Broadband In Kentucky

Research Report No. 477

Legislative Oversight And Investigations Committee

Kentucky Legislative Research Commission

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Broadband In Kentucky

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Abstract

The report reviews broadband development in Kentucky, with emphasis given to legislative and agency-driven efforts to assess, plan, and fund last-mile broadband deployment. The FCC defines *broadband* as any telecommunications technology providing a minimum speed of 25 Mbps download and 3 Mbps upload. Recent federal funding programs require at least 100 Mbps download and 20 Mbps upload. For the past 2 decades, last-mile broadband deployment has largely been the responsibility of local government authorities and private internet service providers. As in many other states, Kentucky's direct involvement in broadband development was limited until the COVID-19 pandemic fully revealed the disparities between areas with access to broadband and those that are classified as underserved and unserved. However, since 2004, Kentucky has made several attempts to address the complexities of broadband policy, planning, and funding. The state legislature established the Kentucky Broadband Task Force in 2004, created the broadband deployment account in 2006, and created the broadband deployment fund in 2020. From 2010 to 2014, the federally funded Kentucky Office of Broadband Outreach and Development surveyed and mapped the extent of broadband in Kentucky for the National Broadband Map. In 2015, the Kentucky Communications Network Authority began constructing the KentuckyWired middle-mile project. During FY 2021 and FY 2022, the Finance and Administration Cabinet used a series of procurements to address mapping of broadband infrastructure, to solicit information regarding last-mile broadband deployment strategies, and to fund last-mile deployment projects. The creation of the Office of Broadband Development during the 2022 Regular Session represents the culmination of recent efforts to align the state with federal funding for broadband expansion and emerging broadband deployment best practices. This report has eight recommendations.

Foreword

Legislative Oversight and Investigations Committee staff appreciate all those who provided assistance with this report. Officials from the Office of State Budget Director, Kentucky Infrastructure Authority, Finance and Administration Cabinet, Education and Workforce Development Cabinet, Kentucky Cabinet for Economic Development, Department of Education, and Department of Agriculture provided information, data, contract documents, and feedback. Agency officials from the Office of State Budget Director and the Kentucky Infrastructure Authority were given the opportunity to provide a written response to the report. However, they chose not to provide a formal response.

Jay D. Hartz
Director

Legislative Research Commission
Frankfort, Kentucky
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Summary

Broadband has become a critical resource for the economic, social, and educational goals of states. The growing importance of broadband is seen in both the unprecedented demand experienced after the onset of the COVID-19 pandemic and the unprecedented level of federal funding for state broadband projects that have followed. During its November 13, 2020, meeting, the Legislative Oversight and Investigations Committee tasked staff with determining the status of broadband in Kentucky and what the state needs to do.

To answer this question, LOIC staff reviewed broadband technologies, infrastructure, legislation, regulation, federal funding, adoption, and accessibility. This review gathered information from federal government organizations, research centers, state governments, local governments, and the broadband provider industry. Staff also reviewed Kentucky's broadband efforts since 2004 and compared them to best practices identified in other states and by research institutes such as the Pew Research Center (Pew). The resulting report provides perspective on both the history and current landscape of broadband technology, infrastructure, funding, availability, and adoption in Kentucky. It also highlights some of the most significant challenges facing state broadband development and how Kentucky can address these challenges.

The Federal Communications Commission (FCC) defines *broadband* as a high-capacity information transmission network that uses a range of technologies to transmit large amounts of data quickly. The FCC includes in its spectrum of broadband technologies the following mediums: fiber-optic cable, coaxial cable, digital subscriber line, fixed wireless, and satellite. Among these technologies, fiber-optic cable exceeds the others in most categories including download bandwidth, upload bandwidth, data fidelity, latency, and future scalability. Other technologies do present advantages in certain circumstances, however.

The FCC definition of *broadband* requires a minimum data transfer rate of 25 Mbps download and 3 Mbps upload, but most states and federal programs set the standard higher. Kentucky, for example, defines broadband speed as 100 Mbps download and 20 Mbps upload, which closely aligns with federal funding eligibility guidelines for the American Rescue Plan Act and from the National Telecommunications and Information Administration (NTIA).

Research organizations such as Pew and the Brookings Institute, as well as federal agencies including the Government Accountability Office, the Department of Commerce, and the FCC, have been tracking national trends in broadband availability and adoption for many years. This research has found that, although the proportion of Americans with access to high-speed broadband increased rapidly over the past decade, a digital divide still exists wherein rural and geographically isolated areas lag significantly behind other regions. Although broadband access is fairly ubiquitous in urban areas, roughly one in four homes in rural areas lack access.

This digital divide represents one of the major challenges facing broadband development and is an issue that has been targeted by a significant amount of federal funding. Low population density, low broadband adoption rates, and difficult-to-navigate rugged terrain make it costly for broadband providers to deploy infrastructure in rural areas; such conditions also reduce the

potential return on investment. This federal funding is designed to offset these challenges. Other pressing areas of concern for current state broadband development are the creation of accurate broadband maps and the managing of significant increases in federal funding available to states for broadband projects.

To examine how Kentucky is addressing these challenges and the overall goals of broadband development across the state, staff reviewed the state's broadband efforts since 2004, including a review and analysis of all major legislation, regulations, funding, projects, and offices. Staff then compared these efforts against the best practices identified in other states and by research institutes such as Pew.

Pew, which has been conducting research into broadband deployment for more than a decade, recently published a report outlining the five critical best practices that states can employ to improve broadband development and close the digital divide. These included stakeholder outreach and engagement, policy framework, planning and capacity building, funding and operations, and program evaluation and evolution.

Pew defines *stakeholder outreach and engagement* as working with a broad range of entities, collaborating with state-level partners, and engaging local stakeholders. LOIC staff determined that Kentucky has been active in such stakeholder engagement activities since 2004 through efforts such as the 2004 Kentucky Broadband Task Force, Kentucky Infrastructure Authority (KIA) collaboration with ConnectKentucky, the 2010 creation of the Office of Broadband Outreach and Development (OBOD), the creation of the Kentucky Communications Network Authority (KCNA) in 2015, and the wholesaler agreement with Accelecom (previously known as OpenFiber Kentucky LLC) in 2017.

Per the agreement, Accelecom is required to provide detailed quarterly reports to the state regarding revenue. LOIC staff determined that Accelecom has not yet provided reports to KCNA regarding wholesale services. Although revenue sharing for the project is not anticipated until 2032, quarterly reporting describing Accelecom's progress facilitating last-mile broadband deployment during the interim would provide the state with valuable stakeholder input and inform future broadband planning decisions. The report makes the following recommendation regarding Accelecom and the quarterly reporting requirements.

Recommendation 3.1

The Kentucky Communications Network Authority should work with Accelecom to establish formal quarterly reporting to keep the legislature updated on anticipated revenue from the sale of dark and lit fiber pursuant to the wholesaler agreement.

With respect to policy frameworks, Pew recommends that state policy provide the foundation for broadband deployment goals. It notes that states with successful broadband programs typically play a strong leadership role in broadband planning and development.

Since 2004, the Kentucky legislature has established a number of important policy frameworks for broadband. These include House Bill 627 in 2004, which stated that broadband services shall

be market-based and not subject to state regulation, and HB 550 in 2006, which created the beginnings of a policy framework for deploying broadband to unserved areas. Since then,

- KCNA was created to oversee the KentuckyWired project,
- the broadband deployment account and broadband deployment fund were established to leverage federal broadband funding, and
- HB 315 created the Office of Broadband Development to manage the unprecedented level of broadband funding following the COVID-19 pandemic and to direct future broadband projects.

Regulation requirements related to the broadband deployment account and broadband deployment fund were addressed differently by KIA, despite specific language stating that each "shall promulgate administrative regulations." Because reviews of best practices for state broadband development indicate that clearly defined regulatory framework guiding broadband programs is critical, the report makes the following recommendation regarding the newly created rural infrastructure fund and other components of HB 315.

Recommendation 3.2

KIA should begin drafting its regulation related to the newly created rural infrastructure fund and program. In addition, it should consider including additional regulatory language to address other components of HB 315 related to the administration of the broadband deployment fund. Finally, it should revisit the public comments received from its draft regulation 200 KAR 17:100, Guidelines for the Broadband Deployment Account, as it considers a regulatory framework for broadband deployment moving forward.

Kentucky has also been actively involved in planning and capacity building. Pew found that the most successful state broadband efforts are those resulting from statewide broadband plans that clearly define objectives, guide investments, measure success, and guide local efforts. Beginning in 2004, Kentucky has been increasingly involved in planning and guiding broadband deployment. This involvement includes the efforts of the Kentucky Broadband Task Force to identify key issues related to broadband expansion, OBOD's broadband infrastructure mapping initiatives, KCNA's KentuckyWired project planning and oversight, the Kentucky Broadband Working Group's efforts to improve remote learning during the COVID-19 pandemic, and the mandate of the Office of Broadband Development (OBD) to incentivize stakeholder collaboration and develop a statewide broadband plan.

OBD's next important step in meeting its mandate will be translating policy into action. LOIC staff identified archived information on KCNA's website with examples of broadband planning efforts associated with KentuckyWired that included lessons learned from the implementation of policy into practice. There are also documents produced by Columbia Telecommunications Corporation that, although dated, provide comprehensive guidance on turning policy into practice. It is likely that this information would be useful to OBD.

Recommendation 3.3

The newly created Office of Broadband Development should thoroughly review and use the archived information stored by KCNA as context for developing its planning and outreach program.

LOIC staff identified development of accurate maps of broadband infrastructure as a key component of planning and capacity building, as well as a key component of NTIA Broadband Equity, Access, and Deployment (BEAD) Program funding that will be a critical source of future broadband funding for states. As a result, this report also recommends that the Office of Broadband Development consider additional investment in broadband infrastructure mapping. Although the state has taken steps toward improving broadband infrastructure mapping through the Kentucky Broadband Initiative, this program concluded in FY 2021 and resulted in maps that do not fully represent the extent of broadband infrastructure in the state.

Recommendation 3.4

The newly created Office of Broadband Development should consider additional procurements related to mapping, in order to assist with the review of current and future address challenges and other mapping issues.

Although HB 315 and the Office of Broadband Development have created an extensive framework for Kentucky broadband planning that aligns with Pew's promising practices, statutory guidance alone may not be sufficient to fully develop a statewide broadband program. LOIC staff reviewed HB 315 and determined a set of 12 responsibilities and authorities that are central to the mission of the newly created Office of Broadband Development. Staff then applied the responsibilities and authorities delegated to Kentucky's Office of Broadband Development to the relevant statutes guiding nine state broadband programs identified as promising by Pew.

The findings indicate that states are diverse in their approaches to developing broadband programs and offices. Some states establish their broadband programs in statute, similarly to Kentucky, while others implement their programs via statewide broadband plans. Both of these strategies have proven to be effective. In either case, administrative regulations are an additional resource that states can use to provide clarification to statewide broadband plans or statutory language. The individual efficacy of each of these approaches indicates that the best practice for creating a statewide broadband program would be to explore each strategy.

Recommendation 3.5

The Office of Broadband Development should review broadband development regulations and policies that other states are successfully putting into practice. The statutory language contained in HB 315 is inclusive, but reviews of regulations and policies already in practice in other states, and their outcomes, can help identify areas for improvement and inform Kentucky's statewide broadband plan.

Another best practice is that successful state broadband projects occur when state governments support broadband deployment through funding to internet service providers, local governments, and other stakeholders. In particular, Pew notes that state direction of broadband funding is a critical component of accurately deploying broadband to unserved and underserved areas and reducing the digital divide. Like most other states, Kentucky has historically addressed the digital divide through federal discount and subsidy programs administered by the FCC and the US Department of Agriculture.

Kentucky has also received significant federal broadband funding via federal support for economic and public health emergencies. For example, Kentucky received significant broadband funding from the American Recovery and Reinvestment Act (ARRA) of 2009 and the Coronavirus Aid, Relief, and Economic Security (CARES) Act and American Rescue Plan Act of 2021. In the near future, Kentucky will also be eligible to receive additional broadband funding from the NTIA via the Infrastructure Investment and Jobs Act (IIJA).

Given that IIJA BEAD funding will be critical to future state broadband projects, LOIC staff recommend that the Office of Broadband Development review the questions posed by NTIA during the public comment process for the IIJA, along with the responses it received. The questions to which NTIA is seeking answers are significant indicators of what will be required of states as they seek eligibility for the BEAD Program, and the responses provide valuable insight into how stakeholders are approaching program eligibility.

Recommendation 3.6

The Office of Broadband Development should review the questions posed by the National Telecommunications and Information Administration (NTIA) during the public comment process for the Infrastructure Investment and Jobs Act, along with the responses NTIA received. These questions and responses indicate which issues NTIA considers critical, and they can inform the state's decision-making related to upcoming procurement documents. In addition, the questions and responses provide valuable insight into what will be required of states as they seek eligibility for the Broadband Equity, Access, and Deployment Program.

LOIC staff determined that federal funding from the coronavirus capital projects fund and the state fiscal recovery fund has not yet been established in the KIA broadband deployment fund in the eMARS state accounting system. Given that Pew has identified tracking and managing broadband funding as a best practice from other states' broadband programs, and that a significant amount of Kentucky's broadband funding has come via the ARRA and the CARES Act, the report recommends that OBD confirm that these funds and projects are being properly tracked.

Recommendation 3.7

The newly created Office of Broadband Development should ensure that federal money appropriated from the coronavirus capital projects fund and the state fiscal recovery fund

is expended and tracked through the Kentucky Infrastructure Authority broadband deployment fund (fund CA4C).

In its final area of best practices for state broadband programs, program evaluation and evolution, Pew recommends that states regularly evaluate the performance of their broadband programs to determine whether they are meeting their stated or legislated goals. They note that these evaluations play a vital role in informing current and future broadband projects and objectives. Since 2006, state-administered broadband programs in Kentucky have been limited to the KIA broadband deployment account and fund, OBOD, and the KentuckyWired project. Kentucky, like many other states, did not actively administer or evaluate broadband deployment activities through a dedicated office until recently.

As a result, for the past two decades, broadband development has largely been the responsibility of local entities and the private sector. The newly established Office of Broadband Development marks a change in this practice by creating Kentucky's first central broadband planning and coordination entity. As the central broadband entity for the state, the new office will be responsible for fostering relationships with other state, regional, local, and private entities. It will also be charged with developing broadband plans, encouraging cost-effective broadband policy, making recommendations for broadband infrastructure development, and providing consultation services to local units of government. The office will bring Kentucky into greater alignment with the best practices Pew has identified in other states. LOIC staff identified steps that OBD can take to adopt additional best practices for central broadband offices that have proven successful in other states. For example, Maine and other states have used memoranda of understanding to annotate general agreement between entities that work together to expand broadband support to communities and partners.

Recommendation 3.8

The newly created Office of Broadband Development should consider developing memoranda of agreement with critical groups in state government related to planning, outreach, and program evaluation, in addition to the expenditure of broadband deployment funds. At a minimum, it should consider creating memoranda of understanding with entities that represent the KCNA Advisory Group pursuant to KRS 154.15-020(2)(j).

Chapter 1

Introduction

Broadband

During its November 13, 2020, meeting, the Legislative Oversight and Investigations Committee (LOIC) approved the study topic of "broadband infrastructure in the state—where we are and what we need to do to move forward."

During its November 13, 2020, meeting, the Legislative Oversight and Investigations Committee (LOIC) approved the study topic of "broadband infrastructure in the state—where we are and what we need to do to move forward." LOIC staff conducted a review of national broadband technologies, infrastructure, legislation, regulation, federal funding, adoption, and accessibility. This review included literature from governmental organizations, research centers, state governments, local governments, and the broadband provider industry. In addition, staff conducted a review of broadband in all 50 states, including an examination of state centralized broadband management.

LOIC staff reviewed broadband funding programs, policy best practices, and the history of broadband deployment efforts in Kentucky.

With respect to Kentucky, staff comprehensively reviewed current and historical broadband funding, including future federal funding programs and their eligibility requirements. Staff also reviewed the history of Kentucky's broadband efforts and compared them to best practices as defined by other states and the Pew Research Center (Pew). Broadband-related legislation was reviewed starting with the 2004 Regular Session and concluding with the 2022 Regular Session. Broadband projects and funds from 2006 to 2022 were examined.

Major Objectives

The study has four major objectives.

The major objectives for this study were to

- review and analyze the literature on broadband in Kentucky and nationwide and provide information on trends and best practices;
- review and analyze the federal and state history of broadband legislation;
- review the history and current landscape of funding for broadband in the US and in Kentucky and provide a framework for Kentucky's current and future broadband initiatives; and
- present findings and recommendations on best practices regarding state broadband development and evaluate Kentucky's broadband development efforts.

Methodology

This study's scope was limited by the timing of the Governor's June 20, 2022, announcement of broadband awards as well as by limited access to certain officials and various procurement documents.

On June 20, 2022, the Governor announced awards of $89.1 million to internet service providers (ISPs) and local government in 35 counties for 46 grant projects. Conducting additional research regarding the review of grant applications, project specifics, and funding fell outside of the report's scope and timing. Because LOIC staff had limited access to certain officials and various procurement documents throughout the process, additional information related to funding and procurement was not included in staff's analysis. Additionally, LOIC staff were not able to fully review and comment on the Kentucky Infrastructure Authority (KIA) broadband deployment fund dashboard map located on the Kentucky Broadband Deployment Fund Grant Application website of the Finance and Administration Cabinet (FAC). Staff were also unable to fully understand how KIA will account for the 50 percent matches in eMARS, the statewide accounting system.

This study defines *broadband* as a telecommunications technology capable of providing a minimum data transfer rate of 100 Mbps download and 20 Mbps upload. Broadband technologies include fiber-optic cable, coaxial cable, digital subscriber line, fixed wireless, and satellite.

This study reviews broadband at the federal and state levels from 2001 to 2020. It includes an analysis of broadband in all 50 states but focuses primarily on the legislation, regulation, funding, deployment, and adoption of broadband in Kentucky. This study defines *broadband* as a telecommunications technology capable of providing a minimum data transfer rate of 100 Mbps download and 20 Mbps upload.[a] Broadband technologies include fiber-optic cable, coaxial cable, digital subscriber line (DSL), fixed wireless, and satellite.

Over the course of this study, LOIC staff conducted the following research tasks related to background research and legal review, fieldwork and interviews, and financial analysis.

Primary research tasks included
- **background research and legal review**
- **fieldwork and interviews**
- **financial analysis**

To complete the background research and legal review, LOIC staff
- conducted literature reviews of broadband technologies, including their properties, application, history, and usage;
- conducted literature reviews of broadband infrastructure and network application;
- reviewed national trends in broadband adoption, availability, and deployment;

[a] The US Department of Treasury states that broadband deployment projects receiving state and local fiscal relief funds under the American Rescue Plan Act must demonstrate that they can provide 100 Mbps symmetrical service, or 100 Mbps/20 Mbps that is scalable to 100 Mbps symmetrical service.

- reviewed Government Accountability Office (GAO) reports and audits pertaining to broadband expansion, federal broadband funding, and federal broadband programs;
- reviewed Pew Charitable Trusts reports and data pertaining to broadband barriers, broadband accessibility and adoption, broadband expansion efforts in other states, and broadband expansion best practices;
- reviewed applicable Kentucky Revised Statutes, Kentucky Administrative Regulations, and Kentucky legislation;
- conducted a legal review of pole attachment regulations at the state and federal levels;
- reviewed state broadband initiatives for all 50 states, including an analysis of central broadband offices and their functions, when they were created, the statutory language, and their funding;
- conducted a review of questions in a request for comment from the National Telecommunications and Information Administration (NTIA) and 561 public comments to the request;
- reviewed and analyzed relevant committee testimony from 2018 to 2020; and
- reviewed Pew best practices for state broadband programs, and examined Kentucky's broadband efforts in regard to these best practices.

To complete fieldwork and interviews, LOIC staff

- conducted field visits of prospective and completed Accelecom middle- and last-mile sites;
- interviewed officials at the following Kentucky agencies regarding broadband deployment in the state:
  - Cabinet for Economic Development
  - Department of Agriculture
  - Department of Education
  - Education and Workforce Development Cabinet
  - Finance and Administration Cabinet
  - Kentucky Communications Network Authority (KCNA)
  - Kentucky Infrastructure Authority
  - Office of State Budget Director
  - Public Service Commission
- interviewed Legislative Research Commission staff from the following committees:
  - Administrative Regulation Review
  - Agriculture and Natural Resources
  - Appropriations and Revenue
  - Budget Review

    - Capital Projects and Bond Oversight
    - Economic Development and Workforce Investment
    - Local Government
    - Office of Education Accountability
    - Tourism, Small Business, and Information Technology
- interviewed officials from the following entities regarding broadband deployment in the state:
    - Accelecom (OpenFiber Kentucky)
    - Government Strategies
    - Kentucky Association of Counties
    - Kentucky Center for Rural Development
    - Kentucky Electric Cooperatives
    - Kentucky League of Cities
    - Kentucky Telecommunications Association
    - People's Rural Telephone Cooperative
- interviewed officials from the following entities regarding broadband deployment best practices, funding, planning, legislation, and strategy:
    - Columbia Telecommunications Corporation
    - Fiber Optic Association
    - LightBox Broadband Mapping
    - National Conference of State Legislatures
    - Pew Charitable Trusts
    - Tennessee state broadband director
    - US Government Accountability Office
    - ValleyNet (Vermont)
    - Washington State Broadband Office

In addition to interviews, LOIC staff sent data and information requests to the following Kentucky agencies:

- Cabinet for Economic Development
- Department of Education
- Education and Workforce Development Cabinet
- FAC
- KCNA
- KIA
- Office of State Budget Director

To complete the financial analysis research task, LOIC staff

- reviewed and analyzed KIA board meeting minutes from 2015 to 2022 to identify and analyze broadband loan amounts and information;
- reviewed and analyzed KIA audited financial statements from 2006 to 2021;

- reviewed and extracted financial data from eMARS to track federal funding for broadband programs such as the Office of Broadband Outreach and Development (OBOD) and KIA's broadband deployment fund;
- reviewed and extracted financial data from eMARS to track revenues and expenses for KCNA;
- reviewed and analyzed budgets of the commonwealth and appropriation bills from 2012 to 2022;
- reviewed and analyzed financial documents related to FAC's series of procurements for broadband deployment grants;
- reviewed and analyzed federal data for information and award details for broadband programs administered by the Rural Utilities Service (RUS) of the US Department of Agriculture (USDA), the US Treasury, and the Federal Communications Commission (FCC), including:
  - E-Rate, the universal service program for schools and libraries
  - the Rural Health Care Program
  - the Lifeline Program for Low-Income Consumers
  - the Connect America Fund, the federal universal service high-cost program
  - the ReConnect Loan and Grant Program
  - the Community Connect Grant Program
  - the Rural Broadband Access Loan and Loan Guarantee Program
  - the Telecommunications Infrastructure Loan and Loan Guarantees Program
- reviewed and analyzed NTIA and RUS data for general information and award details for broadband programs included in the American Recovery and Reinvestment Act (ARRA) of 2009;
- reviewed and analyzed the funding for broadband services included in the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the Consolidated Appropriations Act of 2021, and the American Rescue Plan Act (ARPA);
- reviewed and analyzed broadband programs and funding included in the Infrastructure Investment and Jobs Act (IIJA); and
- reviewed and analyzed various agreements related to the Next Generation—Kentucky Information Highway (also known as KentuckyWired) project, including the wholesaler agreement with Accelecom.

Major Conclusions

The report has 11 major conclusions.

This report has the following major conclusions:

- Kentucky has been actively working toward stakeholder outreach and engagement since 2004 by taking steps such as the creation of the Kentucky Broadband Task Force, the work of the Kentucky Infrastructure Authority, the establishment of the Office of Broadband Outreach and Development, and the creation of the Kentucky Communications Network Authority.

- Accelecom is the wholesaler for the KentuckyWired network. It is currently deploying broadband infrastructure to connect Kentucky last-mile internet service providers and enterprise customers. Per the 2017 wholesaler agreement between Kentucky and Accelecom, Accelecom is required to provide records and reports related to wholesale services to the state at least quarterly. LOIC staff determined that Accelecom has not yet provided quarterly reports to KCNA related to wholesale services.

- Kentucky's legislature has established a detailed policy framework for broadband development in the state. This process began with House Bill 550 in 2006 and culminated with HB 315 in 2022, which created the Office of Broadband Development within the Kentucky Infrastructure Authority.

- Reviews of best practices for state broadband development indicate that a clearly defined regulatory framework guiding broadband legislation and programs is important. Previous funding mechanisms created by legislation—the broadband deployment account and the broadband deployment fund—did not fully benefit from administrative regulations.

- Kentucky has been actively developing broadband planning and capacity building capability since 2004. This process began with the Kentucky Broadband Task Force in 2004 and continued with the creation of the Office of Broadband Outreach and Development in 2010. More recent examples include KCNA's Broadband Outreach and Strategic Planning Project, the Kentucky Broadband Working Group, and KIA's Office of Broadband Development.

- Kentucky's state broadband initiatives and operations have historically relied mostly on federal funding. Kentucky has used federal funds to address the digital divide via FCC grants

and to expand broadband infrastructure via ARRA and CARES funding, and the state will seek to make major broadband investments via the IIJA.

- NTIA requested information from broadband stakeholders regarding how best to distribute broadband funding nationwide and established a public comment period to receive feedback. The questions to which NTIA seeks answers are significant indicators of what will be required of states as they seek eligibility for the Broadband Equity, Access, and Deployment (BEAD) Program.

- LOIC staff identified tracking and evaluation of federal funding opportunities as a best practice for state broadband programs. Staff were unable to fully understand the location or status of funds appropriated to the KIA broadband deployment fund.

- LOIC staff identified that development of broadband infrastructure maps is a best practice for state broadband programs and will be a key component of NTIA's BEAD Program. Although the state has taken steps toward improving broadband infrastructure mapping through the Kentucky Broadband Initiative, this program concluded in FY 2021 and resulted in maps that do not fully represent the extent of broadband infrastructure in the state.

- For the past 2 decades, broadband deployment has largely been the responsibility of local and regional entities and the private sector, both in Kentucky and nationwide. As a result, the evaluation of planning efforts and the funding of infrastructure projects in Kentucky have been minimal at the state level until recently. This trend changed as a result of the COVID-19 pandemic and the increased federal funding opportunities that followed.

- A review of best practices for state broadband development indicated that state broadband authorities should engage with critical groups in state government related to planning, outreach, program evaluation, and the expenditure of funds. The KCNA Advisory Group (KAG) held meetings intermittently beginning in 2017 to discuss middle-mile construction, but it has not met since 2021.

Structure Of This Report

Chapter 2 of the study provides background information related to broadband deployment, funding, and policy.

Chapter 2 of this report provides a literature review and background information on broadband in Kentucky and nationwide. This includes current national and Kentucky statutory definitions and standards for broadband, as well as descriptions of the current technologies used and their inherent advantages and use cases. The background section then reviews some of the major challenges and concerns regarding broadband deployment and how states and the federal government are addressing these challenges. Lastly, this section reviews the history and current landscape of federal broadband funding and how that funding has been used in the commonwealth via various programs, initiatives and legislation.

Chapter 3 of the study presents the major findings of the report using the Pew Research Center's best practices for state broadband development as an organizational framework.

Chapter 3 presents the major findings of the report. The chapter uses the Pew Research Center's best practices for state broadband development as an organizing principle for an analysis of Kentucky's broadband efforts since 2004. Pew's best practices categories include stakeholder engagement, policy framework, planning, funding, and program evaluation. Kentucky's efforts with respect to these categories include various broadband legislation; several broadband projects, offices, and task forces; and the deployment of a wide range of federal funding mechanisms. The chapter presents five finding areas and eight recommendations.

Chapter 2

Broadband Background

Broadband has quickly become a critical resource for the economic, social, and educational goals of states. The growing importance of broadband is seen in both the unprecedented demand experienced throughout the COVID-19 pandemic and the unprecedented level of federal funding and number of state broadband projects that have followed. This chapter provides perspective on both the history and current landscape of broadband technology, infrastructure, funding, availability, and adoption in Kentucky and nationwide. It also highlights some of the most significant challenges facing state broadband development and how Kentucky is addressing these challenges.

Broadband Definitions

The Federal Communications Commission defines *broadband* as a high-capacity information transmission network that uses a range of technologies to transmit large amounts of data quickly. The FCC includes in its spectrum of broadband technologies the following mediums: fiber-optic cable, coaxial cable, DSL, fixed wireless, and satellite. Originally, *broadband* was a term that applied to any high-speed internet access technology that is always on and faster than traditional telephonic dial-up access.[1] That definition has changed over time and is likely to continue to evolve as new technologies emerge and new information demands arise.

The Federal Communications Commission defines *broadband* as a technology capable of transferring data at a minimum of 25 Mbps download and 3 Mbps upload.

The FCC's current definition of *broadband* is laid out in the agency's 2015 Broadband Progress Report, which defines *broadband* by data transmission speed—specifically, *broadband* is any telecommunications technology capable of providing a minimum data transfer rate of 25 Mbps download and 3 Mbps upload. The standard of 25/3 is still recognized by the FCC as of its most recent reporting in 2021, despite being well below many current industry standards and funding eligibility requirements.[2]

Until 2022, Kentucky statutes followed FCC definitions and defined *broadband* as any technology that has a capacity to transmit data at the minimum speed standards adopted by the FCC or the USDA. If the agencies used different speed definitions, the faster speed was recognized. Accordingly, until 2022,

Kentucky statute had established the FCC definition of 25 Mbps download and 3 Mbps upload as the state's standard for broadband.[3]

Kentucky statute also provides definitions for *underserved area* and *unserved area* with respect to broadband availability. Previously, in alignment with FCC definitions, *underserved* referred to any area with broadband speeds below the minimum of 25 Mbps download and 3 Mbps upload, and *unserved* referred to an area where broadband service did not meet a minimum speed of 10 Mbps download and 1 Mbps upload.[4] These definitions of minimum broadband speeds and service areas were redefined in the 2022 Regular Session by HB 315.

HB 315 altered the practice of matching the Kentucky definition of *broadband speed* to the definitions reported by the FCC and the USDA. The legislation defines areas of service first and then derives broadband standards from them. HB 315 defined *underserved area* as any area that lacks broadband service with a minimum of 100 Mbps download and 20 Mbps upload and *unserved area* as one with broadband service not meeting the threshold of 25 Mbps download and 3 Mbps upload.[5]

Table 2.1
Kentucky Broadband Definitions
2022

Type Of Area	Definition
Served	Meets or exceeds 100 Mbps download and 20 Mbps upload
Underserved	Below 100 Mbps download and 20 Mbps upload
Unserved	Below 25 Mbps download and 3 Mbps upload

Source: Kentucky. General Assembly. *Acts Of The 2022 Regular Session*, ch. 202.

Kentucky defines *broadband* as a technology capable of transferring data at a minimum of 100 Mbps download and 20 Mbps upload.

Consequently, Kentucky currently defines *broadband* as a telecommunications technology capable of transferring data at a minimum of 100 Mbps download and 20 Mbps upload, which aligns with areas of the state considered served by HB 315. This definition no longer aligns with FCC definitions, but it does more closely align with federal funding eligibility guidelines for ARPA broadband funding and NTIA BEAD funding. With respect to ARPA, the US Department of the Treasury has ruled that projects eligible for ARPA funding are expected to be designed to deliver service that reliably meets or exceeds symmetrical upload and download speeds of 100 Mbps.[6] For BEAD funding, the NTIA has defined an area as served for broadband if speeds meet or exceed 100 Mbps download and 20 Mbps upload.[7]

Broadband Technologies

Major broadband technologies:
- **coaxial cable**
- **digital subscriber line**
- **fixed wireless**
- **satellite**
- **fiber-optic cable**

A number of technologies are used to provide broadband internet service. The most prominent include coaxial cable, DSL, fixed wireless, satellite, and fiber-optic cable.[8] Legacy technologies such as coaxial cable and DSL transmit data via copper wire and have the significant advantage of being widely deployed preexisting infrastructure that already connects many homes and businesses, whereas fixed wireless and satellite technologies transmit data via radio signal and have the advantage of being able to more easily navigate difficult terrain and isolated geography.[9]

Fiber-optic cable, which sends data via light signals carried by transparent glass fibers, currently exceeds all other broadband technologies in most categories including download bandwidth, upload bandwidth, data fidelity, latency, and future scalability.[10] Fiber-optic cable provides almost all of the backbone of the internet connecting cities, countries, and continents, and all other broadband technologies use fiber-optic cables to transmit data until it reaches their infrastructure.[11]

Although fiber-optic cable has multiple advantages over other broadband technologies, the other technologies can be advantageous in providing last-mile connection to residences and businesses in certain scenarios. For example, until a full fiber-optic network can be extended into areas that are rural or remote, it is possible that a combination of fiber-optic cable, fixed wireless, or coaxial cable may be preferable. Likewise, when significant coaxial cable or DSL infrastructure is already in place, it can be used instead of a new deployment of fiber-optic cable to save costs and time. Ultimately, however, these technologies fill a support role for fiber-optic cable, which provides the foundation for broadband infrastructure.[12] Table 2.2 provides a description of each of the major broadband technologies as well as a summary of the major advantages and disadvantages of each technology.

Table 2.2
Broadband Technologies

Technology	Description	Advantages	Disadvantages
Fiber-optic cable	Fiber-optic cable converts electrical signals carrying data to light and sends the light through transparent glass fibers. It provides almost all of the backbone of the internet connecting cities, countries, and continents. All other internet access technologies, such as cable, DSL, and fixed wireless, use fiber-optic cables to transmit data until it reaches their infrastructure.	• Increasingly commonly deployed infrastructure. • Exceeds all other broadband technologies in most categories, including download bandwidth, upload bandwidth, data fidelity, latency, and future scalability.	• Infrastructure deployment is less common than some other technologies. • Difficulty navigating rugged terrain and isolated geography.
Coaxial cable	One of the most common technologies used for providing last-mile connection to residences and businesses, coaxial cable provides broadband access through the copper wire cables originally installed to provide analog video to televisions. The copper wires also limit the maximum and average speeds of data transmission.	• Widely deployed preexisting infrastructure that already connects many homes and businesses. • Can meet and exceed Kentucky's broadband definitional minimums of 100 Mbps download and 20 Mbps upload.	• Slower average and maximum data speeds than fiber-optic cable. • Difficulty navigating rugged terrain and isolated geography.
DSL	DSL transmits data over traditional copper telephone lines already installed in many homes and businesses. Unlike fiber-optic and coaxial cable, the availability and speed of DSL service depend on the distance from the closest telephone facility, due to the nature of the copper wires used. DSL copper wires also limit the maximum and average speeds of data transmission.	• Widely deployed preexisting infrastructure that already connects many homes and businesses.	• Slower average and maximum data transmission speeds than fiber-optic and coaxial cable. • Data transmission speeds often cannot meet Kentucky broadband definitional minimums. • Difficulty navigating rugged terrain and isolated geography. • Few providers are installing DSL for new deployments.
Fixed wireless	Fixed wireless broadband connects a home or business to the internet using a radio link between customers and a service provider's communication towers. The strength of the connection is determined by distance and obstacles, which can limit reliability, but wireless technologies using long-range directional equipment can provide broadband service in remote areas with terrain that is difficult to navigate.	• Capability in navigating difficult terrain and isolated geography.	• Fixed wireless speeds are comparable to those of DSL but slower than those of coaxial cable and fiber-optic cable. • Data transmission speeds often cannot meet Kentucky broadband definitional minimums. • Fixed wireless is less reliable than other broadband technologies.

Technology	Description	Advantages	Disadvantages
Satellite	Satellite internet service is provided by communication satellites in geosynchronous or low Earth orbit that transmit data to customers via ground relay stations. Satellite broadband can be less reliable and provide slower speeds than other technologies, but its ability to provide broadband service to any isolated area regardless of geography is unmatched.	• Capability in navigating difficult terrain and isolated geography. • Particularly adept at providing internet service to rural and isolated areas.	• Latency due to great distances that data must travel. • Limited upload bandwidth. • Data transmission speeds often cannot meet Kentucky broadband definitional minimums.

Note: DSL = digital subscriber line.
Source: LOIC staff compilation of broadband technology materials from the Pew Research Center, the Merit Network, the Federal Communications Commission, the Electronic Frontier Foundation, the Brookings Institute, and the US Government Accountability Office.

Broadband Infrastructure

The broadband infrastructure that provides internet access is classified in three categories: the backbone, the middle mile, and the last mile.

The backbone network is fiber-optic cable infrastructure that makes up the core of the global broadband telecommunications network. An analogy for the backbone network is the interstate highway system. Internet service providers that operate and provide access to the backbone are referred to as Tier 1 providers. These ISPs provide internet traffic to all other ISPs, but not to end users, and they exchange internet traffic with other Tier 1 providers on a noncommercial basis via private peering interconnections.

Middle-mile networks are the links that connect regions to the backbone and to each other. Like the backbone network, middle-mile networks are composed of fiber-optic cable. The middle mile is analogous to state highways. ISPs that operate and provide access to middle-mile networks are referred to as Tier 2 providers. These providers are typically regional or national providers and are at least one connection away from the backbone of the internet.

Last-mile networks are the part of a telecommunications system that connects a middle-mile network to individual homes or offices. It is the final segment of a telecommunications network that connects an end user to the backbone network. Unlike the backbone and middle mile, the last mile is often not composed of fiber-optic cable. The last mile can be facilitated by any of a number of broadband technologies including coaxial cable, DSL,

fixed wireless, or satellite. The last mile can be thought of as a town road or a home's driveway.

ISPs that operate and provide access to last-mile networks are referred to as Tier 3 providers. These are providers that strictly purchase internet transit from Tier 2 and Tier 1 providers and are, by definition, primarily engaged in delivering internet access to end customers. Tier 3 ISPs utilize a variety of broadband technologies including coaxial cable, DSL, fiber-optic cable, and fixed wireless networks. Their coverage is generally local, and they can provide internet service only by paying for access to networks of higher-tier ISPs.[13]

Table 2.3
Broadband Infrastructure

Provider Tier	Infrastructure	Technology	Coverage
Tier 1 provider	Backbone	Fiber-optic cable	Global or national
Tier 2 provider	Middle and last mile	Fiber-optic cable	Regional or national
Tier 3 provider	Last mile	Fiber, coaxial, DSL, wireless, other	Regional or local

Source: LOIC staff compilation of materials on broadband infrastructure.

Broadband Availability And Adoption

Research organizations such as the Pew Research Center and the Brookings Institute, as well as the federal agencies such as the US Government Accountability Office, the US Department of Commerce, and the FCC have been tracking national trends in broadband availability and adoption for many years.

The telecommunications industry and the federal government have invested nearly $800 billion in broadband infrastructure since 2009.

According to the GAO, the telecommunications industry has invested over $795 billion in broadband infrastructure since 2009. Over this time, the federal government has also invested nearly $50 billion in broadband. These industry and federal investments have increased by an average of 2.8 percent each year. The funding has led to major increases in broadband availability and adoption for American citizens.

With respect to access and availability, in 2020, the FCC reported that fixed broadband service was available to 94.4 percent of the US population, up from 81.2 percent in 2012, although affordability and digital literacy remained barriers to adoption. Meanwhile, service availability in rural areas increased from 45.7 percent in 2012 to 77.7 percent in 2020. According to the FCC's 2020 broadband deployment report, broadband availability

is increasing rapidly in rural areas but continues to lag behind availability in urban areas.

Access to broadband is available to 77 percent of Americans but drops to 72 percent in rural areas.

Since 2000, the Pew Research Center has conducted surveys regarding broadband access and availability. Its research has found that the proportion of American adults with access to high-speed broadband service at home increased rapidly between 2000 and 2010 but has slowed over the past decade. In 2000, only 1 percent of adults had access to broadband. This rate increased to 25 percent by 2005 and to 60 percent by 2010. Currently, the portion of the population with access to broadband sits at 77 percent. This number differs from the 94 percent reported by the FCC because it represents users who actively use broadband service in their home rather than addresses for which broadband is available. In line with the FCC's findings, Pew also found that active service in rural areas continues to lag behind that of urban areas, with 77 percent of urban respondents reporting usage of high-speed broadband in the home and 72 percent of rural respondents reporting the same.

Income and education are the strongest determinants of whether an individual has access to broadband in the community and at home.

With respect to broadband adoption, according to the Pew studies, income and education are the strongest determinants of whether an individual has access to broadband in the community and at home. Respondents to Pew-conducted surveys were significantly more likely to have access to broadband as their incomes increased. Likewise, individuals surveyed were much more likely to have broadband access if they had some college education.

In particular, the cost of broadband access—including both the cost of broadband service from an ISP and the cost of broadband-capable devices—is among the most cited reasons that individuals do not subscribe to home broadband service. The Brookings Institute, using data from the American Community Survey, reported in 2018 that 18 million US households did not have subscriptions to broadband services despite availability. The majority of these unconnected households, 13.6 million, were in urban communities, and the primary barrier to broadband adoption in these cases was the cost of service. Aside from cost, many individuals also cite a lack of interest or need. Many digital literacy programs operated by state and local governments seek to increase interest by improving citizens' understanding of the advantages of broadband services.

National Broadband Concerns

The Digital Divide

The Communications Act of 1934, as amended by the Telecommunications Act of 1996, specifies that consumers in "rural, insular, and high-cost areas" should have access to telecommunications and information services at rates that are "reasonably comparable" to rates charged for similar services in urban areas. Consequently, federal programs exist to support investment in broadband deployment for high-cost areas through federal grants, loans, and other subsidies.

Broadband availability is abundant in most urban areas, but roughly 1 in 4 people in rural areas lack access. This gap, the "digital divide," results from characteristics of rural areas that increase the cost of deploying broadband networks and reduce the return on investment.

The telecommunications industry and the federal government have spent hundreds of billions of dollars to expand broadband across the US. Broadband is ubiquitous in most urban areas, but roughly 1 in 4 people in rural areas lack access.[14] This gap, the "digital divide," results from characteristics of rural areas that increase the cost of deploying and maintaining broadband networks.

Low population density, low broadband adoption rates, and difficult-to-navigate mountainous or rugged terrain make it costly for broadband providers to deploy infrastructure in rural areas; such conditions also reduce the potential return on investment. In a 2014 GAO report, broadband providers said that using potential revenues to cover the cost of installing infrastructure was the critical challenge to deploying broadband in unserved and underserved rural areas.[15] Over 300 public comments responding to broadband funding in the Infrastructure Investment and Jobs Act discussed the importance of overcoming the digital divide and providing broadband to underserved or unserved rural areas.[16]

The cost of providing broadband infrastructure in rural areas in Kentucky is estimated at $75,000 to $80,000 per mile.

The Center for Rural Development (CRD) estimates that the cost of providing broadband infrastructure in rural areas in Kentucky is $75,000 to $80,000 per mile, and the People's Rural Telephone Cooperative, which serves customers in Jackson and Owsley Counties, reports that its costs range from $60,000 to $70,000 per mile.[17] The Fiber Optic Association (FOA) estimates that the per-customer cost of deploying broadband is approximately four times as high in rural communities as in urban communities. FOA estimates the cost per subscriber to be roughly $2,000 in rural areas and $500 in urban areas, making providing broadband to rural communities mostly cost-prohibitive for private entities.[18]

According to FCC data, federal programs invested approximately $47 billion to specifically target broadband infrastructure in

unserved or underserved areas from 2009 through 2017. The FCC reports that this investment made broadband available to roughly 2 million new residential and small business locations.[19] In 2019, to further address the digital divide, the FCC and the Department of Agriculture started multiyear broadband support programs to increase access in rural areas.[20]

In August 2019, the FCC began to change how it collects broadband deployment data, with the goal of improving data accuracy and the FCC's ability to target funds to locations that lack access.

A critical aspect of these programs will be the FCC's new mapping effort to target funding where it is most needed. Currently, data on broadband availability in rural areas is unreliable and will need to improve in order for federal funding to reliably reach unserved areas where it is most needed. In August 2019, the FCC began an initiative to change how it collects broadband deployment data, with the goal of using a new methodology to improve data accuracy and the FCC's ability to target funds to locations that lack access. The FCC is also now coordinating more closely with the Rural Utilities Service to avoid funding areas where broadband service is already deployed.[21] Moreover, in 2020, Congress directed the FCC to further improve the precision of its data; the Consolidated Appropriations Act of that year included $98 million for the project.[22]

The Center for Rural Development reports that a central office for overseeing broadband funding will be crucial to closing the digital divide by getting funding to unserved or underserved rural areas.

The CRD reports that a centralized office for overseeing and managing broadband funding will be crucial to closing the digital divide by getting funding to rural areas that are unserved or underserved. The passage of HB 315 (2022) takes two important steps in furthering this goal: the establishment of the Office of Broadband Development within the Kentucky Infrastructure Authority, and the codifying of unserved and underserved areas.[23]

A review of best practices for broadband development in other states found that expanding broadband into unserved and underserved areas, especially rural areas, is best accomplished by incentivizing collaboration among ISPs, local governments, electric cooperatives, and private stakeholders. Furthermore, although last-mile infrastructure deployment strategies are critical to overall planning, many states are now including digital equity requirements and economic development measures to address issues beyond broadband access.[24]

Broadband Data And Mapping

The National Council of State Legislatures reports that a significant challenge to funding and providing broadband service to unserved and underserved areas is broadband mapping data, which is severely lacking in most states and nationwide due to the unreliability of FCC maps.

The National Council of State Legislatures (NCSL) reports that a significant challenge to funding and providing broadband service to unserved and underserved areas is broadband mapping data, which is severely lacking in most states and nationwide. Only a few states have managed to build reliable data on broadband availability, and the FCC's national data mapping is currently very unreliable.[25]

The FCC's evaluation of its data, mapping, and analyses can lead to significant overstatements of broadband availability. For example, the FCC currently and historically has collected broadband availability data by census blocks. The agency counts an entire census block as served if a provider reports that it does or could offer service to some, but not necessarily all, of the locations in the census block. The FCC has recognized that measuring availability at the census block level is inaccurate and ascribes broadband availability to residences and businesses that may not have access. Further, the FCC has acknowledged that rural census blocks cover larger areas than urban census blocks, which exacerbates the problem, as providers may deploy broadband service to only a small portion of the census block.[26]

Data mapping of this kind makes it impossible for the FCC maps to definitively report on which Americans have broadband and where the government or other entities should target broadband funding to reach unserved or underserved areas. A number of research organizations, such as NCSL and the GAO, as well as several government agencies and industry associations, have expressed concerns regarding FCC data on served and unserved areas.[27] In addition, many public comments responding to the broadband funding aspect of the Infrastructure Investment and Jobs Act reported that inadequate broadband service mapping was holding back provision of broadband to unserved and underserved areas.[28]

In 2019, the FCC established the Digital Opportunity Data Collection program, a more granular approach to gathering nationwide broadband deployment data.

In 2013, following recommendations by the GAO, the FCC declined to gather broadband data at a level more granular than the census block, such as address-level data, because the agency concluded that the complexity and filing burden on the industry would outweigh the benefit. Subsequently in 2019, the FCC began to address this recommendation by establishing the Digital Opportunity Data Collection program, which is a more granular approach to gathering nationwide broadband deployment data.[29]

The initiative to improve the accuracy of broadband deployment mapping data requires broadband service providers to identify their service areas using free-form geographic shapes called polygons. The polygons will identify the presence of service with more precision than the current census-block method. In addition, the new data collection model also better distinguishes between serviceable locations and locations that could be serviceable but are currently not being provided service.[30]

In 2020, the Broadband Deployment Accuracy and Technological Availability Act directed the FCC to issue final rules on data mapping. The FCC must collect granular service availability data from providers to ensure accuracy.

Additionally, on March 23, 2020, the Broadband Deployment Accuracy and Technological Availability Act was enacted. The Act directs the FCC to issue final rules on data mapping for both fixed and wireless deployment. It requires the FCC to collect granular service availability data from wired, wireless, and satellite providers and set strong parameters for service availability data to ensure accuracy. The act also permits the FCC to consider whether to collect verified coverage data from state or local entities and creates a process for states and local entities to challenge FCC maps with their own data. Lastly, the act requires the FCC to use the newly created maps when making new awards of broadband funding and strengthens enforcement against providers that knowingly submit inaccurate broadband data.[31] Further, the 2020 Consolidated Appropriations Act included $98 million for the endeavor. The FCC has since confirmed that the Digital Opportunity Data Collection program will conform to the requirements of the Act.[32]

The FCC is updating its maps, which will be linked to National Telecommunications and Information Administration Broadband Equity, Access, and Deployment funding.

The FCC is currently updating its maps. September 1, 2022, is the deadline for providers to submit their mapping data to the FCC. NCSL's best estimate for when the new FCC maps will be completed is either November or December of 2022. These new maps will be fundamentally linked to NTIA Broadband Equity, Access, and Deployment funding, as no BEAD funding will go out until the FCC mapping update is complete. In the meantime, states can still do their plans and applications, but they will not receive funding until the new FCC maps are completed.[33]

COVID-19 Pandemic And New Broadband Demands

The COVID-19 pandemic transformed Americans' relationship to the internet and broadband. It forced millions to stay home, and it shut down schools, businesses, and workplaces, dramatically increasing the importance of broadband internet solutions to work, learning, health care, and everyday life.

Results from a 2021 Pew Research Center survey of US adults show that internet use increased significantly during the pandemic. Moreover, the number of Americans using the internet for virtual meetings, such as telework, telehealth, and social interaction, increased significantly over previous years.[34] The Information Technology and Innovation Foundation reports that since the onset of the pandemic, peak home broadband traffic increased by roughly 30 percent.[35] The National Cable and Telecommunications Association reports a 24 percent increase in upload traffic and a 10 percent increase in download traffic since March 2022.[36]

Managing Broadband Funding

In response to the increased demand for broadband, the federal government has made an unprecedented amount of funding available to states. Along with the increase in funding opportunities comes an increase in the amount of organization and management required to make sure that states and local entities identify and apply for these opportunities, meet eligibility requirements, avoid duplication of efforts, and properly target unserved and underserved areas. Accomplishing these goals requires careful management, which—as indicated by examples from other states and advice from federal funding sources—is best accomplished by a centralized broadband funding management authority.

Along with other entities, the 2021 NTIA Infrastructure Investment and Jobs Act encourages states to have central broadband offices to manage information related to eligibility for federal funding.

Accordingly, the 2021 NTIA Infrastructure Investment and Jobs Act heavily encourages states to have such an office due to the significant amount of information required to apply, be approved, and remain eligible for federal funding. Other entities, such as the Pew Institute, are also encouraging states to create a central broadband office as a best practice. NCSL reports that 26 states have formal broadband offices.

In Kentucky, HB 315, passed in the 2022 Regular Session, created a centralized broadband management office in the form of the Office of Broadband Development. This new office is administratively attached to the Kentucky Infrastructure Authority and is granted the authority to promulgate administrative regulations and authority over administering the broadband deployment fund.

Broadband Investments

Between 2009 and 2017, the telecommunications industry and the federal government made considerable investments toward expanding and improving broadband infrastructure, access, and adoption across the country. Over this time, the telecommunications industry invested over $795 billion in broadband infrastructure, with the federal government adding a further $47.3 billion. Industry investment has been directed toward virtually all aspects of broadband development, but federal investment has been primarily designed to help close the digital divide by subsidizing the development of broadband infrastructure in rural areas where the return on investment is often insufficient to attract private industry.[37]

Federal efforts to close the digital divide have been directed through programs of the FCC, the Rural Utilities Service of the US Department of Agriculture, and the NTIA.

Federal efforts in this regard have become increasingly important. Over the past decade, the federal government has taken on a more active role in broadband infrastructure investment where digital divides exist. As the economic and social ramifications caused by inadequate or unaffordable high-speed internet have become more apparent, federal programs have also looked to encourage broadband adoption and increase digital equity.[38] Federal efforts in these regards have historically been directed through programs administered by the FCC, the RUS of the US Department of Agriculture, and the NTIA.[39]

FCC Universal Service Fund Programs

The FCC, through the universal service fund, administers four programs supporting increased access to high-speed internet: the Connect America Fund (rural/high-cost areas), the E-Rate program (schools and libraries), Rural Health Care, and Lifeline (low-income consumers).

The FCC's transition from support for voice communication services to broadband began with the Telecommunications Act of 1996, which established the universal service fund (USF) and amended the definition of *universal service* to include high-speed internet.[40] A 2011 FCC order mandated that the USF make a transition away from voice communication service to broadband services. The FCC, through the USF, administers four programs that support increased access to high-speed internet: the Connect America Fund (rural/high-cost areas), the E-Rate program (schools and libraries), Rural Health Care, and Lifeline (low-income consumers).[41]

Kentucky has received nearly $2 billion in FCC universal service program subsidies and discounts since 2012, mostly from the E-Rate program and the Connect America Fund.

Kentucky has received nearly $2 billion in FCC universal service program subsidies and discounts since 2012. Most of this funding derived from the two largest USF component programs: the E-Rate program and the Connect America Fund.

E-Rate discounts can vary, covering 20 percent to 90 percent of a school or library's cost for internet and voice services through reimbursements. Total reimbursement depends on the surrounding poverty level and whether the school district is considered urban or rural. Computers, telephones, software, and other physical requirements for end user connectivity are still the responsibility of the school or library.[42] From 2012 to 2022, the Kentucky Department of Education received approximately $411 million in E-Rate reimbursements. During the same period, the national E-Rate reimbursement total was approximately $27 billion.[43] The Connect America Fund includes the newly established Rural Digital Opportunity Fund (RDOF), which will disburse up to $20 billion over the next 10 years for broadband deployment in unserved rural areas.[44] Of the $9.2 billion awarded in the RDOF Phase I auction, $149 million was assigned to winning bidders in Kentucky.[45] Table 2.4 provides further detail.

Table 2.4
FCC Universal Service Fund Programs Uses And Awards (In Millions Of Dollars)

Program	Description	National	Kentucky
E-Rate	Telecommunications discounts for schools and libraries	$26,851.34	$411.16
Rural Health Care	Funding to rural health care providers for broadband connectivity	2,586.27	36.52
Lifeline	Phone and broadband discounts for low-income citizens	3,919.94	63.89
Connect America Fund	Subsidies to service providers for providing service in rural, high-cost areas	46,862.10	1,446.59
Total		$80,219.65	$1,958.16

Note: The amounts reflected in the table for E-Rate, Rural Health Care, and Connect America Fund are for 2012 through 2022. Funding for Lifeline is from 2018 through 2022.
Source: LOIC staff compilation of information via CRS Report R46613 (programs/descriptions) and the Universal Service Administrative Company Open Data Portal (funding amounts).

USDA Rural Utility Services Programs

The RUS manages several programs that provide loans, grants, and loan/grant combinations for broadband deployment and improvement in rural areas.[46] The largest RUS broadband program is the ReConnect Loan and Grant Program, which was established in 2018 and was appropriated $550 million to $655 million in fiscal years 2018 through 2021. The Infrastructure Investment and Jobs Act appropriated $1.926 billion to the ReConnect program in FY 2022.[47] Table 2.5 provides further detail.

Table 2.5
US Department Of Agriculture Programs And Awards (In Millions Of Dollars)

Program	Description	National	Kentucky
ReConnect Loan and Grant Program	Offers loans and grants to finance broadband deployment in rural areas	$1,500.00	$40.00
Community Connect Grant Program	Offers financial assistance for broadband deployment in unserved rural areas	221.69	13.26
Rural Broadband Access Loan and Loan Guarantee Program	Offers loans and guarantees for the construction, improvement, or acquisition of broadband infrastructure	4,331.00	—
Telecommunications Infrastructure Loan and Loan Guarantees Program	Offers financing for the construction, improvement and expansion of broadband and telephone service in rural areas	—	34.40
Total		$6,052.69	$87.66

Note: Awards amounts listed for the ReConnect program include amounts awarded in the first two rounds of funding in FY 2019 and FY 2020. Award amounts listed for the Community Connect Grant Program are for FY 2013 to FY 2021. The amount in the National column for the Rural Broadband Access program reflects the aggregate amount of annual loan levels (lending authority) set by Congress in appropriation bills from FY 2001 to FY 2019; the amount does not necessarily reflect the total loans generated by the program. LOIC staff were unable to identify the total funding or award amounts for the Telecommunications Infrastructure program, but the annual loan level has historically been $690 million. Other than a US Department of Agriculture press release noting a project in Kentucky, LOIC staff were unable to find any information regarding Kentucky projects financed with the Rural Broadband Access program or Telecommunications Infrastructure program; as such, the total award amounts for Kentucky are likely underestimated in the table.
Sources: US. Library of Congress. Congressional Research Service. *USDA's ReConnect Program: Expanding Rural Broadband*, R47017. Jan. 26, 2022; US. Department of Agriculture. Rural Development. *Community Connect Grants*; US. Department of Agriculture. Rural Development. *Community Connect Grant Awards/ Application Fiscal Years 2013-2021*; US. Library of Congress. Congressional Research Service. *Broadband Loan And Grant Programs In The USDA's Rural Utilities Service*, RL33816. March 22, 2019; US. Department of Agriculture. "USDA Invests $152 Million To Improve Broadband Service In 14 States." Oct. 7, 2019.

American Recovery And Reinvestment Act

Kentucky projects received over $300 million through the American Recovery and Reinvestment Act—the second largest amount of funding for any state.

The American Recovery and Reinvestment Act of 2009 appropriated more than $7 billion to fund broadband grant and loan programs administered by the NTIA and the RUS. Kentucky projects received over $300 million in combined funding—the second largest amount for any state or territory.[48] The awards funded last-mile infrastructure projects and public computer centers that provided broadband access to the public. The state was also awarded over $5 million for the State Broadband Data and Development (SBDD) program, which was used in part to establish the Office of Broadband Outreach and Development.[49] Table 2.6 provides more detail.

Table 2.6
American Recovery And Reinvestment Act Fund Programs 2009
Uses And Awards (In Millions Of Dollars)

Program	Description	National	Kentucky
Broadband Technology Opportunity Program	Competitive broadband grant program administered by National Telecommunications and Information Administration. Uses include broadband infrastructure, public computer centers, and broadband adoption.	$3,900.00	$3.02
Broadband Initiatives Program	Broadband grant and loan program administered by US Department of Agriculture Rural Utilities Service for mostly rural areas.	3,600.00	305.37
State Broadband Data and Development Grant Program	Grants distributed to all states, territories, and the District of Columbia.	293.00	5.30
Total		$7,793.00	$313.69

Note: As of October 2010, all award announcements were complete.
Source: Staff analysis of National Telecommunications and Information Administration data and information.

Broadband Funding During COVID-19

Despite the increased federal attention, the disparities caused by the digital divide were exacerbated by the COVID-19 pandemic. In response, Congress included billions of dollars of appropriations for broadband programs in COVID-19–era spending bills.[50]

In response to COVID-19, Congress appropriated billions of dollars for broadband programs in the Coronavirus Aid, Relief, and Economic Security Act; the Consolidated Appropriations Act of 2021; and the American Rescue Plan Act.

The Coronavirus Aid, Relief, and Economic Security Act was signed into law in March 2020. In addition to directing an additional $100 million to the USDA ReConnect program, the act established the coronavirus relief fund (CRF), which provided $150 billion to state and local governments for a broad range of activities including broadband access.[51] Kentucky received $1.599 billion in CRF dollars, of which it used $8 million for K-12 internet connectivity and just under $60,000 to hire GEO Partners LLC to lead a statewide broadband mapping initiative.[52]

The Consolidated Appropriations Act of 2021 authorized nearly $5 billion to FCC and NTIA programs intended to increase access to affordable and reliable high-speed internet service.[53] In addition to the programs outlined in Table 2.7, the act included $35 million for the USDA's Community Connect broadband grant program and $1.9 billion for the FCC to fund the removal and replacement of telecommunications equipment believed to pose security risks.[54]

Table 2.7
Consolidated Appropriations Act 2021 (In Millions Of Dollars)

Program	Agency	Description	National	Kentucky
Emergency Broadband Benefit	FCC	Financial assistance for low-income households for broadband service; the program transitioned to the Affordable Connectivity Program in CYE 2021.	$3,200.00	*
Broadband Infrastructure Grant Program	NTIA	Broadband deployment program encouraging public/ private partnerships between state governments (or political subdivisions of a state) and broadband service providers; 18 projects, including one Kentucky-based partnership, were awarded a total of nearly $275 million.	288.00	$3.12
Tribal Broadband Connectivity Program	NTIA	Funding for broadband deployment on tribal lands; funds can also be used for telehealth, broadband affordability, and digital equity; as of May 2022, 33 projects have been awarded a total of $83 million.	980.00	0.00
Connecting Minority Communities Pilot Program	NTIA	Funding for historically Black colleges and universities, tribal colleges and universities, and minority-serving institutions to purchase broadband internet access, equipment, etc.	268.00	**
Total			$4,736.00	$3.12

Note: FCC = Federal Communications Commission; CYE = contract year ending; NTIA = National Telecommunications and Information Administration.
* LOIC staff were unable to locate state-by-state funding data. LOIC staff were able to find household data related to the Emergency Broadband Benefit. At CYE 2021, more than 200,000 Kentucky households were enrolled in the program—the 14th highest among the 56 states and territories, and the fourth highest per capita.
** It is unclear whether the NTIA has announced any awardees for the Connecting Minority Communities Pilot Program. The last available press release, from December 2021, stated that there were over 200 applications requesting more than $800 million in funding.
Source: LOIC staff compilation of data from the FCC, the NTIA, and the US Census Bureau.

The $1.9 trillion American Rescue Plan Act, enacted in March 2021, appropriated $7 billion to the FCC to provide remote learning support to schools and libraries. The act also provided hundreds billions of dollars in flexible funding to programs with multiple eligible uses, including broadband. Kentucky received more than $6 billion in ARPA funds, a portion of which was used to fund the KIA broadband deployment fund. Table 2.8 provides more detail.

Table 2.8
American Rescue Plan Act 2021 (In Millions Of Dollars)

Program	Agency	Description	National	Kentucky
Coronavirus state and local fiscal recovery fund	Treasury	Flexible funding for state, local, territorial, and tribal governments. Funds can be used to support public health expenditures; address negative economic impacts caused by pandemic; provide premium pay for essential workers; and invest in water, sewer, and broadband infrastructure.	$350,000.00	$3,770.63
Elementary and secondary school emergency relief fund	OESA	Continuation of the ESSER fund established by the CARES Act. ARP ESSER funds are intended to help state and local educational agencies safely reopen schools and address the effects of the pandemic on students.	122,700.00	2,001.22
Coronavirus capital projects fund	Treasury	Funding to states, territories, and tribal governments for capital projects such as broadband deployment/services and digital connectivity technology projects. Investments in unserved/underserved areas are prioritized.	10,000.00	182.77
Homeowner assistance fund	Treasury	Funding to states, territories, and tribal governments to provide financial relief for vulnerable homeowners. Program includes assistance for internet service.	9,900.00	85.50
Emergency connectivity fund	FCC	Provides remote learning support to E-Rate–eligible schools, libraries, and consortia.	7,170.00	62.17
Economic Development Administration programs	EDA	The EDA received $3 billion in flexible funding that will be distributed through six programs, including $1 billion for the Build Back Better Regional Challenge, $500 million for the Economic Adjustment Assistance program, and $300 million for the Coal Communities Commitment.	3,000.00	10.62*
Institute of Museum and Library Services	IMLS	Funding to state library administrative agencies, museums, etc., for necessary expenses to carry out services, which can include digital/broadband services.	200.00	2.98
Total			$502,970.00	$6.115.89

Note: OESA = Office of Elementary and Secondary Education; ESSER = elementary and secondary school emergency relief fund; CARES = Coronavirus Aid, Relief, and Economic Security Act; ARP = American Rescue Plan; EDA = Economic Development Administration; IMLS = Institute of Museum and Library Services.
*The majority of projects funded via the EDA programs are related to nonbroadband infrastructure or funding economic development plans. Two Kentucky-based agriculture and health IT projects were named finalists and awarded $500,000 in Build Back Better Regional Challenge funds.
Source: LOIC staff compilation of data from the US Treasury, OESA, Federal Communications Commission, EDA, and IMLS.

The Infrastructure Investment and Jobs Act (2021) included over $60 billion in funding for broadband expansion and access—the largest federal broadband investment in history.

The Infrastructure Investment and Jobs Act, passed in November 2021, included over $60 billion in funding for broadband expansion and access. The Act represents the largest federal broadband investment in history and includes $42.45 billion for the BEAD Program; $2.75 billion for digital equity programs; $1 billion for middle-mile projects; and $14.2 billion for the Affordable Connectivity Program (a continuation of the

Emergency Broadband Benefit established by the Consolidated Appropriations Act of 2021).[55] In addition to these programs, the Act appropriated nearly $2 billion to the USDA/RUS ReConnect program, funded and amended the Tribal Broadband Connectivity Program, and authorized state and local governments to use private activity bonds for rural broadband.[56]

Table 2.9
Infrastructure Investment And Jobs Act (In Millions Of Dollars)

Program	Agency	Description	National
Broadband Equity, Access, and Deployment Program	NTIA	Block grants are disbursed to states, territories, and the District of Columbia, funding broadband infrastructure deployment, planning, and adoption. Funding is prioritized sequentially, starting with unserved (<25/3 Mbps), then underserved (<100/20 Mbps), etc. Each state will receive an initial allocation of $100 million, with additional funds distributed based on a formula that considers the number of unserved and high-cost locations in the state (based on FCC maps to be published later in 2022).	$42,450.00
State Digital Equity Capacity Grant Program	NTIA	Two block grant programs for states/territories: ● $60 million available for the development of digital equity plans ● $1.44 billion available over 5 years for digital equity projects and implementation of digital equity plans	1,500.00
Digital Equity Competitive Grant Program	NTIA	Competitive grants for public entities, private companies, and nonprofits funding the implementation of digital equity projects. (State entities receiving State Digital Equity grants are not eligible.)	1,250.00
Middle Mile Grants Program	NTIA	Competitive grants to states, tribal governments, tech companies, electric utilities, nonprofits, etc., for the construction, improvement, or acquisition of middle-mile infrastructure.	1,000.00
Affordable Connectivity Program	FCC	Continuation of the Emergency Broadband Benefit. Financial assistance on broadband services for eligible consumers.	14,200.00
Total			$60,400.00

Note: NTIA = National Telecommunications and Information Administration; FCC = Federal Communications Commission.
Source: LOIC staff compilation of data from FCC and NTIA, along with Benton Institute analyses.

Kentucky Broadband Initiatives And Legislation

Several broadband initiatives and legislation have played an important role in advancing broadband deployment and availability in Kentucky. With the establishment of the broadband deployment account in 2006, Kentucky set its intention to fund broadband projects through the Kentucky Infrastructure Authority. From 2007 to 2018, KIA funded nine broadband projects in the amount of $17.9 million for infrastructure and fiber installation for broadband access.

Broadband projects were also funded through capital projects budgets for colleges, for universities, and for some municipalities. Colleges and universities typically used their restricted funds to expand computing networking components, which included the use of fiber-optic, wireless, and other network-related equipment. Projects normally ranged from $1.5 million to $7 million. Also, prior to 2014, a handful of local governments received direct capital project appropriations averaging $150,000 per project. Table 2.10 provides a timeline of significant broadband funds and projects between 2006 and 2022.

Table 2.10
Kentucky Broadband Funds And Projects Timeline
2006 To 2022

Funds And Projects	Year	Description
KIA Broadband Deployment Account	2006-2020	Established by HB 550 (2006 RS) within the KIA infrastructure revolving fund to administer funds for broadband projects.
Office of Broadband Outreach and Development	2010-2014	Created and funded with federal ARRA money and primarily tasked with generating mapping data for the NTIA national broadband map.
KentuckyWired	2015-present	Statewide middle-mile broadband project designed to connect all state government offices as well as provide wholesale middle-mile services for last-mile providers.
KIA broadband deployment fund	2020-2022	Established by HB 362 (2020 RS). Separated from KIA infrastructure revolving fund and intended to administer ARPA funds for broadband projects.
Office of Broadband Development	2022-present	Established by HB 315 (2022 RS) to be the state broadband office and responsible for the administration of the broadband deployment fund.

Note: KIA = Kentucky Infrastructure Authority; ARRA = American Recovery and Reinvestment Act; NTIA = National Telecommunications and Information Administration; ARPA = American Rescue Plan Act.
Source: LOIC staff compilation of Kentucky broadband funds and projects, 2006 to 2022.

Commonwealth Office Of Broadband Outreach And Development

The Office of Broadband Outreach and Development was created in 2010 to generate data for the NTIA national broadband map.

OBOD was established in 2010 under the purview of the Finance and Administration Cabinet. The office was created and funded with federal ARRA money and primarily tasked with generating mapping data for the NTIA national broadband map. NTIA awarded nearly $300 million in ARRA funding nationally. Kentucky, through the Commonwealth Office of Technology, received $5.77 million in grant funds via the SBDD. Project funding ended December 31, 2014, at which time the state reported having spent $5.12 million of the awarded grant funds.

KentuckyWired

KentuckyWired is Kentucky's middle-mile broadband network. With a construction cost of $274.8 million, the design included more than 3,200 miles of fiber-optic cable and connections to 1,100 government facilities.

KentuckyWired is Kentucky's statewide middle-mile broadband network. The project evolved from a fiber-optic network concept developed by the Center for Rural Development in Somerset. The goal was to serve companies that might want to locate in rural Kentucky and to give local entrepreneurs a platform from which to compete globally.

In 2015, state officials and Macquarie Infrastructure Developments entered into a series of contracts projecting a completion date of July 2018, with a construction cost of $274.8 million. The design included more than 3,200 miles of fiber-optic cable across the state and connections to 1,100 government facilities. The term of the contract was 30 years for construction, operation, maintenance, and debt repayment. The Kentucky Communications Network Authority anticipates that all planned state agency sites will be migrated to the network by FY 2023.

The commonwealth is responsible for paying availability payments, which are structured to include repayment of debt service, private equity returns, and ongoing network expenses. The state intends to offset the estimated $1.2 billion in availability payments through network fees charged to state agencies connected to the network and through an agreement with a wholesaler, Accelecom (previously known as OpenFiber Kentucky LLC). The wholesaler agreement states that Kentucky will receive a percentage of revenues that Accelecom generates from the sale of lit and dark fiber service. The primary source of the state's share of revenues will be derived from the sale of lit fiber services. Due to language in the wholesaler agreement specifying that the state's share of lit fiber service revenue would be calculated on post-tax, net revenue basis, the state is not expected to receive its share of lit fiber revenues until 2032 or 2033.

Legislation

Major legislation responsible for developing broadband in Kentucky includes HB 550 (2006); HB 362 (2020); HB 320 and HB 382 (2021); and HB 315 (2022).

In 2006, the General Assembly passed House Bill 550, which established the broadband deployment account within the KIA infrastructure revolving fund. The bill also gave KIA authority to promulgate regulations to provide guidance for projects using the broadband deployment account.[57] In the 2020 Regular Session, the legislature passed HB 362, which changed the broadband deployment account to a dedicated broadband deployment fund. The new fund was designed to specifically focus on improving broadband service in underserved or unserved areas, with language

indicating that money in the fund would be dedicated and allocated "solely to providing grant funds to governmental agencies and private sector entities to construct infrastructure for the deployment of broadband service to households and businesses in underserved or unserved areas."[58]

Two bills appropriating funding to the broadband deployment fund were passed during the 2021 Regular Session. HB 320 appropriated $250 million to the fund, $50 million of which was to be awarded no later than April 1, 2022.[59] HB 382 appropriated an additional $50 million via the state fiscal recovery fund of ARPA. This appropriation was limited to broadband projects that secure "economic development opportunities for commercial and industrial customers."[60]

In 2022, the legislature passed HB 315, which established the Office of Broadband Development, attached to KIA. The bill amended language from HB 320 and HB 382 (2021 RS) to specify that the $250 million appropriation to the broadband deployment fund would be derived from $182.77 million from the ARPA coronavirus capital projects fund and $67.23 million from the ARPA state fiscal recovery fund. The bill also reappropriated $50 million from the ARPA state fiscal recovery fund, but deleted the economic development opportunities language.[61]

Also in 2022, the state budget (HB 1) included general fund appropriations in the amounts of $1,174,400 and $1,134,400 for fiscal years 2023 and 2024, respectively, to provide for the creation and operation of the Office of Broadband Development. Table 2.11 provides additional detail on that bill, as well as on other legislation that did not pass.[62]

Table 2.11
Kentucky Broadband Legislation/Regulation Timeline
2006 To 2022

Legislation/ Regulation	Year	Description
HB 550	2006	Established the broadband deployment account within the KIA infrastructure revolving fund. The bill stated that KIA shall promulgate regulations to provide guidance for projects using the broadband deployment account.
HB 362	2020	Redesigned the broadband deployment account into the broadband deployment fund within KIA. The fund was designed to focus on improving broadband service in underserved or unserved areas. The bill required KIA to promulgate regulations to guide the approval of funds for broadband projects.
HB 320	2021	Appropriated $250 million to the broadband deployment fund, $50 million of which was to be awarded no later than April 1, 2022.
HB 382	2021	Amended HB 320 (2021 RS) and appropriated an additional $50 million from the state fiscal recovery fund of ARPA for broadband projects that secure economic development opportunities for commercial and industrial customers.
HB 348*	2021	Proposed moving the broadband deployment fund to the Department of Agriculture, funding a state broadband plan, and administering state and federal dollars for broadband deployment.
807 KAR 5:015**	2021	Would have provided guidance for the approval of federal funds dispersed from the broadband deployment fund.
HB 315	2022	Established the Office of Broadband Development, attached to KIA. Created statutory language facilitating pole replacements as well as redefining and setting new standards for broadband speeds and underserved and unserved areas in Kentucky. Amended language from HB 320 and HB 382 (2021 RS) to specify that the $250 million appropriation to the broadband deployment fund would be derived from $182.77 million from the ARPA coronavirus capital projects fund and $67.23 million from the ARPA state fiscal recovery fund. Reappropriated $50 million from the ARPA state fiscal recovery fund, but deleted the economic development opportunities language.
HB1***	2022	Included general fund appropriations of $1,174,400 in fiscal year 2022-2023 and $1,134,400 in fiscal year 2023-2024 to KIA to establish an Office for Broadband to provide direction and planning for the deployment of last-mile broadband services across the commonwealth.

Note: KIA = Kentucky Infrastructure Authority; ARPA = American Rescue Plan Act.
* Did not pass.
** Rescinded before becoming active.
*** 2022 state budget bill.
Source: LOIC staff compilation of Kentucky broadband legislation, 2006–2022.

Chapter 3

Findings And Recommendations

The Pew Research Center recommends a number of best practices for effective state broadband management. These include stakeholder outreach, policy frameworks, planning and capacity building, funding and operations, and program evaluation and evolution.

The Pew Research Center, which has been conducting research into broadband deployment for more than a decade, published a report in 2020 outlining the five critical best practices that states can employ to improve broadband development and close the digital divide:

- Stakeholder Outreach and Engagement: working to engage stakeholders at both the state and local levels
- Policy Framework: setting well-defined goals and clear policy direction in legislation and identifying and addressing barriers to broadband deployment in unserved and underserved areas
- Planning and Capacity Building: establishing plans that define goals and objectives that can be used to measure progress while supporting local planning efforts to educate community members
- Funding Operations: providing funding to support broadband deployment in unserved and underserved areas though grant programs
- Program Evaluation**:** evaluating the performance of planning efforts and funding infrastructure projects to incorporate lessons learned

LOIC staff applied this framework to examine Kentucky's broadband efforts since 2004. The following findings sections discuss Kentucky's efforts in each of these categories.[63]

Kentucky Has Been Active With Stakeholder Outreach And Engagement

Kentucky state government has been actively building stakeholder engagement for broadband development since 2004.

Pew defines *stakeholder outreach and engagement* as working with a broad range of entities, collaborating with state-level partners, and engaging local stakeholders. Kentucky has been active in such stakeholder engagement activities since 2004.[64]

Through House Bill 627 in 2004, the General Assembly established the Kentucky Broadband Task Force "to examine the expansion of the availability of broadband Internet access in the Commonwealth."[65] On November 15, 2006, the task force released its report and adopted various recommendations by ConnectKentucky, a public/private partnership created in 2004 to conduct broadband mapping and planning in the state.[66] The task

force report established mapping, among other findings, to be a crucial aspect of deploying broadband effectively and found that confirmation of mapping efforts at the local level was the ideal strategy for accurately representing broadband coverage.

The report stated that maps

> facilitate strategic decision making regarding regulation and technology investment by identifying areas at the county and census-block levels with inadequate broadband service and existing infrastructure, such as cellular towers and elevated water tanks, which may be useful for broadband deployment. ConnectKentucky … also work[ed] with Internet leadership teams in each county to confirm and refine the accuracy of mapped broadband coverage areas.[67]

Other recommendations the task force supported include the importance of providing financial incentives, the ability to fund broadband projects through a revolving loan/grant pool under the authority of the Kentucky Infrastructure Authority, and the importance of deregulating the telecommunications industry.[68]

Beginning in 2004, the Broadband Task Force and the Kentucky Infrastructure Authority began collaborating with ConnectKentucky, a nonprofit, to develop broadband maps for the state.

During this period, ConnectKentucky actively collaborated with KIA to create a comprehensive geographic information system to identify county and census-block areas with inadequate broadband deployment.[69] ConnectKentucky also worked at the county level to confirm and refine broadband mapping coverage.[70] In doing so, it interacted with business and industry, K-12 schools, health care organizations, libraries, higher education, community-based organizations, government, Kentucky Tourism, and the state Department of Agriculture.[71]

Additional outreach and engagement by ConnectKentucky include the following:

- ConnectKentucky persuaded approximately 80 broadband providers, including cable and telecom companies, to share information about the location of broadband infrastructure in the state.
- The provider information collected by ConnectKentucky resulted in maps that included population density to show where service gaps existed.
- ConnectKentucky's outreach efforts included the formation of volunteer committees in each county that identified the benefits of broadband service and disseminated that information to the public.

- ConnectKentucky used regional coordinators to assist local governments with drafting requests for proposals for broadband providers.[72]

In 2010 Kentucky established the Office of Broadband Outreach and Development within the Commonwealth Office of Technology.

Office Of Broadband Outreach And Development. In 2010, Kentucky received $5.3 million in State Broadband Data and Development grant funds, which it used to establish the Office of Broadband Outreach and Development within the Commonwealth Office of Technology. OBOD contracted with Michael Baker Jr. Inc. to conduct various broadband-related research, including mapping and surveys of broadband adoption and utilization. In addition to OBOD's contract with Michael Baker Jr. Inc., it also established contracts with Murray State University, the Council on Postsecondary Education, and the Green River Area Development District for data collection and technical assistance.[73]

OBOD carried out a broadband benchmarking study that surveyed 2,231 organizations (commercial and noncommercial) and 4,122 households. Broadband benchmarking involves comparing internet use "between groups and regions by various characteristics, such as industry, business size, and household demographics."[74] The research provided by OBOD resulted in eight recommendations to help stakeholders leverage broadband technology. Table 3.1 provides additional detail.

Table 3.1
OBOD Broadband Benchmarking Survey Recommendations

Number	Recommendation
1	Each region or group of communities must develop its own strategy and initiatives based on its own characteristics, values, and priorities.
2	Focus on high-opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.
3	Focus on the small- to medium-enterprise segment, especially organizations with 1-49 employees, to increase internet utilization, thereby driving competitiveness, revenues, and job creation.
4	Initiatives aimed at increasing utilization among the small- to medium-enterprise segment should focus on the following 10 utilization categories: • Delivery of services and content • Rich media or service creation • Teleworking • Staff training and skills development • Advertising and promotion • Social networking • Government transactions • Customer service and support • Selling goods or services • Supplier communication and coordination
5	Develop training programs and resources to target households that have members over the age of 64 or that have below-average incomes.
6	Nonmetropolitan areas are a priority for internet training programs and resources.
7	In designing initiatives to increase and improve internet utilization by households and organizations, considerable weight should be given to the learning methods preferred by the target populations.
8	Broadband adoption programs should focus on key groups that face persistent barriers to adoption, specifically elderly households and lower-income households where no one else in the household uses the internet. Internet adoption programs should be designed to address specific barriers facing their targeted group.

Source: Staff summary from Michael Baker Jr. Inc. and Strategic Networks Group. "Broadband KY e-Strategy Report," May 24, 2012, pp. 5-8.

Project funding for OBOD continued until December 31, 2014, at which time the state reported spending $5.12 million (approximately 96 percent) of the awarded grant funds.

In 2015, Kentucky established the Kentucky Communications Network Authority (KCNA) within the Governor's Office. The agency's duties and responsibilities were codified during the 2017 Regular Session with the passage of HB 343.

Kentucky Communications Network Authority. The Kentucky Communications Network Authority (KCNA) was created in August 2015 within the Governor's Office to oversee and maintain the KentuckyWired middle-mile network.[75] The agency's duties and responsibilities were codified during the 2017 Regular Session with the passage of HB 343. A review of archived information on KCNA's website indicates that KCNA absorbed OBOD's outreach and development functions. However, it appears that KCNA has focused solely on the middle-mile network since 2016.

HB 343 of the 2017 Regular Session required KCNA to "create an advisory group, including major stakeholders, to provide input and feedback on issues important to the user community and to

the long-term sustainability of the project and the network."[76] The KCNA Advisory Group includes representation from state and local government, media, and broadband advocates and internet service providers.[a] According to KCNA's webpage, KAG held its initial meeting on October 18, 2017. It appears to have met twice in 2018, twice in 2019, and once in 2021 to discuss updates on middle-mile construction. Construction of the middle mile is nearing completion. According to KCNA, all huts have been replaced. The authority and the Finance and Administration Cabinet have reviewed the easement for access to Fort Knox property and returned it to Fort Knox for execution. After that easement is finalized, the service provider, LTS Kentucky Managed Technical Services, will complete the construction. There are approximately 60 miles of fiber to hang in Ring 4. The difficulty of obtaining fiber and the damage from tornadoes in December 2021 have delayed construction in Ring 4.[77]

Accelecom is the wholesaler for the KentuckyWired Network, connecting last-mile ISPs and enterprise customers to the middle mile and the internet backbone.

Accelecom Wholesaler Agreement. Although construction of the middle mile is nearly complete, KAG may still wish to meet to provide input and feedback related to the wholesaler agreement with Accelecom (previously known as OpenFiber Kentucky LLC). The commonwealth is responsible for making availability payments, which are structured to include repayment of debt service, private equity returns, and ongoing network expenses. The state intends to offset the estimated $1.2 billion in availability payments through network fees charged to state agencies connected to the network and through an agreement with a wholesaler, Accelecom.[b]

[a] Under KRS 154.15, designated members include the Administrative Office of the Courts, the Cabinet for Economic Development, the Cabinet for Health and Family Services, the Council on Postsecondary Education, the Department of Education, the Finance and Administration Cabinet, the Justice and Public Safety Cabinet, Kentucky Educational Television, the Legislative Research Commission, institutions of higher education, libraries, local government, and public health care entities.

[b] Construction of the KentuckyWired network was funded through a combination of sources, including $311 million in private revenue bonds, a $30 million state contribution, a $23.5 million federally funded milestone payment, and a $6.5 million private equity contribution. The commonwealth is responsible for making availability payments, which are sized to cover debt service, private equity return, and ongoing operational costs. The availability payments are subject to annual adjustments based on fixed and variable components such as inflation, so the state's financial obligation through 2045 is not known; however, most estimates indicate that the state will pay $1 billion to $1.2 billion in availability payments through the project's 2045 termination date. In addition to the availability payments, the state is also responsible for such expenses as network system refreshes, third-party costs, and the debt service for the $100 million in bond debt used to settle a dispute with the network's design-builder.

The wholesaler agreement states that Kentucky will receive a percentage of revenues that Accelecom generates from the sale of lit and dark fiber service. The primary source of the state's share of revenues will be derived from the sale of lit fiber services. Due to language in the wholesaler agreement specifying that the state's share of lit fiber service revenue would be calculated on a post-tax, net revenue basis, the state is not expected to receive its share of lit fiber revenues until 2032 or 2033.[78] Accelecom has generated $4,550 in gross dark fiber revenues, of which the commonwealth will receive 90 percent, or $4,095.[79]

According to Accelecom, challenges related to franchise issues and right of first refusal issues hinder its ability to sell lit fiber services and generate revenues for the commonwealth. For example, a number of municipalities have asserted that franchise agreements are required before Accelecom can provide service in their areas.[c] Certain carriers that have received purported rights of first refusal from the commonwealth have an adverse impact on Accelecom's ability to provide wholesaler services. For example, Accelecom states that KCNA has contracts with East Kentucky Network and Bluegrass Network that purportedly allow them the right of first refusal to provide service in certain areas on the same terms and conditions offered by Accelecom.[80]

As of April 2022, Accelecom has signed 265 customer agreements in 91 Kentucky counties.

As of April 2022, Accelecom has signed 265 customer agreements in 91 Kentucky counties. Although Accelecom did not identify the types of customers with whom agreements exist (for instance, enterprise, last-mile, or Tier 3 ISPs) because of proprietary concerns, a spokesperson stated that a significant percentage of the 265 agreements related to the health care industry and ISPs.[81] Table 3.2 provides additional detail.

[c] Ashland, Frankfort, Glasgow, Murray, Paducah, and Pikeville.

Table 3.2
Accelecom Projects In Kentucky

Number Of Projects Per County	County	Number
1	Adair, Allen, Anderson, Ballard, Barren, Bath, Bath/Montgomery, Boone, Bourbon, Bracken, Butler, Caldwell, Casey, Crittenden, Cumberland, Fleming, Garrard, Green, Hancock, Jackson, Jessamine, Kenton, Lee, Lincoln, Livingston, Logan, Marshall, McLean, Metcalf, Monroe, Nicholas, Owsley, Rockcastle, Todd, Trigg, Washington, Webster, Whitley	38
2	Daviess, Elliott, Harrison, Lyon, Marion, Mercer, Morgan, Russell, Scott, Shelby, Simpson, Taylor, Union, Warren, Wolfe	30
3	Carter, Clinton, Garrard, Grayson, Harlan, Johnson, Knott, Laurel, Leslie, Mason, McCracken, Ohio, Oldham, Owen, Powell, Wayne	48
4	Estill, Lawrence, Lewis, Martin, Menifee, Pike	24
5	Boyd, Franklin, Greenup, Hopkins, Letcher, McCreary, Montgomery, Perry	40
6	Bell, Clark, Floyd	18
10	Madison, Pulaski	20
11	Rowan	11
16	Fayette	16
20	Jefferson	20
Total		265

Source: LOIC staff analysis from information provided by Accelecom.

The 2017 agreement between Accelecom and the state requires Accelecom to provide quarterly reports regarding revenue, billing, and payments.

Per the 2017 wholesaler agreement between Kentucky and Accelecom, Accelecom is required to provide records and reports related to wholesale services to the state at least quarterly. These reports were designed to include detailed information concerning the revenue sources, calculations, and any overdue billings relating to the payments. During its review, LOIC staff did not identify quarterly reports from Accelecom to KCNA. As a result, staff communicated directly with Accelecom to request and review specifics about anticipated revenue to the state from the sale of dark and lit fiber. Although revenue sharing for lit fiber services is not anticipated until 2032 or 2033, quarterly reporting describing Accelecom's progress in facilitating last-mile broadband deployment during the interim would be beneficial for the state. Officials from KIA confirmed that KCNA has a quarterly reporting requirement with Accelecom. It also stated the opinion that the frequency of legislative reporting should be determined by the legislature.[82]

Recommendation 3.1

Recommendation 3.1

The Kentucky Communications Network Authority should work with Accelecom to establish formal quarterly reporting to keep the legislature updated on anticipated revenue from the sale of dark and lit fiber pursuant to the wholesaler agreement.

Accelecom is currently deploying broadband across Kentucky. LOIC staff visited a number of deployment sites in Eastern Kentucky. These included sites in Harlan, Pineville, and Shopville.

Broadband Stakeholder Accelecom Is Building Broadband Projects In Kentucky. LOIC staff traveled to southeastern Kentucky to tour Accelecom broadband sites under construction and in operation. The sites visited included the agricultural development, AppHarvest, in Shopville; the Clear Creek Baptist Bible College in Pineville, including local pole attachments; the Harlan County Health Department in Harlan; and a fiber-optic data distribution hut in Harlan. Accelecom officials conducted the tours and provided explanations covering the technical and logistical challenges of deploying fiber to a site. For the four sites visited by LOIC staff, the prevailing issues encountered had to do with negotiating pole attachment agreements and associated delays. Although the Public Service Commission (PSC) has an established complaint process for pole attachment disputes, the process can be costly and time consuming. In most instances, the negotiating parties attempt to resolve issues on their own.

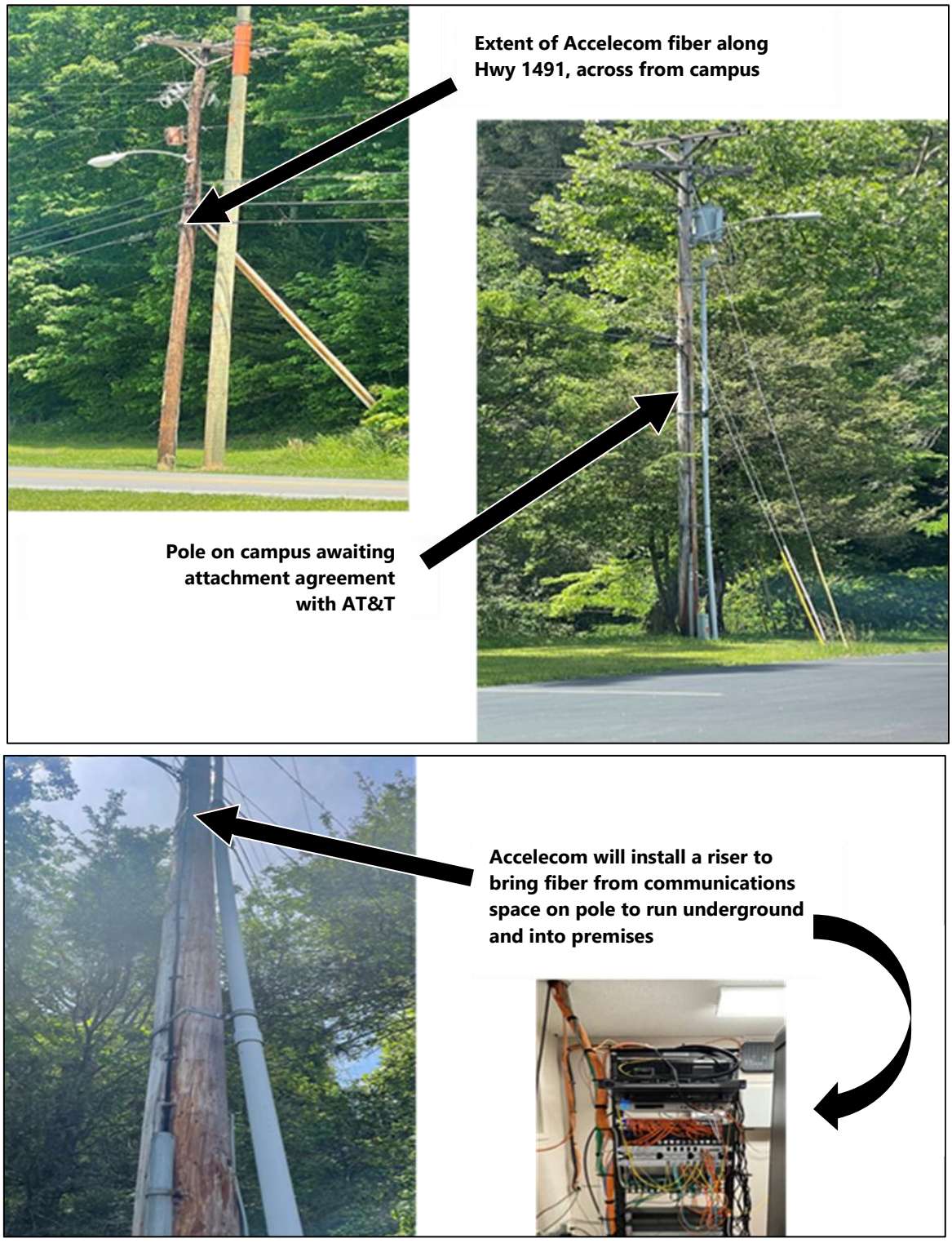
The first site visited was AppHarvest, a 30-acre greenhouse farm under construction just outside Somerset in Pulaski County. Representatives from AppHarvest stated that the location will be served by an Accelecom circuit for their broadband needs. The farm's data and analytics are managed primarily in the cloud using Microsoft Azure. Although the company does not have large data bandwidth demands, it does require the scalability of fiber and reliability of service it provides. Figure 3.1 provides additional context.

Figure 3.1
AppHarvest, Somerset

Source: LOIC staff.

The second site visited was the Clear Creek Baptist Bible College and a tour of prospective pole attachments in Pineville. The college is preparing to upgrade its broadband service from 100/25 Mbps to 1,000/1,000 Mbps. Although Accelecom is able to provide the service at a cost-effective rate, the process is waiting on pole attachment agreements with AT&T. According to college staff and Accelecom representatives, these agreements have languished for several months. Accelecom representatives also provided LOIC staff with a tour of the utility poles in the area, including a look at how fiber is attached to poles and routed to the premises. Figure 3.2 provides additional context.

Figure 3.2
Clear Creek Baptist Bible College, Pineville



Source: LOIC staff.

The third site visit was to the Harlan County Health Department in Harlan. LOIC staff spoke with Health Department staff regarding their use of broadband and the process of upgrading to Accelecom fiber. Accelecom representatives then provided staff with a walkthrough of the fiber broadband technology installed on the interior of the Health Department premises and a walkthrough of the fiber broadband technology on the exterior of the building, including the pole nearest to the Health Department building to which the Accelecom fiber was attached. Figure 3.3 provides additional context.

Figure 3.3
Harlan County Health Department, Harlan

Source: LOIC staff.

Lastly, LOIC staff visited the Harlan County fiber-optic data distribution hut and were provided with a visual walkthrough of how the fiber-optic cable enters the hut from the Health Department connection and other entities in the region, through the various routers and switches in the hut, and then the final connections to the middle-mile network on its way to the internet backbone. The internet "drains" currently serving Accelecom's middle mile are located in Florence (CyrusOne) and Louisville (Cogent).[d] Figure 3.4 provides additional context.

Figure 3.4
Harlan County Communications Hut

Source: LOIC staff.

[d] Internet drains, also called carrier hotels, are data centers full of servers, cooling equipment, and fiber-optic cables where several networks connect to the larger internet backbone.

Kentucky's Legislature Has Established A Detailed Policy Framework

HB 627 (2004) stated that broadband services shall be market based and not subject to state regulation.

The Pew Research Center recommends that state policy must provide the foundation and framework for broadband deployment goals. They note that having a "voice of power" leading broadband development can make progress significantly more successful.[83] Beginning in 2004, the Kentucky state legislature has established a number of important policy frameworks for broadband. In 2004, the legislature passed House Bill 627, which stated that broadband services shall be market based and not subject to state regulation with respect to the availability of facilities or equipment to provide services, and to the rates, terms, and conditions.[84] In 2006, the legislature passed HB 550, which created the beginnings of a policy framework for deploying broadband to unserved areas in Kentucky.

HB 550 (2006) created the broadband deployment account and initiated a policy framework for deploying broadband to unserved areas in Kentucky.

HB 550 (2006 RS). This bill created the broadband deployment account as part of the infrastructure revolving fund. The purpose of the account was to assist with the construction of infrastructure for the deployment of broadband services in the commonwealth. The bill also expanded the definition of *infrastructure project* to include broadband deployment projects and required KIA to establish an incentive program for the allocation of funds to unserved areas. Finally, the legislature required KIA to promulgate regulations to carry out the requirements in the bill.[85]

HB 550 was direct in granting KIA broad authority related to its responsibilities, but it also envisioned that KIA would provide additional specificity through its regulatory authority. To this end, the legislature envisioned that KIA would provide additional detail related to the areas of account management, creation of funding criteria, and creation of award prioritization schedules.[86]

According to KIA officials, the broadband deployment account was created within the infrastructure revolving fund (fund B) and it used that fund's account management, funding criteria, and award prioritization. Officials stated that 200 KAR 17:010 is the administrative regulation that governed the broadband deployment account. Through research, LOIC staff determined that the regulation was amended on July 29, 2009, to include additional wording related to the broadband deployment account. KIA officials also stated that broadband loan information is included on its webpage and provided to the Capital Projects and Bond Oversight Committee. From 2007 to 2018, KIA approved close

to $18 million in broadband deployment loans. Table 3.3 provides additional detail.

Table 3.3
KIA Broadband Projects
FY 2007 To FY 2022

Project	Description	KIA Loan Amount	Date Approved	KIA Fund
ConnectGRADD*	Broadband	$837,586	2/8/2007	Fund B
City of Mayfield*	Broadband	389,255	5/10/2007	Fund C
Hopkinsville Electric System**	Fiber-optic communications	3,000,000	10/4/2007	Fund B
City of Glasgow**	Broadband	1,200,000	2/7/2008	Fund B
MuniNet (assumed from Murray Electric)**	Broadband	2,500,000	6/25/2009	Fund B
MuniNet**	Broadband	2,031,370	4/7/2011	Fund B
MuniNet Fiber Agency**	Cable build project	3,687,038	2/2/2012	Fund C
Hopkinsville Electric System**	Broadband	2,500,000	6/12/2018	Fund B
Hopkinsville Electric System**	Broadband	1,800,000	6/12/2018	Fund C
Total		$17,945,249		

Note: Fund B = infrastructure revolving loan fund; Fund C = Governmental Agencies Program. Some projects were brought before the board multiple times. Date Approved = first date a project was approved by the KIA board.
* Loans have been paid off.
* Loans are still active.
Source: KIA board meeting minutes.

KCNA was established in 2015 by executive order and codified by HB 342 (2017). It oversees and maintains the KentuckyWired project.

Kentucky Communications Network Authority. Established by a 2015 executive order and codified by HB 343 in 2017, the Kentucky Communications Network Authority was created to oversee and maintain KentuckyWired, a statewide fiber-optic middle-mile network. In addition to KAG, the legislation created a KCNA board, with various responsibilities including strategic planning, performance reporting, monitoring, fiscal planning, rate-setting, and directing technology upgrades.[87]

In addition to bringing a middle-mile network to the state, the KentuckyWired project was also intended to provide network connectivity to state agencies. The revenues from state agencies connected to KentuckyWired would then be used to fund availability payments, which are sized to cover debt service, private equity returns, and ongoing operational costs. As stated earlier, the commonwealth has entered into a wholesaler agreement with Accelecom, whereby Kentucky will receive a percentage of revenues that Accelecom generates from the sale of lit and dark fiber service. The sale of this service is intended to connect enterprise customers and last-mile internet service providers to the middle mile.

A more subtle shift in policy occurred in 2015 after OBOD discontinued its operations, concurrent with KCNA's initial

creation via Executive Order 2015-0574. The planning and outreach performed by OBOD was replaced with oversight and planning of the middle mile. KAG and the KCNA board were focused primarily on the construction of the middle mile, as opposed to mapping and outreach. This void would not be addressed until the legislature met during the 2020 Regular Session.

HB 362 (2020) created the broadband deployment fund, separate from the infrastructure revolving fund, and provided definitions for *unserved area* and *underserved area*.

Broadband Deployment Fund. In order to leverage federal broadband funding, the legislature passed HB 362 during the 2020 Regular Session. The legislation created the broadband deployment fund within KIA and provided additional structure for broadband deployment, especially with respect to meeting federal broadband standards. For example, the bill provided definitions for *unserved area* and *underserved area*.[e] It also created a dedicated broadband deployment fund, which is separate from the infrastructure revolving fund. The fund's sole purpose was that

> all moneys in the fund shall be allocated and dedicated solely to providing grant funds to governmental agencies and private sector entities to construct infrastructure for the deployment of broadband service to households and businesses in underserved or unserved areas of the Commonwealth.[88]

Also, in anticipation of using federal moneys outside of a current fiscal year, the bill's language allowed that "any moneys remaining in the fund at the close of the fiscal year shall not lapse but shall be carried forward into the succeeding fiscal year."[89]

In the culmination of its language, the bill required that KIA establish guidelines and standards for applying for and approving grants from the newly created fund. More specifically, KIA was required to ensure that the following information was part of its award guidelines and standards: geographic descriptions; project descriptions; documentation of financial resources and economic feasibility; number of citizens, households or businesses that would receive access to broadband; and matching funds.

Language in HB 362 also included prohibitions against providing broadband funds for deployment in currently served areas, required that KIA ensure public transparency of the review and award

[e] *Underserved area* was defined as "any project area where fixed, terrestrial broadband service with a minimum twenty-five (25) megabits per second downstream and three (3) megabits per second upstream in not available." *Unserved area* was defined as "any project area where fixed, terrestrial broadband service with a minimum ten (10) megabits per second downstream and one (1) megabit per second upstream is not available."

process, and required the agency to create a challenge process. Lastly, the bill required that KIA promulgate regulations within 180 days of the Act.[90] KIA filed 200 KAR 17:100, Guidelines for Broadband Deployment Account, with the LRC on December 15, 2021, and received significant public comments. Shortly after the public comment process, KIA withdrew the draft regulations from consideration.[91] LOIC staff reviewed these public comments and found that they indicated that stakeholders were concerned primarily with ambiguities in the language of the regulation and the associated statute. Since the need for clarification is something that regulation is typically designed to address, KIA may want to revisit these public comments and evaluate whether additional regulatory language is needed.

According to KIA officials, the regulatory language was withdrawn because the agency was made aware that the General Assembly would be updating the statute.

According to KIA officials, the authority rescinded the draft regulations because the agency was made aware that the General Assembly was most likely going to update the law and wanted to wait and see what new or changed statutory provisions were to be considered before refiling administrative regulations.[92] It is also possible that pending changes to federal guidance contributed to the decision to withdraw the regulations.[93]

HB 315 (2022 RS). Again in 2022, the legislature took steps to ready the state to receive continued federal funding, this time from the American Rescue Plan Act. The language in HB 315 is substantive, related to broadband policy and direction. Table 3.4 provides additional detail.

Table 3.4
HB 315 Actions

Action	Description
Establishes the Office of Broadband Development	The office, administratively attached to Kentucky Infrastructure Authority (KIA), encourages, fosters, develops, and improves broadband; improves broadband accessibility for unserved and underserved areas and populations; develops, coordinates, administers, and implements the broadband deployment fund; serves as the central broadband planning and coordination entity, single point of contact and liaison for federal programs, and information clearinghouse; coordinates with other state, regional, local, and private entities; monitors broadband developments in other states and nations; maintains data and statistics; and develops a process for receiving and acting on complaints.
Defines *broadband deployment project area*	A geographic area determined by census block, shapefile geospatial data, or list of addresses.
Defines *underserved area*	Any project area where broadband service with a minimum 100 Mbps downstream and 20 Mbps upstream is not available.
Defines *unserved area*	Any project area where broadband service with a minimum 25 Mbps downstream and 3 Mbps upstream is not available.

Action	Description
Requires the office to issue grant applications for all projects awarded grant funds on or after April 5, 2022	—
Establishes guidelines and standards for applying for and approving grants from the broadband deployment fund	—
Requires public disclosure	Requires the office to disclose to the public all information within each application within 5 business days following the deadline for submission of applications.
Opportunity for challenge	Providers may challenge an award within 15 business days of making all information available to the public.
Prioritization of funding	The office shall award funding first to addresses with no service, then to addresses that are unserved, and then to addresses that are underserved.
Prohibitions	No funds shall be provided to projects involving the upgrade of an existing facility already delivering broadband services, including an upgrade of existing wireline, or terrestrial infrastructure capable of delivering services greater than 25 Mbps downstream and 3 Mbps upstream.
Creates a rural infrastructure improvement fund and program administered by the office*	• The program and fund is necessary to further the commonwealth's goal of expanding and accelerating access to broadband service throughout the state. The fund supports the replacement of utility poles. The office is required to promulgate administrative regulations regarding pole attachments under the commission's jurisdiction, including those necessary for the provision of broadband services. • HB 315, section 9, appropriates $20 million in FY 2023 for the rural infrastructure improvement fund. • Requires KIA no later than September 1, 2022, to promulgate administrative regulations under KRS Chapter 13A necessary for the administration of the newly created fund and program.
Additional requirements for distribution cooperatives to provide broadband services**	Requires economic feasibility study prior to offering broadband, disallows the installation or operation of a broadband system on its electric delivery system by an affiliate or other broadband operator to diminish the reliability of the electric delivery system, prohibits a distribution cooperative from requiring any person to purchase broadband services as a condition of receiving or continuing to receive electric energy from the distribution cooperative, requires an annual compliance audit, and precludes public commission's jurisdiction over the creation or operation of a distribution cooperative's broadband affiliate.

* A separate fund will be created in eMARS to track expenditures related to pole replacement reimbursements. The state is in the process of meeting the requirements of HB 315, Section 5. Until a new executive director is hired for the office, an analysis of Section 5 and the state fiscal recovery fund requirements is under way to ensure alignment.
** Chapter 171 of the Kentucky Acts of the 2021 Regular Session granted authority to distribution cooperatives to provide broadband service to unserved or underserved households and businesses by leasing excess capacity on any fiber-optic cable used to support the distribution cooperative's distribution system; by issuing securities or evidences of indebtedness in an amount not to exceed 25 percent of the net book value of its assets, the proceeds of which shall be used for the exclusive purpose of capitalizing the affiliate; or by pledging up to 25 percent of the net book value of its assets as collateral for a loan entered into by the affiliate for the purpose of providing broadband services.
Sources: Kentucky. General Assembly. *Acts Of The 2021 Regular Session*, ch. 202; John Hicks, state budget director. Email to Gerald W. Hoppmann, June 10, 2022.

As discussed in Table 3.4, HB 315 requires that KIA promulgate administration regulations for the newly created rural infrastructure improvement fund and program no later than September 1, 2022.

The regulatory authority granted to KIA is an important component for carrying out legislative intent and can prove valuable in guiding the newly created rural infrastructure fund and program, as well as other components of HB 315.

According to KIA officials, HB 315 is very specific and it is not yet clear whether administrative regulations will be necessary for the newly created fund and program. Reviews are under way on how the pole replacement program and the requirements of the federal fund source, the State and Local Fiscal Recovery Fund from the American Rescue Plan Act, align. Officials also stated that the legislature did not establish the broadband deployment fund to be a regulatory framework; it is a grant program.[94]

Recommendation 3.2

Recommendation 3.2

KIA should begin drafting its regulation related to the newly created rural infrastructure fund and program. In addition, it should consider including additional regulatory language to address other components of HB 315 related to the administration of the broadband deployment fund. Finally, it should revisit the public comments received from its draft regulation 200 KAR 17:100, Guidelines for Broadband Deployment Account, as it considers a regulatory framework for broadband deployment moving forward.

Kentucky Has Been Active With Broadband Planning And Capacity Building

Kentucky state government has been actively engaged in broadband planning and capacity building since 2004.

Pew reports that state broadband efforts that are most successful are the result of statewide broadband plans that clearly define objectives, guide investments, measure success, and guide local efforts.[95] Beginning in 2004 Kentucky has been increasingly involved in planning and guiding broadband deployment.

Early broadband planning efforts were conducted by the Kentucky Broadband Task Force in 2004 with its broadband infrastructure mapping initiative.

Kentucky Broadband Task Force. In 2004, the Kentucky Broadband Task Force, collaborating with ConnectKentucky, conducted outreach and exploratory efforts to identify the key issues of broadband expansion in the state. These efforts resulted in early broadband mapping projects and establishing policy objectives to facilitate broadband planning and deployment, especially in rural areas.

The Benton Institute explains that states typically go through a process that includes forming a preliminary task force or council dedicated to exploring the broadband issues in the state. The results of this initial work should result in an overall strategy that includes how to best appropriate funds.

> To bring these disparate interests together to develop a unified approach, many states use multistakeholder task forces to evaluate initial broadband needs, perform outreach, and develop strategies to satisfy those needs. Later, a dedicated state broadband office typically is created to administer grant programs, mapping efforts, and digital equity initiatives.[96]

Beginning in 2010, the Office of Broadband Outreach and Development engaged in additional mapping efforts.

Office Of Broadband Outreach And Development. From late 2010 to the end of 2014, OBOD engaged in mapping and broadband service availability efforts in the state. OBOD received federal grant funds from the National Telecommunications and Information Administration to conduct its work. OBOD contracted with Michael Baker Jr. Inc. to collect NTIA-specified data and produce broadband service availability maps, beginning in or around October 2010 and continuing until December 2014. According to Kentucky Communications Network Authority officials, the collection occurred semiannually and the data were stored with Michael Baker Jr. Inc.[97]

Although the NTIA grant funding for OBOD ended in 2014, the planning efforts of the office continued into 2016. Two Finance and Administration Cabinet contracts were awarded to Michael Baker International and the Solarity Group, respectively, to carry out the Broadband Planning Facilitation and Training Services program statewide on behalf of OBOD at the end of 2015.[98]

KentuckyWired is the state's middle-mile broadband network. With a construction cost of $274.8 million, the design included more than 3,200 miles of fiber-optic cable and connections to 1,100 government facilities.

KentuckyWired. The contract between OBOD and Michael Baker Jr. Inc. concluded in March 2015, but OBOD's activities continued to inform planning and strategy efforts during the construction of the KentuckyWired middle-mile network. The KentuckyWired project is Kentucky's statewide middle-mile broadband network and includes more than 3,200 miles of fiber-optic cable. It represents a major effort in planning and capacity building. The Kentucky Communications Network maintains some of the work output of OBOD in an archive on the KentuckyWired website for reference.

FAC entered into a contract with Columbia Telecommunications Corporation (CTC) in March 2014 "to provide consulting and planning services for a statewide Kentucky High Speed Fiber Optic Network."[99] CTC acted on behalf of the state as a broadband planning consultant, focused on middle-mile deployment from

March 2014 to June 2016. The contract with CTC, which was renewed for two 1-year periods, included the deliverables listed in Table 3.5.

Table 3.5
Deliverables Of Contract Between Finance And Administration Cabinet And Columbia Telecommunications Corporation
March 2014

Category	Deliverables
Project initiation	• Vendor orientation and executive leadership interviews • Develop project charter—approval by all stakeholders • Develop project implementation plan • Develop data collection templates
Business assessment: data gathering, analysis, and recommendations	• Plan and conduct an Infrastructure assessment that meets the Emergency Responder Infrastructure Guideline and any additional assessment, as needed, to complete the technical recommendations • Provide a current state spend analysis and financial assessment • Develop a future network financial model—potential cost savings, cost recovery model, and marketing strategy for excess network capacity • Develop public/private partnership options and recommendations • Develop governance and leadership oversight model • Develop sourcing and roll-out strategy, including sustainability
Technical assessment: deployment and operations recommendations	• Complete stakeholder interviews and analysis—current networking leaders • Develop technical architecture and deployment recommendations—statewide backbone approach, including pros and cons of the recommended option, and design • Develop a migration plan—steps to move from current networks to proposed environment • Develop a recommended organizational model and roles/responsibilities—day-to-day network operations

Source: Kentucky. Finance and Administration Cabinet. PON2 079 1400001624.

Over the lifetime of the contract period, CTC developed several documents for FAC, including two planning guides for KentuckyWired and its stakeholders. The Guide to Broadband Funding Strategies for Communities and Utilities, delivered in 2015, aimed to help local communities navigate complex federal broadband grant and loan programs. CTC also produced the Guide to Fiber Planning for Communities and Utilities in 2015, which addressed the need to "enhance broadband adoption by providing the Commonwealth's local governments and utilities with tools that will help them plan for their broadband futures."[100]

In addition to the planning guides, CTC generated five webinars to help communities plan for broadband expansion:

- Overview Of Federal Broadband Funding Opportunities
- Overview Of Local Community Broadband Business Models
- Broadband Technologies: Understanding The Full Range Of Technical Options And Opportunities

- Governance Toolkit For Community Broadband: Stakeholder Involvement
- Broadband Planning For Electric Utilities[101]

The Broadband Outreach and Strategic Planning Project, managed by KCNA, engaged local and regional stakeholders to assist with broadband planning and funding. It resulted in two broadband strategic planning reports in 2016.

Broadband Outreach And Strategic Planning Project. The Broadband Outreach and Strategic Planning Project, managed by KCNA, engaged local and regional stakeholders to assist with broadband planning and funding. The project resulted in two broadband strategic planning reports in 2016:

- *Gateway Area Development District Strategic Plan For Broadband Adoption And Utilization And Final Project Report*
- *City Of Ashland, KY: E-nnovation Broadband Strategic Plan*

KCNA also partnered with the Center for Rural Development and Connected Nation to produce the Southeastern Kentucky Final Mile Five County Broadband Plan in November 2016.

In 2020, in response to COVID-19, the Education and Workforce Development Cabinet organized an informal group of experts from the Kentucky Chamber of Commerce, the broadband industry, energy companies, and rural cooperatives to address the connectivity challenges associated with remote learning.

Kentucky Broadband Working Group and Kentucky Broadband Initiative. The COVID-19 pandemic required remote instruction for students across Kentucky. The Education and Workforce Development Cabinet organized and developed an informal group of experts from the Kentucky Chamber of Commerce, the broadband industry, energy companies, and rural cooperatives to address the connectivity challenges associated with remote learning. Although no formal records or meeting minutes of the group exist, the development of the Kentucky Broadband Initiative, which includes the broadband speed test mapping project, was a result of the working group's efforts.[102]

The Office of Broadband Development (OBD), established in 2022, will play a key role in broadband planning and capacity building for Kentucky.

Office Of Broadband Development. In 2022, the legislature passed HB 315, which established the Office of Broadband Development (OBD) as "the central broadband planning and coordination entity" for the state.[103] This newly created central office aligns well with many best practices identified in other states regarding the need for centralized planning in response to the unprecedented amount of funding available to states. Along with the increase in funding comes an increase in the amount of organization and management required of states as they identify and apply for funds, seek to meet eligibility requirements, attempt to avoid duplication of efforts, and look to accurately target unserved and underserved areas.

Accomplishing these goals requires careful management, which—as indicated by examples from other states and advice from federal funding sources—is best accomplished by a centralized broadband funding management authority. Accordingly, the 2021 NTIA Infrastructure Investment and Jobs Act heavily encourages states

to have such an office, and the Pew Research Center has highlighted it as a planning and capacity building best practice.[104] HB 315 and the newly created Office of Broadband Development are important steps toward improved centralized planning and capacity building.

OBD addresses two of the three major components of planning and capacity building: collaboration with stakeholders and development of a statewide broadband plan.

Three major components of planning and capacity building are incentivizing collaboration among stakeholders, developing a statewide broadband plan to guide future infrastructure deployment, and developing accurate maps of current broadband infrastructure.[105] HB 315 addresses two of these important goals, stakeholder collaboration and statewide broadband planning, by establishing that the Office of Broadband Development will

> [c]oordinate with other state, regional, local, and private entities to:
>
> 1. Develop and implement a statewide broadband plan, including relevant goals and objectives;
> 2. Develop and encourage cost-effective broadband;
> 3. Make recommendations for broadband infrastructure development, particularly in rural, unserved, and underserved areas; and
> 4. Provide consultation services to local units of government or other project sponsors in connection with the planning, acquisition, improvement, construction, or development of any broadband deployment project.

In meeting its mandate to incentivize stakeholder collaboration and develop a statewide broadband plan, OBD's next important step will be translating policy into action. LOIC staff identified archived information on KCNA's website with examples of broadband planning efforts associated with KentuckyWired that included lessons learned from the implementation of policy into practice. There are also documents produced by Columbia Telecommunications Corporation that, although dated, provide comprehensive guidance on turning policy into practice. It is likely that this information would be useful to OBD.

Recommendation 3.3

Recommendation 3.3

The newly created Office of Broadband Development should thoroughly review and use the archived information stored by KCNA as context for developing its planning and outreach program.

HB 315 (2022 RS) mandates that OBD maintain data and statistics for broadband infrastructure and maintain a statewide broadband map.

With respect to the broadband infrastructure mapping component of planning and capacity building, not only has Pew noted its importance but it will also be a key component of the NTIA BEAD program. Moreover, HB 315 (2022 RS) mandates that OBD maintain data and statistics for broadband infrastructure by collecting broadband availability data and that it maintain a statewide broadband map.[106] This responsibility created a challenge for the office with respect to the broadband deployment fund's initial grant proposals, which resulted in more than 17,000 challenged addresses. Ultimately, the office accepted the challenged addresses, but it did not have the resources to fully verify whether they were truly unserved.[107]

As a result, this report also recommends that the Office of Broadband Development consider additional investment in broadband infrastructure mapping. Although the state has taken steps toward improving broadband infrastructure mapping through the Kentucky Broadband Initiative, this program concluded in FY 2021 and resulted in maps that do not fully represent the extent of broadband infrastructure in the state.

According to KIA officials, the office will address the mapping requirements in HB 315 and for purposes of challenging the upcoming FCC map that relates to funding from the Infrastructure Investment and Jobs Act's Broadband Equity, Access, and Deployment program.[108]

Recommendation 3.4

Recommendation 3.4

The newly created Office of Broadband Development should consider additional procurements related to mapping, in order to assist with the review of current and future address challenges and other mapping issues.

Broadband Planning In Kentucky And Other States. Although HB 315 and the Office of Broadband Development have created an extensive framework for Kentucky broadband planning that aligns with Pew's promising practices, statutory guidance may not be sufficient to fully develop a statewide broadband program. LOIC staff reviewed HB 315 and determined a set of 12 responsibilities and authorities that are central to the mission of the newly created Office of Broadband Development:

- Act as Federal Liaison
- Administer Fund(s)
- Authority to Contract
- Broadband Mapping

- Central Coordination
- Central Planning
- Expend Funds
- Information Clearinghouse
- Mediate Complaints and/or Challenges
- Monitor Grants
- Verifying Mapping and Other Data

LOIC staff then applied the responsibilities and authorities delegated to Kentucky's Office of Broadband Development to the relevant statutes guiding nine state broadband programs identified as promising by the Pew Research Center. Table 3.6 lists these states and the areas in which their respective broadband programs were determined to excel.

Table 3.6
Pew Promising Practices By State

State	Pew Promising Practices
California	Stakeholder Outreach and Engagement Policy Framework Program Evaluation and Evolution
Colorado	Planning and Capacity Building Funding and Operations
Maine	Planning and Capacity Building
Minnesota	Stakeholder Outreach and Engagement Policy Framework Funding and Operations
North Carolina	Planning and Capacity
Tennessee	Funding and Operations Program Evaluation and Evolution
Virginia	Funding and Operations
West Virginia	Policy and Framework Planning and Capacity Building
Wisconsin	Funding and Operations Program Evaluation and Evolution

Source: Pew Charitable Trusts. *How States Are Expanding Broadband Access: New Research Identifies Tactics For Connecting Unserved Communities*. Feb. 2020. Web.

Of the nine states evaluated, only two incorporated statutory language that comprised at least half of the responsibilities and authorities contained in HB 315, while most rely on other methods to guide their state broadband programs. Table 3.7 illustrates that leading state broadband plans do not rely exclusively on statutory language to guide broadband development efforts**.**

Table 3.7
Statutory Responsibilities And Authorities Delegated To State Broadband Programs

State	Authorities And Responsibilities	Number Of Responsibilities In Statute
California	Administer Fund(s) Authority to Contract Economic Development Focus	3
Colorado	Act as Federal Liaison Administer Fund(s) Broadband Mapping Central Coordination Central Planning Expend Funds Verifying Mapping and Other Data	7
Kentucky	**Act as Federal Liaison** **Administer Fund(s)** **Authority to Contract** **Broadband Mapping** **Central Coordination** **Central Planning** **Expend Funds** **Information Clearinghouse** **Mediate Complaints and/or Challenges** **Monitor Grants** **Verifying Mapping and Other Data**	**11**
Maine	Administer Funds Authority to Contract Central Coordination Economic Development Expend Funds	5
Minnesota	Administer Fund(s) Authority to Contract Broadband Mapping Central Coordination Central Planning Economic Development Expend Funds Information Clearinghouse Mediate Complaints and/or Challenges Monitor Grants	10
North Carolina	Authority to Contract Broadband Mapping	2
Tennessee	Administer Fund(s)	1
Virginia	Broadband Mapping Monitor Grants	2
West Virginia	Administer Fund(s) Authority to Contract Broadband Mapping Economic Development Expend Funds	5
Wisconsin	—	0

Source: LOIC staff compilation of HB 315, Regular Session 2022, language and Pew Charitable Trusts data.

These findings illustrate that states are diverse in their approaches to developing broadband programs and offices. Some states, such as Minnesota, establish their broadband goals in statute similarly to Kentucky. Others, including Virginia and North Carolina, implement these goals via state broadband plans.[109]

States have approached creating statewide broadband programs through three primary ways: creation of a statewide broadband plan, statutory language, and regulatory language.

Both of these strategies have proven to be effective. For example, North Carolina's broadband program, while noted by Pew as a promising state broadband program, has relatively little of its program laid out in statute. Meanwhile, Minnesota's state broadband program, similarly noted as promising by Pew, has virtually all of its broadband goals laid out in statute.

In either case, administrative regulations are an additional approach that states can use to provide clarification and expand upon ambiguous areas of statute. For example, Maine and West Virginia have both used administrative regulations to support and implement statutory language defining broadband programs and provide clarity to stakeholders.[110]

The individual efficacy of statutory direction, statewide planning, and regulatory guidance indicates that the best possible practice for a centralized state broadband program would be to align with each of these approaches by establishing a state broadband program in statute, supporting the statutory language with regulation, and implementing the program via a statewide broadband plan.

Recommendation 3.5

Recommendation 3.5

The Office of Broadband Development should review broadband development regulations and policies that other states are successfully putting into practice. The statutory language contained in HB 315 is inclusive, but reviews of regulations and policies already in practice in other states, and their outcomes, can help identify areas for improvement and inform Kentucky's statewide broadband plan.

Kentucky's Broadband Initiatives And Operations Rely On Federal Dollars

According to Pew, successful state broadband projects occur when state governments support deployment through funding to ISPs, local governments, and other stakeholders. In particular, Pew notes that state broadband funding is a critical component of deploying broadband in unserved and underserved areas.[111]

Like most other states, Kentucky has historically addressed the digital divide through federal programs administered by the Federal Communications Commission and the US Department of Agriculture.

Incentivizing The Market. Like most other states, Kentucky has historically addressed the digital divide through federal programs administered by the FCC and USDA.[112] Kentucky schools and libraries received over $400 million from 2012 through 2022 in FCC E-Rate discounts for telecommunication services. Over that same period, the FCC's Connect America fund distributed over $1.4 billion in subsidies to carriers providing telecommunications services in rural, high-cost areas in Kentucky.[113] Loan and grant programs administered by the RUS in the US Department of Agriculture incentivized public and private sector investment in rural areas.[114] The RUS awarded nearly $90 million in grants and loans to Kentucky broadband projects over the past decade.[115]

Kentucky received over $300 million in combined funding from the American Recovery and Reinvestment Act (ARRA) of 2009.

Economic And Public Health Emergencies. Kentucky received over $300 million in combined funding from the American Recovery and Reinvestment Act (ARRA) of 2009. The awards funded multiple last-mile infrastructure projects and public computer centers. Kentucky also received $5 million for the State Broadband Data and Development program used, in part, to establish the Office of Broadband Outreach and Development.[116]

In response to the COVID-19 pandemic, the federal government passed three spending bills—the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the Consolidated Appropriations Act of 2021, and the American Rescue Plan Act—that appropriated billions of dollars to new or existing NTIA, RUS, and FCC broadband programs. Additionally, the CARES Act and ARPA directed billions of dollars in flexible funding to states that could be used for a number of purposes, including broadband deployment, accessibility, and digital equity. Kentucky used $8.06 million of its share of CARES Act coronavirus relief funds for K-12 internet connectivity and to hire GEO Partners to lead a statewide broadband mapping project.[117] Kentucky also received more than $6 billion in ARPA funds for a variety of programs including the coronavirus state and local fiscal recovery fund, the elementary and secondary school emergency relief fund, and the coronavirus capital projects fund. The state used Coronavirus State Fiscal Recovery and Capital Projects funds to appropriate $300 million to its broadband deployment fund.[118]

The Infrastructure Investment and Jobs Act (IIJA) includes $60 billion in direct funding for broadband expansion and access, including the $42.45 million Broadband Equity, Access, and Deployment (BEAD) program.

The Infrastructure Investment and Jobs Act, passed in November 2021, includes over $60 billion in direct funding for broadband expansion and access, including $42.45 million for the Broadband Equity, Access, and Deployment Program. The BEAD Program will provide Kentucky a minimum of $100 million in funding for broadband infrastructure deployment. The state will receive

additional BEAD funding based on a calculation that considers the number of unserved and high-cost locations in the state as determined by new FCC maps (which will not be completed until late 2022).

NTIA has established a public comment period to receive feedback on funding and other concerns related to the IIJA. The NTIA must issue a notice of funding opportunity within 180 days of enactment, and the public comments it receives will help NTIA decide how to distribute an unprecedented level of broadband funding. As a result, the questions to which NTIA is seeking answers are significant indicators of what will be required of states as they seek eligibility for the BEAD Program.

NTIA has established a public comment period to receive feedback on funding and other concerns related to the IIJA. The public comments include 561 responses to a list of 36 questions posed by NTIA, which included comments from citizens, government agencies, research institutes, and private companies. The questions raise a number of issues that NTIA has deemed important.

LOIC staff reviewed 561 responses to a list of 36 questions posed by NTIA, which included comments from citizens, government agencies, research institutes, and private companies. The questions raise a number of issues, which are deemed to be critical by NTIA and can inform states such as Kentucky regarding which questions they should be seeking answers to as well. Some of the main concerns indicated by responses to the NTIA questions are

- improving digital equity, broadband adoption, and broadband affordability;
- including a wide range of stakeholder input;
- maintaining transparency and public accountability;
- working with and complementing state broadband programs;
- working with and including many different types of broadband providers;
- addressing the digital divide and providing broadband to rural and isolated areas;
- overcoming obstacles related to geography and investment disincentive;
- determining what types of broadband technology to employ to meet future broadband needs; and
- employing American workers and using American supply chains

Among the many respondents to the NTIA's request for comment is the Pew Research Center, which has been studying US broadband deployment and adoption for decades. Pew recommends placing a priority on collaboration between states, local governments, and local service providers and designing funding programs so that they are not overly complicated or restrictive. It also places importance on transparency and public accountability.

Further, Pew notes that states should know their broadband needs well and should apply the lessons they have learned from deploying ARPA funds to future funding opportunities such as the NTIA BEAD Program. Pew recommends that a wide range of state agencies and stakeholder groups should be engaged in the process but that the exact agencies and stakeholder groups will vary from state to state. Finally, Pew provides a technical assessment that fiber-optic technology is the main technology that should be deployed for broadband development due to scalability.[119]

Given that IIJA BEAD funding will be critical to future state broadband projects, LOIC staff recommend that the Office of Broadband Development review the questions posed by NTIA during the public comment process for the IIJA, along with the responses it received. The questions to which NTIA is seeking answers are significant indicators of what will be required of states as they seek eligibility for the BEAD program, and the responses provide valuable insight into how stakeholders are approaching program eligibility.

Recommendation 3.6

Recommendation 3.6

The Office of Broadband Development should review the questions posed by the National Telecommunications and Information Administration (NTIA) during the public comment process for the Infrastructure Investment and Jobs Act, along with the responses NTIA received. These questions and responses indicate which issues NTIA considers critical, and they can inform the state's decision-making related to upcoming procurement documents. In addition, the questions and responses provide valuable insight into what will be required of states as they seek eligibility for the Broadband Equity, Access, and Deployment Program.

The 2020 Regular Session was pivotal in Kentucky's process of taking advantage of federal emergency funds. HB 362 created a dedicated broadband deployment fund to provide grant funds to governmental agencies and private sector entities to construct broadband infrastructure.

State Appropriations And Operations. The 2020 Regular Session was pivotal in the commonwealth's process of taking advantage of federal emergency funds. HB 362 created a dedicated broadband deployment fund for the sole purpose of providing grant funds to governmental agencies and private sector entities to construct infrastructure for the deployment of broadband services.[120]

Although the bill provided authority to the Kentucky Infrastructure Authority to establish guidelines and standards for applying for and approving grants, it did not create a separate broadband office responsible for making grant awards. The language however,

was very clear in terms of the areas that KIA should use when evaluating grant applications. Generally, applicants were required to clearly detail geographic and project descriptions as well as the documentation of financial resources and economic feasibility. The legislature also required that funds should not be used to extend or deploy facilities in currently served areas.[121]

As noted above, KIA filed 200 KAR 17:100, Guidelines for Broadband Deployment Account, with the LRC on December 15, 2021, but after receiving significant public comments, it did not submit a Statement of Consideration addressing the comments. LOIC staff review of the public comments found that stakeholders were concerned that the draft regulation was not specific enough in areas including, but not limited to

- definition of *unserved location* and *underserved location*;
- consideration of locations funded by the Connect America Fund and RDOF;
- provider challenges;
- project priority list;
- specific grant application criteria;
- scoring rubric;
- public comment period;
- process and timing of funds disbursement; and
- unintentional exclusion of the five TVA-regulated cooperatives.[122]

During the 2021 Regular Session, the legislature appropriated $250 million in federal funds to the broadband deployment fund. An additional $50 million was appropriated in HB 382.

KIA officials indicated that they rescinded the draft regulations because they were told that the General Assembly was most likely going to update the law and they wanted to wait and see what new or changed provisions were to be considered before they refiled administrative regulations.[123] It is also possible that pending changes to federal guidance contributed to the decision to withdraw the regulations.[124]

During the 2021 Regular Session, the legislature appropriated $250 million in federal funds to the broadband deployment fund, $50 million of which was to be awarded no later than April 1, 2022.[125] An additional $50 million was appropriated in HB 382 from the state fiscal recovery fund for broadband projects that secure economic development opportunities for commercial and industrial customers.[126] After the appropriation of these federal funds, the commonwealth initiated a series of procurements. Since federal requirements state that recipients are subject to federal

procurement standards, using a series of procurements is reasonable.[f] Table 3.8 provides additional detail.

Table 3.8
Finance And Administration Procurement Actions Related To HB 320 Appropriations

Procurement	Purpose	Awards	Respondents
RFB 758 2100000279	"The Commonwealth of Kentucky is seeking a vendor to provide an online, crowdsourcing platform to be utilized by the Commonwealth to accurately survey and map current broadband availability, pricing, and speeds (download/upload) in all areas of the state."	$58,210	Breaking Point Solutions, LLC; DBA GEO Partners, LLC
RFI 758 2100000013	• "The Kentucky Infrastructure Authority is developing a grant program to award up to $250 million in federal funds from the American Rescue Plan Act's State Fiscal Recovery Fund through Kentucky's Broadband Deployment Fund for broadband deployment projects." • "The primary purpose of this Request for Information (RFI) is to solicit ideas, suggestions, comments, and any other information as inputs to the development of the initial Request for Proposal (RFP) for the new Kentucky Broadband Deployment Fund grant program."	None	LOIC identified 7 respondents in eMARS*
RFP 758 2200000038	"The Kentucky Broadband Deployment Fund Grant Program has received an appropriation of $250 million from the federal American Rescue Plan Act's State Fiscal Recovery Fund. This first round of funding addresses the Kentucky General Assembly's limitation to award up to $50 million in grant funds before April 1, 2022 to unserved areas. The maximum individual grant amount is $5 million. The maximum grant funding award cannot exceed 50% of the eligible total project costs."**	None	LOIC identified 12 respondents in eMARS.***

*According to the Finance and Administration Cabinet, 26 responses were received, commenting on the following: use of polygons for determining coverage areas in data maps; concerns about creating new and accurate maps; concerns about impractical data reporting challenges; concerns about the ability to provide 100/100 service under all circumstances; proprietary concerns about mapping, revenue, and profits; higher adoption rates in new areas; importance of address-level data for determining project service milestones; and restricting technology only to fiber.
** According to FAC's Kentucky broadband deployment fund grant application, it has received 17,000 challenges to addresses from the broadband deployment fund grant requests for proposals. The final deadline for challenges was January 6, 2022.
*** According to the Finance and Administration Cabinet, the number of grant applications received will be disclosed upon completion of the RFP process.
Source: LOIC analysis of eMARS.

During the 2022 Regular Session, the legislature reappropriated the $300 million from the previous session. Through HB 315, it specified sourcing of the $250 million appropriation to the Broadband Deployment Fund.

During the 2022 Regular Session, the legislature reappropriated the $300 million from the previous session. Through HB 315, it specified that the $250 million appropriation to the Broadband Deployment Fund provided in 2021 (HB 320) be funded with a combination of ARPA funds, specifically $182,769,000 from the coronavirus capital projects fund and $67,281,000 from the state fiscal recovery fund (in two amounts—$67,231,000 and $50,000).

[f] 2 C.F.R. Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, includes general procurement standards, as well as guidelines for formal versus informal procurement (sec. 200.320).

However, it eliminated the economic assistance designation over a combination of concern about utilizing the funds in time and the infusion of $100 million into the Kentucky Product Development Initiative, which permits money to be used for the provision of infrastructure to a business site.[127]

Because the capital projects fund requires the submission of a grant plan to the US Department of Treasury, Kentucky has not yet received the $182,769,000. However, it has received the $67,281,000. The federal money will be expended and tracked using the ARPA KIA broadband deployment fund (fund CA4C).[128] According to KIA, a process has been established for expending and tracking these funds. Since the federal grant awards are different, there will be a separate fund code for the coronavirus capital projects fund.[129]

The newly established office also received funding in the amount of $1,174,400 in fiscal year 2022–2023 and $1,134,400 in fiscal year 2023–2024 to formally fund the office to provide direction and planning for the deployment of last-mile broadband services across the commonwealth.[130]

Recommendation 3.7

Recommendation 3.7

The newly created Office of Broadband Development should ensure that federal money appropriated from the coronavirus capital projects fund and the state fiscal recovery fund is expended and tracked through the Kentucky Infrastructure Authority broadband deployment fund (fund CA4C).

Evaluation of Planning Efforts And Funding Of Infrastructure Projects Has Been Minimal In Kentucky

Kentucky, like many other states, did not actively administer or regulate broadband deployment activities through a dedicated office until recently.

Pew recommends that states regularly evaluate the performance of their broadband programs to determine whether they are meeting their stated or legislated goals. They note that these evaluations play a vital role in informing current and future broadband projects and objectives. Since 2006, state-administered broadband programs in Kentucky have been limited to the KIA broadband deployment account and broadband deployment fund, the Office of Broadband Outreach and Development, and the KentuckyWired Middle-Mile Project. Kentucky, like many other states, did not actively administer or regulate broadband deployment activities through a dedicated office until recently.[131]

As a result, for the past two decades, broadband deployment has largely been the responsibility of local entities and the private sector. According to NCSL officials, a major reason for the surge in creation of state-level centralized broadband offices is that current federal funding programs encourage states to have such an office. Previously, centralized broadband authorities were designed to coordinate broadband development, but now they are being designed to track and coordinate funding opportunities.[132]

Before the broadband funding opportunities contained in ARPA and the forthcoming BEAD infrastructure act, federal funding targeted specific projects and attempted to close the digital divide through a variety of criteria and programs. The results of these programs have been mixed, and the effectiveness of several high-profile federal broadband funding mechanisms has received criticism from industry officials and government oversight entities.[133]

HB 550 of the 2006 Regular Session established the broadband deployment account within the Kentucky Infrastructure Authority's revolving fund.

KIA Broadband Deployment Account. HB 550 of the 2006 Regular Session established the broadband deployment account within KIA's revolving fund. After reviewing KIA board minutes, LOIC staff identified close to $18 million in broadband loans that were made from 2007 to 2018. According to KIA officials, there were no broadband applications from February 2015 through July 2018.[134]

Pew asserts that evaluation of

> broadband programs against stated or legislated goals, such as the number of new locations connected […] can inform next steps, such as addressing broadband adoption and digital literacy, or expanding the focus of a broadband program to applications (for example, precision agriculture, the use of technology, such as GPS guidance on tractors and soil monitors, to better calibrate production; distance learning; and telemedicine). 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.[135]

From 2010 to 2014, the Office of Broadband Outreach and Development deployed federal dollars from NTIA to engage in mapping broadband service availability.

Office Of Broadband Outreach And Development. From late 2010 to the end of 2014, the Office of Broadband Outreach and Development deployed federal dollars from NTIA to engage in mapping broadband service availability in the state, as well as community outreach to identify planning needs through 2016. These efforts initially occurred through OBOD through 2014, but they were extended into 2016 through the Finance and

Administration Cabinet. Specifically, through two contracts awarded to Michael Baker International and the Solarity Group, FAC carried out the Broadband Planning Facilitation and Training Services program.[136]

Since its creation in August 2015, KCNA's primary responsibilities have included the development, construction, and progress monitoring of the KentuckyWired middle-mile network.

Kentucky Communications Network Authority. Since its creation in August 2015, KCNA's primary responsibilities have included the development, construction, and progress monitoring of the KentuckyWired middle-mile network; broadband project or program evaluation outside of the middle-mile network has been minimal. However, KCNA, through its contract with Michael Baker International, evaluated the implementation of the City of Ashland's Broadband Strategic Plan and submitted a "Lessons Learned" report on October 28, 2016.[137] LOIC staff were unable to find evidence of further broadband project or program monitoring or evaluation by a state agency since 2016. Without a central agency providing monitoring or evaluation of broadband projects, the state was not well positioned to take advantage of upcoming federal dollars, until the legislature established additional mechanisms, beginning with the passage of HB 362 during the 2020 Regular Session.

KIA Broadband Deployment Fund. Passed during the 2020 Regular Session, HB 362 established the broadband deployment fund within the Kentucky Infrastructure Authority as a grant fund program with the purpose of assisting

> with the construction, development, or improvement of broadband infrastructure, broadband services, or technologies that constitute a part of, or are related to, broadband infrastructure or broadband services, to provide for broadband service in underserved or unserved areas of the Commonwealth.[138]

The bill removes any reference to the existing broadband deployment account that was included within the infrastructure revolving fund, establishing the broadband deployment fund as a separate, distinct fund. The bill adds definitions for such relevant terms as *broadband*, *unserved*, and *underserved*. Further, the bill specifies that, notwithstanding KRS 45.229, any funds remaining in the broadband deployment fund at the close of a fiscal year will be carried forward to the next fiscal year.

Established by HB 315 in 2022, the Office of Broadband Development is Kentucky's central broadband planning and coordination entity.

Office Of Broadband Development. Per HB 315 from the 2022 Regular Session, the recently created Office of Broadband Development is "the central broadband planning and coordination entity" for the state.[139]

Pew maintains that the continuous evaluation of broadband program funding, criteria, and performance is critical to effective broadband deployment:

> States conduct formal and informal evaluations of their programs. For grant programs, an annual report to the Legislature is a common requirement. States also informally evaluate their programs, using success stories, customer testimonials, and other anecdotal evidence that demonstrate the impacts of their investments. The level of evaluation differs across states, with more highly funded programs often having more requirements. Although states gather significant data through monitoring and reporting of their grant programs, they may lack the staff to conduct additional analysis. In addition, many programs are still in early stages, and their impacts are just beginning to be realized.[140]

Specifically related to program monitoring an evaluation, HB 315 states that the Office of Broadband Development is responsible for

- Analyzing the deployment data collected to inform and guide future investments in broadband infrastructure, including moneys expended under the broadband deployment fund;
- Empirically validating, on a targeted basis, the accuracy of broadband data that is routinely collected by the Federal Communications Commission to pinpoint areas of overstatement and understatement that may exist;
- Challenging the validity of the data as may be warranted, on behalf of the Commonwealth, to ensure that this state is receiving its due share of funding from federal broadband programs; and
- Monitoring the progress of federal awards for deploying broadband infrastructure to Kentucky locations and issuing an annual report to the Governor and the Interim Joint Committee on Appropriations and Revenue by November 1 of each year[.][141]

As a central broadband planning and coordination entity in the state, the new office will be responsible for fostering relationships with other state, regional, local, and private entities—more specifically, to develop broadband plans, to encourage cost-effective broadband, to make recommendations for broadband infrastructure development, and to provide consultation services to local units of government.[142]

Two agencies in Kentucky have expressed the importance of interacting with the newly developed office with respect to funding

last-mile broadband projects. For example, the Cabinet for Economic Development expressed interest in being able to communicate with the newly created office in order to respond quickly to questions from prospective companies related to broadband access.[143] The commissioner of the Department of Agriculture also stated that the creation of the new office is a positive step by the legislature and that the department will work with the office on broadband planning and identifying broadband needs at the local level.[144]

Other states such as Maine, have used memoranda of understanding (MOUs) to annotate general agreement between entities that work together to expand broadband support to communities and partners. For example, the Maine Connectivity Authority collaboratively developed an MOU with ConnectMaine to develop three strategic objectives and 14 impact targets related to projects, places, and people.[145]

According to KIA officials, the method of outreach for completing the planning requirements of HB 315 (2022 RS), the coronavirus capital projects fund, the Broadband Equity Access and Deployment Program, and the State Digital Equity Program is yet to be determined.[146]

Recommendation 3.8

Recommendation 3.8

The newly created Office of Broadband Development should consider developing memoranda of agreement with critical groups in state government related to planning, outreach, and program evaluation, in addition to the expenditure of broadband deployment funds. At a minimum, it should consider creating memoranda of understanding with entities that represent the KCNA Advisory Group pursuant to KRS 154.15-020(2)(j).

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