverse auctions, such providers freeze out Missouri-based providers who are already deploying broadband resources—and have been doing so in some cases for more than a decade. It could be argued that if a state wanted to make sure that the digital divide is never closed, it would adopt the existing Federal approach.

At one town hall, two of the speakers shared what it was like to still be using dial-up technology. As of this date, 2% of Missouri households are still dependent on those services for their internet, none of which are capable of bringing broadband resources to their homes or businesses. A cursory glance at FCC maps demonstrates how woefully inaccurate their information is; one member of the Committee took the step of pointing out areas in his home county that the FCC map reflected as "served" and identified areas of his home county that have no access at all. The lack of accountability at the Federal level is a luxury that Missouri citizens can no longer afford. Accountability measures need to be increased with regard to the State funds as well. Other states have implemented on-site surveys and Missouri should take steps to do the same in order to ensure that providers stay on-time, on-task with taxpayer-provided funding.



Chapter 7: Online Education

COVID-19 laid bare the deficiencies in online education across Missouri like no other sector of society. Hundreds of thousands of students went from in-seat instruction to online instruction with very little warning in spring semester 2020, and the test scores from 2021 prove that many lost meaningful instruction for months at a time. Students who did not have good internet access were immediately left behind in terms of instruction and many stayed behind, despite the deployment of tens of thousands of wi-fi hot spots across the state, including areas in the urban cores. Far too many of these students, rural, suburban and urban, were unable to activate the hot spots due to weak cell phone signals, which rendered the tablets they had been given to complete and upload homework and exams inoperable. This was a problem across the entire state, despite the fact that the vast majority of Missouri's public schools have broadband access through MORE.net. We cannot "hot spot" our way out of this situation.

Online education also suffered at the post-secondary level. Programs such as Western Governors University offer courses in a completely online format, but cannot enroll students who fail their minimum speed tests for course work delivery. There are some 800,000 Missouri residents who have completed some college course work without obtaining a degree. Many are seeking online degrees due to their flexibility. Many others are unable to pass the minimum speed tests. All who do not have sufficient broadband capability are being punished as a result. The same holds true for those pursuing Industry-Recognized Certificates in order to improve careers and job prospects.



Chapter 8: Telehealth

COVID-19 at once demonstrated the value of telehealth resources while pointing out other glaring deficiencies across Missouri, particularly with Seniors who do not have sufficient access or the ability to make Zoom or other virtual platforms work in their homes, which defeats the entire purpose of online appointments. The Committee heard that some providers saw a 1500% increase in the use of telehealth resources. Telehealth is here to stay, for those who can gain access to it. A possible solution that affects telehealth resources for all ages as well as those who have mental health issues is to equip public libraries, of which Missouri has more than 300, with HIPAA-compliant spaces to be able to attend their virtual doctor's appointments. This is an innovation whose time has come across Missouri.

According to AARP: 15% of Americans 50+ do not have broadband; 60% say that cost is a problem.

According to OATS, some 42% of seniors lack wireline access at home; senior adults with less than a high school diploma or an income below \$25,000 are ten times more likely than the general population to be offline. In addition, Black and Latino seniors are more than 2.5 and 3.3 times more likely, respectively, to be offline.

One of the most critical lessons learned from the COVID-19 response is that telehealth is here to stay. The problem of access for Seniors is already acute and will only accelerate as the necessity of virtual visits continues across an ever-aging population. The public health implications of expanding telehealth capabilities are obvious: no one needs to be around other sick people if they have an alternative way of accessing health care. That holds true for the common cold, influenza as well as COVID-19.



Chapter 9: Workforce Development

Broadband touches and concerns all aspects of Workforce Development. COVID also exposed glaring weaknesses in Missouri regarding the ability of individuals to compete in a workforce that has struggled to get back onto its feet as a result of lay-offs and closings. An estimated 30% of all Missouri small businesses closed as a result of the pandemic response, resulting in the laying off of thousands of employees. As mentioned previously, many Missourians do not know how to operate computers even if they have access to sufficient broadband speeds. This problem is particularly acute for those who do not know how to upload a resume to apply for the thousands of jobs that have been and remain open since the beginning of the pandemic response (more than 18 months as of this writing). Digital navigators are necessary to assist with this critical element of the job search. In the Kansas City area, Goodwill Industries is helping to meet this need by providing mobile computer centers which are also staffed with digital navigators who can show job applicants how to set up email accounts, upload resumes and bookmark the most important sites for recurring use as their job searches continue.

Public libraries also have a role to play in this process. Missouri has 34 Job Centers across the state, but more than 300 public libraries, including at least one in every county of Missouri. Equipping public libraries with resources that enable them to administer proctored exams for Industry-Recognized Certificates will only accelerate the development of Missouri's workforce pipeline.

A series of regional studies headed by a retired University of Missouri Professor across the southeast portion of the state concludes that Missouri loses an estimated minimum of \$400,000 for each student who does not have sufficient broadband access to complete their schooling and to compete for jobs in the existing Missouri economy. This sorely depletes the Missouri Workforce Development pipeline that the State has been working on to fill with innovative employer-centric programs and reliance on Apprenticeships, a category where Missouri ranks in the Top 3 in the United States. We cannot play to this strength without sufficient broadband internet access

Surveys of Generation Z students, who are now moving through Missouri schools, demonstrate that as many as half believe they will and wish to work for themselves. This will create thousands of opportunities for entrepreneurship across the State every year for the foreseeable future. Many of these individuals are already attempting to run businesses from their homes. Some are unable to do so because they do not have sufficient bandwidth to take simply payments from PayPal. Missouri should be in a position to take advantage of these individual initiatives. It is not.

When the State of Missouri gave its employees the option to work from home in 2020, some 25% of the total workforce stopped going into State offices and began working from their residences. A significant number of employees who wished to work remotely were unable to do so as a result of insufficient broadband access to upload documents. The Office of Administration surveyed workers from each department and found that all of them had at least 90% job satisfaction among those who were able to work remotely. The flexibility of such work was highly attractive, as was the increased savings in time and money from not having to





commute. Remote work is here to stay, but only for those who have sufficient broadband capacity to stay home in the first place. This is true across the private as well as the government sectors. In order to accommodate this trend and compete for workers from across the globe, Missouri must have sufficient broadband access to attract and keep an increasingly important remote work force.



Chapter 10: Precision Agriculture

Agriculture remains Missouri's #1 economic driver and lack of Rural broadband access has been a thorn in the flesh of Missouri producers for decades already. Missouri has the second most farms of any state and has the most diverse crop base of any state in the Union. Missouri producers have become dependent on GPS to decrease input costs and improve yields. The Director of Agriculture testified before the Committee that the data streams generated by precision equipment has increased to terabytes for a farm field and several megabits for each kernel of corn. A new industry is emerging to interpret these data streams—none of which can be generated without sufficient broadband internet access. This affects cow/calf and hog operations as well due to their dependence on the ability to access veterinary records for their animals in real time. Missouri farmers have noted that they must return to "line of sight" plowing where "the internet ends," the same as they have done since the beginning of recorded history. The difference is that the cost of their equipment has rapidly increased due to technological advances, none of which matter if the producer does not have access to the data. Neighboring states, most notably Iowa, have begun aggressively to address this "last acre" access gap.

Precision agriculture has improved fertilizer placement efficiency by an estimated 7 percent and has the potential to further improve an additional 14 percent with more widespread adoption. This not only saves the farmer money on fertilizer; it also improves water and soil quality and reduces greenhouse gas emissions. Similar benefits accrue in terms of herbicide, fossil fuel, and water use.

Only 82 percent of Missouri farms have internet service in any form. On average, 70 percent of Hispanic-operated farms and 62 percent of Black-owned farms have internet access.

Increased yields increase revenue for school districts as well as enable family farms to continue to operate into the next generation. The advances in GPS technology are literally creating new jobs to interpret the data, another positive development for agricultural producers. All progress in this vital area of Missouri's economic future hinges on the availability of sufficient broadband access.



Chapter 11: Economic Development/Entrepreneurship

As mentioned previously, site selectors eliminate Missouri communities and regions from consideration if they do not have good broadband access. It is impossible to determine how many jobs Missouri has lost, or how limited existing businesses have been in their ability to expand as a result of poor broadband internet access.

The increase of the remote workforce is only going to accelerate as people who have grown accustomed to the flexibility of remote work seek to continue those arrangements permanently. Demographers have indicated that a number of Missouri counties, many along the Iowa and Arkansas borders, have lost significant population over the last decade. These areas also have poor access to broadband resources. If demography is destiny, the lack of sufficient broadband will condemn more Rural Missouri communities to oblivion. Conversely, areas that enjoy excellent broadband resources are seeing increases in population. The most interesting example of this is Ralls County in Northeast Missouri, whose Presiding Commissioner testified before the Committee that the tax receipts coming into Ralls County as a result of population growth have led to a movement to roll back some of its property taxes. Ralls County's Co-Op has been deploying broadband aggressively for more than a decade and offer 1 gig up and down across its entire service area. As a result of this deployment, the population slide has stopped and the Co-Op is within 400 households of providing broadband internet to its entire service area. Ideally, every county in Missouri would be able to tell a similar story.

Younger Missourians who wish to work for themselves and start their own businesses cannot do so without sufficient internet resources. Those who do stay put in Missouri are leading a rebound in Rural areas now known as the "Brain Gain," as opposed to the Brain Drain that has been experienced for the last 25 years. Those who wish to work for themselves and participate in the remote workforce cannot do so without sufficient broadband access.

According to a recent Purdue study, every \$1 spent on broadband equals a \$4 return into Indiana's economy. The implications of lack of access are obvious; Missouri cannot expect to increase its revenue base without sufficient broadband access.



Chapter 12: Resource Partners

Missouri is blessed with a variety of resource partners who are already working to close the digital divide. This list includes MACOG, the Missouri Association of Councils of Government, the umbrella group of the 19 Regional Planning Commissions that interact with every type of government, from townships to the USDA, and were a major component of the effort to roll out broadband a decade ago. Many of the individuals involved with that experience are still working for RPCs today. MACOG assisted the work of this Committee by providing spaces for town halls across the State of Missouri. MACOG has also assisted County Commissioners, Mayors and City Managers and Administrators with disbursement of CARES Act funding as well as engaging with the same stakeholders to plan for the most strategic disbursement of ARPA Funds and to begin planning for receipt of infrastructure funds recently passed by Congress.

The State Broadband Office has received high marks for the performance of its Director, Tim Arbeiter, who will have left the office before this report is published. The process that has received uniform praise is the challenge process implemented by Director Arbeiter. His office has also successfully disbursed State Broadband funds to dozens of providers across the State who are proficient at last-mile access.

Kansas City has assembled an impressive array of stakeholders to bridge the digital divide through the use of digital navigators down to the neighborhood level, including house-to-house visits to equip individuals to enter the workforce and operate equipment needed for telehealth appointments. Stakeholders include the Kansas City Mayor's Office, Kansas City Public Library, Mid-Continent Public Library, and Goodwill Industries.

Missouri's public libraries have bridged the digital divide in every area of the state, be it urban, suburban or rural. They have assisted with distribution of hot spots for Missouri students, have provided dedicated computer access and assisted with digital navigation in many areas of the state as well.

University of Missouri Extension has provided assistance in several areas of the state by facilitating county-wide discussions centered on broadband needs and has partnered with other University System stakeholders to create the Broadband Resource Rail, complete with mapping that is superior to anything produced by the FCC. A retired University of Missouri economist, Abner Womack, has provided granular studies of southeast Missouri counties in the Southeast Missouri and Ozark Foothills Regional Planning Commission service areas that demonstrate Missouri loses a minimum of \$400,000 per pupil for every student who leaves Rural areas for other states.

Missouri's counties and municipalities are proving to be resource partners on a level with the State of Missouri itself in terms of funding and the ability to bridge the digital divide quickly through direct investment of CARES Act and now ARPA funds. The Ralls County and Shelby County Presiding Commissioners testified before the Committee about the processes they used to determine which areas of their counties to fund with both CARES Act and ARPA disbursements. The Ralls County Presiding Commissioner spoke for many stakeholders across the state when he

SPECIAL INTERIM COMMITTEE ON BROADBAND DEVELOPMENT



explained that he and his fellow Commissioners authorized broadband funding in their counties because they do not sit around and wait for the Federal government to tell them what to do.

The Committee heard testimony from Houston, Marshall and North Kansas City regarding their efforts to provide broadband internet for their residents. Houston is advertising itself as Missouri's "Work From Anywhere" destination community and publicly states it would like to exit the internet service provider business. North Kansas City did exit the business and still provides free internet to its residents. As mentioned previously, this has resulted in a business boom that can be replicated anywhere in Missouri.

Missouri's public schools, the vast majority of which are linked to broadband internet through MOREnet, have served as resource partners throughout the pandemic, using such innovations as school buses with hot spots to travel their normal routes to provide students with the opportunity to upload assignments during regular school hours.

Missouri's Electric Cooperatives, which were literally born during the Depression when the Rural Electrification Act brought electricity to millions of American farms that had been in the dark until that time, have also provided significant assistance in several areas of the state. Among the most significant broadband providers are Co-Mo Electric on the south side of the Lake of the Ozarks and Ralls County Electric in Northeast Missouri. Both supply fiber to the home across their service areas and Ralls County is reportedly within 400 households of providing 1 Gigabit Up and Down service to all of its customers. Ralls County was one of the few entities that was "shovel ready" with ARRA funds in the last years of the 2000's and has been deploying broadband internet ever since.



Chapter 13: Federal Funding

As has been discussed previously, Federal funding has been most welcome across Missouri, but has not delivered as much as it could have if the reverse auction process did not place such a high emphasis on "checking the box" within census blocks and neglecting quality, higher-speed internet instead of deploying fixed wireless platforms that have not delivered anticipated results outside their limited radiuses. As of this writing, Missouri is in line to receive at least another \$100 million in broadband funding: perhaps more based on Missouri's middling rank in so many categories denoting deficiencies.

Of special note is the prospect of Missouri's HBCU's, Harris-Stowe University in St. Louis City and Lincoln University in Jefferson City, receiving millions in funding to build out broadband resources as far as 15 miles from their campuses. The impact that Harris-Stowe could have on the urban core of St. Louis City and the southern area of North County is considerable in and of itself and could prove to be a game-changer to bridge the digital divide in the urban core. Lincoln University shows similar promise for mid-Missouri.



Chapter 14: Competition

Missouri's State standard of 25:3 is designed to be a floor, not a ceiling, for State funding. The Committee took testimony from smaller providers that can provide less than 25:3 access to some of the most remote areas of the state, but will not be allowed to participate in Federal or State funding programs due to their lack of speed. Since broadband internet is not regulated, competition has been fierce in some areas and non-existent in others. A constant complaint from Missourians is that there are internet trunk lines in their front yards, but they cannot obtain access to their homes and businesses. The Committee heard testimony from MoDOT that it laid in over 1300 miles of fiber 25 years ago, of which it claims the vast majority cannot be used due to Federal restrictions. Considering that some 1100 miles of fiber are located in the St. Louis area alone, obtaining a release from those restrictions would enable public-private partnerships to build out fiber into areas where the digital divide has been and continues to be acute.

Another disturbing wrinkle of the MoDOT story is that its network is for all intents and purposes controlled by Lumen, the successor in interest to CenturyLink, which was the successor in interest to the original firm that went bankrupt while building out the MoDOT fiber network, and has lain comparatively dormant for 25 years in some of the most rural areas of Missouri. This anomaly must be thoroughly addressed.

For many years, municipal utilities following into areas annexed by growing cities have been hamstrung by incumbent providers that are not willing to provide broadband internet themselves, but refuse to allow municipal utilities to provide it, either. The people caught in this cross-fire therefore continue to do without. This impediment to deployment must also be thoroughly addressed.

The specter of overbuild is equally troublesome in areas of the state that are already served according to the statutory definition of 25:3. The previously mentioned challenge process has succeeded in large measure to stop this practice, but the increasing standards from 25:3 at the Federal level and the anticipated companion increase at the State level will doubtless set off a new round of overbuild in areas that can use the competition, but will draw resources away from areas that have no access at all.



Challenges

There are a number of major challenges facing Missouri's efforts to vault from the middle of the pack into the Top 10 states in the Union in terms of broadband access. Lack of decent mapping resources is one; continued suffering from flawed Federal census-block methodology and reverse auctions that see out-of-state providers making serious money but not making serious progress toward bridging the digital divide is another.

New FCC maps are planned to be released in 2022. However, without current granular level data and updated FCC maps, there is a difficulty in planning broadband expansion projects now in order to meet the timeframes required by ARPA. In addition, FCC maps have shown as much as 15% false positives for coverage.

A recurring theme from testimony and town hall meetings has been the need to simplify the make-ready process for deploying broadband fiber (both buried and aerial). Middle mile access is plentiful, but in some cases, 75% of it is not being used in areas of the state where access is severely deficient. The attitude of some providers that they will not provide broadband and neither will anyone else in their service areas is a serious challenge that serves no one. While Broadband internet is not regulated as a utility, there is zero appetite among providers and stakeholders to subject this necessary resource to a blizzard of new regulations. While the State Broadband Fund has a claw-back period after 3 years that was enacted in 2020, the State Broadband Office itself is not sufficiently staffed to conduct site visits to ensure that fund recipients are deploying on time, on task. On the plus side, middle-mile carriers have indicated a willingness to use resources at full capacity and at the Federal level, railroads have also indicated a willingness to assist with deployment efforts that cross their rights of way.

Other states have implemented needed changes that promote competition, fairness and universal access. Ultimately, Missouri must join their ranks, and with the sheer volume of funds flowing from the Federal Government, 2022 is the best year to make necessary and long overdue changes.

As part of the information gathering process, providers were asked to distribute information on take rates, network capacity, average speeds, redundancies on existing networks, plans for increasing take rates, counties served, expansion, federal and state funds accepted, length of construction delays, length of back orders on materials, and advertising materials.

As of this writing, providers who have directly addressed these questions are Chariton Valley, Google Fiber, AT&T, Wisper, and the Missouri Cable Telecommunications Association (MCTA).

Starlink declined the invitation to testify and i3 Broadband did not attend the hearing it had been scheduled for.



Findings of Fact and Recommendations

In order to begin the process of closing Missouri's digital divide once and for all, using the once in a lifetime infusion of Federal funds that the Parson Administration has pledged more than \$400 million to utilize in FY 2023, the Interim Committee on Broadband Development is making the following recommendations:

- 1. Within the General Assembly, creation of Broadband Committees in both chambers to facilitate the legislative process and provide a measure of legislative oversight;
- 2. The creation of a Broadband development council to ensure accountability, meaningful oversight and stakeholder engagement as well as to provide mapping resources that provide real-time transparency to Missouri citizens regarding where broadband internet is, and where it is not;
- 3. Significant fiscal assistance for the Missouri Broadband Office and Broadband Fund to engage in best practices, including site visits to providers deploying broadband using State funds, as well as provide substantial matching funds through its grant process to enable providers to deploy broadband resources within the next three years;
- 4. A revised State Broadband minimum standard that will be flexible enough to move in concert with Federal standards while carving out exceptions for the most remote last-mile access until such time as technology enables phasing out of such methods;
- 5. Overhaul of right-of-way access, make-ready costs, pole attachment disputes, "Dig Once" policies, processes and deadlines that will enable carriers to engage in public-private partnerships to light dark fiber and that will enable providers to bury and string fiber without undue delays. This includes an overhaul of the existing MoDOT fiber network and a review of obstacles to deployment by networks owned by political subdivisions. Further, common sense concepts such as authorizing structures owned by the State of Missouri and political subdivisions thereof to assist with broadband deployment must be considered.

Appendix A: Links

8-16-21 Committee Hearing

NARUC Broadband Task Force Recommendations – https://pubs.naruc.org/pub/AD1F4A51-1866-DAAC-99FB-068328D2E61C

TC-1 Resolution Supporting Recommendations from the Broadband Expansion Task Force – https://pubs.naruc.org/pub/FBB1FFE6-1866-DAAC-99FB-009C2E161810

9-16-21 Committee Hearing

Starlink Explained –

https://urldefense.com/v3/_https://www.youtube.com/watch?v=LRayRAw465Q_;!!GS PrPlUsyzuLXQ!6YQriNTMwTNxerRVlQHmVBHuV-7Bs2aO54Kq35rRdVMHeqkDA-T82FpA1Dh2NkURvwYfrnTV\$

Starlink explained - why SpaceX needs 42,000 satellites – https://urldefense.com/v3/ <a href="https:/

Technology 2030 Report – https://mochamber.com/tech-report/

10-18-21 Committee Hearing

DragonNet project provides internet access to Pittsburg students – https://www.youtube.com/watch?v=rMFaqGQQqXg

Harris County Rolling Out Broadband Access to Bridge the Digital Divide for Families in Need | Motorola Solutions – https://newsroom.motorolasolutions.com/news/harris-county-rolling-out-broadband-access-to-bridge-digital-divide-for-families-in-need.htm

Personal Tech and the Pandemic: Older Adults Are Upgrading for a Better Online Experience – https://www.aarp.org/research/topics/technology/info-2021/2021-technology-trends-older-americans.html

11-22-21 Committee Hearing

Presentation to the Broadband Committee (AgriExperts) – https://ldrv.ms/b/s!Aru0yr-TSr8ig-kyKzAHcKrDIGYVkg?e=r2jKJ3

The Bootheel Economic Feasibility report on the social and economic impact of broadband on rural Missouri Bootheel – https://ldrv.ms/b/s!Aru0yr-TSr8ig-N1uTz3TXjy6uGf2A?e=Qg6vcu

The Ozark Foothills Economic Feasibility report on the social and economic impact of broadband on rural Ozark Foothills area – https://ldrv.ms/b/s!Aru0yr-TSr8ig-IQhgDJS1ZVtqFg5g?e=jQoJUZ

Other

Addendum to After Action Report Spring 2020 Institutional Response to Covid-19 – https://dhewd.mo.gov/documents/AAR3.2.pdf

After Action Report Postsecondary Education Online Rapid Response Spring 2020 – https://dhewd.mo.gov/documents/AAR.pdf

After Action Report Wraparound Services Spring 2020 – https://dhewd.mo.gov/documents/AAR2.pdf

Broadband Funding – USDA ReConnect Workshop materials – https://mobroadband.org/broadband-funding-usda-reconnect-workshop-materials/

Digitally Connected Community Guide -- https://mobroadband.org/digitally-connected-community-guide/

 $\label{lem:embroadband} Emergency Broadband Investment Program - \underline{https://ded.mo.gov/content/emergency-broadband-investment-}$

program#:~:text=The%20Emergency%20Broadband%20Investment%20Program,to%20the%20COVID%2D19%20pandemic.

Missouri Broadband Resource Rail – https://mobroadband.org/

Missouri Office of Broadband Development – https://ded.mo.gov/content/broadband-development

Missouri Statute 392.248 – https://revisor.mo.gov/main/OneSection.aspx?section=392.248&srch=y

UM System Broadband Initiative – https://muextensionway.missouri.edu/strategic-partnerships/missouris-grand-challenges/broadband-initiative

Reports

2021 National States Geographic information Council Geospatial Maturity Assessment – https://nsgic.memberclicks.net/assets/GMA/2021/2021 December 10 GMA FINAL.pdf

Accurate Broadband Maps Can Help Bridge the Digital Divide – https://www.rpc.senate.gov/policy-papers/accurate-broadband-maps-can-help-bridge-the-digital-divide

Addressing Gaps in Broadband Infrastructure Availability and Service Adoption: A Cost Estimation & Prioritization Framework – https://acaconnects.org/wp-content/uploads/2021/06/Addressing-Gaps-in-Broadband-Infrastructure-Availability-and-Service-Adoption-ACA-Connects-and-Cartesian-June2021.pdf

Bridging the Broadband Affordability Gap – https://www.educationsuperhighway.org/wp-content/uploads/No-Home-Left-Offline-Report EducationSuperHighway2021.pdf

Broadband Availability and Adoption Strategic Plan Pioneer Trails Region – https://midmorpc.org/miscellaneous/Broadband%20Healthcare%20Sector%20-%20review%20DRAFT%20w%20changes%2012-17%202.pdf

Broadband Internet Deployment, Availability, and Adoption in Tennessee Four Years After the Broadband Accessibility Act – https://www.tn.gov/content/dam/tn/tacir/2021publications/2021_BroadbandUpdate.pdf

Broadband Task Force: High-Speed Internet is Essential for All Counties – https://www.naco.org/sites/default/files/documents/NACo-Broadband-Taskforce-report.pdf

Broadband Trends (Route Fifty) – $\underline{\text{https://www.route-fifty.com/assets/broadband-trends-rfq421/portal/}}$

Comparison: All-Fiber vs. Fixed Wireless Networks for Broadband Access – https://www.fiberbroadband.org/page/fiber-research

Digital Equity Strategic Plan (City of Kansas City, Missouri) – https://www.digitalinclusion.org/wp-content/uploads/2020/07/DigitalEquityStrategicPlan.pdf

Examining Kansas City's Progress in Addressing the Digital Divide: A Comparative Analysis –

https://www.shlb.org/uploads/Policy/Policy%20Research/SHLB%20Research/SHLB_K C Broadband.1203 final.pdf

FCC Is Taking Steps to Accurately Map Locations That Lack Access – https://www.gao.gov/products/gao-21-104447

Getting Started: Creating the Intelligent Community -- https://www.intelligentcommunity.org/how to get started

Improving the Nation's Digital Infrastructure FCC – https://www.fcc.gov/document/improving-nations-digital-infrastructure

Make Better Funding Decisions with Accurate Broadband Network Data: A Guide for Federal, State and Local Governments – https://www.speedtest.net/insights/blog/better-funding-decisions-accurate-broadband-network-data/

Mid-MO Broadband Availability and Adoption Strategic Plan: Healthcare Sector (DRAFT) – https://midmorpc.org/miscellaneous/Broadband Healthcare Sector - review DRAFT w changes 12-17 2.pdf

Missouri Office of Rural Health's Biennial Report 2020-2021 – https://health.mo.gov/living/families/ruralhealth/pdf/biennial2020.pdf

No Home Left Offline Bridging the Broadband Affordability Gap — https://www.educationsuperhighway.org/wp-content/uploads/No-Home-Left-Offline-Report_EducationSuperHighway2021.pdf

PEG Access Media: Local Communication Hubs in a Pandemic -- https://cmsimpact.org/report/peg/p/executive-summary/

Public Infrastructure/Private Service: A Shared-Risk Partnership Model for 21st Century Broadband Infrastructure – https://www.benton.org/publications/public-infrastructureprivate-service

Report of June 1, 2020 Workshop: Bringing Broadband to a Missouri Community -- https://mobroadband.org/wp-content/uploads/sites/44/2020/07/WORKSHOP-REPORT-FINAL.pdf

Spring 2021 Connectivity Report Assessing the Digital Divide and Remote Learning Across 22 Kansas City School Districts – https://static1.squarespace.com/static/5aa096aee17ba30da4a41064/t/611d309bf54bb522f 0f85bea/1629302940095/Spring+2021+Connectivity+Report.pdf

The Digital Edge: Middle-Skill Workers and Careers – https://www.burning-glass.com/wp-content/uploads/Digital_Edge_report_2017_final.pdf

The Future of American Farming: Broadband Solutions for the Farm Office, Field, and Community – https://www.benton.org/sites/default/files/FutureAmericanFarming.pdf

The Rural Broadband Industry – https://www.pewtrusts.org/-/media/assets/2021/09/white paper rural broadband industry final.pdf

The State of Connectivity Building Innovation Through Broadband Final Report of the California Broadband Task Force – January 2008 – https://www.cetfund.org/wp-content/uploads/2020/08/2008 CBC TaskForce Final Report.pdf

Articles

Addressing racial and digital inequity – https://blogs.microsoft.com/on-the-issues/2021/06/02/racial-digital-inequity-airband-broadband-access/

Broadband Availability and Adoption – https://www.esri.com/arcgis-blog/products/arcgis-living-atlas/telecommunications/broadband-availability-and-adoption/

Broadband Availability Mapping – https://mobroadband.org/wp-content/uploads/sites/44/2021/08/MOST_Science_Note_Broadband_Mapping.pdf

Broadband and the Infrastructure Investment and Jobs Act -- https://mobroadband.org/iija/

Consolidated Communications Partners with KC Fiber to Bring Managed Services to North Kansas City Businesses -- https://www.consolidated.com/about-us/news/article-detail/id/788/consolidated-communications-partners-with-kc-fiber-to-bring-managed-services-to-north-kansas-city-businesses

Failed Connection: The Broadband Gap -- https://connect.chronicle.com/rs/931-EKA-218/images/FailedConnectionInisghtsReport.pdf

KC Fed: Want to strengthen Kansas City's job market? Narrow skills gap caused by digital division – https://www.startlandnews.com/2018/08/kc-fed-digital-division/

Missouri Digital Score Card – https://state-scorecard.digitalinclusion.org/scorecard/by_state/MO

Not a Luxury: Pandemic Highlights Digital Divide in Rural Areas – https://www.flatlandkc.org/news-issues/not-a-luxury-pandemic-highlights-digital-divide-in-rural-areas/

Public and Private Rural Broadband Can Make Financial Sense – https://www.bbcmag.com/community-broadband/public-and-private-rural-broadband-can-make-financial-sense

Temporary Wireless Solutions: Rapid Deployment Unit -- https://www.commscope.com/globalassets/digizuite/304697-rapid-deployment-unit-mobile-pa-114312-en.pdf

Three Steps to Universal Broadband Access – https://www.pewtrusts.org/en/about/news-room/opinion/2021/05/13/three-steps-to-universal-broadband-access

Using of American Recovery Plan Act Funds for Broadband Infrastructure – Guidance for Local Governments -- https://mobroadband.org/using-of-american-recovery-plan-act-funds-for-broadband-infrastructure-guidance-for-local-governments/

Which States Have Dedicated Broadband Offices, Task Forces, Agencies, or Funds? – https://www.pewtrusts.org/en/research-and-analysis/articles/2021/06/28/which-states-have-dedicated-broadband-offices-task-forces-agencies-or-funds

Appendix B: Committee Materials

Committee Hearings

- Committee Hearing 6-10-21
 - o Broadband Infrastructure & Access MO DED
- Committee Hearing 7-20-21
 - o Committee PPT Farm Bureau
 - o Rural Broadband Principals Farm Bureau
 - o Committee Handout GoSemo
 - o Committee Testimony Pew
- Committee Hearing 8-16-21
 - Chariton Valley
 - Committee Testimony
 - One Page Plan
 - o Broadband: Critical Infrastructure City of KC
 - Google Fiber
 - Committee Testimony
 - Answers to provider questions
 - o Committee Testimony Socket
 - UM System
 - Committee PPT
 - Promoting Broadband in Missouri Communities
 - o Committee Handout Wisper
- Committee Hearing 9-16-21
 - o Committee Testimony American Public Power Association
 - o Committee Testimony Coalition for Local Internet Choice
 - o Committee PPT Green Hills
 - o Committee Testimony Kingdom Telephone
 - o Answers to provider questions MCTA
 - o Committee PPT MO Broadband Providers
 - o MO 911 Board
 - Committee PPT
 - Committee Handout
 - o Map Missouri Telecommunications Industry Association
 - o Committee PPT New Florence Telephone Company
 - o Committee Testimony S2Tech
 - o Committee PPT Springfield Fiber
 - o Committee PPT Von Technologies
- Committee Hearing 5 10-18-21
 - o Committee Testimony BJC Medical Group
 - o Committee Testimony BNSF Railway

- o Committee Testimony MACOG
- Committee Testimony Microsoft
- o Motorola
 - BB Nitro Handout
- o Committee Testimony Missouri Telehealth Network
- Satellite Broadcasting & Communications Association
 - Committee PPT
 - Committee Handout
- Committee Testimony SSM
- Committee Hearing 11-22-21
 - o AgriExperts
 - Cost of Fiber verses the Cost of Fixed Wireless
 - Highlight Issues
- NE Broadband Steering Committee 11-18-21
 - o Policy and Practices Missouri Association of Counties
- Town Hall (Kansas City) 7-26-21
 - Post Event Summary
 - o Literacy KC Digital & Student Information Data
- Marshfield Meeting Minutes

BROADBAND Infrastructure & Access



Missouri is making progress on broadband, but there is a long way to go.

Increased

state broadband access ranking

by 9 slots

Ranked

32nd

nationwide for broadband access

2019 DDI Score

55.07
Missouri's Digital
Divide Index
(Purdue, 2021)

279,420 households in 2018

147,046
unserved or
underserved
households (FCC)

586,630 Missourians in 2018

392,364
Population of unserved or underserved (FCC)

Both infrastructure and affordability are barriers to access.

23% of Missouri students lack access 55.2%
of Missourians
have access to a
low-cost internet
plan

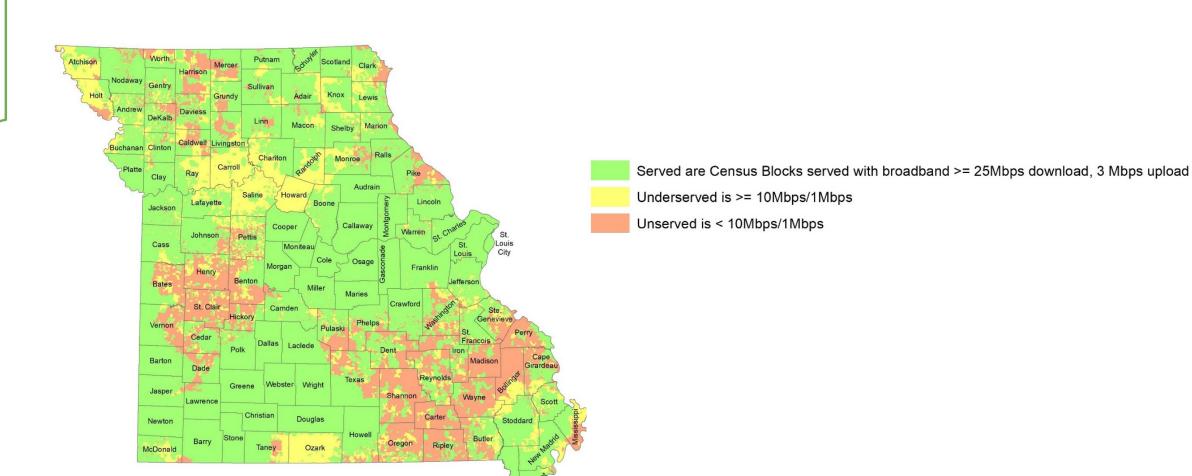
84

LEA's reported students lacked physical access to broadband

Missouri ranks in the **Bottom 5**for access to low-cost Internet

258
of LEA's reported students lacked access because of affordability

FEDERAL BROADBAND COVERAGE





\$824 million invested

State and Federal Broadband Expansion Underway

FCC Connect America Fund

11 winning providers | \$255 M Expanding access for 94,735 locations

FCC Rural Digital Opportunity Fund

13 winning providers & 4 consortiums | \$346.3 M Expanded access for 199,211 locations

USDA ReConnect Round 1

6 winning providers | \$103 M Access to 14,053 households/182 farms & businesses

USDA ReConnect Round 2

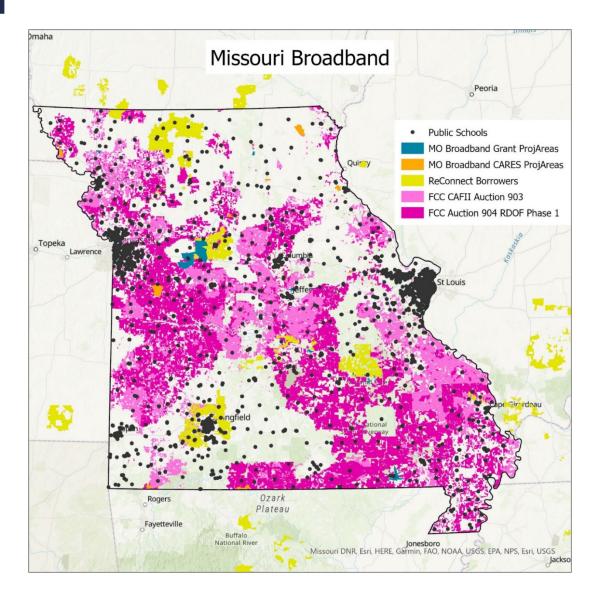
5 winning providers | \$94.4 M Access to 15,989 households/2,173 farms & businesses

Emergency Broadband Investment Program

13 winning providers | \$3.9 M Expanded access for 2,465 households

Missouri Broadband Grant Program

13 winning providers | \$3.05 M Expanded access for 4,416 locations



STATE CARES ACT PROGRAMS

\$800,000

to 39 Libraries 80% rural awards

\$4.0M

to distribute 10,045 hotspots to 38 health clinics

\$7.0M

awarded to 73% of K-12 schools to expand campus Wi-Fi

\$2.4M

to 26 projects to connect 2,500 homes 80% with Gigabyte service

\$8.3M

in awards helped 88% of Higher Ed. facilities expand distance learning

\$22.5 million

reimbursed to clinics, libraries, schools, higher education, and providers

STATE BROADBAND GRANT PROGRAM

6,950 households receiving access

\$15.1M in private investment

\$20.57M total investment

78% of projects installing Gigabyte service

\$3.05 million for infrastructure development across the state

State Broadband Programs and Initiatives

Broadband Technical Assistance Request

Grant submitted in partnership with the MACOG to the Economic Development Administration (EDA) for a pilot project for broadband modeling and engineering feasibility plans for up to 24 counties or 8 regional clusters.

Partnership will also seek resources from upcoming Community Block Grant Program.

Additional Broadband Initiatives

- Legislation passed:
 - SB108 Broadband Improvement Districts for un/underserved areas.
- Failed legislation:
 - SB184 Electrical Corporations to operate broadband
 - HB580 DESE surveys the homework gap

Coronavirus Response and Relief - Broadband

Supplemental Appropriations Act of 2021

MAY 2021

FCC Emergency Broadband Benefit Program

Status: Launched May 12

\$3.2 billion to help lower the cost of internet for eligible households

- Up to \$50/month discount for broadband services;
- A one-time discount of up to \$100 for a tech device through a provider;
- Visit
 ded.mo.gov/getconnected
 for more program info &
 participating providers.

August 2021

NTIA Infrastructure Grants Program

Status: Launched May 19

\$288 million for expanding to un/underserved areas

- Missouri Legislature included \$10M in DED's spending authority for FY22 Budget;
- Eligible applicants: state, or political subdivisions and providers;
- Prioritize 100/20mb or better, must not conflict with federal funding;
- Grantees must construct within 12 months.

SUMMER 2021

NTIA Connecting Minority Communities Pilot Program

Status: Under development

\$285 million for minorityserving institutions

- Purchase of broadband internet access service:
- Purchase of equipment
- Hiring and training IT personnel;
- Focus on minority anchor communities (15-mile radius of institution).

American Rescue Plan - Broadband

Coronavirus State Fiscal Recovery Funds

Missouri's allocation \$2.69 billion

Status: U.S. Treasury Interim Guidance issued on May 10

- ARPA allows for broadband infrastructure;
- Focus on un/underserved;
- Priority to last-mile connections, projects to provide 100Mb symmetrical;
- Assistance for internet access
 & digital literacy allowed.
- Next step: Framework for funded priorities developed pending final guidance.

Coronavirus Capital Projects Fund

\$10 billion in funding for states

Status: Treasury Guidance to be issued this summer

- Will focus on the need for connectivity in response to the pandemic;
- Will allow for investment in high quality broadband;
- Other connectivity infrastructure, devices, and equipment.
- Next step: await for Treasury guidance and application process.

FCC E-Rate Expansion

\$7.17 billion for remote learning

Status: FCC finalized rules, launching program in July

- Reimburse schools and libraries 100% of home connectivity, including:
 - Connected devices
 - Routers
 - Modems
 - Wi-Fi Hotspots
 - Other devices
- Next Step: Partner w/ MOREnet & DESE to promote new program.

Missouri Broadband Grant Challenge Process

- Within three business days of the close of the grant application period, DED publishes proposed projects' unserved and underserved areas,
- Existing broadband providers within 45 days of publication, a written challenge to an application.
- Challenge must be one of the following demonstrating evidence:
 - 1. Provider currently provides broadband internet service to customers within the proposed area; or
 - 2. Provider has begun construction to provide broadband internet service within the proposed area; or
 - 3. Provider commits to providing broadband internet service to retail customers within the proposed area within the timeframe proposed for the applicant's project.
- Within 3 business days after of the submission of a written challenge, DED notifies applicant of such the challenge,
- If the department determines the challenge to be valid the project area is not funded.

Mapping & Speed Testing Initiatives

- Missouri participates in the NBAM, provided by NTIA, US Department of Commerce (1 of 36 states participating)
- UM System Broadband Initiative launched the Ookla speed testing tool: https://mobroadband.org/speed-test-2/
 - June 23 event new online resource tool developed
- Delta Regional Authority launched the DRA Speed Test:
 https://dra.gov/research/broadband-mapping/#speedtest-
 includes 29 counties in southeast and south central Missouri

CONTACT

TIM ARBEITER

Director of Broadband Development 573-694-8785

timothy.arbeiter@ded.mo.gov

Interim Committee Testimony

July 20, 2021



The Future of Missouri Requires Better Broadband

- Definition of Broadband
 - Congress definition Capability that allows users to "originate and receive high-quality voice, data, graphic and video" services. Essential to economic development, public health, educational opportunities and yes, to agriculture.
 - MOFB definition means everyone has access to reliable broadband at speeds that will allow them to do what is needed and at prices they can afford. If any one of these is missing, then you do not have adequate broadband
- Today, our focus is broadband and the impact on our state



Let's Start With the Importance of Broadband to Agriculture

- 86% of products sold nationally are produced on family farms and ranches
- 1 US farm feeds 166 people
- Farmers and ranchers comprise less than 2% of US Population
- Population is expected to increase 2.2 billion by the year 2050 meaning farmers will have to produce 70% more food than they are producing now
- Farmers and ranchers have seen a 50% decline in net farm income in the last 4 years
- After input cost, farmers and ranchers receive 8 cents out of every dollar spent on food
- Americans spend only 10% of disposable income on food or 10 cents of every dollar
- 29% of US farms do not have access to the internet

BROADBAND IS THE ONE AREA OF INFRASTRUCTURE THAT CAN AFFECT AND IMPROVE ALL OF THE FACTS ABOVE!





Why Is Broadband Important to Agriculture in Missouri



- Agriculture is our #1 industry
- Employs nearly 400,000 people in the state
- Home to 95,000 farms covering two-thirds of the state's total land acreage
- Economic contribution \$88 billion industry
- Missouri Standings in National Rankings
 - 2nd in number of farms
 - In top 20 nationally for production of 12 different crops and livestock
 - High value of exports of agricultural products
 - Large line of infrastructure allowing Missouri to get products to market faster and cheaper



Why Is Broadband Important to Agriculture in Missouri



Agritourism can bring many benefits to farmers, visitors and communities

- Farms offer a diverse variety of recreational activities with tours, u-pick crops, and just learning about agriculture processes and that they do not just come from the store
- Several years ago, this business received more than a million visitors and that number increases each year
- Agritourism farms reported higher gross sales
- Creates employment opportunities
- Preserves our natural and cultural heritage
- Missouri products are diverse, so opportunities are great

NEED ADEQUATE BROADBAND TO MARKET MISSOURI AS AN AGRITOURISM STATE!



What's Missing

- Traditionally, discussions on broadband have been about:
 - Healthcare
 - Education
 - Business and workforce
- Agriculture and related businesses have not been a priority or even discussed much
- Not because agriculture is not important, but because getting broadband to farmers and ranchers is hard and it is costly
- And frankly, we don't know what we don't know. Broadband and the connection to Agriculture is the one area where not much data or information exists. This needs to be a top priority as we cannot address a problem if we do not know the current status.



With Good Broadband in Missouri......

- Quality of Life for Rural Communities and Farm Families is Improved
 - Students would be able to complete their homework
 - Young people would be able to return home after school somewhere else or would be able to complete college at home saving the cost of their education
 - Farmers could have increase yields, lower costs, and environmentally friendly practices
 - Farmers and community residents could have a self business or second business with ability to market and accept payments
 - Farmers and community residents would have the ability to receive specialized medical care at home without driving long distances
- Economic Benefits
 - Ratio 4:1 for every \$1 invested in broadband the return to the economy was \$4

Broadband is a powerful Economic Development Engine MISSOURI FARM BUREAU

Broadband Deployment Costs

- Infrastructure costs vary depending on type of technology
- Costs below are from USDA in 2018 so they have changed and probably increased
- USDA included benefits and deficiencies in their analysis
- Buried/Underground
 - Average construction cost per mile: \$32,000-\$50,000
 - Greater Network Protection
 - Longer Installation Period
 - Least visual impact
 - Less maintenance/longer life



Broadband Deployment Costs



Aerial/Pole Line

- Average construction cost per mile \$16,000 \$25,000
- Exposed to weather and vandalism
- Shorter installation period
- Greater visual impact
- Often requires join-use, shared facilities
- Easier access greater maintenance



Broadband Deployment Costs

Fixed Wireless

- Average new construction cost per TOWER -\$200,000 - \$300,000
- Highly susceptible to adverse weather
- Quicker development
- High visual impact
- Need for greater bandwidth still requires a wireline connection
- Bandwidth and quality of service affected by geographical terrain
- No costs on wireless, cable or satellite



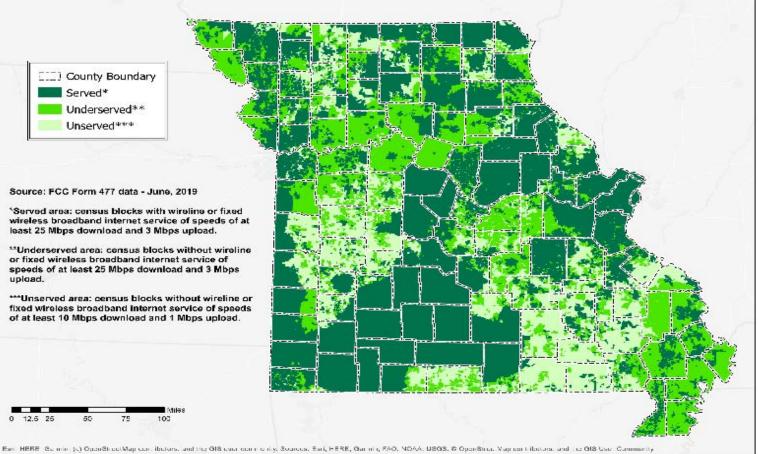


Considerations

- Data is over-stated on who is served with broadband
- Reports of served include awards of broadband to providers a deployment has not yet occurred
- Reports of served may be missing other factors such as whether it is at a speed that can do what is needed, whether it is reliable and is not interrupted by weather or geographical terrain, and whether it is priced reasonably for the end user
- And most importantly for the area of agriculture, there is not much data or information to show who is served, who is not, what is being used in precision ag and ag related areas
- Need support at state level, both in the Office of Broadband and in state legislature
 MISSOURI
 FARM BUREAU

Wireline or Fixed Wireless Broadband Speeds Coverage M Missouri State County Boundary Served* Underserved** Unserved*** Source: FCC Form 477 data - June, 2019 'Served area: census blocks with wireline or fixed wireless broadband internet service of speeds of at least 25 Mbps download and 3 Mbps upload. 0 **Underserved area: census blocks without wireline or fixed wireless broadband internet service of speeds of at least 25 Mbps download and 3 Mbps upload. U ***Unserved area: census blocks without wireline or fixed wireless broadband internet service of speeds of at least 10 Mbps download and 1 Mbps upload. R 0 12.5 25 75 100





MOFB Rural Broadband Principles

MOFB

- Push Data Accuracy and Mapping
- Hold Providers Accountable
- Plan for the Future
- Foster Local, State, and Federal Partnerships
- Focus on Precision Agriculture and Ag Related Activities



THIS IS A BIG DEAL!

Broadband that is fast, reliable and affordable is essential to the agriculture communities for Missouri to prosper!

It is no longer nice to have, it's a necessity. For our state, our communities, our businesses, our farmers and ranchers, our families and ourselves.



Questions/Comments



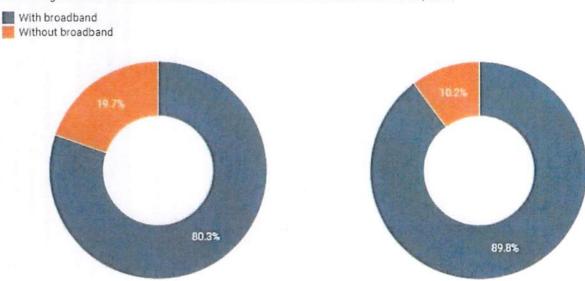


Missouri Farm Bureau (MOFB) is focused on representing the concerns of end-users of rural broadband services in our state. The COVID-19 pandemic has underscored many long-standing issues with broadband availability – specifically in rural areas. The following principles and recommendations are central to our advocacy efforts.

- Push Data Accuracy & Mapping: MOFB continues to advocate for additional mapping and the use of more granular data sets when determining which areas are eligible for federal (and state) funding. There are multiple legislative efforts underway to address these problems. In March 2020, Congress authorized the Broadband DATA Act as part of the CARES package, which requires the Federal Communications Commission (FCC) to establish a serviceable location fabric to serve as a baseline for served, underserved and unserved broadband areas. In addition to updating maps, the legislation, which was funded in December 2020, requires the FCC to: 1) establish an audit process that ensures internet service providers are providing accurate data, and 2) create a user-friendly challenge process. MOFB recommends that data collection efforts and more granular maps be explored before additional significant outlays of funds are pursued. Progress must be made on data collection and mapping to better reflect the service needs in rural areas and better allocate funds.
- Hold Providers Accountable: We have asked that more verification/accountability be completed before
 awards are made to ensure the proposal can be met and then again after deployment to ensure the funded
 service was provided. We have concerns with these processes and believe they could be improved to
 ensure greater accountability and more judicious use of taxpayer funds to deploy critical projects. In
 particular, some projects that have received funding in the last 2-3 years have shown little to no progress,
 and we urge more focus on these recent awards. We support efforts to increase accountability at the FCC,
 USDA, and other agencies that deploy broadband programs.
- **Plan for the Future:** When awarding broadband projects, we should consider speeds that account for teleworking and remote education needs, rather than just recreational use of broadband. Experts say speeds of at least 100 mbps are ideal in today's world and MOFB policy supports a minimum of 25/3 mbps for new project deployment. Particularly in the space of precision agriculture, telemedicine, distance learning, and economic development, we believe symmetrical service (matching upload and download speeds) will be key to effective use of broadband.
- Foster Local, State, and Federal Partnerships: Close working relationships between local, state, and federal partners are critical to maximize the use of funds available for broadband deployment. Various entities that deploy broadband should work together to the greatest extent possible in order to ensure the needs of rural America are being met. For example: main broadband funders should work together on regulatory requirements, timeframes for funding cycles, utilizing uniform standards, and joint funding opportunities.
- Focus on Precision Agriculture: Too often, federal programs do not take into account the specific needs of agriculture and rural America when developing programs that incentivize deployment. Agriculture as a whole has the potential to be a strong beneficiary of rural broadband services, and it will be important to take these needs into account. Access to broadband and data services can result in more data-driven decisions on the farm, if the technology is available.

Rural residents are more likely than urban residents to lack high-speed internet at home

Percentage of rural and urban households with and without broadband at home, 2020*



Figures exclude households that did not respond so that percentages add to 100.

RURAL

Chart: Center for American Progress - Source: Board of Governors of the Federal Reserve System, 'Survey of Household Economics and Decisionmaking,' available at https://www.federalreserve.gov/consumerscommunities/shed_data.htm (last accessed June 2021)

Rural children are about twice as likely as urban children to lack sufficient internet for remote learning

URBAN

Rural and urban households' responses to the statement: "[My child has] adequate access to the internet and technology to complete coursework," 2020

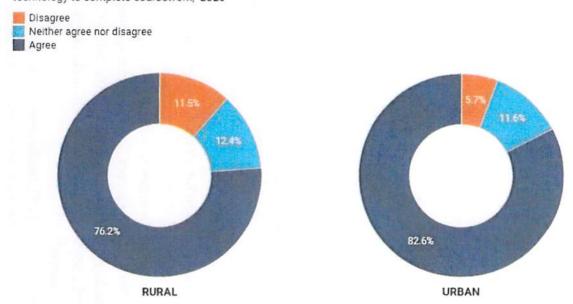


Chart. Center for American Progress - Source. Board of Governors of the Federal Reserve System, 'Survey of Household Economics and Decisionmaking' available at https://www.federalreserve.gov/consumerscommunities/shed_data.htm (last accessed June 2021)

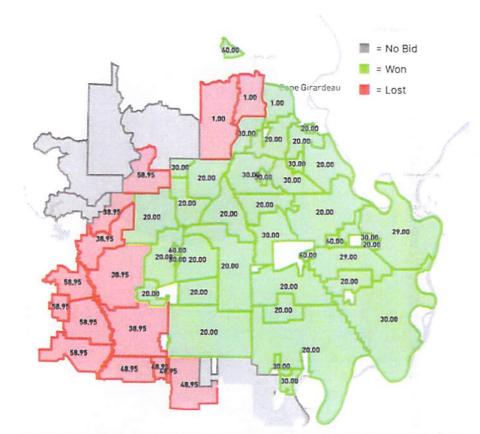
RDOF Potential: \$66.3 million RDOF Result: \$8 million

The Rural Digital Opportunity Fund (RDOF) auction was the Federal Communication Commission's (FCC) next step in bridging the digital divide for SEMO Electric Cooperative and its neighbors.

However, certain companies were allowed to bid beyond their capacity. \$58.3 million of funding opportunity was lost for SEMO Electric to expand its 100% fiber network (when fiber is used throughout the network and fiber is run inside the home or building, which means there is no loss of speed or capacity over the last mile).

The fundamental obligation for winning bidders is to build networks capable of delivering Gigabit service (broadband service with up to gigabit-per-second upload and download speeds). It's the future of internet connectivity in the home. These companies took money from southeast Missouri by bidding low in order to win cash from the FCC. Will these companies build a 100% fiber network to help make people's lives better with fiber-fast internet?

Unless remedied by the FCC, these errors will be devastating to rural communities in southeast Missouri where broadband services are needed.



The areas above are census block groups as assigned by the Federal Communication Commission (FCC) for the Rural Digital Opportunity Fund (RDOF) auction that are relevant to SEMO Electric Cooperative.

SEMO Electric won RDOF funding in the green areas. Each number represents the percentage of potential funds that was awarded. For example, 20.00 (%) of 100.00 (%) - meaning other bidders drove down funding by 80%. The green areas represent most of SEMO Electric's existing service territory. The green areas will require a total investment of \$57,500,000 million to build a 100% fiber network. That's \$23,000 per mile.

SEMO Electric lost the red areas to other bidders as the funding percentage was not adequate to build a 100% fiber network. The number represents where SEMO Electric stopped its bidding. The red areas represent expansion zones where SEMO Electric wanted to expand its 100% fiber network. The red areas were mostly won by wireless carriers, who bid beyond today's capacity of wireless technology to provide Gigabit service. All winning bidders must meet periodic buildout requirements that will require them to reach all assigned locations by the end of the sixth year.

Source: https://www.fcc.gov/reports-research/maps/rdof-phase-i-dec-2020/







Cooperatives From Five States Visit SEMO Electric

In 2019 and 2020, representatives from more than 20 electric cooperatives traveled to SEMO Electric Cooperative and GoSEMO Fiber to discuss safety, electric and broadband best practices. Employees and directors from the electric cooperatives arrived in buses, cars, trucks and vans from Arkansas, Illinois, Mississippi, Tennessee and Texas. Team SEMO and the cooperatives discussed ways to improve overall cooperative performance, plus techniques for fiber installations, subscriber support, network benchmarks, financing and construction methods for high speed, fiber Internet services.

These cooperative visits are an example of the cooperative principle, "Cooperation among Cooperatives," which encourages cooperatives to work together to help each other. An interesting note, one of the visiting cooperatives was Monroe County Electric Power Association, based in Amory, Mississippi. It was the first rural electric cooperative in the United States. Farmers and ranchers formed America's electric cooperatives more than 80 years ago to secure electricity in order to better their lives. Today, co-ops bring that same spirit of purpose and cooperation to the changing needs for more than 20 million American homes, businesses, farms and schools in 48 states. SEMO Electric Cooperative is proud to serve its members in southeast Missouri.











Sharon Guy • 1st

Business/Computer Teacher and FBLA...

I could not have done my teaching job from home while on quarantine without this dependable fiber internet at our house near Circle City!

Karen Schermerhorn moved but emailed to discuss billing and added this comment. One last little thing---I really miss SEMO Fiber!!!! The internet my mother has here in a Detroit suburb is pitiful. The wireless field extends about 3 feet total from her modem, and the provider couldn't suggest anything to improve it. Having to change to a new, hopefully better, carrier this week. Ironic that I had access to high-quality internet in a rural area, and don't have remotely comparable quality available in a major metropolitan area, huh?



I am connected to broadband!!!! No more hotspot!!!!



11 Comments

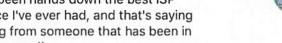


Heather Lentz Taylor Love my gosemofiber. No problems at all. Makes working from home great



Jeff Cotner

This has been hands down the best ISP experience I've ever had, and that's saying something from someone that has been in IT for 20+ years!!





Michael Marks

Dwight unless your on a wired connection WiFi doesn't even do it justice. It's the best I've ever seen.







Kim Sahlfeld Bunger

We love our GoSEMO Fiber - It has changed our lives. I was interested in March 2017 so glad I waited it out and got hooked up in November 2020. Thanks SEMO Fiber for thinking of all your members. Love how you made the hotspots too. You are more than an electric company/internet provider to our family. We are thankful. Congratulations on n 4 years can't wait for all your member-owners to get fiber optics and for you to branch out to others who need good internet.



Dawn Griggs Scherer We just got our Semo Fiber installed today. OMG it's a game changer. So thankful for this







GOVERNMENT

Mississippi broadband internet expansion 'pedal to the metal' as federal money flows







The state Public Service Commission this week has awarded \$268 million to local electric cooperatives across the state to hook up more than 102,000 homes and businesses to broadband internet.

Mississippi's expansion of internet services, fueled by \$570 million in federal money with more on the way, promises to be as life-altering for rural Mississippi as electricity was in the 1930s, PSC Northern District Commissioner Brandon Presley said.

The funding awarded this week is part of \$405 million the state is receiving from the federal Rural Digital Opportunity Fund - the second largest earmark behind California. Last year, Mississippi lawmakers routed \$75 million in federal COVID-19 relief money to broadband expansion, and the state expects to receive another \$166 million for broadband and other infrastructure from the recently passed federal American Rescue Act. Beyond that, Presley said, money from the Biden administration's proposed mrastructure spending plan would likely go to rural broadband expansion as well.

Presley said the internet service expansion funded by the money awarded this week to 13 electric co-operatives should be completed within three years, with much of the work, and connections, done far sooner. Some co-operatives "are already halfway there, without having received a dime yet" and at least a couple will complete their expansion by the end of this year.

"We know that while these funds will help a lot of people, we still have tens of thousands of homes to get to, and areas that may have some connection, but are really underserved," Presley said.



Sally Schatte

SEMC Electric Cooperative A Tachure Every Cooperative

"The last few months have shown how important high-speed home internet is; whether keeping in touch with friends and family, connecting students with their teachers, or maintaining critical lines of communication."

Senator Josh Hawley and Senator Roy Blunt I am one of those individuals that had to maintain critical lines of communication. I work at home for a prominent insurance company and our service allowed me to take a position in the behavioral health field. Our service was critical to maintain a strong, reliable connection in order to execute the 500+ calls I take monthly. These calls are from individuals needing help, many in crisis.

Before GoSEMO Fiber installed fiber at our residence, we were paying upwards of \$250 a month for unreliable service, with data caps. We now pay less than half of that with ZERO interruptions and a steady, reliable speed . And no caps!

Just imagine the number of people whose lives are positively affected by this one connection. Now imagine the thousands more that can be with more expansion, more reliable internet services.

Trust me when I say it is worth it.



#letsbuildabetterconnection #thankfulforfiber #needednowmorethanever



July 20, 2021

2005 Market Street, Suite 2800 Philadelphia, PA 19103-7077

P 215.575.9050 F 215.575.4939

901 E Street NW, 10th Floor Washington, DC 20004 pewtrusts.org P 202.552.2000 F 202.552.2299

Testimony of Kathryn de Wit, project director, broadband access initiative &

Anna Read, senior officer, broadband access initiative The Pew Charitable Trusts

Good afternoon and thank you very much to Representative Louis Riggs, the Interim Broadband Development Committee, and the Missouri House of Representatives for the invitation to share our research with you today. My name is Kathryn de Wit and I'm the project director for the broadband access initiative at The Pew Charitable Trusts. I'm joined by my colleague Anna Read, the senior officer and lead researcher for our project.

As some of you may know, The Pew Charitable Trusts is a nonprofit, nonpartisan, independent public policy and research organization that applies a rigorous and analytical approach to improve policy and inform the public. Our research addresses a range of issues, from state fiscal health to wildlife corridors. We work with diverse stakeholders, including state policymakers such as yourselves, who share a dedication to evidence-based solutions to meet some of today's complex policy issues. One of those policy issues is broadband.

Much of the national conversation about broadband access has focused on federal and local governments, but states have played an important role in addressing the digital divide. Pew's broadband access initiative started its work by examining the role that states play in deploying high-speed, reliable internet. We found that over the last decade, states have been quietly rolling up their sleeves and doing the work. By relying on the foundations of good public policy—collaboration, responsiveness, and adaptability—states have made meaningful progress in increasing the availability of broadband.

It was also abundantly clear that there is still more to do. The country saw this play out in real time over the last 18 months as they tried to work, learn, and do everything else from home. The digital divide affects communities of all types across the country and now, more than ever, we need engagement from every level of government, the private sector, community leaders, and other stakeholders to solve this challenge.

States have responded by dedicating significant funds for broadband deployment. Despite difficult economic circumstances, state lawmakers in 2020 continued to appropriate dollars to boost broadband in their states. Twelve legislatures allocated money to existing broadband funds, with totals ranging from \$1.5 million to \$51 million, or to other state entities authorized



2005 Market Street, Suite 2800 Philadelphia, PA 19103-7077

P 215.575.9050 F 215.575.4939

901 E Street NW, 10th Floor Washington, DC 20004

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P 202.552.2000 F 202.552.2299

to finance broadband projects. Large funding commitments for broadband deployment would be noteworthy in any year, but that was especially the case in 2020 because they occurred amid significant budget uncertainty linked to the recession.

In Virginia, the General Assembly has increased funding to the Virginia Telecommunications Initiative (VATI)—which oversees expansion of broadband service into unserved areas of the state—from \$1 million in 2017 to \$20 million for fiscal 2020. For this fiscal year, Governor Ralph Northam (D) requested \$35 million for VATI. The legislature then appropriated an additional \$16 million, bringing the total to \$51 million. On Friday, July 16, Governor Northam announced a proposal to spend \$700 million of incoming American Rescue Plan Act funds on broadband deployment. The General Assembly will vote on this proposal when it returns for a special session on August 2nd.

Congress has also dedicated significant funds for broadband deployment, including in the Coronavirus Aid, Relief, and Economic Security (CARES) Act, passed by Congress and signed into law in March 2020. As you know, Missouri was one of many states that used CARES funds to support remote learning, telehealth, and broadband infrastructure deployment. After passing CARES, Congress continued providing support for broadband, including in the December Consolidated Appropriations Act, signed into law in December 2020, and the American Rescue Plan Act, signed into law in April 2021.

Even with this progress, we know that tens of millions of Americans lack access to high-speed and reliable internet. Even more lack access to affordable connections. In Missouri, the state estimates that 18% of the population does not have access to broadband.

We're here today to contribute research-driven solutions to your ongoing efforts. One of the early findings from our research was that successful state programs continue to update program goals and activities as their programs mature. Lessons learned can prompt changes to a state's broadband policy and activities, including how and which stakeholders it engages, the types of planning and technical assistance it offers, and the design and administration of grants.

Taking stock of state broadband policies

One of the first major efforts our initiative undertook was reviewing policies, including statutes and executive orders, pertaining to broadband deployment across all 50 states. States have done quite a bit to expand connectivity, particularly since 2017. Policy is generally focused in five key areas:

- Establishing broadband programs and task forces
- Defining key terms (like broadband, unserved, and underserved)



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- Implementing funding and financing efforts (like special funds or tax incentives)
- o Governing infrastructure access, such as dig once and right-of-way policy
- o Clarifying who can and cannot provide broadband

But of the things we've found, the most interesting discovery was about the role of state policies themselves. States aren't just creating ad hoc programs or setting up funds or passing infrastructure legislation. What states are doing is creating a framework – a structure or an agenda – that other broadband stakeholders, including service providers and community leaders and local governments, can follow. State policies define what broadband is, determine who can and cannot provide broadband, set broadband goals, and create resources to fund broadband projects. State policies set the parameters for broadband deployment. What we learned from our research is that state policy really matters when it comes to expanding access.

Promising Practices

The next stage of our research was to discern which elements of state programs and policies are the most promising in terms of expanding access.

Pew's research team did field research in nine states across the country and interviewed more than 300 broadband stakeholders, including representatives of state broadband programs, internet service providers (ISPs), local governments, and broadband coalitions.

Our research found that state broadband programs have many similarities but also differences that reflect the political environment, the state's resource levels, the geography of the areas that remain unserved by broadband, and the entities that provide broadband service.

Ultimately, we identified five practices that effective programs use:

- Engaging a diverse set of stakeholders
- Setting a policy framework
- Planning and capacity-building
- Providing funding for deployment and operations
- Evaluating programmatic impact and evolving to meet state needs

We are happy to provide additional information regarding any of these activities but would like to draw your attention to two items within these promising practices.

The first are the roles of task forces and councils, much like this committee. Many states have set up broadband task forces and councils, which can complement their broadband program's efforts or serve as an important part of those efforts. These entities are charged with facilitating coordination, identifying opportunities for expanding broadband deployment and



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adoption, and making policy recommendations to the governor and legislature. The composition of task forces and councils varies depending on their goals and mandates, and may include representatives of state agencies, internet service providers, local officials, nonprofit organizations, and state legislators.

A few examples include:

West Virginia's Broadband Enhancement Council, which is the primary entity responsible for broadband and supported by the West Virginia Development Office. It is charged with exploring opportunities for expanding broadband service and use, leading data collection and mapping efforts, and overseeing the disbursement of federal funds to support planning and deployment. Its membership includes representatives of state agencies and residential and business broadband users from both rural and urban communities, as well as members from the state Senate and House of Delegates.

Another example is the California Broadband Council (CBC), which the state legislature established in 2010 to create a forum in which state agencies could share information and identify ways to work together to improve broadband access. The council includes representatives from many state agencies engaged in broadband—including the California Public Utilities Commission, the California State Transportation Agency, the California Office of Emergency Services, the Governor's Tribal Advisor, and the California State Library— and is staffed by the Broadband and Digital Literacy Office within the state Department of Technology. It also has an advisory council that includes representatives from the USDA and the Southern California Tribal Chairmen's Association.

The CBC has five task forces that engage a broad range of stakeholders, including nonprofit organizations and federal agencies. These task forces set long term goals, support Tribal initiatives, coordinate device refurbishment and distribution, prioritize highways for broadband deployment, and develop principals on digital equity.

A final example is Minnesota's Governor's Task Force on Broadband, which was formed in 2011 and provides a forum for stakeholders to study and discuss issues related to broadband. It has 15 members that represent communities, businesses, local governments, educational institutions, health care facilities, tribes, and ISPs. The task force releases an annual report outlining policy recommendations for the governor and Legislature, and its work has helped to advance the state's broadband policy.

Task forces and councils, which have different compositions and directives, have been credited with building stakeholder buy-in and support for broadband initiatives, tackling policy and



P 215.575.9050 F 215.575.4939

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administrative challenges, defining statewide strategies and driving progress on those strategies.

Another noteworthy finding from our research was how closely state programs focus on community-supported solutions, particularly by providing support for technical assistance and local broadband planning. Relative to infrastructure investments, planning and technical assistance efforts are low-cost, but have been important to identifying local goals and priorities for broadband deployment, forming public-private partnerships, and securing infrastructure funding from both state and federal programs.

However, local governments' capacity to conduct this sort of extensive planning varies widely across jurisdictions, and many communities, especially rural and underserved ones, may not have the necessary expertise, staff, or financial resources. State programs that provide support for planning or lead technical assistance efforts can help build the capacity and provide the resources that communities need to be successful.

Maine is one of several states that provides planning grants. Phase I grants are designed to help build community-wide support for expanding broadband service, such as surveying stakeholders, evaluating policies that may affect or delay deployment, and talking to providers about existing plans and offers. Phase II grants enable communities to complete activities such as feasibility studies, network designs, and business models. Planning grants help communities identify funding sources and apply for infrastructure grants from Maine, the federal government, and elsewhere.

North Carolina's Broadband Infrastructure Office (BIO) has a team of four technical assistance experts who work across North Carolina to help communities prepare for broadband projects, assisting them with planning and deployment. The technical assistance team provides counties, municipalities, and citizen groups a variety of services, which include helping communities conduct surveys, gather speed test data, engage and educate stakeholders, facilitate conversations with providers, and inventory existing assets available to help providers bring broadband access.

Federal action

As Kathryn noted earlier, Congress has provided funds for broadband deployment and, while negotiations regarding the infrastructure bill are ongoing, broadband remains a bipartisan priority. I'd like to briefly note that discussions regarding the infrastructure bill and guidance on the American Rescue Plan Act are indicating a shift in federal broadband policy.



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Regarding the American Rescue Plan, Treasury is expected to release final guidance soon, the language represents a significant shift in federal broadband policy, including by setting a new preference for speed thresholds, prioritizing community-based solutions, and affirming the role of states in in closing broadband gaps. Notably, the interim rule defines standards for state and local programs that use federal funds but does not include words such as "shall" and "require." The absence of such imperatives provides some flexibility to recipients to determine broadband goals and funding priorities based on their understanding of the problem, not the federal government's.

State updates

Almost every state has an active broadband initiative and the majority have established broadband funds. I'll provide examples from a few peer states, including Indiana, Tennessee, Arkansas, and Iowa.

Indiana established its Next Level Connections broadband program in 2018—the same year a study from Purdue University found that every dollar invested in broadband returns almost \$4 to the state's economy. The program had an initial \$100 million in funding. Indiana has appropriated \$205 million in fiscal year 2022 and \$900 million for fiscal year 2023 to its broadband fund, which will be administered by the Indiana Department of Transportation. The state has also elected to appropriate \$250 million of federal stimulus funding for broadband grants, which will be administered by the Office of the Lieutenant Governor. These funds are targeting communities that lack access to speeds of 25 Megabits per second (Mbps) download and 3 Mbps upload and project applications must commit to providing service at speeds of 50 Mbps download and 5 Mbps upload, but projects providing symmetrical service of 100 Mbps will be given priority. Similarly, projects that also include connecting schools or health care facilities to symmetrical gigabit service will be prioritized.

In fiscal year 2022, Tennessee will enter its fifth year of awarding grants through its Broadband Accessibility Grant Program, which is managed by the Tennessee Department of Economic and Community Development (TNECD). The state legislature established the program in 2017, appropriating \$10 million for grants in the first year. The state legislature has increased its appropriations in subsequent years, including making a one-time appropriation of \$100 million for fiscal year 2022. Tennessee's program is noteworthy for several reasons, but I'd like to focus on its oversight and accountability measures.

The program requires grantees to submit quarterly progress reports and invoices for reimbursement of costs incurred. These reports give the department a regular opportunity to evaluate progress and ensure that projects are proceeding as planned. Prior to grant close out,



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TNECD requires a review from either a professional engineer or third-party verifier to confirm that the build has been completed, conforms to applicable requirements, and will provide service at the levels provided on the grant application. TNECD also requires grantees to submit project closeout reports that detail infrastructure and service that have been provided through the grant funding, as well as to describe the digital literacy activities available for customers in the grant area. TNECD also provides annual reports on the status of grant-funded projects and progress made toward increasing broadband access and adoption to the Legislature.

Arkansas's Rural Connect Broadband Grant Program is focused on expanding broadband to unserved and underserved rural communities. The program provides funding to local governments or groups of local governments that have partnered with an ISP. Areas are eligible for funding if they have a population of at least 500 people – either as a single community or group of communities – and if no more than 80% of the population is served at speeds of 25Mbps/3Mbps. The state combined \$100 million in Coronavirus Relief Fund (CRF) dollars with \$18 million in state funding to fund 76 projects across the state.

Iowa, which awarded its first round of grants for the Empower Rural Iowa Grant program in 2018, has used federal stimulus funds to complement state appropriations. In 2020, the state funded rural broadband deployment by combining \$5 million in state appropriations with \$50 million of CRF. In 2021, the state used an additional \$15 million of CRF to fund broadband projects and appropriated \$100 million in state funds to continue the expansion efforts. The application window for the state-funded projects opened on July 1, 2021—20% of funds will be spent on high-cost communities and the remaining 80% will be available for targeted service areas (TSA). A TSA is a census block where broadband is unavailable in different speed tiers, starting with Tier 1 at 25 Mbps download and 3 Mbps upload. The state is prioritizing funding on Tier 1, before upgrading Tiers 2 and 3. This allows the state to make ongoing progress on its goal of connecting all Iowans to high-speed access by 2025 but focuses on the highest-need communities first.

Conclusion

Now more than ever, broadband is foundational technology. Broadband underlies many major policy priorities, including improving education, enhancing healthcare, and bolstering economic development. And states have been playing a critical role in expanding broadband access – through their policies and programs.

Pew aims to provide policymakers with clear, comprehensive research they need to expand broadband to the millions of Americans still without high-speed, reliable internet.



 2005 Market Street, Suite 2800
 P 215.575.9050

 Philadelphia, PA 19103-7077
 F 215.575.4939

 901 E Street NW, 10th Floor
 P 202.552.2000

 Washington, DC 20004
 F 202.552.2299

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Thank you for your time and we are happy to answer any questions.

Special Interim Committee on Broadband Development Hearing

<u>Testimony by:</u>
<u>Kirby J. Underberg</u>
<u>Chariton Valley</u>
08.16.21

I am pleased to provide the following testimony to the Special Interim Committee on Broadband Development. My name is Kirby J. Underberg, and I am the President and CEO of Chariton Valley Telephone Corporation (CVTC). CVTC is the parent and sole owner of Chariton Valley Communications Corporation (CVCC) and Chariton Valley Wireless Services (CVWS). Collectively, Chariton Valley has approximately 100 employees and offers telecommunications services in twelve counties and operate 3800 miles of fiber. To be clear on the distinctions between companies, I feel it is important to describe each company and the territory in which it operates.

CVTC (Parent Company) is a member owned cooperative company formed in 1952 that serves eighteen traditional telephone exchange areas in north rural Missouri. CVTC is designated as the Incumbent Local Exchange Carrier (ILEC) for those 18 exchanges. The area consists of approximately 10,000 homes passed and covers 2200 square miles. In 2017, the Chariton Valley Board of Directors approved a plan to finish fiber in the entire ILEC service area with an estimated cost of \$42,000,000. This project will be completed by year end 2022 with gigabit fiber to every home in the entire ILEC service area.

CVCC (wholly owned subsidiary) was formed in 1983 to provide deregulated services, such as dial-up internet and video within the ILEC area. CVCC continues to offer deregulated services within the ILEC area. In 2003, CVCC filed as a Competitive Local Exchange Carrier (CLEC). In 2003, CVCC was the first CLEC provider in Missouri to build fiber to an entire community with fiber to the home to all residents in the city of Macon, MO. In 2017, a plan was developed to extend fiber to additional communities outside of our ILEC area in North Missouri. The plan was a hub-and-spoke plan of extending middle mile fiber to several communities, building the towns, and finishing the rural areas. The hub represents communities that can support a business plan to build fiber and the spoke represents rural areas built later as the return on investment grows. This plan was developed and implemented prior to any funding being made available in these areas. Our goal was to complete this project over time. CVCC has built an extensive fiber network that passes approximately 15,000 homes.

CVWS (wireless company) operates in 10 counties with a total population of 156,000 people with most of our service being mobile cell service.

It is important to highlight the programs and progress made to expand broadband by our two major fiber companies, CVTC and CVCC. CVTC (the ILEC provider) is a recipient of federal support through the FCC program titled ACAM (Alternate Connect America Model). This mandates the

buildout of 25/3 broadband to all the ILEC service area. This support is scheduled to sunset in 2028. We are building a fiber-to-the-home network that can provide symmetrical gigabit speeds today and is adaptive to the future needs of tomorrow for all members of CVTC. As mentioned earlier, the build was estimated to cost \$42,000,000 and will be complete by year end 2022. The business model to complete this project even with support was not enough to ensure viability of the company in the long term. To ensure success, an extensive buildout of CVCC was also developed to compliment the work done within our ILEC area.

In 2018, CVCC was a successful bidder in the Connect America Fund (CAF) Phase II program. This program afforded us the opportunity to extend our network to areas that are contiguous to existing networks by making it economically viable to accomplish. We were awarded \$4,179,665 to serve 847 locations in rural Linn, Macon, Randolph, and Shelby Counties. CVCC was also notified that we were successful in bidding in the Rural Digital Opportunity Fund (RDOF). RDOF will provide \$8,070,000 to build to 5002 locations in rural Macon, Marion, Monroe, Randolph, Linn, Chariton, Boone, and Carroll Counties. The final authorization for the RDOF program is still in process and should be done very soon.

CVCC also participated in and was awarded funds from the Missouri Broadband Grant program, and the CARES fund which provided \$1,033,466 to build fiber to 925 locations. This program was completed, and Chariton Valley was one of the first companies in Missouri to finish a fiber build under the new program. Recently, the State of Missouri participated in the National Telecommunications and Information Administration (NTIA) Broadband Infrastructure Program as the grant applicator. CVCC participated and submitted applications for several areas under this program with notifications of any awards scheduled to be announced in November 2021.

This highlights the activity Chariton Valley has undertaken not only with our funds, but also by actively participating in and applying for funds through any program that assists us in bringing fiber broadband to rural Missouri. We are committed to filling the white space gap between those that have fiber broadband and those that do not.

Our largest hurdles to getting fiber broadband to more residents include funding, material availability, and timing. The most expensive homes to provide fiber to are those in the most rural parts of our service areas. With an average cost of \$35,000 per mile to bury fiber, this makes it very difficult for those that live several miles away from any hub or dense population. Our design when we build a hub or dense area is to equip it ready to build to and serve rural locations in the exchange. We continue to extend our network to the rural areas over time as funds allow. Chariton Valley is completing its third year of a comprehensive five-year plan to build fiber in rural Missouri. This plan has been changed due to the funding mechanisms now available and those that will be made available going forward. The current calculation of what we have designed and planned to build is 2000 more miles of fiber in the next couple years.

Chariton Valley is fully committed to partnering with any entity that is interested in extending broadband to rural communities. We understand and agree that connectivity is paramount to the success of our communities, institutions, homes, and farms to not only compete in today's economy, but to also have access to necessary health and other services that are made available by the connection. This is also reflected in our vision statement: "To provide premier services to enhance opportunities for rural communities."

The benefits and necessity of closing the gap of those that have adequate broadband and those that do not are apparent and documented. Chariton Valley has adopted a standard for all fiber deployments to provide gigabit symmetrical services to all locations. We do not use service contracts or any data caps on fiber broadband services. Our current network and all future construction projects are all planned to be underground deployments.

In addition to the summary provided above, I would also like to provide answers to some common questions in a concise and organized manner for your ease. Those questions and answers are listed below:

1. Take rates:

69% across all fiber areas.

2. Network capacity:

Our last mile, middle mile, and transport are gigabit and scalable. Transport ring capacity is scalable up to ninety-six 10 G and/or 100 G channels.

3. Average speeds on existing network:

Top symmetrical subscribed is 100 Meg followed by 500 Meg. 500 meg will overtake 100 meg in popularity in the next months.

4. Average devices per household:

Current data shows 7

5. Average data usage on fiber:

60 Gigabits of data per subscriber per month.

6. Redundancies on existing network:

We have dual network centers with geographical redundancy for all common equipment. Connections to multiple tier 1 internet providers originating from Geographic Redundant Core Routing facilities. Our core network utilizes a ring architecture.

7. Summary of Planning to increase future take rates:

Plan attached

8. Counties served today/counties planning to serve:

Provide services today: Boone, Carroll, Chariton, Linn, Macon, Marion, Ralls, Randolph, and Shelby. Planning to serve: Monroe and Carroll.

9. Length of construction delays, if any:

We do not have major delays, as we have standing agreements with contractors with unit pricing.

10. Length of back orders of materials, if any:

Materials are a problem to secure. In order to resolve this issue, we expanded our inventory to react to projects that are unknown and order bulk for two years out to ensure we have the materials we need. Fiber is getting very long at 40 weeks out.

11. Please also provide current advertising materials:

Material attached

Strategic Plan



Foundation

Our Mission

Keeping You Connected

Our Core Values

- 1. Integrity
- **Customer Focused**
- Quality
- Innovative
- Influential

Competitive Advantages

What we do best

- 1. Reliable SuperFast Fiber Network
- Implementation of Cutting Edge technology.
- 3. History- Almost 70 years as telecommunications leader.
- 4. Knowledgeable Staff
- 5. Local presence in our communities we serve.

Organization-Wide Strategies

How we will get there

- 1. Brand awareness in our markets we service
- 2. Increase customer awareness through "boots on the street" approach; utilizing door hangers, marketing materials, and sales people in the market
- 3. Utilizing our website to accurate represent our brand image, product offering available in market
- 4. Increase company knowledge of product features, benefits, availability and competition

Strategic Objectives and Marketing Goals

Utilize Analytical Marketing

1 Shorten the Sales Cycle:

- 1.1 Review customer data in real time to better understand consumer needs
- 1.2 Clealy idenify our target audience

2 Increase reach by utilzing digital marketing:

- 2.1 Increase marketing reach via digital tools
- 2.2 Distribution channels planned to reach market segments

Enhance Customer Experience

3 Improve Customer Satisfaction:

- 3.1 Investment in improving customer experience including app based self-service tools
- 3.2 Maintaining and providing a reliable network that is being monitored and maintained consistently

4 Marketing

- 4.1 Products and services are targeted to correct audience
- 4.2 Educate and manage expectations for customers providing a clear description of what they will get with our services

Differentiate Our Product

5 Innovation/Product Development:

- 5.1 Launch innovative products and services our customers need and want
- 5.2 Correctly identifying proper needs assessment with our customers at enrollment
- 5.3 Correct pricing to value balance for value perception

6 Customer Awareness:

- 6.1 Easy to understand literature for customers to follow
- 6.2 Blogs & Newsletters. Consistently timely relevant thought leadership that is developed published and preserved
- 6.3 Compelling Brand Story

People and Learning

to develop and grow professionally and personally

- 7.1 Train sales people in best practices
- 7.2 Develop better communication and presentation skills to increase ability to work with and assist customers

7 Training: Actively help our team 8 Community Involvement: Maintain a corporate giving strategy.

8.1 Manage the selection, contribution and customer communication of nonprofit donations

9 Long Term Strategic Objective

- 9.1 Growth
- 9.2 Community Partner thru Economic Development and Involvement
- 9.3 Financial Strength
- 9.4 Premier Employer

Key Performance Indicators

How we measure success

Measure **Target**

Utilization of Fiber Services >40% per market

Net Promoter Score >50

of new installations 200 per month

Churn Percentage >< 2%

Vision

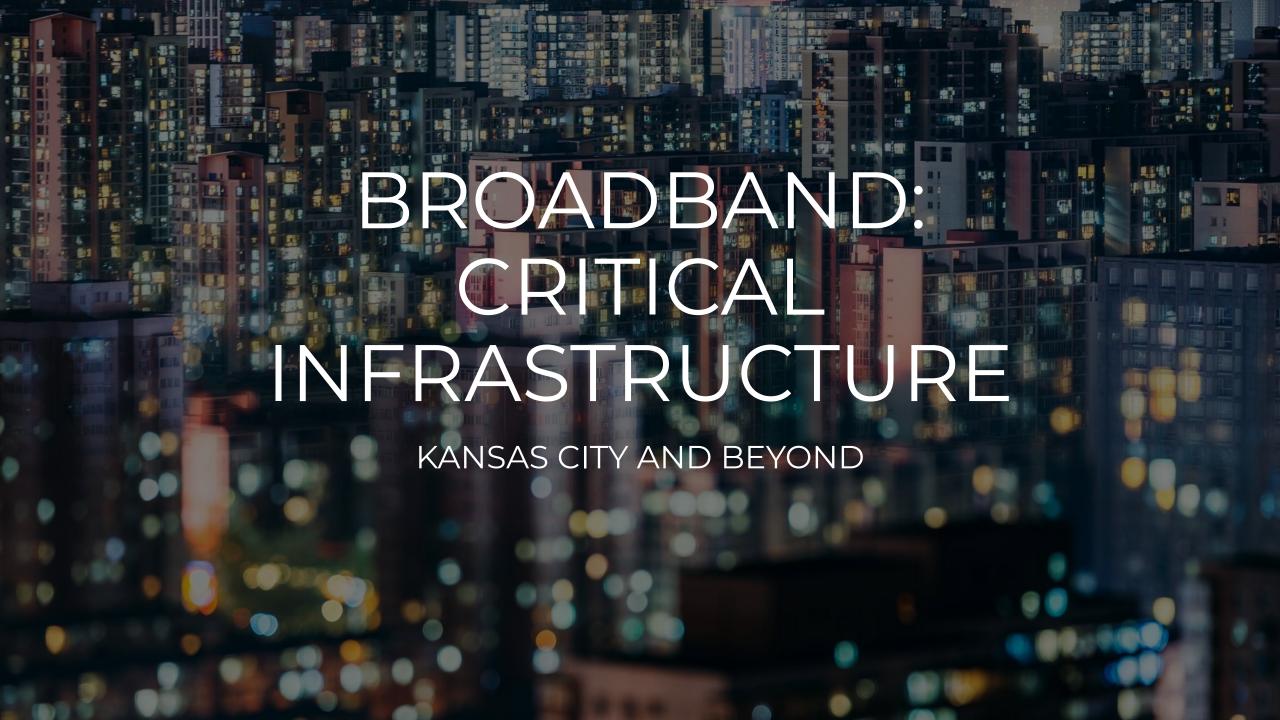
What our Organization will look like

Chariton Valley will provide premier services to enhance opportunities for rural communities.

Implementation

How we make strategy a habit

Hold people accountable Coach for achievement Empower staff Hold effective strategy meetings Leadership engagement



Digital Divide -Solutions in Kansas City

The Digital Divide is real in Kansas City, surrounding communities, and the state of Missouri.

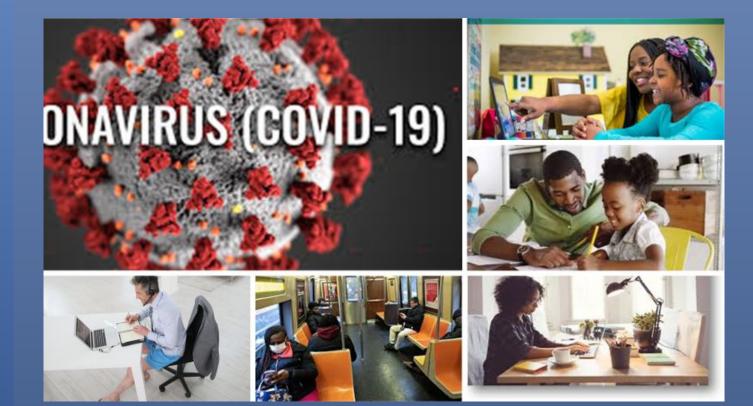
The consequences of living without access to the internet and the skills required to use it are alarming.

Kansas City's approach expands beyond fiber and cables and reaches into digital literacy, adoption and utilization for optimal economic success.

Examples:

- Online job applications Social Security information is moving to online-only
- Health Insurance Marketplace Schools increasingly rely on electronic tools Connections to friends and family

BROADBAND & LITERACY



Internet access and literacy has profound impacts on opportunities in education, jobs, health care and nearly every other facet of modern life.

The language used to describe connectivity has been focused on infrastructure. Even as we convene today, the discussion is centered around critical infrastructure build outs as a way to improve access for communities across the country.

However, In Kansas City, we're recognizing a need to look beyond wires and cables to include optimization and utilization.





WHY INCLUDE LITERACY & TRAINING AS NECESSARY BROADBAND COMPONENTS?

Beyond the examples already provided:

- Broadband utilization expands opportunities - offers increased participation in the local economy
- Investing in non-traditional, community led broadband projects are an investment in human capital shifting from a production based model of work to a more flexible knowledge based workforce
- Informed communities that understand and own data can pivot from anecdotal to data driven decision making: i.e. dangerous intersections, etc.





<u>Understanding the infrastructure Gaps:</u> <u>A Quick Look at Kansas City</u>

Household Level Data can be a challenge

- i.e. Census Data
- connectivity as a measure
- understanding utilization
- device differential

Biggest Opportunity for broadband improvement is in the 3rd District

- 26% of households have no internet access
- 30% have cellular only
- 21% have no computers
- 10% have only a smart cell phone as a device

Find more data related to Kansas City:

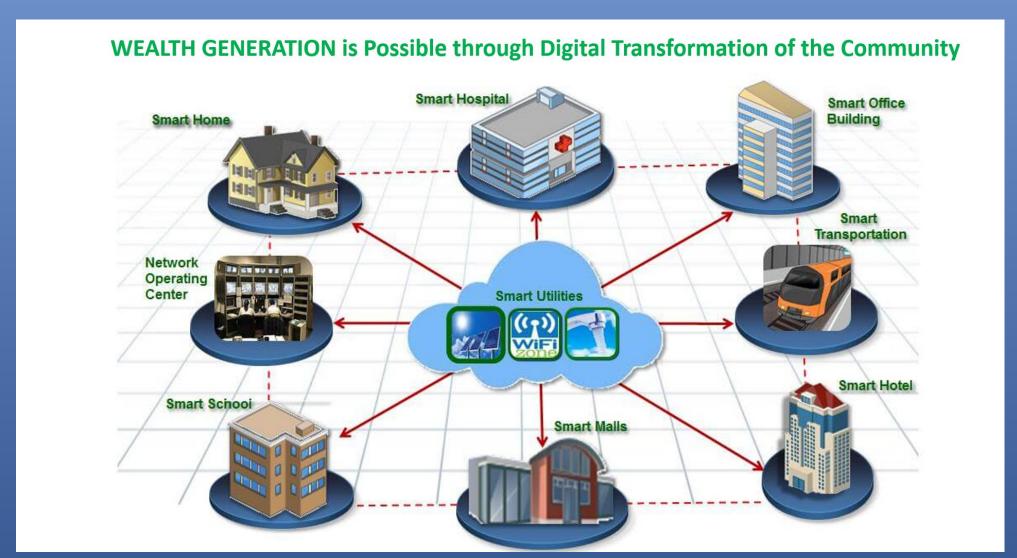
bit.ly/kcdigitaldivide

Phased Broadband Approach: Focus on Economic Development

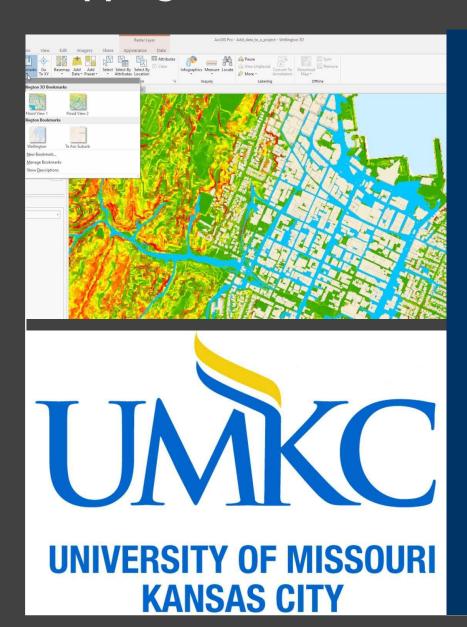
- 1. Achieve an authentic assessment of current infrastructure, capacity, adoption and utilization at ground level
- 2. Include adoption and utilization as a key measure of success
- 3. Fill gaps and incentivize adoption and utilization that leverage broadband for education, workforce development and healthcare



Long Range Goal for Kansas City: Generate Wealth through Community Led Digital Transformation



Data Mapping and Collection - Clarifying FCC v Local Data





ome Wirele

Wireless Solutions

ons Contact

Web Mail

Mail Mamk

KC Web Wireless Broadband Internet Access

For those who live in an area where broadband Internet is unavailable, or the service that is available is inadequate, KC Web offers Wireless Internet. Provided for both home and businesses, our cutting-edge wireless technology puts high-end, always-on Internet access at your finger tips. Multiple packages are available to suit your needs. Call us to ask about our other plans.

Available in and around the following cities: Pleasant Hill, Belton, Raymore, Peculiar, Lake Winnebago, Garden City, Gunn City, Archie, Chilhowee, Greenwood, Lone Jack, Strasburg, Kingsville, East Lynne, Harrisonville, Adrian, Centerview, Lafayette County, Chapel Hill and Greater Kansas City Metro Area.

Basic Package Includes:

1 LAN port

All necessary cable and hardware

Bandwidth: 768Kb download/512Kb upload

Dynamic, firewalled (NAT) IP address

Unlimited in-house computers

Unmetered usage

Advanced Package Includes:

1 LAN port

All necessary cable and hardware

Bandwidth: 2Mb/s download, 768Kb/s upload

Static IP with DMZ

Servers may be hosted on this connection

Unlimited in-house computers

Unmetered usage

Power Package Includes:

1 LAN port

All necessary cable and hardware

Bandwidth: 1.2Mb/s download, 512Kb/s upload

Dynamic, firewalled (NAT) IP address

Unlimited in-house computers

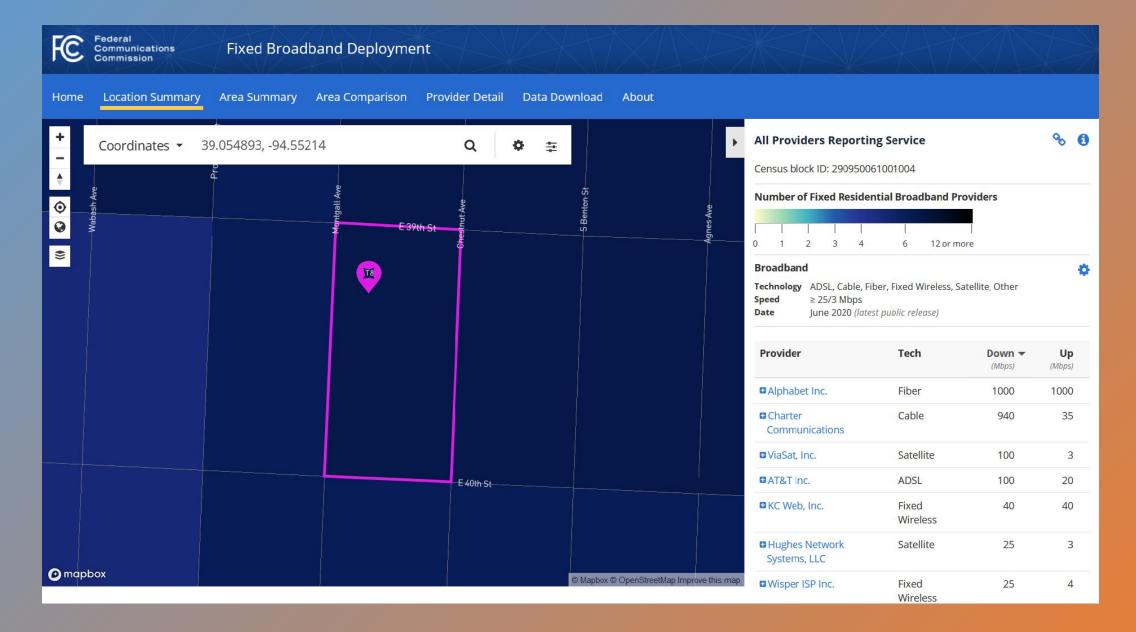
Unmetered usage

Service Package	Installation Fee	Installation Fee w/ 1 Year Up-front	Monthly Rate Starting at		
Basic	\$99.00	\$0.00	\$34.95		
Power	\$99.00	\$0.00	\$44.95		
Advanced	\$99.00	\$0.00	\$54.95		

Note: All equipment will be installed and maintained by a member of the KC Web Team. KC Web will run all neccessary cable to ether one computer or a network hub/switch. More cabling can be installed for additional cost. All equipment will remain property of KC Web.

Wireless Broadband access can only be achieved if you're residence has a line-of-site to our many and growing towers. To become pre-verified for Wireless Broadband, please fill out the below form and we will send a team out to site survey and report back with you if Wireless Broadband is available at your location. We may have to climb onto the roof of your building to check for line of sight to one of our transmitters.

Data Driven Decision Making - Community Problem Solving



Phased Approach

- Adoption and Utilization
- Economic Impact Expanded Participation in the economies of today and tomorrow

Economic Landscape:

- 4th Industrial Revolution
- 21st Century Economy
- Knowledge & Information Economy
- Shared Economy

Broadband Utilization:

Creating Knowledge Workers with Infrastructure Buildout

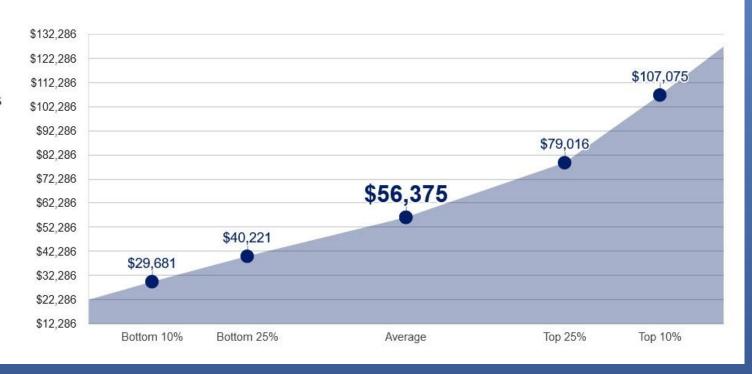
- Smart Cities are made up of interconnected smart communities
- Smart Communities are made up of smart buildings and utilities
- In order to create & sustain a smart city, you need a smart workforce
- Isolating the smart infrastructure from the smart workforce leads to a community disenfranchised

BROADBAND IS CRITICAL INFRASTRUCTURE

knowledge worker Salaries

\$56,375 avg per year

The average salary for knowledge worker jobs is \$56,375.*





Mission

EnVision Centers are centralized hubs that provide people with resources and support needed to excel.





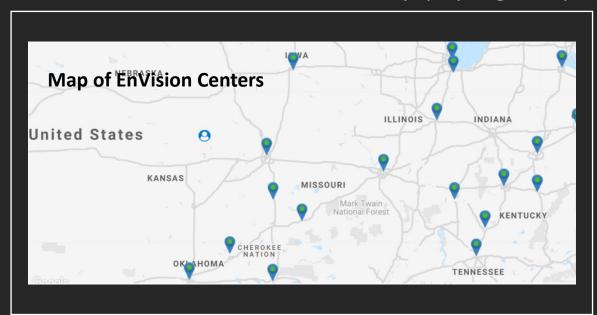




AARP Livability Index | Great Neighborhoods for All Ages

Zip Code	Location	Population	Total Livability Index Score	Education HS Grad Rate	Health Index	Total Opportunity Index	Economic Opportunity Index	Personal Safety	Broadband Index	Media
64108	KCMO Dist. 3	8,450	50	52.00%	41	35	0.81 jobs per person	631	98.60%	
64127	KCMO Dist. 3	15,572	51	53.70%	29	41	0.81 jobs per person	631	92.40%	
64130	KCMO Dist. 3	20,170	47	52.60%	32	38	0.81 jobs per person	631	95.30%	
64420	KCMO D: 1 2	44.044	40	F2 C00/	20	20	0.04 **	624	05.700/	
64128	KCMO Dist. 3	11,844	49	52.60%	29	39	0.81 jobs per person	631	95.70%	
64110	KCMO Dist. 3	16,619	50	52.00%	43	36	0.81 jobs per person	631	95.50%	
04110	Kelvio Dist. 3	10,015	30	32.0070	43	30	0.01 Jobs per person	031	33.3070	
64106	KCMO Dist. 3	9,878	49	52.00%	33	29	0.81 jobs per person	631	75.20%	
64109	KCMO Dist. 3	9,744	52	52.00%	34	39	0.81 jobs per person	631	94.80%	
64124	KCMO Dist. 3	11,366	51	52.00%	33	38	0.81 jobs per person	631	96.50%	
64126	KCMO Dist. 3	6,606	49	62.90%	29	39	0.81 jobs per person	631	90.70%	
Bollinger	Rural Missouri	5,204	47	85.70%	25	58	0.78 jobs per person	113	0%	

Kansas City | Springfield | St. Louis (3 EC's) | Nevada









Current Federal Partners Commitments





Consumer Financial Protection Bureau Held "Your Money, Your Goals" toolkit training



ConnectHome USA

Collaborating in promotion of affordable and accessible internet to sites



Census Bureau

Promoted and recruited for temporary census
workers at EnVision Center sites



Federal Deposit Insurance Corporation
Offered free "Money Smart" financial education
program



Centers for Disease Control and Prevention

Grant awarded to Hartford EnVision Center site



Department of Agriculture
Food Nutrition Services delivering presentation on
available food waivers for COVID-19 response



Corporation for National and Community Service

MOU in progress to deploy Volunteers in Service to

America (VISTAs) at EnVision Center sites; 17 EnVision

Center sites approved to receive a VISTA



Department of Education
Delivered summer programming

Current Federal Partners Commitments





Department of Labor

Grantees offering career-related training, such as through American Job Centers



Small Business Administration

Host small business roundtables and workshops



Health and Human Services

Committed to aligning Community Services Block grantees to EnVision Centers Demonstration



Social Security Administration

Provided webinar training and computer access to its programs; launching a pilot for videoconferencing with 2-3 sites.



Internal Revenue Services

Offering free tax counseling and designating sites as VITA and TCE sites, helping clients with tax returns.

e.g. Choctaw Nation: submitted 65 tax returns resulting in \$110,811 in Federal and \$11,498 in State refunds; estimated \$19,500 total saved/returned to Tribal members.



US Interagency Council on Homelessness

Agreed to amplify EnVision Center sites programs to their interagency partners



Veterans Affairs

Exploring delivering benefits information and services virtually and in-person.

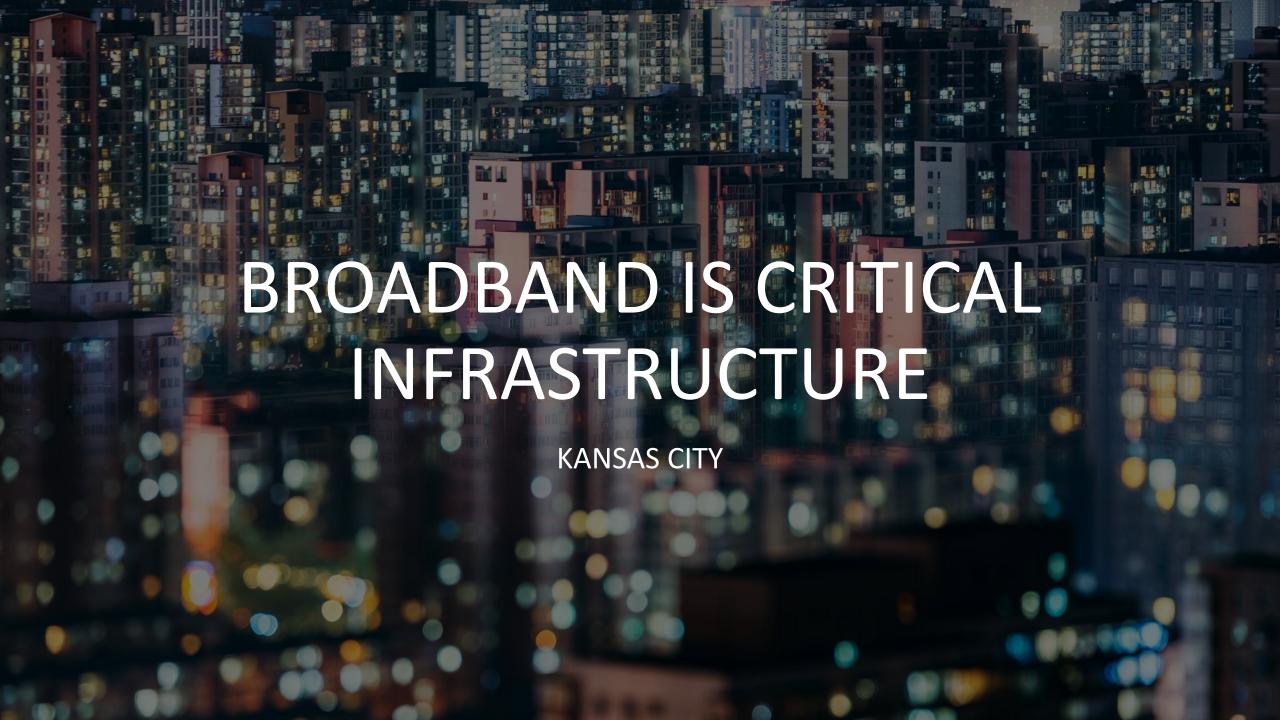
ECONOMIC DEVELOPMENT

Focus on Improving **Upload Speeds**

Developing Communities of Producers

- Utilizing/Creating Knowledge Workers based on the Knowledge Information Economy
- Kansas City's economic goal in Broadband Access includes job creation (providing skills and access to skilled workforce)

 - Advanced Manufacturing
 Research and Commercialization
 Vibrant Knowledgeable Communities
 Neighborhood Businesses
 Sustainability, Transportation, Urban and Rural Planning
 Education & Healthcare





Testimony of Peter Cunningham, General Manager, North Region Google Fiber

Good morning and thank you very much to Representative Louis Riggs, the Interim Broadband Development Committee, and the Missouri House of Representatives for the invitation to speak with you today.

My name is Peter Cunningham, and I am the General Manager of the Google Fiber region that includes our operations here in Missouri. I live in Parkville, Missouri, on the North Side of the Kansas City metro area, with my wife and three young daughters. I am a proud graduate of the University of Missouri in Columbia.

The pandemic has highlighted the need for fast and strong internet connection for everyone. But it didn't take a pandemic to spark our steadfast commitment to Kansas City and the state of Missouri. We've been here for over 10 years.

Google Fiber's Experience in Missouri

When Google announced in 2010 that it was going to become an internet provider, it launched a nationwide contest to determine the first city in which it would launch its service. More than 1,100 communities applied, and Google did extensive evaluation of the proposals, and ultimately decided that Kansas City, right here in Missouri, would be the first Google Fiber market. That was an exciting day for us and for Kansas City.

We commenced construction in 2011, and since 2012, Google Fiber has provided high-speed, high bandwidth internet services to the Greater Kansas City area. We've built our roots here, our core is here. We are very proud of our commitment to Western Missouri. Since then, we have expanded to 16 metro areas around the country. We've worked hard to build out the metro area of Kansas City. We currently offer service in 20 local municipalities in Kansas and Missouri, and are in active discussions with other municipalities in the surrounding Greater Kansas City area.

We are pleased to report that our business is strong and growing everyday. We have been very well received in the market. Our customers appreciate our focus on the speed of our internet, our commitment to service and transparency, and the fact that we don't have any data caps. Our standard 1 gigabit product is an industry leader, and we now even offer a 2 gigabit product for folks who want it. We are proud that even during all of the increased internet traffic when so many people started working from home, our fiber based network had plenty of capacity to handle it all.



Over the course of our 10 years, we have invested hundreds of millions of dollars in Greater Kansas City.

We are committed to expanding Google Fiber throughout the Greater Kansas City area and have maintained an ongoing and robust commitment to the community. Over 200 Missouri schools, libraries, community centers, municipal facilities and nonprofits receive Google Fiber gigabit internet service at no cost through the Community Connections program. We partner with several local organizations devoted to closing the digital divide.

Our community engagement also includes programs providing affordable options to our community members in need. Our Gigabit Community program provides free gigabit internet service at no cost to residents of 835 units in Kansas City public housing complexes. And our Broadband product provides eligible residents with a low cost option with 100/100 mbps speeds for \$15/month.

We are looking to expand and grow in the United States through continued investment in and around our current service areas and through new public private partnership models that would allow us to enter new markets.

Google Fiber's Public Private Partnerships

While we continue to build out the area around Kansas City and our other markets across the country, we are also actively pursuing other models that would allow us to partner with communities to bring high quality broadband to more places.

I'd like to share two examples of partnerships that represent the kind of model we believe could be transformational for communities across the United States, and could work very well in Missouri. In these two examples, the partnership provided a strategy that allows high speed broadband to be built to every part of a community, which would go a long way to alleviating the digital divide.

First, in Huntsville, Alabama, we've partnered with Huntsville Utilities (a municipally owned utility) to bring fiber to the whole community. In Huntsville, the Utility decided to build out and maintain a fiber optic network to every area of the city. Google Fiber signed on as the anchor tenant of this network, and we signed a 20 year lease agreement. The agreement provides that Huntsville Utilities build the network throughout the city. Google Fiber is responsible for marketing our product, doing the drops to homes that sign up for Google Fiber, and providing our internet service on the Huntsville Utilities owned network.



One key aspect about this arrangement is that it was a non-exclusive deal. Other operators can also join the network either in whole or in part. Currently, several businesses, institutions and 5G providers are also on the network.

Second, in West Des Moines, Iowa, we've partnered with the city of West Des Moines. This deal is different from the one in Huntsville in that the City decided to build a non-exclusive <u>conduit system</u> covering the whole city. Google Fiber is again the anchor tenant, on a nonexclusive basis. The projected revenue from the lease agreement will help the City secure the financing for the build cost.

In this deal, tenants will pull their own fiber through the City's conduit, and operate and maintain their own networks. Construction on the conduit system is proceeding rapidly, and we expect to serve our first customer there this fall.

Benefits of Public Private Partnerships

We see these types of public private partnerships as a great way forward for the future of broadband deployment in all types of communities. A public private partnership may be a better solution for a community than a traditional build by an ISP, or a pure municipal build, for the following reasons:

- They allow a community to leverage its assets, such as efficient access to the rights of way, and deep local knowledge, to drive down the cost of a fiber deployment, increase the speed of deployment, and to bring much needed competition to its residents.
- 2. They give the community the ability to own its own critical infrastructure, which it then can lease to one or more providers who will be the ones to provide service to residents, creating a long term revenue stream for communities.
- 3. They can distribute the risk and reward of the broadband deployment equitably between the public and private sectors.
- 4. Most importantly, they give a community leverage to ensure that fiber is deployed to all parts of the community, even areas that present build challenges to traditional providers. This ensures that at long last, the unserved and underserved residents will have access to the broadband that they deserve.

A recent report published by the Benton Institute for Broadband & Society studied Shared-Risk Partnership Models for 21st Century Broadband Infrastructure. Their report argues that neither a purely private nor purely public model is what the country needs to address our glaring internet problems and the digital divide. Instead, they strongly advocate the public/private model, and point specifically to both the West Des Moines and Huntsville examples. These types of partnerships are already happening here in Missouri. In 2019, the City of Springfield, Missouri, entered into a similar partnership with Lumen/Centurylink.



There is no one formula for success. Communities can work with private sector ISPs to structure the partnership in ways that work best for their needs. There are a wide range of options for communities to consider relating to ownership structure, financing mechanisms, risk allocation, and operational responsibilities. The key thing is letting communities decide what is best for them.

Rural Partnerships

The partnership model could be a viable answer in rural parts of Missouri if ISPs were to partner with Electric Co-ops, Investor Owned Utilities, or rural towns or counties across the state.

It is well documented that the primary barrier to connectivity in rural areas is the high cost of deploying broadband in sparsely populated areas. But that cost could be significantly reduced by leveraging the existing infrastructure of the existing electric providers whether they be rural Electric Co-Ops or Investor Owned Utilities. It may make sense for some co-ops to partner with an ISP, where the co-op handles construction, then leases their infrastructure to an ISP to operate and maintain internet service.

Rural communities also should consider public private partnerships. For the first time in memory, rural communities will have access to sufficient funding to actually build high speed internet to serve their whole communities. But a small rural town might not feel like they have the expertise to build, maintain and operate an internet service. These communities should be encouraged to partner with ISPs that could agree to build and operate a network that can serve all parts of the area.

Public Policy Considerations

From its beginning, Google Fiber has been a strong advocate for public policies that will help communities across the United States — small towns, big cities, and rural areas — get the high-speed, high-quality, reasonably priced internet that everyone in this country needs.

The data is clear, economic and social benefits accrue to states that bring fiber-to-the-home to their communities. Counties with better broadband have lower unemployment. Every \$5B investment in internet infrastructure is associated with the creation of 250,000 jobs (100,000 direct; 150,000 indirect). Additionally, every percentage point increase in broadband penetration is associated with 300,000 additional jobs.

And, as more employers and individuals opt for more flexible remote work, quality internet will become a differentiator for communities.



So, what can the state of Missouri do to facilitate better broadband across the state? We believe that if Missouri is to be a leader in broadband deployment, it should consider the following:

Reject Unnecessary Restrictions on Public Private Partnerships for Broadband Deployment

These innovative partnerships are the key to solving the digital divide that the private sector hasn't been able to solve on its own. And, while there has been some criticism of pure municipal networks, this isn't the government competing unfairly with the private sector. It is government building infrastructure that the private sector can use to grow their businesses and the larger local economy. That's like building roads or bridges to support economic development in the community.

2. Authorize Different Types of Organizations to Deploy and Operate Broadband

If you make it easier for entities to enter into Public Private Partnerships, the state of Missouri will see more competition and more innovative ways to serve the unserved and underserved. This authorization should explicitly include at least cities, counties, Municipal Utilities, Electric Co-ops and investor owned utilities. We will need all of these players leveraging their unique assets and experience to get our communities to where we all want to go.

3. Encourage Robust Competition

If Missouri is going to have the broadband ecosystem it will need, there must be much more competition. Even at the relatively slow speed of 100/10 Megabits per second (a fraction of the speed that Google Fiber provides), 80% of Americans face either no service, or have only one or at most two providers for fixed service. It's worse in rural America, where choice is even more limited. Without more competition, there is little incentive for ISPs to raise their speeds, improve their customer service and keep their prices low.

4. Overbuilding is Good for Consumers

Overbuilding is just another word for competition. Without overbuilding, even your constituents with a decent existing internet provider will not have what they really want choice and competition.



5. Allow communities to determine what parts of their communities are unserved or underserved with regard to state and federal funding.

Virtually everyone agrees that the current FCC maps are wildly inaccurate, and overstate availability of high quality broadband. By forcing communities to use these maps and only use funding for an artificially small number of residents, it severely limits their ability to use state and federal funding to get better service to the parts of their communities that don't have sufficient service currently.

6. Authorize Some Public Funding for Partnerships

While Google Fiber hasn't utilized state or federal broadband funds in any of our builds or partnerships to date, we know that communities across the state and the nation are now looking for ways to use federal and state funding to provide high-speed broadband deployment across their communities, including getting service for the areas that have been overlooked for decades. This would give all of their residents an upgrade in service, and reach the previously unserved and underserved.

This approach may make more sense to both a community and private providers than a model that just builds to disjointed, hard to reach and costly to build areas. It generally doesn't make economic sense for a new entrant in an area to build and provide service only to the hardest to reach areas (even with a subsidy), unless there is also a plan to cover the broader community.

Conclusion

In closing, I want to say that Google Fiber is proud that Missouri is the core of where we launched our business 10 years ago, and is still our biggest market. And we want to grow even more in this state, whether it be by a private build like we have in the Kansas City area, or in partnership with a town, a municipal utility, an electric co-op, or some other entity.

I thank Chairman Riggs and each member of this committee for allowing me to represent Google Fiber at today's hearing.

Google Fiber Answers – Ariane Schaffer (arianeschaffer@google.com)

Thank you for the opportunity to testify in August. Please see our responses to your questions below and don't hesitate to reach out if you or others have additional questions.

Take rates

 We don't share our take rates publicly, but we've been very pleased with customer response. In the Kansas City market specifically, they are very strong for a nonincumbent provider.

Network capacity & Redundancies on existing network

Our network is built to be redundant and to handle fluctuations in demand. Because we
are a fully fiber network, we had plenty of excess capacity in our network, even when so
many people started working from home during the pandemic.

Average speeds on existing network

 Our flagship product offering is 1Gig symmetrical and we began offering 2Gig in the state earlier this year, with plans to continue pushing boundaries and increasing speeds in the State of Missouri, and across the country.

• Summary of Planning to increase future take rates

 We have an ongoing marketing effort in all of our markets to make sure people know about the services Google Fiber offers.

Counties served today

- Jackson County
- Kansas City, MO
- Raytown, MO
- Lee's Summit, MO (and Cass County)
- Grandview, MO
- Cass County
 - Raymore, MO
- Clay County
 - Gladstone, MO
- Platte County
 - Weatherby Lake, MO

Federal funds accepted/status of deployment

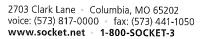
- None to date
- State funds accepted/status of deployment
 - None to date

Length of construction delays or back orders of materials, if any

 With diligent planning, we've been able to keep our projects on track from both a materials and construction resourcing perspective.

Advertising materials attached

While we haven't issued our own 1-pagers or white papers to share, we think the report published by the Benton Institute for Broadband and Society titled Public Infrastructure/Private Service: A Shared-Risk Partnership Model for 21st Century Broadband Infrastructure is very thoughtful. I would like to note that we don't advocate on behalf of everything said in the report, but rather think it is a thoughtful report that is worth the committee reading.





Testimony of R. Matthew Kohly Before The Interim Committee on Broadband Development

My name is Matt Kohly. I am representing Socket Telecommunications ("Socket") where I am the Director of Carrier Relations and Government Affairs. I also work on the business development side working to identify areas where Socket should expand its fiber-optic network.

Founded in 1994, Socket first started as a dial-up Internet service provider and has a long tradition of providing internet access in rural communities throughout the state of Missouri. Socket started providing fiber connections to customers in 2011 and now operates its fiber-optic network in 12 counties across Missouri. We provide a full range of communication and data services, including internet access, voice, and advanced data services.

One of the points the Interim Committee wanted addressed was the use of state and federal grants. Socket has received grant funding under both the State and Federal programs. Those grant funds were combined with Socket's own capital and allowed for the expansion of Socket's fiber network into rural areas in five counties in Central Missouri.

Socket first received funding under the State's broadband program that allowed it to build a fiber-to-the-home network to provide 1Gbps service to over 400 residences, businesses, and critical community institutions in the town of New Franklin located in Howard County. The grant funding accounted for approximately 30% of the total cost of the project with the remaining 70% being provided by Socket.

Socket also received funding under the CARES act for 10 projects. For each of these projects, Socket combined the grant funds with its own capital to the pay the remaining cost of the project. These projects ranged from approximately 250 households to as few as nine households. While it may seem inefficient to spend time preparing and reviewing a matching grant application for a project to serve nine households, this was part of larger project. For example, the project to build a fiber-optic network to serve nine households was combined with a larger, Socket-funded project that now has 54 rural households subscribing to Socket's Internet service. Because of the definition of "served" and the determination of served or unserved being at the census block level where only one location needs to be reported as receiving 10Mbps/1Mbps service, only 9 of the households within Socket's project area qualified as "unserved" for grant funding purposes. In truth, all of the houses in this project should have been considered "unserved" as none actually received 10Mbps/1Mbps service.

The first point I would like to make is that when considering legislation related to broadband funding, grants should not be the only consideration. Long-term, fixed- interest rate loans should be considered as well. These could be provided on a standalone basis or in combination with grants. Having to pay the money back requires the applicant to plan a little more carefully when putting a business plan together. The use of loans also allows for continuous funding as loans are repaid.

The definition of "unserved" and "underserved" found in Section 620.2450 RSMo needs to be updated in recognition that a 25Mbps/3Mbps service is not sufficient to meet today's demands. It should also be modified to allow a small percentage of homes within the project area to be defined as "served". This will avoid having to submit multiple applications or having an application rejected because only a small percentage in the middle may be served.

In addition to increasing the speed requirements to determine "served" and "underserved", there needs to be requirements addressing the reliability of the current Internet service when defining a "served" and "underserved" area. While gathering data to support Socket's grant applications, customers expressed almost as much concern about the reliability of their current service as there was concern about its slow speed. A business may be able to adapt to slow Internet but it is much harder to adapt to Internet service that only works sporadically.

Lastly, Missouri's current statutes regarding areas where grant funds may be awarded is far too limited. Section 620.2456 RSMo prohibits awarding grant funds in areas where a company, generally the incumbent phone company, received grants from the Connect America Fund or the Federal Universal Service Fund. This required them to provide 10Mbps/1Mbps Internet service. This means that an area can be defined as "Unserved" under Missouri's current statutes but it is still ineligible for funding from Missouri's Broadband Grant program because the incumbent phone company received funding from the Connect America Fund or Federal Universal Service Fund. These restrictive requirements need to be removed.

With that, I will take questions.

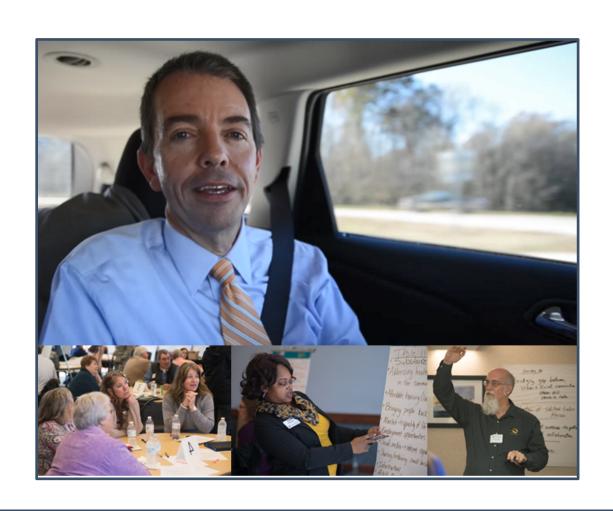
University of Missouri System Broadband Initiative

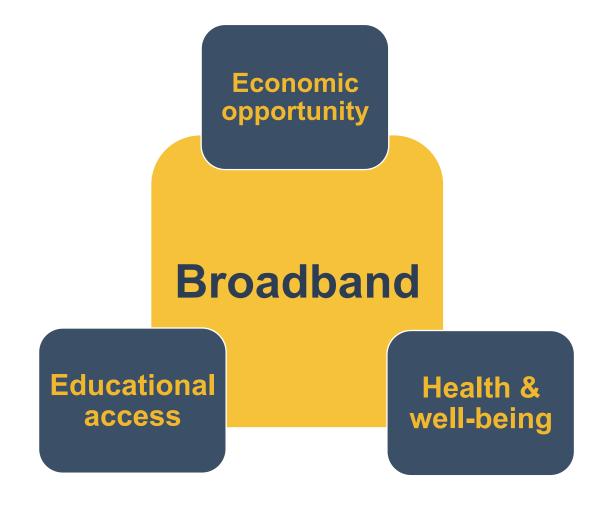


Marshall Stewart, EdD

Chief Engagement Officer

Missouri has three grand challenges



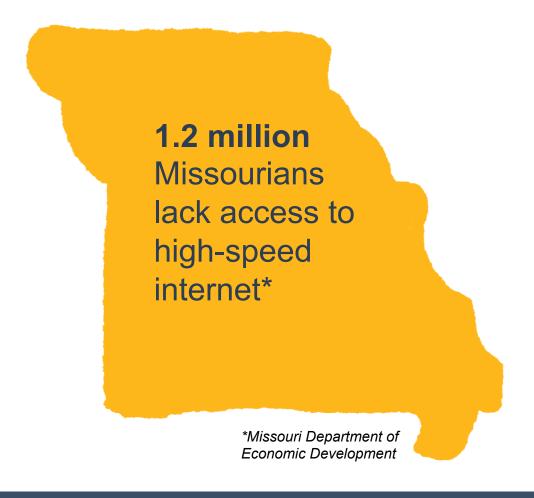


Broadband access: The challenge

The speed, stability and availability of the internet is key to education,

innovation and progress

in Missouri.



Our role

- Megaphone
- Influence
- Action

UM System Broadband Initiative

Includes faculty at all four universities, stakeholders and MU Extension





Making progress

- Missouri Broadband Resource Rail
- Pilot community in Bollinger County
- Digitally Connected Communities
 Guide
- Training program for first MU Extension cohort





The Office of Broadband Development



- MU Extension
- Electric Cooperatives
- Other Partners



A Unifying Moment

Broadband is

the number

one issue in

Missouri



Let's be good stewards of this opportunity

Recommended considerations:

- Fund and support an organized approach
- Incentives to ISPs
- Expand funding for The Office of Broadband Development
- Fund efforts to empower communities
- Commit to a sustained investment over the next
 10 years
- Commit to a state blue ribbon leadership/

We have the opportunity to make a difference for **Missourians**









Thank you.



Marshall Stewart, EdD

Chief Engagement Officer

University of Missouri System Broadband Initiative

Promoting Broadband in Missouri Communities

Why Broadband?

Cutting-edge technologies — such as internet-based business, precision agriculture, tele-healthcare, eLearning, smart infrastructure and smart government, and many more — are key to improving Missourians' lives and opportunities.

These 21st century technologies all require access to reliable high-speed internet and a population trained to use them effectively. Yet, many areas of Missouri currently lack the broadband infrastructure necessary to use these new applications. Almost 20% of Missourians — more than 1.2 million citizens — do not have access to high-speed internet at this time.

Through the Broadband Initiative, the MU System partners with state and local governments, businesses and nonprofit stakeholders, sharing knowledge, resources and tools as we work together to build the digital superhighway and increase broadband access across Missouri¹.

What is the UM System Broadband Initiative?

The UM System will work to find solutions and bring broadband–based applications to local communities by:

- Advising communities related to broadband planning and needs assessment
- Introducing communities to opportunities such as digital learning and education, broadband-based healthcare, workforce development and e-business development
- Introducing community stakeholders to legal and financial structures to help fund broadband deployment
- Promoting the use of broadband-based technologies and applications to address the grand challenges of health, economy and education
- 5. Evaluating and sharing results, to develop "best practices" for other communities

Role for faculty and staff in the initiative

You may have questions about what role to play in the UM System Broadband Initiative's* focus on community broadband efforts. This guide identifies roles for UM System faculty and staff, including MU Extension, in assisting local communities (i.e., neighborhoods, towns, cities, counties, etc.) as they explore solutions to broadband challenges. Considerations include community engagement around the topic of broadband, technology assessment, financing and legal structures and promoting adoption.

Your role will depend on the need of the community and your area of expertise. One size doesn't fit all and that's OK! You can choose a supportive role (resource sharer, connector or collaborator) and/or a leadership role. More information about these roles is outlined below.



WHAT TO DO: Be familiar with the UM System Broadband Initiative and related information and resources and share with community stakeholders working on broadband issues. For more information and resources, go to https://www.umsystem.edu/ums/engagement-outreach/impact.

HOW TO SHARE RESOURCES*: Identify community groups working on broadband issues and respond to their needs (access, affordability, utilization, etc.) by sharing UM System Broadband Initiative resources.

Additionally, be aware of what lives on the <u>mobroadband.org</u> website that can be easily shared and pointed to for reference.

Example: A coalition on internet affordability and adoption has formed in your community to address inequity. Contact the coalition leader and share UM System Broadband Initiative resources.



WHAT TO DO: Connect community stakeholders with UM System faculty and staff who can help solve local broadband challenges.

HOW TO CONNECT: Understand the broadband needs/challenges in the community and then contact Alison Copeland, UM System Broadband Initiative leader, at copelanda@umsystem.edu. Alison can help you identify UM System faculty and staff to help find information and solutions.

Example: A community wants to increase broadband availability because 60% of the population has no access to internet in the home, negatively impacting online learning for children and entrepreneurial opportunities. The group needs assistance understanding broadband funding and finance options. The UM System has faculty and staff members with expertise in broadband-related finance, business and legal matters.



WHAT TO DO: Become an active participant in a community group working to solve broadband challenges.

HOW TO COLLABORATE: Become knowledgeable about broadband and related challenges in the community. Attend community group meetings, sharing UM System Broadband Initiative resources and expertise and advising the community. Contact Alison Copeland, UM System Broadband Initiative leader, at copelanda@umsystem.edu for support and guidance.

Example: A rural health care entity is exploring enhanced telehealth services to increase access to care and reduce patient travel time and cost. The group would benefit from having a faculty or staff member from any of the four UM System universities or MU Extension serving as a member to actively connect UM System assets with community needs.



LEADER

WHAT TO DO: With input from community members, identify broadband needs and challenges and form a working group. Community change takes people power. Try to make your working group diverse and representative of your community. Involve youth, professionals and retired persons. Set a monthly meeting time and location to hold yourselves accountable. Grow this group as more people become interested.

HOW TO LEAD:

- a. Begin with an assessment. You can use the assessment tools on the All Things Missouri platform to identify issues in your community. You can decide to focus on issues within a specific category, like internet access for K-12 learning, or look more broadly across issues. You can use the Broadband Planning Guide on the Missouri Broadband Resource Rail to get a better understanding of your specific county/counties. More UM System Broadband Resources are available at https://www.umsystem.edu/ums/engagement-outreach/impact.
- b. Take an inventory. Talk to people in your community about what's working well and what needs improvement. Take an inventory of organizations, clubs and anchor institutions like schools and churches. Schedule a time to meet with each of these groups and hear their concerns and ideas.
- c. Prioritize and focus based on what you learn. Select one to three issues that were identified through the assessment process and your conversations with the community. Start with your

end goal in mind and build a path of strategies that will get you there. Make sure your goals are SMART — specific, measurable, achievable, relevant and time-bound.

GOAL EXAMPLES:

Education: Ensure that all public schools in a school district have access to internet speeds of at least 25 Mbps by 2022.

Health: Increase the number of local mental health providers who also provide telehealth services by 50% in two years.

Economy: Provide free public WIFI in the downtown area by July 2021.

d. Identify resources, experts and contacts. Share UM System Broadband Initiative resources and expertise. Contact Sam Tennant, UM System Broadband Initiative manager, for support and guidance.

*UM System Broadband Resources

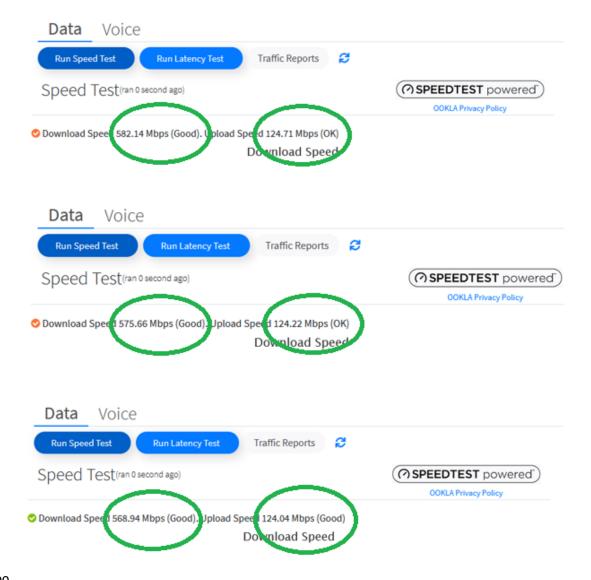
- Missouri Broadband Resource Rail
 - · Resource Navigator is a way to organize community resources and see who else is involved.
 - The library is full of information to get you up to speed or educate others.
 - · Report and Mapping tools help you assess your location.
- Bringing Broadband to a Missouri Community plan
- UM System Broadband Initiative description https://mobroadband.org/about/
- Alison Copeland, UM System Broadband Initiative leader copelanda@umsystem.edu

Other University Resources

- · MU Extension community development specialists, based in counties across Missouri
- All Things Missouri District Explorer tools provide other key contacts at state and local levels.

¹ BroadbandUSA provides a glossary of broadband terms. From digital equity to "fiber to the home" (FTTH) and "rights of way" (ROW) to telemedicine, this site provides definitions of terms associated with broadband and broadband-based applications.





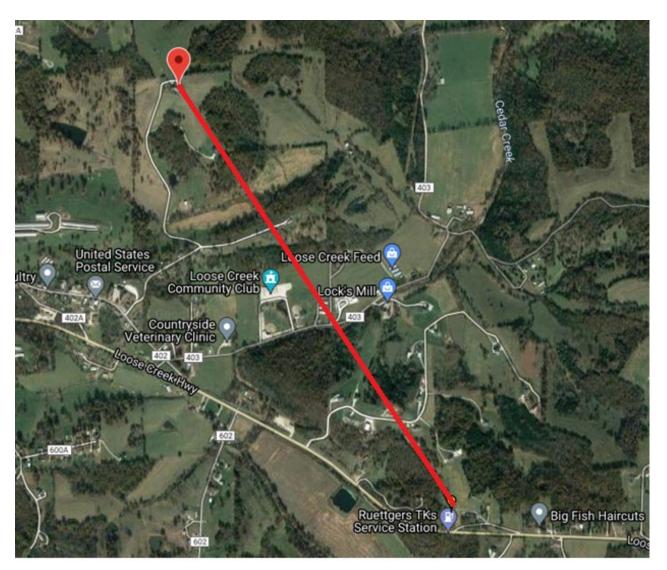
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Before the Missouri House of Representatives Interim Broadband Development Committee

Statement of Joy Ditto President and CEO American Public Power Association

September 16, 2021

Dear Chairman Riggs and Members of the Interim Broadband Development Committee:

My name is Joy Ditto, and I am President and CEO of the American Public Power Association (APPA). APPA is the national service organization for the more than 2,000 not-for-profit, community-owned electric utilities in the U.S. Collectively, these utilities serve more than 49 million Americans in 49 states (all but Hawaii) and five territories. The vast majority of these utilities serve communities of 10,000 people or less. I have been CEO for almost two years, but served as Senior Vice President for Legislative Affairs and other positions at APPA for another 15 years, with a four-year stint in-between as CEO of the Utilities Technology Council (UTC), another Washington, D.C. association representing vital energy and water utilities on their mission-critical technology and communications systems. The first seven years of my career were spent on Capitol Hill as staff to several members of Congress.

APPA was created in 1940 as a nonprofit, non-partisan organization to advance the public policy interests of its members and their customers, and to provide member services to ensure adequate, reliable electricity at a reasonable price with the proper protection of the environment. Most public power utilities are owned and governed by municipalities, while others are owned/governed by subdivisions of states, including public utility districts, irrigation districts, and power authorities. In Missouri there are 87 public power utilities, including Houston, Marshall, and Springfield, representatives from which are testifying before the committee today, as well as Hannibal, Palmyra, Shelbina and Monroe City in the Chairman's district. State-wide, public power utilities serve 436,000 customers. APPA members also include joint action agencies (state and regional entities formed by public power utilities to achieve economies of scale, such as the Missouri Public Utility Alliance) and state and regional associations that have purposes similar to APPA.

The public power business model is an American tradition rooted in community. Created in the 1880s, the model is simple: distribute electricity to local customers on a not-for-profit basis governed by local, community decision-makers. The oldest continuously operated public power utility in the United States, running since 1881, is right in your back yard, Butler, Missouri. Butler prides itself on being known as "electric city" because it was the first city west of the Mississippi to have electric power. Public power utilities' main mission is providing optimal service to their customers. Rates are cost-based. Service is reliable. Dollars spent on electricity stay in the community and are reinvested there. Customers are the owners and — through elected or appointed governing boards or city councils — the decision makers for their utilities. Public power towns are familiar with meeting the needs of the unserved and the underserved. In the early days of the electricity industry, smaller communities were not attractive to private

electricity companies. As electric power became a critical service and the private sector failed to meet their needs, these communities took matters into their own hands.

When the nation grew post World War II, so did electric infrastructure. Communications systems expanded with the industry because workers needed reliable communications to build out, maintain, and restore their grids given the increasingly high expectation for reliable electric service to power businesses, homes, and schools. Because electricity is currently unable to be stored on a large scale, demand must be supplied instantaneously. Communications networks enabling such a delicate balance were also needed to ensure greater levels of operational control reliability. Because such highly reliable communications services were not available, many utilities decided to deploy their own communications networks to ensure they could provide highly reliable electric service. In so doing, they hired communications engineers and technicians, built out communications infrastructure, and partnered with third-party vendors. These networks are known as "private" communications networks because of their internal-facing function.

As communications technology improved so did its use in the electric system. Digital communications technology deployed more broadly beginning in the late 1970s and 1980s, enabled real-time situational awareness in many industries, including the electric sector. The industry began deploying Supervisory Control and Data Acquisition (SCADA) systems, ii a type of industrial control system, which allows utilities to control, monitor, and analyze power generation and distribution, providing real-time situational awareness on the grid. Starting in the late 1990s, many utilities began deploying broadband-based information and communication technology (ICT) networks in addition to their existing systems. As its name suggests, "broadband" networks enable more types of data to be transmitted in a faster, more responsive way." More recent growth in technology has enabled sensors, drone use, advanced metering, and virtual reality communications for workers that have enhanced the ability to prevent outages, respond to weather events, and restore power, as well as to enable integration of intermittent resources, such as wind and solar, all while balancing electrical stability.

Unserved or underserved areas are desperate for service. Utilities have the expertise in infrastructure, complex systems, engineering and, in many cases, a lot of extra bandwidth enabled by their private networks. According to a 2019 study by UTC, approximately 80 percent of all electric utilities in the U.S. own and operate their own private utility networks. Because of our history in serving the community by filling the electric service gap, APPA's public power utility members are the partners people have sought in their communities to assist where broadband is unavailable or service is poor. In many cases, our members' knowledge of communications networks coupled with their understanding of the business and economic development needs of their communities have enabled many of them to consider offering external communications services. APPA is currently undertaking a study to gather additional data on how many of our members are now offering such external communications (broadband) services.

Despite barriers erected by some states to prevent or restrict electric utility involvement in provisioning external broadband service, successful stories exist in communities around the country where such service has been allowed. Members of this committee received testimony

from three Missouri public power utilities that are currently involved in providing broadband services to their communities. Other success stories exist from around the nation, and include:

- **Bristol Tennessee Essential Services (BTES) Bristol, TN** serves 17,000 customers with fiber optics. BTES built its system to enhance its electrical grid for outage and meter reading after a major ice storm in 1998. It expanded internet service for residents and began offering residential fiber to homes in 2005.^v
- EPB of Chattanooga (EPB) Chattanooga, TN serves approximately 90,000 subscribers with fiber optics. EPB built out its fiber optics system to enhance the electric grid, and it led to the creation of one of the most successful city-wide municipal systems offering 10,000 megabytes per second (Mbps) internet speeds to every business and resident. The 600-mile service territory of fiber optic infrastructure was brought to Chattanooga and Hamilton County in 2009 and went residential in 2010. vi
- Conway Corp. Conway, AR serves almost 22,000 customers with a hybrid-biber-coax (HFC) network. Conway has been in the internet business for 25 years since it launched its cable and internet service in 1997. VII
- **Grant PUD Fiber, Grant Public Utility District (PUD), WA** serves just under 21,000 subscribers (75 percent of the entire county). The network was built in 2001 and provides speeds up to 1 gigabyte per second (Gbps). It is a wholesale provider and has 13 different retail service providers operating on its network. Viii

Regardless of the business model or who provides it, every tool in our toolbox should be made available to cross the digital divide and provide broadband service to those who are unserved or underserved. Public power utilities are not-for-profit, service oriented, and community owned. They can partner with their communities, and sometimes with other businesses, to enable such broadband service. Other electric business models, like coops and investor-owned utilities, can also be available to help given their experiences with deploying communications networks.

Delia Patterson, "Public power: A rich history, a bright future" APPA blog post (February 15, 2018) https://www.publicpower.org/blog/public-power-rich-history-bright-future

[&]quot; UTC Issue Brief "Invisible Infrastructure: How Utility Telecommunications Networks Underpin the Grid" https://utc.org/wp-content/uploads/2018/10/About-Utility-Comms-101.pdf

iii UTC Issue Brief "Invisible Infrastructure: How Utility Telecommunications Networks Underpin the Grid" https://utc.org/wp-content/uploads/2018/10/About-Utility-Comms-101.pdf

^{iv} UTC Study "Utility Network Baseline- April 2019 Update" (April, 2019) https://utc.org/wp-content/uploads/2019/04/UTC-Utility-Network-Baseline-Final.0419.pdf

BTES website "About Bristol Tennessee Essential Services" https://www.btes.net/index.php/about-us/

vi EPB website "Who We Are" https://epb.com/

vii Sean Gonsalves, "Staying Ahead of the Curve in Conway, Arkansas" (January 26, 2021) https://muninetworks.org/content/staying-ahead-curve-conway-arkansas

viii Grant County PUD website, "High Speed Network" https://www.grantpud.org/high-speed-network



Before the Missouri House of Representatives Interim Broadband Development Committee

Testimony of James Baller Coalition for Local Internet Choice

September 16, 2021

Dear Chairman Riggs and Members of the Interim Broadband Development Committee:

I am Jim Baller, the president of the Coalition for Local Internet Choice (CLIC). CLIC is an alliance of more than 630 public and private organizations and individuals that works to preserve, protect, and, if necessary, restore local decision-making authority in critical broadband infrastructure matters. I have been invited to address two questions: (1) What are other states doing about barriers to municipal, cooperative, and public-private broadband initiatives? and (2) What is the federal government doing to accelerate the deployment, adoption, and use of advanced communications networks and capabilities? I will begin with a brief introduction and then attempt to answer those questions.

Introduction

If the United States is to remain a great nation and compete successfully for world leadership in the decades ahead, we must act energetically to meet two core broadband challenges. One is to ensure that all Americans have affordable access to the Internet at levels sufficient to enable them to participate well in modern life. The other is to ensure that communities across America have access to the advanced communications capabilities they will need to survive and thrive in the increasingly competitive global economy.

The COVID-19 pandemic has made clear that broadband connectivity is essential at the individual and household level, particularly in the face of severe disruptions of the kind that we have been experiencing in the last year-and-a-half. Individuals with fast connections to the Internet have been able to continue to work, educate themselves, obtain medical care, and maintain social contacts from their homes. Unserved or underserved individuals have not been able to do these things and have been increasingly isolated and frustrated.

At the community level, advanced communications networks, like electric utilities in the last century, have increasingly become platforms, drivers, and enablers of simultaneous progress in just about everything that matters to communities. This includes economic and workforce development, all levels of education, public safety, modern health care, smart transportation, energy efficiency and reliability, environmental protection, government service, and much more.

Communities without affordable access to advanced communications capabilities will inevitably fall behind in all of these areas.

That's why so many communities across America today, facing a wide range of local conditions, are vigorously seeking broadband solutions that will work for them. Some are engaging with willing incumbents. Others are partnering with new entrants. Some are building their own municipal or cooperative networks. Still others are developing creative new ways to meet their needs. CLIC strongly believes that local communities are in the best position to understand their own needs and to make the critical broadband choices that will affect their economic well-being and quality of life in the years and decades ahead.

With billions of federal, state, local, and private dollars becoming available to help accelerate broadband deployment, adoption, and use, we should have a good chance of meeting our nation's two core broadband challenges. But doing this successfully will depend on our using these funds wisely and striking the right balance between meeting community-level needs and ensuring that we leave no individual or household behind.

What Other States Are Doing About Barriers to Local Broadband Initiatives and Public Private Partnerships

In recent years, many States have greatly expanded their support for broadband initiatives. This includes establishing State broadband offices, developing strategic plans, providing information and guidance to local communities, and, increasingly, providing state funds to support broadband projects. The role of the States will expand even more as billions of federal dollars are channeled through them, as discussed in greater detail in the next section.

See, e.g., Pew Charitable Trusts, Fact Sheet: "How Nine States Are Expanding Broadband," (Feb. 2020), https://broadbandcouncil.ca.gov/wp-content/uploads/sites/68/2020/03/Pew-State-Broadband FactSheet-2020.pdf

See, e.g., Ry Marcattilio-McCracken, "Kansas Announces New Ten-Year, \$85-million Broadband Grant Program," Community Networks (Dec. 1, 2020), https://muninetworks.org/content/kansas-announces-new-ten-year-85-million-broadband-grant-program; S. Johnson, "California moves to adopt historic broadband plan," https://edsource.org/2021/california-moves-to-adopt-historic-6-billion-broadband-plan/658121

D. Goovaerts, "States play a key role as federal broadband funding pours in," *Fierce Telecom* (Aug. 16, 2021), https://www.fiercetelecom.com/regulatory/states-play-a-key-role-as-federal-broadband-funding-pours

In addition, some states have recently repealed or rejected barriers to entry by local government entities, cooperatives, and public-private partnerships.⁴

Of particular note, in February 2021, the conservative Arkansas legislature found that "without access to voice, data, broadband, video, and wireless telecommunications services, citizens of Arkansas also lack access to healthcare services, education services, and other essential services; and that this act is immediately necessary to allow government entities to provide high quality voice, data, broadband, video, and wireless telecommunications services to their citizens." In response, the Arkansas Senate voted 35-0, and the House voted 94-0, to give government agencies substantial new broadband powers, and Governor Hutchinson duly signed the bill. Briefly summarized, Arkansas now:

- Allows government entities that own electric systems or cable television systems to
 provide communications services or facilities, now or in the future, directly or
 indirectly, with the exception of basic local exchange service;
- Allows government entities to provide telecommunications services or facilities to support a wide range of emergency management, law enforcement, education, and healthcare activities;
- Allows government entities and their private partners to apply for and use grants or loans from programs that focus on extending services to unserved areas;
- Allows government entities to "acquire, construct, furnish, equip, own, operate, sell, convey, lease, rent, let, assign, dispose of, contract for, or otherwise deal in facilities and apparatus" used to provide any or all of the following services: voice, data, broadband, video, or wireless telecommunications services;
- Allows government entities to issue general obligation bonds or impose special taxes to acquire or construct communications facilities, provided that the government entities
 - o "partner, contract, or otherwise affiliate with" an entity that is experienced in such matters:
 - o conduct due diligence in accordance with industry standards for such projects and in compliance with legal requirements for the kind of funding involved,
 - o hold a public hearing, after giving at least 10 days prior public notice; and
 - o afterward the hearing, "cause an election to be held as required by law."

These requirements do not apply to government entities that qualify as owners of electric or cable TV systems; as providers of services relating to energy

3

CLIC's list of states that had barrier to public broadband initiatives and public-private partnerships as of July 1, 2021, is available at http://www.localnetchoice.org/wp-content/uploads/2021/08/CLIC-List-State-Barriers-7-1-21.pdf

management, law enforcement, education, or health care.; or as providers of services pursuant to grants or loans under programs focusing on unserved areas. $\frac{5}{2}$

Similarly, until this year, the State of Washington had allowed only large home-rule cities to provide telecommunications services (broadly defined) to customers of all kinds, and it had allowed Public Utility Districts (PUDs) to provide telecommunications services only at the wholesale level, and not directly to end-users at the retail level. Through HB 1336, the Washington State Legislature gave smaller municipalities, PUDs, and port authorities unrestricted powers to provide telecommunications to customers of all kinds. ⁶

In the meanwhile, the legislature of Ohio rejected amendments to a budget bill that would have banned all existing and future municipal broadband projects and public-private partnerships in that state. ⁷

Several states have also removed restrictions on entry by cooperatives. As a result, cooperatives are increasingly stepping up to the challenge of providing broadband to their communities. In fact, the history of electrification appears to be repeating itself in the communications area. In

4

Arkansas State Legislature, Act No. 67, (Feb. 4, 2021, https://www.arkleg.state.ar.us/Bills/Detail?tbType=&id=sb74&ddBienniumSession=2021%2F2021R; J. Baller, "Arkansas Legislature Significantly Expands Local Broadband Options," *CLIC* (Feb. 9, 2021), http://www.localnetchoice.org/connections/arkansas-state-legislature-significantly-expands-local-broadband-options/

Washington State Legislature, HB 1336, (Adopted and Engrossed Apr. 11, 2021), https://app.leg.wa.gov/billsummary?BillNumber=1336&Year=2021&Initiative=false,

J. Brodkin, "Ohio GOP ends attempt to ban municipal broadband after protest from residents," Ars Technica (June 29, 2001), https://tech.slashdot.org/story/21/06/30/0042239/ohio-gop-ends-attempt-to-ban-municipal-broadband-after-protest-from-residents

K. Kienbaum, "New State Laws Ease the Way for Electric Co-op Broadband," *Community Networks* (July 18, 2021), https://muninetworks.org/content/new-state-laws-ease-way-electric-co-op-broadband

⁹ ILSR, "Cooperatives Build Community Networks," *Community Networks* (undated), https://muninetworks.org/content/rural-cooperatives-page.

As early as the 1880s, municipalities began to fill gaps in electrification left by the private power industry. By the early 1920s, more than 3000 communities were operating their own electric utilities. In the 1930s, spurred by the Rural Electrification Act of 1936, cooperative electric utilities began to provide electric power in sparsely populated areas that even municipalities could not serve economically. J. Baller, "Essential Role of Consumer-Owned Electric Utilities in Developing the National Information (continued ...)

State barriers to municipal, cooperative, or public-private broadband initiatives are not only bad for the communities involved, but they also hurt the private sector in multiple ways. They prevent private companies from making timely sales of equipment and services to municipal or cooperative networks. They impede companies from using advanced public or cooperative networks to offer businesses and residential customers an endless array of modern products and services. They thwart economic and educational opportunities that can contribute to a skilled workforce that would benefit existing and new businesses across the state. They also deny the community the economic and social benefits from which everyone in the community can benefit, including the private sector. $\frac{11}{2}$

In these challenging times, with the stakes so high, we cannot afford to cut off any potentially viable option for bringing advanced communications capabilities to all American communities as rapidly as possible. The Missouri Legislature should follow the lead of Arkansas and Washington State and repeal the restrictions in R.Mo. § 392.410, once and for all. It should also reject any proposed new restrictions on municipal, cooperative, or public-private broadband projects.

What the Federal Government is Doing to Accelerate Broadband Deployment, Adoption, and Use

According to the National Telecommunications and Information Administration (NTIA), there are now "more than 80 federal programs across 14 federal agencies whose funding can be used for broadband-related purposes."12 NTIA's guide to these programs includes the \$350 billion in federal dollars that the American Recovery Plan Act (ARPA) enables state and local governments to use for broadband projects. The guide does not address the additional \$42.45 billion that the bipartisan Senate bill, the Infrastructure Investment and Jobs Act (IIJA), would also make available for broadband projects through its Broadband Equity, Access and

(...continued)

Infrastructure," (Nov. 2, 1994), https://www.baller.com/1994/11/the-essential-role-ofconsumer-owned-electric-utilities-in-developing-the-national-information-infrastructure/

- 11 For example, the municipal fiber network operated by the Electric Power Board of Chattanooga, TN, has in its first decade generated approximately \$2.69 Billion in economic and social benefits, many of which inured to the private sector. S. Gonsalves, "Study Finds Chattanooga Fiber Network 10-Year ROI: \$2.69 Billion," Community Networks (February 1, 2021), https://muninetworks.org/content/study-finds-chattanoogafiber-network-10-year-roi-269-billion
- 12 NTIA. "NTIA Launches Updated Federal Broadband Funding Guide." https://broadbandusa.ntia.doc.gov/news/latest-news/ntia-launches-updated-federal-broad The guide itself is available at https://broadbandusa.ntia.doc. band-funding-guide gov/news/latest-news/ntia-launches-updated-federal-broadband-funding-guide.

Deployment Program (BEADP).¹³ In the absence of current or future state barriers, a substantial percentage of these funds could be available to Missouri's municipal, cooperative, and public-private projects. In the remainder of this section, we outline some of the key features of these programs.

ARPA was signed into law on March 11, 2021. It provided for \$362 billion that state and local governments can use for broadband, including \$350 billion from the Coronavirus State and Local Fiscal Recovery Funds and \$10 billion Capital Projects Fund. On May 10, 2021, the US Treasury Department issued an Interim Final Rule (IFR) governing the distribution and use of these funds. The Department subsequently issued two rounds of cumulative Frequently Asked Questions (FAQs) to shed further light on these requirements. As interpreted by the IFR and the Department's FAQs, the following are some of most important features of the ARPA funding scheme:

- The definition of areas with unserved and underserved households or businesses includes areas with "one or more households or businesses that are not currently served by a wireline connection that reliably delivers at least 25 Mbps download speed and 3 Mbps of upload speed." IFR, 86 Fed. Reg. at 26821
- "The Interim Final Rule requires eligible projects to reliably deliver minimum speeds of 100 Mbps download and 100 Mbps upload. In cases where it is impracticable due to geography, topography, or financial cost to meet those standards, projects must reliably deliver at least 100 Mbps download speed, at least 20 Mbps upload speed, and be scalable to a minimum of 100 Mbps download speed and 100 Mbps upload speed." FAQ 6.5
- Not every house or business in the service area must be unserved or underserved. That is, at least some overbuilding is permitted. "It suffices that an objective of the project is to provide service to unserved or underserved households or businesses. Doing so may involve a holistic approach that provides service to a wider area in order, for example, to make the ongoing service of unserved or underserved households or businesses within

https://www.epw.senate.gov/public/_cache/files/e/a/ea1eb2e4-56bd-45f1-a260-9d6ee951bc96/F8A7C77D69BE09151F210EB4DFE872CD.edw21a09.pdf

US Treasury Department, "Coronavirus State and Local Fiscal Recovery Funds, Interim Final Rule," 86 Fed. Reg. 26786 (May 17, 2021), https://www.govinfo.gov/content/pkg/FR-2021-05-17/pdf/2021-10283.pdf

US Treasury Department, "Coronavirus State and Local Fiscal Recovery Funds, Frequently Asked Questions, As of July 19, 2021," https://home.treasury.gov/system/files/136/SLFRPFAQ.pdf

the service area economical. Unserved or underserved households or businesses need not be the only households or businesses in the service area receiving funds." FAQ 6.9

- Treasury "encourages recipients to prioritize support for broadband networks owned, operated by, or affiliated with local governments, non-profits, and co-operatives—providers with less pressure to turn profits and with a commitment to serving entire communities." IFR, 83 Fed. Reg. at 26806
- Funding recipients have substantial discretion in determining whether an existing provider is "reliably" offering 25/3 Mbps and need not rely on its advertised speeds. "When making these assessments, recipients may choose to consider any available data, including but not limited to documentation of existing service performance, federal and/or state-collected broadband data, user speed test results, interviews with residents and business owners, and any other information they deem relevant. In evaluating such data, recipients may take into account a variety of factors, including whether users actually receive service at or above the speed thresholds at all hours of the day, whether factors other than speed such as latency or jitter, or deterioration of the existing connections make the user experience unreliable, and whether the existing service is being delivered by legacy technologies, such as copper telephone lines (typically using Digital Subscriber Line technology) or early versions of cable system technology (DOCSIS 2.0 or earlier)." FAQ 6.11

The following are the key features of the bipartisan Infrastructure bill, as passed by the Senate:

- The BEADP requires NTIA to administer a \$42.45 billion grant program for which the term "eligible entity" is defined as "a State." NTIA must issue a Notice of Funding Opportunity within 180 days after the bill is enacted, establishing a process for States to submit a letter of intent, a single initial proposal, and a single final proposal for funding.
- A State may use grant funds "to competitively award subgrants" for:
 - Unserved service projects and underserved service projects.
 - An "unserved location" lacks access to reliable broadband service offered with speed of not less than 25Mpbs/3Mbps. "Unserved service projects" are projects serving areas in which not less than 80% of locations are unserved.
 - An "underserved location" lacks access to reliable broadband service offered with speed of not less than 100Mbps/20Mbps. "Underserved service projects" serve areas in which not less than 80% of locations are underserved.
 - Connecting eligible community anchor institutions. An "eligible" community anchor institution (e.g., a school, library, health care facility, etc.) that lacks access to gigabit service.
- Subgrant awards are to be funded in accordance with the following prioritization:

- Unserved service projects;
- Underserved service projects (after the State certifies that it will ensure universal coverage of all unserved locations); and
- Eligible community anchor institutions (after prioritizing underserved service projects).
- In awarding subgrants, States "may not exclude cooperatives, nonprofit organizations, public-private partnerships, private companies, public or private utilities, public utility districts, or local governments from eligibility for such grant funds."
- A subgrantee for the deployment of a broadband network must provide broadband service at a speed of not less than 100Mbps/20Mbps, with sufficiently low latency "to allow reasonably foreseeable, real-time, interactive applications."
- The network must be deployed and service commenced no later than four years after the date of the subgrant.
- A State must provide, or must require a subgrantee to provide, a matching contribution equivalent to at least 25 percent of project costs. NTIA may waive the matching contribution requirement and the match requirement does not apply in high-cost areas.

In sum, under both ARPA and the Senate's bipartisan Infrastructure bill, Missouri's municipalities, cooperatives, and public-private partnerships stand to receive tens or even hundreds of millions of federal dollars to help accelerate broadband deployment, adoption, and use. It would be highly unfortunate if current or future state barriers precluded them from taking advantage of these much-needed funds.

Respectfully submitted,

Smi faller

James Baller

President

Coalition for Local Internet Choice

4526 30th Street, NW

Washington, DC 20008

(202) 441-3663

jim@baller.com

Presentation to Interim House Committee on Broadband Deployment

September 16, 2021

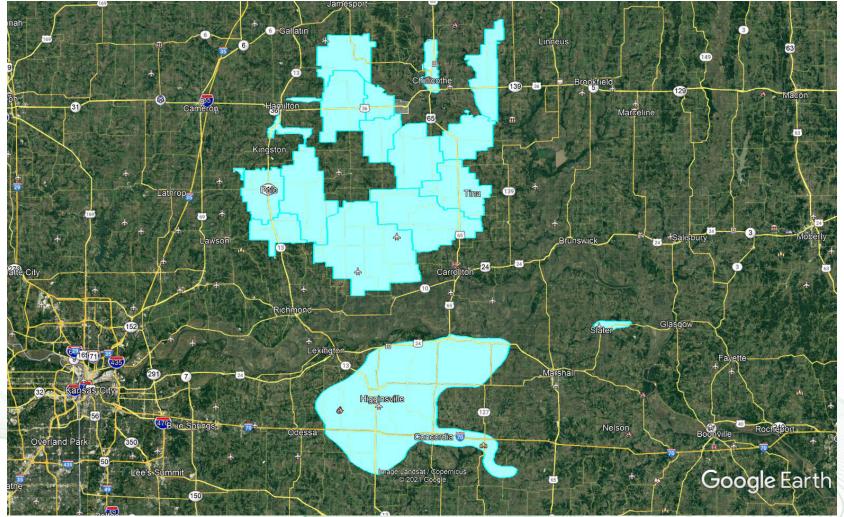


- Green Hills Telephone Corporation (GHTC) is a member-owned telecommunications cooperative based in Breckenridge, Missouri.
- Founded in 1952, Green Hills provides voice and broadband services via its two Incumbent Local Exchange Carrier companies: Green Hills Telephone Corporation and Citizens Telephone Company, based in Higginsville, Missouri.
- GHTC provides competitive voice and broadband services under its Green Hills Communications Inc. in areas outside its traditional telephone company service areas.
- Green Hills also provides Cable TV and broadband services in its Citizens Cablevision Division.



- Green Hills provides services to:
 - 16 ILEC Communities;
 - 13 CLEC Communities;
 - And 9 Counties (Daviess, Caldwell, Carroll, Linn, Livingston, Ray, Lafayette, Pettis, and Saline).
- Green Hills serves 7,725 customers, of which 6,233 are broadband customers.
- Green Hills provides services to 160 anchor institutions.
- Green Hills' service territory spans over 1,100 square miles and includes over 1,200 miles of fiber.







- Green Hills has a unique understanding of the challenges of providing rural broadband.
 - Buried construction in the Green Hills footprint averages \$35K per mile.
 - In most of Green Hills rural footprint, it averages only 5 customers per mile.
 - Only two communities (Chillicothe and Higginsville) have populations greater than 2,000 people.
 - Materials for broadband construction are becoming scarce. It takes significant planning in advance to ensure the supply chain is uninterrupted and construction schedules are not delayed. Green Hills purchases much of its fiber needs a year in advance to help alleviate spikes in demand.



Network Investments

- To date: since 2006, invested over\$15M in its fiber-based networks.
- Green Hills expects to spend over \$20M in capital expenditures over the next five years as part of its fiber network upgrades and expansion.
- GHTC received a \$3.4M USDA ReConnect grant to deploy fiber to rural portions of Caldwell and Livingston counties. The project will build 67 miles of fiber and serve 418 residential, business, farming and critical community facilities.
- Green Hills also received an Emergency State Broadband Grant to serve rural locations in Daviess County in 2020.



Network Capabilities

- Green Hills' fiber network consists of both Gigabit Passive Optical Network (GPON) and Active Ethernet technologies. Both technologies enable Green Hills' customers to receive Gigabit (or greater) connectivity at each location.
- In March of this year, Green Hills announced it has deployed a 10-Gigabit network in Chillicothe, Missouri. Businesses in this community can receive up to 10 Gbps connections. It is one of the few rural communities in the state with such network capabilities.
- Green Hills has diverse, redundant connections to major internet POPs (Points of Presence) in St. Louis and Kansas City, ensuring its customers stay connected when they need it most.



- Make It Fast.
- Investing in <u>fiber-based</u> networks is the best use of state funds for broadband expansion.
- Fiber provides the "future proof" technology needed for consumers, businesses, municipalities, healthcare providers, and any other entity with robust connectivity needs.
- Avoid utilizing state-funded initiatives to build fiber where fiber is already available. Create a fair challenge process to ensure funds only go to areas without coverage today.



- Make It Affordable.
- Consider making changes to the Missouri Universal Service Lifeline and Disabled programs. Under this program, consumers meeting certain eligibility criteria are able to receive monthly discounts for telecommunications service through the Lifeline Program or the Disabled Program.



- Lifeline (low income) and Disabled Service programs offer a monthly discount up to \$24.00 per month. The discounts are available based on the following:
 - \$24.00 for a Disabled Program voice subscriber
 - \$18.75 state discount and a \$5.25 federal discount for a Lifeline program subscriber with voice-only service.
 - \$14.75 state discount and a \$9.25 federal discount for a Lifeline program subscriber with voice service bundled with a qualifying broadband service of 25 Mbps (down)/3 Mbps (up) or higher.
 - \$9.25 federal discount for a qualifying broadband only line which is a broadband speed of 25 Mbps (down)/3 Mbps (up) or higher.



- Presently, the discounts in the first three bullets require a consumer to subscribe to a landline at home.
- As you know, many consumers have been dropping their landline service, especially in areas where cellular coverage is sufficient.
- However, customers can only take advantage of these discounts if a landline is purchased.
- The fourth bullet includes a federal discount for broadband-only service of \$9.25 per month.
- There is no state discount for broadband only service and we urge the legislature to consider providing a state-funded broadband only discount for low income and disabled consumers.



- Make It Local.
- Limit broadband funds to local companies with an established history of serving rural Missouri. Companies new to the state or companies without a proven track record of broadband deployment should be carefully vetted.
- Local companies understand where the gaps are in broadband infrastructure. They hear from consumers and businesses just beyond their borders all of the time. They have the networks available to easily extend services into these unserved or underserved areas.
- Local companies are heavily invested in the rural communities they serve, with employees serving in Rotary clubs, Chambers of Commerce, and school boards. As an example, over the last three years Green Hills has contributed over \$100K in local community support with school supply donations, donations to local charities, and scholarships for local students.



Thank You!

• We greatly appreciate the members of the House Interim Committee on Broadband Deployment for taking the time to ensure all Missourians have adequate access to broadband.



TESTIMONY OF RENÉE REETER

To the Missouri House Special Interim Committee on Broadband Development

September 16, 2021

Good afternoon Representative Riggs and members of the Special Interim Committee on Broadband Development. My name is Renée Reeter and I am General Manager of Kingdom Telephone Company, headquartered in Auxvasse, Missouri. In 1955, Kingdom was formed as a telephone cooperative, meaning its customers are its owners. Our employees live and work in the communities they serve and are actively involved in various civic organizations.

Kingdom provides voice and data services to approximately 3,000 customers in an approximate 560 square mile area in Callaway and Montgomery Counties. It also provides these services to anchor institutions such as libraries, schools and healthcare facilities. All of Kingdom's broadband speeds are symmetrical, meaning that customers receive the same upload and download speeds. Kingdom's broadband offerings range from 100 Megabits per second (Mbps) download/upload to 1 Gigabit per second (Gbps) download/upload. Prices range from \$55 to \$95 per month, including all wi-fi premise equipment. Kingdom currently participates in the federal and state low income (Lifeline) and disabled programs, offering monthly discounts of up to \$24 to qualifying customers.

To date, Kingdom has invested over \$47 million in its plant, \$21 million of which was invested in just the last three years. Kingdom's network is 99.5% fiber-to-the-premise (FTTP) and the remaining .5% is fiber-to-the-node (FTTN). Kingdom's fiber network is buried which protects it from outages and interruptions due to weather events.

Kingdom was recently awarded a \$4.2 million grant to build gigabit, fiber-to-the-premise service in an approximate 81 square mile area around Mexico, Missouri which will be branded under Kingdom's

subsidiary company Phynx Fiber. In addition, Kingdom is engineering an area of approximately 516 square miles at an estimated cost of \$37 million. Kingdom will be able to offer speeds up to 1 Gigabit per second, but will have the ability to offer even higher speeds.

Kingdom's wholly owned affiliate, Phynx Fiber, is a competitive local internet service provider (ISP) serving areas outside Kingdom's traditional telephone company service areas. Phynx currently provides service in Audrain, Randolph, Boone and Montgomery Counties. Phynx provides voice over internet protocol (VOIP) and fiber-to-the-premise broadband services in Mexico, Centralia and Moberly, Missouri. Phynx is currently building in Montgomery City. Phynx offers broadband speeds that range from 200 Mbps/200 Mbps to 1 Gbps/1 Gbps at prices ranging from \$55-\$85 per month. Phynx has invested approximately \$7.5 million in its all-fiber network to date, and hopes to invest another \$7 million over the next 5 years.

One of the main factors impacting access to broadband in rural Missouri is the cost to place fiber. Kingdom estimates that it costs \$25,000-\$35,000 per mile to install fiber, depending on terrain. Kingdom, like many rural companies, lacks customer density. Kingdom averages just under 6 members/subscribers per mile. Kingdom has experienced delays and excessive fees to access public right-of-way and at least one municipality assesses a tax on broadband service if it is bundled with a voice service. Kingdom has experienced a delay in acquiring equipment and contracting with construction companies as a result of the recent, increased demand for fiber service.

Kingdom supports the Missouri Broadband Providers' recommendation that the Missouri legislature support and/or expand state government funding such as the Missouri State Broadband Fund and the Missouri Universal Service Fund. In particular, this Committee should consider legislation that would expand the Missouri Universal Service Fund low income and disabled support to cover broadband-only service. In addition, the legislature should consider prohibiting or limiting a local

taxing authority's ability to tax broadband service and/or charge fees for access to the public right-ofway.

Finally, Kingdom suggests that the legislature be smart with limited government funds, first focusing on providing broadband to unserved and underserved areas. The state currently has a Broadband Grant Program challenge process which works well to identify areas that are not truly unserved and underserved. To the extent the state seeks to award additional grant monies for deployment of broadband facilities, Kingdom recommends that it use a similar challenge process as exists with the State Broadband Grant Fund, in order to make sure state funds are spent prudently. Kingdom also recommends that the legislature consider expanding the State Broadband Office staff. This staff should be directed to hold grant/fund recipients accountable, both in their up-front application process as well as after the fact during the construction process.

Thank you for the opportunity to present this testimony to the Special Interim Committee on Broadband Development. I regret not being able to participate in person; however, if you have any questions or would like more information regarding Kingdom you may contact me directly at:

Renée Reeter
General Manager
Kingdom Telephone Company
211 South Main
Auxvasse, MO 65231
573-386-2241
rreeter@kingdomtelco.com



The Honorable Louis Riggs, Chairman House Special Interim Committee on Broadband Development 201 West Capitol Avenue Room 111 Jefferson City, MO 65101

Dear Chairman Riggs,

Thank you for allowing me the opportunity to testify before your committee on behalf of MCTA – The Internet and Television Association of Missouri (MCTA), on Thursday September 16. It was a pleasure to speak before your committee and share some of what our association members are doing to bridge the digital divide. During the hearing, there were questions asked that I did not immediately have information to answer. Those questions are addressed in the following sections.

Representative Davidson raised the question if symmetrical speeds are necessary.

In most cases they are not necessary. This issue has been addressed within the Information Technology and Innovation Foundation *Broadband Myth*¹ Series of papers addressing common issues and misconceptions. According to the publication, a household of four people would use 18 Mbps downstream traffic and 7.8 Mbps upstream traffic when two people are on video calls, one is watching a movie on *Netflix* in high definition, one is playing games on *Xbox*, and a *Nest* Camera is doing continuous streaming.

Normally, when discussing symmetrical speeds, fiber optic or upgraded cable and fiber hybrid systems are being referenced. Requiring symmetrical speeds to qualify for broadband grant funding would effectively prohibit providers of DSL service and fixed wireless service from qualifying as providers. This requirement would also increase the cost of all projects thereby reducing the total number of fundable projects. The priority is a policy decision for legislators, but our view is that symmetrical speeds are not necessary.

 $^{^1\} https://itif.org/publications/2021/05/12/broadband-myth-series-do-we-need-symmetrical-upload-and-download-speeds$

Representative Smith requested an explanation of the difference between fiber and coaxial cable (coax).

First, the method of delivery is different. Fiber uses glass strands to transmit light signals; whereas coax uses a copper strand with several layers of insulation to transmit electric signals. A network constructed entirely of coax is extremely limited in its speed capabilities, especially compared to a holistic fiber network.

While many of our member companies are beginning to construct more wholly fiber networks, traditionally our members have utilized a hybrid fiber coax (HFC) network to provide services. These networks utilize fiber to send a signal out to a certain point where the signal is then transitioned to a coaxial cable to come into a customer's home. This hybrid network provides reliable gigabit speeds and are scalable to higher speeds. The benefit of a hybrid fiber coax system is that it has typically been cheaper to build, this is important because as the state begins to consider whether or not they want to prioritize fiber construction, the price tag could go up, resulting in few homes connected.

Representative Mosley posed the question asking if speed is lost with cable versus fiber.

While it is generally true that fiber has the capability to deliver higher speeds than cable, for residential users, speed loss is commonly caused by network congestion: internal (within the home) or external (outside of the home). Internal network congestion can occur regardless of using cable or fiber and are often mitigated by reducing the number of devices on a home network, purchasing a higher performance wireless router, or purchasing a higher network download speed, if available. External congestion, which occurs outside of the home, normally occurs during peak hours, when many users are connected to the internet in an area.

Representative Davidson stated that fiber is limitless, and asked if coaxial cable is similarly limitless.

Fiber optic networks are limited by the equipment that sends and receives the signal through the fiber optic cables. Although costly, these can be easily upgraded.

Generally speaking, a hybrid coaxial fiber network is currently capable of providing reliable 1 Gbps service to a home. Similar to fiber, this speed is limited by equipment inside the network and by equipment inside the home. However, the network is scalable and capable of handling much faster speeds than are currently available.

In current field tests, the 10G standard is expected to be enabled and will begin rolling out over the next few years. Not to be confused with 5G (5th Generation) commonly used in the wireless industry, the 10G standard (10 Gigabit download speeds) is a measure of speed and is the cable industry's vision for the future. Through this network technology, homes will have the capacity to have more than 50 devices connected to the internet simultaneously².

² https://mediacomcable.com/10gsmarthome/

The Chairman asked what mapping is needed.

Clear data and accurate mapping are key components in closing the digital divide. Form 477 data that is currently collected is limited to location information at the census block level. Our association and member companies are supportive of changes to this mapping system and are eager for the new maps based on service shapefiles that have been collected from providers. These shapefiles should provide a much clearer picture of the service levels available across the county and will better inform our funding distribution at the federal, state and local levels.

It should also be pointed out that in addition to the shapefiles that have already been collected, the FCC has been working on their Broadband Mapping Initiative pilot program³, which could further improve the mapping capabilities across the country. The broadband mapping fabric plan would provide individual serviceable structures which shape files could be overlaid. While the state could pursue its own mapping system, given the activity at the federal level as well as the measures built into the state broadband grant program to allow for construction projects in "served" census blocks, we believe resources would be better spent funding construction through the grant program in order to get service to more Missourians.

The Chairman also asked if companies are experiencing any construction delays due to labor or supply chain shortages.

While it is also a struggle to ensure your workforce is meeting the current needs of our member companies, MCTA is not currently aware of any member companies experiencing significant construction delays due to shortages in labor or because of shortages in supply chains.

As we discussed, our project delays are due to "make ready" work. These delays are often caused by negotiations about whether a pole requires replacement. Resolution of this issue is perhaps the most significant thing the legislature could do to reduce project delays and a fund established by the state to reimburse attachers for the cost of pole replacement would be a major accelerant in making broadband more available.

Sincerely,

Andy Blunt, Executive Director MCTA – The Internet and Television Association

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https://www.ustelecom.org/wp-content/uploads/2019/11/USTelecom-BMI-Pilot-Results.pdf 217 E. Capitol Avenue, PO Box 1895, Jefferson City, MO 65102 573-415-8234

Missouri Broadband Providers

PRESENTATION TO THE MISSOURI HOUSE INTERIM COMMITTEE ON BROADBAND DEVELOPMENT

SEPTEMBER 16, 2021

W.R. (Trip) England, III Brydon, Swearengen & England P.C. 312 E. Capitol Ave., Jefferson City, MO 65101 573-635-7166

Member Companies

- •34 Community based Incumbent Local Exchange Telephone Companies (ILECS) and their affiliated companies serving rural Missouri (Appendix A).
- Cooperatively owned, family owned or commercially owned.
- •Pioneers in providing telephone and broadband internet access services to over 130,000 rural Missouri customers.
- Carrier of Last Resort (COLR) obligation.

MBP Networks

- •Invested more than \$200 million in their networks over last 3 years.
- •Planning to invest over \$270 million in those networks over next 5 years.
- •State of the art broadband networks providing fiber to the home (FTTH) or fiber to the node (FTTN) technology.
- •Also providing Broadband service to schools, libraries & other community anchor institutions.
- •Primarily "Buried" plant avoids damage & interruption of service due to windstorms, ice storms, lightning strikes, high voltage power line contacts & other aerial or atmospheric outage conditions.

Factors Impacting Access to Broadband

- •High cost primarily driven by lack of customer density & geographic (e.g. rock) conditions.
- •Future reduction in or loss of Federal High Cost (Universal Service) support.
- Construction & equipment delays.
- Access to public and private right-of-way (ROW).
- Local taxing authorities.
- Affordability.
- Digital Literacy.

Steps to Address Access to and Affordability of Broadband

- •Increased state support
 - MO Broadband Grant Program (§620.2450 620.2458 RSMo)
 - MO USF support for low income (Lifeline) & disabled customers (§392.248 RSMo)
- •Limit/restrict local taxing authorities' ability to tax broadband service or charge unreasonably high fees for access to public ROW.
- •Support/Subsidize broadband services to community anchor institutions such as schools, libraries, health care clinics, etc.

Be Smart with Limited Government Funds

- •Focus on unserved & underserved areas.
- •State Broadband Grant Program has appropriate challenge process to avoid unnecessary duplication of facilities.
- •Hold Grant Fund participants accountable up-front and after-the-fact.
- •Expand State Broadband office staff.

Appendix A - Missouri Broadband Providers

Alma Communications Company d/b/a Alma Telephone Company

BPS Telephone Company

Chariton Valley Telephone Corp.

Choctaw Telephone Co.

Citizens Telephone Company of Higginsville, Missouri

Consolidated Communications of Missouri Company

Craw-Kan Telephone Cooperative, Inc.

Ellington Telephone Company

Farber Telephone Company

Goodman Telephone Company

Granby Telephone Company

Grand River Mutual Telephone Corp.

Green Hills Telephone Corporation

Holway Telephone Company

IAMO Telephone Cooperative

KLM Telephone Company

Kingdom Telephone Company

Lathrop Telephone Company

Mark Twain Rural Telephone Company

McDonald County Telephone Company

Miller Telephone Company

MoKan Dial Inc.

Northeast Missouri Rural Telephone Company

New Florence Telephone Company

New London Telephone Company

Orchard Farm Telephone Company

Oregon Farmers Mutual Telephone Company

Otelco Mid-Missouri, LLC

Ozark Telephone Company

Peace Valley Telephone Co., Inc.

Rock Port Telephone Company

Seneca Telephone Company

Steelville Telephone Exchange, Inc.

Stoutland Telephone Company



MISSOURI 911 SERVICE BOARD

THE IMPORTANCE OF BROADBAND TO 911 EMERGENCY COMMUNICATION INFRASTRUCTURE & SERVICES

Introduction

Brian Maydwell, Executive Director of the Missouri 911 Service Board

The Missouri 911 Service Board represents all Missouri 911 entities and jurisdictions, and strives toward the immediate access to emergency services for all citizens in the state of Missouri.

Overview

- Potential for Missouri's 911 System NG911 & Broadband Intersection
- Geographic Information System & Broadband Intersection
- Background on the Challenges for Missouri's Current 911 System
- Missouri's Public Safety Answering Points Unserved & Underserved

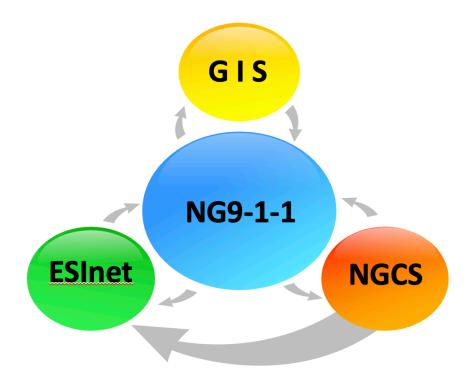
Potential for Missouri's 911 System – NG911

Next Generation 911 (NG911) - NG911 is a cloud-based digital or Internet Protocol (IP)-based 911 system comprised of ESInet(s) that allows for the seamless transition of 911 calls and information sharing among existing 911 systems and public safety answering points (PSAPs)

Potential for Missouri's 911 System – NG911

Emergency Services IP Network (ESInet

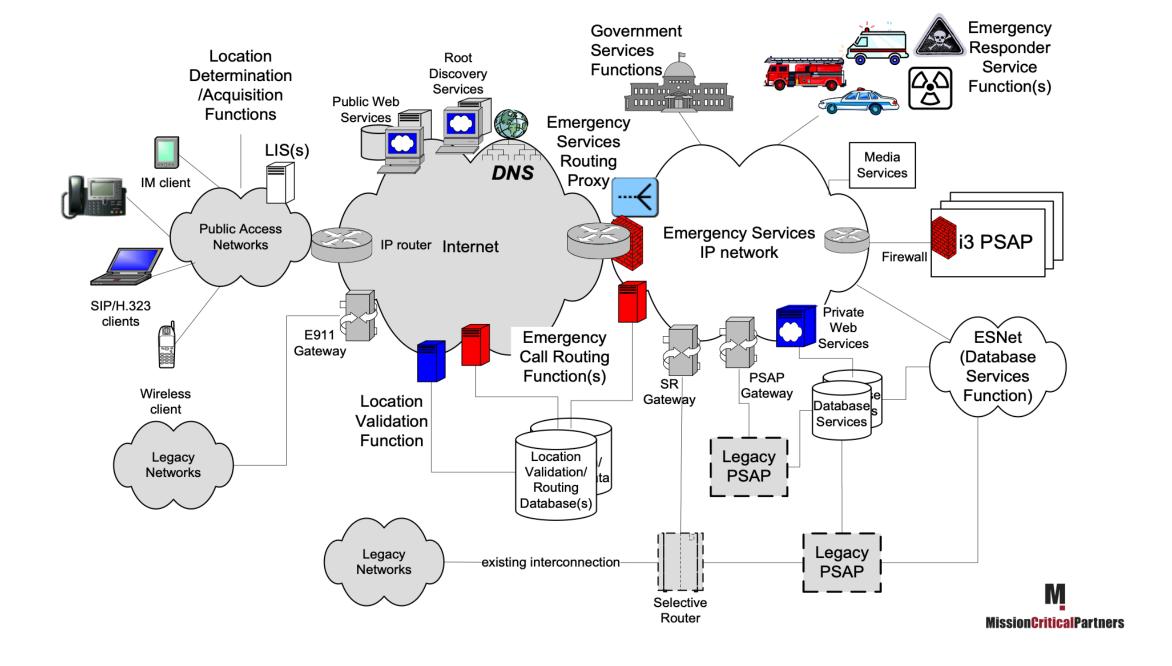
- A managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core services can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services.

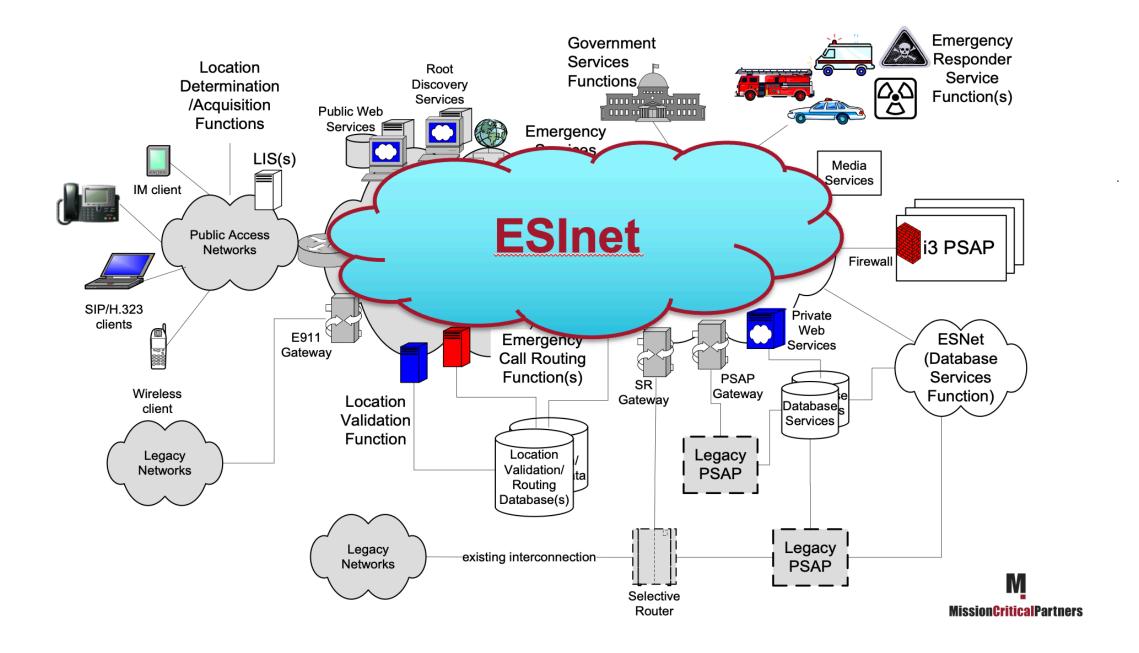


Potential for Missouri's 911 System – NG911

Benefits of an IP-enabled emergency communications network that supports 911:

- Facilitates interoperability and improve connections between 911 call centers
- Provides an automatic backup if one PSAP goes offline and by allowing calls to be routed to another PSAP for call taking and processing.
- Improves connections between 911 call centers
- Provides more robust capacity
- Offers flexibility in receiving and managing calls
- Allows for seamless transitioning of information between 911 call centers
- Allows call-takers to receive texts, videos, pictures, and other multimedia communication
- The same network can also serve wireless broadband communications for public safety and other emergency personnel, as well as other purposes.





NG911 & Broadband Intersection

- IP-enabled networks for emergency communications require broadband infrastructure to operate effectively
- Funding to build broadband and IP-enabled networks will help to expand the potential reach of NG911
- A recent proposal in Congress, if successful, would result in \$10 billion in funding for NG911 funding nationwide – including an estimated \$150 million in Missouri. It is critical that the broadband infrastructure is in place to allow Missouri to implement NG911 services

Geographic Information System (GIS) & Broadband Intersection

Current and highly accurate GIS can assist in Broadband deployment by determining the exact locations of need in a given area and lead to more refined and specific planning for deployment.

 A good example is a recent comparison of Missouri PSAP locations and using the Broadband census tract data showing what levels of Broadband are available statewide that discovered that 6 PSAPs are unserved by appropriate Broadband, and 14 PSAPs in Missouri are underserved for Broadband

Background on the Challenges for Missouri's Current 911 System

Lack of Statewide Interoperability: Missouri's current 911 system operates on a county-by-county level through 185 public safety answering points (PSAPs). Each county system is different. Each county funding mechanism is different. The fragmented system results in limited interconnections between PSAPs around the state.

Background on the Challenges for Missouri's Current 911 System

Antiquated and Incompatible 911 Infrastructure: While many states are looking toward NG911-equipped IP Networks, many Missouri PSAPs rely on antiquated technology that is rapidly becoming unsustainable. A great variance in equipment and technology among Missouri PSAPs impedes the interoperability necessary to transfer 911 calls to another PSAP.

Background on the Challenges for Missouri's Current 911 System

Inability to Locate 911 Callers: 99.2 percent of the nationwide population benefit from at least Phase II level service marked by the ability to locate a caller calling from a cell phone, while 18 Missouri counties currently contribute to the remaining portion of the population who do not.

Missouri Public Safety Answering Points - Unserved

Benton County Central 9-1-1

Independence Police Department

Ozark County Sheriff's Department

Pike County Sheriff's Department

Reynolds County Sheriff's Department

Shannon County Sheriff's Office

Missouri Public Safety Answering Points – Underserved

Bollinger County Sheriff's Office

Carter County Sheriff's Office

Cass County Sheriff Department

Chariton County 9-1-1

Gasconade County E 9-1-1 Central

Communications

Trenton Police Department

Hickory County Sheriff's Department

Lafayette County Sheriff's Office

Lewis County 9-1-1

Madison County 9-1-1

Maries County Sheriff's Department

Miller County Sheriff's Department

New Madrid County 9-1-1

Oregon County Sheriff's Office

Questions?



For questions contact Brian.Maydwell@missouri911.org

The Importance of Broadband to 911 Emergency Communication Infrastructure & Services

Brian Maydwell, Executive Director, Missouri 911 Service Board (Brian.Maydwell@missouri911.org)

Potential for Missouri's 911 System – NG911

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NG911 & Broadband

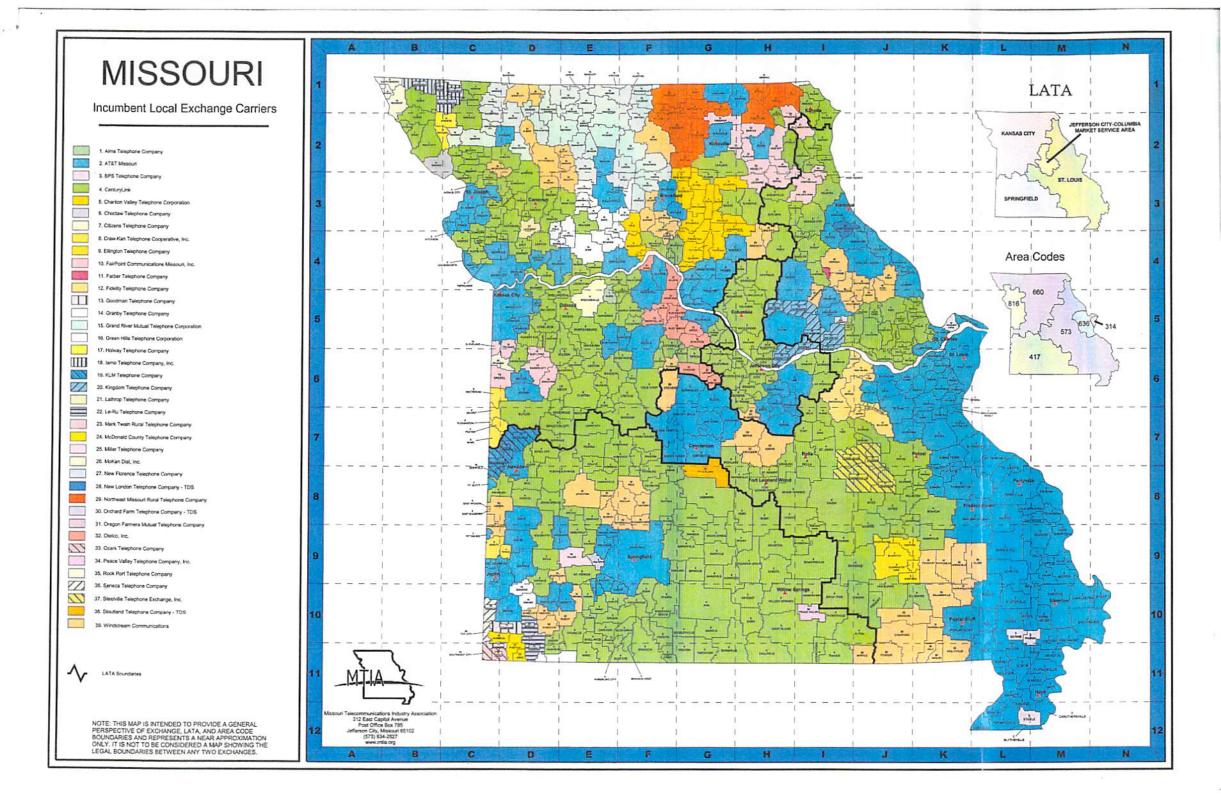
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New Florence Telephone Company d/ b/a Missouricom

- New Florence
- New London
- Orchard Farm
- Stoutland

- Farber
- Seneca
- Goodman
- Ozark

Sam Farr: VP Operations



About Us

- Family owned business operating in **Missouri**, Oklahoma, Arkansas, Oregon, and Washington
- Been in the communications industry since the 1950's and operating in Missouri since
 2008
- We service 710 Sq. Miles in 8 counties Montgomery, St. Charles, Ralls, Audrain, Camden, Laclede, Newton, and McDonald
- Employees live and work in the communities we serve



Network

- Aggressively expanding our fiber footprint to replace copper twisted pair voice and data services. Invested roughly \$5M in the last 3 years
- 2019 Successful fiber build in **High Hill, MO** state grant program
- 2020 \$6M ReConnect grant award in Laclede and Camden Counties
- 2021 Awarded nearly \$4M in state grant funds for fiber construction to 1,150 locations in 2 rural communities in Arkansas
- Designing new network builds to be capable of gig+ services to the premise



Services

- NFTC Provides voice and data services to approximately 4,500 customers
- Our offerings range from 10Mbps to 1Gbps symmetrical up/down on fiber
- Prices range from \$59 to \$150/month (including all Wi-Fi premise equipment and managed services)
- Participate in Federal and State Low Income (Lifeline) and Disabled Programs offering monthly discounts to qualified customers



Access and Affordability of Broadband

- Material and contractor availability
- Cost to place fiber in the rural market and maintain industry standard electronics
 - One node servicing 24 customers \$30-\$50k
 - Fiber construction \$40-\$60k/mile
- Environmental and archaeological challenges
 - Cost and availability of qualified archaeologists
 - Rigorous survey requirements
- Skilled workforce
 - Hiring engineers, fiber technicians, regulatory accountants, and project managers



Steps to Address Challenges

- Support/expand state government funding (state broadband fund, state USF, low interest loans to qualified providers, etc.)
- Modernize MoUSF low income and disabled support to cover Broadband-only service
- Prohibit/limit local taxing authorities' ability to tax Broadband and charge fees for access to public ROW
- Support/subsidize service to community anchor institutions (e.g., schools, libraries, health facilities, etc.)



Be "Smart" with Scarce State Funds

- Focus on unserved and underserved areas
- Ensure state broadband grant program has appropriate challenge process to determine truly un- or under-served areas
- Hold grant/fund recipients accountable, both "up-front" and "after the fact"
- Expand state broadband office staff



Thank you!







Mr. Chairman and members of the Special Interim Committee on Broadband Development:

My name is Day Veerlapati and I am Founder, President and CEO of S2Tech, which provides specialized Information Technology and Business services to both government and private clients. We are headquartered in Chesterfield, Missouri and have a regional development center in Jefferson City. First, I want to thank you for permitting me to testify today about a passion of mine, namely, Internet accessibility for schools and students, especially those in unserved or underserved rural areas in the state. I want to make it clear from the start that my testimony is not connected in any way to S2Tech. I am here as a Missouri citizen and as the Founder of Fortune Fund which I will touch upon later.

I came to St Louis 34 years ago from India. I worked in various companies before I started my business in 1997. I am married and have two daughters. Both daughters are married and settled well in their lives. State of Missouri has helped me a lot in raising my family, and in giving me the first business opportunity to remedy Year2000 problem as part of Anderson Consulting team. After Y2K, I have moved to support Medicaid related IT systems in Missouri and 33 other states in the United States. I'm over 60 years now, my daughters are well settled, my business is doing well and it is time for me and my wife Shanta to give back to the state and the country.

I have established a non-profit organization called Fortune Fund to help academically bright and under privileged children from rural areas get college education. My employees donate money to this fund and I match employees' donations dollar for dollar. This fund made a significant difference in the lives of several rural children in India by helping them become engineers, pharmacists, nurses, and accountants. We were able to eliminate generational poverty among



these children's families. In the year 2020, Fortune Fund adopted Bevier High School in Macon County, Missouri to increase the college going percentage of high school graduates from low 20% to over 50% in the next five years. I and my family made a visit to Bevier High School last year and met students and staff in an assembly. I encouraged students to dream big and said that whole Cosmos including all planets in our solar system are open for exploration. Just like Columbus landed in the United States in 1492, Elon Musk to going to get us landed on planet Mars very soon. We would make planet Mars as great as the United States. We would have summer homes on Moon, and Mars. We would ride into space to see our beautiful planet earth. I also said that our Fortune Fund would help Bevier High School graduates with scholarships to pursue their college education. After my visit, Fortune Fund received three applications and we awarded scholarship to two students, one student pursuing 2-years community college and another student pursuing four years college. We have several ideas to make students in Bevier get excited about higher education. We are meeting Bevier High School leadership team to setup a college prep club to help Bevier children prepare for college.

STARLINK

I want to bring to your attention an alternative method of providing high-speed internet connectivity services to students in Missouri's rural and underserved areas. I have invested time and energy in studying Starlink, which has been developed by SpaceX (an Elon Musk company) and is an interconnected Internet network with thousands of low earth orbit satellites designed to deliver high speed Internet service to unserved or underserved areas. Today, this new technology serves 100,000+ users with new users being added every day. I have personally installed Starlink in my home in Chesterfield and in my office in Jefferson City and have found it to be an efficient and affordable alternative solution to traditional broadband companies. Starlink is offering a beta Internet service called "Better than Nothing" all across Missouri state. The Starlink system comes with a satellite dish,



and a router. We just need to install satellite dish where there is open sky and then plug the system to the power. Within a few minutes, satellite dish finds the satellite in the sky and we get very high-speed internet. My Starlink Internet download speeds ranged from 70 to 188 megabits per second and upload speeds ranged from 10 to 31 megabits per second. I found that Starlink worked well even during a snow storm or in cloudy weather, somewhat at lower speeds. It appears at the present time, anyone in the state of Missouri can order Starlink service on their website and they can expect the delivery of Starlink system before Dec 31st 2021. The price for the system is \$499 for hardware and \$99 per month for unlimited internet service. What I found with this service is that I don't need any last mile connectivity or wait for someone to lay fiber or a wire in the ground to connect me to Internet. As long as I have open sky and electricity available, I can get unlimited high-speed internet service using a satellite dish! At this time, Starlink works in a fixed location. However, there are plans to provide this service on a mobile platform such as a combine, or a truck or a tractor. When such a service is available, precise application of seeds, fertilizer, and pesticides can be done using satellite maps, and Starlink Internet service.

Mr. Chairman, I am not suggesting that Starlink is the end-all of providing Internet service to our unserved or underserved rural areas in Missouri, but I do think it is a piece of the puzzle worthy of consideration. I have no financial interest or stake in the SpaceX company, but I wanted to bring this to the committee's attention for the consideration in supporting the unserved or underserved rural areas of Missouri. I stand ready to try to answer any questions. Thank you again for the privilege of providing testimony.











Springfield Public/ Private Fiber Expansion

September 2021 Update

Social Media Reaction



Springfield Web Devs.

Heard ya'll like them gigabits. City Utilities of Springfield is bringing the heat and running over a thousand of miles of fiber across SGF. THIS. IS. AMAZING. **#GoogleFiberWho**



Paul E.

This is fantastic! Kudos to CU for their vision.



Brett M.

This is a game changer not only for businesses in SGF but for the general population as well. Kudos to @cityutilities for stepping up and making this happen!



Erika B.

This is great! Thanks for putting our community first. So helpful to those in low-income families.

Why and What

Why: Expanding the SpringNet fiber network improves quality of life while enhancing quality of place in Springfield, Missouri.

What: Facilitate highspeed (Gigabit) broadband internet access to communication, vital services, education and entertainment.

Quality of Life

- Job Creation (innovation/work from home)
- Health Care/Telemedicine
- Education
- Senior Citizens and People with Disabilities
- Home Entertainment and Connectivity

Quality of Place

- Economic Growth & Quality Jobs
- E-Government & Civic Participation
- Public Safety
- Libraries





Project Inception Timeline

February 2016	Internal discussions began on expansion options	
2017	Market Research completed	
2017/2018	SpringNet Strategic Business Plan	
November 2018	Tenant Search began	
January 2019	Design and Engineering began	
August 2019	Dark Fiber Lease Agreement signed/Press Release	















Project Overview

- ~1,000-mile expansion of SpringNet's existing fiber network
- ~31 route miles of backbone fiber between 7 huts
- ~115,000 demand points
- ~\$140M project budget
- Estimated project completion in 2022
- Non-exclusive 15-year lease agreement with Lumen (First Tenant)
- Fiber capacity available for additional tenants









Project Scope

2019-2022

Legend

Fiber Hut

Expansion Boundaries

Name

Norton

Nichols

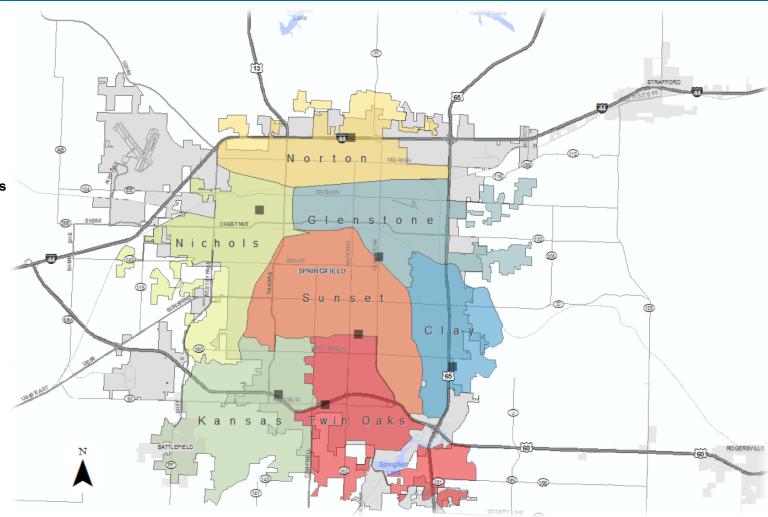
Glenstone

Kansas

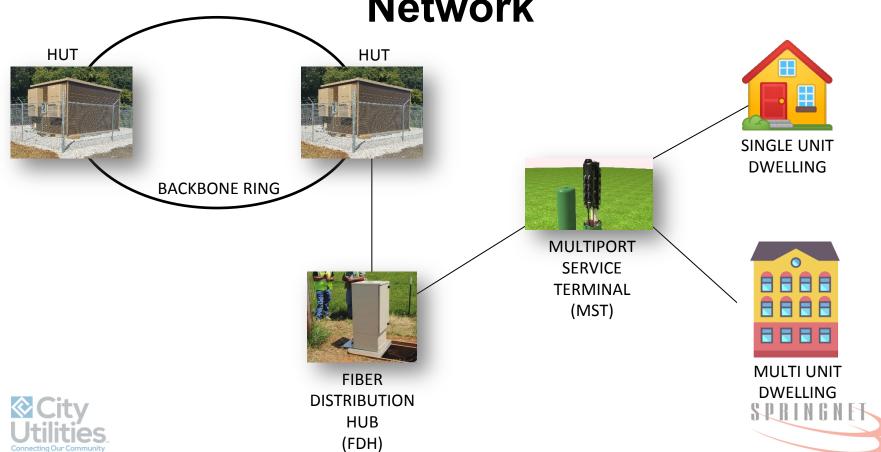
Twin Oaks

Clay

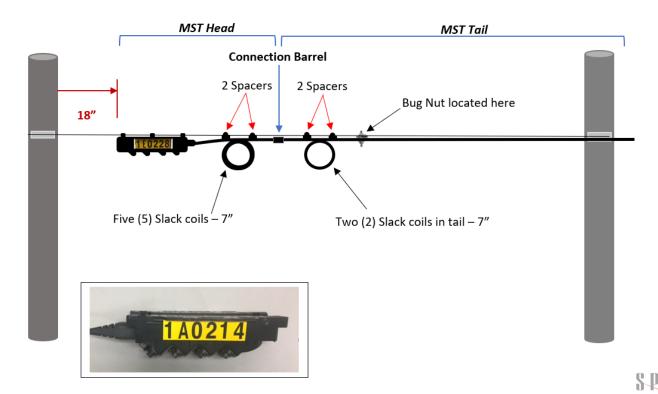
Sunset



Network



Aerial Network Presentation





Fiber Construction - Vault Installation





Economic Highlights

- Springfield and the surrounding area has seen record Economic numbers since 2019
- Residential permits are up over 28%

Year	Announced Projects	New Jobs	New Payroll	New Capital Investment
2019	6	321	\$ 14,300,000.00	\$ 88,800,000.00
2020	9	1014	\$ 25,000,000.00	\$ 288,900,000.00
2021 (YTD)	4	374	\$ 13,600,000.00	\$ 30,500,000.00
Totals	19	1709	\$ 52,900,000.00	\$ 408,200,000.00





Construction Milestones

August 2019	Construction Request for Proposal released
September 2019	Fiber backbone and hut construction began
February 2020	Fiber distribution construction began
Spring/Summer 2020	Fiber turnover to tenant began
Fall/Winter 2022	Estimated Project Completion







Connecting Communities



An Introduction to the Remote Universal Communication System (RUCS)





EXECUTIVE TEAM











Michelle Vondrasek CEO



Rick Mueller VP Solutions



Joe Horvatin VP Service Delivery



Rick Mueller VP MSP



Tom Vondrasek Controller



EXECUTIVE TEAM



Ret. Gen. David Grange Chairman



Andrew Heaton CEO



Dan Abitz Treasurer



James Gilbert
Chief Innovation Officer



Timothy M Stranahan COO

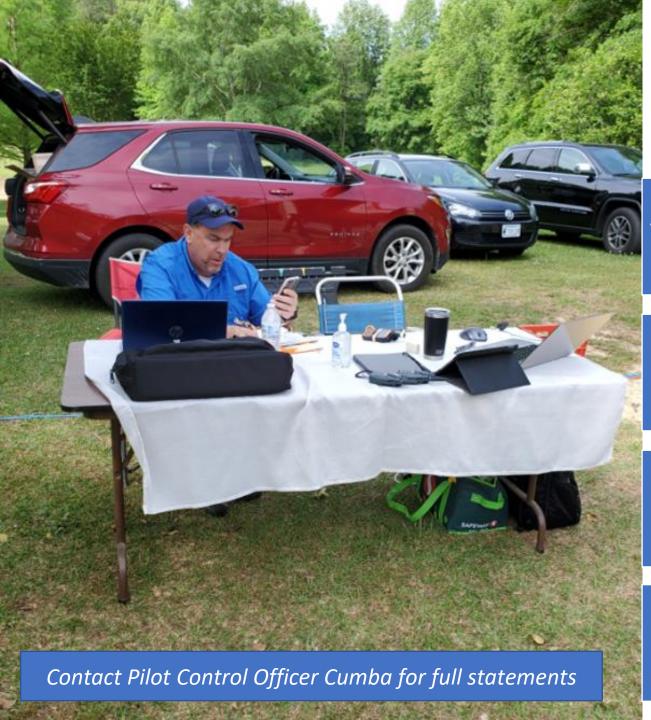
A device which provides access to communications in remote areas of the world

- Compatible with any Wi-Fi Device
- Easy to Use and sets up in under 10 minutes
- Man Portable (50 lbs.)
- Secure & Scalable with 250 simultaneous Wi-Fi connections per node
- Flexible Power Sourcing
- Communication over Internet using Fiber Data Feeds, Cellular systems, Wireless Broadband, and Satellite Services (Ku, KA, and L Bands with parabolic or flat panel self-acquiring antennas)









DoD Evaluators In Their Own Words

"Video and call was clear as a normal call."

"I hope this is available in El Salvador soon." (International Call)

"If there is a better technology available, I haven't seen it."

"The audio quality was outstanding, the level of photo resolution sent over RUCS was outstanding ..."

"Very straight forward...can be deployed rapidly by basically trained individuals."

"Excellent field test, exercised multiple capabilities, thanks for letting me experience the system."

"The quality of call was a 10."

"I'm not aware of anything like this available for students presently."

"I hope this is available to students across the US soon to help with remote learning."

improving internet access for remote learners requiring educational and professional services."

"I was called on What's App video at my work office in Santa Rosa de Lima, El Salvador."

"Facetimes communication from a remote, rural location to one several hundred miles away worked nearly flawlessly."

"It is clearly a solution for

Two Components: Base Unit & Distribution Module

No Digging No Trenching Easy Install/Easy Remove





Ralls County R-II School District

21622 Highway 19 Center, Missouri 63436-0230

Dr. Chris Neale & Amber Riley DESE

Re: Letter of Support for RUCS Deployment Funding

To Whom it may concern:

This letter is in support of the Remote Universal Communications System (RUCS) as a possible short term solution to address the broadband access to underserved communities in

I attended a demonstration of the system in Lewis County and saw firsthand the system's ability to extend coverage by sending a wifi signal for approximately one half mile. The capability to continue extension for miles is available and would make connectivity a reality for many of our students.

Security and safety are also paramount with the system as the signal would only be useful to log in school managed devices. This would prevent unauthorized use of our internet, while allowing students to complete school during closures, complete homework assignments, etc. in

I believe this could be a possible temporary solution until fiber installation in the county is completed in an estimated 2-4 years. Ralls County R-II would be pleased to serve as a test site for RUCS before it is considered for a larger scale project solution.

Superintenden



July 7, 2021

Re: Letter of Support for Remote Universal Communication System (RUCS)

To Whom It May Concern:

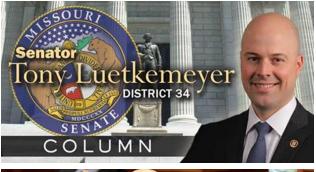
As State Senator of the 34th District, I represent Platte and Buchanan counties, and it is my pleasure to offer my complete support for the Remote Universal Communication System (RUCS) offered by Von Technologies. It is no secret that Missouri has an internet access problem that has given way to a "digital divide", and I see that divide in many of the communities I represent. Von Technologies is seeking to remedy this problem and deliver broadband internet connectivity to unserved and underserved areas through their unique cutting edge technology

We have to face the reality that the Internet is now a necessary utility. This reality was thrust to the forefront during the COVID-19 pandemic when we heavily relied on internet connection as a critical tool and medium - by schools to educate our nation's youth, by employers for their remote workers to maintain production, by health workers to communicate with their patients, and by all citizens to access information, entertainment, and remain in communication with loved ones. But that did not come as easy for some as it did others; most notably, those in rural areas who lack affordable and reliable access.

Over the past few months, I have become very familiar with Von Technologies and RUCS. Von Technologies travels throughout the state forming collaborations with school districts in an effort to close the digital divide in underserved and unserved areas. I applaud the work they have done so far and admire their dedication to bring affordable and reliable broadband internet access to every Missourian. It is truly remarkable what this system can achieve and the results it will produce if the state of Missouri takes advantage of their technology. In that regard, I reiterate my support for RUCS as a potential method to facilitate broadband internet development and expansion for the state of Missouri.









Missouri State Senator for the 34th Senatorial District, Tony Luetkemeyer "It is truly remarkable what this system can achieve and the results it will produce if the state of Missouri takes advantage of their technology."



Clark County R-1 Schools

427 W. Chestnut, Kahoka, Missouri 63445 (660) 727-2377 Fax (660) 727-2035

"Educating Today's Children For Tomorrow's World"

June 3, 202

As Superintendent for Clark County R-1 School District, I am acutely waver of the Issues facing our underserved and unserved students in rural communities. Our students do not have access to reliable high speed internet in several areas of our District and Thave aggressively sought technical solutions which help bridge the digital divide. Providing students with a "hot sport" connection is not a viable lon, term solution financially and in some parts of our county he signals furnellation or non-existen.

On June 2, 2021, John French, Supervistendent at Lewis County School District, hosted a demonstration of a revolutionary and one of a-kind technology called the Remote Universal Communication System (RUCS). In collaboration with Von Technologies, the Lewis County School District administration and the local internet provider, the system was installed to demonstrate ease of set up, strength of the connection and reach of the signal.

RUCS has been function tested and validated by an independent Department of Defense (DOD) liaison and currently running in North Carolina communities. The DOD evaluator has put on record none of the 300 Subject Matter Expert Evaluators on his team were aware of another similar technology to the RUCS as being available in the US marketplace.

On this basis, I am confident in saying the RUCS is a rapid deployable, affordable and scalable proven solution for Clark County's underserved/unserved students. I am not aware of any other like technology commercially available in the marketplace for educational institutions.

I have an immediate unfunded requirement for a technology which would allow access to the Internet for our underserved/unserved students. Providing affordable access to communications means opportunity for our students to maintain their studies. This is a fundamental obligation of education and will provide a benefit beyond measure.

Sincerely,

Athie Graff

An Equal Opportunity Employ



Lewis County C-1 Schools PO Box 366, Ewing, MO 63440 Phone: (573) 209-3217 Fax: (573) 209-3318

V.C

"Educate to Illuminate"

Dr. Chris Neale & Amber Riley

Re: Letter of Support for RUCS Deployment Funding

To Whom It May Concern:

This letter is being submitted as a show of support and interest in the Remote Universal Communication System (RUCS) as a possible deployment in Missouri to address broadband access to the under- and unserved areas in our state.

The COVID-19 pandemic made it painfully obvious that the lack of available broadband connection throughout he state is causing certain tids to be educationally behind their peers without this accessary resource. The lack of broadband availability in Missiouri can be directly compared to when electricity availability was needed throughout the state. Our kids cannot wait 5-10 years for an expansion plan to get fiber to our rural or even whan areas of the state.

Von Technologies conducted a site-visit at Lewis County C-1 School District and demonstrated their ability to take our school's fiber connection and extend the coverage by sending a WiFi signal for approximately a half a mile. The demonstration was not nearly as complicated or robust as the deployment they did in North Carolina; however, it did seem to work extremely well based on the limited demonstration at our site.

While this system is not a permanent or all-encompassing solution to the lack of broadband availability for the entire state, it could be a solution for addressing students' needs for broadband access. By extending the school's connection to our student homes, only their school managed devices would have access to our network. This would prevent numathorized use of our internet, while allowing our students to access the internet at home to continue school during closures, to complete homework, etc. in their own homes.

I believe this could be a possible avenue to address the concern over student learning loss during school closures, especially during a pandemic, but also to provide today's students with the necessary learning resources to be equally equipped to an avigate the future. We would be more than happy to serve as the test site to prove the RUCS system can work on a large scale basis in Missouri.

Sincerely

Shu M. hench

John French Superintender

Lewis County C-1 School District

John French, Superintendent—(573) 209-3217 Alan Koch, High School Principal—(573) 209-3215 Larry Post, Elementary Principal—(573) 209-3586 NEMO Superintendents meet to discuss broadband issues





NEMO Superintendents meet to discuss broadband issues



Clark County R-1 School District Superintendent, Dr. Ritchie Kracht "...the RUCS is a rapid deployable, affordable and scalable proven solution for Clark County's underserved/unserved students."



St. Joseph is a community of 75,000 people with a free/reduced lunch rate of 71%, that means we have a large population of impoverished citizens.

That means a large population of our citizens are worried about feeding their kids and paying rent and utility bills, leaving little room for internet, an item they deem a commodity.

With the direction education is taking, and the dependance on internet access in modern teaching methods, the internet has become a necessity for our students to succeed.

We need to find a way to extend service outside of the classroom for all of our students, regardless of economic standing.





DIRECTOR OF TECHNOLOGY AND DATA MANAGEMENT I TMC 3401 RENICK, ST. JOSEPH, MO 64507 JACOBKELLY@SJSD.K12.MO.US I 816.671.4390



St. Joseph School District Dir. of Technology, Jake Kelly ".....We need to find a way to extend service outside of the classroom for all of our students, regardless of economic standing".

Kinston, North Carolina (Lenoir County)

- ■Pilot Project: Provide Internet to Students Living in Jones Mobile Home Community
 - Leveraging Remote Universal
 Communication System (RUCS)
 - o Implemented May 6th and Still Operating
 - o 50% of homes had no Internet Previously
 - 20+ Students from Different Schools
 - o 27 Single Family Homes
 - o Leveraging the Local Middle School

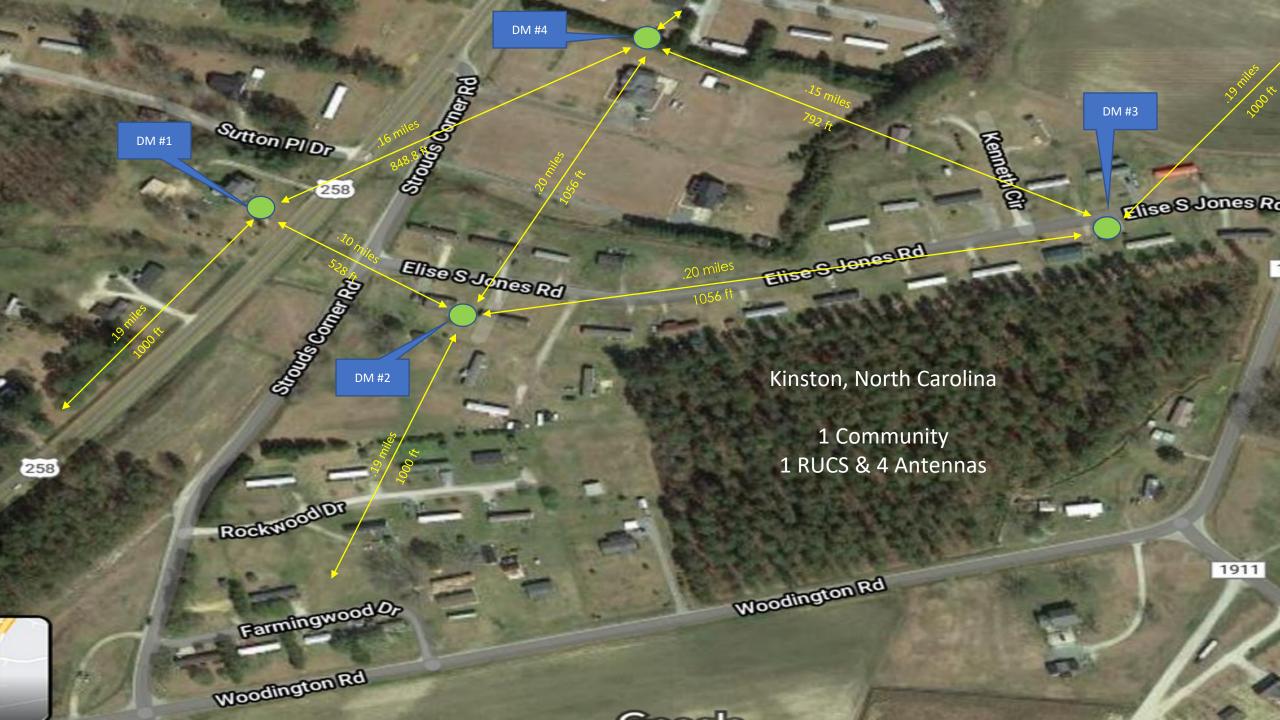


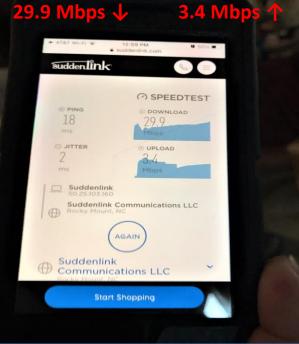


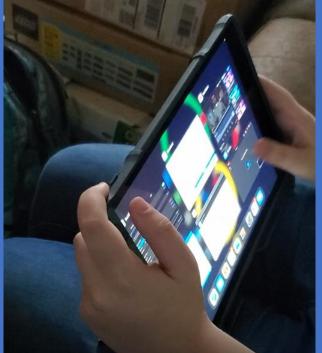








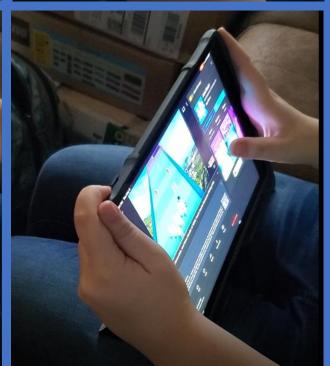






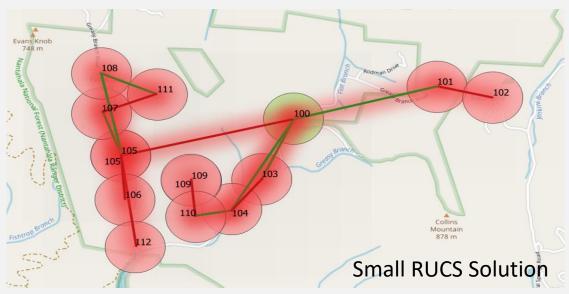


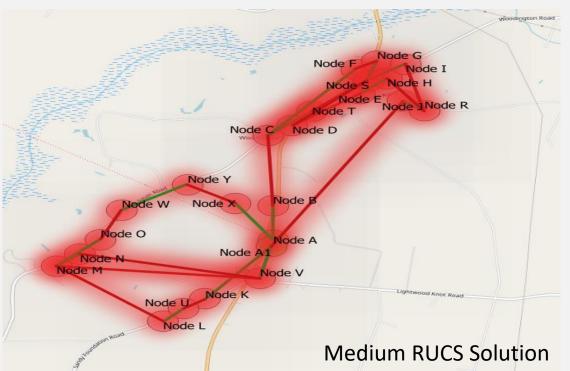




Live Demonstration using RUCS Solution

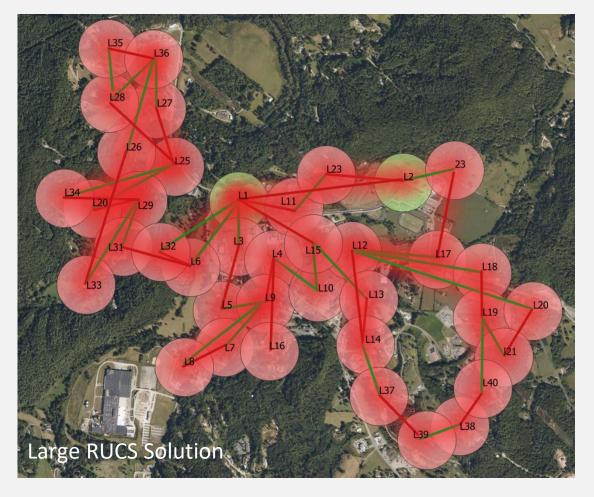
- •Zoom meeting using school approved tablet
- Whitelisted websites (only those approved)
- •Multiple windows at one time
- Streaming video







(RUCS™ SOLUTION)	FIBER	CELLULAR
SMALL	120 Students	40-50 Students
MEDIUM	250 Students	40-50 Students
LARGE	400 Students	80-100 Students



Notice to Proceed

Contracts Signed
Initial Funding
Released
Kick-off meetings with
Local/State Agencies

Design Services (Months 1-3)

Identification of Sites
Site Surveys
Preliminary Network
Designs and Layout
Identification of Local
Agents and Partners

RUCS Assembly (Months 2-5)

Component

Procurement
Component Testing
RUCS Assembly
RUCS Burn-in and
Validation Testing

Field Installs of RUCS Solution (Months 3-6)

Initiate deployments as RUCS system and field surveys are completed

As-Builts & Documentation of Network install and operations

Engage Local
Contractors to assist
with installation and
maintenance

RUCS On-going Support (Months 3-42)

Network Operations
System Maintenance
Network Management

Estimated Timeline to Delivery





PATRICK CUMBA, LLC | Consulting Services







Office of National Security and Industry Initiatives



Strategic Partnerships



Von Technologies, LLC

CEO Michelle Vondrasek vondrasek.michelle@vontechnologies.com 630.985.8474

Summary

- Fiber capacity available to add additional tenants
- Estimated project completion in less than 2 years
- Positive impact on economic vitality and quality of place







Testimony of Dr. Michele Thomas

Chief Medical Information Officer, BJC Medical Group

Written Testimony Before The House Interim Committee on Broadband Development

October 18, 2021

Introduction

Chairman Riggs and members of the Special Interim Committee on Broadband Development, thank you for the opportunity to testify on the importance of broadband expansion and its impact on telehealth. My name is Dr. Michele Thomas. I am the Chief Medical Information Officer for the BJC Medical Group and am board certified in Family Medicine and Clinical Informatics.

BJC HealthCare is one of the largest nonprofit health care organizations in the United States. With 14 hospitals in Illinois and Missouri, BJC serves the health care needs of urban, suburban, and rural communities. Services include inpatient and outpatient care, primary care, community health and wellness, workplace health, home health, community mental health, rehabilitation, long-term care, and hospice.

BJC Medical Group is the multi-specialty physician organization of BJC HealthCare and includes over 600 doctors and advanced practice providers. BJC Medical Group physicians are trained and certified in over 25 medical specialties and serve patients in more than 125 locations in the Greater St. Louis, mid-Missouri, and Southern Illinois areas.

Telehealth is a vital tool in a physician's tool kit to engage patients and get them the care they need. By increasing access to physicians and specialists, telehealth helps ensure patients receive the right care, at the right place, at the right time. At BJC, we support and invest heavily in innovation and redesigning the way we deliver health care. We believe Missouri has an opportunity to utilize different approaches to improve access and quality. In order to do this effectively, we need to encourage innovation such as telehealth. Using the same approaches as in the past, we are unlikely to achieve sustainable and scalable health care.

Recommendations

Policymakers face a difficult challenge designing optimal payment and regulatory policies for telehealth. We are thankful to the Committee for looking at broadband and its impact on telehealth services to allow Missourians better access to health care. There is no single optimal policy for telemedicine; however, there are steps the legislature and the State of Missouri can take to ensure Missourians have access to telehealth services.

1. **Distant sites and originating site changes:** Codifying the public health emergency waivers for Medicaid distant sites and originating sites would benefit patients and providers. The removal of originating and distant site restrictions will allow beneficiaries to receive virtual care regardless of their location, including their own homes, and allow providers to bill from where they are employed, even if they are quarantined or working

- from an alternative site. The removal of these barriers would change how telemedicine functions operationally immediately to the benefit patients and providers.
- 2. **Invest in infrastructure:** The Missouri Legislature should use funding available from the American Rescue Plan Act to modernize Missouri's digital infrastructure and bring affordable, high-speed broadband to every home. Any modernization and infrastructure investment program must also ensure that funds flow to all areas of Missouri, rural and urban.
- 3. **Interstate Medical Licensure Compact:** Joining the agreement with the 30 other participating states, including all states bordering Missouri except Arkansas and Oklahoma, will allow physicians who want to practice in multiple states an expedited pathway to licensure for physicians who qualify. Health care professionals can have patients residing in many states, and it is burdensome to maintain licenses in multiple states. This would allow for continuity of care for patients living outside of Missouri. Additionally, this flexibility would increase the pool of providers during an emergency.
- 4. **Allow audio-only consults:** Allowing telephone communications for those with existing provider relationships will help minimize barriers for rural and low-income communities that otherwise may not have access to appropriate video technology.

As a physician, I believe these are the preliminary steps that will move the health care system toward evidence-based, efficient, and equitable telehealth services. As telehealth continues to expand, additional study, design changes, and policy changes may be necessary. BJC believes these recommendations are the first steps to ensure telehealth is available for years to come for all Missourians.

Changes in telehealth use during the pandemic

The COVID-19 pandemic has driven a dramatic uptake of telehealth. After decades of telehealth being touted as the future of medicine, it has suddenly become commonplace. This growth has been in part facilitated by sweeping changes to regulations and payment across health care — Medicare, Medicaid, private insurers, and states. Emergency waivers enacted gave hospitals and providers the ability to quickly expand and respond to patient needs through telehealth.

I have been involved with telehealth at BJC for the past two years. My work with the BJC virtual care team began as we were piloting telehealth in certain clinics in early 2020 to going to total immersion when practices were closed and went 100% virtual due to the pandemic.

In March 2020, BJC quickly expanded telehealth capabilities and offerings for patients to continue the care our patients need and deserve. The pandemic greatly expedited our timeline and showed patients and providers what is possible in virtual care. In 2020, BJC delivered nearly 190,000 virtual visits. In contrast, BJC provided approximately 4,000 virtual care visits in 2019. Although BJC clinics have been open for patients for the entirety of 2021, BJC is targeting to have approximately 120,000 virtual encounters this year.

At the onset of the COVID-19 pandemic, BJC implemented a virtual first COVID screening service. This included standing up a physical location for a virtual care center in six days. Patients access screening for COVID-19 via telephone, online portal, or public-facing websites. Patients who screen positive are assessed by a team of primary care providers on a video visit. Providers direct patients who meet testing criteria to a network of drive-thru COVID-19 testing sites while patients requiring in-person evaluation or more extensive testing are sent to dedicated respiratory evaluation clinics. Through the virtual COVID-19 screenings, providers have

conducted almost 7,700 e-visits (an asynchronous message-based assessment and treatment) and video visits. Over 83,000 symptom assessments for COVID-19 screenings have been completed by consumers through our public facing website. With these tools, we extended our reach to existing patients without a MyChart account (MyChart is BJC's online portal for patients to securely access their medical record and communicate with providers) and those in our community who may not have had a relationship with us.

Home monitoring for post-discharge and chronic care patients remains an important component to managing the continuum of care and is a key priority for BJC. We enrolled over 16,900 COVID+ patients in a daily symptom and vital sign home monitoring program. There is a telephone only program and a more robust program with MyChart Care Companion for monitoring COVID+ patients at home. The split of patients is about 50/50 in each program. The program allows COVID+ patients to remain at home until medical intervention is necessary based on symptoms and vital signs reported.

Under the current public health emergency, a waiver is issued for licensure reciprocity requirements. The law waived requires health care professionals to maintain licenses in each state they wish to provide services, including telehealth services. For telehealth, the provider must be licensed in the state in which the patient is located. BJC HealthCare treats many patients at BJC locations in Missouri and Illinois while the patients live in another state. With patients residing in multiple states wishing to access virtual care, it is onerous for health care professionals to maintain licenses in each state they have a patient. The waiver allows continuity of care for patients living in other states. This would also be beneficial for Missourians who vacation to other states or individuals who spend the winter in warmer states. These Missourians would be able to connect with their provider while outside of Missouri should the need arise. BJC supports a bill that would allow for physician licensure reciprocity.

Designing for equity

BJC strives to identify the inequities in health care and address them. Our goal is to eliminate health disparities in the communities we serve. Telehealth is one piece of the puzzle in addressing health disparities. Telehealth allows patients to access care where they are. Patients do not have to travel long hours, find childcare, take off work, or locate a mode of transportation to attend an appointment with their physician. Care comes directly to the patients.

Each year, 3.6 million Americans do not receive medical care due to transportation issues, and four percent of American children miss a medical appointment for the same reason. Transportation is also cited as the third most common barrier to health care access. Telehealth gives patients the opportunity to keep their appointment because they no longer have to worry about how they are going to get there. Anecdotally, we find patients are more likely to keep their virtual appointments than in-person visits, and many times, patients calling to cancel their appointments due to lack of transportation opt for a virtual appointment instead of cancelling.

Rural and urban patients should receive the same expert care from specialists in their time of need. Through our academic campus, we have robust virtual offerings in tele-ICU and telestroke. These programs provide high acuity specialty care to rural and community hospitals to improve outcomes and keep patients closer to home. In August, BJC's Missouri Baptist Sullivan Hospital (MBSH) had its first virtual hospitalist visit. MBSH is a 25-bed, critical access hospital that serves the residents in Crawford, Franklin, and Washington counties. The first visit was during a time in which MBSH was experiencing very high COVID-19 volume. The extra

assistance through telehealth provided an avenue for patients to be seen locally without having to be transferred. BJC is developing similar programs for other specialties such as behavioral health, cardiology, pulmonary, and infectious disease.

A way to address disparate access is through audio-only care delivery, which has proven to be an incredibly useful tool during the pandemic. As a physician, I have seen many times where phone consults are perfectly adequate and are much better than having no contact at all with the patient. There are instances where a simple telephone call is all that is necessary to assess and discuss options with a patient or to simply refill a prescription that requires a provider sign-off. Allowing telephone communications for those with existing provider relationships would minimize barriers for rural and low-income communities that otherwise may not have access to appropriate video technology.

Telehealth is a wonderful tool to connect providers to patients; however, the digital divide prevents many patients from utilizing it. Significant gaps remain in people's ability to access broadband internet and digital services because of lack of infrastructure. Broadband is simply not available, reliable, or affordable in many places in Missouri. The City of St. Louis reports that 37% of households in St. Louis do not have access to high-speed internet and that black households are more than twice as likely as white households to lack access to high-speed internet. In rural Missouri, 61% of residents lack access to high-speed internet services. Access to broadband and high-speed internet must be prioritized.

Patient impact

I think patient stories are one of the best ways to convey the impact of telehealth to patients and providers. When I reached out to my colleagues for their telehealth success stories, my inbox was flooded with patients positively impacted by the use of virtual care. The stories ranged from homebound patients to in-state college students who are able to receive treatment for anxiety and depression with familiar providers to busy parents who don't want to neglect their own care. The impact on patients is significant.

The first two stories come from a colleague whose own family has been positively impacted by telehealth. This is her testimonial:

My husband was diagnosed with prostate cancer and instead of delaying treatment during the pandemic and having to go into a physician office to get the results and discuss his treatment options, we were able to schedule a telehealth appointment in the comfort of our home to discuss the options with the physician that ultimately performed surgery. Via telehealth, the physician spent 30 minutes explaining everything to us and answering all of our questions. We did not feel rushed or uncomfortable being on the phone instead of in person. We could see the physician and he could see us. He was able to detect our distress and connect with us in a way that gave us confidence in asking lots of questions, and in return, he patiently answered all of our questions. It was easy, convenient and we did not have to make a trip to a physician's office...again, we were in the comfort of our home.

My elderly parents live in rural Missouri and yes, my mother is on Facebook, and she knows her way around an iPhone! They both have health conditions that cause them to have several regular "check-up" appointments with specialists. Instead of having to drive 2 hours to St. Louis, they were able to schedule telehealth appointments to "check-in" with their physician. I worry about them having to drive so far so the convenience of a periodic telehealth appointment saves them time, keeps them safe at home and allows their physician to still check in and monitor for symptoms or

any concerns. The myth that older patients won't use technology is not true for my elderly parents living in rural Missouri...they are better at it than I am! They want access to quality healthcare and allowing telehealth is keeping them safe and healthy at home!

Many of my colleagues discussed how seeing a patient's living environment – home, family, and pets – make them appreciate the patient's circumstances better which makes them better doctors. One physician had a patient who they had been having trouble ascertaining which medication she was truly taking. Despite asking her to bring in her medication, the patient always forgot. During a telehealth visit, she was able to get up from the table and get her medication. This allowed the provider to stop her from taking duplicate medications. Another physician had an elderly patient living in a rural area without transportation who needed care on a weekend. The patient was treated virtually for a shingles rash on their face. Prompt and accurate treatment prevented the rash from spreading to their eye, which could have caused vision loss. The patient did not have transportation to be seen in urgent care; however, they did have a pharmacy that would deliver their medications to their home. Without virtual care, the patient likely would have inappropriately utilized an ambulance service to be seen in an emergency department.

One of our OBGYN physicians utilizes telehealth appointments every Tuesday. Her schedule is reserved for virtual patients, and she is typically booked 100%. She is able to have all her patients that do not require physical touch to have their discussions with her virtually to better utilize her time on her other days in the office. Additionally, virtual appointments decrease the foot traffic in the office during the current pandemic. Examples of virtual visit discussions include ultrasound reviews, family planning, upcoming procedures, and alerting pregnant COVID patients what symptoms to watch for.

These are just a sliver of the patient impact stories I could relay to you. The positive impact telehealth has on patients and providers is remarkable. My team's, the BJC Medical Group Health Information Technologies team, mission is to bridge the gap between our clients and technology while providing the knowledge and support to improve the health of the communities we serve.

I appreciate the Committee for giving me the time to share with you how we are working to fulfill our mission. Thank you for the opportunity to share my testimony with you. I hope we can count on you to vote for telehealth priorities when the time comes. My colleagues and I look forward to working with the legislature on this important issue.

ⁱ Health Research & Educational Trust. (2017, November). Social determinants of health series: Transportation and the role of hospitals. Chicago, IL: Health Research & Educational Trust. Accessed at www.aha.org/transportation

[&]quot;St. Louis, MO Government. (2018) Justice for All: Internet Access. Accessed at https://www.stlouis-

mo.gov/government/departments/mayor/initiatives/resilience/equity/justice/civic-engagement/internet-access.cfm

Federal Communications Commission. Americans without access to fixed telecommunications capability by county.

JEFF DAVIS - RURAL BROADBAND TESTIMONY

Railroads support rural broadband deployment. We know it's a necessity for economic development.

You've had testimony before this committee that railroads are hard to work with. We are harder to deal with because this is our livelihood and the safety of our employees and communities are at stake. It's our livelihood in the sense that if someone shuts down service, they can disrupt interstate commerce and cost a railroad hundreds of thousands of dollars, if not millions. More importantly, it's a safety issue. I want each and every one of you to know BNSF and the other Missouri railroads are all committed to the safety of our employees and the communities where we operate.

- A loaded grain train might weigh 10,000 tons 20 million lbs of freight.
- A loaded coal train might weigh 19,000 20,000 tons 40 million lbs of freight.
- It takes more than a mile to stop a fully-loaded freight train.
- Railroads are also the largest, safest hauler of hazardous materials.

We haul the chlorine used by water treatment plants, we haul fertilizer and ethanol for farmers, we haul crude oil, nuclear payloads and many other hazardous substances. We do it better and more safely than anyone else. The risks involved are why we're more difficult to work with than your average homeowner and why it costs more:

- We ask people working in our right-of-way to complete an on-line safety course;
- We ask people to pay an application fee. The fees are different for each railroad. BNSF charges approximately \$850.00 per application. Where does that money go? The Federal Railroad Administration (FRA) requires all railroads to keep exact records of what's in our ROW we have to have three dimensional CAD (computer-aided design drawings) of everything there. When someone writes a check to BNSF for an application fee, almost all of that money goes to an engineering firm Bartlett & West who makes sure everything is in its proper form. If you're applying for a RR ROW permit, the #1 thing you can do to speed up your application is give us good three-dimensional drawings.
- We ask people to buy railway protective insurance a special insurance policy that normally costs about \$1,000 and protects the railroad in the event of an accident. This policy protects the railroad, keeps us whole and we don't have to sue anyone to indemnify us if they cause an accident in our ROW.
- Then, we have another FRA safety regulation requiring anyone doing work within 25 feet of our tracks to have flaggers as long as they are working in the ROW. People who do this work are all union and it costs about \$3,000.00 a day.
- None of these steps are cheap, but they are all necessary. That brings us to the cost of the actual easement or permit...
- Missouri statutes already state railroads can't charge a fee for an easement or permit if a carrier is putting the fiber in publicly-owned ROW (roads). So, in most cases, there is no fee.
- When there is a fee, we charge for either a 20-year license or for permanent use. The one-time fee for a permanent permit is a little over \$5,000. It's the same everywhere.

To give you some perspective, BNSF owns 1,400-plus miles of tracks in Missouri. Last year, we had 36 applications for permits to put fiber in our ROW- of those 36 applications, 20 were completed, 9 are "inactive" because they never completed the application process, and 7 are still pending – that means they haven't signed the contract we sent them and paid their money. I presume that, when they're ready, they'll sign and send us a check.

In conclusion, we want to be good neighbors and help streamline the process – that's why all of the large railroads have put our application processes on-line. You can start a BNSF application at www.railpermitting.com. We've prepared a handout listing all of the railroad right-of-way contacts and their websites in Missouri. I spoke to the Missouri Cable Telecommunications Association in September and I stay in contact with the coops and the attorneys who represent the Missouri Public Utility Alliance. I've spoken to Tim Arbeiter at the Missouri Broadband Development Office and we're going to do a much more in-depth webinar in November where we walk providers through the application process and discuss best practices.

Mr. Chairman, that concludes my testimony and I'm happy to answer any questions.

Annette Jenkins
Senior Manager Permits for AR, KS, MO
Jeff Davis
913-626-2545 / Jeffrey. Davis@BNSF.com

Senior Manager Permits for AR, KS, MO tel 1+8172302600 direct 1+8172302627

annette.jenkins@am.jll.com www.joneslanglasalle.com

See also: http://www.bnsf.com/bnsf-resources/pdf/about-bnsf/utility.pdf

Kansas City Southern:

Primary Contact:

https://kcspermit.jllrpg.com
Government Affairs Contact:

Denise Case Kevin McIntosh

Transaction Manager 816-983-1987 / KMcintosh@KCSouthern.com

Jones Lang Lasalle (JLL)

tel 1+8172302600 direct 1+8172302614

denise.case@am.jll.com www.joneslanglasalle.com

Norfolk Southern Railway: https://ns.railprospermitting.com/Login.aspx?ReturnUrl=%2f

Primary Contact: Government Affairs Contact

(402) 965-0539 Ext. 1 Derek Sublette

ns.permitting@railpros.com 317-509-7122 / derek.sublette@nscorp.com

See also: Permitting Login (railprospermitting.com)

Union Pacific Railway: https://www.uprr.com/rem/ucs/jas/#/home

Primary Contact: Government Affairs Contact:

Tom Leddy Ben Jones

Utilies/Drainage/Right of Entry Manager 816-352-3634 / bwjones @ up.com

(402)-544-8571 TLeddy@UP.com

See also: https://www.up.com/real-estate/utilities/index.htm

Missouri & Northern Arkansas Railroad (MNA), a Genesee & Wyoming Railroad:

https://www.gwrr.com/real-estate/utility-occupancies/

Primary Contacts:

Donna Killingsworth – Real Estate Manager at 904-900-6286 – gwappseast@gwrr.com or Crystal Galbreath – Real Estate Coordinator at 904-596-7782 – gwappswest@gwrr.com

Government Affairs Contact: Joe Arbona, 904-352-9377 (cell) / joe.arbona@gwrr.com

Kansas City Terminal Railway: https://ramsinc.com/real-estate/

Primary Contact:
Shawn Lauby
Director of Transportation & Administration
Kansas City Terminal Railway
816-627-6737
SLauby@kctrailway.com

Terminal Railroad of St. Louis:

http://www.terminalrailroad.com/Customers/Contractor%20Right%20of%20Entry.aspx

Primary Contact: Government Affairs Contact:

Asim Raza Asim Raza 314-241-4729 314-241-4729

araza@terminalrailroad.com araza@terminalrailroad.com

Missouri Railroad Association:

Sarah Topp, Executive Director 573-634-4876

*3/3-*034-40/0

sarah@molobby.com



TO: Missouri House of Representatives –

Special Interim Committee on Broadband Development

FROM: Missouri Association of Councils of Government (MACOG)

DATE: October 18, 2021

RE: Missouri's Regional Planning Commissions' Key Role in Broadband

Planning

The Missouri Association of Councils of Government (MACOG) is the state association of Missouri's 19 regional planning commissions and councils of governments. These RPCs provide coverage of the entire state, and the RPC network is an integral partner with the State to deliver a variety of programs and services to their regions and local jurisdictions. Created in 1966 through the Community and Regional Development Act, RPCs have over 50 years experience shaping the growth and development of Missouri's communities and regions. Through planning and program accomplishments, RPCs have a proven record of quality, cost efficiency and recognized success – for the benefit of all Missouri.

Over the years, Missouri's RPCs have been key planning partners with the State on all major public broadband planning initiatives. From the <u>MoBroadbandNow</u> program of 2009 through the work of the <u>Office of Broadband Development</u> today, RPCs have effectively engaged their respective regions and their stakeholders to support the State in driving broadband policy and deployment.

Missouri's RPCs are key broadband planning partners with the State.

Missouri Broadband Now (MBBN)

The MoBroadbandNow (MBBN) program was a public-private partnership established by the State in 2009 with federal economic recovery funds in order to expand and enhance broadband throughout the state. The stated goals of broadband service focused on accessibility, adoption, affordability, choice, speed, usage, and sustainability. The overall goal was to have at least 95% of Missourians accessible to high-speed internet by 2014.

Missouri's RPCs were key to this effort by establishing <u>Regional Technology Teams</u> of public and private stakeholders to help identify regional needs and priorities. Following intensive planning sessions, multiple "town hall" meetings, and regional SWOC analyses, each region adopted a <u>Regional Broadband Availability and Adoption Strategic Plan</u>. The RPCs were also instrumental participants in the statewide <u>Missouri Broadband Summit</u> of October 2010.

In 2013, the RPCs continued with this stakeholder engagement by preparing <u>Regional Broadband Sector Implementation Plans</u>. These regional plans focused on particular needs and priorities within the "health" and "education" sector along with at least one additional critical sector for the respective region (eg. "agriculture", "tourism", etc.).

The MBBN effort was an important first step in recognizing the public priority in broadband service. As technology has improved, and expectations for service levels and usage have evolved,

the eligibility requirements for public funding programs and broadband coverage mapping have changed. That is to be expected. But it is clear that these planning initiatives starting in 2009 formed a critical base level of policy and community engagement that is still helping drive the broadband discussion even today.

RPC On-Going Broadband Efforts

Following the MBBN program, the RPCs have continued their emphasis on broadband infrastructure per the priorities established by their respective boards of directors. Some RPCs continued engagement with their Regional Technology Teams while others found it most effective to incorporate broadband matters within their Comprehensive Economic Development Strategy Committees. RPCs were actively engaged in pursuit of funding opportunities to support specific broadband deployment projects.

RPCs maintained a continued emphasis on broadband infrastructure.

As the federally-designated <u>Economic Development Districts</u> (EDDs) under the US Economic Development Administration's Planning Partnership Program, the RPCs have found it valuable to focus on broadband deployment for increasing economic development, education, healthcare, and quality of life opportunities. The RPCs incorporate broadband planning activities in their annual EDD work programs, and they have remained ongoing partners with the State and various stakeholder organizations advocating for broadband deployment strategies. Local stakeholder interests and internet providers, including Missouri's rural electric cooperatives, remain engaged in many of these regional discussions.

As the State considered a publicly funded grant program to assist with broadband deployment, the RPCs advocated for development of an updated statewide broadband plan and policy. The most effective state funded broadband grant programs relied first on the adoption of a state broadband plan articulating the specific, clear goals and objectives, strategies, and metrics for broadband deployment. Regional and local jurisdictions can then align their efforts with those State priorities. As Missouri began developing its statewide plan, the RPCs were actively engaged providing key input from the local and regional perspective. The RPCs remain ready to support the State in implementing and achieving the goals of Missouri's Broadband Plan (May 2019).

The most effective broadband programs relied first on a state broadband plan.

EDA CARES Act Supplemental Planning Partnership Funding to RPCs

In 2020, the RPCs, in their role as federally-designated EDDs, received supplemental planning partnership funding from the EDA through the CARES Act. The RPCs, having already identified broadband planning support under their annual planning partnership grant, were able to supplement their broadband support activities. A summary of these various activities is provided below:

RPC	Broadband Planning Activities under EDA CARES Act funding
Boonslick RPC	Providing planning, outreach, addressing gaps in service, infrastructure, access, and installation especially for underserved areas and for students and teleworkers.
Southeast Mo RPEDC	Continuing to provide on-going advice and support to local jurisdictions on broadband matters and engage with citizen broadband advocacy organizations within the region.
Mark Twain RCOG	Conducting a feasibility study to identify broadband needs throughout the region. In partnership with the economic developers in the region and the local broadband committee the study will be used to locate

	funding to again in providing broadband in the arrang augmently 1 - in -			
	funding to assist in providing broadband in the areas currently being underserved.			
Northeast Mo RPC	Participating in the Missouri Northeast Development Partnership			
	"Broadband Committee". The NEMORPC Regional Broadband			
	Mapping Project will be a mixture of mapping of current broadband			
	infrastructure and county specific survey data. This information will be			
	crucial for this very rural region to capitalize on federal funding and			
	replace the census block mapping used by current federal grant			
	programs. The region will be able to submit county specific granular			
	data to assist internet service providers in applying for public grant			
	assistance.			
Kaysinger Basin	Supporting county broadband speed-test surveys and mapping to			
RPC	identify unserved/underserved areas more specifically.			
Harry S. Truman	Working with our regional economic development organization, the			
CC	MOKAN Regional Partnership, to map areas determined as high need			
	based on the I-49 connector's completion at the end of September.			
Mid-Missouri RPC	Working with the Columbia Business Broadband Task Force. Attending			
D:	their meetings and providing GIS support.			
Pioneer Trails RPC	Updating the existing 2015 Pioneer Trails broadband planning			
	document. The update will be performed with the purpose of attracting			
	ISP interest in serving the under-served and unserved portions of the			
N. d. A.	PTRPC region with robust and reliable broadband connection.			
Northwest Mo	Conducting a feasibility study to assess the broadband needs and			
RCOG	opportunities in the region. The study will identify opportunities to			
	expand coverage to all business and residential structures. Sustainability			
	of the expansion, including potential one-time and/or recurring third-			
	party funding sources, and a deployment plan will be included to enable			
	the region and its commercial partners to take advantage of these			
	opportunities in conjunction with broadband friendly public policy development. The study will address the need, education, medical			
	treatment, business community, and quality of life.			
Ozark Foothills	Hiring a contracted disaster economic recovery coordinator for a two-			
RPC	year period to assist the five-county region with increasing broadband			
id C	availability. Work elements of this position will include, but not be			
	limited to the following:			
	i. Procure and coordinate a broadband feasibility study that			
	will identify deployment needs, costs, and strategies;			
	ii. Serve as a liaison between local, state and federal partners in			
	order to implement strategies needed to increase broadband			
	availability;			
	iii. Identify and foster private and non-profit providers who			
	could deploy broadband services to the OFRPC region; and			
	iv. Identify funding opportunities for interested providers			
	needed for deployment and prepare proposals to funding			
T 1 0:1 0 1	agencies.			
Lake of the Ozarks	Updating the region's current Broadband Plan and seek additional			
CLG	funding and resources to enhance and expand the broadband			
Doothool DDC	development efforts in areas that are unserved and underserved.			
Bootheel RPC	Contracting for additional personnel to serve as a Disaster Economic			
	Recovery Coordinator which would oversee a broadband committee to			
	see the expansion of broadband to the rural areas, including a broadband feasibility study for service deployment.			
Southwest Mo	Assisting with county-level broadband committees and pandemic			
COG	recovery committees for planning, outreach, and coordination for			
COO	recovery commutees for planning, outreach, and coordination for			

	broadband deployment. We are also providing some technical assistance to broadband providers to connect them with communities, economic developers, and funding opportunities.		
Meramec RPC	Providing technical assistance and capacity building for member organizations, local businesses, and other local stakeholders impacted by COVID [including] broadband consultation on infrastructure needs. We have formed broadband advocacy committees in each of our counties and have local stakeholders talking with ISP representatives. They are also identifying structures for wireless devices and areas within their counties that are underserved/unserved.		
South Central Ozarks COG	Providing funding for economic recovery activities within the region related to broadband expansion feasibility, business retention, business attraction, workforce development and asset-based regional marketing.		
Mo-Kan RC	On-going support activities with local jurisdictions focused on addressing broadband challenges and funding opportunities.		
Green Hills RPC	Providing technical assistance and capacity building for member organizations, local businesses, and other local stakeholders impacted by coronavirus: specific technical assistance (including broadband) based on the needs of business, service organizations, and stakeholders as they are identified during the assessment process.		
Mid-America Regional Council	Working with a civic organization, KC Rising, to develop a broadband infrastructure and digital access plan for the Kansas City metro area. The plan will identify those areas in the region where high speed broadband is not available or areas where services are less than needed for households to fully engage in online work. The plan for digital access will look at how to scale up support for low-income households for devices and internet connection fees and for all households needing digital literacy training.		
East-West Gateway COG	Supporting the Center for Civic Research and Innovation, in concert with the St. Louis Community Foundation, who is leading a broad-based group of funders and stakeholders in a planning effort to address the digital divide in the city of St. Louis and St. Louis County. The consulting firm of Ernst and Young is providing major support in data collection and engagement. Initial deliverables include a data platform and development of options for addressing disparities in broadband access.		

These supplemental RPC activities range from broadband coverage mapping updates and targeted technical assistance and capacity building to updating regional broadband plan priorities and conducting feasibility studies for broadband deployment.

EDA CARES Act supplemental funding enhances RPC broadband planning support.

Those RPCs not identifying specific broadband related activities within their supplemental work programs continue to provide key broadband support through their regular planning partnership funding. With all these activities, the RPCs can focus on the key broadband issues and locations as prioritized by the stakeholders in their respective regions.

MACOG/State of Missouri EDA-CDBG Broadband Statewide Planning

MACOG and the State of Missouri partnered in 2020 to apply for a grant from the US Economic Development Administration, with 50% local match through a Community Development Block Grant, to fund a statewide broadband planning and technical assistance project. This \$1.2 million grant project will fund eight broadband feasibility studies across the state in areas identified as

broadband underserved and significantly impacted by the COVID pandemic. The feasibility studies, supported by the respective RPCs, will identify the most appropriate broadband modalities to service these areas, engage with local stakeholders to determine potential levels of local and state partnerships, and prepare the business plan and construction model that can result in successful broadband deployment. The remaining RPCs that do not have a location for a feasibility study will receive planning and technical assistance support to further their respective broadband planning support activities.

Broadband feasibility studies will lead to actual broadband deployment projects.

The goal of the project is to pursue actual implementation of the feasibility studies, with the identified appropriate levels of public support, and utilize these case studies as models to conduct additional feasibility studies and implementation across the state.

The EDA grant and the 50% local match Community Development Block Grant have been approved, and the project activities are moving forward.

Summary

MACOG and Missouri's RPC network have been, and continue to be, key broadband planning partners with the State. The RPCs mission to engage local stakeholders and support planning and implementation activities with the State has been instrumental in advancing the key goals and objectives for broadband in Missouri. With the Missouri Broadband Plan, all these efforts can be further aligned to increase value and results.

The MACOG/State of Missouri EDA-CDBG Broadband statewide planning and technical assistance project will offer new, concrete opportunities for broadband deployment. The project will also help the RPCs with technical support for their respective broadband planning and engagement efforts.

MACOG and Missouri's RPCs are prepared to strengthen this partnership with the State's broadband efforts to ensure every opportunity is taken to provide broadband service to Missouri's residents, businesses, and institutions.

CONTACT

Cindy Hultz Doug Hermes

MACOG President

Statewide Planning Coordinator Executive Director – Mark Twain RCOG **MACOG**

1910 Kings Hwy 42494 Delaware Lane

Perry, MO 63462 Liberty, MO 64068 Phone: (573) 565-2203 Phone: (816) 781-8631

E-mail: chultz@marktwaincog.com E-mail: dihermes@kc.rr.com

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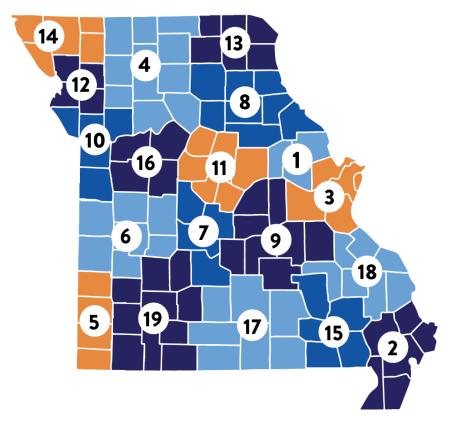
Missouri Association of Councils of Government (MACOG)

213 East Capitol Avenue

P.O. Box 1865

Jefferson City, MO 65102 Phone: (573) 634-5337

E-mail: planning@macog.org Website: www.MACOG.org



1	Boonslick Regional Planning	11	Mid-Missouri Regional Planning
	Commission		Commission
2	Bootheel Regional Planning		Mo-Kan Regional Council
	Commission		
3	East-West Gateway Council of	13	Northeast Missouri Regional
	Governments		Planning Commission
4	Green Hills Regional Planning	14	Northwest Missouri Regional Council
	Commission		of Governments
5	Harry S. Truman Coordinating Council	15	Ozark Foothills Regional Planning
			Commission
6	Kaysinger Basin Regional Planning	16	Pioneer Trails Regional Planning
	Commission		Commission
7	Lake of the Ozarks Council of Local	17	South Central Ozark Council of
	Governments		Governments
8	Mark Twain Regional Council of	18	Southeast Missouri Regional
	Governments		Planning Commission
9	Meramec Regional Planning	19	Southwest Missouri Council of
	Commission		Governments
10	Mid-America Regional Council		

Testimony Before Missouri House of Representatives Interim Committee on Broadband Development

October 18, 2021

Thank you for the opportunity to address this distinguished body. My name is Vickie Robinson, and I am the General Manager for the Microsoft Airband Initiative, which is focused on efforts to close the digital divide in the United States and around the world. Prior to joining Microsoft, I served at the Federal Communications Commission (FCC) for nearly fifteen years in multiple leadership roles, followed by my tenure as Acting CEO and General Counsel of the Universal Service Administrative Company, an independent not-for-profit organization designated by the FCC as the administrator of the federal Universal Service Fund. I am here today to share Microsoft's thoughts on broadband and closing the rural digital divide.

I believe that we all can agree that broadband is essential for meaningful participation in the 21st century. From starting or growing a small business, supporting virtual learning and telehealth, accessing government services, or driving innovation in agriculture and research, broadband fuels enormous economic, civic, and social opportunities. While our country has made significant strides to unleash the power of broadband, the digital divide persists for millions of Americans lacking meaningful access, the majority of which reside in rural areas.

Four years ago, Microsoft launched the Rural Airband Initiative to help close the broadband access gap in the United States. As part of this effort, Microsoft has committed to extend broadband access to three million people residing in unserved rural areas within the United States by July 2022. We have also committed to extend broadband to over forty million people that lack access, outside the US. We are delivering on these commitments by partnering with a network of people and organizations all working on the same goal — connecting people and bringing with that connectivity the opportunity for a better life. Within the US, we are currently partnering with internet service providers and others to extend rural broadband access in more than thirty states, including the state of Missouri, and Puerto Rico. Through these projects, we have helped provide more than two million people with access to broadband in rural, previously unserved areas, and we are moving full steam ahead to accelerate our work even further. As Airband communities come on-line, we are working to empower consumers, educational institutions, healthcare providers, our Nation's veterans, and others to fully unlock the transformative potential of broadband.

According to the Federal Communications Commission's most recent report, at least 14.5M people, including 11M in rural areas, lack broadband access. In Missouri, the FCC estimates that 7% of the total population does not have broadband internet access, with a disproportionate number of rural Missourians (approximately 21% of the population or about 388,000 people), lacking broadband internet access. At Microsoft, we believe that the current broadband mapping methodology is flawed and that the actual problem is probably significantly higher than these figures. That is why we are excited to work with our Airband Partner, Wisper Internet, and others

as we seek to understand the real landscape in Missouri and extend broadband to underserved and unserved areas within the state.

Our partnerships involve a multi-prong approach focused on digital equity as a platform for empowerment and digital transformation.

First, we focus on connectivity through our internet service provider partners to accelerate access to broadband among unserved and underserved communities. Our partner projects are designed to be commercially sustainable and scalable. Many of our Airband partners are recipients of the FCC's Connect America Fund Phase II Auction, have participated in the Rural Digital Opportunities Fund auction, or are participating in other support mechanisms from the U.S. Department of Agriculture and state broadband programs that are funded through the Coronavirus Aid, Relief, and Economic Security Act (CARES Act). To accelerate broadband access, our Airband partners deploy hybrid networks that make use of multiple technologies, including fiber and fixed wireless solutions, based on community specific needs. Airband partners embrace technologies deployed on multiple frequency bands like Citizens Broadband Radio Service (CBRS), a wide range of midband fixed wireless, as well as fiber-based connectivity. For example, our Airband partner Wisper employs this toolkit approach and is deploying a novel wireless system with Tarana equipment using the CBRS band. This equipment has the potential to reach speeds of 800 Mbps. This toolkit approach allows internet service providers to serve more people in the near term in a cost-effective manner.

We believe that digital skilling is a key component to driving digital equity. As a result, we provide digital skilling resources to support all Airband communities. These opportunities are spearheaded through a collaboration with Microsoft Philanthropies, which partners with non-profit organizations like the National 4H Council, Future Farmers of America, and Rural LISC.

To unlock the power of digital transformation, we collaborate across Microsoft, while partnering with other private and public sector organizations, nonprofits, and others to provide connected solutions that are enabled by broadband networks. While our Airband Initiative focuses on extending broadband access in unserved and underserved areas, we recognize that the value of broadband connectivity in rural areas extends beyond connectivity for connectivity's sake. Expanding broadband access facilitates greater access to education, commerce, healthcare, civic, and social opportunities.

The global COVID-19 pandemic underscores the urgency to close the broadband gap. We have seen the need for schools to enable distance learning and healthcare providers to offer telehealth options. There is also an increased need for viable telework as people are sheltering in, which makes the need for broadband more acute. Many of these needs will survive past the pandemic and become part of our everyday life – the new norm. People living in rural areas are particularly impacted, but the pandemic also clarifies that the problem is not simply one of broadband access,

but also affordability, as we see the impact on people with income insecurity. We also see further disparate impact for communities of color and people with disabilities. As a result, we have expanded the Airband Initiative to address broadband gaps in access and adoption. Federal, state, and local governments must also address broadband access and adoption.

Our country has come a long way, but there is work that remains to realize our shared vision of digital equity for all through a commitment to 21st Century Infrastructure – access to affordable broadband, broadband-enabled devices, and digital skills. We are enthusiastic about the various federal and state programs that provide funding to unlock additional opportunities for vital broadband projects in areas that are unserved and underserved in both rural and urban America. What is even more exciting, is that there is funding to ensure that there are affordable broadband services and devices for students and others that are income insecure, as well as support for digital skilling and upskilling. We believe that these existing funds, coupled with funding under consideration through things like the federal infrastructure bill, will go a long way to address the digital divide. Together with our partners, we hope to impact the lives of millions of people in the US by delivering broadband internet access and improving livelihoods in rural and underserved communities.

Again, thank you for your time and I look forward to your questions.



Missouri NITRO Team:

Tony Kosiba

- Strategic Sales, Missouri

Prash Ramani

- Senior Sales Executive, Nitro



(ᠬᠠ) **Nitro**Municipal Broadband LTE



- Motorola powers the existing Public Safety Radio Network.
- NITRO is available on the State of Missouri Contract
- Scalable and Affordable
 - Ability to offer hyper local, targeted broadband
 - Can be deployed where carriers and service providers can or will not currently.
 - Rapid Deployments allow for the ability to meet funding deadlines.

Maintenance Free

 Fully managed cloud core with 24/7 network and security monitoring

Secure

- Firewall protected, software kept up to date
- NIST Cybersecurity Compliant
- Malicious code and vulnerability scans performed regularly.

We look forward to working with you on a "fully connected Missouri" and bridging the digital divide.

For any further product questions or details: Prash Ramani (312) 489-1642 prashanth.ramani@motorolasolutions.com For State of Missouri questions:
Tony Kosiba 402-659-8848
tony.kosiba@motorolasolutions.com



Ellen Rachel Mutrux, Sr. Program Director Missouri Telehealth Network and Show-Me ECHO Office of Health Outreach, Policy, and Education University of Missouri- School of Medicine mutruxe@health.missouri.edu

Cell-573-864-8814

Prepared Testimony for Broadband Development Hearing 10/18/2021

Hot Spot Talking Points for Testimony

Thank you, Representative Riggs and everyone on this committee. My name is Rachel Mutrux. I am the Senior Program Director of the Missouri Telehealth Network and our Show-Me ECHO program at the University of Missouri- School of Medicine- Office of Health Outreach, Policy, and Education. I have worked in the telehealth field for 19 years and I am from a rural part of Missouri, Texas County, so I do know firsthand the limits of broadband access!

The Missouri Telehealth Network has worked to improve access to high quality healthcare for rural Missourians for over 20 years. Broadband has always been one of the biggest barriers. Even with all of the changes in technology, broadband is still one of the biggest barriers. Both accessibility and affordability of broadband are barriers. Not too long ago, when we talked about telehealth, we were talking about videoconferencing where the patient was in a clinic, probably in a rural area, and the health care provider was in another clinic, probably in an urban area. The pandemic really changed that. We know now, that providing telehealth right into the patient home, works and works well.

15 Missouri hospitals have closed since 2014 - 9 rural and 8 acute care hospitals (MHA, 2019). As a primarily rural state (97% of Missouri land is classified as rural) access to healthcare services is challenging because of maldistribution of providers and other socio-economic reasons. Hospital closures are now further limiting access to care, and creating "healthcare deserts" in many counties across the state.

During the COVID-19 public health emergency, stay at home order and subsequent social distancing requirements, healthcare organizations quickly adopted or expanded their telehealth programs to ensure continuity of care while minimizing unnecessary exposure for patients and staff. This was a great option for many patients, however, the most vulnerable Missourians were not able to access these services because of lack of connectivity at home and/or technology ownership. Almost 1.4 million (23%) Missourians do not have broadband access, a number that is likely under-reported due to the flaw with Form 477 reporting apartment complexes and blocks (FCC 2019 Broadband Deployment Report). These issues create "technology deserts", a digital divide between rural and urban areas, with worrisome consequences affecting healthcare outcomes.

I want to tell you about a project that provided broadband access to individuals during the pandemic. The Missouri Telehealth Network-Hotspots for Health Program is a partnership between the Missouri Telehealth Network and the Missouri Department of Economic Development. In response to the CARES Act, this project supports connectivity for telehealth services among vulnerable populations by securing hotspots for use by patients, clients, and providers of Federally Qualified Health Centers and Community Mental Health Centers. The project started in July, 2020 and ends at the end of this month, October, 2021.

We surveyed hot spot recipient organizations- not individual patients- each month January – June 2021 to better understand the impact of this project by asking questions related to hot spot use, technical issues, and how hotspots have impacted patient access.

By June, close to 8,000 of the around 10,000 hot spots were distributed (77%). The number of technical issues encountered was extremely low across the survey period and the majority of issues got fixed. Unresolved technical uses ranged from 1-4 across the survey period each month. The number of patients affected by technical problems also remained low across the reporting period with all survey periods reporting less than 1% of patients with unresolved technical issues.

Staff and patients used hot spots for video visits. In January and February a greater number staff hotspots were used for video visits, however by March patient and staff hotspot were about even. In May 66% of video visits were completed using patient hotspots. Video visits peaked in April with 8,420 video visits and then steadily declined to 4,321 in June as pandemic restrictions were lifted.

There are 3 main benefits of the program reported by partner organizations:

Healthcare Access Patients who could not otherwise access healthcare were helped by having hotspots, hotspots were easy to use and allowed patients to continue attending group behavioral services. Hotspots increased access for people who lacked transportation and resources by providing a means to bring the care to them. Hotspots were used to access care in rural areas, for both routine and specialty care and for vaccine and testing clinics.

Additional Patient Benefits In addition to accessing healthcare, hotspots allowed patients to access educational opportunities, to stay connected with others, and decrease their exposure to COVID.

Provider/Service Benefits Providers noticed a decrease in no shows as a result of providing hotspots. In addition, staff were assisted by having easier access to EMR and easier means to input documentation. It also allowed some to expand services.

Representative quotes

"Hotspots continue to help us access persons served for a variety of services from Intake, to community support, to Psychiatry. The ability to provide telehealth appointments has been greatly appreciated by persons served and staff alike for it's convenience and efficiency. Hotspots have been an integral component to staying in touch during the pandemic and now, beyond." (Jun)

"We continue to have people who don't want to come in to get their services in the office. This has allowed them to continue to get services and attend groups without being exposed to COVID 19." (Apr)

"We are able to reach people who previously didn't have access to internet for video medicine. (Apr)

Patients continue to benefit from the hotspots to have access to the internet in their homes for health purposes, employment, education, and connecting to others socially."(Jun)

"Using telehealth for therapy appointments has been crucial throughout the COVID pandemic and our organization has noted the long-term benefits. Many of our persons served with transportation issues, mobility issues or even anxieties about coming on site have kept in contact with us thanks to telehealth, and we'll keep using this method beyond COVID. Many persons served who are new to our organization are homeless and lack the resources needed to contact us. Telehealth has helped us access those people rather than spend time looking for them in the community and risk losing touch." (May)

"Continues to provide access to care for client who either are afraid or unable to seek services face-to-face." (Jun)

"We have counselors who work on-site at our local community college for the students there. Wifi access at the college can be unreliable. Having a hotspot available for those counselors has helped us stay consistent with clients that have requested telehealth services. Sessions were often interrupted or dropped when trying to use the college wifi, but the counselors have had no issues using one of the grant hotspots." (Apr)

"Clients have been able to access telehealth visits more frequently and direct service staff have found it easier to input documentation and engage with clients." (Apr)

"In addition to giving access to client for remote services and providing access to our staff to deliver services remotely, it has allowed us to provide face-to-face services in locations we had not previously been able to use". (Jan)





Satellite Broadband:

High Speed Internet Everywhere

Steven Hill
President
Satellite Broadcasting & Communications Association
schill@sbca.org



Satellite Broadband - Past

- First generation product
- Slow speed
- Data constraints
- Limited capacity
- Over 1,000,000 customers





Satellite Broadband - Today

- 2 Service providers
- New satellites in 2017
- 25/3+Mbps
- 100Mbps in select markets
- Unlimited plans
- No hard data limits
- Focus on rural and underserved markets
- Over 2,200,000 customers





Satellite Broadband-Applications

- Residential
- Business
- Distance Learning
- Government
- Tele-health
- Airlines
- VolP
- Agriculture
- Security
- Continuity





Satellite Broadband - Benefits

- 3-5 day install
- Increased bonus data time
- Demand from small business
- Reliable
- Cost efficient deployment
- Focus on rural consumers







HughesNet Survey:

- 67% of small business respondents have home-based businesses.
- 10% of small business respondents are farms.
- 30% of small business respondents operate a business like an accounting firm, law office, salon or health practice.

Common Uses:

- 1. Email and web browsing
- 2. To access business services like accounting, security monitoring and payroll
- 3. Running company website
- 4. Business social media accounts
- 5. Process credit card transactions
- 6. As back-up connectivity to another method



Satellite Broadband - Disaster Recovery and Relief



- Easy set up and removal
- Fast high-speed communications
- Short and long-term relief
- Recovery centers
- Medical
- Public safety
- Government

- Currently supporting hurricane, fire, flood and tornado relief
- Puerto Rico, Louisiana, Sonoma County, South Texas and many more locations.
- Over 250,000 hours of service donated





Satellite Broadband - Next Generation GEO 2000

- Hughes and ViaSat launch new satellites in 2022
- 8-10X more capacity
- 100/20Mps nationally
- 100% private investment
- Proven technology





Satellite Broadband - Low Earth Satellites (LEO) ...

- SpaceX, Amazon, One Web
- Lower latency
- Capacity limitations
- Requires 30,000 + satellites
- Full deployment 2027+
- 10's of Billions to deploy
- Current Status- In beta





Satellite Broadband-Future

- Telemedicine
- Smart Agriculture
- IoT
- 5G
- Continued private investment







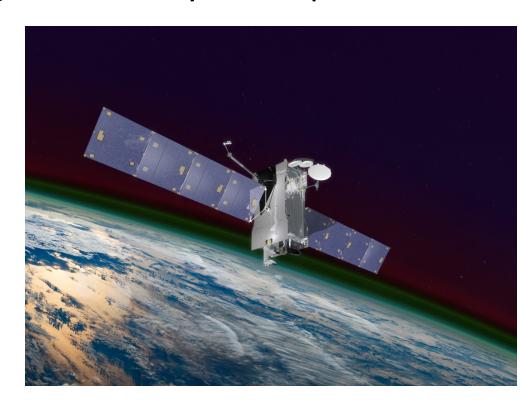
- What is the true cost for consumers to connect.
- How long does it take to build out the infrastructure?
- Is telling a consumer they will have high speed internet in 5+ years a winning strategy?
- Does everyone want the service?
- Majority of broadband traffic (82%) for video/ entertainment.



Satellite Broadband – Conclusion

Don't let the aspirational get in the way of the practical.

- Proven technology
- Most cost efficient to reach rural areas
- Targeted deployment
- Installation in days
- Continuing advancement







Questions?



The Satellite Broadcasting & Communications Association (SBCA) is the national association representing the satellite industry, including satellite broadband providers. Satellite broadband is used throughout the country, with its reach extending to rural and underserved markets that other providers do not cover. The satellite industry has therefore always emphasized the needs of rural and underserved communities.

Today Satellite broadband is currently providing high-speed internet to more than two million new and existing resident, business, and public entity customers throughout country.

Providers HughesNet- A Virtual Tour ViaSat- Who We are

Applications Broadband technology is being used for multiple applications that are needed now more than ever, including <u>telehealth</u>, distance learning/education, business continuity, agriculture, e-commerce and other standard consumer and business uses.

Technology Today satellites deliver fast, reliable download and upload speeds of at least 25/3Mbps throughout the country. In many locations, we provide significantly faster speeds.

The Future The next generation of satellites are expected to online in 2021. These new satellites will dramatically enhance speeds in excess of 100Mps, 8-10x the capacity, and improved performance for millions of homes, businesses and applications throughout the country. This significant investment by the private satellite industry will continue to enhance the consumer experience for the foreseeable future.

Reliability The satellite broadband connection is very reliable and is frequently used for redundancy and to support areas impacted by natural disasters where wireline infrastructure has been damaged.

Availability Even during times of heavy demand, consumers in need of new service are typically connected within a matter of days.

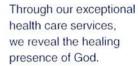
Pricing There are two satellite broadband providers that serve the market, and they offer residential and business plans that give consumers a variety of choices on speed and data, and therefore costs. There also is an optional voice feature that allows the broadband connection to be used as a traditional phone.

Data Unlike many traditional wireline connections, there are no hard data caps. If customers exceed their monthly usage threshold for their selected pricing plan, they may be prioritized behind other customers during periods of high network congestion, but their service will never be turned off. Instead, they may only experience slower speeds during this time compared to other customers who have not yet reached their usage threshold.

Free Data Both providers offer a time period during which data is free and doesn't impact a customer's data plan (typically 2:00 a.m. to 6:00 a.m.) during which customers are encouraged to schedule more dataheavy activities, such as downloading large files or running backups.

Commitment We understand the urgent need to connect communities with broadband solutions, especially rural communities, and have dedicated resources to reach these markets. To learn more about the options available to consumers and businesses please visit the websites of our providers: www.hughesnet.com and www.hughesnet.com and www.viasat.com.

Please do not hesitate to reach out to the SBCA should you have any questions. Steve Hill – President Schill@sbca.org





10101 Woodfield Lane St. Louis, MO 63132 phone: 314-994-7800

314-994-7900

Testimony to the Interim Committee on Broadband Deployment Monday, October 18, 2021

Susan Kendig, JD, WHNP-BC, FAANP Women's Health Integration Specialist SSM Health Maternal Services, St. Louis, MO Susan.kendig@ssmhealth.com; 314-629-2372

Telehealth and telemedicine interventions can improve maternal and infant health outcomes; decrease disparities in tracking high-risk conditions, such as hypertension; and increase access to prenatal, postpartum, and preventive health care. Investments in Broadband will support further deployment of successful telehealth models. The following are examples of current maternal telehealth interventions designed to improve pregnancy and postpartum health.

1. The U.S is experiencing a shortage of Maternal Fetal Medicine (MFM) physician workforce. As of 2010 there were approximately 1,355 MFM subspecialists in the U.S., with the vast majority located in urban areas.²

- SSM Health is home to the first and most robust MFM telehealth program in the region, with over a
 decade of experience. The program offers MFM consultation and higher level ultrasounds via
 telehealth in Cape Girardeau, Poplar Bluff, and Rolla, MO, and four locations throughout southern
 Illinois.
- The program uses a unique model that incorporates MFM consultation via telehealth with on the ground collaboration and support by WHNPs trained in caring for high risk patients. This model allows patients to access higher levels of care close to home.
- Over 65% of high risk patients accessing high risk maternity care via SSM Health Maternal Services telehealth program receive all prenatal and postpartum care within their community.³
- Only 4 12% of those accessing SSM Health MFM care and consultation via telehealth deliver outside of their home community at the perinatal center in St. Louis.³
- SSM Health was awarded a USDA Distance Learning and Telemedicine Program (USDA DLT) grant
 which will expand MFM consultation and higher level obstetric ultrasound access to families
 throughout southeast Missouri. This program will place specialized telehealth and ultrasound
 equipment in three facilities in the Bootheel, extending services to Dunklin, Pemiscot, New Madrid,
 and Mississippi Counties; and two additional FQHC based sites in Poplar Bluff and Ellington, MO.
 We will begin to roll this out throughout the end of 2021 and into first quarter 2022.

¹ Society for Maternal-Fetal Medicine. Telehealth: Opportunities to increase access to quality health care and advance equitable maternal health. (Dec. 2020); DeNicola, N., Grossman, D., Marko, K., et al. Telehealth interventions to improve obstetric and gynecologic health outcomes. Obstet & Gynecol 2020;135(2):371-382

² Rayburn, WF, Klagholz, JC, Elwell, EC, & Strunk, AL. Maternal-Fetal Medicine workforce in the United States. American Journal of Perinatology. 2012; 29(9):741-746.

³ SSM Health Maternal Services Data. (2021).

- 2. Nationally, rural residents have a greater probability of experiencing severe maternal morbidity and mortality. The HRSA funded Rural Maternity and Obstetric Management Strategies (RMOMS) programs seek to improve access to and quality of maternity care in rural communities through creation of a perinatal system of care that includes leveraging telehealth to expand access to specialty care.
- Of the six RMOMS awards issued between 2019 and 2021, two have come to Missouri. The Bootheel Perinatal Network (BPN) (fiscal agent St. Francis Health Center), awarded in 2019, covers Dunklin, Pemiscot, Mississippi, New Madrid, Scott, and Stoddard counties. RMOM-Southeast Missouri Partnership (RMOM-SMP) Network (Fiscal agent Big Springs Medical Association, Inc., d/b/a Missouri Highland Health Care), awarded in 2021, serves Butler, Carter, Iron, Reynolds, Ripley, Shannon, and Wayne counties. These two awards address thirteen contiguous counties in areas affected by gaps in access to obstetric and specialty providers, and some of the highest rates of maternal and infant mortality and morbidity in the state.
- A portion of each RMOMS award is dedicated to supporting telehealth capabilities in the respective regions. BPN is using funding to improve technology to enhance communications and digital diagnostics between provider practices and the Level 2 Perinatal Center in Cape Girardeau.
- The SSM Health USDA DLT grant is separate, but synergistic to the RMOMS projects in each
 catchment area and will provide the higher level technologies to expand telehealth access to maternal
 fetal medicine specialists, diabetes educators specializing in high risk pregnancy, and genetic
 consultation to five additional sites in the regions.
- 3. Cardiovascular conditions contribute to maternal deaths during pregnancy and the first postpartum year. ⁵ Blood pressure (BP) assessment, a key component of prenatal and postpartum care, is an early marker of cardiovascular risk. Remote BP monitoring increases access to care and early detection of risk.
- During 2020, Missouri's Perinatal Learning Action Network (Perinatal LAN), led by MHA, participated in the Preeclampsia Foundation's "Cuff Kit Project", which provided blood pressure cuffs and standardized instructions to patients for use with telehealth assessments.
- The program, with \$150,000 funding from Missouri Foundation for Health, provided 2,998 Cuff Kits to patients throughout Missouri.
- Cuff Kits were distributed by partnering health care providers and agencies, including: the thirty-four organizations participating in the Missouri AIM Severe Hypertension in Pregnancy Collaborative, FQHCs, the Bootheel RMOMS grant partners, community clinics, and maternal-child home visitors.
- Participating providers report high satisfaction with the program, increased access, and participation
 in care during the pandemic, and early identification of high-risk conditions requiring immediate in
 person intervention.⁶

In summary, internet access is uneven or non-existent in many parts of Missouri, with those living in rural and remote areas most affected. Broadband infrastructure and enhancements are necessary to operationalize obstetric telehealth services.

⁴ Kozhimanil, K.B., Interrante, J.D., Henning-Smith, C., & Admon, L. K. Rural-urban differences in severe maternal morbidity and mortality in the US, 2007-2015. Health Affairs 2019; 38 (12):2077-2083.

⁵ Missouri Pregnancy Associated Mortality Review 2018 Annual Report. Missouri Department of Health and Senior Services. (June 2021).

⁶ MHA. COVID-19 and Severe Maternal Hypertension: Use of the Cuff Kit Project to Address Disparity. Presentation, Feb. 11, 2021.



November 24, 2021

Representative Louis Riggs Missouri House of Representatives

The Honorable Louis Riggs,

Re: Cost of Fiber verses the Cost of Fixed Wireless

During our testimony the question was raised: "What is the cost per mile for Fixed Wireless" The answer should be viewed from two different perspectives:

- A. The engineering costs ----verses
- B. The social and economic costs

The engineering costs are significantly less in the short-run on a per mile bases, if measurable at all. On our analysis for the FCC formulas, the FCC looked at engineering costs to the Provider to "Provide the greatest amount of coverage for the least amount of federal dollars spent"

The FCC did not look at the Economic side of the equation. Economics is what is missing.

However, when spending tax-payer dollars the legislative branch typically would look at

- A. The 10-year projections
- B. The long run impact of social and economic impact on its citizens

Provider Cost verses Cost to the End User—the consumer

- A. All the FCC funding for broadband has been based on the cost to the broadband provider.
- B. The FCC funding does NOT consider the cost to the consumer of rural America
 - a. The formulas were based upon an Urban survey not a rural survey
 - b. The formulas do not take into account the speeds paid for verses the actual speeds received by the end user—the customer consumer
 - c. The formulas do not take into account the Long-run social and economic costs to
 - i. The consumer—both short-run and long run
 - ii. The Government long term investment
 - 1. Currently a continual need to upgrade fixed wireless
 - a. For replacement costs
 - b. For consumer demand for greater speeds

Another way to view the costs from an economic perspective is:

REPLACEMENT COSTS of Fixed Wireless verses Fiber Optic

Engineers in the field of broadband that have experience in both have provided the best estimate:

- A. Fixed Wireless--Five years or less for replacement of fixed wireless equipment
 - a. The equipment wears out due to various reasons including the exposure to the elements
 - b. The equipment is quickly outdated due to the rapidly changing technology
 - c. The customers demand greater speeds that cannot be offered by the fixed wireless
- B. Fiber Optic--50 to 75 years for replacement and upgrades of fiber optic
 - a. Some engineers claim the glass fiber optic line never needs to be replaced.

- b. The engineers claim that only the sending equipment in the huts need to be upgraded to keep up with the growing demand for higher speed fiber
- c. The greatest cost of laying fiber is the cost of the physical laying of fiber not the cost of fiber or its equipment in the huts

Misconception about Fixed Wireless and Cell Towers

Cell Towers:

- A. The general public is not aware that for every cell tower, a fiber optic line is needed at the cell tower
- B. This is another way to conduct mapping of fiber optic lines throughout the state

Fixed Wireless

- A. The main tower for sending radio frequency signals to fixed wireless antennas requires a fiber optic line to the "main home base" of the fixed wireless unit
- B. Each of the "repeater fixed wireless antennas" placed on grain elevators etc. that then send the radio frequency to the homes do NOT have fiber at their locations.

We look forward to more conversations and ways that we can assist the legislative process to make the most effective and efficient use of federal and state broadband dollars for rural Missouri citizens. Please keep in mind, the same economic models and analysis for rural Missouri can be applied to low-income communities in the major cities.

Sincerely,

Keith and Abner



November 23, 2021

Representative Riggs,

On behalf of Abner and myself, thank you for the opportunity to present some of our broadband research to the committee. We were pleased with the response from the committee members and are available to answer more questions when asked.

The topic of pilot projects was brought up during our testimony. The attached information we believe will be a summary of some of the key points from our presentation yesterday. These areas seemed to spark an interest from the committee so we wanted to make a shorter version for you and the committee.

Keith and Abner



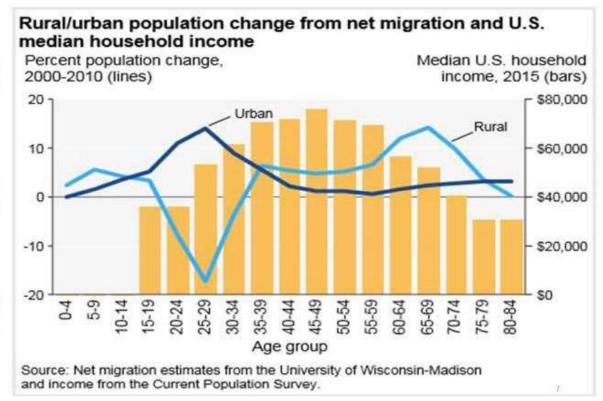
PILOT PROJECTS--OPTIONS FOR CONSIDERATION PRIOR TO DISTRIBUTION OF BROADBAND DOLLARS

- 1. Conduct an economic feasibility report on the social and economic impact of broadband on out-migration--for each region of Missouri
- 2. Conduct an economic feasibility report on the social and economic impact and lack of broadband on rural education and schools--for each region of Missouri
- 3. Update middle mile--Fill in areas missing on maps of "middle mile" broadband providers in the state
- 4. Conduct a pilot project developed around measuring the social and economic consequences associated with current levels of broadband services
 - a. the measuring of in-migration due to reliable, high broadband speeds at affordable rates
 - b. the measuring of out-migration due to slow speeds, unreliable broadband
- 5. Create a Formula to distribute Missouri rural broadband dollars in a fair and equitable manner
 - a. Minimum standards
 - b. consideration of consumer rates, speeds, reliability and quality of service
 - c. long-run longevity, robust broadband system
 - d. symmetrical broadband speeds
- 6. Develop methodology based on economics for Due Diligence of recipients of federal and state rural broadband dollars for legislative oversight
 - a. prior to bidding process, verification of capabilities of broadband providers technical capability to provide the service speeds in the area of which the company is bidding for state and federal \$
 - b. winning bidders must show proof of technical capability prior to receiving broadband dollars
 - c. with-in three years show proof of a pre-determined percentage of project completion
 - d. Track results-- economic development based on econometric analysis—a measured amount of social and economic growth associated with broadband service and cost in real time
- 7. Develop a methodology based on economics for accountability of recipients of federal and state rural broadband dollars for legislative oversight
 - a. based on economics, the goal of long-term, best use of federal and state broadband dollars
 - b. goal of eliminating cherry-picking
 - c. goal of closing the digital divide, providing robust, high-speed, affordable rural broadband
 - d. goal of spurring the deployment of up to gigabit speed broadband network to rural Missouri
 - e. goal of using state and federal rural broadband dollars to Missouri citizens who need broadband to start a business, expand their business, educate a child, grow crops, raise livestock, get access to tele health, and provide robust, high-speed, affordable, reliable broadband to rural Missouri

CAFNR DEEDP
Question:
How can rural
Missouri stop the
out-migration of
our younger
generation?

CAFNR DEEDP Question: Can high speed broadband be an answer to stop out-migration?

CAFNR DEEDP
Question:
Can the Midwest
compete with
the East Coast /
West Coast to
stop outmigration?



MU CAFNR's Dynamic Econometric Development Program (DEEDP) Eisberg / Womack 2019

HOW MUCH INVESTED IN THE 20 - 22 YEAR OLDS THAT MIGRATE TO OTHER STATES? BY AGE 22 \$500,000/child

Cost of raising a child to age 18 \$14,000/yr/child \$252,000.

Federal/State/ Local \$ spent K-12 \$12,500/yr/child \$162,000.

Total Money Invested to Age 18 \$400,000.

Add 4 Yr College Federal Money \$5,000/yr/child

Add 4 Yr family \$ cost College \$20,000/yr/child

With College Total Money Invested to Age 22 \$500,000.

 HUMAN EQUITY LOST TO OUT-MIGRATION: \$400,000. to \$500,000 / person

AgriExperts ECONOMIC FEASIBILITY REPORT BOOTHEEL RPC COST OF OUT-MIGRATION OVER LAST 10 YEARS UNDER FOLLOWING ASSUMPTIONS: LOSS OF HIGH SCHOOL GRADUATES Assume all out-migration from each county were high school graduates. Using Federal cost per student data: **Total Loss Out-migration Cost Per Student** County (\$1,468,000,000) **Dunklin** -3670 \$400,000 \$400,000 (\$712,400,000) Mississippi -1781 **New Madrid** (\$1,008,800,000) \$400,000 -2522 **Pemiscot** -2635 \$400,000 (\$1,054,000,000) (\$452,800,000) **Scott** -1132 \$400,000 Stoddard (\$518,400,000) -1296 \$400,000 \$400,000 (\$5,214,400,000) **Bootheel Total** -13036 100% of total (\$5,214,400,000) 50% of total (\$2,607,200,000.0) (\$521,440,000.0) 10% of total 1% of total (\$52,144,000.00)



ECONOMIC FEASIBILITY REPORT BOOTHEEL RPC

COST OF OUT-MIGRATION ASSUMING LOSS OF FAMILIES

<u>ADDITIONAL SCENARIOS</u> for the BOOTHEEL Region

Assume all leaving the counties were a family of 4 making \$38,000. per year \$38,000 is the average income for the 6 counties

A total of 2,338 individual households left the region in the last 10 years

Assuming a family of 4 implies that 585 families left the region

Over the 10-year period, 585 X \$38,000 equals a loss of \$22,230,000.

If only 50% (293) left the region, the loss would be around \$11,115,000.

If only 25% (146) left the region, the loss would be around \$5,557,500.

Compare these numbers to the cost of investing in high-speed fiber for the counties to stop out-migration.



IMPACT OF FIBER ON RURAL EDUCATION

BY: LONNIE THOMPSON, EDUCATIONAL CONSULTANT WITH AGRIEXPERTS AND FORMER SUPERINTENDENT

DIRECT LEARNING OUTCOMES OF PROVIDING FIBER ACCESS TO RURAL AREAS OF MISSOURI

- a) Enhanced academic support during Covid restrictions
- b) Enrollment in dual credit classes/college direct courses
- c) Individualized academic support between student and teacher
- d) Extended instructional and credit recovery during summer
- e) Enriched performance assessment activities and programs
- f) Access to non-traditional outside academic vendors
- g) Developing research competences and thus expanding the capacity of students to understand complex tasks
- h) Enriched academic and intellectual curiosity resulting in greater productivity throughout life.
- i) Creating additional support for professional and occupational advancement for staff and students

INDIRCT AND LONG-TERM RESULTS OF PROVIDING FIBER ACCESS TO RURAL AREAS OF MISSOURI

- a) Enhanced support and access to local, state, and national accountability standards or testing
- b) Increased accessibility to appropriate student and school information for parents and patrons

SCHOOLS BROADBAND SURVEY BOOTHEE	DATA Sources: MOOREnet / Schools / ISP providers 2021
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34 Bloomfield R-XIVNEW ISF Stoddard Bloomfield SEMO 1000 1000 \$ 375 Fiber NEW ISP SEMO	\$	0.38	\$21.04									
35 Puxico R-VIII Prior ISP Stoddard Puxico MOREnet 375 375 500 \$ 1,063 Fiber AT&T Prior ISP	\$	2.83										
36 Puxico R-VIII NEW ISP Stoddard Puxico SEMO 1000 1000 \$ 375 Fiber NEW ISP SEMO		0.38	\$ 2.46									
37 If these numbers do not change for the rest of the year total estimated savings are estimated to												

	М	N	0	Р	Q	R	S	Т	U	V	W	Х
	Savings	Savings	Savings/Mb	Circuit Cost		Net Circuit	MOREnet	MOREnet	City of the			
1	Per mo.	Per Year	used with	Morenet Lease	Less E-Rate	Cost (MRC)	NCF (MRC)	Total Cost	School	Aar	iExp	erts
2	on Bill	On Bill	Inreased Mb	\$ 175.00		\$ 175.00	\$ 886.67	\$1,061.67	Campbell	, 19	יבאף	0, 10
3					\$ 541.02	\$ 73.98	\$ 468.67	\$ 542.65	Holcomb			
4	\$ 115	\$ 1,380	\$ 6,613			\$ -		\$ -	Holcomb	ECONOM	IC FEASIBIL	ITY REPORT
5				\$ 342.00		\$ 342.00	\$2,293.33	\$2,635.33	Kennett		BOOTHEE	RPC
6				\$ 462.52	\$ (370.02)	\$ 92.50	\$ 125.00	\$ 217.50	Clarkton			
7				\$ 274.00		\$ 274.00	\$ 886.67	\$1,160.67	Malden			
8					\$ 347.76	\$ 586.94	\$2,869.33	\$3,456.27	Senath			
9	\$2,906	\$34,872	\$ 30,609			\$ -		\$ -	Senath			
10				\$ 645.80	\$ (503.72)	\$ 142.08	\$ 886.67	\$1,028.75	East Prairie		Dark Fiber	
11				\$ 552.99	\$ (486.63)	\$ 66.36	\$ 319.25	\$ 385.61	Gideon		AgriExperts	Added Data
12				\$ 175.00		\$ 175.00	\$ 886.67	\$1,061.67	New Madrid			
13						\$ -		\$ -	Portageville		MOREnet A	dded Data
14				\$ 175.00		\$ 175.00	\$ 319.25	\$ 494.25	Risco		MOREnet A	dded Data
15						\$ -		\$ -	Caruthersville			
16				\$ 274.00		\$ 274.00	\$ 741.33	\$1,015.33	Cooter			
17					\$ 296.14	\$ 48.21	\$ 295.82	\$ 344.03	Hayti			
18	\$ (206)	\$ (2,468)	\$ 33,546						Hayti			
19				\$ 175.00		\$ 175.00	\$ 468.67	\$ 643.67	Hayti			
20				\$ 274.00		\$ 274.00	\$ 468.67	\$ 742.67	Caruthersville			
21				\$ 175.00		\$ 175.00	\$ 886.67	\$1,061.67	Scott City			
22				\$ 328.73		\$ 328.73	\$2,625.33	\$2,954.06	Sikeston			
23						\$ -		\$ -	Chaffe			
24				\$ 175.00		\$ 175.00	\$ 468.67	\$ 643.67	Benton			
25				\$ 274.00		\$ 274.00	\$ 741.33	\$1,015.33	Sikeston			
26				\$ 585.21	\$ (468.17)	\$ 117.04	\$ 886.67	\$1,003.71	Benton			
27	\$ 629	\$ 7,548	\$ 1,439						Benton			
28				\$ 175.00		\$ 175.00	\$ 886.67	\$1,061.67	Dexter			
29	\$1,792	\$21,504	\$ 3,377						Dexter			
30					\$ -	\$ 841.00	\$ 741.33	\$1,582.33	Advance			
31	\$ 466	\$ 5,592	\$ 2,242						Advance			
32				\$ 573.58	\$ (458.86)	\$ 114.72	\$ 319.25	\$ 433.97	Bell City			
33					\$ 361.17	\$ 67.08	\$ 196.17	\$ 263.25	Bloomfield			
34	\$53.25	\$ 639	\$ 20,617						Bloomfield			
35				\$ 880.79	\$ (704.63)	\$ 176.16	\$ 886.67	\$1,062.83	Puxico			
36	\$ 688	\$ 8,256	\$ 1,537						Puxico			
37	_	\$77,323										
<u> </u>				1		L			I			



- 1. From the analysis of our survey and respondents, there are indicators that out-migration is occurring in areas of yellow-in our table of internet service providers. The yellow coded areas stand for slow speed broadband at a relatively high price compared to the speeds and reliability being provided.
- 2. From the analysis of our survey and respondents, there are indicators that in-migration is occurring in the areas of green in our table of internet service providers. The green coded areas stand for high-speed fiber broadband at a relatively low price compared to the speeds and reliability being offered.
- 3. From our analysis and survey, there are indicators that Internet Service Providers delivering high-speed fiber internet are seeing In-migration patterns into the areas of fiber broadband expansion.
- 4. From our analysis and survey, real estate agents claim that their million-dollar homes in rural Missouri are not selling in 2021 because the houses do not have high-speed fiber internet.
- 5. From our analysis and survey, claims made by Internet Service Providers (ISPs) that during and after the Covid Pandemic, a greater number of people are demanding high-speed fiber in their homes because their office now allows them to work from home.
- 6. From our analysis and survey, claims by ISPs often overstate their coverage of internet service in areas where in actuality the ISP has NO service. This is an overstatement of coverage that has a negative impact on additional FCC federal funding limiting new sources of broadband expansion.
- 7. From our analysis and survey of schools and residential survey respondents we have learned that many people in the Bootheel do not have enough internet speeds at their homes for their children to do their homework.
- 8. From our analysis and survey of schools and residentials, indicated that children at school have fiber optics and are now seeing the difference in opportunities when high-speed fiber is available.
- 9. From our analysis and survey, there are indicators that people are moving into areas of high-speed internet and leaving areas of slow speed internet
- 10. From our analysis and survey, comments were made by respondents that if people in the region had high-speed broadband their company would allow them to work from home saving them travel time, money, and quality time with their families.
- 11. From our analysis and survey, we have found that people in neighboring counties that have high-speed fiber are working from home and claim greater efficiency for work and all the other benefits that come from working at home.
- 12. From our analysis there are some comparative advantages of quality of life, living expenses and the median value of homes in the Bootheel region that could be a drawing card for In-migration when high-speed fiber optic internet is available.
- 13. Federal dollars in the amount of \$7.1 Billion are now available for broadband via schools through the Emergency Connectivity Fund, in the American Rescue Plan passed by the US Congress in March 2021. Working with forward-thinking internet service providers (ISPs) these funds could be used for broadband expansion in the Bootheel region. AgriExperts and the Bootheel RPC have informed schools and their respective ISPs working with the schools to take advantage of this one-time opportunity for broadband expansion.
 - a. Schools can be a key to economic development and broadband expansion for reasons laid out later in our report on schools and their broadband connectivity.
 - b. Schools have fiber internet connections at their physical buildings
 - c. Students when they go home do not have fiber connections in the majority of the Bootheel RPC region. This trend will have an impact on Out-Migration.

NOTE:

CAFNR BROADBAND SURVEY SUMMARY

This survey, by the College of Agriculture Food and Natural Resources (CAFNR) at the University of Missouri beginning in 2018, was conducted to determine the likely rural economic and social consequences associated with fiber broadband providers that received FCC funding in the open bidding process in 2018. Seven Electric COOPs in Missouri received federal support funding and represent the survey base- 2 in northern Mo., 2 in Mid Mo and 3 in Southern MO.

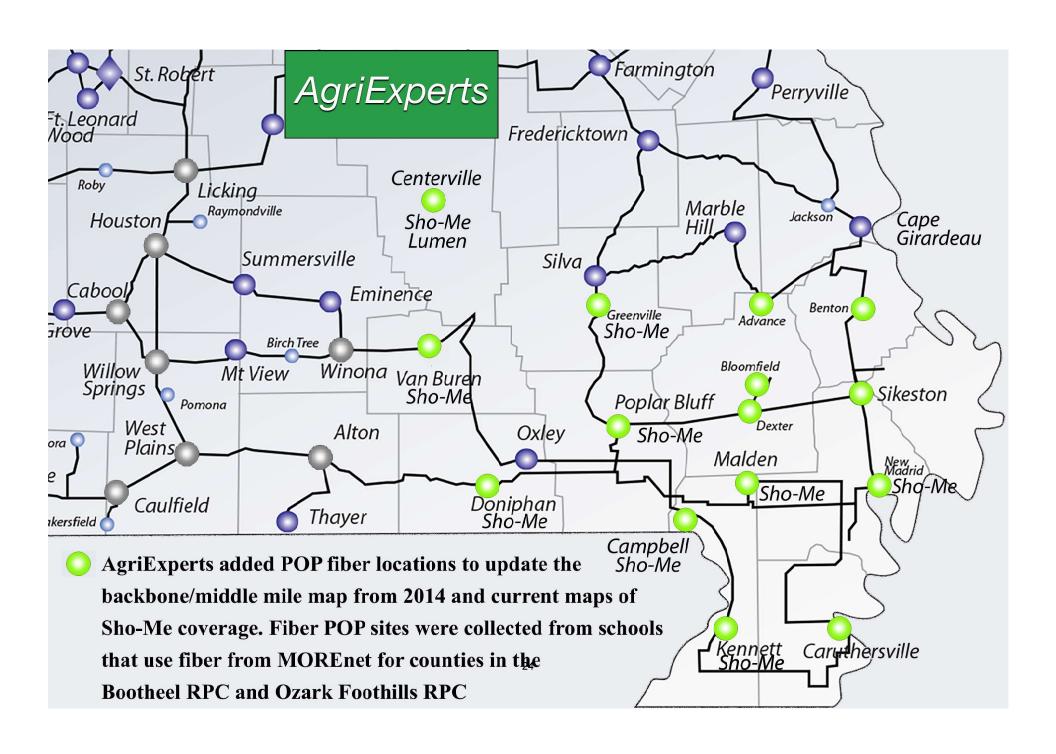
NOTE

Survey results indicates that fiber broadband providers with service of 1000 Mbps download and 1000 upload speeds at rates to consumers much lower than other competitors is likely to be one of the major reasons for finally reversing the outflow of businesses and individuals from rural areas.

An overview of the study includes:

- Two schools in southern MO saved \$42,000 per year
- One Cotton Gin saved \$4,000 per month
- New homes in North East MO increased in value \$7000 with fiber
- Tele Med minimized in- home health care cost
- Increases in start-up businesses, business expansion and recruitment
- Reduction in out-migration and migration increases
- Enhances home employment and remote employment
- Community support via streaming church services and social events

University of Missouri /CAFNR/Dynamic Econometric Economic Development Program (DEEDP) Womack / Eisberg 2020



	А	В	С	D	E	F (G H	I	J	K	L	М
1												
2	BOOTHEEL	•	Ac	ariF	=x	erts						
3	RESIDENTI	AL ISPs	7 18	<i>,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				COLOR CO	DDES BROA	DBAND PRO	OVIDERS:	
4										nigh speed pr		
5	BOOTHEEL RE	C FEASIBILITY	REPORT						•	for relatively		
6	A. BROADBA	ND PROVIDER P	PACKAGE	S BOOT	HEEL RP	C AREA		Yellow= Sa	tellite/Fixed	l Wireless/Co	pper Cable	
7									slow speed	for relatively	y high price	
8	B. SURVEY DA	ATA BROADBAN	D COSTS	& SPEE	DS ACTU	ALLY RECE	IVED					
9								SURV	EY AVERAGI	E <u>S</u>		
10			A. RES		AL PACKA	GES	B. RESI	DENTIAL SPE	EDS ACTUA	LLY RECEIVED	<u> </u>	
	COMPANY	BROADBAND	DOWN	UP	Internet		Survey	Survey	Survey	Survey	Survey	Available
12		TYPE	LOAD	LOAD	COST		Custome	r Customer	Customer	Customer	Average	Locations
13			Mbps	Mbps	Per Mo.			Ave. Actua			Residential	of ISP's
14								d Download	•	Upload	Internet Bill	
15			DOWN	UP	\$		Paying Fo	or Receiving	Paying For	Receiving	Per Month	
16			<u>Mbps</u>	<u>Mbps</u>	<u>Per Mo.</u>		<u>Mbps</u>	<u>Mbps</u>	<u>Mbps</u>	<u>Mbps</u>	<u>\$</u>	
17			6	1	\$45							
	ATT Packages		8	1	\$80							
19		Cable	12		\$130		30	8	3	0.73	\$63	Regional area
20			50		\$200		•					
21			100		\$300							
22												
23	Century Link	Copper	1.5		\$45							
24			5		\$50		5	1.12	1	0.22	\$50	Regional area
25			10	5	\$55							
26	_						_					
	Ozark	Fixed Wireless	3	1	\$50		10	7	1	0.5	\$49	Bootheel
	Country		6	1	\$65							Ozark Foothills
29			9	3	\$80							
30				_			_					
	BPS	DSL Cable	25	3	\$90							
32			25	5	\$95							
33			50	10	\$105							

	А	В	С	D	Е	F	G	Н	I	J	K	L	М
34													
	BPS	Fixed Wireless	1.5	1	\$45			5	1.75	5	0.32	\$68	
36			2	1									Bootheel
37			4	1	\$55								Ozark Foothills
38			6	1	\$65								NE Arkansas
39			10	1	\$85								
40			10	2	\$100								
41			25	3	\$125								
42			25	5	\$135								
43													
	Earthlink	Cable	7	1	\$50								Bootheel
45			15	2	\$55								
46													
47	Mo-Ark	Fixed Wireless	3	0.256									Bootheel
48													NE Arkansas
49													
	Blue Mule	Fixed Wireless	3	1	\$50								
51			6	1	\$50								Regional
52			12	3	\$75								Bootheel
53			24	3	\$100								Ozark Foothills
54					4								
	King Street	Fixed Wireless	1	0.256	\$50								Bootheel
56			12	2	\$60								and Regional
57			12	2	\$70								25 states
58	\('	Catallita	12		60=								Daniamal
59	Viaset	Satellite	12		\$85								Regional
60 61			25		\$120								
62			30		\$170								
	Hughes	Satellite	10		\$60								
64	nugnes	Satemite	20		\$60 \$70								
65			30		\$100			25	3	5	2.11	\$125	Pogional
66								25	5	5	2.11	\$125	Regional
66			50		\$150								

	Α	В	С	D	Е	F	G	Н	I	J	K	L	М
67													
68	Verizon Cell	Cell phone	5	N/A	\$200			N/A	5.32	N/A	0.11	\$200	Regional
69	for Internet												
70													
71	Windstream	Copper/Cable	50		\$70								Regional
72	Windstream	Copper/Cable	100		\$80			22	11	8	3.48	\$84	
73													
74	Big River	Fixed Wireless	10	0.005	\$50								Bootheel
75			10	1	\$70			10	8	1		\$70	Ozark Foothills
76			10	1.5	\$100								Dunklin Scott Co
77													
78													
79	City Kennett	Fiber	3	3	\$20								
80	City Owned L	Itility	6	6	\$25								City of Kennet
81			12	12	\$30								only
82			16	16	\$40								
83			25	25	\$50								
84			50	50	\$65								
85			100	100	\$85								
86													
	Sparklight /	Cable DSL	100	10	\$55								
88	Cable One		200	20	\$65								Bootheel areas
89			300	30	\$80			300	137	44	22	\$97	Ozark Foothills
90			1000	50	\$125								
91			(1 Gbps										
92											_		_
	GoSEMO	Fiber	100	100	\$50		Ш	100	110	100	110	\$50	Expanding
	(SEMO		1000	1000	\$80		Ш	1000	940-1000	1000	940-1000	\$80	Stoddard Co
	Electric Coop		(1 Gbps	(1Gbps)				GoSE	MO "overpr	ovision' to	ensure full sp	eeds	
96	_				4								
	Pemiscot	Fiber	100	100	\$50		Ш	100	110	100	110	\$50	Expanding
	Dunklin		1000	1000	\$80		Ш	1000	940-1000	1000	940-1000	\$80	Dunklin Co
99	Pemiscot Dunklin Fiber "overprovision' to ensure full speeds												

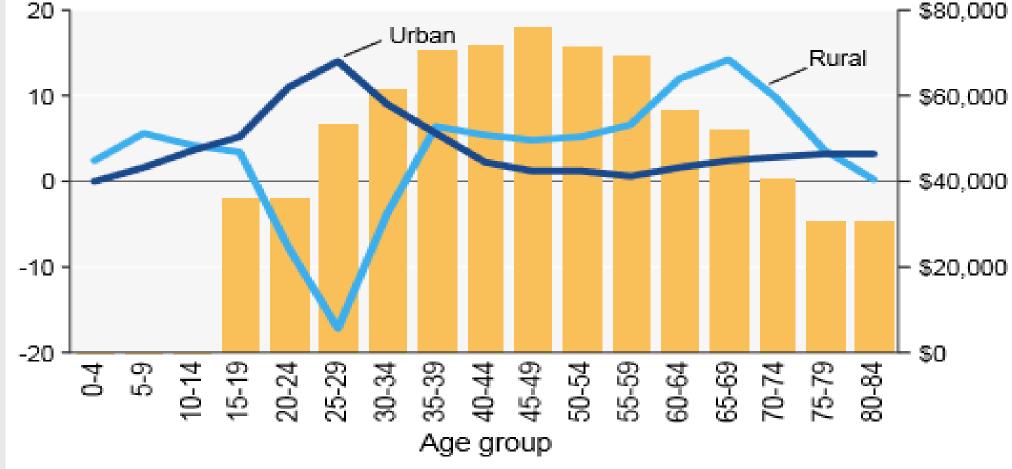
CAFNR DEEDP Question: How can rural Missouri stop the out-migration of our younger generation?

CAFNR DEEDP
Question:
Can high speed
broadband be an
answer to stop
out-migration?

CAFNR DEEDP
Question:
Can the Midwest
compete with
the East Coast /
West Coast to
stop outmigration?

Rural/urban population change from net migration and U.S. median household income

Percent population change, 2000-2010 (lines) Median U.S. household income, 2015 (bars)



Source: Net migration estimates from the University of Wisconsin-Madison and income from the Current Population Survey.

1

HOW MUCH INVESTED IN THE 20 - 22 YEAR OLDS THAT MIGRATE TO OTHER STATES?

BY AGE 22 \$500,000/child

```
• Cost of raising a child to age 18 $14,000/yr/child $252,000.
```

- Total Money Invested to Age 18
- Add 4 Yr College Federal Money \$5,000/yr/child
- Add 4 Yr family \$ cost College \$20,000/yr/child
 - With College Total Money Invested to Age 22

• HUMAN EQUITY LOST TO OUT-MIGRATION: \$400,000. to \$500,000 / per person

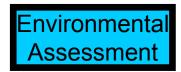
\$400,000.

\$500,000.

FAPRI ANALYTICS



International, National, and Regional Economic Assessment

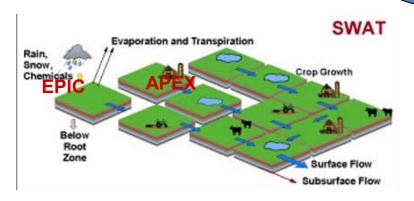


Integrated
Analytics

Grain

Representative Farm Economics

Livestock



Prices
Prices
Farm Income Risk Assessment

Why We Do It? National Farm Policy Objectives

Maintain adequate net farm income for livestock and crop farmers

Maintain an adequate <u>food supply</u> at reasonable prices

Maintain a competitive trade position

Programs must enhance environmental and conservation quality

Maintain a viable <u>input</u> industry

Adequate <u>reserves</u> in the event of crop production problems Complementary to <u>rural development</u>

Achieve all objectives at the least government cost

University has a neutratility position on policy options evaluated

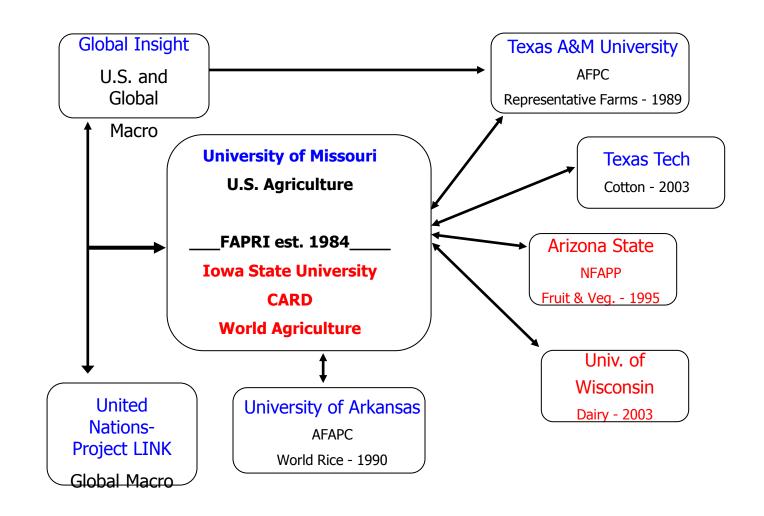
The Economy and the Baseline

The baseline is strongly affected by what is happening in the general economy:

Income growth here and abroad
Interest rates and inflation
Exchange rates
Inflation rates
Energy prices
Agricultural input costs

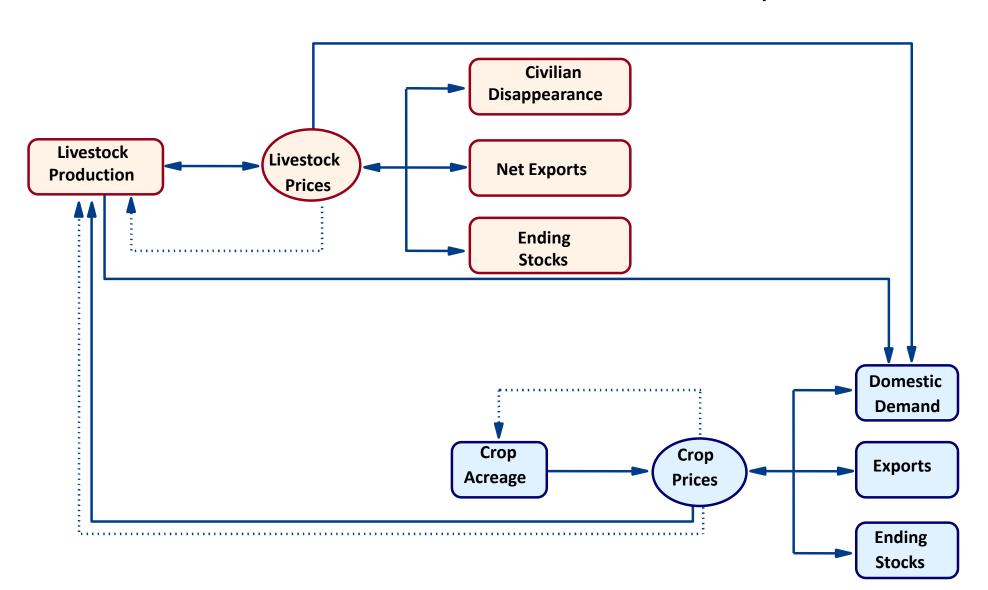


FAPRI-Missouri - Consortium



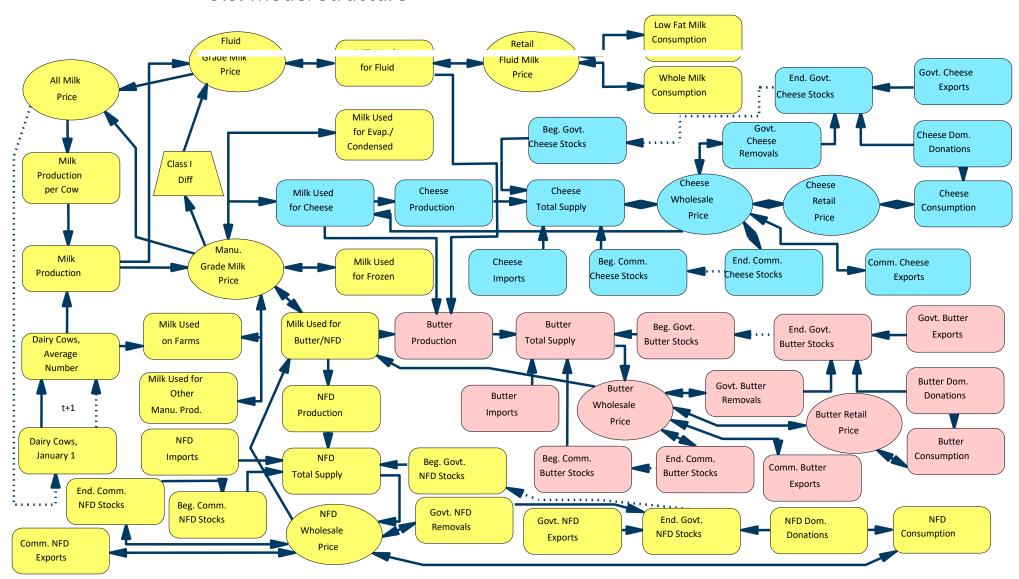
U.S. Model Structure

Interaction Between the U.S. Livestock and Crop Models



United States Dairy Flow Diagram

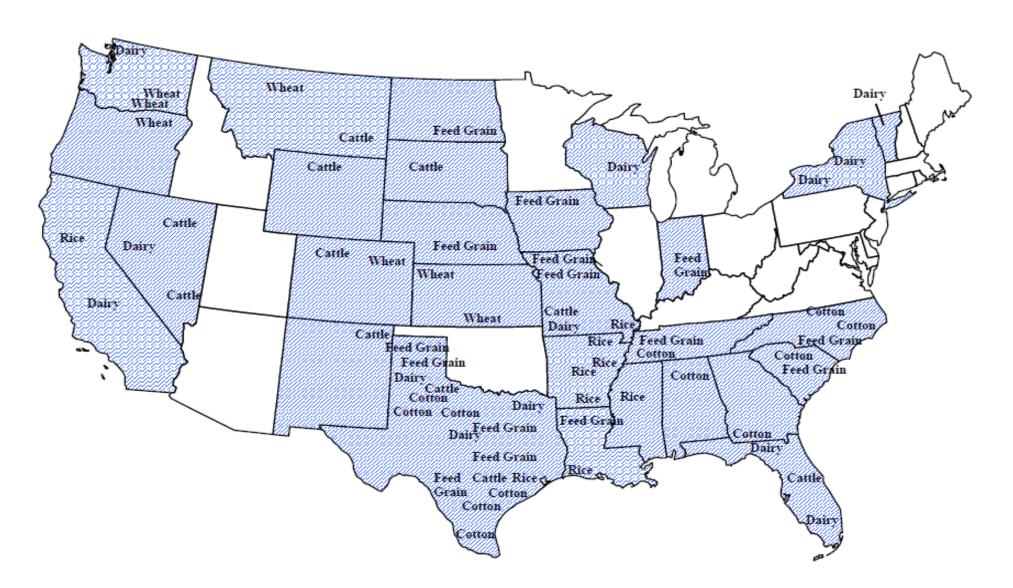
U.S. Model Structure



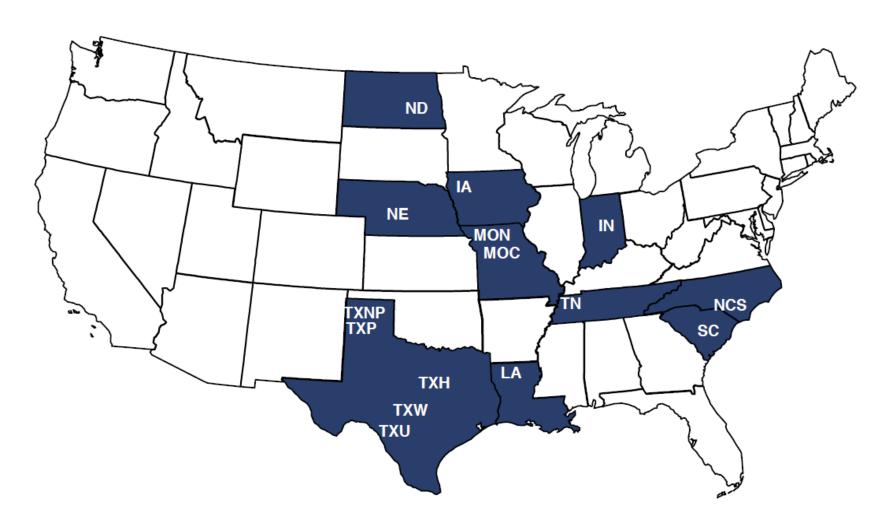
Discussions with DC staff regarding Broadband expansion into rural areas in Missouri

Possibility of building dynamic business econometric models for the CO OP industry? Similar to the Rep Farm system? 10 year projection capabilities? Enough CO Ops to get a State profile? Linkage to the general economy and FAPRI projections? Estimated longer run consequences of different levels of Federal and State subsidies per CO OP?

Figure 1. Representative Farms and Ranches



• Eleven of the twenty-two farms will be under severe cash flow stress; eleven farms also have high likelihoods (greater than a 50 percent chance) of losing real net worth.



Characteristics of Panel Farms Producing Feed Grains, 2016.

Representative Farm: Feed Grains

Economic Viability of Representative Farms over the 2017-2021 Period	ı
--	---

Farm Name	Overall	Ranking	P(Negative Ending Cash)	P(Real Net Worth Declines)
7/4/11	2017	2021	2017-2021	2017-2021
IAG1350			99-98	99-98
IAG3400			25-41	51-57
NEG2400			62-69	65-65
NEG4300			94-89	97-90
NDG3000			84-72	80-72
NDG8000			58-42	92-61
ING1000			68-62	37-40
ING2200			98-94	95-83
MOCG2300			14-2	2-1
MOCG4200			1-1	1-1
MONG2300			9-24	8-10
LANG2500			99-99	99-99
TNG2500			75-53	57-42
TNG4500			1-2	1-1
NCSP2000			99-98	92-98
SCG3500			28-5	9-1
TXNP3450			1-1	1-1
TXNP10640			1-1	1-1
TXPG2500			48-34	9-5
TXHG2700			99-99	99-99
TXWG1600			99-99	99-99
TXUG1600			4-33	4-18

¹ Viability is classified as good (green), moderate (yellow), and poor (red) based on the probabilities:

Implications of the January 2017 FAPRI Baseline on the Economic Viability of Representative Farms Primarily Producing Feed Grains and Oilseeds

² P(NegativeEnding Cash) is the probability that the farm will have a cash flow deficit. Reported values represent the probabilities for 2017 and 2021.

³ P(Real Net Worth Decline) is the probability that the farm will have a loss in real net worth relative to the beginning net worth. Reported values represent the probabilities for losing real net worth from 2014 to 2017 and from 2014 to 2021.

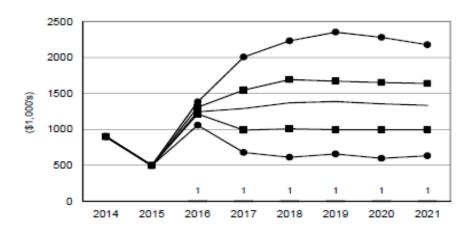
Figure 6. Net Cash Farm Income and Probabilities of a Cash Flow Deficit: Feed Grain and Oilseed Farms

— Average NCFI - 25 & 75 Percentile NCFI - 5 & 95 Percentile NCFI SSS Prob. of Cash Flow Deficit

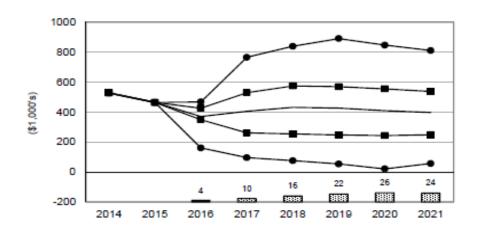
MOCG2300 Central Missouri Grain Farm

(\$1,000's)

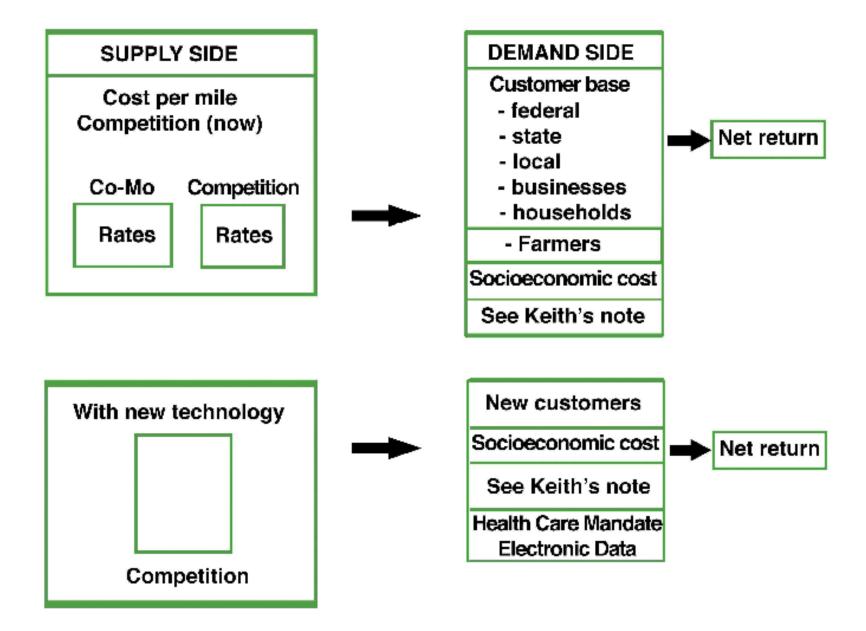
MOCG4200 Large Central Missouri Grain Farm



MONG2300 Northwest Missouri Grain Farm



Co-Mo BROADBAND



(1.) First Task (Select 1 Base- Pilot CO OP); Working with Director, Board & Staff Supply Side Data Collection - Financial Track Record & Other Sources

Past 20 years — Electronic?

- 1. Supply side- significant costs

 Major categories over last 20 year

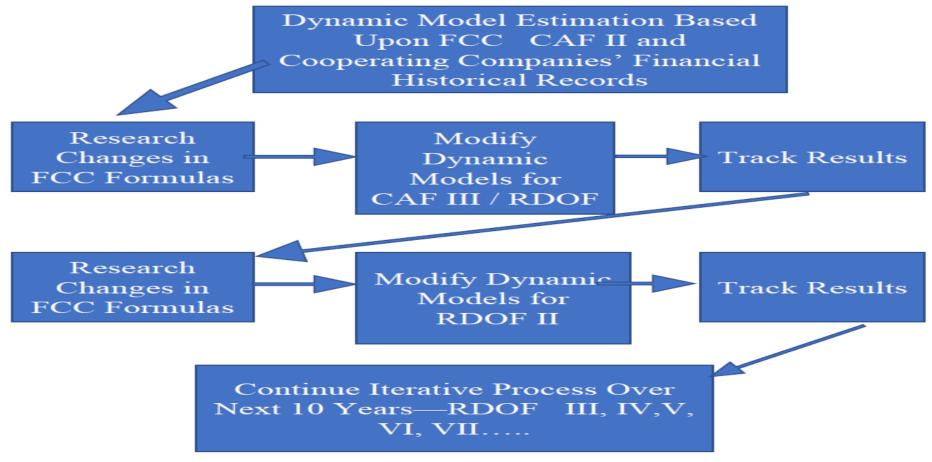
 * Prices & Quantity Purchased
 -electricity, energy, wages, machinery, management, (annual payments short term and longer term debt), technology upgrades, fees, taxes, ...
- 2. Econometric Supply Side- Model development based on historical data
- 3. Baseline -10 year projections
- 4. Macro measure of per unit cost per mile of service?

<u>Demand Side-Data Collection</u> - <u>Financial Track Record & Other Sources</u> <u>Past 20 years – Electronic?</u>

- 5. Demand for services Price and Quantity
 - *Households demographics, income, age, education
 - * Industrial Small, medium, large
 - * Public Sector
 - * Agriculture: Livestock, Crops, Trees, Hay, etc
 - * Others
 - * towns and municipalities
- 6. Econometric Demand Side -Model development based on historical data —link supply and demand system
- 7. Baseline -10 year projections
- 8. Macro Measures per unit of service likely breakeven

Proposed Econometric Economic Development Research Project:





OBJECTIVES

Improvements in FCC Formulas:

- a. Reflecting economic growth potential
- b. Spur development of up to gigabit-speed broadband in rural America
- e. Expand broadband for rural Americans who need broadband to start a business, educate a child, grow crops, raise livestock, get access to telehealth, and do all the things that the online world allows

ADVANTAGES

Assisting Congress, FCC and their staffs to:

- a. Attract more businesses to rural America
- b. Slow out-migration from rural America
- e. Spur economic growth / economic development in rural America
- d. Efficient use of federal dollars
- e. Academic research, training and publications

National Policy on Broadband Objective

Cover The Largest Area At The Least Cost To The Government

FCC Funding Process: Time Limit On Open Competitive Bidding

Bidding Results: Leans Heavily Toward Low Level Providers

Pandemic Has Refocused On The Need For Higher Level Service

Information Required To Complement The Fcc Formula Funding Process

Transcript: Community Broadband Bits Episode 371 | community broadband networks

that I think that you and I can agree vigorously about and that I hope we back each other up on Twitter about a lot, is that no technology is really going to solve what is a regulatory and market structure problem more than anything else. That the digital divide is not going to be solved by a new wave, it's not going to be solved by a "G," it's not going to be solved by magic satellites in the sky, when the real issue is a lack of regulatory backbone, when the real issue is a small providers and community and municipal providers getting beaten down by unjust laws designed to maintain monopolies. This is an economic structure problem, not a technological problem, that we have in the U.S.

SIGNIFICANT FACTORS FOR BROADBAND FUNDING---- FCC CAF II ISSUES FOR FURTHER VISITATION

Missouri University, CAFNR's Dynamic Econometric Economic Development Program (DEEDP) Womack / Eisberg 2019

- 1. Rate Differential and Urban Rate Formula--Fiber providers do not have a footprint in FCC formulas
 - a. No FCC representation of weights and rates above 1 Gbps
 - b. Lack of transparency of how formulas work and expected consequences of rates / weights formulas
- 2. Broadband Speed Performance Tier Weight Formulas
 - a. Weighting differential spread in scoring is designed to cover more area—greater the area gets higher weight
 - b. Largest Area Weight Formula—One Size Shoe Fits All
 - c. For farm program, FAPRI uses the Representative Farm model to solve the issue of one size shoe fits all
- 3. MO Fiber consortium lost over \$100 million in CAF II resulting from inadequate representation in FCC formulas according to SEMO CEO Sean Vanslyke
- 4. Territorial—10 years blocks out competition of receiving federal funds limiting areas for better service at low costs
- 5. Lookback of 3 years formula constrains fiber providers that made investments prior to the period of FCC funds
- 6. Cherry picking small areas of higher population within a region of a fiber provider without providing to remote areas
- 7. Lack of Due Diligence for 3 years and continually 24/7—1st Report to FCC occurs in year 3
- 8. Due Diligence Required—associated with dynamic econometric analysis—similar to FAPRI 24/7 to Congress
 - a. Economic development—a measured amount of economic growth associated with broadband service and costs in real time
 - Timely information—Real Time information compliments policy decision makers associated with allocation of funding formulas
- 9. Why should we be concerned? Outmigration rates for rural America

Summary: Sample base Reflecting Economic and Social Consequences of Rural Fiber provided by Electric Coops Sample Base: Seven Rural Electric Coops located in Northern, Middle and Southern Missouri

Summary of Survey Consequences:

- 1. In Home Businesses: Enhances school lessons, New startup businesses, High resident take rate, Reduction of outmigration, in-migration uptake.
- 2. Extended Seasonal Vacations-Lake Ozarks: Fiber service exceeds home service, Partial retirement increase-working at Lake property, Increase in home businesses from other locations
- 3. Brick and Mortar Businesses: Significant increase in commercial business
- **4.** Remote Employment: Home fiber more efficient than office location of employment, more workdays at home, Tech employees work at home reporting to home office 1 day per month, Increase productivity 1000 times faster internet than previous service
- 5. Real Estate: Home and Business value increases, home value estimated increase in North East Mo, \$7,000, Reduced outmigration-homes and businesses
- 6. Community Support: Business expansion and recruitment, Streaming-Churches, Weather, Security systems, News, Sports, Entertainment.

- 1. Agriculture: Remote monitoring; barns, gain mills, Milking systems, marketing, tracking real time business information, grain bins-moister content, production and input quantities and prices; Cotton Gin's saving \$4000 per month on internet; Regional Implement dealer- Communication with various dealers plus marketing and tracking,
- 2. Precision Agriculture: Downloads data to field equipment and, at farm uploads data to farm files on crop production data, fertilizer and other relevant ag data to: farm operation, implement dealers, seed dealers and other agriculture businesses using precision agriculture.
- 3. Industrial: Manufacturing plant (500 employees) Eliminating shutting down all computers during download periods
- **4.** Education: Two schools 7 miles apart in Southeast Mo saved \$42,000 per year with fiber service, Live streaming in classroom and school sport events.
- **5. Tele-Medicine**: Requires high speed broadband service, heath records, Ambulance and Doctor service, Minimizes care in-home cost by as much as \$60,000 per year.
- 6. Information Technology: IT industries need high speed Gigabit speeds. IT company chose small rural community over larger micropolitan area to train and create a new middle-class workforce in rural communities

University of Missouri/CAFNR/Dynamic Econometric Economic Development Program (DEEDP) Womack / Eisberg 2020

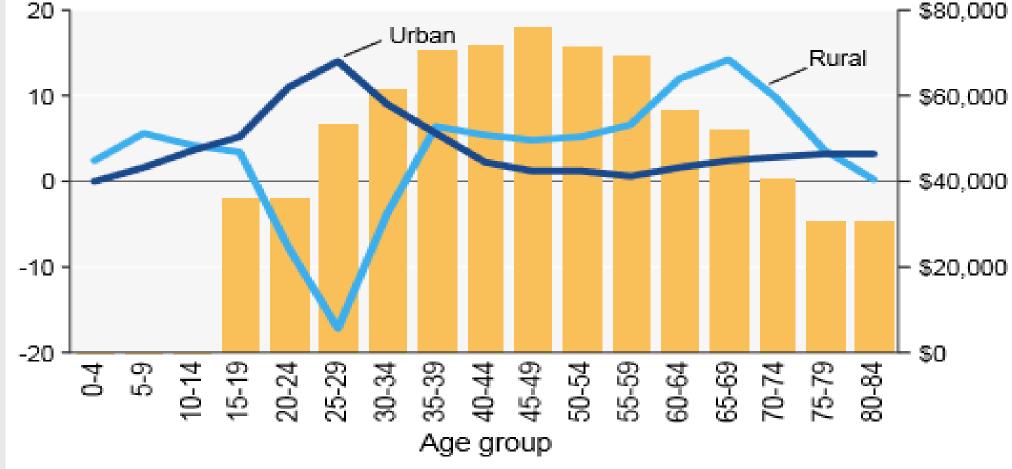
CAFNR DEEDP Question: How can rural Missouri stop the out-migration of our younger generation?

CAFNR DEEDP
Question:
Can high speed
broadband be an
answer to stop
out-migration?

CAFNR DEEDP
Question:
Can the Midwest
compete with
the East Coast /
West Coast to
stop outmigration?

Rural/urban population change from net migration and U.S. median household income

Percent population change, 2000-2010 (lines) Median U.S. household income, 2015 (bars)



Source: Net migration estimates from the University of Wisconsin-Madison and income from the Current Population Survey.

23

HOW MUCH INVESTED IN THE 20 - 22 YEAR OLDS THAT MIGRATE TO OTHER STATES?

BY AGE 22 \$500,000/child

• Cost of raising a child to age 18 \$14,000/yr/child \$252,000.

• Federal/State/Local \$ spent K-12 \$12,500/yr/child \$162,000.

Total Money Invested to Age 18

Add 4 Yr College Federal Money \$5,000/yr/child

• Add 4 Yr family \$ cost College \$20,000/yr/child

• With College Total Money Invested to Age 22

• HUMAN EQUITY LOST TO OUT-MIGRATION: \$400,000. to \$500,000 / per person

\$400,000.

\$500,000.

Missouri Association of Counties Information Technology / Telecommunications / Broadband Committee

Vision Statement

Be a resource for all Missouri Counties to utilize the development, implementation, and utilization of technology and communications for the County, all citizens, and businesses thereof.

STATEMENT OF BASIC PHILOSOPHY

Counties play a major role in the nations communications system as regulators, service providers, and consumers of communications services. County officials have a responsibility to ensure that the public interest is being served by communications providers, regardless of the delivery platform. The social goals and public good expected from our citizens must be ensured. This includes public educational government access, public and homeland security matters, and protecting the interests of special needs citizens.

Expanding communication has become a critical component of a successful economic development policy. Access to affordable high-speed internet is critical to attract and retain labor and industries. Additionally, homeland security requires an integral role for counties in securing the Nation. Adequate communications systems and information access are vital to meet this important responsibility. It is therefore imperative that county officials play key role in the future of communications policy.

Technology has changed the future of county governance, and the evolving opportunities for counties to utilize technology to provide timely and effective service are immense.

Faster computer networks, wireless internet access, enhanced broadband services, new public safety systems, geospatial information applications and technologies not yet deployed, will make the county of the future more responsive and meaningful to county residents. County officials must be prepared to adapt to this changing environment.

POLICIES AND PRACTICES

Preemption of Local Authority: Counties need to be concerned about retaining authority as trustees of public property and as protectors of public safety and welfare. The 1996 Telecommunications Act acknowledges the balance among federal, state, and local authority.

MAC opposes any actions that would undermine this shared responsibility and any federal or state preemption of counties' traditional powers in these areas. MAC opposes efforts to restrict or prohibit, at state and federal levels, county or municipal ownership of communications facilities.

Financial Assistance for Enhanced Communications Capacity: Communications play an important role in county government operations and the delivery of services. Counties use advanced telecommunication systems for a full range of public and law enforcement services. Nothing in state or federal policy should undermine the ability of counties to develop such infrastructure through partnerships with network providers.

MAC believes state and federal governments should provide financial assistance for these initiatives and should encourage efforts to improve coordination across jurisdictions and systems, especially for public safety and security issues. Access charges for completion of calls on the local public switched telephone network need to continue in some form to assure rural counties retain adequate communications services.

Easements and Rights-of-Way: Counties own substantial amounts of public easements and rights-of-way, which many communication providers use extensively to construct their own communications networks. These are valuable local government real estate assets that are held in trust by local governments to benefit the local community.

Federal and state governments must recognize the authority of local governments to protect the public investment, to balance competing demands on this public resource and to require fair and reasonable compensation from communications providers for use of the public easements and rights-of-way on a nondiscriminatory (but not necessarily identical) basis. Easements and rights-of-way disputes between communications companies and local governments should be resolved in local jurisdictions.

In order to use the easements and rights-of-way, private communications companies should be required to enter into an agreement with local government that sets the terms and conditions of such use/access.

Local governments must have the right to analyze the legal, financial, and technical qualifications of any communications provider wanting to use the public easement or right-of-way and shall have the right not to issue a permit to an unqualified applicant.

The ongoing construction of public property and rights-of-way also provides an opportunity for federal, state, and local governments to assist with the future deployment of fiber-based broadband networks through effective dig-once policies and practices. To ensure the scalability of these efforts, evaluations and/or studies should be conducted to provide appropriate sized conduit able to accommodate fiber lines and be of multi-duct variety to ensure adequate separation of provider assets. Any dig-once policy imposed on local governments should also be supported by federal and state resources to ensure local governments are not held solely responsible for the costs associated with the construction. Additionally, federally and state funded transportation projects should also require the incorporation of state and local broadband plans prior to construction.

Broadband Deployment and Adoption: MAC strongly supports legislation and administrative policies that help counties rapidly expand public-private partnerships and to attract affordable, abundant, redundant and reliable high-speed broadband services that meet or exceed federal broadband speed definitions regardless of population or technology used. MAC supports legislation and/or policy that:

- Creates location maps and open access to broadband infrastructure deployed with public funds;
- Mandates middle-mile broadband systems to be open networks;
- Requires coordination between local governments and ISPs with an emphasis on locally collected and verified data;
- Encourage the utilization of fiber optic broadband infrastructure, where practical, where public funds are used by implementing a sliding scale of awarded grant funds with fiber projects receiving the most;
- Demands a minimum broadband speed requirement of 100Mbs down and 25Mbs up but

- incentivizes 1gbps symmetrical network by implementing a sliding scale of awarded grant funds with Gigabit networks receiving the 100% funding;
- Provides tax credits to telecommunications providers that develop broadband in rural and underserved communities;
- Provides for broadened eligibility and additional state and federal agency loan authority to deploy broadband in rural communities;
- Creates a graduated distribution model for state and federal grants/loans/subsidy programs based on performance (speed, need, latency, and cost).
- Allows for local control of franchise agreements for providers operating within their communities to ensure that customer service standards are upheld and that access to service is consistently available.

MAC believes all levels of government should work cooperatively with the private sector, nonprofits, and academia to develop robust awareness, adoption, and use programs for broadband. Additionally, broadband is as essential to our health and wellbeing as water or electricity. Therefore, MAC believes broadband should be classified as a Title II Utility allowing the Federal Communication Commission to ensure common carriers provide affordable and reliable service by preventing price gauging and discriminatory deployment practices. Unbundling local networks and price regulations would open access and allow other service providers to provide competitive and affordable service alternatives to residents.

CyberSecurity: MAC recognizes the evolving and continuous cyber threats that our state and counties face from multiple sources. The threats are ever-increasing in sophistication and, in turn require costly proactive measures to minimize the potential loss of data and/or damage to our state and county infrastructure. Understanding this, MAC supports the following:

- Funding assistance in any form deemed necessary to provide for critical cybersecurity tools and resources required to adequately protect the county infrastructure at all levels;
- Implementation of MFA, DMARC, DotGov, Monitoring tools, IT Assessments, certification of third party providers, regional IT expertise, end-user education and cybersecurity incident policy and procedure development;
- Funding assistance for basic security awareness training of employees and advanced security training for information technology professionals within local government, including assistance in the completion of advance certification and degree programs;
- Cooperative efforts in information sharing among all federal, state, and local governments in addition to private sector organizations regarding breaches, potential threats, threat levels, and any techniques that would assist in the prevention or mitigation of cyber-related threats;
- Encourage all counties to become members and utilize resources from the Department of Homeland Security and subprograms such as US-CERT, MS/EI-ISAC, CISA and ICS-CERT;
- Encourage all counties to implement and follow NACo Cyber Security Priorities and Best Practices as defined in the publication released by NACo Telecommunications and Technology Policy Steering Committee.

TELECOMMUNICATIONS AND TECHNOLOGY RESOLUTIONS

Resolution to Ensure the Participation of County Governments in the Development and Implementation of Broadband Expansion Efforts

Issue: Members of the Missouri Association of Counties (MAC) are uniquely positioned to advise and help facilitate digital connectivity for urban and rural areas for which long-standing connectivity inequities have been made more acute by the COVID-19 pandemic. The expansion of broadband internet will require resources from all levels of government, but foremost will require the integration of local government in establishing the programmatic components that will successfully implement connectivity for all communities.

Policy: The Missouri Association of Counties (MAC) urges the General Assembly, Congress and involved State and Federal agencies to commit to the inclusion and engagement of MAC members in the earliest phases of the strategic planning and expansion of broadband services and access.

Resolution in Support of Empowering Counties to Be Active in the Deployment and Operations of High-Speed Internet

Issue: High-speed internet is an essential element of modern commerce, but local governments in many states are prohibited from being active participants in the deployment of these services.

Policy: The Missouri Association of Counties (MAC) supports the removal of barriers to counties supplying infrastructure to the private sector, partnering with the private sector or operating internet services as a public utility when no commercial service is available.

Resolution Encouraging The General Assemble and Congress to Pass Legislation to Formalize the Process Through Which Data Gathered by the TestIT and Other Granular Internet Connection Tools are Used to Modify the Broadband Coverage Maps

Issue: The Missouri Association of Counties (MAC) feels the current coverage maps tend to inflate the availability of service across the state but particularly in more rural areas. These maps are an important source document in the development of state broadband deployment policy and the deployment of federal and state funds for broadband development. Having accurate coverage maps is essential to the development of good state and federal policy on broadband deployment.

Policy: The Missouri Association or Counties (MAC) encourages The General Assembly, Congress and the Federal Communications Commission (FCC) to create a formal process by which crowd-sourced data gathered by applications such as the TestIT app can be used to create new or update the existing FCC broadband coverage maps. Further, MAC believes that such legislation should require the FCC to test and certify the accuracy of these crowd-sourcing applications.

Special Interim Committee on Broadband Development

Roundtable Discussion and Townhall Post Event Summary July 26, 2021

Is there data showing an economic correlation to broadband adoption?

Referenced data from this June, 2021 <u>Federal Reserve Bank of Philadelphia report</u>, *Broadband Subscription Computer Access and Labor Market Attachment Across US Metros:*

- Across U.S. metros, we find that prime-age workers (people 25–54) with a broadband enabled computer participate in the labor force at a much higher rate than prime-age workers without access
- An "Access Policy" that provides a broadband-enabled computer to unserved metro populations could affect prime-age labor force participation rates. Net number of labor force participants added to the labor force across metro areas as the result of such policy would be close to 400,000. Note this does not account for job creation outside of Metropolitan Statistical Areas.
- Affordability is often cited by households as a major barrier to subscribing to broadband. The literature affirms that low-income households are more likely to lack a household subscription and to cite cost constraints as an impediment to broadband adoption.
- The study looked at the percentage of households having both an internet connection and a computer in each of the 376 metropolitan statistical areas. In Missouri, only Columbia ranked high, coming in at 37th on the list with 80% of households having both broadband and a computer. Kansas City and St Louis were both mid-pack coming in at 138th and 151st. The five other Missouri cities came in at the bottom:

Columbia: 37 Kansas City: 138 St. Louis: 151 St. Joe: 325

Jeff City: 338 Cape Girardeau: 348 Springfield: 351 Joplin: 363, 55%

This isn't to suggest that the higher ranked MO MSAs aren't in need. Even in Columbia 20% of households are cutoff from online learning, healthcare, and economic opportunity.

Is there data showing an economic correlation to digital skills development?

Referenced data from the State Digital Equity Scorecard, released July 2021.

- In June 2021 there were:
 - o 182,956 job openings. Of these, 75% (137,217) require foundational digital skills.
 - o 161,000 unemployed in MO, of which at least 53,000 lack foundational digital skills.
 - In other words, a lack of foundational digital jobs skills kept 53,000 Missourians from being eligible for 137,217 jobs openings. Just one way this is an economic development issue.

There's also research on the relationship between connectivity and population change in rural America.

One <u>study examined the 420 most rural counties in the country</u> (see chart page nine). The study then broke the counties out into five groupings based on how well connected they were. Between 2010 and 2016, the most connected of these counties experienced a 7.5% population increase. This was the only group that saw population growth.

Correlation, size and scope of computers and affordable home internet on education

Whitacre study, July 2021, "<u>Do Hotspots Improve Student Performance? Evidence from a Small-Scale Randomized Controlled Trial</u>" small study but finds what logic tells us: educational outcomes are only improved when students are given both a computer and an internet connection—so educational efforts should address both.

Common Sense Media Report, "Closing the K-12 Digital Divide in the Age of Distance Learning", students without an adequate connection:

- 21% urban students
- 25% suburban
- 37% rural

Roughly 15-16 million students lack either a connection or a computer. Nine million lack both.

Examples of what this looks like in both metro and urban communities

The research and data are important, but stories and examples can help paint the picture, so I'll share a couple with you. Starting with one from Eastern Kentucky. As you likely know, Eastern KY is one of the more economically disadvantaged places in the country. In short, the region has struggled with too many workers and not enough decent paying jobs with ½ of households making less than \$28,000 per year. Broadband connectivity was also an issue, until the Peoples Rural Telephone Cooperative invested \$50M in a fiber to the home network to every home in a two-county region. With a fully connected community, the Eastern KY Concentrated Employment Program was launched with a goal of reskilling 100 former coal miners. The coalminers received training to work in tech support and customer services jobs, and were matched with fortune 500 companies open to hiring remote workers. Today more than 3,400 people have obtained remote work jobs through the program with large hotels and corporations like Microsoft and Apple. The jobs include vacation and health care benefits and pay in the range of \$30,000-40,000 per year, at or above the median household income level. These workers are now pulling in income from out of state companies and into the local rural economy.

Here's another example from the KC region. Neelima Parasker owns SnapIT Solutions, an Information Technology company with a unique business model that helps develop high-tech talent from under-represented communities. Her for-profit company received State certification in Kansas to deliver post-secondary training, which allowed her company to partner with the Full Employment Council here in

KCMO to create a tech training and apprenticeship program. The program starts by providing needed tech industry software skills training, in conjunction with an apprenticeship program. For the past 4 plus years the training has helped 1,000's of students gain entry-level high-tech jobs across the Kansas City region. I spoke to Neelima a few weeks ago and she told me about how some of program graduates from just a couple years ago are now making six figure incomes. Programs like these are changing the economic trajectory for lower income students and adults. People for whom traditional career paths are not an option financially.

These programs are making a difference, but they aren't feasible without affordable broadband and digital skills training.

Adoption: Digital Navigators

Many internet providers offer discount internet plans for lower income households, and some participate in the <u>Emergency Broadband Benefit</u> program. We've heard from nonprofit organizations serving lower-income households that clients struggle finding out about the programs, comparing plans and signing up. This process can be challenging for any consumer. Those who need the help most are often the least likely to have the time, technology (computer vs shopping on a smart phone) or technical skills required to subscribe.

Communities across the country are creating Digital Navigator positions to walk people through the process, help them shop around and subscribe. Digital Navigators can also refer clients to digital skill training and organizations that sell low-cost computers.

In Kansas City, Leslie Scott does this part time for KC Digital Drive. (Leslie was present via Zoom and I asked Leslie to share her experience assisting clients).

Here are a few related resources:

- The Connecticut State Library launched a pilot digital navigator program
- Governor Inslee (Washington) <u>committed \$6M to fund a digital navigator program</u> in budget years 2021-2023.
- A sample Digital Navigator job description is available from the <u>National Digital Inclusion</u> Alliance

Our mission at Literacy KC is to advance literacy within the Kansas City metropolitan area through direct services, advocacy, and collaboration. Our vision is "Literacy for All".

Literacy KC provides an innovative suite of services. By focusing on the multidimensional aspects of literacy through complementary program areas, Literacy KC strengthens our students to succeed through improved literacy skills. These mutually reinforcing program areas work together to increase literacy in the KC metro and provide our adults and families with the foundational literacy skills they need to thrive in today's society.

Our Adult Education & Literacy classes are offered for free to students and help them achieve the civic, career, and educational goals they have set for themselves. Above all, we create a welcoming, collaborative environment that places our students in the driver's seat. By placing our students at the center of our services and collaborating with other community organizations, we successfully eliminate barriers to service.

We serve adults, 17 and older, in the KC area and rural regions of Missouri who need employment, including the under and unemployed, those seeking a high school equivalency, those seeking workforce credentials, and adults learning the English language. With the Kansas City Public School graduation rate being only 71.2% (likely lower after the last pandemic year) and many area neighborhoods hosting foreign-born populations of over 40% per capita, we know there is a tremendous need for these services and plan to serve 2400 students throughout the fiscal year. We currently serve Jackson, Clay, Platte, Cass, Bates, Ray, Butler, and Cedar counties in Missouri.

Our current demographics are as follows:

RACE AND ETHNICITY:

- 40% African American
- 36% Hispanic and Latino descent
- 12% Caucasian
- 5% Asian
- 7% Other Nationalities

POVERTY LEVEL

90% meet or exceed the federal poverty level

GENDER

- 64% Female
- 36% Male

AGE

- 6% are 60 and older
- 21% are 45-59
- 53% are age 25-44
- 20% are age 16-24

Many of Literacy KC's students come through referrals from area libraries, work placement programs, the housing authority, and other such community organizations that have contact with potential students. Along with Literacy KC's reputation in the Kansas City area, these partnerships are crucial in reaching students and their families.

When COVID hit our community we were unable to teach classes at Literacy KC but we worked hard to provide the best learning opportunities. Many of our students did not have access to computers in their home and had limited exposure to using computers in general. As Literacy KC launched our distance learning program, we asked students about their access and comfort using a computer to engage in learning. This is what we learned:

- 56% of Literacy KC students have a computer at home
- 41% of Literacy KC students feel comfortable/can independently use a computer for learning
- 57% of Literacy KC students said they are most comfortable learning with paper/pencil materials

From mid-March 2020 through early-August 2020 Literacy KC has shifted our model of instruction to support the needs of our unique adult learners. Our instructors have made contact

with the majority of the student body and engaged them in the learning process in a variety of ways:

- We transformed our instruction to offer online support through instructor-created lessons/videos and continued use of online learning programs.
- · We created various homework packets to meet the needs of each unique learner and mailed them to each student.
- · All students are meeting with their class and/or instructor weekly/bi-weekly through conference and/or telephone calls, and video chats.

This 2-minute video best tells the story of how Literacy KC responded to our students connectivity needs when covid first hit:

□ Literacy KC Pivots to Digital Learning During COVID-19

We continue to work hard to improve our virtual learning services and we are preparing to offer limited services to the students most in need. The requirement to adapt our services rapidly was not easy but we are inspired by the resilience and commitment of our students. Students themselves continue to navigate this new digital world and are continuing to increase their literacy skills to meet their goals, and to improve their lives and the lives of their families.

A key lesson we have learned through this pandemic is about the resilience and commitment of our students and our staff. Before COVID hit we thought we were years away from developing a robust online learning program and within only a few months we were offering over 50 classes virtually to our students. This has required our students to embrace the world of technology like never before from taking intensive digital preparation classes to learn how to navigate a computer - to purchasing home internet and devices for the first time. Our staff has committed to learning and developing best practices in online instruction. These are only some of the ways our students and staff have shown resilience by adapting to the changes life has offered and committing to the improvement of lives through adult education.

The past year was a challenging one due to COVID-19 restrictions, shutdowns, quarantines, and general fear surrounding the pandemic. The Kansas City area was hit hard by the COVID pandemic and strict guidelines and policies were put in place by our local leaders. For a significant portion of the year, we were only able to offer in person classes at our Troost location and Clymer Community Center location. We were limited in the number of students we could enroll due to social distancing policies and limited space. We had to pivot our instructional

strategies to offering virtual classes in addition to the limited smaller in person classes we were allowed to offer.

The obstacles we have faced include: shortened class times, students and staff out with COVID or on quarantine, late start to the school year, limited space for in person classes, many site closures, and digital literacy skills needed for students to access virtual classes. As our partner sites began opening up and we were able to offer more in person classes, our numbers for Measurable Skill Gain improved consistently. Progress will continue to be measured by DESE's standards and also by our students' personal achievements and advancements that they have made on the personal goals they have set for themselves.

How many staff and volunteers have been trained in digital inclusion/literacy programming?

All program and instructional staff and all current tutors have engaged in training around digital inclusion.

How many internet hotspots did we give out to students in 2020?

Due to a lack of resources we were unable to purchase a large quantity of hotspots but have distributed all hotspots in our possession, a total of 15 hotspots. Since we were unable to give hotspots away we have worked with students to complete applications for discounted Wi-Fi and other similar opportunities. Through this support 34 students have been able to get the internet in their homes.

How many devices did we give out to students in 2020?

Due to a lack of resources we were unable to purchase a large quantity of laptops/Chromebooks but have distributed all devices in our possession, a total of 15 devices. We have supported students as they have sought low cost devices through referrals and helped them complete applications. 36 students have purchased their first computer.

How many students gained employment and/or applied for jobs with LKC support?

- We have helped 21 students gain employment.
- · We have helped 22 students write a resume.

We have helped 36 students' complete electronic forms like applications.

Additional metrics relevant to digital literacy efforts:

- 61 students have self-reported increased internet skills.
- 45 students report making an online purchase for the first time.
- · All students who have entered classes in 2020 have received digital instruction. The skills that we teach in Digital Prep classes include:
 - o Start, sign in & sign off computer
 - Use a computer mouse
 - Use a keyboard
 - o Connect to Wi-Fi
 - Navigate to the internet & to websites
 - Log in to Gmail
 - Send an email
 - Log in to Google Classroom
 - Log in to learning programs (Burlington English, Reading Horizons, Newsela, Reading A-Z)
 - o Open an assignment in Google Classroom
 - o Turn in an assignment in Google Classroom
 - Join Zoom to attend class
 - o Turn mic/video off/on, join breakouts, chat on Zoom, use whiteboard
 - Zoom in, scroll & move screen around

Do we have any STEM-focused programs?

All of our classes are currently offering computer instruction, so this would include the Technology part of STEM. All ABE classes teach math.

How many digital literacy participant training hours were provided?

Through our stand-alone Digital Literacy program + Digital Prep classes we have 2,430 hours of direct digital instruction. However, this does not include the digital instruction that happens regularly in our other programs, like ESL and HSE.

Broadband Deployment Funding Meeting - Organized by Representative John Black

Location: Marshfield City Hall

Date & Time: Tuesday, December 21st at 10:00am

Represented Interests: Marshfield City (city officials present); Marshfield Schools (superintendent present); Webster County (County Commissioners present). State Representatives John Black, Louis Riggs, Bishop Davidson, & Hannah Kelly. State Senator Karla Eslinger's office represented. Ralls County Electric Co-op (Lynn Hodges), Show-Me Power.

Introduction - John Black

Co-op Perspective - Lynn Hodges, CEO Ralls County Electric Cooperative

- Started in 2003
- Bias for fiber, but cost was prohibitive at 4 people/mile. Stimulus funds were used
- 43% projected take rate, but now they are over 80% take rate
- Gigabit connectivity 10-100 gigabit connections offered
- Challenges: RUS (Rural Utility Service) 477 maps, Reverse-auction process
- 400 addresses from Ralls County goal of connection to every household by end of 2022
- \$17,000/mile for overhead attachment; \$40,000/mile for burying in good dirt

Questions & Comments: John from Show-Me power affirmed what Lynn Hodges had to say (collaboration is paramount, diversity of deployment, etc)

School Perspective - Mike Henry, Superintendent of Marshfield School District

- Covid has shown the importance of fast, accessible internet
- Last year 3,300 devices added (over 5,000 devices throughout the district)
- ECF funding has been utilized and helped with connectivity (Cellular not Fiber)
- Projects 20% of homes don't have broadband

Questions & Comments:

State Perspective - Louis Riggs & Bishop Davidson

- Locally driven, State supported
- Multi-pronged: fiber, satellite, emerging technologies
- Educate local stakeholders on resources available to them
- Build out state resources: legislative committees, public-private partnerships with Broadband council, fiscal assistance to Missouri Broadband Office & Broadband Fund, improved mapping, etc.
- Create regulatory flexibility: adjust standards according to technology used as well as regulatory overhaul of right-of-way, make-ready costs, etc.
- Urgency: 2022 is the year to begin these investments and deployments

Questions & Comments: How do we actually get funds to the county?

Federal Perspective - Will from Karla Eslinger's office (formally Roy Blunt's office)

- Maps won't be fixed before 2023 from a federal level
- State of Missouri will get at least 100 million dollars from new Infrastructure Bill; other funding subject to specific grants/needs

Appendix C: Supporting Materials

Supporting Materials

- MODOT
 - o District Information
 - MODOT Owned Fiber Optic Locations
 - Amended and Restated Fiber Optic Cable on Freeways in Missouri Agreement
 - o Fiber Optic Cable on Freeways in Missouri
 - Response to follow up questions to testimony provided related to MODOT's fiber optic network
 - o Lumen Fiber Optic Network KC
 - o Lumen Fiber Optic Network STL
 - o Lumen Fiber Optic Network MO
- DED Data
- Emergency Broadband Benefit flyer
- Grain Belt Express information
- MO 911
 - Letter of Support for the MO 011 Service Board's Next Generation 911 GIS Data Initiative
 - o MO 911 GIS Info
 - Proposal
- Pew
 - o Broadband Network Disaster Resilience
 - o Resource List of State Broadband Plans
 - State Broadband & Transportation Coordinating efforts
- UM System
 - Broadband Recommendations
- Mid-America Regional Council
 - o Broadband and Digital Access Needs Kansas City Metro Area
- Goodwill
 - o Artemis Initiative
 - o Organizational Background
- Lit Communities
 - o BTX Fiber
 - Medina Fiber
 - Silica Broadband
 - YoCo Fiber
 - Community Impact
 - NE Broadband Steering Committee PPT
- Handout MoreAble

Northwest District	
Route	Length (miles)
US 169 (from I29 to MoDOT south MT complex)	0.61
US 169 (from MoDOT District Office to MSHP, and branch to US 169/Rochester S	Signal) 0.18
US 36 (from Bob Griffin Rd to SB Ramps)	0.36
1-29 (from Mitchell CCTV to IS 29)	0.07
1-29 (from MO 6 CCTV to IS 29)	0.17
I-29 (from 169 North Junction CCTV to IS 29)	0.05
Northeast District	
Route	Length (miles)
US 61 at US 36	0.21
US 63 at US 36	3.67
I-70 at Graham Cave EB	0.56
I-70 at Rt. F	0.08
I-70 at Rt. MM	0.29
I-70 at Rt. J	0.19
US 61 at Cherry St.	0.05
Kansas City Scout	
Route	Length (miles)
I-29	4.5
I-35	7.9
1-49	5.5
1-70	21.2
l-435	17.5
i-470	16.9
I-670	1.3
Hwy. 9	1.2
Hwy. 50	2.2
Hwy. 71	3.9
Hwy. 169	2.8
Kansas City District	
Route	Length (miles)
RT W & I-435 signal Interconnect	0.66

Pleaseant Valley interchange interconnect	0.31
Tiffany Springs interchange	0.59
MO 1	3.66
MO 78	4.22
I-435 & MO 78	0.25
MO 291 North Signal Interconnect	1.29
350 Highway Signal interconnect	2.58
7 Highway Signal interconnect	2.76
RT W Signal Interconnect	2.40
I-49 & 163rd	0.07
I-435& State	0.20
40 Highway Signal interconnect	6.75
MO 9 Signal Interconnect (Parkville)	0.66
MO 210 & I-35 fiber Interconnect	0.77
Front St & I-435 Interchange fiber	0.22
Adams Dairy and I-70 interchange fiber	0.30
Woods Chapel & 1-70 interchange	0.28
MO 291 & I-35 Interchange	0.57
MO 291 & I-49 interchange	0.40
MO 150 Signal interconnect Fiber	8.57
Main & I-49 (Grandview)	0.12
Blue Ridge & I-49	0.15
MO 291 & Scherer/Thompson	1.10
I-470 & Bowlin	0.27
I-70 & Noland	0.17
US 40 Highway Stadium Signal interconnect	0.58
MO 291 Signal Interconnect (Adaptive)	2.57
MO 92 Kearney Signal Interconnect	0.64
RT AA Grain Valley Signal Interconnect	0.29
RT F Oak Grove Signal Interconnect	0.30
US 50 and 3rd (Lee's Summit)	0.28
RT D Platte County Signal Interconnect	0.45
MO 92 Platte Signal Interconnect	1.25
US 50	1.13
US 65	2.50

Central District	Central District		
Route	Length (miles)		
MO 763 (College) from MO 740 to BL 70	2.04		
MO 763 (Randgeline) from RT BL 70 to Brown School Rd	2.57		
I-70 & St. Charles Interchange from I-70WB Ramp to Bull Run Dr	0.23		
RT AC from MO 163 to US 63NB Ramp	2.33		
MO 163 (Providence) from MO 740 to I-70WB Ramp	2.22		
MO 740 (Stadium) from I-70 NOR to Cinnamon Hill Rd	6.59		
RT TT (Broadway) from MO 740 to Park De Ville	0.72		
Rt B (Paris) from WhitegateDr to MoDOT Maintenance/RE Offic	2.14		
US 63 Connector from SOR to RT PP then to Creekwood Pkwy	0.55		
US 54 from McStop/SOR to I-70WB Ramp	0.28		
BUS 50 (Missouri Blvd) from MoDOT Old Garage on Main St to S. Country Club Dr	4.49		
US 50 & Truman/Country Club Interchange from SOR (Missouri Blvd) to NOR/Country Club Dr	0.27		
US 50/63 from Bus 50 (Missouir Blvd) to Monroe St	0.66		
MO 179 from Missouir Blvd to Country Club	0.23		
US 54 & Rt C (Ellis/SW Blvd) Interchange) from Christy to RtC (Southridge)	0.25		
US 50/63 & Lafayette Interchange from E McCarty to Dunklin (includes both 5/63 Ramps)	0.28		
MO 42 from MoDOT RE Office to Osage Beach Pkwy then along MO 42 (Osage Beach Pkwy) to Wal-Mart	1.91		
US 54 & Passover Interchange from Osage Beach Pkwy to US 54EB Ramp	0.27		
US 54 & Nichols Rd Interchange from US 54EB Ramp to US 54WB Ramp	0.10		
US 54 & RT KK Interchange from US 54WB Ramp to Osage Beach Pkwy	0.27		
MO 242 from RT MM to Bagnal Dam Blvd	0.21		
US 54 from MO 5NB Ramp to Elm/Laker Pride	0.18		
MO 5 from I-70EB Ramp to 4th St	1.42		
I-44 Spur (Missouri Ave) from I-44WB Ramp to Gateway Cir	1.91		
I-44 & RT H (Waynesville) from I-44WB Ramp to I-44EB Off Ramp/ Walnut	0.11		
I-44 & US 63 Interchange from I-44WB Ramp to I-44EB Ramp	0.17		
I-44 & MO 19 Interchange from Route DD/P to Eldon Street	0.23		
St. Louis District			
Route	Length (miles)		
1-44	92.00		
I-70	90.00		
1-55	72.00		

1-64	82.00
I-270	66.00
I-170	22.00
Rte. 370	26.00
Rte. 364	42.00
Rte. 367	10.00
Rte. 141	30.00
Rte. 61/67	28.00
Rte. 94	25.00
Rte. 100	22.00
Rte. 340	38.00
Rte. 180	12.00
Rte. 115	7.00
Rte. 30	11.00
Rte. 21	7.00
Rte. 366	11.00
Rte. 231	5.00
Rte. 109	3.00
Rte. 47	5.00
Rte. 50	2.00
Rte. D	5.00
Rte. 79	5.00
Rte. K	7.00
Rte. AC	1.00
Rte. EE	1.00
Southwest District	
Route	Length (miles)
Kearney from Cresthaven to Kansas Expwy	1.81
Chestnut from Haseltine to W Bypass	1.75
US 60 from US 65 to Rte VV	10.10
US 60 from W Bypass to Kansas Expwy	3.44
Glenstone from Evergreen to Division	1.39
Glenstone from St Louis to Sunshine	1.90
Rte CC from 22nd to Fremont Road	0.75

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Rte CC from 17th to NN	0.26
MO 14 from 25th to 20th	0.35
MO 14 from 18th to 3rd	1.16
BU 65 from US 65 to 6th Ave	1.57
MO 14 from US 160 to Ridgecrest	1.00
MO 66 from Maiden Lane to Rangeline	2.98
32nd Street from Main Street to I-49	4.81
Rangeline from 20th Street to 32nd Street	0.99
MO 248 from US 65 to Shephard of the Hills Expressway	2.00
MO 76 from Branson to Hollister	3.88
Southeast District	
Route	Length (miles)
US 63 and MO CC to WP Maint Building	5.36
US63 and US 160 to US 160 and Southern Hills	0.40
BUS 60/67 and Rt W to Maud St	2.61
BUS 60/67 intersection to BUS 60 and 5th St	0.76
US 60 CCTV camera to Poplar Bluff Maint Building	0.31
US 60 ShowMe hand hole to Dexter Maint Building	0.07
US 60 and MO 25 Overhead	0.20
BUS 60 and Selma St to Sikeston Maint building	0.91
US 61/62 and MO 114 intersection to Tanner St	0.23
Sikeston Maint Building to CCTV MM 67 on 155	1.48
I55 Welcome Center	0.61
US412 & MO 25 intersection to US 412 & S Bypass	0.25
I55 and Rt AB Overhead	0.20
MO 74 & Mt Auburn intersection to Emerson Bridge	2.94
Bloomfield Rd to Cape Rock	1.33
Rt K to Kingshighway	1.72
Center Junction CCTV to Veteran Memorial Dr	0.38
MO 25 & MO 72 intersection to West Lane	1.53
MODOT Jackson Project office to I55 CCTV	1.46
Perryville Maint building to I55 & MO 51 intersection	1.00
Progressive Dr to Westmount	0.51
Karsch Blvd & Washington instersection to Maple Valler Dr	1.04

MoDOT Owned Fiber Optic Locations

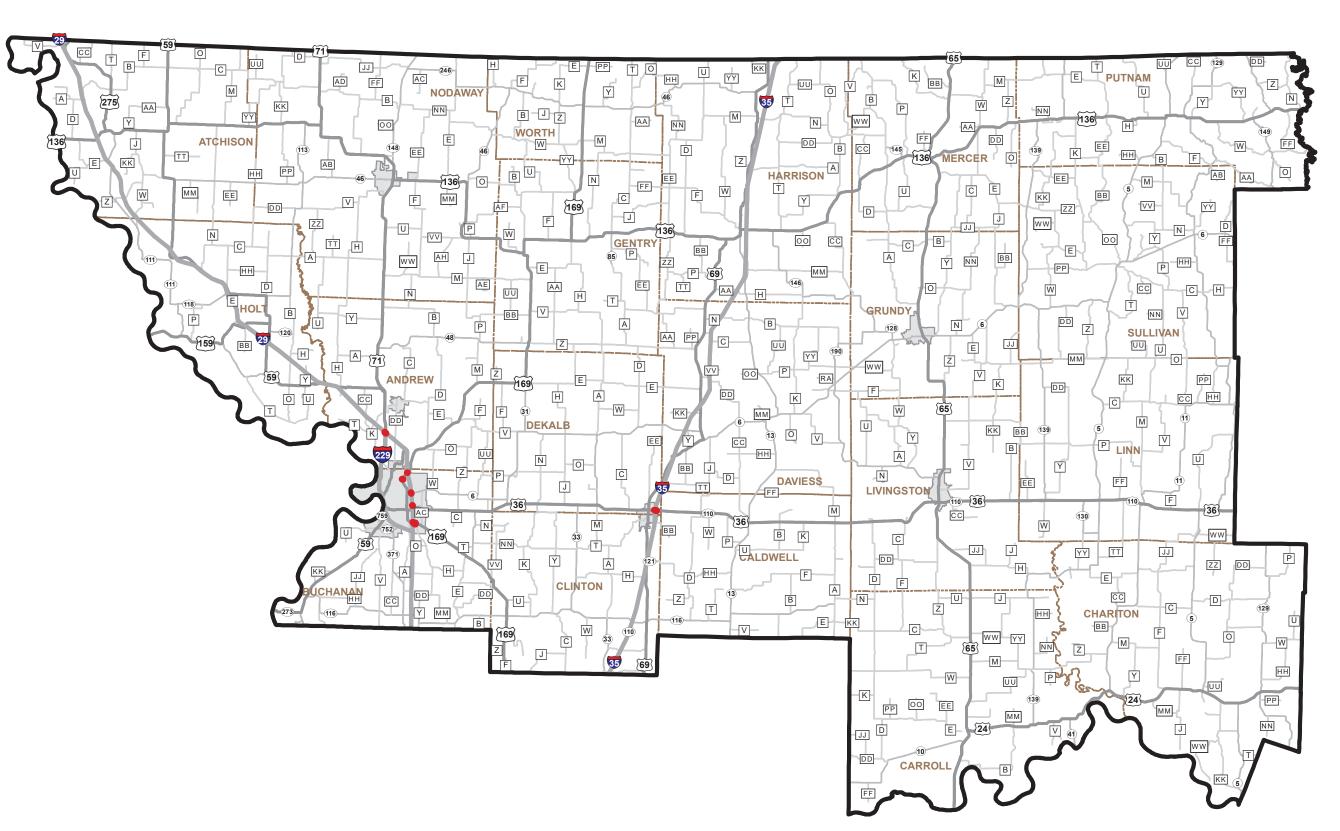
NORTHWEST DISTRICT

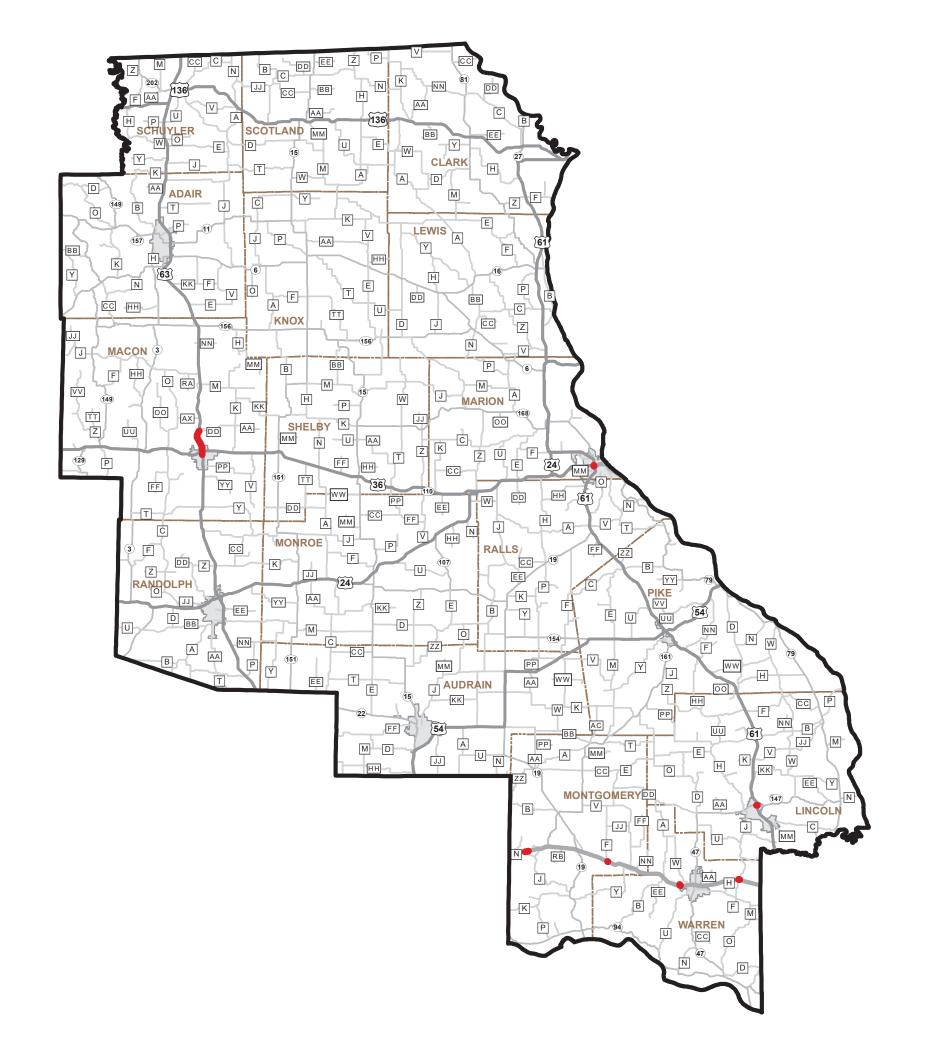
MoDOT Owned Fiber Optic



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MoDOT Owned Fiber Optic Locations

NORTHEAST DISTRICT

MoDOT Owned Fiber Optic



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MoDOT Owned Fiber Optic Locations

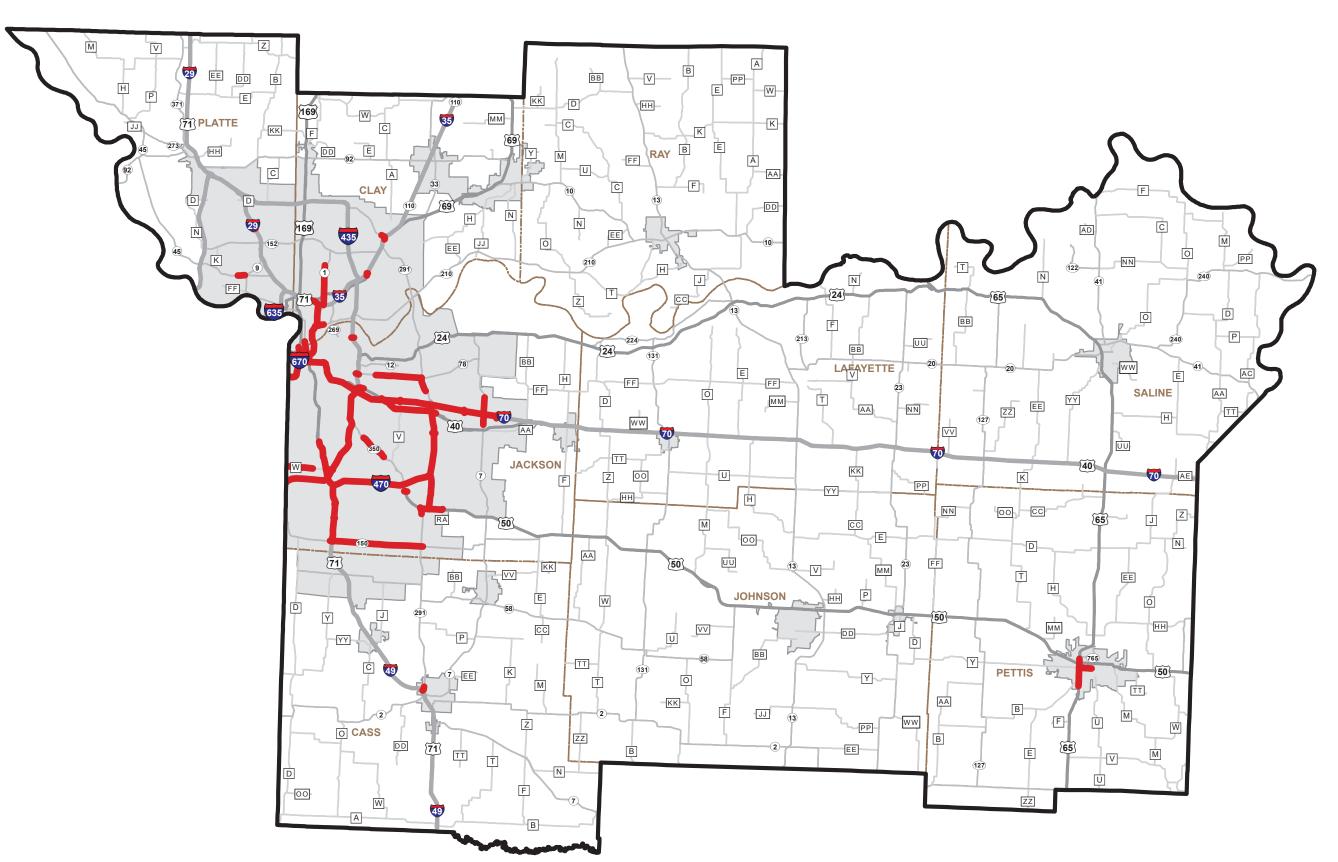
KANSAS CITY
DISTRICT

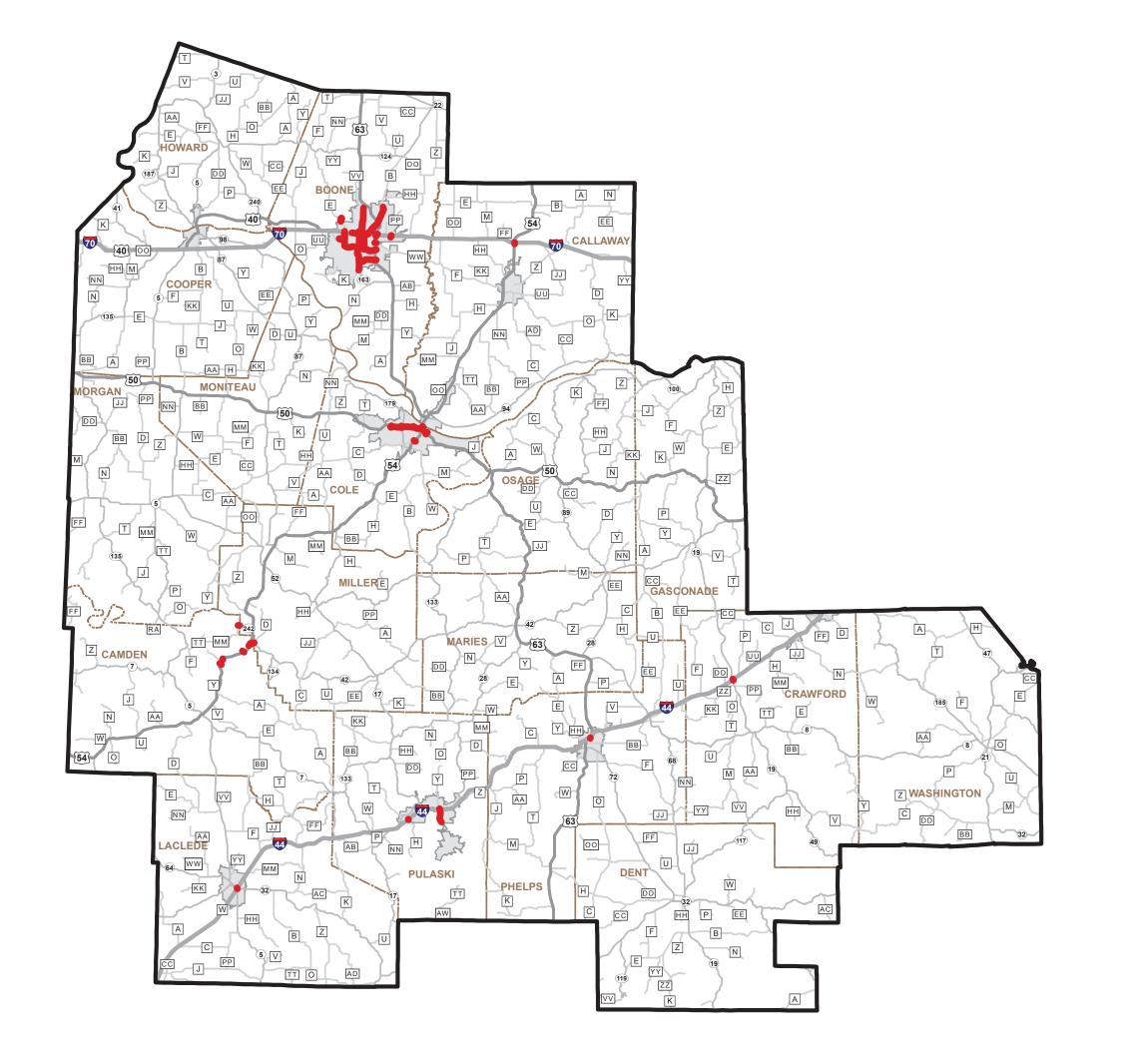
MoDOT Owned Fiber Optic



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MoDOT Owned Fiber Optic Locations

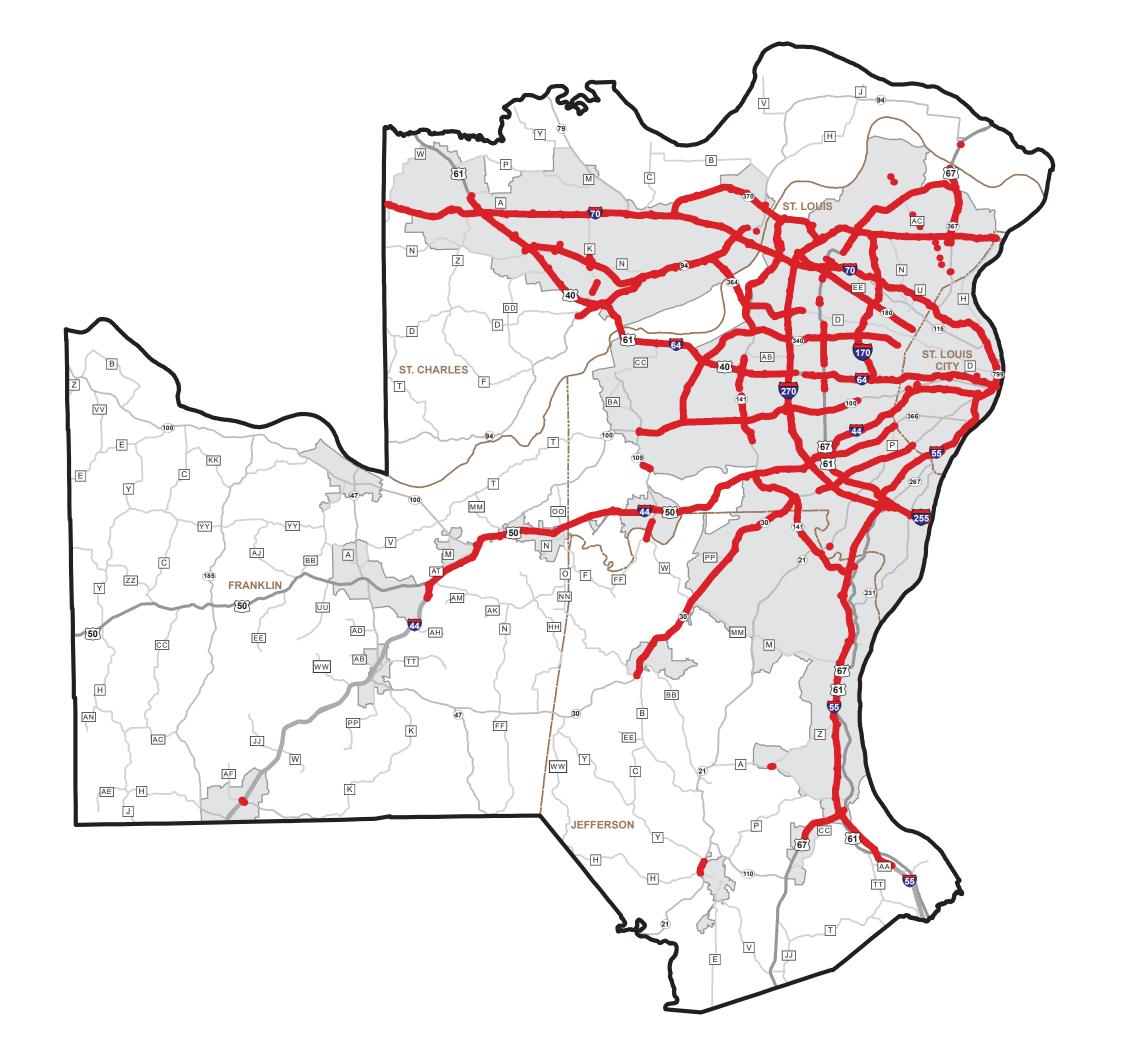
CENTRAL DISTRICT

MoDOT Owned Fiber Optic



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MoDOT Owned Fiber Optic Locations

ST. LOUIS DISTRICT

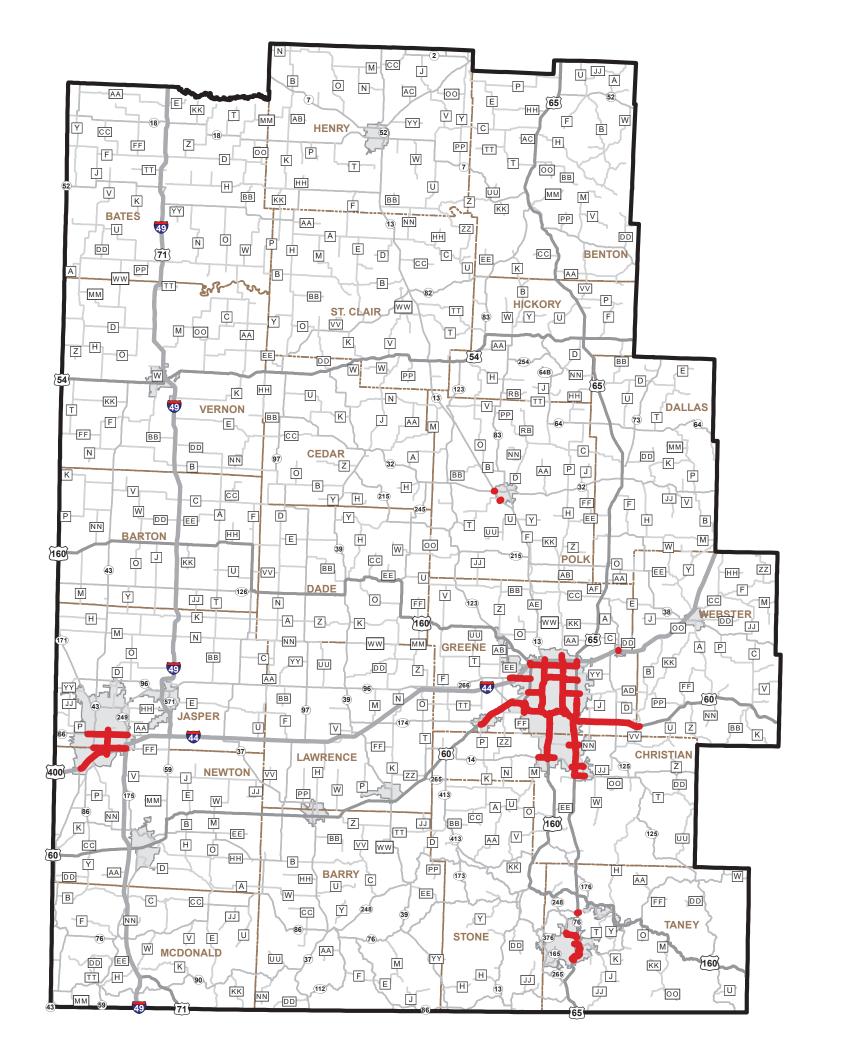
MoDOT Owned Fiber Optic



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Date: 12/3/2021



MoDOT Owned Fiber Optic Locations

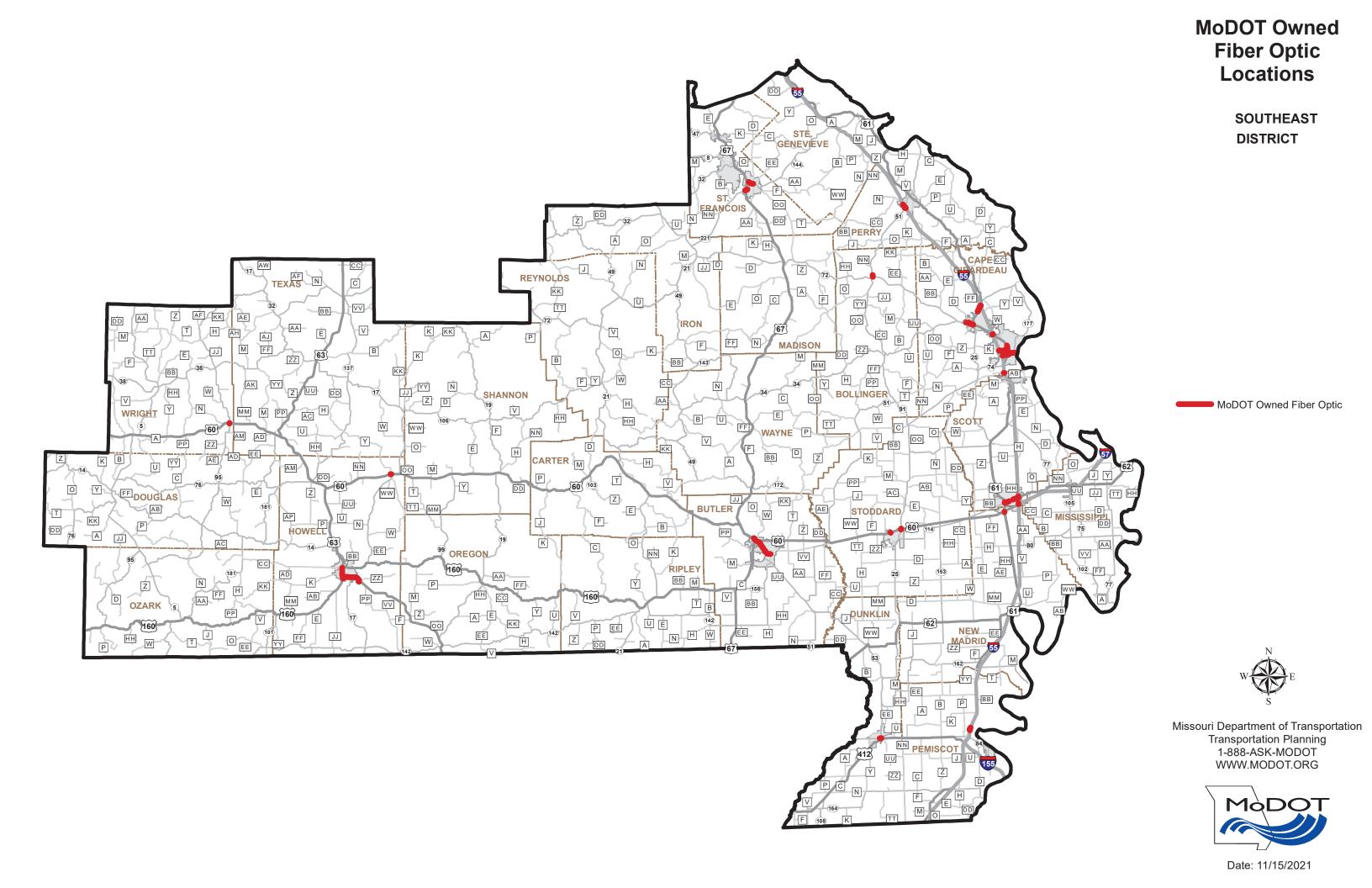
SOUTHWEST DISTRICT

MoDOT Owned Fiber Optic



Missouri Department of Transportation Transportation Planning 1-888-ASK-MODOT WWW.MODOT.ORG





AMENDED AND RESTATED FIBER OPTIC CABLE ON FREEWAYS IN MISSOURI AGREEMENT

This Amended and Restated Fiber Optic Cable on Freeways in Missouri Agreement (the "Agreement"), is made as of June 5, 2003, by and among Digital Teleport, Inc., a Missouri corporation ("Digital Teleport"), the Missouri Highway and Transportation Commission ("MHTC") and the Missouri Department of Transportation (collectively referred to herein with MHTC as "MoDOT"), each a "Party" and together, the "Parties".

SECTION 1. Recitals

- A. Digital Teleport and MHTC are parties to that certain Fiber Optic Cable on Freeways in Missouri Agreement dated as of July 29, 1994, which was amended by that certain amendment effective September 22, 1994, that certain Second Amendment effective November 7, 1994 and that certain Third Amendment effective October 9, 1996 (collectively, the "Old Agreement").
- B. MHTC and Digital Teleport entered into that certain Settlement Agreement and Agreement to Restate the Digital Teleport/MoDOT Agreement, dated as of October 17, 2002 (the "Settlement Agreement").
- C. Whereas, Digital Teleport has filed the Settlement Agreement along with a motion under Federal Rule of Bankruptcy Procedure 9019 seeking approval from the Federal Bankruptcy Court in the Eastern District of Missouri (the "Bankruptcy Court") for the compromise contemplated by the Settlement Agreement.
- D. MoDOT obtained authority from MHTC to enter into the Settlement Agreement on October 11, 2002 and obtained required authorization from MHTC to enter into this Agreement on June 5, 2003.
- E. To effect the terms of the Settlement Agreement and to amend and restate the terms of the Old Agreement, in their entirety, the parties hereto have entered into this Agreement.
- NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, and other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Parties hereto agree as follows:

SECTION 2. Easement

- 2.1. This Agreement specifies the terms and conditions agreed upon by the Parties for the construction, operation and maintenance by Digital Teleport of fiber optic communication facilities longitudinally on the mainline freeway system in Missouri. This Agreement supersedes and replaces all prior agreements between the Parties, including without limitation the Old Agreement, and all rights and remedies thereunder are fully and forever waived, and all claims thereunder are fully and forever released, subject only to the obligations of the Parties hereunder.
- <u>2.2.</u> MoDOT has granted, remised and quit-claimed to Digital Teleport, all of its successors and assigns, and all their respective tenants, subtenants, utility providers, licensees, contractors and agents, subject to the terms and conditions of this Agreement:

- (a) an exclusive easement with respect to the installation of fiber optic facilities as described in Section 3.1 on, over under and across the Fiber Optic Cable Corridor in place as of the date of this Agreement (the "Easement Area") for the use, construction, operation, maintenance, repair, replacement and upgrade (collectively, "Operations") of all of Digital Teleport's fibers, cables, conduit, hand holes, equipment shelters and other communication facilities, improvements, equipment and fixtures that exist either above or below ground within MoDOT's rights of way as of the date of this Agreement (the "Existing Facilities"); together with
- (b) the right to enter upon the Easement Area and all other portions of MoDOT's rights of way that may be reasonably required to be entered for the purposes of the Operations.
- <u>2.3.</u> The easement granted herein shall also include the right of Digital Teleport to construct fiber lateral routes and hand holes to create new fiber connections to the Existing Facilities (whether in the median or otherwise), subject to compliance by Digital Teleport with the provisions of the Policy (defined in Section 10.1) and Section 10.

SECTION 3. Fiber Optic Cable Corridors And Equipment Shelters

- 3.1. This Agreement applies to Digital Teleport's current facility installations on the roadway system in Missouri along the corridors listed below (the "Fiber Optic Cable Corridors"). The exact location of the Existing Facilities are indicated on the "as-built" plans previously provided to MoDOT, generally along the routes depicted on Exhibits A, C and E attached hereto, which are incorporated herein and made a part of this Agreement. Digital Teleport shall provide MoDOT with updates to the as-built plans within forty-five (45) days of any changes, additions or deletions to the Existing Facilities.
 - (a) For purposes hereof, Existing Facilities are identified as follows:
 - (1) the St. Louis Freeway System as depicted on Exhibit A hereto.
 - (2) the Kansas City Freeway System as depicted on Exhibit C hereto.
 - (3) the Rural Interstate as depicted on Exhibit E hereto.
- (b) Digital Teleport has also constructed certain fiber optic facilities on non-MoDOT rights of way in downtown St. Louis and Kansas City as depicted on Exhibits B and D respectively ("Non-MoDOT Existing Facilities").
- 3.3. Equipment Shelters Digital Teleport may operate and maintain, equipment shelters for its fiber optic cable and communications system at various sites along the right-of-way as listed below (the "Equipment Shelters"). The exact location of the Equipment Shelters are indicated on the "as built" plans previously provided to MoDOT as depicted on Exhibit F hereto. MoDOT will provide access to MoDOT rights of way for ingress and egress to and from such Equipment Shelters to Digital Teleport, its agents, and employees or authorized contractors who operate fiber and/or maintain equipment in such facilities. Subject to MoDOT prior written approval, Digital Teleport shall be allowed to have other utilities, e.g. electrical and water service, installed to serve its Equipment Shelters.

SECTION 4. Consideration

- 4.1. In consideration of the mutual covenants and conditions set forth herein, and other good and valuable consideration, including forgiveness of defaults by Digital Teleport in prior agreements and in MoDOT's waiver of future performance of prior agreements, Digital Teleport acknowledges the receipt and sufficiency of consideration, and the Parties agree that Digital Teleport, at no charge or expense to MoDOT other than as explicitly set forth below, shall provide MoDOT with all of the following services and good as consideration, within the time specified herein or if no time is specified within ninety (90) days after the Effective Date (as defined in Section 13(t) below):
- (a) Legal title, free and clear of all liens and encumbrances, to six (6) unlit fibers (SMF-28) dedicated to MoDOT in (i) the Existing Facilities installed on the Easement Area and (ii) in the Non-MoDOT Existing Facilities; *provided, however,* that MoDOT has previously utilized some or all of these six (6) strands on various routes in the St. Louis metro area to construct its four (4) ATM ITS rings as depicted on Exhibit H and further *provided*, that Digital Teleport will provide to MoDOT an additional two (2) unlit (dark) fibers SMF-28 (for a total of eight (8) fibers) between the fiber patch panel in the Digital Teleport building at 700 South 21st Street and the Digital Teleport handhole at the Southeast corner of the I-64/Compton Avenue overpass (collectively, the "MoDOT Fibers"). Legal title shall be delivered within ten (10) days of the Effective Date.

In relation to the MoDOT Fibers Digital Teleport agrees as follows:

- (1) Digital Teleport has provided a fiber testing data booklet clearly delineating and identifying MoDOT Fibers with industry standard OTDR traces, continuity tests, power loss ratings and other industry specific characteristics unique to the MoDOT Fibers; and
- (2) MoDOT may in the future, at MoDOT's cost, install its own electronics along the route of the MoDOT Fibers.
- Oigital Teleport will promptly and expeditiously complete the splicing and related work to support the St. Louis Intelligent Transportation System ("ITS") as set forth on Exhibit G hereto.
- (4) Digital Teleport will provide to MoDOT access to the MoDOT Fibers at all existing and future Equipment Shelters in the Fiber Optic Cable Corridor and at all existing and future Digital Teleport hand holes containing either splice points or slack coils; provided, however, that such requested access does not materially and adversely affect the operations of the Digital Teleport Fiber Optic Network.
- (5) MoDOT may request in writing that Digital Teleport add a new hand hole and splice point along the route of the MoDOT Fiber at which MoDOT may access the MoDOT Fibers for immediate use by MoDOT provided that such requested access does not materially and adversely affect the operations of the Digital Teleport Fiber Optic Network. Digital Teleport will commence installation of any such new hand hole or splice point within thirty (30) days of the applicable request. Digital Teleport will pay for all costs of purchasing and installing only the new hand hole or splice point

and MoDOT will pay for 100% of the actual out of pocket all other expenses incurred by Digital Teleport in physically accessing and splicing the MoDOT Fibers at that new hand hole or splice point. MoDOT will be responsible for all costs of constructing for MoDOT's use any additional lateral fiber route out from that new Digital Teleport hand hole or splice point.

- (b) Digital Teleport will continue to provide to MoDOT access to a total of 622 Mbps of bandwidth capacity on the Digital Teleport fiber optic ring from Kansas City to Columbia to Lebanon to Joplin to Kansas City "West Ring" on the Existing Facilities (currently in the form of a SONET OC-12 circuit) which bandwidth will be accessible at the St. Joseph, Kansas City, Springfield, Joplin and Jefferson City district offices through a 622 Mbps connection from each district office to that bandwidth on the West Ring.
- (c) Digital Teleport will continue to provide to MoDOT access to a total of 622 Mbps of bandwidth capacity on the Digital Teleport fiber optic ring from St. Louis to Columbia to Lebanon to Rolla to St. Louis "East Ring" on the Existing Facilities (currently in the form of a SONET OC-12 circuit) which bandwidth will be accessible at the St. Louis and Sikeston district offices through a 622 Mbps connection from each such district office to that bandwidth on the East Ring.
- (d) Digital Teleport will continue to provide MoDOT access to a total of 2,488 Mbps of bandwidth capacity on the route depicted on Exhibit I in the St. Louis metro area (currently in the form of a SONET OC-48 circuit) to transport the ITS traffic data from the four (4) MoDOT ATM rings back to the MoDOT Traffic Operations Center ("TOC") ("St. Louis ITS Bandwidth").
- (e) No later than forty-five (45) days following the Effective Date Digital Teleport will provide to MoDOT:
 - (1) a 622 Mbps connection (utilizing the Existing Facilities) between the Hannibal MoDOT district office and the 622 Mbps of bandwidth capacity that is available to MoDOT on the East Ring.
 - (2) a 45 Mbps connection (utilizing a DS-3 circuit leased from a third party) between the Macon MoDOT district office and the 622 Mbps of bandwidth capacity that is available to MoDOT on the East Ring.
 - (3) a 45 Mbps connection (utilizing a DS-3 circuit leased from a third party) between the Willow Springs MoDOT district office and the 622 Mbps of bandwidth capacity that is available to MoDOT on the East Ring.
- (f) If, in the future, MoDOT can demonstrate an immediate need for a connection greater than 45 Mbps to the Macon or Willow Springs district office for MoDOT's Governmental Purposes only, then Digital Teleport will provide such additional bandwidth, subject to availability from 3rd party carriers, within ninety (90) days of such request with evidence of such need, *provided, however*, Digital Teleport shall not be required to provide more than 622 Mbps of bandwidth capacity between the East Ring and either the Macon or Willow Springs district office.
- (g) Digital Teleport and MoDOT will jointly design and plan the Kansas City ITS system for MoDOT. Digital Teleport will only be required to provide bandwidth transport

services to MoDOT by installing optical electronics equipment on two (2) Digital Teleport fiber strands on the Existing Facilities and the Non-MoDOT Existing Facilities (which are not MoDOT Fibers) to support this jointly developed Kansas City ITS system ("Kansas City ITS Bandwidth"), and MoDOT will pay for all out of pocket costs incurred by Digital Teleport in excess of \$190,000 to purchase and install that equipment. The bandwidth transport services provided to MoDOT pursuant to sections 5.1(b) through (g) shall be referred to herein as "MoDOT Bandwidth".

- (h) Digital Teleport agrees that any maintenance or corrective measures, including replacement of equipment to provide the MoDOT Bandwidth will be performed without charge to MoDOT. Digital Teleport agrees that subject to the force majeure clause of Section 9 in this Agreement, all outages will be restored within twenty-four (24) hours of MoDOT notification to Digital Teleport, at no expense to MoDOT.
- (i) Digital Teleport will provide to MoDOT a license to use one (1) standard 19" telecommunications equipment rack in the joint use collocation area of each Equipment Shelter ("MoDOT Racks"). Digital Teleport will provide to MoDOT 30 amps of 48v DC power to each MoDOT Rack through bulk power feeds. MoDOT will provide its own fiber patch panels, power distribution panels, racks and other equipment that will be installed in the MoDOT Rack. The demarcation point for access to the MoDOT Fibers within the Equipment Shelters will be at DTI's fiber distribution panel in the Equipment Shelter.
- (j) MoDOT shall have the right to use all MoDOT Fibers and MoDOT Bandwidth provided to MoDOT in this Agreement for any legitimate, state governmental purpose ("Governmental Purpose").
- 4.2. All access to MoDOT Bandwidth for the district offices and the St. Louis and Kansas City ITS systems that is provided through the Digital Teleport network will be through a dim fiber meet at the location where those services are to be delivered to MoDOT:
- (a) Access to the MoDOT Bandwidth at each district office shall be through a dim fiber meet located at a patch panel inside of each district office.
- (b) Access to the St. Louis ITS Bandwidth and projects shall be through a dim fiber meet located at existing Digital Teleport hand holes with slack coils or splice cases in the Fiber Optic Cable Corridor.
- (c) MoDOT will be responsible for providing all other fiber and optronic equipment necessary to access that MoDOT bandwidth from that dim fiber meet.
- (d) MoDOT may also access MoDOT Bandwidth at all Equipment Shelters along the fiber route transporting the MoDOT Bandwidth that have Digital Teleport add/drop optronic equipment that has existing interface capacity and which transports the MoDOT Bandwidth.
- 4.3. Notwithstanding anything herein to the contrary, the Parties acknowledge and agree that SONET ring protection (i) is the current transport protocol utilized by Digital Teleport in provision of services to its commercial customers in Missouri, and (ii) is the transport protocol that is useful for MoDOT to meet its communications needs on the MoDOT district office network and on the St. Louis and Kansas City ITS networks. Notwithstanding the foregoing, due to the long term nature of this Agreement, Digital Teleport and MoDOT will work cooperatively to determine, from time to time, whether the transport protocol utilized by Digital

Teleport in delivering the MoDOT bandwidth should change in order to keep that protocol consistent with the prevailing transport protocol utilized by Digital Teleport in providing services to the commercial customers of Digital Teleport and utilized by MoDOT to meet its communications needs for its district office network and the ITS networks. When Digital Teleport and MoDOT agree that a change in the protocol is needed, (i) any costs to replace or modify the Digital Teleport equipment used to transport the MoDOT Bandwidth to the dim fiber meet point in the hand holes shall be paid by Digital Teleport, and (ii) any costs to replace or modify the MoDOT equipment that receives the MoDOT Bandwidth at the MoDOT Bandwidth service delivery locations shall be paid by MoDOT.

<u>4.4.</u> If MoDOT shall have an immediate need for additional similar telecommunications services along I-94 between I-70 and I-64, then Digital Teleport shall obtain for MoDOT, at Digital Teleport's cost, such bandwidth transport services from a third party to the extent then available from a third party. The level and means to deliver such services that must be provided by Digital Teleport shall not be required to exceed the prevailing level of services that MoDOT provides for its own use through dark fiber provided to MoDOT along the System Additions (as set forth in Section 6.1 below).

SECTION 5. Transfer of Digital Teleport Fibers

<u>5.1.</u> Digital Teleport has the right to sell, lease, license, grant title to any third party or enter into any similar transaction regarding the Existing Facilities to any third party without obtaining an additional permission or utility permit for either Digital Teleport or such third party from MoDOT. All agreements of Digital Teleport with third parties regarding such transactions shall contain a provision that (i) expressly excludes the right of any third party to take any interest in or right to the MoDOT right of way and (ii) provides that the third party will comply in all material respects with MoDOT health and safety regulations while accessing any equipment buildings located on the MoDOT right of way.

SECTION 6. Facility Relocation

- 6.1. The location of the easement granted herein shall be relocated at MoDOT's sole discretion within MoDOT's rights of way, provided that MoDOT shall bear the full cost of any relocation of all Existing Facilities which it requires of Digital Teleport after installation thereof provided, however, that MoDOT shall have no obligation to pay for such relocation for Existing Facilities along the following routes:
 - (a) Route 376-Route 67 from I-270 to Mississippi River
 - (b) Route 94 from I-70 to Hemstath Rd
 - (c) Route 61 from I-70 to Route 36 (Hannibal)
 - (d) Route 65 from I-44 to Division St(Springfield)
 - (e) Route 71 from I-435 to I-44 and continuing to Arkansas State line(future I-49)
- <u>6.2.</u> If MoDOT requires that the Existing Facilities to be relocated to a location in MoDOT's airspace which is already occupied by MoDOT utility corridor, or another utility is occupying that location by permit or variance and the Existing Facilities cannot be relocated in a feasible or prudent manner elsewhere in MoDOT's rights of way in that vicinity, then MoDOT shall have the option to either acquire additional right-of-way in which to place the Existing Facilities in a manner acceptable to Digital Teleport, or to remove or relocate the other utility or

utility corridor at MoDOT's sole expense, so that Digital Teleport may relocate its Existing Facilities in that corridor, as necessary.

SECTION 7. Exclusivity

<u>7.1.</u> No other fiber optic cable will be permitted to be installed in the MoDOT rights of way along the route of the Existing Facilities during the Term of this Agreement; *provided, however,* that this provision shall not prohibit another firm's fiber optic cable from crossing the Fiber Optic Cable Corridor at approximately a right angle, at a location to be mutually agreed by MoDOT and Digital Teleport. Furthermore, nothing herein shall limit MoDOT's authority to install its own independent fiber optic cable within MoDOT's airspace exclusively for Governmental Purposes.

SECTION 8. Termination

- <u>8.1</u> <u>Rights Granted</u>: This agreement may be terminated by either party at its option upon material breach by the other party, subject to the right to cure in Section 8.2.
- 8.2 Right to Cure: In the event that a party determines in good faith that any event has occurred which would give it the right to terminate this Agreement that party shall notify the other party of said event in writing, after which, notwithstanding anything else herein to the contrary, the other party shall have a period of ninety (90) days from the date of such notice to cure such violation of the terms of this Agreement. This ninety (90) day period may be extended upon the mutual written agreement of the parties.
- **8.3** Termination of the Agreement: When this Agreement and the rights it conveys is terminated, Digital Teleport shall have the option to:
- (a) Remove all fiber optic cable equipment shelters and hand holes from MoDOT's property at Digital Teleport's own cost and repair all damages to MoDOT's property which result. Empty conduit may be abandoned in place without removal. Digital Teleport shall have one-hundred and eighty (180) days from the termination of this Agreement to complete that work. Digital Teleport shall not block or materially delay, impede or interrupt traffic to effect the removal of its property and shall not take any action which creates a dangerous condition of public property or which would endanger any pedestrian or occupant of a motor vehicle. If Digital Teleport elects this option, Digital Teleport must remove all hazardous or regulated wastes it generates or is responsible for (directly or indirectly) from MoDOT property in accord with all federal, state and local environmental laws, regulations and ordinances.
- (b) Sell to MoDOT the Existing Facilities or any portion thereof which is acceptable to MoDOT, at a price to be mutually agreed upon.
- (c) Sell to any third party the Existing Facilities *provided, however*, that such third party can show reasonable evidence of its ability to comply with the Policy.
- (d) Abandon all Existing Facilities in place or any portion thereof, in a written notice to MoDOT, in which instance that portion of the Existing Facilities becomes the sole and exclusive property of MoDOT; provided, however, Digital Teleport may not abandon any items or equipment which may contain or create hazardous or regulated wastes or materials without

prior notice to MoDOT of the description and location of those materials. MoDOT may refuse to accept the abandonment of all or any portion of the Existing Facilities tendered by Digital Teleport until any hazardous or regulated wastes or materials have been removed in accord with all applicable laws. In any event, Digital Teleport remains liable for the remediation and full restoration of any damaged real or personal property and for injuries or death resulting from the presence of any hazardous or regulated wastes or materials on or adjacent to MoDOT's property, which wastes or materials are or were owned, placed or operated by Digital Teleport.

SECTION 9. Force Majeure

- <u>9.1.</u> If either Party's performance of its obligations hereunder becomes impossible or impractical because of an act of God, war, riot, fire, explosion, accident, flood, sabotage, inclement weather, strikes, lockouts or injunctions or any other cause beyond the reasonable control of such party, such party shall be given a reasonably adequate time to remedy such situation. These conditions do not constitute grounds for avoidance of a party's obligations hereunder but merely excusable delay. A condition, however, will not excuse performance if it does not directly affect performance under the terms hereof.
- (a) The Party invoking this provision shall immediately notify the other party orally and promptly thereafter provide notice in writing of the cause for the delay, restriction or limitation of its ability to perform, together with an estimate of the extent to which its performance has been and will be delayed.
- (b) Should a "Force Majeure" delay the performance of this Agreement for a period in excess of thirty (30) days, the Party delayed from performing shall on or before the 1st and 15th day of each calendar month thereafter notify the other Party of its best estimate of the length of time such "Force Majeure" will remain in effect and, notwithstanding any provision herein to the contrary, the other Party may take such reasonable actions as will mitigate any damages.

SECTION 10. Median Fiber Access

- <u>10.1.</u> MoDOT's Utility Accommodation Policy and the exceptions thereto granted by MoDOT in order to implement and comply with This Agreement on the date of the Old Agreement (the "Policy") shall apply to all aspects of construction, operation, and maintenance of Digital Teleport's communication facilities. This Policy may be amended from time to time by MoDOT, *provided, however*, that no changes to the Policy will change the rights or obligations of Digital Teleport under this Agreement.
- <u>10.2.</u> It is acknowledged and agreed that MoDOT has granted Digital Teleport exceptions to the Policy including, without limitation, allowing longitudinal installation of fiber optic cables within the freeway right-of-way, provided that this exception does not compromise other provisions of the Policy, including the prohibition of maintenance access from the freeway roadway *provided, however,* that prior to being granted the right to construct fiber lateral routes to Existing Facilities in the interstate median, Digital Teleport shall certify to MoDOT that constructing such fiber lateral routes to the nearest interchange that has an existing hand hole outside the median is at least fifteen percent (15%) more costly to Digital Teleport than constructing the new fiber lateral route to establish a hand hole point of connection in the median. Standard utility permits will be issued covering all the installations.

SECTION 11. Maintenance

- <u>11.1.</u> Digital Teleport will be responsible for the maintenance and Missouri One Call utility locate duties regarding the Existing Facilities (including the MoDOT Fibers) accordance with Digital Teleport's company policies.
- <u>11.2</u> Digital Teleport shall maintain and repair the MoDOT Fibers at Digital Teleport's expense. Digital Teleport disclaims any and all warranties, express or implied, as to the use or condition of the MoDOT Fibers and Rack Spaces or any other matter hereunder, including without limitation warranties of merchantability, workmanship, quality or fitness for a particular purpose and MoDOT agrees to look solely to the manufacturer of all materials and equipment subject to the grant of title or license to MoDOT hereunder for any recovery for claims of MoDOT relating to such materials and equipment.
- <u>11.3.</u> All plans for work on the Existing Facilities involving excavation or trenching shall be submitted to MoDOT's State Traffic Engineer for approval at least thirty (30) days prior to the desired date of such work. Attachment to any structure shall be submitted thirty (30) days prior to installation. MoDOT will approve or disapprove any such submissions within twenty-one (21) days of receipt thereof. MoDOT's approval or disapproval of such plans shall be made in accordance with the Policy.

SECTION 12. Taxes And Liens

12.1. Digital Teleport shall promptly pay and discharge all personal property taxes, assessments, fees, and other similar charges levied or assessed against it or its assets situated on MoDOT right-of-way, and any and all other charges levied or assessed by reason of Digital Teleport's use and occupancy of the right-of-way which become due during the term of this Agreement which are hereby declared the obligation of Digital Teleport under this Agreement. Digital Teleport shall keep the right-of-way free from any liens arising from work performed, materials furnished or obligations incurred by Digital Teleport provided, however, Digital Teleport shall have the right to pledge its rights and privileges contained in this Agreement to secure financial obligations to third parties without the need to obtain consent from MoDOT.

SECTION 13. Miscellaneous

- (a) Applicable State Laws and Encumbrances: At no time during this Agreement or any renewal period thereto shall Digital Teleport place, install or deposit any hazardous waste or hazardous substance in the MoDOT airspace. This does not include, however, those hazardous substances which are lawfully and properly contained within Digital Teleport's equipment or structures with the exception of propane tanks which shall be buried in compliance with all federal, state and local regulations. If Digital Teleport causes, allows or permits a spill of a hazardous waste or substance within MoDOT airspace, or on property immediately adjacent thereto, then Digital Teleport shall remain solely liable.
- (b) <u>Conflict of Interest</u>: No official or employee of MoDOT or its governing body and no other public official of MoDOT who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of the project covered by this Agreement shall voluntarily acquire any personal interest, directly or indirectly, in this Agreement. Digital Teleport covenants that it presently has no interest and shall not acquire any such interest,

directly or indirectly, which will conflict in any manner or degree with the performance of the services hereunder. Digital Teleport further covenants that no person having any such known interest shall be employed or conveyed such interest, directly or indirectly, in this Agreement.

- (c) <u>Liability Insurance</u>: At a minimum, Digital Teleport shall maintain the following insurance coverage:
 - (1) Commercial general liability insurance, having minimum liability limits of four hundred thousand dollars per each bodily injury or property damage claim up to two million five hundred dollars per occurrence.
 - (2) Commercial automobile liability insurance for all vehicles owned or used by Digital Teleport in any phase of the construction, installation, operation, maintenance and repair of the fiber optic cable system on MoDOT's right-of-way. The minimum limits of liability of such insurance shall be two million five hundred dollars per occurrence.

Hereafter as those limits may be increased under RSMo Section 537.600. If a statutory limit of liability for a type of liability specified in this section is repealed or does not exist, the Commission shall set reasonable limits of that insurance coverage which shall be as specified or adjusted periodically in a written notice from the Commission to Digital Teleport, Inc

- (d) Workers Compensation: Workers compensation insurance shall be maintained at all times by Digital Teleport in amounts sufficient to comply with all the obligations of Digital Teleport under the laws of the State of Missouri relating to workers compensation.
- (e) <u>Subcontractors</u>: Digital Teleport shall be responsible to see that its subcontractors possess at least the same minimum extent of liability insurance at such times that they are constructing, installing, operating, maintaining or repairing any portion of the fiber optic cable system on MoDOT's right-of-way.
- (f) <u>Proof of Insurance</u>: Digital Teleport shall provide proof of insurance to MoDOT within seven (7) business days upon receipt of a written request for same from an authorized representative of MoDOT. Digital Teleport shall also provide proof of insurance to MoDOT of any subcontractor, or require that subcontractor to do so, within seven (7) business days upon receipt of a written request for that subcontractor's insurance status from an authorized representative of MoDOT.
- (g) <u>Digital Teleport's Liability for Negligent Acts or Omissions</u>: Digital Teleport shall be responsible for any and all injury or damage to third parties as a result of any negligent acts or omissions in the services provided to MoDOT under the terms and conditions of this Agreement. In addition to the liability imposed upon Digital Teleport on account of personal injury, bodily injury (including death) or property damage suffered as a result of Digital Teleport's negligence, Digital Teleport assumes the obligation to save harmless MoDOT including its employees and assigns from every expense, liability or cost arising solely out of such negligent act or omission. Digital Teleport also agrees to hold harmless MoDOT, its employees and assigns for any negligent act or omission committed by any subcontractor or other person employed by or under the supervision of Digital Teleport under the terms of this Agreement.

- (h) MoDOT's Liability to Digital Teleport: MoDOT will reimburse Digital Teleport for all actual repair costs if the MoDOT personnel or any other contractor or subcontractor to MoDOT damages or destroys any part of the fiber optic cable system or equipment installed by Digital Teleport. However, MoDOT, its employees, agents and assigns will not be liable for lost revenues or any other types of incidental or consequential damages sustained by Digital Teleport as a result of an inadvertent or unintentional cable cut or other loss of signal transmission. This provision does not limit the scope of liability of an MoDOT highway construction contractor or subcontractor to Digital Teleport for actionable negligence in the construction, reconstruction, repair or maintenance of a state highway or other state transportation facility.
- (i) <u>Limitation of Liability</u>. Notwithstanding any provision of this Agreement to the contrary, in no event shall any Party to this Agreement be liable to any other Party for any special, incidental, indirect, punitive, reliance or consequential damages, whether foreseeable or not, arising out of, or in connection with, transmission interruptions or problems, including but not limited to, damage or loss of property or equipment, loss of profits or revenue, cost of capital, cost of replacement services, or claims of customers, whether occasioned by any repair or maintenance performed by, or failed to be performed by, any Party to this Agreement, or any other cause whatsoever, including, without limitation, breach of contract, breach of warranty, negligence, or strict liability. No claims for damages with respect to this Agreement may be made more than five (5) years after the date that the event giving rise to such claim is known or reasonably should have been known to the person or entity making such claim; and no claim for indemnity under the provisions of Section 6 hereof may be made more than five (5) years after the first notice of any claim received by the Party claiming under such indemnity provision.
- (j) Performance and Payment Bond: Digital Teleport must furnish and attach to this Agreement, a performance bond on the form provided by MoDOT without deviations, omissions or additions, in at least the penal sum of Two Hundred Fifty Thousand Dollars (\$250,000.00). This bond shall be issued and executed by a surety or sureties acceptable to MoDOT, to ensure the continued maintenance and performance of the MoDOT Fibers and MoDOT Bandwidth for the remaining term of this Agreement in accord with its provisions, and the payment for all labor performed and materials installed, consumed or used in that phase of the contract work. This bond shall remain in full force and effect at all times, without a break in coverage, for the initial period and all renewal periods of this Agreement. This bond shall not be cancelled except prospectively, and with at least thirty (30) days' advance notice in writing to MoDOT and Digital Teleport. Prior to such effective date of cancellation of this bond, Digital Teleport must obtain and submit to MoDOT a valid substitute bond meeting all terms of this Agreement.
- (k) <u>Amendments</u>: No modification of any provision of the Agreement shall be made or construed to have been made unless such modification is mutually agreed to in writing by Digital Teleport and MoDOT and incorporated in a written amendment to the Agreement and approved by MoDOT prior to the effective date of such modification.
- (I) <u>Communications and Notices</u>: Any notices required or permitted to be delivered under this Agreement shall be in writing and shall be deemed to be delivered on the earliest to occur of (a) actual receipt; or (b) three (3) business days after having been deposited with the United States Postal Service, postage prepaid, certified mail, return receipt requested; or (c) one (1) business day after having been deposited with a reputable overnight express mail service that provides tracking and proof of receipt of items mailed. All notices shall be addressed to MoDOT or Digital Teleport, as the case may be, at the address or addresses set forth below, or such other addresses as the parties may designate in a notice similarly sent:

If to MoDOT, address to:

Missouri Highway and Transportation Commission Capitol Avenue and Jefferson Street P.O. Box 270 Jefferson City, Missouri 65102 Attn: Chief Engineer

and if to Digital Teleport, Inc.:

Digital Teleport, Inc. 14567 N. Outer Forty Rd., Ste. 500 Chesterfield, MO 63017 Attn: General Counsel

- (m) <u>Venue</u>: No action may be brought by either party hereto concerning any matter, thing or dispute arising out of or relating to the terms, performance, nonperformance or otherwise of this Agreement except in the Circuit Court of Cole County, Missouri. The parties agree that this Agreement is entered into at Jefferson City, Missouri, and substantial elements of its performance will take place or be delivered at Jefferson City, Missouri, for which Digital Teleport consents to venue of any action against it in Cole County, Missouri.
- (n) <u>Wage Laws</u>: Digital Teleport and its subcontractors shall pay the prevailing hourly rate of wages for each craft or type of workmen required to execute this project work as determined by the Department of Labor and Industrial Relations of Missouri, and they shall further comply in every respect with the minimum wage laws of Missouri and the United States. Federal wage rates under the Davis-Bacon or other federal acts apply to and govern this Agreement also for such work which is performed at the jobsite, in accord with 29 CFR Part 5. Thus, this Agreement is subject to the "Work Hours Act of 1962", Public Law 87-581, 76 Stat. 357, as amended, and its implementing regulations. Digital Teleport shall take those acts which may be required to fully inform itself of the terms of, and to comply with, state and federal labor and wage laws applicable to this Agreement. This Agreement is a service contract, and not a public works contract.
- (o) <u>Nondiscrimination Assurance</u>: With regard to work under this Agreement, Digital Teleport agrees as follows:
 - (1) Civil Rights Statutes: Digital Teleport shall comply with all state and federal statutes relating to nondiscrimination, including but not limited to Title VI and Title VII of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d and 2000e), as well as any applicable titles of the Americans with Disabilities Act. In addition, if Digital Teleport is providing services or operating programs on behalf of MoDOT, it shall comply with all applicable provisions of Title II of the Americans with Disabilities Act.
 - (2) Executive Order: Digital Teleport shall comply with all the provisions of Executive Order 94-03, issued by the Honorable Mel Carnahan, Governor of Missouri, on the fourteenth (14th) day of January 1994, promulgating a Code of Fair Practices in regard to nondiscrimination, which is incorporated herein by reference and made a part of this Agreement.

This Executive Order prohibits discriminatory practices by the state, Digital Teleport or its subcontractors based on race, color, religion, national origin, sex, age, disability or veteran status.

- (3) Nondiscrimination: Digital Teleport shall not discriminate on grounds of the race, color, religion, creed, sex, disability, national origin, age or ancestry of any individual in the selection and retention of subcontractors, including procurement of materials and leases of equipment. Digital Teleport shall not participate either directly or indirectly in the discrimination prohibited by 49 CFR Subtitle A, Part 21, Section 21.5, including employment practices.
- (p) <u>Laws of Missouri to Govern:</u> This Agreement shall be construed according to the laws of the State of Missouri without regard to its conflicts of laws provisions.
- (q) <u>Nonsolicitation</u>: Digital Teleport warrants that it has not employed or retained any company or person, other than a bona fide employee working for Digital Teleport, to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, MoDOT shall have the right to terminate this Agreement without liability, or in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gifts, or contingent fees.
- (r) <u>Assignment</u>. Digital Teleport may transfer this Agreement (i) in whole in connection with a transfer or assignment of all or substantially all of Digital Teleport's assets pursuant to the ongoing bankruptcy reorganization of Digital Teleport, or (ii) in whole to any party who agrees to be bound by all of the terms herein and has shown to MoDOT, to MoDOT's reasonable satisfaction, that party's ability to fulfill the obligations of Digital Teleport under this Agreement.
- (s) <u>Severability</u>: To the extent that a provision of this Agreement is contrary to the constitution or the laws of the State of Missouri or of the United States, that provision shall be void and unenforceable. However, the balance of the Agreement shall remain in full force and effect between MoDOT and Digital Teleport.
- (t) <u>Effectiveness</u>: This Agreement shall become effective upon the last to occur of the following (the "Effective Date"):
 - (1) Approval of the Settlement Agreement and this Agreement by the Bankruptcy Court;
 - (2) Approval of the Settlement Agreement and/or this Agreement by MoDOT; and
 - (3) Receipt of clarification from the FHWA that the provisions of Section 10 are not in conflict with existing FHWA law, rules or regulations, in form and substance reasonably acceptable to Digital Teleport.
- (u) The parties agree that the Exhibits A-I to the Agreement are drawings and are not intended to be engineering specifications or plans. Correspondence dated May 14, 2003 from David P. Stoeberl to Spencer P. Desai is incorporated as part of the Agreement and attached as Exhibit J.

P.2/3 * NO.561 573 526 5419 P.14

In witness whereof, the undersigned has executed this Agreement on the date set forth opposite their signature.

STATE OF MUSSOURI

Sworn to and subscribed before me this _____ day of Jun

JENNINE SCHMIDT Notary Public - Notary Seal STATE OF MISSOURI St. Louis County

My Commission Expires: Jan. 28, 2006

In witness whereof, the undersigned has executed this Agreement on the date set forth opposite their signature.

	MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION BY: Name Chief Daviday Title
	MISSOURI DEPARTMENT OF TRANSPORTATION BY: Name Auf Operating Office Title
STATE OF MISSOURI)) ss.	
Sworn to and subscribed b	pefore me this day of, 2002.
Notary Public	
My commission expires	

Approved as to Form:

Approved as to Form:

Commission Counsel

Exhibit A
St. Louis Freeway System – MoDOT Rights of Way

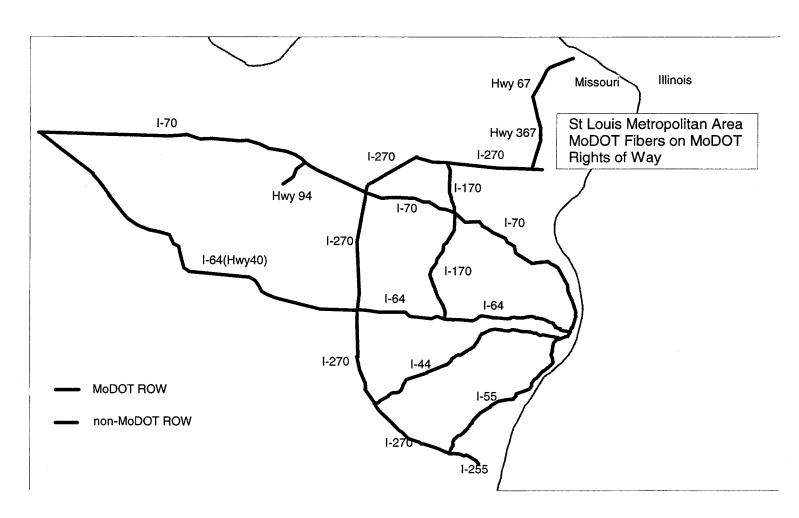


Exhibit B
Downtown St. Louis Freeway System – Non-MoDOT Rights of Way

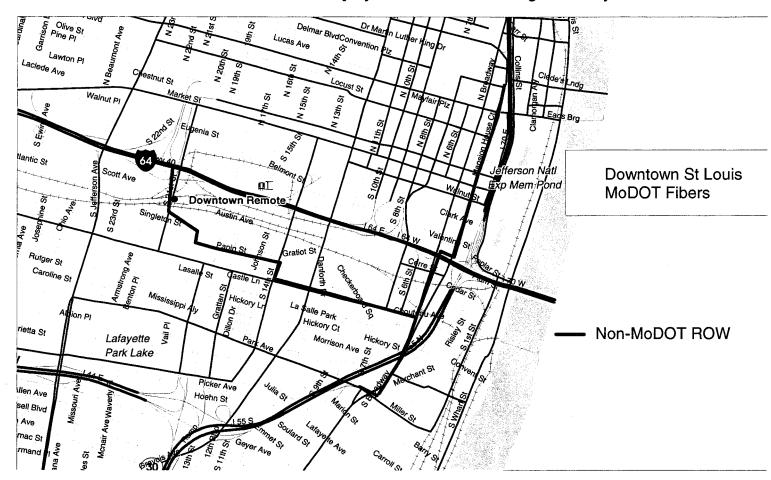


Exhibit C
Kansas City Freeway System –MoDOT Rights of Way

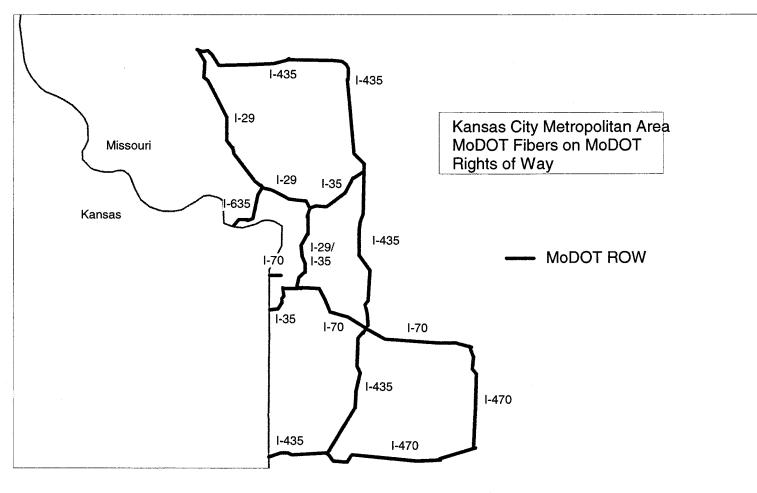


Exhibit D

Downtown Kansas City Freeway System – Non-MoDOT Rights of Way

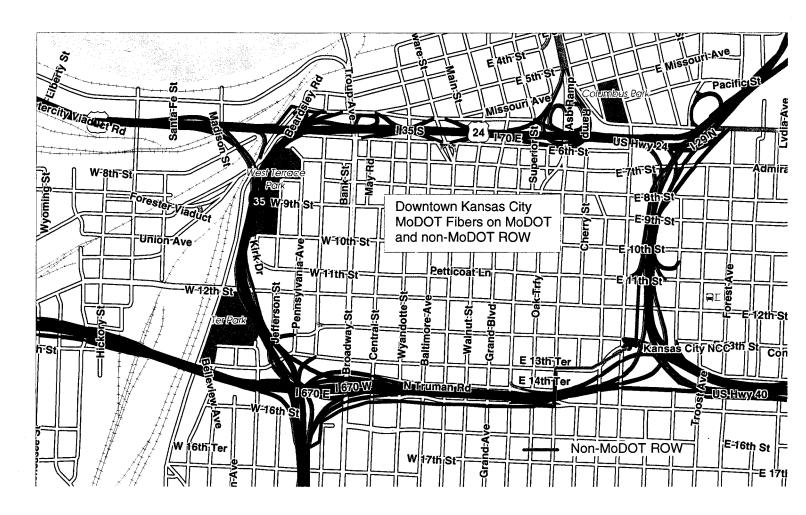


Exhibit E Rural Interstate System

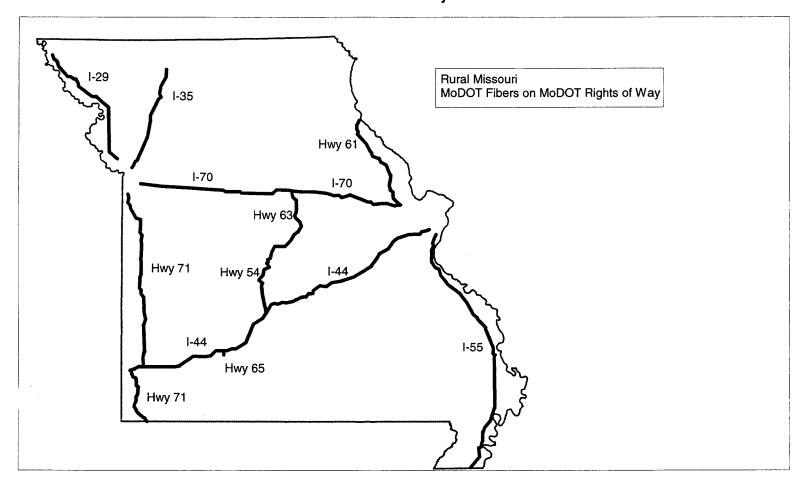


Exhibit F Equipment Shelter Locations

Site Name	Address of Building	City	State	Zip Code
Anderson (DTI)	Hwy 59 & Park Street	Anderson	MO	64831
Bethany (DTI)	NE corner of Hwy 136 & I-35	Bethany	МО	64424
Booneville (DTI)	I-70 & Hwy 5	Booneville	МО	65233
Bourbon (DTI)	SW Corner I-44 & Hwy J/N	Bourbon	MO	65441
Bowling Green (DTI)	NW Corner of US 61 & US Hwy 54	Bowling Green	MO	63334
Branson (DTI)	2449 State Hwy 76 E (Sho-Me buldg behind White Riv	Branson	MO	65616
Brewer (DTI)	SE corner of Hwy M & I-55	Brewer	MO	63775
Butler (DTI)	SE corner of Hwy 52 & Hwy 71	Butler	MO	64730
Camden Point (DTI)	SE corner Hwy E & I-29	Camden Point	MO	64018
Cape Girardeau (DTI)	5500 Old Cape Road	Cape Girardeau	MO	63701
Columbia Jct. (DTI)	SE Corner I-70 & US 63	Columbia	MO	65203
Festus/Crystal City (DTI)	HWY 61 & St. Pius Dr.	Festus	МО	63028
Gray Summit (DTI)	I-44 & Hwy 100 - exit 253	Gray Summit	MO	63039
Hannibal (DTI)	3250 Rendlen Ave (NE corner of US 36/61 Interchange)	Hannibal	MO	63401
Harrisonville (DTI)	102 Plaza Drive (NE Corner Hwy 28 & 71)	Harrisonville	MO	64701
Jefferson City Jct. (DTI)	SE Corner Hwy 54 & Hwy 50	Jefferson City	MO	65101
Joplin Jct. (DTI)	3590 S. Rangeline Rd	Joplin	MO	64804
Kingdom City (DTI)	I-70 & Hwy 54 (South I-70 Outer Rd)	Kingdom City	MO	65262
Lake Ozark (DTI)	686 Osage Hills Rd. (St. Hwy 54 & Bus. Rt. 54)	Eldon	MO	65026
Lamar (DTI)	Junction Hwy 71 & 126 (SE)	Lamar	МО	64759
Lebanon (DTI)	I-44 & State Hwy 5	Lebanon	MO	65536
Mound City (DTI)	I-29/Hwy 118	Mound City	МО	64470
Mt. Vernon (DTI)	1151 E. Industrial Dr.	Mount Vernon	МО	65712
Nevada (DTI)	1355 N. Osage Rd	Nevada	MO	64772
New Florence (DTI)	I-70 & Hwy 19	New Florence	MO	63363
New Madrid (DTI)	I-55 N. New Madrid Rest Area (1355 N. Osage)	New Madrid	MO	63869
Niangua (DTI)	I-44 N Outer Rd Exit 100 (2255 Rolling Meadows)	Niangua	MO	65713
Odessa (Higginsville) (DTI)	N side of I-70 Frontage Rd 1/2 mi west of Hwy 131 in MoDOT Maintenance Lot	Odessa	МО	64076
Rockport (DTI)	1/2 mile E of I-29 S side of Hwy 136 next to Rock Port Hotel	Rock Port	МО	64482
Rolla (DTI)	I-44 Hwy & Hwy 63	Rolla	МО	65401
Sikeston (DTI)	108 S. Interstate Drive	Sikeston (Miner)	МО	63081
Springfield (DTI)	2801 North Eastgate	Springfield	МО	65803
St. Joseph (DTI)	I-44 and Mitchell Ave. (NE Corner Rt YY & I-29)	St. Joseph	МО	64507
St. Robert (DTI)	I-44 & Rt Y	Waynesville	MO	65583
Stanbury (Savannah) (DTI)	NE corner of Hwy 136 & State Hwy B	Stanbury	MO	64489
Sweet Springs (KCPL)	Hwy 27, 600 ft. south of Oak Street	Sweet Springs	MO	65351
Sweet Springs (EE/K) DTI	NW corner of I-70 & Hwy EE/K	Sweet Springs	MO	65333
Wentzville (Bldg 1) (DTI)	200 Callahan Rd	Wentzville	МО	63385

Exhibit G ITS Splicing

Ring 1

- I-70 west of Pearce DMS splice due to construction change
- I-64 west of Mo River Bridge splice due to construction
- I-64 at Mason DMS splice not made
- I-64 at Ballas CCTV splice that was changed needs to be corrected
- I-270 at Rte 100 splice needed to tie in Barrett Station Road Signal Shop
- J6I1412 40 @ Mo. River; (modification splices due to removal and relocation of CCTV on const. Project)
- J6I1412 70 at Pearce Blvd; (Modification of splices due to construction of interchange)

Ring 3

Connection in DTI downtown hub for backbone connection

Ring 2

- 270 at 170 (Potential modification to splices due to interchange construction and relocate of ITS equipment)
- Field elements away from Field Terminals have not had fiber checks

Ring 3

- I-55/64/70 Field Terminal Poplar and 4th St. splice not made
- I-55/64/70 I-70 leg OTDR indicates fiber may not be turned at I-170 requiring splice change
- I-64 at I-170 fiber to DTI backbone did not appear to be connected at the DTI Ladue Hub (some work was done at HUB)
- I-64 at I-170 OTDR to east appeared to make I-64 at 20th St. but do not see Field Terminal
- I-64 at Compton splices need to be made
- I-64 at 20th cannot connect to Field Terminal in either direction (probable splice problem at Popular and 4th St.)
- Field elements away from Field Terminals have not had fiber checks
- J6I1450D 44/55 (Modification of existing splices due to application of ITS devices)
- Possible splices or patches missing at downtown hub.

Ring 4

- I-55 at Butler Hill splices not made for Detector and DMS
- Field elements away from Field Terminals have not had fiber checks

Exhibit H
MoDOT ATM ITS rings

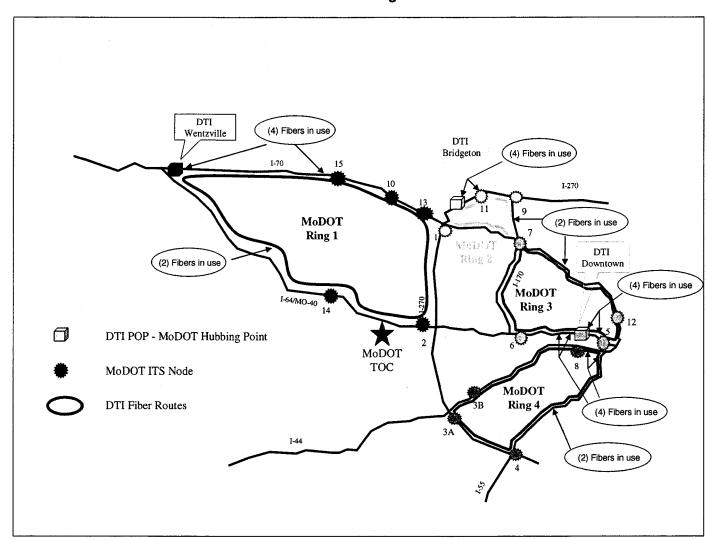


Exhibit I St. Louis ITS Bandwidth

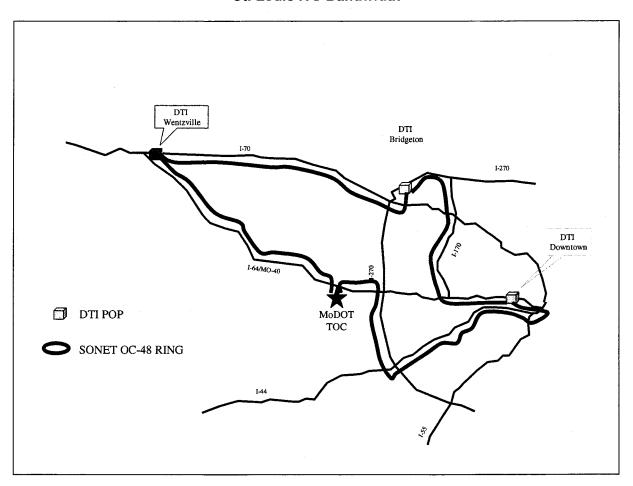


Exhibit J

FIBER OPTIC CABLE ON FREEWAYS IN MISSOURI

This Agreement is entered into by the Missouri Highway and Transportation Commission (hereinafter the "MHTC") and Digital Teleport, Inc., (hereinafter the "Fiber Optic Contractor", or "FOC").

WITNESSETH:

WHEREAS, the Intermodal Surface Transportation Efficiency Act of 1991, P.L. 102-240, 105 Stat. 1914-2207 (ISTEA), enacted at Section 1034 established requirements for highway management and traffic monitoring systems in 42 U.S.C. Section 303; and

WHEREAS, pursuant to ISTEA and 42 U.S.C. Section 303, the Federal Highway Administration (FHWA) has adopted 23 CFR Parts 500 and 626, which govern such highway traffic management and monitoring systems, with sanctions on those states which fail to comply with its program mandates; and

WHEREAS, at ISTEA Title VI, Part B, Congress enacted the Intelligent Vehicle-Highway Systems Act of 1991. calling for the widespread implementation of intelligent vehicle-highway systems to enhance the capacity, efficiency, and safety of the Federal-aid highway system and to serve as an alternative to additional physical capacity of the Federal-aid highway system; and

WHEREAS, within the presently available technology, the development and installation of a dedicated fiber optic cable system at or in close proximity to the Federal-aid highway system is desirable or necessary in order to achieve the mandates of these federal-laws and regulations; and

WHEREAS, on February 1, 1994, the FHWA approved the request of the Missouri Highway and Transportation Department (MHTD) for an exception to its utility accommodation policy on freeways, to allow longitudinal installation of fiber optic cables within the freeway right-of-way, provided that this exception does not compromise other provisions of MHTD's utility policy, including the prohibition of maintenance access from the freeway roadway; and

WHEREAS, the parties hereto desire to enter into an agreement, under which the FOC installs and maintains a buried fiber optic cable system on the mainline freeway system in Missouri, pursuant to a three phase plan to include the St. Louis metropolitan area, the Kansas City metropolitan area, and certain rural areas of Missouri, a portion of which system is reserved for the use of the MHTD and MHTC to aid in complying with these federal legal mandates.

NOW, THEREFORE, in consideration of these mutual covenants, promises and representations, the parties agree as follows:

(1) <u>DEFINITIONS</u>:

- (A) Airspace: That space located above, at, or below an MHTC highway's established gradeline, lying within the approved right-of-way limits.
- (B) Boring: Drilling or pushing under roadway.
- (C) Collapsed Ring: Redundant fibers within the same cable.
- (D) Conduit: Rigid pipe used to house cable.
- (E) <u>Crossroads</u>: Any public road or street that crosses over or under freeways.
- (F) <u>Distribution Nodes</u>: A point where lines of the same speed or different speed are brought together to create a line of greater speed in the digital hierarchy.
- (G) DS-1: Circuit that runs at 1.54 megabits/second.
- (H) Exhibit A: Three Phase Construction Plan

Exhibit B: Fiber Optic Terminal Equipment location and Schedules for Three Phases

Exhibit C: Technical Interface Design

- (I) <u>Existing Structures</u>: Bridges, walls, overpasses, etc., that are currently in place or which might be constructed in the future.
- (J) <u>Fiber Optic Cable Corridor</u>: The three-dimensional area above, below, and at ground level, within the metes and bounds description of MHTC's airspace.
- (K) Fiber Optic Cable System: The fiber optic cable system consists of all fiber optic cable, conduits, splices, buildings and enclosures, manholes and hand holes and optical termination equipment to provide DSI's, OC-3 and OC-12 circuit capacity.
- (L) <u>Highway Purpose</u>: To maintain and operate the state highway system in Missouri and not for commercial use or resale.
- (M) Interchanges: Any point that has ramps or roadways that access or exit the through lanes on the freeway where FOC will locate all fiber optic cable corridor components as described in the definition of Fiber Optic Cable Corridor.
- (N) Kansas City Freeway System: As shown on Exhibits A and B.
- (O) <u>Mainline Freeway System</u>: Through lanes of a roadway that are divided and accessible only at interchanges.

- (P) <u>Multiplexor Nodes</u>: A point where lines of the same speed or different speeds are brought together to create a line of greater speed in the digital hierarchy.
- (Q) OC-3: A circuit that runs at 155.52 mb/s.
- (R) OC-12: A circuit that runs at 622.08 mb/s.
- (S) Off Hour Services: Services performed after 5:00 p.m. and before 8:00 a.m. or on weekends or holidays.
- (T) Point of Demarcation: Electronic interface apparatus wherein FOC provides MHTC connections to DS1's, OC3's and OC12's as required in the Agreement.
- (U) Rural Freeway System: As shown on Exhibit A and B.
- (V) Schedule of Construction: The FOC will provide the network to MHTC in three construction phases. Phase One is the St. Louis metropolitan area, Phase Two is the Kansas City metropolitan area, and Phase Three is the Federal Rural Limited Access Interstate as described in Exhibit A. All phases include the full installation and completion of all fiber optic cable and electronic terminal equipment. Phase Three will initially include fiber optic cable to all interchange locations. In Phase Three, the FOC will locate fiber optic cable terminal equipment at the locations set forth in Exhibit B.
- (W) <u>Self-healing Loop Configuration</u>: If service is lost from one direction, it will automatically be restored from another direction.
- (X) <u>Sonet</u>: Synchronous Optical Network is a set of domestic phone company optical standards for fiber optic interfacing rates and band widths.
- (Y) St. Louis Freeway System: As shown in Exhibits A and B.
- (Z) Through-pavement: Pavement that goes from one interchange to another.
- (AA) <u>Unconduited</u>: Cable not placed in conduit.
- (BB) <u>Urban Area of St. Louis</u>: As shown on map as part of Exhibit B.
- (2) <u>PURPOSE</u>: This Agreement establishes the respective responsibilities of MHTC and the FOC for the purpose of installing and maintaining a buried fiber optic cable corridor along the mainline freeway system (existing and future) in Missouri pursuant to the three-phase plan set forth in Exhibit A.

- (3) CONTRACT PERIOD: The initial contract period shall be for forty (40) years. The contract shall not bind nor purport to bind MHTC or the FOC for any contractual commitment in excess of the original contract period. MHTC and FOC shall have the right, at their option, to renew the contract at twenty (20) year intervals thereafter. In the event the parties exercise this right, all terms, conditions and provisions of the original contract shall remain the same and apply during the renewal period. In the event MHTC and FOC exercise this right, all terms, conditions and provisions of the original contract shall remain the same and apply during the renewal period, unless otherwise mutually agreed to by the parties or their successors.
- (4) <u>CONTRACT CONSIDERATION</u>: In exchange for granting to FOC an exclusive easement in the fiber optic cable corridor, and in additional consideration of the exclusive right to construct and operate the fiber optic cable system in the fiber optic cable corridor, FOC will provide MHTC with six (6) dedicated and lighted fiber optic strands in the statewide system and the necessary connections thereto set forth in Exhibit B, and will maintain them in good operating condition.
- EXCLUSIVE EASEMENT: The exclusive easement granted to FOC by this Agreement shall be located within MHTC's airspace but outside of the utility corridor. It shall be broad enough to accommodate the fiber optic cable system and its maintenance, and shall be located as specified by MHTC's representative. The fiber optic cable corridor easement shall be exclusive only as to other fiber optic cable systems or communications systems. An exception is that another firm's fiber optic cable may cross the easement at approximately a right angle, with the mutual consent as to location by MHTC and FOC. The existence of the easement may be recorded by the FOC at its sole option and expense. The location of the easement shall be movable at MHTC's sole discretion within MHTC's airspace, provided that MHTC shall bear the cost of any relocation of the fiber optic cable corridor which it requires of the FOC after the fiber optic cable system is installed. The FOC shall have the option to locate any part of the fiber optic cable system within MHTC's utility corridor, but the use of that corridor shall not be exclusive. This easement is terminable by MHTC or its successor at its sole discretion at the conclusion of this Agreement and any option period exercised. Nothing in this provision or Agreement shall limit MHTC's authority to install its own independent fiber optic cable within MHTC airspace for highway purposes, if MHTC elects to do so.
- (6) <u>CONTRACT DOCUMENTS</u>: This Agreement between MHTC and the FOC incorporates and merges the terms of: (1) the Request for Proposal (hereinafter "RFP"), and any amendments thereto; and (2) the FOC's proposal submitted in response to the RFP.

(7) <u>EASEMENT GRANT AND CONSTRUCTION GUIDELINES:</u>

(A) MHTC, by this Agreement grants to FOC an exclusive easement as that term is defined in paragraph (5), for the purposes of constructing and operating the fiber optic cable system within the defined fiber optic cable corridor.

- (B) No other fiber optic cable will be permitted in the fiber optic cable corridor (or on the mainline freeway system outside any MHTC utility corridor unless a variance exists or is granted) as long as this fiber optic cable system is maintained under this Agreement. However, this provision shall not prohibit another firms fiber optic cable from crossing the fiber optic cable corridor at approximately a right angle, at a location to be mutually agreed by MHTC and FOC. No new variance shall be granted to place fiber optic cable for more than 1000 yards within MHTC's right-of-way at any one location. Any variance of a greater distance will be done only with the approval of FOC.
- (C) The fiber optic cable is to be buried twenty (20) feet to thirty (30) feet from the edge of the through-pavement, where possible, on MHTC right-of-way. Where that is not possible, due to structures, bridges, walls, lack of right-of-way, etc., installation shall be as mutually agreed between MHTC and the FOC. Where possible, the cable should be placed in existing conduit on bridge structures or conduit added by the FOC.
- (D) Distribution nodes and their associated power needs will be allowed only at interchanges or crossroads, where a service vehicle of the FOC will be off the paved roadway.
- (E) Boring will be required under any pavement, including roadways and ramps, in conduit. Crossing of the freeway may be at existing structures where possible, as determined by MHTC.
- (F) The location of all facilities constructed within the fiber optic cable corridor or on MHTC right-of-way shall be approved by MHTC. Standard utility permits will be issued covering all the installations. Any and all such permits or approvals shall be issued by MHTC's District Engineer for the district of installation. All plans for the installation of the fiber optic cable system shall be submitted to MHTC's district engineer for approval at least 30 days prior to the desired date of excavation or trenching for installation. Attachment to any structure should be submitted 60 days prior to installation.
- (G) With the exceptions noted in this Agreement, the work shall be accomplished in accordance with the existing permit policies and regulations in the Missouri Highway and Transportation Commission's Revised Rule 7 CSR 10-3.010 Location and Re-Location of Utilities on State Highways.

(8) TERMS AND CONDITIONS:

(A) MHTC's use of the fiber optic cable corridor will be for highway purposes. MHTC shall have access nodes at each interchange along the freeway system set forth in Exhibit B. MHTC shall have dedicated six (6) fibers for the provision of service in a self-healing loop configuration of a collapsed ring.

(B) The FOC shall own and operate the fiber optic cable system and retain all the revenues derived from it. If MHTC transfers or relinquisnes ownership rights in any property on which the fiber optic cable system is located while this or a successive contract exists. MHTC shall preserve the FOC's easement and other rights under this Agreement. This includes, but is not limited to, the continuity of self-healing loops.

(9) FOC'S FAILURE TO PERFORM:

- (A) If the FOC fails to either complete the installation of its system as bid or to provide the service as bid on a regular and uninterrupted basis, in accordance with its timetable as bid, the FOC will be liable to MHTC for all resulting damages allowed by law which its breach has caused MHTC and the traveling public. These damages shall include but are not limited to: delay and impact costs, public inconvenience, and expenses of any kind resulting from the failure of the system to be in place and fully functional, and all MHTC costs to remedy the breach, including self-help or hiring a replacement firm to complete the work.
- (B) Force Majeure: If the following events occur, MHTC or the FOC shall be given an adequate time to remedy the situation unless performance becomes impossible or impractical by an act of God, war, riot, fire, explosion, accident, flood, sabotage, inclement weather, governmental laws, regulations, strikes, lockouts or injunctions or any other cause beyond the reasonable control of such party, subject to the following. These conditions do not constitute grounds for avoidance of the contract, but merely excusable delay. A condition, however, will not be excusable if it does not directly affect performance under the terms of the contract.
 - 1. The party invoking this provision shall immediately notify the other party verbally and promptly thereafter in writing of the cause for the delay, restriction or limitation of its ability to perform, together with an estimate of the extent to which its performance has been and will be delayed.
 - 2. Should a "Force Majeure" delay the performance of this Agreement for a period in excess of thirty (30) days, the party delayed from performing shall on or before the 1st and 15th day of each calendar month thereafter notify the other party of its best estimate of the length of time that "Force Majeure" will remain in effect and, notwithstanding any provision herein to the contrary, the other party may take such reasonable actions as will mitigate any damages.

(10) EQUIPMENT TO BE PROVIDED BY THE FIBER OPTIC CONTRACTOR:

- (A) General Description: The FOC will construct the network in the three phases as set forth in Exhibit A. This construction will result in the installation of all fiber optic cables on the routes and detailed per FOC route maps set forth in Exhibit B.
- (B) Equipment to be Provided:

FIBER OPTIC TERMINAL EQUIPMENT

The FOC will furnish and install Northern Telecom fiber optic terminal equipment, or its equivalent. The equipment the FOC provides for MHTC will be updated at any time the FOC updates any portion of the fiber optic cable system on MHTC right-of-way.

FIBER OPTIC CABLE

The FOC will furnish single mode fiber optic cable that meets necessary "fiber optic link-loss" budgets for the specific path/distance application. Fiber optic cable will contain "Coming" standard quality glass or the equivalent.

- (C) Graphic Outline Displaying Technical Interface Between Components: the FOC design of technical interface set forth in Exhibit C.
- (11) INSTALLATION: [TIMETABLE FOR COMPLETION OF EACH PHASE]
 - (A) St. Louis Metropolitan Area (*)
 - (B) Kansas City Metropolitan Area (*)
 - (C) Rural Interstate (*)
 - (*) The FOC's timetable for the completion of Phases 1, 2 and 3 is set forth in Exhibits A and B.

(12) MAINTENANCE

- (A) <u>General Maintenance</u>:
 - General Maintenance. General maintenance will be the same for all three phases and associated service areas. FOC technicians will be responsible for the maintenance of the network.
 - 2. Preventive Maintenance. Preventive maintenance programs will be provided to maintain all equipment in accordance with the manufacturers specifications. This will further ensure that all equipment is maintained to the manufacturers specified tolerances and qualities.

- Warranties and liabilities. The FOC will be responsible for all warranties and liabilities for service and performance to ensure satisfactory network performance to points of demarcation.
- 4. Distribution of Duties Among the FOC and Subcontractors: The FOC will have the ultimate responsibility to MHTC for all aspects of the network installation and operation, including those aspects the FOC subcontracts to other firms.
- 5. Service. Service will be provided seven (7) days a week, twenty-four (24) hours a day.
 - (a) The primary service locations, in accordance with the installation and completion of FOC three construction phases shall be located in St. Louis, Jefferson City and Kansas City.
 - (b) A minimum of two (2) service representatives located at the three primary locations will be certified by the FOC on the equipment to be serviced.
 - (c) The following is how the FOC will respond to off-hours requests for service on holidays, weekends and vacations: Twenty-four (24) hours a day, seven (7) days a week.
 - (d) The following procedures for the FOC's service representatives staffing shall apply during vacation and holidays. A minimum of two service technicians will be on immediate call.
 - (e) The following procedures shall apply to FOC's service personnel during normal working hours and on weekends: a minimum of two (2) technicians during normal working hours available in each of the three (3) primary areas and available for call after hours and on weekends.
 - (f) The guaranteed response time following notification is two (2) hours for a major or minor outage. Response time is determined when a qualified technician, certified on the FOC-furnished equipment, is on-site or the problem is corrected.
 - (g) Moves, additions and changes, and other service calls shall be completed within 48 hours after a request for normal service. Any special work will be completed within other time frames, to be agreed upon by MHTC and FOC.

- (13) <u>STATE AND FEDERAL REGULATIONS</u>: The FOC agrees to abide by all federal and state regulations which pertain to the subject matter of this Agreement and shall maintain and/or obtain any necessary certifications, licenses, or governmental approval and file any required reports, tariffs, or notices needed to effectuate the terms of this Agreement.
- (14) RIGHTS GRANTED: This Agreement grants the FOC an easement within the fiber optic cable corridor in return for the consideration set forth in paragraph 4. This easement may be terminated by MHTC at MHTC's option upon the occurrence of any of the following events: (1) material failure to provide fiber optic cable service to MHTC in accord with the terms of this Agreement between MHTC and the FOC, including but not limited to the failure to develop or maintain in good repair the fiber optic cable system and any related equipment owned or operated by the FOC; (2) a breach or default by the FOC of any provision of this Agreement; (3) the termination of this Agreement or any option period exercised; and (4) the bankruptcy or insolvency of the FOC.
- (15) RIGHT TO CURE: In the event that MHTC determines that FOC is in violation of any of its obligations under this Agreement or should any event occur which would give MHTC the right to terminate this Agreement including, but not limited to the provisions of paragraph (14), MHTC shall notify FOC of said violation in writing, after which, notwithstanding anything else herein to the contrary, FOC shall have a period of ninety (90) days from the date of such notice to cure such violation. This ninety (90) day period may be extended upon the agreement of the parties.
- (16) <u>FOC PREFERENCE</u>: As in the case of highway expansion which conflicts with the location of existing utilities, if:
 - (A) The FOC desires the fiber optic cable corridor to be placed in a location in MHTC's airspace which is already occupied by MHTC utility corridor, or another utility is occupying that location by permit or variance; and
 - (B) The fiber optic cable corridor cannot be located in a feasible or prudent manner elsewhere in MHTC's airspace in that vicinity;

then, MHTC shall have the option to either acquire additional right-of-way in which to place the fiber optic cable corridor in a manner acceptable to the FOC, or MHTC shall remove and relocate the other utility or utility corridor at its sole expense, so that the FOC may place its fiber optic cable system in that corridor, as necessary.

- (17) <u>SALE OR ASSIGNMENT</u>: FOC reserves the right to sell or assign, at any time, any or all of its rights under this Agreement, or any of FOC's assets under this Agreement to any entity which shall agree, in writing, to abide by the terms of this Agreement and to take over each and every obligation of the FOC set out herein. FOC shall provide written notice to MHTC of any such sale or assignment and provide MHTC the written assignee's agreement to abide by the terms of this Agreement and to undertake the obligations of the FOC no later than thirty (30) days prior to the effective date of any such sale or assignment.
- (18) <u>TERMINATION OF THE AGREEMENT</u>: When this Agreement and the rights it conveys is terminated, the FOC shall have the option to:

- (A) Remove all fiber optic cable and related appurtenances from MHTC's property at the FOC's own cost and repair all damages to MHTC's property which result. The FOC shall have one-hundred and eighty (180) days from the termination of this Agreement to complete that work. The FOC shall not block or materially delay, impede or interrupt traffic to effect the removal of its property and shall not take any action which creates a dangerous condition of public property or which would endanger any pedestrian or occupant of a motor vehicle. If the FOC elects this option, the FOC must remove all hazardous or regulated wastes it generates or is responsible for (directly or indirectly) from MHTC property and must restore MHTC property to at least the condition it was in before it was awarded this Agreement, in accord with all federal, state and local environmental laws, regulations and ordinances.
- (B) Sell the fiber optic cable system and the FOC's owned equipment and fixtures pertinent to the system on MHTC property to MHTC, or any portion thereof which is acceptable to MHTC, at a price to be mutually agreed upon.
- (C) Sell the fiber optic cable system and the FOC's owned equipment and fixtures pertinent to the system on the MHTC property to a successor provider of fiber optic cable services to MHTC, or sell any portion thereof to a successor provider which is acceptable to MHTC.
- (D) Abandon the entire fiber optic cable system on MHTC's property, or any portion thereof, in a written notice to MHTC, in which instance that portion of the fiber optic cable system becomes the sole and exclusive property of MHTC; except, however, the FOC may not abandon any items or equipment which may contain or create hazardous or regulated wastes or materials without prior notice to MHTC of the description and location of those materials. MHTC may refuse to accept the abandonment of all or any portion of the fiber optic cable system tendered by the FOC until any hazardous or regulated wastes or materials have been removed in accord with all applicable laws. In any event, the FOC remains liable for the remediation and full restoration of any damaged real or personal property and for injuries or death resulting from the presence of any hazardous or regulated wastes or materials on or adjacent to MHTC's property, which wastes or materials are or were owned, placed or operated by the FOC.
- (19) <u>APPLICABLE STATE LAWS AND ENCUMBRANCES</u>: At no time during this Agreement or any renewal period thereto shall the FOC place, install or deposit any hazardous waste or hazardous substance in the MHTC airspace. This does not include, however, those hazardous substances which are lawfully and properly contained within the FOC's equipment or structures. If the FOC causes, allows or permits a spill of a hazardous waste or substance within MHTC airspace, or on property immediately adjacent thereto, then the FOC shall remain solely liable.
 - (A) Conflict of Interest: No official or employee of MHTC or its governing body and no other public official of MHTC who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of the project covered by this Agreement shall voluntarily acquire any personal interest, directly or indirectly, in the Agreement or the proposed Agreement. The FOC covenants that it presently has no interest and shall not acquire any

interest, directly or indirectly, which will conflict in any manner or degree with the performance of the services hereunder. The FOC further covenants that no person having any such known interest shall be employed or conveyed an interest, directly or indirectly, in the contract.

- (B) <u>Title</u>: Title to any leased and/or lease-purchased equipment required by the Agreement shall be held by and vested in the FOC. MHTC shall not be liable in the event of loss, incident, destruction, theft, damage, etc., for the leased equipment, including but not limited to devices, wires, software, technical literature, etc. It shall be the FOC's sole responsibility to obtain insurance coverage for such loss in the amount the FOC deems appropriate.
- (C) <u>Liability Insurance</u>: The FOC shall obtain sufficient liability insurance to protect itself and MHTC from tort liability due to the construction, installation, operation, maintenance and repair of the fiber optic cable system on MHTC's right-of-way. At a minimum, the FOC shall obtain the following insurance coverage:
 - 1. The FOC shall obtain commercial general liability insurance, having minimum liability limits of one million dollars for each bodily injury or property damage occurrence, combined single limit, one million dollars aggregate; and one million dollars product/completed operations aggregate. Each such policy shall be endorsed so as to cover liability arising from underground property damage.
 - 2. The FOC shall obtain commercial automobile liability insurance for all vehicles owned or used by the FOC in any phase of the construction, installation, operation, maintenance and repair of the fiber optic cable system on MHTC's right-of-way. The minimum limits of liability of such insurance shall be one million dollars combined single limit.
- (D) Workers Compensation: Workers compensation insurance shall be maintained at all times by the FOC in amounts sufficient to comply with all the obligations of the FOC under the laws of the State of Missouri relating to workers compensation.
- (E) <u>Subcontractors</u>: The FOC shall be responsible to see that its subcontractors possess at least the same minimum extent of liability insurance at such times that they are constructing, installing, operating, maintaining or repairing any portion of the fiber optic cable system on MHTC's right-of-way.
- (F) Proof of Insurance: The FOC shall provide proof of insurance to MHTC within seven (7) business days upon receipt of a written request for same from an authorized representative of MHTC. The FOC shall also provide proof of insurance to MHTC of any subcontractor, or require that subcontractor to do so, within seven (7) business days upon receipt of a written request for that subcontractor's insurance status from an authorized representative of MHTC.

- (20) <u>LIABILITIES. RIGHTS AND REMEDIES</u>: The FOC agrees that MHTC shall not be responsible for any liability incurred by the FOC or its employees arising out of the ownership, selection, possession, leasing, renting, operation, control, use, maintenance, delivery, return and/or installation of equipment provided by the FOC except as otherwise provided in this Agreement. No provision in this Agreement shall be construed expressly or implied as a waiver by MHTC of any existing or future right and/or remedy available by law in the event of any claim made by, or default in or breach of contract of the FOC. Notwithstanding the above, the FOC shall not be liable for any damages incurred by MHTC or its subordinate department and employees, due to causes beyond the reasonable control of the FOC, attributable to any service, products or actions of any person other than the FOC, its employees, subcontractors and agents.
- (21) FOC'S LIABILITY FOR NEGLIGENT ACTS OR OMISSIONS: The FOC shall be responsible for any and all injury or damage as a result of any negligent acts or omissions in the services rendered under the terms and conditions of this Agreement. In addition to the liability imposed upon the FOC on account of personal injury, bodily injury (including death) or property damage suffered as a result of the FOC's negligence, the FOC assumes the obligation to save harmless MHTC including its employees and assigns from every expense, liability or cost arising out of such negligent act or omission. The FOC also agrees to hold harmless MHTC, its employees and assigns for any negligent act or omission committed by any subcontractor or other person employed by or under the supervision of the FOC under the terms of this Agreement.
- (22) MHTC'S LIABILITY TO THE FIBER OPTIC CONTRACTOR: MHTC will reimburse the FOC for all actual repair costs if the MHTC personnel or any other contractor or subcontractor to MHTC damages or destroys any part of the fiber optic cable system or equipment installed by the FOC. However, MHTC, its employees, agents and assigns will not be liable for lost revenues or any other types of incidental or consequential damages sustained by the FOC as a result of an inadvertent or unintentional cable cut or other loss of signal transmission. This provision does not limit the scope of liability of an MHTC highway construction contractor or subcontractor to the FOC for actionable negligence in the construction, reconstruction, repair or maintenance of a state highway or other state transportation facility.
- PERFORMANCE AND PAYMENT BOND: The FOC must furnish and attach to this Agreement, a performance and payment bond on the form provided by MHTC without deviations, omissions or additions, in at least the penal sum of Two Hundred Fifty Thousand Dollars (\$250,000.00). This bond shall be issued and executed by a surety or sureties acceptable to MHTC, to ensure the proper and prompt completion of the work in accordance with the provisions of this contract, and to ensure payment for all labor performed and materials installed, consumed or used in the work. The bond, if executed by a surety which is a corporation organized in a state other than Missouri, shall be signed by an agent or broker licensed by the Director of the Missouri Department of Insurance. The bond shall remain in full force and effect until the entire fiber optic cable system, and all related equipment and materials are fully installed and operational, in accordance with the terms of this contract. At such time, and upon production of satisfactory documentation by the FOC that it has paid in full the costs of all labor performed and materials installed, consumed or used in the fiber optic cable system, the FOC may apply to MHTC to substitute another bond having the penal sum of not less than Fifty Thousand Dollars (\$50,000), to ensure the continued maintenance and performance of that system for the remaining term of this Agreement in accord with its provisions, and the payment for all labor performed and materials installed, consumed

or used in that phase of the contract work. The initial bond shall remain in effect for the purpose of satisfying those valid project claims against the FOC for work, materials or

obligations performed or incurred prior to the date a valid substitute bond was accepted by MHTC. In any event, the original or a valid substitute bond shall remain in full force and effect at all times, without a break in coverage, for the initial period and all renewal periods of this Agreement. No initial or substitute performance and payment surety bond shall be cancelled except prospectively, and with at least thirty (30) days' advance notice in writing to MHTC and the FOC. Prior to such effective date of cancellation of the performance and payment bond, the FOC must obtain and submit to MHTC a valid substitute bond meeting all terms of this Agreement.

- (24) <u>AMENDMENTS</u>: No modification of any provision of the Agreement shall be made or construed to have been made unless such modification is mutually agreed to in writing by the FOC and MHTC and incorporated in a written amendment to the Agreement and approved by MHTC prior to the effective date of such modification.
- (25) <u>COMMUNICATIONS AND NOTICES</u>: Any notices required or permitted to be delivered under this Agreement shall be in writing and shall be deemed to be delivered on the earliest to occur of (a) actual receipt; or (b) three (3) business days after having been deposited with the United States Postal Service, postage prepaid, certified mail, return receipt requested; or (c) one (1) business day after having been deposited with a reputable overnight express mail service that provides tracking and proof of receipt of items mailed. All notices shall be addressed to MHTC or the FOC, as the case may be, at the address or addresses set forth below, or such other addresses as the parties may designate in a notice similarly sent:

If to MHTC, address to:

Missouri Highway and Transportation Commission Capitol Avenue and Jefferson Street P.O. Box 270 Jefferson City, Missouri 65102 Attn: Division Engineer, Maintenance and Traffic

and if to the Fiber Optic Contractor:

Digital Teleport, Inc. 11111 Dorsett Road St. Louis, Missouri 63043 Attn: Richard D. Weinstein, President

(26) VENUE: No action may be brought by either party hereto concerning any matter, thing or dispute arising out of or relating to the terms, performance, nonperformance or otherwise of this Agreement except in the Circuit Court of Cole County, Missouri. The parties agree that this Agreement is entered into at Jefferson City, Missouri, and substantial elements of its performance will take place or be delivered at Jefferson City, Missouri, for which the FOC consents to venue of any action against it in Cole County, Missouri. The FOC shall cause this provision to be incorporated in all of its contracts with subcontractors for this fiber optic cable system, to be binding upon all subcontractors of the FOC in the performance of this Agreement.

- (27) WAGE LAWS: The FOC and its subcontractors shall pay the prevailing hourly rate of wages for each craft or type of workmen required to execute this project work as determined by the Department of Labor and Industrial Relations of Missouri, and they shall further comply in every respect with the minimum wage laws of Missouri and the United States. Federal wage rates under the Davis-Bacon or other federal acts apply to and govern this Agreement also for such work which is performed at the jobsite, in accord with 29 CFR Part 5. Thus, this Agreement is subject to the "Work Hours Act of 1962". Public Law 87-581, 76 Stat. 357, as amended, and its implementing regulations. The FOC shall take those acts which may be required to fully inform itself of the terms of, and to comply with, state and federal labor and wage laws applicable to this Agreement.
- (28) <u>NONDISCRIMINATION ASSURANCE</u>: With regard to work under this Agreement, the FOC agrees as follows:
 - (A) Civil Rights Statutes: The FOC shall comply with all state and federal statutes relating to nondiscrimination, including but not limited to Title VI and Title VII of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d and 2000e), as well as any applicable titles of the Americans with Disabilities Act. In addition, if the FOC is providing services or operating programs on behalf of the Department or Commission, it shall comply with all applicable provisions of Title II of the Americans with Disabilities Act.
 - (B) Executive Order: The FOC shall comply with all the provisions of Executive Order 94-03, issued by the Honorable Mel Carnahan, Governor of Missouri, on the fourteenth (14th) day of January 1994, promulgating a Code of Fair Practices in regard to nondiscrimination, which is incorporated herein by reference and made a part of this Agreement. This Executive Order prohibits discriminatory practices by the state, the FOC or its subcontractors based on race, color, religion, national origin, sex, age, disability or veteran status.
 - (C) Nondiscrimination: The FOC shall not discriminate on grounds of the race, color, religion, creed, sex, disability, national origin, age or ancestry of any individual in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The FOC shall not partcipate either directly or indirectly in the discrimination prohibited by 49 CFR Subtitle A, Part 21, Section 21.5, including employment practices.
 - Solicitations for Subcontracts, Including Procurements of Material (D) and Equipment: These assurances concerning nondiscrimination also apply to subcontractors and suppliers of the FOC. In all solicitations either by competitive bidding or negotiation made by the FOC for work to be performed under a subcontract including procurement of materials or equipment. each subcontractor or supplier shall be notified by the FOC of the requirements of this Agreement relative to nondiscrimination on grounds of the race, color, religion, creed, sex, disability or national origin, age or ancestry of any individual.

- reports required by the Agreement, or orders and instructions issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by MHTC or the U.S. Department of Transportation to be necessary to ascertain compliance with other contracts, orders and instructions. Where any information required of FOC is in the exclusive possession of another who fails or refuses to furnish this information, the FOC shall so certify to MHTC or the U.S. Department of Transportation as appropriate, and shall set forth what efforts it has made to obtain the information.
- (F) Sanctions for Noncompliance: In the event the FOC fails to comply with the nondiscrimination provisions of this Agreement, MHTC shall impose such contract sanctions as it or the U.S. Department of Transportation may determine to be appropriate, including but not limited to:
 - 1. Withholding of payments to the FOC under the Agreement until the FOC complies; and/or
 - 2. Cancellation, termination or suspension of the Agreement, in whole or in part, or both.
- (29) <u>COMMISSION REPRESENTATIVE</u>: MHTC's Division Engineer for Maintenance and Traffic is designated as MHTC's representative for the purpose of administering the provisions of this Agreement. The Division Engineer for Maintenance and Traffic may designate additional representatives, generally or for specific purposes, as deemed appropriate by MHTC.
- (30) <u>FIBER OPTIC CONTRACTOR'S REPRESENTATIVE</u>: Richard D. Weinstein, Digital Teleport, Inc.'s President, is designated as the FOC's representative for the purpose of administering the provisions of this Agreement.
- (31) <u>LAW OF MISSOURI TO GOVERN</u>: The Agreement shall be construed according to the laws of the state of Missouri. The FOC shall comply with all local, state and federal laws and regulations relating to the performance of the Agreement.
- (32) <u>CONFIDENTIALITY</u>: Neither the FOC nor MHTC shall disclose to third parties confidential factual matter provided by either party, except as may be required by federal or state statutes or regulations by court order, or as authorized by the provider of that confidential information. Either party shall notify the other immediately of any request for such information.
- (33) NONSOLICITATION: The FOC warrants that it has not employed or retained any company or person, other than a bona fide employee working for the FOC, to solicit or secure this Agreement, and that it has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, MHTC shall have the right to terminate this Agreement without liability, or in its discretion, to deduct from the Agreement price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gifts, or contingent fees.

(34) <u>SEVERABILITY</u>: To the extent that a provision of this Agreement is contrary to the constitution or the laws of the State of Missouri or of the United States, that provision shall be void and unenforceable. However, the balance of the Agreement shall remain in full force and effect between MHTC and the FOC.

IN WITNESS WHEREOF, the parties have entered into this Agreement on the date last written below.

Executed by Digital Teleport, Inc. thise Executed by the Commission this 29	
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION	DIGITAL TELEPORT, ING.
Assistant Chief Engine Attest:	Richard D. Weinstein, President Attest:
Mari Una Munters Secretary to the Commission	By Jen D. Weister Title 1973 / Sex 14
Approved as to Form:	Approved as to Form: Richard S. Bronder 124
Commission Counsel	Richard Browniee, Attorney at Law

j/lc/draft-f

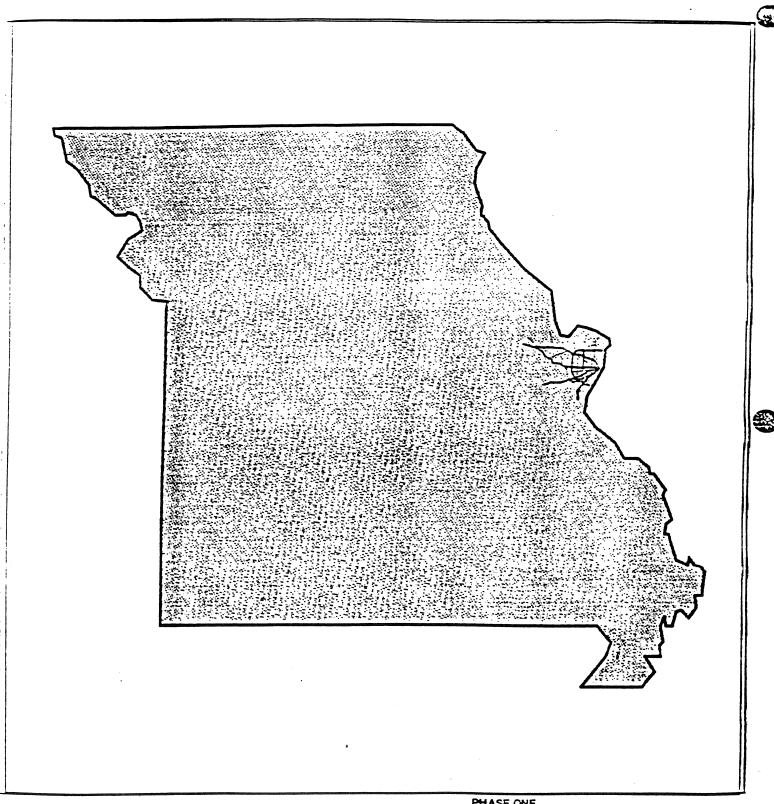
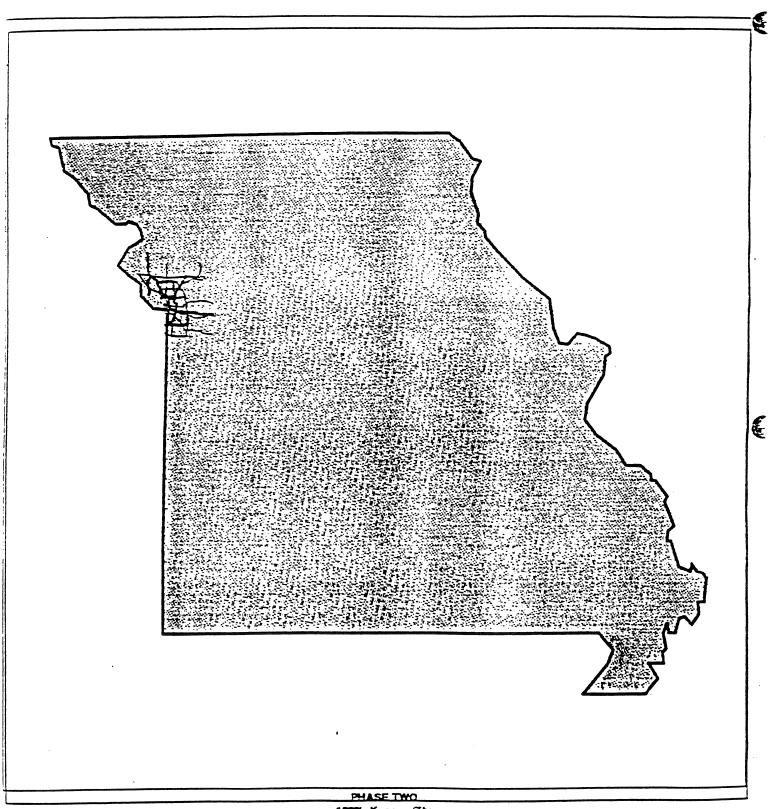


EXHIBIT A - Phase One

PHASE ONE 100%, St. Louis Metropolitan Area

FOC will construct and maintain fiber and points of demarcation for the St. Louis Freeway System as set forth in MHTC RFP.

O 1994 DTL St. Louis, MO. "Proprietary"

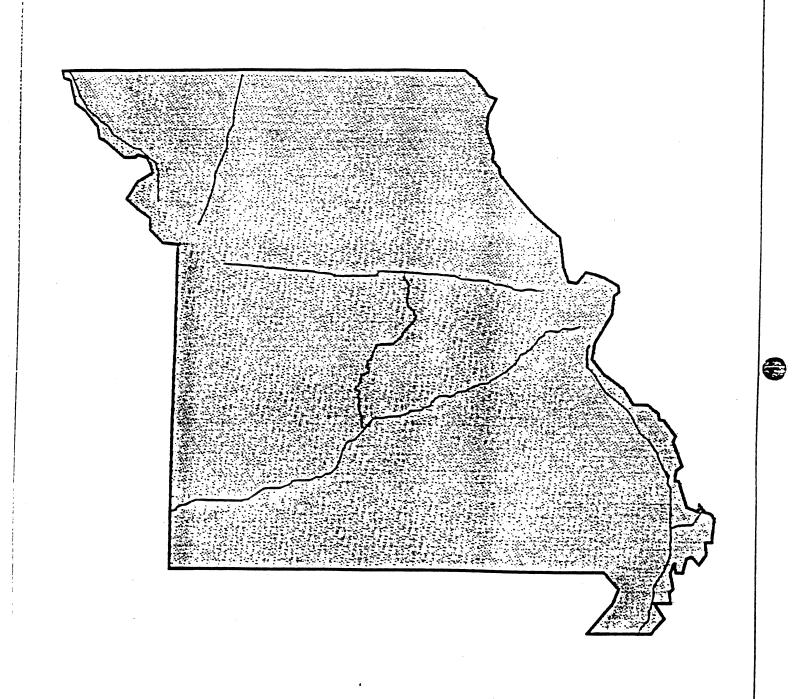


100%, Kanses City Metropolitan

EXHIBIT A - Phase Two

FOC will construct and maintain fiber and points of demarcation for the Kansas City Freeway System on all

O 1994 DTL St Louis, MO. "Proprietary"



PHASE THREE

100%, Rural Area, FOC will construct and maintain fiber
Interstate, and points of demarcation for the Rura

Interstate.
Including, Columbia and points of demarcation for the Rural to Jefferson City Freeway System per Exhibit A Phase Three to Lake Of The Ozarksattached.

to 1-44

EXHIBIT A Phase Three

O 1994 DTI, St. Louis, MO. "Proprietary"

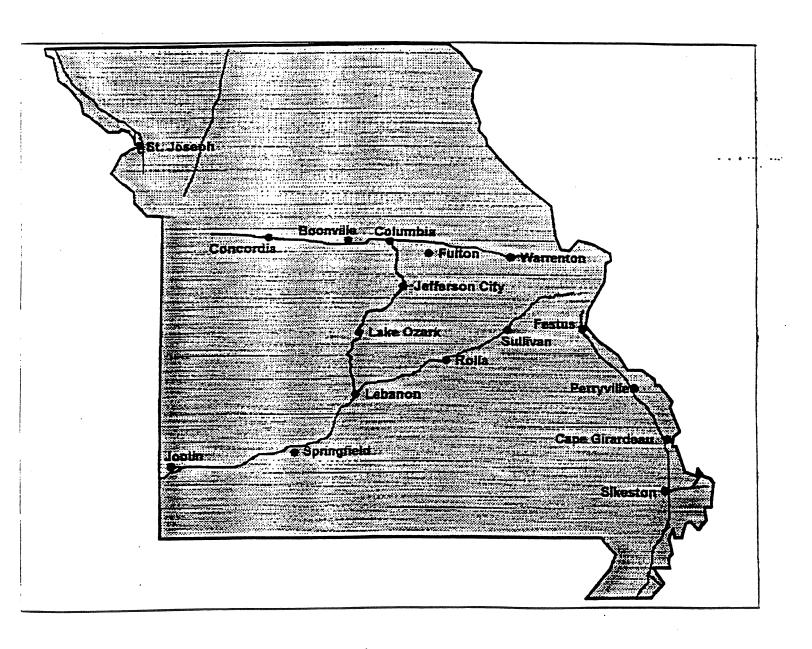
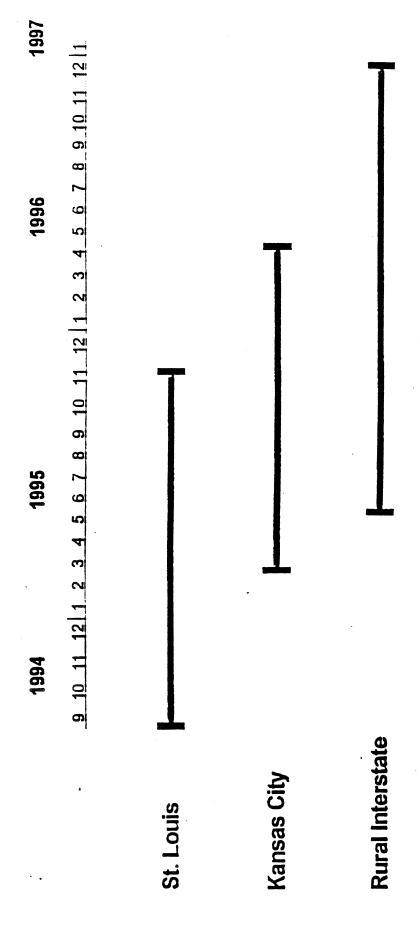
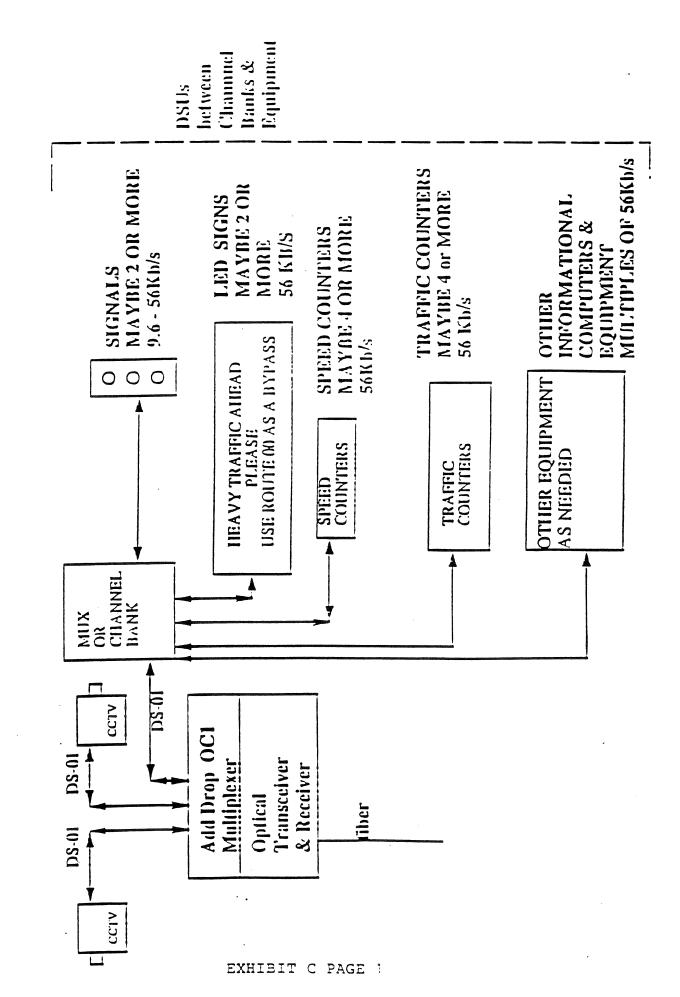


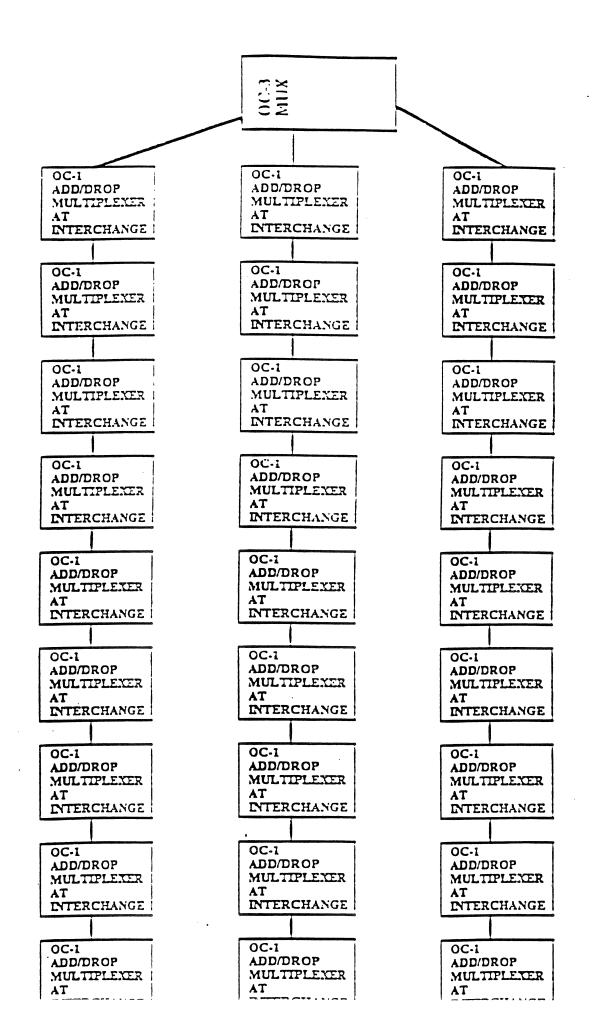
EXHIBIT A PHASE THREE - ATTACHED

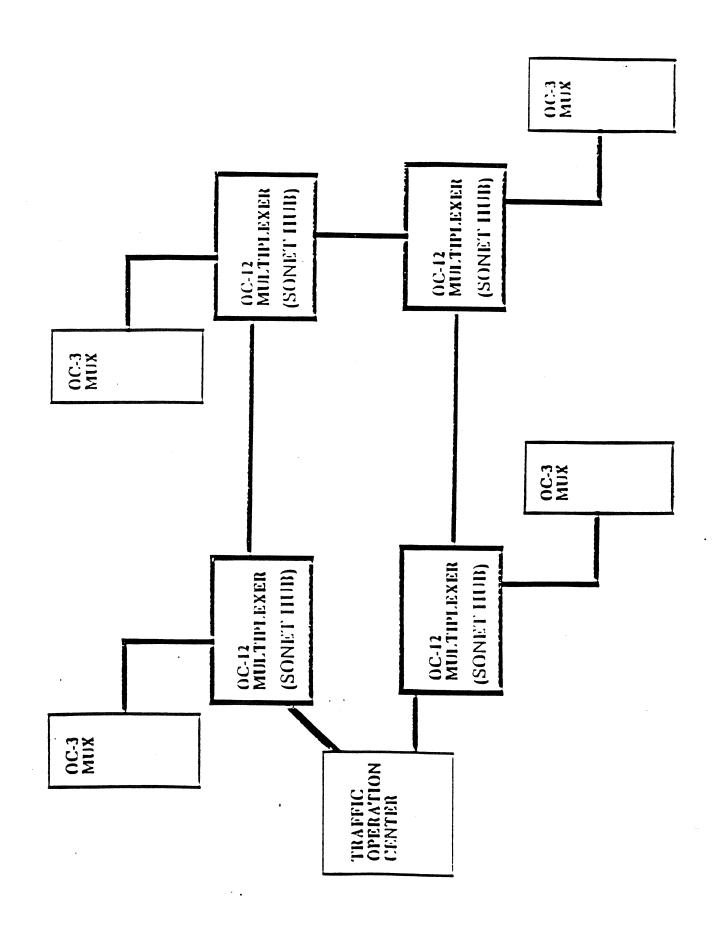
Digital Teleport, Inc.Timeline/Construction Schedule

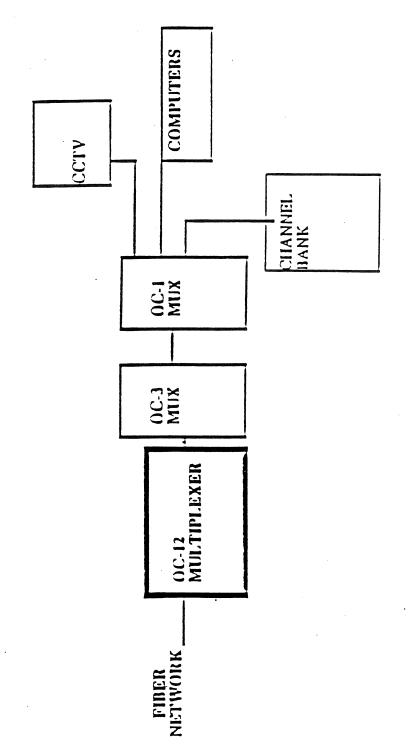
Commensing on or before, 9/94











FIBER OPTIC CABLE ON FREEWAYS IN MISSOURI AMENDMENT

This amendment to the Agreement executed July 29, 1994 is entered into by the Missouri Highway and Transportation Commission (hereinatter the "MHTC") and Digital Teleport. Inc., (hereinatter the "Fiber Optic Contractor," or "FOC").

- (1) Paragraph (23) of the original Agreement is hereby amended to read as follows:
- (23) PERFORMANCE AND PAYMENT BOND: The FOC must furnish and attach to this Agreement, a performance and payment bond on the form provided by MHTC without deviations, omissions or additions, in at least the penal sum of Two Hundred Fifty Thousand Dollars (\$250.000). This bond shall be issued and executed by a surety or sureties acceptable to MHTC, to ensure the proper and prompt completion of the work in accordance with the provisions of this contract, and to ensure payment for all labor performed and materials installed, consumed or used in the work. The bond, if executed by a surety which is a corporation organized in a state other than Missouri. shall be signed by an agent or broker licensed by the Director of the Missouri Department of Insurance. A bond shall remain in full force and effect until the entire fiber optic cable system, and all related equipment and materials are fully installed and operational, in accordance with the terms of this contract. Provided however, the bond will be issued on an annually renewable basis. All renewals will be at the option of the surety, and will be provided in the form of a written continuation certificate executed by the surety. The continuation certificate will be provided to MHTC no later than thirty (30) days prior to the expiration of the current bond. At such time, and upon production of satisfactory documentation by the FOC that it has paid in full the costs of all labor performed and materials installed, consumed or used in the fiber optic cable system, the FOC may apply to MHTC to substitute another bond, or Irrevocable Letter of Credit acceptable to MHTC, having the penal sum of not less than Fifty Thousand Dollars (\$50,000), to ensure the continued maintenance and performance of that system for the remaining term of this Agreement in accord with its provisions, and the payment for all labor performed and materials installed, consumed or used in that phase of the contract work. The initial bond(s) shall remain in effect for the purpose of satisfying those valid project claims against the FOC for work, materials or obligations performed or incurred prior to the date a valid \$50,000 substitute bond, or Irrevocable Letter of Credit, was accepted by MHTC. In any event, the original, or a valid substitute bond, or Irrevocable Letter of Credit, shall remain in full force and effect at all times, without a break in coverage, for the initial period and all renewal periods of this Agreement. No initial or substitute performance and payment surety bond shall be cancelled except prospectively, and with at least thirty (30) days' advance notice in writing to MHTC and the FOC. Neither non-renewal by the surety, nor failure, nor inability of the FOC to file a replacement bond shall constitute a loss to the MHTC which is recoverable under the The Surety's liability under this bond and all continuation certificates expiring bond. issued in connection therewith shall not be cumulative and shall in no event exceed the amount as set forth in the bond, or in any additions, riders, or endorsements properly issued by the surety as supplements thereto. Prior to such effective date of cancellation of the performance and payment bond, the FOC must obtain and submit to MHTC a valid substitute bond, or irrevocable Letter of Credit, meeting all terms of this Agreement. The FOC shall not perform any construction, work or maintenance under the original contract without an original bond or an Irrevocable Letter of Creat in full force during the actual time of performance of the original contract.

(2) All other terms and conditions force and effect.	of the original Agreement shall remain in ful
IN WITNESS WHEREOF, the parties relast written below.	nave entered into this Agreement on the date
Executed by Digital Teleport. Inc. this	· · · · · · · · · · · · · · · · · · ·
Executed by the Commission this 6	2 day of <u>Sest.</u> , 19 <u>94</u> .
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION Jary Fulling	DIGITAL TELEPORT, INC. Richard D. Weinstein, President
// Assistant Chief Engineer	
Attest:	Attest:
Mary Commission Secretary to the Commission	By Area & OWen Our
,	Title 7.7.7.
Approved as to Form:	Approved as to Form:
Mini h. Hora	Richs Brownles &
Commission Counsel	Richard Brownlee, Attorney at Law

jk/schrog/draft-f1

FIBER OPTIC CABLE ON FREEWAYS IN MISSOURI SECOND AMENDMENT

This second amenament to the Agreement executed July 29, 1994 is entered into by the Missouri Highway and Transportation Commission (hereinafter the "MHTC") and Digital Teleport, Inc., (hereinafter the "Fiber Optic Contractor." or "FOC").

- (1) Paragraph (27), "Wage Laws". in the original Agreement is hereby deleted in its entirety as unnecessary. This contract is a service contract, and not a public works contract.
- (2) All other terms and conditions of the original Agreement as previously amended at Paragraph (23), shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have entered into this Agreement on the date

last written below.	ive entered into this Agreement on the date
Executed by Digital Teleport, Inc. this The Executed by the Commission this	day of <u>November</u> , 19 <u>94.</u>
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION	DIGITAL TELEPORT, INC.
Assistant Chief Engineer	Richard D. Weinstein, President
Attest:	Attest:
Mari Caro Winters Secretary to the Commission	By Ma Leastering Title Dn B3/ SQ'4
Approved as to Form:	Approved as to Form:
Genoule Selvoede	Richard Browniee, Attorney at Law
	riichard browniee, Attorney at Law

FIBER OPTIC CABLE ON FREEWAYS IN MISSOURI THIRD AMENDMENT

This third amendment to the Agreement executed July 29, 1994 is entered into by the Missouri Highway and Transportation Commission (hereinafter the "MHTC") and Digital Teleport, Inc. (hereinafter the "Fiber Optic Contractor", or "FOC").

WITNESSETH:

WHEREAS, it is to the mutual benefit of the parties to modify the July 29, 1994 Agreement, by providing additional locations for the FOC to install its fiber optic cable and related equipment outside of existing utility corridors on MHTC highway right-of-way, in certain locations which provide further IVHS (now "Intelligent Transportation System" or "ITS") resources for MHTC and its state highway and transportation system; and

WHEREAS, it is to the mutual benefit of the parties for the FOC to receive these additions to the Fiber Optic Cable System, in return for MHTC having that system fully connected to all Missouri Department of Transportation (MoDOT) District headquarters office buildings at no additional expense to MHTC;

NOW. THEREFORE, in consideration of these mutual covenants, promises and representations, the parties agree as follows:

- (1) <u>AMENDMENTS:</u> The original Agreement, as previously modified by a first and second amendment to that Agreement, is further amended as follows:
- (A) Section (1), "<u>DEFINITIONS</u>", is amended by adding a subsection (CC), "<u>System Additions</u>", to read as follows:
 - (CC) System Additions: Those proposed Fiber Optic Cable System builds that are agreed to by MHTC and FOC, which were not designated on the original freeway system designated in the Agreement, but which are now considered necessary to support that system and the MHTC's intent in developing that system.
- (B) Section (1), "<u>DEFINITIONS</u>", is further amended by modifying its subsection "H", adding a new "<u>Exhibit D</u>", so that the subsection now reads in full as follows:
 - (H) Exhibit A: Three Phase Construction Plan

Exhibit B: Fiber Optic Terminal Equipment location and Schedules for Three Phases

Exhibit C: Technical Interface Design

Exhibit D: System Additions

- (C) Section (7), "<u>EASEMENT GRANT AND CONSTRUCTION</u> <u>GUIDELINES</u>", is amended by adding a subsection (H), to read as follows:
 - (H) Commencing no later than January 1, 1997, the FOC shall physically mark the surface location of the existing buried cable or conduit on an on-

going basis until all locations are marked in a manner acceptable and approved by MHTC's Division Engineer for Traffic. Cable or conduit which are placed after October 1. 1996, that are shown in Exhibits A and B shall be marked by the FOC within sixty (60) calendar days after burial of the cable or conduit. Cable or conduit placed as shown in Exhibit D shall be marked by the FOC within forty-five (45) calendar days after burial of the cable or conduit, if any of the locations are not within the existing utility corridor. The surface location of cable or conduit buried within the utility corridor may (but need not be) physically marked in the same manner.

- (D) Section (7), "EASEMENT GRANT AND CONSTRUCTION GUIDELINES", is further amended by adding a subsection (I), to read as follows:
 - (I) All terms and conditions of this Agreement will govern and apply to all system additions (as shown in Exhibit D), except that any such system additions shall be relocated at the expense of the FOC, if relocation is deemed necessary by the MHTC or by its Commission Representative designated in Section (29) of this Agreement.
- (E) Section (11), "INSTALLATION", is amended by adding a subsection (D), which subsection reads as follows:

(D) System Additions:

- 1. Without regard to the FOC's timetable for the completion of Phases 1, 2 and 3, the installation of those system additions described in Exhibit D must be completed by the FOC no later than July 31, 1998. If the system additions are not completely installed and operational on the designated routes and locations, the FOC must provide alternative, comparable and acceptable service to the MHTC no later than July 31, 1998. At the sole option of the MHTC, if any system additions are incomplete and no alternate, comparable and acceptable service is provided by the FOC by July 31, 1998, under this Agreement and Exhibit D, any partial Fiber Optic Cable System installations within those designated routes may be reconsidered for disposition by the MHTC. If an alternate service is provided to a designated route shown in Exhibit D, the designated route shown in Exhibit D may be removed at any time after July 31, 2000, at the sole discretion of the MHTC.
- 2. Further, the FOC shall connect all of the MoDOT District Headquarters office buildings to the Fiber Optic Cable System either from the original system, the system additions, or by other means of access, no later than July 31, 1998. The FOC's obligation shall be to connect the system to the exterior of one such building within each district headquarters complex at a location to be specified by the Division Engineer for Traffic. The authority to install any system additions in locations outside of the utility corridor is conditioned upon compliance with this provision.
- (2) <u>EXTENSIONS FOR WORK TO BE COMPLETED BY THE FOC</u>: At the sole option of the MHTC, the MHTC may allow an extension of time for the FOC to complete the work required under this Agreement or in any of the amendments to the Agreement. The FOC shall formally request an extension in writing to the MHTC regarding such an

extension. The MHTC will respond in writing to the FOC regarding the FOC's request for an extension to complete any of the required work.

- (3) NAME CHANGE OF HIGHWAY AND TRANSPORTATION DEPARTMENT: With the enactment of H.B. 991. effective August 28, 1996, the "department of highways and transportation" is to be known as the Department of Transportation." As a result, any references in the Agreement or in any of the previous amendments to the Missouri Highway and Transportation Department (MHTD) shall now be referred to the Missouri Department of Transportation (MoDOT).
- (4) <u>REAFFIRMATION OF CONTRACT AS AMENDED</u>: Except as they may be amended by this third amendment, all other terms and conditions of the original Agreement, and those contained in the first and second amendments to that Agreement, shall remain in full force and effect.

IN WITNESS WHEREOF, the parties has ast written below.	ive entered into this agreement on the date
Executed by Digital Teleport. Inc. this	1996.
Executed by MHTC this _am_day of _	October, 1996.
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION	DIGITAL TELEPORT, INC.
By: Deputy Chief Engineer Attest:	By <u>Airhau D. Munifau</u> Richard D. Weinstein, President Attest:
Marie Commission Secretary to the Commission	By: Michael 1 / Kinstein Title: SELY
Approved as to Form: Nobel M. Hells Commission Counsel	Approved as to Form: Sometimes Some S

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SYSTEM ADDITIONS

St. Louis Metropolitan Area Additions

- (1) Route 367 Route 67 from I-270 to Mississippi River
- (2) Route 94 from I-70 to Route 40/I-64

Outside Additions

- (1) Route 60 from Route 65 to Route 76 (Willow Springs)
- (2) Route 61 from I-70 to Route 36 (Hannibal)
- (3) Route 63 from I-70 to Route 36 (Macon)
- (4) Route 65 from I-44 to the Arkansas state line (including Route 765 in Branson)
- (5) Route 71 from I-435 to I-44 and continuing to Arkansas state line (future I-49)

EXHIBIT D



February 7, 1997

Mr. Tom Dollus,
Asst. Division Engineer - Traffic Division
MO. DEPARTMENT OF TRANSPORTATION
105 W. Capitol Avenue
Jefferson City, MO 65102

re: Extension of Schedule Phase 1, 2 & 3
completion dates of the "Fiber
Optic Cable on the Freeways in
Missouri" Agreement, dated July
29, 1994

Dear Mr. Dollus:

Pursuant to paragraph (2) of the "Third Amendment" executed by the parties on October 9th, 1996, please herein find a request for a "Revised Schedule" of dates for completion of the phases of the project. The amended dates for completion are as follow:

Phase One: September 30, 1997

Phase Two: July 31, 1998

Phase Three: December 31, 1998

Indicate the acceptance of the revised completion dates on behalf of MHTC and return three executed copies to us. Thank you for your cooperation in this matter.

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DIGITAL TELEPORT, INC.

Dated: February 7, 1997

ACCEPTED BY:

MISSOURI HIGHWAY AND TRANSPORATION **COMMISSION**

Title:

Dated: February 13,199

APPROVED AS TO FORM:

Assistant Counsel

Secretary to State Highway & Transportation Commission

The following information is in response to follow up questions to testimony provided related to MoDOT's fiber optic network.

Included in the information is a copy of the original 1994 Digital Teleport Inc and Missouri Highway and Transportation Commission agreement Fiber Optic Cable on Freeways in Missouri. A copy of the 2003 Amended and Restated Fiber Optic Cable on Freeways in Missouri Agreement is included.

MHTC executed five agreements with DTI/Lightcore/ DTI. The original agreement was executed on 6/01/94. The First Amendment changing "Performance of Payment Bond" was entered on 9/21/94. The Second Amendment removing the prevailing wage requirement was approved on 11/4/94. The Third Amendment which included System Additions was approved 10/09/96. On 12/31/01 DTI filed for bankruptcy. On 6/5/03 the new agreement, "Amended and Restated Fiber Optic Cable on Freeways in Missouri Agreement," was finalized. In exchange for granting DTI an exclusive easement, and in additional consideration of the exclusive right to construct and operate the fiber optic cable system, DTI provided the MHTD with dedicated dark fiber and lighted network (broadband) service on their fiber.

Section 4 of the agreement beginning on page 3 of the Amended and Restated Fiber Optic Cable on Freeways in Missouri Agreement sets out the specific considerations that MoDOT receives as part of the agreement.

Today, upon this base network technology, MoDOT has constructed the Gateway Guide and Kansas City Scout ITS systems. Each comprises thousands of networked devices, such as traffic detectors, message boards, cameras. To that was added a Rural ITS system that's comprised of message boards and cameras along I-70, I-44, I-35, I-29, I-55 and a few localities like Rolla, Jefferson City and Poplar Bluff.

MoDOT has also connected, via this fiber network, its District offices, many Resident Engineer project offices and quite a few maintenance buildings. This has resulted in a very efficient and effective distribution of Information Technology (IT) services to these sites. The 2002 amended agreement with CenturyLink (now Lumen) limits the use of the Commission's fibers to "legitimate, state governmental purposes" and no other. MoDOT has entered into agreements with OA, Conservation and Highway Patrol for the use of these fibers. To allow uses (which are not specifically state governmental purposes) of those fibers would constitute a breach of the agreement and subject the Commission to penalties. MoDOT uses its fiber to construct ITS systems to connect traffic detectors, message boards and cameras. We do not want to put our systems at risk by breaching this contract.

MoDOT constructed and operates fiber optic cables for transportation purposes using a combination of state transportation funds and federal transportation funds in some portions of the state. This fiber is not part of the 1994 Fiber Optic Cable Agreement or the 2003 Amended Fiber Optic Agreement. Included are maps for the location of this fiber optic cable and a spreadsheet listing location and length for the locations.

Constitutional and Statutory prohibitions for use of transportation funds (state road funds).

Constitutional Authority:

- 1. Article IV, section 29, gives the Commission the authority: A. over the state highway system; B. over all other transportation programs and facilities as provided by law, including, but not limited to, aviation, railroads, mass transportation, ports, and waterborne commerce; and C. to limit access to, from and across state highways and other transportation facilities where the public interests and safety may require.
- 2. Article IV, section 30(b), creates a clearly defined source of revenue and lists five express purposes and uses for the expenditure of State Road Funds. State Road Fund moneys can be spent for no purposes other than the section 30(b) purposes.
- 3. Article IV, section 30(c), identifies the authority of the Commission to plan, locate, relocate, establish, acquire, construct, maintain, control and operate transportation facilities.
- 4. Article IV, section 30(d), prohibits the Commission's constitutionally dedicated revenue stream from being diverted from the state highway system purposes listed in section 30(b)1.

Statutory Authority:

1. Section 227.120, RSMo, authorizes the Commission to purchase, lease, or condemn, lands in the name of the state of Missouri for specific statutory purposes when needed to build and maintain state highways.

Caselaw:

Acquisition of Right of Way via negotiation. Without a review of deeds, it is
impossible to be certain, but it is most of our right of way was acquired during
negotiation via easements that contained a restriction of uses for the
easement. The language typically reads "for roadway or highway purposes" or
something similar. Those clauses have been interpreted strictly by the courts.
Allowing an expanded use of the easements without additional legislation would put
the Commission at risk of a lawsuit similar to the Show Me case discussed below.

Construction of the plain language of an easement "for highway purposes" evidences the grantors' intent that the property be used only for the limited purpose of building a state highway according to Commission plans. Erwin v. City of Palmyra, 119 S.W. 3d 582 (2003).

Any expanded use of state property could subject the Commission to a claim of inverse condemnation, similar to the claims made by property owners in the recent Sho-Me litigation. Barfield v. Sho-Me Power Elec. Coop., 852 F.3d 795 (8th Cir. 2019). In the Sho-Me power case, more than three thousand members of the electric cooperative sued Sho-Me in a class action suit after a subsidiary company used Sho-Me's existing electric transmission line easements to provide broadband internet services to individual homes and companies in Missouri. Members of the class claimed that because telecommunications were not one of the enumerated purposes of the original easements, Sho-Me had trespassed on their properties and overburdened its original easements for electrical lines. The courts agreed and awarded millions of dollars in damages to the plaintiffs.

2. Acquisition of Right of Way via Eminent Domain. The language typically used in a condemnation petition limits the use of the property to the specific highway purpose for which the land is acquired. This is because the Commission only has the right to acquire land for the purposes identified above – roadway purposes.

Other considerations:

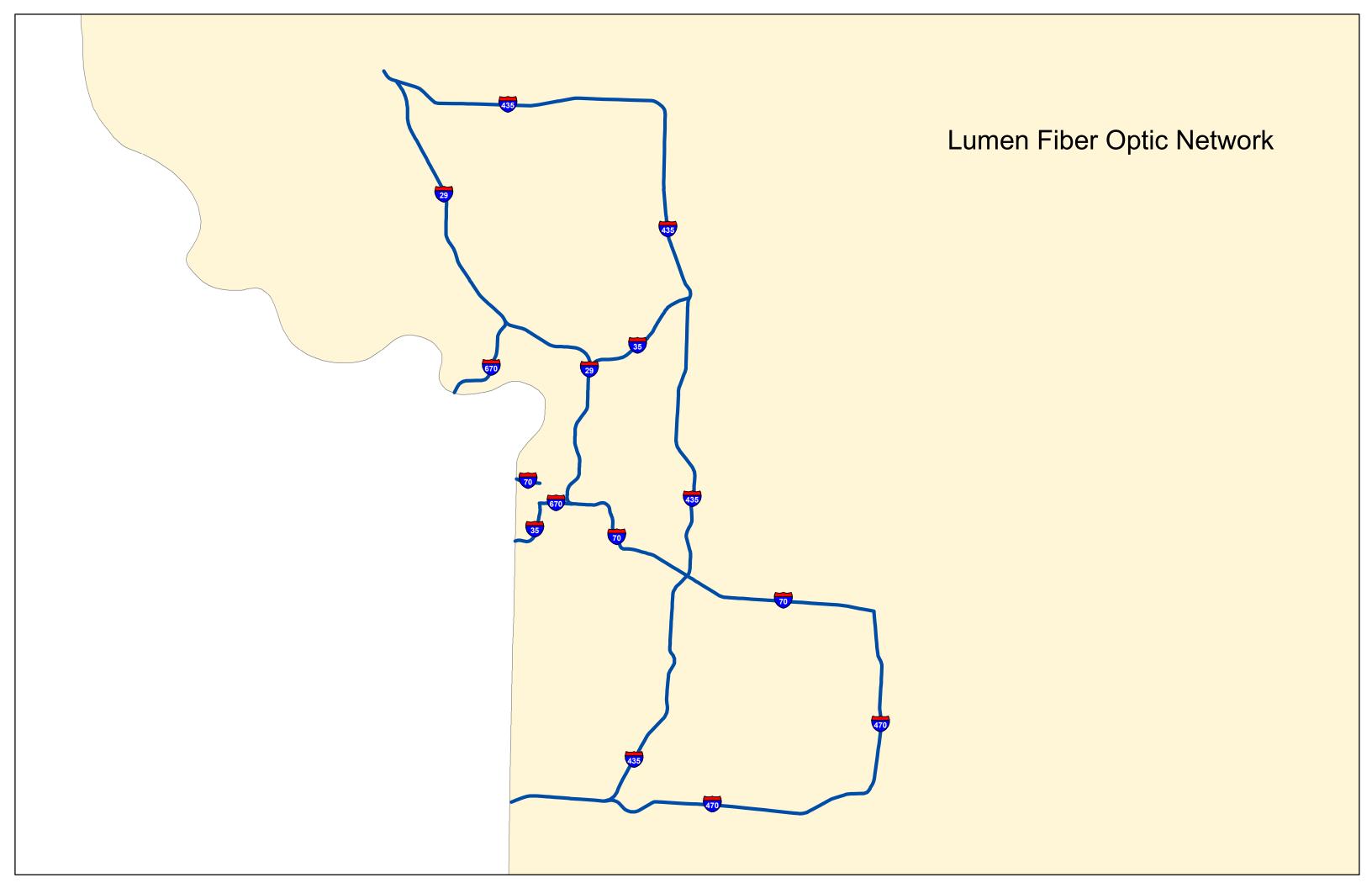
Transportation Funds. MoDOT receives federal transportation funds but MoDOT can use those funds only for specific transportation purposes. **See 23 CFR 1.9a)** Federal-aid funds shall not participate in any cost which is not incurred in conformity with applicable Federal and State law, the regulations in this title, and policies and procedures prescribed by the Administrator. Federal funds shall not be paid on account of any cost incurred prior to authorization by the Administrator to the State highway department to proceed with the project or part thereof involving such cost.

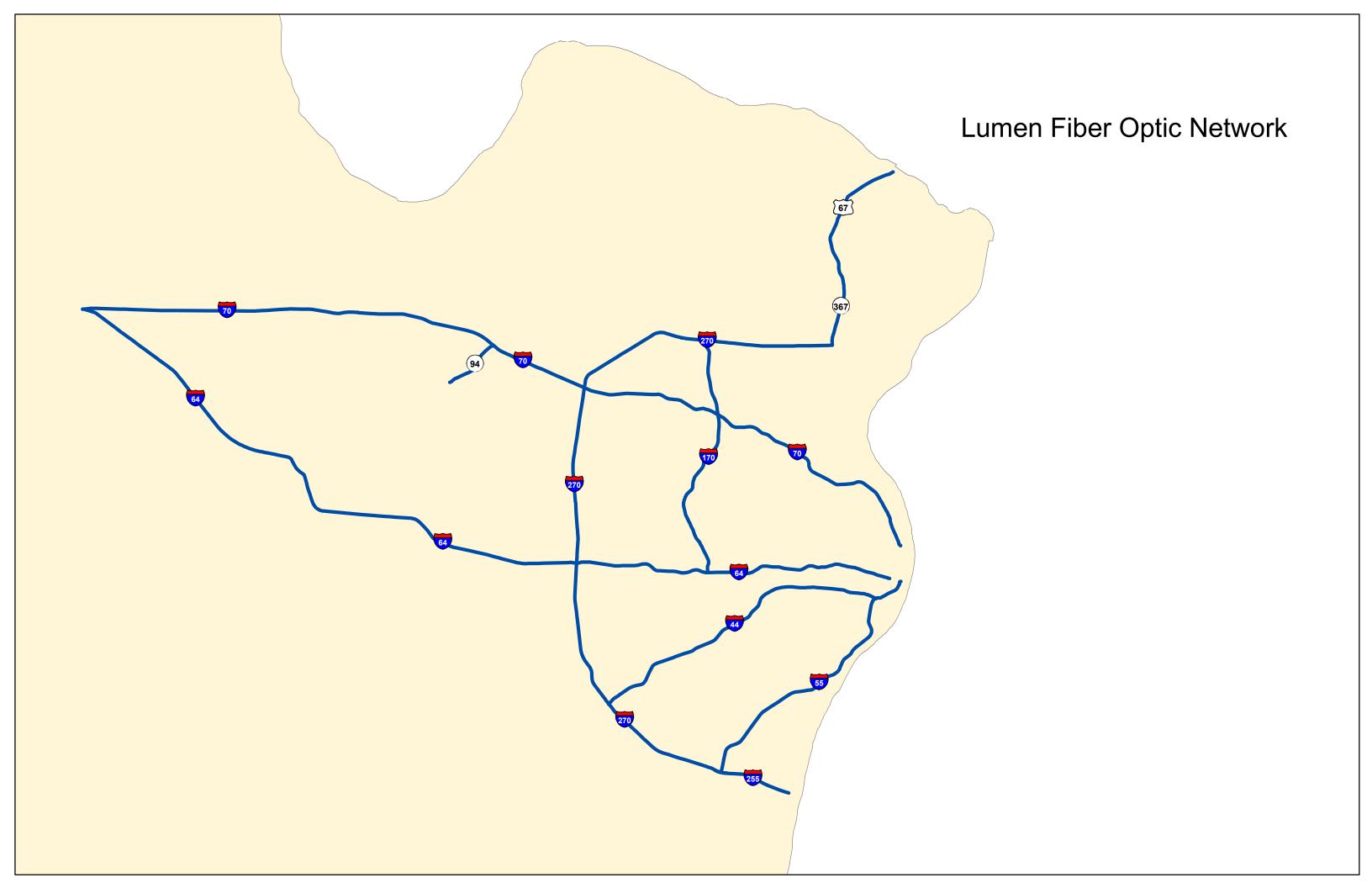
Future role in broadband:

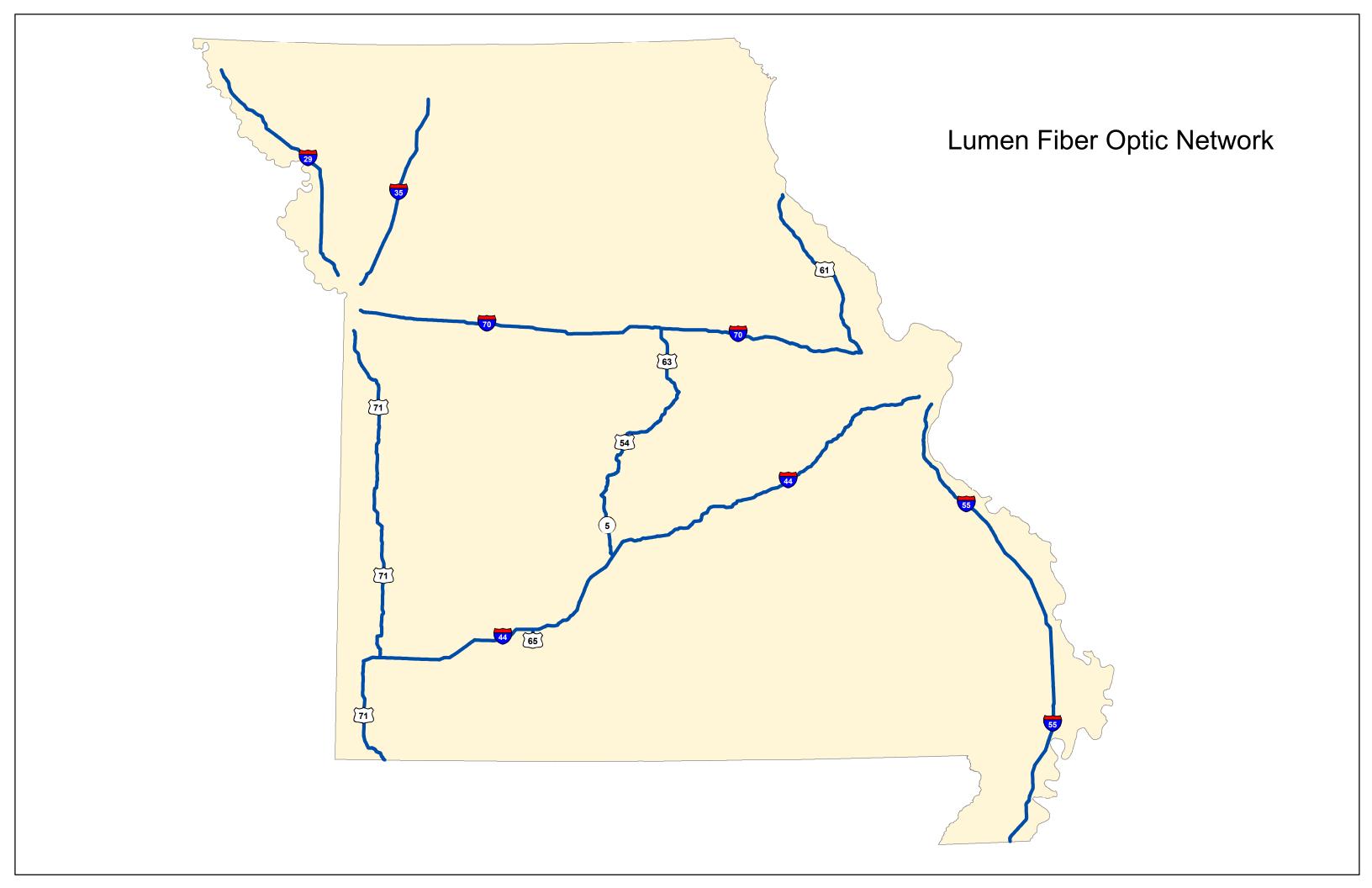
RSMO 227.24 establishes a utility corridor along both sides of state highway rights of way.

CSR Division 10 Chapter 3 Utility and Private Line Location and Relocation establishes rules for use of the utility corridor along state's rights of way.

The utility corridor is available at no cost to public utilities. The department has worked with broad band providers to locate lines in the corridor in the past and has staff in each of our districts to coordinate and assist in the process.







MO DED

Representative Riggs,

Our team wanted to follow up on the item of unserved/underserved populations. The numbers we sent you previously are the best representation of the current situation based on existing definitions. However, we know they could change quite a bit if/when Missouri's broadband speed definitions are updated, 2020 census data becomes available at the granularity we need for this calculation, and the new FCC maps are released in 2022.

We were able to take a look at what the populations and households would look like if the state's broadband speed thresholds are updated to: 1) Served = above 100 Mbps download / 20 Mbps upload, 2) Underserved = above 25/3 but not quite 100/20, 3) Unserved = no service but not quite 25/3. That change alone increases the numbers significantly:

Results:

Estimated population in unserved/underserved census blocks: 948,853

Estimated households in unserved/underserved census blocks: 362,967

Sources: December 2020 FCC data and 2010 Decennial Census population and household estimates

How many households/individuals remain unserved/underserved:

Estimated population in unserved/underserved census blocks: 177,617

Estimated households in unserved/underserved census blocks: 66,583

Sources: December 2020 FCC data and 2010 Decennial Census population and household estimates

It's worth noting that because the FCC data is only available at a very granular level (census blocks), we have to use it in combination with the decennial census data rather than more recent estimates, such as the American Census Survey. We're eager to utilize the 2020 census data when it becomes available, but the estimated timing of that isn't known at this point.

Responses to your requests:

Where does Missouri rank at this moment in access/speed?

<u>Broadnow.com</u> ranks Missouri's State Broadband Access at 32nd (up two place)

<u>Broadnow.com</u> Average Statewide Speed at 115.2 Mbps (average download speed by almost 900,000 tests within the last 12 months)

Where does Missouri rank at this moment in affordability?

According to the U.S. Census Bureau, as of 2019, home use of fixed broadband technologies such as cable, fiber optic, or DSL (which may include some services less than 25/3 Mbps) stood at 70.8% nationally, but only 64.6% in Missouri, only the 44th highest among the states.

Missouri Broadband Adoption vs. National Averages			
	Missouri (Rank Among States)	United States	
Home use of fixed broadband	64.6% (44 th)	70.8%	
Reliance on cellular data for internet	14.4% (7 th)	11.8%	
Usage of satellite internet	8.3% (11 th)	6.5%	
Households with no internet access	15.0% (15 th)	13.4%	

U.S. Census Bureau, "Types of Computers and Internet Subscriptions," American Community Survey 2019 1-Year Estimates, Table S2801.

THE EMERGENCY BROADBAND BENEFIT

Helping households connect during the pandemic



WHAT IT IS

- Up to \$50 paid directly towards your monthly internet bill (\$75 on qualifying Tribal lands)
- A \$100 discount for a computer purchased from a participating provider

WHO'S COVERED

- Households at or below
 135% of poverty guidelines
 (\$17,388 for one person,
 \$35,775 for a family of four)
- Households with loss of income since Feb 2020

YES, EVEN YOU!

- The following households still qualify
- With previous/past due internet accounts
- With existing internet plans
- Receiving the Lifeline benefit

No long-term contracts! Program lasts until funding runs out. Participating households will be given 30-day notice before program expires. They can either enroll in a plan with the internet provider or terminate service when it runs out.

To search for participating providers and to apply for the program go to **GetEmergencyBroadband.Org**



Here's some information about the broadband as it relates to our conversation last week that could be included in any sort of legislative report:

Invenergy, the owners of the Grain Belt Express, has announced its project will also include broadband infrastructure that will be made available for commercial use to internet service providers or others, along or near the route. The Grain Belt Express is a Direct Current (DC) transmission line project stretching from Buchanan County to Ralls County. With permission from landowners, the line carrying 4,000 megawatts of renewable power will provide additional backbone and / or redundancy for service providers and other industries including healthcare and education. The counties along the Grain Belt Express route contain underserved and sometimes unserved areas when it comes to wireline or fixed wireless broadband.

Actually, this is probably more succinct:

Invenergy Transmission, the owner of the Grain Belt Express, a high-voltage direct current (HVDC) transmission line project running from Buchanan County to Ralls County, Missouri, has announced its commitment to making backbone broadband infrastructure available for communities along the project route. With permission from landowners, the line carrying 4,000 megawatts of renewable power will include this critical infrastructure which can be tapped by local internet service providers and other industries including healthcare and education.

Aaron Baker, Vice President 117 Madison St. | Jefferson City, MO 65101 abaker@cloutpublicaffairs.com | (660) 281-7777





MISSOURI GEOGRAPHIC INFORMATION SYSTEMS ADVISORY COUNCIL

December 6, 2021

From: Mrs. Jennifer Bowden, Chair - Missouri GIS Advisory Council

To: Mr. Jeffrey Wann, Chief Information Officer - State of Missouri

Subject: Letter of Support for the MO 911 Service Board's Next Generation 911 GIS Data Initiative

Dear Mr. Wann,

On behalf of the Missouri GIS Advisory Council (MGISAC), I am writing to convey our support of the NG911 GIS data initiative. This effort aligns with our organizational objectives by seeking to modernize existing GIS data as well as develop new foundational GIS layers across our state. Ultimately, we believe this 911 GIS modernization effort and implementation will result in improved emergency service response and readiness for the citizens of Missouri.

As a collection of public and private sector leaders in the geospatial field, it is within the MGISAC mission to enhance and guide the use of geographic information technology and GIS based initiatives in our state through education, collaboration, cooperation, and stakeholder engagement. As of the December 2021 MGISAC meeting, council membership voted to support the Missouri 911 Service Board's efforts to secure funding for critical GIS components tied to NG911 implementation in Missouri. While there is much work yet to do in order to fully engage all of our partners at every level of government, the MGISAC stands ready to advise and assist the 911 Service Board's efforts to standardize foundational GIS data across Missouri.

Quality current GIS data and updated aerial imagery are important factors in the safety and security of all Missourians and travelers who pass through our state. This is especially true when relying upon modern GIS based systems for emergency management and public safety response. However, responsible and transparent data sharing is an equally critical aspect to leverage the total potential of this initiative. The MGISAC is committed toward working to close the communication gap with data owners that may have reservations about the details of how this data sharing will proceed. The MGISAC will work to accomplish this through continued outreach and meaningful dialogue with our valued colleagues and partners across Missouri.

Regards,

Jennifer Bowden, Chair

Missouri Geographic Information Systems Advisory Council



GIS-related statute - RSMo 67.1850, 82.1035, 256.670

The state 911 board has completed a first-ever Missouri GIS overview to determine the quality of GIS data in Missouri. This report, which will be released to the public on December 31, 2021, indicates that much improvement is needed. The 2019 and 2021 National States Geographic Information Council Geospatial Maturity Assessment gave Missouri a C+ overall, with an especially low grade in address data which corresponds with the recently completed GIS data review.

We urge local governments to participate in state coordination efforts and share available data publicly.

Therefore:

- We urge local governments to participate in state coordination efforts and share available data.
- Many states consider GIS data public information. Missouri is somewhat unique in that some
 local governments sell GIS data. In these instances, should local government continue to charge
 fees, these fees should be capped at their current levels. Local governments should be
 encouraged to provide the data for public use without charge.
- The California Supreme Court claimed that the GIS databases are a matter of public record whereas the mapping software used by the county is exempt from the Public Records Act. In its ruling, the California Supreme Court also upheld the right of the public to have access to GIS databases in order to keep the government accountable for its actions.

Arguments for Open GIS Data

- Public Service Improvement: Open Data gives citizens the raw materials they need to engage
 their governments and contribute to the improvement of public services. For instance, citizens
 can use Open Data to contribute to public planning or provide feedback to government
 ministries on service quality.
- Innovation and Economic Value: Public data, and their re-use, are key resources for social innovation and economic growth. Open Data provides new opportunities for governments to collaborate with citizens and evaluate public services by giving citizens access to data about those services. Businesses and entrepreneurs are using Open Data to better understand potential markets and build new data-driven products.
- Efficiency: Open Data makes it easier and less costly for government ministries to discover and access their own data or data from other ministries, which reduces acquisition costs, redundancy and overhead. Open Data can also empower citizens with the ability to alert governments to gaps in public datasets and to provide more accurate information.

Missouri 911 Service Board - Next Generation 911 (NG911) GIS Project

Overview: To implement NG911 across Missouri high quality accurate GIS data must be developed. The Missouri 911 Service Board seeks to bring all counties up to NG911 GIS standards, and maintain this data in a GIS repository to improve 911 dispatching.

911 GIS Background:

- Geographic Information Systems (GIS) integrates hardware, software and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information or location information. GIS data is used in 911 mapping addressing, and computer aided dispatch.
- GIS allows 911 telecommunicators and dispatchers to identify dispatchable addresses during an emergency.
- Most of the authoritative GIS data in Missouri is created at the local level. The Board is looking to leverage local GIS data in the development NG911 mapping.

Additional State Agencies benefitting from GIS Mapping:

- Public Service Commission
- Department of Public Safety
- Department of Conservation
- Department of Natural Resources
- Department of Revenue
- Department of Transportation
- State Emergency Management Agency
- County Local Governments
- Highway Patrol
- Department of Mental Health

Existing GIS Activity: The Missouri 911 Service Board has adopted NG911 GIS standards and is currently conducting a statewide assessment of local GIS data and capabilities, and generating a final gap analysis report on track to be completed by September 31, 2021 but no later than December 31, 2021. This project was funded in-part through a Federal NG911 Grant, and with a funding match from the Missouri 911 Service Board.

Future GIS Activity: Additional funding for data development and maintenance is necessary to bring GIS standards to NG911 capability. Current areal imagery and LiDAR mapping must also be obtained.

Statewide Benefit/Data Sharing: The Missouri 911 Service Board intends to share data with the state for their benefit. The Draft GIS Data Sharing Center (GIS Data Sharing, Project Charter 1.2), outlines the following efforts by the Board and the state to ensure GIS data sharing from local levels to the state:

• Existing effort (MO 911 Service Board): Seven GIS data layers are being collected, standardized, and provided to the 9-1-1 Service Board from local authorities.

Proposed Enabling solution: Share that data with the State of Missouri to benefit the entire state and endure as an analysis tool for decision makers.

• **Existing effort**: Missouri Spatial Data Information Service (MSDIS) is utilized as the GIS data clearinghouse for the state and is already functioning appropriately.

Proposed Enabling solution: Expand existing server storage capacity to include the NG9-1-1 data layers.

• Existing effort: The Missouri GIS Advisory Council (MGISAC) assembles leaders in geospatial technologies across Missouri to discuss, build, enhance, and guide the mapping landscape through education, collaboration, cooperation, and stakeholder engagement.

Proposed Enabling solution: Codify the MGISAC under OA/CIO to serve as a liaison between local and state government, adjudicate privacy concerns, set standards, support local efforts, and ensure the data flow from 9-1-1 Service Board to MSDIS.

• Existing Effort: ESRI ArcGIS infrastructure is set up for ad-hoc use throughout the State, save for an Enterprise Agreement solely for Department of Natural Resources use.

Proposed Enabling Solution: Build on existing infrastructure and expand the current system to all users supported by OA/ITSD, including DNR, to include server capacity, which enables support across all consolidated agencies, the Governor's Office, and the House and Senate.

Proposed Budget Language: \$8,000,000 to the 911 Service Trust Fund as established in 190.420 RSMo for the purpose of collecting, improving and maintaining statewide NG911 GIS including but not limited to aerial imagery, LiDAR, identification, verification, 911 mapping of structures, roads and political subdivision boundaries.

Budget breakdown attached.

Next Generation 911 GIS	TARGET COMPLETION	COST
Phase I Objectives		
Task A – Establish NG911 GIS standards	Completed February, 2021	Included in Project Total
Task B – Conduct assessment of current GIS data and		
capabilities.	In Progress	Included in Project Total
Task C – Generate final gap analysis reports	December 31, 2021	Included in Project Total
		Federal NG911 Grant: \$173,465 Missouri 911 Service Board Match:
Total Phase I Cost	December 31, 2021	\$141,689

Phase II Objectives		
Task A – Addressing of counties lacking 911 addresses &		
updating of local GIS data to meet the NG911 standard		\$3,580,000
Task B –NG911 level aerial imagery and LiDAR (Light Detection		
and Ranging) mapping		\$2,750,000
Task C - Develop a state GIS portal and 911 State Repository to		
store the master copy of 911 GIS data		\$670,000
Task D - Quality control, update and maintainence of NG911		
data		\$1,000,000
Total Phase II Cost	July 31, 2023	\$8,000,000

Broadband Network Disaster Resilience

Summary

- After hurricanes and other disasters, coordinating restoration work with electrical and other
 utilities as appropriate is considered a <u>best practice</u> as outlined by the FCC's Communications
 Security, Reliability and Interoperability Council.
- FEMA and FCC provide regular resources on disaster mitigation and post-disaster lessons learned.
- Strategies to create more resilience can include creating redundancy systems for both the communications infrastructure and the power supply, and quickly deploying temporary mobile towers to provide coverage.
- The pending federal infrastructure bill contains resources for energy resilience and have funding for state broadband planning, which can be used to guide the grant administration along a variety of priority areas.

Issue Framing

The resilience of internet and communications infrastructure is commonly measured across several categories and components:

- Shortening the time needed for restoration
- Knowing current and future disaster risks
- Designing for resilience (in the physical backbone, capacity, and power supply)
- Ensuring last mile connectivity
- Use of mobile base stations and cellular phones
- Smart phones and mobile devices for disaster data collection and early warning systems

(These aspects are further discussed in an international context in a 2015 <u>United Nations Technical Brief</u> by the Information and Communications Technology and Disaster Risk Reduction Division)

FEMA and FCC resources

Guide to Expanding Mitigation: Making the Connection to Communications Systems

This guide is designed to help community officials initiate a conversation about mitigation investments that can help make communications systems more resilient.

Telecommunications professionals recommend considering the following mitigation strategies for communications systems:

- 1. Regular Upgrades and Inspections: Reinforce or upgrade infrastructure to mitigate the risk of physical damage. Perform regular inspections of both physical infrastructure (cables, server rooms, telephone poles, etc.) and digital infrastructure (software updates).
- 2. Autonomous Power Supplies: Provide an autonomous power supply and enough fuel for generators as electricity failure may last for a long time. Consider alternative power sources like wind or solar to ensure continuity in the event of power outages.
- 3. Safer and More Accessible Equipment Locations: Install equipment in safer places that are further from at-risk areas. When reviewing or updating the location of essential equipment,

- make sure it is accessible, that it has security measures like fencing, and that surrounding vegetation is trimmed.
- 4. Critical System Backups: Ensure redundancy and backups for critical systems and implement interoperable systems and diversified access technologies.
- 5. Computer System Networking: Embrace mesh topologies to provide redundancy routes and reduce the risk of network failure.
- 6. System Monitoring: Install a warning system that uses sensors to monitor and provide digital data about environmental conditions.
- 7. Co-location with Other Utilities: Work with other utility sectors, including electric power, to ensure resilient communication considerations, like undergrounding, are addressed within their mitigation plans and projects.

FCC Post-Disaster Reports

Hurricane Michael Findings (2019)

"The Bureau finds that three key factors 1) insufficiently resilient backhaul connectivity, 2) inadequate reciprocal roaming arrangements, and 3) lack of coordination between wireless service providers, power crews, and municipalities – were the predominant causes of the unacceptable lack of service."

"The Bureau further concludes that a lack of coordination and cooperation among wireless providers themselves (exacerbated by inadequate roaming arrangements) inhibited their ability to increase service availability via roaming. Some providers appear not to have comported with the Wireless Resiliency Cooperative Framework (Framework), the voluntary commitment that several nationwide service providers proposed and committed to abide by in 2016. Specifically, it appears that some wireless providers demurred from seeking assistance from potential roaming partners and, therefore, remained inoperable."

Hurricanes Harvey, Irma, Maria, and Nate (2017)

"The 2017 Atlantic Hurricane season underscored the importance of relationships for effective incident response. Cross-sector dependencies greatly affected communications services, which are often highly dependent on electric power, fuel distribution (in the absence of electricity), and transportation at the local level (for access to sites and facilities) and regional level (for transportation of restoration crews and equipment). Various interagency ad hoc efforts have attempted to address cross-sector dependencies, but more cross-sector incident response engagement is needed."

...

"Service providers, network operators, and others should ensure they have reviewed, and are implementing where practicable, best practices issued by the <u>Communications Security</u>, <u>Reliability</u>, <u>and Interoperability Council</u> (CSRIC) and applicable standards bodies.

Relevant CSRIC best practices include:

- coordinating hurricane and other disaster restoration work with electrical and other utilities as appropriate;
- coordinating with local, state and/or federal emergency management and law enforcement agencies for pre-credentialing to help facilitate access by technicians to restricted areas during an event;
- placing all power and network equipment in a location, (such as higher ground) to increase reliability in case of disaster (e.g., floods, broken water mains, fuel spillage); in storm surge areas, placing all power related equipment above the highest predicted or recorded storm surge levels;

- placing standby generators on line and verifying proper operation of all subsystems (e.g., in cases of heavy ice, snow, flood, hurricanes); and
- service providers should ensure the availability of emergency/backup power (e.g., batteries, generators, fuel cells) to maintain critical communications services during times of commercial power failures, including natural and manmade events; the emergency/backup power generators should be located onsite, when appropriate.

Resilience Strategies

Power Redundancy

California

In February 2021, following recent wildfires that revealed failures in California's communications networks, the <u>California Public Utilities Commission</u> ordered the state's wireline providers to address key areas of resiliency, including:

- To develop comprehensive resiliency strategies to prepare for catastrophic disasters and power outages;
- And to maintain minimum level of service with 72-hour backup power during disasters and grid outages (wireline providers have 18 months to implement this ruling in all facilities in high-risk areas).

Cells on Wheels

Mobile cell sites, also known as "cells on wheels" (or COWs) can be deployed in response to a disaster event to provide temporary coverage. COWs are also often used for large events, and are deployed with a variety of network technologies, including wired, satellite, and terrestrial microwave. As the UN Working Paper on Enhancing E-resilience of Information and Communications Technology Infrastructure details, "in the aftermath of Hurricane Katrina, in the early days of 3G cellular technology, ViaSat and Qualcomm staff transported mobile base stations to provide cellular connectivity for first-responders in New Orleans. Calls were allowed for communication both within and outside the network. External calls were routed via a ViaSat IP Satcom Flyaway Terminal."

Alabama

In response to the COVID-19 pandemic, the Alabama Department of Economic and Community Affairs (ADECA) utilized \$5 million in CARES Act funding for a "Cells on Wheels" program to deploy in unserved areas. The program leased the devices to partnered providers under a contract to deploy them within the state and can be used in response to other disaster events.

Combined wired and wireless redundancy

Summary blurb from CCG's Doug Dawson:

"[The company] Climate Resilient Internet recommends that vulnerable communities and key infrastructure in vulnerable communities incorporate resilient Internet links as part of the core Internet infrastructure. This means using powerful millimeter-wave radio links that are built to hurricane standards to beam broadband from key buildings to data centers away from flood plains and coastal flooding. It means putting those radio transmitters in secure places like rooftops where they can be bolted down to withstand hurricane winds. It means having onsite microgrid and backup power sources that don't rely on the commercial power grid. And it means avoiding all wires between the radio transmitter and the data centers.

This doesn't have to mean a new layer of extra expense. [CRI's Founder David Theodore] recommends that large broadband users incorporate radio links into their daily broadband usage so that some of their Internet traffic always travels via the wireless link. Large businesses and critical anchor institutions like hospitals should have diverse routing to reach the Internet. Unfortunately, as many have found out during outages, routes that are promised to be diverse often are not if they eventually converge or share physical address switching points. Having a backup connection using wireless links is one of the only sure ways to guarantee diverse routing."

Federal Policy Tracking

Reenforcing and Evaluating Service Integrity, Local Infrastructure, and Emergency Notification for Today's (RESILIENT) Networks Act

Summary from Public Knowledge:

"Introduced by Chairman Frank Pallone (D-NJ) and Rep. Jerry McNearny (D-CA) of the House Energy and Commerce Committee, the <u>RESILIENT Networks Act</u> is the first federal legislative effort to substantially address the problem of how to get modern communications systems back up and running if they go down in a disaster... [by requiring] existing networks to work together. This creates resiliency through cooperation and redundancy, rather than the traditional way of hoping each network reduces its own vulnerabilities."

Status: Introduced in 2020

Bipartisan Infrastructure Investment and Jobs Act (IIJA)

As summarized by the White House, "the legislation's roughly \$65 billion investment includes the single largest investment in clean energy transmission in American history. It upgrades our power infrastructure, including by building thousands of miles of new, resilient transmission lines to facilitate the expansion of renewable energy. It creates a new Grid Deployment Authority, invests in research and development for advanced transmission and electricity distribution technologies, and promotes smart grid technologies that deliver flexibility and resilience."

The IIJA includes significant boosts in funding for two key federal disaster mitigation programs. By devoting \$1 billion to the Building Resilient Infrastructure and Communities Program (BRIC) of the Federal Emergency Management Agency (FEMA), the bill aims to help communities undertake comprehensive planning and projects to better withstand extreme weather before it strikes. The IIJA also provides FEMA's Flood Mitigation Assistance (FMA) program with \$3.5 billion over five years, allowing the agency to more than triple grant awards it typically makes to help reduce the risk of repetitive flood damage to homes and businesses insured by the National Flood Insurance Program (NFIP). The legislation also improves the affordability of FMA grants by reducing the nonfederal amount of matching funds required for certain socially vulnerable and lower-income communities and individuals.

For energy utilities and the electric grid, Sec. 40101 "Preventing outages and enhancing the resilience of the electric grid" would provide grants for grant awarded to eligible entities under the program that may be used for activities, technologies, equipment, and hardening measures to reduce the likelihood and consequences of disruptive events, including:

- (A) weatherization technologies and equipment;
- (B) fire-resistant technologies and fire prevention systems;
- (C) monitoring and control technologies;

- (D) the undergrounding of electrical equipment;
- (E) utility pole management;
- (F) the relocation of power lines or the
- (G) reconductoring of power lines with low-sag, advanced conductors;
- (H) vegetation and fuel-load management;
- (I) the use or construction of distributed energy resources for enhancing system adaptive
- (J) capacity during disruptive events, including
 - a. microgrids; and
 - b. battery-storage subcomponents;
- (K) adaptive protection technologies;
- (L) advanced modeling technologies;
- (M) hardening of power lines, facilities, substations, of other systems; and the replacement of old overhead conductors and underground cables.

On broadband planning, the legislation currently includes language that will require details of the existing broadband efforts in the state and a 5-year action plan for the Broadband Equity, Access, and Deployment Program (BEADP). Up to 5 percent (a minimum of \$5 million at current levels) of the state's allotment may be awarded to planning activities.

The BEADP, which will be administered by NTIA, has three planning-related phases:

- 1. Pre-planning: States must submit a letter of intent that addresses topics such as current program activities, existing state plan, capacity and FTE, notional strategy for applying forthcoming funds, and additional capacity or support needed to implement program requirements (E.g., data collection, local technical assistance).
- 2. Planning funds: Pending approval of this letter, states may use up to 5% of their overall allocation to plan for activities outlined in the letter of intent, including training for state employees and local officials; publications, outreach, and technical assistance; program budget design; data collection; and supplementing the capacity of the state broadband office.
- 3. Five-year action plan: Those activities will inform the state's five-year action plan, which states are required to submit to receive their remaining funding allocation. This plan, which must be developed in coordination with local and regional officials, will identify investment priorities and associated costs; propose solutions for affordable access; and outline how these investments will advance priorities in economic development, health care, education, and other areas. The plan may also include details on how the state plans to coordinate with local officials during implementation, identify further technical assistance needs that may be met by the state or NTIA, or elevate proposals for the most appropriate solutions for serving unserved locations (e.g., public-private partnerships, formation of broadband cooperatives).

Information requirements are subject to change pending guidance from NTIA's Assistant Secretary, but states should begin assessing how they might go about collecting this information, identifying needs, and developing timelines for execution.

Status: Passed Senate in August 2021, awaiting passage in the House.

Resource List of State Broadband Plans

Statewide broadband plans provide useful strategy documents for assessing the current status of broadband access in the state, setting long-term goals, and making policy recommendations. State broadband plans can also increase collaboration between key stakeholders and related-agencies and provide an opportunity to align broadband activities with other state plans and programs.

The Bipartisan Infrastructure Framework includes planning requirements, which will necessitate that states create 5-year action plans.

Statewide broadband plans typically incorporate three key components:

- 1) an assessment of the current state of broadband deployment, adoption, and/or affordability in the state, along with descriptions of past or existing mechanisms and progress from previous reports or goals;
- 2) a long-term strategy for the state's broadband activities; and
- 3) a set of immediate goals, activities, and/or recommendations.

The following memo includes examples of and information on key features of state broadband plans, as well as a summary of the relevant provisions of the pending Bipartisan Infrastructure Bill (as passed by the Senate on August 10, 2021). Appendixes include the relevant provisions in the Broadband Infrastructure Bill (Appendix A) and an inventory of the latest state plans in circulation (Appendix B).

Select Examples

- California "California Broadband for All" plan: This 2020 plan identifies key challenges to
 achieving universal broadband access and sets three long-term goals focused on ensuring that
 all Californians have access to broadband at home, work, and school; have access to an
 affordable connection and the devices they need to get online and; have access to training and
 support. The plan defines actions towards achieving each of those goals and identifies the key
 agencies or groups required to implement these activities.
- Delaware "Broadband Strategic Plan: Prepared for the State of Delaware": Prepared by the
 company CTC Technology & Energy to assess the state's progress and develop a strategic plan in
 2020, which included a targeted field studies, a survey of Delaware residents and businesses, a
 survey collection of speed data, and outreach with key stakeholders. The plan also identifies
 federal funding opportunities and highlights ongoing areas of interagency collaboration in the
 state.
- North Carolina "Connecting North Carolina" plan: This 2016 plan was developed with input from stakeholders across the state and includes recommendations for how the state can encourage broadband deployment and adoption, the homework gap, economic development, and public safety. The goals and recommendations laid out in the plan have played a key role in shaping the state's broadband activities, including the focus on the "homework gap," creation of the Growing Rural Economies with Access to Technology (GREAT) grant program, and provision of technical assistance support to communities and regions.
- Vermont "<u>Emergency Broadband Action Plan</u>": This plan was prepared in June 2020 as a supplement to the state's ten-year Telecommunication Plan. This plan offers strategies for

targeting federal funds and lays out an action plan for meeting the state's immediate needs and achieve universal broadband availability by 2024. The action plan offers specific guidance on legislative vehicles and statutory changes that are required to achieve these goals. For example: "[Section 1, Step 3] Pass legislation to facilitate fast-tracking or waiver of Act 250 and Section 248a processes for installing wireless facilities that will serve locations identified as needing broadband or commercial wireless connectivity," and "[Section 2, Step 3] Modify 30 V.S.A. § 8091 to provide open access to middle-mile fiber owned by Vermont's electric distribution utilities."

• West Virginia – "West Virginia State Broadband Plan 2020-2025": Prepared by the company Tilson for the West Virginia Broadband Enhancement Council, this strategic plan provides a comprehensive survey of the latest data on broadband availability in the state, details ongoing deployment efforts – including those in collaboration with the Appalachian Regional Commission and other federal partnerships. The plan also details the regional broadband planning efforts that were executed in 2018 and 2019, through Community Development Block Grant funds. The plan provides detailed stakeholder surveys, identifies existing barriers and challenges unique to the state, and provides targeted goals into three key categories: improving broadband infrastructure, improving information on broadband availability and speeds, and increasing and improving use (specifically in four areas: education and healthcare, workforce development, public safety, and state and municipal services).

Plan Development

Plan Alignment: States may also align broadband plans with other statewide planning efforts. For example, Maine produces a three-year strategy document, in addition to an annual action plan. These reports also coordinate with the state's ten-year economic development strategy and the state's three-year unified plan. Additionally, some states provide annual reports with information on program progress and federal funding, either as updates to their state plan or as supplemental documents. For example, the 2021 edition of the Minnesota Employment and Economic Development Office of Broadband Development's annual report (supplemental to Minnesota's strategic broadband infrastructure plan) details the Minnesota projects that received federal funding, including those funded through the FCC's Connect America Fund and Rural Digital Opportunity Fund and the USDA's Community Connect Grant and ReConnect programs.

Planning support: While some state broadband programs lead their strategic planning efforts, others may engage partners or consultants to conduct or advise the state in the development of their broadband plan. For example, the New Hampshire 2015 broadband report was assembled by the University of New Hampshire, in collaboration with relevant state agencies and regional commissions. Delaware contracted with the company CTC Technology & Energy to assess the state's progress and develop a strategic plan in 2020, which included a targeted field studies, a survey of Delaware residents and businesses, a survey collection of speed data, and outreach with key stakeholders. And Alaska and Michigan contracted with the non-profit organization Connected Nation to develop their statewide strategic plans.

Stakeholder engagement: Engaging with stakeholders is a key aspect of the plan development process. For example, the Indiana Office of Broadband Opportunities touts engaging with 90 stakeholders across

68 separate organizations in the development process for the state's "Indiana Statewide Broadband Strategic Plan" (February 2020). In Arizona, the state's 2018 strategic plan was informed by six informational focus groups with relevant stakeholders, with attendees surveyed on a variety of factors and engaged in a strategic planning workshop.

Policy Recommendations: Policy recommendations are a frequent feature of state broadband plans, either through the identification of general goals and barriers or with specific commentary on individual legislative items. States may identify specific policies that need to be changed. For example, Virginia's "Commonwealth Connect" plan includes recommendations for both legislative and non-legislative policy change. (See California, North Carolina, and Vermont's plans listed above for additional examples).

Broadband Plan Provisions in the Senate-passed Infrastructure Bill

The federal funds expected to pass from the Bipartisan Infrastructure Framework currently includes language that will require details of the existing broadband efforts in the state and a 5-year action plan. Up to 5 percent (a minimum of \$5 million at current levels) of the state's allotment may be awarded to planning activities. A total of \$60 million will also be available for states to develop Digital Equity Plans, to be awarded based on a needs- and population-based formula. See the below Appendix A for additional details.

Appendix A: Broadband Plan Provisions in the Senate-passed Infrastructure Bill

As currently written, the Bipartisan Infrastructure Framework (BIF), has two key components related to planning: The Broadband Equity, Access, and Deployment Program (BEADP) and the State Digital Equity Capacity Grant Program. While still pending passage in the House, current feedback from the Hill is that it's unlikely these components will change.

The BEADP, which will be administered by NTIA, has three planning-related phases:

- 1. Pre-planning: States must submit a letter of intent that addresses topics such as current program activities, existing state plan, capacity and FTE, notional strategy for applying forthcoming funds, and additional capacity or support needed to implement program requirements (E.g., data collection, local technical assistance).
- 2. Planning funds: Pending approval of this letter, states may use up to 5% of their overall allocation to plan for activities outlined in the letter of intent, including training for state employees and local officials; publications, outreach, and technical assistance; program budget design; data collection; and supplementing the capacity of the state broadband office.
- 3. Five-year action plan: Those activities will inform the state's five-year action plan, which states are required to submit to receive their remaining funding allocation. This plan, which must be developed in coordination with local and regional officials, will identify investment priorities and associated costs; propose solutions for affordable access; and outline how these investments will advance priorities in economic development, health care, education, and other areas. The plan may also include details on how the state plans to coordinate with local officials during

implementation, identify further technical assistance needs that may be met by the state or NTIA, or elevate proposals for the most appropriate solutions for serving unserved locations (e.g., public-private partnerships, formation of broadband cooperatives).

Information requirements are subject to change pending guidance from NTIA's Assistant Secretary, but states should begin assessing how they might go about collecting this information, identifying needs, and developing timelines for execution.

The State Digital Equity Capacity Grant Program, which can be found in Section 60304 (page 2090) of the current text, provides funds for states to develop a Digital Equity Plan for the State, which will include factors such as identified barriers to digital equity, availability of affordable wired and wireless broadband, statewide digital literacy, availability of consumer device and technical support programs, and more. It will also address how improving digital equity will impact economic, health, and education-related outcomes for the state, as well as how the state plans to collaborate with partners in the community and private sector. Finally, the state will outline how it plans to implement and oversee efforts to meet measurable goals, including allocating subgrants, serving as an advocate for digital equity policy and digital inclusion actives, and providing a repository of best practices materials. A total of \$60 million will be available for states for planning purposes through the State Capacity Grants, divided by formula with 50 percent based on the state's population, 25 percent based on the population of covered individuals in the state compared to other states, and 25 percent based on the comparative lack of availability and adoption of broadband in the state.

Covered populations for these activities include: Households with income no more than 150 percent of the area poverty level, seniors, incarcerated individuals, veterans, individuals with disabilities, individuals with language barriers (including English learners and those with low levels of literacy), racial or ethnic minority groups, and individuals that reside primarily in rural areas.

Appendix B: Table of State Broadband Plans

State	Title (Year)	Link
Alabama	Broadband Alabama Strategy	https://adeca.alabama.gov/wp-
	(2019)	content/uploads/Broadband-
		Alabama-Strategic-Plan.pdf
Alaska	Updated Broadband Plan (2019)	https://www.denali.gov/update
		d-broadband-plan-document/
Arizona	Arizona Statewide Broadband	https://azlibrary.gov/sites/defa
	Strategic Plan (2018)	ult/files/erate_2018_az_broadb
		andstrategicplan_final.PDF
Arkansas	Arkansas State Broadband Plan	https://governor.arkansas.gov/i
	(2019)	mages/uploads/Arkansas_State
		_Broadband_Plan_Final_5.151
		<u>9pdf</u>
California	Broadband for All Action Plan	https://broadbandcouncil.ca.go
	(2020)	<u>v/wp-</u>

		content/uploads/sites/68/2020 /12/BB4All-Action-Plan- Final.pdf
Delaware	Broadband Strategic Plan (2021)	https://broadband.delaware.go v/contentFolder/pdf/strategicpl an.pdf?cache=1630341898278
Georgia	The State of Georgia Broadband Plan (2019)	https://broadband.georgia.gov/media/7/download
Hawaii	Hawaii Broadband Strategic Plan (2020)	http://broadband.hawaii.gov/wp- content/uploads/2020/11/Hawaii-BB-Plan-2020-FINAL_10-23- 20_v1.1.pdf
Idaho	Broadband Access is Imperative for Idaho (2019)	https://commerce.idaho.gov/content/uploads/2019/11/Broadband-Taskforce-Final_v3.pdf
Illinois	Connect Illinois: Broadband Strategic Plan (2020)	https://www2.illinois.gov/dceo/ ConnectIllinois/Documents/Bro adband%20Strategic%20Plan%2 02.5.20.pdf
Indiana	Indiana Statewide Broadband Strategic Plan (2020)	https://www.in.gov/indianabro adband/files/indiana-statewide- broadband-strategic-plan-3-24- 2020.pdf
Kentucky	State Broadband Planning Program Update (2019)	https://kentuckywired.ky.gov/R esinfo/Documents/Final%20Stat e%20Plan%205.21.pdf
Louisiana	Broadband for Everyone in Louisiana (2019)	https://gov.louisiana.gov/assets /docs/Broadband-for-Everyone- in-Louisiana-(BEL)-Plan- FINAL.pdf
Maine	Detailed 2019-2021 Strategic Plan for Broadband Service in Maine (2019)	https://www.maine.gov/connec tme/sites/maine.gov.connectm e/files/inline- files/ConnectME%20Authority% 20%202019- 2021%20Strategic%20Plan.pdf
Michigan	Michigan Broadband Roadmap (2018)	https://connectednation.org/w

		content/uploads/sites/13/2019
		/01/Final-Roadmap-8-8-18.pdf
Minnesota	Minnesota Broadband	https://mn.gov/deed/assets/br
	Infrastructure Plan (2021)	oadband-annual-report-
	, ,	2021_tcm1045-463735.pdf
Missouri	Missouri Broadband Plan (2019)	https://ded.mo.gov/sites/defaul
		t/files/Missouri%20Broadband%
		20Plan%20(2).pdf
Montana	Interconnectivity and	https://mainstreetmontanaproj
	Telecommunications Key	ect.com/wp-
	Industry Network Report and	content/uploads/2019/03/Attac
	Recommendations (2019)	hment-7Interconnectivity-
		Telecommunications.pdf
Nebraska	Rural Broadband Task Force	https://ruralbroadband.nebrask
	Report (2019)	a.gov/reports/2019/RBTF2019R
Name	The Neverte Due 11 17 1	eportfinal.pdf
Nevada	The Nevada Broadband Task	https://osit.nv.gov/uploadedFil
	Force Report (2016)	es/ositnvgov/Content/Broadba nd/2016%20Broadband%20Tas
		k%20Force%20Report%20to%2
		0the%20Governor%206-30-
		2016%20%5bFINAL%5d.pdf
New Hampshire	Broadband: The Connection to	https://www.unh.edu/broadba
	New Hampshire's Future (2015)	nd/sites/www.unh.edu.broadba
	, , ,	nd/files/media/kb-
		reports/initiatives/NH_Broadba
		nd_Report_2015_UNH.pdf
New Mexico	State of New Mexico	https://www.doit.state.nm.us/b
	Broadband Strategic Plan	roadband/reports/nmbbp_strat
	and Rural Broadband	egic20200616Rev2Final.pdf
	Assessment (2020)	
North Carolina	Connecting North Carolina	https://www.ncbroadband.gov/
	(2019)	data-reports/connecting-north-
N. II S. I. I	N 11 D 1 1 D 11 1 D 1	carolina-state-broadband-plan
North Dakota	North Dakota Broadband Plan	https://www.nd.gov/itd/sites/it
	(2019)	d/files/legacy/alliances/broadba
		nd/ND-Broadband-Plan- 2019.pdf
Ohio	The Ohio Broadband Strategy	https://innovateohio.gov/wps/
Onio	(2019)	wcm/connect/gov/bde9a8ce-
	(2023)	5f93-4a04-b937-
		102788469bdb/OhioBroadband
		Strategy_121919.pdf?MOD=AJP
		ERES&CONVERT TO=url&CACH
		EID=ROOTWORKSPACE.Z18_M1
		HGGIK0N0JO00QO9DDDDM300
		0-bde9a8ce-5f93-4a04-b937-

		102788469bdb-mYuKib6
Oklahoma	Oklahoma State Broadband Plan	https://onenet.net/wp-
	(2019)	content/uploads/2020/03/Okla
		homa-State-Broadband-Plan-
		October-2019-Accessible.pdf
Oregon	Oregon Broadband Office	https://www.oregon4biz.com/d
	Strategic Plan (2020)	ev/www/BOR/Broadband-
		Office/OBAC/Reports/Broadban
		dStratPlan2020.pdf
South Dakota	Broadband in South Dakota	https://sdgoed.com/wp-
	(2020)	content/uploads/2020/08/State
		<u>-Broadband-Plan.pdf</u>
Tennessee	Report of the Tennessee	https://www.tn.gov/content/da
	Advisory Commission on	m/tn/tacir/2021publications/20
	Intergovernmental Relations	21_BroadbandUpdate.pdf
	(2021)	
Texas	Broadband in Texas (2020)	https://gov.texas.gov/uploads/f
		iles/business/Texas_Broadband
		_Briefing_Book
		_April_2020.pdf
Utah	Utah Broadband Advisory	https://business.utah.gov/wp-
	Council Plan (2020)	content/uploads/2020/07/Utah
		-Broadband-Advisory-Council-
		Plan-2020.pdf
Vermont	Broadband Action Plan (2020)	https://publicservice.vermont.g
		ov/content/emergency-
		<u>broadband-action-plan</u>
Virginia	Report on Commonwealth	https://www.commonwealthco
	Connect 2.0: Governor	nnect.virginia.gov/sites/default/
	Northam's 2020 Plan to	files/CIT%20Documents/Comm
	Connect Virginia (2020)	onwealth%20Connect%20Repor
		<u>t.pdf</u>
Washington	Broadband in Washington	https://data.wa.gov/stories/s/ir
	(2019)	<u>v9-b275</u>
West Virginia	West Virginia State Broadband	https://broadband.wv.gov/wp-
	Plan 2020-2025 (2020)	content/uploads/2020/01/West
		_Virginia_State_Broadband_Pla
		<u>n_2020-2025.pdf</u>
Wisconsin	Wisconsin Broadband Plan	https://psc.wi.gov/Documents/
	(2021)	broadband/WisconsinBroadban
		dPlan2021.pdf
Wyoming	Broadband Enhancement Plan	https://www.wyomingbusiness.
	(2018)	org/Uploads/wbbp%20final.pdf

State Broadband & Transportation Coordination Efforts

Summary

- Dig once policies create standardized coordination between ISPs, State Broadband Offices, State
 Departments of Transportation, and other relevant entities (see: AZ, CA, IL, NV, UT, WV) and can
 include requirements to install conduit for future use (see: AZ, IL, UT)
- Fee structures vary, with some states allowing for in-kind contributions (see: CO) or free access if fiber is being deployed to an underserved area (see: WI), or are based on the type of infrastructure asset (see: MN for railroad crossings)
- States have developed new processes and created uniform permitting systems to streamline fiber deployment along rights-of-way and other similar areas (see: IN, MD, MN, WV)
- Several states have recently undergone studies to identify recommendations to improve their broadband/transportation coordination and permitting processes (see: CA, NM)

State Examples

Sections of the state examples below pulled from the California State Transportation Agency's 2018 white paper are marked with "CA Dig Once Summary"

Arizona:

Since 2012, Arizona has had a <u>"dig once" policy</u> under which the state installs empty conduit in its right-of-way during all highway construction projects and then leases it to telecommunications providers at a cost-based rate.

California:

California Governor's Executive Order S-23-06 (PDF) Twenty-First Century Government directed the establishment of the California Broadband Task Force, of which the California Department of Transportation (Caltrans) is a member, to bring together public and private stakeholders to better facilitate broadband installation, identify opportunities for increased broadband adoption, and enable access to and deployment of new advanced communication technologies.

California Assembly Bill 1549 (Wood, Chapter 505, Statutes of 2016) requires that Caltrans, during the planning phase of specified Caltrans-led highway construction projects, notify broadband deployment companies and organizations on its Internet Web site of transportation projects that involve construction methods suitable for the installation of broadband. Upon notification from Caltrans, companies or organizations working on broadband deployment may collaborate with Caltrans to install a broadband conduit as part of a project. The bill also requires Caltrans, in consultation with Broadband Stakeholders, to develop guidelines to facilitate the installation of broadband conduit on State highway right-of-way on or before January 1, 2018.

Permitting information and relevant resources: http://www.dot.ca.gov/wiredbroadband

California's Dig Once White paper catalogs state practices in Maryland, Minnesota, Illinois, Nevada, and Utah, and their recommendations for California: https://calcog.org/wp-content/uploads/2020/10/CALSTA-DigOnceWhitePaper.pdf

Colorado:

CDOT owns over 1,500 miles of fiber, 25,000 pole boxes, as a public benefit to the transportation and safety network. CDOT has the authority to lease, barter, swap, or enter into a public-private partnership for the public benefit of improving the traffic safety network and public safety. The state's relevant agencies (DORA, DOLA, CDOT, and OIT) meet every other week as a group to share the projects they are working on and their priorities to better inform relevant stakeholders.

In 2017, Colorado <u>passed legislation</u> granting broadband providers permanent right-of-way over, under, upon, and across all state-owned public lands on "payment of just compensation."

Illinois:

CA Dig Once Summary: Illinois DOT and ISPs collaborates to install fiber in new state-funded construction 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.

- Relevant statute: 605 ILCS 5/9-131
- DOT is required to install conduit in road excavation projects
 - Three 1.5" diameter conduits: two reserved for the DOT and the third is excess
- Public bidding notices must describe the need for fiber-optic conduit or cable
- Either department may permit a third party to manage the fiber and conduit leasing

Indiana:

The INDOT Broadband Corridors program was implemented in 2018 and is designed to facilitate, implement, and maintain new avenues for rapid deployment of broadband throughout Indiana by focusing on removing any barriers that may prevent providers from deploying broadband or wireless facilities within the right of way. Information on permit types, access agreements, and corridor access rates are available here: https://www.in.gov/indot/doing-business-with-indot/permits/broadband-access-permit-\$55/broadband-corridors/

Maryland:

In 2017, the Maryland Departments of Natural Resources (DNR) and the Environment (MDE) launched a cooperative effort to examine and streamline this process among state agencies. For internet service project developers, telecom utility companies and other entities ('telecommunication vendors") for planning, designing, permitting and securing resource access to enhance the deployment of high speed internet to underserved rural communities. Specific advances in support of this objective include:

- A sequential approach, complete with defined timeframes, for engaging agencies to ensure that necessary authorizations and permits can be easily expedited.
- Design and routing recommendations to minimize environmental impacts, reducing the need for extensive permit review.
- Planning tools, guidance and points of contact to identify needs for early coordination with specific agencies thus avoiding costly delays later in project planning.

- New interagency "Tiger Teams", led by the Maryland Department of the Environment (MDE), composed of agency experts who will make on-site decisions with a goal of issuing environmental permits in a matter of days and weeks, not months.
- Opportunities to group multiple impact locations in a single application and/or authorization minimizing the number of permits that need to be processed.

Maryland DNR Permitting User's Guide: https://dnr.maryland.gov/Documents/Navigating-Broadband-Permitting-Process.pdf

CA Dig Once Summary: Maryland DOT coordinates with internet providers and local utilities to install conduit for future use and provides ROW access without charge to certain entities, such as the Maryland Broadband Cooperative. Through resource sharing, the state has been able to achieve interoperability and reduce capital costs for communications infrastructure.

- Reduce capital costs for communications infrastructure
- The private entity installs and maintains the conduit.
- Agreements with Private ISP's
 - o Majority of private ISP's install and maintain the conduit
- Sharing highway ROW's for monetary or in-kind compensation may include communications or IT equipment provided to Maryland State Highway Administration (MSHA) or exclusive allocation of fiber optic cables to MSHA
- ROW available without charge (until 2020)
- ROW valuing:
 - The fair market value or rent of ROW was not easy to quantify; generally fiber exchanged for use of fiber has worked best for the state
- Recommendations provided by the State
 - Encourage the use of trenchless technologies (e.g. Maryland uses horizontal directional drilling methods for most construction projects).
 - Install conduit for future use
 - If the conduit is installed and owned by a private entity, leasing rates remain competitive - may request the private entity install additional conduit to be owned by the city/state, so that the public entity may rent out the conduit at competitive rates
 - o Identify environmentally-sensitive areas early

Minnesota:

In 2016, the Minnesota Legislature passed <u>SF 877</u> to improve right-of-way proceedings for railroad crossings, adding a new section to state law, creating a process and limits for involved parties. The legislation also codified case law precedent establishing that railroads could not charge utilities for lines in public rights-of way. The other states passing standardized fee and process railroad right-of-way crossing legislation or administrative rules include this same provision.

Other provisions in the bill:

- Established a \$1,250 standard fee per facility to the railroad operator. One conduit and its
 contents are considered "one facility." That fee increases each year, based on the <u>Producer</u>
 Price Index.
- If a utility submits an application and engineering design, a certificate of insurance, and the required fee, they can commence construction in 35 days unless the rail operator objects. Objections must be based on a "serious threat to safe operations" and notice of the objection must be served in writing to the utility.
- A utility may file their own objection if a railroad imposes a condition or requirement that's not allowed in statute. Either party can petition the Minnesota Public Utilities Commission (PUC) for mediation or arbitration and the PUC has 120 days to issue an order.
- Railroad operators may require utilities to pay additional costs, such as flagging expenses
 associated with traffic at the crossing. They may also require a utility to relocate if the crossing is
 "essential" to railroad operations and the utility's presence will interrupt that activity.

CA Dig Once Summary: The state promotes broadband conduit coordination between the DOT and private entities, connects broadband infrastructure to ITSs and co-locates fiber/conduit in the same trench with other utilities. Their policy includes a competitive process which allows providers to install infrastructure when the ROW is open for utility work.

- Relevant Statutes: 116J.39 116J.40
- Coordination of Broadband Infrastructure Development (2013)
 - "The office shall, in collaboration with the Department of Transportation and private entities, encourage and coordinate "dig once" efforts for the planning, relocation, installation, or improvement of broadband conduit within the right-of-way in conjunction with any current or planned construction, including, but not limited to, trunk highways and bridges."
 - Encourage and assist local units of government to adopt and implement similar policies.
 - One trench may include conduit/fiber for city, county, state, school levels and additional unused strands for future use.
 - o Connects fiber infrastructure to city/county ITS
 - Dakota County installs fiber for State's network backbone
 - State provides maintenance and operations

Nevada:

Nevada DOT's telecommunications permitting resources: https://www.dot.nv.gov/doing-business/right-of-way/permits/telecommunications-permit-installations

CA Dig Once Summary: Nevada promotes the policy through local model guidelines and recently passed legislation which allows the DOT to enter into agreements with telecoms and establishes procedures for the valuation of in-kind compensation paid by telecoms to the department for the ROW access they receive.

Relevant statute, SB53 (2016)

- Authorizes the DOT to grant longitudinal access to right-of-way for telecommunication companies
- Telecommunication companies required to fairly compensate DOT
 - In-kind compensation for right-of-way access
 - o DOT agreements for telecommunication companies to use excess conduit

New Mexico:

The New Mexico Department of Transportation (NMDOT) issues permits for utility installation, including fiber-optic cable and other broadband-related infrastructure, in state-owned highway right-of-way. NMDOT is exploring the use of resource sharing agreements under which the state grants the use of its right-of-way to run data transmission lines in exchange for connecting to and using this infrastructure for free or at reduced cost. NMDOT may be able to use such agreements to facilitate access to data services for electronic message signs, traffic cameras, and other operations facilities. New Mexico Legislative Finance Committee Program Evaluation Report (November 2019).

Utah:

Utah has utilized a dig once approach since 2000, under code 72-7-108. Utah Department of Transportation's Fiber Optics Manager, Lynne Yocom, describes the states approach as a "dig once best practices" rather than a policy.

CA Dig Once Summary: UDOT has facilitated cooperative fiber and conduit trades with broadband service providers to expand its communications network across the state without major capital investment. UDOT'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. Through frequent meetings with telecoms, creating open ROW's, extensive information sharing and trading assets with telecoms, the state has doubled their network, which now includes 900 miles of conduit owned by the DOT and about 1,000 miles obtained through trades. These public-private partnerships have saved the state and taxpayers millions of dollars. Regional Broadband Planning councils were created to develop strategic plans to address local needs and provided recommendations.

DOT guidelines/policies:

- Install empty conduit along major routes
- Cooperative planning with telecoms
- Telecoms have access to highway ROW for build-outs
- DOT can enter into fiber trades with telecoms
 - Telecommunications Advisory Council reviews and approves trades and valuations, and discusses issues relating to deployment barriers
- Extensive mapping of fiber locations
- Receives annual "wish list" from telecoms
- Meets with the telecoms every 2 months about broadband projects. The state has a single point of contact for all telecoms in the state.
- ROW is open at all times, allowing for easy access to complete continuous build-outs, and
 ensuring that no single company has exclusive access and used to reduce permit processing
 times

- Policy on Monetary Damages
 - o If a construction company hits a fiber optic line, monetary damages imposed by the telecom should be reasonable.
- Information sharing with telecoms
 - Fiber and conduit locations, plans for economic development, contact information and web links are also available online to provide the telecom with information about the area they are servicing
 - Project Database:
 http://maps.udot.utah.gov/uplan_data/documents/apps/UDOTProjectsApp/
- How they trade:
 - O Utah DOT installs conduit for its own network—sometimes coordinating conduit installation with road construction—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 not have broadband infrastructure. UDOT 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 telecoms. Resulted in large cost savings since they were able to extensively expand their infrastructure without major investment.

Utah DOT, in <u>comparing two rural broadband deployment projects</u>, estimated cost savings of roughly 15.5 percent per mile when conduit and fiber were installed during a road project rather than being installed independent of a road project.

AASHTO Summary and Interview on Utah's program: "FHWA proposes Right-Of-Way Rule for Broadband Installation" (August 2020)

While states <u>do not support</u> a strict federal preemption on how states manage broadband deployment on their own properties, Carlos Braceras – executive director of the Utah Department of Transportation and the 2018-2019 president of the American Association of State Highway and Transportation Officials – noted in <u>Congressional testimony</u> in 2019 that speeding up the federal permitting process for high-speed broadband deployment, especially in rural areas, would in turn facilitate "the merger of technology between motor vehicles and infrastructure," leading to greater mobility and increased safety on the nation's roads.

"An important component to advance roadway technology is the ability to create a digital highway with fiber optics to make our roads smarter and safer, benefiting surrounding communities, including underserved rural areas," he stressed. "The Utah DOT deploys conduit and fiber with every road project that makes sense and coordinates road projects with any telecommunication company that wants to partner," Braceras added. "[But] the ability to be flexible is what makes these partnerships possible. Rigid regulations or mandates can remove the very flexibility that is needed, complicating implementation and adding unnecessary additional system costs."

West Virginia:

As proscribed by the legislature in 2018, the West Virginia Division of Highways <u>developed guidelines</u> to accommodate telecommunications facilities within the division's right-of-way, coordinating the

installation of broadband conduits to minimize costs to the carriers and to minimize disruption and inconvenience to the traveling public. The developed guidelines include a permitting checklist for applicants. In May 2021, the West Virginia legislature <u>enacted several changes</u> to the state's dig once and right-of-way policies with the creation of a new statewide broadband office, including:

- establishing requirements for agreements between the Division of Highways and an entity seeking to install telecommunications facilities;
- providing that if such installation can be accommodated as a utility pursuant to federal and state law, the division shall issue a permit for access to rights-of-way;
- requiring notice to the Office of Broadband of a telecommunication entity's intent to seek construction in division rights-of-way;
- providing the Office of Broadband is responsible for ensuring compliance with certain terms of permit requirements;
- granting the division authority to determine whether its use of a telecommunication carrier's trench warrants apportionment of costs to it;
- modifying exceptions to dig once requirements;
- providing the division authority to allow carriers to use excess telecommunications facilities;
- allowing the division to transfer or assign ownership of excess telecommunications facilities to another state agency upon approval by Governor;
- establishing requirements for counites, municipalities, and political subdivisions regarding installation of conduit;
- authorizing a broadband operator to construct or operate a system over public rights-of-way
 and through easements which are within the area to be served and which have been dedicated
 for compatible uses;

Wisconsin:

Wisconsin <u>legislation allows</u> state departments, agencies, and commissions with control of state lands to grant easements for broadband infrastructure, and if an easement is granted in an underserved area, no fee may be charged.

The University of Missouri System Broadband Initiative: Digitally Connecting Missouri's Communities

An Historic Opportunity for Transformational Change

"Investing in our broadband infrastructure is critical to unlocking our full economic potential in this state and will serve Missourians for generations to come," Governor Parson said. "We expect this investment to increase broadband internet connectivity and access in every corner of the state for hundreds of thousands of Missourians. Quality internet supports learning, health care, business, and agriculture in today's economy, and we are excited to capitalize on this opportunity to truly make a difference and improve lives." 1

Governor Parson's proposal to allocate \$400 million of the American Rescue Plan Act funds for broadband access truly represents a transformational opportunity to capitalize on the promise of affordable, reliable high-speed internet. The announcement comes amid other existing and promised federal funding to expand access and adoption of high-speed internet throughout the United States. ² With so much funding either already committed or expected, it is tempting to assume that the promised improvements to learning, health care, business, and agriculture are destined to become a reality as projects are completed.

Lessons Learned from Past Efforts

Yet, history teaches that one should not assume broadband infrastructure will be delivered as promised even if large public subsidies are provided,³ or that fundamental improvements to health, education and economic opportunity will automatically follow just because high-speed internet service is available in a community.⁴

In many ways the desire to expand access to high-speed internet in the 21st century parallels the challenges and opportunities presented when America expanded electrical service in unserved rural areas nearly a century ago.⁵ While today we take the existence of electrical power in every community for granted, it was the exception in most rural communities up until the 1940s. The electrification of rural America was not without controversy and setbacks, and it succeeded in no small part due to the work of faculty at land grant universities throughout the United States.⁶

While it can be misleading to extrapolate too much from past experience, it is difficult to ignore two "lessons learned" from the electrification effort.

- First, the dream of electrical power for all became a *reality* only when the massive public investment by the federal government was harnessed with the commitment of hundreds of local communities that organized to use and deploy those resources wisely and effectively.
- Second, the efforts of land-grant universities, local community volunteers and staff from the Rural Electric Authority (REA) were critical to creating community support for electrification. Industries, research and other organizations, and myriad individuals worked tirelessly to develop the new machines and appliances powered by electricity that would change lives, and they demonstrated how those inventions could be used effectively in the local communities throughout the United States.

These collective efforts created the public support for change and, when combined with financial support from the federal government, resulted in the successful deployment of electrical infrastructure

and the adoption of electrical machinery and appliances that ultimately transformed communities across the nation.

The two lessons learned from efforts to "electrify" communities are equally relevant today when applied to 21st century initiatives to bring the benefits of digital internet-based applications to all Missourians. Just as electrical infrastructure alone did not bring prosperity to farms and cities in the 20th century, the availability of high-speed internet infrastructure *alone* will not herald the new era of prosperity and improvements to health, education, and economic opportunities today. The evidence is clear: <u>adoption</u> of internet-based applications by individuals and businesses, as well as access to the internet, is the key to fully realizing the economic and societal benefits of the internet.⁷

Facilitating Broadband Access and Adoption are Core to the UM System's Mission

Today, across the United States, land-grant universities and their Extension services are playing a critical role in supporting state and local government efforts to both expand access to high-speed internet and create an environment to encourage individuals and businesses to *adopt* high-speed internet⁸.

In Missouri, the mission of the land-grant institution extends from the four campuses of the University of Missouri System to MU Extension offices located in every county of the state. Most recently, community outreach has been part of the five "Missouri Compacts for Achieving Excellence" and a critical part of the mission of the UM System's Office of Engagement and Outreach (the Office of Engagement). The Office of Engagement is focused on addressing Missouri's biggest challenges at the state and local level by building and strengthening connections between the UM System and the communities it serves. Partnering with and serving Missouri residents, not just educating students at the UM System's campuses, is part of the modern land-grant institution mission. Economic opportunity, health, educational access and excellence are the "grand challenges" serving as focal points for engagement efforts, and for many years access to high-speed internet and adoption of internet-based technologies has been a critical aspect of the work.

UM System faculty and staff from all four campuses and the teams at MU Extension have and continue to play critical roles in achieving the vision of internet access for all. They are working to build the skills and resources necessary to foster adoption of cutting-edge internet-based technologies. But these efforts need to be scaled up significantly over the coming months and years to truly leverage and effectively spend the unprecedented financial resources that have become available.

The UM System's Broadband Resources

MOREnet / Missouri Telehealth Network

Any discussion of the UM System's role in increasing access to high-speed internet and adoption of internet-based applications must begin with the Missouri Research and Education Network (MOREnet). In the early 1990s, MOREnet literally brought the Internet to Missouri in the form of connecting thirteen higher education institutions to the National Science Foundation Network (NSFNET). This connection was transitioned to the commercial internet in 1993. Over the last thirty years, MOREnet has inspired economic development throughout Missouri by helping to bring broadband to its community anchor institutions in support of education and research, and thus encouraging providers to connect to the local community. Today, MOREnet operates a robust and secure statewide fiber network spanning more than 3,600 route miles and connecting more than 600 public sector organizations. As an independent operating unit of the University of Missouri, MOREnet is both a data network and a human network, serving as a trusted partner and functioning as a neutral interface between its public sector member organizations

and commercial providers, and is a customer of nearly every major Internet Service Provider (ISP) in the state. It provides internet connectivity, access to Internet2, ¹⁵ technical services, resources, and support, as well as technical training to Missouri's public sector entities, including K-12 schools, colleges and universities, public libraries, health care, government, and other affiliated organizations. ¹⁶ MOREnet is an important member of the UM System Broadband Initiative Team. ¹⁷

Most recently, MOREnet's experience, statewide-reach, and reputation made it a critical resource in disseminating software and training educators to work online when school closed due to the COVID-19 pandemic last year. Along with another long-standing UM System resource, the Missouri Telehealth Network, MOREnet enabled much-needed technology access for Missouri's small health care clinics during the early months of the pandemic. Given the continued need for remote services, MOREnet created a Zoom Health Care Membership Service Package to help make certain smaller health care providers would be able to continue patient care access over an affordable encrypted videoconferencing platform. Missouri Telehealth Network was tasked with administering distribution of internet hotspots to the states federally qualified health centers and community mental health centers for use by patients in telehealth encounters.

The UM System Broadband Initiative: Creating "Digitally Connected" Communities

In October 2019, the UM System's Chief Engagement Officer and Vice Chancellor, Marshall Stewart, announced a system-wide "Broadband Initiative" to align and focus efforts on high-speed internet access and adoption in Missouri. Since that announcement, the Broadband Initiative team has steadily expanded to include System faculty, MU Extension, representatives from other System resources and external advisors, including the State's Director of Broadband Development. Reflecting this spirit of collaboration, the Department of Economic Development provided critical logistical resources for training MU Extension specialists working as facilitators for the Digitally Connected Community Guide Program (described below), and the UM System has been able to offer technical assistance to the State's Broadband Office on various matters during the past year.

We believe that several projects described below will be critical as the state focuses on how to accomplish its objectives for universal internet connectivity and expanded internet adoption over the next several years.

The Missouri Broadband Resource Rail (www.mobroadband.org)

The Missouri Broadband Resource Rail (the Resource Rail) is a publicly available website created during the first half of 2020 by a team of university faculty and experts from the University of Missouri Extension Center for Applied Research and Engagement Systems (CARES)²⁵ and SourceLink²⁶ (a UMKC-based, UM System resource that has focused on entrepreneurial development).

The objective of the Resource Rail is to provide a comprehensive source of information and resources relevant to all aspects of internet access and adoption either directly or by identifying other external resources in ways that promote collaborations and collective impact by broadband proponents. The website includes a Resource Navigator²⁷ to locate government, private and nonprofit resources and experts; a Funding Resource Tool²⁸ to quickly locate potential sources of grants and subsidized loans to pay for improved internet access and internet adoption programs; Mapping Resources²⁹ to help communities better identify and visualize internet connectivity resources and available funding; and a Calendar of Events³⁰ to promote public access and digital literacy programs. The Resource Rail also contains a robust library of articles, reference material,³¹ and blogs³² that address topics related to broadband funding, legal issues, technologies, adoption, and community planning.

Most recently, the Resource Rail is being used to showcase the Broadband Initiative's community planning program, The Digitally Connected Community Guide³³, and provides access to some of the tools and resources used in that program.³⁴

The Online Workshop & Digitally Connected Community Guide

The creation of the Digitally Connected Community Guide in the first half of 2021 illustrates how engagement with government, private, and nonprofit entitities outside the campus setting can lead to new tools and applications to foster internet access and adoption. This program responds to needs surfaced in the June 2020 online workshop that was organized by the Broadband Initiative team and sponsored by the Office of Engagement. The workshop assembled over 100 participants from the telecommunications industry, government, university faculty and NGOs to discuss and identify critical steps in developing an actionable community plan to bring high-speed internet to a Missouri community – Bollinger County. Information gleaned from the workshop illustrated the need for a resource to enable Missouri communities to develop a thoughtful and systematically written plan for internet expansion.

The Digitally Connected Community Guide³⁶ responds to this need. The Guide uses MU Extension, supported by other Broadband Initiative resources, to facilitate the work of community-based volunteer teams. These volunteer teams will work over the course of the program to develop a comprehensive written plan to design, finance and operate an affordable, reliable internet network in the community. The Guide is aligned with the steps suggested in workshop and other studies³⁷: (1) develop a community vision; (2) engage with all community stakeholders; (3) evaluate and select appropriate infrastructure technologies based on the community's needs and resources, (4) develop a public-private partnership solution appropriate for the community's needs, and finally, (5) foster adoption and use internet-based applications to bring transformational change.

The Digitally Connected Community Guide³⁸ contains nine narrated power point presentations; online household and business community survey materials; templates for conducting community forums; tools to evaluate physical and human resources that are useful for internet accessibility and adoption; decision making tools to evaluate possible ownership and operating structures; and a template document that can be used to organize the community volunteer team's findings into a comprehensive written proposal for community decision-makers to evaluate. The Guide is being "beta tested" in six Missouri communities in the fall of 2021.³⁹

Economic Benefit Analysis – Exceed

The Regional Economic and Entrepreneurial Development Program⁴⁰ (Exceed) is an MU Extension asset and an important member of the Broadband Initiative team. Exceed's mission is to enhance economic development opportunities by providing high-quality research and insights. In 2021, as part of the Broadband Initiative, Exceed was commissioned by the Office of Engagement to prepare a comprehensive economic benefit analysis⁴¹ showing the likely impact of increased adoption and use of the internet in three Missouri counties that have varying levels of current internet access. In each case the study showed substantial gains in GNP directly attributable to higher rates of adoption of internet-based applications. This work serves as a model for other communities and its decision makers as they work with the Digitally Connected Community Guide or otherwise consider plans to provide public support for broadband access and adoption programs.

Research Outreach & Technology Transfer (Examples)

The Broadband Initiative and the creation of the Resource Rail along with the related projects described above have fostered greater collaborative engagement among MU Extension and other

resources throughout the UM System as well as with external partners. Examples of some of the projects resulting from this collaboration are discussed below:

Community Health Workers "Digital Equity" Project 42

This project will develop curriculum and programs to help front line community health workers learn how to better incorporate internet-based applications into their work as frontline health care providers. The work is a collaborative effort of KC Digital Drive, ⁴³ faculty involved in UMKC's Health Equity Institute, MU Extension faculty and staff, and is funded by a grant from the Health Forward Foundation to KC Digital Drive. In addition to UM System faculty, UMKC students have been engaged as research assistants on this project.

Project OVERCOME -Ignite (Clinton County, MO)44

Project OVERCOME installed and is currently testing a wireless internet system in Clinton County, Missouri. The project will bring broadband service to the Turney, Missouri community and will test router technologies that are designed to provide more robust service to households in the community. The project is a collaborative effort involving many partners including Missouri S&T faculty, other UM System faculty, MU Extension, United Fiber and Wireless Technology Labs, and Local Economic Development groups such as the Clinton County Initiative and Maximize NWMO. The project is funded by a grant from the National Science Foundation.

Interdisciplinary Course Based Research and Community Engagement

Faculty on the Broadband Initiative team have incorporated internet access and adoption projects as part of several interdisciplinary course-based projects, providing students valuable practical learning experiences and an opportunity to meaningfully contribute to broadband access and adoption.⁴⁵

Scaling Up to Support Implementation of the State's Vision

While the University System's work on internet access and adoption is not new, it is important to recognize that many of the productive resources and collaborations described above were developed in just the past two years. Since the Broadband Initiative was announced, it has successfully demonstrated the System's ability to build agile and efficient teams. The Broadband Initiative builds upon research-based ideas for community and regional planning – taking into account what works best for each community, today and in the future. The Initiative provides timely, relevant information to decision makers, and enlists trusted community-based Extension resources to help individuals and businesses effectively and efficiently use internet-based applications. 46

However, to grow capacity and increase the reach and impact of the Broadband Initiative across the state, additional financial resources are needed. The financial resources currently allotted to this Initiative from the UM System do not support the ubiquitous expansion of internet infrastructure and adoption of internet-based applications. In an environment where public funding at the state and local level likely will increase one hundred times or more from that provided just a few years ago, significant funding of the UM System Broadband Initiative from such recent and forthcoming sources would be a much needed and wise investment.

To scale up the University System's contribution we recommend the following priorities for this next phase of enhanced public funding:

Priority One: Maintain and enhance the Missouri Broadband Resource Rail (www.mobroadband.org).

The website needs fulltime staff to assist the State and support the increased needs for timely and relevant information for communities and businesses seeking to expand access to the internet and adoption of internet-based applications. In addition to website software and hosting support currently provided by CARES and SourceLink, funding should be provided for a website administrator, a resource navigator coordinator, a content editor, and student interns to help support content growth and curation.

Priority Two: Enhanced Resources for Community Planning and Digital Literacy.

Longstanding programs for educator training created by MOREnet and MU Extension's collaborative engagement to help in training front line community health workers serve as models, but to fully realize on the billions of dollars now directed to internet infrastructure deployment, MU Extension, MOREnet, and Exceed need additional funding to support community and regionally-based planning using the Digitally Connected Community Guide; and to create additional community programs specifically designed to promote adoption of internet based-applications; for training in digital literacy and internet security; for adoption and deployment of precision agriculture, and to encourage online entrepreneurship. ⁴⁷

Priority Three: Increase Funding to Support Access to Federal Resources.

The sheer number of active federal grant and loan funding programs, not to mention those expected under the infrastructure bill creates unprecedented opportunities for local communities to fund new projects and programs and for ISPs to increase service to economically distressed communities. Unfortunately, many local governments, individuals, and communities lack the resources and time to utilize these programs. MOREnet's E-Rate Program support and training discussed earlier, provides a model that could be used to meet this challenge through the development of resources and tools to assist with the process of applying for and administering these new programs.⁴⁸

Priority Four: Increase Funding for Research and Test Bed Demonstrator Projects.

As illustrated by Project OVERCOME discussed earlier, UM System faculty have made important contributions to testing new ideas for the deployment of internet infrastructure. In addition to continuing these efforts, additional funds are needed to focus on demonstrating and developing the promise of precision agriculture and telemedicine in real-world community settings. UM System faculty and MU Extension also are uniquely positioned to develop programs designed to enable local business and entrepreneurs to capitalize on newly created high-speed internet based assets both in rural and urban communities through competitive learning initiatives. ⁴⁹ In addition, designated funding is needed to support efforts to identify and evaluate legal and economic structures used to develop and operate internet infrastructure in other communities and to develop best practices for using internet based applications.

These Four Priorities focus on predevelopment community planning and assessment for broadband infrastructure projects, digital literacy, facilitating community adoption, and the promotion of internet access, all of which are appropriate uses of the ARPA funds based on U.S Treasury guidance. ⁵⁰

The next several years provides Missouri a truly extraordinary opportunity to make transformational improvements and usher in an era where better healthcare, education and job training, transportation, and government services, are delivered more effectively and efficiently using applications that rely on affordable and reliable high-speed internet. But to realize on that promise, the State must work with local and national partners to plan and construct broadband infrastructure resources that can grow and adapt to meet future needs, and it must work to make sure the public is equipped to use these resources. The

Four Priorities described above will help the State accomplish these objectives, but they will require an expansion of Broadband Initiative team's resources that is commensurate with increased funding for broadband infrastructure deployment.

Nearly 100 years ago land-grant universities helped meet each of those challenges and brought us an economy driven by electrical energy. Today, The UM System stands ready to again meet a new challenge and to work in partnership to fully realize the promise of affordable reliable high-speed internet.

End Notes

1Press Release https://governor.mo.gov/press-releases/archive/governor-parson-announces-400-million-plan-improve-broadband-infrastructure

2 For example, currently the FCC is funding \$255 million of Missouri broadband expansion projects over a 10-year period pursuant to CAFII Program and an additional \$346 million was designated in the RDOF auction for Missouri internet service providers. Again, these funds should be distributed over a 10-year period once the preliminary awards are approved later this year. In January 2020 Missouri internet providers were awarded \$61 million in grants and low-interest loans to expand broadband service under the USDA Reconnect Program, followed by an additional 91.5 million in October 2020 under the same program. In addition, the ARPA has provided Missouri counties, cities and towns over \$2.5 billion of funds that can be used for broadband infrastructure improvements and of course, the Infrastructure Investment and Jobs Act passed by the Senate a few months ago contains \$65 billion for broadband.

3 Past attempts have failed to fully achieve desired outcomes for a number of reasons including <u>poor allocation of resources</u> and <u>inadequate oversight</u>. In some cases, the planned structure of the grant program was flawed. For example, the FCC CAFII awards were initially announced in 2018 – yet final approval and funding did not begin in some cases until early 2020, and infrastructure can be built out over 6 years and the total amount awarded will not be distributed until 2030! By that point, many of the systems paid for will be obsolete, <u>inadequate to serve community needs</u>.

4 Lack of programs to encourage internet "adoption" has been noted in multiple articles as a significant and <u>overlooked</u> prerequisite to achieving the promise of internet-based applications. Historically, the failure to demonstrate the <u>need</u> and to <u>properly price internet</u> service has created a significant drag on the demand for fixed, stable high speed internet service. Of course, logically the two issues are interrelated, as the amount one is willing to pay for any product depends in part on its perceived value to the user.

5 See Wallace, Harold "Power from the people: Rural Electrification brought more than lights" National Museum of American History (February 12, 2016) https://americanhistory.si.edu/blog/rural-electrification and Holland, Connie "Now you're cooking with electricity" National Museum of American History (August 24, 2017) https://americanhistory.si.edu/blog/cooking-electricity. These articles detail efforts required to "make the case" for electrical power to drive adoption levels sufficient to realize real economic and social progress.

6 See generally, Hirsh, Richard, Shedding a New Light on Rural Electrification Shedding a New Light on Rural Electrification, 92 Agricultural History Society 296-327 (2018) (attached as an **Appendix A**) for an account of the role played by land-grant university faculty and see O'Malley, Sharon, Private Utility Propaganda and the Creation of the REA, Wisconsin REA News, National Rural Electric Cooperative Association, Washington D.C. (1991) http://sea.coop/wp-content/uploads/2015/03/privateutilitypropaganda.pdf for a perspective of sove of the controversy that surrounded the electrification effort.

7 Exceed, MU Extension "Economic Benefits of Expanding Broadband in Select Missouri Counties," (June 2021) https://mobroadband.org/wp-content/uploads/sites/44/2021/06/Exceed BroadbandImpactReport Jun2021.pdf Gallardo, Roberto et.al, Broadband's Impact, A Brief Literature Review, Research & Policy Insights, Purdue University (2018), https://pcrd.purdue.edu/wp-content/uploads/2018/12/Broadbands-Impact-Final.pdf; Fields, Jessica "We are leaving older adults out of the digital world, TechCrunch (May 5, 2019), https://mobroadband.org/wp-content/uploads/sites/44/2020/07/We-are-leaving-older-adults-out-of-the-digital-world-TechCrunch-1.pdf While

certainly there are instances where the availability of high-speed internet was accompanied by sufficient "adoption" as well, it does not follow that this will be true in every case and in fact is there is good reason to believe – at least before the COVID pandemic, that many did not see the need for internet service beyond the limited capabilities of texting, email and basic internet searches. See, for example, the findings of a 2019 study published by the Pew Research Center on attitudes toward home high-speed internet connections.

https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/

8 For example, Maryland has provided its <u>Extension Service \$4 million</u> in this fiscal year to fund a new division focused on supporting, training developing curriculum and disseminating awareness and educational opportunities to bridge the digital divide and support statewide internet adoption. Similar efforts involving Extension services have been underway in <u>North Carolina</u> and <u>Indiana</u>.

9 The UM System includes the four university campuses (UMSL, S&T, UMKC and MU); MU Extension; and many other constituent assets, programs, and entities, several of which are referenced in this paper. Collectively these will be referred to as the "UM System" throughout the remainder of this paper.

10 https://www.umsystem.edu/strategicplan/compacts. The Missouri Compacts are unifying principles that guide strategic planning for each of the four university campuses (UMSL, MU, Missouri S&T, and UMKC), MU Extension and all its constituent entities. The Compacts include Student Success, Research and Creative Works; Inclusive Excellence; Planning, Operations and Stewardship; and Engagement and Outreach.

11 Sternberg, Robert, The Modern Land-Grant University, Purdue University (2014)

12 A five-year funding period, from 2019-2023, supports the Engagement Compact. During this time, the System Office of Engagement was established to support and serve MU, UMKC, S&T and UMSL in amplifying and, when appropriate, aligning community engagement at and between these institutions through university-designated engagement leaders. MU Extension is a key partner in furthering the reach of UM System universities in and with communities. In fulfillment of the University of Missouri's land-grant mission, MU Extension brings the practical knowledge, resources and research of the university and the UM System to the people of Missouri through faculty and programming in all 114 counties and the City of St. Louis. MU Extension faculty and staff across the state have embraced the opportunity to leverage UM System assets to meet community needs. Increasingly, Office of Engagement leaders and faculty have reached out to MU Extension to make community connections. Every day more contacts are made due to the engagement structure in place to facilitate these connections. This mutually beneficial relationship enables communities' full access to the UM System's on-campus assets and further informs faculty and staff research and outreach efforts about the needs of Missourians. It's working well and is poised to grow.

13 The National Science Foundation Network (NSFNET) was a program sponsored by the National Science Foundation (NSF) to promote advanced research and education networking in the United States. The program created several nationwide backbone internet networks to support of these initiatives. A grant from the National Science Foundation (NSF) enabled several research and education networks like MOREnet to connect to the NSFNET internet "backbone."

14 https://www.more.net/the-morenet-network.

15 Internet2 (https://internet2.edu/) supports research and education for higher education, research institutions, government, and cultural organizations.

16 See https://www.more.net/morenet-history. MOREnet currently provides internet connectivity and/or essential technical services to more than 700 member elementary and secondary University of $Missouri\ System$

school, higher education institutions and libraries across Missouri. It also provides these public institutional members with a variety of other services such as help with network design, cybersecurity. MOREnet houses the State E-rate Coordinator for Missouri who provides training, support and assistance in filing for E-rate (an FCC program that reduces the cost of internet service and network equipment in schools and libraries) and files for E-rate on behalf of its connected school and library members. MOREnet also partners with the Missouri State Library (administered by the Missouri Secretary of State) to offer online resources and programming on topics as varied as internet security and teen health and wellness, to conducting online job searches and resume building. https://search.more.net/all-resources/

17 Senior MOREnet staff participated in training MU Extension specialists for The Digitally Connected Community Program discussed below. MOREnet's Executive Director Natasha Angell serves on the Broadband Initiative Steering Committee.

18 For example, last year MOREnet distributed over 20,000 Zoom licenses and trained over 5,000 Missouri teachers to support conversion to online training. See, e.g., https://www.more.net/news/2004092 and https://www.more.net/news/200408

19 https://medicine.missouri.edu/offices-programs/missouri-telehealth-network

20 https://www.more.net/morenet-history

21 https://www.missourinet.com/2020/07/02/missouri-announces-50-million-program-for-broadband-expansion-including-telehealth/

22 https://showme.missouri.edu/2019/university-of-missouri-leads-call-for-broadband/

23 <u>Dr. Alison Copeland</u>, Deputy Chief Engagement Officer provides direct support from the Office of Engagement to the Broadband Initiative. Members of the Broadband Initiative team represent a wide range of academic disciplines and many have extensive experience in business operations and community organization as well as classroom teaching. The group includes, <u>Assistant Professor Casey Canfield</u> (S&T), <u>Assistant Professor Lav Gupta</u> (UMSL), (engineering management and computer science); Professor <u>Tony Luppino</u> (UMKC), <u>Assistant Professor Bryan Boots</u> (UMKC), Adjunct Professor <u>Marc McCarty</u> (UMSystem); (law, business, entrepreneurship and economic development); <u>Assistant Professor Kent Shannon</u> (MU) (agricultural engineering/precision agriculture); <u>Assistant Professor Alan Spell</u> (economic analysis - <u>Exceed</u>), <u>Natasha Angell</u> (Executive Director <u>MOREnet</u>); <u>Timothy Arbeiter</u>, Missouri Director of Broadband Development; <u>Joe Lear</u> (Regional Director MU Extension and leader of the Digitally Connected Communities Program); <u>Jamie Klensorge</u> (rural sociologist and <u>CARES</u> Project Coordinator), <u>Samuel Tennant</u> (CARES Project Support Coordinator for the <u>Missouri Broadband Resource Rail</u>); <u>Robert J. Williams</u> (Network Builder and Director <u>SourceLink</u>); and Leslie A. Scott (Consultant, UMKC)(digital equity and inclusion);

24 As part of the Broadband Initiative team CARES has been able to work with the Missouri Department of Economic Development, Broadband Office to create public facing maps of RDOF funding areas in Missouri, facilitate creation of a public map-based internet speed test and provide valuable mapping data of participation in the federally funded Emergency Broadband Benefit program. CARES extensive database and All Things Missouri application have been adopted as part of the Resource Rail to help individual Missouri communities quickly visualize needs and available resources.

25 https://extension.missouri.edu/programs/cares

26 https://www.joinsourcelink.com/. MoSourceLink, https://www.mosourcelink.com/, is a collaborative effort of the UM System and the Missouri Technology Corporation. It provides critical resources to entrepreneurs looking to build connections and identify resources throughout Missouri.

- 27 https://mobroadband.org/resource-navigator-3/
- 28 https://mobroadband.org/funding-opportunities/
- 29 https://mobroadband.org/map-gallery-2/
- 30 https://mobroadband.org/calendar
- 31 https://mobroadband.org/library-glossary/
- 32 https://mobroadband.org/blog-2/
- 33 https://mobroadband.org/digitally-connected-community-guide/
- 34 For example an internet speed test and mapping tool -- https://mobroadband.org/speed-test-2/ and an internet infrastructure technology chart https://mobroadband.org/wp-content/uploads/sites/44/2021/06/Internet-Infrastructure-Technology-Chart-Memo-1-1.pdf
- 35 The findings and results were published in a comprehensive report at https://mobroadband.org/wp-content/uploads/sites/44/2020/07/WORKSHOP-REPORT-FINAL.pdf
- 36 https://mobroadband.org/digitally-connected-community-guide/
- https://mobroadband.org/wp-content/uploads/sites/44/2021/02/Public-Private-Collaboration-Imperative-to-Deliver-Modern-Connectivity.pdf (the need for public private partnerships) and https://mobroadband.org/wp-content/uploads/sites/44/2020/08/BBC_Jul20_BroadbandModels.pdf (alternative structures); https://mobroadband.org/wp-content/uploads/sites/44/2020/05/BroadbandUSA-Implementing-a-Broadband-Network-Vision-A-Toolkit-for-Local-and-Tribal-Governments.pdf (NTIA's Community Broadband Planning Guide); https://mobroadband.org/wp-content/uploads/sites/44/2020/07/The-Social-Impact-of-Broadband-Colwell-Schumann-Shakfa_FINAL3-1.pdf (Case study for broadband planning/and implementation).
- 38 A short description of the Guide is attached as Appendix B
- 39 The Guide Program is led by Missouri Extension Regional Director Joe Lear. Currently 17 Extension Specialists have completed approximately 20 hours of training in the use of the Digitally Connected Community Guide program. The program can be completed in as little as 15 weeks or longer depending on the needs of the community.
- 40 https://extension.missouri.edu/programs/exceed-community-economic-and-entrepreneurial-development
- 41https://mobroadband.org/wpcontent/uploads/sites/44/2021/06/Exceed BroadbandImpactReport Jun2021.pdf
- 42 See **Appendix C** for a summary project description. A similar Broadband Initiative-sponsored effort is underway involving a team of MU business students. The students, working with members of the Broadband Initiative team are conducting a needs assessment to determine interest among nonprofit organizations for the creation of a Digital Awareness and Literacy Corps ("DALC") consisting of university students and students in the 4-H Youth Development

Program. As envisioned, the DALC would work with MU Extension and community organizations to do "on-the-ground" education and demonstrations in communities and neighborhoods to increase awareness of the benefits of using high-speed internet applications and to connect individuals with programs that provide further skills training in digital literacy.

43 https://www.kcdigitaldrive.org/

44 https://www.maximizenwmo.org/broadband-project-overcome

45 For example, this spring the law and computer science students assisted in the creation of the internet technology chart for the Digitally Connected Community Guide and interviewed government and internet service providers that had used public private partnership initiatives to develop access to high-speed internet in multiple communities across the United States. This work is part of an ongoing effort to help develop best practices and ideas for the use of public-private partnerships to expand service in communities such as Bollinger County. The Office of Engagement also supported graduate research used to develop the funding opportunities tool for the Resource Rail and the Digitally Connected Community Guide.

46 Increased funding is particularly critical in light of the popularity of the site. Traffic on the site has increased by over 236% over last year and 58% in just the month of September. As more local government resources seek answers to how best to use internet-based resources, it is no longer feasible to limit the Resource Rail to part time administration and faculty contributors.

47 Effective planning for infrastructure development at the community level needs to be coordinated with efforts of <u>regional planning commissions</u> and the state agencies through the <u>Office of Broadband</u>, but MU Extension can be a trusted partner to facilitate community engagement, surveys and programs specifically targeted to increase adoption and utilization of high-speed internet-based technologies. Based on the NTIA's latest internet funding program, and the senate infrastructure legislation, it seems very likely that future funding will favor states that have adopted programs that focus on developing strategies to increase internet adoption in addition to building internet infrastructure.

48 Information, tools and support may can be disseminated though MU Extension specialists, the Resource Rail and where appropriate MOREnet.

49 For example, UMKC's Bloch School of Management is a sponsor of <u>competitions</u> to support new and impactful ideas for innovation and entrepreneurship. This program and <u>others</u> should be expanded to encourage new internet-based businesses and the adoption of internet based applications in existing business through the UM System's Entrepreneurship Educators Network.

50 See https://home.treasury.gov/system/files/136/SLFRPFAQ.pdf (Frequently Asked Questions and Answers 2.5; 6.6; and 6.12) See also https://mobroadband.org/using-of-american-recovery-plan-act-funds-for-broadband-infrastructure-guidance-for-local-governments/

BROADBAND AND DIGITAL ACCESS NEEDS KANSAS CITY METRO AREA

The Mid-America Regional Council (MARC) is the association of local governments and metropolitan planning organization serving the bi-state Kansas City metro area, including Cass, Clay, Jackson, Platte and Ray counties in Missouri. The five Missouri counties have 1,143,011 persons. The counties range from Jackson County with 696,216 persons to Ray County with 22,875 persons. The five-county area has 514,712 housing units, with 90.5 percent occupied. The proportion of units that are multi-unit range from 9.7 percent of all units in Ray County to 25.9 percent in Jackson County.

Importance to Regional Economy

The Kansas City region has a diverse economy with just over 1 million jobs. By industry, the region's economy has strengths in wholesale trade and logistics; professional, scientific and technical industry sectors; finance, insurance and real estate; health care and life sciences; and manufacturing. The region rebounded from the 2007 recession but lost 12 percent of its jobs in the early months of the COVID-19 pandemic. The entertainment and leisure firms suffered the most with many being small businesses and are not expected to recover until 2025.

Broadband availability is critical to the Kansas City economy, with many firms doing business across the nation and the globe. In March 2020, many employers sent their workers home, with many struggling to use their limited technology and broadband services to meet their work obligations. The region's recovery and the future of work is likely to see more remote work patterns. Certain urban neighborhoods, suburban and rural portions of the Kansas City region lack adequate high speed broadband services to enable workers to connect and complete work remotely and for businesses to operate without interruption. State investments to ensure that all parts of the Kansas City metro area have high speed internet service is critical to the region's economic recovery and continued growth.

Importance to Inclusive Economic Prosperity

The region's residents with limited incomes face the greatest challenges to benefit from education through online services and to work from home. High speed broadband services are unaffordable for many households. Many lower income neighborhoods have limited high speed broadband coverage. In particular, neighborhoods with large proportions of persons of color face the greatest barriers to high-speed broadband access. An important way that minority adults build wealth for their families is to start their own businesses, often in their homes. Poor connectivity limits their ability to build their business. The state of Missouri should invest in high-speed broadband in urban, suburban and rural parts of the state, and support programs that allow all households to have access through high-speed coverage and to have services priced to allow for affordable services.

Importance to an Educated Population

Education at all levels – early education, K-12 and higher education – relies on broadband to both bring educational content into the classroom and to connect students of all ages to instructors and others. While schools have made investments in broadband systems to support their educational mission, many students lack the technology and high-speed internet service to support learning. The COVID-19 pandemic had significant impacts on schools, teachers and students. More emphasis needs to be given to digital literacy training so that all residents are able to use technology for education, employment, telehealth, social connections and other purposes. Many school districts worked to provide hardware and hot spots to students when the pandemic required remote learning. The resources forhardware were limited, and hotspots have proven to be insufficient to meet many student and household needs.

State investments to ensure all schools have high speed internet services and that neighborhoods and communities have high speed internet services to enable families to benefit from remote learning.

Importance to Healthy Population

The Kansas City region is a health care center, with over 30 hospitals, over 40 EMS agencies, seven federally qualified health centers, six Comprehensive Mental Health Centers, and hundreds of physicians and other health professionals. Health providers, both before and during the pandemic, have increasingly relied on telehealth to connect to patients, provide important health information and offer treatment. Tele-health services have proven effective in serving those unable to attend in person, saving transportation resources, reducing missed appointments, and increasing access. The need for high-speed broadband is crucial to enabling patients to connect medical devices and to see and talk with health care professionals in secure settings. The state of Missouri should invest in high-speed broadband for health providers throughout the region and for residents who rely on health services through telehealth.

Importance to Strong Connected Public Safety System

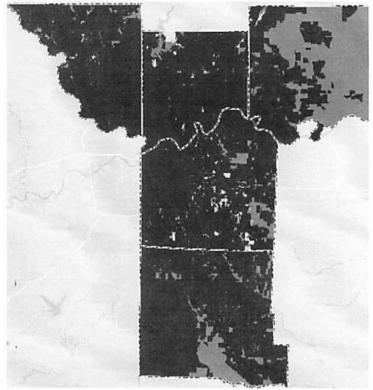
Broadband availability is important to the region's public safety system. The region has a well-functioning 911 system and a regional system of emergency radios. Both systems rely on fiber and microwave technology to operate. Many public safety agencies are sharing data securely using high speed broadband. We expect that future public safety technologies will require robust broadband services to deliver information to the 911 Public Safety Answer Points (PSAPs). As technology improves for voice and data communications, it is important for the state of Missouri to Invest in high-speed broadband for public safety purposes.

Importance to Strong Connected Transportation System

Operation Green Light is a cooperative effort to improve the coordination of traffic signals and incident response on major routes — on both sides of the state line — throughout the Kansas City area. Operation Green Light helps synchronize traffic signals on major streets throughout the region, especially those that cross city limits. The program works closely with MoDOT in the operation of KC Scout throughout the region, and fiber connections between the systems could support improved traffic management. Currently, the program depends on wireless connectivity in much of the region, and in some areas, there are reliability issues with fiber networks beyond the program's budget. State investments in broadband for transportation systems are critical to a 21st century safe and efficient transportation system.

Importance to Strong Civic Engagement

Residents increasingly rely on online systems to hear from and communicate with family, friends, neighbors, community and faith leaders and others. Social media is becoming the predominant way that messages reach persons of all ages, incomes, races and ethnicities. The absence of broadband services mean that some residents are at a substantial disadvantage in learning about community and civic issues and perspectives and to have the ability to provide input. State investments in broadband to support civic engagement is important and fundamental to an engaged population.



Light green shows areas not covered with broadband services. Missouri Broadband coverage June 2020

While high-speed broadband services are available in many parts of the Kansas City area, there are still significant urban and suburban neighborhoods and rural areas with limited or no broadband coverage. In particular, much of Ray County and significant portions of Cass County, eastern Jackson County and northern Clay and Platte counties lack coverage of both middle and last mile infrastructure. Much of Ray County's services are offered at only 25 Mbps by companies using dial up and satellite technologies. Similar limitations exist in areas like Liberty in Clay County with service from 10 Mbps to 25 Mbps through fixed wire, DSL and satellite technologies. The larger national companies have infrastructure in significant portions of Kansas City and the other more urban and suburban portions of Jackson County but their last mile infrastructure does not always mean that every neighborhood has middle mile service to enable homes to be connected.

County	2019 Broadband Usage	2020 Broadband Access	Population without internet	% Pop without internet
Cass County	28%	97.11%	7,906	7.7%
Clay County	43%	99.39%	12,658	5.3%
Jackson County	51%	99.43%	53,951	7.9%
Platte County	43%	98.55%	5,368	5.4%
Ray County	13%	81.45%	2,487	11.0%

Source: Missouri Broadband office, US Census American Community Survey 2015-2019

Interventions to Improve Coverage and Services

Local governments and libraries, nonprofit organizations, neighborhood groups and charitable foundations and businesses have taken steps to increase broadband availability and access to services for households throughout the Kansas City area.

Several local governments have invested in wi-fi systems to allow residents, businesses and visitors to connect and obtain information or conduct work online. Since 2006, the city of North Kansas City has owned its own fiber-optic broadband network. As the only complete underground fiber network north of the river, liNKCity delivers high speed internet throughout the City to both residents and businesses. The city of Kansas City, Missouri, installed wi-fi in the downtown area, and the KC Streetcar offers free wi-fi on its streetcar vehicles. The Kansas City, MO and Mid-Continent Libraries offer free internet services for those using their facilities.

The Kansas City Coalition for Digital Inclusion is an open, collaborative group of Kansas City area nonprofits, individuals, government entities and business focused on fostering internet access and digital readiness in greater Kansas City. Meetings occur on a monthly basis at the Kansas City Public Library.

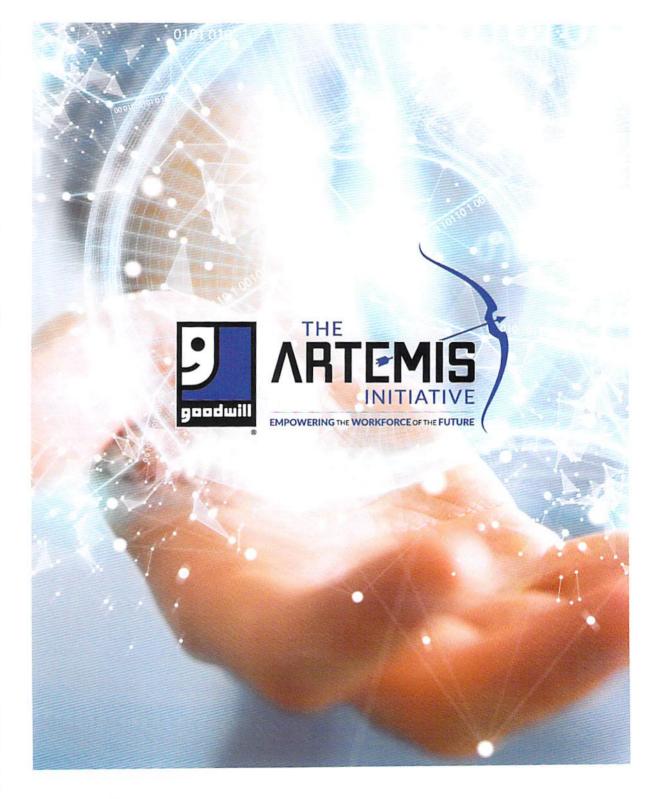
School districts and area colleges and universities have provided students with hardware and hotspots to support learning. Many educational buildings offer opportunities for students without technology or broadband services in their homes to use school systems.

Many businesses and public institutions work with PCs for People to donate and refurbish hardware for use by households without the necessary technology.

Foundations and a new COVID-19 Regional Response and Recovery Fund have contributed funds to organizations and schools to support the purchase of hardware and to support the costs for monthly internet services.

PCs for People has piloted the installation of wi-fi technology in urban neighborhoods to help households without internet access to make use of the technology in their homes.

Finally, KC Rising, a business-led initiative was established by the Civic Council of Greater Kansas City, the Kansas City Area Development Council, the Greater Kansas City Chamber and MARC, to support investments and actions to strengthen the Kansas City region's economic competitiveness. KC Rising exists to achieve a shared vision of regional prosperity for all by aligning and accelerating community effort for greatest impact. KC Rising has identified the need for high quality, affordable and universal broadband service as critical to the region's economic progress.



Work is more than a paycheck - it is self-sustainability, growing a family, pride, dignity, and equality.

However, we are in the 4th Industrial Revolution, and exponential advancement in technologies is changing the job market. Millions of people will need to switch occupations or upgrade skills to remain employable, and individuals with disabilities and other barriers will be disproportionately impacted. We can and must come together to proactively equip workers and companies for this transformation so that no one is left behind.



The Artemis Initiative is a partnership among technology companies and Goodwill of Western Missouri and Eastern Kansas to train workers for the occupations of the future.

Beyond that, we will leverage these technologies to augment the human experience. Technology can be ethically intertwined with everyday job functions for disadvantaged workers in order to create more job opportunities.



HELP MAKE THESE POSSIBILITIES INTO REALITIES

Advocate on this issue to ensure policies and appropriations exist to protect workers in the 4th Industrial Revolution.

Lend your technology and industry expertise as we build tech solutions and training programs for the future of work.

Provide funds and other resources to sustain this effort to catapult people with barriers into living-wage jobs.

Hire our future graduates to ensure you have the diverse, experienced talent you need.

Refer job seekers, companies, or other potential partners so we can continue to build a stronger coalition.



1 in 4 adults in the United States has a disability (US Centers for Disease Control and Prevention 2018).

50% of existing work activities are automatable with currently demonstrated technologies (McKinsey and Company 2019).

In 6 out of 10 jobs, at least 30 percent of activities could be automated today (McKinsey and Company 2019).

Up to 54 million people in the U.S. will be displaced from their work by 2030 (McKinsey and Company 2019).

30% of educators are pessimistic about the education system's current ability to teach new tech skills (2016 Pew Survey).

Machines and algorithms will create 58 million net new jobs by 2022 (World Economic Forum 2018). These jobs will require new skills, and see a positive shift in quality, location, and permanency.

Half of what students learn in their first year of technical school is outdated by the time they graduate (World Economic Forum 2016).

65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist (Annunziata and Biller 2014).

The employment-population ratio was only 19.1% for persons with disabilities in 2018 (US Bureau of Labor Statistics 2019).







Kristen Wood

Director of Strategic Initiatives

c: 816.213.3235

e: kwood@mokangoodwill.org





Organization Background:

Goodwill of Western Missouri and Eastern Kansas (Goodwill) empowers people to discover their potential and adapt for the future through the power of work. We are a 501c3 organization headquartered in Kansas City, Missouri. Our model provides services throughout the entire employment continuum; we support individuals in engaging the workforce, retaining work, gaining skills, and advancing their careers.

Goodwill provides workforce development services, job training, and employment in 82 counties across western Missouri and eastern Kansas, focusing our programs in the following counties: Jackson, Clay, Platte, Wyandotte, and Johnson. We support individuals with different abilities and disadvantaging conditions, such as persons with physical challenges or cognitive disorders, limited education and work history, criminal backgrounds, underemployment or unemployment, or a situational barrier such as lack of transportation or housing.

We believe every person deserves the opportunity to work. Employment is more than a paycheck. It is independence, agency, dignity, and equality. Jobs empower people to support themselves and their loved ones, pursue life goals, and participate in their communities.

Goodwill impacts lives through four strategies customized to meet participants' unique needs:

- Our donated goods retail model provides employment, career planning, and upskilling through the recycling and reselling of material donations in our stores.
- Our commercial and government contracts offer case management and employment for individuals with a different ability.
- Our employment services and workforce development programs provide job training, job
 coaching, career placement, and ongoing retention support for people with severe barriers to
 employment.
- Our Goodwill Artemis Institute provides classroom training and on-the-job learning experiences to prepare job seekers for the technology-based careers created by the Fourth Industrial Revolution.

In 2020, our organization assisted 12,065 individuals, providing over 17,000 services, and securing jobs for 601 people. We strive towards our vision of building sustainable and prosperous communities. Over our 127 years, we have served over 632,000 people, provided over 23,000,000 services, and secured over 203,000 jobs.



NETWORK LOCATION

Brownsville, TX

SIZE (LAST MILE)

550 miles of fiber (planned)

BUDGETED COST

\$61mm (planned)

SCOPE

Broadband Feasibility & Digital Inclusion Plan and Planned FTTP Deployment in 2022

DATE

July 2020 - Present

ANTICIPATED COMPLETION

48 months

NETWORK TYPE

Aerial & Underground



Middle Mile Development

- According to the National Digital Inclusion Alliance (NDIA), Brownsville, TX, has consistently ranked as one the least connected cities in the United States, with 47.13% of households without broadband of any kind and 67% of households who do not have cable, DSL, or fiber broadband.
- Recognizing the severity of this problem, the City established a partnership with seven community anchor institutions to fund the Broadband Feasibility and Digital Inclusion Plan to study and address the lack of broadband in the community.
- In July 2020, Lit Communities began working with Brownsville on a Citywide broadband feasibility study and digital inclusion plan.
- The City's plan consisted of a comprehensive plan for a fiber-optic network owned by both the public and private partners, including last mile fiber to the premise.
- Currently, the City is embarking on a 24 month effort to develop its own 93-mile middle mile backbone network utilizing \$19.5 million in American Rescue Plan Act funding, allowing for further opportunities to work with private partners such as BTX Fiber to deploy last mile services in priority areas of the community.
- Additionally, the City's proposed network will connect 32 anchor institutions including city facilities, Police, Fire, EMS, and public parks.

Current Status

- In July 2021, Lit Communities Broadband, Inc. created BTX Fiber, LLC for the sole purpose of serving Brownsville's residents and businesses and partnering with the City to provide a source of revenue generation.
- Understanding the importance of affordability, BTX Fiber planning to implement a 50 Mbps download / 50 Mbps upload service tier that is 100% subsidized through the FCC's Lifeline program.

- Press
- Brownsville approves \$19.5M for deployment of broadband installation
- ► Getting connected: City hires broadband consultant
- Expanding Broadband Access: City of Brownsville, Texas

- BTX Fiber will work with the local workforce and community college (Texas Southmost College) to meet both the skills and labor needs of the project.
- In August 2021, BTX Fiber partnered with the City and applied for \$15.2mm in NTIA Broadband Infrastructure Program funding to deploy last mile infrastructure for 10,876 households in the twelve Census Tracts of which 6,054 are unserved.







Community Action Plan

Our work in Brownsville began with a community-wide survey. The results enabled local decision-makers to hear from residents and identify needs and priorities before moving forward.

The following statistics and quotes are from our survey results unless noted otherwise.

*From Table B28002 in the 2019 American Community Survey One-Year Estimates 1,594

Number of residents who took the survey



Speed tests that failed

to pass the FCC's

broadband definition

speed of 25/3 Mbps



66.59%*

Brownsville households without cable, fiber optic, or DSL



93%

Respondents who indicated a likelihood to sign up for enhanced broadband services if made available



23.08%

Brownsville households with no broadband of any type, including cellular data plans





38%

Respondents who indicated their options for internet were too slow, unreliable, too expensive, or not available



99.2%

Speed test results that fell below 1000 Mbps for download speed



65.5%

Speed test results that fell below 100 Mbps for download speed

"If speeds were faster and cheaper, everyone from Brownsville would sign up!"

"A faster speed and better connectivity would help us all. We are constantly being buffered and disconnected. [Current Provider] is worthless."

"The internet is not fast enough for online school work and is not reliable for multiple Zoom calls."

"My son was denied a job online because [our] internet [is] so slow."

"I have to rely on hotspots for internet access since broadband is not offered at my location at this time and sometimes it is not fast enough to support 3 children signed in to online classes."

"I am paying for significantly more speed than I am getting."

"Bringing another provider to end the monopoly in the valley or at least bring good fast reliable internet."





Medina Fiber

NETWORK LOCATION

Medina County, OH

SIZE (LAST MILE)

450 miles of fiber

BUDGETED COST

\$58mm

SCOPE

Business Plan, Road Map and Deployment for approximately 50,000 residents and businesses

DATE

July 2017 - Present

ANTICIPATED COMPLETION

48 months

NETWORK TYPE

Aerial & Underground

INITIAL SERVICES

Internet: 100/100 Mbps, 250/250 Mbps, 1 Gig



Middle Mile Partnership

- In 2010, the Medina County Port Authority bonded a broadband project, Medina County Fiber Network (MCFN), to create the infrastructure for robust broadband service that could be shared by multiple telecommunications carriers as part of driving economic development within Medina County.
- The MCFN created a strategic plan in 2017 that addresses expansion of certain fiber trunks into industrial parks and to introduce a residential and small business fiber product through commercial partnering.
- In 2021, a relationship was created with the commercial entity, Medina Fiber, to introduce a residential and small business offering to Medina County. Medina Fiber is partnering with MCFN, leasing strands to build last mile connectivity to the residents and small businesses of the County.

Current Status

- Since March 2021, Medina Fiber has deployed fiber across nearly 4,000 households in Seville, Westfield Center, Montville and Medina City combined.
- In October 2021, Medina Fiber opened its first Demonstration Center in Seville for customers to provide direct customer service, learn about gigabit internet services and its utilization in the home and business.
- Through a partnership with Medina County, Medina County Fiber Network and the Lorain-Medina Rural Electric Co-op, Medina Fiber is applying for the State of Ohio's Residential Broadband Grant Program to bring gigabit service to over 4,500 unserved and underserved households, students, businesses, and remote workers who currently do not have access to reliable and affordable internet



Medina Fiber



A Locally-Operated ISP

By launching a locally-operated ISP, we are able to keep jobs and influence in the community, while also providing Medina with ongoing support from our established team of experts.





✓ Branded for Medina

Medina Fiber branding establishes the company as local and community-focused.



✓ Demo Center

We built a brick-and-mortar demo center to better serve the community with events, educational classes, and local customer service.

✓ Backed by Lit Communities

While Medina Fiber is locally-managed and locally-staffed, the team has the full support of Lit Communities' experts, software, and other resources to make it a success.



It was worth the wait.



Medina Fiber just left my place... As of now, I don't see myself switching to anyone else. It's unbelievable how fast it is now!

Remains consistent...
No drop at peak
hours.

Great, consistent speed!

Sooooo helpful explaining and assisting, from tech to billing services

I cannot say enough good things about the young men that have worked here to make this happen, from the gentlemen who laid the cable, those who installed the box and wires, to the ones who hooked me up, they have all been courteous, professional and extremely helpful. Thank you for making this all come together for me.

Local staffing in Seville has been more than excellent



NETWORK LOCATION

Oldham County, KY

SIZE (LAST MILE)

245 miles of fiber (planned)

BUDGETED COST

\$36.9mm (planned)

SCOPE

Community Assessment and Planned Middle Mile, Pilot Area and FTTP Deployment in 2022

DATE

April 2020 - Present

ANTICIPATED COMPLETION

36 months

NETWORK TYPE

Aerial & Underground



Last Mile Development

- In 2019, the Oldham County Fiscal
 Court entered into a Memorandum of
 Understanding with theCommonwealth of
 Kentucky to purchase a 144 count bundle
 of excess fiber through the Kentucky
 WiredProject. With this connectivity from
 Kentucky Wired, Oldham began looking for
 last mile fiber solutions for their community.
- In April 2020, Lit Communities began working with Oldham County on a Countywide Community Assessment that would provide the County with a network design, cost estimates, ownership and funding options and demonstrate community support.
- In September 2020, the County launched its broadband survey to measure current broadband usage and likelihood to sign up for services over 3,000 residents inBallardsville, Buckner, Orchard Grass Hills, Centerfield, Goshen, La Grange and Crestwood took the survey. 86% of respondents indicated they would sign up for a network that provided enhanced connectivity.



Current Status

- In the summer of 2021, Lit Communities established a
 relationship with Silica Broadband, Oldham County's only local
 ISP which resulted in an opportunity to acquire their existing
 network assets and exemplary customer service for the sole
 purpose of serving Oldham County's residents and businesses.
- Silica is owned and operated by Oldham County resident
 Dave Wallace who six years ago saw the County's need for
 connectivity and has worked diligently to provide an affordable
 fiber option to as many Oldham County residents as possible.
- Silica Broadband offers internet, voice and wireless services to residents and businesses within selected areas of Goshen, Prospect and Pendleton and wireless service to areas of Westport. Current fiber and wireless subscribers are at 320.
- In October 2021, Silica Broadband applied for a \$10mm grant through Oldham County's Broadband Grant Deployment Program, funded by the American Rescue Plan Act Funding to provide service to Oldham's unserved and underserved communities.
- Upon award of the County's grant funding, Lit Communities will invest an additional \$26.2mm to deploy last mile infrastructure and enhanced broadband connectivity to all of Oldham's residents, businesses, and municipal organizations.
- Once the partnership is finalized, Silica Broadband will become
 a Lit Communities Company and will have the resources and
 equity to complete a full Fiber to the Home build out to 90% of
 all underserved and unserved residents within 24 months with
 the remaining 10% served wirelessly within the 24 month period
 because of their location in the most rural parts of the County.
- Silica is committed to providing Oldham County access to fiber within 36 months over a network that can provide the minimum speeds of 100/100.



Silica Broadband





Community Action Plan

Our work in Oldham County began with a community-wide survey. The results enabled local decision-makers to hear from residents and identify needs and priorities before moving forward.

The following statistics and quotes are from our survey results unless noted otherwise. 3,410

Number of residents who took the survey





45%

Respondents who indicated dissatisfaction with the speed and reliability of current options



66%

Respondents who indicated that current internet options are too expensive





33%

Speed tests that failed to pass the FCC's broadband definition speed of 25/3 Mbps



86%

Respondents who indicated a likelihood to sign up for enhanced broadband services if made available



98%

Respondents whose speed test results fell below 100 Mbps for upload speed



100%

Speed test results that fell below 1 Gbps for download speed



68%

Speed test results that fell below 100 Mbps for download speed

"Please make sure everyone has the ability to get internet. Our neighborhood doesn't have cable run."

"Lack of a fiber cable option, especially during Covid-19 days, makes living in this beautiful part of Oldham County extremely difficult. I would NOT have moved here if I truly understood there wasn't a fiber cable option. I didn't even know that was a possibility in 2020 and only 20 miles outside a metropolitan area. I discourage anyone interested in moving to this area from doing so because of this limitation. It needs to be corrected ASAP. I'll help in any way possible."

"I am so incredibly grateful someone is trying to do something about this!! It is hands down the worst part of living in La Grange, and we have considered moving back to Jefferson county because of this issue."

> "Offering reliable internet to many of us just off the main roads would be so helpful. We have kids in school, work from home, enjoy the ability to access streaming services, and [want to] join everyone else with access to 21st century technology."



"[It will help if] the decision makers who live in areas served by fiber optic really understand the travails of a family who have to rely on a top speed of 2.5 mbps and its limitations. It is like trying to convince those in cities in the 1940s what life was like in rural America without electricity!"



NETWORK LOCATION

York County, PA

SIZE (LAST MILE)

3,125 miles of fiber (planned)

BUDGETED COST

\$70mm (planned)

SCOPE

Community Assessment, Pilot Middle Mile and Wireless Project and Planned FTTP Deployment in 2022

DATE

October 2020 - Present

ANTICIPATED COMPLETION

56 months

NETWORK TYPE

Aerial & Underground



Middle Mile Development

- According to the 2019 American Community Survey, 18.4% of households in York County are without broadband internet access. As a result, nearly a fifth of the County's residents struggle to access the internet, conduct personal business or complete schoolwork.
- Recognizing the severity of this problem, the County utilized \$1.3mm in COVID-19 CARES Act funding to complete its Broadband Community Assessment and 16mile Rail Trail Pilot Project to begin addressing the lack of broadband in the community.
- In October 2020, Lit Communities began working with York County on a County-wide Community Assessment and strategy for a fiber-optic network owned by both the public and private partners, including last mile fiber to the premise.
- Currently, the County is embarking on a multi-year effort to develop its own 333-mile middle mile backbone network utilizing up to \$25mm of American Rescue Plan Act funding, allowing for further opportunities to work with private partners to deploy last mile services in priority areas of the community.
- Additionally, the County's proposed network will connect 285 anchor institutions including, 38 Emergency Medical Service facilities, 74 Fire Stations, 33 Police Stations, 121 Schools, and nineteen 911 towers.

Current Status

- In July 2021, Lit Communities Broadband, Inc. created YoCo Fiber for the sole purpose of serving York County's residents and businesses and partnering with the County to provide a source of revenue generation.
- In August 2021, Lit Communities partnered with the County and applied for \$8.9mm in NTIA Broadband Infrastructure Program funding to deploy last mile infrastructure for 4,177 households in the three Census Tracts of which 1,194 are unserved.
- Beyond the direct and immediate availability of fiber-optic based broadband services, the NTIA funded project will also yield a positive impact on public safety, workforce development and adoption of telehealth/telemedicine.



YoCo Fiber





Community Action Plan

Our work in York County began with a community-wide survey. The results enabled local decision-makers to hear from residents and identify needs and priorities before moving forward.

The following statistics and quotes are from our survey results unless noted otherwise.

*From Table B28002 in the 2019 American Community Survey One-Year Estimates 1,273

Number of residents who took the survey



Speed tests failed to pass the FCC's

broadband definition

speed of 25/3 Mbps



28%*

York households without cable, fiber optic, or DSL



42%

Respondents who indicated they are dissatisfied with the reliability of their current internet service



87%

Respondents who indicated a likelihood to sign up for enhanced broadband services if made available



45%

Respondents who indicated they are dissatisfied with current speeds



57%

Speed test results that fell below 100 Mbps for download speed

"I need fast fiber internet in order to take my business to the next level."

"[Current Provider] is the only provider in the area and has horrible upload max speed and bad reliability."

"Cell service throughout southcentral York County is spotty and unreliable. I would not trust it in making a 911 call."

"Fiber optic internet would be great with no caps."

"It should not cost rural homeowners thousands of dollars to connect to internet service. [Current Provider] will not provide me internet service, because they state I live too far from the main road." "Our area is desperate for basic internet service, let alone high-speed internet. I'm willing to participate in any way needed to move this effort along."

"If rural homeowners had internet service, they could apply for telecommuting positions. We need affordable internet access to provide more job opportunities for all."



Lit Communities

Your constituents want better internet.
We help them bridge the digital divide.

Communities deserve equal access to the opportunities a fiber network can provide.



Stronger **Economies**



Increased Access to Healthcare



More Educational Opportunities

We link arms with municipal leaders and offer them a way forward.

Fiber Networks

We only use the best internet technology to ensure networks can provide sufficient bandwidth for decades to come.

Open Application

We give residents a choice and make it easy for companies to deliver telehealth services, smart city applications, and other modern solutions.

Network Funding

We don't just build community networks. We invest our money to fund them, too.



"Lit's team of professionals was instrumental in helping us assess our needs and create a plan that was right for us. Thanks to their guidance, we are looking forward to breaking ground on a citywide fiber network very soon!"

> **Juan "Trey" Mendez** Mayor of Brownsville, TX

It's always feasible!

Internet connectivity is always feasible. Instead of wasting time and money figuring out if a community can get connected, we help municipal leaders figure out how to bridge the digital divide.

Make a plan

We help municipalities develop a strategic Community Action Plan for funding and building a fiber network.

02 Build a network

We build open application networks so municipalities can provide additional services and generate income.

03 Create an ISP

We set up locally-operated ISPs to create jobs and keep control of the network in the communities we connect.



Middle Mile Community Impact

When Lit Communities partners with a community to build the "middle mile" of fiber, we're laying a strong foundation for a more connected future.

Scalability

Capability to expand geographical service area as well as increased network capacity.

Flexibility

Capability to service various client environments and technologies.

Security

All devices and facilities associated with the network have rigid monitoring and controlled access.

Capacity

Robust infrastructure to prevent overload of data even at peak congestion.

Efficiency

Resource allocation and structure designed to be dynamic and operate smoothly.

Resiliency

Both structurally redundant and physically robust fiber path.



Last Mile Community Impact

When Lit Communities builds the "last mile" of fiber, we're bringing high-speed internet and modern applications directly to the residents and businesses in that community.

- Bridge the digital divide by enabling greater access, affordability, and competition.
- End the homework gap by enhancing the options available to local education agencies seeking to utilize fiber and wireless solutions.
- Attract new residents and businesses (at home or in commercial spaces)
- Increase home values by 3.1% if connected to fiber (Source: FTTH Council)

- Enable utilization of Smart home applications
- Support adoption and availability of full-service Telehealth offerings
- Support future advancements in the technology, setting up the City, residents, and businesses for the future as we grow to 10 Gig and beyond
- Private communities and HOA's could create
 5G and smart connected communities



NE Missouri Broadband Steering Committee

December 28, 2021

Presented by: Jessica Fowler, CCO & Rene Gonzalez, CSO

Introduction to Lit Communities





- UVerse for AL, FL, LA, MS
- Mini-Master Contract for North AL
- FTTH for New Orleans, LA: State of AL: Columbus, OH; Dayton, OH; Madison, WI

Google Fiber

• Engineering & construction management for: Austin, TX; San Antonio, TX; Salt Lake City, UT; Charleston, SC (assessment)

2014

Huntsville & Verizon

- Huntsville Utilities, AL
- 5G Fiber Densification for: Seattle, WA: San Francisco, CA: Cleveland, OH: Nashville, TN: Knoxville, TN

2015

Gia City Program Created

• State of AL backbone; Breckenridge, CO; Broomfield, CO; Lampasas, TX; New Orleans, LA; Air Force Academy Colorado Springs, CO

2019

Lit Communities Founded

- Medina County, OH; New Orleans, LA; Jackson County, FL; RVBA: Salem, VA and Botetourt County, VA; Oldham County, KY; Brownsville, TX; Nevada County, CA; Jackson, MS; Center, TX
- Amherst County Public Schools, VA; Jackson Public Schools, MS



Lit Community Assessment Experience













Medina County, OH Community Assessment

New Orleans, LA Community Assessment

Brownsville, TX
Community Assessment &
Digital Inclusion

Oldham County, KY Community Assessment

Monongalia County, WV
Community Assessment



Jackson, MS
Community Assessment
School District Connectivity
Assessment



York County, PA
Community Assessment



Center, TX
Community Assessment



Jackson County, FL Community Assessment

Lit Communities covers all aspects of broadband connectivity. Lit's staff has been designing networks for 25 years and Lit is currently installing both underground and aerial fiber infrastructure in Medina County, Ohio and Oldham County, Kentucky.

Lit's Community Assessment ("CA") Process



- 1. Kick-Off Meeting / Data Collection
- 2. Market Service & Incumbent Analysis
- 3. Preliminary Design
- 4. Construction Ride Out / Make Ready
- 5. Financial Model & Business Plan
- 6. Strategy Session
- 7. Demand Aggregation
- 8. Stakeholder/Partner Engagement
- 9. Grant Services

Kick-Off Meeting / Data Collection



<u>Purpose</u>

- Establish goals and workflow
- Create schedule and point of contact list
- Define network area boundaries, GIS data needed
- Discuss Grants

<u>Deliverables</u>

- Evaluate all County data and provide feedback to ensure accuracy for all future tasks
- Identify possible County partners and local stakeholders (this will be ongoing throughout the project)





Oldham County, KY Kick Off Meeting

Primary Point of Contacts					
Partners	Name	Title	Title	Phone	
Oldham County, KY	David Voegele	Judge Executive, Fiscal Court	dvoegele@oldhamcountyky.gov	(502) 222-9357	
	Kevin Nuss-POC	Deputy Judge Executive, Fiscal Court	knuss@oldhamcountyky.gov	(502) 222-9357	
Transitional Technologies	Richard Hollander	CEO	richard@transitionaltechnologies.com	(502) 225-4303	
	Norman Schippert	Retired	norman@bluegrass.net	(502) 797-1594	
Lit Communities	Brian Snider	CEO	brian@litcommunities.net	(334) 714-1439	
	Jessica Fowler-POC	Chief Client Officer	jessica@litcommunities.net	(860) 309-0987	
	Lauren Bender	Chief Operating Officer	lauren@litcommunities.net	(512) 743-5612	
	Ben Lewis-Ramirez	Chief Marketing Officer	ben@litcommunities.net	(512) 775-1351	
	Ren Gonzalez	Chief Strategy Officer	rene@litcommunities.net	(956) 346-3439	
	Lindsey Brannon	Chief of Staff & VP of Finance	lindsey@litcommunities.net	(561) 719-2084	
	Maria Gamo	GIS/Data Scientist	maria@litcommunities.net	(647) 861-1145	
cos	Isak Finer-POC	CMO/VP North America	isak.finer@cossystems.com	(540) 988 -3224	
	Jessica Thorfve	Key Account Manager	jessica.thorfve@cossystems.com	46 73-828 51 82	
Jackson Solution Systems	Aaron Jackson	CEO	ajackson@solutionsthatserve.com	(504) 444-1166	
Project Goals					

Project Goals						
Specific, Measurable, Attainable, Relevant and Timely (S.M.A.R.T.)						
Goal 1: Create a preliminary design for the network utilizing data obtained from the County.						
Goal 2: Develop a Bill of Materials (BOM) including all labor and material estimates.						
Goal 3: Perform a CRO and MREA to update the preliminary design and BOM.						
Goal 4: Survey, measure and forecast network take rates utilizing COS Service Zones tool.						
Goal 5: Federal and State research on existing and new broadband grant program and development and evaluation of prospective project opportunities.						
Goal 6: Create a viable business and financial plan for an open access network in Oldham County KY that will serve all of the residents and businesses.						

Timelines and Major Milestones					
Milestone	Date Due or Estimated Timeline				
Kickoff Meeting and Data Collection	6/3/2020-6/15/2020				
Preliminary Design- Set Up	6/15/2020-6/29/2020				
Preliminary Design- Execution	6/29/2020-7/13/2020				
Demand Aggregation- Set Up	6/8/2020-7/6/2020				
Demand Aggregation- Execution	7/6/2020-11/23/2020				
Financial Model and Business Plan	7/13/2020-8/10/2020				
Grant Development Services	6/3/2020-8/31/2020				
Strategy Session	9/8/2020-9/11/2020				



Market Service & Incumbent Analysis/Trends Review



<u>Purpose</u>

- Identification of fiber network ownership
- Current internet service levels and service adequacy
- Location of fiber within the community to identify currently available resources for residents and businesses that
- Assess market and technology trends

Deliverables

- Detailed list and analysis of incumbent service providers and offerings within the Community
- A map identifying existing the incumbent service providers within the Community
- Nearby long haul fiber for connectivity opportunities
- Market Trends/ Technology Analysis included as part of final Business Plan Deliverable



Doto Sources

In order to analyze each zip code within Brown

- Broadbandnow.com. BroadbandNow source Form 477 Filings and cross-validates that dat datasets to show the most accurate results a in data since the FCC waits 6-9 months to re money through advertising and affiliate arrar cases BroadbandNow receives compensation.
- BroadbandSearch.net, Broadband Search or records plus "old-fashioned detective work"
- when there are any gaps in data information

 DecisionData.org. Decision Data gathers its opinions. The majority of their data comes frusage data and combine the two. Decision I independently from the business and sales

ISP	Infrestructure	Coverage (%)	Max Download Speed (Mbps)	Avg Actual Download Speed Tests (Mbps)	Max Upload Speed (Mbps)	Prices Starting At (\$)	Resi (R) or Business (B)
Spectrum	Cable	97.2	940	184	5	39.99	R
AT&T	DSL	86.7	1,000	90	8	39.99	R
Earthlink	DSL	86.7	1,000	NA	3	39.95	R
Vlasat	Satellite	100	100	NA	3	60.00	R
HughesNet	Satellite	100	25	NA	3	49.99	R
Sinlar	Fixed Wireless	100	3	NA	NA	NA	R
VTX	Fixed Wireless	100	30	NA	5	NA	R
AT&T- B	DSL	100	1,000	NA	NA.	NA	В

Zip Code: 78521, Population approximately 93,818



Preliminary Design



<u>Purpose</u>

- High Level design for Middle and Last Mile
- Understand Footages necessary for construction
- High level planning for complete access
- Outputs provide footages for budgeting

Deliverables

- Shape file or KMZ of preliminary design,
- Bill of Materials ("BOM") including all labor and material estimates
- Identification of any adjacent fiber assets to be leveraged





Construction Rideout / Make Ready Engineering



<u>Purpose</u>

- Desktop/in-person CRO
- Analyze outside plant infrastructure placement for cost and schedule efficiency
- Identify aerial vs. underground
- Identify methodology for construction including trench, plow, bore, etc.

- Updated preliminary design and bill of materials for cost estimations
- All data collected including pole data and classification
- All results incorporated into the business plan



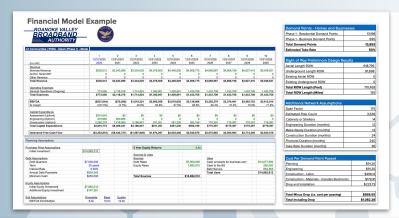
Financial Model & Business Plan



<u>Purpose</u>

- Provide our recommended funding and deployment option
- Provide multiple scenarios
- Provide the vested parties the necessary information to make an educated decision to complete the network build out
- Forge a path to a clear, detailed and comprehensive business plan outlining next steps to take to complete detailed engineering and design.

- Financial Model
- Business Plan









Strategy Session



<u>Purpose</u>

- Gather Client and all stakeholders together to recap results and learnings of CA
- Recommendations for network moving forward including:
 - Local marketing campaigns, grant research and eligible programs, capital introductions, detailed design and construction package creation, permit and pole attachment agreements, construction, operations and maintenance

<u>Deliverables</u>

 Presentation and formal write-up and summarization of the sessions and action items



Demand Aggregation

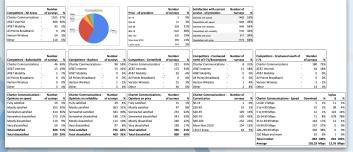


<u>Purpose</u>

- Measure needs and interest of residents and businesses for internet and next-gen services
- Survey community to justify a network capital investment
- Engage with community

- Client access to demand aggregation platform and generated reports, analysis, and output showing resident interest and support for a municipal fiber network
- Project Map





Stakeholder/Partner Engagement



<u>Purpose</u>

- Identifying stakeholders
 - Economic Development/Quality of Life Entities
 - K-12, Community Colleges and Universities
 - Workforce Development
 - Health Care
- Gather relevant and candid data

- Stakeholders Needs Matrix/Focus Group Analysis
- Engage Community and Stakeholders in the CA process



Grant Services



<u>Purpose</u>

- Broadband Grant Development Strategy Session (to coincide with Task # 1 - Kickoff Meeting and Data Collection
- Federal and State research on existing and new broadband grant programs for the Client capable of expanding the Client's network funding needs
- Development and evaluation of prospective project opportunities identified in the Business Plan

- Formal write up and summarization of responses from the Strategy Session
- Grant Research and Program synopses
- Development and Evaluation of Prospective Project Opportunities Planning document



Why Lit?



"We conducted a 4 year search for a partner who would complement our commercial open-access network. We found that partner in Lit Communities."

"Lit Communities' ability to engage the appropriate financial partners allowed us to move forward with this very important project of fiber to the home."

MEDINACOUNTY FIBERNETWORK

Dave Corrado, CEO



"Financing is not the only area where Lit Communities excels. They bring a team of seasoned engineers and project managers that have experience in network design, technology enabling and fiber construction."

"Their [Lit's] detailed demand aggregation tools *provide a clear view of customer interest by location and circuit capacity*. The reporting structure from these tools is used to attract additional investors and to guide the build process through the *evaluation of potential take rates* in the various geographies."

"Our partnership with Lit Communities is a great impact to economic development within Medina County and allows us to address the residential and small business entities that we could not previously serve."

Do you have any questions for our team?

Appendix D: Provider Materials

Provider Info

- AT&T
 - Answers to provider questions
 - o BID vs. ARP Handout
 - o Our Commitment to Help Bridge the Digital Divide
 - o State BB Deployment 5 Pillars Handout
 - o State BB Fund (Middle-Mile Projects) Handout
 - o A Bold Plan for a Connected America
 - State Activities to Support Broadband Access
 - State Strategies for Accelerating Broadband Adoption and Inclusion
 - The Role of States in Helping to Create a New Nationwide Broadband Map
- Chariton Valley
 - o Emergency Broadband Benefit Brochure
 - Handout
- Comcast
 - Lift Zones
 - o Missouri 2021 State Investment Report
- Google Fiber
 - o Ad 1
 - \circ Ad 2
 - Answers to provider questions
- LTD
 - o AG RDOF Letter 8-2-21
 - Answers to provider questions
- Nextlink Who We Are
- SEMO Electric
 - o RDOF Results with Map Dec 2020
- Total Highspeed Brochure
- Windstream
 - o Kinetic Brochure
 - o Letter
- Wisper
 - Counties Served
 - Response to provider questions
 - Marketing Plan For Future Take Rates
 - o Ad 1
 - o Ad 2
 - Ad 3
 - o Ad 4
- Xfinity
 - o Emergency Broadband Benefit

AT&T Response to Interim Broadband Committee Questions

Representative Riggs,

Please see below for our answers to your questions. In addition, we have included attachments that outline our priorities regarding access, adoption, and affordability. The attached documents also highlight what we have found to be best practices for states and communities along with our recommended policy positions.

AT&T is committing more than \$2 billion over the next 3 years to bridge the digital divide through affordable broadband offers for both consumers and education institutions, as well as high quality educational resources and community investment through AT&T Connected Learning, a program to connect students to skills, resources, and opportunities for success in school and in life. Our findings on the components of reducing the digital divide are consistent with your committee's and must include not only access considerations but also adoption and affordability strategies.

Thanks for your consideration and an opportunity to provide input.

The following answers some of the questions you sought from Service Providers.

> Take rates

EBB Program Info:

- Emergency Broadband Benefit Program Enrollments and Claims Tracker Universal Service
 Administrative Company (usac.org) includes total enrolled HHs by state. MO has 118,751 as of 10/17. This data is updated weekly. It also includes enrollment by zip code.
- Additional EBB Program Data Universal Service Administrative Company (usac.org) contains
 data re enrollments by method of eligibility; age categories; and service type. Data is not state
 specific
- Please also know that the infrastructure bill recently signed into law would make the current Emergency Broadband Benefit program permanent, by transforming it into the Affordable Connectivity Program. ACP would provide a \$30/month benefit to most eligible consumers (up to \$75/month Tribal) in the form of a discount on broadband services.

> Network capacity

https://about.att.com/sites/broadband

> Average speeds on existing network

https://about.att.com/sites/broadband

> Redundancies on existing network

https://about.att.com/sites/broadband

> Summary of Planning to increase future take rates

AT&T EBB Info: AT&T home internet, Cricket Wireless, and AT&T Mobility Prepaid all participate in the EBB program, including in MO. Marketing info – see:

- Emergency Broadband Benefit (EBB) | Cricket Wireless
- AT&T is Offering the Emergency Broadband Benefit (att.com) (contains links to both home internet & AT&T Mobility prepaid EBB)

Emergency Broadband Benefit | AT&T PREPAID (att.com)

> Counties served today/counties planning to serve

AT&T provides broadband throughout much of the areas of the state where we provide telephone service. In addition to our legacy DSL broadband service, we also provide Gigabit service to an increasing number of households through fiber to the home connections. Our on-going initiative in Missouri to build fiber to the home for Gigabit level service (with plans to expand to multi-gigabit service) is part of our national initiative to bring fiber to 30M locations by 2025. Because we are working to help solve the digital divide, partnering with cities, counties, the state, and others by utilizing local, state, and federal funds may both accelerate our planned build and increase the number of locations passed.

> Federal funds accepted/status of deployment

AT&T has not accepted Federal funds in Missouri via CAF Phase II or RDOF. AT&T invested nearly \$1.9 Billion in private capital in Missouri from 2017 thru 2019.

> State funds accepted/status of deployment

AT&T has not accepted any Missouri state funding for general broadband deployment.

> Length of construction delays if any

We have experienced some construction delays due to material shortages, but it has improved dramatically with each passing month. We don't expect extensive construction delays moving forward.

> Length of back orders of materials if any

We have seen supply chain issues on various materials this year. However, we continue to partner with our suppliers to get materials here and improve processes. The entire industry is experiencing some delays and we expect this to continue to improve as supply chain issues improve.

> Please also provide current advertising materials

Please refer to the website below for AT&T's current advertising materials. AT&T Fiber – Unlimited Internet Data | AT&T Internet (att.com)

UNIQUE FUNDS TO MEET URGENT NEEDS: Understanding the Differences Between Federal Broadband Funds

Congress has made historic commitments to broadband infrastructure deployment, presenting state and local governments with unique opportunities to expand internet access according to the needs of each community.

Yes, but: The Bipartisan Infrastructure Deal (BID) contains grant deployment program requirements that the American Rescue Plan (ARP) Coronavirus State & Local Fiscal Recovery Funds (SLFRF) and Capital Projects Fund (CPF) do not.

Why it matters: When distributing these funds it is vital that decision makers understand and account for the differences between funding sources to deploy broadband expeditiously and most efficiently.

Understanding the Differences: ARP CPF & SLFRF vs. BID Funded Projects

1 UNSERVED, UNDERSERVED, AND SERVED AREAS					
ARP Capital Projects Funds	ARP State & Local Fiscal Recovery Funds	BID Broadband Deployment Grant			
Encourages (but does not require) focus on areas unserved by wireline 100/20 Mbps.	Encourages (but does not require) focus on areas unserved by wireline 25/3 Mbps.	Mandates prioritization of funds based on a hierarchy:			
Must invest in assets designed to enable work, education, and health monitoring and that address a critical need of the community, as made more apparent by COVID-19.	Recognizes "holistic approaches" that aim to serve a combination of unserved, underserved, and served locations, as well as rural and urban areas, may make projects more economical.	1. Unserved ≥ 80% of broadband-serviceable locations are unserved by 25/3 Mbps 2. Underserved ≥ 80% of broadband are unserved by 100/20 Mbps service 3. Anchor Institutions without access to			
Prioritizes fiber and 100/100 Mbps delivery, but allows for 100/20 Mbps with the ability to scale to 100/100 Mbps where appropriate	Prioritizes fiber and 100/100 Mbps delivery, but allows for 100/20 Mbps with the ability to scale to 100/100 Mbps where appropriate	1 Gbps service Requires minimum 100/20 Mbps delivery, with latency sufficiently low to allow reasonab foreseeable, real-time, interactive applications			

Big picture: When leveraging ARP funding, state and local policymakers should seek comprehensive proposals that include unserved, underserved, *and* served areas based on the ARP-fund model, not that of BID. This is essential to obtain the scale and proximity needed to attract private investment and is consistent with U.S. Treasury's ARP-related guidance to support holistic and economical deployments.

2 FCC BROADBAND MAPS					
ARP Capital Projects Funds	ARP State & Local Fiscal Recovery Funds	BID Broadband Deployment Grant			
Doesn't require use of FCC's forthcoming Broadband DATA Act maps.	Doesn't require use of FCC's forthcoming Broadband DATA Act maps.	Must use FCC's forthcoming Broadband DATA Act maps to identify unserved and underserved locations.			

Big picture: In the near term, state and local governments should use existing mapping resources and their local knowledge as they consider deployment plans using ARP funds. While the FCC's Broadband DATA Act maps will be a valuable asset, they are not yet available. When reviewing funding proposals, stakeholders must recognize that that creating new state maps or waiting for the national maps may slow down vital deployment measures.

3 ADDED

ADDED REQUIREMENTS IN BID

BID Broadband Deployment Grant

- Network outages that do not exceed, on average, 48 hours over any 365-day period
- Quality of service standards that must be established by NTIA
- · Broadband infrastructure reliability and resilience best practices, which must be defined by NTIA

Big picture: Policymakers should be aware of extra service requirements that appear in BID but not in ARP. Applying BID standards to ARP funded projects, is not necessary, and would likely result in slower buildouts.



Our Commitment to Help Bridge the Digital Divide

At AT&T, we're dedicated to doing our part to bring affordability, educational resources, and economic opportunity to the <u>millions of Americans</u> who don't have broadband connectivity today. AT&T will invest **an additional \$2 billion over the next 3 years** to help address the digital divide, building on our contribution of \$1 billion over the last 3 years.

AT&T CUSTOMER OFFERS



Education Offers: We continue to <u>offer</u> discounted wireless solutions to more than 135,000 public and private K-12 schools, colleges, and universities. These offers help keep students and teachers connected in a 1:1 learning model to assist in transforming education beyond when schools reopen.



Access from AT&T: This AT&T-funded program provides qualifying households with wireline internet service at \$10 or less per month. We are providing unlimited data through the end of the year for these customers and expanding eligibility to qualifying households and those participating in the National School Lunch Program and Head Start.¹



Emergency Broadband Benefit (EBB): Eligible customers will be able to temporarily reduce their monthly broadband costs by taking advantage of the Federal Communications Commission's EBB program which will allow more than 30 million eligible² households to receive an additional subsidy of up to \$50 a month. Those on Tribal lands are eligible for up to \$75 per month. The monthly cost of broadband – after applying the Emergency Broadband Benefit – can fall to as low as \$0 a month.³

The EBB can be applied to eligible home internet services like Access from AT&T or AT&T Internet, available within our 21-state wireline footprint.⁴ Or it can be applied toward eligible prepaid wireless plans at AT&T PREPAID and Cricket Wireless, which are available in all 50 states.

INTRODUCING AT&T CONNECTED LEARNING

AT&T Connected Learning is our multi-year commitment to help stem the tide of learning loss, narrow the homework gap, and create compelling educational content.



Connectivity Solutions – AT&T and leading nonprofit Connected Nation selected more than 100 organizations and schools across the country that will receive⁵ free wireless hotspots as well as wireless data and content filtering services. We plan to reach more than 35,000 students with this connectivity, including some of our nation's most vulnerable students.



Summer Learning Support – We will provide **\$3 million to Khan Academy** to support personalized student learning, including free virtual summer camps for students in preschool through twelfth grade. Our commitment will support various free initiatives, including <u>Camp Khan</u>, a 30-day math challenge for children in third through 12th grade, <u>Camp Khan Kids</u>, a self-paced virtual summer learning program for children ages 2–8 and self-paced education courses covering K-12 math, grammar, science, history, AP®, SAT® and more.





Digital Literacy Courses – Together with Public Library Association (PLA), we will offer a collection of digital literacy courses to help families navigate remote learning and build digital skills. Courses will be available digitally for everyone and offered in-person at our Connected Learning Centers as well as public libraries.



AT&T Connected Learning Centers – In collaboration with our employees and local organizations, we're launching **20 AT&T Connected Learning Centers** in 2021 in traditionally underserved neighborhoods, where we'll provide high-speed AT&T Fiber internet and Wi-Fi. The centers also will have access to a digital learning platform we're launching which will include exclusive educational content from WarnerMedia properties and talent, as well as tools from leading education groups to help students and families improve academic success.

AT&T GIVING & COMMUNITY EFFORTS IN 2020

Since the initial impact of the pandemic, AT&T has made it a priority to offer students, families and educators resources to continue learning and growing. Our giving and community efforts in 2020 include:

<u>Distance Learning and Family Connections Fund</u> – We created a \$10 million Distance Learning and Family Connections Fund that gave parents, students and teachers tools they needed for at-home learning.

- Our contribution of \$1 million to **Khan Academy** helped Khan offer educational practice exercises, instructional videos and a personalized learning dashboard that empowered students to study at home.
- In recognition of teachers' tireless work, AT&T's contribution included more than <u>\$1 million to</u> <u>teacher-focused organizations</u>. These contributions supported a variety of programs and resources that provided teachers with tools and training to better support their students.
- AT&T committed <u>more than \$500,000 to organizations focused on connecting young people</u> with meaningful and enduring mentor relationships online.
- AT&T committed \$1.2 million to small businesses focused on distance learning solutions.

"K-12 Bridge to Broadband" Initiative – In September 2020, we joined USTelecom and our fellow member companies in the new <u>"K-12 Bridge to Broadband" initiative</u> to help deliver connectivity to households lacking highspeed broadband internet. The initiative, in collaboration with <u>EducationSuperHighway (ESH)</u>, will scale innovative solutions helping public school districts and states identify and connect students in low-income families, enabling more students to participate in remote or hybrid learning.



¹ Through 6/30/21, AT&T is waiving home internet data overage fees (does not apply to DSL) and expanding Access from AT&T eligibility for households participating in National School Lunch and Head Start Programs.

² Eligibility determined by the National Lifeline Eligibility Verifier (National Verifier), managed by the Universal Service Administration Company (USAC). For more information on eligibility criteria for the EBB visit getemergencybroadband.org.

³ Additional fees and taxes may apply.

 $^{4\ \}mathsf{Includes}; \mathsf{AL}, \mathsf{AR}, \mathsf{CA}, \mathsf{FL}, \mathsf{GA}, \mathsf{IL}, \mathsf{IN}, \mathsf{KS}, \mathsf{KY}, \mathsf{LA}, \mathsf{MI}, \mathsf{MO}, \mathsf{MS}, \mathsf{NC}, \mathsf{NV}, \mathsf{OH}, \mathsf{OK}, \mathsf{SC}, \mathsf{TN}, \mathsf{TX} \ \mathsf{and} \ \mathsf{WI}$

⁵ Selected recipients are required to agree to certain terms before receiving Internet subscriptions and wireless hotspots.

Funding Successful Broadband Projects in Your Community

Congress has made a historic commitment to broadband infrastructure deployment, presenting state and local governments with a historic opportunity to expand internet access and narrow the digital divide.

Five Pillars for Swift and Effective State Broadband Deployment

As you assess and develop plans to deploy broadband infrastructure in your community, consider the following recommendations:



I. Future-proof deployments to the extent possible

- Encourage funding for projects to deploy fiber to the premises, delivering symmetrical speeds (≥ 100/100 Mbps service), where feasible.
- Promote funding for faster speeds, including fiber deployments to ensure all people have robust service.
- Require the use of technologies capable of achieving speeds of 100/20 Mbps service.
- Remain technology neutral to allow for innovative wireless technologies that may offer greater capabilities in rural areas.



II. Utilize competitive processes, like RFPs

- Encourage participating providers to tailor proposals to a community's unique needs
- Accommodate a range of proposals, including large-scale proposals that can get service to more consumer locations both unserved and underserved most efficiently and expeditiously
- Facilitate participation by all providers, including those with the expertise, financial capability, and proven experience successfully deploying retail internet service



III. Incentivize private sector investment and innovation

- Realize the greatest taxpayer value at the least taxpayer risk.
- The private sector is best positioned financially and technically to deploy broadband efficiently, and to make ongoing investments and pro-consumer service improvements.
- The private sector has a proven track record of innovation and investment –\$1.9T since 1996 and \$79B in 2020 alone. The competitive market results in better products for consumers while prices for all speed tiers continue to drop.



IV. Rely on existing mapping resources

- Utilize limited state funds for deployment and adoption programs, not mapping.
- The FCC is implementing new, congressionally mandated broadband maps, but they may not be ready for ARPA deadlines.
- State maps will quickly be superseded by new FCC maps so using existing broadband maps, no matter how imperfect, will result in faster deployments.



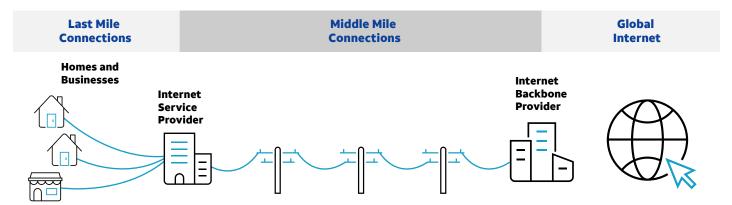
V. Overcome connectivity obstacles

- Encourage participating providers to offer programs to overcome obstacles to service adoption.
- Encourage participating providers to address affordability and adoption, consistent with the requirements of the federal requirements for the funds, in their proposals



State Broadband Funding & Middle-Mile Projects

What is middle-mile? "Middle-mile" refers to the connection between last-mile networks and the point at which internet backbone services are available. Middle-mile connections enable last-mile providers to provide internet service to their end users.



Middle-mile facilities and services are widely available – often from multiple private sector providers, driving competitive pricing of these services.

Will investment in middle-mile networks alone bridge the digital divide? No. Directing government funding to middle-mile facilities alone will likely have little effect on getting broadband to people who don't currently have it at home.

That's because "last-mile" facilities – not middle-mile facilities – typically represent the overwhelming majority of the costs of retail deployments, particularly in rural areas.

 Locations that lack adequate internet service are often in areas that are difficult to reach – whether due to terrain, remoteness, or other factors. And because deploying last-mile networks requires providers to build last-mile connections into each individual home and small business location where people will use the internet, deployment costs in these areas can run very high.

Why does it matter? Access to the internet is vital to the lives of everyday Americans. Government funding should be prioritized to last-mile deployments to get service to people who lack adequate service today.

Policy Recommendations for State Middle-Mile Funding Projects

If a state creates a middle-mile only broadband funding program, or seeks funding from the bipartisan Infrastructure Investment & Jobs Act's \$1B Middle-Mile Infrastructure Grant Program, the state should consider:

- Prioritizing areas where connections between last-mile providers and the internet do not exist or are insufficient; and
- Focusing on increasing availability and connecting existing or planned last-mile networks to the internet.

Require recipients to offer *retail* internet service to homes and small businesses, but not preclude providers from using funds on middle-mile transport. Consider these approaches:



Do not add artificial restrictions on uses of funding for middle-mile or mandate providers purchase middle-mile transport from incumbents.



Give providers discretion on how they source middle-mile transport, if needed to offer service to locations covered by grants.



Do not prejudge or limit the technical options of grant recipients, so long as they provide the retail service obligations required.



Ensure competitive processes, like RFPs – which provide inherent incentives against unreasonable proposals, are used to select grant recipients.



A BOLD PLAN FOR A CONNECTED AMERICA

Creating pathways to broadband connectivity for all Americans remains a top priority for AT&T. The National Urban League's (NUL) Lewis Latimer Plan for Digital Equity & Inclusion lays out a comprehensive plan for achieving this important goal and is a welcome and important contribution to the broadband conversation. We agree that we must leverage the tools of the information economy to create a more equitable and inclusive society.

BROADBAND AFFORDABILITY

As the Plan states, the current Lifeline framework is simply not up to the task of making broadband accessible and affordable for all Americans. The NUL Plan succeeds in sustaining Lifeline's core objectives while modernizing and building upon it through a "Lifeline+" framework, which:

- Provides a meaningful level of support to end user beneficiaries that is commensurate with today's broadband marketplace
- Disperses support directly to end user beneficiaries to maximize choice and encourage broad provider participation
- Provides a more sustainable funding source through appropriations provided directly by Congress outside
 of the broken and unsustainable USF contribution system

BROADBAND AVAILABILITY

The NUL Plan acknowledges that private capital alone is insufficient to fund all the necessary investments for building the infrastructure in low density areas. Since higher capital costs are required to reach fewer customers in these areas, the Plan recommends:

CONGRESS	Make available to the FCC sufficient appropriations to fund capital expenses necessary to deploy broadband networks to all Americans
FCC	Produce an accurate map of broadband availability
	Eliminate the ETC requirement for carriers to receive government funding
	Continue to distribute funds via competitive auctions in a technology neutral manner

BROADBAND ADOPTION & UTILIZATION

The Plan correctly acknowledges that gaps in broadband adoption and utilization stand in the way of achieving digital equity and inclusion for all. The lack of digital readiness, for example, is a significant barrier to certain population groups adopting and then fully utilizing broadband services.

Over the last several months, we have <u>laid out our thoughts</u> on how best to address the digital divide. We look forward to joining NUL in its efforts to drive us toward a more equitable and connected future.



Identifying Gaps in Broadband Adoption & Inclusion

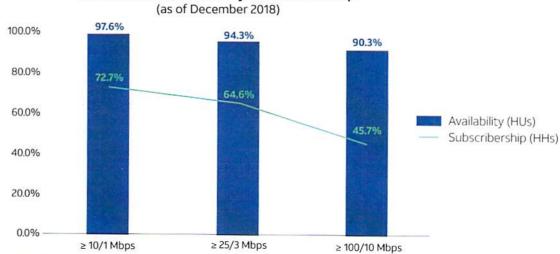
Broadband fuels jobs, education, civic engagement, economic growth, and much more. Yet, the benefits of high-speed broadband connectivity are only realized if those with access to broadband actually subscribe to the service.

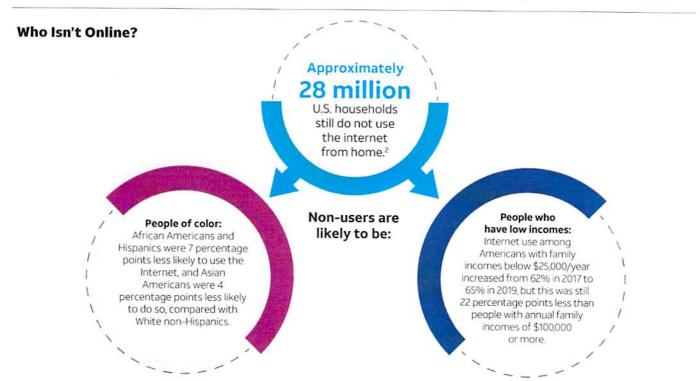
That's why, now more than ever, ensuring universal broadband access for all Americans is a critical public policy objective. That objective includes two components: broadband **availability** and broadband **adoption**.

While broadband adoption has been growing over the last two decades, there remains a significant segment of the population not subscribing to broadband, even when it is available.

Robust Broadband is Widely Available **But Not Everyone Subscribes**

Fixed Broadband Availability vs. Subscribership¹







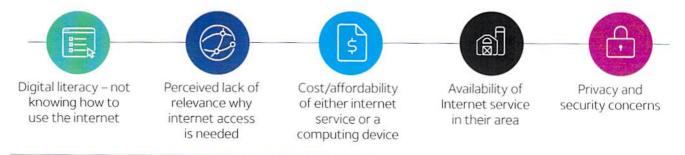
Why Aren't They Online?

Who's Not Online & Why

Don't Need or

Not Interested

Studies and surveys conducted over the last decade have identified several factors that contribute to someone not being online:



Main Reason for Not Using the Internet at Home³

18.8%

Too Expensive

2.9% Can Use Elsewhere



Privacy or

Not Available

Security Concerns

¹ Availability: CensusNBM; Adoption: FCC Internet Access Services Report 2 April 2019 NTIA Report

³ NTIA Digital Nation Data Explorer (as of November 2019)

STATE ACTIVITIES TO SUPPORT BROADBAND ACCESS

The COVID-19 pandemic provides policymakers with a unique opportunity to examine broadband by taking stock of what has worked well, what hasn't, and what action we need to take to ensure a prosperous future for all Americans. While American broadband networks have proven that they are up to the task, the COVID-19 crisis has laid bare critical shortcomings in the U.S. approach to universal service. As good as our networks are, broadband accessibility is still an issue for some American households.

Over the past decade, the FCC has worked to update its universal service programs to focus on broadband deployment, distributing financial support through reverse auction mechanisms. While the FCC is somewhat constrained by existing requirements in the Communications Act, these programs are helping participating private sector providers to bring broadband to more than 5.9 million homes and small businesses in hard-to-serve areas across the nation. AT&T specifically will have deployed high-speed broadband to 1.1 million mostly rural homes and small businesses across 18 states by the end of 2020.

But millions more Americans still lack access to broadband, and the FCC's universal service programs lack a stable and sustainable funding source to address all of them. AT&T therefore recently <u>called on Congress to take bold action</u> to modernize and reform the federal universal service programs administered by the FCC and to <u>establish a secure funding source</u> to ensure that all Americans have access to broadband connectivity.

State governments offer on-the-ground perspective in this effort, given their close proximity to their residents and communities. In particular, states are uniquely positioned to identify local barriers that impede adoption where broadband is available, and to develop needed strategies to address them. FCC data for broadband service at speeds of at least 25/3 Mbps indicate that about 94% of U.S. homes have physical access but only about 58% of households actually subscribe. Pew Research Center recently estimated that 10% of U.S. adults still do not use the internet, finding that internet non-adoption is linked to demographic variables including age, educational attainment, household income and community type. As the federal government provides the funding necessary to more accurately map broadband availability and ensure that broadband is available to all Americans through a number of existing programs, including the Connect America Fund programs, the Rural Digital Opportunity Fund, and the ReConnect program, among others, States should focus on increasing broadband adoption among non-users.

States seeking to go beyond broadband adoption programs by establishing a funding program for broadband deployment should only do so in a manner that complements federal programs and that continues to incentivize private sector investment and deployment.

- → State programs should be carefully crafted to not interfere where the market is working, nor should they replace opportunities where the market can work. Most critically, public/private partnerships should be considered in the first instance over government-owned networks to address those areas where no private sector will build.
- → A state broadband fund should be designed to get service to the most people who are unserved and likely to remain unserved, in the most cost-effective and efficient manner possible. Guiding principles:
 - Target unserved locations that are not being addressed by the private sector and are not eligible for federal government broadband funding programs. Homes that lack at least 10/1 Mbps should be prioritized.
 - Use "reverse auction" competitive bidding to award funding in a technologically-neutral manner.
 - Refrain from requiring matching dollars. They undercut the financial support provided by the state funding.
- Allow funds to be used for both capital and operational costs.
- Avoid imposing additional regulatory obligations that can disincentivize provider participation; and Appropriate state general funds to pay for any state broadband funding program.



State Strategies for Accelerating Broadband Adoption and Inclusion

While policymakers are appropriately focused on increasing the availability of broadband, it is equally important to dedicate resources towards encouraging broadband adoption or subscribership. Given their proximity to local communities, state governments – compared to the federal government – are uniquely positioned to identify local barriers to broadband adoption and articulate the linkages between broadband and jobs, education, healthcare and civic engagement in their respective states.

Developing a statewide broadband adoption plan can be a useful starting point to addressing barriers to adoption.

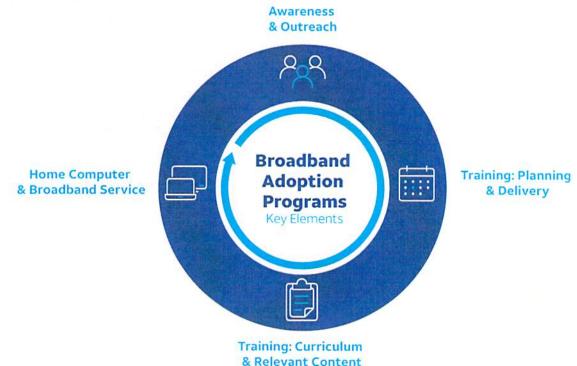
State broadband adoption planning: Just one in five states are focused on unconnected households and barriers to internet adoption through their broadband plans, task forces, commissions, or other means. Such a plan can be a useful starting point to dramatically – and cost-effectively – increase the number of households participating in the educational, health care, civic and commercial opportunities made available by internet access.

A comprehensive broadband adoption plan can include identifying best practices, highlighting case study models, and making recommendations for education and outreach.

Implementing broadband adoption programs: States can prioritize which programs to implement based on the identified barriers to adoption in a particular community, and the needs and preferences of the population that will be served. Establishing a state broadband adoption grant program that partners with non-profits, community anchor institutions and other key stakeholder would allow a state to run multiple adoption programs addressing these various barriers simultaneously.

To the extent a state does choose to establish a broadband grant program, such a program should be funded out of a general state budget, and **not** through a state USF program or other industry specific funding mechanism.

Successful <u>broadband adoption programs</u> typically incorporate the 4 key elements identified below:







Awareness & Outreach: Community outreach to demonstrate use cases for the internet, sharing information about affordable internet and device options, and promoting the availability of trainings, public computer center and other services.

• The City of Chicago coordinated an awareness campaign to increase broadband adoption in low-income neighborhoods. By placing ads on buses and rail, as well as on brochures and postcards for door-to-door outreach, the awareness campaign contributed, in part, to more than 32,000 households obtaining broadband subscriptions.2



Training: Planning & Delivery: Digital literacy training planned for maximum accessibility and approachability - a positive and supportive environment with trusted instructors.

• The Tennessee Broadband Accessibility Grant Program partners with the Tennessee State Library & Archives to administer grants of up to \$20,000 to local libraries to improve the public's digital literacy through training and access to technology.3



Training: Curriculum & Relevant Content: Curricula tailored to the audience to include basic (e.g., keyboarding or using a mouse) and/or more advanced skills training (e.g., evaluating online information; paying bills online; creating digital media).

· In Washington, public libraries are expanding their services to aid people who now have to learn to adapt to a virtual work setting. They are offering online proctoring so residents can get certified in programs like Microsoft Office, Adobe, and Quickbooks.4



Home Computer & Broadband Service: Multiple strategies, such as discounts and incentives, to make owning a computer and using a broadband connection less expensive and less intimidating.

 In North Carolina, the Broadband Infrastructure Office and the North Carolina State Library have partnered with public libraries to lend Wi-Fi hot spots to students who lack internet service at home and provide digital literacy training to students and their parents.5

AT&T does not advocate for one specific framework or model for States to use when implementing programs targeted to increasing broadband adoption. There is no "one size fits all solution". Because consumers have different reasons for not subscribing to broadband, a variety of approaches to improve adoption should be considered. Accordingly, programs should be flexible and varied enough to address all the barriers to broadband adoption and be inclusive of an array of target audiences.

By promoting policies that address the main barriers to adoption like affordability, digital literacy, and concerns of internet relevancy, states can make significant progress in closing the digital divide and realizing the benefits of broadband.

² NTIA "2013 NTIA Broadband Adoption Toolkid" 3 Pew Trusts, "How States Arc Expanding Broadband Access" 4 My Northwest, "Local libraries offering virtual job training for remote work skills"





¹ National Conference of State Legislatures, "State Broadband Task Forces, Commissions or Authorities and Other Broadband Resources"

THE ROLE OF STATES IN HELPING TO CREATE A NEW NATIONWIDE BROADBAND MAP

Policymakers – at both the Federal & State level – agree that:



Rural areas are in critical need of better broadband service.



The Federal Communication Commission's (FCC) existing broadband map is not accurate enough to precisely identify where broadband has NOT been deployed.

After years of ineffective trials, a new mapping solution was developed in 2019 and enacted by Congress in 2020. The solution, as outlined in the Broadband DATA Act, requires the FCC to take two steps: 1) create a database or "Fabric" of every broadband serviceable location in the country at the address level; and 2) require broadband providers to identify with unprecedented precision where they offer broadband and mobile service. When the two elements are combined, we will finally know, at the address level, where broadband is available and where it is not.

In December 2020, Congress appropriated funds for the development of the FCC's broadband mapping "Fabric." Through its <u>Digital Opportunity Data Collection (DODC)</u> proceeding, the FCC has established reporting rules for providers and processes to implement other elements of the DATA Act, including making the nationwide Fabric and broadband map publicly accessible, allowing inputs by other federal and state agencies, enabling challenge process by the public, and crowdsourcing.

What states can do while the FCC implements the DATA Act. Closing the digital divide is a large and complicated task that will only succeed if all parties are working cooperatively to reach the same goal. To enable consistent mapping methods across the country, states can do their part to complement the national broadband map required by the DATA Act and assist in improving its accuracy.

Based on the experience of the <u>Broadband Mapping Initiative's Pilot project</u> in Virginia and Missouri, there are several areas where states can contribute valuable information while simultaneously gaining a better understanding of broadband availability in their areas.

- As states strive to better understand broadband deployment in their local areas, they will need to identify and collect the same type of granular location-level data. To the extent any state wants to move ahead of the FCC's pace, it's important that all contributors use the same two-steps process required by the DATA Act so that state collected information is consistent with what is being collected at the Federal level. Doing so will reduce confusion when state results are compared and will prevent broadband providers from having to modify their data collection for each state.
- The accuracy of the national DATA Act map will depend upon the quality of the information used to create the Fabric. Even states waiting on the FCC's timeline can begin to identify and refine sources within their states for addresses for broadband serviceable locations to satisfy the statutory role anticipated for states to provide input into the Fabric creation process. State and local level information on land parcels, building types, tax attributes and more are critical inputs for



identifying the "broadband serviceable locations" that have/lack service. The Pilot project identified some areas where improving the quality of this underlying data would greatly assist the development of the DATA Act's Fabric.

Perhaps most importantly, remaining consistent with Federal requirements will put states in a powerful position to participate in the challenge process required by the DATA Act. The FCC is establishing the requirements for the challenge process now because it is required by the Act to allow consumers and government entities to submit information if they question the accuracy of the map and require providers to respond and update their coverage. This will be an ongoing process since the Fabric and the DATA Act map will both be living databases that are refined and improved over time. States that have a good understanding of their own on-the-ground broadband deployment situation are going to be critical to ensuring that the new DATA Act map is the tool the country needs to speed broadband deployment.

The result will be a consistent, nationwide, location-by-location database of who does, or does not, have broadband. Prior broadband maps have suffered from inconsistent reporting methods and showed only where broadband was already available. Unserved areas were marked as an empty space with no information to aid deployment or to size funding. Furthermore, the quality of data for rural areas has been particularly poor. Policymakers and carriers alike need to know where the consumers who don't have broadband are located so they can work efficiently to get them service.

To address this problem, states and federal policymakers must work on implementing the provisions of the Broadband DATA Act and the FCC rules that require the creation of a broadband serviceable location, or "Fabric," as the foundation for broadband reporting.

What's Next?

Congress <u>appropriated \$65 million</u> for the FCC to create the nationwide Fabric and implement more accurate broadband mapping. In the wake of the FCC's recent \$9 billion initiative to fund rural broadband deployment (known as the Rural Digital Opportunity Fund (RDOF) <u>Phase I auction</u>) – and with more than \$11 billion set aside for the next phase of that effort – better maps are the next critical step. Accurate maps will allow us to precisely target subsidy dollars to close any remaining rural broadband gaps. The FCC is expected to release an RFP soon to solicit vendor(s) to create the Fabric and other portals or platforms required by the DATA Act.





EMERGENCY BROADBAND BENEFIT

The Emergency Broadband Benefit is an FCC program to help households struggling to pay for internet service during the pandemic. This new benefit will connect eligible households to jobs, critical healthcare services, and virtual classrooms.

Who Is Eligible?

A household is eligible if one member of the household:

- Qualifies for the Lifeline program;
- Receives benefits under the free and reduced-price school lunch program or the school breakfast program, including through the USDA Community Eligibility Provision, or did so in the 2019-2020 school year;
- Received a Federal Pell Grant during the current award year;
- Experienced a substantial loss of income since
 February 29, 2020 and the household had a total income in 2020 below \$99,000 for single filers and \$198,000 for joint filers; or
- Meets the eligibility criteria for a participating providers' existing low-income or COVID-19 program.

To learn more, contact us: www.cvalley.net/ebb 660.395.9000



BROADBAND BENEFIT

PTO PER MO PER MO ** Towards Broadband Service

PLUS Get a one-time discount \$100*

to purchase a tablet

To learn more, contact us: www.cvalley.net/ebb

imited to one monthly service discount and one device discount per eligible household. Device discount requires a \$10 minimum contribution toward the purchase price. This program is not administered by Chariton Valley and is subject to availability of funds.





STATS

- Incorporated in 1952
- Headquarters Macon, MO
- 95 Employees
- 3,000+ Fiber Miles Deployed
- 73 Cell Tower Locations
- Smart Rural Communities Showcase Award Winner
- Recognized by NTCA as a Gig-Certified Provider
- 12,000+ Fiber Customers
- Connect America Fund Phase II Recipient

communications

Expanding our fiber network daily

- 70 years in the telecommunications industry
- Voice, internet, streaming video and fiber connectivity
- * First in Missouri to provide fiber-to-the-home (FTTH) services throughout a community

together. Advanced HPBX system integrated with your network and staff

providing superior HD call quality, video conferencing and mobile phone applications that tie your business with customers. There is an urgent need for rural broadband expansion.

BUSINESS COMMUNICATIONS SOLUTIONS

RURAL REACH

Chariton Valley is actively adding connections in the following counties: Boone, Carroll, Chariton, Linn, Macon, Marion, Ralls, Randolph and Shelby

VISION:

To provide premier services to enhance opportunities for rural communities.

Go Further....Go Faster... GO FIBER!

2552 • 660 395 9000 • cvallev.net • customercare@cvalley.net

Economic Development



"It is imperative that the connectivity issue be resolved to allow for additional remote working, online/virtual schooling, and additional telehealth opportunities. Chariton Valley is leading the way in Northeast Missouri for Fiber build-out."

Corey Mehaffy, Executive Director of Hannibal Regional Economic Development Council



"Broadband service is very near the top of the list of requirements for the business expansion and recruitment. One of our largest employers is an information technology company, Onshore Outsourcing, employing near 230 people. Job / investment retention, expansion, and recruitment is dependent on many factors; workforce development, education, tourism, and quality of life to name a few and affordable and reliable broadband service plays a key part in all of these areas."

Sue Goulder, Macon Economic Developer Director



"Access to high speed, fiber optic supplied internet service is a key component in the decision-making process for local companies expanding and attracting new business investment from outside the community."

David Gaines, Managing Director of Goldstone Consulting Group

Agricultural Technology



"Carroll Family Farms really appreciate the personal attention from our representative Tim and Chariton Valley's great services. We utilize Chariton Valley wireless for immediate communication, to power the iPads in our machinery so we can be sure we always have up-to-date information, and to run our Arlo cameras to protect against vandalism and theft."

E.W. Carroll, Carroll Family Farms

Education



"The Monroe City R-1 School district has partnered with Chariton Valley to enhance alternative classroom delivery with much success through these trying times. The team of professionals at Chariton Valley has led a collaboration that has allowed our district to operate worry free about connectivity concerns. Our team presented our issues and they answered! The Monroe City Panthers are proud partners in education with Chariton Valley."

Tony DeGrave, Monroe City R-1 School District Superintendent







Small Provider Category



What are Lift Zones?

Comcast announced a multiyear program to launch more than 1,000 WiFi-connected "Lift Zones" in community centers nationwide to help students get online, participate in distance learning, and do their homework.



The COVID-19 crisis has put many low-income students at risk of being left behind and has accelerated the need for comprehensive digital equity and Internet adoption programs to support them. Lift Zones are intended to help those students who, for a variety of reasons, may be unable to connect to distance learning at home, or who just want another place in which to study.



This initiative will provide free hotspot connectivity, and also access to hundreds of hours of educational and digital skills content to help families and site coordinators navigate online learning. Lift Zones complement Comcast's Internet Essentials program, which, since 2011, has helped connect more than 8 million low-income people to the Internet at home. The Lift Zones initiative comes on the heels of Comcast's recent launch of its new "Internet Essentials Partnership Program," which focuses on enabling cities, school districts, and communitybased organizations to connect large numbers of low-income students to the Internet at home to support distance learning.





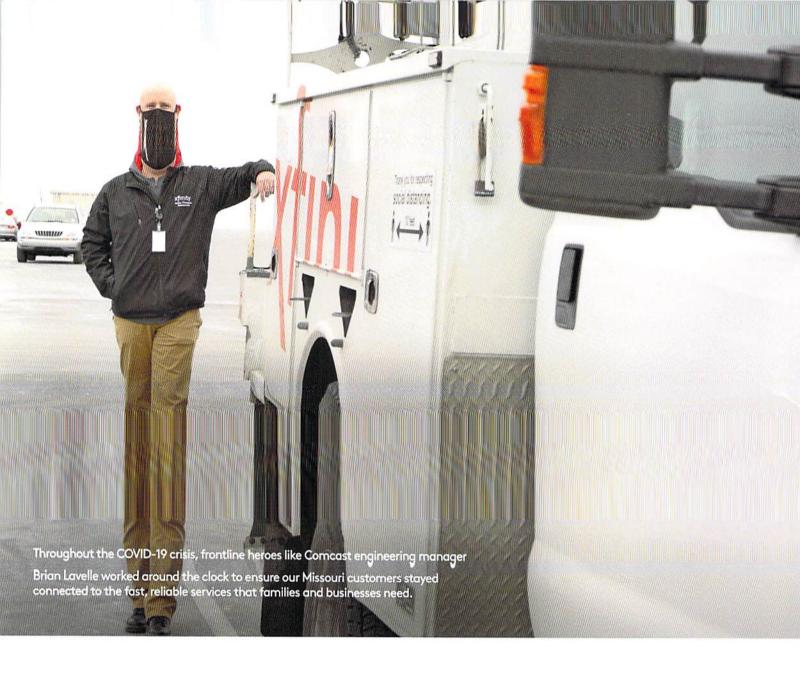


MISSOILPI

2021

State Investment Report

Since 2011, Comcast's Internet Essentials program has opened possibilities for everyone by widening access to digital technology. In the last 10 years, Comcast has connected 16,000 low-income Missouri residents from 4,000 households to low-cost, high-speed Internet at home.



\$123.4 million

We invested \$123.4 million in Missouri, including capital expenditures, employee wages and benefits, taxes and fees, and charitable giving in the last three years.

ECONOMIC ENGINE

Through innovation and investment, we are proud to drive economic growth and opportunity.

At Comcast NBCUniversal, we are proud to make a significant economic impact on Missouri. This investment starts with our workforce through competitive pay, benefits, training, flexible working arrangements, and 2020 Family Care PTO during the COVID-19 pandemic.

\$50.1M

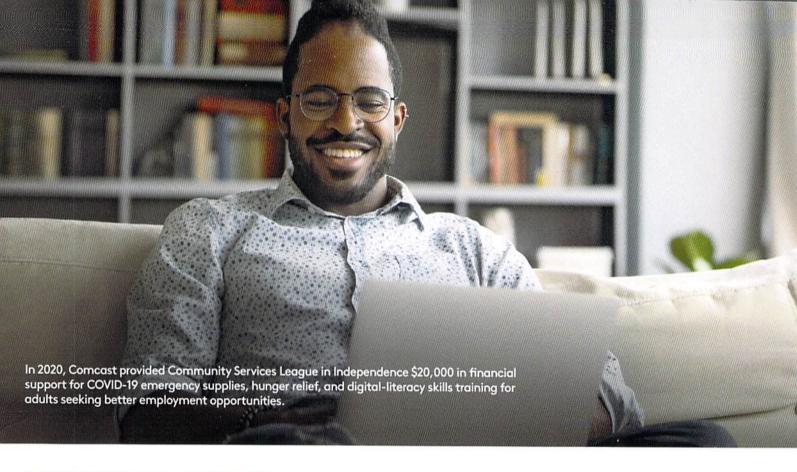
Technology and infrastructure investments in Missouri in the last three years, including upgrades to our broadband network.

\$50.2M

Invested in payroll, benefits, and training for our Missouri workforce in the last three years.

\$22.6M

Taxes, fees, and permits paid to and collected for Missouri state and local governments in the last three years.



COMMUNITY IMPACT

We are committed to creating equitable pathways to success in an increasingly digital world.

\$555,100

Total cash and in-kind charitable contributions invested in Missouri nonprofits in the last three years, including COVID-19 relief efforts valued at more than \$50,000.

16,000

Cumulative low-income Missouri residents in 4,000 homes connected to the Internet through Internet Essentials since 2011.

NETWORK RESILIENCE AND IMPACT

We are building a powerful network with a simple purpose: always keep our customers connected.

We make continuous strategic investments in building broadband network capacity to stay ahead of demand — effectively doubling our capacity every 2.5 years. In 2020 — when we saw an unprecedented 38% increase in peak downstream traffic over 2019 levels — our secure, reliable network kept families, students, and workers connected.

164,800

Missouri homes and businesses have access to Xfinity and Comcast Business products and services.

2,900

Public Xfinity WiFi
Hotspots are available
to Comcast customers
statewide, and have
been open to everyone
in Missouri for free
during COVID-19.

BUSINES

Comcast NBCUniversal is proud to serve Missouri.

We are dedicated to further strengthening our network, accelerating digital equity, and generating continued economic impact in Missouri.

xfinity



ComcastCorporation.com

Those with hanks then Witnesser Medal from

thread on end of year 2020 information

Stream. Game. Learn. Teach. Work. Faster.

Fast, reliable internet.

1 Gig gives you download speeds up to 10x faster and upload speeds up to 86x faster than the average speeds you get from cable internet. 2 Gig takes those download speeds up a whole gigabit. And our 2 Gig plan includes the very latest wireless standard available. Wi-Fi 6.

None of the nonsense.

No data caps, no annual contracts, and no hidden fees. Just really good, really fast internet. It's that simple.

Internet you can trust.

With a fiber optic network that was built for the internet, you'll have (way) fewer outages than you'd get with cable. And you won't have to compete with your neighbors for a connection.



Google Fiber 1 Gig: \$70/month*
Google Fiber 2 Gig: \$100/month*

Let's talk about your internet.



Call us. +1 (833) 813-5283



Email or chat us. google.com/fiber/mybuilding

^{*}Terms and Conditions: Plus taxes and fees. Service not available in all areas. If you live in an apartment or condo, Google Fiber's ability to construct and provide Fiber is subject to the continued agreement between Google Fiber and the property owner. Upload/download speed and device streaming claims are based on maximum wired speeds. Actual Internet speeds are not guaranteed and may vary based on factors such as hardware and software limitations, latency, packet loss, etc. Go to google.com/fiber for more information.



Broadband internet for \$15/month*

Plan overview

- Broadband internet is a plan for residents in neighborhoods with low rates of internet connectivity.
- For \$15/month," residents in these neighborhoods will be automatically eligible to sign up for Broadband internet with up to 25 Mbps upload and download speeds. That's fast enough to make video calls and stream HD content.
- There's no application process, no contracts, no equipment rental, no data caps, and no construction or installation fees.

To see if you're eligible, check your address at google.com/fiber/broadband

Key benefits

For students and their parents

With the internet at home, students can finish homework, watch educational videos, and even learn to code.

For connecting with loved ones

Whether you're video chatting with friends, uploading photos for family, or just sharing the latest YouTube video, Broadband internet lets you stay connected to what matters.

For job seekers

Access to the web makes it possible to create resumes, do employment searches, and apply for jobs from home.



How we determine eligibility and coverage areas

We believe that more people should have access to fast internet. We are auto-qualifying residents for the Broadband plan in low connectivity areas we serve, determined using publicly available data from the U.S. Census and Federal Communications Commission (FCC). Visit our website to see other options available in your area.



Questions to Google Fiber

- > Take rates
- > Network capacity
- > Average speeds on existing network
- > Redundancies on existing network
- > Summary of Planning to increase future take rates
- > Counties served today/counties planning to serve
- > Federal funds accepted/status of deployment
- > State funds accepted/status of deployment
- > Length of construction delays, if any
- > Length of back orders of materials, if any
- > Current advertising materials

Google Fiber Answers (via Ariane Schaffer)

Thank you for the opportunity to testify in August. Please see our responses to your questions below and don't hesitate to reach out if you or others have additional questions.

Take rates

- We don't share our take rates publicly, but we've been very pleased with customer response. In the Kansas City market specifically, they are very strong for a nonincumbent provider.
- Network capacity & Redundancies on existing network
 - Our network is built to be redundant and to handle fluctuations in demand. Because
 we are a fully fiber network, we had plenty of excess capacity in our network, even
 when so many people started working from home during the pandemic.
- Average speeds on existing network
 - Our flagship product offering is 1Gig symmetrical and we began offering 2Gig in the state earlier this year, with plans to continue pushing boundaries and increasing speeds in the State of Missouri, and across the country.
- Summary of Planning to increase future take rates
 - We have an ongoing marketing effort in all of our markets to make sure people know about the services Google Fiber offers.
- Counties served today
 - Jackson County
- Kansas City, MO
- Raytown, MO
- Lee's Summit, MO (and Cass County)
- Grandview, MO
- Cass County
 - Raymore, MO
- Clay County
 - Gladstone, MO
- Platte County
 - Weatherby Lake, MO
- Federal funds accepted/status of deployment

- None to date
- State funds accepted/status of deployment
 - None to date
- Length of construction delays or back orders of materials, if any
 - With diligent planning, we've been able to keep our projects on track from both a materials and construction resourcing perspective.
- Advertising materials attached



ATTORNEY GENERAL OF MISSOURI ERIC SCHMITT

Honorable Jessica Rosenworcel, Acting Chairwoman Federal Communications Commission 445 12 Street S.W. Washington D.C. 20554

Acting Chairwoman Rosenworcel:

Access to quality, high-speed internet has never been more important than it is today. Many Missourians still face a digital divide that holds our state back, as a lack of reliable broadband services burdens and marginalizes many of our poorest residents while digital commerce and education become increasingly important.

While I commend the Federal Communications Commission's work to expand broadband by hosting the Rural Digital Opportunity Fund (RDOF) auctions, many problems still exist with bidders overpromising and under delivering, which directly hurts Missourians. It is imperative that the Commission reevaluate the process by which bids are accepted and awarded, specifically to providers who are unable to meet their obligation.

In Missouri we have seen bidders, such as LTD Broadband LLC, erroneously awarded RDOF funding, only to discover they are not capable of delivering the services they had promised. Under the current process, these funds awarded are withdrawn and as a result Missourians are left waiting for the next cycle of funding further exacerbating the digital divide in our state.

We must not continue this delay which leaves rural Missourians behind. Instead of withdrawing dollars awarded to regions of our state and punishing rural Missourians for a bidders' overpromises, I ask that you please consider awarding the vital dollars to another bidder who is capable of delivering the broadband services our state desperately needs. It is critical that we reward these dollars immediately and cause no further delays in this process.

Thank you for your attention to this important matter and for your work to expand broadband services to Missourians who desperately need it.

Sincerely,

Eric S. Schmitt

Missouri Attorney General

Supreme Court Building

207 W. High Street P.O. Box 899 Jefferson City, MO 65102 Phone: (573) 751-3321 Fax: (573) 751-0774

www.ago.mo.gov

Thank you for the opportunity to speak with the Broadband Development Committee today. We are very passionate about brining fast, reliable broadband to rural areas that have been lacking for far too long. We have independently grown to be one of the largest providers in the country because we are so dedicated to bridging the broadband gap. Without any other background than the questions below that I believe I answered for the committee I guess I didn't realize or have the correct expectation for the hearing.

Due to the nature of the Rural Digital Opportunity Fund's (RDOF) funding process in conjunction with other grant opportunities available it is relatively difficult to forecast timelines for the project. Our shovels will be in the ground and bucket trucks will be in the air likely before funding even occurs as we will absolutely invest ourselves a great deal in this project and want to get started as soon as possible. We are excited to bring fiber to the home in some of the most rural parts of Missouri where each location we install will have access to the fastest speeds available in the entire country.

I want to note that in the State of Missouri as well as every other RDOF location we were awarded will have fiber to the home where they are able to get up to 1 Gig internet speeds.

We want you to think of us as assets and a solution to a problem so if you or any Representatives have any questions we can answer we are more than happy to do so.

Haley Tollefson

LTD Broadband
haleytollefson@ltdbroadband.com
507-369-6669

MEXTLINK INTERNET & PHONE

WHO WE ARE

Nextlink Internet was founded in 2012 in Hudson Oaks, TX. Since then, we've grown to over 850 employees in size and we serve over 75,000 subscribers across Texas, Oklahoma, Kansas, Nebraska, Iowa, and Illinois.

We operate a fully IP-based, carrier class network from core to edge for high reliability. Our hybrid approach of rich fiber & wireless assets enables our rapid deployment of 100+ Mbps Internet speeds to homes across our footprint.

SUPPORTING COMMUNITIES

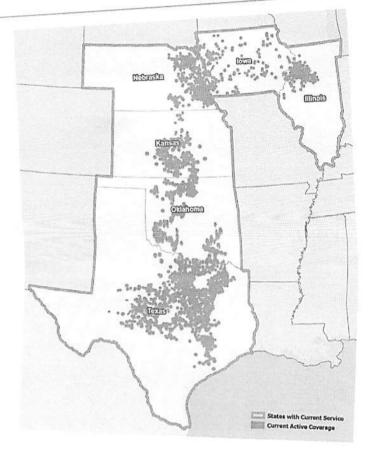
We've partnered with the Emergency Broadband Benefit Program (EBBP) which offers \$50 off monthly Internet plans as well as a personal computing device for \$50 to eligible customers.

Additionally, we are one of the top E-rate Providers serving over 100 school districts, libraries, and rural hospitals.

INVESTING OVER \$1 BILLION IN RURAL MARKETS

We are the largest Winner of CAF2 Funding of \$281m to serve 100,000 households and the 5th Largest Winner of RDOF Funding of \$429m to serve 206,000 households.

Our rapid growth has resulted in opening 23 new field offices in last 18 months. And we've put a focus on hiring locally so that we can continue to give back to the communities we serve.



THE AMERICAN RESCUE PLAN ACT

We partner with counties to put ARP funds to work to build broadband infrastructure to serve homes, schools, first responders, healthcare facilities and more. These efforts help to improve broadband quality and availability.

We focus on the Heartland and our expertise is rural and suburban broadband. We are Nextlink Internet.

> opportunities@team.nxlink.com nextlinkinternet.com | 855-698-5465



OTHER WAYS WE SERVE

FIXED WIRELESS

At Nextlink, customer service is our #1 priority and we uphold this by:

- · Utilization reviews to evaluate our network
- Not over selling our towers
- Our Tower Acquisition Team manages and acquires towers to expand our network and supplement highly occupied towers
- Updating technology on our towers for better quality of service, connectivity, and higher speeds
- Multiple data centers for redundancy
- Ensuring low latency with fiber paths between towers

POSITIVE REVIEWS FROM OUR CUSTOMERS

We proudly boast a 4.8 star rating on Google and are an accredited member of the Better Business Bureau with an A+ rating.





FIBER TO THE HOME

We know that developers are tired of being told, "we will do phase 1 but not phase 2." That is why Nextlink will never leave a developer high and dry with no option for their home buyers. We believe, "where there is a will, there is a way" to make it happen. Nextlink has that will

At Nextlink, we are committed to providing fast, reliable solutions that developers and communities can count on. We have deployed many successful fiber housing developments as well as whole-city builds including Hudson Oaks and Lampasas, TX.

We are currently building fiber to over 35,000 homes. Our fiber crews are ready to deploy today with our always growing fleet of boring drills, bucket trucks and more.

Our in-house engineers design and deploy these projects quickly as a turn-key solution. We are currently working with multiple EDC's, developers, electric co-op's, and cities.











opportunities@team.nxlink.com nextlinkinternet.com | 855-698-5465





INTERNET & PHONE

WHY CHOOSE NEXTLINK FIBER?

FIBER OPTIC NETWORK

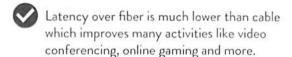
COAXIAL CABLE NETWORK

SPEED



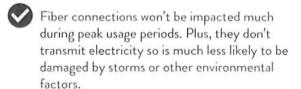
Cable networks typically have low upload speeds and cannot provide 1Gig symmetrical speeds.

LATENCY



Latency is much higher on cable. This means that you could experience delays during zoom meetings, online chatting, gaming and more.

RELIABILITY



Cable connections may become bogged down during peak usage hours your speeds could be noticeably slower than usual. Cable can also be effected by environmental factors such as storms and high-voltage equipment.

DISTANCE



Data can be sent much farther over a fiber network than a cable one.

Internet speeds over cable will degrade the farther they have to travel.

FUTURE PROOF



Fiber networks are capable of speeds much higher than they currently provide. This will ensure that no matter what new program you run or device you buy, you will always have a connection that can support it. Cable networks have many limitations compared to fiber. Many telecom providers are deploying more fiber than cable so that they can meet the future demands of their network and customers.

At Nextlink, we deliver on our promises. Our teams are 100% dedicated to bringing fiber to your community, on time, and will not back out at the last minute while a phase is in development.









THE PREFERRED PROVIDER

Fiber communities provide their residents with the speed and reliability they need in today's world. And the Nextlink connection doesn't end at just Internet, we're dedicated to being there for our customers when they need us.













We've completed whole city builds making Lampasas and Hudson Oaks Gigabit Cities.



We partner with some of the top builders and developers in the area to bring fiber speed and reliability to their communities. We've connected over 6,000 community doors to fiber and have another 45,000 underway.

HARRIS BROTHERS

















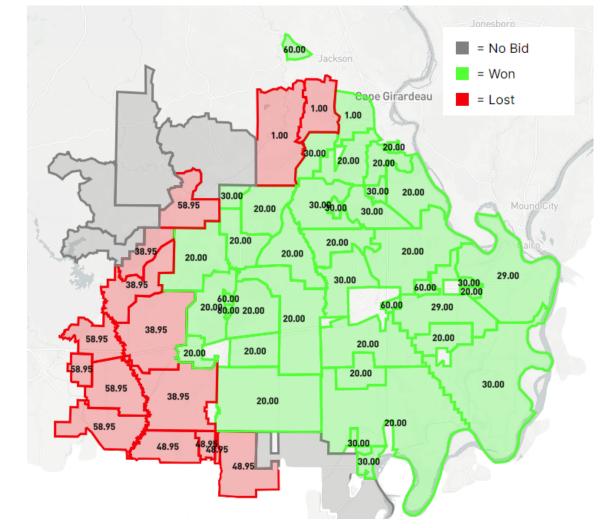
RDOF Potential: \$66.3 million RDOF Result: \$8 million

The Rural Digital Opportunity Fund (RDOF) auction was the Federal Communication Commission's (FCC) next step in bridging the digital divide for SEMO Electric Cooperative and its neighbors.

However, certain companies were allowed to bid beyond their capacity. \$58.3 million of funding opportunity was lost for SEMO Electric to expand its 100% fiber network (when fiber is used throughout the network and fiber is run inside the home or building, which means there is no loss of speed or capacity over the last mile).

The fundamental obligation for winning bidders is to build networks capable of delivering Gigabit service (broadband service with up to gigabit-per-second upload and download speeds). It's the future of internet connectivity in the home. These companies took money from southeast Missouri by bidding low in order to win cash from the FCC. Will these companies build a 100% fiber network to help make people's lives better with fiber-fast internet?

Unless remedied by the FCC, these errors will be devastating to rural communities in southeast Missouri where broadband services are needed.



The areas above are census block groups as assigned by the Federal Communication Commission (FCC) for the Rural Digital Opportunity Fund (RDOF) auction that are relevant to SEMO Electric Cooperative.

SEMO Electric won RDOF funding in the green areas. Each number represents the percentage of potential funds that was awarded. For example, 20.00 (%) of 100.00 (%) - meaning other bidders drove down funding by 80%. The green areas represent most of SEMO Electric's existing service territory. The green areas will require a total investment of \$57,500,000 million to build a 100% fiber network. That's \$23,000 per mile.

SEMO Electric lost the red areas to other bidders as the funding percentage was not adequate to build a 100% fiber network. The number represents where SEMO Electric stopped its bidding. The red areas represent expansion zones where SEMO Electric wanted to expand its 100% fiber network. The red areas were mostly won by wireless carriers, who bid beyond today's capacity of wireless technology to provide Gigabit service. All winning bidders must meet periodic buildout requirements that will require them to reach all assigned locations by the end of the sixth year.

WE'RE HERE TO HELP

Subscribers have access to technical support 24 hours a day, 365 days a year.

Call to talk with a technical support representative.

For billing and account questions, call from 8:00 am to 5:00 pm Monday through Friday.

417.851.1107

TOTAL HIGHSPEED



FIBER



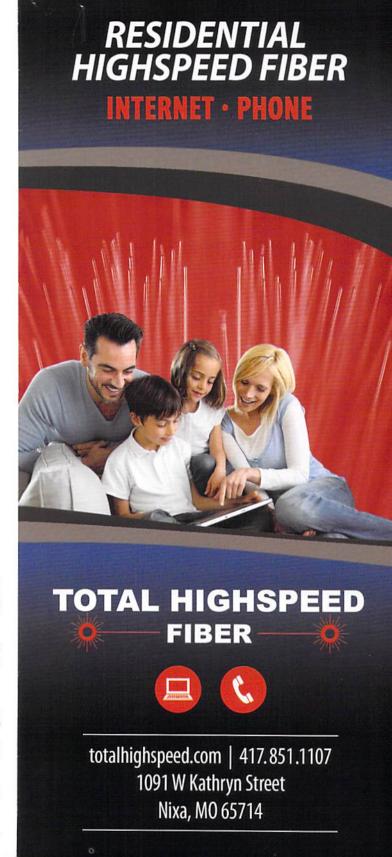


Internet

Gigabit is a maximum capacity. Speed is likely to be slower because transport overhead and other locations on the internet are not yet gigabit capable. Very few wireless routers support gigabit connection speeds. Gigabit speeds are "best-effort" and not guaranteed. Speeds in the 700 to 900 mbps range are most common on Gigabit tier.

All business services come with priority after-hours support and one free static IP address (if requested). For additional details on business services available, see totalhighspeed.com for details. Prices do not include applicable fees or taxes.

Unlimited local and long-distance telephone service included the entire United States and Canada. Phone subscribers also receive 100 free minutes each month for each of the following countries: Dominican Republic, Bahamas, U.S. Virgin Islands, Puerto Rico, and Guam. Mexico and international calling plans are available for additional cost. Calls to cellular phones are not included in Mexico or International calling plans, so they will incur a per minute charge. Additional services available for additional cost. Each additional line is \$25/residential & \$35/business. Taxes, regulatory, and/or local government franchise fees apply.



INTERNET

 Principal Fiber 100 100 Mbps 	\$55.00
• Professional Fiber 300 300 Mbps	\$75.00
• Pinnacle Fiber 1,000	\$95.00

^{*}Includes everything you need to get going

Unlimited Data Usage in Every Package!*2 year contract

TELEPHONE

Total Highspeed telephone is crystal clear and affordable. We offer unlimited local and long distance calling and because we use the latest fiber technology, you can rely on the best quality of service.

Keep your same number.

Just a one time activation fee of \$9.95.

Phone Service Outside of Bundle Offer: \$39.95

As part of your Total Highspeed phone service, you receive standard features including three-way calling, call forwarding, call waiting, & voicemail, as well as:

- Caller ID Name
- Unpublished Listing
- Remote Access to Call Forwarding
- Sim Ring

- Call Return
- Anonymous Call Reject
- Caller ID Name/ Number Blocking

We have a more flexible User Portal which allows you to make changes to your phone service at anytime!

CALL TODAY TO PLACE YOUR ORDER: 417.851.1107

WHAT YOU CAN DO WITH IT

Principal Fiber 100

Great for multiple streaming services & several devices being online Netflix, Hulu, Amazon Prime Video, Ring, Nest

Professional Fiber 300

Great for working from home & multiple online gaming consoles being played at the same time (Xbox, PS4, CPU gaming, etc)

Pinnacle Fiber 1Gig

Great for doing all of the things on the internet

Why Choose Total Highspeed?

Total Highspeed is a locally owned and operated Internet Service Provider (ISP). With our main office located in Nixa, Missouri. We offer a state of the art Fiber Optic to the Home (FTTH) for southwest Missouri. We have our support and staff that comprises of some of the most intelligent and knowledgeable personnel in the field.

BUNDLE PLANS

Available for first time customers only

• Principal Fiber 100	\$80.00 \$100.00
• Professional Fiber 300 300 Mbps	
• Pinnacle Fiber 1,000	\$120.00

*All plans include phone & modem

1 Gbps

^{*}Bundle plans available



A connected community is possible and the benefits of having truly reliable, fiber-fast internet available for local homes and businesses is within reach. Count on Kinetic to be your broadband deployment partner.



The time is now.

Several government programs provide funding for state, municipal, and community-based broadband infrastructure. We can help you explore these programs and navigate the process if funds are available in your area.

The future is fiber.

All connections are not all equal. Fiber connectivity is the fastest and most reliable technology. As your community grows, and demand inevitably increases, fiber is how you will stay ahead. Kinetic has proven it in community after community – big and small – urban and rural.

Count on Kinetic.

No one is more experienced in deploying fiber-fast connectivity to communities across the country. Kinetic has participated in many state and federal network expansion programs and we have a strong track record of meeting our commitments.













FACT: The need for fiber broadband is more important than ever, especially in areas that have historically lagged due to geographic and economic deployment barriers.

Count on Kinetic: We are pursuing our own \$2 billion fiber deployment strategy to expand gigabit internet service in rural America. Additionally, we are seeking partnerships with local communities so that we can deploy fiber deeper into our network and connect even more customers to future-proof broadband solutions.

FACT: Public and private sectors can bring unique yet complementary advantages to the broadband deployment effort.

Count on Kinetic: Public funds are almost always necessary to deploy fiber in remote areas that would otherwise be uneconomic to serve. However, as a private entity, Kinetic brings existing network infrastructure, engineering design, construction management and operational expertise to deployment projects. Kinetic's community engagement initiative is all about bringing the strengths of public and private sectors together to achieve real results for your community.

FACT: Broadband infrastructure is a key enabler for communities to access education and health care, provide remote work opportunities, and enhance economic development.

Count on Kinetic: To help communities achieve their objectives, we are engaging local leaders to better understand the needs of their communities and communicate the capabilities of Kinetic. At Kinetic, we firmly believe that together we can do more.



4001 North Rodney Parham Road Little Rock, Arkansas 72212

Tony Thomas

President & Chief Executive Officer

501.748.7821 tony.thomas@windstream.com



November 15, 2021

The Honorable Louis Riggs
Missouri House of Representatives
Chairman, Special Interim Committee on Broadband Development
201 West Capitol Avenue, Room 111
Jefferson City, MO 65101
Louis.Riggs@house.mo.gov

Dear Chairman Riggs:

The need for robust broadband connectivity for all Missourians, including those in rural areas, has never been more critical than today. The COVID-19 pandemic clearly highlighted the importance of broadband as large sections of the workforce transitioned to working from home, students shifted to virtual classrooms and individuals increasingly interacted with their doctors online. I want to thank you for your efforts to highlight this important topic as Chair of the House's Special Interim Committee on Broadband Development.

We collectively have a once-in-a-generation opportunity to build broadband infrastructure to the highest cost areas that are unserved or underserved, and it is important that we move expeditiously. At Windstream, we are pursuing our own \$2 billion fiber deployment strategy to expand our Kinetic gigabit internet service in Missouri and other states. However, public funding is essential to close the digital divide in sparsely populated rural areas where there is no economically feasible business case.

Windstream today provides its Kinetic broadband service to approximately 1.1 million customers in 18 states. In Missouri, we serve approximately 70,000 locations across the state, including the areas of Bolivar, Doniphan, Dixon and Gallatin. Broadband service of 25 Mbps/3 Mbps is available to approximately 60 percent of these locations. Obviously, there is still work to be done, and we are eager to partner with the state to expand broadband availability in unserved and underserved areas.

When developing a statewide broadband plan, we urge you to use federal resources to fund fiber construction projects for broadband expansion and leverage the expertise and network infrastructure of established broadband providers.

Windstream has made significant investments in the transport and middle-mile sections of its network. The challenge we face today in expanding broadband availability is building fiber to customers on the last mile of the network due to small population density that is scattered across remote areas.

Additionally, we firmly believe fiber broadband service rather than fixed wireless is the best long-term solution for Missouri. Fiber is simply a superior technology for only modest, if any,

November 15, 2021 Page 2

incremental cost. Fixed wireless solutions will not meet the future needs of consumers and will have to be replaced with fiber in the future.

As the Fiber Broadband Association noted in a recent whitepaper, which is attached, "For this reason, as the 'do it once, do it right' option, fiber continues to be the answer to meet long-term residential and business bandwidth requirements."

Lastly, state broadband expansion programs should leverage the extensive network investments by established broadband providers. Windstream has deep experience deploying fiber-fast connectivity to rural communities across the country. We have participated in many state and federal network expansion programs, and we have a strong track record of meeting our commitments.

As you know, Missouri's rural communities cannot afford to be left behind as education, healthcare and business are increasingly conducted online. Each day that passes without funding critical broadband projects represents lost opportunities for Missourians. Windstream looks forward to working with the state of Missouri to expand broadband access and build a brighter future for its citizens.

Thank you again for your leadership in this important area. My team and I are available to further discuss if needed.

Sincerely,

Tony Thomas
President & CEO

cc: Members of the Special Interim Committee on Broadband Development

ID		NAME	ST_ABBREV
		Clay County	AR
		Greene County	AR
		Alexander County	IL
		Bond County	IL
		Calhoun County	IL
		Clinton County	IL
		Fayette County	IL
		Franklin County	IL
		Gallatin County	IL
		Greene County	IL
		Hamilton County	IL
		Jackson County	IL
		Jefferson County	IL
		Jersey County	IL
		Johnson County	IL
	17119	Madison County	IL
	17121	Marion County	IL
	17127	Massac County	IL
	17133	Monroe County	IL
	17135	Montgomery County	IL
	17145	Perry County	IL
	17151	Pope County	IL
	17153	Pulaski County	IL
	17157	Randolph County	IL
	17163	St. Clair County	IL
	17165	Saline County	IL
	17181	Union County	IL
	17189	Washington County	IL
	17191	Wayne County	IL
	17193	White County	IL
	17199	Williamson County	IL
	18129	Posey County	IN
	20021	Cherokee County	KS
	20037	Crawford County	KS
	20045	Douglas County	KS
	20059	Franklin County	KS
	20091	Johnson County	KS
	20099	Labette County	KS
	20103	Leavenworth County	KS
	20121	Miami County	KS
		Wyandotte County	KS
		Ballard County	KY
		Barry County	МО
		Barton County	MO
		Bates County	MO
		Benton County	MO
		Bollinger County	MO
		Buchanan County	MO
		230,	-

	Camden County	MO
	Cape Girardeau County	MO
	Cass County	MO
	Christian County	MO
	Clay County	MO
29049	Clinton County	MO
29051	Cole County	MO
29053	Cooper County	MO
29057	Dade County	MO
29059	Dallas County	MO
29071	Franklin County	MO
29073	Gasconade County	MO
29077	Greene County	MO
29093	Iron County	MO
29095	Jackson County	MO
29097	Jasper County	MO
29099	Jefferson County	MO
29101	Johnson County	MO
29105	Laclede County	MO
29107	Lafayette County	MO
29109	Lawrence County	MO
29113	Lincoln County	MO
29125	Maries County	MO
29131	Miller County	MO
29133	Mississippi County	MO
29141	Morgan County	MO
29145	Newton County	MO
29151	Osage County	MO
29157	Perry County	MO
29159	Pettis County	MO
29163	Pike County	MO
29165	Platte County	MO
29177	Ray County	MO
29183	St. Charles County	MO
29186	Ste. Genevieve County	MO
29187	St. Francois County	MO
29189	St. Louis County	MO
29195	Saline County	MO
29219	Warren County	MO
29221	Washington County	MO
29225	Webster County	MO
29510	St. Louis city	MO
40035	Craig County	OK
40105	Nowata County	ОК
40115	Ottawa County	OK

Wisper

Take Rate:

- Anything outside an urban area based on the Census definition of an urban area linked
 - here: https://www.arcgis.com/home/item.html?id=432bb9246fdd467c8813 https://www.arcgis.com/home/item.htm
- There are approximately 200K addresses under our service footprint that are non-urban
- We have approximately 20K customers including EasyNet
- With these assumptions and numbers in mind, that would yield about a 10% take rate.

Funding:

CAF Federal funds rec'd staring Feb 2020 thru Aug 2021 = 19 @ \$1,835,994.79/month = \$34,883,901.01.

Inventory:

Depends on the Manufacturer, it can range from 4-20 weeks, if we're talking about an average it's 8 weeks < length of order on materials

Marketing Plan For Future Take Rates

Rinse & Repeat

The Wisper Marketing team has put together and implemented a monthly Rinse & Repeat plan for every tower release. This includes marketing strategies from the pre-marketing to when the tower is live. These strategies include:

Connecting with locals/boots on the ground

- o Essential worker appreciation
- Yard signs
- Door hangers
- Fliers to local businesses

Market Research

- Overall analysis on the area
- Customer demographics
- o Competitors, their speeds and prices
- Market saturation
- o General market data

Local businesses

- Listing and contacting them.
- o Maintaining a database for local businesses for all the areas we go to.

LinkedIn

- o Finding local leaders in the areas we are going to and connecting with them
- o Reaching out to them with our press release
- o Extending Wisper's online reach by sharing our page's content for our network to see.

❖ Social Media

- o Facebook Ads
- o "Coming soon" posts:
 - Facebook
 - Instagram
 - LinkedIn
 - Twitter
- Posts on local Facebook swap sites

Contacting leads/customer base

- o Direct Mailers
- Mass Texting
- Email blasts

❖ News/Media

- o Press Releases
- Ads in Local News Papers
- o LinkedIn messages to members of local news stations
- Contacting local news stations

Other Post-Conversation strategies include:

Refer a friend note cards/calls

- Email series
- Local sponsorships
- Taking part in local festivals/events
- Returning boots on the ground team
- Customer testimonials to post on socials
- o Follow-up LinkedIn and Local Business messaging

2021 Marketing Campaigns

Beyond the Rinse & Repeat strategies, marketing also puts together local campaigns throughout the year. Listed below are the upcoming events the marketing team has planned:

September:

o September 22nd: Wisper Customer appreciation party at the Hub Office in Mascoutah, IL.

October

October 21st: Trunk or Treat at the Hub office in Mascoutah, IL

❖ November:

Thanksgiving food drive

Refresh Marketing Strategies

The marketing wants to continue nurturing customers and leads from previous tower releases. The plan is to cycle through towers from former months, starting from the farthest back to the most current. Below are a few ways marketing has planned to accomplish this:

Updating Market Analysis on former sites

- o Demographics
- Competitor Analysis
- Market Saturation

❖ Social media

- Posting on local swap sites
- Facebook messages
- Facebook Ads

❖ LinkedIn

o Follow-up connections and messaging to local leaders.

Email blasts out to customers

o "What can 100 MBPS do for you"

Direct mailers

o "What can 100 MBPS do for you"

Boots on the ground

- o Yard Signs
- Door Hangers
- Re-visiting local businesses



GET RURAL INTERNET YOU DESERVE

Get high-speed Internet at an honest price when you sign-up for Wisper Internet.

- No hidden fees
- No data caps
- No contract





(800) 765-7772 WisperISP.com Follow Us On



What can **400 MBPS** do for you

Visit Us Online Or Call Today!

(800) 765-7772 WisperISP.com Follow Us On





CORE FEATURES

Email

Web Browsing

Multi-Video

Multi-Sharing

Multi-Streaming

INCLUDES

- In-home Wi-fi
- Antivirus Protection
- Parental Controls
- Guest Wi-fi
- Router

You may be eligible for up to \$50/month toward your Internet service

As part of our ongoing commitment to digital equity, Comcast is proud to support the Federal Government's Emergency Broadband Benefit (EBB), a temporary benefit program available on all tiers of Xfinity Internet service, including Internet Essentials. We're making it simple for both new and existing customers to apply.

Only eligible households may enroll. Benefit covers up to \$75/month in Tribal Lands.



What Is the Emergency Broadband Benefit?

The Emergency Broadband Benefit (EBB) is a temporary benefit program from the Federal Government designed to help low-income households connect to the Internet and stay connected during the COVID-19 crisis. Qualified households can receive a temporary monthly credit of up to \$50/month (up to \$75/month for customers in Tribal Lands) toward their Internet service and leased Internet equipment until the program's funding runs out.

Am I Eligible for this Benefit?

If you're an Internet Essentials customer, you automatically qualify for the Emergency Broadband Benefit and simply need to enroll in the program. Other qualifying criteria include a household member's qualification for the Lifeline program (such as Medicaid and SNAP), free and reduced-price school lunch program, Pell Grant, or if the household experienced a substantial loss of income since February 29, 2020.

You will still need to connect services and apply to enroll following your eligibility check.

How to Apply for this Benefit

To apply for the Emergency Broadband Benefit, simply follow these easy steps below.

Current Internet Essentials customers automatically qualify for the benefit and can skip to step 3.



QUALIFY

All non-Internet Essentials Xfinity Internet customers must confirm their eligibility with the program's National Verifier.

Confirm Eligibility:
GetEmergencyBroadband.org



CONNECT

Sign up for Internet services. If you are already a customer, move to step 3.

Apply for Internet Essentials: <u>InternetEssentials.com</u> Shop Xfinity: <u>Xfinity.com</u>



ACCESS YOUR BILL CREDIT

Once you've confirmed eligibility and ordered Internet services, use our simple application form to easily enroll in the benefit.

> Start EBB Application: Xfinity.com/EBB

Once you have successfully enrolled, you will see the Emergency Broadband Benefit credit on your bill toward your Internet service.

Note: This credit may not appear on the first bill and instead you will receive two credits on your second bill.

Once the EBB program ends, your service will continue at regular rates. You can choose to change your Internet service by visiting

Xfinity.com/MyAccount, or cancel your Internet service by calling 1-800-Xfinity.

For more information, refer to our Frequently Asked Questions on Xfinity.com/EBB.



BENEFICIO DE EMERGENCIA PARA BANDA ANCHA (EBB)

Podrías ser elegible para hasta \$50 al mes para tu servicio de Internet

Como parte de nuestro compromiso continuo con la equidad digital, Comcast se enorgullece de apoyar el Beneficio de Emergencia para Banda Ancha (EBB) del Gobierno Federal, un programa de beneficio temporal disponible en todos los niveles del servicio de Xfinity Internet, incluyendo Internet Essentials. Estamos haciendo que sea fácil solicitarlo tanto para clientes nuevos como para los ya existentes.

Solo pueden inscribirse los hogares elegibles. El beneficio cubre hasta \$75 al mes en Territorios Tribales.



¿Qué es el Beneficio de Emergencia para Banda Ancha?

El Beneficio de Emergencia para Banda Ancha (EBB, por sus siglas en inglés) es un programa de beneficio temporal del Gobierno Federal diseñado para ayudar a hogares de bajos ingresos a conectarse al Internet y mantenerse conectados durante la crisis de COVID-19. Los hogares que califiquen podrían recibir un crédito mensual temporal de hasta \$50 al mes (hasta \$75 al mes para clientes en Territorios Tribales) para su servicio de Internet y un equipo de Internet alquilado hasta que los fondos del programa se terminen.

¿Soy elegible para este Beneficio?

Si eres cliente de Internet Essentials, automáticamente calificas para el Beneficio de Emergencia para Banda Ancha y simplemente necesitas inscribirte en el programa. Otros criterios de calificación incluyen la calificación de un miembro del hogar para el programa Lifeline (como Medicaid y SNAP), el programa de almuerzos escolares gratuitos o de precio reducido, la Beca Pell, o si el hogar experimentó una pérdida importante de ingresos desde el 29 de febrero de 2020.

Después de tu verificación, aún necesitarás conectar los servicios y solicitar la inscripción al programa.

Cómo solicitar este beneficio

Para solicitar el Beneficio de Emergencia para Banda Ancha, simplemente sigue estos sencillos pasos. Los clientes actuales de Internet Essentials califican automáticamente para el beneficio y pueden ir al paso 3.



CALIFICA

Todos los clientes de Xfinity Internet, que no sean clientes de Internet Essentials, deben confirmar su elegibilidad con el Verificador Nacional del programa.

Confirma elegibilidad:
GetEmergencyBroadband.org



CONÉCTATE

Suscríbete a los servicios de Internet. Si ya eres cliente, ve al paso 3.

Solicita Internet Essentials:

<u>es.InternetEssentials.com</u>

Adquiere servicios de Xfinity:

<u>es.Xfinity.com</u>



ACCEDE AL CRÉDITO PARA TU FACTURA

Una vez hayas confirmado tu elegibilidad y ordenado el servicio de Internet, usa nuestro sencillo formulario de solicitud para inscribirte en el beneficio.

Empieza una solicitud EBB: es.Xfinity.com/EBB

Una vez que te hayas inscrito con éxito, verás el crédito del Beneficio de Emergencia para Banda Ancha para tu servicio de Internet en tu factura. Nota: Este crédito podría no aparecer en la primera factura y en su lugar recibirás dos créditos en tu segunda factura. Una vez que termine el programa EBB, tu servicio continuará a las tarifas regulares. Puedes elegir cambiar tu servicio de Internet visitando es.Xfinity.com/MiCuenta, o cancelar tu servicio de Internet llamando al 1-800-Xfinity.

Para más información, consulta nuestra sección de Preguntas Frecuentes en es.Xfinity.com/EBB.

Internet Essentials
1-855-8-INTERNET

Xfinity
1-800-XFINITY

