State Broadband Expansion Programs – A Primer

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Forward

State/Local Government Policies -- roadmap for broadband infrastructure

The United States already is in the midst of a generational investment in broadband. Since March of 2020, federal actions including the CARES Act, the 2020 Consolidated Appropriations Act, the American Rescue Plan, and the RDOF Phase I Auction have made newly available billions of dollars for broadband. Current legislative proposals supported by the Biden Administration would add up to $65 to 100 billion more. At these historic levels of public investment, the key policy question is how to distribute the gusher of new funds most effectively to achieve the greatest impact on long-term economic development and societal health, and critically to avoid ineffective steps that would waste some of the historic opportunity.

An important -- and somewhat overlooked -- aspect of this question is the role of states and localities. Despite near unanimity on the importance of broadband at both the federal and state levels, as well as clear steps at the federal level to provide a significant role for state and local entities, many questions remain unanswered about how states and localities can most effectively promote broadband deployment and adoption, including:

a. How do state regulatory policies impact the landscape of broadband providers available to deploy new networks, and with what impact on the nature of new broadband infrastructure that will be deployed?
b. How should states and localities deploy available funding -- including independently available state and local funds, as well as the state and local portions of new federal funding -- to maximize overall broadband investment and adoption, including both the local share of federal funds as well as new private investment?
c. How can state infrastructure and publicly supported networks, such as state research and education networks, be leveraged to maximize overall broadband deployment and adoption?
d. What steps should states and localities take with respect to broadband mapping in light of ongoing Federal activities and the expected timeline for new funding opportunities?
e. How can states and localities improve the combined impact of expanded support both for deployment and for affordability at the federal level, and in particular how can states and localities support both providers and users in navigating what are traditionally disparate funding processes?

As of today, the status of state broadband planning varies tremendously, with many states falling behind the curve given the very rapid pace of policy development at the federal level.

The goal of this whitepaper primer is to develop an issue checklist, timeline and roadmap, and a set of well-defined options for state and local entities to draw on as we enter the second half of 2021, including the potential enactment of national infrastructure legislation.

State Broadband Expansion Programs – A Primer:

The demand for broadband services is now higher than it ever has been. The last year has seen schools move to distant learning, millions shift to telework, huge increases in online commerce, and more. It has also seen people moving from urban areas with high cost of living to areas with more open space and more affordable costs of living. These shifts have highlighted a number of societal issues relating to broadband, including access to robust broadband, affordability of broadband, and the capability of people to use broadband.

To meet these ever-growing broadband challenges, States need to update and/or implement their own State Broadband Expansion programs. And the timing is critical. The American Rescue Plan, signed into law by President Biden on March 11th, 2021, provides each state the opportunity to obtain grants of ~$100 million or more in support of a range of uses related to broadband. New proposals for infrastructure investment include an additional $60 billion for broadband expansion, provided directly to states.

This document provides some basic items States need to consider for their State Programs ("Program(s)").

Introduction

Development, implementation, and long-term support of state programs to encourage broadband expansion is a complex effort whose success is tied to proper planning and consideration of goals, incentives and costs. Program Incentives should be targeted to achieve Program Goals, such as: (1) Encourage the deployment of technologies that are future proof and that bring the greatest long-term socio-economic benefits to local communities, (2) Encourage full deployment by 2025, (3) Reduce the risk of stalled or failed deployment projects, (4) Make the deployment a viable and attractive investment (i.e., an attractive Internal Rate of Return or IRR) for the entities who will be awarded funding under the Program, including public-private partnerships as well as fully public projects. The Program Incentives and Goals must reflect a clear financial understanding of the Program Cost and the ability to afford the Costs by the governmental entity. Much of the Program Incentives will take the form of funding that should be awarded in a competitive, managed effort to encourage an economically efficient use of limited governmental funds.

Best practice checklist in the development of State Programs:

Coverage expansion is just one of the objectives states need to consider when establishing a Broadband Program. While this paper primarily focuses on approaches related to Coverage Expansion, states also need to consider initiatives that go beyond technology deployment. The following are steps and processes to take into consideration when establishing a comprehensive State Broadband Program:

- Determine the components and objectives for the Program
    - Broadband coverage expansion, including to small businesses and anchor institutions
    - Affordable rates, digital equity, low-income support
    - Broadband use, training, and support ("digital literacy")
- Identify initiatives, processes, data requirements, and timeframe
- Identify potential funding sources and requirements
- Review state policies and identify requirements to support Program
- Consider joining consortium of States

    - Share best practices from state work so far, build a private community to connect the teams of different states so they can help each other.
- Identify requirements and create internal program information, such as
    - Project-supporting mapping applications
    - Data portals
    - Analytic requirements, tools, and users
- Identify requirements and create consumer information, such as
    - Public facing mapping applications
    - Information portal (Open-Source data portal and library)
    - Service lookup tools – e.g., I type my address and find who provides service and at what rates.
    - Adoption and use programs development/advisory
    - Broadband Marketplace development and implementation
        - Contains single stop for program information
        - Allows for potential of connecting supply with demand

Optimizing Coverage Expansion:

As background, with the ever-increasing demand growth, broadband providers have diligently been upgrading portions of their networks to provide more ubiquitous and higher speed services. In many areas, high speed networks, capable of gigabit broadband speeds, have been deployed. However, many areas still remain without access to affordable and robust broadband. The question we are now faced with is, are we, as a state, prepared to make sure all citizens have access to this essential service.

Well informed decisions always include a look into the future far enough to ensure that the investments that are made in the near term are sufficient to meet forthcoming demand. As an analogy, wise transportation project planning is based not just on current needs but also projected growth. It is a reasonable assumption that, as has been the case for the last two decades, future needs for broadband network performance will continue to grow well into the future. Indeed, practical uses of broadband technology will move beyond what we can even envision today. However, we know enough about bandwidth need trends to say with reasonable certainty that bandwidth requirements are growing exponentially. Existing and upcoming use scenarios (such as the growth in IoT and the potential for autonomous driving) indicate that it would be foolish to ignore these forthcoming demands. Gigabit speeds will likely be the expected standard for both fixed and mobile broadband solutions in the not-to-distant future. What will achieving these speeds cost in real dollars? Equally important, what will be the lost opportunity costs from not achieving those speeds?

For States interested in expanding robust broadband coverage, the following provides a checklist of important items to consider/incorporated into the Program.

1. Determine what unserved means
    a. Definition
        i. Review policy implications of unserved versus underserved concepts and definitions
        ii. Identify Tech-type capabilities: data speeds, symmetric capabilities, latency
        iii. Understand Practical uses by speed tier

iv. Other considerations: uptime/availability, long-term resiliency (e.g., emergencies and natural disasters), future scalability

b. Understand long term policy regarding continual improvement
    i. Bandwidth consumption forecasting

2. Determine who is unserved (i.e., Service availability determination)
    a. Establishment of best practices
    b. Dedicated ISP data collection programs
        i. Depending on what the "portal" looks like for filing the coverage polygons at the federal level, we might consider combining the state-level data collection and DODC requirements to promote consistency of coverage reporting
    c. Technology Availability Estimation Data as interim step to coverage and to review DODC data when available (needs refinement by state)
3. Clearly map state areas of broadband coverage gaps, and make sure that reality is included in new federal maps used for funding awards
    a. Review/integrate FCC DODC (and legacy 477) and/or NTIA NBAM process
    b. What should be filed
    c. Process for challenging and commenting on challenges from others
    d. Process to integrate the selected data into state efforts
4. Develop state strategy vis-a-vis federal broadband policy opportunities, including direct broadband funding and supporting legislative and regulatory initiatives
    a. Assess current landscape of existing programs and new proposals
    b. Develop advocacy strategy (coalitions; other influencers/stakeholders; legislative, executive, regulatory)
    c. Identify priority federal opportunities and develop state strategies to augment/complement
    d. Assess the viability of technology options along all relevant performance dimensions, including speed, scalability, resiliency, and future-proof profile Efficient deployment scenarios for funding programs
    e. Scalability and future-proofing advisory
        i. Potential prioritization of build out phases (highest impact spends for early optics)
5. Analyze state-specific financial requirements for achieving state broadband coverage goals
    a. Determine the 'cost' of the program, including the identification of cost for unserved by technology type and suggested technology (per above)
    b. Determine who pays to understand the size of the program and what the Feds Pay, the states pay, local municipalities, and the carriers.
    c. Consider impact of Federal programs and funds
    d. Business Case Analysis by community
        i. Consumer/retail adoption potential
        ii. Business/enterprise potential
        iii. Carrier/wholesale potential (including wireless fronthaul and backhaul)
        iv. Demand subsidies: e-Rate, Lifeline, rural healthcare, new support programs
        v. Competitive providers (if any): facilities available, supported services and prices

vi. New provider potential: electric providers, municipalities, new competitive telecommunication providers, areas of potential new investment/expansion by existing providers
vii. Estimated capital requirements
viii. Projected full business case, including financing requirements

6. Identify features in the rollout that incorporate broader state policy preferences for technology deployment, such as
    a. Open Access, Dark Fiber, Public-Private Partnership structures, ownership
    b. Middle mile / transport networks
    c. Affordable rate policies
    d. State infrastructure assets (rights of way, siting, existing communications networks)
    e. Smart cities
    f. Role of anchor institutions: state and local facilities, universities, schools, libraries
    g. Utility regulatory models, including on adjacent sectors such as electric power
7. Obligations of providers participating in state program
    a. Relationship to federal obligations (e.g., faster deployment, higher performance)
    b. State administration/reporting/enforcement model for state-specific obligations
8. Provider/funding participant outreach and evangelism
    a. Tailored to different kinds of providers, including incumbents and new entrants: larger carriers, small/rural carriers, electric co-ops, WISPs, municipalities
    b. Information gathering from private capital providers: what attributes of state program would maximize amount / minimize cost of project funding in excess of direct federal and state subsidy
    c. Technical support program for new entrants/geographically expanding providers: mapping, business case modeling, legal/regulatory, technical/engineering
9. Create the incentive program to award funds (additional detail on this step is provided in the next section)
    a. Grants, auction, loans, etc.
10. Implement and manage the program
    a. Program management automation
    b. Validation and Verification of build
    c. Audit of services and obligations
    d. Broadband Program Viewer
        i. Data layers
            1. Locations
            2. Deployment
            3. Service availability
    e. Crowd Source Data
        i. Availability feedback
        ii. Pricing info
        iii. Demand identification and aggregation

Incentive Programs

Structurally, direct incentive awards can be provided as an upfront cash grant, or as annual funding amounts over a specified timeline through mechanisms such as Revenue Guarantees, Tax Credits, and/or operational cost funding guarantees. In addition, indirect support for financing in the form of loan guarantees or loan loss reserve funds can amplify the impact of direct award programs by reducing the cost of capital for projects. Conceptually, in an efficient and competitive bidding program with full knowledge of the future outcomes, the approaches should have the same net present value of funding requirements. That is, if the funding is meant to provide an attractive IRR, both types of mechanisms operate to make projects reach acceptable net present value of present and future cash flows. However, each achieves this goal with different profiles, noted below in the sub-sections.

With either the lump sum or funding over time, additional options and incentives can be included such as coordinated bidding, leveraging existing assets, local matching support, state regulatory streamlining or exemptions, and contributions-in-aid of construction to entice providers to bid in Program's target areas. Similarly, indirect financing support programs such as loan guarantees can broadly improve the performance of any combination of direct funding plus additional incentives, and they also can be targeted to specific types of providers or projects. There are various options at the governmental entity's disposal. However, it is important to understand that overall state-wide unserved areas typically will attract interest from a very large and diverse group of providers or potential providers, with wide ranging business models, financial positions, tax liabilities, service territories, and overall size of their respective operations. It is crucial to the Program's success to offer an incentive(s) that appeals to all or at least a large share of this provider base.

The following provides an overview of potential incentive programs.

Reverse Auctions

The most straightforward way that an Expansion Program can offer support for broadband buildout is through a Reverse Auction that provides direct cash grants for winning bidders. These programs typically provide some or all of a project's capital requirements in exchange for specific deployment obligations to expedite network build outs. In addition, these programs can be set up such that grants are directly tied to participant invoices for the network buildout. As such, there is a verifiable and auditable method to show that government funds were spent appropriately. An alternative to direct cash grants is a Reverse Auction of periodic subsidies, such as those used in the FCC's CAF and RDOF programs. These subsidies are meant to cover the revenue shortfall expected from deployments in areas that will likely not be economically viable. These subsidies are similar to Revenue Guarantees, covered later.

Under either Reverse Auction alternative, to the extent that there is insufficient funding to cover all unserved areas with the funds available, a relevant question becomes how best to integrate or coordinate other funding mechanisms with the grant. This obviously will increase the complexity of administering the program over one with a single funding mechanism. The following are options for support to supplement the core grant mechanism.

Coordinated bidding with other funding or procurement opportunities

To leverage multiple opportunities whose goals are intertwined, both the Program and the entity with which it is coordinating should consider running a bidding process in the same timeframe. Respondents who are responding to more than one funding opportunity can submit both "stand-alone" and "dependent" bids (bids that assume they get both awards). Other program funding mechanisms can include:

- State/local opportunities
- Regional funding programs
- E-rate
- Rural Healthcare
- USDA ReConnect programs
- FCC's RDOFII
- FCC's Mobility Fund including the 5G Fund
- E-911 programs
- USDA RUS Programs

Due to federal rules, the procurement windows from E-rate and Rural Healthcare are roughly 1Q of each year. In a number of states, state-wide consortia help coordinate overall state funding requests on behalf of individual local entities.

An issue to be aware of is that each opportunity may require additional constraints on the program that can impact Expansion Program goals.

Incentives other than straight cash grant

To the extent that the governmental entity cannot provide all of its support in the form of a straight cash grant, other types of funding may be offered in the auction. Applicants would need to indicate under which type(s) of incentives that they would be willing to receive assistance, and a multiplier to create an equivalent between straight cash grants and other forms of incentives. Example of these alternative incentives could include:

- Payment from State Education/Transportation/Health/Safety departments in exchange for Expansion Program services/benefits
- Revenue guarantees
- Tax Credits

Assets service providers may be allowed to use or buy at discount

The following are examples of assets or networks that the governmental entities may be able to offer to companies expanding broadband. The availability of these incentives need not be tied exclusively to participation in the Expansion Program, but their availability may enable bidders to participate or bid more cost-effectively.

- Government Towers
- Government dark fiber
- Governmental Networks

- Rights-of-way

Governmental Policies

In addition to funding programs and potential use of governmental assets, government entities can institute programs/policies to reduce the cost of broadband deployment, remove or lessen the obstacles to broadband deployment, identify anchor tenants that help provide guaranteed revenue, consider alternative funding approaches, and/or encourage broadband adoption to maximize the revenue potential.

Items to consider to reduce the cost of broadband deployment include:

- Simplified and expedited permitting
- Access to government assets
- Consideration of open/equal access
- Build policies (e.g., build once, conduit deployment with road construction, etc.)
- Authorization of public construction and ownership of broadband networks, such as by municipalities, counties, or other sub-state level jurisdictions

Items to consider to remove hurdles include:

- Simplified and defined pole attachment and make ready costs
- Simplified and defined conduit rental and make ready costs
- Defined permitting requirements and considerations, focused on simplification and promptness
- Governmental databases that identify the owner, rates and access to infrastructure (e.g., poles, conduits, etc.)
- Simplified and defined environmental considerations

Items to consider for anchor tenants include:

- Schools and libraries (including higher education)
- Governmental institutions
- Business partners

Items to consider for alternative funding approaches include:

- Property Tax assessments
- Government ownership with open/equal access

Items to consider for broadband adoption include:

- Education programs
- Joint advertising
- Subsidized consumer equipment

Fall-back / alternative options

In areas where grant funding fails to procure participants, there are Expansion Program alternatives to deploy grant funding. These options could be deployed by re-directing funds outside of the auction mechanism after at least one bidding round establishes that they are going to be more cost-effective.

- Cable line extension Contribution-in-Aid-of-Construction (CIAC)
- Matching local or coop applications for federal grants

Revenue Guarantees

With a Revenue Guarantee, the Expansion Program or a local partner would, in lieu of offering a fixed amount of grant funding, offer to ensure that a broadband provider realized at least a certain level of revenue required to economically sustain the network. These programs do not incent expedited build out but rather they support the build out that the provider's limited capital can support. In addition, it is more difficult with these programs to establish a link between state expenditures and identifiable needs of the provider. Establishing and evaluating a revenue guarantee is more complex, as it requires evaluating how much funding is required not just up front, but over time, and it requires more ongoing administration.

A revenue guarantee may take the form of a base commitment by the public partner to purchase a certain amount of services or provide a recurring level of subsidy. The former is really a form of "coordinated procurement opportunity." The latter is really like a straight grant that is paid out over time. Alternatively, the revenue guarantee may be variable, and kick in to partially or fully make up a revenue shortfall only when revenue from customers does not meet a certain expected level.

Revenue guarantees hold out the possibility that the subsidy required could be less than a fixed grant payment if customer revenues exceed expectations. However, conversely, it could be more costly if revenues underperform expectations. The Expansion Program could cap the amount of downside support and/or mitigate its size by only partially making up the shortfall. Both of these measures, however, make the incentive somewhat less attractive to the recipient. In either case, however, the governmental entity or a local partner may not know the exact size of its future obligations and may need to either reserve a pool of funds larger than will ultimately be needed or be prepared to raise additional revenue if the guarantee calls for it.

A revenue guarantee may also have different tax implications than a grant to reimburse capital expenses. A revenue guarantee may be taxable income in instances where a reimbursement of capital expenses is not, thereby diluting the power of the incentive.

A revenue guarantee may be more attractive to some entities than others. In particular, it may be attractive to entities that are in the business of financing broadband infrastructure in a public-private partnership, where the guaranteed revenue stream reduces the risk to the investors.

For last-mile broadband projects, revenue guarantees may be better suited to projects structured at the local level instead funded through a reverse auction the State level, where the local partner, not the governmental entity offers the revenue guarantee. The guarantee would reflect a level of "willingness-to-pay" by the population being served, primarily through subscription revenue, but if that is insufficient, ensuring that the burden of raising the additional revenue needed to support the funded network is broadly shared. End users

have some assurance that, the more broadly customers choose to sign up, the lower the subsidy the community will need to raise. A related concept is the use of property tax assessments to cover the subsidy requirement.

Tax Credits

Offering tax credits instead of grant funds would be attractive only if it is possible to make money available through a tax credit mechanism, but not through raising an equivalent amount of money for grants. The prime limitation of tax credits is that they only provide help to entities that have a sufficiently large governmental tax liability, which limits the companies with which the program can work and therefore make it more difficult or expensive to find a solution in some areas.

This limitation can be overcome in a couple of ways, although they are more administratively complex than a straight grant program. First, the tax credit may be made refundable, which essentially acts like a grant administered through the government's Tax Department. Second, the tax credit could be offered to investors other than the entity building the broadband network, investors who do have a tax liability. To illustrate, the Expansion Program could offer to assign the tax credit to an investor (for example, a bank), who agrees to provide funding to a qualified broadband project (without an expectation that this investment will be returned, except in the form of the tax credit). Although it overcomes the limitation of needing to have a tax liability, this mechanism is administratively complex to administer, would need to be "sold" to both investors and recipients, and may not be attractive to all recipients.

Loan Guarantees and Loan Loss Reserve Funds

From a cost of financing point of view, ideally broadband networks would be financed using similar approaches to other long-lived, essential forms of infrastructure such as roads, water treatment plants, and electrical distribution networks. However, unlike such obvious "natural monopoly" forms of infrastructure – which easily lend themselves to traditional public financing approaches such as public bonds backed by the taxing authority of state or local governments – broadband networks have been traditionally viewed as competitive commercial undertakings and, crucially, are not viewed as classic public utilities to be directly backed by governmental revenue guarantees.

On the flip side, unlike transportation, power, and water, broadband communications retain an intrinsic growth potential as not only new underserved customers are connected but also as usage per customer continues to grow at a far higher rate. The potential for attractive project returns from intrinsic revenue growth over time remains an important driver of financing support for broadband networks across the county. However, in rural areas with lower customer densities, the financing challenge remains significant.

One approach to reducing financing costs by providing a similar level of risk protection to that seen in classic infrastructure projects such as roads, power, and water is the use of state loan guarantees or loan loss reserve funds. Importantly, such guarantees can reduce risk levels for the early years of a broadband project, during which significant capital must be invested in construction prior to the on-boarding of customers and revenues. Importantly, state funds serve only as a loss protection rather than direct expenditures and therefore can serve a multiplying effect in stimulating the formation of significant levels of private capital, especially in combination with other direct forms of support as outlined above.

Note that new federal infrastructure legislation proposals currently include up to $5 billion in federal loan guarantees to be administered by the U.S. Commerce Department; if enacted, such federal support could amplify state efforts for projects that are structured to maximize total federal and state financing support opportunities.

State Infrastructure Banks

An additional state effort to support any of these broadband programs is a State Specific Infrastructure Bank. These state infrastructure banks can finance public infrastructure and private development that contribute to the state's economy and improve the overall quality of life for the State's citizens. The state infrastructure bank should be created to have broad authority to interact with and support the States Broadband Expansion Program. This authority can include the ability to issue tax-exempt and taxable revenue bonds, provide financing to public agencies, provide credit enhancements, acquire or lease facilities, and leverage State and Federal funds.