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Recommendation: The Potential for Pilot Funding for Gigabit Networking in Connecticut

Prepared for the State of Connecticut

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1. Introduction

This report represents a preliminary deliverable for the State of Connecticut, as part of the ongoing consultation of CTC Technology & Energy regarding the State's gigabit broadband plans. This preliminary report was prepared by CTC Technology & Energy (CTC) in late 2015 and will be complemented by additional deliverables in February 2016.

Recommendation Summary

It is CTC's recommendation that the State consider creating a broadband grant program to catalyze and incent local government and private investment in the infrastructure that enables gigabit services—fiber-to-the-premises (FTTP).

The neighboring states of New York and Massachusetts have created two of the three most significant state funding mechanisms for next generation broadband such as FTTP (the other state is California).

Even if Connecticut does not choose to create a program that is competitive in size to those of its neighbors on a per capita basis, it should consider some kind of program for three critical reasons: first, a grant program would be a means of maintaining the considerable momentum that has been created by the CT Gig program over the past two years; second, a grant program could catalyze new efforts at the local level, in both urban and rural communities; and third, a grant program would enable Connecticut to compete for private broadband investment that would otherwise flow to the neighboring states.

This preliminary report recommends creation of such a program and offers guidance for program design and operation. The report also summarizes how other states have built and deployed such programs and offers lessons learned from the experiences of those states.

Report Methodology

This report was prepared in late 2015 by CTC Technology & Energy at the request of the State of Connecticut's Consumer Counsel. Per the State's request, we evaluated the potential for a state pilot funding program, with a particular focus on risks and opportunities for localities that might apply for the State funding.

We based our analysis on our experience with federal and state funding programs over the past decade, including our observations of how funding opportunities can catalyze new planning, partnering, and investment at the local level. We also conducted research of the leading state broadband funding projects in the country and summarized our analysis.

2. Rationale for Developing Pilot Broadband Funding

CTC staff analyzed the potential for a pilot program in Connecticut in light of a number of factors, including:

1. The significant competition in broadband and for broadband investment coming from Connecticut's neighbors, particularly in Massachusetts and New York
2. Key policy goals that have been communicated to us by State officials
3. The tremendous level of interest and engagement at the local level

For all of these reasons, we recommend that the State consider a broadband funding program on a pilot basis. The program does not have to be enormous, and can even be quite modest in scale. But it will allow the State to maintain momentum developed thus far, and not cede the broadband landscape to neighboring states and their most prominent cities.

Rationale 1: Competition from Neighboring States

In CTC's analysis, the first strong rationale for developing a pilot program is the fact that state-level broadband funding is fast becoming a best practice for the states that lead the country economically—and for which meeting the needs of companies that employ knowledge workers across multiple sectors is a high priority. It is no coincidence that the states that have led the ongoing trend toward state-level broadband funding are the knowledge economy centers of California, Massachusetts, and New York. Other less-resourced but sophisticated states have also pioneered these kinds of program. These include Illinois and Minnesota.

The ongoing execution of massive state funding programs for local broadband efforts in New York and Massachusetts has the likely and inevitable outcome of not only attracting large amounts of private capital that seeks to access the public funding and benefit from the new infrastructure, but also has the impact of sending a clear message to businesses and workers that communications infrastructure is a critical part of state policy making and that those states will see significant investment in the next-generation infrastructure that will enable the next generation of Internet uses by companies and consumers.

In our view, this dynamic in the Northeast/New England region is particularly acute because this region stands with the Mid-Atlantic as the most sophisticated and dynamic in the country *not* to be seeing significant new broadband investment by the private sector without public catalysts—specifically, these regions have been conspicuously left off the FTTP investment plans of Google Fiber, which has announced enormous investments in more than two dozen cities, none of them located in the Northeast or New England regions.

And where Google Fiber has announced projects, so has AT&T. Indeed, AT&T has, along with CenturyLink, announced more gigabit cities than even Google Fiber (though it is as of yet unclear how extensive AT&T's actual construction will be). Regardless, Connecticut is not served by AT&T, and there is no indication that the kind of new private investment we see from Google Fiber and from incumbent phone companies in the Southeast, Southwest, and West Coast states is likely to emerge in or around Connecticut. The end result of these dynamics is that Massachusetts and New York, through their funding programs, are attracting interest and investment that is unlikely to materialize in Connecticut absent an effort by the State.

This is our first and primary rationale for recommending funding for a pilot program.

Rationale 2: Connecticut's Key Policy Goals

A range of policy goals articulated by State officials and stakeholders provides further impetus toward a State funding program for broadband.

It is clear from the State's efforts to date, as well as the ongoing economic vitality efforts of the State, that Connecticut is committed to supporting its economy and its communities with world-class infrastructure. This includes in the area of communications, where Connecticut has been a leader nationally in developing next-generation communications networks to support public sector users, including public safety, schools, libraries, and the broader higher education community, both public and private. Indeed, to our knowledge, Connecticut was the first state to connect every school district building throughout its territory over robust fiber optics—an effort that was then adopted as a best practice in many other states following Connecticut's successful efforts.[1]

The CT Gig program has also served as a singular and exemplary effort. It represents the first statewide initiative to build a coalition of the great majority of localities within any state to explore options for both public and private investment. Indeed, CTC staff have found that in every state we visit, one of the first questions we are asked is about the CT Gig initiative and how that effort can be replicated elsewhere.

A further policy goal articulated by the State is to maximize the benefits of federal funding for broadband, even where the actual funding is modest or incremental. Thus, for example, the State seeks to ensure that federal funding under the E-rate program (this is the informal name for the Schools and Libraries Program created by the FCC to provide robust subsidies for broadband to schools and libraries throughout the country) and the Connect America Fund II program (this is

[1] The very well-regarded Connecticut Education Network (CEN) delivers superior services to a range of public sector and education users. CEN's substantial upcoming needs for renewals or replacements of its fiber optic lines will be addressed in some detail in CTC's February deliverables under this engagement, in which we will provide analysis of the challenges and recommendations regarding the ways in which the State can support CEN and its users.

the FCC's most recent effort to support modest broadband in rural parts of the country) are maximized and potentially supplemented to enable the emergence of world-class networks over time.

The final policy goal that has been communicated to us is a clear commitment to the workings of a functioning market and a competitive environment. The State officials with whom we have spoken seek to enable competition and opportunity for all kinds of entities that seek to provide services in the broadband ecosystem, and to open opportunity where possible for local companies, local communities, and local non-profits. State policymakers recognize that the benefits of competition accrue to all of the entities in the broadband ecosystem, including incumbent phone and cable companies, new entrants, entrepreneurs, power companies, municipalities, and consumers. The goal of the pilot funding will therefore be to enable opportunity and competition, and to support the emergence of competitive broadband markets.

Rationale 3: Interest and Engagement at the Local Level

The third strong rationale underlying our recommendation to create a broadband funding program is that the local governments and local communities of Connecticut have clearly signaled their interest and need, and that even modest Sate financial support would enable them to continue on their journeys of exploring partnerships and opportunities to improve broadband in their communities.

Simply put, the local government participation in the CT Gig program was unprecedented anywhere in the United States and a stunning outcome. The level of interest generated by the CT Gig program at the local level, both among government officials and the public, was greater than we have seen elsewhere in two decades of working on comparable projects. In our estimation, one of the great accomplishments of the CT Gig program was catalyzing local planning processes in a wide range of Connecticut communities, and providing guidance and support to those communities as they have explored their own needs, assets, and opportunities.

No one understands the need for broadband more than local elected officials and their staffs, who encounter their constituents and their neighbors on a daily basis. And what has been demonstrated over the past two years is that local communities in Connecticut recognize the importance of broadband for their communities' futures. Because understanding of these needs and the specific needs themselves are so inherently local, it should come as no surprise that each Connecticut community has engaged in a planning process that is based on its own needs and unique circumstances. This is as it should be—and very appropriate given that local communities will likely be required to carry much of the load in both effort and potentially even funding to solve some of the broadband challenges they encounter locally.

The net results of these new efforts and processes at the local level is an enormous benefit to the State, in that significant efforts are underway and planning has been undertaken, partnerships developed, stakeholders engaged, and so on. It has been widely observed that the creation of new funding opportunities, however modest, has tremendous positive impact on local planning, partnering among public and private sectors, and inter-sectoral planning and partnering. Most notably this happened with the Recovery Act broadband funding programs, which launched hundreds of efforts—many of which continued through subsequent planning and execution phases even if they did not receive the public funding for which they were created.

We have observed similar dynamics in the states in which broadband funding programs have been created. And in California, which has one of the oldest and longest-standing programs, the impact at the local planning level among both public and private partners has enabled not only the emergency of new projects and networks, but also the kinds of preparations that have made projects "shovel-ready" as new funding opportunities, even unexpected ones, have emerged.

As a result of all of these factors, our first and primary recommendation for the State, which will be supplemented by additional analysis and recommendations in our later deliverables this winter, is that the State consider a program designed if not to match those of Massachusetts or New York, at least to keep the State in the ballgame.

3. Recommended Parameters for the Program

Based on best practices developed in other states, as well as our experience and observations of federal and state-level broadband programs, we offer the following analysis and recommendations for program parameters.

Scored Grant Mechanism

We recommend a scored grant mechanism that in our experience has been the most successful way of distributing modest broadband funding, both at the federal and state levels. In a scored program, as distinguished from some kind of auction mechanism, funding is awarded based on key selection criteria that flow from policy goals and risk containment strategies. Scored grants are a tested model that have been used by the U.S. Department of Commerce, the U.S. Department of Agriculture, and all of the states that have thus far awarded broadband funding.

Generally, a scored grant process will involve the following steps:

- First, the State would create a program management team or entity that ideally should include representation of multiple agencies of Connecticut government with expertise to understand broadband and evaluate grant applications.
- Second, once this program management mechanism has been created, the members of the selection team would develop the selection criteria for the grants, and direct development of the grant application itself, as well as forms for required data submission.
- Third, the entity would publish an RFP that includes the application materials, forms, and criteria.
- Fourth, the program management team would assemble a broad representation of agencies to evaluate the applications.
- Fifth, the team would award funding.
- Finally, and just as critically, award funding would be followed by verification of outcomes and auditing of the appropriate use of State funds.

A grant program of this sort has significant advantages in light of the State's goals. Among other things, it allows quantitative and qualitative evaluation of key criteria, including not only cost but also such matters as the track record of the applying entity, community support, the likely pricing for services under the program, commitment to customer service, likelihood of service to community anchor institutions (CAI), and likely impact on advancing digital inclusion and digital equity goals. In other words, this kind of process and program would allow the State to award

funding based on more factors than just cost—unlike most FCC Universal Service funding programs, where awards are based primarily on cost, usually through a reverse auction process.

Administering a grant program can be quite labor intensive. But it allows for custom analysis and, ideally, maximization of State resources. The states of California and Minnesota have had tremendous success in administering scored grant programs that enable the states to give targeted awards to entities that present the strongest business case and best use of state funding. Those programs are discussed in more detail below.

Eligible Entities

CTC recommends that the State open eligibility for the funding program as broadly as possible, in order to spur participation, planning, and creativity. We recommend this breadth of eligibility in part because many communities may choose to partner with private for-profit or non-profit entities, and their grant applications may be stronger as a result.

We do recommend that the focus of the grant program be first and foremost the localities themselves, given that the local governments of Connecticut have been so instrumental in working with the State to demonstrate local needs for broadband, and to begin to plan accordingly. We thus encourage the State to require local government participation in any grant application, but also to allow consortia (including a full range of other entities as well) to be part of the grant application.

Indeed, we believe there are a considerable number of potential private sector partners who will eagerly seek partnerships with localities in this regard. (As is mentioned above, CTC's late February deliverables will summarize and describe the kinds of private sector partners and partnerships we see emerging across the country.)

A decade of experience demonstrates the value of a breadth of potential applicants and beneficiaries. The Recovery Act funding programs, for example, were open to all applicants and funded substantial and successful programs led by state governments, local governments, and research and education non-profit networks. Well-regarded state funding programs such as that in Minnesota are open to all applicants, and the state of California recently expanded eligibility to include public entities despite the earlier iterations of its program that were limited to a certain class of telecommunications companies. California discovered that the broader eligibility served better to facilitate the goals of competition, efficient use of resources, and expansion of broadband services to all Californians.

Based on these best practices, we therefore recommend that local governments be a required participant in a grant application, and that the State encourage partnership applications that can

include telephone companies, cable companies, competitive Internet service providers (ISP), electric utilities, non-profits, and a full range of other potential stakeholders.

Eligible Areas

We recommend that the State create a pilot program for funding that would benefit both metropolitan and rural areas. For example, the State could potentially fund two metropolitan area programs and two in rural communities. This pilot approach would enable the State to test the viability and some of the parameters of funding programs in a full range of Connecticut communities, rather than focusing only on metro or rural areas.

We note that some broadband companies argue that public sector efforts should be focused only on the most rural communities, and only on markets where no Internet service is available at all. Our observations of Connecticut suggest, first, that there are few rural areas with no Internet service available at all, and second, that there are considerable, thus far unrecognized, broadband challenges and deficiencies in both rural and metropolitan area markets within Connecticut.

As is illustrated in our report, "A Brief Overview of Broadband Deficiencies in Connecticut,"[2] Connecticut businesses struggle to purchase broadband services even on main streets in downtown Hartford within sight of the State's government buildings. And as that report further demonstrates, nationally recognized measurement tools such as the Akami State of the Internet report[3] documented as recently as last month that average Internet speeds in Connecticut are falling, even as speeds nationally and in neighboring states are increasing.

The broadband challenges around access, competition, and affordability are not limited to only the most remote parts of the State. Indeed, the spectacular participation of the great majority of Connecticut's local governments in the CT Gig program is a clear demonstration of the recognition among local officials that broadband remains an area of real concern for community and economic development—and that those communities recognize the value of next-generation infrastructure capable of delivering gigabit and beyond speeds to all residents and businesses, not just a select few who may be able to purchase, at great cost, services comparable to those now offered in many Google Fiber and AT&T markets.

Further, we suggest that the State target both urban/suburban and rural markets for the pilot funding in order to further test the interest of Connecticut's cities, as well as its rural localities, in taking further steps. A State funding effort will require significant effort, and most likely significant additional funding from the local governments that apply for the State funding. If, as

[2] Released by The Office of Consumer Counsel, Jan. 25, 2016.
[3] "Akamai's State of the Internet, Q3 2015 Report," https://www.akamai.com/us/en/multimedia/documents/report/q3-2015-soti-connectivity-final.pdf.

some representatives of the broadband industry claim,[4] there is no lack of broadband in the State of Connecticut, the State can then expect that Connecticut localities will decline to apply for the pilot funding. If, however, local governments (which understand the needs of their communities far better than outside entities) choose to apply for the funding and demonstrate interest in the program, the State will have confirmation of the breadth of interest and need.

Finally, with regard to eligible areas, we note that the State of Connecticut, in other sectors of its economy, has seldom been content to settle for adequacy or even parity with other states. To the contrary, the State seeks to be among the leading economies in regard to all sectors of its economy, and the underlying infrastructure that enables it. And unlike states with enormous rural areas, Connecticut has had the opportunity to focus also on its metropolitan areas in broadband—not simply on trying to enable some form of parity for rural areas.

For all these reasons, we recommend pilot funding for both metropolitan and rural areas, with an eye toward best-in-class infrastructure, rather than simple adequacy.

Scoring Criteria

CTC recommends that the State entity or team charged with establishing the grant program and making awards consider the following criteria, among others, in scoring awards. These criteria are based on experience and best practices, both at the federal and state levels, over nearly a decade of broadband grant program experience. (There will be other criteria for award, of course, but in our experience, these are the principal ones that bear consideration from the very beginning.) Other states' experience with these and other factors is described in Section 5 below.

Financial Viability

For obvious reasons, the first criterion we recommend is the financial viability of the project. We note that many projects will be in the planning stage rather than ready for execution, but we encourage the State to require a showing of financial viability as a means of determining how extensive the planning has been, and how far along the project is. A more sophisticated and extended planning process is likely evidence of long-term effort, extensive local input, and working through some of the pragmatic challenges likely to arise. Among other things, the State can require detailed description of the business model, and potentially business plan as well as financial projections and an explanation of the assumptions underlying them.

[4] See, for example, this letter from the president of the New England Cable and Telecommunications Association: Paul Cianelli, "CT Broadband Speeds Are An Asset, Not Liability," Letters to the Editor, *Hartford Courant*, Jan. 25, 2016,
http://www.courant.com/opinion/letters/hc-ct-broadband-speeds-are-an-asset-not-liability-20160125-story.html

While it is never possible to remove all risk from a broadband project, as the economics of a broadband project are inherently challenging and risky, vetting a business model for viability and sufficiency is one means by which to identify high-quality applications.

Related to this requirement, we note that the State should also require that the entities partnering with the localities that apply for the funding are indeed themselves financially viable. The states of Illinois and Wisconsin, among others, encountered challenging situations when private sector grant awardees turned out not to have sufficient experience, depth of resources, or capability to overcome challenges.

The FCC overcomes this concern by requiring private sector applicants for federal funding to provide documentation of their financial viability in the form of letters of credit and multiple years of audited financials. Such documentation or other means of determining viability represent a best practice for protecting public funding.

Additional Funding Commitments

Depending on the size of the financial commitment the State makes, some level of additional funding—and indeed, possibly considerable additional funding—will be necessary. Among the potential sources of that funding could be investment by private partners, the local government applicants, potential commercial users of the network, and other parties that stand to benefit.

A showing of commitments for additional funding, whether by public or private sectors, should be a necessary requirement of the grant scoring process, as an additional means of assessing the viability of the application and the likelihood of success. The showing can be made in a range of ways, from letters of interest to lease fiber, to commitments to invest, to local government documentation of pledged resources, proposed bonding, or budget allocations. Both the federal Recovery Act programs and most state grant programs have required commitments of this sort.

Technical Viability and Sufficiency

As with financial viability, we recommend that the state require a strong showing of technical capacity by the applicant or consortium of applicants. This capacity can be demonstrated through partnerships that a locality develops with other entities if the locality itself does not have experience building or operating communications networks. The technical viability can be shown in the form of discussion of experience, both with regard to construction and operations, including provision of service to the public.

While the requirement of this kind of experience may have the impact of reducing the participation of start-up companies, it will at the same time provide protection for the public funds involved. In our experience, one way to enable newer companies to participate is to take into account the depth of experience of the management team in the broadband industry—

which can be an indication of technical capacity, if it is supported by the business and financial viability discussed above.

Breadth of Community Support

One critical criterion for assessing the viability and likely success of the grant application is demonstration of local community need and support. In our experience, this broad support usually exists in any community that applies for broadband funding. But it is advisable to request a showing of that support as means of ensuring that the community has been consulted and engaged, and a broad range of stakeholders has been part of the planning process and has demonstrated their interest and need—not only to support execution for the program, but to be users and customers of the broadband program that will emerge from the effort.

Both federal and state grant makers have found that letters of support—including, by way of example, organizations as diverse as business improvement districts, Boys & Girls Clubs, and religious organizations—serve as indicators of need and local commitments.

Digital Inclusion Benefits

Among other criteria, we recommend that the State include a showing that the program will benefit those in the community who have the least access to broadband services—whether that lack of access is because services are not available or not affordable. This is an area in which applicants should be encouraged to develop creative solutions and build them into their business and technical models, so they can meet the unique needs of their own communities.

Based on our discussions with a range of Connecticut localities as a part of this project, it is our conclusion that digital equity and digital inclusion goals are driving the broadband efforts in many of those communities—as is a clear understanding that lack of access to affordable broadband puts Americans who lack that access at a huge disadvantage relative to education, healthcare services, access to government services, and many of the other benefits conferred by broadband access.

4. Local Government Applicants for State Pilot Funding Have Before Them a Range of Potential Broadband Investment Models

A handful of models for localities to enable new broadband networks have emerged over the past few years and are evolving at a rapid rate. Indeed, new models appear to be emerging on a monthly basis. As of this writing, however, we have divided the range of existing and emerging models into the following categories:

- Municipal Broadband: Localities build, own, and operate fiber-to-the-home (FTTH) networks themselves in the "municipal broadband" model. This is a very high risk and high reward proposition, with a respectable track record in communities across the country.

- Middle Mile Broadband: Localities build less extensive networks to address "middle mile" needs, thus ensuring the availability of fiber optics to government users and key community anchor institutions, but not reaching all the way to the home or business.

- Middle Mile Plus Broadband: Localities route their middle mile networks to reach key economic or community development targets, such as business parks, historic downtowns, or revitalization areas.

- Public Facilitation of Private Investment: Localities encourage new private investment through economic development incentives and other measures to reduce costs for private sector infrastructure deployment.

- Public Funding, with Private Execution: Localities negotiate formal public–private partnerships that resemble transit and toll-road construction projects, with public funding and private execution.

- Shared Public and Private Risk and Cost: Localities create hybrid models where a locality and private partner find a creative way to share the capital, operating, and maintenance costs of a broadband network.

Each of these will be explored in some detail in CTC Technology & Energy's next set of deliverables for the State of Connecticut.

5. Other States' Experience Suggest Certain Best Practices for Creation of Broadband Funding Programs

California Advanced Services Fund

The California Advanced Service Fund (CASF) was created in 2007 to provide grants to bridge the digital divide in unserved and underserved parts of the state. The CASF is administered by the California Public Utilities Commission (CPUC) and began with $100 million from the state to first provide broadband services to areas without any broadband access, then to build out infrastructure in underserved areas with any remaining funds.

In 2010, Governor Schwarzenegger allocated an additional $100 million to the Broadband Infrastructure Grant Account, the sub-program of the CASF that handles grants for broadband construction.[5] In 2011, Governor Brown signed legislation to expand the CASF to $225 million through 2018. The CASF is being funded through a small assessment on telephone and VoIP services.[6]

The goal of the CPUC is to approve funding for infrastructure projects that will provide broadband access to no less than 98 percent of California households.

Projects Eligible for Funding

The CASF provides both grants and loans to assist in the building and/or upgrading of broadband infrastructure in areas that are not served or are underserved by existing broadband providers. The funded projects are a mix of middle mile and last mile, including DSL, wireless, and FTTP projects. The State prioritized unserved and underserved areas, specifically focusing on households, but also provides direct and indirect support for anchor institutions that are working on bridging the digital divide through deployment of broadband technology, education of the public about the availability of service options, promotion of use of service options, and provision of consumer outreach and training.

Underserved is defined as no wireline or wireless carrier offering service at advertised speeds of at least 6 Mbps download and 1.5 Mbps upload; unserved is defined as only having dial-up service available. Organizations looking to build infrastructure in served areas are not permitted to apply,

[5] *California Public Utilities Commission*, "California Advanced Services Fund (CASF): Background and History," http://www.cpuc.ca.gov/PUC/Telco/Information+for+providing+service/CASF/index.htm (accessed November 25, 2015).
[6] *TechNet*, "2012 State Broadband Index," http://www.technet.org/wp-content/uploads/2012/12/TechNet_StateBroadband3a.pdf (accessed November 12, 2015).

unless the organization can prove that speeds in that area are not, in actuality, as high as initially assessed.[7]

As of December 2014, the CPUC had authorized $99.19 million for 47 projects that were expected to benefit nearly 300,000 households. Of these households, around 16,000 were previously unserved and 276,000 were underserved.

Applicants Eligible for Funding

In the original legislation, CASF funding was available to entities with a Certificate of Public Convenience and Necessity (CPCN) that qualify as a "telephone corporation" or wireless carriers that are registered with the CPUC. CASF funding is now also available to non-telephone corporations that are facilities-based broadband service providers. Non-telephone corporations must provide last-mile broadband access and only receive funding to provide access to unserved or underserved households. The program allows incumbent telephone providers in underserved areas a right of first refusal for grants, if they make a commitment to upgrade their facilities in the areas using their own funds.

The majority of the projects have been partnerships. The State provides grants for up to 70 percent of construction costs for projects in unserved areas and up to 60 percent of construction costs for projects in underserved areas. The Revolving Loan Program provides supplemental financing for up to 20 percent of projects costs, with a maximum of $500,000.[8]

Lessons Learned

The CPUC concluded that its eligibility requirements for grant applications were too constrictive, resulting in too few applications and too large a surplus of funding—the CPUC received only five applications in the October 2012 application period, even though it still offered more than $40 million of the second $100 million allocated in 2010. Based on letters from private companies and the California public, the CPUC realized that requiring applicants to possess a CPCN or a Wireless Identification Registration (WIR) was the aggravating factor, because it cut out the 28 wireless ISPs (WISP) already operating cost-effectively in rural areas, as well as American Indian tribes trying to build infrastructure on their tribal lands, among other entities.

Additionally, the large telecommunications companies were using their grant money to focus almost exclusively on middle-mile infrastructure instead of serving individual homes and businesses, because that was the cheaper portion of the overall network to build. This meant

[7] *California Public Utilities Commission*, "California Advanced Services Fund (CASF): Infrastructure Grant and Revolving Loan Account," http://www.cpuc.ca.gov/PUC/Telco/Information+for+providing+service/CASF/CASFGrantLoan.htm (accessed July 16, 2015).

[8] Wells, Diane, "State Broadband Infrastructure Programs," *Minnesota Office of Broadband Development*, February, 2015.

that a lot of public money was being used, but the original mission of the program to supply broadband access to 98 percent of California households was not being fully realized.

To remedy the situation, the CPUC lobbied the state legislature to remove the restrictions. At the end of 2013, after several attempts, CPUC was successful. Now, more types of entities are eligible to apply for grants. The legislature initially rejected the idea because organizations not holding CPCNs or WIRs are subject to less direct regulatory control, which raised concerns about the potential for waste, fraud, and abuse. However, the CPUC has been able to make use of previous grant-allocation models to develop pathways to oversee and regulate the work of the grantees, satisfying the legislature. No grants had been made to non-CPCN, non-WIR entities as of the end of 2015, but multiple applications are currently under review and likely to be funded.[9]

Illinois Gigabit Communities Challenge

This program was launched by Governor Pat Quinn in February 2012 to award up to $4 million in seed funding to "the most promising ultra-high-speed broadband deployment projects in Illinois" under Governor Quinn's multi-year Illinois *Jobs Now!* economic development program.

The project was coordinated by the Illinois Broadband Opportunity Partnership (IBOP), a statewide consortium of public and private sector partners organized by Governor Quinn and led by Illinois State University's Central Illinois Regional Broadband Network (CIRBN) and the State of Illinois Department of Central Management Services (CMS).[10]

The targeted, long-term goals of the project were to: "Improve employment opportunities; enhance economic development through the development of 'smart communities;' bring Illinois closer to the goal of increasing the proportion of residents with high-quality degrees and credentials to 60 percent by the year 2025; connect health care professionals with their patients; and position Illinois' universities to continue to lead the nation in research, technology, and innovation."[11]

Projects Eligible for Funding

The program funded broadband infrastructure projects to connect major higher-education institutions and high-density corridors, prioritizing high-impact connections over connection of more rural, lower-access areas of the state. However, projects that extended broadband

[9] *California Public Utilities Commission*, "Order Instituting Rulemaking to Consider Modifications to the California Advanced Services Fund," October 25, 2012, pp. 6–21, http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M032/K728/32728734.PDF (accessed November 30, 2015).

[10] *Broadband Illinois*, "Illinois Gigabit Communities Challenge," http://www.broadbandillinois.org/Use-it/Illinois-Gigabit-Challenge.html.

[11] *Broadband Illinois*, "Illinois Gigabit Communities Challenge," http://www.broadbandillinois.org/Use-it/Illinois-Gigabit-Challenge.html.

infrastructure to the unserved and underserved were also funded. Higher-density areas were prioritized with the idea that the extended infrastructure would reduce the cost for private providers to build last-mile broadband infrastructure off the State's backbone.

Applicants Eligible for Funding

The challenge was open to any private or public organization and required projects to connect at least 1,000 end users to an ultra-high-speed broadband network capable of delivering speeds of 1 Gbps.[12]

One of the State's priorities was expanding higher education through broadband deployment, so the areas prioritized were those with large higher-education institutions such as the University of Chicago, Northwestern University, and Southern Illinois University.

Each project prioritized universities and/or community anchor institutions first, then expanded to business interests, such as commercial resale of ultra-high-speed broadband services.[13]

Funded Projects

A total of $8 million was awarded under the program. The partnership of Gigabit Squared, Cook County, the City of Chicago, and the University of Chicago received $2 million to deploy fiber and wireless in nine neighborhoods in Chicago.[14] The second award of $1 million went to OnLight Aurora to connect the City of Aurora's fiber optic network to its education, business, and healthcare institutions.[15] The third award, also for $1 million, was granted to the City of Evanston and Northwestern University for a $2.5 million project to promote business, medical service, and educational opportunities for the City, and research programs for the university.[16] The City of Carbondale—in partnership with Frontier Communications, Southern Illinois University, and Connect SI—earned the fourth grant of $1.5 million for fiber deployment to businesses, schools, hospitals, and neighborhoods, as well as the university.[17]

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[12] *Broadband Illinois*, "Illinois Gigabit Communities Challenge," http://www.broadbandillinois.org/Use-it/Illinois-Gigabit-Challenge.html (accessed November 24, 2015).
[13] Clark, Drew, "Onlight Aurora, Most Advanced Illinois Gigabit Communities Awardee, Shows How to Leverage Its Fiber Network," *Broadband Breakfast*, http://broadbandbreakfast.com/2013/11/onlight-aurora-most-advanced-illinois-gigabit-communities-awardee-shows-how-to-leverage-its-fiber-network/ (accessed November 11, 2015).
[14] *Broadband Illinois*, "Governor Quinn Announces First Winner of Illinois Gigabit Communities Challenge," press release, http://www.broadbandillinois.org/news/194 (accessed November 24, 2015).
[15] *Broadband Illinois,* "Governor Quinn Announces Second Illinois Gigabit Communities Challenge Winner" press release, http://www.broadbandillinois.org/news/196 (accessed November 24, 2015).
[16] *Broadband Illinois,* "Quinn Grants $1 Million to Evanston in Gigabit Communities Challenge Program," press release, http://www.broadbandillinois.org/news/226 (accessed November 24, 2015).
[17] *Broadband Illinois*, "Gov. Quinn Awards $1.5 Million to Carbondale Area as Part of Gigabit Communities Challenge" press release, http://www.broadbandillinois.org/news/307 (accessed November 24, 2015).

Lessons Learned

The Illinois experience demonstrates two areas of peril: First, it is critical to fully vet potential grant applicants if they are private sector. Illinois, in one case, funded an impressive looking but, in reality, unstable and inexperienced company. The company defaulted on its obligations after spending much of the funding granted by the State, with the result that the local community's hopes were deeply disappointed and the State was deeply embarrassed. Funding granted to public and higher education entities does not entail this kind of risk, as these entities offer both stability and long-term relationships with the State that they will not endanger recklessly.

The second lesson learned in Illinois is the importance of providing grants to entities that are ready and able to execute, based on prior planning and internal capacity. In one Illinois project, the university and city partnership was so slow commencing the build-out of the project that when a new governor was elected, he demanded the money back. Since the network had not broken ground and the funding was still available, the city and university were forced to relinquish it. Proven ability to execute in a reasonable time frame should therefore be a criterion for funding.

Maine ConnectME Authority

The State of Maine created the ConnectME Authority in 2006 with the goal of stimulating investment in communications technology infrastructure in unserved or underserved areas. Since that time, the Authority has conducted nine grant rounds.[18] From 2007 through 2014, the Authority awarded 122 grants totaling nearly $10 million through a process that solicited, scored, and awarded bids from public–private partnerships.[19]

Areas Eligible for Funding

The ConnectME Authority focuses entirely on underserved or unserved areas of the state and the Authority included defining the terms as part of its mission. However, the Authority has thus far focused almost entirely on defining and serving unserved areas, as they are numerous.[20]

The networks were built as small FTTP or wireless projects, often off the backbone of the Three-Ring Binder fiber project, a Recovery Act-funded project of over $25 million that built three rings of fiber running along the eastern and southern sides of the state, connecting the northernmost

[18] *ConnectME*, "ConnectME Authority Grant Program—Funds for Broadband Infrastructure Projects," http://www.maine.gov/connectme/grants/index.shtml (accessed November 6, 2015).
[19] "ConnectME Authority Grant Program—Funds for Broadband Infrastructure Projects" (accessed November 6, 2015).
[20] Based on interview by CTC staff of Executive Director of the ConnectME Authority of Phil Lindley, November 25, 2015.

tip to the southernmost tip. The Three-Ring Binder is an open-access, middle-mile network completed in 2012.[21]

Entities Eligible for Funding

The communities applying for grants were required to partner with one of the five approved telecommunications providers already serving customers in Maine. Each grant applicant was required to show a partnership between a municipality, county, or regional authority, and an established ISP.[22]

The ConnectME Authority's funds come from a 0.25 percent surcharge on all communications, video, and Internet service bills in Maine, as well as a $2.5 million cash contribution from Verizon, per its agreement with the Maine Public Utilities Commission as a condition of the sale of its local telephone lines. To fund itself, the Authority can also require every provider to contribute on a competitively neutral basis.[23]

Public–private partnerships applied for and won grants for higher-impact areas in the first five grants rounds, leaving more difficult and costlier projects for the most recent four grant rounds. The ConnectME Authority is now facing declining revenues and is only able to fund smaller and smaller projects. One difficulty is geography; another is population density and demographics. The terrain over which the grantees are building is more treacherous and remote. The number of households served per grant dollar is lower because the population is less dense and what people there are, are less likely to sign up for broadband service with the ISP than those in higher-density areas.[24]

Of the 122 projects the ConnectME Authority has funded over past eight years, all but eight projects have been completed to date: one project that was declined by the grant awardee before work began, two projects that were begun in 2013 and were granted extensions based on make-ready issues encountered, and five from 2014 that have either finished and have not yet filed paperwork or are finishing soon. The tenth grant round will be opening in early 2016 and will for the first time include funding for feasibility studies and other such projects, in addition to construction projects.

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[21] *Maine Fiber Company*, "Our History," http://www.mainefiberco.com/about/history/ (accessed November 30, 2015).
[22] *ConnectME*, "ConnectME Authority Grant Program—Funds for Broadband Infrastructure Projects," http://www.maine.gov/connectme/grants/index.shtml (accessed November 25, 2015).
[23] Wells, Diane, "State Broadband Infrastructure Programs," *Minnesota Office of Broadband Development*, February, 2015.
[24] *ConnectME*, "ConnectME Authority, Draft of Detailed Triennial Strategic Plan for Broadband Service," October 30, 2015, p. 10, http://www.maine.gov/tools/whatsnew/attach.php?id=660801&an=1 (accessed November 25, 2015).

Lessons Learned

In the beginning, the ConnectME Authority allowed incumbent ISPs to challenge grant applications if they already had infrastructure or plans to construct it soon. Over the course of the ConnectME project, incumbents made roughly half a dozen challenges, most of them successful. The intent was to allow the private sector to take care of areas they were already covering or planning to cover, thus reserving public funds for unserved areas. However, a challenge was overturned in one case, when local citizens acted collectively to prove the incumbent's services actually provided speeds below the "served" definition. The challenge option has since been removed for that and other reasons.[25]

A critical component of success is strong and steady support from the State legislature and executive branch. Local activism and organization efforts should also get sufficient attention: in some communities, local economic development groups and councils actively drew attention to their areas' needs and the benefits that would accrue from increased broadband access. In Maine, the State legislature, executive branch, senators, and representatives were all highly supportive of the ConnectME Authority's efforts and need for funding.[26]

Massachusetts Broadband Institute (MBI)

In August 2008, Governor Deval Patrick signed into law a Broadband Act establishing the Massachusetts Broadband Institute (MBI), which leveraged public and private resources to bring broadband to communities found to have no access to high-speed Internet.[27] The legislation set out a timeline of three years to complete all expansion projects and placed the MBI within the Massachusetts Technology Collaborative. The program's focus was to close the digital divide in Massachusetts, particularly expanding broadband availability in the unserved areas of western and central Massachusetts.

Since 2008, the program has been renewed and funding expanded several times. Most recently, in 2015, $50 million was set aside by the state legislature to continue the project into fiscal years 2015 and 2016. The current main focus is projects that can utilize the MassBroadband 123 fiber network, a middle-mile network connecting 123 communities.[28] In addition, MBI provides support for communities and providers in the form of grants, access to infrastructure, and technical assistance.

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[25] Based on interview by CTC staff of Executive Director of the ConnectME Authority of Phil Lindley, November 25, 2015.
[26] Ibid.
[27] "Broadband Bill," *Massachusetts Broadband Institute*, http://broadband.masstech.org/history/broadband-bill.
[28] "MassBroadband 123," *Massachusetts Broadband Institute*, http://broadband.masstech.org/building-networks/middle-mile/massbroadband-123.

Areas Eligible for Funding

Ninety-five communities in Massachusetts were assessed to have either limited or no broadband availability, particularly in the western half of the state, which meant that more than 220,000 households and more than 25,000 businesses lacked adequate broadband. The Commonwealth determined that adequate broadband availability would improve public safety and access to health care, provide more educational opportunities, and encourage higher civic participation. The Department of Revenue estimated the Commonwealth would save $300,000 annually once each town hall could conduct business online.[29]

In early 2013, Governor Deval Patrick authorized $40 million in new bonds to fund the last mile.[30] Later in 2013, Governor Patrick allocated an additional $10 million toward "a swifter solution to one of its major hurdles: delivering high-speed broadband connections to the homes of people in the state's 45 most unserved and underserved communities," which will be "invested into the Last Mile portion of the project, which expands the fiber optic network to individual homes and small businesses."[31] When Governor Charlie Baker was sworn into office in 2015, he upheld and pledged support for the program, which is still funded and operating.

Prior to 2013, roughly $194,000 was awarded to four entities for wireless infrastructure buildouts and the remainder paid for four feasibility studies for FTTP or wireless infrastructure.

Of the funds allocated in 2013, the Town of Leverett was the first to complete a last-mile project, utilizing a $27,700 grant from MBI and making up the balance with local funds.[32]

The grants from the 2011-2012 program were up to a maximum of $50,000 per provider and project, and recipients were required to provide 25 percent in matching funding.[33]

The grants for the last-mile initiatives were given out based on ability of the entity to quickly provide last-mile service to underserved areas.

The Commonwealth prioritized unserved communities, primarily in the western half of the state, that were without any type of broadband service.

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[29] *Massachusetts Broadband Institute*, "Governor Deval Patrick Signs Broadband Access Law," press release, http://broadband.masstech.org/sites/mbi/files/documents/who-we-are/broadband-pr808.pdf.
[30] "History: The MBI Timeline," *Massachusetts Broadband Institute*, http://broadband.masstech.org/what-we-do/history.
[31] Ibid.
[32] "MBI Broadband Last Mile Broadband Policy," *Massachusetts Broadband Institute*, http://broadband.masstech.org/sites/mbi/files/documents/building-the-network/mbi-last-mile-program-policy-07-30-2015%20.pdf.
[33] "History: The MBI Timeline."

For the current phase of the Broadband Extension Program, communities that have neighborhoods with lower than 96 percent cable penetration rates are eligible.[34]

The MBI utilized the MassBroadband 123 fiber optic network, which was specifically designed to provide a regional framework to support the expansion of services in the underserved communities. MassBroadband 123 lays the groundwork for private ISP investment into last-mile service to residents and businesses, by providing any broadband service provider open access to connect and offer services. The Commonwealth also offers technical assistance and contracts with a network operator to increase efficiency.[35]

Projects Eligible for Funding

Local governments have a choice of three frameworks: a regional fiber-to-the-home (FTTH) network, a single-town FTTH enterprise option, and a single-town wireless-fiber hybrid Enterprise option. In the first option, fiber in a town will extend along all streets and be accessible to all premises in a town (business as well as residential). The MBI network design for the regional network will enable towns to select a single regional operator, multiple regional operators, or their own town operator. In the second option, a town partners with a private company that designs, constructs, and operates the network for the town. In the third, a town partners with a private company that designs, constructs, and operates the network on behalf of the town, through a multi-year agreement.[36]

Applicants Eligible for Funding

The Commonwealth took the approach of a public–private partnership with a co-investment model, using public bonds to fund futureproof fiber or long-lived wireless infrastructure, while the private partners funded complementary infrastructure and provided services.

The Town of Leverett was the first to complete its planned project of connecting all residences and businesses to the MassBroadband 123 fiber backbone, which was itself completed in 2014. More than 75 percent of Town residents signed up for the Commonwealth -funded broadband program, which is owned by the Town and served by the local ISP Crocker Communications of Greenfield.[37]

Minnesota Border-to-Border Broadband Development Grant Program

In 2010, Minnesota adopted the goal that no later than 2015, all state residents and businesses would have access to broadband service that provides a minimum download speed of 10 Mbps

[34] "Broadband Extension Program," *Massachusetts Broadband Institute*, http://broadband.masstech.org/building-network/last-mile-resources/broadband-extension-program.
[35] "2011-12 Grant Program."
[36] "MBI Broadband Last Mile Broadband Policy."
[37] Bray, Hiawatha, "'Last mile' of Internet lit up in Leverett," *The Boston Globe*, October 2, 2015, http://www.betaboston.com/news/2015/10/02/last-mile-of-internet-lit-up-in-leverett/.

to 20 Mbps and a minimum upload speed of 5 Mbps to 10 Mbps. The law provides that the State's goal is to be in the top five in the nation for universally accessible broadband speed, the top five states for broadband access, and the top 15 when compared to countries globally for broadband coverage.

In 2013, legislation created the Office of Broadband Development (OBD), and in 2014, the Governor created a $20 million program called the Border-to-Border Broadband Infrastructure grant program.[38]

The goal is to extend broadband access to unserved and underserved areas of the State, which the State defines in this way: An unserved area is one in which households or businesses lack access to wireline broadband service that meets the FCC threshold of 25 Mbps download and 3 Mbps upload. An underserved area is one in which households or businesses do receive service above the FCC threshold but lack access to service that meets the State goals of 10 to 20 Mbps download and 5 to 10 Mbps upload.[39]

The Minnesota Border-to-Border Broadband Development Grant Program funds the acquisition and installation of middle-mile and last-mile infrastructure that supports symmetrical broadband service scalable to at least 100 Mbps.[40]

During the 2015 special session, the legislature included almost $11 million in funds. Funding for projects for 2014 reached almost $20 million.[41] The total value of the projects to be deployed is over $45 million.[42]

In 2014, the State selected 17 projects for funding, 16 of which eventually accepted the funding. Awards ranged from just over $100,000 to the maximum of $5 million and in total equaled just under $20 million.

Two examples of programs selected in 2014 are the following:

Federated Telephone Cooperative was awarded $3.92 million to construct broadband infrastructure that will make service available to more than 1,000 unserved premises. The full project cost is $7.92 million; the remaining $4 million (51 percent) in matching funds will be raised through tax abatement bonds, with the county loaning the bond proceeds to Federated.

[38] Wells, Diane, "State Broadband Infrastructure Programs," *Minnesota Office of Broadband Development*, February, 2015.
[39] Ibid.
[40] *Minnesota Department of Employment and Economic Development*, "Broadband Grant Program: Overview," http://mn.gov/deed/programs-services/broadband/grant-program/.
[41] Ibid.
[42] Wells, Diane, "State Broadband Infrastructure Programs."

Rock County Broadband Alliance (RCBA) FTTP project was awarded $5 million to deploy FTTP service for more than 1,000 underserved and almost 300 unserved locations in a rural county. The total project costs are $12.85 million; the remaining $7.85 million (61 percent local match) will be provided by Alliance Communications Cooperative as an equity infusion to RCBA, which is a wholly owned subsidiary of Alliance.[43]

One example of a project funded in 2015 is *Paul Bunyan Central Itasca County Fiber*, which will build out a $1.98 million broadband infrastructure in Itasca County in three townships and the former Iron Range Township—now incorporated into a nearby city. High-speed Internet service will be available to 1,193 households, 53 businesses, and five CAIs. Total project costs are $5.52 million. Paul Bunyan Communications, Itasca County, and the Iron Range Resources and Rehabilitation Board—a State development agency—will provide the remaining $3.54 million (64 percent local match). The project aims to reach the estimated 3,500 people and about 100 small businesses in the area, in order to improve market access, options for education, and health care services, and "the region's viability and attractiveness to telecommuters, freelancers, and others who depend on technology and the Internet for work."[44]

Projects Eligible for Funding

The program pays up to 50 percent of the infrastructure deployment costs for a qualifying project, including project planning, the cost of obtaining permits, facilities construction, construction of middle-mile and last-mile infrastructure, equipment, and installation and testing of the broadband service. The maximum grant amount is $5 million.

Applicants Eligible for Funding

Groups eligible to apply included: Incorporated businesses or partnerships, political subdivisions, American Indian tribes, Minnesota nonprofits, Minnesota cooperative associations, and Minnesota LLCs organized for the expressed purpose of expanding broadband access.[45]

The State made funding available to invest in broadband infrastructure with the goal of continuing to create more partnerships and supporting providers working to implement next-generation gigabit service. Many partnerships were forged, with private and public entities

[43] *Minnesota Department of Employment and Economic Development (DEED)*, "Broadband Grant Program: Grantees," http://mn.gov/deed/programs-services/broadband/grant-program/ (accessed November 4, 2015).
[44] *Minnesota DEED*, "Minnesota Awards $11 Million for Broadband Projects," press release, November 20, 2015, http://www.mn.gov/deed/newscenter/press-releases/newsdetail.jsp?id=466-175352 (accessed November 24, 2015).
[45] *Minnesota DEED*, "Broadband Grant Program: Overview," http://mn.gov/deed/programs-services/broadband/grant-program/ (accessed November 4, 2015).

sharing costs and risks. The State and local governments made use of grants, loans, and funds allocated by the legislature to cover their portion of the costs.[46]

The Governor's Taskforce on Broadband drew from a year of programs, research, and outreach to recommend continued funding for the Office of Broadband Development (OBD). The OBD plans to expand its focus by continuing its tracking and measurement of broadband access levels across the state, making broadband projects more feasible by expediting permitting processes, and establishing an accurate inventory of public investments in broadband at an institutional and building-specific level, in addition to funding further broadband projects.[47]

All of the 16 projects funded in 2014 are currently ongoing, with a portion close to completion. A 17th grant was awarded, then declined by the applicant, so it never became an active project. The active projects have a completion deadline of June 2017.[48]

Lessons Learned

According to the leadership of the Minnesota program, one lesson learned is to develop strong relationships with smaller providers who are interested and willing to participate. A state needs to make an effort to build them into the process, consult with them, and get their thoughts about how to structure and execute the program. Their buy-in and participation are essential.

Another piece of advice is to strive to keep up relationships with grantees, so as to identify issues before they become problems. Also essential is the development of a strategy to integrate with and leverage Connect America Fund II funding, to maximize the benefit to the State.

Cable provider opposition can potentially hurt formation of a program. However, demonstrating to the cable companies early on that a rural grant program will not impact the primarily metropolitan territories they serve can win their trust and cooperation.

There is also a need to develop a pre-established pipeline, if such is possible, and to require robust feasibility studies from vendors, which will dramatically increase the chances of funding successful projects.

Building the program within an agency that has experience and expertise giving and overseeing competitive grants also contributes to success. Alternatively, the agency tasked with the program is well advised to create opportunities to consult with state agencies that have that capacity. [49]

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[46] Ibid.
[47] "Broadband Grant Program: Overview," (accessed November 4, 2015).
[48] Based on email correspondence between CTC staff and Minnesota DEED Director of Communications, Madeline Koch, November 24, 2015.
[49] Based on interview by CTC President, Joanne Hovis, of Executive Director of Minnesota Office of Broadband Development, Danna MacKenzie, November 11, 2015.

Wisconsin State Broadband Office's LinkWISCONSIN Broadband Initiative

In November 2009, the NTIA awarded almost $2 million to a statewide broadband mapping and planning effort, named LinkWISCONSIN, which is charged with developing a long-term, sustainable plan for increasing access to and use of broadband across the State.[50] In June of 2013, the State of Wisconsin created the Broadband Expansion Grant Program, which falls under the administration of LinkWISCONSIN, to allocate funding to reimburse a portion of the construction costs for projects extending or improving broadband infrastructure to underserved areas of the state.

The mission of the State Broadband Office's LinkWISCONSIN Initiative is to make Wisconsin more competitive through advancing the availability, adoption, and use of broadband technologies, especially in underserved areas. As part of the Public Service Commission of Wisconsin, the State Broadband Office works with stakeholders to build partnerships with providers and consumers.[51]

Projects Eligible for Funding

The State Broadband Office administers broadband improvement funding through the annual Broadband Expansion Grant Program. This program provides reimbursement for equipment and construction expenses incurred to extend or improve broadband telecommunications service in underserved areas of the state, defined as areas with only two ISPs operating.[52]

In 2014 and 2015, $500,000 was made available annually for funding broadband projects and seven awards were made in each fiscal year.[53] The Commission has set aside $1,500,000 during Fiscal Year 2016 for projects proposed by one or more public and private entities that meet the eligibility requirements.

In 2014, seven grants were awarded: two for small DSL projects, three for medium and large fixed wireless projects, and two for medium-sized fiber projects. In 2015, another seven grants were awarded: one for a small DSL project, two for large fixed wireless projects, and four for small cable and/or fiber projects.[54]

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[50] *Public Service Commission of Wisconsin, State Broadband Office*, "About LinkWISCONSIN," http://www.link.wisconsin.gov/about-link-wisconsin (accessed November 4, 2015).
[51] *Public Service Commission of Wisconsin, State Broadband Office*, "Connecting Wisconsin to the World," http://www.link.wisconsin.gov/ (accessed November 4, 2015).
[52] Ibid.
[53] *Public Service Commission of Wisconsin, State Broadband Office*, "Funding," http://www.link.wisconsin.gov/funding (accessed November 30, 2015).
[54] LinkWISCONSIN Blog: News & Events: Broadband Expansion Grant Award Maps, 2014–2015," http://www.link.wisconsin.gov/blog/news-and-events/post/broadband-expansion-grant-award-maps-2014-2015 (accessed November 30, 2015).

Entities Eligible for Funding

Each year, the State has accepted applications for grants from for-profit or non-profit organizations or cooperatives, telecommunications utility companies, and municipal or county governments that have formed a partnership or joint-venture agreement with one of the previous two types of entities.[55]

Grant funds can only be used to reimburse the construction of broadband facilities. The program is not intended to fund the operating costs of a service provider or the monthly bills of individual users of Internet services.[56]

Areas Eligible for Funding

The State targeted underserved areas, defined as areas where two or fewer carriers offered broadband services, or areas where only DSL service was available.[57]

The networks were constructed with a mix of fixed wireless, middle-mile fiber, last-mile fiber, and DSL technology. In one area, existing fiber routes passed prime locations for wireless towers, so the existing infrastructure was connected to cellular towers in four locations.

Of the projects approved for 2016, 10 of the 11 are projects that bring broadband to the home. The 11th project is to build out a middle-mile fiber backbone in one community. Of the 10 last-mile projects, one is for fixed wireless and seven are for FTTP construction.[58]

Entities Eligible for Funding

The goal was to use public money as seed funding for private investment or local public–private partnerships. Of the 11 projects approved for 2016, nine involve partnerships. In Wisconsin, almost all counties have some form of County organization for economic development, so private companies are often partnering with those organizations.[59]

The program has enjoyed enough success and support that the State authorized the Broadband Expansion Grant Program for an additional two years, with $1.5 million allocated for each year. There is good support for the projects in the state legislature and from the Governor.

Of the projects initiated in 2014, four are complete, two are on target to finish by the end of 2015, and only one is behind schedule. Using the lessons learned in the previous year, the State

[55] "Broadband Expansion Grant Program" (accessed November 12, 2015).
[56] *Public Services Commission of Wisconsin*, "Broadband Expansion Grant Program," http://psc.wi.gov/utilityInfo/tele/broadband/grants/bbGrantApplicationPage.htm (accessed November 12, 2015).
[57] State Legislature of Wisconsin, "2013 Assembly Bill 40: 2013 WISCONSIN ACT 20," Date of publication: July 1, 2013, p. 495, http://docs.legis.wisconsin.gov/2013/related/acts/20.pdf (accessed November 30, 2015).
[58] Based on interview by CTC staff of the Public Service Commission's Program and Policy Analyst, Dennis Klaila, November 30, 2015.
[59] Ibid.

Broadband Office approved projects it assessed to have higher chances of success, resulting in on-target progress on the 2015 projects. Two of the projects are complete and five are progressing according to schedule.[60]

Lessons Learned

The State's first clear lesson learned is that permitting and land use permissions are critical path items, and that grantees should demonstrate progress in this area early—perhaps even as early as during the grant application process. In the State's experience, all of the grants were issued with deadlines, with the understanding that the deadlines could be extended by request. In most cases, those deadlines were met or the extensions were reasonable. In one instance, a service provider for a fixed wireless project tried to build a wireless tower in a public park and encountered environmental and other land-use problems. The project called for building one very tall tower in a public park in the center of the county, high enough to reach most county residents. Unfortunately, residents thought the tower would be an eyesore and an inappropriate use of park land. Also, environmental groups raised objections to cutting down trees in the proposed construction site before spring, because a large number of bats were wintering in those trees.

As a result of these experiences, the State Broadband Office more closely scrutinizes wireless projects for land-use permissions progress. Reviewers favor proposals that show the applicant has started securing permissions.

Another clear lesson learned is the importance of vetting smaller companies for robustness and viability. The State Broadband Office decided to set aside funds for smaller companies, to spread opportunities beyond large, incumbent providers. However, one awarded company was too small to work with smoothly. The company retained too few employees to be fully responsive to the State's requests or even fulfill basic communication needs. Since that time, the State Broadband Office has more carefully assessed the health and reputation of companies before approving their grants. As a result, larger, more responsive, and better-established providers are winning grants. In 2015, all projects remained on target.[61]

[60] Based on interview by CTC staff of the Public Service Commission's Program and Policy Analyst, Dennis Klaila, November 30, 2015.
[61] Ibid.